

# NW Rota-1 2009 Cruise Report

**R/V Thomas Thompson Cruise TN-232**

**April 3 – 17, 2009**

**Guam – Guam**

**JASON Dives J2-396 to J2-412**

**Chief Scientist: William Chadwick**

**R/V Thompson Captain: Alan McClenaghan**

**JASON Expedition Leader: Tito Collasius**

**Cruise report prepared by: Andra Bobbitt**



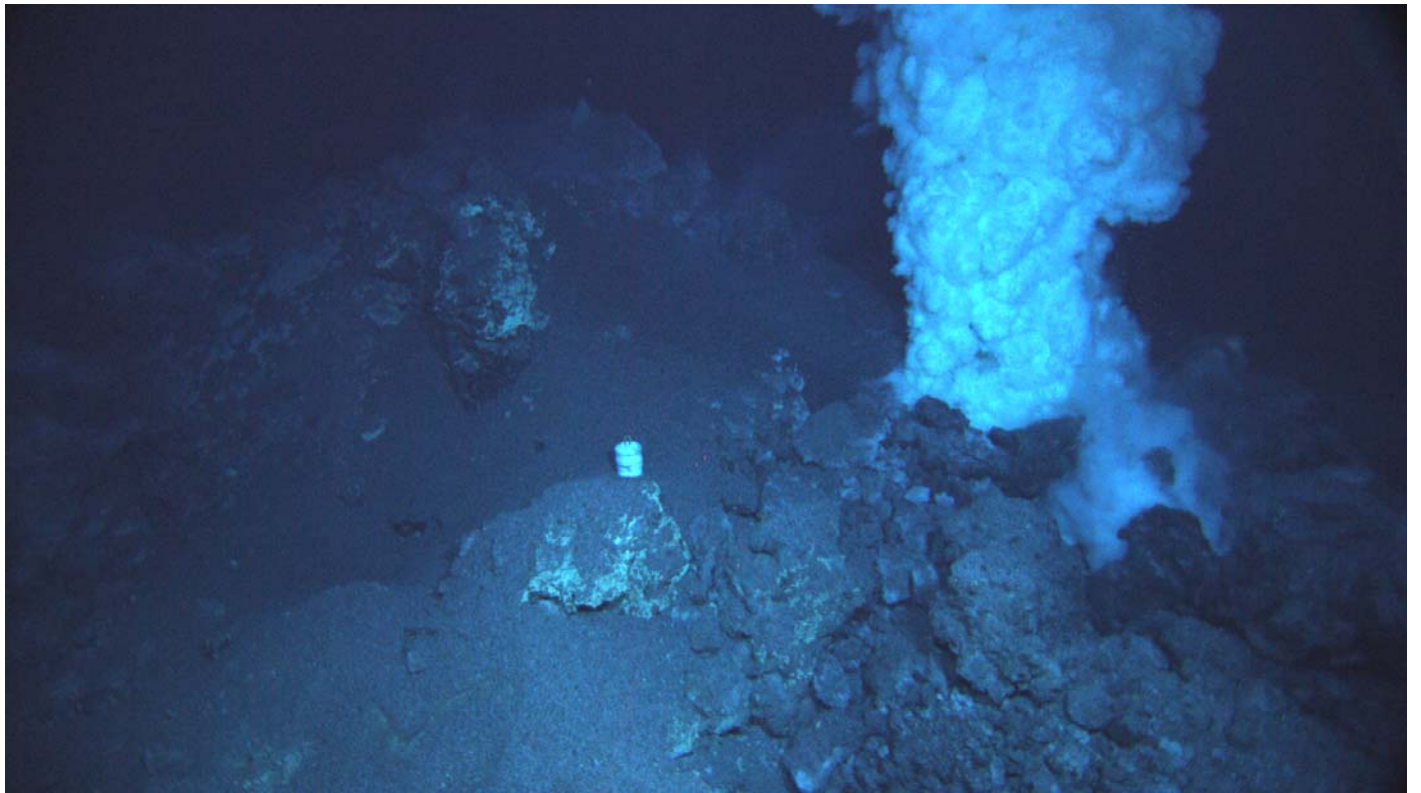


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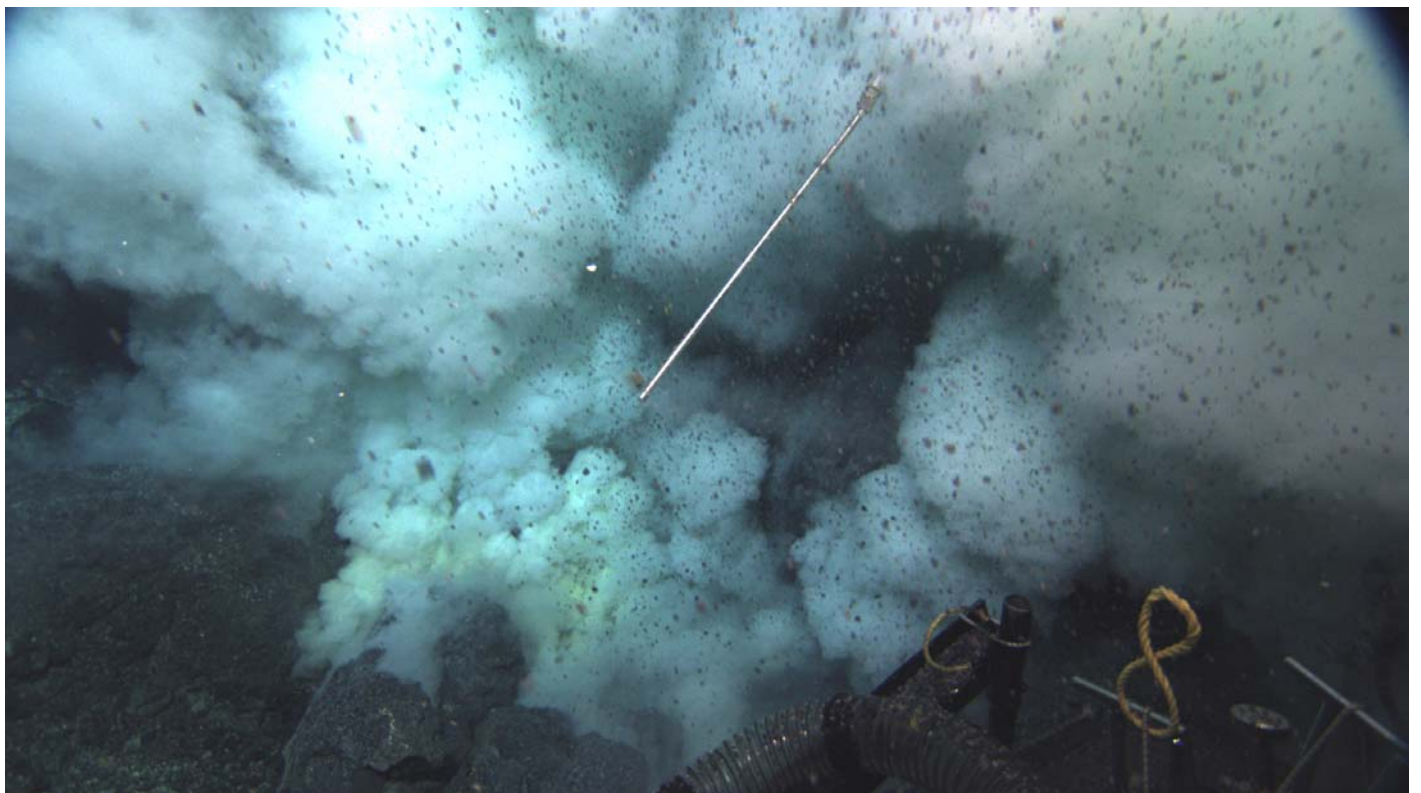
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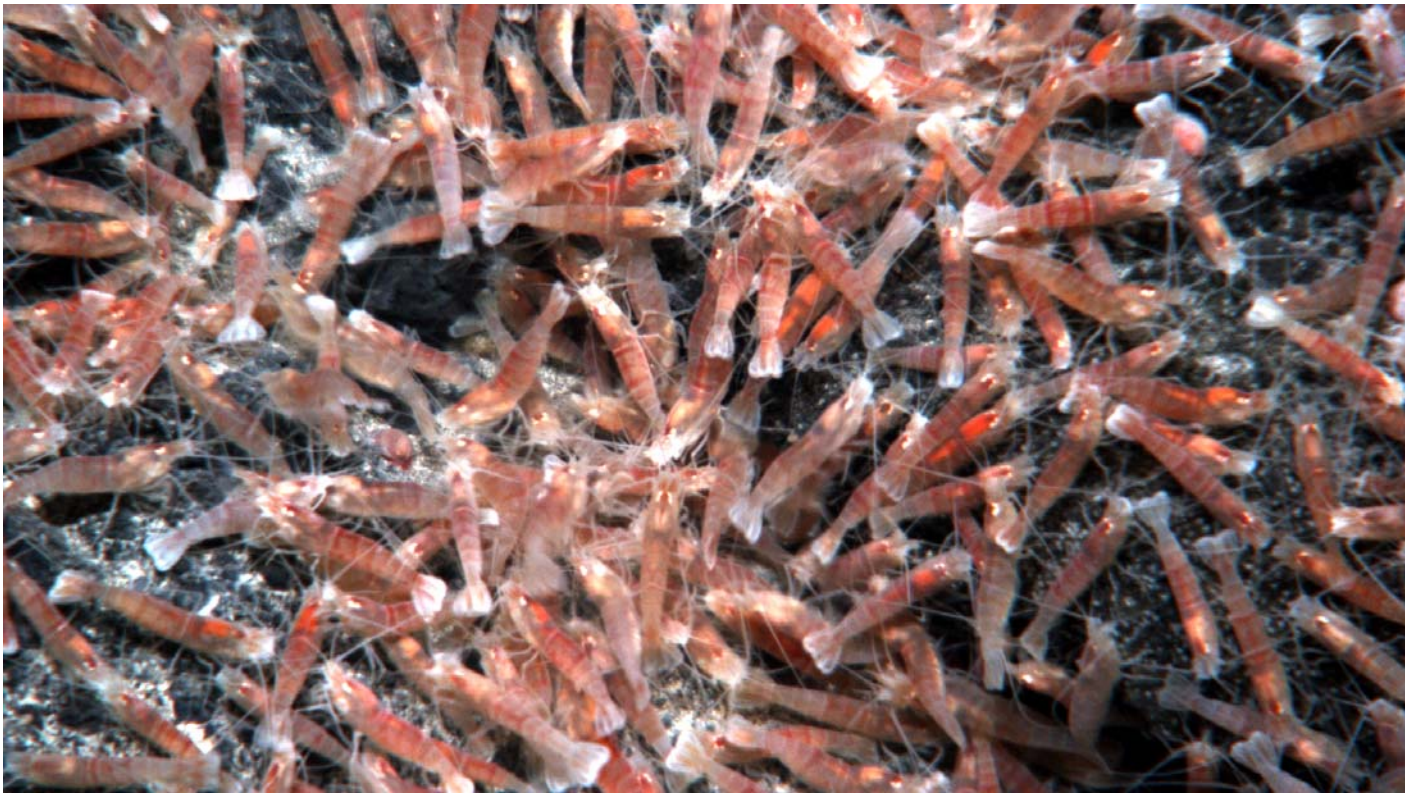
## Image Highlights



View of Brimstone vent with eruption plume and tephra sampler.



Fluid sampling at Brimstone vent during ash fall.



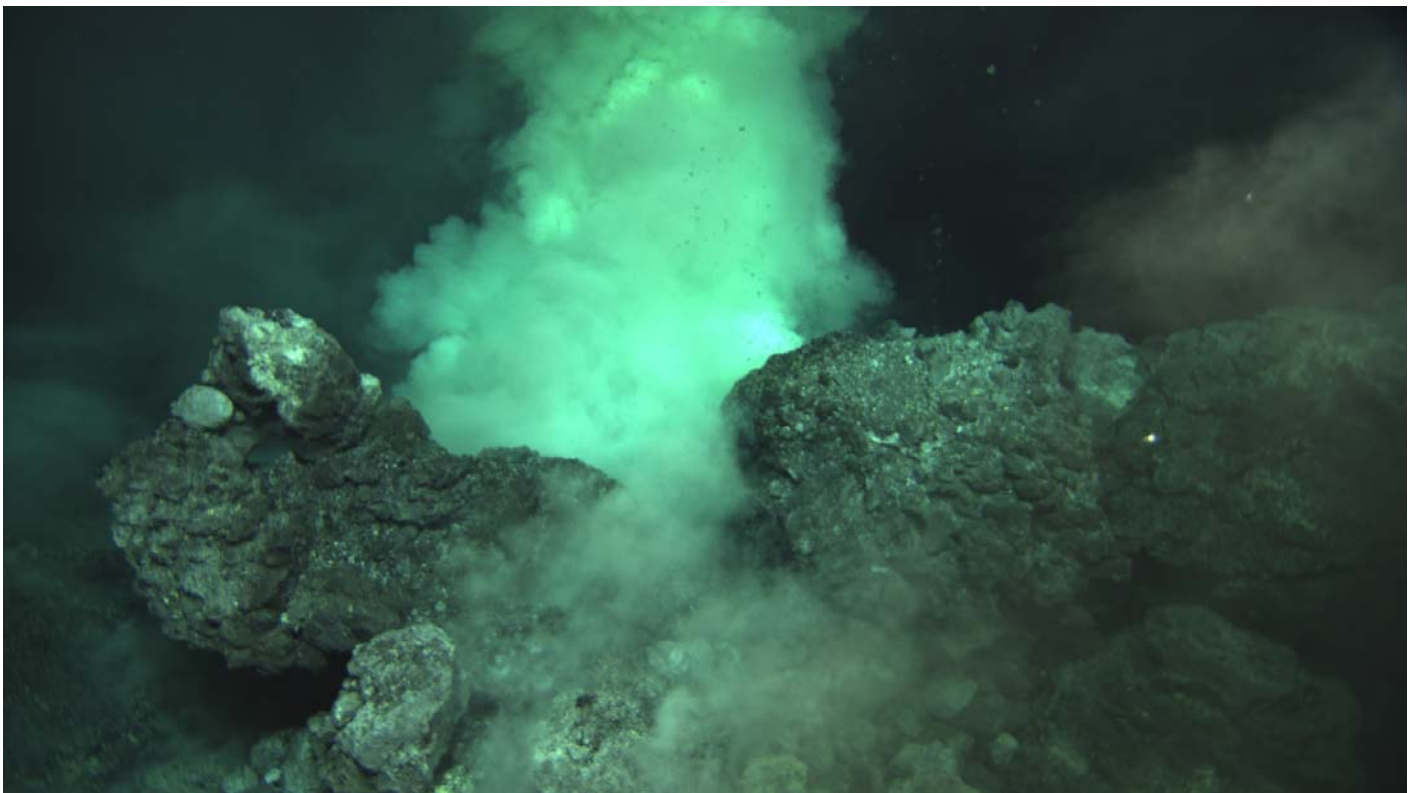
"Loihi" shrimp congregated at diffuse vent near Marker 109.



Close-up of Alvinocaris shrimp near Marker 109.



CO<sub>2</sub> and SO<sub>2</sub> degassing during eruption at Brimstone vent.



Lava blocks in foreground were split in half during slow lava extrusion.

## 1.0 Expedition Summary

This expedition to NW Rota-1 volcano in April 2009, funded by the US National Science Foundation, is a follow-up to the discoveries made at this erupting submarine volcano during previous brief visits in 2004-2006. The goals of this two-year project include making longer-term observations by ROV and autonomous instruments, as well as collecting more comprehensive geological, chemical, and biological samples from this unique site. Using this new information will allow us to build a better understanding of the range of activity at this site and to document its impact on the surrounding ocean and the biological community at the volcano summit.

This cruise report outlines preliminary results from the expedition and is a detailed record of the operations at sea. Our first year was a great success largely due to the diverse contributions from everyone in the science party, the hard work of the Jason ROV team, and the great support from the captain and crew of the R/V Thompson. The dynamic activity at NW Rota-1 makes this an extraordinary natural laboratory for the study of submarine eruptions. It seems we are almost guaranteed to find something new and exciting on every visit.

## 2.0 Operations Log

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
4/3/2009	8:10	4/2/2009	22:10	R/V Thompson departs Guam
	8:41		22:41	EM300 start logging (line 1)
	9:01		23:01	Start of EM300 Survey 1; waypoint 1
	9:41		23:41	EM300 stop logging (line 1)
	9:41		23:41	EM300 start logging (line 2)
	9:59		23:59	EM300 waypoint 2
	10:41	4/3/2009	0:41	EM300 stop logging (line 2)
	10:41		0:41	EM300 start logging (line 3)
	11:41		1:41	EM300 stop logging (line 3)
	11:41		1:41	EM300 start logging (line 4)
	12:29		2:29	EM300 on line 4
	13:35		3:35	Heading to CTD site
	13:53		3:53	CTD test. EM300 stopped logging (line 4)
	15:10		5:10	CTD back on deck.
	15:25		5:25	EM300 start logging (line 5)
	15:45		5:45	XBT.
	15:48		5:48	EM300 stop logging (line 5 during XBT swap.)
	15:50		5:50	EM300 start logging (line 7)
	17:07		7:07	EM300 stop logging (line 7); heading to transponder deployments.
	18:00		8:00	Deploying/calibrating 5 transponders.
	20:00		10:00	Finished transponder surveys.
4/4/2009	0:43		14:43	Ship heading to Waypoint 2A for NW Rota EM300 survey
	1:17		15:17	EM300 start logging (line 8)
	2:19		16:19	End EM300 line 8; start turn.
	2:25		16:25	EM300 stop logging (line 8)
	2:34		16:34	EM300 start logging (line 9)
	3:43		17:43	EM300 stop logging (line 9)
	3:53		17:53	EM300 start logging (line 10)
	4:55		18:55	EM300 stop logging (line 10)
	5:07		19:07	EM300 start logging (line 11)
	6:08		20:08	EM300 stop logging (line 11)
	6:21		20:21	EM300 start logging (line 12)
	7:23		21:23	EM300 stop logging (line 12); end NW Rota survey
	8:24		22:24	CTD T09B-01 start
	13:49	4/4/2009	3:49	CTD T09B-01 end.
	15:00		5:00	Plankton Tow Net09Rota-01 (300m)
	16:17		6:17	<b>J2-396 Dive at Brimstone; JASON in water.</b>
4/5/2009	8:15		22:15	<b>J2-396; JASON on deck</b>
	9:37		23:37	CTD T09B-02 start.
	15:49	4/5/2009	5:49	CTD T09B-02 end.
	16:34		6:34	<b>J2-397 dive at Brimstone; JASON in water</b>
	17:52		7:52	<b>J2-397 end due to hydraulic leak in arm; on deck</b>



Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
	19:13		9:13	CTD V09B-01 start.
	20:25		10:25	CTD V09B-01 end
	21:00		11:00	Plankton Tow Net09Rota-02; new hydrophone site (550m)
	23:34		13:34	<b>J2-398 dive start; JASON in water.</b>
4/6/2009	8:19		22:19	<b>J2-398 dive end; JASON on deck.</b>
	9:00		23:00	Recovering 2 transponders (east side of summit)
	10:55	4/6/2009	0:55	CTD V09B-02 start.
	12:11		2:11	CTD V09B-02 end.
	13:17		3:17	CTD V09B-03 start.
	14:32		4:32	CTD V09B-03 end.
	15:30		5:30	Plankton Tow Net09Rota-3; (600m)
	18:33		8:33	<b>J2-399 SM2000 mapping dive; JASON in water.</b>
4/7/2009	10:41	4/7/2009	0:41	<b>J2-399 end; JASON on deck</b>
	11:20		1:20	CTD T09B-03 start.
	16:07		6:07	CTD T09B-03 end.
	17:00		7:00	Plankton Tow Net09Rota-4; (600m)
	18:06		8:06	CTD V09B-04 start
	18:39		8:39	CTD V09B-04lost on recovery.
	19:33		9:33	<b>J2-400; JASON in water</b>
	8:47		22:47	<b>J2-400 aborted; JASON on deck</b>
4/8/2009	9:00		23:00	Heading to EM300 survey
	9:50		23:50	EM300 start logging (line 13)
	10:29		0:29	EM300 stop logging (line 13)
	10:29		0:29	EM300 start logging (line 14)
	10:32		0:32	EM300 stop logging (line 14)
	10:32	4/8/2009	0:32	EM300 start logging (line 15)
	11:50		1:50	EM300 end survey
	12:21		2:21	EM300 stop logging (line 15)
	12:21		2:21	EM300 start logging (line 16)
	12:26		2:26	EM300 stop logging (line 16)
	12:26		2:26	EM300 start logging (line 17 back toward NW Rota)
	13:44		3:44	EM300 stop logging (line 17)
	13:45		3:45	EM300 logging (line 18)
	14:26		4:26	EM300 stop logging (line 18)
	15:00		5:00	Plankton TowNet09Rota-5; (600m)
	16:45		6:45	Plankton TowNet09Rota-6; (600m)
	18:37		8:37	CTD V09B-05 start.
	19:18		9:18	CTD V09B-05 end.
	19:46		9:46	<b>J2-401; JASON in water</b>
	8:57		22:57	<b>J2-401; JASON on deck</b>
4/9/2009	10:46	4/9/2009	0:46	CTD T09B-04 start
	15:37		5:37	CTD T09B-04 end.
	16:45		6:45	Plankton Tow Net09Rota-7; (600m)
	18:03		8:03	CTD V09B-06 start.
	18:52		8:52	CTD V09B-06 end.
	19:52		9:52	<b>J2-402; JASON in water</b>
	8:20		22:20	<b>J2-402: JASON on deck</b>
4/10/2009	9:20	4/10/2009	23:20	CTD V09B-07 start
	11:08		1:08	CTD V09B-07 end.
	12:30		2:30	Plankton Tow Net09Rota-8; (600)
	13:30		3:30	CTD V09B-08 start.
	14:42		4:42	CTD V09B-08 end.
	16:31		6:31	<b>J2-403; JASON in water</b>
	8:12		22:12	<b>J2-403; JASON on deck</b>
4/11/2009	9:04		23:04	CTD V09B-09 start.
	10:21	4/11/2009	0:21	CTD V09B-09 end
	11:32		1:32	CTD V09B-10 start.
	12:55		2:55	CTD V09B-10 end.

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
	13:50		3:50	Plankton Tow Net09Rota-9; (600m)
	15:00		5:00	Plankton Tow Net09Rota-10; (600m)
	17:38		7:38	<b>J2-404 dive; JASON in water</b>
	19:12		9:12	<b>J2-404 aborted (HFS problem); JASON on deck</b>
	19:41		9:41	<b>J2-405 dive; JASON in water.</b>
	8:14		22:14	<b>J2-405; JASON on deck.</b>
4/12/2009	8:42		22:42	CTD V09B-11 start
	10:14	4/12/2009	0:14	CTD V09B-11 end.
	11:19		1:19	CTD V09B-12 start.
	12:17		2:17	CTD V09B-12 end.
	13:30		3:30	Plankton Tow Net09Rota-11; (600m)
	15:00		5:00	Plankton Tow Net09Rota-12; (600m)
	15:14		5:14	CTD V09B-13 start.
	15:43		5:43	CTD V09B-13 end.
	16:32		6:32	<b>J2-406 dive; JASON in water.</b>
	8:02		22:02	<b>J2-406 dive; JASON on deck.</b>
	9:03		23:03	CTD T09B-05 begin.
	14:01	4/13/2009	4:01	CTD T09B-05 end.
	16:14		6:14	<b>J2-407 dive; JASON in water.</b>
	8:12		22:12	<b>J2-407 dive; JASON on deck</b>
4/14/2009	9:45		23:45	Plankton Tow Net09Rota-13; (600m)
	10:35	4/14/2009	0:35	CTD V09B-14 start.
	11:10		1:10	CTD V09B-14 end.
	12:30		2:30	Plankton Tow Net09Rota-14; (600m)
	14:03		4:03	CTD V09B-15 start.
	14:57		4:57	CTD V09B-15 end.
	16:56		6:56	<b>J2-408 (Deep Dive); JASON in water</b>
	8:22		22:22	<b>J2-408; JASON on deck</b>
4/15/2009	9:35		23:35	Deploying 1000m-mooring
	11:25	4/15/2009	1:25	Mooring released.
	12:30		2:30	Deploying 1500m-mooring
	14:00		4:00	Mooring released.
	16:01		6:01	<b>J2-409; JASON in water</b>
	16:42		6:42	<b>J2-409 (aborted to HD leak); JASON on deck</b>
	16:57		6:57	<b>J2-410; JASON in water</b>
	21:49		11:49	<b>J2-410; JASON on deck</b>
	23:04		13:04	<b>J2-411; JASON in water</b>
	8:13		22:13	<b>J2-411; JASON on deck</b>
4/16/2009	9:00		23:00	RAS deployment
	10:30	4/16/2009	0:30	RAS released
	11:00		1:00	Recovering transponders.
	12:45		2:45	Finished transponder recovery.
	13:50		3:50	CTD V09B-16 start.
	14:48		4:48	CTD V09B-16 end.
	16:00		6:00	<b>J2-412; JASON in water</b>
4/17/2009	0:08		14:08	<b>J2-412; JASON on deck</b>
	08:00		22:00	R/V Thompson arrives in Guam

### 3.0 Cruise Participants

#### 3.0-1 Scientists:

Scientist	Affiliation	Expertise
<b>William Chadwick</b> (Chief Scientist)	Oregon State University	Geology
Kathy Cashman	University of Oregon	Geology
Robert Embley	NOAA/PMEL	Geology
Dave Butterfield	University of Washington	Vent fluid chemistry
Verena Tunnicliffe	University of Victoria	Biology
Cornel de Ronde	GNS Science	Geology
Koichi Nakamura	AIST	Geochemist
Kevin Roe	University of Washington	Vent fluid chemistry
My Christensen	University of Washington	Vent fluid chemistry
Sharon Walker	NOAA/PMEL	Plume mapping
Nathan Buck	University of Washington	Plume mapping
Sheryl Bolton	University of Victoria	Microbiology
Susan Merle	Oregon State University	Data management
Andra Bobbitt	Oregon State University	Data management
Nick Deardorff	University of Oregon	Geology
Heidi Berkenbosch	GNS Science	Geology
Leigh Evans	Oregon State University	Gas geochemistry
Ron Greene	Oregon State University	Gas geochemistry
Eric Olson	University of Washington	Gas geochemistry
Evan Kovaks	WHOI	HDTV tech
Nick Delich	NOAA/PMEL	Mooring tech

#### 3.0-2 R/V Thompson crew:

R/V Thompson	Position
<b>Alan McClenaghan</b>	Captain
John Wilson	Chief Mate
Paul Logan	2nd Mate
Ian Maury	3rd Mate
Terrence Anderson	Chief Engineer
Mark Johnson	1st Engineer
Christina Aguiar	2nd Engineer
David Bartell	3rd Engineer
Dan McBriar	Chief Steward
Tony Balbon	2nd Cook
Terence Singerline	Mess Attendant
Tony Burke	Marine Technician
Chase Stoudt	Marine Technician
Brian ClamVentt	AB
Lawrence Mezzano	AB
David Philbrick	AB
Gary Ramos	AB
Pamela Blusk	AB
Scott Moore	AB
Michael Henderson	Oiler
Russell Rowley	Oiler
Mario Yordan	Oiler
Kimberly Gardner	Wiper

#### 3.0-3 JASON Team:

JASON Team	Affiliation
<b>Tito Collasius</b> (JASON leader)	WHOI/NDSF
Will Handley	Contractor
Scott Hansen	Contractor
Bob Hess	WHOI/NDSF
Jon Howland	WHOI/NDSF
Scott McCue	WHOI/NDSF
Dara Scott	Contractor
Ben Tradd	WHOI/NDSF
Korey Verhein	WHOI/NDSF
Bob Waters	Contractor

## 4.0 Discipline Summaries

### 4.1 Geology

#### 4.1.1 Volcanology and Seafloor mapping

*Kathy Cashman, Bill Chadwick, Bob Embley, Nick Deardorff*

##### *Objectives for the cruise:*

Our primary objective for this cruise was to learn more about the style of volcanic activity at NW Rota-1 volcano and to compare it to that of analogous volcanoes on land. Video observations and vent samples from the 2006 SRoF cruise showed that the magma eruption rate at NW Rota-1 was quite low, and suggested that eruptive activity was driven primarily by gas, that is, that the eruption style was best described as Strombolian. Therefore our specific plans for this cruise were to:

- Obtain video footage that would allow us to better characterize the behavior of the volcanic plume to provide information about rates of gas release;
- Obtain tephra samples from around the vent area, to provide estimates of mass accumulation rates, and to compare with the style of activity observed at the vent;
- Obtain a time-sequence of samples that would allow us to examine changes in groundmass characteristics (controlled by magma ascent and cooling rates) and magma interaction with seawater;
- Document morphologic changes at the volcano from the deposition of eruptive deposits and remobilization by landslide events, by resurveying at two different scales – from the ship with the Thompson's EM300 multibeam sonar, and from the ROV with Jason's SM2000 multibeam sonar;
- Collect hydrophone recordings during the ROV dives, so that the visual observations at Brimstone vent can again be compared with near-field acoustic data, as we did in 2006.

##### *What we accomplished:*

We were able to observe activity at Brimstone vent during 10 of the 12 dives. These observations showed that during our two weeks at NW Rota-1, the activity ranged from low level fuming with associated hydrothermal activity to vigorous emissions of gas and tephra associated with lava effusion and growth of the cone around the vent. We have several long stable sequences of video footage that should provide sufficient coverage to make some plume measurements. However, the new observations of this cruise relate to the styles and rate of lava effusion, which we should also be able to document in great detail from the video footage.

The tephra samplers worked beautifully. In total, we collected 13 tephra samples. 10 of these were repeat collections from the same location a few meters west of the vent. The amount of tephra collected in these 10 samples (most of which were collected after approximately 24 hours) varies from an amount that was insufficient to cover the base of the sampler to enough to fill about 2/3 of the sample bucket. As the amount of tephra collected appear to correlate with the observed vigor of eruptive activity, our tephra samples should provide a record of eruptive activity that can be compared with the hydrophone data. The 3 additional samples were collected from points along the volcano's summit ridge; even these locations showed measurable tephra accumulation during the two weeks when they were deployed. For this reason, we left one sample bucket at the summit ridge, to be retrieved during a future cruise to NW Rota-1.

To supplement the tephra samples, we also obtained 8 scoop samples, 6 from near the vent on different days, and 1 each from the summit and from the tephra-blanketed north slope of the volcano. The summit samples differ significantly from those collected near the vent. Vent samples are composed of a mixture of black (fresh) and gray (altered) clasts of variable vesicularity. In contrast, samples from the summit and north slope are uniformly black and appear to be glassy and highly vesicular. We suspect that these samples record the more vigorous levels of volcanic activity. Additionally, we collected several samples of newly extruded lava. Lava samples collected early in the cruise contained incorporated altered material and sulfur; later erupted samples (during more active extrusion phases) tended to be more homogeneous, although many still showed evidence of successive 'lobes' of lava extrusion.

Three portable hydrophones were used this year at NW Rota-1 to record near-field acoustic data: two BProbes (the same kind as used in 2006) and a LARa hydrophone (recently developed by Holger Klink at OSU). The BProbe hydrophones were provided courtesy of Brandon Southall, the director of the NOAA Ocean Acoustics Program, National Marine Fisheries Service, in Silver Spring, MD. The BProbes were deployed one-at-a-time and programmed to record at 1024 Hz, whereas the LARa recorded at 44.1 kHz. Both types of hydrophones could record for about 4.5 days at these settings. A BProbe and a LARa were deployed together at the volcano summit (Marker 107) twice on a cement pad holder. Subsequently, one of the BProbes was deployed a third time alone without the cement pad. The

recording times for the hydrophones as well as the times when Jason was making video observations at Brimstone vent are provided in Table 4.1.1.-1. It should also be noted that a Haruphone hydrophone mooring was deployed west of the summit on February 4, 2009, by Bob Dziak and Joe Haxel (with the assistance of the US Coast Guard) and was presumably recording the entire time during this expedition. However, its data will not be available until the Haruphone is next recovered. These hydrophone data will give us a continuous record of the level of eruptive activity over time, which we will be able to related to our visual observations at the vent.

#### *New observations*

The volcano's activity in 2009 differed from that in 2006 in significant ways. The big surprise was that the activity manifested during this cruise was dominated by slow lava extrusion rather than explosive activity. We had some excellent opportunities to observe this process, which differs from analogous situations on land in the form of the extrusion (primarily lava spines and blocks rather than fluid flow lobes) and in the rapidity with which these spines disintegrated into blocks as they were forcefully shoved aside by new extrusions, eventually creating small rockfalls and debris slides down the sides of the cone. Other evidence for debris flow activity included plumes of fine material that were disturbed during each collapse event and subsequently wafted back upslope to the vent where we were observing most of the time. We conducted one deep dive (J2-408) that started at 1650 m, on the south flank, downslope of Brimstone vent and made several zigzag traverses upslope back to Brimstone. This dive confirmed that this area is a chute where debris from the vent has periodically remobilized downslope.

**Table 4.1.1.-1 Hydrophone deployments and observation periods at Brimstone**

Dive	Date	Start time	End time	Duration	Comments
J2-396	4-Apr	8:27	8:40	0:13	Brimstone observations #0
J2-396	4-Apr	9:13			<b>Deployed hydrophones (BProbe &amp; LARa) #1</b>
J2-396	4-Apr	9:24	10:43	1:19	Brimstone observations #1
J2-396	4-Apr	19:21	21:25	2:04	Brimstone observations #2
J2-398	5-Apr	14:36	17:40	3:04	Brimstone observations #3
J2-398	5-Apr		15:31		LARa hydrophone stopped recording
J2-401	8-Apr	10:45	12:30	1:45	Brimstone observations #4
J2-401	8-Apr	0:29	12:37		LARa hydrophone recording again
J2-401	8-Apr		13:35		BProbe hydrophone stopped recording
J2-401	8-Apr	20:53	21:02	0:09	Brimstone observations #5
J2-401	8-Apr	21:40	22:05	0:25	Brimstone observations #6
J2-402	9-Apr	10:24	13:08	2:44	Brimstone observations #7
J2-402	9-Apr		16:32		<b>Recovered hydrophones #1</b>
J2-402	9-Apr	19:54	21:31	1:37	Brimstone observations #8
J2-403	10-Apr	6:59	7:03	0:04	Brimstone observations #9
J2-403	10-Apr	10:26			<b>Deployed hydrophones (BProbe &amp; LARa) #2</b>
J2-403	10-Apr	10:51	15:47	4:56	Brimstone observations #10
J2-403	10-Apr	20:46	21:31	0:45	Brimstone observations #11
J2-405	11-Apr		15:28		LARa hydrophone stopped recording
J2-405	11-Apr	16:41	20:02	3:21	Brimstone observations #12
J2-406	12-Apr	10:05	10:31	0:26	Brimstone observations #13
J2-406	12-Apr	20:27	21:34	1:07	Brimstone observations #14
J2-407	13-Apr	8:11	16:14		LARa hydrophone recording again
J2-407	13-Apr	10:11	11:34	1:23	Brimstone observations #15
J2-407	13-Apr	21:21	21:38	0:17	Brimstone observations #16
J2-408	14-Apr		9:25		BProbe hydrophone stopped recording
J2-408	14-Apr	14:01	14:03	0:02	Brimstone observations #17
J2-408	14-Apr		14:15		<b>Recovered hydrophones #2</b>
J2-408	14-Apr	14:15			<b>Deployed hydrophone (BProbe only) #3</b>
J2-408	14-Apr	14:23	16:40	2:17	Brimstone observations #18
J2-408	14-Apr	19:23	21:24	2:01	Brimstone observations #19
J2-411	15-Apr	13:53	15:57	2:04	Brimstone observations #20
J2-411	15-Apr	16:17	16:22	0:05	Brimstone observations #21
J2-411	15-Apr	19:38	19:43	0:05	Brimstone observations #22

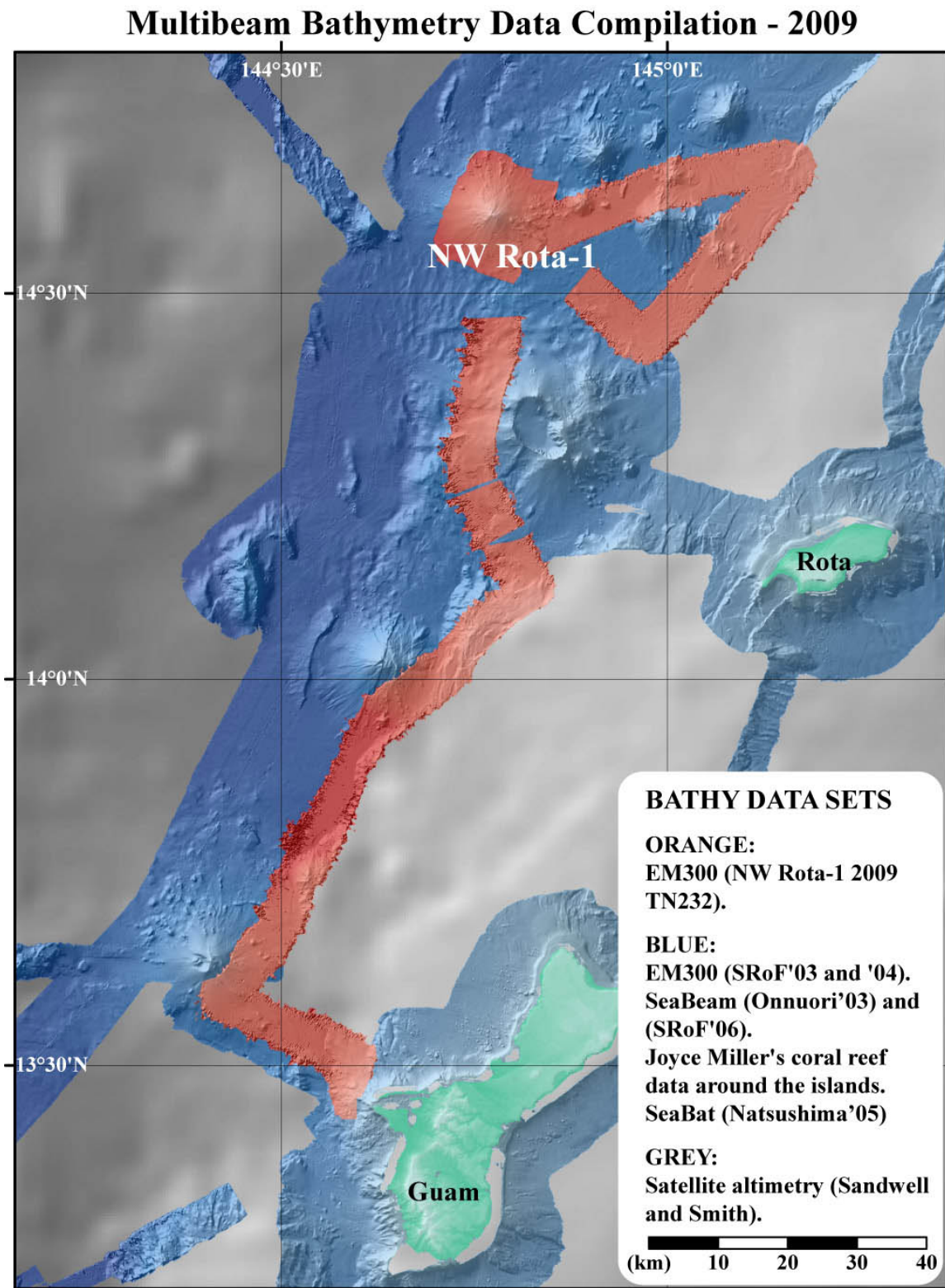
Dive	Date	Start time	End time	Duration	Comments
J2-411	15-Apr		20:01		<b>Recovered hydrophone #3</b>
J2-411	15-Apr	20:13	21:29	1:16	Brimstone observations #23
J2-412	16-Apr	7:10	7:45	0:35	Brimstone observations #24
				34:00	Total

### *Mapping*

The ship's EM300 multibeam sonar system collected bathymetric data between Guam and NW Rota-1 and then a resurvey of the volcano was collected during the first day on site. Initial processing of the EM300 data at sea showed unusually high noise in the areas of swath overlap, and this was later found to be due to an incorrect sound velocity profile entered in the EM300 acquisition system (which can be corrected in post-processing). Therefore, the results of this resurvey will have to await further analysis. In addition, a high-resolution resurvey of the summit of NW Rota-1 was collected with Jason's SM2000 multibeam sonar during dive J2-399. The data were processed at sea by Scott McCue and the results looked promising, but there were obvious navigation problems during the survey. This was due to the fact that the Doppler sonar lost bottom lock several times due to steep slopes and cliffs in the survey area, and due to the fact that the LBL navigation was poor. Because of this, a few of the lines were resurveyed again on dive J2-406, but we did not have enough time during the cruise to see how well this might have improved the survey. Since the cruise, Vicki Ferrini at Lamont Doherty Earth Observatory has re-processed the navigation from dive J2-399, and has significantly improved the SM2000 mapping results. She used reprocessed dopper navigation for the survey (as is true for all the Jason dive navigation on this cruise); no LBL nav was used. Nevertheless, the resulting SM2K grid was shifted 20 m south and 10 m west to best match the other Jason dive tracks. See Section 5.1 on Jason Navigation for more information.

The detailed SM2000 bathymetric survey of the summit showed that eruptive activity at Brimstone has created a large cone with a vent almost 40 m higher than it was in 2006. Also apparent in the new bathymetry were at least two lava flows emerging from the middle of the cone, one to the south and the other to the west. Observations of the southern flow showed that it consisted of lobes and pillows, and that it forms the western boundary of a currently active debris flow chute. The points where the flows emerge from the cone where covered by more recent debris from the active vent.

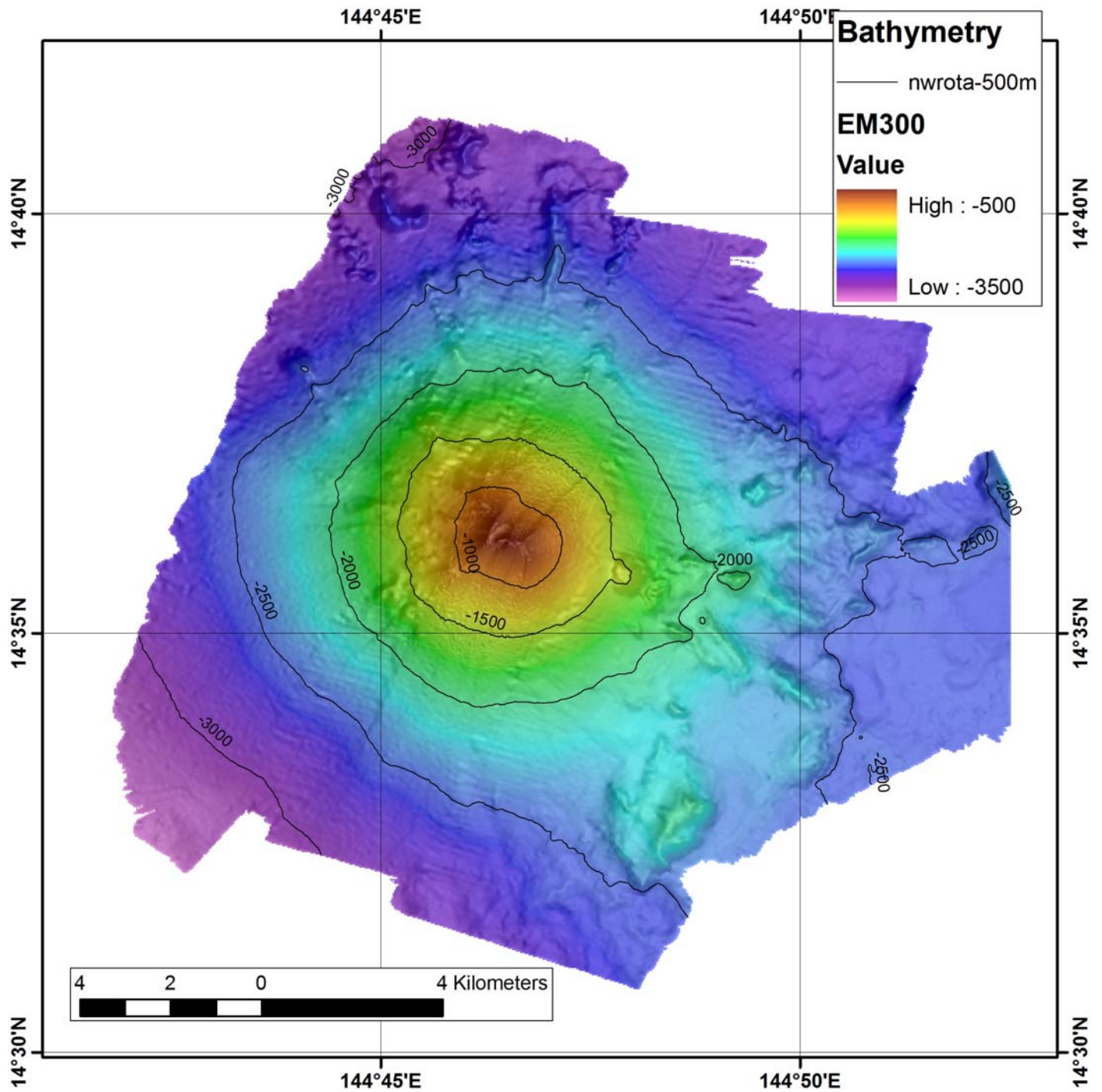
Figure 4.1.1.-1 TN-232 EM300 Mapping additions



Map shows multibeam data collections between Guam and the cruise study site. Map prepared by Susan Merle (OSU Vents Program).

Figure 4.1.1.-2 TN-232 EM300 Resurvey of NW Rota-1 Summit

# NW Rota-1 EM300 Survey

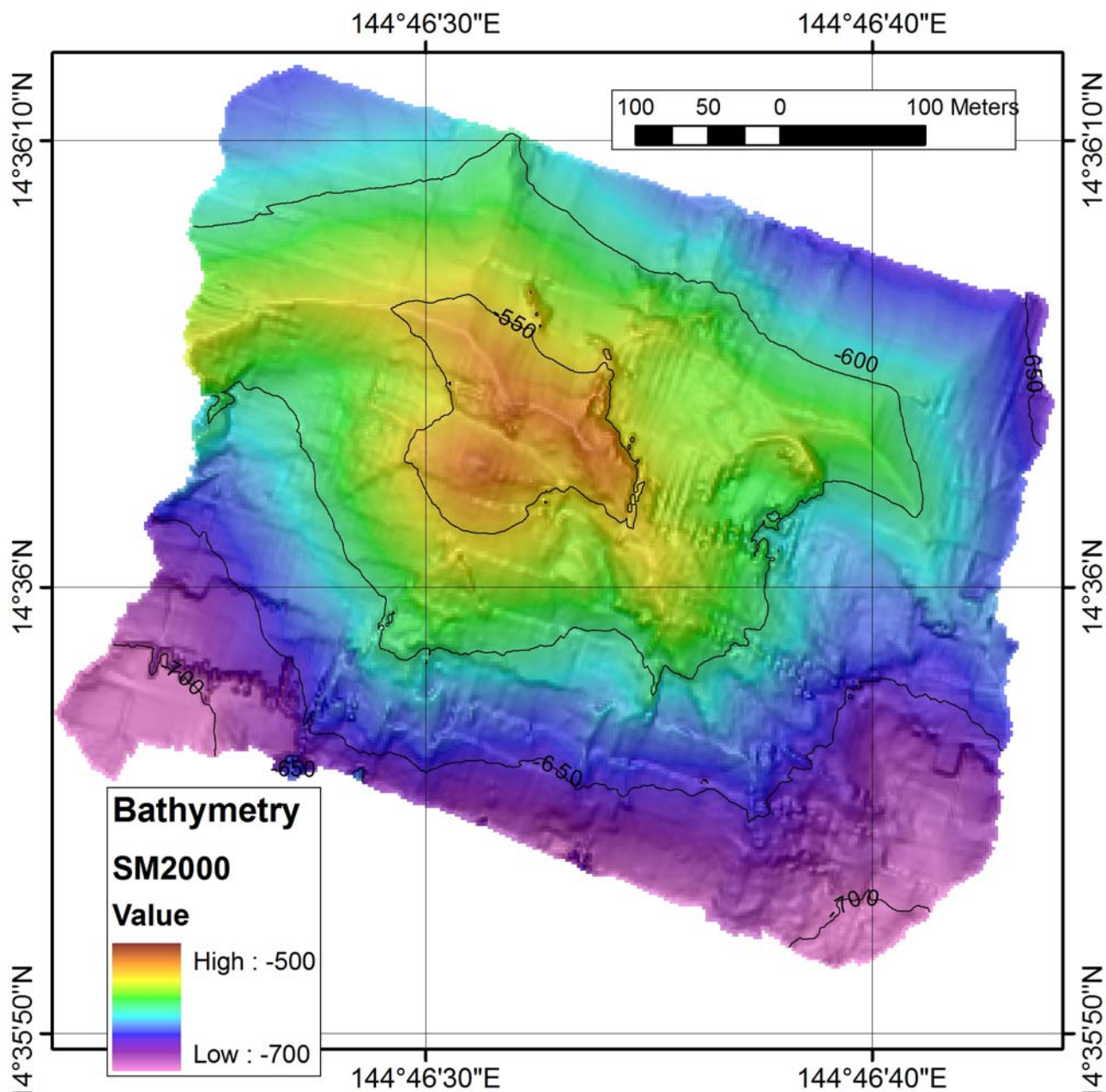


EM300 data was processed and map prepared by Susan Merle (OSU Vents Program). Grid cell size is 30 meters.



Figure 4.1.1.-3 JASON SM2000 mapping of NW Rota-1 Summit

## TN-232 JASON SM2K Data



SM2000 bathymetric survey was collected on dive J2-399. The navigation used for the SM2K survey was DVL-only (reprocessed by Vicki Ferrini at WHOI after the cruise). The SM2K bathymetric grid was subsequently shifted, 20 m south and 10 m west for a better fit with the other JASON 2009 dive tracks (see section 5.1 and figures 5.1-1 and 5.1-2). Grid cell size is 2 meters.

**Table 4.1.1.-2 EM300 Survey Waypoints:  
NW Rota-1**

<b>longitude</b>	<b>latitude</b>	<b>surveypoint</b>
144.77471	14.68040	2a
144.71731	14.55683	2b
144.73406	14.54301	2c
144.79119	14.666848	2d
144.80501	14.663127	2e
144.74708	14.53903	2f
144.75983	14.53212	2g
144.81723	14.65542	2h
144.83584	14.64665	2i
144.77843	14.52335	2j

**Table 4.1.1.-3 EM300 Survey Waypoints:  
Guam to NW Rota-1**

<b>longitude</b>	<b>latitude</b>	<b>surveypoint</b>
144.59545	13.50843	1a
144.42373	13.58512	1b
144.49749	13.67775	1c
144.51356	13.72217	1d
144.61402	13.93825	1e
144.71806	14.01283	1f
144.76093	14.06720	1g
144.82470	14.11058	1h
144.74123	14.26863	1i
144.77887	14.46100	1j
144.77343	14.60120	summit

**Table 4.1.1.-4 SM2000 Survey Waypoints, NW Rota-1**

<b>Name</b>	<b>local X</b>	<b>local Y</b>	<b>lat</b>	<b>long</b>
SOL 1	4887.101	5701.254	14.601531	144.778679
EOL 1	4390.215	5865.268	14.603013	144.774069
SOL 2	4380.734	5832.189	14.602714	144.773981
EOL 2	4876.582	5668.313	14.601233	144.778582
SOL 3	4867.724	5635.372	14.600935	144.7785
EOL 3	4370.907	5798.832	14.602413	144.77389
SOL 4	4362.049	5765.199	14.602109	144.773808
EOL 4	4859.973	5600.77	14.600622	144.778428
SOL 5	4850.838	5567.275	14.60032	144.778343
EOL 5	4352.499	5731.151	14.601801	144.773719
SOL 6	4341.149	5697.656	14.601498	144.773614
EOL 6	4840.873	5533.504	14.600014	144.77825
SOL 7	4829.523	5500.009	14.599712	144.778145
EOL 7	4332.568	5664.438	14.601198	144.773534
SOL 8	4323.71	5630.113	14.600888	144.773452
EOL 8	4820.388	5465.96	14.599404	144.77806
SOL 9	4810.7	5432.465	14.599101	144.77797
EOL 9	4313.191	5596.618	14.600585	144.773354
SOL 10	4305.44	5563.123	14.600282	144.773282
EOL 10	4799.35	5399.247	14.598801	144.777865
SOL 11	4792.983	5365.199	14.598493	144.777806
EOL 11	4295.475	5529.074	14.599974	144.77319
SOL 12	4283.295	5496.687	14.599682	144.773077
EOL 12	4783.572	5331.427	14.598188	144.777719
SOL 13	4774.16	5297.656	14.597883	144.777631
EOL 13	4271.668	5463.192	14.599379	144.772969
SOL 14	4261.98	5429.697	14.599076	144.772879
EOL 14	4765.4	5266.4	14.5976	144.77755

## Summary

In summary, our observations of eruptive activity over the two-week period during this expedition show that the volcano appears to have been quite active since 2006, consistent with the sporadic visual observations and hydrophone data collected between February 2008 and February 2009. This activity has constructed a substantial cone through a combination of lava effusion and tephra accumulation. The presence of fluid lava flows emerging from the cone indicates that at times the magma effusion rate is higher than we have observed (and may correspond to the intense activity identified on the hydrophone records in early 2008). The cone itself appears to be constructed from a combination of lava breccia formed by slow extrusion and tephra accumulation. We see no evidence that the volcanic activity is diminishing and anticipate that volcanic activity at NW Rota-1 will continue to occur into the foreseeable future.

### 4.1.2 Rock/Sediment Sampling

*Cornel deRonde, Nicholas Deardorff*

#### Synopsis

A number of rock and mineral samples were collected from various localities at NW Rota-1 volcano. The majority, however, were taken from the Brimstone Vent area. The rock samples are dominated by relatively fresh, mostly blocky and massive, vesiculated, phenocryst-rich lavas. The vesicularity varies, though commonly comprises 5-7 vol. % of the sample, with some vesicles up to 2 cm in length and 'stretched' as a result of lava flow. Similarly, feldspar phenocrysts are also common, and comprise 5-10 vol. % of the lavas. Locally, sulfur is seen as small inclusions within some samples, lining cavities and vesicles, and may have exsolved directly from the magma. However, in most cases it would appear that the lavas have passed through zones of molten sulfur immediately seafloor, considering the large amounts of sulfur seen intermingled with the samples. More obvious, older, pillow lavas were noted further downslope (to the south) of Brimstone Vent, and in particular on the northern flank of the volcano.

Elemental sulfur was the only 'mineral' sample collected. Sulfur is ubiquitous around the Brimstone Vent area, and in another area further to the west, known as "Sulfur Slide". It also dominates the yellow plumes emanating out of Brimstone Vent and as a consequence, covers many of the ash slopes of NW Rota-1. At Sulfur Slide, there is evidence for sulfur to have been extruded onto the seafloor, forming crude sulfur mounds, and to have flowed down existing ash slopes. In addition, part way down the lava and ash-rich slope below Sulfur Slide, several planar zones ~15 cm thick of sulfur-rich material cut the volcanic sequence at the same general angle as the present-day slope. Closer inspection of sulfur-rich samples from these planar zones shows evidence for the sulfur to have been molten. This suggests that these sulfur zones represent paleo-slopes of the volcano and thus represent time markers. No sulfides were seen in any of the samples.

#### Dive J2-396, 2009/4/4

- Geo-3 524m. Collected a few m from Brimstone Vent. Fresh volcanic lava, dark black, glassy, fine-grained with phenocrysts of plagioclase 1- 6mm. Also contains spherules of what was molten sulfur <0.5-8mm. Sample is vesiculated with vesicles 1- 15mm long. 1- 3cm long clasts of grayish altered rock locally in a sulfur matrix. Sample is brecciated. The sulfur commonly has a smooth surface, and has flowed as molten sulfur. It contains small clasts of rock, both fresh and hydrothermally altered. Commonly seen as spherules. See cavities filled with sulfur which locally contain examples Pele's hair of sulfur inside.
- Geo-4 524 m. Scoop sample near Brimstone Vent. The sulfur was obviously molten and contains minor inclusions of rock. The sulfur locally shows evidence for flow and instant quenching. Spherule shapes noted. The ash component is 2-18mm, mainly 2-5mm. The sample is ~90% fresh with the remainder altered rock chips and sulfur.
- Geo-6 524m. Brimstone Vent. As for Geo-3, though less sulfur included in the sample and some alteration staining, though no obvious altered clasts included.
- Geo-9 524m. Brimstone Vent. Hydrothermally altered version of Geo-3. Rock is grayish-white with rare Fe-oxide staining. Alteration appears to be surficial. Still vesiculated, though sulfur inclusions are rare.
- Geo-11 525m. Brimstone Vent. Massive ~30 kg sample! Appeared to have "buds" of lava (~20- 30cm diameter) almost pillow-like with altered selvages, otherwise similar to Geo-3. Still highly vesiculated with cavities up to 3cm long. Contains less sulfur than Geo-3 on the exterior of the sample, though the interior contains small (<1- 7mm) spherules. No obvious altered clasts like Geo-3. Sulfur obviously molten before being quenched.

#### Dive J2-398, 2009/4/5

- Geo-12 566m. Fault Shrimp. Steep slopes of ash within a few meters of the fault shrimp outcrop. Slopes are host to large slabs of a pale crust that appear sulfur-rich. Sample is a 18 x 19 x 3cm slab, pale gray on the exterior with clumps of black ash protruding from the sample. Otherwise the sample is a massive, fine-grained (<1mm) ash/sand. Some grains are elongated up to 5mm. In cross section, there is a rapid change from the grayish surface to a more yellow color, indicating the presence of sulfur. The sample is massive such that layering is not altogether obvious, although there is a vague suggestion of it. This is, in part, consistent with seawater

water flows horizontally out of the sample when tilted. The base of sample is a much darker colour and with larger grain sizes. The sulfur gradient through the sample is not always even.

Unlabelled Also recovered several smaller (thinner) pieces of similar crust. Again, pale gray ash and blacker pieces of tephra with noticeable sulfur-rich matrix binding the sample. Ash is more coarse. Location unknown, sample was on the JASON basket upon recovery.

#### **Dive J2-401, 2009/4/8**

Geo-2 525m. Brimstone Vent. Black to pale grey, vesiculated, massive lava. Vesicles up to 5mm; phenocrysts up to 6mm, average 1-2mm. Minor sulfur infilling vesicles locally (<1mm). No included altered clasts, and rare Fe staining.

Bio-10 578m. Barnacle Block. Dark grey, bulbous, bread crust-like lava. Minor Fe-oxide staining on exterior surface. Some phenocrysts up to 2mm. Vesicles 1- 2mm. See flow banding locally.

#### **Dive J2-402, 2009/4/9**

Geo-1 523m. Brimstone Vent. Fresh, black, massive, blocky, vesiculated, phenocryst-rich lava. Vesicles up to 1cm, average 2-3mm and mostly elongate. Feldspar phenocrysts mostly 2mm. Rare sulfur on sample exterior.

Geo-2 523m. Scoop sample at Brimstone Vent. Largely tephra sample with spaghetti-like sulfur on surface. Sulfur was molten when extruded. Long (several cm), "tubes" of sulfur, often with small (<1cm) clasts of rock/ash adhering to external surface. Local examples of "Pele's hair".

Geo-3 536m. East of Brimstone. As for Geo-1 with orange Fe-oxide staining on exterior. Vesicles more rounded. Phenocrysts <1 to 5mm.

Bio-5 538m. Limpet Lair. As for Geo-1 with rare vesicles up to 12mm and rare Fe-oxide staining the sample exterior. Limpet eggs also on exterior. No sulfur. Slightly more phenocrysts?

Geo-6 572m. Scarp east of Barnacle Block. Great sample from blocky sulfur outcrop of what was surely molten sulfur extruded onto the seafloor? See crust and layers where sulfur flowed, locally quite crystalline. Sulfur also locally occurs in between layers of ash. Definitely molten when extruded onto the seafloor. Very nice!

Geo-7 573m. West of Scarp Top. Seafloor weathered with orange/brown Fe-oxide coating on exterior. Massive, vesiculated, though phenocrysts harder to see.

Bio-8 570m. West ridge. As for Geo-1. Vesicles up to 15mm, minor Fe-oxide staining and some barnacles on sample surface. Minor sulfur infilling vesicles and along fractures up to 18mm. Sulfur is crystalline, was molten locally, and contains clasts of lava.

Geo-11 522m. From inside Brimstone Vent! As for Geo-1. Minor light gray alteration on exterior. Extruded right before our eyes! See video.

Geo-12 522m. Brimstone Vent. Also collected from extruded lava at vent. As for Geo-11 only here contains blobs of what was molten sulfur within the vesicles. Both samples fresh.

#### **Dive J2-403, 2009/4/10**

Geo-11 574m. Limpet Lair. Black, fresh, vesiculated (~10-15%), phenocryst-rich (~5-7%) lava. Vesicles are up to 15mm long and elongated. Phenocrysts up to 4mm, cubic looking feldspar, average 1- 2mm in length. Slight Fe-oxide staining on sample exterior.

Geo-12 590m. Scoop sample at Marker #114. Site is steep slope of Fe-oxide covered, unconsolidated, brecciated lava covered in bacterial mat together with localized, soft crust. The rock is dark gray, superficially weathered with Fe-oxide staining. Slightly altered. Phenocryst-poor though some noted up to 3mm. Vesicles not as common as Geo-11, <8mm, elongated, and locally friable. The Fe-oxide crust is reddish brown, up to 2mm thick, and friable.

Geo-13 603m. Brecciated wall (see log). Sample is black, fresh, and vesiculated, as for Geo-11, although vesicles are more rounded. Those vesicles that are elongated are up to 3cm long. Rinds of glassy material locally. Yellowish tinge to the feldspars? Some phenocrysts appear zoned.

Brimstone Sulfur Sulfur collected on outside of the Hot Fluid Sampler inlet hose during sampling of Brimstone vent for fluids. T= 187°C (check log). Sulfur clogged up inlet.

#### **Dive J2-405, 2009/4/11**

Geo-25 521m. Extruded from Brimstone Vent. Large (35 x 23 x 20 cm) block of very fresh lava with excellent glass apparent and flow banding. Molten globules of sulfur on outer surface. See altered clasts of lava incorporated in the sample.

Geo-26 521m. Brimstone Vent. Smaller (20 x 12 x 11 cm) piece of lava taken right out of the degassing brimstone Vent just after was extruded! See video. Also contains molten sulfur on its exterior which is locally altered to pale gray. Both this sample and Geo-25 are vesiculated and contain phenocrysts, although Geo-26 more so. Glass on exterior of sample.

Geo-27 523m. Select globules of sulfur from tephra sampler placed about 5m west of Brimstone Vent. Up to 1 cm "buttons" that are more spherical. Definitely molten in the plume.

#### **Dive J2-406, 2009/4/12**

- Geo-1 523m. Brimstone Vent. Very large (~40 kgs, 45 x 30 x 18 cm), very fresh, flow-banded (striated) lava. Extruded from Brimstone Vent while viewing with JASON. Glass apparent locally on exterior to sample. Spherules of sulfur cover the sample and are also seen internally within the sample. Sample is surficially altered on exterior surfaces. Very vesiculated locally, with vesicles up to a 2 cm and deformed (stretched) during flow. Lots of phenocrysts, usually 3- 4mm and often 'blocky'. All visible phenocrysts are feldspar.
- Geo-4 523m. Brimstone Vent. Sample about half the size of Geo-1. Like Geo-1, get conchoidal fractures upon breaking the lava, so locally is massive. Otherwise, flow banded and more friable. Abundant phenocrysts (2-4%) that appear smaller than those in Geo-1. Also spherules of sulfur.
- Geo-5 523m. Brimstone Vent. Smaller sample again than Geo-4, collected at the same time/place as Geo-1. Phenocrysts up to 6mm, vesicles up to 25mm, otherwise much smaller and not obviously elongated.

#### **Dive J2-407, 2009/4/13**

- Geo-12 572m. Sulfur slide. 15 x 20 x 10 cm lump of sulfur. Outside has a "bread crust" texture and has 'flowed'. Was molten when extruded. Interior is crystalline, more fine-grained, and intermingled with ash. Sample is porous inside and very vesiculated. See different layers of sulfur and ash. Suspect it was molten sulfur extruded onto the seafloor periodically, and flowed on top of different ash horizons. Some larger (though <1cm) pieces of rock inside the sulfur.
- Geo-14 571m. Sulfur slide. Sitting adjacent to more irregular 'mounds' of sulfur, as in Geo-12. Here, have a crust ~1.5cm thick that has an ash-rich exterior surface but which is more sulfur-rich inside. The ash is quite coarse (1-2mm) and sulfur looks like was molten inside, which is slightly different to the crust seen in J2-398-Geo-12. Appears that the sulfur has flowed, which is how it looks on the video. In fact, the sulfur looks to have flowed around the more massive Geo-12 and has incorporated ash while doing so. Interesting. Two physical forms of sulfur present. Poorly sorted grain size suggests sulfur has incorporated bottom material as flowed on the seafloor.
- Unlabelled Unsure of where sample came from. Was on JASON's basket upon recovery. Phenocryst-rich with some green phenocrysts noticeable. Fe-oxide staining on ~1/3 of sample exterior.

#### **Dive J2-408, 2009/4/14**

- Geo-1 1467m. Slide chute down slope, south of Brimstone Vent. Single rock in sediment. 20 x 15 x 15cm block of relatively fresh, dark, vesiculated, phenocryst-rich lava. Minor orange coloured Fe-oxide on surface. Vesicles up to 2cm and phenocrysts up to 5mm. More phenocrysts than what we've seen at Brimstone thus far. No sulfur.
- Geo-2 770m. Slide chute down slope to south from Brimstone Vent. Single piece of rock sitting within slope dominated by ash. 18 x 8 x 15cm piece of lava. Quite rounded with plagioclase phenocrysts up to 1cm! This, and Geo-1, appear as variations of pillows. No sulfur. As for Geo-1, i.e., relatively fresh. Phenocrysts again seem more abundant than seen in samples from Brimstone.
- Geo-3 746m. Slide chute down slope to south from Brimstone Vent. 8 x 8 x 8cm block of lava as rubble on largely ash-covered slope. Massive lava, perhaps slightly less fresh than Geo-1, but a very similar rock. Phenocrysts slightly smaller than those seen at Brimstone? Minor sulfur in interior of sample.
- Geo-4 708m. Taken from outcrop of pillow lava down slope south from Brimstone. 13 x 8 x 8cm tubular piece of pillow. See glassy rind ~4mm thick on exterior of this elongate pillow. As for other rocks, it is phenocryst and vesicle rich. No sulfur, though tiny sulfur beads seen on exterior of sample which believe are due to sample sitting on front basket of JASON while viewing Brimstone during latter part of dive.

#### **Dive J2-411, 2009/4/15**

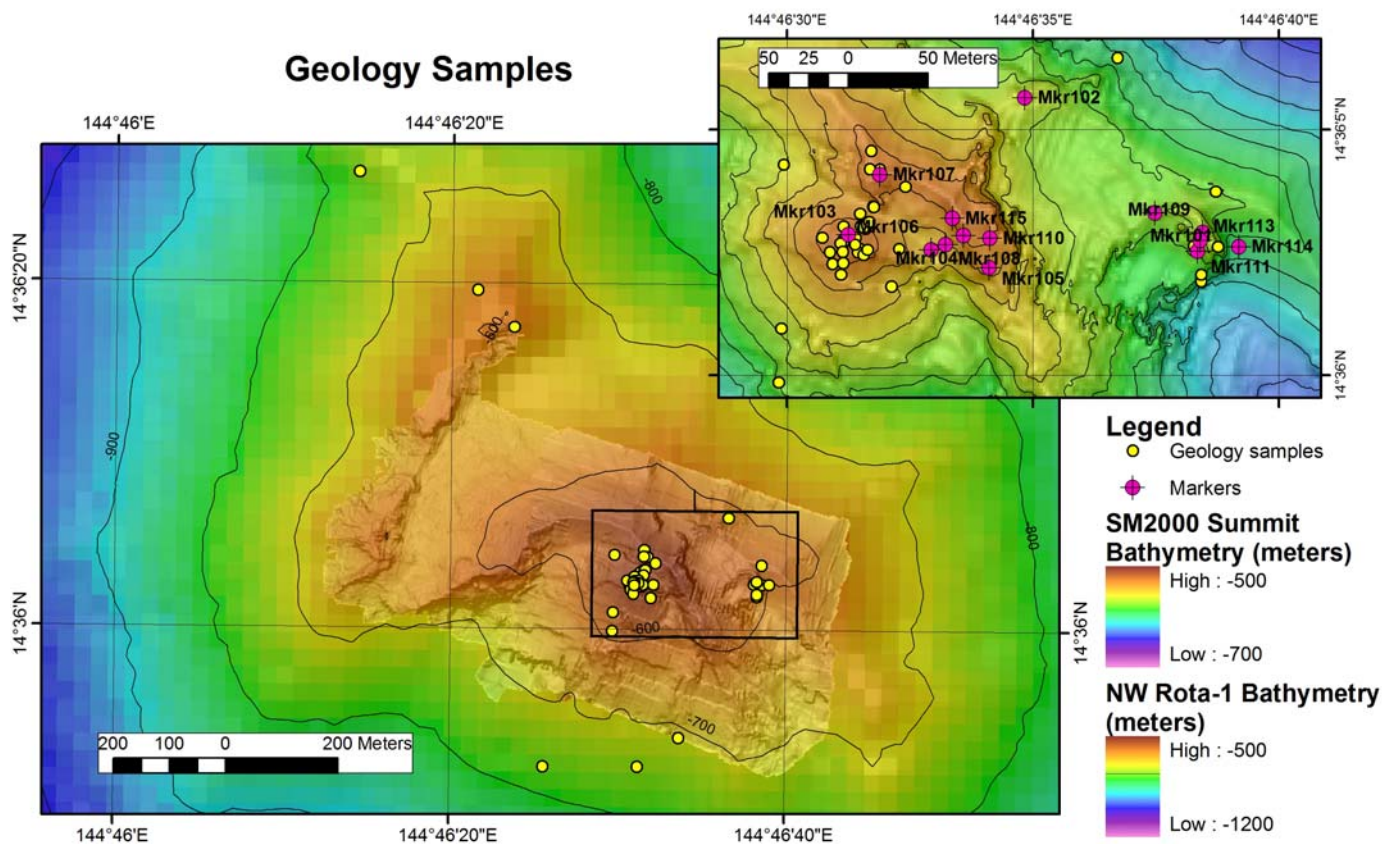
- Geo-4 521m. Directly from Brimstone Vent. Large (53 x 28 x 18cm) piece of vesiculated, massive, phenocryst-rich lava. Locally, have conchoidal fractures when broken. Phenocrysts up to 4mm. Vesicles <3mm, average 2mm. Rare <1mm sulfur.
- Geo-6 521m. Very near (~2m) Brimstone Vent. Outcrop of lava with "flanges" of lava and sulfur. Three small pieces, each no bigger than 7cm. Coarse rock with abundant phenocrysts up to 4mm. Vesicles <2mm. Blocky texture. Sulfur in the sample occurs as 2cm thick "layers" where it appears to have bound layers of ash. Sulfur is fine-grained, though locally crystalline. One piece ~2cm wide and ~6mm thick is crystalline and has textures indicative of flow - was molten.
- Geo-7 584m. Below Sulfur Slide (Marker #113). Located on both eastern-most and central knife-sharp ridges of blocky lava/ash. Samples collected from planar structures that cut these ridges at same angle as the present-day slopes. Are approximately 10-15cm thick. Appear as sulfur "flows" as see molten flow textures with 1cm rock fragments embedded in the top of the sulfur layers, with less coarse rock fragments throughout. The sulfur locally quite crystalline and fibrous. See cavities within the sample lined by globular sulfur indicative of a molten state upon deposition. Suggest these layers (there were about 3 or 4 of them over a 2- 3m section with intervening layers of lava plus ash) represent paleo-slope surfaces between successive flows. Thus, they represent time markers.

- Geo-10 522m. Brimstone Vent. 29 x 14 x 15cm rock. Part of outcrop near contact with Brimstone lobate flows. Highly vesiculated (<1mm) and blocky. Contains phenocrysts, though less abundant than in other samples.
- Geo-13 520m. Brimstone Vent. Three pieces (with the largest 10 x 8 x 6cm) that were actively degassing when sampled! Blocky, with glass on exterior surfaces, vesiculated, and phenocryst-bearing. The sample contains minor sulfur throughout.

**Dive J2-412, 2009/4/16**

- Bio-1 610m. NW Ridge (Cnidaria area). 13 x 8 x 5cm, very glassy lava. Vesiculated though appears less than lavas at Brimstone Vent. Contains phenocrysts up to 4mm. Sample is slightly weathered.
- Geo-3 604m. NW Ridge. Relatively fresh. Elongated vesicles and phenocrysts up to 4mm, average 2mm. Sample is relatively glassy.
- Geo-4 610m. Same location as Bio-1. Exterior is oxidized from seafloor weathering? Similar to other samples as vesiculated (not elongated) rock with phenocrysts.
- Geo-8 795m. NW Ridge. Less glassy and more weathered than other samples. Few phenocrysts. Fe-oxide crust on the exterior.

**Figure 4.1.2-1 Geology Sample Sites**



**4.2 Biology**

**4.2.1 Macrobiology**

*Verena Tunnicliffe*

My objective for the 2009 NW Rota cruise was to determine i) whether the animals populations had been able to sustain themselves through the violent phases of volcano activity; and ii) how the dominant animal (shrimp) recruited to the seamount. NW Rota has a very simple community – on the eruptive summit only a few species tolerate the conditions and concentrate where microbial filaments occur.

Species encountered - The species list for this volcano has always been short. In 2009, all the 2004 and 2006 animals were still there except one (a limpet, *Lepetodrilus* nr *schrolli*) Shrimp (Family Alvinocarididae)

*Opaepele loihi*  
*Alvinocaris* n. sp. (under description by R. Webber)  
 Limpet (Family Phenacolepadidae)  
*Shinkailepas* n. sp. (under description by A. Waren)  
 Scale worm (Family Branchiopolynoe)  
 cf *Branchinotogluma* sp.

The most interesting find was an animal not encountered before: a small barnacle. It does not fit easily with descriptions I have and it may be a new species of *Neoverruca*. This genus is known only at vents in the Pacific.

#### Dispersion on the volcano

The biggest change was the coverage by vent animal around the summit. The shrimp were both abundant at diffuse flow vents and scattered across sediments between vents. The limpet had also spread to many areas and the barnacle was on both sides of the summit. Thus, the overall biomass was much higher than observed in 2004 or 2006. On the slopes and summit of the volcano away from venting, we saw many small macrourid fish. On the last dive, we examined the northwestern ridge away from the influence of Brimstone. Here, there were three species of fish and many types of soft and stony corals. Benthic shrimp were abundant.

#### The Shrimp

Before we found it at three sites on the Mariana Arc, the "loihi" shrimp was known only on Loihi Seamount in Hawai'i. It has adapted to grazing bacterial filaments with tiny claws like garden shears. The second shrimp is a new species; it also grazes bacteria after the juveniles settle to the volcano. But, as they grow to the adult stage, their front claws enlarge and they become predators. While the second species is able to evade Jason's suction sampler, we took advantage of its scavenging habits: a trap baited with Spam came back with 4 dozen shrimp.

#### Deadfalls

In 2006 during the enhance activity of Brimstone Vent, we saw many dead pelagic animals on the bottom around the volcano summit: fish, squid, pelagic shrimp. These deadfalls were surely caused by Brimstone emissions and were readily devoured by the vent shrimp. This year, deadfalls were rare. Some toxic substance (possibly sulphite) is likely much less now.

#### Plankton

In conjunction with CTD and water sampling, I sampled plankton on and off seamount to compare abundances and composition. We made vertical hauls from 600m to surface. The nets have caught juvenile shrimp which will become part of the population studies.

**Table 4.2.1-1 TN-232 Plankton Tows**

**NW Rota 2009 zooplankton vertical hauls  
 250 um net at 20m/min**

Sample #	Date	Start Time (local)	Location	Tow Depth (m)	Water Depth (m)	Other Description
NET09Rota -1	4-Apr-09	1500	14°38.81'N, 144°47.50'E	300	2000	End of CTD Tow T09B-01, at N end of cross Rota CTD tow, JD94
NET09Rota -2	5-Apr-09	2100	14°36.08'N, 144°46.61'E	550	577	CTD cast V09B-01, at new hydrophone site, JD95
NET09Rota -3	6-Apr-09	1530	On NW/SE CTD tow track	600	1767	Associated CTD V09B-03, JD96
NET09Rota -4	7-Apr-09	1700	14°39.45'N, 144°44.72'E	600	2815	T09B-03(end), JD97
NET09Rota -5	8-Apr-09	1500	14°33.00'N, 144°48.00'E	600	2200	+ MAPR JD98
NET09Rota -6	8-Apr-09	1645	14°34.70'N, 144°47.25'E	600	1825	+ MAPR JD98
NET09Rota -7	9-Apr-09	1645	14°34.55'N, 144°42.95'E	600	2820	T09B-04, JD99
NET09Rota -8	10-Apr-09	1230	14°33.94'N, 144°51.43'E	600	3200	V09B-07 "Background", JD100
NET09Rota -9	11-Apr-09	1350	14°35.96'N, 144°46.97'E	600	630	Over Summit + MAPR
NET09Rota -10	11-Apr-09	1500	14°35.93'N, 144°46.79'E	600	686	Over Summit + MAPR

NET09Rota -11	12-Apr-09	1330	14°36.14'N, 144°46.75'E	600	685	+ MAPR
NET09Rota -12	12-Apr-09	1440	14°36.15'N, 144°46.22'E	600	683	+ MAPR
NET09Rota -13	14-Apr-09	945	14°36.24'N, 144°46.61'E	600	700	+ MAPR
NET09Rota -14	14-Apr-09	1230	14°35.97'N, 144°46.40'E	600	725	+ MAPR

**Collections:**

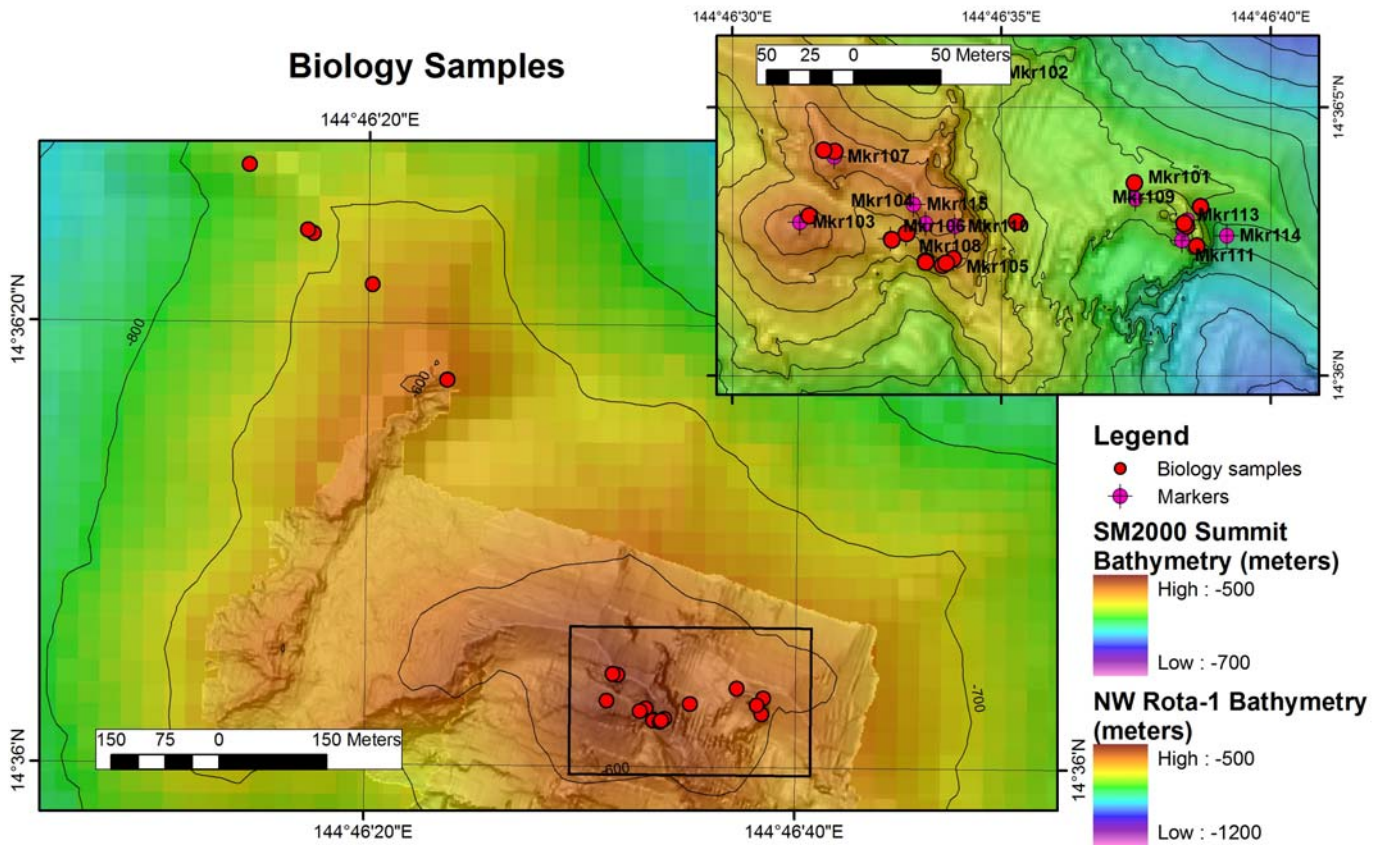
Plankton – Seven vertical hauls from 600m over 1500 to 3000 m off seamount;  
 Seven vertical hauls from 600m over the 700m contour around the volcano summit.

Vent animals: Four suction samples of *Opaepele loihi* (about 250 in total).  
 Four trap and suction samples of *Alvinocaris* sp about 60 in total)  
 One rock with limpets (~20) and egg cases  
 Two rocks with barnacles (~30 in all)

**Deep Sea (non-vent) animals:**

6 sites from outcrops of the ridge NW of the summit were sampled. 9-11 corals and 2 anenomes.  
 Samples for Peter Schupp (University of Guam) included J412-\* -01,02,05,06,07,09

**Figure 4.2.1-1 Biology Sample Sites**



**4.2.2 Microbiology**

*Sheryl Murdock*

The goal of microbiological work at NW Rota-1 is to describe the microbial communities and their associated metabolic capacity and link it with geochemical processes in low temperature (<150 °C) hydrothermal fluids. Objectives for 2009 included: 1) Re-sampling of vents of interest indicated by 2004 and 2006 results, 2) Enrichment culturing of mesophilic, thermophilic, and hyperthermophilic anaerobic microorganisms from fluids, 3) Collecting high volumes (3-4 L) of filtered vent fluids for molecular-based analyses, and 4) Incubating vent fluids with 15N-labeled tracers to look for evidence of denitrification and anaerobic ammonia oxidation.



Samples were collected primarily using Dave Butterfield's Hot Fluid Sampler (HFS), with one additional sample collected from a CTD cast to be used as a background comparison. (Table 4.2.2-1) Unfiltered water samples from the HFS were used for enrichment cultures in media designed based on microbes detected in samples from 2004 and 2006. These included acidophiles, anaerobic sulfur reducers, and hyperthermophilic archaea. Parallel samples were also taken for total cell counts. The HFS was also used to filter fluids through Sterivex filters for both DNA and RNA extractions. Extracted DNA will be used to continue time-series observations of the range of genetic diversity and relative numbers of various groups of microorganisms. Extracted RNA will be used to investigate metabolic potential of the microbial community through gene expression. Culturing and molecular analyses will be completed by Dr. Julie Huber (Marine Biological Laboratory).

Unfiltered fluids were also incubated with both <sup>15</sup>N-labeled nitrate and ammonium to measure rates of denitrification and anaerobic ammonia oxidation by bacteria present in the fluids. Parallel samples were also taken for nitrogen isotope and N<sub>2</sub>O measurements to help calculate these rates. Some of the DNA extracted from the Sterivex filters will also be used in molecular studies to identify the organisms involved in these processes. This work will be completed by Annie Bourbonnais (University of Victoria).

#### *Microbial Mat*

Three suction samples of dense microbial mat were also collected for DNA and RNA extraction and continuing studies of mat-forming microbial communities at NW Rota-1 by Dr. Craig Moyer (Western Washington University). One suction of microbial mat at Flock Rock was collected for Nathan A. Magarvey, McMaster University, Departments of Biochemistry & Biomedical Sciences. (Table 4.2.2-2)

In total, we collected 31 diffuse vent samples across a 61 °C temperature range as well as a background sample from outside the Brimstone plume, which will allow us to differentiate between indigenous vent organisms and seawater communities. This suite of microbiological samples along with the geochemical data and results from 2004 and 2006 will allow us to closely examine the microbial ecology and how it changes over time at this dynamic location.

**Table 4.2.2.-2 Microbiology Mat Suction Samples:**

<b>Dive</b>	<b>Sample #</b>	<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Virtual Van #</b>
J2-396	j396-mat-02	Iceberg (Marker 110)	14.600796	144.776465	1060-1076
J2-402	j402-mat-04	Wailing Wall (Marker 106)	14.600736	144.775898	4740-4769
J2-405	j405-mat-05	Flying Floe (Marker 115)	14.60070417	144.775824	8120-8132
J2-408	J408-mat-06	Flock Rock (Mkr-103)	14.6008277	144.775396	12856

Table 4.2.2-1 Microbiology Fluid Samples:

Dive/ CTD	Port/ Bottle #	Culture	Counts	RNA	DNA	Type	Vent	Tmax	Tavg	Vol. (ml)	in- situ pH	Virtual Van #	Cruise Report Sample-ID
J2-398	HFS11				x	Sterivex from HFS	Mat Mecca	45.8	42.9	3004	2.3?	2016	j398-hfs-17
J2-398	HFS6	x	x			HFS piston 6	Mat Mecca	45.3	45		2.3?	1995	j398-hfs-13
J2-398	HFS3		x			HFS piston 3	Brimstone	69.8	55.7			1833	j398-hfs-07
J2-398	HFS8		x			HFS piston 8	Brimstone	31.2	22.5			1734	j398-hfs-03
J2-398	HFS22		x			HFS bag 22	bkgd, Mat Mecca	9.4	9.3			2034	j398-hfs-18
J2-398	HFS1		x			HFS piston 1	Brimstone	28.7	27.3			1670	j398-hfs-01
J2-401	HFS10				x	Sterivex from HFS	Brimstone	55.1	42.3	1368	1.15	3154	j401-hfs-07
J2-401	HFS15				x	Sterivex from HFS	Scarp Top (Marker 109)	18	16.9	3012	5.17	3544	j401-hfs-15
J2-401	HFS11				x	Sterivex from HFS	Iron 599	8.6	8.3	3005	5.67	3762	j401-hfs-18
J2-401	HFS14				x	Sterivex from HFS	Iceberg 09-2 (Marker 110)	39	36.7	3003	4.65	3989	j401-hfs-24
J2-401	HFS13			x		Sterivex from HFS	Iceberg 09-2 (Marker 110)	39.3	37.2	3003	4.65	4012	j401-hfs-25
J2-401	HFS23	x	x			HFS bag 23	Scarp Top (Marker 109)	16.7	16.3		5.29	3484	j401-hfs-13
J2-401	HFS8	x	x			HFS piston 8	Iceberg 09-2 (Marker 110)	36.7	35.9		4.65	3944	j401-hfs-20
J2-401	HFS22		x			HFS bag 22	Iron 599	8.6	8.3		5.67	3728	j401-hfs-16
V09B-07	Bottle 52			x	x	Sterivex from CTD	non-plume, 503 m			~3 L each		N/A	
J2-403	HFS10				x	Sterivex from HFS	Brimstone Floc	19.7	14.9	3006	2.9	6430	j403-hfs-03
J2-403	HFS24	x	x			HFS bag 24	Brimstone Floc	20.5	17.2		2.9	6393	j403-hfs-01
J2-403	HFS1		x			HFS piston 1	Brimstone Floc	21.2	18.5		2.9	6470	j403-hfs-04
J2-405	HFS10				x	Sterivex from HFS	Flying Floc	46.3	46.1	3002	2.55	8086	j405-hfs-03
J2-405	HFS12				x	Sterivex from HFS	The Amphitheater	13.5	12.9	3005	5.48	8303	j405-hfs-09
J2-405	HFS13			x		Sterivex from HFS	The Amphitheater	13.3	12.7	3281	5.48	8341	j405-hfs-10
J2-405	HFS24	x	x			HFS bag 24	Flying Floc	41.5	39.7		2.55	8064	j405-hfs-01
J2-405	HFS23	x	x			HFS bag 23	The Amphitheater	13.2	12.8		5.48	8270	j405-hfs-06
J2-405	HFS3		x			HFS piston 3	Brimstone	24.5	20.9			8480	j405-hfs-13
J2-407	HFS14			x		Sterivex from HFS	Limpet Lair (Mkr. 105)	14.4	11.8	3266	5.4	10641	j407-hfs-06
J2-407	HFS15				x	Sterivex from HFS	Limpet Lair (Mkr. 105)	16.5	14.4	3013	5.4	10608	j407-hfs-05
J2-407	HFS12				x	Sterivex from HFS	Sulfur Slide (Mkr. 113)	17.9	17.4	3006	4.96	10853	j407-hfs-10
J2-407	HFS10				x	Sterivex from HFS	Summit Ridge, S side	33	31.8	3002	4.65	11024	j407-hfs-18
J2-407	HFS11				x	Sterivex from HFS	Floc Rock (Mkr. 103)	32.2	29	3059	5.01	11107	j407-hfs-22
J2-407	HFS24	x	x			HFS bag 24	Limpet Lair (Mkr. 105)	16.2	14.4		5.4	10588	j407-hfs-03
J2-407	HFS1	x	x			HFS piston 1	Sulfur Slide (Mkr. 113)	14.9	14.5		4.96	10828	j407-hfs-08
J2-407	HFS3	x	x			HFS piston 3	Floc Rock (Mkr. 103)	32.2	29.7		5.01	11089	j407-hfs-20

## 4.3 Chemistry

### 4.3.1 Hydrothermal Fluid Sampling

*Dave Butterfield*

#### Sampling methods

During this 2009 Expedition to NW Rota volcano, our primary tool for collecting hydrothermal and volcanic fluids was the PMEL Hydrothermal Fluid Sampler. The sampler was configured this year to collect 18 discrete water samplers, of which 9 were piston samples (HFS numbers 1-9) and 9 were collapsible Tedlar inert plastic bags within cylinders (HFS numbers 16-24). We set the system up to have roughly an equal number of filtered and unfiltered water samples. All filters used on HFS were Millipore 0.4 micron pore size polycarbonate membranes, type http. In addition to the water sample containers, the system had 6 positions for sterivex cartridge filters for DNA/RNA sampling (HFS numbers 10-15). For some of the dives, cylinder 20 was removed and replaced with a 47mm filter holder for glass fiber filter sampling of particulate organic material specifically for nitrogen isotope analysis. In addition to the sample ports, the home port was connected to a housing for an in-situ pH sensor (AMT, Rostock, Germany), and this sensor was used on most of the dives to collect data on the pH of venting fluids. The sensor worked well throughout the cruise based on repeat calibrations in the lab. New this year are titanium pistons with Teflon end caps (parts finished a few days before the cruise started and delivered to the ship the morning that we sailed). Some of the PVC pistons were replaced with the Ti pistons to avoid problems of reactivity between high-temperature, gas-rich fluids and the PVC cylinders, and to improve our capability to capture whole samples of gas and aqueous fluids. (Cylinders from previous years were physically damaged by fluids with high gas content).

We also used discrete titanium gas-tight samplers held by the manipulator, and “port” and “starboard” gas-tights connected to the HFS fluid line near the junction of the nozzle hose with the fixed titanium manifold on the sampler frame.

At the beginning of the cruise, we installed (for the first time) a large volume cartridge filter at the inlet of the flush pump to remove sharp volcanoclastic material and sulfur to prevent damage to the pump head. This worked well. Problems with the sampler were limited to plumbing issues: clogging of the intake nozzle with molten sulfur when the nozzle was dropped at Brimstone, twisting and kinking of the intake hose, and clogging of the nozzle tip, especially when the extra-long nozzle with small inlet strainer was used. In spite of the problems, we were able to collect a very good set of samples during this expedition. The long nozzle was needed to reach into Brimstone pit during periods of strong eruptive activity, and it could also be used to sample diffuse vents without difficulty.

#### Shipboard analysis

Shipboard analysis was the same as in most previous cruises. We did spectrophotometric H<sub>2</sub>S (modified Cline method) silica (silicomolybdate method of Froehlich), and ammonia (indophenol), pH with Ross Sure-Flow semi-micro electrodes at lab temperature, and alkalinity by automated titration. Sample cuts were preserved for frozen nutrients, majors (filtered), trace metals, O/H isotopes, S isotopes, 13C-DIC, and sulfite measurement preserved with formaldehyde. Eric Olson analyzed methane and hydrogen by GC on nearly all HFS fluid samples.

Personnel involved in fluid sampling/chemistry:

Dave Butterfield

Kevin Roe – HFS setup, sample processing, H<sub>2</sub>S and ammonia analysis

My Christensen – HFS setup, sample processing, pH, alkalinity and dissolved silica analysis

Sheryl Murdock – Sterivex filter processing, incubations for Annie Bourbonnais

Nick Delich – RAS moorings, HFS maintenance and setup

Eric Olson – methane and hydrogen analysis by gas chromatography

Leigh Evans – gas-tight sampler setup and extraction

#### Sampling summary

The sampling strategy was to collect fluids from the active volcanic vent on multiple dives to assess the range of composition and temperature of fluids during active eruption processes. In addition, our goal was to sample as many of the vents away from Brimstone as possible, and to look for correlations between vent location, temperature, fluid composition, and animal and microbial communities. We were able to carry out this plan with HFS on 6 separate Jason-2 dives.

Dives 398 through 401 used an approximately 25cm long titanium extension on the HFS nozzle to give some extra reach for sampling. On dive 398, we sampled a full suite of samples for chemistry and microbiology from Brimstone, with fluids up to 80degC. We followed with a series of samples from “Mat Mecca”. HFS was on dive J2-400, but this dive was changed to look for the CTD lost just prior to the start of the dive. No vent samples were collected on this dive, but we did take one filtered bag sample on the edge of the Brimstone particle plume. We began dive 401 at Brimstone, taking 4 water samples with temperature up to 207°C, and one sterivex filter for DNA just above the sediment surface in white smoke. This was followed by taking 3 water samples and 1 sterivex at Scarp Top, depth

564m. We then collected two water samples and a sterivex from a site with practically no visible flow but covered with orange coatings or mat (Iron599), and 4 water samples, 2 sterivex and a glass fiber filter from Iceberg.

For dives 403 and 405, we attached a 1-meter titanium extension on HFS to allow access to the intense venting at Brimstone. To start dive 403, we took 2 water samples and a sterivex from sulfur and/or mat-covered rocks on the north side of Brimstone vent, at a site which would later be called "Flock Rock". We moved to the volcanic vent and took w water samples, but then the sampling nozzle was dropped into sediments saturated with molten sulfur and became permanently clogged. A replacement tube was made for the next HFS dive.

During dive 405, we took 2 water samples and a sterivex from "Flying Floc", about 50-60 m east of Brimstone on a steep face at 530m depth with lots of white mat, where we deployed marker 115. There was strong diffuse flow here. From here, we moved to the north side of the summit ridge to the "Amphitheater" area, marker 102, and took 3 water samples, 2 sterivex and 1 glass fiber filter from flow coming out of a steep talus slope with lots of small shrimp at 558m depth. The next fluid sampling stop was Brimstone, where we collected 10 HFS water samples over approximately 2.5 hours. One of these samples, bag 21, was taken over volcanoclastic sand around the edge of the volcanic vent.

The standard short nozzle with no extension was on for dive 407. During dive 407, we took two water samples and two sterivex from within a few meters of marker 105, "Limpet Lair", where the shrimp trap had been. (The second water sample, bag 18, was accidentally overfilled and burst.) Next, took a background sample, followed by 3 water samples and one sterivex at the "Sulfur Slide", marker 113 site, 571m depth on the "middle knife ridge" that extends roughly southward out of the east-west ridge near Scarp Top. From there we transited to the summit, and continued slightly west of the summit on the south side of the summit ridge and took two water samples at 529m depth (the first, bag 22, had zero volume due to a plumbing leak) and a sterivex. From this point, we made a short transit down and immediately back up the slope of the new eruptive mound that has formed around Brimstone, and took 3 water samples and one sterivex at the "Flock Rock" marker 103 site, 520m depth, within site of the Brimstone plume. This area was covered with white material, probably bacterial mat, but possibly sulfur, and there were shrimp here. By appearance and navigation, this is very close to the site sampled on dive 403. We moved to a spot about 50m east of Brimstone, depth 542m, and took two more water samples, from cracks in rocks covered with white and orange mat and dusted with dark volcanoclastics. The final sample of the cruise was a background sample at approximately 180m depth during the ascent.

Overall, we took 58 successful water samples with the HFS, as well as 15 filters for DNA/RNA analysis and 2 filters for N isotope analysis. The samples included a time series from Brimstone volcanic vent (25 HFS samples), and samples from an additional 11 vent sites between 520 and 600m depth. It is likely that volcanic sulfur dioxide plays a major role in the ecology as well as the geochemistry of NW Rota. The toxicity and strong acidity of SO<sub>2</sub> are likely an inhibiting factor to macrofauna, and we intend to test this hypothesis with the analysis of SO<sub>2</sub> from all of the vent sites, in combination with data on which species are present at each vent site. In addition to the fluid chemistry work, we made observations of temperature within the volcanic sediments at different points around the summit of the volcano, either with the Jason temperature probe or with Koichi Nakamura's multi-temperature sensor. These observations can help to constrain how heat is lost and may relate to the formation of different colored surface layers on volcanoclastic deposits.

**Table 4.3.1-1 HFS Fluid Samples**

HFS sample number	Cruise Report Sample-ID	Date	Start time UTC	Stop Time UTC	Tmax degree C	T avg degree C	Reported volume pumped ml	Lab measured volume ml	Gas head space ml	Vent/Marker Name	Comments
Sample codes: B=bag, BF=filtered bag P=piston PF=filtered piston F=sterivex filter GFF=glass fiber filter Ti=titanium piston											
<b>Water Samples</b>											
J2-398PF4	J2-398-HFS-02	4/5/2009	16:12:23	16:12:23	80.5	53.3	337	410	0	Brimstone	filt pist brimstone
J2-398-P8	J2-398-HFS-03	4/5/2009	16:16:50	16:16:50	31.2	22.5	355	366	1	Brimstone	unfilt pist brimstone
J2-398-B24	J2-398-HFS-04	4/5/2009	16:43:10	16:43:10	15.1	14.6	252	320.1	5	Brimstone	unfilt bag brimstone 3 above bottom white smoke middle of pulse
J2-398-PF2	J2-398-HFS-05	4/5/2009	17:11:08	17:11:08	26.4	22.2	331	332	leaked	Brimstone	Ti filt piston brimstone close to center gas bubbles right after tephra event
J2-398-P3	J2-398-HFS-07	4/5/2009	17:16:40	17:16:40	69.8	55.7	278	272	0	Brimstone	Ti piston with stbd gastite strong pulse
J2-398-BF16	J2-398-HFS-09	4/5/2009	17:23:27	17:23:27	37.4	35.6	202	251.1	0	Brimstone	filt bag
J2-398-PF5	J2-398-HFS-10	4/5/2009	17:38:38	17:38:38	40.1	28.5	300	324	1	Brimstone	filt pist brimstone ground move
J2-398-P6	J2-398-HFS-13	4/5/2009	20:59:22	20:59:22	45.3	45	505	580	123	Mat Mecca	unfiltered piston Mat Mecca 538m hdg, piston leaky
J2-398-PF7	J2-398-HFS-14	4/5/2009	21:02:47	21:02:47	45.2	40.8	361	380	32	Mat Mecca	filtered piston Mat Mecca
J2-398-B23	J2-398-HFS-15	4/5/2009	21:13:19	21:13:19	43.8	42.4	485	579.9	53	Mat Mecca	mat mecca unfiltered bag
J2-398-BF17	J2-398-HFS-16	4/5/2009	21:19:17	21:19:17	43.1	42.2	476	567.2	33	Mat Mecca	filtered bag mat mecca

HFS sample number	Cruise Report Sample-ID	Date	Start time UTC	Stop Time UTC	Tmax degree C	T avg degree C	Reported volume pumped ml	Lab measured volume ml	Gas head space ml	Vent/Marker Name	Comments
J2-398-B22	J2-398-HFS-18	4/5/2009	21:52:31	21:52:31	9.4	9.3	364	447.5	27	Background SW	background on the way up
J2-400-BF16	J2-400-HFS-01	4/7/2009	18:09:29	18:09:29	7.8	7.8	320	no sample		Brimstone plume	1st plume sample, loose fitting, did not fill
J2-400-BF17	J2-400-HFS-02	4/7/2009	18:14:29	18:14:29	8.4	7.9	503	603		Brimstone plume	2nd plume sample, on edge of Brimstone particle plume
J2-401-P1	J2-401-HFS-03	4/8/2009	11:39:58	11:42:11	46.9	37.7	294	222	13	Brimstone	brimstone first samp just above sediment in white smoke
J2-401-PF2	J2-401-HFS-05	4/8/2009	11:45:19	11:48:28	58.4	49.8	288	71	5	Brimstone	attempted brimstone same spot as P1
J2-401-P3	J2-401-HFS-06	4/8/2009	11:49:37	11:52:12	41.9	35.1	345	415	21	Brimstone	brimstone in white smoke just above sed surface. Miscommunication: No filter on this position.
J2-401-P6	J2-401-HFS-09	4/8/2009	12:15:05	12:16:34	207.4	201.3	193	249	180	Brimstone	Brimstone in sediment white smoke molten sulfur pH 1.15 Excellent sample
J2-401-B24	J2-401-HFS-12	4/8/2009	14:20:01	14:23:53	18.8	18.4	520	599	34	Scarp Top	Scarp Top 564m
J2-401-B23	J2-401-HFS-13	4/8/2009	14:24:05	14:47:05	16.7	16.3	503	592	0	Scarp Top	Scarp Top 564m
J2-401-BF16	J2-401-HFS-14	4/8/2009	14:48:27	14:52:11	16.1	15.6	501	567	0	Scarp Top	Scarp Top 564m
J2-401-B22	J2-401-HFS-16	4/8/2009	16:27:30	16:40:43	8.6	8.3	302	381.3	13	Iron 599	iron 599 m
J2-401-BF17	J2-401-HFS-17	4/8/2009	16:42:07	16:45:50	8.6	8.1	499	602	0	Iron 599	iron 599 m
J2-401-B21	J2-401-HFS-19	4/8/2009	18:19:34	18:23:56	27.3	18.8	346	420.9	0	Iceberg	iceberg unfiltered bag, sample is clear, more diluted than 18
J2-401-P8	J2-401-HFS-20	4/8/2009	18:34:24	18:38:08	36.7	35.9	502	500	50	Iceberg	annie's iceberg
J2-401-BF18	J2-401-HFS-21	4/8/2009	18:40:20	18:44:19	39	35.6	510	593	0	Iceberg	filtered bag iceberg. Fine white precip in bag after in-situ filtration, filter is good.
J2-401-P4	J2-401-HFS-22	4/8/2009	18:46:50	18:50:37	38.8	35.9	511	625	0	Iceberg	filtered piston iceberg

HFS sample number	Cruise Report Sample-ID	Date	Start time UTC	Stop Time UTC	Tmax degree C	T avg degree C	Reported volume pumped ml	Lab measured volume ml	Gas head space ml	Vent/Marker Name	Comments
J2-403-B24	J2-403-HFS-01	4/10/2009	11:28:42	11:33:39	20.5	17.3	468	572		Brimstone	B N side of Brimstone in sulfur coated rocks
J2-403-PF4	J2-403-HFS-02	4/10/2009	11:38:34	11:42:32	17.6	13	402	462		Brimstone	filt pist N side of brimstone sulfur coated rocks with floc
J2-403-P1	J2-403-HFS-04	4/10/2009	12:05:19	12:09:32	21.2	18.5	437	603	2	Brimstone	unfilt pist Brimstone
J2-403-PF2	J2-403-HFS-05	4/10/2009	12:23:54	12:25:13	140.7	124.7	149	664		Brimstone	Ti filt pist Brimstone, affected by reverse pumping when tip clogged
J2-405-B24	J2-405-HFS-01	4/11/2009	13:05:31	13:09:40	41.5	39.7	484	503	0	Flying Floc	B 530m depth Marker 115 strong flow through mat-covered rocks
J2-405-PF4	J2-405-HFS-02	4/11/2009	13:11:38	13:15:41	46.4	46.1	518	660	5	Flying Floc	PF mkr 115 "Flying Floc"
J2-405-B23	J2-405-HFS-06	4/11/2009	14:57:52	15:01:18	13.2	12.8	462	604	7air	Mkr 102	B marker 102 558m small shrimp
J2-405-P1	J2-405-HFS-07	4/11/2009	15:02:27	15:07:35	13.3	12.8	594	563	0	Mkr 102	P near 102, 558m depth, rocks and small shrimp
J2-405-BF17	J2-405-HFS-08	4/11/2009	15:08:52	15:13:11	13.2	12.7	555	665	0	Mkr 102	BF near 102 rocks, amphitheater small shrimp steady temp
J2-405-P3	J2-405-HFS-13	4/11/2009	16:55:50	16:58:04	24.5	20.9	250	360	29	Brimstone	P Brimstone
J2-405-P5	J2-405-HFS-14	4/11/2009	16:59:35	17:02:14	34.7	19	212	30		Brimstone	P brimstone second P1 exhaust puffs at start then stops
J2-405-PF2	J2-405-HFS-15	4/11/2009	17:22:35	17:25:41	44.5	40.6	242	127	0	Brimstone	PF-Ti brimstone pump not exhausting
J2-405-B22	J2-405-HFS-16	4/11/2009	17:26:39	17:28:14	38.7	35.2	175	220	0	Brimstone	B brimstone
J2-405-B21	J2-405-HFS-17	4/11/2009	17:43:28	17:46:30	21.5	19.2	250	352	0	Brimstone	B brimstone over sands on side of vent

HFS sample number	Cruise Report Sample-ID	Date	Start time UTC	Stop Time UTC	Tmax degree C	T avg degree C	Reported volume pumped ml	Lab measured volume ml	Gas head space ml	Vent/Marker Name	Comments
J2-405-P6	J2-405-HFS-20	4/11/2009	18:49:47	18:54:03	55.7	48	503	565	200	Brimstone	P-Ti brimstone after gas tight
J20405-PF7	J2-405-HFS-21	4/11/2009	18:54:51	18:59:15	57.9	46.4	499	570	75	Brimstone	PF brimstone after gas tight
J2-405-P8	J2-405-HFS-22	4/11/2009	19:00:31	19:04:21	48.4	41.2	507	550	125	Brimstone	P in smoke on edge of eruptive pit white smoke and not the intense yellow
J2-405-PF9	J2-405-HFS-23	4/11/2009	19:07:48	19:12:43	39.5	35.2	327	305	8	Brimstone	PF brimstone last in yellow smoke heading 319
J2-405-BF18	J2-405-HFS-24	4/11/2009	19:14:51	19:17:07	35.1	28.8	203	360	13	Brimstone	BF
J2-407-B24	J2-407-HFS-03	4/13/2009	14:59:00	15:02:53	16.2	14.4	514	603	0	Mkr 105	B shrimp trap Limpet Lair mark 105 544.6m depth
J2-407-BF18	J2-407-HFS-04	4/13/2009	15:05:25	15:09:54	16.4	16.2	582	broken bag		Mkr 105	BF intake jammed in crack below shrimp trap below mkr 105 OVERFILLED BROKE PUT IN 1L BOTTLE
J2-407-PF4	J2-407-HFS-07	4/13/2009	16:06:20	16:11:13	6.4	6.2	657	765	0	Background SW	PF background sw 581m en route to mkr 109
J2-407-P1	J2-407-HFS-08	4/13/2009	17:06:37	17:10:29	14.9	14.5	522	546	0	Sulfur Slide 113	P sulfur flow area 571m depth on middle knife ridge below scarp top.
J2-407-BF17	J2-407-HFS-09	4/13/2009	17:15:43	17:19:24	16.6	16	496	589	0	Sulfur Slide 113	BF sulfur flow area topo of middle ridge
J2-407-B23	J2-407-HFS-11	4/13/2009	17:42:04	17:45:07	16.7	16.4	451	496	5	Sulfur Slide 113	B sulfur flow area
J2-407-B22	J2-407-HFS-15	4/13/2009	18:54:58	18:58:15	32.3	31.6	504	no sample	plumb leak	W of summit 530m	B west of summit south of ridge 530m ZERO VOLUME IN BAG
J2-407-PF5	J2-407-HFS-16	4/13/2009	18:59:35	19:03:27	32.6	32	532	666	0	W of summit 530m	PF summit rock outcrop 530m shrimp



HFS sample number	Cruise Report Sample-ID	Date	Start time UTC	Stop Time UTC	Tmax degree C	T avg degree C	Reported volume pumped ml	Lab measured volume ml	Gas head space ml	Vent/Marker Name	Comments
J2-407-P3	J2-407-HFS-20	4/13/2009	19:48:10	19:52:09	32.2	29.7	538	546	8	Flock Rock 103	P 10m N of Brimstone white rock flock 521.9m hdg 131, luer valve came off b4 processing
J2-407-PF7	J2-407-HFS-21	4/13/2009	19:53:44	19:57:38	31.9	30.7	509	515	0	Flock Rock 103	PF N Brimstone flock white rock shrimp
J2-407-BF16	J2-407-HFS-24	4/13/2009	20:16:55	20:20:28	31.1	30	478	552	0	Flock Rock 103	BF 10m NE of Brimstone white rock and flock 522m hdg 137 pH
J2-407-P8	J2-407-HFS-25	4/13/2009	21:08:54	21:12:18	18.6	13.7	458	460	0	Brimstone E	P 50m east of brimstone, leaking out of blue filt hold lid
J2-407-PF9	J2-407-HFS-26	4/13/2009	21:13:23	21:16:01	16.2	13.6	294	324	0	Brimstone E	PF 50m east of brimstone 544m
J2-407-B21	J2-407-HFS-29	4/13/2009	21:45:32	21:49:10	13.7	11.4	477	broken bag		Background SW	B background sample end of dive BROKEN BAG, LOST
J2-407-PF2	J2-407-HFS-30	4/13/2009	21:52:13	21:55:57	26.6	24	501	680	0	Background SW	PF-Ti background sw 180m end of dive

**TOTAL:** 58 water samples

**Filter Samples**

J2-398-F11	J2-398-HFS-17	4/5/2009	21:42:44	21:42:44	45.8	42.9	3004			Mat Mecca	sterivex mat mecca
J2-401-F10	J2-401-HFS-07	4/8/2009	11:57:09	12:08:49	55.1	42.3	1368			Brimstone	Brimstone just at sed surface white smoke sterivex
J2-401-F15	J2-401-HFS-15	4/8/2009	14:53:14	15:14:09	18	16.9	3012			Scarp Top	Scarp Top Sterivex
J2-401-F11	J2-401-HFS-18	4/8/2009	16:47:40	17:03:44	8.6	8.3	3005			Iron 599	sterivex iron 599 m
J2-401-GFF20	J2-401-HFS-23	4/8/2009	18:54:41	19:08:20	36.7	34.9	3005			Iceberg	Annie's Iceberg
J2-401-F14	J2-401-HFS-24	4/8/2009	19:09:39	19:27:13	39	36.7	3003			Iceberg	sterivex iceberg
J2-401-F13	J2-401-HFS-25	4/8/2009	19:28:41	19:47:01	39.3	37.2	3003			Iceberg	sterivex Iceberg

HFS sample number	Cruise Report Sample-ID	Date	Start time UTC	Stop Time UTC	Tmax degree C	T avg degree C	Reported volume pumped ml	Lab measured volume ml	Gas head space ml	Vent/Marker Name	Comments
J2-403-F10	J2-403-HFS-03	4/10/2009	11:43:45	12:03:21	19.7	14.9	3006			Brimstone	sterivex
J2-405-F10	J2-405-HFS-03	4/11/2009	13:17:08	13:33:11	46.3	46.1	3002			Flying Floc	sterivex mkr 115 "Flying Floc"
J2-405-F12	J2-405-HFS-09	4/11/2009	15:14:44	15:30:48	13.5	12.9	3005			Mkr 102	sterivex near 102 558m shrimp and rocks
J2-405-F13	J2-405-HFS-10	4/11/2009	15:31:33	15:49:05	13.3	12.7	3281			Mkr 102	sterivex mkr 102 558m pH 5.48
J2-405-GFF20	J2-405-HFS-11	4/11/2009	15:51:26	16:04:50	12.6	12.2	3066			Mkr 102	mkr 102 "Mat" small shrimp rocks
J2-407-F15	J2-407-HFS-05	4/13/2009	15:11:05	15:26:14	16.5	14.4	3013			Mkr 105	sterivex below mkr 105 crab eating shrimp intake jammed in crack
J2-407-F14	J2-407-HFS-06	4/13/2009	15:27:25	15:44:15	14.4	11.8	3266			Mkr 105	sterivex below mkr 105 544.6m hdg 26deg jammed in crack crab ate a shrimp
J2-407-F12	J2-407-HFS-10	4/13/2009	17:21:56	17:37:12	17.9	17.4	3006			Sulfur Slide 113	sterivex
J2-407-F10	J2-407-HFS-18	4/13/2009	19:05:20	19:19:52	33	31.8	3002			W of summit 530m	Sterivex west of summit 530m
J2-407-F11	J2-407-HFS-22	4/13/2009	19:59:15	20:14:47	32.2	29	3059			Flock Rock 103	sterivex 10m NE of Brimstone 522.1m hdg 137 white rock and flock

**TOTAL:** 17 filter samples

Figure 4.3.1-1 Fluid Sampling Sites

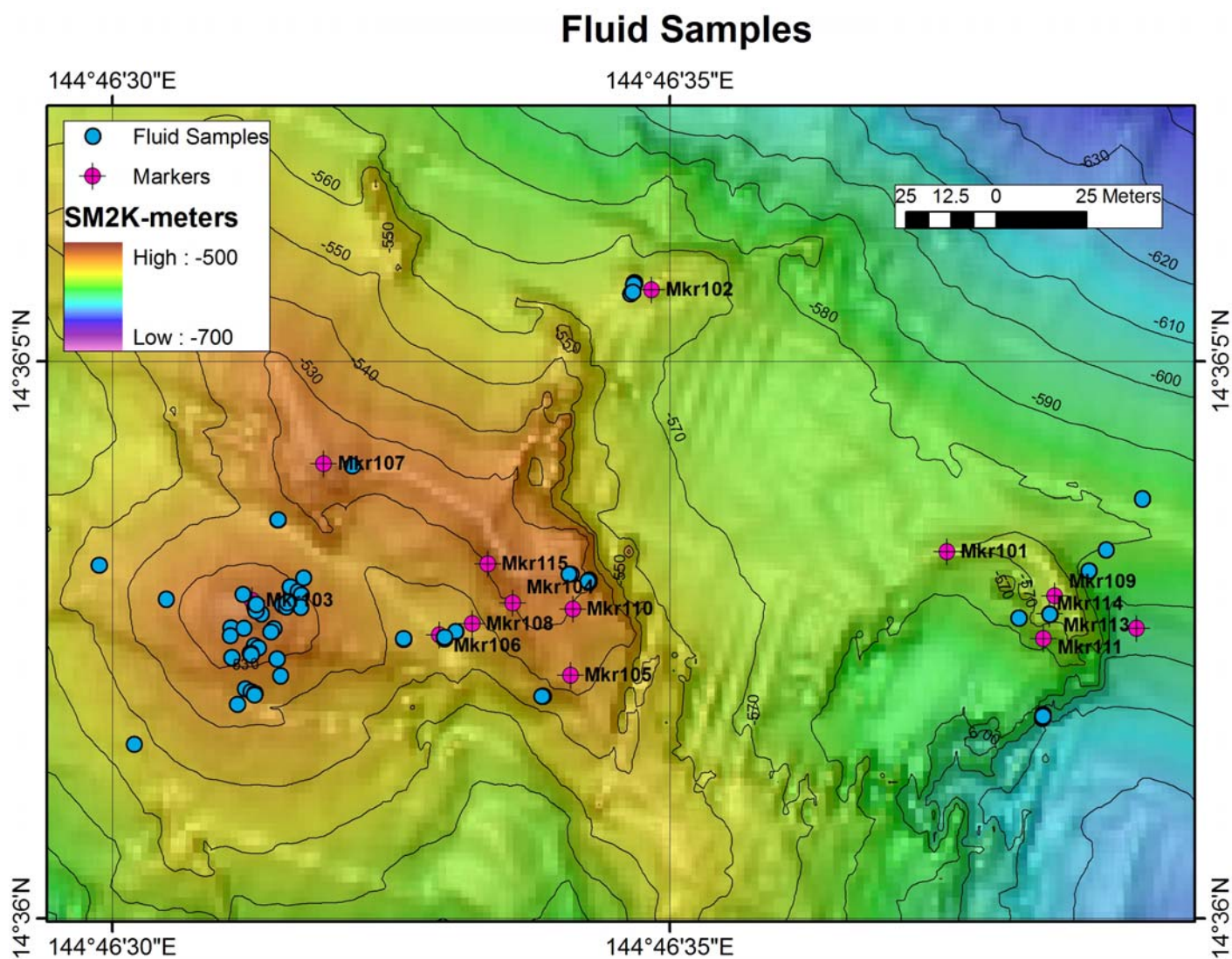


Table 4.3.1-2 Niskin Samples

Sample Name	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j396-niskin-10	Brimstone	20090404 211430	14.60072 5	144.775295	519.0	525.9	Niskin. Hoped to fire it in the plume but missed that. We're hoping to get ash but will probably be a background sample.	Deardorff	1405
j408-niskin-13	Brimstone Plume	20090414 212702	14.60043 42	144.775055	503.3	547.3	Tripped the Niskin bottle in the plume. Z=517m. Above Brimstone.	Deardorff	13125

### 4.3.2 Gas Sampling

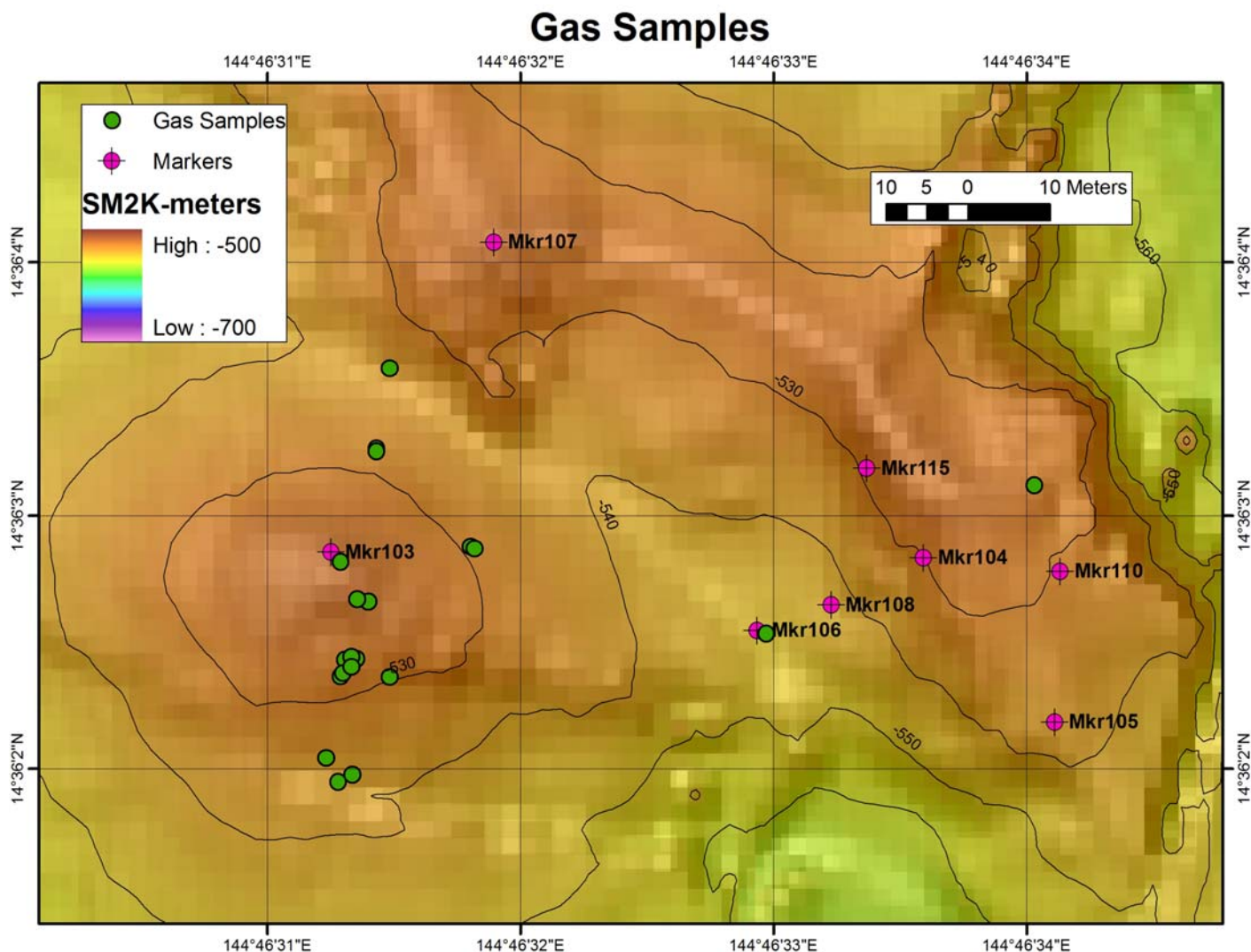
Leigh Evans

The 2009 expedition to NW Rota #1 saw most of the ~20 gastight bottle samples come from the Brimstone Vent area. DesVente visibility problems, a sample with an apparent gas concentration above 100 millimoles per kilogram was gathered. This nearly equals the maximum from 2006. A half dozen other samples were between 30 and 50 millimoles per kilogram were also gathered. Additionally, four gastight bottles were filled with the bubble stream from Brimstone. Other samples in the area of Brimstone could be useful as the Vent's activity changes over years.

**Table 4.3.2-1 Gas Samples**

Cruise Report Sample-ID	Dive	GTB	bottle description	Vent	fluid wt. (g)	Vent T ©	gas m-mole /kg
j396-gtb-07	J2-396	5	B&W	Brimstone smoke	148.7	<70	11.5
j396-gtb-08	J2-396	7	B&O	Brimstone smoke	166.9	<70	38.6
j398-gthfs-06	J2-398	15	port HFS	Brimstone	164.5	23.9	15.2
j398-gthfs-08	J2-398	11	stbd HFS	Brimstone	161.9	55	18.4
j401-gtb-26	J2-401	9	red	Iceberg	166.6	39	2.8
j401-gthfs-04	J2-401	11	stbd HFS	Brimstone	159.1	200	115.9
j401-gthfs-08	J2-401	15	port HFS	Brimstone	163.2	47	53
j403-gtb-07	J2-403	9	red	Brimstone smoke	25.4	<b>low wt</b>	70.1
j405-gthfs-04	J2-405	15	port HFS	mkr 115 Flying Floc	164.7	46.3	39.2
j405-gthfs-12	J2-405	11	stbd HFS	mkr 103 Amphitheater	167.5	12.6	10.3
j405-gtb-18	J2-405	2	grn	Brimstone 110 deg edge of venting	160.4	~50	35.4
j407-gthfs-23	J2-407	11	stbd HFS	N of Brimstone	167	31.2	14.9
j407-gthfs-17	J2-407	15	port HFS	near mkr 107	137	31.3	17.3
j407-gtb-28	J2-407	9	red	Brimstone smoke		no sample	
j408-gtb-11	J2-408	2	grn	Brimstone smoke	160		51.3
j411-gtb-01	J2-411		red/white/blue	bottle lost from basket			
j411-gtb-02	J2-411	5	B&W	Brimstone smoke	148.3		18
j411-gtb-03	J2-411	9	red	Brimstone smoke no sulfamic acid	163.5		36.1
<b>GAS Bubble Sampling</b>							<b>Liters STP gas</b>
j403-gtb-06	J2-403	7	funnel	Brim bubs	drip		8.56
j405-gtb-19	J2-405	7	funnel	Brim bubs	drip		7.82
j407-gtb-27	J2-407	5	funnel	Brim bubs	drip		8.16
j408-gtb-10	J2-408	7	funnel	Brim bubs	drip		8.35

Figure 4.3.2-1 Gas Sampling Sites



#### 4.4 CTD Operations

Sharon Walker

CTD operations were conducted using a Seabird 9*plus* CTD. The following auxiliary sensors were added to the system: 2 Seapoint optical backscatter sensors (LSS, detects particles); PMEL and AIST (Japan) Oxidation-Reduction Potential sensors (ORP, detects reduced chemical species); a Seabird pH/ORP sensor; and a Benthos altimeter.

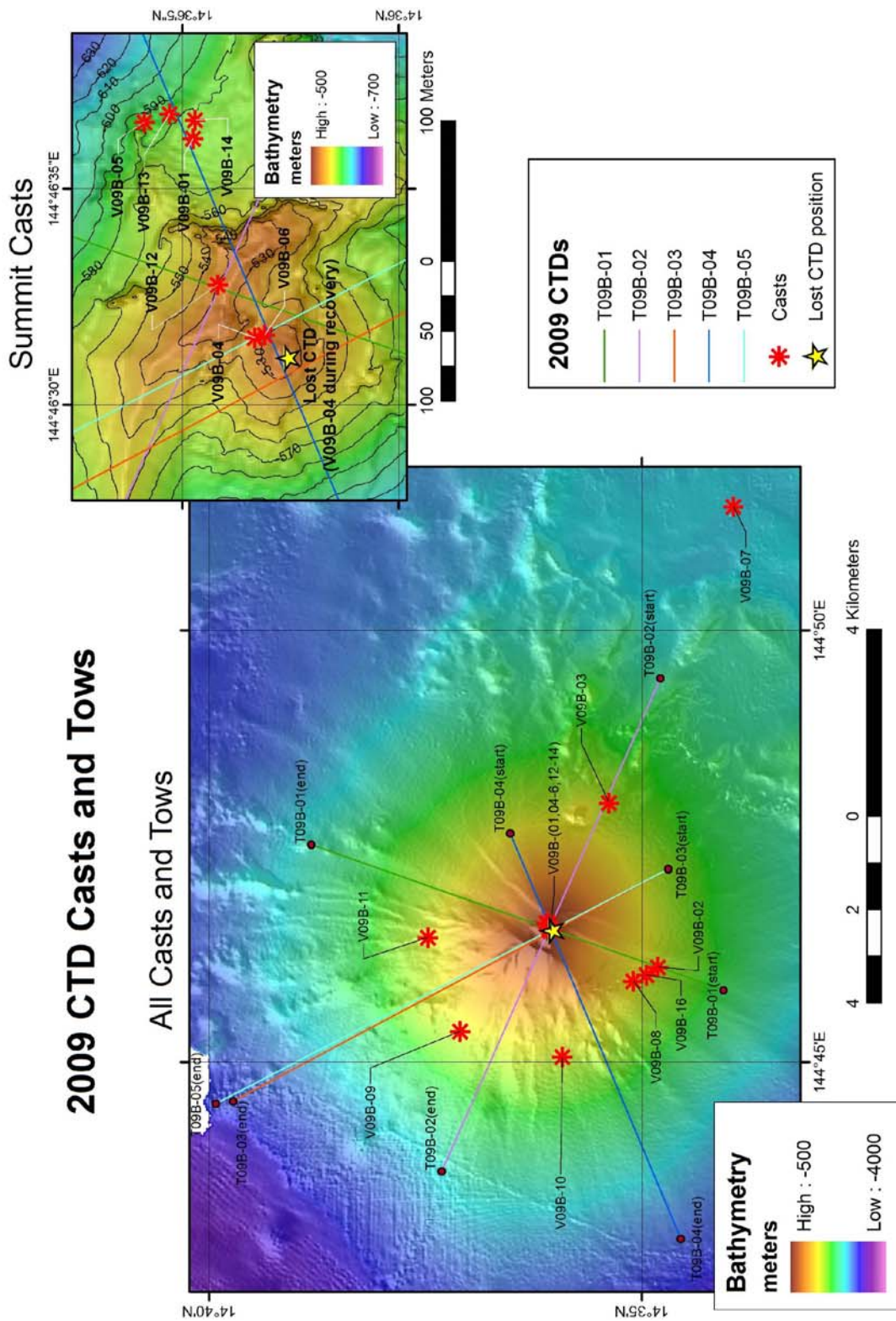
A total of 21 CTD casts were completed during this cruise. Five (5) tows and 12 vertical casts mapped the extent of particle plumes over the summit and surrounding the flanks of the volcano. The tows were oriented in a wagon-wheel pattern with vertical casts positioned between the tows and beyond the tow endpoints, providing good coverage for mapping the vertical and areal extent of the plumes. Tow T09B-05 was a repeat of T09B-03 to document short-term variability along that transect. Four (4) repeat vertical casts provided data on the short-term variability of the plume height at the RAS mooring site that was needed to finalize the design and assembly of the RAS mooring which was deployed at the end of the cruise. Water was collected during the casts for shipboard or laboratory analyses of helium, pH, CO<sub>2</sub>, hydrogen, methane, total dissolvable metals, sulfite, and particulates (filters for SEM and XRF analyses). Table 4.4-1 is a summary of CTD cast locations and samples acquired during each cast.

**Table 4.4-1 CTD Casts and Tows**

CTD	Cast/Tow Name	Lat (deg)N	Lat (min) N	Long (deg)E	Long (min) E	Comments
1	T09B-01(start)	14	34.0553	144	45.8340	NW Rota - tow SW->NE along mooring transect (to 2000m contour on each end of tow)
	T09B-01(end)	14	38.8199	144	47.5160	
2	T09B-02(start)	14	34.7852	144	49.4458	NW Rota - tow SE->NW across mooring transect/summit (to 2000m contour on each end of tow)
	T09B-02(end)	14	37.3127	144	43.7358	
3	V09B-01	14	36.0792	144	46.6028	vertical cast @ RAS mooring location (to determine plume depth; plan to repeat for variability)
4	V09B-02	14	34.8121	144	46.1023	vertical cast to extend summit plume info along "gap" in T09B-01 (~1650m contour)
5	V09B-03	14	35.3775	144	48.0040	vertical cast to extend summit plume info along "gap" in T09B-02 (~1650m contour)
6	T09B-03(start)	14	34.6936	144	47.2315	tow SE->NW between T09B-01 and T09B-02 with focus on shallow plume
	T09B-03(end)	14	39.7243	144	44.5482	
7	V09B-04	14	36.0554	144	46.5259	Brimstone Vent
8	V09B-05	14	36.0980	144	46.6090	repeat cast at RAS mooring site
9	T09B-04(start)	14	36.5211	144	47.6509	tow NE->SW between T09B-01 and T09B-02 with focus on shallow plume
	T09B-04(end)	14	34.5520	144	42.9533	
10	V09B-06	14	36.0516	144	46.5270	Brimstone Vent
11	V09B-07	14	33.9397	144	51.4325	background cast 9.8km from summit to SE
12	V09B-08	14	35.0995	144	45.9364	vertical cast at ~1500m contour SW of summit (in "channel" from Brimstone, slightly west of T09B-01)
13	V09B-09	14	37.0983	144	45.3547	vertical cast at ~1500m contour NW of summit (between T09B-02 and T09B-03)
14	V09B-10	14	35.9191	144	45.0599	vertical cast at ~1500m contour SW of summit (between T09B-01 and T09B-02)
15	V09B-11	14	37.4702	144	46.4427	vertical cast at ~1500m contour N of summit (between T09B-01 and T09B-03)
16	V09B-12	14	36.0698	144	46.5464	Brimstone
17	V09B-13	14	36.0883	144	46.6123	repeat cast at RAS mooring site
18	T09B-05(start)	14	34.6916	144	47.2341	repeat of T09B-03
	T09B-05(end)	14	39.9244	144	44.5167	
19	V09B-14	14	36.0785	144	46.6099	repeat cast at RAS mooring site
20	V09B-15	14	41.6378	144	43.6210	vertical beyond end of T09B-03(T09B-05)
21	V09B-16	14	34.9444	144	46.0091	vertical cast at ~1600m downslope of Brimstone - not far from 1500m mooring

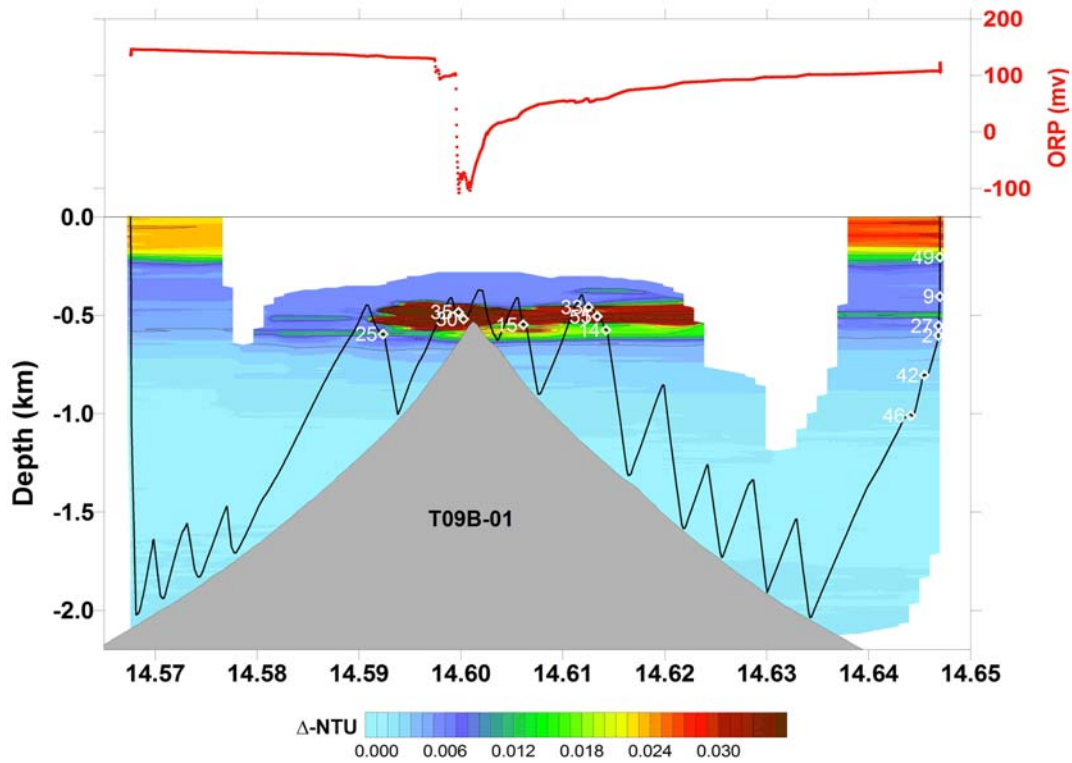
During previous visits to NW Rota-1 (2004, 2005 and 2006), deep particle layers were present at multiple depths in all directions surrounding the volcano. No deep particle layers were present during this expedition. The plume over the summit of the volcano was observed between the depths of 460-635 m with the plume maximum usually occurring at 500-535 m. In some tows, two distinct plume layers were present with the core of the deeper layer around 600-613 m. The plume appeared to be dispersing predominantly to the north and west. ORP anomalies were always strongest directly over the summit of the volcano.

Figure 4.4-1 CTD Casts and Tows



**Figures 4.4 2-5:** Particle plumes (contoured values) and ORP anomalies (red line) along the CTD tow transects. Contoured values are  $\Delta$ NTU (Nephelometric Turbidity Units above a non-plume affected background value); black line shows the tow track of the CTD; white symbols show where the bottles were tripped and are labeled with the Niskin bottle number.

**Figure 4.4-2 CTD T09B-01**



**Figure 4.4-3 CTD T09B-02**

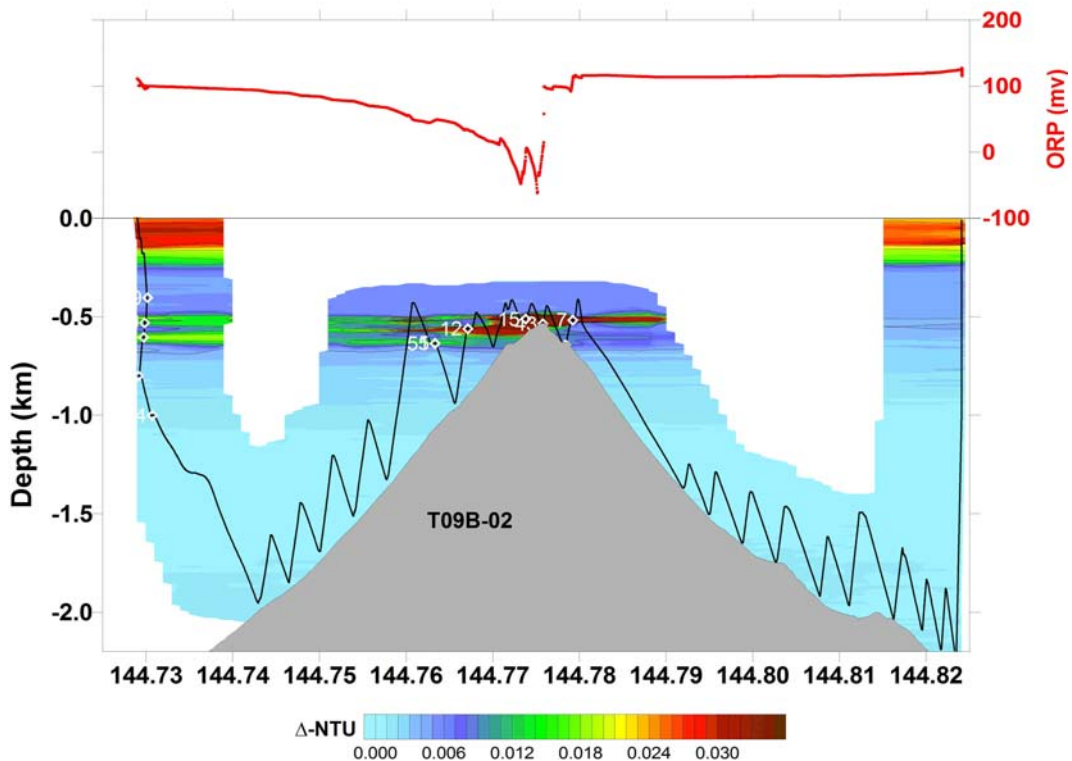




Figure 4.4-4 CTD T09B-03

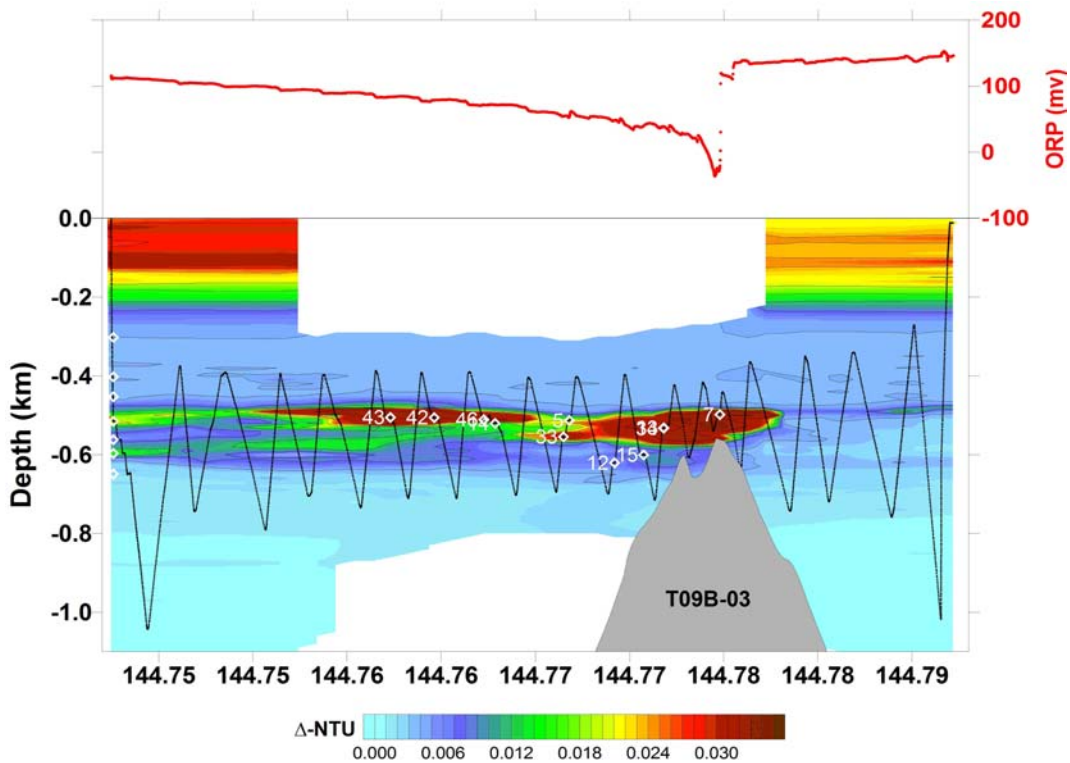


Figure 4.4-5 CTD T09B-04

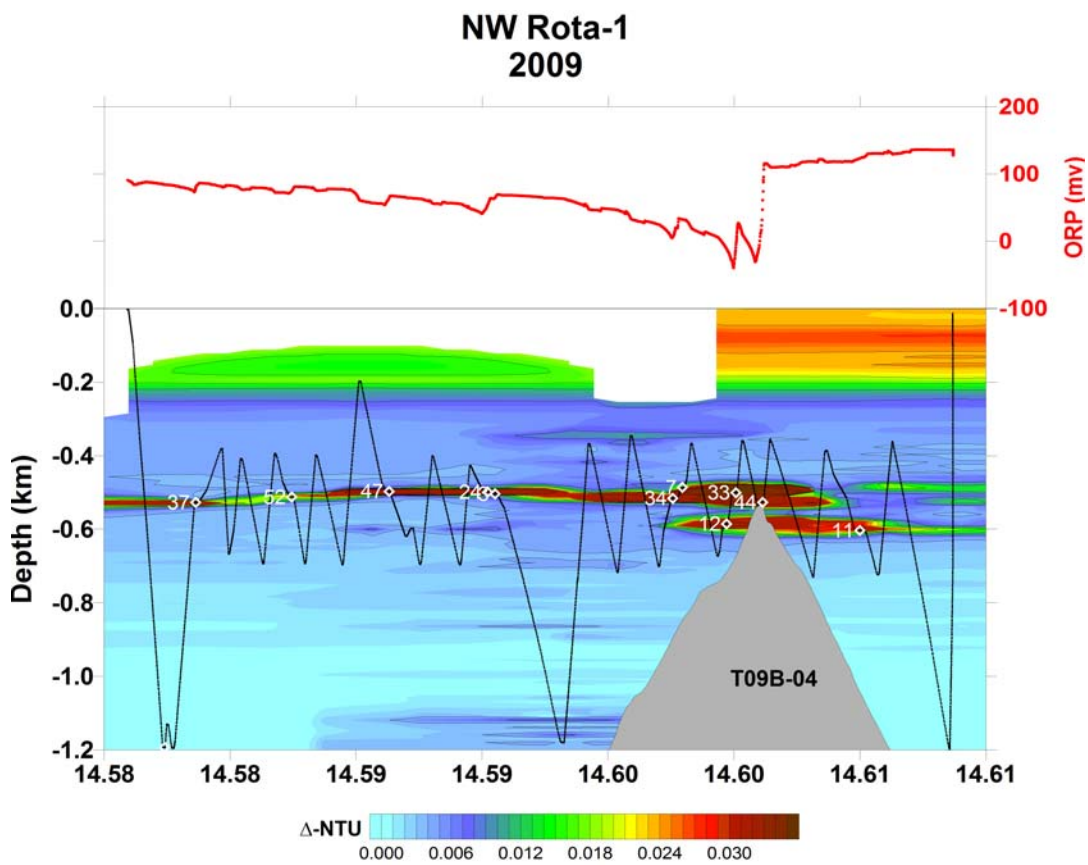
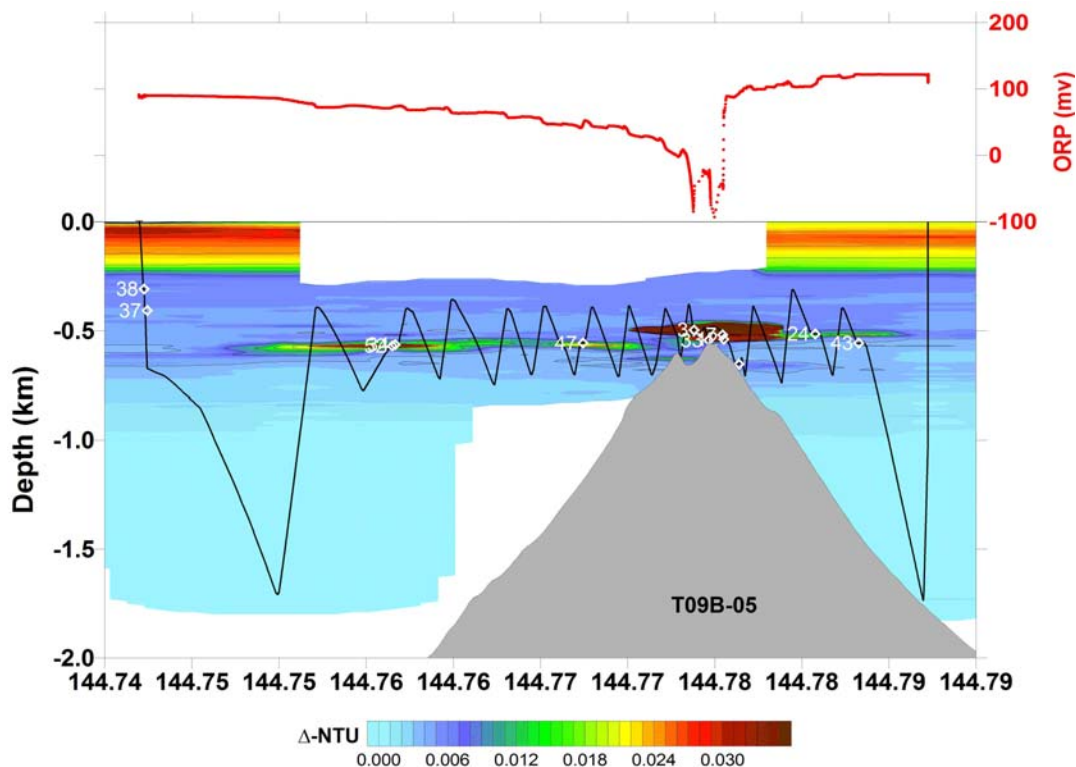


Figure 4.4-6 CTD T09B-05



### CTD LOSS

The PMEL CTD was lost over the side during CTD operations on April 7, 2009 due to winch operator error during a recovery (the CTD was two-blocked and the cable parted). The following is a report about the loss of the PMEL CTD by Sharon Walker:

We had just completed a routine vertical cast and were in the process of bringing the CTD package back on deck. The winch operator had stopped the winch with the CTD at the surface so that the marine technician could direct the recovery. The normal procedure was to raise the CTD to about rail-height and stop again before the marine technician started moving the boom inboard. The winch operator needs to slowly bring in the wire as the boom is moved so that the CTD maintains the desired height to clear the rail before being lowered onto the deck. The problem occurred at this point: the winch speed was not properly controlled thereby raising the CTD way too fast. The wire broke when the CTD termination slammed into the block and the CTD dropped into the ocean. The location of the ship was noted at the time this happened. After the PMEL CTD was lost the ship's CTD was used, with spare PMEL analog sensors, for subsequent operations.

This accident occurred on our eighth cast during this cruise. The prior seven deployments and recoveries were without incident, however, I noticed two things that concerned me during the previous deployments/recoveries. 1) The CTD was routinely raised very close to the block to control swinging of the CTD, leaving only a very short length of cable between the CTD and the block (I had asked the marine technician to consider using tag lines to control swinging instead, but he was satisfied with their method); and 2) the railing over which the CTD had to pass was not lowered during deployments or recoveries. The weather was generally good during this cruise and swinging of the CTD was not extreme.

The CTD frame did not have a safety line, although a Chinese-fingers cable grip loop was attached to the wire above the termination when we arrived at the ship as it had been used during the prior cruise. I had requested we be able to use this loop and add a safety line from it to our frame at the start of the cruise, however, since the PMEL CTD frame (approx. 7 feet tall) is taller than the CTD used on the previous cruise, there was a concern that there would not be enough room to leave the cable grip loop on. The loop was removed at the marine technician's discretion. It is not certain that a safety line attached to something above the termination would have prevented the loss of the CTD under

these circumstances since a printout of the shipboard data showed the winch speed went from 0 to 50 m/min in the span of 1 second. A safety line may also have broken upon impact with the block at this speed.

The short distance of cable between the CTD termination and block during deployment/recovery procedures means human reaction times need to be nearly instantaneous to avoid an accident such as this. Modifying the deployment/recovery procedure to allow for more room between the CTD termination and block could provide a small margin for error for human reflexes. After the PMEL CTD was lost, the railing was lowered for all subsequent CTD deployments and recoveries, however, tag lines were still not employed. The feasibility of an automatic shut-off for the winch that is triggered before the termination gets too close to the block should be evaluated.

The PMEL CTD package included:

- 1 Custom-built frame
- 21 custom-built 19-liter trace metal ready Niskin style bottles
- 1 Seabird 24-position Carousel water sampler
- 1 Seabird 9plus CTD
- 2 Seabird temperature sensors
- 1 Seabird conductivity sensor
- 1 Seabird pump
- 2 Seapoint light backscattering sensors (turbidity sensor) with custom sensitivity
- 1 Wetlabs light backscattering sensor
- 1 custom-built (PMEL) ORP sensor
- 1 custom built (AIST-Japan) ORP sensor
- 1 Seabird pH/ORP sensor
- 1 Benthos altimeter (model 2110D – worked extremely well!)

complete set of underwater cables, including 3 specialized Y-cables

- 1 Sequoia Scientific, Inc LISST particle size analyzer plus battery pack

The entire package was owned by PMEL (Vents program), with the exception of the LISST which was owned by National Institute of Advanced Industrial Science and Technology (AIST), AIST Tsukuba Central 7, Tsukuba, 305-8567, Japan (Ko-Ichi Nakamura).

The following is an eye-witness account of the incident by Ron Greene:

After stopping at the surface and as all were ready for recovery, the winch operator brought up the pkg to about 3' below the block. That was about 2 feet higher than is comfortable, but not unreasonable as we next boom in which lowers the pkg. So Tony started the boom in and the operator snugged up more to about 18" below the block which was too close at that time of the boom in, since the pkg is still outboard of the ship about 10' and the operator still has time to adjust the pkg to a comfortable ht above the rail as we get in closer over about the next 10 seconds. Often the operator will keep the pkg up high to keep from swinging but not closer than about 3'. Anyway as I was saying, the operator had the pkg up to about 18" and after a very brief pause seemed to make a move (at a time I thought he might have been slightly uncomfortable with the snugged up spot and was meaning to lower it a tad, but went up instead, then panicked as it was way too close and he was wanting to get lower) then powered it on up into the block. I think he lost track of his direction and in the confusion, and with the safe distance unacceptable he overreacted and powered away, lastly in desperation, all in about 2 seconds of mistakes. It was over before anyone could react. From the time he snugged up to about 3', then brief pause at 18" etc., was no more than 2 seconds.

The following is an eye-witness account of the incident by Nathan Buck:

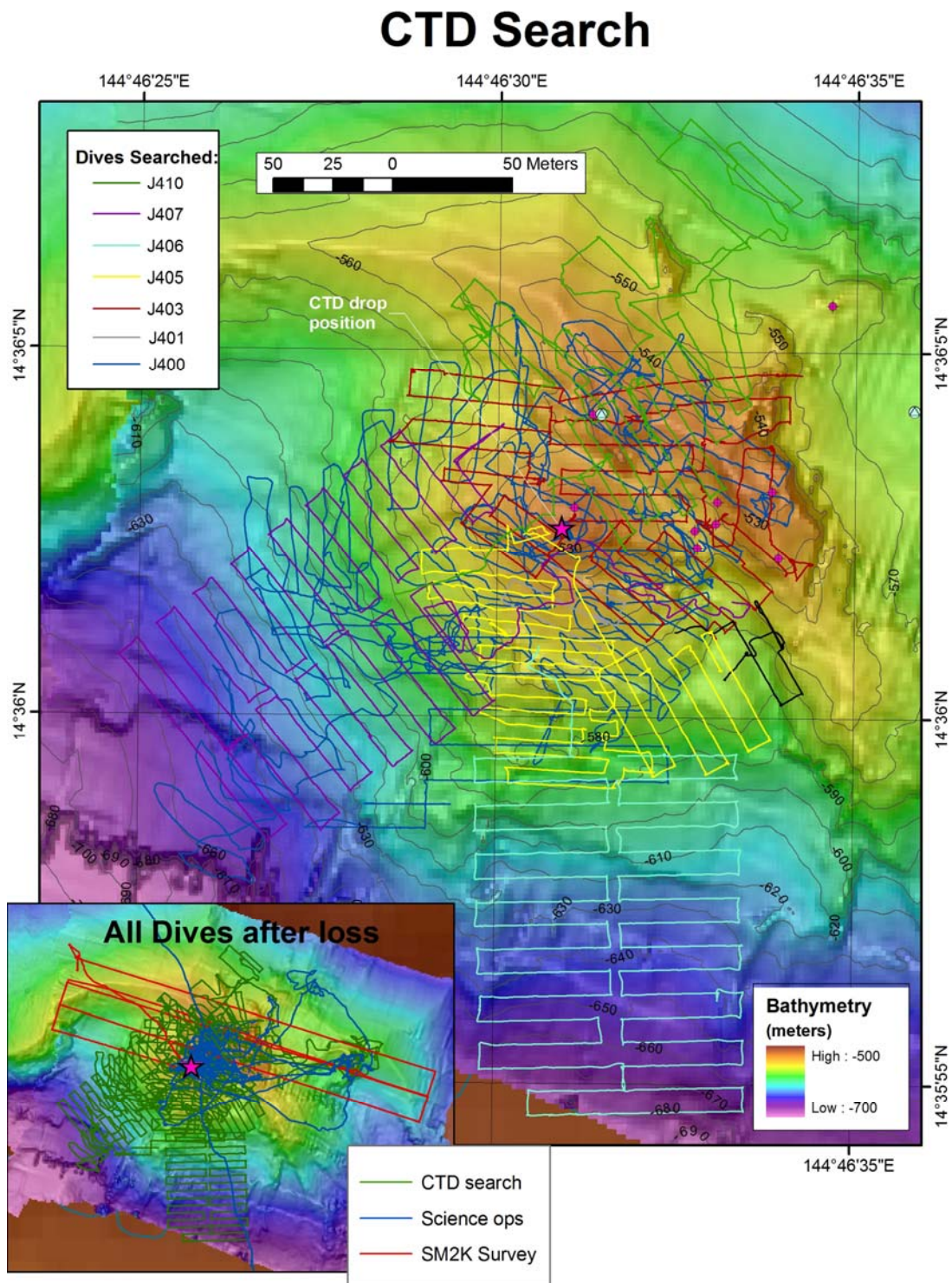
For what it's worth I remember the CTD coming to the surface where it stayed for a short period of time, maybe 2 or 3 minutes, while Ron, Nick and Toni prepared for recovery on deck. The CTD then left the water and briefly stopped about a meter from the block, with the bottom of the CTD about level with the top of the bulkhead. The boom was then engaged and started retracting when the package was pulled right up into the block at a very rapid rate of speed. I also remember seeing a printout that Toni, the SSG, had which showed a record of the winch speed during the accident and it corroborated what I saw. This being a change of wire speed from 0 m/m to 50 m/m in a matter of seconds.

The following is a description of the subsequent search for the CTD on the seafloor by Bill Chadwick:

The location where the CTD was dropped is precisely known (14° 36.043'N, 144° 46.518'E), and is within a few meters of Brimstone vent. The Jason dive later that day (J2-400) was devoted entirely (12 hours) to searching for the CTD on the seafloor using a systematic search pattern. On April 10th, at the suggestion of the CTD team, we adopted a Jason dive schedule in which the first 4 hours of subsequent 16-hour dives were devoted to repeating, improving, and

expanding the systematic search for the CTD on the bottom. This was accomplished on dives J2-403, J2-404-5, J2-406, J2-407, and J2-409-10-11 (see figure with CTD search dive tracks). In total, this amounted to about 30 hours of dive time devoted to searching for the CTD on the seafloor. Despite this thorough search of the area within 100 meters of Brimstone vent, the area where the CTD almost surely landed on the bottom, we did not find it, probably because it rolled downslope to the south after it landed. Unfortunately these slopes extend down from Brimstone vent at 520 m to over 3000 m depth, so includes a much larger area that would be impractical to search. In addition to the searches near Brimstone vent, another 16-hour Jason dive (J2-408) started at a depth of 1650 m and made long zigzag traverses up the slope below Brimstone. No evidence of the CTD or its likely path downslope was found on this dive.

Figure 4.4-7 JASON CTD Search



## 4.5 HD video, HD framegrabs, and DSC still imagery

A prototype HDTV camera was installed on Jason for this expedition by WHOI's Advanced Imaging and Visualization Laboratory (AIVL), and took the place of the normal Jason 3-chip science camera. Funding for the HD camera was from the Canadian Broadcasting Corp. (CBC), the NOAA Vents Program, and the National Science Foundation, and was supported at sea by Evan Kovaks (WHOI/AIVL). The controls for the HD camera were somewhat awkward, involving a joystick for pan & tilt, and scroll bars on a computer screen for focus, iris, and zoom. The HD video was recorded in several different formats. HD video was recorded selectively (as "highlights") to and HDCAM tape deck (provided by AIVL) and to an HDV tape deck (provided by NOAA). The video from the HD camera was also down-converted to standard definition video and recorded continuously to DVCam tapes (provided by Science) and to DVD (the standard Jason data product). Data overlays were added to the DVCam and DVD recordings, but not on the HD recordings. In total, we recorded 34 hours of HDTV video to 17 2-hour HDCAM tapes and 37 1-hour mini-DV tapes (in HDV format). A 1-hour highlight tape was made from the HDTV video by AIVL after the cruise. A list of the (standard-definition) Video DVDs and the Data DVDs is provided in Tables 4.5-1 and 4.5-2, and a list of the HDTV video record times is provided in Table 4.5-3.

**Table 4.5-1 JASON Video DVD Listing**

Video DVD	Start Date/Time	End Date/Time	Lowering	Comments
DVD-001-BC-A	2009/04/04 6:25	2009/04/04 8:24	J2-396	1st lowering for NW Rota-1, 2009
DVD-001-PC-A	2009/04/04 6:25	2009/04/04 8:24	J2-396	at ~29min in BC-A and PC-A stopped, unknown reason.
DVD-001-SC-A	2009/04/04 6:25	2009/04/04 8:24	J2-396	May have lost 1-2 min.
DVD-002-BC-A	2009/04/04 8:20	2009/04/04 10:20	J2-396	
DVD-002-PC-A	2009/04/04 8:20	2009/04/04 10:20	J2-396	
DVD-002-SC-A	2009/04/04 8:20	2009/04/04 10:20	J2-396	
DVD-003-BC-A	2009/04/04 10:16	2009/04/04 12:15	J2-396	
DVD-003-PC-A	2009/04/04 10:16	2009/04/04 12:15	J2-396	May have muffled voice recording as headset worn incorrectly on
DVD-003-SC-A	2009/04/04 10:16	2009/04/04 12:15	J2-396	both 003 and 004 set
DVD-004-BC-A	2009/04/04 12:11	2009/04/04 14:13	J2-396	~12:38. When HDCam is on, screen is split and colours incorrect.
DVD-004-PC-A	2009/04/04 12:11	2009/04/04 14:13	J2-396	Seems that HDCam recording correctly but DVCAM and DVDs not.
DVD-004-SC-A	2009/04/04 12:11	2009/04/04 14:13	J2-396	13:13. Can use HDCam correctly without remote
DVD-005-BC-A	2009/04/04 14:08	2009/04/04 16:07	J2-396	
DVD-005-PC-A	2009/04/04 14:08	2009/04/04 16:07	J2-396	
DVD-005-SC-A	2009/04/04 14:08	2009/04/04 16:07	J2-396	
DVD-006-BC-A	2009/04/04 16:04	2009/04/04 18:03	J2-396	
DVD-006-PC-A	2009/04/04 16:04	2009/04/04 18:03	J2-396	
DVD-006-SC-A	2009/04/04 16:04	2009/04/04 18:03	J2-396	
DVD-007-BC-A	2009/04/04 17:59	2009/04/04 19:59	J2-396	
DVD-007-PC-A	2009/04/04 17:59	2009/04/04 19:59	J2-396	
DVD-007-SC-A	2009/04/04 17:59	2009/04/04 19:59	J2-396	
DVD-008-BC-A	2009/04/04 19:54	2009/04/04 21:26	J2-396	
DVD-008-PC-A	2009/04/04 19:54	2009/04/04 21:26	J2-396	
DVD-008-SC-A	2009/04/04 19:54	2009/04/04 21:26	J2-396	
DVD-009-BC-A	2009/04/05 6:58	2009/04/05 7:12	J2-397	
DVD-009-PC-A	2009/04/05 6:58	2009/04/05 7:12	J2-397	
DVD-009-SC-A	2009/04/05 6:58	2009/04/05 7:12	J2-397	
DVD-010-BC-A	2009/04/05 13:58	2009/04/05 15:58	J2-398	
DVD-010-PC-A	2009/04/05 13:58	2009/04/05 15:58	J2-398	
DVD-010-SC-A	2009/04/05 13:58	2009/04/05 15:58	J2-398	
DVD-011-BC-A	2009/04/05 15:55	2009/04/05 17:55	J2-398	
DVD-011-PC-A	2009/04/05 15:55	2009/04/05 17:55	J2-398	
DVD-011-SC-A	2009/04/05 15:55	2009/04/05 17:55	J2-398	
DVD-012-BC-A	2009/04/05 17:50	2009/04/05 19:51	J2-398	
DVD-012-PC-A	2009/04/05 17:50	2009/04/05 19:51	J2-398	
DVD-012-SC-A	2009/04/05 17:50	2009/04/05 19:51	J2-398	
DVD-013-BC-A	2009/04/05 19:46	2009/04/05 21:46	J2-398	
DVD-013-PC-A	2009/04/05 19:46	2009/04/05 21:46	J2-398	

Video DVD	Start Date/Time	End Date/Time	Lowering	Comments
DVD-013-SC-A	2009/04/05 19:46	2009/04/05 21:46	J2-398	
DVD-014-BC-A	2009/04/05 21:41	2009/04/05 21:54	J2-398	
DVD-014-PC-A	2009/04/05 21:41	2009/04/05 21:54	J2-398	
DVD-014-SC-A	2009/04/05 21:41	2009/04/05 21:54	J2-398	
DVD-015-BC-A	2009/04/07 10:06	2009/04/07 12:06	J2-400	
DVD-015-PC-A	2009/04/07 10:06	2009/04/07 12:06	J2-400	
DVD-015-SC-A	2009/04/07 10:06	2009/04/07 12:06	J2-400	
DVD-016-BC-A	2009/04/07 12:02	2009/04/07 14:02	J2-400	
DVD-016-PC-A	2009/04/07 12:02	2009/04/07 14:02	J2-400	
DVD-016-SC-A	2009/04/07 12:02	2009/04/07 14:02	J2-400	
DVD-017-BC-A	2009/04/07 13:57	2009/04/07 15:57	J2-400	
DVD-017-PC-A	2009/04/07 13:57	2009/04/07 15:57	J2-400	
DVD-017-SC-A	2009/04/07 13:57	2009/04/07 15:57	J2-400	
DVD-018-BC-A	2009/04/07 15:52	2009/04/07 17:52	J2-400	
DVD-018-PC-A	2009/04/07 15:52	2009/04/07 17:52	J2-400	
DVD-018-SC-A	2009/04/07 15:52	2009/04/07 17:52	J2-400	
DVD-019-BC-A	2009/04/07 17:48	2009/04/07 19:49	J2-400	
DVD-019-PC-A	2009/04/07 17:48	2009/04/07 19:49	J2-400	
DVD-019-SC-A	2009/04/07 17:48	2009/04/07 19:49	J2-400	
DVD-020-BC-A	2009/04/07 19:45	2009/04/07 21:44	J2-400	
DVD-020-PC-A	2009/04/07 19:45	2009/04/07 21:44	J2-400	
DVD-020-SC-A	2009/04/07 19:45	2009/04/07 21:44	J2-400	
DVD-021-BC-A	2009/04/07 21:41	2009/04/07 22:07	J2-400	
DVD-021-PC-A	2009/04/07 21:41	2009/04/07 22:07	J2-400	
DVD-021-SC-A	2009/04/07 21:41	2009/04/07 22:07	J2-400	
DVD-022-BC-A	2009/04/08 10:16	2009/04/08 12:16	J2-401	
DVD-022-PC-A	2009/04/08 10:16	2009/04/08 12:16	J2-401	
DVD-022-SC-A	2009/04/08 10:16	2009/04/08 12:16	J2-401	
DVD-023-BC-A	2009/04/08 12:12	2009/04/08 14:12	J2-401	
DVD-023-PC-A	2009/04/08 12:12	2009/04/08 14:12	J2-401	
DVD-023-SC-A	2009/04/08 12:12	2009/04/08 14:12	J2-401	
DVD-024-BC-A	2009/04/08 14:07	2009/04/08 16:07	J2-401	
DVD-024-PC-A	2009/04/08 14:07	2009/04/08 16:07	J2-401	
DVD-024-SC-A	2009/04/08 14:07	2009/04/08 16:07	J2-401	
DVD-025-BC-A	2009/04/08 16:02	2009/04/08 18:03	J2-401	
DVD-025-PC-A	2009/04/08 16:02	2009/04/08 18:03	J2-401	
DVD-025-SC-A	2009/04/08 16:02	2009/04/08 18:03	J2-401	
DVD-026-BC-A	2009/04/08 17:58	2009/04/08 19:58	J2-401	
DVD-026-PC-A	2009/04/08 17:58	2009/04/08 19:58	J2-401	
DVD-026-SC-A	2009/04/08 17:58	2009/04/08 19:58	J2-401	
DVD-027-BC-A	2009/04/08 19:53	2009/04/08 21:56	J2-401	
DVD-027-PC-A	2009/04/08 19:53	2009/04/08 21:56	J2-401	
DVD-027-SC-A	2009/04/08 19:53	2009/04/08 21:56	J2-401	
DVD-028-BC-A	2009/04/08 21:50	2009/04/08 22:09	J2-401	
DVD-028-PC-A	2009/04/08 21:50	2009/04/08 22:09	J2-401	
DVD-028-SC-A	2009/04/08 21:50	2009/04/08 22:09	J2-401	
DVD-029-BC-A	2009/04/09 10:05	2009/04/09 12:06	J2-402	
DVD-029-PC-A	2009/04/09 10:05	2009/04/09 12:06	J2-402	
DVD-029-SC-A	2009/04/09 10:05	2009/04/09 12:06	J2-402	
DVD-030-BC-A	2009/04/09 12:01	2009/04/09 14:01	J2-402	
DVD-030-PC-A	2009/04/09 12:01	2009/04/09 14:01	J2-402	
DVD-030-SC-A	2009/04/09 12:01	2009/04/09 14:01	J2-402	
DVD-031-BC-A	2009/04/09 13:56	2009/04/09 15:55	J2-402	
DVD-031-PC-A	2009/04/09 13:56	2009/04/09 15:55	J2-402	
DVD-031-SC-A	2009/04/09 13:56	2009/04/09 15:55	J2-402	
DVD-032-BC-A	2009/04/09 15:54	2009/04/09 17:53	J2-402	
DVD-032-PC-A	2009/04/09 15:54	2009/04/09 17:53	J2-402	
DVD-032-SC-A	2009/04/09 15:54	2009/04/09 17:53	J2-402	

Video DVD	Start Date/Time	End Date/Time	Lowering	Comments
DVD-033-BC-A	2009/04/09 17:49	2009/04/09 19:49	J2-402	
DVD-033-PC-A	2009/04/09 17:49	2009/04/09 19:49	J2-402	
DVD-033-SC-A	2009/04/09 17:49	2009/04/09 19:49	J2-402	
DVD-034-BC-A	2009/04/09 19:45	2009/04/09 21:36	J2-402	
DVD-034-PC-A	2009/04/09 19:45	2009/04/09 21:36	J2-402	
DVD-034-SC-A	2009/04/09 19:45	2009/04/09 21:36	J2-402	
DVD-035-BC-A	2009/04/10 6:53	2009/04/10 8:52	J2-403	
DVD-035-PC-A	2009/04/10 6:53	2009/04/10 8:52	J2-403	
DVD-035-SC-A	2009/04/10 6:53	2009/04/10 8:52	J2-403	
DVD-036-BC-A	2009/04/10 8:49	2009/04/10 10:49	J2-403	
DVD-036-PC-A	2009/04/10 8:49	2009/04/10 10:49	J2-403	
DVD-036-SC-A	2009/04/10 8:49	2009/04/10 10:49	J2-403	
DVD-037-BC-A	2009/04/10 10:44	2009/04/10 12:45	J2-403	
DVD-037-PC-A	2009/04/10 10:44	2009/04/10 12:45	J2-403	
DVD-037-SC-A	2009/04/10 10:44	2009/04/10 12:45	J2-403	
DVD-038-BC-A	2009/04/10 12:40	2009/04/10 14:40	J2-403	
DVD-038-PC-A	2009/04/10 12:40	2009/04/10 14:40	J2-403	
DVD-038-SC-A	2009/04/10 12:40	2009/04/10 14:40	J2-403	
DVD-039-BC-A	2009/04/10 14:35	2009/04/10 16:36	J2-403	
DVD-039-PC-A	2009/04/10 14:35	2009/04/10 16:36	J2-403	
DVD-039-SC-A	2009/04/10 14:35	2009/04/10 16:36	J2-403	
DVD-040-BC-A	2009/04/10 16:30	2009/04/10 18:30	J2-403	
DVD-040-PC-A	2009/04/10 16:30	2009/04/10 18:30	J2-403	
DVD-040-SC-A	2009/04/10 16:30	2009/04/10 18:30	J2-403	
DVD-041-BC-A	2009/04/10 18:27	2009/04/10 20:27	J2-403	
DVD-041-PC-A	2009/04/10 18:27	2009/04/10 20:27	J2-403	
DVD-041-SC-A	2009/04/10 18:27	2009/04/10 20:27	J2-403	
DVD-042-BC-A	2009/04/10 20:21	2009/04/10 21:32	J2-403	
DVD-042-PC-A	2009/04/10 20:21	2009/04/10 21:32	J2-403	
DVD-042-SC-A	2009/04/10 20:21	2009/04/10 21:32	J2-403	
DVD-043-BC-A	2009/04/11 8:12	2009/04/11 8:37	J2-404	Dive terminated and Jason brought back on board to repair
DVD-043-PC-A	2009/04/11 8:12	2009/04/11 8:37	J2-404	fluid sampler
DVD-043-SC-A	2009/04/11 8:12	2009/04/11 8:37	J2-404	
DVD-044-BC-A	2009/04/11 10:00	2009/04/11 11:56	J2-405	
DVD-044-PC-A	2009/04/11 10:00	2009/04/11 11:56	J2-405	
DVD-044-SC-A	2009/04/11 10:00	2009/04/11 11:56	J2-405	
DVD-045-BC-A	2009/04/11 11:54	2009/04/11 13:55	J2-405	
DVD-045-PC-A	2009/04/11 11:54	2009/04/11 13:55	J2-405	
DVD-045-SC-A	2009/04/11 11:54	2009/04/11 13:55	J2-405	
DVD-046-BC-A	2009/04/11 13:50	2009/04/11 15:50	J2-405	
DVD-046-PC-A	2009/04/11 13:50	2009/04/11 15:50	J2-405	
DVD-046-SC-A	2009/04/11 13:50	2009/04/11 15:50	J2-405	
DVD-047-BC-A	2009/04/11 15:46	2009/04/11 17:46	J2-405	
DVD-047-PC-A	2009/04/11 15:46	2009/04/11 17:46	J2-405	
DVD-047-SC-A	2009/04/11 15:46	2009/04/11 17:46	J2-405	
DVD-048-BC-A	2009/04/11 17:42	2009/04/11 19:42	J2-405	
DVD-048-PC-A	2009/04/11 17:42	2009/04/11 19:42	J2-405	
DVD-048-SC-A	2009/04/11 17:42	2009/04/11 19:42	J2-405	
DVD-049-BC-A	2009/04/11 19:37	2009/04/11 21:31	J2-405	
DVD-049-PC-A	2009/04/11 19:37	2009/04/11 21:31	J2-405	
DVD-049-SC-A	2009/04/11 19:37	2009/04/11 21:31	J2-405	
DVD-050-BC-A	2009/04/12 7:00	2009/04/12 8:58	J2-406	
DVD-050-PC-A	2009/04/12 7:00	2009/04/12 8:58	J2-406	
DVD-050-SC-A	2009/04/12 7:00	2009/04/12 8:58	J2-406	
DVD-051-BC-A	2009/04/12 8:55	2009/04/12 10:52	J2-406	
DVD-051-PC-A	2009/04/12 8:55	2009/04/12 10:52	J2-406	
DVD-051-SC-A	2009/04/12 8:55	2009/04/12 10:52	J2-406	
DVD-052-BC-A	2009/04/12 10:49	2009/04/12 11:02	J2-406	Started this set at 10:49 when Jason had lost power.

Video DVD	Start Date/Time	End Date/Time	Lowering	Comments
				Stopped at
DVD-052-PC-A	2009/04/12 10:49	2009/04/12 11:02	J2-406	10:52 when decided to start SM2000 survey. Restarted at 11:02
DVD-052-SC-A	2009/04/12 10:49	2009/04/12 11:02	J2-406	when ended up over Brimstone. Record travel along bottom to
DVD-053-BC-A	2009/04/12 20:19	2009/04/12 21:35	J2-406	start of survey.
DVD-053-PC-A	2009/04/12 20:19	2009/04/12 21:35	J2-406	Since regained power science cam is on but can't control iris
DVD-053-SC-A	2009/04/12 20:19	2009/04/12 21:35	J2-406	zoom, etc. Repaired at 11:11
DVD-054-BC-A	2009/04/13 6:49	2009/04/13 8:46	J2-407	
DVD-054-PC-A	2009/04/13 6:49	2009/04/13 8:46	J2-407	
DVD-054-SC-A	2009/04/13 6:49	2009/04/13 8:46	J2-407	
DVD-055-BC-A	2009/04/13 8:44	2009/04/13 10:44	J2-407	
DVD-055-PC-A	2009/04/13 8:44	2009/04/13 10:44	J2-407	
DVD-055-SC-A	2009/04/13 8:44	2009/04/13 10:44	J2-407	
DVD-056-BC-A	2009/04/13 10:39	2009/04/13 12:29	J2-407	
DVD-056-PC-A	2009/04/13 10:39	2009/04/13 12:29	J2-407	
DVD-056-SC-A	2009/04/13 10:39	2009/04/13 12:29	J2-407	
DVD-057-BC-A	2009/04/13 14:34	2009/04/13 16:34	J2-407	
DVD-057-PC-A	2009/04/13 14:34	2009/04/13 16:34	J2-407	
DVD-057-SC-A	2009/04/13 14:34	2009/04/13 16:34	J2-407	
DVD-058-BC-A	2009/04/13 16:31	2009/04/13 18:29	J2-407	
DVD-058-PC-A	2009/04/13 16:31	2009/04/13 18:29	J2-407	
DVD-058-SC-A	2009/04/13 16:31	2009/04/13 18:29	J2-407	
DVD-059-BC-A	2009/04/13 18:26	2009/04/13 20:25	J2-407	
DVD-059-PC-A	2009/04/13 18:26	2009/04/13 20:25	J2-407	
DVD-059-SC-A	2009/04/13 18:26	2009/04/13 20:25	J2-407	
DVD-060-BC-A	2009/04/13 20:21	2009/04/13 21:39	J2-407	
DVD-060-PC-A	2009/04/13 20:21	2009/04/13 21:39	J2-407	
DVD-060-SC-A	2009/04/13 20:21	2009/04/13 21:39	J2-407	
DVD-061-BC-A	2009/04/14 8:05	2009/04/14 10:05	J2-408	
DVD-061-PC-A	2009/04/14 8:05	2009/04/14 10:05	J2-408	
DVD-061-SC-A	2009/04/14 8:05	2009/04/14 10:05	J2-408	
DVD-062-BC-A	2009/04/14 9:59	2009/04/14 11:59	J2-408	
DVD-062-PC-A	2009/04/14 9:59	2009/04/14 11:59	J2-408	
DVD-062-SC-A	2009/04/14 9:59	2009/04/14 11:59	J2-408	
DVD-063-BC-A	2009/04/14 11:54	2009/04/14 13:54	J2-408	
DVD-063-PC-A	2009/04/14 11:54	2009/04/14 13:54	J2-408	
DVD-063-SC-A	2009/04/14 11:54	2009/04/14 13:54	J2-408	
DVD-064-BC-A	2009/04/14 13:49	2009/04/14 15:51	J2-408	
DVD-064-PC-A	2009/04/14 13:49	2009/04/14 15:51	J2-408	
DVD-064-SC-A	2009/04/14 13:49	2009/04/14 15:51	J2-408	
DVD-065-BC-A	2009/04/14 15:44	2009/04/14 17:43	J2-408	
DVD-065-PC-A	2009/04/14 15:44	2009/04/14 17:43	J2-408	
DVD-065-SC-A	2009/04/14 15:44	2009/04/14 17:43	J2-408	
DVD-066-BC-A	2009/04/14 17:39	2009/04/14 19:38	J2-408	
DVD-066-PC-A	2009/04/14 17:39	2009/04/14 19:38	J2-408	
DVD-066-SC-A	2009/04/14 17:39	2009/04/14 19:38	J2-408	
DVD-067-BC-A	2009/04/14 19:34	2009/04/14 21:25	J2-408	
DVD-067-PC-A	2009/04/14 19:34	2009/04/14 21:25	J2-408	
DVD-067-SC-A	2009/04/14 19:34	2009/04/14 21:25	J2-408	
DVD-068-BC-A	2009/04/15 7:25	2009/04/15 9:21	J2-410	
DVD-068-PC-A	2009/04/15 7:25	2009/04/15 9:21	J2-410	
DVD-068-SC-A	2009/04/15 7:25	2009/04/15 9:21	J2-410	
DVD-069-BC-A	2009/04/15 9:20	2009/04/15 11:06	J2-410	Science Cam got a leak and turned off at ~10:53.
DVD-069-PC-A	2009/04/15 9:20	2009/04/15 11:06	J2-410	Abort dive to repair camera
DVD-069-SC-A	2009/04/15 9:20	2009/04/15 11:06	J2-410	
DVD-070-BC-A	2009/04/15 13:40	2009/04/15 15:39	J2-411	
DVD-070-PC-A	2009/04/15 13:40	2009/04/15 15:39	J2-411	



Video DVD	Start Date/Time	End Date/Time	Lowering	Comments
DVD-070-SC-A	2009/04/15 13:40	2009/04/15 15:39	J2-411	
DVD-071-BC-A	2009/04/15 15:33	2009/04/15 17:34	J2-411	
DVD-071-PC-A	2009/04/15 15:33	2009/04/15 17:34	J2-411	
DVD-071-SC-A	2009/04/15 15:33	2009/04/15 17:34	J2-411	
DVD-072-BC-A	2009/04/15 17:32	2009/04/15 19:31	J2-411	
DVD-072-PC-A	2009/04/15 17:32	2009/04/15 19:31	J2-411	
DVD-072-SC-A	2009/04/15 17:32	2009/04/15 19:31	J2-411	
DVD-073-BC-A	2009/04/15 19:26	2009/04/15 21:26	J2-411	
DVD-073-PC-A	2009/04/15 19:26	2009/04/15 21:26	J2-411	
DVD-073-SC-A	2009/04/15 19:26	2009/04/15 21:26	J2-411	
DVD-074-BC-A	2009/04/16 6:59	2009/04/16 8:59	J2-412	
DVD-074-PC-A	2009/04/16 6:59	2009/04/16 8:59	J2-412	
DVD-074-SC-A	2009/04/16 6:59	2009/04/16 8:59	J2-412	
DVD-075-BC-A	2009/04/16 8:54	2009/04/16 10:53	J2-412	
DVD-075-PC-A	2009/04/16 8:54	2009/04/16 10:53	J2-412	
DVD-075-SC-A	2009/04/16 8:54	2009/04/16 10:53	J2-412	
DVD-076-BC-A	2009/04/16 10:49	2009/04/16 12:48	J2-412	
DVD-076-PC-A	2009/04/16 10:49	2009/04/16 12:48	J2-412	
DVD-076-SC-A	2009/04/16 10:49	2009/04/16 12:48	J2-412	
DVD-077-BC-A	2009/04/16 12:44	2009/04/16 13:27	J2-412	
DVD-077-PC-A	2009/04/16 12:44	2009/04/16 13:27	J2-412	
DVD-077-SC-A	2009/04/16 12:44	2009/04/16 13:27	J2-412	

**Table 4.5-2 JASON Data DVD Listing**

Data DVD	Description
TN232_DVD-001	Still images from Insite Scorpio DSC, dive J2-396
TN232_DVD-002	Still images from HiDef Framegrabber, dive J2-396; original filenames 1-199
TN232_DVD-003	Still images from HiDef Framegrabber, dive J2-396; original filenames 200-457
TN232_DVD-004	Still images from HiDef Framegrabber, dive J2-396, capture times as filenames 1-199
TN232_DVD-005	Still images from HiDef Framegrabber, dive J2-396, capture times as filenames 200-457
TN232_DVD-006	Still images from HiDef Framegrabber, dive J2-398; original filenames
TN232_DVD-007	Still images from HiDef Framegrabber, dive J2-398; capture times as filenames
TN232_DVD-008	Still images from Insite Scorpio DSC, dive J2-398
TN232_DVD-009	J2-399 SM2000 sonar survey files, .smb format; parts 0-52
TN232_DVD-010	J2-399 SM2000 sonar survey files, .smb format; parts 53-106
TN232_DVD-011	Still images from HiDef Framegrabber, dive J2-400; original filenames
TN232_DVD-012	Still images from HiDef Framegrabber, dive J2-400, capture times as filenames
TN232_DVD-013	Still images from HiDef Framegrabber, dive J2-401; original filenames
TN232_DVD-014	Still images from HiDef Framegrabber, dive J2-401; capture times as filenames
TN232_DVD-015	Still images from Insite Scorpio DSC, dives 400 and 401
TN232_DVD-016	Raw vehicle data 20090404
TN232_DVD-017	Raw vehicle data 20090405
TN232_DVD-018	Raw vehicle data 20090406
TN232_DVD-019	Raw vehicle data 20090407
TN232_DVD-020	Raw vehicle data 20090408
TN232_DVD-021	Raw vehicle data 20090409
TN232_DVD-022	Still images from HiDef Framegrabber, dive J2-402; original filenames
TN232_DVD-023	Still images from HiDef Framegrabber, dive J2-402, capture times as filenames
TN232_DVD-024	Still images from HiDef Framegrabber, dive J2-403, both original and timestamped
TN232_DVD-025	Raw vehicle data 20090410
TN232_DVD-026	Raw vehicle data 20090411
TN232_DVD-027	Raw vehicle data 20090412
TN232_DVD-028	J2-406 SM2000 sonar survey files, .smb format
TN232_DVD-029	Still images from HiDef Framegrabber, dive J2-407; original filenames

Data DVD	Description
TN232_DVD-030	Still images from HiDef Framegrabber, dive J2-407; capture times as filenames
TN232_DVD-031	Still images from HiDef Framegrabber, dive J2-404 and J2-405; original filenames
TN232_DVD-032	Still images from HiDef Framegrabber, dive J2-404 and J2-405; capture times as filenames
TN232_DVD-033	Raw vehicle data 20090413
TN232_DVD-034	Raw vehicle data 20090414
TN232_DVD-035	Processed data by dive: J2-396, J2-397, and J2-398
TN232_DVD-036	Processed data by dive: J2-399
TN232_DVD-037	Processed data by dive: J2-400, J2-401, and J2-402
TN232_DVD-038	Still images from Insite Scorpio DSC, dives J2-403 through J2-411
TN232_DVD-039	Still images from HiDef Framegrabber, dive J2-408; original filenames & capture times as filenames
TN232_DVD-040	Still images from HiDef Framegrabber, dive J2-410; original filenames and capture times as filenames
TN232_DVD-041	Still images from HiDef Framegrabber, dive J2-411, original filenames
TN232_DVD-042	Still images from HiDef Framegrabber, dive J2-411, capture times as filenames
TN232_DVD-043	Processed data by dive: J2-403, J2-404, and J2-405
TN232_DVD-044	Processed data by dive: J2-406 and J2-407
TN232_DVD-045	Processed SM2000 sonar data J2-399 and J2-406 range/times and XYZ dot cloud
TN232_DVD-046	Raw vehicle data 20090415
TN232_DVD-047	Processed data by dive: J2-408, J2-410, and J2-411
TN232_DVD-048	Processed data by dive: J2-412
TN232_DVD-049	Still images from HiDef Framegrabber, dive J2-412; original filenames and capture times as filenames
TN232_DVD-050	Still images from HiDef Framegrabber, dive J2-403; edited after diev; original filenames and capture times as filenames
TN232_DVD-051	DVLNAV for the cruise
TN232_DVD-052	Still images from Insite Scorpio DSC, dive J2-412
TN232_DVD-053	Raw Data by type, entire cruise

**Table 4.5-3 HDTV Video Record Times**

HDCAM Tape	Dive	Date	Time Code In	Time Code Out	Duration	cumulative duration	Content
1	J2-396	4/4/2009	7:05:34	7:06:26	0:00:52	0:00:52	Off bottom (nothing)
1	J2-396	4/4/2009	8:27:27	8:42:00	0:14:33	0:15:25	Brimstone plume & vent (Obs #0)
1	J2-396	4/4/2009	8:49:52	8:56:40	0:06:48	0:22:13	Deploy hydrophone & marker @ summit
1	J2-396	4/4/2009	9:05:00	9:07:12	0:02:12	0:24:25	hydrophone & marker @ summit
1	J2-396	4/4/2009	9:24:42	9:28:38	0:03:56	0:28:21	Brimstone Obs #1
1	J2-396	4/4/2009	9:30:33	9:51:47	0:21:14	0:49:35	Brimstone Obs #1 - plume spreading
1							(~3 min gap)
1	J2-396	4/4/2009	10:13:13	10:14:50	0:01:37	0:51:12	Brimstone Obs #1 - in a cloud & ash
1	J2-396	4/4/2009	10:22:16	10:31:50	0:09:34	1:00:46	Brimstone Obs #1 - vent, rocks, plume
1	J2-396	4/4/2009	10:38:05	10:43:45	0:05:40	1:06:26	Brimstone Obs #1
1	J2-396	4/4/2009	10:53:54	11:03:13	0:09:19	1:15:45	Deploy tephra sampler, north of summit
1	J2-396	4/4/2009	11:06:56	11:10:03	0:03:07	1:09:33	Outcrops at summit
1	J2-396	4/4/2009	11:20:34	11:23:27	0:02:53	1:12:26	Crabs at summit
1	J2-396	4/4/2009	11:36:03	11:45:48	0:09:45	1:22:11	Sedimented slope with rusty outcrops
1	J2-396	4/4/2009	11:50:42	11:54:48	0:04:06	1:26:17	Deploy tephra sampler
1	J2-396	4/4/2009	12:33:19	12:41:20	0:08:01	1:34:18	Outcrops at Bubbler vent, shrimp
1	J2-396	4/4/2009	12:41:57	12:42:00	0:00:03	1:34:21	False start
1	J2-396	4/4/2009	12:42:45	12:42:48	0:00:03	1:34:24	False start
1	J2-396	4/4/2009	12:45:03	12:45:06	0:00:03	1:34:24	False start
1	J2-396	4/4/2009	12:47:04	12:47:25	0:00:21	1:34:45	False start
1	J2-396	4/4/2009	12:49:42	12:49:50	0:00:08	1:34:53	False start
1	J2-396	4/4/2009	12:56:39	12:56:41	0:00:02	1:34:47	False start
1	J2-396	4/4/2009	12:59:38	12:59:40	0:00:02	1:34:49	False start

HDCAM Tape	Dive	Date	Time Code In	Time Code Out	Duration	cumulative duration	Content
1	J2-396	4/4/2009	13:01:20	13:01:22	0:00:02	1:34:51	False start
1	J2-396	4/4/2009	13:01:38	13:02:40	0:01:02	1:35:53	Koichi datalogger
1	J2-396	4/4/2009	13:10:25	13:12:04	0:01:39	1:37:32	Dark - off bottom
1	J2-396	4/4/2009	13:34:54	13:37:48	0:02:54	1:40:26	Bacterial mat & barnacles
1	J2-396	4/4/2009	13:50:38	13:54:00	0:03:22	1:43:48	White summit ridge, cursts, shrimp
1	J2-396	4/4/2009	14:00:34	14:02:15	0:01:41	1:45:29	Dark - off bottom
1	J2-396	4/4/2009	14:05:28	14:13:30	0:08:02	1:53:31	Shrimp at Mkr 109 outcrop
2	J2-396	4/4/2009	14:18:00	14:26:15	0:08:15	0:08:15	Iron oxide breccia scarp with mat
2	J2-396	4/4/2009	14:32:17	14:36:50	0:04:33	0:12:48	Iron oxide breccia scarp with mat & fish
2	J2-396	4/4/2009	14:56:56	15:01:45	0:04:49	0:17:37	Breccia scarp with mat & limpets
2	J2-396	4/4/2009	15:32:38	15:41:32	0:08:54	0:26:31	Shrimp on white crust
2	J2-396	4/4/2009	15:52:39	16:17:56	0:25:17	0:51:48	Shrimp observations @ Mkr 109
2	J2-396	4/4/2009	17:04:59	17:11:56	0:06:57	0:58:45	Shrimp on outcrop with venting (Iceberg?)
2	J2-396	4/4/2009	17:23:05	17:26:40	0:03:35	1:02:20	Shrimp & crab
2	J2-396	4/4/2009	17:48:48	17:51:34	0:02:46	1:05:06	Outcrop with diffuse venting near Gastros
2	J2-396	4/4/2009	19:24:58	19:37:13	0:12:15	1:17:21	Brimstone Obs#2: plume & sulfur on rocks
2	J2-396	4/4/2009	20:26:20	20:30:33	0:04:13	1:21:34	Brimstone Obs#2: plume against wall
2	J2-396	4/4/2009	20:55:52	21:06:14	0:10:22	1:31:56	Brimstone - vent, closeups, rock sampling
2	J2-396	4/4/2009	21:06:27	21:25:00	0:18:33	1:50:29	Brimstone - vent, closeups, rock sampling
2	J2-396	4/4/2009	22:07:41	22:07:48	0:00:07	1:32:03	Jason approaching ocean surface
2	J2-396	4/4/2009	22:07:41	22:07:48	0:00:07	1:32:10	Jason approaching ocean surface
2	J2-396	4/4/2009	22:14:07	22:14:16	0:00:09	1:32:19	Jason recovery (out of water-power cutoff)
3	J2-398	4/5/2009	5:25:53	5:26:07	0:00:14	0:00:14	Color bars - new dive
3	J2-398	4/5/2009	13:34:34	13:34:40	0:00:06	0:00:20	Off bottom (nothing)
3	J2-398	4/5/2009	14:08:04	14:08:05	0:00:01	0:00:21	Brimstone cone Obs#3
3	J2-398	4/5/2009	15:02:20	15:06:35	0:04:15	0:04:36	Brimstone vent with spine
3	J2-398	4/5/2009	15:07:59	15:11:33	0:03:34	0:08:10	Brimstone plume drifting downcurrent
3	J2-398	4/5/2009	15:18:48	15:31:00	0:12:12	0:20:22	Brimstone vent closeup, fluid sampling
3	J2-398	4/5/2009	16:56:24	16:56:30	0:00:06	0:20:28	Jason arm (nothing)
3	J2-398	4/5/2009	17:18:27	17:24:31	0:06:04	0:26:32	Fluid sampling with port arm, ashfall
3	J2-398	4/5/2009	17:49:01	17:49:03	0:00:02	0:26:34	Brimstone - from W - false start (+gap)
3	J2-398	4/5/2009	18:59:45	19:07:28	0:07:43	0:34:17	Shrimp (+gap)
3	J2-398	4/5/2009	19:57:03	20:00:14	0:03:11	0:37:28	Steep slope with surface crusts
3	J2-400	4/7/2009	7:38:20	7:38:37	0:00:17	0:37:45	Color bars - new dive
3	J2-400	4/7/2009	7:38:37	7:40:27	0:01:50	0:39:35	Jason on deck - view of horizon
3	J2-400	4/7/2009	10:58:07	11:01:12	0:03:05	0:42:40	Steep slopes along summit ridge (dark)
3	J2-400	4/7/2009	11:03:39	11:04:48	0:01:09	0:43:49	Steep slopes along summit ridge (dark)
3	J2-400	4/7/2009	11:11:47	11:13:23	0:01:36	0:45:25	Steep slopes along summit ridge (dark)
3	J2-400	4/7/2009	11:17:59	11:25:19	0:07:20	0:52:45	Steep slopes along summit ridge (dark)
3	J2-400	4/7/2009	11:41:12	11:47:56	0:06:44	0:59:29	Steep slopes along summit ridge (dark)
3	J2-400	4/7/2009	14:55:51	14:58:20	0:02:29	1:01:58	Jumbled lavas (dark)
3	J2-400	4/7/2009	15:27:48	15:28:24	0:00:36	1:02:34	Pillow lavas (dark)
3	J2-400	4/7/2009	15:28:56	15:36:05	0:07:09	1:09:43	Off bottom then dark rocky bottom
3	J2-400	4/7/2009	16:57:04	17:01:36	0:04:32	1:14:15	Steep sedimented slope
3	J2-400	4/7/2009	16:57:04	17:01:36	0:04:32	1:18:47	Steep sedimented slope
3	J2-401	4/8/2009	9:41:05	9:42:01	0:00:56	1:19:43	Color bars - new dive
3	J2-401	4/8/2009	10:45:13	10:50:45	0:05:32	1:25:15	Brimstone Obs#4, passive plume
3	J2-401	4/8/2009	10:55:29	10:59:54	0:04:25	1:29:40	Tephra sampler deployment, swing arms
3	J2-401	4/8/2009	11:03:25	11:14:31	0:11:06	1:40:46	Tephra sampler deployment, rock sample
3	J2-401	4/8/2009	11:17:45	11:30:21	0:12:36	1:53:22	Tephra sampler recovery, Brimstone vent
3	J2-401	4/8/2009	11:46:15	11:50:02	0:03:47	1:57:09	Back of Brimstone fluid sampling
3	J2-401	4/8/2009	12:07:27	12:07:46	0:00:19	1:57:28	Brimstone fluid sampling
3	J2-401	4/8/2009	12:14:48	12:15:43	0:00:55	1:58:23	Brimstone sampling diffuse plume
3	J2-401	4/8/2009	13:10:01	13:15:11	0:05:10	2:03:33	Steep white slope, breccia ridge, barnacles
3	J2-401	4/8/2009	13:36:45	13:43:20	0:06:35	2:10:08	Temp probe in sediment at base of breccia ridge, barnacles, deploy mkr 111

HDCAM Tape	Dive	Date	Time Code In	Time Code Out	Duration	cumulative duration	Content
4	J2-401	4/8/2009	13:54:24	14:04:19	0:09:55	0:09:55	Shrimp trap @ mkr 109
4	J2-401	4/8/2009	14:10:38	14:15:58	0:05:20	0:15:15	Fluid sampling @ mkr 109
4	J2-401	4/8/2009	14:21:37	14:26:35	0:04:58	0:20:13	Crab & shrimp @ mkr 109
4	J2-401	4/8/2009	14:52:47	14:58:17	0:05:30	0:25:43	Shrimp @ mkr 109
4	J2-401	4/8/2009	15:03:49	15:07:16	0:03:27	0:29:10	Crab & shrimp @ mkr 109
4	J2-401	4/8/2009	15:10:58	15:26:53	0:15:55	0:45:05	Crab eating another crab @ mkr 109
4	J2-401	4/8/2009	16:09:52	16:15:57	0:06:05	0:51:10	Bacterial mat on breccia ridge
4	J2-401	4/8/2009	16:33:04	16:36:58	0:03:54	0:55:04	Bacterial mat on rocks
4	J2-401	4/8/2009	20:55:00	21:01:35	0:06:35	1:01:39	Brimstone Obs#5
4	J2-401	4/8/2009	21:18:57	21:20:37	0:01:40	1:03:19	Shrimp & blocks near Brimstone
4	J2-401	4/8/2009	21:42:32	22:06:35	0:24:03	1:27:22	Brimstone Obs#6
4	J2-402	4/9/2009	9:30:02	9:31:01	0:00:59	1:28:21	Color bars - new dive
4	J2-402	4/9/2009	10:25:39	11:06:59	0:41:20	2:09:41	Brimstone Obs#7 - extended view of slow extrusion & moving & tilting blocks in vent
5	J2-402	4/9/2009	11:11:43	12:47:15	1:35:32	1:35:32	Brimstone Obs#7 continued
5	J2-402	4/9/2009	13:04:35	13:08:42	0:04:07	1:39:39	Brimstone departure
5	J2-402	4/9/2009	13:59:03	14:09:27	0:10:24	1:50:03	Deploying shrimp trap @ mkr 104
5	J2-402	4/9/2009	14:11:18	14:11:52	0:00:34	1:50:37	Shrimp close up (arm in the way)
5	J2-402	4/9/2009	14:13:48	14:15:24	0:01:36	1:52:13	Shrimp close up (arm in the way)
5	J2-402	4/9/2009	15:10:56	15:12:18	0:01:22	1:53:35	Three fish on yellow sediment
5	J2-402	4/9/2009	15:22:23	15:24:49	0:02:26	1:56:01	Orange breccia ridge, fish
5	J2-402	4/9/2009	15:57:14	16:01:43	0:04:29	2:00:30	White sedimented slope, yellow ripples
5	J2-402	4/9/2009	16:19:59	16:24:49	0:04:50	2:05:20	Recovering Koichi's temp logger
5	J2-402	4/9/2009	16:30:37	16:31:00	0:00:23	2:05:43	Hydrophone & tephra sampler at summit
5	J2-402	4/9/2009	17:10:58	17:11:05	0:00:07	2:05:50	Shrimp swarming on garbage?
6	J2-402	4/9/2009	17:17:32	17:21:21	0:03:49	0:03:49	Shrimp swarming on garbage?
6	J2-402	4/9/2009	17:31:34	17:32:09	0:00:35	0:04:24	Shrimp near Iceberg (cloudy visibility)
6	J2-402	4/9/2009	18:10:30	18:12:37	0:02:07	0:06:31	Filamentous bacterial mat on rock wall
6	J2-402	4/9/2009	18:46:08	18:49:54	0:03:46	0:10:17	Massive lava in cliff face
6	J2-402	4/9/2009	18:57:29	19:06:17	0:08:48	0:19:05	Orange bacterial mat & temp probe
6	J2-402	4/9/2009	20:04:52	20:09:23	0:04:31	0:23:36	Brimstone Obs#8
6	J2-402	4/9/2009	20:17:53	21:34:15	1:16:22	1:39:58	Brimstone Obs#8
6	J2-403	4/10/2009	6:32:56	6:34:03	0:01:07	1:41:05	Color bars - new dive
6	J2-403	4/10/2009	6:36:06	6:37:10	0:01:04	1:42:09	Blue water - near surface (nothing)
6	J2-403	4/10/2009	6:41:55	6:41:58	0:00:03	1:42:12	Dark - near bottom (nothing)
6	J2-403	4/10/2009	10:44:29	10:47:01	0:02:32	1:44:44	near Brimstone, cloudy
6	J2-403	4/10/2009	10:52:48	10:58:50	0:06:02	1:50:46	Brimstone Obs#10
6	J2-403	4/10/2009	12:01:50	12:10:27	0:08:37	1:59:23	Fluid sampling behind Brimstone
6	J2-403	4/10/2009	12:13:57	12:20:05	0:06:08	2:05:31	Fluid sampling at Brimstone
7	J2-403	4/10/2009	12:21:25	12:42:22	0:20:57	0:20:57	Fluid sampling at Brimstone - molten sulfur dripping from long intake
7	J2-403	4/10/2009	12:44:44	14:29:41	1:44:57	2:05:54	Fluid & gas sampling & observations at Brimstone vent
8	J2-403	4/10/2009	14:38:15	14:54:30	0:16:15	0:16:15	Brimstone observations (continued)
8	J2-403	4/10/2009	15:48:31	15:55:40	0:07:09	0:23:24	Swapping out tephra samplers
8	J2-403	4/10/2009	16:26:24	16:32:32	0:06:08	0:29:32	Close-up of shrimp @ mkr 105
8	J2-403	4/10/2009	18:00:36	18:02:36	0:02:00	0:31:32	Rock outcrops with fish
8	J2-403	4/10/2009	18:05:04	18:06:46	0:01:42	0:33:14	Rock outcrops with fish
8	J2-403	4/10/2009	18:43:42	18:45:33	0:01:51	0:35:05	Rock outcrops with fish
8	J2-403	4/10/2009	18:51:50	18:57:50	0:06:00	0:41:05	Close-up of bacterial mat on breccia wall
8	J2-403	4/10/2009	18:59:38	19:23:54	0:24:16	1:05:21	Mat on wall, scoop sample, mkr 114
8	J2-403	4/10/2009	20:48:58	20:53:52	0:04:54	1:10:15	Brimstone Obs#11
8	J2-403	4/10/2009	20:59:59	21:01:27	0:01:28	1:11:43	Brimstone vent (cloudy visibility)
8	J2-403	4/10/2009	21:09:57	21:12:46	0:02:49	1:14:32	Brimstone vent

HDCAM Tape	Dive	Date	Time Code In	Time Code Out	Duration	cumulative duration	Content
8	J2-403	4/10/2009	21:13:33	21:31:55	0:18:22	1:32:54	Brimstone vent - departure
8	J2-403	4/10/2009	22:04:00	22:07:06	0:03:06	1:36:00	Jason just below surface for recovery
8	J2-403	4/10/2009	22:09:20	22:11:18	0:01:58	1:37:58	Jason recovery
8	J2-404	4/11/2009	5:51:30	5:52:42	0:01:12	1:39:10	Color bars - new dive
8	J2-404	4/11/2009	5:52:43	5:52:44	0:00:01	1:39:11	Jason on deck
8	J2-404	4/11/2009	7:37:11	7:39:27	0:02:16	1:41:27	Jason launch
8	J2-405	4/11/2009	13:18:09	13:18:37	0:00:28	1:41:55	Fluid sampling near mkr 108
8	J2-405	4/11/2009	13:20:18	13:21:16	0:00:58	1:42:53	Fluid sampling near mkr 108
8	J2-405	4/11/2009	13:22:43	13:23:52	0:01:09	1:44:02	White mat covered rock & diffuse venting
8	J2-405	4/11/2009	15:24:14	15:31:41	0:07:27	1:51:29	Filamentous mat & barnacles on rocks
8	J2-405	4/11/2009	16:48:25	16:57:30	0:09:05	2:00:34	Fluid sampling at Brimstone vent
8	J2-405	4/11/2009	17:09:17	17:13:45	0:04:28	2:05:02	Fluid sampling at Brimstone vent
8	J2-405	4/11/2009	17:57:42	17:58:01	0:00:19	2:05:21	Heavy ashfall at Brimstone
9	J2-405	4/11/2009	7:15:55	7:34:39	0:18:44	0:18:44	Shrimp video survey at mkr 105, then put out shrimp trap
Timecode problem: Virtual Van log says this should be dive J2-405, 4/11/09, starting at 21:03							
9	J2-406	4/12/2009	7:34:40	7:35:14	0:00:34	0:19:18	Color bars - new dive
9	J2-406	4/12/2009	7:35:14	7:35:15	0:00:01	0:19:19	False start
9	J2-406	4/12/2009	10:12:57	10:33:17	0:20:20	0:39:39	Brimstone Obs#13
9	J2-406	4/12/2009	20:29:40	20:47:08	0:17:28	0:57:07	Brimstone Obs#14
9	J2-406	4/12/2009	21:22:53	21:33:40	0:10:47	1:07:54	Brimstone vent lava sampling
9	J2-407	4/13/2009	21:33:40	21:34:02	0:00:22	1:08:16	Color bars - new dive
Timecode problem: Virtual Van log says dive J2-406 ended at 21:34							
9	J2-407	4/13/2009	21:34:02	21:56:04	0:22:02	1:30:18	Brimstone Obs#15
Timecode problem: Virtual Van log says this should be dive J2-407, 4/13/09, Brimstone Obs#15 started at 10:13							
9	J2-407	4/13/2009	21:56:05	21:56:13	0:00:08	1:30:26	gap (nothing)
9	J2-407	4/13/2009	21:56:14	21:56:40	0:00:26	1:30:52	Brimstone vent
9	J2-407	4/13/2009	21:56:41	21:58:05	0:01:24	1:32:16	gap (nothing)
9	J2-407	4/13/2009	21:58:06	22:11:26	0:13:20	1:45:36	Brimstone vent
Timecode suddenly changed to correct time (video continuous)							
9	J2-407	4/13/2009	11:00:55	11:21:02	0:20:07	2:05:43	Brimstone - great slow extrusion sequence, rocks being shoved aside with camera steady
10	J2-407	4/13/2009	11:22:24	11:34:39	0:12:15	0:12:15	Brimstone Obs#15 (continued) - landsliding of blocks and dust plumes
10	J2-407	4/13/2009	11:53:32	12:03:08	0:09:36	0:21:51	Shrimp @ mkr 109 - nice video
10	J2-407	4/13/2009	12:03:53	12:16:04	0:12:11	0:34:02	Shrimp @ mkr 109, suction sampling
10	J2-407	4/13/2009	12:18:01	12:25:59	0:07:58	0:42:00	Arrival at mkr 105 to recover shrimp trap
10	J2-407	4/13/2009	16:42:02	16:54:53	0:12:51	0:54:51	Fluid sampling on breccia wall, bacterial mat, then ridge with sulfur outcrops
10	J2-407	4/13/2009	17:03:10	17:15:52	0:12:42	1:07:33	Fluid sampling at sulfur outcrops
10	J2-407	4/13/2009	21:23:39	21:38:08	0:14:29	1:22:02	Brimstone Obs#16 - gas tight with funnel
10	J2-407	4/13/2009	22:05:01	22:05:41	0:00:40	1:22:42	Jason near surface for recovery
10	J2-407	4/13/2009	22:08:55	22:12:52	0:03:57	1:26:39	Jason recovery all the way to on deck
10	J2-408	4/14/2009	5:46:39	5:46:46	0:00:07	1:26:46	Jason on deck, ship steaming
10	J2-408	4/14/2009	5:46:47	5:47:30	0:00:43	1:27:29	Color bars - new dive
10	J2-408	4/14/2009	14:23:24	15:01:39	0:38:15	2:05:44	Arriving at Brimstone Vent for Obs#17
11	J2-408	4/14/2009	15:04:06	15:39:31	0:35:25	0:35:25	Brimstone Obs#17 (continued). Used extra light in starboard arm 15:17-15:22.
11	J2-408	4/14/2009	15:49:56	15:50:28	0:00:32	0:35:57	Squid flyby (missed), near Brimstone
11	J2-408	4/14/2009	16:02:02	16:05:41	0:03:39	0:39:36	Brimstone - offload cam on arm, ashfall
11	J2-408	4/14/2009	16:07:01	16:15:22	0:08:21	0:47:57	Brimstone - offload cam on arm
11	J2-408	4/14/2009	16:23:42	16:26:15	0:02:33	0:50:30	Brimstone then swapped tephra samplers
11	J2-408	4/14/2009	16:47:10	16:55:45	0:08:35	0:59:05	Drove along summit ridge to summit
11	J2-408	4/14/2009	17:00:07	17:03:55	0:03:48	1:02:53	Using offload camera & light at summit

HDCAM Tape	Dive	Date	Time Code In	Time Code Out	Duration	cumulative duration	Content
11	J2-408	4/14/2009	17:07:55	17:24:59	0:17:04	1:19:57	Using offload camera & light at summit for crab and shrimp close ups
11	J2-408	4/14/2009	17:33:56	17:38:14	0:04:18	1:24:15	In plume then on sedimented slope
11	J2-408	4/14/2009	18:10:16	18:44:47	0:34:31	1:58:46	Using offload camera & light for shrimp close ups about 25 m NW of summit
11	J2-408	4/14/2009	18:53:14	18:55:38	0:02:24	2:01:10	Diffuse venting with white mat on rocks
11	J2-408	4/14/2009	18:59:56	19:01:12	0:01:16	2:02:26	Suction sample of mat on rocks
11	J2-408	4/14/2009	19:13:16	19:16:44	0:03:28	2:05:54	Recovery of shrimp trap at summit
12	J2-408	4/14/2009	19:22:40	19:29:01	0:06:21	0:06:21	Arrival at Brimstone for Obs#19
12	J2-408	4/14/2009	19:32:17	19:37:59	0:05:42	0:12:03	Brimstone - gas tight with red funnel
12	J2-408	4/14/2009	19:45:28	19:48:31	0:03:03	0:15:06	Brimstone - regular gas tight sampler
12	J2-408	4/14/2009	20:15:27	20:45:45	0:30:18	0:45:24	Brimstone - using offload camera on port arm, slow extrusion, distinct gas bursts, ROV engulfed in cloud at 20:44
12	J2-408	4/14/2009	20:51:39	21:24:34	0:32:55	1:18:19	Brimstone vent - drove into plume at end
12	J2-409	4/15/2009	5:53:34	5:54:22	0:00:48	1:19:07	Color bars - new dive
12	J2-409	4/15/2009	10:40:00	10:51:50	0:11:50	1:30:57	Recover tephra sampler N of summit ridge - water visible in lens (end of dive)
Be aware: There are spots on the HD camera lens during dive J2-411							
12	J2-411	4/15/2009	13:43:11	13:48:12	0:05:01	1:35:58	Driving along summit ridge outcrops
12	J2-411	4/15/2009	13:50:28	14:20:18	0:29:50	2:05:48	White rocks, venting @ mkr 103, then moved over to Brimstone (Obs#20), Koichi's temp probe, slow extrusion
13	J2-411	4/15/2009	14:24:15	15:00:50	0:36:35	0:36:35	Brimstone - Koichi's temp probe, gas tight samplers, offload camera on port arm
13	J2-411	4/15/2009	15:09:03	15:49:46	0:40:43	1:17:18	Brimstone - light in starboard arm, excellent video, offload camera, lava sample
13	J2-411	4/15/2009	15:50:24	15:54:53	0:04:29	1:21:47	Brimstone - using offload camera
13	J2-411	4/15/2009	16:02:03	16:08:58	0:06:55	1:28:42	Just W of Brimstone on tephra
13	J2-411	4/15/2009	16:16:32	16:22:21	0:05:49	1:34:31	Departing Brimstone (Obs#21)
13	J2-411	4/15/2009	16:50:06	17:07:25	0:17:19	1:51:50	Breccia ridge with distinct sulfur layer
13	J2-411	4/15/2009	17:11:09	17:25:08	0:13:59	2:05:49	Sampling sulfur layer
14	J2-411	4/15/2009	17:26:19	17:44:05	0:17:46	0:17:46	Sampling sulfur layer (continued)
14	J2-411	4/15/2009	17:53:00	18:14:03	0:21:03	0:38:49	Shrimp at mkr 109
14	J2-411	4/15/2009	19:00:57	19:19:47	0:18:50	0:57:39	Pillow lava on S side of new cone (sample)
14	J2-411	4/15/2009	19:38:08	19:41:10	0:03:02	1:00:41	Brimstone Obs#22
14	J2-411	4/15/2009	20:13:00	21:18:03	1:05:03	2:05:44	Brimstone Obs#23
15	J2-412	4/16/2009	5:56:12	5:56:58	0:00:46	0:00:46	Color bars - new dive
15	J2-412	4/16/2009	5:58:44	6:00:34	0:01:50	0:02:36	Jason on deck then launch
15	J2-412	4/16/2009	6:59:15	8:15:06	1:15:51	1:18:27	Brimstone cone, looking for lost gas-tight sampler, Brimstone Obs#24 (07:10-07:45), then over summit to Cnideria
15	J2-412	4/16/2009	8:32:28	8:57:15	0:24:47	1:43:14	North slope of Brimstone to Cnideria area
15	J2-412	4/16/2009	9:16:01	9:38:37	0:22:36	2:05:50	Sampling at Cnideria area
16	J2-412	4/16/2009	9:40:17	9:48:51	0:08:34	0:08:34	Cnideria area (continued)
16	J2-412	4/16/2009	9:50:05	10:10:40	0:20:35	0:29:09	Sampling at Cnideria area
16	J2-412	4/16/2009	10:15:14	11:09:43	0:54:29	1:23:38	Exploring Cnideria area (amazing floater @ 10:19:57)
16	J2-412	4/16/2009	11:17:14	11:45:10	0:27:56	1:51:34	Exploring Cnideria area
16	J2-412	4/16/2009	11:50:02	12:01:06	0:11:04	2:02:38	Exploring Cnideria area
16	J2-412	4/16/2009	12:07:19	12:09:52	0:02:33	2:05:11	Exploring Cnideria area
17	J2-412	4/16/2009	12:10:31	12:23:07	0:12:36	0:12:36	Cnideria area (continued)
17	J2-412	4/16/2009	12:29:18	13:26:50	0:57:32	1:10:08	Exploring Cnideria area

A prototype system to capture frame grabs from the HD camera was also set up in the Jason control van on a laptop by AIVL. Each frame grab is a 12 Mb .TIF file. This system worked well, but there were a few glitches: all the HD frame grabs were recorded as .jpgs instead of .TIFs on dive J2-403, and all the frame grabs for dive J2-407 appear to be black, but their content can be enhanced by using image processing software (like Photoshop autolevels).

A second internally-recording HDTV video camera (the “off-load” camera) was also provided by AIVL and used during this expedition, funded by Fritz Heidi at WHOI. It was also used in a “highlight” mode and could be turned on and off from the Jason control van. During the first half of the cruise it was mounted on Medea for a down-looking view of Jason on the seafloor. Then towards the end of the cruise it was mounted on Jason’s port manipulator arm for some close-up video on the seafloor. Evan Kovaks also recorded a considerable amount of HDTV video on the ship, both for WHOI and for the CBC.

The standard Jason digital still camera (DSC) was mounted on the science camera pan & tilt for this cruise. Close-ups with the DSC camera are often a bit clearer and better lit than the HD frame grabs because the DSC uses a strobe and has auto-focus. A summary of the DSC images and the HD frame grabs collected during this cruise is provided in table 4.5-4.

**Table 4.5-4 Summary information on Jason Digital Still Images and HD Frame Grabs**

Dive	Number of DSC images	Total size of JPG files (in Mb)	Number of HD frame grabs	Total size of TIF files (in Gb)	Total size of JPG files (in Mb)	Comments
J2-396	200	371	457	5.3	684	Some DSCs are in TIF format on Data_DVD_001 (TIFs+JPGs=715 Mb)
J2-397	0	0	0	0	0	Aborted dive - no still images
J2-398	183	173	211	2.45	300	
J2-399	0	0	0	0	0	SM2000 survey - no still images
J2-400	167	162	307	3.56	470	
J2-401	180	179	243	2.82	355	
J2-402	0	0	351	4.07	477	No DSCs because no video feed from camera
J2-403	188	181	356	0	493	All HD framegrabs recorded as JPGs. Originals had text at bottom then were cropped. Note cropped files on original Data_DVD_050 have wrong capture times in filenames (since corrected). The uncropped filenames are correct on Data_DVD-024.
J2-404	0	0	4	0.05	6	Aborted dive
J2-405	237	242	304	3.52	446	
J2-406	63	55	0	0	0	Aborted dive
J2-407	116	114	300	3.48	461	All original HD framegrabs (Data_DVD_030) appear to be black but content has been enhanced by using Photoshop Autolevels.
J2-408	273	264	188	2.18	278	
J2-409	0	0	0	0	0	Aborted dive - no still images
J2-410	21	23	47	0.56	81	Aborted dive
J2-411	240	205	228	2.64	330	
J2-412	214	205	100	1.16	153	
Totals	2082	2174	3096	31.79	4534	

## 4.6 Outreach

Text, images, and video were posted to a cruise blog during the expedition at this URL:

<http://nwrota2009.blogspot.com/>

A press release was issued before the cruise by Oregon State University to bring attention to the blog and another press release was released by OSU and NSF after the cruise to highlight preliminary results from the expedition. The expedition was featured on the NBC Nightly News on April 23, 2009 as part of a story on the new Mariana Marine National Monument:

<http://www.msnbc.msn.com/id/21134540/vp/30376206#30376206>

as well as on the Nature News, National Geographic News, US News & World Report web sites, and others. At least one and possibly two TV documentaries are in preparation by the Canadian Broadcasting Corp (CBC).

## 5.0 Navigation and Positions

### 5.1 JASON Navigation

The Jason team deployed five navigation transponders at NW Rota-1 at our request. The calibrated transponder positions are listed in the Table 5.1-1 below. The aim was to have the best navigation possible for a planned SM2000 multibeam sonar resurvey of the volcano summit using Jason. The idea was to have a long-baseline (LBL) acoustic navigation network combined with Jason's doppler sonar (DVL) to provide vehicle navigation. Both systems have their own strengths and weaknesses and a combination has been shown to work well for navigation at other (deeper) dive sites (using "renav" software that combines data from the two navigation systems after a dive). However, the LBL transponders we deployed at NW Rota-1 ended up being essentially useless for our purposes, because of the strong currents at the shallow depths of NW Rota-1's summit (500-600 m) and the long tethers (200 m) needed on the transponders to work at the top of on a conical volcano. This combination meant that the transponders moved a great deal at the top of their tethers in the changing currents, resulting in radically inconsistent acoustic positions that changed up to 40-50 m from dive to dive or even during a single dive. After the first few dives we compared the "renav" navigation (LBL + DVL) to the DVL-only navigation, and found that the navigation using LBL was clearly poor and very inconsistent. Thus we decided to use the DVL-only navigation for all dives during this cruise, and all of the dive maps only show the DVL-only navigation. No LBL navigation was used.

The strength of the DVL-only (doppler) navigation is that it is very accurate over short time periods (minutes to hours) and distances, but its weakness is that it does not have an absolute reference frame. It has to be seeded with a starting position from which it navigates in a relative sense thereafter. Also, it drifts over long-time periods (hours to days), and it can lose its absolute reference frame if it loses "bottom-lock", by either being too close (<1 m) or too far (>30 m) from the seafloor. At the beginning of a dive or when bottom-lock is lost a "doppler reset" must be done manually to reestablish an absolute position for the vehicle. This was done using LBL navigation positions early in the cruise (which turned out to be a bad idea), and later was done by other methods, either by resetting to known sites (like Brimstone vent or marker positions), or by estimating Jason's position under the stern of the ship (which is determined by GPS). When Doppler resets are done there can be a sudden jump in the vehicle position of meters or tens of meters. All this needs to be kept in mind when using the Jason navigation from this cruise. It is decidedly imperfect and changed with time as our understanding of the situation increased.

The 2009 SM2000 bathymetric survey (dive J2-399) is used as the underlay for all the dive maps at the summit in this cruise report. The navigation used for the SM2K survey was DVL-only (reprocessed by Vicki Ferrini after the cruise). The navigation for the survey should be fairly internally consistent. However, there was a clear offset between the SM2K bathymetry and the other Jason dive tracks (for example, when Jason was at Brimstone vent). Therefore, we have shifted the SM2K bathymetric grid 20 m south and 10 m west for a better fit with the other Jason dive tracks (see Figure 5.1-1 and 5.1-2). None of the other dive navigation is shifted.

The DVL-nav repeatability from dive-to-dive is only about 10-20 m, partly because we were relying on LBL nav during the 1<sup>st</sup> half of the cruise, and we were not religious about performing "Doppler-resets" at known positions to help make the Doppler nav more consistent. The relative positions of the markers and vents is also probably not very good. A good idea for the next cruise would be to do a Doppler-only navigation transect between Brimstone vent, the summit, and all the marker sites, in order to get a more consistent navigation framework. Subsequently, whenever Doppler lock is lost, Jason should go to a site with known position to reset the Doppler as soon as possible. For future years, LBL navigation should not even be attempted. It is a waste of time. An ultra-short baseline (USBL) system combined with DVL would be ideal, and hopefully Jason will have this available in the near-future. In the meantime, DVL-only is the way to go with a consistent strategy for how to use doppler resets.



Figure 5.1-1 JASON Navigation at Brimstone with unshifted bathymetry

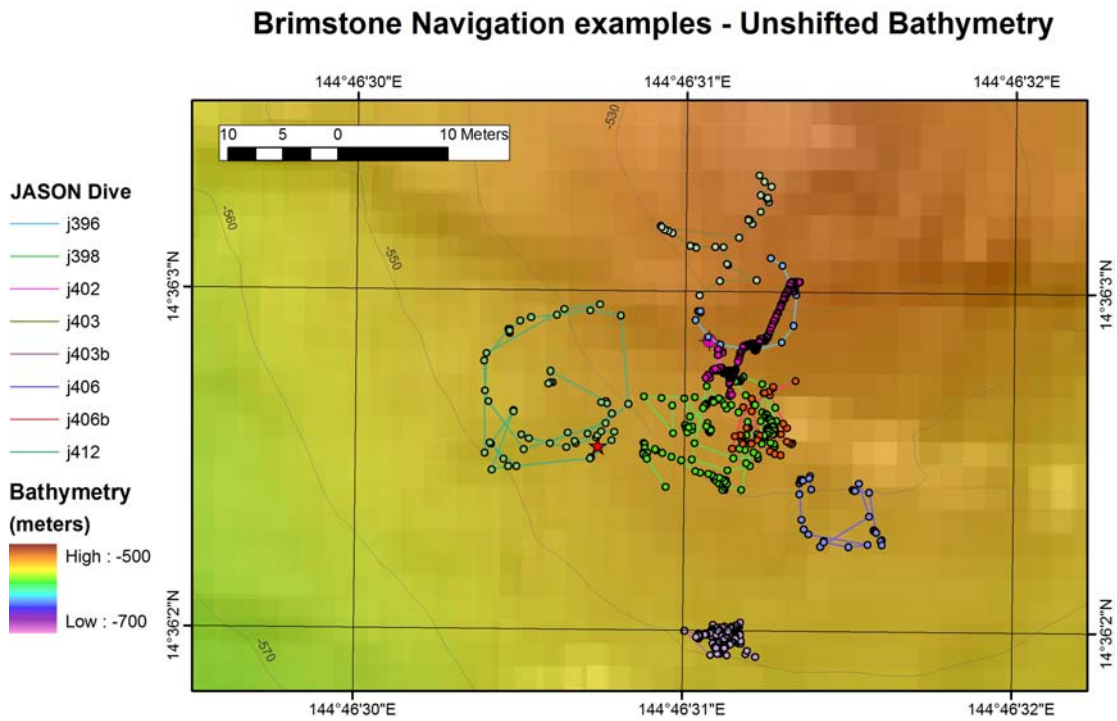


Figure 5.1-1 shows JASON navigation at selected time periods while sampling at the Brimstone vent. Underlying bathymetry is SM2000 prior shifting. Figure 5.1-2 is identical navigation but uses the shifted SM2000 bathymetry.

Figure 5.1-2 JASON Navigation at Brimstone with shifted bathymetry

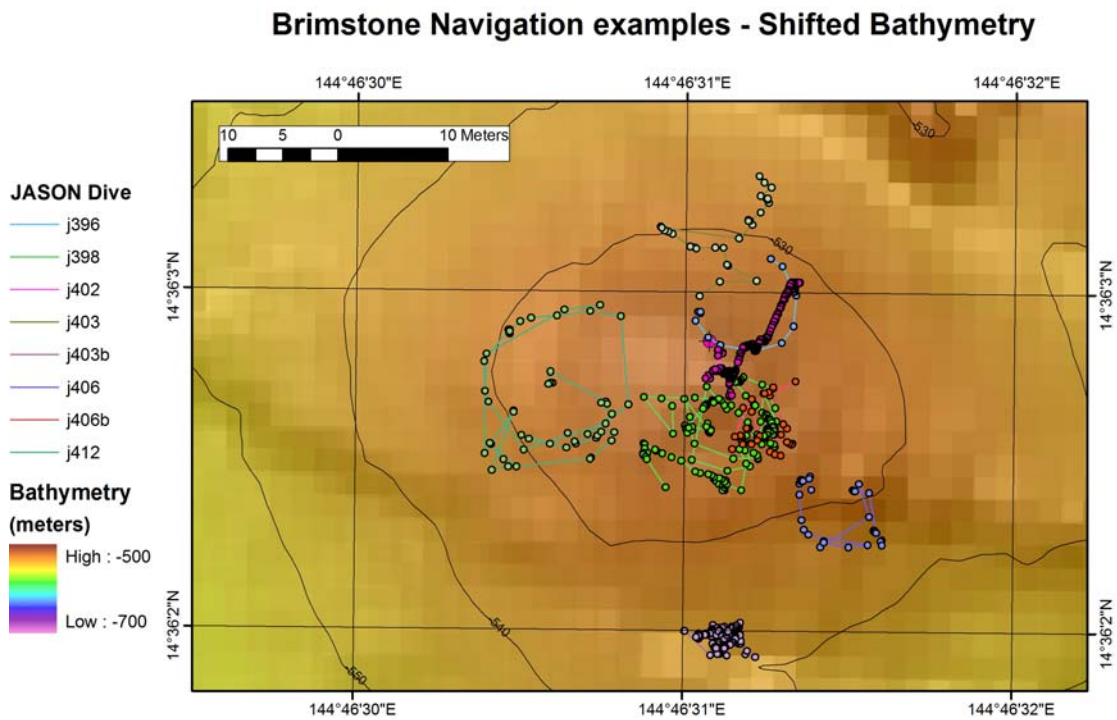


Figure 5.1-3 JASON Navigation offsets at revisited sites

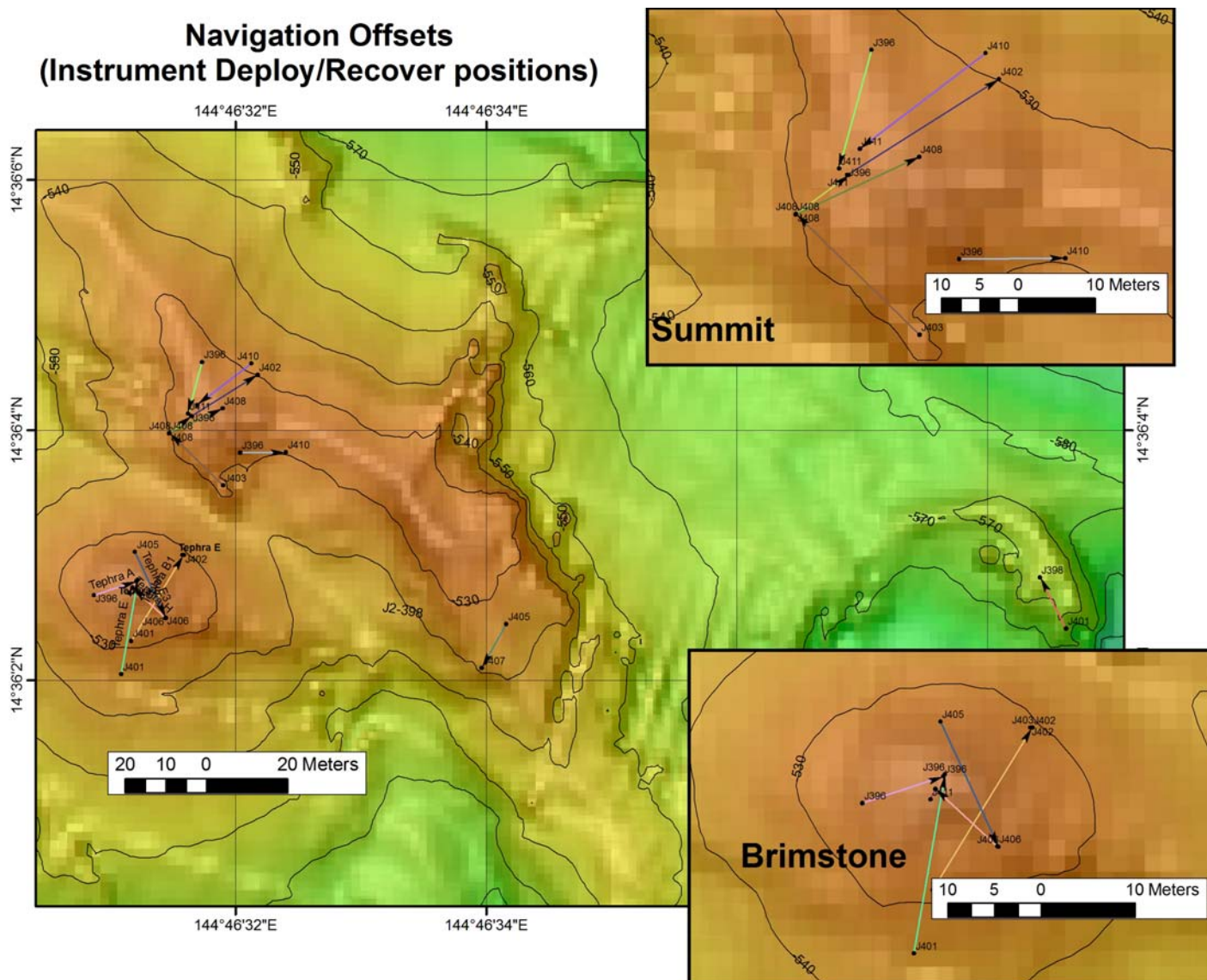


Figure 5.1-3 shows select JASON navigation positions when experiments/instruments were deployed and subsequently recovered at the same site. Underlying bathymetry is SM2000 with shifted bathymetry.

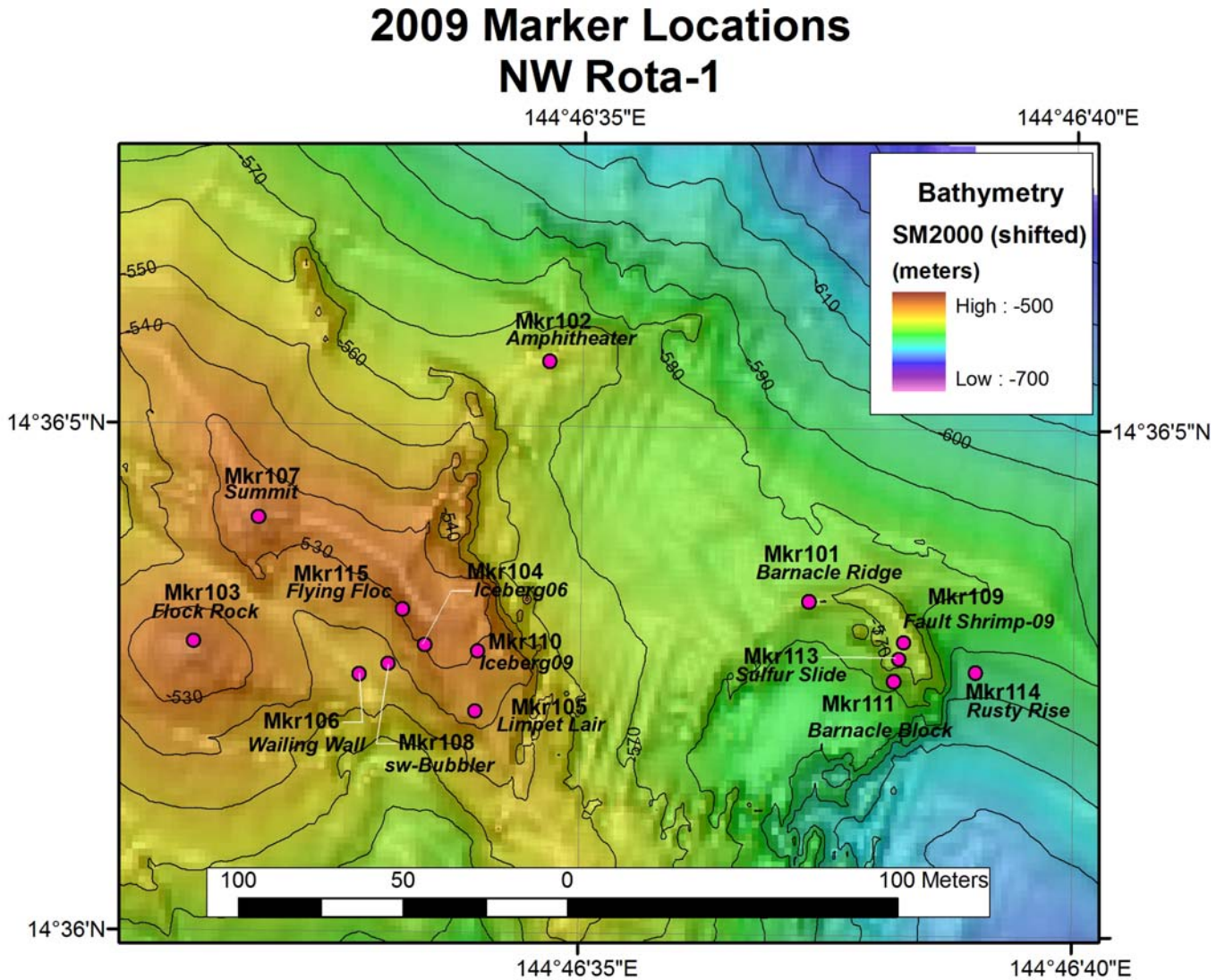
Table 5.1-1 Calibrated transponder positions:

Transponder	Latitude	Longitude
A	14° 36.2414' N	144° 46.3271 E
B	14° 36.1741' N	144° 46.8369 E
C	14° 35.8570' N	144° 46.7790 E
D	14° 36.0678' N	144° 46.2637 E
E	14° 35.7970' N	144° 46.0515 E

## 5.2 Marker Positions

Marker positions were originally the deployed positions derived from the shifted, renav, JASON navigation. The final marker positions were determined by bathymetry, dive log observation comments and navigation from all JASON dives which visually saw the markers. JASON dive maps show the original deployed marker position for markers deployed on that particular dive.

Figure 5.2-1 Marker Map



**Table 5.2-1 NW Rota-1 Marker positions**

Marker	Location / Comments	latitude	longitude	Jason Z	Total Z	Date Time	Dive Deploy	Virtual Van Record
Marker 101	<b>Barnacle Ridge.</b> Barnacle sampling site E of summit. ESTIMATED POSITION	14.60091486	144.7770804	569.65	574.41	20090409 154933	J2-402	5065
Marker 102	<b>Amphitheater.</b> Extensive Mat site on a cliff face of massive lavas N of summit ridge.	14.60156739	144.7763447	553.45	557.55	20090409 181441	J2-402	5380
Marker 103	<b>Floc Rock.</b> Fluid sample site located about 10 m NE of Brimstone vent.	14.60079301	144.7753483	519.98	523.82	20090413 202843	J2-407	11150
Marker 104	Area of intense diffuse venting on W side of N-S spur south of summit ridge, 30m west of Mkr 110. Hdg=069. Temperature measured but no samples here. ESTIMATED POSITION	14.6007871	144.7759983	532.02	539.06	20090408 201100	J2-401	4073
Marker 105	<b>Limpet Lair.</b> Shrimp trap deployment site.	14.60060664	144.7761421	538.31	541.61	20090409 140840	J2-402	4825
Marker 106	<b>Wailing Wall.</b> Sample J2-402-mat-04 taken here. At base of cliff on NE edge of saddle between Brimstone cone and summit ridge. ESTIMATED POSITION.	14.600707	144.775816	544.24	545.99	20090409 134738	J2-402	4775
Marker 107	<b>Summit.</b> Next to hydrophone site at summit. ESTIMATED POSITION	14.601133	144.775527	519.09	520.34	20090404 091319	J2-396	285
Marker 108	Just E and upslope of Mkr 106 and SW of Bubbler target. Area of diffuse flow with lots of shrimp. The marker slid downslope after deployment. ESTIMATED POSITION.	14.600735	144.775897	541.1	546.96	20090404 182556	J2-396	1165
Marker 109	<b>Fault Shrimp-09.</b> Spur S of summit ridge with abundant shrimp. Not the same as 2006 "Fault Shrimp" target, but close to that position. Markers 113 and 111 are downslope on same spur ridge.	14.60080424	144.7773493	565.62	568.35	20090405 192134	J2-398	1932
Marker 110	<b>Iceberg09-2.</b> Fluid sample site for J2-401 (samples 19-26). On E side of N-S spur, south of summit ridge, 30 m east of Mkr 104. ESTIMATED POSITION.	14.60077199	144.7761483	533.53	536.88	20090408 195552	J2-401	4049
Marker 111	<b>Barnacle Block.</b> Sampling site (Hdg=053) on SW side of knife ridge, downslope of Mkr 113. ESTIMATED POSITION.	14.60069858	144.7773213	576.71	578.75	20090408 134804	J2-401	3387
Marker 113	<b>Sulfur Slide.</b> Located below Mkr 109 on same ridge where sulfur blocks were sampled.	14.60075957	144.7773358	570.84	576.3	20090413 175243	J2-407	10900
Marker 114	<b>Rusty Rise.</b> Heading 321. Marker is at about 590m.	14.60072435	144.7775529	588.36	605.47	20090410 191647	J2-403	7356
Marker 115	<b>Flying Floc.</b> Site just below and S of summit ridge. Hdg=089. ESTIMATED POSITION.	14.600885	144.775936	529.49	532.95	20090411 135658	J2-405	8150

### 5.3 Experiments Deployed/Recovered

Times are UTC (10 hrs behind local Guam time). Position is the deployed JASON latitude and longitudes from the renav version.

Instrument	Comments	Latitude	Longitude	Jason Z	Total Z	datestamp yyymmdd hhmmss	Deploy	Recover	PI	Virtual Van Record
Hydrophones	2 hydrophones bundled on one base. Deployed at summit	14.6011419	144.7754579	517.45	518.96	20090404 085149	J2-396	J2-402	Chadwick	243
Tephra Sampler A	NW of Brimstone ~2m (recovered same dive at 20:05)	14.6007451	144.7752416	524.16	525.35	20090404 104702	J2-396	J2-396	Deardorff	443
Tephra Sampler C	51 meters upslope of Brimstone. Bearing of 340.	14.6010611	144.7755655	534.89	536.43	20090404 110157	J2-396	J2-410	Deardorff	466
Tephra Sampler F	At the summit next to marker and hydrophone.	14.601262	144.77548	518.25	521.45	20090404 111605	J2-396	J2-411	Deardorff	490
Tephra Sampler D	116 degree heading - 117 m from the active vent.	14.6017334	144.7749526	544.45	547.18	20090404 115253	J2-396	J2-410	Deardorff	551
Tephra Sampler E	Leaning against a big rock just downslope from Brimstone.	14.6007792	144.7753386	524.97	526.73	20090404 195954	J2-396	J2-401	Deardorff	1318
Shrimp Trap	Verena's shrimp trap is being placed on the top of this large outcrop covered with shrimp.	14.6007839	144.7773379	566.31	570.72	20090405 191608	J2-398	J2-401	Tunncliffe	1927
Tephra Sampler B	Crater Rim NW of plume. Brimstone rim Heading 309	14.6006435	144.7753243	520.51	523.07	20090408 110817	J2-401	J2-402	Deardorff	3016
Shrimp Trap	At top of outcrop on a bit of a saddle for trap. Limpet Lair/Marker 105.	14.6006072	144.7761435	538.64	541.77	20090409 140737	J2-402	J2-403	Tunncliffe	4823
Koichi Sensor	Logger #148 On summit ridge.	14.601031	144.7760056	518.53	522.02	20090409 161326	pre- 2009	J2-402	Koichi	5110
Koichi Sensor	Logger H952A from summit ridge	14.6010427	144.7759997	519.4	522.03	20090409 162012	pre- 2009	J2-402	Koichi	5124
Tephra Sampler E	20m NNW of Brimstone	14.600834	144.7754382	519.99	522.43	20090409 194342	J2-402	J2-403	Deardorff	5560
Hydrophone	Deployed at summit in sediment.	14.6009881	144.7755276	519.25	521.28	20090410 103154	J2-403	J2-408	Chadwick	6255
Tephra Sampler G	Deployed just NW of the Tephra-E that was recovered just after this deployment (Brimstone). On volcanislastic sediments.	14.6007752	144.7751988	520.13	521.54	20090410 155222	J2-403	J2-405	Deardorff	6947
Tephra Sampler B	Deployed ~10m E of Brimstone on rockier sediments.	14.6006765	144.7753326	522.89	529.29	20090410 160025	J2-403	J2-406	Deardorff	6963
Tephra Sampler E	Deployed at Brimstone next to G (recovered just after this deployment)	14.6008407	144.7753333	521.06	521.86	20090411 200852	J2-405	J2-406	Deardorff	8805
Shrimp Trap	Shrimp Trap on the flat(ish) rock here at Mkr-105 (Limpet Lair).	14.6006815	144.7761559	538.18	543.69	20090411 211623	J2-405	J2-407	Tunncliffe	8910

Times are UTC (10 hrs behind local Guam time). Position is the deployed JASON latitude and longitudes from the renav version.

Instrument	Comments	Latitude	Longitude	Jason Z	Total Z	datestamp yyymmdd hhmmss	Deploy	Recover	PI	Virtual Van Record
Tephra Sampler H	Tephra Sampler H. NW of Brimstone about 5m (at Tephra-E being picked up)-moved upslope about a foot.	14.6006943	144.7753999	520.36	521.51	20090412 210137	J2-406	J2-408	Deardorff	9374
Shrimp Trap	Deployed on summit next to hydrophone.	14.6011039	144.7754086	518.93	521.36	20090414 141345	J2-408	J2-408	Tunncliffe	12217
Hydrophone	Small hydrophone placed on ridge top next to bigger hydrophone to left.	14.6011043	144.7754088	518.94	521.4	20090414 141551	J2-408	J2-411	Chadwick	12221
Tephra Sampler E	Just W of Brimstone (5m). Z=521(next to H being recovered)	14.6007617	144.7753269	520.23	521.49	20090414 163134	J2-408	J2-411	Deardorff	12618
Shrimp Trap	Deployed Shrimp Trap next to Tephra samplers. Mkr-107 Summit.	14.6012592	144.7755911	519.24	521.47	20090415 110226	J2-410	J2-411	Tunncliffe	13614
Koichi Sensor	Koichi temperature probe. It has been pushed all the way into the seds here at the base of Eastern scarp wall-middle ridge. (20min deployment)	14.6005599	144.7773186	586.85	588.69	20090415 171018	J2-411	J2-411	Koichi	14236
Koichi Sensor	Temperature probe in the seds at end of the top of the ridge. (Recovered at 18:31)	14.6007968	144.7773106	563.9	572.08	20090415 175319	J2-411	J2-411	Koichi	14316
Tephra Sampler G	At the summit ridge. At Mkr-107. Z=520. This sampler will be here until the next cruise here in June.	14.6011471	144.7754501	519.26	521.32	20090415 195012	J2-411		Deardorff	14512

## 5.4 Mooring/Instrument Locations

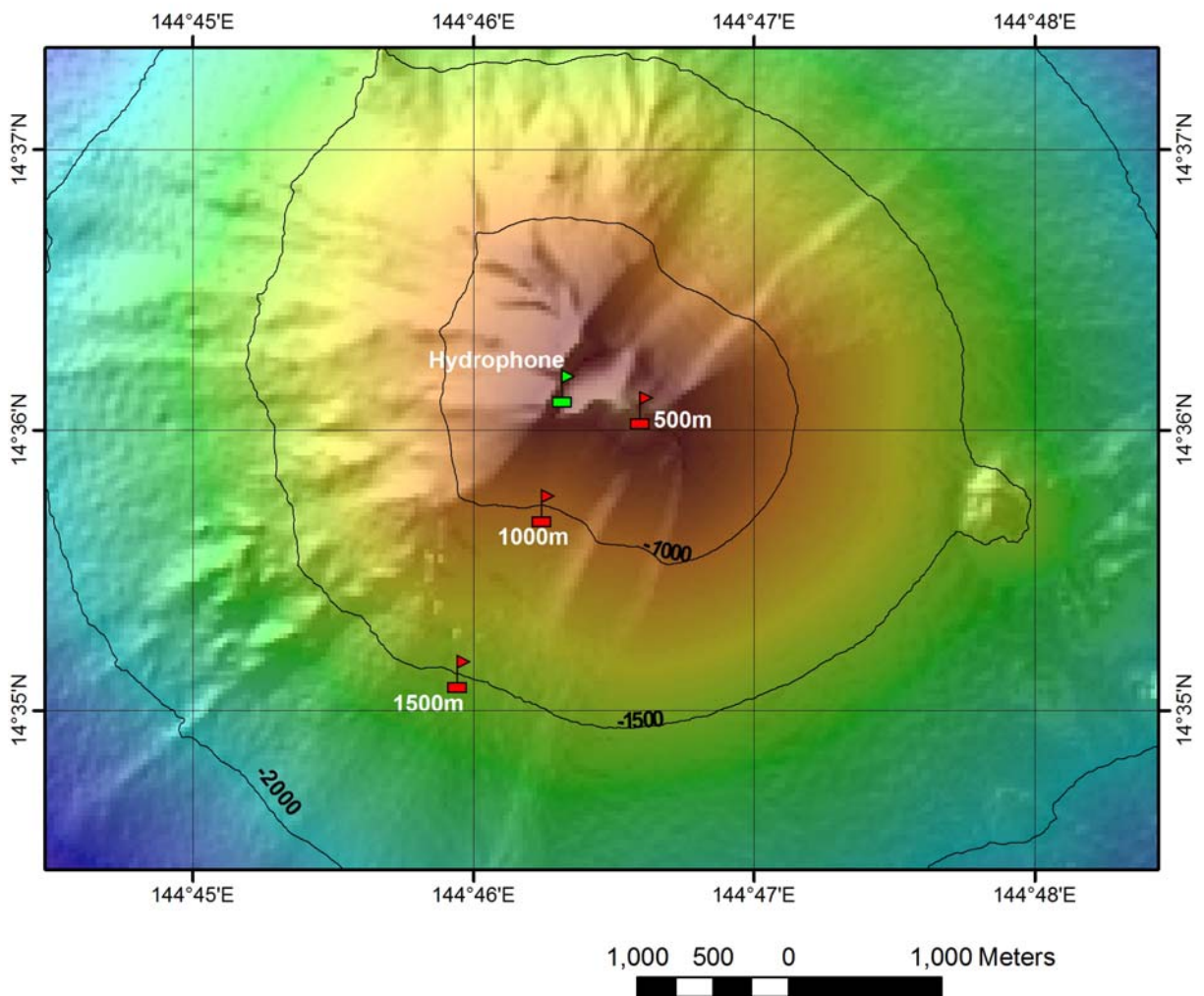
**Table 5.4-1 Mooring/Instrument Positions**

These moorings and instruments were left in place after the 2009 expedition.

Name	Latitude	Longitude	Anchor depth (m)	Mooring height (m)	Top of mooring depth (m)
2009 hydrophone mooring	14 36.148'N	144 46.324'E	635	230	405
550m (RAS) mooring	14 36.060'N	144 46.631'E	570	125	445
1000m mooring	14 35.722'N	144 46.269'E	970	172	798
1500m mooring	14 35.139'N	144 45.958'E	1487	620	867

**Figure 5.4-1 Mooring/Instrument Location Map**

### NW Rota-1 Moorings 2009



## 6.0 JASON Dives

### 6.1 Statistics

Table 6.1-1 JASON dive statistics for TN-232

#### Jason dive statistics for NW Rota 2009 cruise

Dive	Jason in water	Jason on deck	Wet time	Jason on bottom	Jason off bottom	Bottom time
J2-396	4/4/2009 6:17	4/4/2009 22:15	15:57	4/4/2009 7:36	4/4/2009 21:25	13:49
J2-397	4/5/2009 6:34	4/5/2009 7:52	1:17	4/5/2009 6:58	4/5/2009 7:12	0:13
J2-398	4/5/2009 13:34	4/5/2009 22:19	8:44	4/5/2009 14:01	4/5/2009 21:46	7:44
J2-399	4/6/2009 8:33	4/7/2009 0:41	16:07	4/6/2009 9:24	4/7/2009 0:07	14:43
J2-400	4/7/2009 9:33	4/7/2009 22:47	13:14	4/7/2009 10:06	4/7/2009 22:04	11:57
J2-401	4/8/2009 9:46	4/8/2009 22:57	13:10	4/8/2009 10:16	4/8/2009 22:05	11:49
J2-402	4/9/2009 9:52	4/9/2009 22:20	12:28	4/9/2009 10:23	4/9/2009 21:36	11:12
J2-403	4/10/2009 6:31	4/10/2009 22:12	15:40	4/10/2009 6:56	4/10/2009 21:32	14:35
J2-404	4/11/2009 7:38	4/11/2009 9:12	1:33	4/11/2009 8:11	4/11/2009 8:35	0:23
J2-405	4/11/2009 9:41	4/11/2009 22:14	12:33	4/11/2009 10:00	4/11/2009 21:31	11:30
J2-406	4/12/2009 6:32	4/12/2009 22:02	15:29	4/12/2009 7:35	4/12/2009 21:36	14:00
J2-407	4/13/2009 6:14	4/13/2009 22:12	15:57	4/13/2009 6:52	4/13/2009 21:46	14:54
J2-408	4/14/2009 6:56	4/14/2009 22:22	15:26	4/14/2009 8:08	4/14/2009 21:27	13:19
J2-409	4/15/2009 6:01	4/15/2009 6:42	0:40			
J2-410	4/15/2009 6:57	4/15/2009 11:49	4:52	4/15/2009 7:26	4/15/2009 11:05	3:38
J2-411	4/15/2009 13:04	4/15/2009 22:13	9:08	4/15/2009 13:40	4/15/2009 21:30	7:50
J2-412	4/16/2009 6:00	4/16/2009 14:08	8:08	4/16/2009 7:02	4/16/2009 13:27	6:24
<b>Totals</b>			hours:min:sec	180:31:59	hours:min:sec	158:06:35
<b>Average per day</b>			hours:min	15:02	hours:min	13:10

### 6.2 Dive Summaries

**J2-396 – Brimstone recon.** JASON equipped with portable hydrophone, 2 markers, 3 scoop bags, 2 gas tights, Eh sensor, Niskin. Dive target was 100m downslope of Brimstone vent, landed in chute to the west and drove to Brimstone vent. Using LBL and doppler navigation during dive. (Dive later re-navigated using doppler only). Deployed hydrophone and Mkr-107 at Brimstone summit. Returned to Brimstone vent and made observations using HD video. Deployed tephra sampler at NW corner of vent. Moved up summit slope and deployed a tephra sampler on slope. Deployed an additional tephra sampler on summit ridge. Moved SE and discovered an diffuse vent area, named it Bubbler. Moved upslope and located Koichi's instruments on summit ridge. Moved east to find "Fault Shrimp" area (later renamed because of depth mismatch), and located area of knife-edge scarps. Headed east to Scarp Top area. At westernmost scarp at top of ridge found area of shrimp with limpets, mat and water flow. Headed back to Iceberg area and discovered good mat site with flow and took a mat sample (east of Iceberg site). Looked for Gastros site to west and then headed back to Bubbler. Passed over an area that looked like Iceberg (later Mrk110 left here and called Iceberg09). Discovered large area of diffuse flow and deployed Mkr108 (Bubbler) at site. (Note: marker later slid downslope and was relocated on J2-400). Headed back west to Brimstone, made observations and collected rock samples. Recovered a tephra sampler and deployed a new one at same site. Collected an additional rock sample and took 2 gas-tights at Brimstone. Took Niskin over vent as began ascent.

**J2-397 – Fluid Sampling (aborted).** JASON equipped with HFS Beast with 2 gas-tights, single-chamber suction sampler, HOMER receiver, 2 tephra samplers, 8 markers, 3 scoop bags, 2 gas-tight bottles, Niskin, Eh sensor. JASON landed in lavas about 100m downslope of Brimstone. Headed to Brimstone when hydraulic fluid leak observed and dive was aborted.

**J2-398 – Fluid Sampling (continued).** JASON equipped with HFS Beast with 2 gas-tights, single-chamber suction sampler, HOMER receiver, 2 tephra samplers, 8 markers, 3 scoop bags, 2 gas-tight bottles, Niskin, Eh sensor. JASON landed in lava rubble downslope of Brimstone (47m navigation offset at beginning of dive until Doppler reset).



Drove to Brimstone and put tephra sampler E upright. Initial observations of new lava at Brimstone. Conducted visual observations and HFS sampling at vent (8 fluid/2 gas). Moved east toward "Fault Shrimp" area. At eastern fault scarps observed lots of shrimp as well as limpets. Took suction sample of shrimp and deployed shrimp trap on top of outcrop. Deployed Mkr-109 at "Fault Shrimp". Could not position for HFS sampling due to current but took a sample of sulfur crust. Transited west toward Mkr-108 but could not locate marker (later found it had fallen downslope). Found area of large microbial mats (Mat Mecca) and took 5 HFS samples. Took one background HFS sample as ascended.

**J2-399 - SM2K Survey.** JASON equipped with SM2K multibeam sonar for survey of NW Rota-1 summit. Entire dive is dedicated to mapping above bottom; no samples; no video.

**J2-400 - CTD Search.** JASON dive dedicated to search for CTD instrument lost during last CTD before dive. Dive target was the drop position of CTD, near Brimstone vent. JASON navigators conducted search patterns around the target position but were limited by rough terrain and low visibility at times (from plumes). 2 HFS samples of Brimstone vent obtained during dive.

**J2-401 - Fluid Sampling.** JASON equipped with HFS Beast (including 2 gas-tights), single-chamber suction, HOMER receiver, 2 tephra samplers, 8 markers, 3 scoop bags, 2 gas-tight bottles, Eh sensor, Niskin. Searched for CTD downslope of Brimstone before fluid sampling. Deployed tephra sampler and took sulfur-rock sample from underneath sampler. Recovered tephra sampler near Brimstone vent. Took 7 HFS/gas samples at Brimstone. Moved east toward Mkr108 site but poor visibility and moved further east to Barnacle target at base of one of the knife-edge ridges. Took barnacle sample on rock substrate then deployed Mkr111 (Barnacle Block). Moved north to recover shrimp trap at Mkr109 ("Fault Shrimp"). Moved up ridge to other side and took fluid samples (4). Headed east to Scarp Top. Nav depths indicate Fault Shrimp should be Scrap Top. Moved to Mkr111 (Barnacle Block) and explored area finding very-low temp flow. Took 3 HFS samples at this site and named it Iron599. Transited west to Iceberg finding area with high shrimp concentration. Took 8 HFS samples and deployed Mkr-110, calling site Iceberg09 (30m E of Iceberg06 site). Moved west toward Mat Mecca and deployed Mkr104 (near Iceberg06) in area with large mat. Didn't find Mat Mecca area and moved back west to Brimstone. Explored area NW of Brimstone and made visual observations of vent.

**J2-402 - Bio/Geo Sampling.** JASON equipped with single-chamber suction sampler, Biobox, HOMER receiver, Koichi data loggers, 1 tephra sampler, 4 markers, 3 scoop bags, shrimp trap, Eh sensor, Niskin. Began dive at Brimstone making visual observations and taking 2 geology samples. Searched for CTD then headed east to Mat Mecca area, took a geology sample of yellow outcrop on the way. Near Mkr-108 (Bubbler) took a suction sample of microbial mat. Deployed marker at sample site (Mkr106, Wailing Wall). Went east stopped at area with an abundance of shrimp/limpets and deployed shrimp trap. Deployed Mkr105 at sample site, named Limpet Lair. Took limpet sample. Headed east to Barnacle Block area (Mkr111) and took sample of yellow, sulfur rock further upslope. Moved over scarps and took orange (iron oxide) rock sample. Moved west and upslope along ridge and sampled barnacles/limpets on rock. Deployed Mkr101 at sample site, Barnacle Ridge. Headed west to recover Koichi samplers on summit ridge. Went further west along summit ridge to recover hydrophones at summit ridge (Mkr107). Headed east toward Iceberg. Headed north from base of wall which had flow. High concentration of shrimp as moved up wall. Placed marker on top of vertical outcrop (Mkr102 Amphitheater) with filamentous white mat. Headed NW over outcrops with thick lava flows but no animals. Drove south to summit then on to Brimstone. Swapped out tephra samplers 20m N/NW from vent. Finished dive making visual observations at vent after taking 2 geology samples.

**J2-403 - CTD Search/Fluid Sampling.** JASON equipped with HFS Beast (including 2 gas-tights), single-chamber suction sampler, 2 tephra samples, 4 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. Began dive at Brimstone and then searched for the CTD east of Brimstone for almost 3 hours. After search, went to summit ridge (Mkr 107), deployed hydrophone and set tephra-sampler F upright. Headed to Brimstone for fluid sampling. Took 4 HFS samples on backside of Brimstone rim. Beast wand clogged with sulfur during sampling at vent. Took 2 gas-tight bottles in vent (one with funnel) and made video observations. Swapped a tephra sampler at vent and put an additional one 10m E of vent. Headed to Limpet Lair and made biology observations (HD). Took shrimp sample with suction and recovered shrimp trap. Drove N/NE across bench and explored east side of summit. Took rock sample from older outcrop. Headed south to area named Rusty Rise (deployed Mkr114) and obtained sample of crusty material. Took another rock sample as headed south (south of Fault Shrimp). Explored further south along ridge before heading NW back to Brimstone. Made video observations of vent before ascending.

**J2-404 - CTD Search/Fluid Sampling (aborted).** JASON equipped with HFS Beast (with long intake), single-chamber suction sampler, 2 tephra samples, 4 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. Started on bottom SE of Brimstone in chute. Began CTD search but dive aborted after 20 minutes due to problem with HFS sampler.

**J2-405 - CTD Search/Fluid Sampling (continued).** JASON equipped with HFS Beast (with long intake, including 2 gas-tights), single-chamber suction sampler, HD offload camera, 2 tephra samples, 3 markers, 3 scoop bags, 2 gas-

tight bottles (one with funnel), Eh sensor, Niskin. Beginning of dive searched for CTD south of Brimstone. Near end of search found fluid sampling site near Mat Mecca location, took fluid(3)/gas(1)/mat(1) samples. Deployed Mkr-115 at sample site, named Flying Floc. Drove to top of ridge passing over leftover Koichi sensor base (large nav offset, 30m) en route to Mkr-102 Amphitheater (reset Doppler, nav improved). Sampled 5m below Mkr102 on scarp face taking fluid (6)/gas(1) samples also observed barnacles at site. Headed west to Brimstone. Took 10 fluid samples, 2 gas samples, 2 rocks, 1 sediment scoop and swapped out tephra samplers. Headed east to Limpet Lair (Mkr-105) to deploy shrimp trap. Recorded video of shrimp before deploying shrimp trap on rock beneath Mkr-105.

**J2-406 - CTD Search/Brimstone Observations/SM2K Mapping.** Searched for CTD south of Brimstone ~3 hours on bottom. Moved to Brimstone and took rock sample from south side of Brimstone (needed some ballast). Made visual observations of north side (normally covered by plume). After power problem decided to conduct SM2K survey of north side of Brimstone (~9 hours). Headed back to Brimstone after survey. Recovered tephra sampler which had slid SE downslope from vent. Returned to vent and swapped tephra samplers 5m NW of Brimstone. Took rock from edge of vent before ascending.

**J2-407 - CTD Search/Fluid Sampling.** JASON equipped with HFS Beast (including 2 gas-tights), single-chamber suction sampler, 2 tephra samples, 4 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. JASON began the dive NW of Brimstone, searching for the lost CTD. CTD search (~3 hours) conducted west of Brimstone. Science portion of dive began at Brimstone with visual observations of vigorous activity at vent, ~1 hour. Passed over Mkr-104 and Mkr-108 en route to Limpet Lair (Mkr-105). Took HD images for a mosaic at shrimp site then took suction sample of shrimp. Retrieved shrimp trap and then JASON had engineering time for ~2hr while recording more HD video at site. After JASON engineering time, took 4 HFS samples at same location. Drove east toward Scarp Top area while taking background pH reading. Furry mats and old yellow deposits found east of Mkr-109 on middle of the 3 ridges. Took 4 fluid samples at this site and 3 sulfur/sediment samples (Sulfur Slide). Moved west across the ridges and along summit. Found an area of venting in outcrop 9m below rim and took 3 HFS and 1 gas sample. Moved south toward Brimstone and found high concentration of shrimp, mat and flow north of Brimstone. Took 4 HFS and 1 gas-tight sample. Deployed Mkr-103 at site named Flock Rock. Drove ENE in search of source of apparent second plume and noted diffuse flow, no single source found. Took 2 fluid samples from cracks in area. Next went back west to Brimstone. Took 2 gas-tight samples, one with funnel. Took a background fluid sample while ascending.

**J2-408 - Deep traverse up landslide chute/Brimstone Observations.** JASON equipped with single-chamber suction sampler, small hydrophone, 2 tephra samplers, 2 gas-tights (one with funnel), shrimp trap, 2 markers, 2 scoops, Niskin, Eh sensor. JASON began dive at 1640m depth, south of Brimstone in landslide chute. Traverse up slope with small zig-zags (heading ~330) in primarily sediments with some outcrops. Viewed mooring site (1480m) with scattered rocks in sediment. Took a rock sample near mooring site. Turned east across slope at 1380m depth encountered areas with more rock than sediment. Alternated between rocky vs. sediment areas during traverse. Turned upslope (heading ~325) into area with large blocks. As moved upslope encountered areas with benthic shrimp, sediment and rock patches. Turned due west and took rock sample (depth 750m) from a rock pile which had intact pillows and rubble. Moved into area of blacker rocks and took another rock sample. Noted more intact pieces of lava in this area. Turned north to Brimstone and took a rock sample (pillow basalt) from the start of a slope. Transit up noted large, intact lavas. Stopped at Brimstone and viewed tephra bucket. Moved to summit rim (Mkr-107) to deploy hydrophone. Deployed small hydrophone and recovered other hydrophone. Left shrimp trap at site. Returned to Brimstone at north side and viewed cone from above then set down on south side looking NW (317deg). JASON conducted engineering tests (~1hr) while making visual observations of Brimstone. Moved to left with a heading of 055deg. At end of engineering time, took HD with the off-load camera at Brimstone. Had to move vehicle due to white-out and then observed at 248deg with HD off-load camera. Moved north to recover and deploy tephra samplers 5m from vent. Next went back to summit and took HD images of shrimp trap area and left trap deployed at summit. Headed west along summit to observe shrimp. Encountered dense Brimstone plume. Vehicle lost power to a thruster. Returned to summit for video observations of high shrimp concentration area. Left summit for Mkr-103 (Flock Rock) site. Took sample of mat at Mkr-103 and then returned to summit. Recovered shrimp trap. Moved back to Brimstone to take gas-tight samples in the plume. Made visual observations and used off-load camera at vent. Took tephra sample of falling ash from JASON basket. Dive ended at Brimstone.

**J2-409 – aborted before reaching bottom**

**J2-410 - CTD Search/Brimstone observations (aborted).** JASON equipped with single-chamber suction sampler, 2 tephra samplers, HD off-load camera and light, 3 gas-tights (one with funnel), shrimp trap, 2 markers, 2 scoops, Koichi logger, Niskin, Eh sensor. Dive began at Brimstone with a search for the CTD to the north (~4 hours). First part of search concentrated on the area north of Brimstone but south of the summit ridge. A smaller search was conducted on the north side of the ridge. NW of Brimstone a lost scoop bag was recovered with a geology sample of sediment. Nearby a tephra bucket was also recovered which had slid down the slope but did not have a sample. Conducted temperature readings using Ko-ichi instrument in orange sediments. NW ridge had striking orange and white sediment

on a steep slope with lots of evidence of sliding. Moved toward Mkr-107 at summit and recovered tephra sampler with sediment sample. Deployed shrimp trap at summit. Dive aborted early due to seawater visible inside HD camera housing.

**J2-411 - Brimstone observations (continued).** JASON equipped with single-chamber suction sampler, 2 tephra samplers, HD off-load camera and light, 3 gas-tights, 2 markers, 3 scoops, Ko-ichi logger, Niskin, Eh sensor. Dive began just north of Brimstone with a strong N. current. Settled at a Brimstone viewing location on south side during some JASON engineering time. Vigorous activity at Brimstone. Took measurements with Ko-ichi temperature sensor at vent. During activity took 3 gas-tights. (At recovery discovered one gas-tight sampler was lost). Used off-load HD camera to image plume and activity. Took lava sample after visual survey then recovered nearly full tephra sampler (after 1 day). Took rock sample with scoop of sulfur-coated rock. Headed to eastern scarps. Took HD off-load imagery of base of middle steep ridge and sulfur crusts. Took measurements with Ko-ichi probe at ridge base then took a scoop of pieces of sulfur crust from 2/3 up ridge. Moved to the western ridge (near Fault Shrimp) and used Ko-ichi probe at the nose of ridge top. Filmed shrimp at site with HD off-load camera and then took shrimp sample with suction. Headed back SW to Brimstone over area of lava flows. Collected rock in pillow/lobate flow area. Turned north following flow upslope and stopped at contact with rubble of Brimstone's cone. Took lava sample at contact of pillow lava. Followed ridge up to Brimstone then continued up to summit at Mkr-107. Deployed tephra sampler to be left until next cruise to site and recovered the other tephra sampler. Recovered shrimp trap and hydrophone from summit. Returned to Brimstone for final visual observations (~1.5 hrs) before ascent.

**J2-412 - Brimstone and NW Ridge.** JASON equipped with single-chamber suction sampler, 2 bioboxes, 2 scoop bags, Niskin, Eh sensor. Dive began at Brimstone searching for lost gas-tight bottle and observing vent activity. Activity remarkably different with less smoke and heavy tephra deposits. Searched to the east of Brimstone following path of last dive, gas-tight bottle not found. Headed NW over summit rim and along the NW trending spur ridge. On the east slope of ridge wall collected coral and anemone; later discovered a rock that fell into the basket during collection. Ridge outcrops at times obscured by heavy sediments, used sonar to locate outcrops along route. In an orange rock/sediment area collected an old, lava rock. At next outcrop collected an anemone. Scooped additional corals/anemones from another ridge/outcrop along same trend of spur. Further along at the base of the scarp's western wall, picked the blackest available rock in orange and black layered lavas. Picked up a coral hanging from an overhung ledge of the lava outcrop. Observed biology along ridge until dive ended.

### 6.3 Dive Samples

All times and dates are GMT. All Latitude/Longitude positions were revised based on the JASON renav software. Virtual Van record numbers are provided as a guide but can differ slightly from the current online Virtual Van version. JASON collected a total of 178 samples listed below by dive: 81 fluid, 54 geology, 22 gas and 21 biology samples. 2 additional samples were found on JASON (on undercarriage and in basket) after recovery and kept (J398 and J407). One additional sulfur sample was taken from the HFS sulfur-coated wand after J407 (see section 4.1.2 for details).

**Table 6.3-1 J396 Sample Log:**

J2-396 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j396-tephra-01	geology	Brimstone area	20090404 111226	14.601267	144.775478	518.1	521.3	Tephra sampler B moved to the stbd biobox. Opportunistic sample. It was in the port biobox earlier in the dive.	Deardorff	486
j396-mat-02	biology	Iceberg?	20090404 171638	14.600796	144.776465	538.2	539.7	Slurp sample of bacterial mats at Iceberg in flow. Slurped a couple shrimp bicatch as well. Sampled more mat at adjacent crack with flow (didn't move vehicle).	Moyer	1069
j396-rock-03	geology	Brimstone (upslope)	20090404 194803	14.600798	144.775345	523.0	526.3	Large volcanic rock with sulfur. T=7.9 in sed's nearby.	de Ronde Deardorff	1291
j396-sed-04	geology	Brimstone	20090404 195244	14.600786	144.775345	524.2	526.6	Scoop of sulfur-rich volcanoclastic sandy material next to Brimstone	de Ronde Deardorff	1299
j396-tephra-05	geology	Brimstone area	20090404 200433	14.600777	144.775337	524.7	527.0	Tephra sampler A. Just downslope from Brimstone.	Deardorff	1315
j396-rock-06	geology	Brimstone	20090404 203642	14.600911	144.775414	523.8	524.5	Large fresh volcanic rock taken from the crater rim area. Wedge shape. Rock is quite fresh.	de Ronde Deardorff	1358
j396-gtb-07	gas	Brimstone	20090404 204913	14.600907	144.775398	523.9	525.3	Gastight taken in the pit. Can't really see where. It's in the plume. Fired. White and black tape #5. Tmax =70. Tconstant=40.	Evans	1372
j396-gtb-08	gas	Brimstone	20090404 205141	14.600904	144.775398	523.8	524.7	Gastight in the pit. Can't really see where. Orange and black tape #7. Tmax =70. Tconstant=40.	Evans	1376
j396-rock-09	geology	Brimstone	20090404 211128	14.600695	144.775242	524.1	525.6	Rock. Small altered gray volcanic rock grabbed near the base of the pit.	de Ronde	1399
j396-niskin-10	fluid	Brimstone	20090404 211430	14.600725	144.775295	519.0	525.9	Niskin. Hoped to fire it in the plume but missed that. We're hoping to get ash but will probably be a background sample.	Deardorff	1405
j396-rock-11	geology	Brimstone	20090404 212141	14.600627	144.775259	523.2	532.0	Huge fresh rock pulled from the edge of the pit.	de Ronde Deardorff	1413

Table 6.3-2 J398 Sample Log:

J2-398 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j398-hfs-01	fluid	Brimstone	20090405 153942	14.600760	144.775371	523.4	524.6	Unfiltered piston#1. Start 153942. End 154422. Tmax=28.7 Tavg=27.3. Vol=600ml. Flush pump not working. Not a good sample.	Butterfield Murdoch	1669
j398-hfs-02	fluid	Brimstone	20090405 160956	14.600723	144.775402	523.3	524.4	Filtered piston#4. Start 160956. End 161223. Tmax=80.5 Tavg=53.3 Vol=337ml.	Butterfield	1721
j398-hfs-03	fluid	Brimstone	20090405 161434	14.600714	144.775395	523.3	524.6	Unfiltered piston#8. Start 161434. End 161615. Tmax=31.2 Tavg=22.5 Vol=355ml. pH=1.99.	Butterfield Murdoch	1733
j398-hfs-04	fluid	Brimstone	20090405 164128	14.600724	144.775328	523.4	525.1	Unfiltered bag #24 Start 164128. End 164310 Tmax=15.1 Tavg=14.6 Vol=252 ml. About 10-15 cm above of the rocks. Close to center gas bubbles right after tephra event.	Butterfield	1774
j398-hfs-05	fluid	Brimstone	20090405 170853	14.600680	144.775353	524.0	524.7	Titanium filtered piston#2. Start 160956. End 161223. Tmax= 80.5 Tavg=53.3. Vol=337ml. Close to center gas bubbles right after tephra event	Butterfield	1817
j398-gtb-06	gas	Brimstone	20090405 171554	14.600675	144.775363	524	576.8	HFS PORT GTB#15. End 171640. Strong pulse. Temp=23.9. Taken with J398-HFS-05	Evans	1825
j398-hfs-07	fluid	Brimstone	20090405 171442	14.600675	144.775363	524.0	606.7	Titanium piston#3. Start 171442 End 171640. Strong pulse. Tmax=69.8 Tavg=55.7 Vol=278 ml.	Butterfield Murdoch	1833
j398-gthfs-08	gas	Brimstone	20090405 171442	14.600675	144.775363	524.0	606.7	HFS STBD GTB#11. End 1716. Taken with J398-HFS-07	Evans	1836
j398-hfs-09	fluid	Brimstone	20090405 172201	14.600705	144.775294	524	589.5	Filtered bag #16. Start 172201. End 172327. Tmax=37.4 Tavg=35.6.	Butterfield	1845
j398-hfs-10	fluid	Brimstone	20090405 173633	14.600651	144.775297	524.1	586.2	Filtered piston#5. Start 173633 End 173838. Tmax=40.1 Tavg=28.5 Vol=300 ml. Ground moving during sample. Big plume with bubbles and ash.	Butterfield	1859
j398-shrimp-11	biology	Fault Shrimp-09 Mkr-109	20090405 190507	14.600775	144.777341	566.7	568.9	Suction shrimp at "Fault Shrimp". Caught both known species. the big shrimp are Alvinocarid. The small shrimp are Opaepele loihi. About a dozen shrimp.	Tunncliffe	1917

J2-398 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j398-crust-12	geology	Fault Shrimp-09 Mkr-109	20090405 193700	14.600729	144.777299	565.9	567.8	Flat altered piece of sulfur (?) crust from the spiny ridge just ~5m north Mkr-109. 5-6cm.	de Ronde	1940
j398-hfs-13	fluid	Mat Mecca	20090405 205302	14.600716	144.775856	538.3	540.3	Unfiltered piston#6. Start 205552. End 205922. Tmax=45.3 Tavg=45 Vol=505ml. The mat is coating everything but there is a curious absence of animals here.	Butterfield Murdoch	1995
j398-hfs-14	fluid	Mat Mecca	20090405 210023	14.600716	144.775856	538.3	540.3	Unfiltered piston#7. Start 210000. End 210247. Tmax=45.2 Tavg=40.8 Vol=361ml. This sample is in the same little hole as previous sample.	Butterfield	2000
j398-hfs-15	fluid	Mat Mecca	20090405 211003	14.600715	144.775855	538.3	540.3	Unfiltered bag#23. Start 210954. End 211320. Tmax=43.8 Tavg=42.5. Vol=485ml.	Butterfield	2008
j398-hfs-16	fluid	Mat Mecca	20090405 211529	14.600716	144.775855	538.2	540.3	Filtered bag#17. Start 211520. End 211917. Tmax=43.1 Tavg=42.2 Vol=476ml	Butterfield	2012
j398-hfs-17	fluid	Mat Mecca	20090405 212252	14.600715	144.775855	538.3	540.2	HFS filtered sterivex #11. Start 215231. End 214240. Tmax=45.8. Tavg=42.9. Vol=3004ml.	Murdoch	2016
j398-hfs-18	fluid	background	20090405 215042	14.601128	144.775598	448.3	529.5	HFS background sample. Unfiltered bag 22. 360ml. Tavg=9.6 Start 215225 Stop 215236	Butterfield Murdoch	2035

Table 6.3-3 J400 Sample Log:

J2-400 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j400-hfs-01	fluid	plume Brimstone	20090407 180717	14.600605	144.775419	528.0	532.2	Filtered bag #16. In the plume. Start 1807. End 130930. Tmax=7.8 vol=320ml. Sampling while driving in the plume.	Butterfield	2628
j400-hfs-02	fluid	plume Brimstone	20090407 181024	14.600808	144.775325	522.6	528.3	Filtered bag #17. Start at 181045. Stop 181335. Tmax=8.4. Tavg=7.5. 503 ml. pH=6.70	Butterfield	2635

**Table 6.3-4 J401 Sample Log:**

<b>J2-401 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j401-rock-01	geology	Brimstone rim top	20090408 111147	14.600632	144.775316	520.7	523.7	Very brittle but a large piece. Looks like sulfur-coated.	deRonde	3024
j401-tephra-02	geology	south Brimstone Pit	20090408 111827	14.600567	144.775304	524.6	527.8	Tephra Sampler # was recovered from just south of Brimstone Pit (HDG 357)	Deardorff	3043
j401-hfs-03	fluid	Brimstone Pit	20090408 114101	14.600572	144.775332	523.1	524	Brimstone Pit (west side looking slightly east) Unfiltered Piston #1 Tmax=46.9 Tavg=37.7 vol=294 pH 1.3 (HDG 030) Brimstone Pit (west side looking slightly east)	Butterfield	3107
j401-gthfs-04	gas	Brimstone Pit	20090408 114450	14.600567	144.775342	523.1	524	GT #15 Port Temp=47 (HDG 030)	Evans	3118
j401-hfs-05	fluid	Brimstone Pit	20090408 114642	14.600565	144.775346	523.1	524	Filtered piston #2 Tmax=58.4 Tavg=49.8 vol=228 (HDG 030)	Butterfield	3125
j401-hfs-06	fluid	Brimstone Pit	20090408 115046	14.600561	144.775355	523.2	524.1	Filtered piston #3 Tmax=41.9 Av=35.1 vol=345 (HDG 030)	Butterfield	3138
j401-hfs-07	fluid	Brimstone Pit	20090408 115817	14.600534	144.775311	523.1	524	Stereovix #10 Tmax=55.1 Tavg=42.3 vol=1368 (HDG 030)	Murdoch	3154
j401-gthfs-08	gas	Brimstone Pit	20090408 121417	14.600656	144.775412	522.8	523.9	STBD Gastight #11 fired Temp=200deg (HDG 030)	Evans	3195
j401-hfs-09	fluid	Brimstone Pit	20090408 121603	14.600648	144.775409	522.8	523.9	Unfiltered #6 Tmax=207.4 Tavg=201.3 vol=193 (HDG 030)	Butterfield	3200
j401-barnacle-10	biology	Barnacle Block (Mkr 111)	20090408 132649	14.600671	144.777396	577	579.5	Small barnacle sample scooped on the west face of cliff. Substrate very fragile. (HDG 061)	Tunncliffe de Ronde	3343
j401-shrimp-11	biology	Marker 109 west face below ridge	20090408 135759	14.600875	144.777417	565.6	567.3	Shrimp trap has been down for 2 days. Baited with cat food.	Tunncliffe	3416
j401-hfs-12	fluid	Marker 109 east face below ridge	20090408 142107	14.600867	144.777434	565.5	567.7	Unfiltered bag #24. Tmax=18.8 Av=18.4 vol=520 T2=11.1 pH=5.17 (HDG 302)	Butterfield	3473
j401-hfs-13	fluid	Marker 109 west face below ridge	20090408 142553	14.600867	144.777434	565.4	567.7	Unfiltered bag #23 Tmax=16.7 Ave=16.3 Vol=503 T2=11.0 (sample stopped/restarted/slight repositioning during power outage)	Butterfield Murdoch	3484

J2-401 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j401-hfs-14	fluid	Marker 109 west face below ridge	20090408 144925	14.601046	144.777567	565.8	568	Filtered bag #16 starting Tmax=16.1 Av=15.6 vol=501 T2=10.8 (HDG 310)	Butterfield	3533
j401-hfs-15	fluid	Marker 109 west face below ridge	20090408 145425	14.60092	144.777477	565.8	568	Sterivex filter 15 Tmax=18.0 Av=16.9 vol=3012 T2=11.0 (HDG 310)	Murdoch	3544
j401-hfs-16	fluid	iron599	20090408 162800	14.600509	144.777319	598	600.3	Unfiltered bag #22 Tmax=8.6 Tavg=8.3 (HDG 316)	Butterfield Murdoch	3728
j401-hfs-17	fluid	iron599	20090408 164439	14.6005	144.777318	598	600.3	Filtered bag #17 Tmax=8.6 Tavg=8.1. Vol=499 (HDG 316)	Butterfield	3754
j401-hfs-18	fluid	iron599	20090408 165036	14.600505	144.777319	598	600.3	Sterivex filter #11. Tmax=8.6. Tavg=8.3 vol=3005 pH is 5.67	Murdoch	3762
j401-hfs-19	fluid	Iceberg09-2 Marker 110	20090408 182132	14.600845	144.776188	533.6	535.9	Unfiltered bag #21. Tmax=27.3. Tavg=20.0 vol=346 (HDG 338)	Butterfield	3915
j401-hfs-20	fluid	Iceberg09-2 Marker 110	20090408 183720	14.600842	144.776189	534.5	536.7	Unfiltered piston #8. Tmax=36.7 Tavg=35.9 vol=502 (HDG 338)	Butterfield Murdoch	3940
j401-hfs-21	fluid	Iceberg09-2 Marker 110	20090408 184213	14.600841	144.776188	534.4	536.7	Filtered bag #18. Tmax=39.0 Tavg=35.6 vol=510 (HDG 338)	Butterfield	3947
j401-hfs-22	fluid	Iceberg09-2 Marker 110	20090408 184752	14.60084	144.776188	534.5	536.7	Filtered piston #4. Tmax=38.8. Tavg=35.9. vol=511 (HDG 338)	Butterfield	3957
j401-hfs-23	fluid	Iceberg09-2 Marker 110	20090408 185615	14.600841	144.776184	534.5	536.8	Filter #20 Tmax=36.7 Tavg=34.9 Vol=3005 pH=4.6 (HDG 338)	Butterfield	3971
j401-hfs-24	fluid	Iceberg09-2 Marker 110	20090408 191041	14.600858	144.776144	534.5	536.8	Sterivex filter #14 Tmax=39.0 Tavg=36.7 Vol=3003 (HDG 338)	Murdoch	3989
j401-hfs-25	fluid	Iceberg09-2 Marker 110	20090408 192956	14.600859	144.776138	534.6	536.7	Filter #13 Tmax=39.3 Tavg=37.2 Vol=3003 (HDG 338)	Butterfield	4012
j401-gtb-26	gas	Iceberg09-2 Marker 110	20090408 195406	14.600867	144.776119	534.6	536.7	Red GT #9 same crack as the previous samples here Tmax=39.3 (HDG 337)	Evans	4045



**Table 6.3-5 J402 Sample Log:**

<b>J2-402 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j402-lava-01	geology	Brimstone	20090409 104425	14.600842	144.775417	522	523.7	Lava sample in front of plume of black fresh lava.	de Ronde	4346
j402-sed-02	geology	Brimstone	20090409 125744	14.600785	144.775355	521.1	523.3	Scoop of yellow material and tephra found under in-place rock. Also included a piece of the in-place rock.	de Ronde Deardorff	4670
j402-rock-03	geology	20m east of Brimstone; close to Mat Mecca.	20090409 131743	14.600712	144.775634	534.4	535.2	Rock is coated with yellow and partly buried in sediment which was all black.	de Ronde	4714
j402-mat-04	biology	Marker 106; Wailing Wall	20090409 133726	14.600736	144.775898	544.3	546.1	Suction sample of mat material on ledges with a lot of diffuse water. Not mecca-too shallow here but good mat.	Moyer	4756
j402-limpet-05	biology	Limpet Lair; Marker 105	20090409 141114	14.600604	144.776139	538.5	542.1	Pink limpets on rock from top of crag.	Tunncliffe de Ronde	4834
j402-rock-06	geology	E. of Barnacle Block	20090409 144018	14.600724	144.777434	570.8	576.6	Piece of fragile-yellow rock (sulfur) from ridge top.	de Ronde	4910
j402-rock-07	geology	W. of Scarp Top	20090409 152711	14.601035	144.777421	572.7	576.4	Iron oxide from outcrop on ridge top just before large buttress encountered as going west toward Marker 109.	de Ronde	5014
j402-multibio-08	biology	Barnacle Ridge/Marker 101	20090409 154522	14.600998	144.777074	570.2	573.8	Rock with a lot of barnacle/limpets.	Tunncliffe de Ronde	5058
j402-tephra-09	geology	20m NNW of Brimstone	20090409 194215	14.600834	144.77544	520	522.2	Tephra Sampler B recovered from the seafloor. We are N/NW of the vent about 20m.	Deardorff	5557
j402-sed-10	geology	20m NNW of Brimstone	20090409 194931	14.600839	144.775433	520.2	522.1	Scoop of volcanoclastic sed. Right next of the Tephra sampler just deployed (TSF). 20m N/NW of Brimstone.	Deardorff	5572
j402-rock-11	geology	Brimstone	20090409 205730	14.600952	144.775486	521.4	688.5	Rock sample Brimstone Pit right where plume is rising	de Ronde Deardorff	5674
j402-rock-12	geology	Brimstone	20090409 210205	14.600949	144.775491	521.3	522.1	Rock about 25cm square from edge of plume area.	de Ronde Deardorff	5686

**Table 6.3-6 J403 Sample Log:**

J2-403 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j403-hfs-01	fluid	N. Backside of Brimstone cone	20090410 112718	14.600662	144.775343	519.1	521.5	Unfiltered bag #24. Some obstruction messages during sample. Tmax=20.5 Tavg=17.2 vol=468 T2=9.3 pH is 2.9	Butterfield Murdoch	6393
j403-hfs-02	fluid	N. Backside of Brimstone cone	20090410 113856	14.600661	144.775344	519	521.5	Filtered piston #4. Tmax=17.6 Av=13.0 vol=402 T2=8	Butterfield	6418
j403-hfs-03	fluid	N. Backside of Brimstone cone	20090410 114347	14.60066	144.775344	519.1	521	Sterivex filter #10 Tmax=19.7 Tavg=14.9 vol=3006 T2=8.0	Murdoch	6430
j403-hfs-04	fluid	N. Backside of Brimstone cone	20090410 120522	14.600658	144.775345	519	520.9	Unfiltered piston #1 Tmax=21.2 Tavg=18.5 vol=437 T2=9.1 pH=2.87	Butterfield Murdoch	6470
j403-hfs-05	fluid	Brimstone Pit	20090410 122433	14.600557	144.775353	522.8	523.9	Filtered piston #2. Wand was laying in the plume and clogged. Tmax=174	Butterfield	6525
j403-gtb-06	gas	Brimstone Pit	20090410 131802	14.600549	144.775371	522.4	524.3	Funnel #7 over bubbles (lots of bubbles) Rocks moving. Saw bubbles in funnel.	Evans	6659
j403-gtb-07	gas	Brimstone Pit	20090410 132432	14.600541	144.775356	522.3	524.2	GT #9-red in white smoke near funnel sample. Fired. (rocks still tumbling)	Evans	6674
j403-tephra-08	geology	Brimstone Pit	20090410 155400	14.600776	144.775199	520.2	521.5	Recovered Tephra Sampler E. Deployed yesterday.	Deardorff	6950
j403-shrimp-09	biology	Marker 105	20090410 171742	14.600593	144.775997	540.1	544.7	Suctioned shrimp off rocks at Marker-105.	Tunncliffe	7117
j403-shrimp-10	biology	Marker 105	20090410 173735	14.600585	144.775997	539.2	542.7	Recovered shrimp trap at Marker 105.	Tunncliffe	7152
j403-rock-11	geology	NE rim (~60m from Mkr-102)	20090410 183629	14.601793	144.776868	574.4	576.3	Rock from this outcrop of older vespicularized lavas. Weathered. Massive weathered iron oxide-coated lava	de Ronde Deardorff	7272
j403-crust-12	geology	Rusty Rise Mkr-114	20090410 191932	14.600722	144.777548	588.3	605.9	Scoop sample of crusty material and perhaps some mat.	de Ronde Deardorff	7360

J2-403 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j403-rock-13	geology	base of Ridge near Mkr-114	20090410 194315	14.600528	144.777341	601.5	603.9	Piece of pillow-like rock from the base of this wall. This piece is less-weathered.	de Ronde Deardorff	7404

**Table 6.3-7 J405 Sample Log:**

J2-405 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j405-hfs-01	fluid	Flying Floc Mkr-115	20090411 130533	14.600697	144.775827	530.2	533.4	Unfiltered bag #24 Tmax=41.5 Tavg=39.7 vol=484 T2=12.2 pH=2.87	Butterfield	8040
j405-hfs-02	fluid	Flying Floc Mkr-115	20090411 131141	14.600699	144.775827	530.2	533.4	Filtered Piston #4 Tmax=46.4 Tavg=46.1 vol=518 T2=22 (same place but temp increased)	Butterfield	8077
j405-hfs-03	fluid	Flying Floc Mkr-115	20090411 131706	14.600701	144.775827	530.2	533.4	Sterivex #10 Tmax=46.3 Tavg=46.1 vol=3002 T2=22	Murdoch	8086
j405-gthfs-04	gas	Flying Floc Mkr-115	20090411 133546	14.600704	144.775825	530.2	533.4	Port GT #15 pH 2.55	Evans	8110
j405-mat-05	biology	Flying Floc Mkr-115	20090411 134124	14.600704	144.775824	530.2	533.5	Mat at same place as HFS samples. Sampled until pump would not flow anymore.	Moyer	8120
j405-hfs-06	fluid	Amphitheater Mkr-102	20090411 145754	14.601583	144.7763	557.2	558.4	Unfiltered bag #23 Tmax=13.2 Tavg=12.8 vol=462 T2=10 pH is 5.48	Butterfield Murdoch	8270
j405-hfs-07	fluid	Amphitheater Mkr-102	20090411 150229	14.601584	144.776301	557.2	558.4	Unfiltered piston #1. Tmax=13.3 Tavg=12.8 vol=594 T2=10.2	Butterfield	8278
j405-hfs-08	fluid	Amphitheater Mkr-102	20090411 150856	14.601584	144.776299	557.1	558.3	Filtered bag #17 Tmax=13.2 Tavg=12.7 vol=555 T2=10.0 (over-filled bag)	Butterfield	8291
j405-hfs-09	fluid	Amphitheater Mkr-102	20090411 151651	14.60158	144.776298	557.2	558.4	Sterivex #12 Tmax=13.5 Tavg=12.9 vol=3005 T2=10.2 (DNA)	Murdoch	8303
j405-hfs-10	fluid	Amphitheater Mkr-102	20090411 153135	14.601557	144.776291	557.1	558.4	Sterivex #13 Tmax=13.3. Tavg=12.7. Vol=3881ml. T2=9.6(RNA)	Murdoch	8341
j405-hfs-11	fluid	Amphitheater Mkr-102	20090411 155249	14.601561	144.776296	557.1	558.3	Filter #20. Temp=13. Tbackground=6.9. Tmax=12.6. Tavg=12.2. Vol=3066ml	Murdoch	8372
j405-gthfs-12	gas	Amphitheater Mkr-102	20090411 160643	14.601554	144.776297	557.1	558.3	Stbd gastight fired at 1606. Tmax=12.6.	Evans	8391

J2-405 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j405-hfs-13	fluid	Brimstone Pit	20090411 165651	14.600823	144.775444	521.5	523.2	Unfiltered piston #3. Positioned in the plume about 1.5 feet above the rocks. Start 165550. Tmax=24.5. Tavg=20.9. Vol=250ml. T2=10	Butterfield Murdoch	8480
j405-hfs-14	fluid	Brimstone Pit	20090411 170039	14.600827	144.775443	521.5	523.3	Unfiltered piston #5 Tmax=34.7 Tavg=19 Vol=212ml T2=8 (but not sure it worked-stopped/restarted few times)	Butterfield	8488
j405-hfs-15	fluid	Brimstone Pit	20090411 172440	14.600815	144.775463	521.4	522.8	Filtered piston #2. Starts and stops. Not going too well. Stop 172545. Tmax=44.5. avg=40.6. Vol=242	Butterfield	8538
j405-hfs-16	fluid	Brimstone Pit (white smoke not yellow)	20090411 172737	14.600807	144.775471	521.6	523.3	Unfiltered bag #22. Start 172645. Stop 172820. Tmax=38.7 Tavg=35.2 Vol=175ml	Butterfield	8543
j405-hfs-17	fluid	Brimstone Pit (white smoke not yellow)	20090411 174446	14.600849	144.775476	521	522.6	Unfiltered bag#21. Start 174335. (Just above the sed 2m N of the vent) Stop 174547. Tmax=21.5. ave=19.2. Vol=250ml. T2=9	Butterfield	8576
j405-gtb-18	gas	Brimstone Pit (white smoke not yellow)	20090411 182552	14.600799	144.775501	521.6	523	Gas #2 Green. Fired 182500. Jason temp probe=~50deg	Evans	8654
j405-gtb-19	gas	Brimstone Pit (white smoke not yellow)	20090411 183729	14.600797	144.775505	521.5	523.1	GTB#7 with funnel. Big bubbles going in the funnel. Fired at 183716. Jason temp at edge of vent was T=120	Evans	8670
j405-hfs-20	fluid	Brimstone Pit (white smoke not yellow)	20090411 185037	14.600777	144.77547	521.2	522.5	Unfiltered Piston #6 - Tmax= 55.7 Tavg=48deg vol=503 T2=19	Butterfield	8691
j405-hfs-21	fluid	Brimstone Pit (white smoke not yellow)	20090411 185517	14.600782	144.775424	521.2	522.5	Filtered piston #7. Stop 185930. Tmax=57.9. ave=46.4. Vol=499ml. T2=20	Butterfield	8698
j405-hfs-22	fluid	Brimstone Pit (white smoke not yellow)	20090411 190240	14.600778	144.775433	521.3	522.6	Unfiltered piston #8. Start 190033. In the smoke. Temp is fluctuating a lot. Stop 190428. Tmax=48.4. ave=41.2. Vol=507. T2=19	Butterfield	8709
j405-hfs-23	fluid	Brimstone Pit	20090411 190821	14.60079	144.775438	520.8	523.5	Filtered piston #9. Start 190801. Stop 191255. Tmax=39.5. ave=35.2. Vol=327ml. T2=15	Butterfield	8719
j405-hfs-24	fluid	Brimstone Pit	20090411 191625	14.600788	144.775436	520.8	523.6	Filtered bag #18. Start 191455. Same position as previous. Stop 191713. Tmax=35.1. avg=28.8. Vol=203ml. T2=15	Butterfield	8730

<b>J2-405 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j405-rock-25	geology	Brimstone Pit	20090411 193244	14.600828	144.775441	521.7	523.1	Rock sample from the edge of Brimstone vent. Recently extruded. ~20cm long and fresh.	de Ronde Deardorff	8755
j405-rock-26	geology	Brimstone Pit	20090411 194017	14.600833	144.775433	520.7	522.5	Rock sample from the edge of Brimstone. Right in the smoke. Small rock (~10cm) with sulfur coating.	de Ronde Deardorff	8765
j405-sed-27	geology	NE of Brimstone	20090411 195745	14.600865	144.775464	522.2	525.5	Scoop of sed; ash; and volcanoclastic sed. NE of Brimstone.	Deardorff de Ronde	8789
j405-tephra- 28	geology	Brimstone (10m west)	20090411 201208	14.600839	144.775319	520.1	522	SAMPLE Geology 29. j2-405-geo-29. Tephra Sampler G. Location from nav: 144 46.5198 14 36.0505. Z=522. We are 10m west of Brimstone. PI Deardorff.	Deardorff	8810

**Table 6.3-8 J406 Sample Log:**

<b>J2-406 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j406-rock-01	geology	Brimstone	20090412 101236	14.600711	144.775414	521.8	523.3	Black lava block adjacent flow area on south side of Brimstone Pit.	de Ronde Deardorff	9127
j406-tephra- 02	geology	SE (10m) of Brimstone	20090412 202505	14.6005	144.775591	528.5	533.7	Tephra Sampler B that tumbled downslope SE of Brimstone (deployed J2-403).	Deardorff	9323
j406-tephra- 03	geology	NW (5m) of Brimstone	20090412 210321	14.600694	144.775401	520.5	521.6	Recovered Tephra Sampler E. Was 5m NW of Brimstone (at sampler G site)	Deardorff	9375
j406-rock-04	geology	Brimstone	20090412 213252	14.600681	144.775433	521.4	523	Rock from the edge of the vent. Nice striations on the rock. Rock is bigger than the milk crate.	de Ronde Deardorff	9399
j406-rock-05	geology	Brimstone	20090412 101236	14.600711	144.775414	521.8	523.3	Collected at same time as J406-rock-01 but not logged.	de Ronde Deardorff	9127

**Table 6.3-9 J407 Sample Log:**

<b>J2-407 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j407-shrimp-01	biology	Limpet Lair Mkr-105	20090413 120555	14.60057	144.776084	540.5	546.5	Suction sample of shrimp near Shrimp Trap.	Tunncliffe	10336
j407-shrimp-02	biology	Limpet Lair Mkr-105	20090413 122441	14.600583	144.776101	539.4	540.8	Recovered shrimp trap deployed on J2-405.	Tunncliffe	10409
j407-hfs-03	fluid	Limpet Lair Mkr-105	20090413 145904	14.600554	144.776072	543.7	547.3	Positioned 5m meters deeper from the Marker. Unfiltered bag 24. Tmax=16.2 Tavg=14.4 Vol=514 T2=10.8.	Butterfield	10588
j407-hfs-04	fluid	Limpet Lair Mkr-105	20090413 150526	14.600554	144.776073	543.7	547.5	Filtered bag 18. Tmax=16.4 Tavg=16.2 Vol=582 T2=10.9	Butterfield	10598
j407-hfs-05	fluid	Limpet Lair Mkr-105	20090413 151104	14.600554	144.776071	543.7	547.5	Steverix #15 Tmax=16.5 Tavg=14.4 Vol=3013 T2=9.0	Murdoch	10608
j407-hfs-06	fluid	Limpet Lair Mkr-105	20090413 152733	14.600554	144.77607	543.8	547.6	Stereovix #14 starting (DNA) Tmax=14.4 Tavg=11.8 Vol=3266ml T2=8.5	Murdoch	10641
j407-hfs-07	fluid	Mkr-105 to Mkr-109 plateau	20090413 160730	14.60075	144.777259	577.9	580.9	Filtered piston #4 for background. Tmax=6.4 Tavg=6.2 Vol=657 Start 1160620 Stop 161125	Butterfield	10702
j407-hfs-08	fluid	Sulfur Slide Mkr-113	20090413 170754	14.600759	144.777338	570.8	576.5	Unfiltered piston #1 Tmax=14.9. Tavg=14.5 Vol=522ml. T2=10 Start 131640. Stop 171030	Butterfield Murdoch	10828
j407-hfs-09	fluid	Sulfur Slide Mkr-113	20090413 171610	14.600759	144.777338	570.8	576.3	Repositioned slightly-.5m away from last sample. Filtered bag #17 Tmax=16.6 Tavg=16 T2=11.4 Vol=496ml Start 171543. Stop 171930	Butterfield	10843
j407-hfs-10	fluid	Sulfur Slide Mkr-113	20090413 172301	14.60076	144.777338	570.8	576.3	Sterivex filter #12. Tmax=17.9 Tavg=17.4 Vol=3006ml T2=11 Start 172156 Stop 173710	Murdoch	10853
j407-hfs-11	fluid	Sulfur Slide Mkr-113	20090413 174313	14.600759	144.777337	570.8	576.4	Unfiltered bag #3 Tmax=16.7 Tavg=16.4 Vol=451ml. T2=11 Start 174212 Stop 174513 pH=4.96	Butterfield	10884
j407-rock-12	geology	Sulfur Slide Mkr-113	20090413 175011	14.60076	144.777336	570.8	576.4	Light-colored piece of sulfur. Right in the flow close to where collected samples 7 thru 11.	de Ronde	10896
j407-sed-13	geology	Sulfur Slide Mkr-113	20090413 175853	14.600767	144.777341	570.8	578.6	Scoop of lighter/darker seds and crust. The darker stuff is actually quite hard.	Deardorff	10907
j407-rock-14	geology	Sulfur Slide Mkr-113	20090413 180037	14.600766	144.777339	570.8	577.9	Grab of darker colored flow ledge. Looks like it is mostly sulfur flow coated with ash.	de Ronde	10910

J2-407 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j407-hfs-15	fluid	Summit near Mkr-107	20090413 185651	14.600994	144.775412	529	531.7	Unfiltered bag #22. Tmax=32.3 Tavg=31.6 Vol=504ml T2=16.7 Start 185450\ Stop 185814	Butterfield	11009
j407-hfs-16	fluid	Summit near Mkr-107	20090413 190030	14.600994	144.775413	529	531.7	Filtered piston #5. Tmax=32.6 Tavg=32.0. Vol=532ml Start 190003 Stop 190328	Butterfield	11015
j407-gthfs-17	gas	Summit near Mkr-107	20090413 190504	14.600995	144.775412	529	531.7	HFS Gastight port #15. Temp = 31.3.	Evans	11021
j407-hfs-18	fluid	Summit near Mkr-107	20090413 190702	14.600995	144.775412	529	531.8	Sterivex filter #10. Tmax=33 Tavg=31.8 Vol=3002ml. T2=16 Start 190527 Stop 191956	Murdoch	11024
Note: Sample 19 does not exist										
j407-hfs-20	fluid	Flock Rock Mkr-103	20090413 194906	14.600777	144.775355	520.9	522.7	Unfiltered Piston #3 Tmax=32.2 Tavg=29.7 Vol=538ml. T2=15 Start 194812 Stop 195230 pH is 5.01	Butterfield Murdoch	11089
j407-hfs-21	fluid	Flock Rock Mkr-103	20090413 195527	14.600769	144.775357	520.9	522.8	Filtered piston #7 Tmax=31.9 Tavg=30.7 Vol=509 T2=15.8 Start 195340 Stop 195730	Butterfield	11099
j407-hfs-22	fluid	Flock Rock Mkr-103	20090413 195948	14.600768	144.775357	521.1	523.2	Sterivex filter #11 Tmax=32.2 Tavg=29.0 Vol=3059ml. T2=-17 Start 195906 Stop 201447	Butterfield	11107
j407-gthfs-23	gas	Flock Rock Mkr-103	20090413 201606	14.600783	144.775358	521.1	523.2	HFS Stbd gastight #11. 201536. Tmp=31.	Evans	11127
j407-hfs-24	fluid	Flock Rock Mkr-103	20090413 201945	14.600784	144.775358	521.1	523.2	Filtered bag #16. Tmax=31.1 Tavg=30.0 Vol=478ml. T2=16 Start 201655 Stop 202030 pH 5.4	Butterfield	11132
j407-hfs-25	fluid	40m east of Brimstone	20090413 211107	14.600695	144.775725	542	544.5	Unfiltered piston #8. Tmax=18.6 Tavg=13.7 Vol=458. T2=10 Stop 211219	Butterfield	11226
j407-hfs-26	fluid	40m east of Brimstone	20090413 211442	14.600698	144.775725	542	544.6	Filtered piston #9. Tmax=16.2 Tavg=13.6. Vol=294. T2=10 Start 211320 Stop 211549	Butterfield	11233
j407-gtb-27	gas	Brimstone	20090413 212756	14.600657	144.775358	520.8	524.1	Gastight #5 with funnel. Fired at 212456.	Evans	11256
j407-gtb-28	gas	Brimstone	20090413 213544	14.600661	144.775361	520.8	523.9	Red gastight #9. Fired 213525.	Evans	11268
j407-hfs-29	fluid	background ascending from Brimstone	20090413 214358	14.600881	144.774966	428.9	541.5	Unfiltered bag#21. Started at 384m Stop 214531. pH is 5.4.	Butterfield	11281

J2-407 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j407-hfs-30	fluid	background ascending from Brimstone	20090413 215213	14.600797	144.775135	428.9	541.5	Filtered Piston #2-Ti background sw 180m end of dive Tmax=26.6 Tavg=24 vol=501 (not logged)	Butterfield	11281

**Table 6.3-10 J408 Sample Log:**

J2-408 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j408-rock-01	geology	past 1500m mooring site	20090414 092955	14.58624	144.765211	1465	1467	Rock from seafloor at 1467 meters just past mooring site (south of Brimstone)	de Ronde Deardorff	11487
j408-rock-02	geology	Rock from E traverse of rubble pile	20090414 125136	14.59777	144.773829	769.8	771.9	Rock from east traverse in rubble pile.	de Ronde Deardorff	11984
j408-rock-03	geology	Rock from E traverse of rubble pile	20090414 130126	14.597779	144.775388	741.1	744.7	From east traverse near EOL (100m) at 745. Small round with white.	de Ronde Deardorff	12010
j408-rock-04	geology	At end of E traverse	20090414 132549	14.598242	144.776071	707.8	711.2	Rock from start of up slope at end of east traverse line (piece of pillow basalt)	de Ronde Deardorff	12069
j408-tephra-05	geology	5m NW of Brimstone	20090414 163402	14.600768	144.775322	519.6	521.4	Tephra sampler H recovered (deployed J2-406).	Deardorff	12623
j408-sed-06	biology	Flock Rock Mkr-103	20090414 190025	14.600828	144.775396	520.7	523.7	Suction of white material on large white rock. Could be sulfur by-products.	Magarvey	12856
j408-shrimp-07	biology	Summit Mkr-107	20090414 191709	14.601159	144.775527	518.6	520.7	Shrimp trap recovered after ~4 hours.	Tunncliffe	12885
j408-sed-08	geology	Summit Mkr-107	20090414 191923	14.60116	144.775527	519.2	520.7	Scoop of sediments here at the summit. Bag quite full. Z=520.	Deardorff	12888
j408-sed-09	geology	NE (5m) Brimstone	20090414 192616	14.600776	144.775389	520	521.5	Scoop of volcanoclastic seds. We're NE of the vent < 5m.	Deardorff	12901
j408-gtb-10	gas	Brimstone	20090414 194007	14.600739	144.775389	519.8	521.9	Gastight 7 with the funnel bubble catcher.	Evans	12928



J2-408 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j408-gtb-11	gas	Brimstone	20090414 194752	14.600742	144.775377	519.8	522.6	Gastight bottle #2 fired in the vigorous plume. Not sure if the bottle fired. The plate and the pin are too far apart.	Evans	12941
j408-tephra-12	geology	Brimstone	20090414 211840	14.600707	144.775454	520.8	521.8	Closed up the tephra sampler that has been riding in the front basket for the entire dive.	Deardorff	13110
j408-niskin-13	fluid	Brimstone Plume	20090414 212702	14.600434	144.775055	503.3	547.3	Tripped the Niskin bottle in the plume. Z=517m. Above Brimstone.	Deardorff	13125

**Table 6.3-11 J410 Sample Log:**

J2-410 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j410-sed-01	geology	Base of cone NW of Brimstone	20090415 100140	14.601189	144.774984	567.2	568.8	Recovery of scoop and sample of sediment (has some orange). Scoop fell out of basket 2 days ago.	Deardorff	13479
j410-tephra-02	geology	Sediment slope below summit	20090415 104940	14.601062	144.775668	534.5	536.6	Recovery of Tephra C that was at summit but is now on the sediment slope.	Deardorff	13588

**Table 6.3-12 J411 Sample Log:**

J2-411 Sample Name	Type	Location	Date Time yyymmdd hhmmss	Latitude	Longitude	Jason Depth	Total Depth	Dive log comments	PI	Virtual Van record
j411-gtb-01	gas	Brimstone	20090415 144000	14.600676	144.775375	520.4	522.9	Fired red-white-blue gas tight in plume burst. (South side of Brimstone) (bottle later lost off basket)	Evans	13874
j411-gtb-02	gas	Brimstone	20090415 144544	14.600678	144.77537	520.3	522.5	White gastight #5 fired with plume yellowing and increasing activity at Brimstone.	Evans	13889
j411-gtb-03	gas	Brimstone	20090415 145310	14.600667	144.77537	520.6	523.2	Red GT #9 in thick yellow plume to left.	Evans	13913
j411-rock-04	geology	Brimstone	20090415 154425	14.600736	144.775386	520.2	521.5	Lava rock. From Brimstone at 265deg at 521m.	de Ronde Deardorff	14078

<b>J2-411 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j411-tephra-05	geology	Brimstone	20090415 160335	14.600752	144.775321	520.3	521.3	Tephra sampler E. Nearly full sampler after 1 day (deployed J2-408). Sampler was about 2/3 buried.	Deardorff	14113
j411-sed-06	geology	Brimstone	20090415 161429	14.600744	144.775303	520.2	521.3	Scoop of sulfur off this rock with flange W/NW of Brimstone next to the tephra sampler we just recovered (TSE).	de Ronde	14133
j411-crust-07	geology	Eastern scarp wall (base below Mkr-109)	20090415 172401	14.600566	144.777339	582.8	587.4	Sulfur layer (crust?) piece knocked off from about 2/3 up the middle ridge at the nose of the ridge; scooped from base of ridge. Eastern scarp wall-middle knife ridge (base below Mkr-109)	de Ronde	14264
j411-shrimp-08	biology	Fault Shrimp Mkr-109	20090415 181927	14.600789	144.777331	566.2	571	Suction sample shrimp. Shrimp on the rocks and plates (sulfur?) Big shrimp (Alvinocaris) and little shrimp (Opaepele).	Tunncliffe	14365
j411-rock-09	geology	Pillow flows SSW of Brimstone	20090415 190654	14.599957	144.774954	576.3	579.6	Small black rounded piece of this lava flow. Friable piece of lava flow.	Deardorff	14435
j411-rock-10	geology	Pillow flows SSW of Brimstone	20090415 193144	14.600261	144.774969	548.7	555.3	Round lava rock - part of a pillow from fresh flow more upslope toward Brimstone.	de Ronde Deardorff	14475
j411-tephra-11	geology	Summit Mkr-107	20090415 195316	14.601164	144.77547	519.7	522.2	Sampler deployed on J2-396 (first dive)	Deardorff	14517
j411-shrimp-12	biology	Summit Mkr-107	20090415 195526	14.601167	144.77547	519.9	522.3	Recovered the shrimp trap at the summit (deployed on J2-410)	Tunncliffe	14521
j411-rock-13	geology	Brimstone	20090415 205056	14.600698	144.775315	519.5	522.9	Sample was plucked from the smoke at the edge of the plume. Bob wants this for Rubin. Z=521. Hdg 334.	de Ronde Deardorff	14615

**Table 6.3-13 J412 Sample Log:**

<b>J2-412 Sample Name</b>	<b>Type</b>	<b>Location</b>	<b>Date Time yyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Jason Depth</b>	<b>Total Depth</b>	<b>Dive log comments</b>	<b>PI</b>	<b>Virtual Van record</b>
j412-anemone-01	biology	Prawn Precipace	20090416 085239	14.604844	144.773295	608.8	611.1	Pulled an anemone off the edge of this cliff. Z=609m. 144 46.398 14 36.291. On our way to Cnidaria. Rock included.	Schupp de Ronde	14936
j412-coral-02	biology	Prawn Precipace	20090416 085655	14.604842	144.773297	608.7	611.3	Scoop of soft coral from the steep cliff face. The coral is bright reddish-orangish. Got another soft coral in the same scoop bag as traveled up cliff face Z=608m Scooped more: 3-5 total.	Schupp	14943
j412-rock-03	geology	Past top of Cnidaria	20090416 100030	14.605436	144.772691	603.1	604.7	Old lava rock (outcrop) buried in sediments	de Ronde	15064
j412-rock-04	geology	Prawn Precipace	20090416 103759	14.604842	144.773297	608.7	611.3	Rescued rock from port biobox that came off wall while sampling J2-412-SCOOP-02 (position is same as Sample 2; time here is when rescued).	de Ronde	15169
j412-anemone-05	biology	Outcrop	20090416 110431	14.606039	144.772324	646.5	647.8	Anemone very attached to rock from small outcrop.	Schupp	15250
j412-coral-06	biology	NW trending ridge	20090416 113654	14.606676	144.771555	694.3	703.7	Purple and yellow cnidarians from outcrop.	Schupp	15344
j412-coral-07	biology	NW trending ridge	20090416 115710	14.606719	144.771479	696.2	699.2	Yellow coral. Looks more like a gorgonian coral. Also purple one and additional yellow all from same site.	Schupp	15398
j412-rock-08	geology	Wall of outcrop NW ridge	20090416 123441	14.607335	144.770709	794.7	798	Lava layers from wall. Looks fresher underneath.	de Ronde	15493
j412-coral-09	biology	Wall of outcrop NW ridge	20090416 124754	14.607539	144.770721	761.9	770.7	Coral from wall (same as sample #8) at 762m. Whip coral.	Schupp	15536

## 6.4 Dive Maps

JASON navigation depicted on the maps is using the re-navigated Doppler navigation (DVL) with minimal editing (obvious bad fixes were deleted). Maps show samples, markers and instruments relevant to the dive. Marker positions use the final, shifted position (see section 5-2). Yellow marker symbols show the original deployed position if the marker was deployed on that particular dive. The order of the bathymetry used on the maps was SM2000 (top), Imagenex and EM300. Contours were made from the SM2000 (10-meter) and EM300 (100-meter) bathymetry. Markers appear on the maps as they were deployed during the expedition and instruments relevant to the dive are shown. See the dive sample sheet and log sheet for dive details.

The legend used for all JASON dive maps unless otherwise indicated, is:

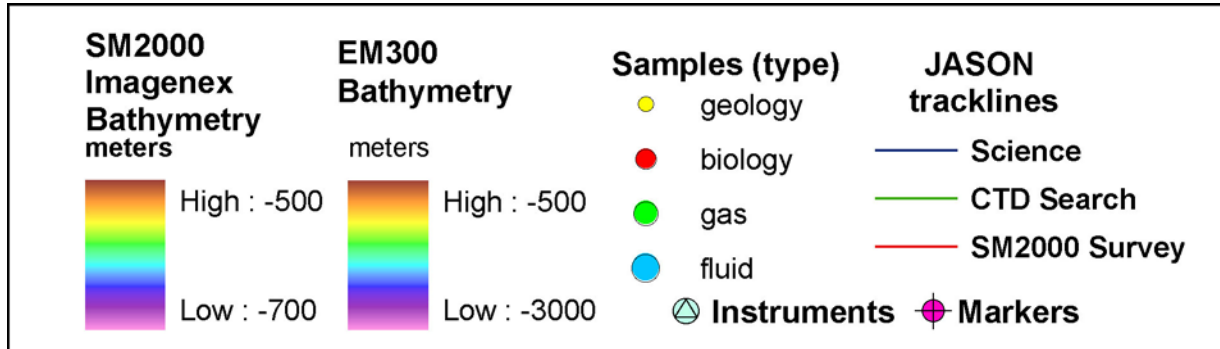
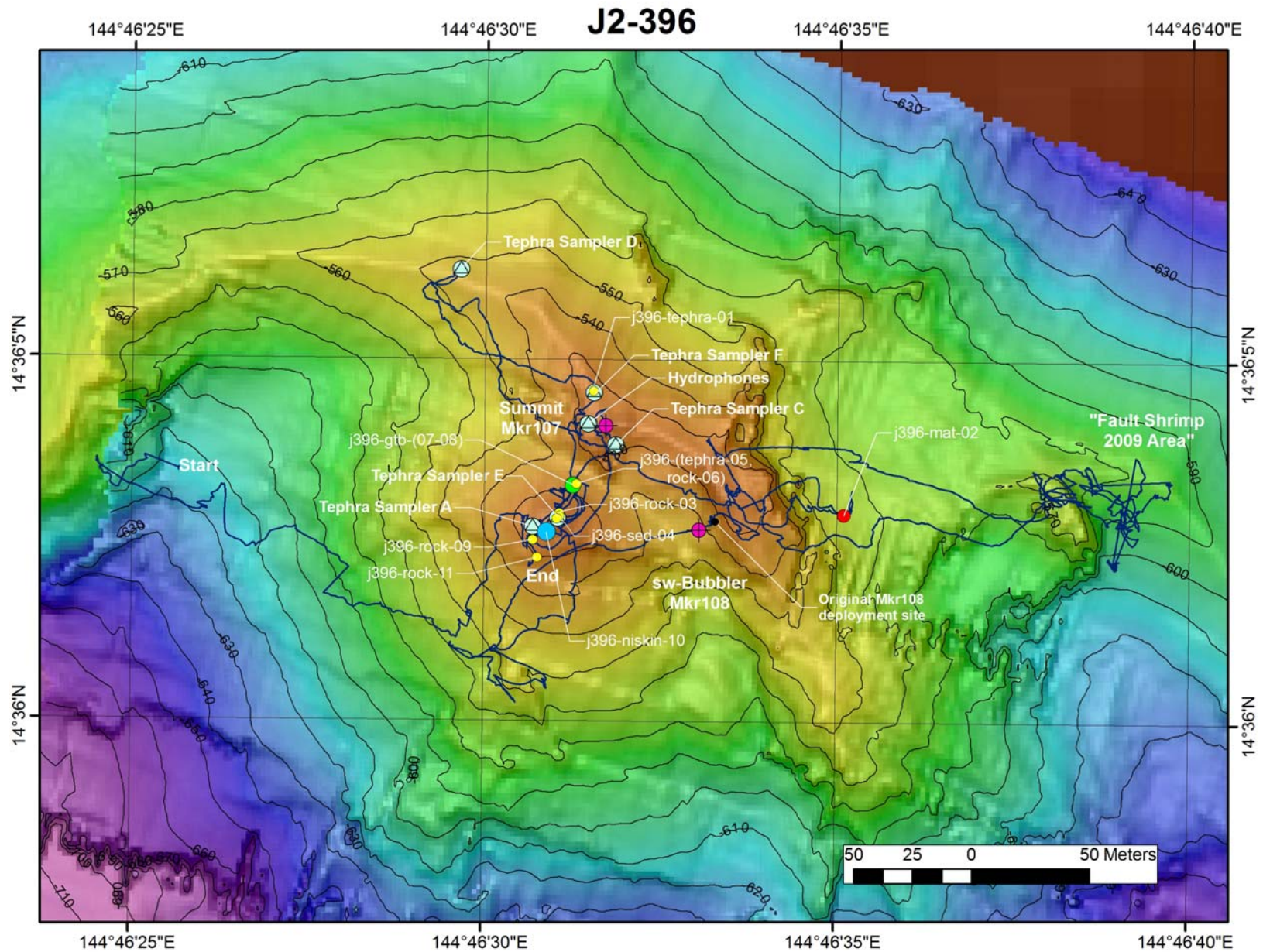


Figure 6.4-1 JASON Dive J2-396



Note Marker 108 deployed on this dive later was found to have slid downslope and was renavigated on J2-400.

Figure 6.4-2 JASON Dive J2-398

# J2-398

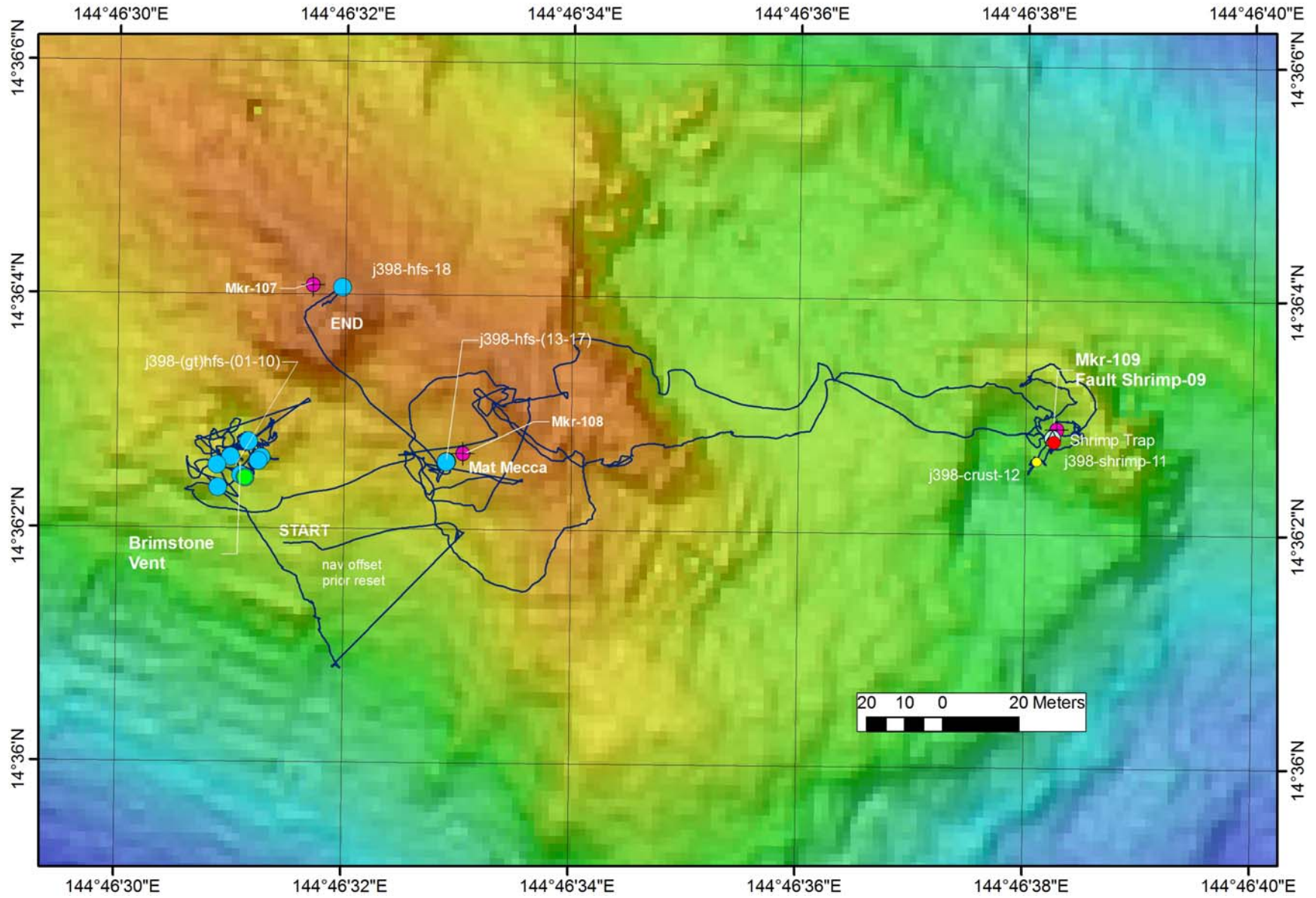
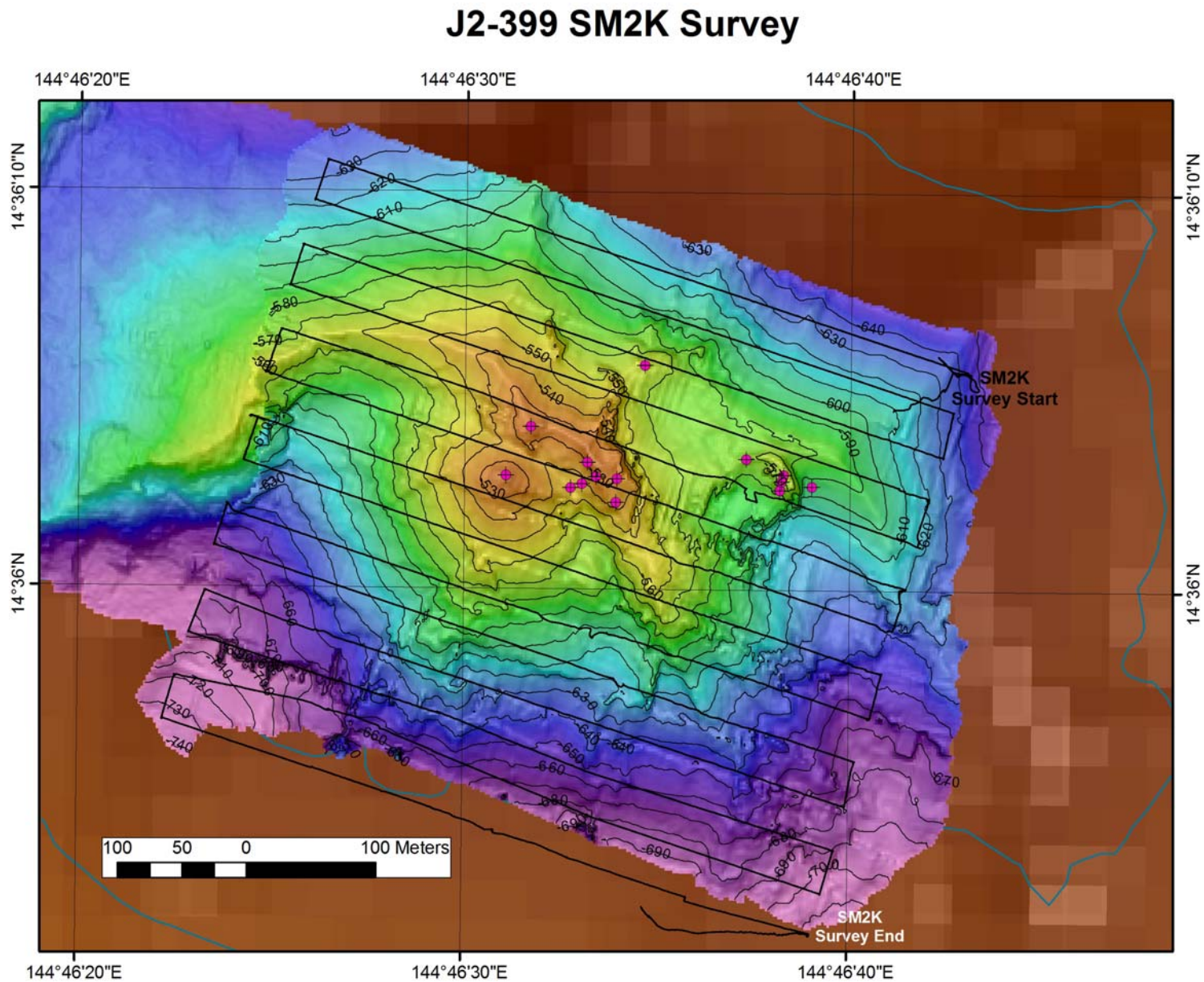


Figure 6.4-3 JASON Dive J2-399



As the JASON navigation shows, the last survey line's SM2000 data was left out of the final bathymetry grid because the navigation was messy. It might be able to be added back in when Vicki Ferrini finalizes the reprocessing. All marker positions are shown on this map although not all markers were deployed at the time of this dive.

Figure 6.4-4 JASON Dive J2-400

### J2-400 CTD Search

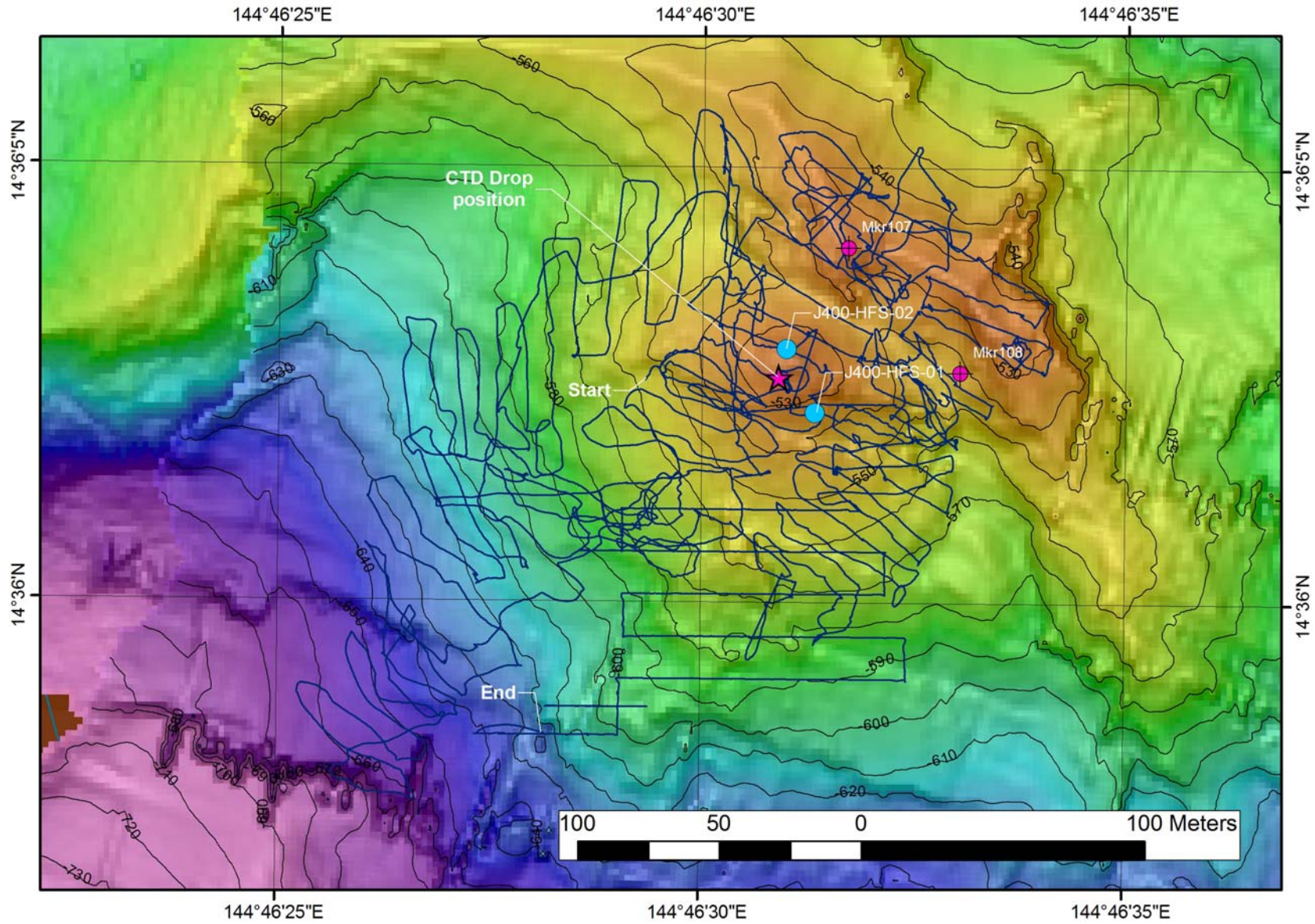




Figure 6.4-5 JASON Dive J2-401

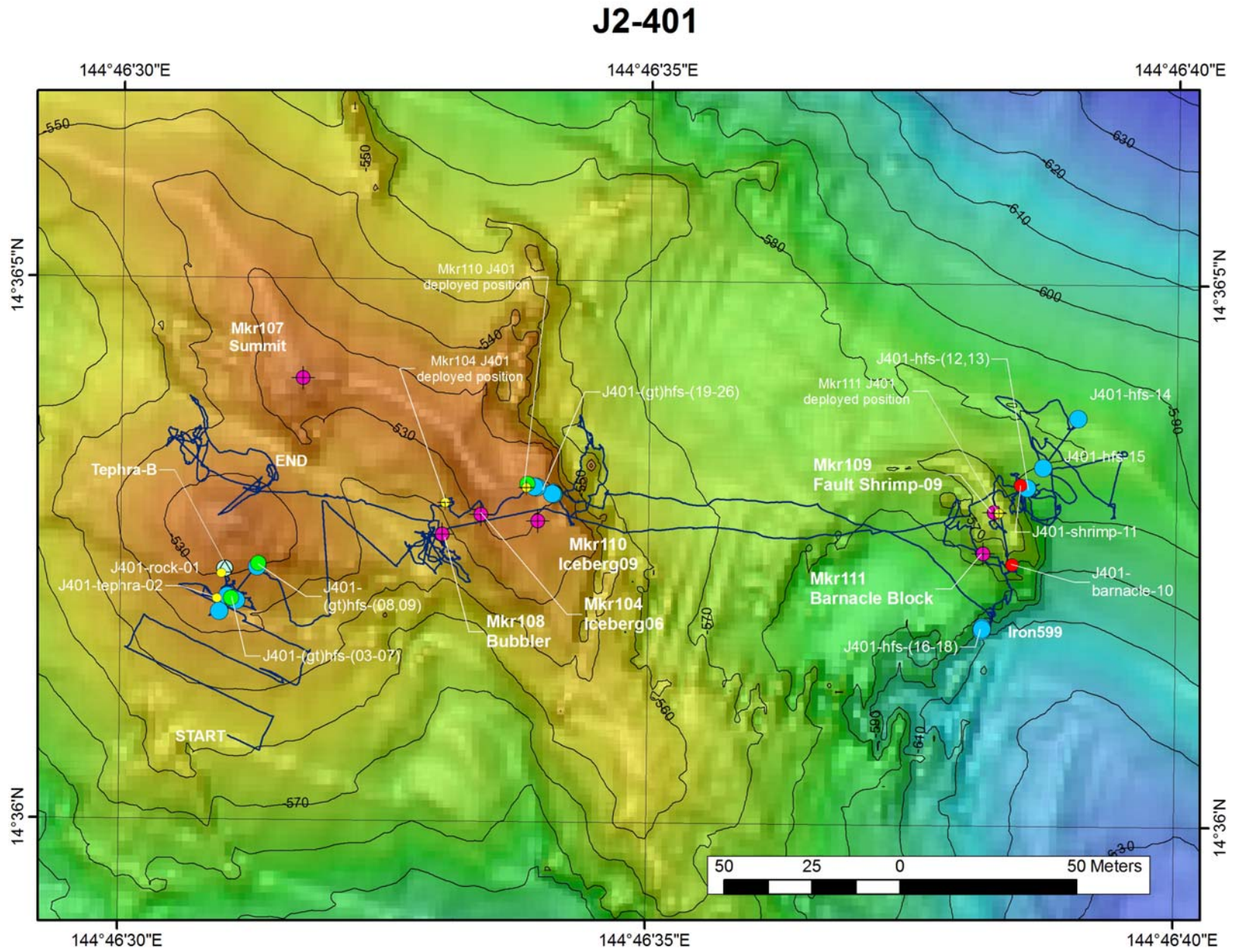


Figure 6.4-6 JASON Dive J2-402

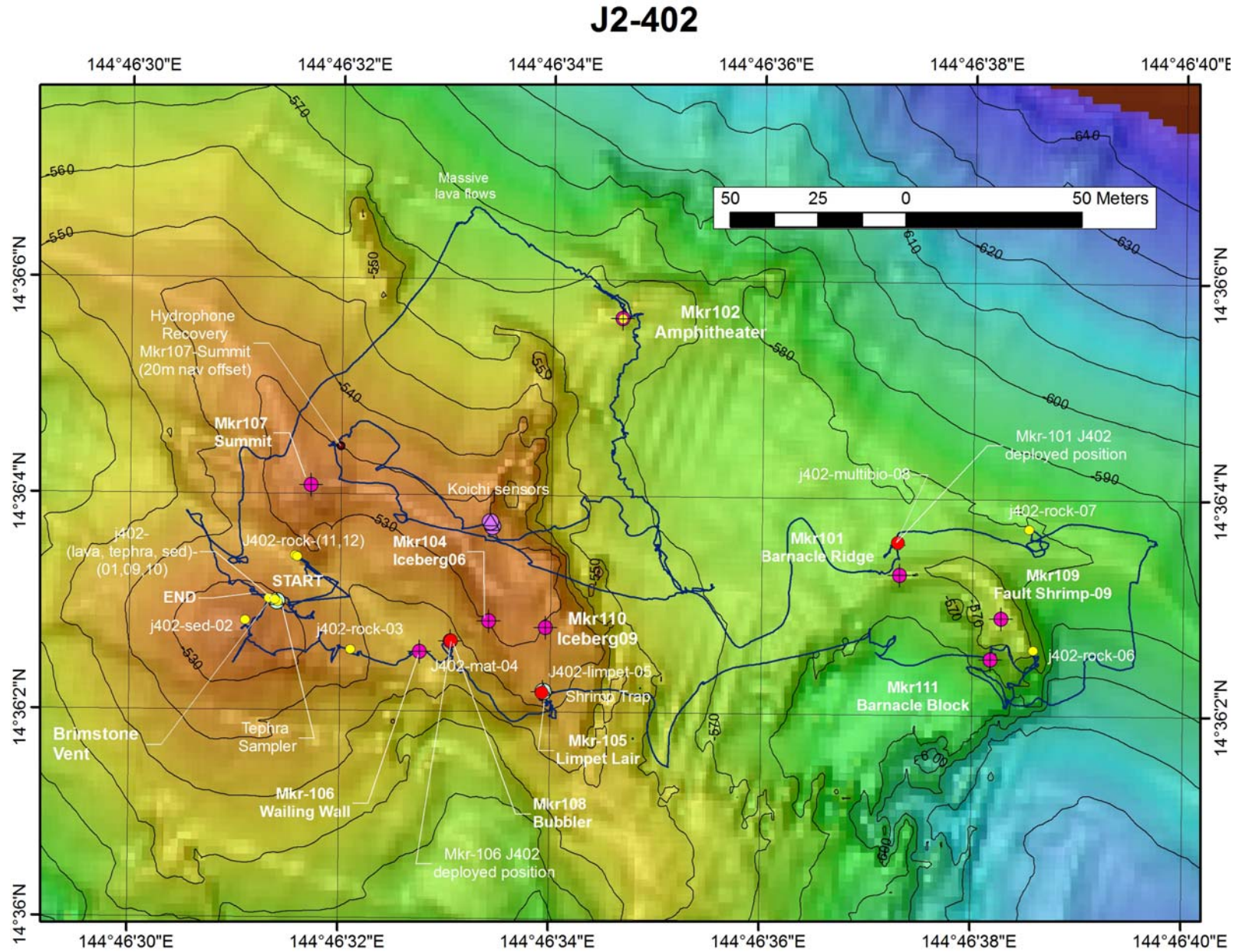


Figure 6.4-7 JASON Dive J2-403

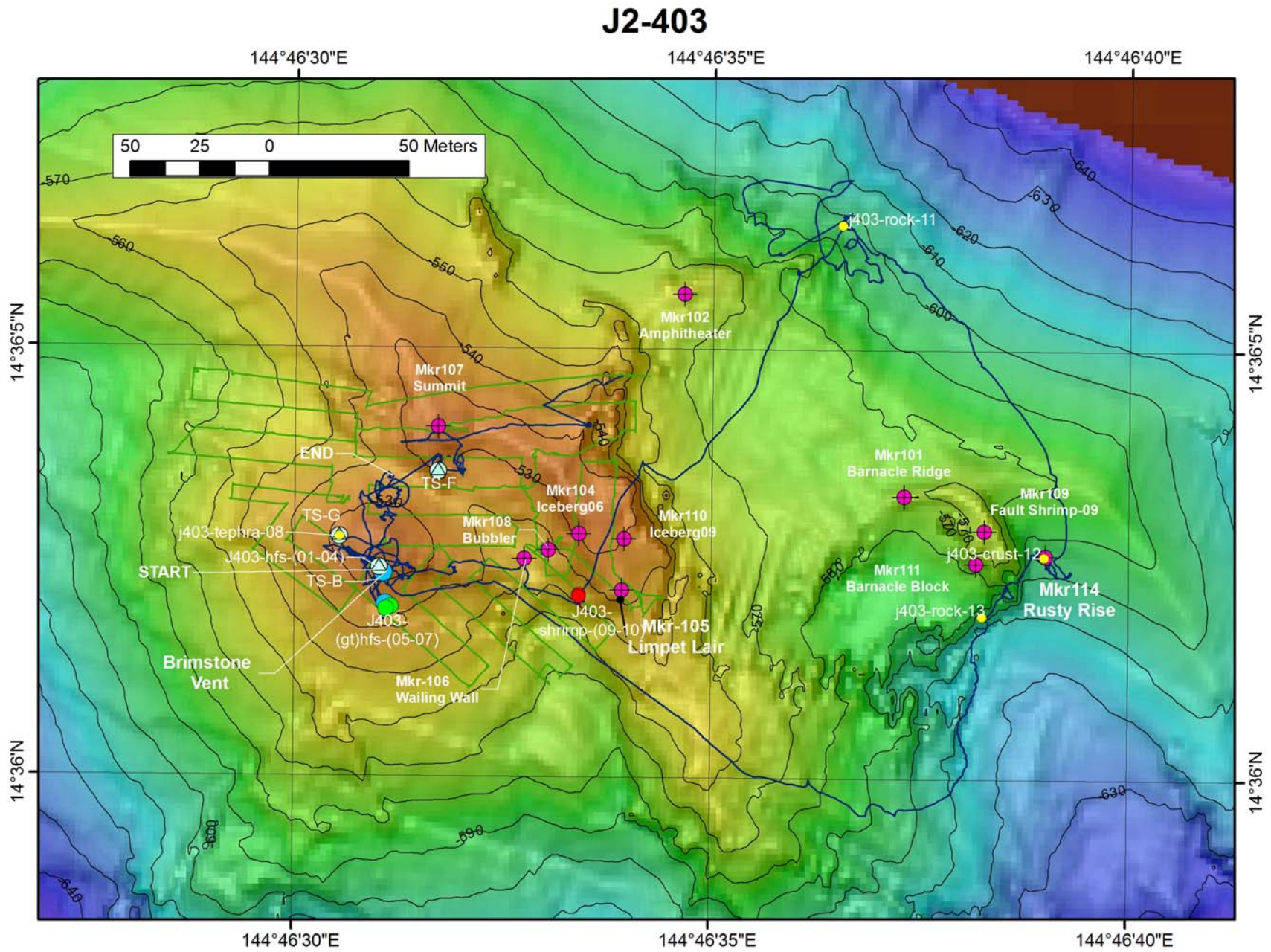


Figure 6.4-8 JASON Dive J2-404

### J2-404 CTD Search/Aborted

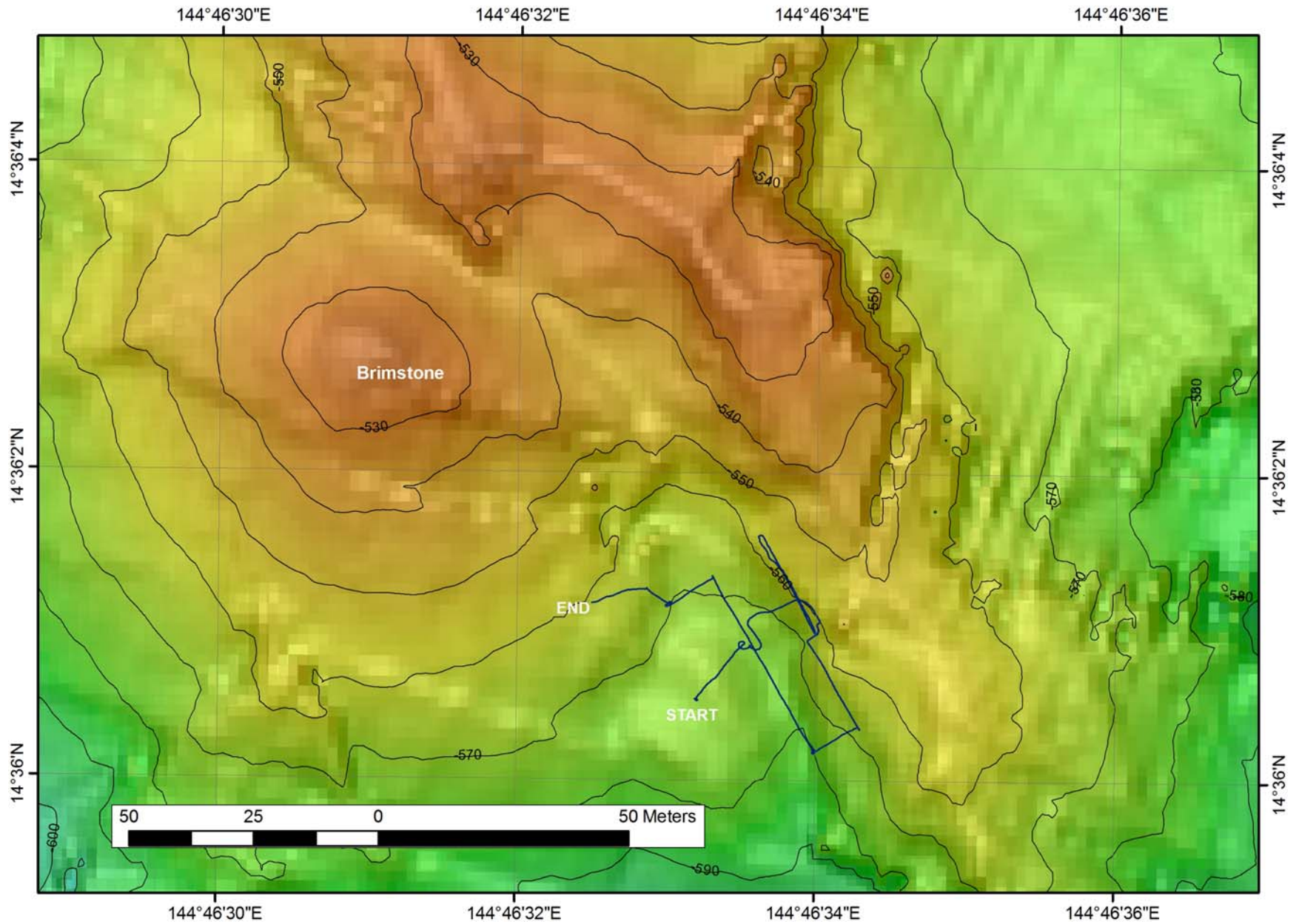


Figure 6.4-9 JASON Dive J2-405

# J2-405

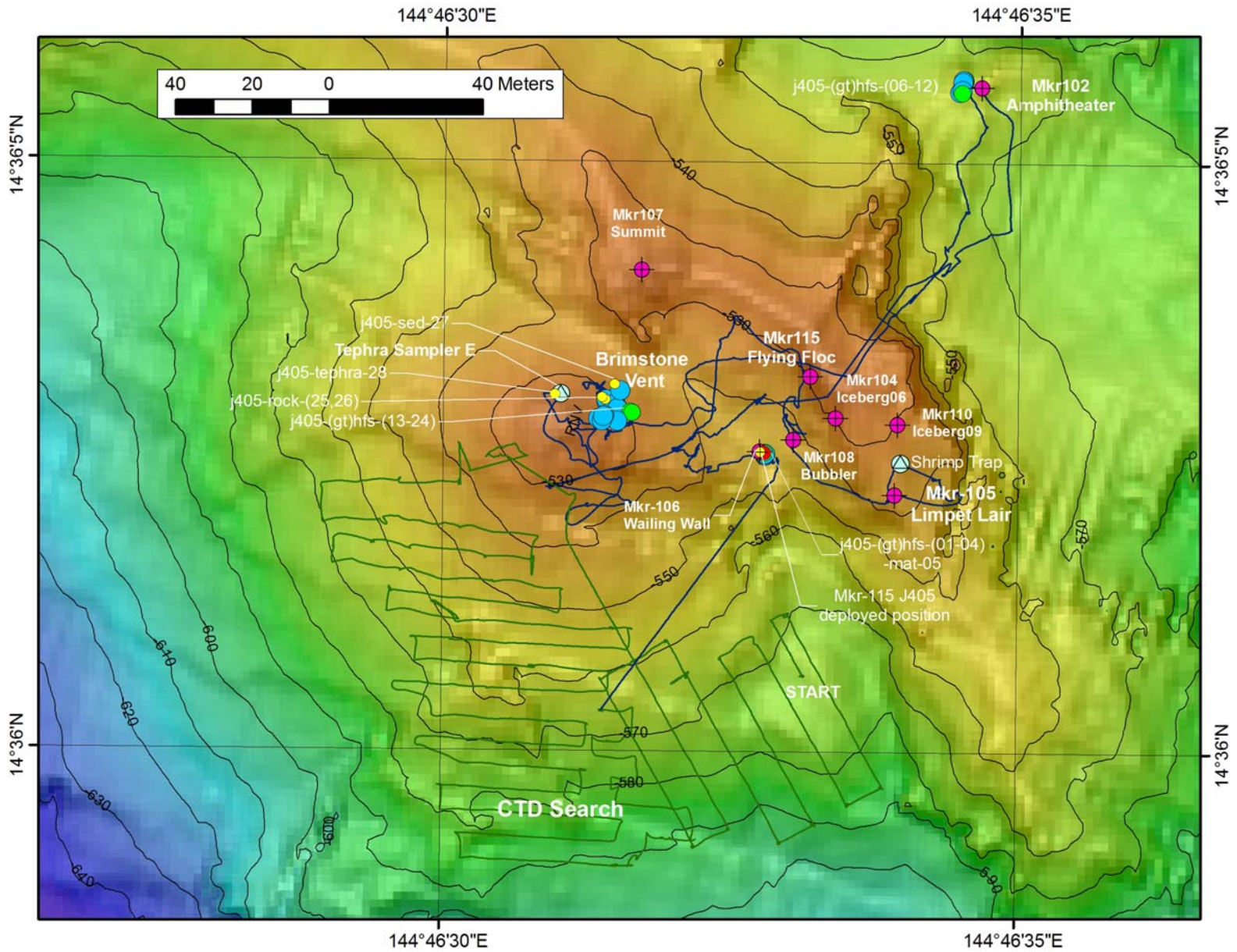


Figure 6.4-10 JASON Dive J2-406

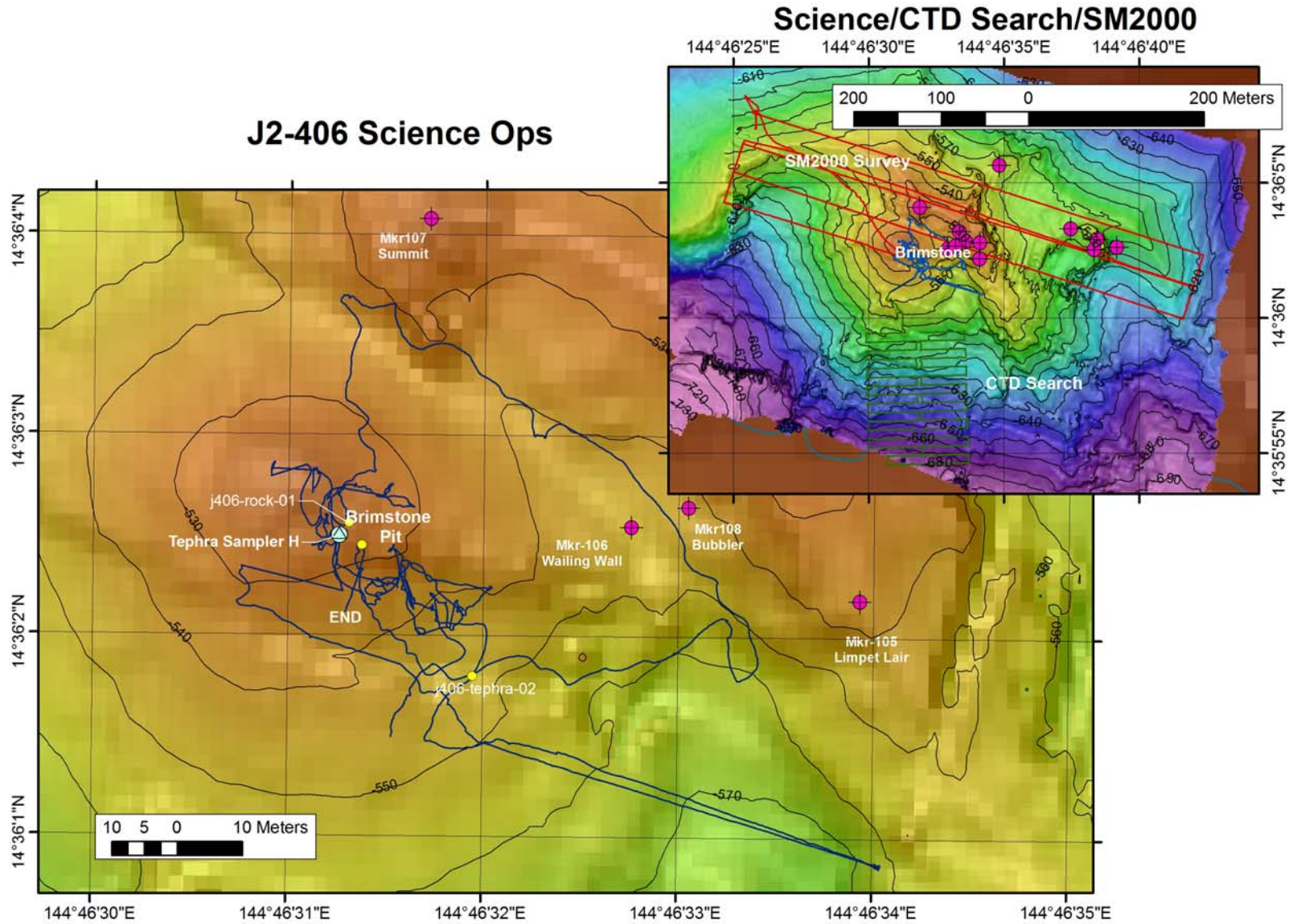


Figure 6.4-11 JASON Dive J2-407

### J2-407 Science

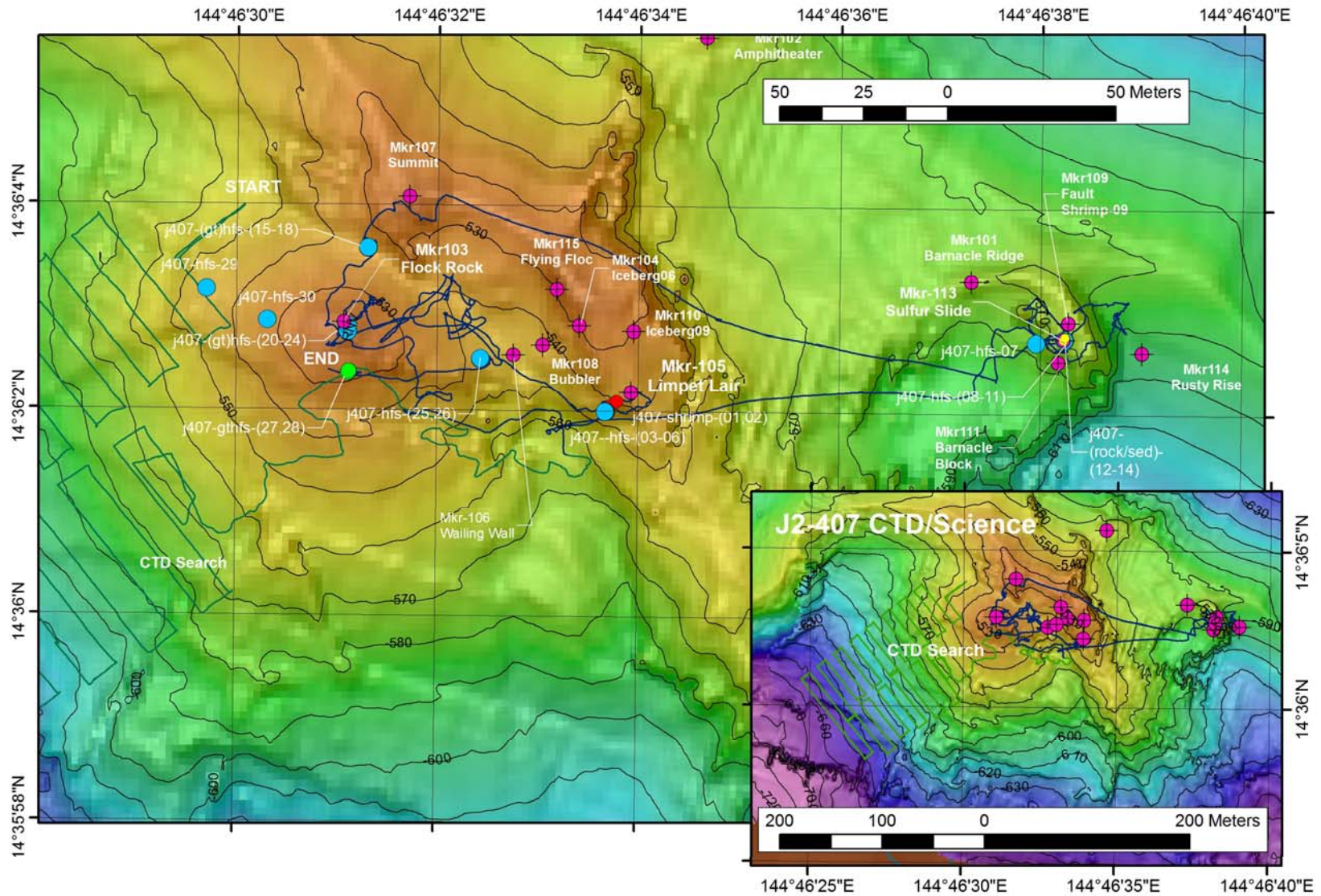


Figure 6.4-12 JASON Dive J2-408

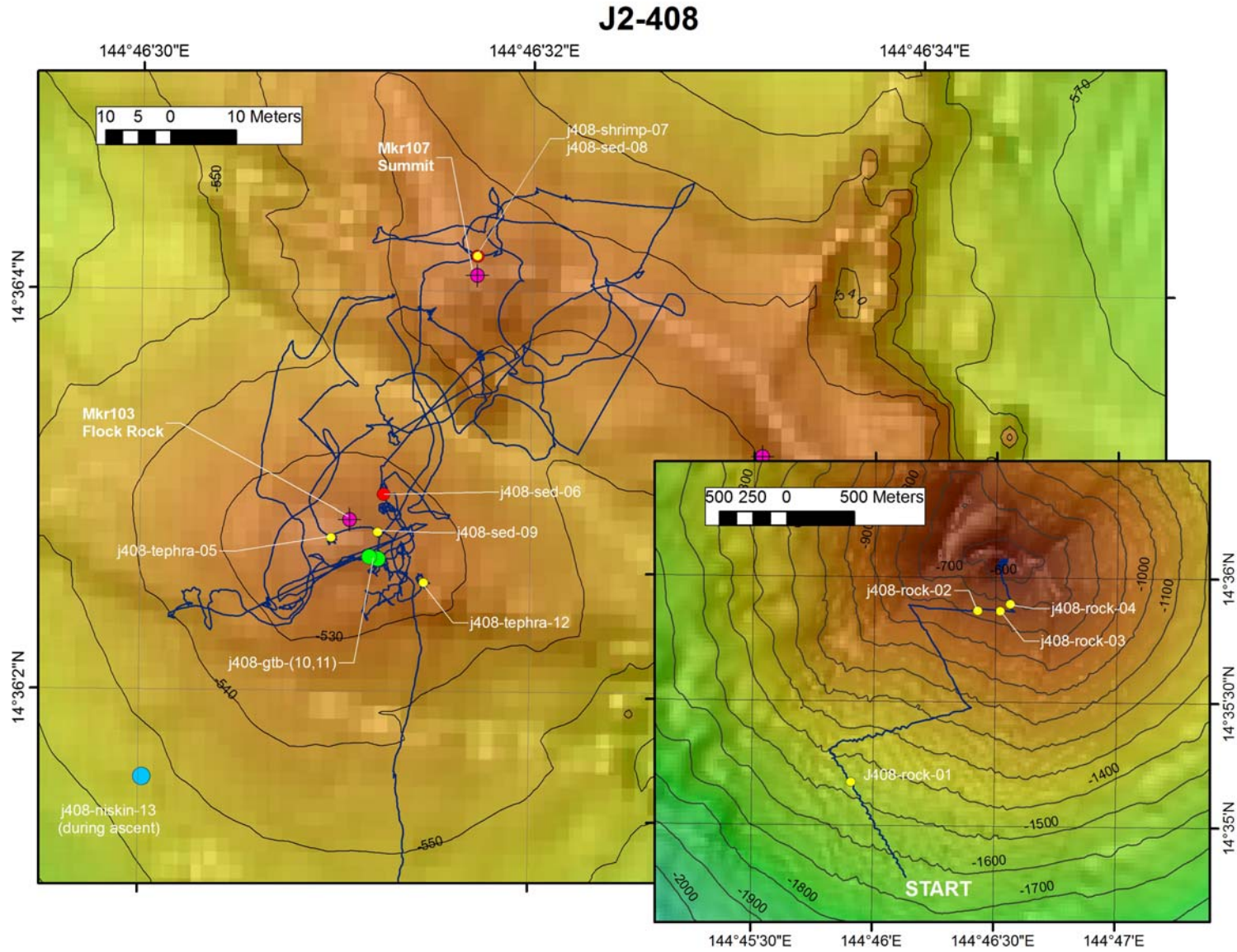




Figure 6.4-13 JASON Dive J2-410

# J2-410

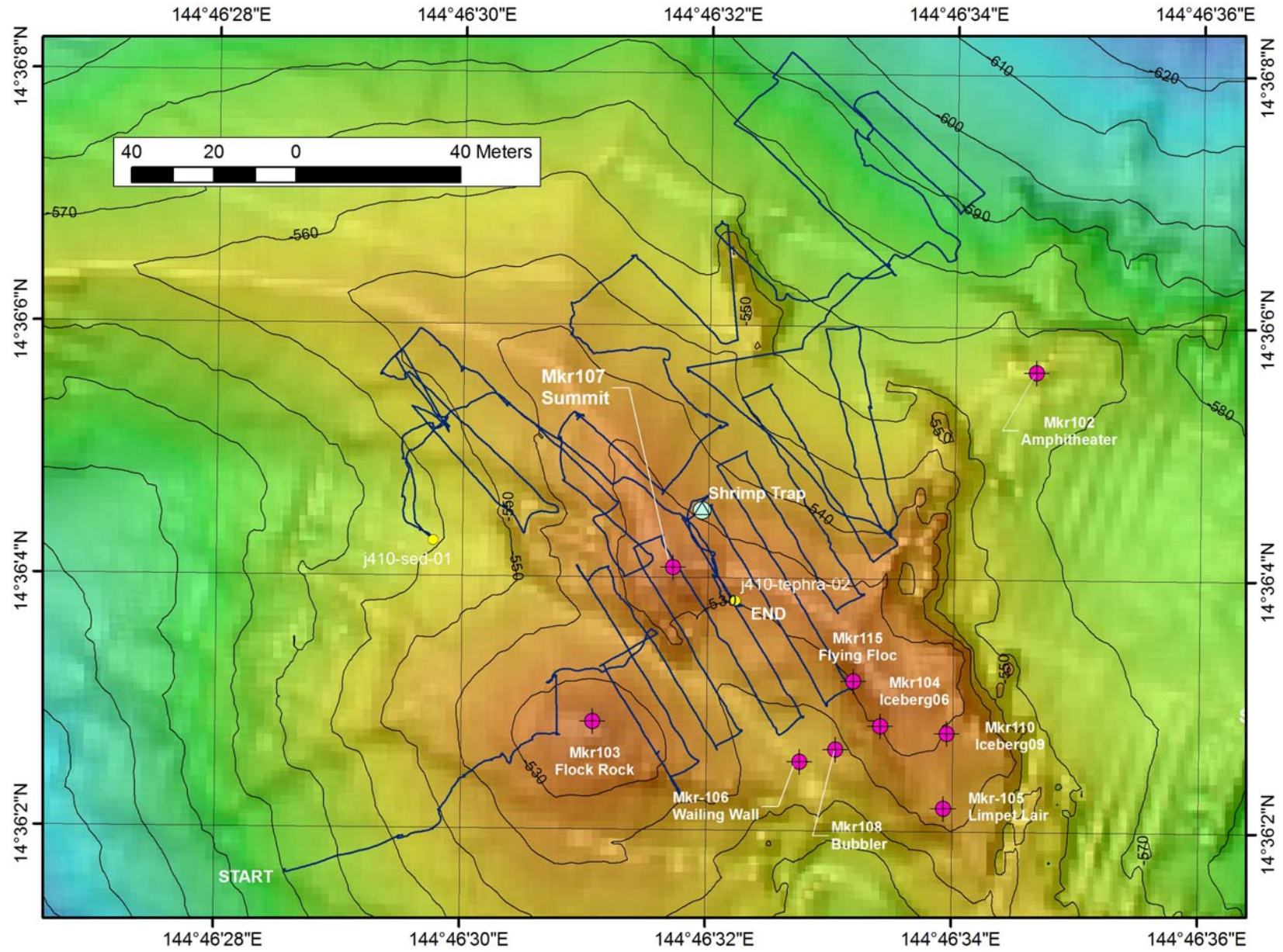


Figure 6.4-14 JASON Dive J2-411

# J2-411

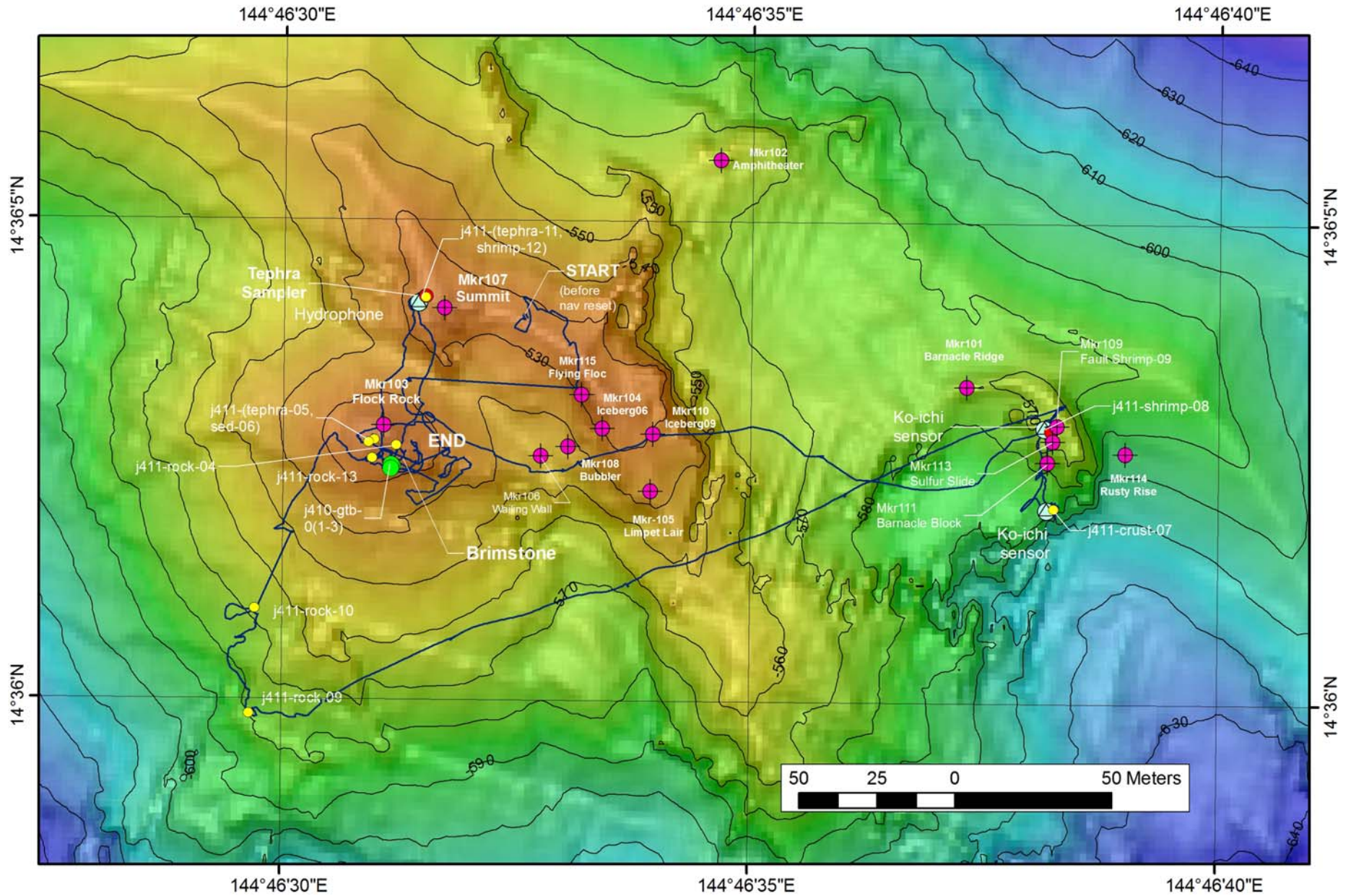
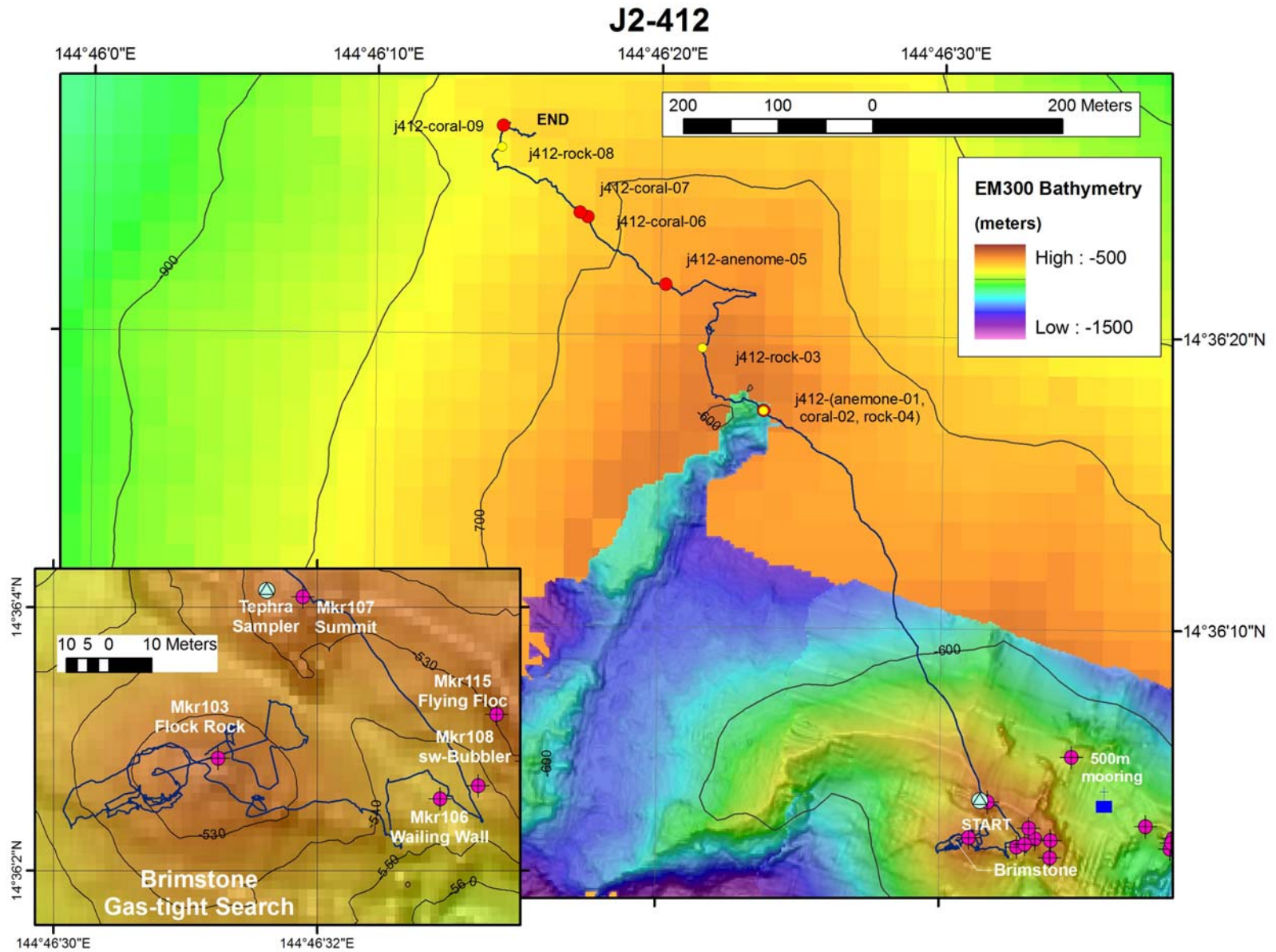


Figure 6.4-15 JASON Dive J2-412



## 6.5 Dive Logs

Logbook times are UTC (10 hrs behind local Guam time). Position data (latitude and longitude) and Virtual Van record numbers were obtained from the renavigated (RENAV) data. JASON Latitude, longitude and depth values which were obviously inaccurate were replaced with text but the records are included for other data values such as logbook comments. Note that the "Virtual Van Record" numbers provided in this report may differ slightly than the online version due to subsequent edits but can be used as a guide for viewing the online Virtual Van. Comments were minimally edited but do differ from the un-edited version that appears in the WHOI JASON Virtual Van files available online (<http://4dgeo.whoi.edu/jason/>).

### **Note:**

**The dive logs are not provided in the printed version of the cruise report. The cruise report documents do contain the complete dive logs. You can print the logbook section, pages 97-326, from Word or the pdf documents on the disc included.**

## 6.5 Dive Logs, cont.

**J2-396 – Brimstone recon.** JASON equipped with portable hydrophone, 2 markers, 3 scoop bags, 2 gas tights, Eh sensor, Niskin. Dive target was 100m downslope of Brimstone vent, landed in chute to the west and drove to Brimstone vent. Using LBL and doppler navigation during dive. (Dive later renavigated using doppler only). Deployed hydrophone and Mkr-107 at Brimstone summit. Returned to Brimstone vent and made observations using HD video. Deployed tephra sampler at NW corner of vent. Moved up summit slope and deployed a tephra sampler on slope. Deployed an additional tephra sampler on summit ridge. Moved SE and discovered an diffuse vent area, named it Bubbler. Moved upslope and located Koichi's instruments on summit ridge. Moved east to find "Fault Shrimp" area (later renamed because of depth mismatch), and located area of knife-edge scarps. Headed east to Scarp Top area. At westernmost scarp at top of ridge found area of shrimp with limpets, mat and water flow. Headed back to Iceberg area and discovered good mat site with flow and took a mat sample (east of Iceberg site). Looked for Gastros site to west and then headed back to Bubbler. Passed over an area that looked like Iceberg (later Mrk110 left here and called Iceberg09). Discovered large area of diffuse flow and deployed Mkr108 (Bubbler) at site. (Note: marker later slid downslope and was relocated on J2-400). Headed back west to Brimstone, made observations and collected rock samples. Recovered a tephra sampler and deployed a new one at same site. Collected an additional rock sample and took 2 gas-tights at Brimstone. Took Niskin over vent as began ascent.

**Table 6.4-1 JASON Dive J2-396**

Virtual Van Record	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
15	20090404 061643	badnav	badnav	356.3	badvalue	1.53	badvalue	Jason Dive J2-396 NW Rota-1 4-April-2009
16	20090404 061744	badnav	badnav	275.89	badvalue	2.9	badvalue	JASON in water Main Goal: Explore summit of NW Rota
17	20090404 061836	badnav	badnav	286.17	badvalue	7.6	badvalue	On board: milk crate; hydrophone; 2 markers; 3 scoop bags; 2 gas tights
18	20090404 061857	badnav	badnav	285.5	badvalue	7.27	badvalue	On all dives: Niskin; temp probe; Eh sensor
19	20090404 061940	badnav	badnav	280.34	badvalue	5.41	badvalue	Suction hose is loose from vehicle
20	20090404 062157	badnav	badnav	280.93	badvalue	44.93	badvalue	Jason holding hose on basket for descent
21	20090404 062226	badnav	badnav	281.75	badvalue	62.05	badvalue	Deployment target 14deg36.0N 144deg 46.5E depth=620m
22	20090404 062340	badnav	badnav	281.64	badvalue	76.01	badvalue	All transponders are being tracked during descent
23	20090404 062409	badnav	badnav	280.34	badvalue	73.36	badvalue	Going down
24	20090404 062416	badnav	badnav	280.51	badvalue	73.9	badvalue	Descent rate at 35
25	20090404 063804	badnav	badnav	277.65	146.61	433.72	580.33	150m off bottom
26	20090404 063932	badnav	badnav	294.32	98.66	478.76	577.42	100m off bottom
27	20090404 064226	badnav	badnav	308.29	51.93	512.47	564.4	50m off bottom-all stop
28	20090404 064255	badnav	badnav	311.58	51.23	510.46	561.69	Dive is starting about 100m downslope of Brimstone Pit
29	20090404 064539	badnav	badnav	334.57	52.14	501.1	553.24	Rearranging the suction hose
31	20090404 064910	badnav	badnav	170.35	20.45	531.15	551.6	Descending
33	20090404 065100	badnav	badnav	170.45	20.38	533.05	553.43	Holding at 20m
34	20090404 065121	badnav	badnav	170.24	22.14	529.95	552.09	Jason lost power
35	20090404 065131	badnav	badnav	170.24	22.14	529.95	552.09	Asking ship to move out to deep water
37	20090404 065252	badnav	badnav	170.24	22.14	529.95	552.09	Restarting power
38	20090404 065308	badnav	badnav	170.24	22.14	529.95	552.09	Ship is moving to deep water
39	20090404 065331	badnav	badnav	170.24	29.74	529.95	559.69	Altitude is increasing
40	20090404 065402	badnav	badnav	333.28	67.15	514.55	581.7	Cameras are up again
41	20090404 065452	badnav	badnav	46.9	48.49	507.31	555.8	Stopping ship
42	20090404 065750	badnav	badnav	62.92	69.97	490	559.97	cameras up again
43	20090404 070216	badnav	badnav	63.77	22.52	544.37	566.89	encounter plume

Virtual Van Record	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
44	20090404 070247	badnav	badnav	60.55	13.48	553.64	567.12	bottom in sight
46	20090404 070533	badnav	badnav	36.22	54.18	538.6	592.78	in thick plume
47	20090404 071022	badnav	badnav	78.31	116.85	483.97	600.82	trying to resolve some issues with Jason
48	20090404 071744	badnav	badnav	234.17	80.37	511.08	591.45	We are west of original target
49	20090404 071828	badnav	badnav	231.61	75.09	514.58	589.67	Power outage occurred when ship was cycling power from one generator to another
50	20090404 072135	badnav	badnav	231.71	91.88	510.53	602.41	Medea is port aft of ship location
51	20090404 072331	badnav	badnav	241.04	94.19	509.93	604.12	At outage ship couldn't hold position and went on walkabout to the NW
52	20090404 072849	badnav	badnav	219.35	88.66	510.17	598.83	Ship is not moving yet
53	20090404 073036	badnav	badnav	242.25	87.5	517.66	605.16	Going to start moving vehicle down
54	20090404 073218	badnav	badnav	246.54	45.98	559.24	605.22	Seeing smoke
55	20090404 073226	badnav	badnav	246.19	41.28	563.39	604.67	AT 560 see plume
56	20090404 073243	badnav	badnav	246.14	32.64	570.13	602.77	38m off bottom where seeing the smoke
57	20090404 073254	badnav	badnav	249.53	28.22	574.13	602.35	Picking up doppler signal
58	20090404 073315	badnav	badnav	247.74	23.73	578.81	602.54	All stop
59	20090404 073323	badnav	badnav	264.42	23.7	581.24	604.94	Seeing wall to right of vehicle on sonar
61	20090404 073357	badnav	badnav	122.07	11.33	591.57	602.9	Problem with Sharps navigation
62	20090404 073408	badnav	badnav	124.26	9.66	593.85	603.51	Stopping vehicle here
63	20090404 073415	badnav	badnav	124.09	9.81	594.15	603.96	Seeing some smoke on the Medea cam
64	20090404 073434	badnav	badnav	123.25	12.36	592.17	604.53	NAV Doppler reset Since near bottom
65	20090404 073443	badnav	badnav	123.75	11.85	592.6	604.45	12m off bottom still seeing smoke
66	20090404 073513	badnav	badnav	122.12	11.5	592.74	604.24	Ship is still not moving while resolving nav issue
68	20090404 073548	badnav	badnav	244.85	20.62	593.06	613.68	Sediment DVCAM start at 07:35
69	20090404 073618	14.60096213	144.773847	271.62	16.28	599.19	615.47	Bottom in sight
70	20090404 073655	14.60095941	144.7738445	272.58	13.55	602.27	615.82	JASON on bottom See bottom and white staining
71	20090404 073711	14.60096298	144.7738442	272.7	14.03	601.55	615.58	Laser distance is 10cm
72	20090404 073724	14.60096237	144.7738435	272.71	13.76	601.84	615.6	All videos are recording
74	20090404 073744	14.60096251	144.7738434	272.6	13.94	601.75	615.69	Data DVDs start DVCAM start at 07:35
75	20090404 073807	14.60096257	144.7738435	272.76	13.91	601.72	615.63	Adjusting brightness on HD
77	20090404 074025	14.60096866	144.7738228	270.43	13.46	602.57	616.03	Holding position with bottom view while resolving computer issues
78	20090404 074117	14.60097906	144.7737954	271.56	6.9	609.6	616.5	Watch leader headset audio now on-Bill Chadwick recording
79	20090404 074130	14.60098166	144.7737886	276.27	6.23	610.23	616.46	Lava with staining
81	20090404 074143	14.60098426	144.7737817	275.49	6.94	609.81	616.75	WATCHSTANDERS Andra Bobbitt logger Nick Deardorff video
82	20090404 074242	14.60099606	144.7737507	280.9	7.55	610.32	617.87	SAMPLE Geology Getting ready to drop weights from basket
83	20090404 074246	14.60099686	144.7737486	281.35	7.75	610.12	617.87	Dropping weights
84	20090404 074332	14.60100606	144.7737243	282.29	12.05	605.43	617.48	JASON in water Shrimp
86	20090404 074352	14.60101006	144.7737138	281.82	15.01	603.11	618.12	Looks like white dusting on rocks
87	20090404 074503	14.60099664	144.7737164	281.23	17.55	603.87	621.42	Dropping more weight
89	20090404 074600	14.6009481	144.7736345	295.34	22.77	603.5	626.27	Ship is still holding position
90	20090404 074616	14.6008934	144.7736099	293.51	25	604.26	629.26	Jason panning around
91	20090404 074640	14.60092393	144.7735763	307.85	22.58	607.05	629.63	Moving closer to bottom
92	20090404 074720	14.60093615	144.7735491	307.39	16.58	602.66	619.24	Shimmering water right of the staining
94	20090404 074813	14.6009545	144.7735332	308.07	10.39	603.64	614.03	Sulfur staining
96	20090404 075013	14.60096112	144.7735471	307.97	13.16	601.07	614.23	Looking around with science camera

Virtual Van Record	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
97	20090404 075023	14.6009648	144.7735414	307.48	12.73	599.43	612.16	Pillows
98	20090404 075101	14.60099846	144.7735223	316.09	10.68	594.56	605.24	biology floating by
99	20090404 075109	14.60100056	144.7735222	315.39	9.6	594.66	604.26	It was a comb jelly
101	20090404 075153	14.60097348	144.77353	229.35	11.05	591.4	602.45	Ready to move at 120-backing away from bottom
102	20090404 075241	14.60089632	144.773653	119.88	21.49	599.11	620.6	At 120 and going to head down to bottom
103	20090404 075321	14.600851	144.7737633	119.63	13.63	611.72	625.35	Can see smoke in Medea camera
105	20090404 075333	14.60084872	144.7737796	124.52	9.55	615.6	625.15	Can see bottom again
106	20090404 075352	14.60083412	144.7738316	119.52	3.45	618.24	621.69	Lots of white staining here and a fish
107	20090404 075415	14.60082042	144.7738665	119.89	3.48	617.81	621.29	Smaller lava features
108	20090404 075435	14.60080601	144.7738982	119.68	4.98	616.37	621.35	Staining probably bacterial but can't tell
109	20090404 075459	14.60081486	144.7739354	115.6	5.96	613.57	619.53	Driving 120 and fairly solid lava pillows
110	20090404 075523	14.60080641	144.7739578	90.01	7.6	611.46	619.06	Could also be sulfur from above raining down
112	20090404 075601	14.60082778	144.7739256	89.59	10.98	609.23	620.21	May be coming toward downslope debris as seeing smaller lava pieces
114	20090404 075756	14.60088049	144.7740028	89.7	11.69	604.11	615.8	DSC having problems
116	20090404 075953	14.60087677	144.7740305	94.43	14.34	599.96	614.3	Ship has been moving-Jason is stopped
120	20090404 080548	14.60066363	144.7741485	99.72	12.8	597.45	610.25	Still resolving nav and computer issues
122	20090404 080756	14.60073967	144.7743002	104.96	11.1	586.22	597.32	Looking across slope to east
123	20090404 080838	14.60069337	144.7743649	106.66	12.35	581.45	593.8	Steep slope looking at 105
124	20090404 080856	14.60066086	144.774424	105	10.25	580.93	591.18	Lots of sediment or dusting here
126	20090404 080947	14.60059662	144.7745032	104.86	7.64	579.1	586.74	No Sharps just lbl
127	20090404 080956	14.6005863	144.7745167	104.87	7.06	578.83	585.89	Medea cam shows smokey water
128	20090404 081056	14.6004602	144.7745032	115.74	5.76	574.13	579.89	NAV Doppler reset
129	20090404 081125	14.60044126	144.7745167	116.51	6.48	572.53	579.01	Heading over to target in the chute area
131	20090404 081133	14.60043472	144.7745299	117.33	5.45	572.28	577.73	Lots of rounded pillows
132	20090404 081156	14.60044044	144.7745483	92.64	6.34	571.01	577.35	Turning to 090 and expect to head upslope soon
133	20090404 081230	14.60043776	144.7746027	93.32	5.36	568.06	573.42	DSC is not working
134	20090404 081249	14.60044353	144.7746348	94.23	5.25	565.75	571	Some rubble here with pillows
135	20090404 081328	14.60042631	144.774671	92.34	5.34	564.25	569.59	Visibility going down and lava more blocky
138	20090404 081558	14.60035564	144.7748643	97.48	6.25	555.09	561.34	Sandy area here
139	20090404 081612	14.6003405	144.7748887	96.53	4.71	555.26	559.97	Very black material adjacent the white
140	20090404 081632	14.60033937	144.7749139	97.82	4.38	555.44	559.82	Zoomed in and black is standing up and white at base
141	20090404 081653	14.60032679	144.7749207	97.83	7.81	552.64	560.45	More likely sulfur deposit
142	20090404 081712	14.60032183	144.7749363	95.66	9.59	549.98	559.57	Only on upper surfaces so looks like sulfur snow
143	20090404 081724	14.60032458	144.7749456	72.93	8.05	548.72	556.77	On edge of something maybe slide chute or ?
145	20090404 081744	14.60035554	144.7749573	32.44	8.43	546.97	555.4	More blocky to left as we head up slope
146	20090404 081803	14.60037465	144.7749569	90.93	7.39	547.98	555.37	Water is very murky here again
147	20090404 081833	14.60037226	144.774963	114.54	5.01	549.22	554.23	Abrupt change with white snow or deposit
148	20090404 081855	14.60036113	144.77498	114.48	5.08	549.08	554.16	Drops straight down on edge
149	20090404 081915	14.60038385	144.7749931	115.78	3.53	548.39	551.92	Very downslope of Brimstone so must be chute
151	20090404 081933	14.60041137	144.7749881	302.55	6.88	544.23	551.11	On left looks like younger stuff that buried chute
152	20090404 081942	14.6004	144.7749964	152.78	5.68	543.94	549.62	DSC is intermittent
153	20090404 082003	14.60041603	144.7749834	240.78	5.55	543.68	549.23	Jason looking around
154	20090404 082045	14.60047325	144.7749976	34.14	7.63	540.74	548.37	Upslope edge is buried with debris from upslope
155	20090404 082056	14.60049527	144.7750181	35.09	7.23	539	546.23	Data DVDs start blue DVD set 08:20

Virtual Van Record	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
156	20090404 082108	14.60052142	144.7750413	34.15	7.7	535.9	543.6	Heading upslope
158	20090404 082135	14.60059262	144.775059	38.78	6.91	531.83	538.74	Finer grain material now with no sulfur deposit
159	20090404 082212	14.60068757	144.7750973	38.88	6.3	525.34	531.64	More sulfur drifts between blocks
160	20090404 082233	14.60070831	144.7751076	38.28	3.28	526.07	529.35	Yellow patch on bottom-seeing staining
161	20090404 082259	14.60074186	144.7750933	39.65	4.89	524.51	529.4	Lots of sulfur (better on pilot display than science)
162	20090404 082318	14.60075738	144.775097	75.15	3.84	524.89	528.73	Going down to sulfur patch
164	20090404 082357	14.60076895	144.7751123	74.25	2.35	525	527.35	Shrimp swimming around sulfur area
165	20090404 082411	14.60077035	144.775114	74.08	2.51	524.77	527.28	Wash from Jason disturbed shrimp into the water
166	20090404 082429	14.60076834	144.7751115	74.24	2.23	525.14	527.37	Shrimp are covering the sulfur material
167	20090404 082435	14.6007702	144.7751124	74.32	2.09	525.17	527.26	Looks like there is ash on the sulfur
168	20090404 082444	14.60077062	144.7751124	75.06	2.06	525.12	527.18	Data DVDs stop Red DVD set
169	20090404 082530	14.60078915	144.775117	72.79	3.04	523.27	526.31	Taking dsc photos
171	20090404 082549	14.60079121	144.7751316	67.44	4.18	521.61	525.79	Looks like some alteration on the rocks here
172	20090404 082637	14.60078813	144.7751958	65.46	4.13	517.38	521.51	See plume in Medea cam
173	20090404 082653	14.60078514	144.7752226	117.24	3.85	516.25	520.1	We are about at the height of vent
174	20090404 082658	14.60078811	144.775223	127.53	2.99	516.59	519.58	There is the plume
175	20090404 082708	14.60077619	144.7752183	121.95	2.64	517.4	520.04	Plume is in depression
176	20090404 082717	14.60075621	144.775216	110.81	2.78	517.5	520.28	Smoking pit again
178	20090404 082737	14.60070645	144.7752326	77.89	4.03	517.19	521.22	HD recording on
179	20090404 082748	14.60068989	144.7752312	63.53	4.81	518.8	523.61	VIDEO Start recording HDCam See bubbles
180	20090404 082826	14.60068077	144.7752548	35.06	3.55	521.9	525.45	Particle plume
181	20090404 082837	14.60067409	144.7752653	7.92	3.08	522.34	525.42	Do not see ash in plume at depth 522
182	20090404 082915	14.60066893	144.7752975	313.54	3.25	523.87	527.12	Seems more open around plume
184	20090404 082944	14.60066447	144.7752957	313	3.35	523.79	527.14	Entering nav target
185	20090404 083004	14.60066445	144.7752955	312.96	3.29	523.85	527.14	Offset from previous nav position
186	20090404 083010	14.60066455	144.7752955	313.09	3.3	523.82	527.12	Looks like passive plume
187	20090404 083025	14.60066476	144.7752956	313.06	3.36	523.79	527.15	Could be slow extrusion with degassing
188	20090404 083041	14.60066469	144.7752959	312.98	3.35	523.8	527.15	Rocks look altered
189	20090404 083048	14.60066362	144.7752997	312.04	3.18	523.82	527	rock is moving
190	20090404 083105	14.6006565	144.7753067	313.92	4.38	523.81	528.19	Jason backing off plume
192	20090404 083134	14.6006574	144.7753063	313.43	4.33	523.76	528.09	Looking NW at plume
193	20090404 083204	14.60065741	144.7753062	313.5	4.41	523.73	528.14	Going to deploy hydrophone and then come back
194	20090404 083224	14.60065749	144.7753062	313.5	4.44	523.72	528.16	Turning lasers off
195	20090404 083329	14.60065742	144.7753061	313.48	4.31	523.75	528.06	Plan to put hydrophone 50-60m away from pit
197	20090404 083335	14.60065735	144.7753064	313.45	4.33	523.73	528.06	Plume pulses
198	20090404 083424	14.60065724	144.7753063	313.39	4.44	523.74	528.18	We came over rim and then into a bowl-like area
199	20090404 083454	14.60065725	144.7753063	313.49	4.33	523.74	528.07	Burst coming
200	20090404 083515	14.60065726	144.7753063	313.46	4.43	523.74	528.17	Lots of gas coming out
201	20090404 083532	14.60065727	144.7753064	313.44	4.41	523.74	528.15	Big burst of plume and moved the rocks
203	20090404 083547	14.60065732	144.7753063	313.44	4.41	523.74	528.15	Saw rock move and crumble when fell down
204	20090404 083613	14.60065734	144.7753064	313.47	4.43	523.75	528.18	bubbles came first then large plume and finally the rock moved
205	20090404 083723	14.60065735	144.7753066	313.49	4.39	523.75	528.14	Good view of plume circulating
207	20090404 083802	14.60065742	144.7753066	313.45	4.39	523.77	528.16	More bubbles
208	20090404 083813	14.60065732	144.7753065	313.45	4.43	523.77	528.2	Rock moving



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209	20090404 083822	14.6006575	144.7753065	313.45	4.4	523.75	528.15	there are the bubbles and increase in plume
211	20090404 083949	14.60066034	144.7753138	353.9	3.9	523.72	527.62	going to head to hydrophone deployment at summit
212	20090404 083954	14.60066223	144.7753167	5.83	4.43	522.99	527.42	moving at 030
213	20090404 084018	14.60071248	144.7753843	45.96	3.4	521.22	524.62	Off to right another plume
214	20090404 084040	14.60072989	144.7754311	49.88	5.88	521.27	527.15	That is the plume going down wind
215	20090404 084053	14.60076538	144.7754566	35.38	8.5	519.94	528.44	Not another plume and looks like sulfur in the water
216	20090404 084112	14.60083291	144.7755096	39.27	12	521.22	533.22	In some smoke as moving off at
217	20090404 084119	14.60085342	144.7755213	43.23	12.03	521.63	533.66	Bottom has fallen out
219	20090404 084156	14.60096941	144.7755437	358.71	7.08	527.86	534.94	Medea has good view of plume
220	20090404 084212	14.60101152	144.775537	4.1	4.05	529.23	533.28	VIDEO Stop recording HDCam stop
221	20090404 084231	14.60102926	144.7755379	358.91	3.94	528.29	532.23	Lots of sandy bottom with sulfur deposit
222	20090404 084252	14.60103584	144.7755316	358.34	4.58	527.26	531.84	Going to move upslope and place it at top
223	20090404 084328	14.60108206	144.7755112	357.13	5.6	522.97	528.57	We were on a sandy slope and now seeing rocky outcrops
225	20090404 084338	14.6010895	144.7755127	342.44	6.81	521.55	528.36	Seen this before at top
226	20090404 084351	14.60109414	144.7755052	315.26	7.76	519.75	527.51	Medea still has plume in view
227	20090404 084357	14.6010968	144.7754991	315.45	8.26	518.99	527.25	Moving to top
228	20090404 084429	14.60110954	144.7754898	304.41	7.23	517.38	524.61	Looking around for a flat spot
229	20090404 084459	14.60112296	144.7754828	299.86	5.56	516.32	521.88	Marker 78 was here in 2006
231	20090404 084655	14.60114334	144.775455	117.1	2.49	516.96	519.45	Shrimp swam up when bumped bottom
233	20090404 084735	14.60114164	144.7754589	115.16	0.95	517.45	518.4	Found a good place to park the marker
234	20090404 084922	14.6011418	144.7754605	122.41	0.99	517.42	518.41	This year Brimstone position is 20m from 2006 and 10m from 2004 (to the NE)
236	20090404 084933	14.6011419	144.7754603	122.4	0.99	517.43	518.42	Moving hose to reach hydrophone
237	20090404 084952	14.60114193	144.7754602	122.14	0.95	517.43	518.38	VIDEO Start recording HDCam getting hd on
238	20090404 085011	14.60114207	144.7754603	122.18	1.51	517.45	518.96	Going to video the hydrophone deployment
239	20090404 085041	14.60114214	144.7754599	122.19	1.51	517.47	518.98	Retrieving marker from basket
240	20090404 085104	14.60114252	144.7754596	122.18	1.51	517.47	518.98	that is retrieving hydrophone from basket
241	20090404 085127	14.60114259	144.7754594	122.23	1.51	517.46	518.97	Hydrophones programmed to start at 5pm local time or at 0700GMT
243	20090404 085149	14.60114189	144.7754579	122.25	1.51	517.45	518.96	DEPLOY-RECOVER Hydrophone on bottom
245	20090404 085315	14.60113718	144.7754486	122.13	0.81	517.48	518.29	DEPLOY-RECOVER Marker 107 deployed next to hydrophone
247	20090404 085356	14.60113724	144.7754487	122.2	1.51	517.48	518.99	Jason managing suction hose
248	20090404 085430	14.60114391	144.7754494	118.97	2.3	517.39	519.69	Can see plume in background
249	20090404 085448	14.60114412	144.7754494	118.17	2.36	517.44	519.8	going to move marker higher
251	20090404 085554	14.60114418	144.7754492	117.15	2.34	517.41	519.75	hose secure on basket
252	20090404 085628	14.60114888	144.77546	116.64	4.28	516.16	520.44	Looking around for a good high spot for marker
253	20090404 085647	14.60113224	144.775487	133.45	1.71	516.61	518.32	VIDEO Stop recording HDCam off
255	20090404 085901	14.60119693	144.7755252	205.51	10.61	516.33	526.94	Jason nav entering target at marker deployment site
257	20090404 090049	14.60119687	144.7755255	205.62	10.39	516.33	526.72	Frame Grab
259	20090404 090221	14.60119674	144.7755255	205.24	10.26	516.44	526.7	hose management still
261	20090404 090444	14.60117545	144.7755054	209.62	7.5	516.48	523.98	done with suction management
262	20090404 090449	14.60116767	144.7755114	241.48	6.96	516.42	523.38	Marker shot
263	20090404 090500	14.60113611	144.7755221	280.59	4.21	516.27	520.48	VIDEO Start recording HDCam on
264	20090404 090510	14.60111059	144.7755108	295.99	8.84	516.23	525.07	did not move marker after all
265	20090404 090517	14.6011087	144.7755003	296	9.05	516.73	525.78	school of shrimp swam by

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267	20090404 090544	14.60111666	144.7754804	292.88	6.5	517.04	523.54	Deciding whether or not to move marker now
268	20090404 090605	14.60111665	144.7754704	293.49	4.34	517.4	521.74	going to move marker to top of the ridge peak next to hydrophone
269	20090404 090629	14.60111954	144.7754798	240.31	5.06	516.1	521.16	Looks like hydrophone may be shadowed by the ridge
270	20090404 090635	14.60112828	144.7754829	241.77	4.59	515.95	520.54	VIDEO Stop recording HDCam off
271	20090404 090658	14.60114888	144.7754723	171.61	6.43	515.24	521.67	Can see smoke as layer
273	20090404 090738	14.60114105	144.7754579	168.56	2.91	517.47	520.38	Would like hydrophone on other side of ridge so going to move both
274	20090404 090824	14.60114142	144.775458	168.5	2.79	517.47	520.26	grabbing marker first
275	20090404 090844	14.60114134	144.7754578	168.46	2.9	517.54	520.44	Marker placed on top of ridge
276	20090404 090856	14.60114162	144.7754581	168.03	2.76	517.51	520.27	now reaching for hydrophone
277	20090404 090920	14.60114284	144.7754591	168.69	2.99	517.47	520.46	hydrophone in arm
279	20090404 090955	14.60114228	144.7754588	168.88	2.71	517.6	520.31	moving Jason to other side with hydrophone placed on top of basket
280	20090404 091101	14.60112392	144.7754239	77.46	3.93	516.97	520.9	moving Jason looking for place in sight of marker
282	20090404 091206	14.60114376	144.775416	44.07	1.23	519.21	520.44	Looks like a sandy spot on south side of peak for placement
283	20090404 091242	14.60114325	144.775416	44.16	1.34	519.03	520.37	retrieving hydrophone
284	20090404 091252	14.60114352	144.7754161	44.15	1.26	519.07	520.33	crabs on rock near hydrophone
285	20090404 091319	14.60114406	144.7754162	44.19	1.25	519.09	520.34	DEPLOY-RECOVER Marker moved marker 107 to new site
287	20090404 091414	14.60114345	144.7754167	44.09	1.36	519.03	520.39	Position of marker 107 looks good
288	20090404 091423	14.60114338	144.7754166	44.1	1.35	519.02	520.37	crab has eggs underneath
291	20090404 091757	14.60114402	144.7754158	44.18	1.28	519.07	520.35	going back to Brimstone
293	20090404 092046	14.60106635	144.7754056	194.06	7.94	515.45	523.39	ready to move now
295	20090404 092135	14.60090256	144.7754572	202.66	16.66	519.46	536.12	Lots of sulfur snow on bottom
296	20090404 092248	14.60083307	144.7754408	205.2	10.38	522.78	533.16	Came off summit and were 4m lower already with a lot of sulfur coating everything
297	20090404 092301	14.60080048	144.7754311	261.54	8.05	524.03	532.08	fine grain sulfur and some slides cutting through
298	20090404 092320	14.6007832	144.7754114	257.67	5.06	525.28	530.34	slabs are sticking above sedimented slopes
300	20090404 092411	14.60075448	144.7753695	259.5	5.44	521.46	526.9	dark sandy material on top of white
301	20090404 092429	14.60073502	144.7753524	261.08	5.34	520.64	525.98	There is Brimstone at a different angle
302	20090404 092438	14.60071424	144.7753542	246.86	5.63	520.66	526.29	We are coming from north and just east of it
303	20090404 092450	14.60071777	144.7753379	213.01	4.6	520.8	525.4	VIDEO Start recording HDCam at Brimstone
304	20090404 092515	14.60072074	144.7753028	199.08	1.41	521.47	522.88	can see different colors of plume but could be the monitors
305	20090404 092531	14.60072478	144.775303	196.14	1.5	521.43	522.93	it really is yellow patches in plume
307	20090404 092602	14.60073161	144.77527	204.2	0.94	520.13	521.07	Did not see yellow before hydrophone deployment
308	20090404 092611	14.60072405	144.7752618	189.78	0.75	520.15	520.9	We are on the high side of Brimstone
309	20090404 092617	14.60072272	144.7752637	180.91	1.63	519.36	520.99	Bubbles
310	20090404 092636	14.60071854	144.7752538	163.19	3.3	517.97	521.27	Lots of bubbles ands now a large plume
312	20090404 092756	14.60072966	144.7752354	137.53	1.08	518.98	520.06	vehicle in plume
313	20090404 092824	14.60078189	144.7752006	145.41	0.98	518.01	518.99	shrimp
314	20090404 092839	14.60078241	144.7752024	145.43	1.1	518.16	519.26	VIDEO Stop recording HDCam letting things settle
315	20090404 092849	14.60078218	144.7752027	145.16	1.23	518.06	519.29	Medea view of Jason and plume is great
316	20090404 092922	14.60078168	144.7752033	143.79	1.34	518.08	519.42	At Brimstone 180deg from beginning
317	20090404 092929	14.60078191	144.7752033	143.89	1.35	518.06	519.41	On the north side looking toward south
319	20090404 093025	14.60067224	144.775206	59.52	3.58	521.18	524.76	moving around to original side
320	20090404 093035	14.60066866	144.775215	41.31	2.61	523.38	525.99	VIDEO Start recording HDCam on
321	20090404 093102	14.6006705	144.7752179	40.78	1.21	524.75	525.96	turning lasers on

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323	20090404 093212	14.60067296	144.7752183	40.34	1.26	524.74	526	big bubble blast with ash
324	20090404 093229	14.60067369	144.7752182	40.42	1.24	524.74	525.98	burst is continuing
325	20090404 093250	14.60067037	144.7752184	40.33	1.28	524.74	526.02	no tephra just blocks around vent
326	20090404 093259	14.60066998	144.7752183	40.45	1.24	524.72	525.96	large particles in plume
327	20090404 093315	14.60067104	144.7752183	40.39	1.24	524.7	525.94	plume is yellow now
328	20090404 093329	14.60066883	144.7752185	40.41	1.24	524.69	525.93	more bubbles
330	20090404 093409	14.60066298	144.7752189	40.45	1.24	524.7	525.94	plume vortex is very strong
331	20090404 093420	14.60066274	144.7752189	40.42	1.24	524.71	525.95	larger plume after bubble burst again
332	20090404 093422	14.60066275	144.7752189	40.41	1.24	524.7	525.94	Data DVDs stop DVCAM stop
333	20090404 093432	14.60066306	144.7752189	40.38	1.24	524.69	525.93	definite ash or particles coming out of plume
334	20090404 093440	14.60066361	144.7752189	40.33	1.25	524.66	525.91	Data DVDs start DVCAM start
335	20090404 093507	14.60066153	144.7752191	40.45	1.24	524.68	525.92	ash raining down from plume
337	20090404 093542	14.6006719	144.7752186	40.64	1.23	524.66	525.89	going to observe plume before deploying tephra sampler
338	20090404 093621	14.60068368	144.775218	40.66	1.24	524.65	525.89	bubbles again
340	20090404 093913	14.60069545	144.7752178	40.01	1.25	524.61	525.86	observing bubble bursts and then more vigorous plume with ash
341	20090404 093917	14.60069544	144.7752177	39.99	1.25	524.61	525.86	turning lasers off
345	20090404 094500	14.60068982	144.7752186	34.6	1.6	524.48	526.08	WATCHSTANDERS Susan Merle logger
346	20090404 094506	14.60069003	144.7752185	34.69	1.5	524.5	526	WATCHSTANDERS Heidi Berkenbosch video
349	20090404 094810	14.6006792	144.7752214	32.84	1.48	524.46	525.94	Bob Embley coming on shift relieving Bill Chadwick
354	20090404 095704	14.60069973	144.7752208	44.05	1.28	524.18	525.46	Sharps nav is not working at the time. Still have doppler and LBL.
356	20090404 095757	14.60070021	144.7752214	43.78	1.3	524.2	525.5	Lot of stuff raining down. Saw a bit of red in the plume.
358	20090404 100058	14.60070774	144.7752195	44.46	1.29	524.16	525.45	Going through shift change maneuvers.
360	20090404 100315	14.60071297	144.7752229	44.57	1.28	524.14	525.42	HD is off for awhile now (about 10 minutes or so).
362	20090404 100429	14.60071444	144.7752325	44.21	1.38	524.14	525.52	We're still sitting here.
363	20090404 100527	14.60071575	144.7752385	44.19	1.25	524.16	525.41	Brimstone looks quite different. Finer material around it. Older lava around the rim.
365	20090404 100557	14.6007169	144.7752375	43.91	1.26	524.13	525.39	About the same cycling back and forth as the past. Quieter than the past.
367	20090404 100741	14.60072152	144.7752371	44.06	1.23	524.18	525.41	We're sitting at a depth of 525. Some kind of a cone has built up. Haven't got a good look.
368	20090404 100800	14.60072159	144.7752368	44.13	1.23	524.16	525.39	Blocks around the crater rim are larger than the past. Expect they are extruded lava blocks.
369	20090404 100856	14.60072178	144.7752366	43.88	1.21	524.17	525.38	More degassing. Looking like some sulfur coming out.
371	20090404 101014	14.60072359	144.7752351	44.06	1.25	524.16	525.41	Lots of material raining down. Particulate sulfur coming down out of the cloud.
372	20090404 101021	14.60072413	144.7752351	44.06	1.24	524.15	525.39	Similar look as 2004.
373	20090404 101045	14.60072404	144.7752341	44.18	1.23	524.16	525.39	Seeing some ash now.
374	20090404 101131	14.60072489	144.7752329	43.89	0.8	524.13	524.93	Looks like ash and sulfur raining down.
376	20090404 101302	14.60072881	144.7752317	43.95	1.25	524.13	525.38	Lots of stuff bubbling out.
377	20090404 101311	14.60072901	144.7752317	43.98	1.25	524.1	525.35	Lots of action right now.
379	20090404 101405	14.60074847	144.7752246	43.86	1.23	524.16	525.39	VIDEO Start recording HDCam Lots of ash coming out. The most we've seen right now. Quarter inch of stuff on front of vehicle.
381	20090404 101544	14.60076003	144.7752241	43.82	1.24	524.09	525.33	VIDEO Stop recording HDCam It has finished blowing out ash now. Quieter. About 2 minutes of ash action.
382	20090404 101631	14.60076673	144.7752246	43.94	1.34	524.07	525.41	Lot of big bubbles coming back. Big bunch of sulfur and BIG bubbles.

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383	20090404 101702	14.60076865	144.7752255	43.79	1.25	524.1	525.35	Temp jumped up to 15 degrees from 7. Now back to 7.
384	20090404 101720	14.60076911	144.7752255	43.77	1.24	524.09	525.33	So the temp doubled while we saw the burst.
386	20090404 101747	14.60077016	144.7752251	43.8	1.26	524.08	525.34	Lots of plume now. Can't see much. Temp up to 10 now.
387	20090404 101809	14.60076989	144.7752253	43.87	1.26	524.09	525.35	J2-396 Data DVDs start Red DVD set 003
388	20090404 101814	14.60076981	144.7752253	43.89	1.25	524.09	525.34	Seeing huge bubbles. Action increasing.
389	20090404 101911	14.60077077	144.7752256	43.75	1.25	524.1	525.35	Debating what to do now.
391	20090404 101949	14.60077237	144.7752256	43.82	1.26	524.09	525.35	We're staying here for a little bit.
392	20090404 102057	14.60077424	144.7752251	43.79	1.26	524.07	525.33	Can't see much.
393	20090404 102105	14.60077434	144.7752247	43.79	1.26	524.05	525.31	White out.
394	20090404 102125	14.60077543	144.7752239	43.79	1.25	524.08	525.33	Going to move a bit to find a better viewing place.
396	20090404 102222	14.60076238	144.7752601	318.01	2.64	523.82	526.46	We're at 525m here at the rim of the crater. The summit is at 516m.
397	20090404 102245	14.60076067	144.7752581	317.89	2.84	523.51	526.35	J2-396 Data DVDs stop Blue set 002
398	20090404 102303	14.60076195	144.7752743	299.18	2.49	523.49	525.98	VIDEO Start recording HDCam We're starting up the HD cam again.
399	20090404 102323	14.60075849	144.7752763	304.21	2.05	523.82	525.87	We're moving slightly to get a better view.
401	20090404 102435	14.60075276	144.7752843	304.16	2	523.89	525.89	Pilot cam has automatic white balance. Looks better than HD.
402	20090404 102505	14.60074617	144.7752939	303.72	2.03	523.9	525.93	HD cam doesn't seem to see the yellow that the science cam sees.
404	20090404 102615	14.60073842	144.7753032	303.18	2	523.9	525.9	The basket is covered with tephra. There are larger blocks on the front of the basket.
405	20090404 102650	14.60073853	144.7753036	303.57	2.03	523.88	525.91	Building up for a bigger burst now. Lots of bubbles and yellow smoke.
406	20090404 102720	14.6007364	144.7753062	303.39	2.01	523.88	525.89	Some sulfur is getting pushed to the surface. Very vigorous now.
408	20090404 102755	14.60073539	144.7753075	306.69	1.88	524.03	525.91	Lots of degassing going on now. Not lots of ash.
409	20090404 102840	14.60073849	144.7753085	306.06	1.86	523.97	525.83	Another degassing episode.
411	20090404 102936	14.60073696	144.7753085	306	1.85	523.98	525.83	Discussing where to put the Tephra sampler.
412	20090404 103028	14.60073749	144.7753099	306.14	2.2	523.85	526.05	Can't tell what's in the buckets (tephra sampler).
413	20090404 103102	14.60073681	144.77531	305.72	1.86	523.97	525.83	No buckets (tephra samplers) out yet.
415	20090404 103154	14.60073702	144.7753111	304.82	1.79	524	525.79	The intense bursts is episodic.
416	20090404 103225	14.60073784	144.7753091	304.57	1.79	524	525.79	Changing out the HD tape. Putting in 2nd tape. They are 1 hour long.
418	20090404 103338	14.60073637	144.7753062	304.51	1.78	524.02	525.8	The temp measurements we have been recording are on the sub.
419	20090404 103358	14.60073585	144.7753063	303.82	1.74	524.02	525.76	HD cam turned off.
421	20090404 103708	14.60073992	144.7753106	302.09	1.78	524	525.78	A few more minutes here then will move on.
422	20090404 103732	14.60074089	144.7753106	301.76	1.81	523.98	525.79	We've seen a few shrimp in one location and a few crab at the summit - earlier.
424	20090404 103757	14.60074183	144.7753104	301.81	1.79	524	525.79	Zooming the HD in on the vent.
425	20090404 103823	14.60074218	144.7753101	301.82	1.83	524.02	525.85	VIDEO Start recording HDCam Zoomed in looking at the vent.
426	20090404 103838	14.6007419	144.7753103	301.74	1.81	524.03	525.84	Gas coming out now. Increasing action.
428	20090404 103934	14.60074151	144.7753111	302.57	1.76	524.04	525.8	Roiling clouds. Lots of gas bubbles. Yellow in the plume.
429	20090404 103942	14.60074158	144.7753117	302.4	1.76	524.04	525.8	Quieting down a bit.
430	20090404 104022	14.60074232	144.7753131	302.81	1.76	524.03	525.79	Lots of gas bubbles. Not any tephra right now.
431	20090404 104027	14.60074252	144.7753131	302.68	1.78	524.03	525.81	Building up again.
433	20090404 104150	14.60074629	144.7753185	302.77	1.76	524.03	525.79	Plume is constant. Degree of action varies.
434	20090404 104200	14.60074698	144.7753186	302.8	1.76	524.03	525.79	More activity off to the right of the screen now.
435	20090404 104231	14.60074859	144.775319	303.06	1.76	524	525.76	Maybe we should move on now.
436	20090404 104308	14.60073853	144.7753158	337.34	3.76	522.65	526.41	We're going to navigate to the left now. We want to position a bucket on the NW side of the vent if possible.

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437	20090404 104322	14.6007207	144.7752883	10.01	4.81	522.26	527.07	Moving a couple meters from the vent.
439	20090404 104342	14.60072015	144.7752403	46.94	3.94	522.07	526.01	Looking for a relatively flat spot to deploy.
440	20090404 104519	14.60074628	144.7752401	28.33	1.29	524.13	525.42	VIDEO Stop recording HDCam Preparing to deploy one of the tephra samplers (buckets) on the NW corner of the vent.
442	20090404 104609	14.60074563	144.7752415	29.03	1.16	524.17	525.33	Attempting to deploy bucket A. It's really steep here and having a problem getting it upright.
443	20090404 104702	14.60074514	144.7752416	29.28	1.19	524.16	525.35	DEPLOY-RECOVER Tephra Sampler A. Tephra sampler A is sitting on the bottom straight up.
445	20090404 104749	14.60074554	144.7752414	30.24	1.21	524.27	525.48	Tephra sampler A has been deployed NW of the vent about 2 m.
446	20090404 104826	14.60074615	144.7752409	30.2	1.21	524.25	525.46	Going to go half way to the summit and deploy another bucket. Then will proceed to the summit and deploy another.
448	20090404 105003	14.6007509	144.7752599	39.94	5.64	519.43	525.07	test
449	20090404 105132	14.60086517	144.7754059	46.62	3.33	521.53	524.86	We're moving up slope now. Will deploy another sampler. Thick plume.
451	20090404 105328	14.60101369	144.7754919	332.66	5.24	531.07	536.31	We're halfway up from the vent. Will lateral along the slope. It's very steep here. Too steep to deploy the bucket here.
453	20090404 105414	14.60101267	144.7755037	320.6	3.71	532.85	536.56	Looks like an iron cruse on top of the ash. Light colored stuff is sulfur. Black stuff is ash.
454	20090404 105443	14.60106172	144.7755644	326.73	2.39	534.13	536.52	VIDEO Start recording HDCam Iron oxide. The bright white blobs are elemental sulfur.
455	20090404 105514	14.60106199	144.7755672	325.94	2.21	534.38	536.59	We're a bit to the west of the line connecting the vent to the summit.
457	20090404 105654	14.60106231	144.7755669	325.95	2.23	534.33	536.56	Vehicle pitch is 7.2 degrees so it exaggerates the view of how steep the slope is. 7 degrees steeper than it actually is.
458	20090404 105713	14.60106239	144.7755672	326.18	2.23	534.33	536.56	HD video is very intense.
460	20090404 105739	14.60106224	144.775567	326.02	2.18	534.34	536.52	Something dead on the seafloor. Debating whether it is a shrimp or a scaleworm.
461	20090404 105757	14.60106203	144.775567	325.92	2.13	534.34	536.47	Preparing to deploy Tephra sampler C here.
463	20090404 105953	14.6010623	144.7755668	325.86	2.16	534.31	536.47	DEPLOY-RECOVER Tephra Sampler C. Maneuvering the sampler. It's half way between the vent and the summit. Dumping out the bucket for a clean sample.
465	20090404 110157	14.60106107	144.7755655	327.17	1.54	534.89	536.43	Tephra Sampler C is 51 meters away from the vent upslope. Bearing of 340.
466	20090404 110217	14.60106112	144.7755657	327	1.55	534.86	536.41	The sampler is in place.
468	20090404 110346	14.60106103	144.7755659	327.9	1.48	535.02	536.5	VIDEO Stop recording HDCam Heading for the summit now.
469	20090404 110458	14.60110079	144.7755403	328.09	8.14	525.62	533.76	On our way to the summit. The plume is thick. Marker 107 ahead.
470	20090404 110522	14.60110692	144.7755229	312.1	12.9	519.82	532.72	Volcanic "necks" ahead. They look a bit like chimneys.
472	20090404 110553	14.60112823	144.775463	311.37	10.49	515.64	526.13	They are little spurs coming down. They are more lava-like. Possibly exposed dikes.
473	20090404 110645	14.60115857	144.7754068	83.22	10.71	518.79	529.5	Extruded lava pillars. They represent some sort of lava injection. If get a ridge they are called dikes. If a column they are lava necks.
475	20090404 110747	14.60117466	144.7754406	83.56	10.8	518.26	529.06	There is mat (?) on these structures. Could be sulfur or hematite?
476	20090404 110802	14.6011746	144.7754407	83.23	10.83	518.28	529.11	VIDEO Start recording HDCam Turned it on about a minute ago.
477	20090404 110900	14.60117956	144.7754391	91.99	10.48	518.23	528.71	Peculiar little hillock here. Probably a "hoodoo" in Bob speak.
478	20090404 110908	14.6011832	144.7754374	84.7	10.55	517.92	528.47	Great colors on the HD cam.
479	20090404 110921	14.60117926	144.7754421	84.69	10.95	517.62	528.57	We're at the summit now.
480	20090404 110933	14.60117994	144.7754374	82.76	10.09	517.64	527.73	Summit depth is about 518 meters.

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482	20090404 110945	14.60117964	144.7754289	44.2	11.8	518.28	530.08	Looking around for a place to deploy another bucket for Nick.
483	20090404 111015	14.60119339	144.7754203	45.02	8.68	519.35	528.03	VIDEO Stop recording HDCam
485	20090404 111154	14.60126343	144.7754823	74.02	3.14	518.25	521.39	Approaching the hydrophone and marker. Will deploy Sampler F here.
486	20090404 111226	14.60126229	144.7754814	74.14	3.19	518.14	521.33	DEPLOY-RECOVER Tephra Sampler F. Deploying it at the summit next to marker and hydrophone.
488	20090404 111340	14.60126204	144.77548	73.99	3.2	518.25	521.45	Bucket is out of the stbd biobox.
490	20090404 111605	14.6012683	144.775478	75.34	2.69	519.16	521.85	Tephra sampler F is on the bottom. Sitting on a relatively flat bench.
492	20090404 111842	14.6012678	144.7754781	75.3	2.7	518.99	521.69	Digital still cam is not being used much. It is blacked out most of the time and hard to know what you're getting.
493	20090404 111907	14.60126788	144.7754779	74.86	2.8	518.99	521.79	Crabs at the summit.
495	20090404 112043	14.60126742	144.7754776	76.72	2.91	519.01	521.92	Moving tephra sampler B to the stbd biobox. The fabric has been cinched up on the top so it is "closed up".
496	20090404 112053	14.60126692	144.7754775	76.9	2.89	518.99	521.88	VIDEO Start recording HDCam
498	20090404 112230	14.60126781	144.7754778	73.23	2.83	518.98	521.81	Fancy maneuvering. Moving bucket B to the stbd biobox. It has ash etc that has fallen into it up to now.
499	20090404 112317	14.60126785	144.7754777	75.08	2.78	519	521.78	Quite a few shrimp here. Only seen shrimp and crabs here. Big crabs here.
501	20090404 112421	14.60126761	144.7754774	71.03	2.94	518.82	521.76	Next we're going 100 m along the summit ridge to the N/NW to deploy another bucket.
502	20090404 112432	14.60127518	144.7754771	35.38	3.19	518.16	521.35	VIDEO Stop recording HDCam
504	20090404 112557	14.60132351	144.7754099	319.77	7.23	517.61	524.84	We're moving along the summit ridge to the west (W/NW).
505	20090404 112632	14.60131056	144.7753755	318.72	6.58	519.97	526.55	We can't see much.
507	20090404 112847	14.60131818	144.7753046	319.43	7.38	523.62	531	We want to follow the ridge crest.
509	20090404 113126	14.60132789	144.7752885	319.78	7.23	524.82	532.05	Jason changing watches. Scott is the pilot. John is the navigator. Will is the Medea guy.
511	20090404 113228	14.6013606	144.7752089	319.11	6.54	531.57	538.11	Starting to move along the ridge now. We're heading 100m W/NW to deploy another bucket.
513	20090404 113449	14.60141279	144.7750112	319.75	2.45	551.76	554.21	Looks like a mineralized crust at the surface. Relatively old material? Ash and sulfur deposits here.
515	20090404 113608	14.60144542	144.774965	358.31	2.51	555.41	557.92	Large chunks of sulfur along the southern side of the summit ridge.
516	20090404 113615	14.60144457	144.7749636	358.08	2.59	555.46	558.05	VIDEO Start recording HDCam
517	20090404 113732	14.60144257	144.7749615	358.25	1.85	556.33	558.18	snowing of the ash. Runnels down the slope. Localized. Physical phenomena not currents.
519	20090404 113758	14.60145814	144.7749438	358.51	3.49	555.46	558.95	The gray is ash more than likely.
520	20090404 113816	14.60147104	144.7749412	358.47	2.86	556.03	558.89	There is a bit of a "track" along the sediments here. Animal?
521	20090404 113835	14.60148249	144.7749324	358.34	2.95	556	558.95	The slope looks a bit older.
522	20090404 113846	14.60148644	144.7749281	358.54	2.94	556.15	559.09	Dark bands are a bit of a mystery.
523	20090404 113858	14.60148486	144.7749283	358.28	3.01	556.12	559.13	J2-396 Watch Change DVCAM 002 end DVCAM 003 start
524	20090404 113929	14.60148529	144.7749286	358.18	2.93	556.15	559.08	We're looking at current ripples. Current is flowing clockwise. The ripples are perpendicular to it.
526	20090404 113941	14.60148515	144.7749283	358.2	2.75	556.1	558.85	Slope is "older" here.
527	20090404 114020	14.60151471	144.7749109	358.64	3.34	556.15	559.49	Currents indicate that the slope is somewhat older.
528	20090404 114058	14.60153522	144.7748946	358.73	3.6	556.05	559.65	Yellow is an iron-oxide coating perhaps? Sulfur less likely. Bacterial mat?
530	20090404 114148	14.60154023	144.7748785	358.19	4.13	556.15	560.28	The consensus is that it is sulfur. No samples to confirm that.
531	20090404 114247	14.60158579	144.7748657	357.43	2.66	556.11	558.77	Blocky sulfur. Big "wall" of sulfur up ahead.

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532	20090404 114300	14.60159689	144.7748624	357.83	3.35	555.32	558.67	Huge blocks of sulfur in front of us.
533	20090404 114330	14.60160754	144.7748605	0.12	3.9	554.56	558.46	What is the white thing in the front.
535	20090404 114353	14.6016097	144.7748479	25.53	4.83	554.37	559.2	Cornel thinks the big wall is iron oxide.
536	20090404 114423	14.60163036	144.7748081	44.88	5.73	554.52	560.25	Probably low temp diffuse flow creating the iron oxide.
537	20090404 114450	14.601659	144.7748073	48.21	4.71	553.8	558.51	"Anything that can be mineralized will be mineralized" Embley
539	20090404 114604	14.6016869	144.7748699	58.68	4.11	550.2	554.31	VIDEO Stop recording HDCam We want to be on the summit.
540	20090404 114647	14.60170072	144.7749052	66.15	5.2	546.56	551.76	The yellow is the remnants of crust. Probably is mostly iron oxides not sulfur.
541	20090404 114724	14.60170141	144.7749155	70.43	5.33	545.41	550.74	We're debating if we are at the summit now.
543	20090404 114759	14.6017165	144.7749227	70.29	4.21	545.51	549.72	Amazing video. It's probably "older" stuff here.
544	20090404 114913	14.60173786	144.7749504	71.08	3.15	544.12	547.27	We're at the summit now.
546	20090404 114951	14.60173414	144.7749527	70.13	2.48	544.68	547.16	The whole top of the ridge is coated with the yellow stuff "iron-oxide cruse?".
547	20090404 115013	14.60173453	144.7749533	70.11	2.66	544.56	547.22	At the very summit there is a swath of darker crust.
548	20090404 115056	14.60173448	144.7749532	70.23	2.71	544.52	547.23	VIDEO Start recording HDCam at the summit ridge.
550	20090404 115235	14.60173345	144.7749526	69.77	2.8	544.47	547.27	We're deploying 116 degree heading - 117 m from the active vent.
551	20090404 115253	14.60173339	144.7749526	69.83	2.73	544.45	547.18	DEPLOY-RECOVER Tephra Sampler D
553	20090404 115403	14.60173343	144.7749528	70.83	2.64	544.5	547.14	Tephra sampler D emptied of ash etc. accumulated before this.
554	20090404 115433	14.60172955	144.7749417	70.87	3.65	544.24	547.89	Tephra sampler D deployed. (TSD).
555	20090404 115449	14.60173034	144.7749437	70.86	3.45	544.4	547.85	The sediments are very black when disturbed.
556	20090404 115532	14.60173	144.7749424	71.13	3.6	544.26	547.86	Preparing to head back along the ridge to the E/SE.
558	20090404 115548	14.60172988	144.7749425	71.07	3.51	544.36	547.87	Stopped HD recording.
559	20090404 115706	14.60172159	144.7749365	90.06	3.81	544.41	548.22	NAV Lost bottom lock This is a test. Not the case....
561	20090404 115822	14.60171231	144.774933	114.43	3.84	544.33	548.17	Started moving the ship. Plan to travel along the ridge to the E/SE
563	20090404 120023	14.60166126	144.7748476	115.37	8	547.07	555.07	Plan to deploy the last tephra sampler then head to the vent sites with biology.
564	20090404 120126	14.6016346	144.7748545	115.39	6	549.04	555.04	Change plans. Will not deploy bucket now. Will deploy it at the vent at end of dive.
568	20090404 120559	14.60153187	144.7750515	86.79	4.36	546.1	550.46	Moving to the east (a bit to the south of the summit because of the ship position).
569	20090404 120611	14.60152084	144.7750592	86.79	4.15	546	550.15	Will meet up with the summit ridge eventually.
570	20090404 120642	14.6014684	144.7750759	86.49	4.71	545.78	550.49	Ripples come and go. Not a lot of iron deposits here to the south of the summit.
571	20090404 120732	14.60140882	144.7751055	86.22	5.48	543.97	549.45	The look of the sediments changes. Less iron oxides here more volcanic sands (blacker) exposed.
573	20090404 120832	14.60133532	144.7751102	123	4.81	544.5	549.31	The whiter color we see up here is probably sulfur .
574	20090404 120854	14.60130626	144.7751033	121.76	5.28	544.48	549.76	Coated with iron oxides and sulfur up here.
575	20090404 120929	14.60127095	144.7751041	120.9	5.29	544.56	549.85	Iron oxide outcroppings with sulfur on top.
577	20090404 121039	14.60123407	144.7751826	127.95	2.39	540.53	542.92	We're seeing lots of lava talus blocks here. Spurs are perpendicular to the slope. All is heavily mineralized.
578	20090404 121108	14.60122863	144.7751865	108.39	4.99	538.58	543.57	Climbing up the slope laterally now. The pit is just to the south of us.
580	20090404 121217	14.60119242	144.7752269	79.63	3.74	537.49	541.23	Next will look at Ko-ichis samplers then will move on to the biological area at the E/SE summit area.
581	20090404 121226	14.60118722	144.7752281	78.98	3.31	537.85	541.16	J2-396 Data DVDs start Blue set 004
582	20090404 121234	14.60118465	144.7752312	79.96	1.99	537.8	539.79	Just west of the summit now.

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583	20090404 121306	14.60118346	144.775251	79.75	2.6	536.8	539.4	Still on the steep southern slope. Vertical scarps and outcrops here.
585	20090404 121533	14.60114521	144.7752914	109.75	2.1	534.85	536.95	Salt and pepper texture. Mixture of volcanic and sulfur sed. quite a few shrimp here.
587	20090404 121553	14.60114429	144.775294	110.72	2.11	534.69	536.8	Shrimp in the new volcanic sands. Could be bacterial mat here.
588	20090404 121710	14.60112698	144.7753469	110.27	2.81	531.71	534.52	Poor visibility.
589	20090404 121713	14.60112675	144.7753496	110.3	2.7	531.76	534.46	J2-396 Data DVDs stop Red set 003
590	20090404 121729	14.6011248	144.7753587	110.37	2.64	531.87	534.51	About 20m west of the summit. Visibility poor.
592	20090404 121818	14.60112508	144.7753574	110.52	2.61	531.85	534.46	We must be in the plume here. Can't see a thing.
593	20090404 121901	14.60111628	144.7753806	111.91	2.06	532.02	534.08	Less than 2m off the bottom and can't see a thing.
594	20090404 121923	14.6011044	144.7754136	109.55	1.3	532.41	533.71	Starting to see the bottom again but still very murky.
596	20090404 122034	14.6010869	144.7754248	100.22	2.36	530.65	533.01	We have visibility again. Bright orange volcanic necks (hoodoo) sticking out.
597	20090404 122057	14.60107636	144.7754473	103	1.55	531.8	533.35	Frame Grab
599	20090404 122145	14.60106357	144.7754613	61.81	1.06	531.17	532.23	Little "valley" here. A crack. White sulfur? covering the iron oxide outcrops here.
600	20090404 122217	14.60105679	144.7755007	64.4	1.29	532.05	533.34	Maybe a local source of material here.
601	20090404 122251	14.60103812	144.775546	88.36	2.34	532.62	534.96	Could be the top of a mass wasting scarp here.
603	20090404 122357	14.60099349	144.7756432	99.76	1.83	536.3	538.13	We're going to get the "homer" numbers on Koichi's sensors. Looking around for them.
604	20090404 122504	14.60093995	144.7756856	98.46	1.24	539.63	540.87	We're due NE of the pit now.
606	20090404 122601	14.600914	144.7757778	98.35	0.85	540.73	541.58	The white on the surface is probably clumps of sulfur (Cornel).
607	20090404 122630	14.60089569	144.7758281	98.77	0.98	540.99	541.97	Rippled volcanic sands here.
608	20090404 122645	14.6008773	144.7758378	66.07	3.3	540.27	543.57	Start seeing ripples when are outside of the direct fallout.
609	20090404 122709	14.60088495	144.7758516	65.19	2.86	540.04	542.9	The sulfur looks white and the iron oxides are yellow. Could possibly be diffuse venting going on here.
611	20090404 122929	14.60087681	144.7758834	60.72	3.55	538.51	542.06	There is a possibility of diffuse flow here??
613	20090404 123027	14.60085584	144.7759142	100.55	3.21	536	539.21	We haven't seen any of the filamentous bacteria here.
615	20090404 123149	14.60083309	144.7759912	88.5	2.56	533.34	535.9	Shimmering here. Bubbles coming up out of the sand.
616	20090404 123204	14.60083255	144.7759916	88.49	2.51	533.42	535.93	Lots of shrimp and diffuse flow.
618	20090404 123349	14.60083327	144.7759915	88.33	2.55	533.38	535.93	This area is called "Bubbler". Lots of shrimp and bubbling flow.
619	20090404 123415	14.60083332	144.7759915	88.28	2.53	533.38	535.91	VIDEO Start recording HDCam at new "Bubbler" Vent.
620	20090404 123511	14.60083315	144.7759916	88.31	2.64	533.38	536.02	Odd color on the HD cam. The shrimp have turned blue (it's the video monitor not the HD cam).
622	20090404 123548	14.6008351	144.7759963	88.33	2.64	532.71	535.35	Looks like there are 2 types of shrimp here. Taking some DSC pics and HD video.
623	20090404 123614	14.60083697	144.7760038	88.74	2.99	531.46	534.45	Quite intense flow bubbling out of a crack.
624	20090404 123702	14.60084638	144.7760057	87.23	3.4	530.46	533.86	Bubblier is 259 deg 82m from Brimstone09.
626	20090404 123757	14.60084775	144.7760062	86.51	3.46	530.13	533.59	VIDEO Stop recording HDCam
627	20090404 123841	14.60084757	144.7760062	86.46	3.53	530.13	533.66	Going to get Evan to check why the HD cam monitor is giving us odd colors.
628	20090404 123901	14.60084719	144.776011	82.99	2.75	529.33	532.08	We're waiting for Evan.
631	20090404 124242	14.60084746	144.7760107	82.96	3.01	529.22	532.23	HD cam problems with screen. Splitting the screen.
632	20090404 124257	14.60084767	144.7760108	82.92	3.03	529.18	532.21	When press record get a split screen on the big cam.
635	20090404 124630	14.60084762	144.7760108	82.83	2.99	529.15	532.14	Evan says that it's only the monitor. the HD recording is fine.
636	20090404 124712	14.60084736	144.7760108	83.08	3.8	529.15	532.95	Annotated science camera is being recorded on the DVCam deck (aside).



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638	20090404 124804	14.60084694	144.7760111	83.03	4.63	529.18	533.81	Evan thinks that the DVCam image is screwed up.
639	20090404 124836	14.60084703	144.7760112	83.1	4.71	529.17	533.88	Bob's probably not being recorded for awhile.
641	20090404 124936	14.60084553	144.7760172	82.77	4.39	528.83	533.22	Now we're seeing Bob's voice on the recording. That is Ok. Just moved the headset.
642	20090404 125001	14.60083653	144.7760445	83.32	2.06	528.61	530.67	Still debating the DVCam problem. It's split even in the non-annotated version.
646	20090404 125537	14.60096701	144.7760142	343.51	2.28	521.68	523.96	The super high def (HDCam) is the 1 hour big tapes. When it is on (highlights) all the other video strings get a split (horizontal) screen.
647	20090404 125615	14.60100192	144.7759891	343.51	3.39	519.57	522.96	This is a large problem because the DVCam and DVDs will be split then too. Solution is to limit HDCam recording..Not a good one!
648	20090404 125721	14.6010171	144.775982	9.09	3.53	519.18	522.71	We have found Koichis instrument. Looking at it. Sitting on the ridge crest here.
651	20090404 125950	14.60102752	144.7759811	9.78	3.26	518.83	522.09	This sensor is using homer 49. The pressure case has a number 148 on it.
652	20090404 130012	14.60103255	144.7759657	9.34	3.91	518.46	522.37	The other Koichi sensor is 30m to the west. We see it here.
653	20090404 130123	14.60107934	144.7759244	45.95	5.06	518.42	523.48	Koichis sensors are measuring the subseafloor temps. The probes are about 5cm into the sediments.
655	20090404 130151	14.60108836	144.7759327	45.3	3.69	518.65	522.34	Both of Koichis instruments have been located along the ridge line.
657	20090404 130430	14.60103321	144.7759598	100.94	2.8	518.46	521.26	We're heading to the easternmost vents on the summit. Fault Shrimp and Scarp top. Biology on the way..
659	20090404 130559	14.60104836	144.7760519	88.09	3.35	518.27	521.62	We're moving on now.
663	20090404 131312	14.60100532	144.776515	87.46	13.53	550.91	564.44	We can record HD without using the remote. Won't effect the other video as long as don't use the remote.
665	20090404 131424	14.60100368	144.776488	87.3	8.98	554.62	563.6	Koichis instruments: With Homer 49 TRmeter#3. No Homer - TR meter #4.
667	20090404 131635	14.60100074	144.7765421	87.81	5.81	559.86	565.67	We're waiting for the ship to move before we move the sub anymore.
670	20090404 132029	14.60094125	144.7767157	87.52	5.74	562.11	567.85	We're starting to head east towards Fault Shrimp.
672	20090404 132140	14.60092639	144.7767552	87.8	2.76	566.29	569.05	Rippled volcanoclastic sedes here on the seafloor.
673	20090404 132159	14.60091994	144.7767819	87.91	2.46	567.14	569.6	We've dropped off onto the flat area to the east of the summit.
674	20090404 132247	14.60090063	144.7768513	87.12	1.78	569.37	571.15	Depth is 568 here. We're on the flat area here in the center.
675	20090404 132303	14.60089427	144.7768834	87.8	2.24	570.11	572.35	Lots of rippling black sands with white (sulfur?) particles.
676	20090404 132323	14.60088488	144.7769058	87.73	1.88	572.15	574.03	This is a bench of sorts. Much less steep.
678	20090404 132406	14.60086239	144.7769481	88.77	1.73	574.73	576.46	Outcrops here. Heading towards Fault Shrimp.
680	20090404 132700	14.60079278	144.77713	76.45	4.18	580.25	584.43	Beautiful ripples here. Probably lots of sulfur.
682	20090404 132823	14.60078426	144.777194	64.98	1.63	582.04	583.67	Scoping out the area. No signs of life yet.
683	20090404 132835	14.600785	144.7772039	65.54	1.53	582.05	583.58	Volcanoclastic sedes.
684	20090404 132852	14.60078429	144.777213	64.95	1.55	581.84	583.39	The navigation stopped.
685	20090404 132915	14.60078307	144.7772169	64.27	1.66	581.65	583.31	LBL stopped talking. Doppler is working fine.
687	20090404 133009	14.60079147	144.7772492	65.68	1.8	580.07	581.87	This area looks quite old. Heavily winnowed sedes.
688	20090404 133049	14.60080634	144.7772732	65.5	2.03	578.29	580.32	NAV - No LBL right now.
689	20090404 133107	14.60081854	144.7772711	30.85	2.78	577.43	580.21	Looks like some bacterial floc here.
690	20090404 133130	14.60082563	144.7772688	19.15	2.39	577.46	579.85	This looks like bacterial mat here.
692	20090404 133149	14.60082751	144.7772653	23.18	2.51	577.36	579.87	The mat looks fuzzy. The sulfur is more granular.
693	20090404 133252	14.60082883	144.777259	28.92	2.73	577.28	580.01	Seeing lots of bac mat but no animals so far.
695	20090404 133437	14.60082854	144.7772591	29.23	2.86	577.28	580.14	Scale worms here. Looks like barnacles here too. Filamentous bacteria.
696	20090404 133502	14.60082992	144.777258	29.31	2.73	577.29	580.02	J2-396 DVCAM 003 end DVCAM 004 start
697	20090404 133516	14.6008319	144.7772552	28.75	3	577.11	580.11	VIDEO Start recording HDCam here.

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699	20090404 133637	14.60083092	144.7772563	29.21	2.88	577.09	579.97	Actually just starting to record HD cam now.
700	20090404 133726	14.60083106	144.7772564	29.29	2.8	577.21	580.01	Looking at the little barnacles and some orange floc.
702	20090404 133746	14.60083104	144.7772565	29.21	2.9	577.19	580.09	VIDEO Stop recording HDCam
703	20090404 133810	14.6008312	144.7772561	33.49	2.81	577.21	580.02	NAV - operating without LBL.
704	20090404 133843	14.60083098	144.7772565	33.67	2.85	577.23	580.08	Going to head up to the top of this little hill.
706	20090404 134040	14.60083989	144.7772663	28.92	4.5	574.68	579.18	Moving now over this small scarp hopefully to Fault Shrimp.
708	20090404 134243	14.60091583	144.7772419	64.16	9.29	566.11	575.4	Basalt breccias. Looks like a dike. It's very thin. It defines the western edge (?) of the block. No NAV right now.
710	20090404 134348	14.60095657	144.7772312	89.02	3.25	569.77	573.02	Right now have no LBL or Sharps. We do have Doppler. That's the word from John.
711	20090404 134514	14.60093161	144.7772422	89.68	1.95	571.98	573.93	Looking at a bunch of gastropods here. Probably limpets. Also seeing shrimp and scaleworms.
713	20090404 134635	14.60090417	144.7772376	90.14	1.89	573.98	575.87	We're looking over this area. Lots of limpets and some shrimp.
716	20090404 135034	14.60092794	144.7773813	1.2	3.78	563.32	567.1	Lasers are on now. Zoomed out a bit to get a better. We're looking at the edge of this sharp scarp.
717	20090404 135047	14.60092989	144.7773762	4.51	3.16	563.98	567.14	Just went east over the top of that dike.
718	20090404 135058	14.60093342	144.7773712	12.24	3	564.27	567.27	VIDEO Start recording HDCam
720	20090404 135225	14.60096518	144.7773329	37.38	1.15	563.63	564.78	WATCHSTANDERS Andra Bobbitt logger
722	20090404 135407	14.60095923	144.7773257	35.01	2.53	562.42	564.95	VIDEO Stop recording HDCam
724	20090404 135700	14.60088882	144.777265	33.6	10.64	564.7	575.34	Moving along ridge at 050
725	20090404 135723	14.60087179	144.7772778	12.55	5.91	568.18	574.09	Moving to look along the dike
727	20090404 135825	14.60086285	144.7773105	9.14	5.21	569.61	574.82	The ridge is a dike outcrop with another one further east
728	20090404 135840	14.60086447	144.7773087	37.69	7.08	568.68	575.76	Steep chute on right side
729	20090404 135929	14.60085455	144.7773724	50.1	4.5	566.03	570.53	Intersecting ridges
731	20090404 140032	14.60084261	144.7773952	354.94	10.08	562.58	572.66	This ridge is N-S (perpendicular to the ridge we just were on)
732	20090404 140051	14.60087473	144.7773757	6.33	7.04	563.14	570.18	VIDEO Start recording HDCam
733	20090404 140112	14.6008845	144.777335	5.07	10.94	562.61	573.55	Looking at the ridge intersection
735	20090404 140207	14.60087216	144.7772938	259.64	4.15	568.08	572.23	Ship is stationary and Jason is turning counterclockwise
737	20090404 140520	14.60095979	144.7773102	92.63	5.51	563.04	568.55	VIDEO Stop recording HDCam Video off HD Cam
739	20090404 140547	14.60095967	144.7773113	92.74	5.21	562.89	568.1	VIDEO Start recording HDCam
740	20090404 140700	14.60095281	144.7773157	92.06	3.38	565.23	568.61	Lots of shrimp
741	20090404 140734	14.6009472	144.7773173	75.27	4.68	564.83	569.51	Incredible amount of shrimp
743	20090404 140756	14.60094679	144.7773173	75.05	4.65	564.85	569.5	J2-396 Data DVDs start red sed
744	20090404 140802	14.60094688	144.7773172	75.08	4.7	564.84	569.54	Zooming in on shrimp and can see some shimmering water
745	20090404 140822	14.60094681	144.7773171	75.03	4.68	564.83	569.51	We are 10m north of Fault Shrimp
746	20090404 140833	14.60094684	144.7773172	74.96	4.69	564.82	569.51	Lots of diffuse flow
748	20090404 140959	14.60095498	144.7773206	89.27	3.19	564.76	567.95	Looks like red staining on rock from afar but actually dense concentrations of shrimp
749	20090404 141016	14.60095922	144.7773184	105.68	2.6	564.86	567.46	Looks like lots of shimmering on the ridge
750	20090404 141027	14.60096342	144.7773233	125.95	2.49	564.88	567.37	Panning to right
751	20090404 141051	14.60096256	144.7773266	123.68	2.21	564.88	567.09	Promontory off the EW ridge
752	20090404 141132	14.60096976	144.7773314	119.42	2.29	564.92	567.21	Tefra (dark) with sulfur crust above
754	20090404 141216	14.60096992	144.7773313	119.44	2.16	564.95	567.11	Arm showed it is rock and sand
755	20090404 141238	14.60097396	144.7773329	125.59	2.76	564.31	567.07	Ship is moving

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756	20090404 141302	14.60097936	144.7773567	100.37	3.15	562.72	565.87	Heading east to Scarp Top
757	20090404 141319	14.60098118	144.7773801	96.56	1.94	562.4	564.34	Moving along ridge heading east
759	20090404 141341	14.6009579	144.7774108	99.01	2.38	562.23	564.61	Outcrops sticking out along ridge with altered sulfur crust
760	20090404 141342	14.60095732	144.7774128	99.1	2.45	562.19	564.64	J2-396 Data DVDs stop blue set
761	20090404 141352	14.60095254	144.7774307	104.36	2.48	562.12	564.6	On top of ridge
762	20090404 141403	14.60095248	144.7774325	163.11	5.53	561.51	567.04	Turning vehicle to face ridge as we go down
763	20090404 141458	14.60092459	144.7774461	264.91	18.16	559.84	578	We are on the south side of the ridge
764	20090404 141530	14.6009164	144.7774832	258.37	26.47	563.37	589.84	Coming down scarp
766	20090404 141556	14.60090707	144.7774816	262.05	22.44	568.5	590.94	Changed HD end tape 1 and start tape-2
767	20090404 141644	14.60090886	144.7774821	261.48	22.68	567.97	590.65	We under lip of ridge-facing the ridge
768	20090404 141702	14.6009061	144.7774772	258.36	22.79	567.91	590.7	Waiting for ship and Medea
769	20090404 141732	14.600889	144.7774585	257.19	13.88	567.06	580.94	Lots of staining-very colorful
771	20090404 141743	14.60088941	144.7774562	254.64	16.33	567.32	583.65	Alteration or ?
772	20090404 141802	14.60089188	144.7774508	257.54	14.58	567.07	581.65	VIDEO Start recording HDCam recording
774	20090404 142006	14.60092805	144.7774366	256.42	12.96	567.26	580.22	Only one lonely crab
775	20090404 142115	14.60092092	144.777443	253.14	17.19	566.44	583.63	Moving ship more East
777	20090404 142155	14.60092938	144.7774424	256.59	16.31	567.77	584.08	Current is moving Medea over other side so can't go down too far
778	20090404 142203	14.60092702	144.777442	256.45	15.55	567.93	583.48	Mat filaments
779	20090404 142300	14.60094659	144.7774302	256.2	13.04	567.35	580.39	Moved only 40m east from the shrimp site
780	20090404 142324	14.6009462	144.7774304	258.63	12.7	567.47	580.17	Zooming in and seeing lots of mat material
782	20090404 142336	14.60094523	144.7774301	254.87	13.43	567.36	580.79	Can see shimmering so diffuse flow coming out of ridge
783	20090404 142356	14.60094802	144.7774298	254.79	13.61	567.18	580.79	Would be an interesting sampling spot for low temperature
784	20090404 142421	14.60095609	144.7774278	255.76	12.51	567.68	580.19	Face is almost vertical with a bit of overhang
785	20090404 142434	14.60095229	144.7774295	256.33	12.28	567.93	580.21	Great close-up view of the mat
786	20090404 142501	14.60095681	144.7774273	246.2	12.85	568.09	580.94	Looking at lighter areas of mat
788	20090404 142625	14.60098131	144.7774155	247.95	12.96	568	580.96	VIDEO Stop recording HDCam
790	20090404 142737	14.60098226	144.7774345	244.63	18.61	569.2	587.81	Trying to get some Jason fixes with the LBL
791	20090404 142758	14.60098525	144.7774254	246.32	13.86	572.28	586.14	Looks like a vertical wall
792	20090404 142823	14.60098697	144.7774274	249.1	13.28	574.13	587.41	Sonar shows a solid wall
793	20090404 142841	14.6009852	144.77743	247.88	11.65	576.19	587.84	Moving down further about 6-8 meters from the scarp
795	20090404 142951	14.60091858	144.7774642	262.01	13.99	579.99	593.98	Offset agrees with the Brimstone 06-09 offset
796	20090404 143028	14.60093396	144.7777501	263.17	9.43	585.18	594.61	NAV Doppler reset
797	20090404 143042	14.60093163	144.7777426	263.72	8.33	586.17	594.5	Wall looks like completely covered by mat
798	20090404 143103	14.60092804	144.7777371	263.12	8.45	586.23	594.68	Older part of the volcano with alteration and eroded
799	20090404 143112	14.60092848	144.7777379	263	8.49	586.21	594.7	Couple of fish
801	20090404 143220	14.60092499	144.7777377	262.69	8.38	586.45	594.83	VIDEO Start recording HDCam
802	20090404 143314	14.60092538	144.7777378	263.16	8.43	586.42	594.85	Stopping and observing wall with fish
804	20090404 143341	14.60092516	144.7777377	262.89	8.46	586.38	594.84	Brow cam shows more fish on the slope
806	20090404 143652	14.60092504	144.7777372	262.05	8.44	586.41	594.85	VIDEO Stop recording HDCam
808	20090404 143746	14.60092507	144.7777406	261.8	8.05	586.53	594.58	Going further down scarp
809	20090404 143833	14.60092652	144.7777536	263.36	3.09	592.26	595.35	Base of the wall
810	20090404 143848	14.60092737	144.7777577	262.43	2.75	592.67	595.42	Bottom of breccia with finer sediment at base
812	20090404 143948	14.60092447	144.7777538	246.99	1.65	593.51	595.16	Looks like different type of mat-orange spongy
813	20090404 144058	14.60092264	144.7777489	247.17	1.58	593.42	595	Sandy slope down below us

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814	20090404 144135	14.60092363	144.7777523	224.61	1.05	593.38	594.43	Going to drive SW a bit and go up slope
816	20090404 144301	14.60091833	144.7777473	247.04	7.14	587.82	594.96	Moving up slope and see another fish
817	20090404 144327	14.60090365	144.7777503	248.08	11.04	584.79	595.83	There is the outcrop from the HD video site
819	20090404 144353	14.6008753	144.7777429	248.42	14.53	582.66	597.19	At top of scarp
820	20090404 144405	14.60087471	144.7777404	244.68	14.61	582.7	597.31	Altitude is 14m at top of scarp
821	20090404 144441	14.6008769	144.777739	248.42	14.76	582.57	597.33	Another scarp ahead
823	20090404 144555	14.60087397	144.7777244	294.54	16.68	581.67	598.35	Going to follow along this ridge back toward shrimp area but on the other side
824	20090404 144607	14.60087892	144.7777178	294.36	6.21	581.95	588.16	Another fish
825	20090404 144634	14.60087439	144.7776958	306.27	1.81	581.6	583.41	This side of scarp is also coated in mat
826	20090404 144706	14.60088455	144.7777015	307.54	2.66	581.62	584.28	A small rat tail fish only 20cm
828	20090404 144805	14.60088085	144.777695	307.18	3.31	580	583.31	Going to come up to top view of ridge and follow it laterally to left
829	20090404 144912	14.60088136	144.7776871	307.82	8.26	574.71	582.97	All coated in mat
831	20090404 144944	14.60086643	144.7776709	309.58	11.09	572.6	583.69	Getting near the top
832	20090404 145012	14.60084689	144.777656	322.69	13.39	572.26	585.65	At the top and can see the fault shrimp area beyond
833	20090404 145051	14.60082515	144.7776435	323.35	13.39	574.41	587.8	Series of knife-edge scarps
835	20090404 145202	14.60082192	144.777624	313.89	11.48	578.98	590.46	Coming down to top of another knife-edge
837	20090404 145415	14.6008251	144.7776294	304.12	8.86	580.85	589.71	This scarp is between the Shrimp Fault and the large scarp we went up
838	20090404 145434	14.60082494	144.7776293	304.4	8.71	580.85	589.56	Seeing some snails of some sort
840	20090404 145537	14.6008251	144.7776288	305.13	8.95	580.85	589.8	Mat here looks different like Swiss cheese
841	20090404 145629	14.6008248	144.7776286	304.9	8.93	580.86	589.79	Fairly sure the snails are pink limpets
842	20090404 145656	14.60082494	144.7776284	304.91	8.93	580.86	589.79	VIDEO Start recording HDCam view of limpets
844	20090404 145854	14.6008248	144.7776281	305.02	8.83	580.83	589.66	Lasers off
846	20090404 145958	14.60082482	144.7776281	304.98	8.75	580.84	589.59	Weird structure of mat - sheep's wool or Swiss cheese
847	20090404 150024	14.6008247	144.7776281	305.2	8.78	580.83	589.61	Verena confirmed they are limpets
848	20090404 150040	14.60082465	144.7776281	305.17	8.79	580.85	589.64	Here before but new
849	20090404 150116	14.60082476	144.7776281	305.11	9.28	580.82	590.1	Shinkailepas limpets only found here on previous dives and currently under description
851	20090404 150145	14.60082479	144.777628	305.1	9.26	580.85	590.11	Another animal in view but can't identify
852	20090404 150152	14.60082477	144.777628	305.1	9.29	580.81	590.1	VIDEO Stop recording HDCam
853	20090404 150211	14.60082474	144.777628	305.06	9.26	580.81	590.07	Done with video survey and going to move
854	20090404 150247	14.60080591	144.7776159	302.36	10.19	580.8	590.99	Moving up to top of edge
855	20090404 150323	14.60078435	144.7776125	283.66	10.41	580.43	590.84	Going to go down this ridge and move over to next
856	20090404 150331	14.60077785	144.7776105	299.5	11.46	580.29	591.75	this one ends abruptly
858	20090404 150416	14.60076137	144.7775873	3.08	9.41	581.39	590.8	Narrow and steep underwater compared to what could occur on land
859	20090404 150438	14.60075928	144.7775809	4.83	8.7	581.99	590.69	Ridges are close to parallel and N-S where graben structure is
861	20090404 150554	14.6007661	144.7775709	52.36	6.03	583.34	589.37	Can't move to bottom of this ridge without moving ship so going to move over to next one
862	20090404 150608	14.60077565	144.7775747	65	5.05	583.39	588.44	Looking at knife edge of this ridge
863	20090404 150641	14.60079607	144.7775785	72.05	3.4	583.37	586.77	Looking at west face of the other side of the knife edge ridge (over from the breccia ridge)
864	20090404 150654	14.60079331	144.7775775	71.91	3.65	583.34	586.99	Not as much mat on this side-can see the rocks
865	20090404 150706	14.60079306	144.7775755	72.57	3.65	583.3	586.95	This one looks like a breccia too
866	20090404 150723	14.60079366	144.7775754	72.81	3.61	583.33	586.94	This area has less current and could be sheltered

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868	20090404 150805	14.6008186	144.7775568	81.75	1.41	583.31	584.72	At start of next ridge and want to stay on right side
869	20090404 150925	14.60082277	144.7775538	78.42	0.74	583.85	584.59	Can see some mat on the beginning of this ridge (looks like ship brow)
871	20090404 150939	14.60082332	144.7775539	78.77	0.78	583.71	584.49	Some layering in the rock
872	20090404 151014	14.60082702	144.7775564	69.43	1.1	583.24	584.34	Going to follow along this edge facing or on right side
873	20090404 151052	14.60082054	144.7775606	36.38	2.94	582.85	585.79	Moving around to right side of ridge
874	20090404 151125	14.60081682	144.777568	31.86	3.75	582.47	586.22	Can see shelf on right side and looks like it extends across
876	20090404 151144	14.60081634	144.777575	33.02	4.1	582.31	586.41	Some crust that could have built up and then gave way
877	20090404 151207	14.60081677	144.7775787	32.46	4.15	582.13	586.28	Crust goes through both sides
878	20090404 151216	14.60081542	144.777581	25.09	4.4	582.08	586.48	Formerly laterally continuous
880	20090404 151346	14.60081368	144.7775845	25.31	4.38	582.12	586.5	Zooming in on crust layer
881	20090404 151455	14.60081823	144.7775718	28.02	4.36	581.9	586.26	Looks like deposited on downslope and then eroded
883	20090404 151538	14.60082667	144.7775756	30	5.25	580.29	585.54	Moving up on top of ridge and think this is the one with the shrimp on the other side
884	20090404 151547	14.60083	144.7775768	30.3	5.2	580.12	585.32	Good view of the crust
885	20090404 151718	14.60086329	144.777586	20.18	3.51	575.78	579.29	Moving along ridge at 020
887	20090404 151821	14.60087639	144.7775959	19.92	5.58	572.43	578.01	Looks like some sulfur staining on left
888	20090404 151841	14.60088015	144.7775977	19.9	5.96	571.6	577.56	Not seeing any shrimp since the concentrated site
889	20090404 151849	14.60088109	144.7775984	20.3	6.19	571.29	577.48	Covered in mat here
890	20090404 151903	14.60088371	144.7775996	20	6.35	570.9	577.25	Seeing more white sulfur or altered crust
891	20090404 151927	14.60088047	144.7776166	3.82	7.59	570.96	578.55	Block structure on top
893	20090404 151948	14.60087802	144.7776182	5.74	5.91	570.45	576.36	Breccia ridge ran out and this looks like ash dune mixed with sulfur
894	20090404 152024	14.60088066	144.7776197	6.02	6.8	570.09	576.89	Cornel may want a sample of this
896	20090404 152157	14.60090176	144.7776342	3.32	3.35	568.17	571.52	Big overhang
898	20090404 152336	14.60094184	144.7776422	40.47	2.39	566.76	569.15	Moving along knife edge and see a crab heading 041
900	20090404 152604	14.60101279	144.7776268	359.98	3.18	562.83	566.01	We've had LBL back for awhile on Medea
901	20090404 152619	14.60101817	144.777623	359.72	2.99	562.82	565.81	Jason is too far down the ridge to get LBL
902	20090404 152630	14.60101817	144.7776234	0.38	3.39	562.57	565.96	Jason is under vehicle with good Medea nav
903	20090404 152701	14.60075649	144.7775632	0.64	2.89	562.55	565.44	NAV Doppler reset
904	20090404 152711	14.60075848	144.7775642	0.11	2.74	562.58	565.32	Shrimp on the white slope
906	20090404 152751	14.60075787	144.7775468	23.75	1.7	563.41	565.11	White definitely looks like a crust as can see edges
907	20090404 152803	14.60075839	144.7775493	24.46	1.6	563.51	565.11	Shrimp are on top of white crust
908	20090404 152824	14.60075753	144.7775488	24.36	1.66	563.42	565.08	Looks like the crust we saw downslope on ridge that was eroded
909	20090404 152921	14.60075609	144.7775445	26.08	1.63	563.48	565.11	Some diffuse flow and shimmering water
911	20090404 153019	14.60077747	144.7775537	27.01	192.1	564.87	756.97	On the bottom
912	20090404 153248	14.60060562	144.7775388	27.3	198.8	564.85	763.65	VIDEO Start recording HDCam
913	20090404 153306	14.60060796	144.7775419	27.39	143.76	564.85	708.61	Shrimp are feeding madly
914	20090404 153322	14.60061096	144.7775421	27.58	143.76	564.85	708.61	Only one species of shrimp here (grazer)
915	20090404 153405	14.60060657	144.7775358	27.9	196.64	564.85	761.49	Verena taking watch leader to view shrimp
916	20090404 153436	14.60061507	144.777535	28.05	177.01	564.81	741.82	Now sees the carnivore
917	20090404 153519	14.60062486	144.777548	27.74	140.88	564.84	705.72	White eyes are the grazers
918	20090404 153522	14.60062571	144.7775496	27.7	140.88	564.85	705.73	J2-396 Data DVDs stop DVCAM 004 stop
919	20090404 153532	14.60062616	144.7775445	27.74	189.64	564.85	754.49	Carnivores have a black eye with white underneath
920	20090404 153541	14.60062068	144.7775303	27.71	189.64	564.86	754.5	J2-396 Data DVDs start DVCAM 005 start
921	20090404 153648	14.6006161	144.7775397	28.25	0.74	564.69	565.43	Not a lot of flow here

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923	20090404 153744	14.60062556	144.7775075	27.31	0.74	564.83	565.57	Both species are here
924	20090404 153909	14.6006336	144.7775113	27.03	194.88	564.89	759.77	Large shrimp looks like it is still grazing a bit
925	20090404 153937	14.60062678	144.7775109	27	177.32	564.89	742.21	Carnivores start as grazers then as get big switch (Juniper work)
926	20090404 154017	14.60061629	144.7775168	27	190.69	564.9	755.59	Crab among the shrimp
927	20090404 154039	14.60061796	144.7775169	27.05	195.91	564.89	760.8	Zooming in on crab
928	20090404 154102	14.60061878	144.777518	27.13	172.65	564.88	737.53	Looks like fluid coming out from under edge
929	20090404 154133	14.60062421	144.7775168	27.13	175.44	564.87	740.31	VIDEO Stop recording HDCam
930	20090404 154308	14.60062498	144.7775154	27.08	160.5	564.87	725.37	big carnivore on pilot cam
932	20090404 154346	14.60061931	144.7775147	27.06	0.96	564.84	565.8	Watching shrimp attacks
933	20090404 154506	14.6006055	144.7775263	27.07	1.19	564.01	565.2	Done observing here
934	20090404 154525	14.60083935	144.777565	26.34	0.89	564.32	565.21	NAV Doppler reset
936	20090404 154632	14.60090198	144.7774951	28.69	6.84	562.07	568.91	Flat top on this scarp
937	20090404 154722	14.60091297	144.7774042	354.89	11.43	561.02	572.45	Moving west along the top of this ridge
938	20090404 154733	14.60092357	144.7773944	353.65	10.5	561.01	571.51	Lost the white staining crust
940	20090404 154833	14.6008558	144.7775385	89.58	7.05	561.19	568.24	shear drop off to right side of this scarp
941	20090404 154859	14.60082632	144.7775917	89.28	0.95	563.9	564.85	More white on top with shrimp and crust
943	20090404 154941	14.60075116	144.7776297	77.92	2.3	566.25	568.55	Moving west along ridge top
944	20090404 155024	14.60078821	144.7776012	19.13	3.81	564.9	568.71	Rough edge on top
945	20090404 155052	14.60082196	144.7775547	21.62	2.39	564.2	566.59	Shrimp density is increasing
946	20090404 155117	14.60080754	144.7775242	30.57	3.74	565.27	569.01	Sheets of white crust with some small outcrops all covered with shrimp
948	20090404 155239	14.60083869	144.7775193	137.13	1.56	567	568.56	VIDEO Start recording HDCam At shrimp fault area
949	20090404 155309	14.60084301	144.7775231	167.39	0.74	567.03	567.77	Shrimp area was just below the top of the ridge
950	20090404 155344	14.60084439	144.7775228	173.6	112.37	567.03	679.4	Back near the fault shrimp target
951	20090404 155400	14.60084495	144.7775228	175.67	114.39	567.01	681.4	Limpets and shrimp together (carnivore shrimps)
952	20090404 155535	14.60084788	144.7775223	180.46	188.78	567.13	755.91	Getting good HD footage of shrimp
953	20090404 155637	14.60085245	144.7775267	180.53	189.76	567.13	756.89	Species are segregated into groups
954	20090404 155723	14.60085743	144.7775298	180.52	198.95	567.14	766.09	Few limpets here
955	20090404 155839	14.60086274	144.7775348	180.51	181.79	567.11	748.9	More shrimp observations
956	20090404 155922	14.60086421	144.7775346	180.5	178.35	567.11	745.46	shrimp are more concentrated at crust edges
957	20090404 160218	14.60087294	144.7775421	180.46	164.53	567.14	731.67	White dots on rocks could be limpet eggs
958	20090404 160236	14.60087537	144.7775436	180.46	196.05	567.15	763.2	These limpets are brooders
959	20090404 160306	14.60087735	144.7775453	180.45	184.55	567.09	751.64	Many gastropods on the Marianas arc are brooders
960	20090404 160350	14.6008771	144.7775456	180.48	187.53	567.11	754.64	More limpets in this view with many shrimp
961	20090404 160358	14.60087746	144.7775454	180.48	187.53	567.11	754.64	J2-396 Data DVDs start DVD 006 start
962	20090404 160541	14.60088117	144.7775469	180.48	167.4	567.13	734.53	Continue watching shrimp mash pit
963	20090404 160629	14.60088296	144.7775484	180.48	167.61	567.13	734.74	Lots of shimmering water in crack
964	20090404 160727	14.60088591	144.777551	180.27	172.15	567.17	739.32	J2-396 Data DVDs stop DVD 005 stop
965	20090404 160848	14.60088582	144.7775513	157.83	0.74	567.19	567.93	Just going to rotate vehicle to left to see if can capture the crack better
966	20090404 160911	14.60088664	144.7775519	154.52	0.74	567.51	568.25	thrusters sent shrimp swimming
968	20090404 161053	14.60088575	144.7775517	154	0.74	567.52	568.26	Observing shrimp in hole/crack
970	20090404 161206	14.60088364	144.7775531	154.26	0.74	567.52	568.26	Good flow here
971	20090404 161226	14.60088223	144.7775531	153.99	0.74	567.51	568.25	Shrimp congregated at the flow
974	20090404 161626	14.6008768	144.7775493	154.39	0.74	567.5	568.24	Panning and zooming around the shrimp
975	20090404 161630	14.60087713	144.7775492	154.39	0.74	567.5	568.24	J2-396 previous start was blue set

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976	20090404 161710	14.60087896	144.7775479	154.5	0.74	567.5	568.24	Shrimp on top grooming itself
978	20090404 161803	14.60087925	144.777547	154.41	0.74	567.5	568.24	VIDEO Stop recording HDCam done with shrimp observations
979	20090404 161829	14.60087936	144.7775468	154.58	0.74	567.5	568.24	This is Fault Shrimp site
980	20090404 161853	14.6008798	144.7775467	154.25	0.74	567.5	568.24	Going to head over to Iceberg due west
982	20090404 162009	14.60087997	144.7775478	154.48	0.74	567.51	568.25	Ship will start to move over to 270
984	20090404 162142	14.60087789	144.7775464	154.43	2.31	565.79	568.1	Going to look around the fault structure to get bearings before heading to Iceberg
985	20090404 162208	14.60086594	144.7775503	96.18	4.01	564.52	568.53	Now looking east
986	20090404 162248	14.60086865	144.7775904	99.27	3.33	562.93	566.26	EW ridge up ahead and shrimp on spur off of it.
987	20090404 162335	14.60079214	144.7775972	129.33	6.08	562.35	568.43	Sides of scarp are very different (orange vs. white)
989	20090404 162343	14.60077705	144.7775749	105.21	7.44	563.56	571	Knife edges come off of this
990	20090404 162417	14.6007097	144.7775838	8.7	12.63	568.37	581	Here are the steep chutes coming off of ridge
991	20090404 162450	14.60071506	144.7776253	291.33	3.04	570.48	573.52	Scarp below us.
993	20090404 162612	14.60078843	144.7775298	32.9	5.41	573.16	578.57	Dike looking structure
994	20090404 162715	14.60079907	144.7774765	359.42	5.91	574.17	580.08	White staining fuzzy rocks in areas
996	20090404 162743	14.60083643	144.777414	1.63	4.81	575.33	580.14	Looks like a ski slope with all the white and steepness
997	20090404 162831	14.60085823	144.7773916	21.48	3.91	576.14	580.05	Quite a block of rock without a trail on the white crust
998	20090404 162840	14.60086199	144.7773706	3.35	4.18	576.35	580.53	Jason watch change getting ready.
1001	20090404 163206	14.60080937	144.7772199	321.73	3.69	577.08	580.77	Another outcrop
1002	20090404 163330	14.60075831	144.7771639	322.07	2.88	577.13	580.01	large pillows some with multiple lobes
1005	20090404 163549	14.60069636	144.7770118	321.75	2.68	570.95	573.63	dune like ripples in sediment
1008	20090404 164036	14.60077963	144.7767304	321.64	2.03	559.42	561.45	orange sediment crust of some sort - localized
1009	20090404 164057	14.60078322	144.7767027	320.81	1.7	558.45	560.15	small white or yellow blobs in sediment when zoomed in - sulfur?
1011	20090404 164155	14.60079234	144.7766394	321.54	1.51	554.94	556.45	Seeing some plume in upper right
1012	20090404 164222	14.6007869	144.7766157	322.06	1.78	552.99	554.77	Sulfur staining
1013	20090404 164327	14.60078538	144.7766092	321.71	1.31	553.05	554.36	Some shrimp
1014	20090404 164333	14.60078536	144.7766092	321.71	1.31	553.03	554.34	Outcrop on top
1016	20090404 164536	14.6006796	144.7765648	320.6	3.16	549.47	552.63	Driving toward Iceberg which had a depth of 534m
1018	20090404 164704	14.60070832	144.7764022	289.55	2.76	540.03	542.79	Shrimp and outcrop to right
1019	20090404 164720	14.60069597	144.7763912	289.82	2.63	539.91	542.54	More shrimp here than last visit in 2006
1021	20090404 164813	14.60067808	144.7763562	290.43	2.51	538	540.51	Sandy broad ridge with some outcrops (and shrimp)
1022	20090404 164850	14.60067237	144.7763266	290.59	2.25	536.4	538.65	Lots of shrimp
1023	20090404 164859	14.6006625	144.7763166	289.75	2.08	536.12	538.2	Edge has outcrop
1024	20090404 164913	14.6006571	144.7763089	289.79	2.23	535.84	538.07	Is this Iceberg? Nav does not think so.
1026	20090404 165003	14.60068192	144.77622	289.59	3.74	533.14	536.88	Iceberg was an odd promontory but that wasn't iceberg shaped
1027	20090404 165027	14.60071518	144.7762205	293.89	5.58	533.81	539.39	Heading 294 looking for Iceberg
1029	20090404 165137	14.60078138	144.7761452	351.97	6.28	533.21	539.49	Some yellow sulfur and white dusting along this part of ridge
1030	20090404 165202	14.60081196	144.7761522	29.27	7.56	529.34	536.9	We are at right depth and looking for Iceberg
1032	20090404 165347	14.60092135	144.7762379	66.8	6.43	514.89	521.32	Above top of ridge and spinning around.
1033	20090404 165453	14.60094086	144.7763565	115.45	3.54	521.27	524.81	Coming back down to ridge top
1034	20090404 165527	14.60086535	144.7763662	172.48	4.74	524.29	529.03	Over 10m above Iceberg height right now so coming down
1037	20090404 165743	14.60084768	144.7764912	278.43	6.48	533.35	539.83	Yellow staining on some of the outcrops could be altered
1038	20090404 165833	14.60081553	144.7764962	282.22	8.81	536.64	545.45	This is iceberg with not too much flow
1039	20090404 165900	14.6008186	144.7764969	282.05	8.7	536.65	545.35	Still some shrimp but not as much as before.

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1040	20090404 165913	14.60081889	144.776497	282.05	8.58	536.74	545.32	Some flow on left side and there is shrimp in flow.
1042	20090404 165938	14.60080673	144.7764933	295.94	7.81	536.77	544.58	coming around to left to view into flow
1043	20090404 165945	14.6008092	144.7764939	296.41	8.05	536.72	544.77	Crab with shrimp
1044	20090404 170015	14.60081169	144.7764852	297.07	5.69	537.36	543.05	Depth is deeper this time at 538 and nav about 20m off
1045	20090404 170058	14.60081472	144.7764795	297.15	4.84	537.49	542.33	Nav is off 20m from 2006 position
1047	20090404 170142	14.6008129	144.7764791	296.99	5.03	537.5	542.53	Nav putting a target at this site
1048	20090404 170333	14.60080502	144.7764633	326.73	1.46	538.2	539.66	Is that mat in flow?
1050	20090404 170350	14.60080216	144.776465	326.43	1.45	538.2	539.65	Moyer wants filament material
1051	20090404 170423	14.60080287	144.7764643	326.42	1.41	538.27	539.68	Good fluid sampling site for later
1052	20090404 170456	14.60080428	144.7764633	327.04	1.48	538.2	539.68	VIDEO Start recording HDCam few minutes of HD
1054	20090404 170612	14.6008031	144.7764637	325.69	1.41	538.29	539.7	Observing flow and shrimp with mat breaking up
1056	20090404 170753	14.60080722	144.7764608	326.6	1.43	538.27	539.7	Still observing flow area
1057	20090404 170813	14.60080798	144.7764602	326.59	1.45	538.25	539.7	Pieces of mat breaking off in flow with shrimp on edges.
1058	20090404 170931	14.60080678	144.7764601	326.49	1.44	538.25	539.69	Shrimp in middle has another shrimp under it.
1061	20090404 171206	14.60079674	144.776466	326.58	1.44	538.25	539.69	VIDEO Stop recording HDCam done with shrimp observation with HD
1062	20090404 171234	14.60079731	144.7764655	326.63	1.44	538.26	539.7	Going to slurp some mat for Moyer at Iceberg
1063	20090404 171301	14.60079882	144.7764642	326.34	1.44	538.26	539.7	Nice size crabs with shrimp
1064	20090404 171329	14.60079632	144.7764662	329.16	1.55	538.11	539.66	Preparing vehicle for slurp sample
1066	20090404 171359	14.60079658	144.776466	326.91	1.49	538.19	539.68	These crabs feed on bacterial mats
1067	20090404 171445	14.60079661	144.7764658	326.54	1.48	538.23	539.71	Arm has suction hose
1069	20090404 171638	14.60079646	144.7764651	326.76	1.46	538.24	539.7	SAMPLE Biology Slurp sample of bacterial mats at Iceberg in flow J2-396-bio-02
1070	20090404 171701	14.60079641	144.7764649	326.8	1.46	538.24	539.7	SAMPLE Biology J2-396-bio-02 has some shrimp bicatch in it
1072	20090404 171749	14.60079649	144.7764647	326.75	1.43	538.3	539.73	finished sample J2-396-bio-02
1073	20090404 171850	14.60079636	144.7764644	327.43	1.39	538.32	539.71	Crack looks cleaned out of mat material
1074	20090404 171933	14.60079645	144.7764643	327.51	1.41	538.27	539.68	Sampling more mat at adjacent flow crack area (without moving vehicle) J2-396-bio-02
1076	20090404 172116	14.600794	144.7764659	327.67	1.58	538.4	539.98	Done sampling and bringing basket out to store slurp hose
1078	20090404 172226	14.60079477	144.7764646	327.52	1.28	538.51	539.79	Getting some imagery of crab with HD
1079	20090404 172303	14.60079475	144.7764646	327.46	1.24	538.55	539.79	VIDEO Start recording HDCam crabs
1081	20090404 172432	14.60079438	144.7764647	327.37	1.25	538.55	539.8	Following crab with camera
1083	20090404 172550	14.60079456	144.7764644	327.58	1.23	538.55	539.78	Moved camera back to bigger crab in crack
1084	20090404 172642	14.60079435	144.7764644	327.57	1.24	538.53	539.77	VIDEO Stop recording HDCam done with crab
1086	20090404 172856	14.60079447	144.7764631	326.99	1.28	538.53	539.81	Going to next target at Gastros
1088	20090404 173101	14.60080563	144.7764426	306.29	4.3	534.3	538.6	Moving 314 to Gastros which should have a depth at 536
1090	20090404 173211	14.60081771	144.7763679	306.84	5.04	530.51	535.55	Moving west 305 to Gastros with a few outcrops above us
1091	20090404 173220	14.60082422	144.7763575	306.17	4.9	529.99	534.89	Driving at 530
1092	20090404 173233	14.6008295	144.7763463	307.25	4.01	529.8	533.81	Looks like water coming out of outcrop base
1093	20090404 173304	14.60083194	144.7763305	307.92	2.38	530.78	533.16	See water in crack and a good place to fluid sample
1094	20090404 173328	14.60082928	144.7763239	302.35	1.56	531.28	532.84	Drove 16m NW from Iceberg to this outcrop at 530m depth
1096	20090404 173354	14.60082893	144.7763239	302.73	1.76	531.1	532.86	Kicked up some sediment here
1097	20090404 173431	14.60082847	144.7763239	302.7	1.83	531.09	532.92	This outcrop is at the 2006-Iceburg location also known as target-12 in Jason nav
1098	20090404 173442	14.60082829	144.776324	302.7	1.8	531.1	532.9	Use those coordinates for fluid sampling



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1099	20090404 173509	14.60082794	144.7763242	302.71	1.83	531.09	532.92	Letting water clear
1100	20090404 173514	14.60082803	144.7763242	302.71	1.84	531.07	532.91	J2-396 Data DVDs stop DVCAM 005 stop
1102	20090404 173547	14.6008324	144.7763274	305.37	1.96	530.84	532.8	J2-396
1103	20090404 173609	14.60082785	144.7763311	306.9	3.96	529.27	533.23	Water isn't going to clear so going to continue to Gastros
1104	20090404 173614	14.60082546	144.7763325	306.04	4.44	528.94	533.38	J2-396 Data DVDs start DVCAM 006 start
1105	20090404 173621	14.60082412	144.7763366	305.61	5.1	528.55	533.65	Outcrop has onion-skin look
1107	20090404 173812	14.60085859	144.7762611	306.11	4.23	523.66	527.89	It is a small outcrop bulging out of outcrop and not very distinguished
1108	20090404 173826	14.6008558	144.7762534	305.76	3.89	523.78	527.67	We are at 523m and Gastros should be at 536m.
1109	20090404 173840	14.60085182	144.7762637	309.91	4.75	523.61	528.36	May be downslope on south side
1111	20090404 174023	14.60076279	144.7761646	353.76	11.11	526.09	537.2	Looking along ridge at 353
1113	20090404 174207	14.60088038	144.776012	61.47	8.53	531.4	539.93	See some plume wafting by
1114	20090404 174332	14.60087199	144.7760263	72.51	5.71	534.49	540.2	At the old Gastros depth of 536 searching outcrops for the location
1116	20090404 174513	14.60088561	144.7760547	71.47	4.13	534.67	538.8	We are about at old Gastros target at the proper depth
1119	20090404 174904	14.60088495	144.7760275	72.64	1.5	538.05	539.55	VIDEO Start recording HDCam
1120	20090404 174916	14.60088575	144.7760279	73.35	1.48	537.99	539.47	WATCHSTANDERS Susan Merle logger
1121	20090404 174926	14.60088571	144.7760277	72.99	1.49	537.99	539.48	WATCHSTANDERS Heidi Berkenbosch video
1123	20090404 174959	14.60088564	144.7760275	72.97	1.49	537.97	539.46	Bob Embley is relieving Bill Chadwick. Cornel is on also.
1124	20090404 175126	14.60088587	144.7760278	72.64	1.58	538.01	539.59	Bill has seen a lot of diffuse flow coming out of the base of these fault structures.
1126	20090404 175230	14.60088598	144.7760278	72.52	1.54	538.02	539.56	VIDEO Stop recording HDCam
1129	20090404 175654	14.60088594	144.7760277	72.52	1.54	538.05	539.59	We're going to head to Bubbler (based on Jason nav from this dive).
1130	20090404 175715	14.60088599	144.7760277	72.54	1.56	538.03	539.59	This spot looks like Iceberg to many in the van.
1132	20090404 175933	14.60083581	144.776019	73.22	3.6	538.86	542.46	J2-396 Data DVDs start Red set 006
1134	20090404 180044	14.60083349	144.776012	73.08	3.96	538.87	542.83	J2-396 Data DVDs start Red set 007 not 006 as in previous entry
1135	20090404 180049	14.60083342	144.7760107	72.45	4.08	538.83	542.91	We want to head to Bubbler and put a marker down.
1136	20090404 180122	14.60083327	144.7760115	72.66	3.91	538.92	542.83	Waiting for a LBL fix.
1139	20090404 180442	14.60076032	144.7760432	71.79	6.55	538.98	545.53	J2-396 Data DVDs stop Blue set 006
1142	20090404 180904	14.60072157	144.7761277	21.62	3.05	539.95	543	Largest area of diffuse flow that we have seen - at least on this watch.
1144	20090404 180941	14.60072396	144.7761341	21.58	2.58	539.86	542.44	Large area of intense diffuse flow with lots of limpets and some scaleworms. Bacterial mat.
1145	20090404 181017	14.60072393	144.7761339	21.62	2.54	539.85	542.39	Both species of shrimp here.
1146	20090404 181058	14.60072403	144.7761338	21.67	2.51	539.86	542.37	Grazing shrimp here.
1148	20090404 181157	14.60072381	144.776134	21.77	2.5	539.88	542.38	Shrimp nibbling on bacterial mat.
1149	20090404 181324	14.60072388	144.7761339	21.94	2.53	539.87	542.4	Zooming in and looking at these shrimp.
1151	20090404 181339	14.60072392	144.7761339	21.89	2.5	539.88	542.38	Jason guys are trying to reset the LBL.
1153	20090404 181609	14.60079052	144.7759427	0.89	5.21	541.36	546.57	We're maneuvering here to take a temp in the bubbling diffuse flow area.
1154	20090404 181723	14.60078843	144.7759452	356.22	6.36	541.09	547.45	Lots of shrimp here. Heading is 356 depth is 542 meters. High flow area on southern edge of this ridge.
1156	20090404 181749	14.60078914	144.7759457	355.86	6.33	541.07	547.4	Alteration here. Want to take a temp here with Jason probe.
1157	20090404 181810	14.60078894	144.7759456	355.79	6.25	541.05	547.3	HD cam is off - in case I forgot to say.
1158	20090404 181924	14.60078925	144.7759458	355.8	6.33	541.07	547.4	Lots of flow here. Temp is 36. Depth is 541.
1160	20090404 181953	14.60078986	144.7759464	355.67	6.34	541.05	547.39	We're going to put a marker here.
1161	20090404 182127	14.60078964	144.7759462	355.71	6.61	541.04	547.65	Will deploy a marker here. Temp is 36 here. Vessiculated rocks. Shrimp. Intense flow.

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1165	20090404 182556	14.60079054	144.7759454	354.88	5.86	541.1	546.96	DEPLOY-RECOVER Marker 108. 355 heading, Z=541. Area of intense diffuse flow with lots of shrimp.
1166	20090404 182731	14.60079033	144.7759454	355.55	5.84	541.16	547	This is a on the edge of a ridge here.
1168	20090404 182818	14.60078288	144.7759433	356.08	5.73	541.94	547.67	Backing off down slope here. Lots of flow coming out all over the place.
1169	20090404 182830	14.60078362	144.7759434	356.02	5.5	542	547.5	The lasers are 10 cm apart.
1170	20090404 182919	14.60078383	144.7759431	356.14	4.24	542.45	546.69	Intense flow here at the base of the marker. Taking the temp.
1173	20090404 183204	14.60078455	144.7759425	355.49	3.61	543.04	546.65	Temp here is increasing. We're over 40. Ambient temp is 8.04.
1174	20090404 183228	14.60078465	144.7759425	355.45	3.54	543.13	546.67	Stowing the temp probe.
1175	20090404 183313	14.60077641	144.7759425	356.05	5.53	542.75	548.28	We want to fly about 50 - 100 m south of Brimstone and climb up slope.
1177	20090404 183453	14.60076629	144.7759394	356.13	7.03	542.21	549.24	We want to look around south of Brimstone and climb up slope so can get a good look.
1179	20090404 183616	14.600761	144.7759532	45.72	6.4	542.28	548.68	Marker 108 is just SW of the Bubbler target.
1180	20090404 183711	14.60075504	144.7759346	250.64	4.73	542.23	546.96	We're off the bottom now.
1182	20090404 183808	14.60071889	144.7757838	250.45	6.95	542.22	549.17	We are moving to the SW. Will land 100 m downslope from Brimstone and climb up the chute.
1183	20090404 183825	14.60070901	144.7757222	249.5	2.76	542.26	545.02	Intense plume in the area.
1184	20090404 183844	14.60070059	144.7756984	251.68	3.2	540.68	543.88	Seeing the bottom again. Spurs of outcrop coming off the main ridge.
1185	20090404 183901	14.60068361	144.7756842	247.95	4.39	539.58	543.97	Brimstone was 523m when we saw it earlier.
1187	20090404 183959	14.60065895	144.7755417	237.24	2.79	537.36	540.15	Talus along this chute. Coated with ash and sulfur?
1188	20090404 184033	14.60067563	144.7755066	237.64	3	534.52	537.52	The talus is angular here.
1189	20090404 184116	14.60066832	144.7754267	237.6	3.43	531.38	534.81	Intense plume but can see the bottom a bit here.
1191	20090404 184316	14.60052059	144.7751957	212.5	14.51	531.53	546.04	We're off the bottom now.
1197	20090404 185300	14.60011788	144.775133	219.32	7.96	568.83	576.79	The depth is really off from old map 605m and we're at 575m.
1199	20090404 185408	14.6001004	144.7751518	209.54	3.39	574.8	578.19	It's shallower here than the old map. Is that from the added material falling down slope?
1200	20090404 185432	14.6001234	144.7751304	239.77	2.64	574.81	577.45	We're on the bottom. Will move up slope from here. At 575 m now.
1201	20090404 185512	14.60013396	144.7751046	258.2	2.56	574.84	577.4	Pillow lavas here.
1203	20090404 185607	14.60015322	144.775079	73.89	3	574.36	577.36	Looking at a chute. Pathway to Brimstone?
1204	20090404 185706	14.60016806	144.7750718	63.71	2.71	572.87	575.58	This slope looks pretty intact with pillow lavas and rubble. White coating on the rocks.
1205	20090404 185722	14.60017731	144.7750751	63.67	4.64	570.91	575.55	Waiting for the ship. Heading up the slope.
1207	20090404 185745	14.60019556	144.7750782	63.51	4.04	569.81	573.85	The coating on the rocks is probably mostly sulfur. See ash in the water column as well.
1208	20090404 185858	14.60023907	144.7750879	57.88	2.25	566.31	568.56	These rocks are vespicular. Due to the gas when the lavas were formed.
1209	20090404 185920	14.60024281	144.7750727	57.74	2.43	566.17	568.6	We are probably in between the chute here it appears.
1211	20090404 190013	14.60024438	144.7750072	64.4	4.59	565.53	570.12	Most of the lavas now appear intact. See some intact pillows and rubble that has come down slope.
1212	20090404 190130	14.60028505	144.774931	83.68	4.61	564.27	568.88	Not seeing the main chute here.
1214	20090404 190233	14.60026729	144.7749437	115.77	7.21	560.13	567.34	Will lateral to the E/NE up the slope for a while.
1216	20090404 190351	14.60024419	144.7750283	74.04	8.71	560.22	568.93	We can't really go by the map because it has changed.
1217	20090404 190509	14.60027021	144.7751255	16.07	6.58	558.86	565.44	35m below Brimstone now.
1219	20090404 190621	14.60034118	144.775209	352.54	7.55	556.99	564.54	We're looking at a bit of a depression here.
1220	20090404 190704	14.60037054	144.7752665	10.89	4.71	556.11	560.82	Lots of talus. These are smaller blocks. No sand streams here.
1222	20090404 190753	14.60040407	144.7753286	8.66	4.65	553.72	558.37	Various sizes of talus. Lack of staining on the rocks here.

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1223	20090404 190844	14.60038226	144.775386	12.24	6.56	552.51	559.07	We're looking at the main chute now? Lots of pieces of sulfur here.
1225	20090404 191022	14.60037383	144.7753793	11.62	4.09	555.81	559.9	We're coming a bit closer to the seafloor. Were at 9 meters. Now are at 5.
1226	20090404 191121	14.60037342	144.7753796	11.67	4.33	555.57	559.9	Zooming in on some of the rocks. Breccia cemented together. Speckled part is sulfur.
1229	20090404 191413	14.6004418	144.7754081	18.54	3.05	551.57	554.62	Probably previously altered bits of lava that have been ejected downslope.
1230	20090404 191419	14.60044721	144.7754079	18.67	3.1	551.2	554.3	Lots of stained rocks.
1231	20090404 191431	14.60045939	144.7754078	18.58	2.39	550.3	552.69	We're at 551m here.
1232	20090404 191520	14.6004863	144.7753987	19.68	3.84	546.99	550.83	The bright spots are bits of sulfur. The lighter stuff is probably also sulfur.
1234	20090404 191723	14.60058382	144.7754108	19.37	3.11	540.49	543.6	We're at 548. Not seeing much of the fine-grained stuff.
1236	20090404 191757	14.6006208	144.7754081	19.64	2.7	537.46	540.16	We're not seeing it right here. Fine stuff could be carried downslope.
1237	20090404 191810	14.60063792	144.7754125	19.7	2.64	536.65	539.29	Why do we have chutes of coarse stuff.
1238	20090404 191838	14.60066232	144.7754093	19.67	2.58	534.89	537.47	We're seeing some fine-grained material now. The older sulfur oxidizes and turns whiter.
1239	20090404 191927	14.60068241	144.7753842	18.74	4.54	531.48	536.02	Rock slide going on now. Didn't take much. All at the angle of repose.
1241	20090404 192136	14.60078564	144.7753188	22.32	1.96	524.17	526.13	We see the Brimstone plume off in the distance on the Medea cam.
1243	20090404 192215	14.60078308	144.7753512	26.68	3.96	523.13	527.09	Just passed a tephra sampler.
1244	20090404 192235	14.60077327	144.775374	0.27	5.36	522	527.36	Lots of bubbles pouting out of the vent. Yellow color in the plume.
1245	20090404 192311	14.6007685	144.775365	1.95	4.43	523.8	528.23	It's not the fine-grained cone that we saw earlier. It's poking through a bunch of rubble.
1247	20090404 192401	14.60078083	144.7754078	325.86	5.28	522.48	527.76	Circling around to the right now. We're at 352 (almost due north) and are now looking NW.
1248	20090404 192438	14.60079988	144.7754296	292.97	4.4	522.24	526.64	Great shot of the vent.
1249	20090404 192521	14.60083348	144.7754333	260.98	3.58	521.52	525.1	VIDEO Start recording HDCam Zoomed out looking at the vent while lateralling around it.
1251	20090404 192540	14.60084318	144.7754302	252.08	3.51	521.1	524.61	Finer grained material upslope.
1252	20090404 192559	14.60086139	144.775418	233.3	2.54	520.72	523.26	Now we're looking 252 toward the southwest.
1253	20090404 192628	14.60086794	144.775405	217.92	1.55	520.19	521.74	Can see a remnant of a cone rim.
1254	20090404 192645	14.60086457	144.7754018	218.11	1.23	520.36	521.59	We're looking SW downslope. The plume is billowing up slope.
1255	20090404 192716	14.60086053	144.7753994	217.52	1.23	520.53	521.76	Don't see any ash right now.
1257	20090404 192738	14.60085465	144.7754088	230.38	2.16	520.3	522.46	Going to circle around again. Heading down slope.
1258	20090404 192807	14.60083106	144.775421	266.64	2.31	521.5	523.81	Putting out a lot more bubbles now. The color is changing. More yellow.
1259	20090404 192903	14.60080553	144.7754191	290.37	3.06	522.19	525.25	We're looking toward the west at the pit.
1260	20090404 192919	14.60079209	144.7754085	308.69	4.73	522.09	526.82	The cinder area is to the north of the pit. The south area is more rubble.
1262	20090404 193002	14.60078953	144.7753566	20.05	3.9	522.84	526.74	Looking NW now.
1263	20090404 193014	14.60079635	144.7753474	45.17	2.8	523.13	525.93	Periodic bursts.
1264	20090404 193034	14.60081001	144.7753363	71.96	0.83	523.08	523.91	Now we're seeing sulfur coming out upslope.
1265	20090404 193121	14.60081705	144.775338	54.41	0.9	522.85	523.75	We will sample some of this rock. Big sandfall going on.
1267	20090404 193142	14.60081705	144.7753395	54.51	1.4	522.29	523.69	We're looking toward the east now. Upslope to the left. Downslope to the right.
1268	20090404 193158	14.60081412	144.7753421	44.97	2.28	522.11	524.39	Want to collect a piece of rock with sulfur inside the rock.
1269	20090404 193255	14.60082355	144.7753403	10.92	1.9	522.59	524.49	This looks like part of the old sulfur wall. It's blown apart and in rubble.
1271	20090404 193354	14.60082267	144.77534	12.35	1.06	523.6	524.66	We're stopping to sample a rock. Want it to have sulfur inclusions.
1273	20090404 193540	14.60082103	144.7753423	4.54	1.51	523.12	524.63	Preparing to sample.
1274	20090404 193654	14.60082398	144.775345	5.54	2	522.39	524.39	J2-396 Stop DVCAM 006 start DVCAM 007

Virtual Van Record	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
1275	20090404 193701	14.60082409	144.7753455	2.94	1.98	522.5	524.48	Want to pick up the rock with the lasers on it. Changing our mind on that....
1276	20090404 193720	14.60082427	144.7753453	3.32	1.93	522.55	524.48	VIDEO Stop recording HDCam
1278	20090404 193930	14.60083087	144.775347	356.32	2.55	521.89	524.44	Trying to pick up this rock for Cornel.
1280	20090404 194012	14.60083171	144.7753476	355.03	2.56	521.86	524.42	That rock slid down slope a bit. It's still there somewhere....
1282	20090404 194155	14.60083306	144.7753353	6.39	2.49	521.3	523.79	The last piece got away. Going for a different piece.
1283	20090404 194337	14.60083485	144.7753276	1.99	1.86	521.54	523.4	Large blocks riddled with sulfur. Vessicles. Dark spots could be ash.
1285	20090404 194403	14.60083377	144.775328	2.34	1.84	521.56	523.4	The rocks crumble. They are probably part of the matrix.
1286	20090404 194439	14.60081881	144.7753402	13.22	3.14	521.66	524.8	The sulfur is binding the ash together.
1288	20090404 194538	14.60082663	144.7753482	7.97	1.81	522.7	524.51	trying for another rock.
1289	20090404 194612	14.60082764	144.775349	3.95	2.03	522.5	524.53	Big rock in the claw.
1291	20090404 194803	14.60079828	144.7753454	15.08	3.26	523.04	526.3	SAMPLE Geology 3. Large volcanic rock with sulfur. Placed in the quad where TS D was on the descent.
1292	20090404 194827	14.60079968	144.7753453	14.89	3	523.07	526.07	Sulfur-rich fluids are percolating through.
1293	20090404 194842	14.60079933	144.7753455	14.58	2.96	523.08	526.04	Will scoop up the sulfur-rich sandy material here for Nick.
1294	20090404 194851	14.60079968	144.7753453	14.79	2.96	523.08	526.04	Sample 3 was for deRonde.
1295	20090404 194910	14.60079944	144.7753455	14.75	3.01	523.09	526.1	Scoop sample next for Deardorff.
1297	20090404 195038	14.60080141	144.7753447	354.07	2.2	524.37	526.57	Scooping up seds at same depth as Brimstone.
1299	20090404 195244	14.60078629	144.7753453	354.58	2.41	524.2	526.61	SAMPLE Geology 4. Sample 4 is scoop sample of lots of sediments next to Brimstone. Deardorff.
1301	20090404 195421	14.60075336	144.7753587	1.41	4.9	523.36	528.26	Dropped a weight.
1302	20090404 195505	14.60075388	144.7753591	1.82	5.38	522.86	528.24	J2-396 Data DVDs start Blue set 008
1304	20090404 195621	14.60075375	144.7753587	0.97	6.7	521.68	528.38	Would like to get a fresh piece of lava. Will first deploy TSE and deploy another tephra sampler in its place.
1306	20090404 195746	14.60075481	144.7753514	355.96	8.19	520.04	528.23	Pulling TSE out of the back port biobox.
1307	20090404 195853	14.60077929	144.7753387	341.54	1.79	524.95	526.74	Putt down TSE where TSA is now. Will recover TSA.
1308	20090404 195933	14.60077945	144.7753389	341.43	1.76	524.97	526.73	J2-396 Data DVDs stop Red set 007
1310	20090404 195954	14.60077921	144.7753386	341.46	1.76	524.97	526.73	DEPLOY-RECOVER Tephra Sampler E. TSE deployed. Actually working on it.
1311	20090404 200114	14.60077983	144.7753383	341.63	1.83	524.97	526.8	Trying to upright TSE.
1313	20090404 200315	14.60077596	144.7753363	340.17	1.8	524.89	526.69	Trying to put the new sampler right where the old one was.
1315	20090404 200433	14.60077669	144.7753366	338.95	2.23	524.74	526.97	SAMPLE Geology Sample 5. TSA. Picked up Tephra sampler A. Placed in the back port swingarm.
1317	20090404 200619	14.60077846	144.7753377	338.72	2.06	524.83	526.89	Still trying to place TSE on a flat spot.
1318	20090404 200644	14.6007775	144.7753371	338.69	2.13	524.82	526.95	Tucked up against a large rock. Looks stable.
1320	20090404 200804	14.60081377	144.7753514	330.92	2.03	523.4	525.43	Plan to take a temperature reading here in the sulfurous sands near the pit.
1321	20090404 200852	14.60084117	144.7753627	327.92	2.29	522.85	525.14	On west side of the pit. Near the spot Cornel sampled the big rock.
1322	20090404 200917	14.60088441	144.7753662	320.71	2.88	522.27	525.15	The temp probe is about 15 inches long.
1323	20090404 200938	14.60087902	144.7753774	325.59	3.64	521.16	524.8	Ambient here is about 7.4 degrees.
1325	20090404 201005	14.60085626	144.7753809	323.54	7.25	518.52	525.77	Big bubbles coming out of the vent right now. Visibility is poor.
1327	20090404 201140	14.60089144	144.7753204	51.52	5.68	519.3	524.98	Stirred it up a bit so are moving slightly. Still working on getting temperature reading her.
1328	20090404 201253	14.60087918	144.7753486	50.08	3.41	520.7	524.11	Brimstone is billowing. We are off to the west.
1329	20090404 201315	14.60087812	144.7753564	22.65	2.31	523.1	525.41	A bit of bubbling and yellow smoke at the base of the plume.

Virtual Van Record	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
1331	20090404 201523	14.60087602	144.7753571	11.99	2.06	523.57	525.63	Temperature probe in the volcanoclastic seds. 7.9 degrees in sediments where Cornel got his rock.
1333	20090404 201646	14.6008887	144.7753511	10.34	1.6	524.6	526.2	A bit closer to the vent now. Doing a temperature reading quite close to the vent. 9.7 degrees here.
1335	20090404 201900	14.60089163	144.7753654	19.88	1.41	524.5	525.91	Repositioning now. Looking N/NE. Change in the plume. We're right in it.
1338	20090404 202155	14.60090109	144.7754001	298.03	1.84	523.94	525.78	The current flowing over the vehicle seems to make an eddy and draw the plume.
1340	20090404 202502	14.60090145	144.7753934	267.5	1.01	523.66	524.67	The pilot cam consistently has the best view.
1342	20090404 202552	14.60090011	144.7754014	272.51	0.74	523.77	524.51	We're maneuvering to get a better view on the science cam.
1343	20090404 202612	14.60090019	144.7754014	272.64	0.74	523.76	524.5	Shutting off the lasers for a bit.
1344	20090404 202633	14.60090064	144.7754021	272.63	0.74	523.76	524.5	VIDEO Start recording HDCam looking at Brimstone.
1346	20090404 202742	14.60090191	144.7754026	271.77	0.74	523.73	524.47	Seeing bubbles coming out of the vent.
1347	20090404 202900	14.6009035	144.7754059	271.73	0.74	523.7	524.44	Cornel wants a black rock right on the edge of the vent. The least-altered near the pit edge.
1349	20090404 203046	14.60091559	144.7754149	273.65	1.64	523.55	525.19	Attempting to pick up a non-altered (?) rock near the vent orifice.
1350	20090404 203053	14.60091853	144.7754174	288.64	1.19	523.33	524.52	VIDEO Stop recording HDCam
1351	20090404 203108	14.60091513	144.7754222	280.49	2.04	522.8	524.84	Cornel is in the hot seat now.
1353	20090404 203157	14.60091198	144.7754062	280.06	1.16	523.93	525.09	We want a relatively unaltered sample.
1354	20090404 203335	14.60091305	144.7754071	279.73	1.18	523.94	525.12	We see the bucket in the background.
1356	20090404 203527	14.60091061	144.7754123	277.5	0.74	523.93	524.67	The exterior of these lavas are quite black when not coated with sulfur. Rock is quite fresh and delicate.
1358	20090404 203642	14.60091062	144.7754135	277.47	0.74	523.78	524.52	SAMPLE Geology 6. Geology sample 6. Fresh volcanic rock taken from the crater rim area. Wedge shape.
1359	20090404 203734	14.60090964	144.7754134	277.45	0.74	523.94	524.68	Lots of bubbling going on now. Looks like it is increasing in amplitude.
1361	20090404 203827	14.60091015	144.7754119	277.54	0.74	523.92	524.66	Looks a bit more active. Cornel thinks it has been more constant this year.
1362	20090404 203927	14.60090816	144.7754129	277.68	0.74	523.79	524.53	Dave wants a Jason temperature reading here at the pit.
1365	20090404 204201	14.60090503	144.7754078	276.16	1.19	523.9	525.09	Moving the probe into the pit. In the plume. "A pig in a poke". Bob the pilot can't really see where the end of the probe is.
1367	20090404 204421	14.60090309	144.7754085	277.8	0.91	523.97	524.88	He's in the pit now. The temperature rose quickly. It's not down in the flow very far. Temp still increasing. 63 degrees. 67 degrees.
1369	20090404 204608	14.60090505	144.7754081	277.84	0.91	523.98	524.89	Tons of gas bubbles coming out. Cornel thinks that it's probably mostly CO2.
1371	20090404 204747	14.60090321	144.7754029	278.83	1.36	523.94	525.3	Going for a gastight now. Same place took the temperature a few minutes ago.
1372	20090404 204913	14.60090664	144.7753978	279.02	1.36	523.93	525.29	SAMPLE Gas 7. Gastight taken in the pit. Can't really see where. It's in the plume. Fired. White and black tape.
1374	20090404 205043	14.60090667	144.7753969	277.94	1.28	523.83	525.11	Going to do both gastights in the pit.
1376	20090404 205141	14.60090392	144.7753984	278.24	0.89	523.81	524.7	SAMPLE Gas 8. Sample 8 gastight in the pit. Can't really see where. Orange and black tape. Sample for Evans.
1377	20090404 205210	14.60090394	144.7753978	277.49	0.86	523.81	524.67	The arm is in all the way but probably just on the outer edge of the pit.
1378	20090404 205221	14.60090421	144.7753979	277.69	0.86	523.83	524.69	Firing the gastight now.
1380	20090404 205405	14.60090522	144.7754004	277.62	1.26	523.9	525.16	Max temp was close to 70 where the gastights were fired. Constant temp has been about 40.
1382	20090404 205546	14.60090423	144.7754164	277.17	1.28	523.96	525.24	VIDEO Start recording HDCam

Virtual Van Record	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-396 Logger Comment
1383	20090404 205644	14.60090621	144.775419	275.94	1.21	523.94	525.15	Looking at the pit. Heading 276. Lots of yellow smoke. Gas bubbles. Sulfurous plume.
1385	20090404 205849	14.60083857	144.7753616	277.13	1.25	523.96	525.21	It's still wonderful to look at. Quite amazing. 60 degrees just at the periphery of the flow.
1387	20090404 210133	14.60070452	144.7752503	276.64	1.26	523.93	525.19	Seeing an increase in the action.
1389	20090404 210309	14.60070258	144.7752477	276.47	1.23	523.94	525.17	We're debating if it is time to head to the surface. 5 more minutes then we will head up.
1391	20090404 210453	14.60069627	144.7752509	279	1.04	524.03	525.07	The consensus is 0800 on the deck. That means leaving the bottom at 0730 local.
1393	20090404 210633	14.60069229	144.7752431	276.94	0.75	523.98	524.73	We will record HD until the end of the dive.
1394	20090404 210732	14.60068997	144.7752437	263.66	0.74	523.98	524.72	Going to grab another rock.
1396	20090404 210756	14.60068926	144.7752452	263.81	0.74	523.95	524.69	Attempting to grab a rock near the base of the pit.
1397	20090404 210923	14.60069568	144.7752413	307.08	1.91	523.91	525.82	Backing the HD cam out so that we can look at the plume while sampling.
1399	20090404 211128	14.60069542	144.7752422	298.33	1.59	524.05	525.64	SAMPLE Geology 9. Small altered volcanic rock. Sample 9. Altered gray rock. Sample for de Ronde.
1401	20090404 211158	14.60069014	144.7752414	298.36	1.59	524.05	525.64	We're waiting for an ash event to put the Nisken in.
1402	20090404 211231	14.60068746	144.7752414	298.36	1.59	524.05	525.64	Lots of bubbles. Looks more vigorous now than earlier.
1403	20090404 211321	14.6006943	144.7752542	20.92	4.46	521.03	525.49	Lots more gas bubbles rising. Plume is more vigorous than we have seen in the last hour.
1405	20090404 211430	14.60072465	144.7752952	272.9	6.85	519.03	525.88	SAMPLE Fluid 10. Nisken fired. Wasn't in the plume. We're hoping to get ash.
1406	20090404 211537	14.60071297	144.7752507	274.24	1.7	521.76	523.46	Sample 10 may be a background water sample.
1409	20090404 211743	14.6006865	144.7752286	317.32	1.04	524.59	525.63	We're observing the active venting. Lots of bubbling. Quite a lot of plumage.
1410	20090404 211912	14.60068641	144.7752317	317.79	0.75	524.85	525.6	The bigger the bubble the more the wobble. (Dave Butterfield).
1413	20090404 212141	14.60062733	144.7752587	323.02	8.86	523.16	532.02	SAMPLE Geology 11. Fresh rock pulled from the edge of the pit. Huge black rock for Cornel de Ronde.
1414	20090404 212230	14.60063002	144.7752618	324.86	8.54	522.81	531.35	Sample 11 will go into the port biobox where the dive weights were.
1416	20090404 212418	14.60061546	144.7752438	279.43	8.25	522.71	530.96	We're ready to head to the surface.
1417	20090404 212500	badnav	badnav	173.17	6.68	522.67	529.35	JASON off bottom Heading up.
1418	20090404 212513	badnav	badnav	277.22	8.46	522.44	530.9	VIDEO Stop recording HDCam
1420	20090404 212557	badnav	badnav	273.28	10.08	520.34	530.42	We're leaving the bottom now. Turning off the video.
1421	20090404 212636	badnav	badnav	274.42	15.84	527.15	542.99	J2-396 Stop DVCAM 007 end of dive and coming up
1422	20090404 212736	badnav	badnav	274.19	34.93	513.85	548.78	J2-396 Data DVDs stop Blue set 008 end of dive and coming up
1423	20090404 220955	badnav	badnav	269.24	badvalue	badvalue	badvalue	Medea is on deck and secured.
1424	20090404 221104	badnav	badnav	288.71	badvalue	badvalue	badvalue	Damsel fish in the water near the surface.
1425	20090404 221354	badnav	badnav	266.92	badvalue	badvalue	badvalue	Jason is alongside the ship.
1426	20090404 221543	badnav	badnav	291.84	badvalue	badvalue	badvalue	JASON on deck
1427	20090404 221558	badnav	badnav	291.84	badvalue	badvalue	badvalue	End of Dive J2-396.

**J2-397 – Fluid Sampling (aborted).** JASON equipped with HFS Beast with 2 gas-tights, single-chamber suction sampler, HOMER receiver, 2 tephra samplers, 8 markers, 3 scoop bags, 2 gas-tight bottles, Nisken, Eh sensor. JASON landed in lavas about 100m downslope of Brimstone. Headed to Brimstone when hydraulic fluid leak observed and dive was aborted.

Table 6.4-2 JASON Dive J2-397

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-397 Logger Comment
1430	20090405 063428	14.6008148	144.773607	274.19	badvalue	2.9	badvalue	JASON in water
1431	20090405 063439	14.6008141	144.7736073	270.92	badvalue	4.05	badvalue	Vehicle clear and heading away from ship
1432	20090405 063519	14.6008223	144.7735886	274.55	badvalue	11.91	badvalue	Jason still driving away from ship
1433	20090405 063615	14.6008227	144.7736025	274.51	badvalue	13.8	badvalue	Medea in water
1434	20090405 063651	14.6008227	144.7736143	271.34	badvalue	13.97	badvalue	Jason is going down
1435	20090405 063714	14.6008234	144.7736114	271.01	badvalue	13.97	badvalue	Slurp is working
1436	20090405 063807	14.6008303	144.7736217	262.96	badvalue	20.45	badvalue	On board for science: single-chamber suction HFS Beast with 2 gas-tights Homer receiver
1437	20090405 063829	14.6008343	144.7736264	266.77	badvalue	27.75	badvalue	In basket: quad milk crate 2 tephra samplers 8 markers
1438	20090405 063903	14.6008299	144.7736378	245.31	badvalue	40.22	badvalue	In basket continued: 3 scoop bags 2 gas-tights
1439	20090405 063926	14.6008299	144.7736379	243.13	badvalue	48.08	badvalue	On all dives: Niskin temp probe Eh sensor
1440	20090405 064049	14.6008485	144.7736605	251.36	badvalue	67.35	badvalue	WATCHSTANDERS Andra Bobbitt logger Nick Deardorff video lights out in van
1441	20090405 064228	14.6008616	144.7736871	237.91	badvalue	99.08	badvalue	Power is on the Beast
1442	20090405 064434	14.6008784	144.7737132	240.29	badvalue	174.55	badvalue	Testing Beast interface-pump is running
1443	20090405 064520	14.6008835	144.7737229	238.77	badvalue	202.29	badvalue	depth 200
1444	20090405 065655	14.60093	144.7737656	284.15	42.28	569.66	611.94	Jason stopped at 50m above bottom
1445	20090405 065723	14.6009369	144.77384	285.41	29.08	575.95	605.03	Jason still descending-no stop
1447	20090405 065747	14.6009502	144.773928	66.27	21.75	580.19	601.94	See the bottom in Medea camera
1448	20090405 065810	14.60086838	144.7739782	165.45	15.26	583.69	598.95	Data DVDs start DVD start red set
1449	20090405 065828	14.60077864	144.7740288	152.76	15.94	584.75	600.69	Sharps is up this dive
1450	20090405 065838	14.60075304	144.7740629	94.23	17.06	585	602.06	Can see bottom in Jason cameras
1451	20090405 065841	14.60074879	144.7740744	91.09	15.56	585.06	600.62	Data DVDs start DVCAM 008 start
1452	20090405 065910	14.60071313	144.7742071	89.76	7.43	584.83	592.26	JASON on bottom here we are at the start target-lots of lava
1453	20090405 065918	14.6007182	144.7742338	90.19	5.94	584.49	590.43	Fresh looking lavas
1454	20090405 065922	14.60071951	144.7742406	91.66	5.81	583.99	589.8	This is start of dive J2-397
1455	20090405 065941	14.6007382	144.7742733	91.93	3.14	583.83	586.97	We are downslope 100m of Brimstone Pit-fairly fresh with only light dusting.
1457	20090405 070026	14.60008735	144.7748436	91.12	8.06	576.63	584.69	Some sulfur dust on the pillows
1458	20090405 070059	14.60014727	144.7748952	90.11	4.59	573.42	578.01	Beast has the long arm on its probe for sampling Brimstone
1459	20090405 070130	14.60017195	144.7749613	90.69	3.13	569.91	573.04	As we move upslope there is more sulfur snow
1461	20090405 070250	14.60017536	144.7749696	91.1	3.46	569.18	572.64	Little bump stirred up the sulfur snow
1463	20090405 070344	14.60016336	144.7750305	91.38	2.63	568.9	571.53	Jason going to drop some weights from the basket
1464	20090405 070422	14.6001648	144.7750296	90.6	2.59	568.83	571.42	Weight away
1465	20090405 070515	14.6001645	144.7750291	90.65	2.81	568.72	571.53	Second weight away
1467	20090405 070657	14.60016392	144.7750291	90.88	2.36	568.88	571.24	Long filamented floaters in the water
1468	20090405 070710	14.60016396	144.7750292	90.79	2.36	568.88	571.24	Seeing oil bubbles from Jason
1469	20090405 070734	14.60016372	144.7750292	90.75	2.33	568.88	571.21	Looking around for source of a potential leak?
1471	20090405 070747	14.60016365	144.7750292	90.84	2.31	568.88	571.19	STBD arm has a leak of hydraulic fluid
1472	20090405 070827	14.60016366	144.7750292	91.06	2.15	568.88	571.03	Jason examining for other leak source
1474	20090405 071129	14.60016404	144.7750299	90.89	2.43	568.23	570.66	Must recover Jason to repair leak
1476	20090405 071201	14.6001945	144.7750258	11.38	4.84	565.44	570.28	STBD arm leak

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-397 Logger Comment
1477	20090405 071204	14.6001959	144.7750215	359.59	4.88	565.37	570.25	stop DVD and DVCAM
1478	20090405 071237	14.6001931	144.7749778	334.04	5.83	563.88	569.71	Next deployment will be J2-398
1479	20090405 071246	14.6001866	144.7749519	286.89	7.35	562.43	569.78	Jason is ascending
1480	20090405 071251	14.6001896	144.7749352	287.1	8.73	561.9	570.63	recovering Jason due to hydraulic leak in starboard arm

**J2-398 – Fluid Sampling (continued).** JASON equipped with HFS Beast with 2 gas-tights, single-chamber suction sampler, HOMER receiver, 2 tephra samplers, 8 markers, 3 scoop bags, 2 gas-tight bottles, Niskin, Eh sensor. JASON landed in lava rubble downslope of Brimstone (47m navigation offset at beginning of dive until Doppler reset). Drove to Brimstone and put tephra sampler E upright. Initial observations of new lava at Brimstone. Conducted visual observations and HFS sampling at vent (8 fluid/2 gas). Moved east toward “Fault Shrimp” area. At eastern fault scarps observed lots of shrimp as well as limpets. Took suction sample of shrimp and deployed shrimp trap on top of outcrop. Deployed Mkr-109 at “Fault Shrimp”. Could not position for HFS sampling due to current but took a sample of sulfur crust. Transited west toward Mkr-108 but could not locate marker (later found it had fallen downslope). Found area of large microbial mats (Mat Mecca) and took 5 HFS samples. Took one background HFS sample as ascended.

**Table 6.4-3 JASON Dive J2-398**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
1484	20090405 133450	14.6004134	144.7751765	267.6	badvalue	10.4	badvalue	JASON in water This is dive J2-398.
1485	20090405 135709	14.6005083	144.7754311	254.9	76.04	500.27	576.31	Water is cloudy-lots of plume
1486	20090405 135752	14.6005114	144.7754365	255.19	56.73	512.93	569.66	Lots of plume in water.
1487	20090405 135814	14.6005117	144.7754395	255.73	46.08	524	570.08	Data DVDs start DVD blue set start
1488	20090405 135831	14.6005122	144.7754428	256.59	37.29	533.1	570.39	Medea is stopping.
1489	20090405 135838	14.6005123	144.7754444	256	35.12	535.19	570.31	Auto heading on Medea.
1490	20090405 135858	14.6005201	144.7754546	270.67	30.19	540.01	570.2	Holding at 30m off bottom.
1491	20090405 135921	14.6005228	144.7755248	324.45	22.33	544.52	566.85	New lowering J2-398
1492	20090405 135937	14.60050541	144.7755517	59.16	22.97	543.63	566.6	Dive J2-398 configured same as J2-397.
1493	20090405 135946	14.60050768	144.7755704	70.34	20.64	545.66	566.3	Sharps is working.
1494	20090405 140126	14.60053579	144.7758803	86.83	15.26	553.89	569.15	Water is clearing. 15m off bottom.
1495	20090405 140138	14.60055159	144.7758846	87.08	12.89	555.58	568.47	Going down.
1496	20090405 140151	14.6005488	144.7758937	86.82	7.35	561.89	569.24	Lots of plume again and can see bottom at 8m.
1497	20090405 140157	14.60054832	144.7758959	86.56	4.58	564.69	569.27	JASON on bottom
1498	20090405 140251	14.60054795	144.7758987	86.94	3.75	565.78	569.53	Landed in a rubble-looking lava area
1499	20090405 140316	14.60022759	144.7755815	86.95	3.65	565.83	569.48	Talus slope down slope of Brimstone.
1500	20090405 140326	14.60022639	144.7755817	86.91	3.64	565.9	569.54	NAV Doppler reset
1501	20090405 140625	14.60022579	144.775581	328.98	7.51	564.56	572.07	Navigator is happy and we're ready to go.
1502	20090405 140635	14.60022746	144.7755832	328.59	7.55	564.55	572.1	Looking around at talus slope.
1503	20090405 140652	14.60023061	144.775586	328.79	7.06	564.81	571.87	Data DVDs start DVCAM start
1504	20090405 140833	14.60028224	144.7755679	328.63	6.35	561.08	567.43	Not much fresh looking here and little sulfur dust.
1505	20090405 140842	14.60029241	144.7755615	329.48	5.28	560.8	566.08	Heading up slope to Brimstone.
1506	20090405 140917	14.60031471	144.7755473	332.21	6.13	558.1	564.23	Heading 330 and going up the talus slope.



Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
1507	20090405 141109	14.60031191	144.7755483	330.06	6.49	558.19	564.68	Holding here while Jason checks system.
1508	20090405 141126	14.60031191	144.7755482	330.03	6.25	558.23	564.48	All is well with Jason and getting ship control from bridge.
1509	20090405 141446	14.600312	144.7755485	330.09	6.11	558.24	564.35	Verified we are getting Eh data.
1510	20090405 141541	14.60034094	144.7755474	331.06	5.04	557.95	562.99	Now we are heading upslope an altered talus slope.
1511	20090405 141648	14.60033888	144.7755469	330.52	5.26	557.78	563.04	On Jason: BEAST with 2 gastights and long arm; single-chamber suction sampler.
1512	20090405 141700	14.6003386	144.7755471	330.55	5.34	557.76	563.1	Trouble with the ship control.
1513	20090405 141809	14.60033879	144.775547	330.43	5.18	557.77	562.95	also on Jason: Homer receiver; milk crate quad; 2 tephra samplers; 8 markers; 3 scoop bags; 2 loose gas-tights; Niskin; temp probe; Eh
1514	20090405 141817	14.60033883	144.7755471	330.47	5.19	557.75	562.94	WATCHSTANDERS Andra Bobbitt logger Nick Deardorff video
1515	20090405 141837	14.60034009	144.7755479	330.58	5.44	557.48	562.92	Bridge is steering the ship and we are now headed to the Brimstone09 target.
1516	20090405 141919	14.60034589	144.7755358	330.77	5.66	556.03	561.69	Brimstone09 target is 14.60071N 144.7753E in Jason van.
1517	20090405 142011	14.60037731	144.7755327	331.56	5.19	553.93	559.12	Lots more sandy-like talus as head up slope-slide area.
1518	20090405 142051	14.6003811	144.7755245	331.41	4.93	553.3	558.23	Heading is 320 upslope NW across instead of straight up. We are a bit East of target.
1519	20090405 142237	14.60039557	144.7755079	331.7	4.08	552.55	556.63	We are waiting for Medea before moving again--we are slowly moving.
1520	20090405 142341	14.60045322	144.7754677	331.15	3.24	549.61	552.85	Looks like we are on a chute and there is a target Brimstone chute which we are near according to nav.
1521	20090405 142350	14.60045647	144.7754591	331.91	2.86	549.32	552.18	Now some big blocks and pillows.
1522	20090405 142408	14.60046162	144.7754586	0.55	2.21	548.83	551.04	No DSC on this dive as the resolution is not properly set.
1523	20090405 142423	14.60046637	144.7754518	344.64	4.56	546.33	550.89	Heading straight up now at 345.
1524	20090405 142435	14.60048026	144.7754425	344.64	4.91	544.6	549.51	Visibility is getting worse at depth 545.
1525	20090405 142446	14.600491	144.7754357	344.67	4.38	543.98	548.36	Going into a plume and even worse visibility.
1526	20090405 142526	14.60052032	144.7754165	345.24	3.88	542.25	546.13	Still in plume.
1527	20090405 142631	14.60055287	144.775392	344.98	3.75	539.65	543.4	Large lava blocks in chute-1m across.
1528	20090405 142658	14.60057396	144.7753785	344.85	3.83	537.78	541.61	Should be about 20m from vent.
1529	20090405 142709	14.60058331	144.7753735	345.16	3.85	537.08	540.93	Water is still murky.
1530	20090405 142737	14.60060634	144.7753527	338.97	3.84	535.4	539.24	Plume is clearing up a bit-still talus.
1531	20090405 142809	14.60063442	144.775314	334.55	4.83	531.96	536.79	Seeing some sulfur snow in water.
1532	20090405 142820	14.60064756	144.7753033	335.09	5.23	530.96	536.19	Mixed talus as near top.
1533	20090405 142900	14.60067734	144.7752688	342.13	5.01	529.39	534.4	Should be close to vent at 529m.
1534	20090405 142938	14.60069509	144.7752397	0.57	4.8	530.09	534.89	Looks really dusty.
1535	20090405 142952	14.60070027	144.7752292	0.81	5.14	529.97	535.11	Can see plume in Medea cam.
1536	20090405 143013	14.60070728	144.7752241	41.68	5.24	530.32	535.56	Lots of plume in Medea cam. Jason panning to right.
1537	20090405 143039	14.6007238	144.7752215	47.37	5.06	529.66	534.72	Large tower plume now engulfed Medea.
1538	20090405 143114	14.60069326	144.7752248	33.88	7.84	528.58	536.42	At 529m and yesterday saw it at 522 m.
1539	20090405 143138	14.60067282	144.7752454	33.77	6.79	528.85	535.64	Dramatic plume view from Medea as it is on edge of large plume.
1540	20090405 143243	14.60071069	144.7752813	32.46	4.9	526.97	531.87	Yesterday Brimstone was in a basin with a small rim and south was best approach.
1541	20090405 143402	14.60078535	144.7752856	36.9	4.24	523.65	527.89	Looking at 034 and still see plume on Medea but not clear enough here to see far ahead.
1542	20090405 143417	14.60078814	144.7752841	36.31	4.5	523.36	527.86	Some ash in rear camera.
1543	20090405 143538	14.60074558	144.775308	24.93	5.05	523.29	528.34	According to nav we have passed it.
1544	20090405 143639	14.60074029	144.7753174	99.29	2.48	524.13	526.61	See tephra sampler on its side and it was placed 5m NW of Brimstone. There is ash on top of the bucket. We are north of Pit.
1545	20090405 143719	14.60077477	144.7753294	48.97	1.95	523.63	525.58	Going back to bucket. This is Tephra A.
1546	20090405 143729	14.60078436	144.7753215	49.9	3.14	522.04	525.18	Mixture of ash and sulfur in plume raining down.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
1547	20090405 143823	14.60081029	144.7753348	335.86	4.44	519.06	523.5	Tephra Sampler = TS.
1548	20090405 143849	14.60078783	144.775324	296.92	3.68	521.18	524.86	Poor visibility here and see Brimstone in rear camera.
1549	20090405 143900	14.60077534	144.7753112	349.64	4.21	521.23	525.44	Jason turning around.
1550	20090405 144010	14.60074879	144.7752728	40.66	4.25	525.45	529.7	We are still looking for the bucket.
1551	20090405 144045	14.60071654	144.7753175	39.74	4.3	525.61	529.91	Visibility is very poor again.
1552	20090405 144115	14.60074742	144.7752931	31.12	5.23	523.93	529.16	Nav says we should be back at the bucket or TSA site.
1553	20090405 144152	14.60074741	144.7753362	48.32	0.74	526.12	526.86	Back in ash rain with sulfur.
1554	20090405 144217	14.60074505	144.775356	45.21	2.13	526.04	528.17	A lot more fallout of ash and sulfur compared to yesterday.
1555	20090405 144307	14.60075564	144.7753459	347.51	4.08	524.01	528.09	There is the bucket TSA on its side.
1556	20090405 144333	14.60077001	144.7753435	356.04	2.33	524.76	527.09	Want to grab bucket and empty it; then put it back in place.
1557	20090405 144440	14.60076955	144.7753454	346.6	2.05	524.92	526.97	There is a lot of ash on TS-E. Note this is Tephra sampler E not A.
1558	20090405 144509	14.60077144	144.7753465	346.51	2.08	524.93	527.01	Tephra sampler E. (Tephra sampler A
1559	20090405 144529	14.6007704	144.7753449	346.7	2.3	524.95	527.25	Tephra sampler E is upright now.
1560	20090405 144627	14.60077025	144.7753468	345.26	1.96	524.96	526.92	Arm is going to push bucket down in sediment to settle it down more.
1561	20090405 144712	14.60077156	144.7753479	347.36	2.1	525.08	527.18	Bucket has been pushed down but doesn't look like very stable. Started to fall over again.
1562	20090405 144729	14.60077061	144.7753473	347.04	2.16	525.02	527.18	Bucket is on a slope so not stable.
1563	20090405 144801	14.6007711	144.7753481	346.26	2.05	524.97	527.02	Jason is picking up bucket to move it over next to rock with a flatter area.
1564	20090405 144818	14.60077344	144.7753478	345.94	2.06	524.99	527.05	Picking it up and moving it over to right off of the scree slope.
1565	20090405 144835	14.60077501	144.7753487	345.87	2.05	525.01	527.06	This is TS-E; tephra sampler E.
1566	20090405 144904	14.60077319	144.7753483	346.94	2.28	525.21	527.49	Jason dropped bucket adjacent to large rocks and looks more stable than previous position.
1567	20090405 145013	14.60077742	144.775361	347.64	2.08	525.38	527.46	This position is 10m east of target for bucket A. No target entered into nav system.
1568	20090405 145055	14.6007784	144.7753599	347.75	3.13	524.73	527.86	Changing target name to bucket E but position was not changed in nav targets.
1569	20090405 145106	14.60078044	144.7753671	345.48	2.83	524.02	526.85	Lifting off to approach Brimstone Pit.
1570	20090405 145125	14.60076242	144.7753889	315	3.89	523.74	527.63	Circling around to west to approach it from the south.
1571	20090405 145224	14.60069555	144.7753337	322.17	3.35	530.26	533.61	Brimstone depth yesterday was 524 and the rim was 519.
1572	20090405 145305	14.60071606	144.7752631	354.6	4.78	529.21	533.99	On talus slope with lots of ash as now heading north for south approach.
1573	20090405 145326	14.60070472	144.7752407	11.61	7.31	528.93	536.24	Good plume view again in Medea.
1574	20090405 145459	14.6006873	144.7753638	9.38	3.01	531.18	534.19	Need to lateral to the south as we move.
1575	20090405 145526	14.60069128	144.7753831	9.79	3.46	530.73	534.19	Now see larger rock pieces.
1576	20090405 145601	14.60071583	144.77538	12.58	3.49	528.31	531.8	Need to be a bit more shallow.
1577	20090405 145610	14.60071735	144.7753889	12.47	4.11	527.6	531.71	Moving up slope.
1578	20090405 145631	14.60073931	144.7754036	9.53	2.93	526.78	529.71	Looks like Pit in Medea cam.
1579	20090405 145712	14.60075764	144.7753925	9.83	4.45	523.08	527.53	There is Brimstone Pit in Science cam.
1580	20090405 145726	14.60075452	144.7754019	359.23	5.83	522.58	528.41	We are at Brimstone Pit and lateraling around to the right.
1581	20090405 145805	14.60077034	144.7754395	340.48	4.25	523.64	527.89	We are moving to the up plume side of Brimstone. Plume is going west.
1582	20090405 145824	14.60077564	144.7754389	332.88	4.11	523.51	527.62	Plume is rotating in opposite direction (clockwise) compared to yesterday.
1583	20090405 145848	14.60078077	144.7754343	333.66	2.73	523.57	526.3	Nav position is off from yesterday.
1584	20090405 145903	14.60077912	144.7754337	333.6	2.81	523.54	526.35	The large pillar in the middle is new compared to yesterday.
1585	20090405 145914	14.60077823	144.7754335	333.44	2.79	523.57	526.36	Bubbles preceded a large burst.
1586	20090405 145933	14.60077503	144.7754314	333.2	3.65	522.9	526.55	Different today is the pillar and the plume spiral direction.
1587	20090405 145944	14.60077579	144.7754384	331.72	4.36	523.05	527.41	Lasers on to get good picture of the pillar.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
1588	20090405 150124	14.60077803	144.7754368	331.31	3.88	523.38	527.26	Depth here is 523.4m (yesterday we used 524m).
1589	20090405 150145	14.60077797	144.7754368	331.25	3.88	523.38	527.26	Not a lot of ash coming up now.
1590	20090405 150157	14.60077827	144.7754369	331.09	3.91	523.38	527.29	Lots of bubbles and now a burst.
1591	20090405 150232	14.60077823	144.7754373	331.52	3.85	523.39	527.24	VIDEO Start recording HDCam Lasers off.
1592	20090405 150341	14.60077787	144.7754364	330.95	3.9	523.36	527.26	We will be sampling with the Beast and are now observing the pillar and surrounding area with camera.
1593	20090405 150456	14.60077752	144.7754362	330.91	3.94	523.32	527.26	Want to video a bit more before sampling.
1594	20090405 150518	14.60077752	144.7754363	330.99	3.94	523.33	527.27	Want to rotate Jason to left to have better mobility with HD camera.
1595	20090405 150529	14.60077145	144.7754319	325.96	4.26	523.27	527.53	Large bubble release.
1596	20090405 150602	14.60077293	144.7754253	318.17	1.74	524.78	526.52	Moved Jason to better position.
1597	20090405 150613	14.60077113	144.7754247	322.47	2.24	524.63	526.87	Looks like pillar is 1m high.
1598	20090405 150637	14.60077126	144.7754247	322.12	2.23	524.67	526.9	VIDEO Stop recording HDCam
1599	20090405 150745	14.60076967	144.7754245	321.75	2.3	524.63	526.93	Will have to move Jason to sample.
1600	20090405 150817	14.60076878	144.7754225	318.31	3.83	522.91	526.74	Done with video and positioning to sample with the Beast.
1601	20090405 150834	14.60078388	144.7754243	316.21	3.26	522.61	525.87	VIDEO Start recording HDCam Nice plume
1602	20090405 150842	14.60078942	144.7754262	316.83	3.94	522.19	526.13	Strong current.
1603	20090405 150848	14.60079353	144.7754285	318.28	3.75	522.2	525.95	Here come the bubbles.
1604	20090405 150903	14.60080096	144.7754293	306.19	3.45	522.52	525.97	Moving left around vent to position.
1605	20090405 150918	14.60080458	144.7754236	304.75	1.64	523.6	525.24	Looking 305 (NW) .
1606	20090405 150925	14.60080402	144.7754239	309.91	1.38	523.8	525.18	Top of pillar knocked down by Jason.
1607	20090405 151004	14.60080296	144.7754234	311.12	1.41	523.59	525	Basket is pushed up against pillar and rock. Depth is 523.6 on this side.
1608	20090405 151012	14.60080327	144.7754242	310.79	1.43	523.58	525.01	Grabbing the long arm of the Beast.
1609	20090405 151046	14.6008033	144.7754258	311.62	1.44	523.5	524.94	The position is 10m to the east of yesterday's position (Brimstone09) in nav targets.
1610	20090405 151115	14.60080288	144.7754265	311.36	1.36	523.53	524.89	Turning on pump and background T=7.6deg with Beast.
1611	20090405 151135	14.60080234	144.7754264	311.58	1.31	523.57	524.88	VIDEO Stop recording HDCam Temp is going up
1612	20090405 151228	14.60080167	144.7754265	310.35	1.31	523.6	524.91	Ph is dropping down with Beast.
1613	20090405 151238	14.60080165	144.7754263	310.53	1.33	523.59	524.92	Beast is on edge of Pit but not in it right now.
1614	20090405 151306	14.60080171	144.7754266	311.52	1.34	523.55	524.89	Need to sample behind the big pillar rock. Can knock it down.
1615	20090405 151323	14.60080167	144.7754267	311.82	1.33	523.57	524.9	Bubbles and big burst.
1616	20090405 151415	14.60080192	144.7754266	311.23	1.35	523.58	524.93	Moving wand into Pit. The long wand is NOT on Beast.
1617	20090405 151432	14.6008016	144.7754265	311.41	1.29	523.65	524.94	There is kink in hose which needs to be undone to get good flow.
1618	20090405 151454	14.60080108	144.7754264	311.03	1.28	523.67	524.95	Correction to tool list is that the long arm for Beast is NOT on this dive.
1619	20090405 151534	14.60080102	144.7754264	311.44	1.29	523.66	524.95	Removing kink from wand.
1620	20090405 151628	14.60079976	144.7754262	312.87	1.35	523.6	524.95	Moving basket against rock and appears Jason is in a hole so can't get good wand position.
1621	20090405 151636	14.60079983	144.7754263	312.88	1.34	523.6	524.94	Bubbles.
1622	20090405 151802	14.60080084	144.7754208	310.04	1.26	523.64	524.9	Good grip on wand.
1623	20090405 151825	14.60080025	144.7754211	310.64	1.35	523.57	524.92	Wand dropped-not good.
1624	20090405 151839	14.60080014	144.7754214	310.52	1.31	523.61	524.92	Ash in plume and some yellow.
1625	20090405 151854	14.60080013	144.7754211	310.26	1.28	523.64	524.92	Arm looks like it is not functioning.
1626	20090405 151944	14.60080049	144.7754217	309.54	1.2	523.72	524.92	Arm is malfunctioning and can't use it for HFS.
1627	20090405 152002	14.60080078	144.7754217	310.13	1.21	523.71	524.92	Going to try using the Port arm for sampling.
1628	20090405 152025	14.60080137	144.7754217	310.14	1.23	523.7	524.93	VIDEO Start recording HDCam

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1629	20090405 152038	14.60080079	144.7754222	310.06	1.24	523.7	524.94	HD may have been on a minute.
1630	20090405 152048	14.60080075	144.7754227	311.19	1.29	523.72	525.01	Here comes the port arm.
1631	20090405 152103	14.6008008	144.7754224	311.68	1.28	523.7	524.98	Visibility is worse.
1632	20090405 152131	14.60080071	144.775422	311.78	1.25	523.78	525.03	Bubbles again.
1633	20090405 152211	14.60079876	144.7754233	310.06	1.24	523.78	525.02	Trying to retrieve wand with port arm.
1634	20090405 152221	14.60079802	144.7754241	310.02	1.25	523.77	525.02	Bubbles.
1635	20090405 152236	14.60079662	144.7754246	309.7	1.24	523.77	525.01	Still getting good signals from Beast.
1636	20090405 152315	14.60079634	144.7754228	309.1	1.25	523.76	525.01	Bubbles.
1637	20090405 152347	14.60079803	144.7754213	309.54	1.25	523.75	525	Have wand in arm.
1638	20090405 152411	14.60079654	144.7754219	310.1	1.3	523.75	525.05	Put basket out.
1639	20090405 152436	14.60079824	144.7754219	305.82	2.16	523.07	525.23	Beast cable looks good in sci cam zoom-in.
1640	20090405 152555	14.60081102	144.7754271	281.86	0.75	523.13	523.88	Just when temp was a few degrees above ambient the Ph dropped 4 from 7.5
1641	20090405 152654	14.60080981	144.7754318	281.86	0.76	523.14	523.9	Placing probe in plume. Bubbles.
1642	20090405 152740	14.60080662	144.7754314	283.4	0.8	523.17	523.97	The pH was reading 4 from the background of 7.5 should be the entry.
1643	20090405 152758	14.60080506	144.7754293	283.65	0.81	523.15	523.96	Some ash falling.
1644	20090405 152806	14.6008042	144.7754287	283.65	0.81	523.14	523.95	Having a problem with the pump.
1645	20090405 152811	14.60080376	144.7754282	283.65	0.81	523.14	523.95	Rebooting the Beast.
1646	20090405 152844	14.60080041	144.7754245	283.78	0.83	523.15	523.98	Without the pump Beast is reading 15deg.
1647	20090405 152906	14.60079842	144.7754225	283.78	0.81	523.16	523.97	Brow cam has best view of wand position.
1648	20090405 152942	14.60079643	144.7754197	283.75	0.81	523.17	523.98	Flush pump is not working so will cycle the power.
1649	20090405 152956	14.60079495	144.7754182	283.71	0.8	523.18	523.98	Large burst and bubbles.
1650	20090405 153024	14.60079299	144.7754158	283.83	0.83	523.18	524.01	Lots of bubbles.
1651	20090405 153059	14.60078742	144.7754092	283.85	0.81	523.19	524	Without stbd arm the gas-tights in basket can not be triggered.
1652	20090405 153103	14.60078678	144.7754085	283.83	0.83	523.18	524.01	VIDEO Stop recording HDCam
1653	20090405 153119	14.60078532	144.7754067	283.84	0.83	523.18	524.01	Sampler program coming back up after power cycling.
1654	20090405 153156	14.6007815	144.7754023	283.86	0.83	523.17	524	Big plume in Medea camera and bubbles.
1655	20090405 153204	14.60078078	144.7754009	283.93	0.83	523.19	524.02	Flush pump is not working.
1656	20090405 153223	14.60077917	144.7753987	283.93	0.81	523.19	524	A lot of CO2 and not much bursting-just constant.
1657	20090405 153404	14.60077357	144.7753891	283.72	0.81	523.16	523.97	Constant bubbles while trying to restart pump on Beast.
1658	20090405 153537	14.60076992	144.7753852	283.93	0.83	523.17	524	Reading 25deg without pumping any water.
1659	20090405 153555	14.60076807	144.7753835	283.99	0.83	523.17	524	Trying to run sample pump and temp is going up to 40deg.
1660	20090405 153620	14.6007642	144.7753772	284.01	0.83	523.16	523.99	Pumping in this manner the filter will clog up.
1661	20090405 153628	14.6007621	144.7753751	284.14	0.83	523.16	523.99	Temp went up to 62deg.
1662	20090405 153642	14.60076023	144.7753737	284.88	0.95	523.25	524.2	Still trying the flush pump.
1663	20090405 153709	14.60076052	144.775373	285.97	1.08	523.4	524.48	The vehicle started to move with the ground.
1664	20090405 153759	14.60076133	144.7753725	285.76	1.08	523.38	524.46	Large plume (related to ground moving).
1665	20090405 153807	14.60076136	144.7753724	285.82	1.06	523.39	524.45	Plume engulfed entire area and no visibility.
1666	20090405 153848	14.60076125	144.7753715	286.45	1.06	523.38	524.44	If flush pump not working not much .
1667	20090405 153856	14.60076111	144.7753712	286.3	1.08	523.38	524.46	Big plume-very big.
1668	20090405 153904	14.60076095	144.7753711	286.33	1.09	523.36	524.45	May need to move without any visibility.
1669	20090405 153942	14.60076006	144.7753709	286.03	1.15	523.41	524.56	Piston sample #1 J2-398-fluid-01 at Brimstone.
1670	20090405 154025	14.60076121	144.7753703	286.75	1.05	523.42	524.47	Unfiltered J398-fluid-01 Piston #1.
1671	20090405 154047	14.600761	144.7753703	286.73	1.16	523.41	524.57	Started at 15:39:41 Piston #1 J398-fluid-01

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1672	20090405 154055	14.60076106	144.77537	286.59	1.16	523.41	524.57	Starting to cycle burst activity.
1673	20090405 154110	14.60076198	144.7753695	285.96	0.99	523.44	524.43	SAMPLE Fluid
1674	20090405 154131	14.60076044	144.7753704	285.52	1.01	523.43	524.44	SAMPLE Fluid J398-fluid-01 still pumping.
1675	20090405 154226	14.60074909	144.7753792	285.75	1.03	523.46	524.49	SAMPLE Fluid J2-398-fluid-01 still pumping.
1676	20090405 154304	14.60074202	144.7753856	286.06	1	523.45	524.45	SAMPLE Fluid Temp 26deg.
1677	20090405 154321	14.60074095	144.7753871	285.72	1.01	523.45	524.46	SAMPLE Fluid Not great sample without the flush pump.
1678	20090405 154403	14.60073476	144.7753929	285.65	1.01	523.49	524.5	SAMPLE Fluid Bubbles coming. Still sampling.
1679	20090405 154455	14.60073395	144.7753959	285.5	1	523.48	524.48	SAMPLE Fluid Bubbles and plume engulfing wand.
1680	20090405 154531	14.60073277	144.7753973	285.63	1.01	523.47	524.48	SAMPLE Fluid Some material sliding to right of basket.
1681	20090405 154701	14.6007306	144.7753963	285.5	1.01	523.44	524.45	SAMPLE Fluid J2-398-fluid-01 still pumping. Stopped. 600ml Tmax 28.7
1682	20090405 154929	14.60073027	144.7753975	285.39	1.04	523.44	524.48	STBD biobox off limits due to arm malfunction (Tephra sampler G will not be deployed).
1683	20090405 155037	14.60072784	144.7753921	283.65	3.94	521.22	525.16	Also since Tephra sampler E was left at Brimstone and not recovered not having G is ok.
1684	20090405 155126	14.60075105	144.7753943	275.62	4.34	518.75	523.09	Making a new plan without Beast and stbd arm.
1685	20090405 155230	14.60075121	144.7754208	275.41	6.46	516.87	523.33	Stowing wand. See sulfur on wand arm.
1686	20090405 155252	14.60075146	144.7754208	275.57	6.56	516.83	523.39	Sulfur stuck on arm and wand.
1687	20090405 155314	14.60075215	144.7754203	275.25	6.43	516.91	523.34	We are backed off the Brimstone Pit.
1688	20090405 155433	14.6007523	144.7754195	275.33	6.38	516.89	523.27	Pump is starting to work after stowing the wand.
1689	20090405 155456	14.60076448	144.7754033	280.48	5.04	517.38	522.42	Ran in reverse-now trying forward.
1690	20090405 155524	14.60071998	144.7754216	272.45	7.56	516.89	524.45	Data DVDs start DVD 001 red set start
1691	20090405 155530	14.60071903	144.7754305	269.65	7.16	517.13	524.29	Pump is working.
1692	20090405 155649	14.60071793	144.7754332	274.63	4.51	520.57	525.08	Definitely pumping.
1693	20090405 155728	14.60071775	144.7754334	274.84	4.65	520.62	525.27	Going to try sampling with Beast after all.
1694	20090405 155803	14.60071749	144.7754333	273.7	5.09	520.66	525.75	Picking up wand again.
1695	20090405 155804	14.60071755	144.7754333	273.67	5.1	520.64	525.74	Data DVDs stop DVD 010 blue set stop
1696	20090405 155925	14.60071729	144.7754328	272.77	5.21	520.58	525.79	Experimenting with manipulator
1697	20090405 160033	14.60071768	144.7754333	273.43	5.15	520.6	525.75	Picking up sampler
1698	20090405 160141	14.60071757	144.775433	273.35	4.71	520.61	525.32	Picking up wand again
1699	20090405 160150	14.60071748	144.7754331	273.38	4.7	520.64	525.34	Pump is still running
1700	20090405 160316	14.60071856	144.7754309	273.3	4.51	520.77	525.28	Have wand and selecting where Dave wants to sample.
1701	20090405 160326	14.60072233	144.7754198	272.76	2.78	521.79	524.57	Starting with large plume area on right.
1702	20090405 160341	14.60072765	144.7754054	277.11	1.4	523.18	524.58	Moving into position.
1703	20090405 160430	14.60072769	144.7754006	274.27	0.98	523.23	524.21	Pump is still running fine. Positioning wand in center of plume.
1704	20090405 160441	14.60072746	144.7754007	273.19	0.99	523.23	524.22	Some warm water and T going up.
1705	20090405 160448	14.60072806	144.7754005	273.19	0.99	523.23	524.22	Up to 16deg.
1706	20090405 160527	14.6007303	144.7753989	273.16	1.04	523.24	524.28	Good flow from outtake. Getting 18deg.
1707	20090405 160600	14.60073024	144.7753993	272.75	1.26	523.24	524.5	Bubbles now.
1708	20090405 160643	14.60072855	144.7754	272.23	1.26	523.25	524.51	Temp is going down and wand no longer in flow.
1709	20090405 160659	14.60072744	144.7754014	272.24	1.24	523.25	524.49	Need to reposition the wand.
1710	20090405 160738	14.60072436	144.7754028	272.24	1.24	523.26	524.5	Data DVDs start DVCAM 009 start
1711	20090405 160738	14.60072436	144.7754028	272.24	1.25	523.26	524.51	Some smoke coming back to where wand is positioned.
1712	20090405 160752	14.60072305	144.7754038	272.25	1.24	523.26	524.5	Wand is in some plume again.

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1713	20090405 160754	14.60072271	144.7754038	272.25	1.24	523.25	524.49	Data DVDs stop DVCAM 008 stop
1714	20090405 160805	14.60072133	144.7754039	272.24	1.24	523.25	524.49	Temp is going up again and seeing CO2 bubbles.
1715	20090405 160828	14.60071849	144.7754046	271.8	1.31	523.25	524.56	Temp is only 9deg-just 2deg above background.
1716	20090405 160838	14.60071866	144.7754043	271.8	1.31	523.25	524.56	Lots of bubbles again.
1717	20090405 160900	14.60071944	144.7754044	271.82	1.3	523.25	524.55	Wand still not quite in flow.
1718	20090405 160912	14.60072031	144.775404	271.78	1.31	523.25	524.56	Rotating wrist to see if better position.
1719	20090405 160920	14.6007211	144.7754033	271.63	1.33	523.26	524.59	Temp is going up after moved wand.
1720	20090405 160939	14.60072352	144.7754018	271.59	1.33	523.25	524.58	Temp up 30..32...35...flow picking up and seeing yellow
1721	20090405 160956	14.60072279	144.7754019	271.8	1.15	523.25	524.4	SAMPLE Fluid Piston 4 filtered start.
1722	20090405 161028	14.60071956	144.7754029	271.81	1.16	523.25	524.41	SAMPLE Fluid 76deg..J2-398-fluid-02 Piston 4 filtered at Brimstone.
1723	20090405 161108	14.60071725	144.7754025	271.76	1.31	523.25	524.56	SAMPLE Fluid temp up to 62...had been 80.5.
1724	20090405 161115	14.60071744	144.7754021	271.73	1.31	523.26	524.57	Here comes more burst and bubbles.
1725	20090405 161131	14.60071857	144.7754005	271.72	1.31	523.26	524.57	SAMPLE Fluid Temp falling with bigger plume.
1726	20090405 161222	14.60072168	144.7753982	271.77	1.31	523.27	524.58	SAMPLE Fluid Slowing down and temp is still falling.
1727	20090405 161226	14.60072132	144.7753979	271.77	1.31	523.26	524.57	SAMPLE Fluid Stop.
1728	20090405 161255	14.60072156	144.7753965	271.74	1.16	523.27	524.43	SAMPLE Fluid Tmax 80.5 Taverage 53.3 vol=337
1729	20090405 161258	14.60072132	144.7753966	271.74	1.15	523.27	524.42	next one
1730	20090405 161309	14.60072027	144.7753969	271.75	1.16	523.27	524.43	Staying in position and getting ready for next sample.
1731	20090405 161331	14.60071873	144.7753977	271.46	1.3	523.27	524.57	Data DVDs start correction started DVCAM 010
1732	20090405 161346	14.60071747	144.7753971	271.45	1.29	523.27	524.56	Data DVDs stop correction stopped DVCAM 009
1733	20090405 161413	14.60071473	144.7753962	271.43	1.29	523.27	524.56	SAMPLE Fluid That was j2-398-fluid-02.
1734	20090405 161434	14.60071443	144.7753951	271.18	1.33	523.26	524.59	SAMPLE Fluid start unfiltered Piston 8 J2-398-fluid-03
1735	20090405 161520	14.60071535	144.775395	271.42	1.16	523.26	524.42	SAMPLE Fluid No visibility with wand-totally in plume.
1736	20090405 161538	14.60071559	144.7753949	271.41	1.16	523.25	524.41	Sulfur melts at 115C
1737	20090405 161641	14.60070912	144.7754014	271.28	1.33	523.25	524.58	SAMPLE Fluid J2-398-fluid-03 plume is dying down during the sample and temp is falling.
1738	20090405 161722	14.60070671	144.7754036	271.37	1.33	523.25	524.58	SAMPLE Fluid J2-398-fluid-03 stopping tmax 31.2 Tave=22.5 vol=355.
1739	20090405 161734	14.60070697	144.7754032	271.37	1.33	523.26	524.59	Doing a pH measurement now.
1740	20090405 161817	14.60070933	144.7754033	271.39	1.31	523.25	524.56	Repositioning wand to more consistent flow area.
1741	20090405 161850	14.60071029	144.7753996	271.27	1.3	523.27	524.57	Plume burst and gas bubbles.
1742	20090405 161930	14.6007086	144.7753933	271.37	1.3	523.25	524.55	More plume and bubbles coming.
1743	20090405 162001	14.60071423	144.7753895	271.41	1.21	523.26	524.47	Looking at pH but not much happening at the moment.
1744	20090405 162116	14.60072669	144.7753806	271.36	1.3	523.26	524.56	Big burst coming.
1745	20090405 162223	14.60073539	144.775373	271.45	1.33	523.27	524.6	Temp 8 voltage 3.2 on pH reading...for Dave.
1746	20090405 162325	14.60074066	144.7753675	271.28	1.31	523.27	524.58	Only getting 8deg with increased plume-going to have to move.
1747	20090405 162352	14.60073831	144.7753632	271.17	1.31	523.27	524.58	Temp is just staying at 8deg so going to move.
1748	20090405 162436	14.60074089	144.7753606	271.35	1.33	523.26	524.59	In 2006 we got 265 where a rock had just erupted.
1749	20090405 162515	14.60074524	144.7753581	271.34	1.33	523.28	524.61	New position also is dying.
1750	20090405 162539	14.60074612	144.7753562	271.32	1.33	523.27	524.6	Moving wand around looking for warmer water.
1751	20090405 162643	14.60074466	144.7753509	268.78	0.9	523.34	524.24	Burst coming and plume engulfing view.
1752	20090405 162803	14.60074368	144.7753517	268.34	0.9	523.36	524.26	Lots of bubbles-probably going to warm up.
1753	20090405 162807	14.60074357	144.7753517	268.29	0.9	523.35	524.25	Here comes the burst.
1754	20090405 162819	14.60074385	144.7753514	268.35	0.91	523.35	524.26	Temp did not really warm up-7.7deg.

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1755	20090405 162912	14.60074301	144.775352	267.99	0.91	523.36	524.27	Moving Jason over to right to get better position.
1756	20090405 163018	14.60074223	144.7753458	281.12	0.74	523.43	524.17	Shrimp just swam by coming from Brimstone.
1757	20090405 163033	14.60074132	144.7753446	281.15	0.74	523.44	524.18	Stopped Jason and now positioning wand.
1758	20090405 163044	14.60074145	144.7753457	280.19	0.74	523.47	524.21	Temp is not going up yet.
1759	20090405 163103	14.60074142	144.7753458	280.8	0.74	523.49	524.23	No heat here either.
1760	20090405 163143	14.60073959	144.7753453	282.98	0.74	523.53	524.27	Trying to find hot spot.
1761	20090405 163243	14.60073951	144.775344	283.54	0.79	523.55	524.34	Big plume and no visibility.
1762	20090405 163347	14.60073815	144.7753432	283.96	0.79	523.55	524.34	Hunting for hot water now that view improved.
1763	20090405 163526	14.60072153	144.7753291	294.38	1.83	523.33	525.16	Temp went up a few degrees.
1764	20090405 163539	14.6007218	144.775329	295.09	1.85	523.33	525.18	Temp is going up 5deg or so.
1765	20090405 163803	14.60071921	144.7753305	291.31	1.74	523.32	525.06	pH reading Temp=12.6 voltage=2.16
1766	20090405 163827	14.60071887	144.7753307	291.14	1.74	523.32	525.06	Roughly ph=3.5 for voltage/Temp
1767	20090405 163847	14.6007219	144.7753288	292.72	1.65	523.36	525.01	Waiting for smoke to clear to move probe.
1768	20090405 163905	14.60072123	144.7753291	294.46	1.68	523.38	525.06	pH sensor does not seem to be working well.
1769	20090405 163923	14.60072143	144.7753295	293.6	1.66	523.35	525.01	Temp is going up.
1770	20090405 163939	14.60072067	144.7753308	293.39	1.66	523.34	525	pH is going down and temp is going up.
1771	20090405 164023	14.60072097	144.7753297	293.68	1.64	523.4	525.04	Temp=17.0 voltage is 1.99
1772	20090405 164038	14.60072116	144.7753291	294.17	1.81	523.42	525.23	pH reading for Temp 17.0 and pH voltage of 1.99
1773	20090405 164054	14.60072218	144.7753288	293.95	1.74	523.43	525.17	Going to take another sample.
1774	20090405 164128	14.60072423	144.7753278	293.93	1.68	523.43	525.11	SAMPLE Fluid J2-398-fluid-04 start unfiltered bag #24
1775	20090405 164224	14.6007221	144.7753285	294.6	1.75	523.4	525.15	Wand has been repositioned from samples 2
1776	20090405 164239	14.60072161	144.7753286	294.5	1.74	523.42	525.16	SAMPLE Fluid J2-398-fluid-04 with no visibility.
1777	20090405 164313	14.6007206	144.7753288	294.79	1.64	523.42	525.06	SAMPLE Fluid In the middle of a big pulse. Above 10-15 cm of the rocks.
1778	20090405 164338	14.60071849	144.7753297	294.85	1.8	523.41	525.21	SAMPLE Fluid Stop. Tmax=15.1 Tave=14.6 vol=252 J2-398-fluid-04
1779	20090405 164506	14.60072045	144.7753337	293.61	2.31	522.62	524.93	pH reading voltage 2.11 temp=14.0
1780	20090405 164515	14.60072278	144.7753331	294.81	2.73	522.23	524.96	Wand moved.
1781	20090405 164520	14.60072281	144.7753343	293.43	3.06	521.87	524.93	Temp up to 17deg
1782	20090405 164621	14.60072013	144.7753492	292.85	2.58	523.33	525.91	Jason moved out of way.
1783	20090405 164637	14.6007192	144.7753479	293.05	2.1	523.67	525.77	Better visibility so maybe a better sample--big burst.
1784	20090405 164653	14.60071975	144.7753482	292.69	2.3	523.6	525.9	Positioning wand to other side of the rock in the middle.
1785	20090405 164707	14.60071971	144.7753482	292.57	2.33	523.58	525.91	VIDEO Start recording HDCam recording while sampling
1786	20090405 164727	14.60071969	144.7753487	292.54	2.29	523.62	525.91	VIDEO Stop recording HDCam HD did not turn on.
1787	20090405 164737	14.60071941	144.7753489	292.66	2.28	523.61	525.89	Still moving wand.
1788	20090405 164752	14.60071834	144.7753493	292.93	2.33	523.63	525.96	VIDEO Start recording HDCam Really on now.
1789	20090405 164808	14.60071891	144.7753489	293.17	2.29	523.68	525.97	VIDEO Stop recording HDCam HD turned itself off.
1790	20090405 164818	14.6007188	144.7753494	293.34	2.15	523.66	525.81	HD may have been at end of tape.
1791	20090405 164910	14.60072017	144.7753496	293.46	2.31	523.68	525.99	HD will not turn on.
1792	20090405 164935	14.60072056	144.7753498	293.7	2.3	523.73	526.03	Going to try to move rock out of the way.
1793	20090405 164940	14.60072027	144.7753498	293.84	2.3	523.75	526.05	Stowing wand.
1794	20090405 165033	14.60072571	144.7753468	293.12	2.08	523.58	525.66	Bashing the rock to get it out of the way.
1795	20090405 165200	14.60072327	144.7753457	289.93	1.86	523.61	525.47	Rock does not want to budge or break.
1796	20090405 165533	14.60074097	144.7752563	346.79	8.35	517.07	525.42	A few pieces of ash then plume cleared.
1797	20090405 165643	14.60076099	144.7753496	45.49	2.63	519.38	522.01	Moving Jason back to pit to look for better sampling plume.

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1798	20090405 165659	14.60074559	144.7753273	65.69	5.06	518.68	523.74	Pump is not flushing. pH went back up to seawater.
1799	20090405 165757	14.60073085	144.7753322	67.11	4.64	519.94	524.58	Correction...pH is NOT going up to seawater because filter might be clogged a bit.
1800	20090405 165832	14.60073051	144.7753324	66.97	4.88	519.94	524.82	Running it in reverse is clearing out the filter for the pH.
1801	20090405 165852	14.60072191	144.7753331	84.19	5.48	519.39	524.87	Maybe sulfur is going through and sticking.
1802	20090405 165909	14.60070947	144.7753356	80.97	5.74	519.57	525.31	Reading are back to background now.
1803	20090405 165942	14.60069659	144.7753691	79.93	0.74	521.8	522.54	pH reading for background temp=7.4 voltage 3.59.
1804	20090405 170007	14.60069761	144.7753901	77.97	64.7	523.5	588.2	pH is going up as it is flushing out.
1805	20090405 170013	14.60069738	144.7753896	77.73	44.44	523.53	567.97	Good ash fallout now.
1806	20090405 170025	14.60069849	144.7753897	77.23	30.32	523.58	553.9	Coarse ash particles in plume falling out.
1807	20090405 170058	14.60069954	144.7753893	77.24	36.4	523.58	559.98	Still having ash fall from plume.
1808	20090405 170103	14.60069979	144.7753893	77.24	49.94	523.58	573.52	Trying to position wand.
1809	20090405 170129	14.60070012	144.7753895	80.3	65	523.75	588.75	There goes the visibility.
1810	20090405 170150	14.60070224	144.7753855	80.33	126.35	523.75	650.1	Clearing up again as plume spirals clockwise away from Jason.
1811	20090405 170222	14.60070445	144.7753794	80.34	99.85	523.75	623.6	pH temp-7.3 voltage at 3.69 stabilized reading.
1812	20090405 170248	14.60070468	144.7753744	80.37	135.54	523.77	659.31	Another pulse and ash raining down.
1813	20090405 170419	14.6006926	144.7753804	79.59	78.22	523.98	602.2	Temp is still background.
1814	20090405 170544	14.60067065	144.7753762	79.61	0.74	523.98	524.72	More ash coming out of plume but no change in temp on wand.
1815	20090405 170709	14.60067696	144.7753588	79.74	33.49	523.98	557.47	Temp is starting to go up.
1816	20090405 170722	14.60068072	144.7753534	79.77	25.08	523.98	549.06	Lots of ash falling around probe.
1817	20090405 170853	14.6006803	144.7753529	79.66	0.74	523.98	524.72	SAMPLE Fluid J2-398-fluid-05 temp going up over 20...starting piston#2 filtered (titanium)
1818	20090405 170915	14.60067954	144.7753541	79.67	0.74	523.98	524.72	SAMPLE Fluid J2-398-fluid-05 temp is about 25deg.
1819	20090405 170934	14.60067796	144.7753554	79.67	0.74	523.99	524.73	Getting gas bubbles.
1820	20090405 170947	14.60067639	144.7753567	79.68	0.74	523.98	524.72	Start of another gas burst.
1821	20090405 171011	14.60067356	144.77536	79.71	130.24	523.98	654.22	More bubbles.
1822	20090405 171055	14.60067115	144.7753615	79.69	61.72	523.98	585.7	SAMPLE Fluid More bubbles. Still sampling.
1823	20090405 171114	14.60067117	144.7753602	79.64	51.52	523.98	575.5	SAMPLE Fluid J2-398-fluid-05 stopping
1824	20090405 171140	14.6006733	144.7753619	79.63	41.34	524	565.34	J2-398-fluid-05 max Tmax=26.5 Tave22.2 vol331
1825	20090405 171154	14.60067476	144.7753628	79.63	82.74	524	606.74	SAMPLE Gas Port GT J2-398-gas-06 fired.
1826	20090405 171203	14.60067555	144.7753631	79.63	96.21	523.99	620.2	Fired where last fluid sample happened.
1827	20090405 171222	14.60067632	144.7753635	79.64	89.59	524	613.59	SAMPLE Gas Temp=23.9 for J2-398-gas-06.
1828	20090405 171309	14.600679	144.7753626	79.72	59.21	524.02	583.23	Gas-06 and fluid-05 taken from same place.
1829	20090405 171325	14.60067854	144.7753625	79.82	63.47	523.95	587.42	Gas and big burst and vehicle teetered.
1830	20090405 171333	14.60067849	144.7753623	79.83	50.47	524.02	574.49	Ground is moving under basket.
1831	20090405 171401	14.60068018	144.7753592	79.86	63.37	524.02	587.39	Lots of gas bubbles.
1832	20090405 171416	14.60068055	144.7753569	79.84	86.74	524.02	610.76	Temp is up to 40deg and shaking and t up.
1833	20090405 171442	14.60068204	144.7753535	79.84	62.31	524.02	586.33	SAMPLE Fluid J2-398-fluid-07 piston #3 unfiltered start
1834	20090405 171456	14.60068303	144.7753514	79.83	90.79	524.01	614.8	SAMPLE Fluid Temp up to 69deg.
1835	20090405 171515	14.60068377	144.7753481	79.83	75.29	524.02	599.31	SAMPLE Fluid J2-398-gas-08 fired stbd beast
1836	20090405 171554	14.60068472	144.7753407	79.87	52.78	524.03	576.81	SAMPLE Fluid Fired Gas-08 during fluid-07 just after shaking and rise in temperature.
1837	20090405 171615	14.60068642	144.7753368	79.89	70.38	524.02	594.4	SAMPLE Fluid J2-398-fluid-07 still going
1838	20090405 171651	14.60069455	144.7753253	79.9	51.57	524.03	575.6	SAMPLE Fluid J2-398-fluid-07 stopping.
1839	20090405 171720	14.60069765	144.7753171	79.85	71.07	524	595.07	SAMPLE Fluid J2-398-fluid-07 Tmax=69.8 ave=55.7 vol=278



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1840	20090405 171757	14.60070088	144.7753088	79.87	50.03	524.04	574.07	J2-398-gas-08 was GT #11 STBD on beast taken during j2-398-fluid-07.
1841	20090405 171833	14.60070323	144.7753044	79.87	60.53	524.02	584.55	Add GT #15 port to J2-398-gas-06...
1842	20090405 171839	14.60070403	144.7753028	79.87	52.33	524.03	576.36	VIDEO Start recording HDCam
1843	20090405 172059	14.60070859	144.7752934	79.75	40.24	524.03	564.27	SAMPLE Fluid More gas bubbles and ash.
1844	20090405 172112	14.60070785	144.775294	79.75	65.51	524.03	589.54	Plume increasing.
1845	20090405 172201	14.60070468	144.7752942	79.7	129.23	524.03	653.26	SAMPLE Fluid J2-398-fluid-09 filtered bag #16 starting
1846	20090405 172250	14.6007008	144.7752955	79.68	75.34	524.05	599.39	SAMPLE Fluid J2-398-fluid-09 as going as plume increases.
1847	20090405 172330	14.60070135	144.7752931	79.67	48.98	524.02	573	SAMPLE Fluid J2-398-fluid-09 stopping.
1848	20090405 172350	14.6007001	144.7752933	79.65	33.68	524.05	557.73	SAMPLE Fluid Tmax=37.4 Ave=35.6 vol=202
1849	20090405 172359	14.60069968	144.7752933	79.62	47.23	524.03	571.26	More ash and bigger plume.
1850	20090405 172434	14.60069764	144.775295	79.6	112.39	524.03	636.42	VIDEO Stop recording HDCam
1851	20090405 172444	14.60069625	144.7752964	79.6	56.3	524.05	580.35	SAMPLE Fluid Plume increasing.
1852	20090405 172718	14.60067269	144.7753121	79.45	60.16	524.06	584.22	pH reading: temp=27deg 1.88 volts
1853	20090405 173133	14.60063112	144.7753376	79.38	64.33	524.07	588.4	Big plume lost visibility.
1854	20090405 173319	14.60064673	144.7752995	79.34	58.23	524.07	582.3	SAMPLE Fluid Big plume and no visibility at all.
1855	20090405 173426	14.6006509	144.7752855	79.41	31.52	524.07	555.59	Doesn't look like pump is flushing at the outtake.
1856	20090405 173443	14.60065007	144.7752867	79.48	43.43	524.07	567.5	Very low visibility at wand end of Jason-white out.
1857	20090405 173503	14.60064873	144.7752904	79.42	48.18	524.06	572.24	Running pump in reverse.
1858	20090405 173528	14.60064948	144.7752927	79.34	49.28	524.05	573.33	Pump is working.
1859	20090405 173633	14.6006513	144.7752969	79.34	62.1	524.05	586.15	SAMPLE Fluid temp is rising Jw-398-fluid-10 Piston #5 filtered start
1860	20090405 173721	14.60065381	144.775299	79.33	76.27	524.07	600.34	SAMPLE Fluid Ground is moving during sampling.
1861	20090405 173802	14.6006558	144.775301	79.33	46.49	524.06	570.55	SAMPLE Fluid J2-398-fluid-10 inside big plume with bubbles and ash.
1862	20090405 173858	14.60065648	144.7753032	79.37	58.2	524.07	582.27	SAMPLE Fluid J2-398-fluid-10 Tmax= 40.1 Tave=28.5 vol=300.
1863	20090405 173912	14.60065673	144.7753039	79.39	67.25	524.07	591.32	Temp dropped after started sample.
1864	20090405 173927	14.60065693	144.7753045	79.39	49.39	524.07	573.46	Done fluid sampling here. Can stow wand.
1865	20090405 174003	14.60065576	144.7753045	79.4	85.91	524.09	610	Putting wand away. Everything has yellow sulfur coating it.
1866	20090405 174017	14.60065397	144.7753034	79.39	62.3	524.08	586.38	Going to back Jason away from Brimstone before stowing wand.
1867	20090405 174017	14.60065397	144.7753034	79.39	62.3	524.08	586.38	
1868	20090405 174246	14.60064256	144.7752345	79.97	2.65	524.24	526.89	Can see TS-E while stowing wand.
1869	20090405 174754	14.60064124	144.7752361	78.23	2.65	524.25	526.9	Somewhere (about 1 hr ago) HD still cam was fixed.
1870	20090405 174818	14.6006416	144.7752358	78.33	2.66	524.26	526.92	There were problems at start of dive with beast but pump was fixed (start of dive)
1871	20090405 174912	14.60064272	144.7752387	78.73	2.39	524.26	526.65	WATCHSTANDERS Susan Merle logger
1872	20090405 174919	14.60064272	144.7752387	78.66	2.36	524.28	526.64	WATCHSTANDERS Heidi Berkenbosch video
1873	20090405 174950	14.6006427	144.7752385	78.62	2.38	524.28	526.66	Verena is in the hotseat. Bob Embley is taking over for Bill Chadwick.
1874	20090405 175030	14.6006426	144.7752383	78.76	2.38	524.28	526.66	Voltage here (flushing background water) = 3.61.
1875	20090405 175108	14.60064283	144.7752384	78.2	2.43	524.27	526.7	Sitting here back from the edge of Brimstone Pit.
1876	20090405 175205	14.60064328	144.7752386	78.01	2.4	524.28	526.68	J2-398 Data DVDs start Blue set 012
1877	20090405 175421	14.60062575	144.7754556	78.23	2.79	525.31	528.1	We're moving toward the Fault Shrimp target.
1878	20090405 175547	14.60062519	144.7754545	80.18	2.84	525.28	528.12	Whoops. We are still here at Brimstone area.
1879	20090405 175548	14.6006252	144.7754545	80.18	2.86	525.3	528.16	J2-398 Data DVDs stop Red set 011
1880	20090405 175722	14.6006341	144.7754895	80.18	4.59	525.36	529.95	We're waiting on the ship before we move on to Fault Shrimp.
1881	20090405 180016	14.60073255	144.7757726	80.18	14.33	529.25	543.58	Lots of ash in the water.
1882	20090405 180333	14.60076592	144.775946	87.87	12	520.6	532.6	We're moving to the east. About 100m to go.

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1883	20090405 180400	14.60078071	144.7759786	87.86	12.55	513.36	525.91	The plume is thick here. Very little visibility.
1884	20090405 180855	14.60093469	144.7761169	87.77	8.78	517.13	525.91	We're starting to see the bottom again.
1885	20090405 181144	14.6009699	144.7763421	86.47	36	520.24	556.24	Still in the water column.
1886	20090405 181428	14.60092676	144.776451	86.74	35.57	525.86	561.43	J2-398 Stop DVCAM 010 and start DVCAM 011
1887	20090405 181622	14.60086381	144.7767223	88.44	35.58	533.36	568.94	We're still in the water column. 25m to the target.
1888	20090405 182039	14.60092086	144.7769398	91.62	9.25	566.06	575.31	Seeing the bottom again.
1889	20090405 182059	14.60089418	144.7769705	90.34	8.56	565.98	574.54	Huge fault in front of us.
1890	20090405 182141	14.6008873	144.7770385	90.62	8.6	565.69	574.29	The bottom slopes off quite steeply on the other side of this vertical fault as well
1891	20090405 182220	14.60090368	144.7770774	91.95	7.99	565.63	573.62	This feature is trending EW
1892	20090405 182436	14.6009117	144.7771727	92.19	3.23	565.07	568.3	Beautiful fault scarp here trending east/west.
1893	20090405 182458	14.60091328	144.7771796	92.25	4.29	563.73	568.02	Sulfurous (?) crust on the top is very thin.
1894	20090405 182548	14.60090362	144.7772253	93.14	3.89	562.36	566.25	The top of this ridge is a sharp peak.
1895	20090405 182616	14.60089137	144.7772468	93.63	4.8	562.27	567.07	It's so steep it looks like the roof of a house.
1896	20090405 182737	14.60085777	144.7773003	87.53	3.31	565.07	568.38	Lots of shrimp in this area. Wow. Amazing
1897	20090405 182759	14.600861	144.7773016	87.71	2.38	565.83	568.21	Looks like we are very close to the old Fault Shrimp target.
1898	20090405 182849	14.60086078	144.7773015	87.84	2.16	566.01	568.17	This is shrimp heaven. They are thick.
1899	20090405 182956	14.60086068	144.7773015	87.95	2.08	566.14	568.22	Lots of yellow sulfur blobs on the seafloor here.
1900	20090405 183035	14.60086069	144.7773016	87.9	2.04	566.16	568.2	We're hanging out waiting for the ship to move.
1901	20090405 183046	14.60086085	144.7773022	87.83	1.86	566.36	568.22	We're not quite at the spot Verena wants to be.
1902	20090405 183135	14.60086102	144.7773028	87.96	1.78	566.34	568.12	Zoomed in on the HD looking at a plethora of shrimp.
1903	20090405 183157	14.60086106	144.7773028	87.96	1.78	566.37	568.15	Both species are here. Limpets here too.
1904	20090405 183241	14.60085863	144.777312	88.16	2.2	565.65	567.85	All the tiny white dots are limpet egg cases.
1905	20090405 183747	14.60079437	144.7773528	77.01	3.59	564.38	567.97	It's beautiful here. Steep slopes.
1906	20090405 184734	14.60092627	144.7772982	100.5	1.55	565.72	567.27	We've been scrambling around trying to find the Fault Shrimp target. We passed it earlier more than likely.
1907	20090405 185543	14.60076347	144.7773476	66.68	2.56	566.36	568.92	We believe we may be at the spot. Looking for the flow at the base of this.
1908	20090405 185619	14.6007752	144.7773427	68.17	1.83	567	568.83	Haven't found the flow but definitely lots of shrimp here.
1909	20090405 185644	14.60077725	144.7773432	65.93	1.53	566.83	568.36	Amazing amount of shrimp.
1910	20090405 185939	14.60077632	144.777343	63.43	1.61	566.7	568.31	VIDEO Start recording HDCam Here in the area where Verena wants to suction shrimp.
1911	20090405 190108	14.60077515	144.7773403	64.91	2.24	566.72	568.96	We're debating whether or not we see shimmering. We see shrimp everywhere here.
1912	20090405 190132	14.60077487	144.7773398	65.01	2.18	566.77	568.95	Verena will suction shrimp right here. Looks like the spot.
1913	20090405 190242	14.60077505	144.7773399	65.53	2.09	566.59	568.68	We see both species of shrimp here.
1914	20090405 190307	14.60077498	144.77734	65.55	2.29	566.63	568.92	Also see pink limpets.
1915	20090405 190320	14.60077499	144.77734	65.53	2.01	566.71	568.72	The matrix to this is sulfur and ash.
1916	20090405 190418	14.60077526	144.7773403	65.3	2.2	566.69	568.89	The suction hose is out there. Sucking up shrimp.
1917	20090405 190507	14.60077523	144.7773406	65.27	2.2	566.69	568.89	SAMPLE Biology 11. Suctioning shrimp here at "Fault Shrimp". He's getting some.
1918	20090405 190625	14.60077516	144.7773407	65.06	2.33	566.63	568.96	The big shrimp are the hardest to catch. Lots of shrimp in the suction sampler.
1919	20090405 190731	14.60077517	144.7773407	64.88	2.23	566.64	568.87	The big shrimp are Alvinocaris. The small shrimp are Opaepele loihi. Pink limpets are Shinkailepas.
1920	20090405 190750	14.60077521	144.7773408	64.92	2.3	566.62	568.92	VIDEO Stop recording HDCam
1921	20090405 190837	14.60077517	144.7773407	64.87	2.2	566.66	568.86	Sample 11 continuing. Got a big shrimp! Only the 3rd one captured.
1922	20090405 191028	14.6007753	144.7773407	64.77	2.29	566.6	568.89	Fault Shrimp area here. Lots of shrimp in the chamber.

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1923	20090405 191058	14.60077531	144.7773407	64.84	2.25	566.61	568.86	Sample 11 finished. Looks like we have about a dozen shrimp in the chamber.
1924	20090405 191222	14.60077519	144.7773406	64.88	2.24	566.67	568.91	An amazing amount of shrimp here.
1925	20090405 191255	14.60077512	144.7773407	64.46	2.29	566.55	568.84	Next we will deploy Verena's shrimp trap here at Fault Shrimp area.
1926	20090405 191435	14.60077541	144.7773408	65.13	2.21	566.55	568.76	Maneuvering the shrimp trap trying to make sure it's sitting upright.
1927	20090405 191608	14.60078386	144.7773379	67.31	4.41	566.31	570.72	DEPLOY Shrimp Trap Verena's shrimp trap is being placed on the top of this large outcrop covered with shrimp.
1928	20090405 191752	14.60078865	144.7773439	66.93	4.13	566.07	570.2	We're looking at shimmering water here. Finally found it.
1929	20090405 191841	14.60078774	144.7773419	67.79	4.68	566.02	570.7	Going to deploy a marker here at Fault Shrimp.
1930	20090405 191931	14.60078905	144.777344	68.22	3.93	566.15	570.08	DEPLOY Marker 109. Deploying Marker 109 at Fault Shrimp near Verena's shrimp trap.
1931	20090405 192050	14.60080395	144.7773497	71.76	2.3	565.84	568.14	Manipulating the marker to bring it to the top of this ridge.
1932	20090405 192134	14.60080424	144.7773493	70.1	2.73	565.62	568.35	Marker 109 placed at the top of the ridge.
1933	20090405 192224	14.60082452	144.7773468	125.1	3.45	564.42	567.87	We're now going to look for the source of the venting here at Fault Shrimp.
1934	20090405 192516	14.60079597	144.7774002	257.83	1.83	563.6	565.43	Saw a bit of shimmering water but think there is more flow here.
1935	20090405 192552	14.60079825	144.7773963	258.64	2.04	563.54	565.58	Looks like there is water leaching out all over this ridge.
1936	20090405 192704	14.60079591	144.7773857	261.14	1.19	564.79	565.98	Shimmering water is leaking out all over this feature.
1937	20090405 192808	14.60079365	144.7773881	269.02	1.24	564.99	566.23	The shrimp are piled up on top of each other - they are incredibly thick here.
1938	20090405 193036	14.60080694	144.777392	162.95	96.84	564.54	661.38	Trying to maneuver the sub so that they can sit still for a sterex filter - and other HFS samps.
1939	20090405 193339	14.60075891	144.7773446	257.33	1.3	564.36	565.66	DEPLOY Koichi Sensors Giving up on fluid sampling here. Too much current. Will fluid sample at Mkr 108 instead.
1940	20090405 193445	14.60075198	144.7773345	256.68	1.06	564.72	565.78	Cornel wants to grab a piece of the thin sulfur crust here.
1941	20090405 193700	14.6007338	144.7772996	144.04	3.41	562.81	566.22	Want a piece of sulfur crust from the spiny ridge just to the north of the marker.
1942	20090405 194014	14.60072853	144.7772991	84.85	1.96	565.86	567.82	12. Sample 12 geology. Flat altered piece of crust. Probably sulfur. 5-6 cm. Sitting on steep ash slope. Within 5 m of Fault Shrimp.
1943	20090405 194029	14.60072847	144.7772991	84.89	1.91	565.88	567.79	Sample 12 in front portside box.
1944	20090405 194142	14.60074038	144.7772938	103.31	3.6	564.15	567.75	Next we are heading to Mkr-108 for fluid sampling. Too much current her at Fault Shrimp.
1945	20090405 194402	14.60070441	144.7772803	118.76	3.08	564.88	567.96	Checking out the shrimp in this area.
1946	20090405 194429	14.60070432	144.7772805	118.67	3.06	564.89	567.95	SAMPLE Other Looking at Verena's trap. There is one little shrimp in the trap.
1947	20090405 194454	14.60070427	144.7772805	118.31	3.09	564.91	568	We're waiting for the ship to move before we take off.
1948	20090405 194612	14.60079329	144.7772937	281.38	2.79	561.75	564.54	Moving toward Marker 108 now.
1949	20090405 194617	14.60079301	144.7772876	273.28	3.09	561.57	564.66	J2-398 Data DVDs start Red set 013
1950	20090405 194717	14.60078831	144.7771339	276.45	10.61	560.85	571.46	Flying over this sharp ridge.
1951	20090405 194855	14.60086304	144.7769182	269.81	20.59	553.54	574.13	Flying through the water column to Marker 108.
1952	20090405 194956	14.60091592	144.7767823	273.96	7.33	568.78	576.11	The bottom is in sight.
1953	20090405 195112	14.60078992	144.7767085	274.69	3.58	568.43	572.01	Lots of ripples along the ridge here.
1954	20090405 195124	14.60078753	144.776684	275.61	2.15	568.61	570.76	J2-398 Data DVDs stop Blue set 012
1955	20090405 195135	14.60077992	144.7766645	274.43	1.26	568.49	569.75	Globs of sulfur - or iron oxide seds here.
1956	20090405 195243	14.60079053	144.7765559	274.1	2.24	567.33	569.57	Strobe back off. The blobs on the seafloor are probably iron oxide.
1957	20090405 195507	14.6007922	144.7765406	276.32	2.08	567.2	569.28	We're waiting for the ship. Again....
1958	20090405 195609	14.60078287	144.776505	275.6	2.4	565.42	567.82	Mkr-108 is at 541 meters.
1959	20090405 195744	14.60076593	144.7764368	275.27	1.79	562.91	564.7	VIDEO Stop recording HDCam Starting to climb up the ridge to the west of the bench between Fault Shrimp and Mkr-108.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
1960	20090405 195952	14.60076042	144.7763316	274.4	2.41	557.7	560.11	CORRECTION. We're STARTING the HDCam NOT stopping it.
1961	20090405 200028	14.60073617	144.776309	274.38	2.4	555.8	558.2	Lots of shrimp along this ridge. Not as many as at Fault Shrimp - but they are here.
1962	20090405 200035	14.60073488	144.7763108	274.67	2.11	556.23	558.34	VIDEO Stop recording HDCam
1963	20090405 200318	14.60073401	144.7762845	271.87	15.41	540.83	556.24	Climbing over the steep ridge to the west of the bench. Heading to Mkr-108.
1964	20090405 200538	14.60071881	144.7762072	267.55	7.13	534.4	541.53	Lots of shrimp here. Looks like a bit of milky flow.
1965	20090405 200705	14.60074254	144.7761169	293.07	4.23	527.4	531.63	Shrimp are pretty thick on this ridge.
1966	20090405 200746	14.60078123	144.7760556	292.3	4.1	522.04	526.14	We're starting the running commentary again.
1967	20090405 200747	14.60078181	144.7760544	292.7	4.14	521.87	526.01	We'
1968	20090405 200841	14.600851	144.7759747	230.77	4.09	523.64	527.73	We've been traversing from Fault Shrimp to Mkr-108. Cornel is providing a bit of commentary on the traverse.
1969	20090405 201158	14.60078704	144.7757729	111.55	8.78	523.49	532.27	We've passed the marker position and are circling around to clump up to the marker?
1970	20090405 201352	14.60057933	144.7758311	32.29	3.7	536.5	540.2	Trying to get to the correct depth and find the marker.
1971	20090405 201625	14.60045067	144.7761001	37.53	2.64	538.45	541.09	Very brecciated here. Lots and lots of shrimp.
1972	20090405 201725	14.60060308	144.7762199	351.37	7.01	538.7	545.71	The slopes and rock outcrops are covered in shrimp.
1973	20090405 201736	14.60063118	144.7762056	319.68	3.8	538.46	542.26	Blocky lavas and winnowed sediments.
1974	20090405 202002	14.60078571	144.7760308	283.82	4.28	521.89	526.17	Having a hard time finding mkr-108.
1975	20090405 202119	14.60082902	144.775948	172.24	5.03	520.28	525.31	J2-398 Stop DVCAM 011 start DVCAM 012
1976	20090405 202236	14.60088958	144.775932	139.9	5.06	519.85	524.91	Now we can see Koichi's samplers on the ridge crest.
1977	20090405 202946	14.600623	144.7758462	342.3	5.66	530.98	536.64	We can't find the marker. Moving the ship and sub now.
1978	20090405 203130	14.600673	144.776041	13.88	3.3	531.55	534.85	Not sure what type of navigation we had when the target was placed.
1979	20090405 203325	14.60068024	144.7759444	9.92	3.76	536.93	540.69	Lots of water leaking out of this slope. May have to choose another spot.
1980	20090405 203345	14.60067023	144.7759004	1.35	4.46	537.52	541.98	Lots of talus here. The matrix is probably sulfur.
1981	20090405 203537	14.60069237	144.7757632	339.93	0.84	539.05	539.89	We have pretty much given up on finding the marker. Will now just look for another spot to samples.
1982	20090405 203812	14.60072049	144.7758531	352.65	2.65	537.49	540.14	Looking better here. Lots of white mat here.
1983	20090405 203901	14.60071882	144.7758565	358.68	2.16	538.1	540.26	There is tons of microbial mat here.
1984	20090405 204110	14.60067762	144.775833	327.43	1.99	540.87	542.86	We're debating what to do here. We have less than an hour to sample.
1985	20090405 204130	14.60068601	144.7758371	327.33	2.24	540.06	542.3	Lots of bacterial floc in the water here.
1986	20090405 204142	14.60068824	144.7758353	2.22	2.43	540.01	542.44	We're within 10 meter of Mkr-108.
1987	20090405 204214	14.60069668	144.7758129	358.73	1.99	540.12	542.11	The depth at the spot with all the mat was a little less than 540m.
1988	20090405 204321	14.60071053	144.7758503	355.37	2.38	538.39	540.77	The area of intense bacterial mat is right in front of us.
1989	20090405 204423	14.60071456	144.7758379	33.05	3.44	537.04	540.48	This whole area must be bathed in fluid.
1990	20090405 204442	14.600709	144.7758543	353.07	3.36	537.4	540.76	On the edge of an outcrop heading 17 degrees.
1991	20090405 204513	14.60071189	144.7758596	350.49	2.26	538.34	540.6	Sheryl would like to sample mat here on another dive.
1992	20090405 204906	14.60071189	144.7758597	350.3	2.3	538.29	540.59	We're calling this spot "Mat Mecca". The rocks are covered in bacterial mat.
1993	20090405 205005	14.60071554	144.775856	350.79	2.03	538.37	540.4	Our heading here is 350 degrees looking at this rock face. Depth is 538 meters. Ambient temp is 7.9
1994	20090405 205023	14.60071564	144.775856	350.68	2.01	538.37	540.38	Preparing to sample this diffuse flow coming out of a little crack in the rocks.
1995	20090405 205302	14.60071563	144.775856	351.07	2.08	538.25	540.33	SAMPLE Fluid 13. Fluid sample 13. Unfiltered piston 6. Here at this new vent site Mat Mecca.
1996	20090405 205453	14.60071584	144.7758562	350.85	2.05	538.26	540.31	Sample 13. HFS unfiltered piston 6. Temp is rising. Up to 30 deg now. Temp is 38. Temp is 40 and rising.
1997	20090405 205552	14.60071585	144.7758562	351.05	2.1	538.25	540.35	Sample 13. Starting sample at 2055. T=44 and still rising. This is an unfiltered piston #6.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
1998	20090405 205725	14.60071617	144.7758563	350.94	2.1	538.27	540.37	Sample 13 cont. 180 ml now - want to collect 500ml. Temp leveling off at 45.5.
1999	20090405 205949	14.6007164	144.7758562	351.31	2.06	538.25	540.31	Sample 13 cont. Stopping the sample at 505m. Tmax=45.3 Tavg=45. Stopped at 2059:30
2000	20090405 210023	14.60071631	144.7758562	351.26	2.05	538.24	540.29	SAMPLE Fluid 14. Sample 14. Unfiltered piston 7. Start at 2100.
2001	20090405 210135	14.60071627	144.7758561	351.38	2.09	538.23	540.32	HFS Sample 14 cont. Here at Mat Mecca. The mat is coating everything but there is a curious absence of animals here.
2002	20090405 210234	14.600716	144.7758559	351.32	2.15	538.22	540.37	HFS Sample 14 cont. Stirred it up a little. T is 38deg now.
2003	20090405 210245	14.60071593	144.7758559	351.12	2.16	538.23	540.39	HFS Sample 14 cont. This sample is in the same little hole.
2004	20090405 210320	14.60071576	144.7758558	350.53	2	538.29	540.29	HFS Sample 14 cont. stopping sample 212050. Volume = 361 ml Tavg=39 Tmax=45.2
2005	20090405 210338	14.60071569	144.7758558	350.48	2.01	538.3	540.31	Repositioning a bit to bring the temp back up.
2006	20090405 210527	14.60071579	144.7758556	350.13	2	538.31	540.31	Temp is rising again.
2007	20090405 210817	14.60071523	144.7758553	349.94	1.95	538.32	540.27	pH here (voltage) in this little crack at Mat Mecca is 1.89. T is 41.2.
2008	20090405 211003	14.60071509	144.7758553	349.85	1.95	538.31	540.26	SAMPLE Fluid 15. HFS Sample. Unfiltered bag 23. Start 210954.
2009	20090405 211048	14.60071556	144.7758547	347.23	2.31	538.14	540.45	Sampler came out of the hole. It is still holding at 41.2.
2010	20090405 211344	14.60071595	144.7758552	347.09	2.25	538.14	540.39	Sample 15 cont. HFS unfiltered bag 23. Stop 211320. 485ml. Tmax=43.8 Tavg=42.5.
2011	20090405 211416	14.60071596	144.7758553	347.06	2.24	538.12	540.36	SAMPLE Fluid
2012	20090405 211529	14.60071599	144.7758552	349.51	2.03	538.23	540.26	Sample 16. HFS filtered bag 17. Start 211520.
2013	20090405 211607	14.60071543	144.7758549	349.57	2.03	538.23	540.26	SAMPLE Fluid 16. HFS sample. Filtered bag 17.
2014	20090405 211826	14.60071455	144.7758545	349.96	2.03	538.22	540.25	Sample 16 cont. HFS. The temp is fluctuating. Coming back up now.
2015	20090405 211941	14.60071429	144.7758542	350.11	2.05	538.24	540.29	Sample 16 cont. HFS. Temp back up to 41.7. Stop at 2119. Tmax=43.2. 476ml.
2016	20090405 212252	14.60071473	144.7758546	350.35	1.96	538.25	540.21	SAMPLE Fluid 17. Sample 17. HFS filtered sterivex #11. Sheryl wants 3 liters of water.
2017	20090405 212356	14.60071488	144.7758547	350.29	1.99	538.25	540.24	Sample 17. HFS filtered sterivex #11. 150 ml per minute. Kevin is going to try to pump it faster.
2018	20090405 212551	14.60071538	144.7758545	350.73	2	538.26	540.26	Sample 17 cont. HFS filtered sterivex #11. 150ml/min. 500 ml now.
2019	20090405 212655	14.60071526	144.7758545	350.56	2.01	538.26	540.27	Sample 17 cont. HFS. 800 ml now.
2020	20090405 212743	14.60071502	144.7758545	350.45	2.01	538.24	540.25	Sample 17 cont. HFS filtered sterivex for Sheryl's microbiology.
2021	20090405 213124	14.60071588	144.7758548	348.62	2.28	537.99	540.27	Sample 17 cont. HFS. Tavg=43.8. We will continue to pump until we get 3 liters.
2022	20090405 214118	14.6007163	144.7758558	350.23	2.01	538.09	540.1	Sample 17 cont. HFS filtered sterivex #11 approaching the end....
2023	20090405 214200	14.60071641	144.7758561	350.38	2	538.12	540.12	J2-398 Data DVDs start Blue set 014
2024	20090405 214305	14.60071629	144.7758562	350.57	2.01	538.17	540.18	Sample 17 cont. HFS. Tvg=42.9. Tmax=45.8. Sample stopped 214240. Vol=3004ml.
2025	20090405 214425	14.60071373	144.7758568	352.25	2.7	537.81	540.51	Removing the HFS wand from the sampling site here at Mat Mecca.
2026	20090405 214430	14.60070962	144.7758548	351.21	3.5	537.14	540.64	Leaving the bottom.
2027	20090405 214438	14.60070459	144.775852	350.62	4.61	536.42	541.03	JASON off bottom
2028	20090405 214538	14.60070014	144.7758467	349.86	6.06	535.38	541.44	Slightly premature. There is "housekeeping to do". Throwing the weights.
2029	20090405 214613	14.60071256	144.775832	291.9	11.85	527.95	539.8	Now Jason is leaving the bottom.
2030	20090405 214624	14.60074704	144.7758038	292.96	9.76	526.53	536.29	End of dive J2-398.
2031	20090405 214715	14.60089237	144.7756428	298.92	6.66	521.55	528.21	J2-398 Data DVDs stop Red set 013
2032	20090405 214728	14.60091816	144.7756094	297.42	8.96	517.92	526.88	No more science. Just went by some beautiful geology.
2033	20090405 214809	14.60104628	144.7755082	299.31	12.85	513.89	526.74	Maneuvering around to get off the bottom.
2034	20090405 214913	14.60113198	144.7755994	320.64	33.48	490.86	524.34	SAMPLE Fluid Sample 17. HFS background sample.
2035	20090405 215042	14.60112761	144.7755978	334.99	81.21	448.32	529.53	THAT WAS ACTUALLY SAMPLE 18. HFS background sample. Unfiltered bag 22. Start 215225.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-398 Logger Comment
2036	20090405 215127	14.60112327	144.7755975	338.1	96.96	427.78	524.74	SAMPLE 18. HFS unfiltered bag #22 for background.
2037	20090405 215306	14.60109297	144.7755658	337.54	152.86	373.39	526.25	Sample 18. HFS. Stopped at 215236. 360ml. Tavg=9.6.
2038	20090405 215410	14.60108922	144.7755556	332.36	173.54	343.35	516.89	J2-398 Stop DVCAM 012
2039	20090405 215533	14.6010772	144.7755435	307.59	196.24	301	497.24	J2-398 Data DVDs stop Blue set 014
2040	20090405 220938	14.6010317	144.7757065	267.38	badvalue	1.57	badvalue	Bubbles are in the water. Dave wonders if they are coming off the beast. Maybe off the exhaust tube.
2041	20090405 220957	14.6010301	144.7757075	268.2	badvalue	1.72	badvalue	Jason is at the surface.
2042	20090405 221143	14.6010246	144.7757259	252.69	badvalue	1.94	badvalue	Medea is on deck.
2043	20090405 221904	14.6010063	144.7758214	242.37	badvalue	0.96	badvalue	JASON on deck
2044	20090405 221917	14.6010063	144.7758214	242.37	badvalue	0.96	badvalue	End of dive J2-398.

**J2-399 - SM2K Survey.** JASON equipped with SM2K multibeam sonar for survey of NW Rota-1 summit. Entire dive is dedicated to mapping above bottom; no samples; no video.

**Table 6.4-4 JASON Dive J2-399**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-399 Logger Comment
2049	20090406 083309	14.5997687	144.7742014	329.84	badvalue	2.09	badvalue	JASON in water J2-399 SM2000 Mapping Dive
2050	20090406 083323	14.599766	144.7741955	310.88	badvalue	2.09	badvalue	Jason driving away from ship.
2051	20090406 083407	14.5997568	144.7741837	296.64	badvalue	3.14	badvalue	Science on board: 6 markers; 3 scoop bags; 2 tephros; 2 gas-tights.
2052	20090406 083434	14.5997547	144.7741836	295.69	badvalue	3.16	badvalue	Dive objective: SM2000 mapping; no other science expected at this time.
2053	20090406 083502	14.5997506	144.7741853	293.99	badvalue	2.92	badvalue	Medea is in the water.
2054	20090406 083526	14.5997468	144.7741902	289.76	badvalue	2.61	badvalue	Jason dropping 2 weights.
2055	20090406 092413	14.6011115	144.7778921	70.09	1.91	592.62	594.53	JASON on bottom Ballast check
2056	20090406 093101	14.60131254	144.7782713	89.54	9.43	608.96	618.39	Medea and Jason altimeters turned off
2057	20090406 094139	14.60158782	144.7785094	315.39	9.43	625.66	635.09	Start cal line 1 20 translation 10 m altitude heading 316
2058	20090406 094630	14.60150883	144.778592	314.39	9.43	623.18	632.61	10m cal: 0940 start out 0942 end; return 0943 back 0944 end
2059	20090406 094654	14.6015295	144.7785729	314.69	9.43	624.09	633.52	20m cal line start
2060	20090406 094738	14.6015987	144.7785004	314.14	9.43	619.08	628.51	Line is 20 m altitude 0.25 m/s heading 315
2061	20090406 094822	14.60163569	144.7784593	314.58	9.43	616.69	626.12	SURVEY End line
2062	20090406 094843	14.60163098	144.7784647	313.43	9.43	616.65	626.08	SURVEY Start line Return 20 alt
2063	20090406 095007	14.6015081	144.7785943	316.21	9.43	624.21	633.64	SURVEY End line complete 20 m back and forth cal line
2064	20090406 095315	14.60153323	144.7786663	288.39	9.43	621.27	630.7	Positioning vehicles at entry position into the survey area.
2065	20090406 095501	14.60153359	144.7786666	288.33	9.43	621.22	630.65	SURVEY Start survey 3 beams on Doppler at 25 meters altitude 523 meter translation heading 288
2066	20090406 095543	14.60153348	144.7786665	288.29	9.43	621.16	630.59	Error: survey has not started
2067	20090406 095609	14.6015452	144.778628	289.22	9.43	621.02	630.45	SURVEY Start survey Real start of survey
2068	20090406 103705	14.60270128	144.7739894	107.19	9.43	591.61	601.04	SURVEY Start line 2
2069	20090406 181159	14.59934475	144.7741376	110.16	20.89	604.26	625.15	Doppler bottom lock lost
2070	20090406 181305	14.59933679	144.7741611	108.91	26.82	611.28	638.1	altimeter on

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-399 Logger Comment
2071	20090406 181549	14.59925702	144.7744161	107.17	18.66	608.15	626.81	altimeter off
2072	20090406 181626	14.59925245	144.7744285	107.54	29.89	597.03	626.92	alt on
2073	20090406 181809	14.5992365	144.7744804	106.27	24.33	602.29	626.62	doppler in and out
2074	20090406 182152	14.59915589	144.774761	106.68	17.75	607.19	624.94	0.23 meters/sec
2075	20090406 195733	14.59860001	144.7743949	107.64	25.57	651.03	676.6	Observation: DP lost
2076	20090406 200802	14.59833693	144.7751622	98.56	25.57	641.28	666.85	Dropped doppler Jason heading off course
2077	20090406 202339	14.59759623	144.7775457	95.77	25.57	652.02	677.59	SURVEY End survey
2078	20090406 205229	14.59810804	144.7761191	17.64	25.57	701.67	727.24	SURVEY Start line start of first cross line heading 18 degrees 25m alt
2079	20090406 205842	14.59853823	144.7763356	18.29	25.57	668.47	694.04	correction of alt from 10m to 25m
2080	20090406 221305	14.6031801	144.7754411	198.06	25.57	601.57	627.14	SURVEY Start line cross line #2
2081	20090406 225156	14.59829914	144.773816	196.34	25.57	721.1	746.67	SURVEY End line end cross line #2 heading was 198
2082	20090406 225236	14.5983078	144.7738227	148.8	25.57	720.92	746.49	move 72m heading 101 to start point of last crossline
2083	20090406 230159	14.59818077	144.7744676	20.08	27.74	708.46	736.2	eol transit found a pit lost doppler lock
2084	20090406 230315	14.5982195	144.7744362	320.76	19.65	708.37	728.02	doppler reacquired after descent altimeter on briefly
2085	20090406 231442	14.59860309	144.7746574	17.2	19.65	687.66	707.31	23:11 was start time for this line
2086	20090406 232620	14.59979981	144.7750829	20.83	23.99	568.81	592.8	Huge wall ahead.
2087	20090406 232737	14.5999344	144.7751303	19.71	23.15	559.86	583.01	Added another line over the peak.
2088	20090406 232829	14.60002289	144.7751606	19.48	21.19	554.96	576.15	The added line is from south to north.
2089	20090406 234822	14.60229287	144.7759492	20.7	20.27	570.29	590.56	SURVEY End line crossline #3
2090	20090406 235335	14.60236756	144.7758855	322.12	20.27	588.15	608.42	SURVEY Start line cal line 10m heading 323 20m
2091	20090406 235445	14.60250146	144.7757789	322.94	20.27	583.57	603.84	SURVEY End line
2092	20090406 235506	14.60250787	144.7757775	170.03	20.27	582.23	602.5	rotate 180
2093	20090406 235535	14.60247711	144.7757968	142.36	20.27	582.81	603.08	SURVEY Start line 20m 10m alt heading 143
2094	20090406 235654	14.60237039	144.775887	317.87	20.27	587.49	607.76	SURVEY End line elevate to 20m
2095	20090406 235753	14.6023951	144.7758609	325.22	20.27	577.68	597.95	SURVEY Start line cal 20m alt 20 translation hdg 323
2096	20090406 235854	14.60250965	144.7757716	323.26	20.27	575.88	596.15	SURVEY End line
2097	20090406 235924	14.60251055	144.7757701	141.76	20.27	577.07	597.34	rotate 180
2098	20090406 235933	14.60249294	144.7757819	142.49	20.27	577.62	597.89	SURVEY Start line 20m cal line
2099	20090407 000055	14.6023646	144.7758879	141.24	20.27	577.41	597.68	SURVEY End line
2100	20090407 000730	14.6024421	144.7760808	272.75	20.27	449.42	469.69	JASON off bottom off bottom 00:03
2101	20090407 003137	14.6024317	144.7762951	277.87	badvalue	5.08	badvalue	Jason is at the surface.
2102	20090407 003416	14.6024038	144.7763364	265.97	badvalue	badvalue	badvalue	Medea on deck.
2103	20090407 004105	14.6023428	144.7764261	255.5	badvalue	badvalue	badvalue	JASON on deck
2104	20090407 004105	14.6023428	144.7764261	255.5	badvalue	badvalue	badvalue	
2105	20090407 004120	14.6023428	144.7764261	255.5	badvalue	badvalue	badvalue	End of dive J2-399.

**J2-400 - CTD Search.** JASON dive dedicated to search for CTD instrument lost during last CTD before dive. Dive target was the drop position of CTD, near Brimstone vent. JASON navigators conducted search patterns around the target position but were limited by rough terrain and low visibility at times (from plumes). 2 HFS samples of Brimstone vent obtained during dive.

**Table 6.4-5 JASON Dive J2-400**

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-400 Logger Comment
2109	20090407 093331	badnav	badnav	307.98	badvalue	2.65	badvalue	JASON in water Start.
2110	20090407 093347	badnav	badnav	258.01	badvalue	2.73	badvalue	Jason in water and driving away from ship.
2111	20090407 093410	badnav	badnav	287.93	badvalue	7.23	badvalue	NW Rota-1 Marianas J2-400
2112	20090407 093443	badnav	badnav	288.45	badvalue	8.83	badvalue	First objective is to locate CTD instrument which was dropped from ship approximately 1 hour ago at this location on Brimstone.
2113	20090407 093514	badnav	badnav	281.54	badvalue	9.33	badvalue	Medea in water.
2114	20090407 093536	badnav	badnav	272.45	badvalue	9.35	badvalue	J2-398 VID_GRAB
2115	20090407 093624	badnav	badnav	281.08	badvalue	16.25	badvalue	VID_GRAB
2116	20090407 093648	badnav	badnav	283.6	badvalue	25.21	badvalue	Deployment location 14deg 36.0'N 144deg 46.5'E depth=620m
2117	20090407 093713	badnav	badnav	283.18	badvalue	34.45	badvalue	After CTD location-primary goal is fluid sampling.
2118	20090407 093850	badnav	badnav	303.93	badvalue	66.83	badvalue	On vehicle is the Beast; single chamber suction; Homer receiver; quad milk crate; 2 tephra samplers; 8 markers; 3 scoop bags; 4 gas-tights (also 2 GT on Beast).
2119	20090407 093904	badnav	badnav	304.89	badvalue	67.73	badvalue	Always on vehicle: Niskin; Temp probe; Eh sensor.
2120	20090407 093917	badnav	badnav	305.04	badvalue	68.07	badvalue	WATCHSTANDERS Andra Bobbitt logger Heidi Berkenbosch video
2121	20090407 094109	badnav	badnav	308.8	badvalue	71.12	badvalue	Jason dropping weights.
2122	20090407 094147	badnav	badnav	310.03	badvalue	75.7	badvalue	Marker 110 is a bit loose in the basket.
2123	20090407 094349	badnav	badnav	311.6	badvalue	100.09	badvalue	Beast is happy.
2124	20090407 094852	badnav	badnav	294.7	badvalue	250	badvalue	Jason taking control of ship navigation.
2125	20090407 095344	badnav	badnav	292.36	badvalue	374.43	badvalue	Dive target was revised and is located between Brimstone09 and BucketE.
2126	20090407 095453	badnav	badnav	294.16	badvalue	395.4	badvalue	Sharps ground fault.
2127	20090407 095831	badnav	badnav	290.24	116.54	490.57	607.11	Jason is using the position from the GPS antenna corrected to the actual drop position off the stbd side of the ship when CTD dropped.
2128	20090407 095857	badnav	badnav	293.65	100.99	503.2	604.19	100m off the bottom.
2129	20090407 100218	badnav	badnav	332.73	49.89	523.53	573.42	50m off bottom and diving.
2130	20090407 100418	badnav	badnav	0.19	29.3	523.53	552.83	Holding above bottom.
2131	20090407 100445	badnav	badnav	1.96	29.07	521.49	550.56	All looks good-Jason is headed for the bottom.
2132	20090407 100625	badnav	badnav	212.48	9.93	533.85	543.78	JASON on bottom There is the bottom.
2133	20090407 100651	badnav	badnav	199.92	5.76	534.52	540.28	Landed is an area of consolidated lava with some sort of ledge.
2134	20090407 100658	badnav	badnav	199.66	5.51	534.36	539.87	J2-400 Data DVDs start Red set 015
2135	20090407 100742	badnav	badnav	204.68	3.79	533.74	537.53	J2-400 DVCAM 013 start
2136	20090407 100832	badnav	badnav	231.26	5.51	539.09	544.6	Rough looking lavas but no visible plume.
2137	20090407 100943	badnav	badnav	227.68	7.78	540.85	548.63	Adjusting displays and instruments.
2138	20090407 100959	14.6007066	144.7748632	229.02	7.73	540.9	548.63	We are due west of the target.
2139	20090407 101149	14.60079896	144.7750089	97.9	5.78	533.06	538.84	We are 50m west of Brimstone pit (30m) and heading upslope.
2140	20090407 101211	14.60083714	144.7750457	96.91	4.93	530.97	535.9	Lots of ash on these lavas.
2141	20090407 101317	14.60082202	144.7751144	98.29	3.99	526.01	530	Some sulfur staining in isolated areas.
2142	20090407 101326	14.60082871	144.7751286	98.02	3.09	525.21	528.3	Getting shallow at 525 so close to Brimstone depth.
2143	20090407 101426	14.60077412	144.7751691	95.56	2.66	524.07	526.73	lavas more angular and broken looking with lots of alteration compared to drop site.
2144	20090407 101447	14.60076913	144.775186	95.35	2.66	523.4	526.06	Color display on science cam off.
2145	20090407 101454	14.60076955	144.7751895	97.47	2.4	523.37	525.77	Edge of crater or chute.
2146	20090407 101502	14.60076806	144.7751903	94.34	3.19	522.72	525.91	Slight touchdown with vehicle.
2147	20090407 101527	14.60076393	144.7752093	94.6	4.33	520.24	524.57	Plume is visible and we are on edge of crate with Brimstone below us.
2148	20090407 101540	14.60074835	144.7752241	82.95	4.94	519.96	524.9	Low level activity at Brimstone as we face due East.
2149	20090407 101601	14.6007238	144.7752624	81.17	4.93	519.86	524.79	Lot of sulfur in the plume-looks dirtier.
2150	20090407 101617	14.60072242	144.775291	81.19	3.59	520.6	524.19	That is lots of sulfur....
2151	20090407 101710	14.60070747	144.7753166	76.88	3.45	521.5	524.95	Jason nav is creating a search pattern from the target area.



Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-400 Logger Comment
2152	20090407 101730	14.60070555	144.7753151	81.08	3.31	521.5	524.81	Jason dropping weights.
2153	20090407 101757	14.60070594	144.7753155	79.59	3.6	521.29	524.89	Activity at Brimstone is remarkably less than our previous visits this year.
2154	20090407 101921	14.60067258	144.7753243	271	6.68	523.27	529.95	Jason is circling around to look before leaving target for search.
2155	20090407 102104	14.60072181	144.7753256	317.19	7.86	518.42	526.28	Bucket in view-looks like Bucket E is on its side again.
2156	20090407 102118	14.60073565	144.7753218	344.01	7.58	516.96	524.54	Almost looks like vent is shut off in places.
2157	20090407 102215	14.60073374	144.7753928	192.04	5.8	520.36	526.16	Jason is getting in some plume.
2158	20090407 102308	14.60067845	144.7753049	252	5.9	522.2	528.1	Waiting for ship and Medea before heading east.
2159	20090407 102329	14.60065348	144.7752283	250.81	5.51	523.49	529	Positioning Medea directly over drop target.
2160	20090407 102410	14.60061008	144.7751289	263.8	4.3	530.71	535.01	Jason downslope of Brimstone about 10m looking south.
2161	20090407 102512	14.6006749	144.7749381	296.7	5.3	539.07	544.37	We are 20m away west from Brimstone.
2162	20090407 102528	14.60070218	144.7749294	306.7	4.06	540.69	544.75	Slope is falling away from us.
2163	20090407 102556	14.60076605	144.7749193	354.97	4.01	541.08	545.09	Heading NW upslope and then due north.
2164	20090407 102613	14.60078716	144.7749376	44.56	4.68	539.46	544.14	We are 40m west of Brimstone.
2165	20090407 102652	14.60079489	144.7749881	113.38	4.63	534.45	539.08	Heading due west.
2166	20090407 102713	14.60078543	144.7750471	137.79	5.01	528.47	533.48	Talus slope.
2167	20090407 102826	14.60063231	144.775244	155.19	5.01	524.69	529.7	Made one search loop to the west.
2168	20090407 102840	14.60062334	144.7752591	238.21	5.81	525.51	531.32	Vent is in the butt cam.
2169	20090407 102905	14.6006533	144.7752212	285.81	6.01	525.04	531.05	Heading back WNW.
2170	20090407 102953	14.60068322	144.7750696	280.82	6.14	528.74	534.88	Able to roam about 40m out from Medea with tether.
2171	20090407 103039	14.60066111	144.7750366	122.22	5.19	533.92	539.11	Going to head out 106deg and zig-zag.
2172	20090407 103049	14.60065087	144.7750676	105.22	4.84	532.8	537.64	Talus and steep slope.
2173	20090407 103123	14.60061076	144.7751745	110.74	1.91	531.63	533.54	Jason heading west.
2174	20090407 103225	14.60055166	144.7753297	104.1	2.24	534.81	537.05	We are traversing west along slope that is south of Brimstone.
2175	20090407 103257	14.60054725	144.77539	100.84	0.89	536.97	537.86	Current is moving west to east.
2176	20090407 103318	14.60056008	144.775417	12.33	8.08	532.61	540.69	Now going to head north back up to Brimstone.
2177	20090407 103356	14.60061879	144.7754312	1.95	8.51	529.13	537.64	Current is about 1knt going east.
2178	20090407 103413	14.60065119	144.7754183	312.92	5.9	529.28	535.18	Cable is stretched out between Jason and Medea.
2179	20090407 103422	14.60064787	144.7754194	276.98	6.44	528.57	535.01	Looking along a slide chute area.
2180	20090407 103546	14.60067939	144.7754528	165.02	3.86	528.47	532.33	Looking around downslope.
2181	20090407 103621	14.60072836	144.7754735	103.92	3.29	527.12	530.41	Thruster dust clouding visibility.
2182	20090407 103650	14.60073979	144.7754495	99.04	1.58	527.24	528.82	Trying to get some more tether from Medea.
2183	20090407 103751	14.60074465	144.7754321	294.68	5.81	524.79	530.6	Jason is 20m east of Brimstone and going to head 290.
2184	20090407 103914	14.60080309	144.7753379	290.43	5.86	517.5	523.36	Shimmering water.
2185	20090407 103921	14.60080341	144.7753267	292.56	5.76	517.21	522.97	We should be upslope 10m of vent.
2186	20090407 103929	14.60081351	144.7753122	298.18	4.85	516.93	521.78	this could be northern rim of vent.
2187	20090407 104002	14.60084355	144.7752413	287.24	2.15	516.49	518.64	Up on Brimstone rim. Bottom falling off.
2188	20090407 104117	14.60091996	144.7750486	284.72	4.39	526.94	531.33	Can't see with slope dropping off before us.
2189	20090407 104206	14.60097997	144.7750341	28.35	4.06	533.56	537.62	Turning Jason around to 030.
2190	20090407 104245	14.60103601	144.7750904	88.26	5.38	533.52	538.9	Now turning to 1115.
2191	20090407 104517	14.60096863	144.7751691	119.4	8.28	522.53	530.81	We are N of target location about 25m.
2192	20090407 104552	14.60096279	144.7751625	118.55	7.09	523.98	531.07	Had been waiting for tether.
2193	20090407 104559	14.60096276	144.7751633	113.65	7.21	523.94	531.15	Now moving at 115.
2194	20090407 104725	14.60093686	144.7752181	114.96	7.8	519.32	527.12	Edge of rim in front of us with a heading of 115 (and 43m from target).
2195	20090407 104739	14.60092741	144.7752455	114.32	8.96	516.72	525.68	Very altered area (mat or alteration?).
2196	20090407 104826	14.60088823	144.7753244	114.64	8.73	514.24	522.97	Can see plume going away from us in pilot cam. Plume is hugging ground-strong current.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-400 Logger Comment
2197	20090407 104909	14.60085305	144.7753988	114.72	8.2	516.7	524.9	Full plume image (much reduced activity.)
2198	20090407 104959	14.6008044	144.7755007	116.11	8.99	521.71	530.7	In the plume and see large particulates (they are shrimp!).
2199	20090407 105104	14.60077406	144.775572	27.43	8.76	525.63	534.39	Coming out of plume a bit and turning 90 to left.
2200	20090407 105207	14.60085882	144.775602	294.59	7.83	533.08	540.91	In the plume with no visibility.
2201	20090407 105217	14.60086858	144.7755819	296.93	7.13	532.57	539.7	Looks like amphipods and not shrimp in plume
2202	20090407 105252	14.60090464	144.7755067	294.63	7.44	528.43	535.87	there is the slope in front heading 295 on the northern side of Brimstone.
2203	20090407 105402	14.60092733	144.7754684	299.95	8.34	525.18	533.52	This is the northern edge of the cone and the summit.
2204	20090407 105406	14.60092792	144.7754685	300.45	8.43	525.16	533.59	Driving along a little valley.
2205	20090407 105511	14.6009952	144.7753588	297.31	5.75	525.16	530.91	Driving along the valley (would have been a good landing spot).
2206	20090407 105605	14.60106246	144.7752372	298.08	8.86	523.33	532.19	Figure the instrument should fall not more than 100m from its drop spot.
2207	20090407 105712	14.60111291	144.7751504	300.26	6.9	531.27	538.17	Butt cam really shows the valley with edge of cone on right and rim to left.
2208	20090407 105736	14.60112269	144.7751585	26.77	7.3	531.98	539.28	Jogging to the NE.
2209	20090407 105802	14.60117694	144.7751884	28.33	6.3	532.94	539.24	Cone is really blocky so putting out lava and not tephra as much.
2210	20090407 105827	14.60122559	144.7752209	28.74	9.4	527.52	536.92	Heading NNE and summit ridge coming up.
2211	20090407 105907	14.60120757	144.7752568	120.55	8.08	525.99	534.07	Looking SE.
2212	20090407 105924	14.60118778	144.7752897	120.7	8.61	523.19	531.8	Working our way up summit ridge then head to east.
2213	20090407 105936	14.60117584	144.7753092	120.31	8.59	521.61	530.2	Spires near the summit.
2214	20090407 105952	14.60117078	144.7753196	122.05	8.33	521.35	529.68	Rocky outcrops near rim.
2215	20090407 110009	14.60114774	144.7753584	120.72	5.86	520.77	526.63	VIDEO Start recording HDCam
2216	20090407 110038	14.60111353	144.7754147	120.44	7.18	517.64	524.82	Flying over spires of rim.
2217	20090407 110118	14.6010698	144.775496	119.74	8.14	520.72	528.86	VIDEO Stop recording HDCam
2218	20090407 110131	14.60105312	144.7755198	121.73	6.01	524.72	530.73	Spire view in butt cam.
2219	20090407 110151	14.60102793	144.7755593	120.56	6.23	526.65	532.88	Going over valley floor.
2220	20090407 110210	14.60100801	144.7755984	120.93	5.43	527.52	532.95	Plume is wafting over valley.
2221	20090407 110306	14.60096935	144.7756806	32.89	7.14	526.92	534.06	Back in the plume at 23m from target heading 302.
2222	20090407 110350	14.60102403	144.7757165	30.32	5.76	525.48	531.24	Looking NE at patch of black that doesn't have white coating.
2223	20090407 110356	14.60103715	144.7757236	30.42	5.73	524.82	530.55	VIDEO Start recording HDCam
2224	20090407 110409	14.60104888	144.775726	0.12	6.84	523.25	530.09	Heading north.
2225	20090407 110427	14.60104396	144.7757263	299.66	6.03	524.28	530.31	Lots of sulfur deposits (white) on summit.
2226	20090407 110449	14.60104529	144.7757229	300.33	6.3	524.06	530.36	VIDEO Stop recording HDCam
2227	20090407 110506	14.60107006	144.775692	297.6	4.88	523.56	528.44	
2228	20090407 110507	14.60107115	144.7756907	297.72	4.83	523.43	528.26	
2229	20090407 110509	14.60107346	144.7756879	298.32	4.95	523.16	528.11	
2230	20090407 110512	14.60107677	144.7756836	298.69	4.8	522.9	527.7	
2231	20090407 110514	14.6010792	144.7756808	298.7	4.84	522.76	527.6	
2232	20090407 110522	14.60108924	144.7756677	297.55	5.33	522.13	527.46	This is the summit ridge.
2233	20090407 110530	14.6010995	144.7756503	297.47	6.29	521.94	528.23	Heading along another 298 transect.
2234	20090407 110639	14.60116598	144.7755593	294.97	7.6	518.84	526.44	Summit rim.
2235	20090407 110655	14.6011767	144.775564	297.56	8.05	515.72	523.77	There is the hydrophone marker. Marker 107 in view.
2236	20090407 110701	14.60118367	144.7755582	296.18	7.58	515.49	523.07	Marker 107 site.
2237	20090407 110714	14.60120293	144.7755332	293.16	5.75	515.66	521.41	Current is blowing the marker significantly.
2238	20090407 110734	14.601228	144.7754994	296.31	4.24	516.28	520.52	bucket is upright and hydrophone is in place.
2239	20090407 110758	14.60125372	144.7754702	295.9	5.81	516.16	521.97	Hydrophone may hear Jason as it passed by.
2240	20090407 110907	14.60131939	144.7753566	292.59	7.7	518.64	526.34	Marker 107 position is off by about 10 meters to the east. Marker in nav is 10m to the west of where we just passed it.
2241	20090407 110934	14.60133945	144.7753233	294.19	8.01	520.93	528.94	At end of search line.

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2242	20090407 111029	14.60140511	144.7753145	29.6	3.56	529.18	532.74	Butt cam has good view of striated pattern in drifts of sulfur and ash.
2243	20090407 111047	14.60140896	144.7753261	36.99	3.49	528.61	532.1	Lots of stripes as we drive to north to turn around for another transect.
2244	20090407 111052	14.60141045	144.7753254	35.03	3.96	528.42	532.38	We are on the north side of the summit.
2245	20090407 111129	14.60145249	144.7753524	40.36	3.48	527.32	530.8	Bright yellow sulfur patches.
2246	20090407 111145	14.60144985	144.7753682	117.97	2.36	527.45	529.81	summit.
2247	20090407 111149	14.60145308	144.7753694	115.31	2.69	527.25	529.94	VIDEO Start recording HDCam
2248	20090407 111208	14.6014553	144.7753782	118.18	3.91	525.56	529.47	Crab on summit.
2249	20090407 111334	14.60136814	144.7754749	120.07	5.81	522.13	527.94	VIDEO Stop recording HDCam
2250	20090407 111416	14.60132891	144.7755413	120.52	5.61	524.5	530.11	Driving 120 on transect.
2251	20090407 111554	14.60124606	144.7756838	120.52	5.34	524.72	530.06	Lots of particulates in water.
2252	20090407 111734	14.60119809	144.775806	120.92	3.09	526.89	529.98	Going to continue on the heading for 30m more and then head south to fill in the next search patch.
2253	20090407 111817	14.60114118	144.7758685	123.94	5	524.48	529.48	VIDEO Start recording HDCam
2254	20090407 111835	14.60112487	144.7758991	121.69	4.9	523.62	528.52	Lots of coating on rocks and particulates in water.
2255	20090407 112004	14.60105512	144.7760063	121.46	5.56	520.18	525.74	We are near Koichi's loggers on the rim.
2256	20090407 112120	14.60102243	144.7760703	120.85	6	521.44	527.44	Saw the 2 loggers in the butt cam on the rim.
2257	20090407 112133	14.60101172	144.7760937	121.96	3.8	521.88	525.68	There is the summit ridge.
2258	20090407 112235	14.60095812	144.7761801	119.68	3.51	524.06	527.57	Lots of particulates in water.
2259	20090407 112330	14.60095934	144.7761824	30.96	2.71	526.45	529.16	Lots of shrimp just disturbed off bottom.
2260	20090407 112509	14.60089623	144.7761289	32.13	2.14	526.33	528.47	Trying to figure out best strategy to deal with strong current.
2261	20090407 112528	14.60090611	144.7761113	27.81	1.68	525.32	527	VIDEO Stop recording HDCam
2262	20090407 112552	14.60091699	144.7760956	26.92	1.91	523.72	525.63	We are near the Gastros area according to the nav.
2263	20090407 112628	14.60092202	144.7761012	298.72	3.64	524.26	527.9	We are looking upslope with a heading of 299. Lots of shrimp on bottom.
2264	20090407 112649	14.60093175	144.7760713	293.82	3.16	523.16	526.32	Going over a little ridge.
2265	20090407 112732	14.60094998	144.7760071	285.9	2.71	520.05	522.76	Going back down other side of ridge (sloping away from us).
2266	20090407 112823	14.60098343	144.7759162	284.87	3.5	519.42	522.92	At Koichi's logger again on the ridge.
2267	20090407 112839	14.60098848	144.7759031	290.97	5.16	517.18	522.34	There is one of the instruments in view.
2268	20090407 112907	14.60101389	144.775856	284.24	4.88	515.77	520.65	We are in the plume with zero visibility.
2269	20090407 112930	14.60102863	144.77582	278.3	4.11	516.82	520.93	Bottom is falling away as we crossed the ridge.
2270	20090407 113020	14.60104162	144.7757905	200.56	3.08	520.77	523.85	Again nav has Koichi's instruments 10m off-Jason was 10m to the west of the instrument location in nav.
2271	20090407 113042	14.60100892	144.7757922	201.65	3.08	519.35	522.43	Plume is wafting above us and now we are in it again.
2272	20090407 113116	14.6009478	144.7757696	201.2	3.78	523.08	526.86	Jason is heading back south.
2273	20090407 113132	14.60094678	144.7757669	192.05	2.1	525.3	527.4	Removing some targets from the nav screen to clean it up (took out Brimstone 06).
2274	20090407 113234	14.60094883	144.775797	112.55	3.8	523.9	527.7	Very steep here.
2275	20090407 113333	14.60093488	144.7758736	107.01	5.33	515.81	521.14	There is Koichi's instrument again.
2276	20090407 113419	14.600903	144.7759553	106.85	3.06	516.72	519.78	Lots of plume as we head east.
2277	20090407 113529	14.60085852	144.7760744	102.54	3.98	521.74	525.72	There has been no visibility in this search sector with the plume.
2278	20090407 113550	14.60084481	144.7761097	95.57	4.84	523.52	528.36	There is some bottom in the butt cam.
2279	20090407 113643	14.60080703	144.7761962	193.45	3.56	534.33	537.89	Turning Jason South.
2280	20090407 113832	14.6007357	144.7761652	289.29	2.84	536.95	539.79	Shrimp on bottom here.
2281	20090407 113911	14.600761	144.7761039	288.63	5.04	531.44	536.48	We were 10m due east of marker 108 (which was not relocated after its drop).
2282	20090407 113924	14.60077363	144.7760884	286.85	5.91	529.41	535.32	Below correction that is sector not secot.
2283	20090407 114011	14.60080773	144.776057	286.77	4.88	526.7	531.58	Lots of white coating the rocks. Looks like the Marker 108 site.
2284	20090407 114021	14.60082049	144.7760406	288.06	3.48	526.72	530.2	See shrimp.
2285	20090407 114130	14.60085277	144.7760854	298.12	3.39	525.05	528.44	VIDEO Start recording HDCam

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2286	20090407 114156	14.60083959	144.7760882	332.78	3.75	524.7	528.45	Current is strong and can't get back on transect line.
2287	20090407 114232	14.60082042	144.7760966	291.91	7.2	523.26	530.46	Current is tumbling down this hill.
2288	20090407 114411	14.60083845	144.7760717	266.96	5.68	523.1	528.78	Can see plume moving quickly by as we are looking at the same rock below.
2289	20090407 114615	14.60075515	144.7760776	314.87	17.08	516.18	533.26	Some tether management.
2290	20090407 114804	14.60079526	144.7760194	300.02	13.73	514.41	528.14	VIDEO Stop recording HDCam
2291	20090407 114828	14.600813	144.7759719	300.19	11.44	514.37	525.81	Plume tumbling over us.
2292	20090407 115104	14.60092914	144.7757544	290.91	4.13	529.64	533.77	Some poor visibility again (but better than the last few minutes.)
2293	20090407 115241	14.60085385	144.7757002	161.45	1.95	532.68	534.63	Most of this search line would not have seen the instrument due to the poor visibility of the plume emissions.
2294	20090407 115308	14.6008422	144.7757109	129.97	3.48	535.15	538.63	But cam has the most visibility at the moment.
2295	20090407 115427	14.60075325	144.7758221	130.63	4.71	537.04	541.75	Can see the bottom and now it is very steep.
2296	20090407 115611	14.60065679	144.7759534	120.37	1.03	533.36	534.39	We are under the plume and can see again.
2297	20090407 115654	14.6006317	144.7760033	209.43	1.15	533.25	534.4	Going to head south away from the no visibility area.
2298	20090407 115742	14.6005934	144.7759792	209.61	2.26	534.18	536.44	Back into some plume.
2299	20090407 115906	14.60062045	144.775934	296.81	6.45	534.63	541.08	Large outcrop.
2300	20090407 115921	14.60063342	144.7759119	295.62	3.85	537.5	541.35	Slope falls off on port as we drive 295.
2301	20090407 115959	14.60066763	144.7758433	299.68	4.89	537.29	542.18	Small rectangular shape seen in camera.
2302	20090407 120007	14.6006726	144.7758334	302.47	5.11	536.87	541.98	Could be Marker 108 that fell down slope.
2303	20090407 120017	14.60065992	144.7758492	302.32	5.06	537.76	542.82	Going back down for a look.
2304	20090407 120039	14.60063039	144.7758476	328.65	7.36	540.6	547.96	We are downslope from Marker 108 location.
2305	20090407 120050	14.6006423	144.7758269	337.21	7.96	540.83	548.79	This is the new Marker 108 location-it slid down slope.
2306	20090407 120104	14.60064763	144.7758301	336.46	6.33	541.33	547.66	This is marker 108 now.
2307	20090407 120117	14.60064826	144.7758301	335.56	6.25	541.48	547.73	Marker was on cliff face and probably just fell down to the bottom.
2308	20090407 120144	14.60064776	144.7758302	336.24	6.11	541.37	547.48	Marker 108 is now at the bottom of the structure where originally placed. Depth is 541m.
2309	20090407 120206	14.60064706	144.7758318	334.99	6.75	539.29	546.04	Nav got a good target for this location.
2310	20090407 120215	14.60064783	144.7758318	335.87	7.18	538.62	545.8	Looks like a good place to sample mat.
2311	20090407 120236	14.60064727	144.7758307	335.89	6.63	539.19	545.82	Lat from doppler is 14deg 36.039 144deg 46.550E
2312	20090407 120240	14.60064771	144.7758316	336.15	7.18	538.87	546.05	J2-400 Data DVDs start Blue set 016
2313	20090407 120313	14.6006673	144.7758078	325.84	4.64	539.14	543.78	Continuing to survey.
2314	20090407 120400	14.60075049	144.7756955	313.33	4.48	539.69	544.17	Moving back along search line.
2315	20090407 120412	14.60077452	144.7756599	319.91	4.69	538.74	543.43	Lots of white coating on surface.
2316	20090407 120443	14.60077607	144.7756139	237.55	6.36	536.02	542.38	Going to head to left and around to start another line.
2317	20090407 120542	14.60065546	144.7756885	116.32	2.34	539.32	541.66	Butt cam has most visibility.
2318	20090407 120558	14.60063125	144.7757569	120.58	2.8	542.79	545.59	More plume smoke along this direction again.
2319	20090407 120604	14.6006269	144.7757801	122.77	3.46	543.8	547.26	There is the Marker 108 on left.
2320	20090407 120654	14.60049207	144.7758863	128.95	2.39	553.14	555.53	J2-400 Data DVDs stop Red set 015
2321	20090407 120656	14.60049289	144.7758866	128.68	2.19	553.31	555.5	Passing Marker 108 again. It is 20m downslope from the marker 108 location in the nav.
2322	20090407 120738	14.6005048	144.7758787	13.72	3.76	553.67	557.43	Lots of shrimp in water.
2323	20090407 120746	14.60052181	144.7758821	15.32	3.26	552.86	556.12	Not great visibility.
2324	20090407 120811	14.60051197	144.7758836	15.26	5.83	550.59	556.42	Shrimp on rock face that appeared out of nowhere.
2325	20090407 120911	14.60052163	144.7758581	282.98	6.3	549.33	555.63	Butt cam has good view of rock face. (very close)
2326	20090407 120953	14.60050408	144.7757771	290.67	5.59	548.37	553.96	Poor visibility.
2327	20090407 121048	14.6005428	144.7756993	293.79	5.63	546.74	552.37	Patch of visibility. White dusting on rocks.
2328	20090407 121101	14.60055354	144.7756841	297.77	5.36	546.13	551.49	Jumbled steep terrain.

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2329	20090407 121116	14.6005599	144.7756747	296.06	5.13	544.94	550.07	Lots of blocks with particles raining down.
2330	20090407 121333	14.60061808	144.775556	299.82	4.93	534.02	538.95	Outcrops with sandy deposits between and plume smoke.
2331	20090407 121403	14.60062369	144.775518	296.3	3.96	532.43	536.39	J2-400 DVCAM 013 stop DVCAM 014 start
2332	20090407 121420	14.60063383	144.7755075	294.13	4.68	531.02	535.7	Some stained rock.
2333	20090407 121631	14.60052589	144.7755328	127.87	2.23	539.54	541.77	Slope is going down in front of us-but cam has some view.
2334	20090407 121800	14.6004945	144.7756394	127.79	1.04	545.95	546.99	Shrimp in water.
2335	20090407 121808	14.60049488	144.7756484	126.92	2.63	544.91	547.54	Big rocks in butt cam.
2336	20090407 121903	14.6004939	144.7756451	129.08	1.93	545.49	547.42	Jason doing some weight management. Dropping a weight.
2337	20090407 122051	14.60046138	144.7757005	127.46	7.5	545.16	552.66	All better and continuing search line.
2338	20090407 122245	14.60032273	144.7757985	300.07	5.05	564.09	569.14	We are west of chute bottom target area for Brimstone approach. Poor visibility still.
2339	20090407 122258	14.60033774	144.7757641	298.96	5.35	562.29	567.64	Jason is now headed up slope. Lots of white coating the rocks.
2340	20090407 122716	14.60042935	144.7754926	15.57	10.39	537.01	547.4	Jason heading back south-east downslope.
2341	20090407 123109	14.60012743	144.7757652	209.19	3.58	567.86	571.44	Edge of rim here.
2342	20090407 123302	14.60021016	144.7756789	309.79	13.65	557.11	570.76	Heading up slope again with some more consolidated rocks with coating.
2343	20090407 123332	14.6002672	144.7756249	304.14	10.83	552.68	563.51	One of the CTD bottles had broken at the surface after impact with the block.
2344	20090407 123400	14.60032008	144.7755399	306.4	8.4	550.05	558.45	Rocks less consolidated as move upslope
2345	20090407 123518	14.60041135	144.7754367	306.17	11.48	536.86	548.34	We are at/near our normal launch area for approaching Brimstone.
2346	20090407 123537	14.60042378	144.775418	302.13	12.16	534.85	547.01	In Brimstone chute.
2347	20090407 123653	14.60029727	144.7754468	133.7	8.96	543.41	552.37	Jason heading back downslope across the chute.
2348	20090407 123723	14.6002301	144.7755461	132	7.45	552.53	559.98	Current may have eased up a bit.
2349	20090407 123758	14.60020429	144.7755757	132.89	11.5	551.76	563.26	Flying too high off bottom to see.
2350	20090407 123815	14.60020219	144.7755849	131.95	6.73	557.53	564.26	Butt cam has some view up the slope.
2351	20090407 123929	14.60009342	144.7757626	215.87	4.04	567.1	571.14	Going over some ridge or outcrop. Drop off in front of us.
2352	20090407 124035	14.59999459	144.7756936	319.75	10.04	571.88	581.92	Some sulfur staining on rock.
2353	20090407 124053	14.60001722	144.7756835	319.47	9.7	571.27	580.97	Jason heading up slope again.
2354	20090407 124217	14.60008281	144.7756689	307.18	7.46	567.87	575.33	Delineation between black rock and rock with white dust.
2355	20090407 124350	14.60015716	144.7755151	305.4	9.5	559.16	568.66	Upslope the rocks are getting more broken up and jumbled appearing.
2356	20090407 124511	14.60024937	144.7753654	312	7.35	550.83	558.18	Fine talus and smaller pieces on slope.
2357	20090407 124656	14.60023228	144.7753131	228.1	8.01	548.2	556.21	Heading downslope again.
2358	20090407 124955	14.59993566	144.7755405	321.7	7.35	577.68	585.03	Jason turning around right to head up slope again.
2359	20090407 125332	14.59993881	144.7754374	298.47	10.09	573.96	584.05	Repositioning ship and preparing a new search sector.
2360	20090407 125739	14.60022119	144.7752334	298.54	6.24	552.75	558.99	continuing west
2361	20090407 125804	14.6001317	144.775233	210.06	8.04	554.95	562.99	heading downslope
2362	20090407 125832	14.60009703	144.7752708	135.32	1.34	564.81	566.15	traversing slope again
2363	20090407 130133	14.59998551	144.7752657	189.82	5.98	569.03	575.01	Rubble.
2364	20090407 130250	14.59983891	144.7752028	17.65	7.51	581.63	589.14	We are south of the Brimstone chute target.
2365	20090407 130305	14.60009242	144.7753159	3.3	8.19	580.05	588.24	NAV Doppler reset
2366	20090407 130332	14.60008908	144.7753165	3.54	8.04	580.38	588.42	Nav jumped over 20m after reset.
2367	20090407 130350	14.60008873	144.775316	3.19	8.14	580.29	588.43	The nav lines are not as far south as they look.
2368	20090407 130527	14.60016706	144.7752664	303.21	10.64	570.44	581.08	Heading back up slope.
2369	20090407 130643	14.60025366	144.7751472	300.55	10.88	562.78	573.66	Lines finish 25m north of snail trail after doppler reset.
2370	20090407 131131	14.60023539	144.7750318	301.44	14.46	561.82	576.28	Trying to decide on a search pattern.
2371	20090407 131420	14.60018834	144.7747932	110.41	9.09	574.16	583.25	Waiting for the ship to get into position.
2372	20090407 131443	14.60015424	144.7748535	102.06	7.39	575.31	582.7	Fish with color.
2373	20090407 131450	14.60014389	144.7748677	100.37	6.28	575.79	582.07	Not a rat tail.

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2374	20090407 131536	14.60008376	144.774954	106.17	3.53	579.45	582.98	Another non-rat tail fish...actually same one with orange color. Look like a goldfish (but bigger).
2375	20090407 131606	14.60010171	144.7750301	81.11	4.69	577.59	582.28	Bottom giving way from lava to sediment at 580m.
2376	20090407 131625	14.60014966	144.7750399	38.21	7.15	575.38	582.53	Small slide chute.
2377	20090407 131705	14.60019332	144.7749398	12.56	6.01	571.34	577.35	Looks like pillow tube.
2378	20090407 131715	14.60019625	144.7749015	317.47	8.06	570.82	578.88	Flow here looks more fluid.
2379	20090407 132102	14.60013493	144.7746004	282.74	3.88	586.81	590.69	Heading west over lava flow.
2380	20090407 132308	14.60033683	144.774322	12	9.71	601.11	610.82	Lots of lava pillows here.
2381	20090407 132431	14.60038034	144.774405	118.89	3.15	598.15	601.3	Jason heading back to the east across slope.
2382	20090407 132455	14.60031353	144.774439	104.21	3.69	599.58	603.27	Actually heading SE but heading is 111.
2383	20090407 132524	14.60028455	144.7745202	95.54	6.5	594.19	600.69	Good visibility here but no CTD.
2384	20090407 132645	14.60024963	144.7747482	73.71	10.63	573.94	584.57	Lava ridges across slope and a fish (same kind).
2385	20090407 132828	14.60035533	144.7748809	346.94	11.19	560.89	572.08	More white sediment covering rocks as we move eastward.
2386	20090407 132857	14.60029893	144.7748125	270.26	10.01	566.98	576.99	Jason now turning around to head back westward.
2387	20090407 132938	14.60025405	144.7746889	270.57	7.48	578.54	586.02	Butt cam has best view.
2388	20090407 133010	14.60030483	144.7746555	312.23	6.08	581.42	587.5	Current pushed us back on to the line we just did so heading north now.
2389	20090407 133039	14.60035493	144.7745624	304.46	7.11	587.24	594.35	Moving along an unexplored line now to the west.
2390	20090407 133242	14.60039394	144.7744679	323.61	11.14	587.36	598.5	Spun Jason around to look at slide seen in butt cam but it was not recent.
2391	20090407 133448	14.60044286	144.7744662	129.61	0.81	594.76	595.57	Jason turning around to head east along another line.
2392	20090407 133521	14.60039341	144.7745105	120.81	4.41	590.87	595.28	Running across a talus slope with a mixture of rubble sizes.
2393	20090407 133629	14.60035248	144.7746729	113.11	6.68	582.29	588.97	More pillow forms and consolidated looking.
2394	20090407 133647	14.60032386	144.7747084	112.53	11.35	576.93	588.28	Drop off in front of us.
2395	20090407 133833	14.60027545	144.7749852	42.17	5.74	568.04	573.78	Sharps is off.
2396	20090407 134341	14.60030546	144.7748788	279.19	8.7	563.93	572.63	Moving SW.
2397	20090407 134531	14.60033833	144.7747171	316.17	9.16	574.58	583.74	Change of Jason watch.
2398	20090407 134540	14.60033852	144.7747181	317.26	8.89	575.08	583.97	Very strong current.
2399	20090407 135252	14.6002088	144.7747909	315.83	7.18	576.55	583.73	Jason has been stationary while watch changed. New team is discussing a search strategy.
2400	20090407 135303	14.60021405	144.7747913	316.93	6.69	576.47	583.16	Current seems to be changing a bit.
2401	20090407 135453	14.60022072	144.7747941	44.13	9.14	574.6	583.74	Going to continue to zigzag e-w heading back up to Brimstone Pit.
2402	20090407 135701	14.60024945	144.7751787	21.04	9.06	567.5	576.56	Heading 060 to start zigzag.
2403	20090407 135713	14.60025672	144.7751786	3.34	11.43	564.2	575.63	Large consolidated lavas with heavy sedimentation.
2404	20090407 135734	14.60031476	144.7751821	4.56	7.66	559.72	567.38	J2-400 Data DVDs start Red set 017
2405	20090407 135903	14.60044176	144.7750375	2.95	8.89	550.85	559.74	Top of a ridge or outcrop.
2406	20090407 135922	14.60045326	144.7749802	6.1	7.78	551.87	559.65	Heading is due north.
2407	20090407 135942	14.60048356	144.7749501	349.55	8.15	555.68	563.83	On the other side of the ridge feature.
2408	20090407 140030	14.60049653	144.7748218	334.1	9.83	563.21	573.04	Back of ridge in butt cam.
2409	20090407 140127	14.60054523	144.7746569	323.39	10.45	571.33	581.78	Jason is heading more north than the actual COG which is more westerly.
2410	20090407 140156	14.60061113	144.7747292	33.25	6.13	568.58	574.71	Lava rubble.
2411	20090407 140204	14.60061824	144.7747521	36.84	5.6	567.44	573.04	Much less sedimentation on this side of the ridge.
2412	20090407 140228	14.60057162	144.7748189	65.16	4.79	565.78	570.57	J2-400 Data DVDs stop Blue set 016
2413	20090407 140248	14.6005452	144.774867	69.08	7.05	562.46	569.51	Jason is swinging to the east.
2414	20090407 140327	14.60052058	144.7749844	74.4	9.03	554.49	563.52	Getting back into more sedimentation.
2415	20090407 140414	14.60044753	144.7751563	32.52	5.68	550.48	556.16	Passed over a low ridge of rock.
2416	20090407 140543	14.60057674	144.7752292	339.07	6.21	545.96	552.17	Heading back to west.

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2417	20090407 140636	14.60062812	144.7750927	322.95	5.54	545.11	550.65	Last night's SM2000 survey passed through plume several lines away south of Brimstone.
2418	20090407 140733	14.60071053	144.7749551	322.31	7.91	548.06	555.97	The plume was as thick as Brimstones but definitely distinct and different than Brimstone.
2419	20090407 140819	14.60072703	144.7749182	52.22	6.73	550.92	557.65	The plume was about 80m south.
2420	20090407 140841	14.6007443	144.7749276	50.79	6.94	549.49	556.43	Finished filling the search area SW of Brimstone.
2421	20090407 140924	14.60073366	144.775009	77.67	4.91	546.88	551.79	Heading back to Brimstone drop target was to see if anything was missed in that area.
2422	20090407 140959	14.6006789	144.7751156	80.09	5	542.73	547.73	Rubble and talus with some sediment chutes. Just passed over a dive weight.
2423	20090407 141057	14.60059948	144.7751973	349.95	12.11	539.83	551.94	See slide areas.
2424	20090407 141142	14.60055068	144.7751868	327.91	10.8	544.63	555.43	Going back to fill small gap to the west.
2425	20090407 141221	14.60056317	144.7750647	315.62	3.78	547.9	551.68	Moving along fill line.
2426	20090407 141246	14.60060206	144.7749737	317.18	8.44	551.15	559.59	Slope is downward in front of us.
2427	20090407 141330	14.60067411	144.7748364	323.52	4.3	559.81	564.11	Rubble and talus again. Finished gap filling line.
2428	20090407 141355	14.60065981	144.774811	324.36	6.83	559.51	566.34	J2-400 DVD 017 PC-W stopped recording after about 3 minutes.
2429	20090407 141418	14.60064219	144.7748003	324.71	8.48	559.51	567.99	J2-400 DVD recorder did self-check and restarted. Recommended new disc be used
2430	20090407 141418	14.60064219	144.7748003	324.71	8.48	559.51	567.99	Stopping to determine current direction and strength.
2431	20090407 141428	14.60063267	144.7747975	324.76	9.21	559.55	568.76	Current is pulling vehicle south.
2432	20090407 141456	14.60062345	144.7748088	321.87	8.44	559.87	568.31	J2-400 Started DVD 017 PC-W-2 at 14:05. Lost a few minutes of video.
2433	20090407 141702	14.60040903	144.7749185	6.94	10.81	555.83	566.64	Going to look even further south following the downslope area from Brimstone.
2434	20090407 141925	14.60028527	144.7748522	216.28	10.48	564.04	574.52	Going to move the ship.
2435	20090407 141939	14.60027701	144.7748422	216.55	12.03	563.56	575.59	Butt camera has a great view from the Medea lights.
2436	20090407 142129	14.6002442	144.7748285	214.59	9.58	566.12	575.7	J2-400 DVCAM 014 stop DVCAM 015 start
2437	20090407 142439	14.60016708	144.7747029	216.84	6.68	581.46	588.14	Still waiting for ship.
2438	20090407 142548	14.60010774	144.7745882	216.17	2.43	590.46	592.89	Heading south a bit.
2439	20090407 142745	14.60001282	144.7745523	215.56	5.88	591.5	597.38	Or maybe we are just looking south while still waiting for the ship.
2440	20090407 142759	14.60001609	144.7745154	215.51	3.65	594.28	597.93	Looking downslope so really only the butt cam has a view.
2441	20090407 142902	14.59995782	144.774397	173.11	5.64	604.44	610.08	Thruster blast or touch disturbed some shrimp and sediment off rock in butt cam.
2442	20090407 143356	14.59980213	144.7742147	102.87	3.84	622.58	626.42	Still waiting
2443	20090407 143509	14.59985055	144.7741448	352.73	6.46	622.54	629	Coherent lava flows down here rather than debris of the slope
2444	20090407 143659	14.59982362	144.7740283	120.87	9.63	627.62	637.25	Consolidated lava with slides or scrapes.
2445	20090407 143852	14.59963012	144.7741934	26.57	3.94	639.86	643.8	This area more lava flow than rubble.
2446	20090407 143946	14.59963704	144.7742137	6.31	3.16	640.66	643.82	Garbage bundle on the seafloor.
2447	20090407 144324	14.59946921	144.7738374	35.69	7.5	661.04	668.54	Still lava not debris
2448	20090407 144422	14.59944419	144.7738445	54.1	7.76	662.06	669.82	Starting zigzag trending NE
2449	20090407 144517	14.59939855	144.773929	58.52	4.99	662.9	667.89	Medea camera has nice view of Jason and bottom
2450	20090407 144613	14.59937933	144.774068	59.42	4.69	664.83	669.52	Longer pillows and tubes.
2451	20090407 144650	14.59937399	144.7741141	59.48	4	663.58	667.58	Not much sediment in this area.
2452	20090407 144722	14.5993931	144.7740992	13.76	6.7	660.89	667.59	Fish.
2453	20090407 144738	14.59942001	144.7740897	14.99	5.71	660.92	666.63	White layers in rock.
2454	20090407 144757	14.59945611	144.7740666	354.85	4.8	659.54	664.34	Bill says they are stripes. (expert opinion)
2455	20090407 144835	14.59951162	144.7739125	344.53	3.94	656.6	660.54	Seeing a lot of white in rock (doesn't look like a deposit on the rock).
2456	20090407 144937	14.59972896	144.7737356	52.42	6.69	658.68	665.37	Starting a slight zig to the east.
2457	20090407 145039	14.59966986	144.7738475	97.17	3.81	654.09	657.9	More solid looking lava (not pillows) some small ridges.
2458	20090407 145048	14.59965827	144.7738644	98.53	2.25	653.47	655.72	Broken pillow.
2459	20090407 145115	14.59962908	144.7739106	99.6	2.43	651.07	653.5	Long pillow with shrimp and fish.

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2460	20090407 145206	14.59953854	144.7740178	101.47	2.63	650.21	652.84	Jason looking east climbing over a ridge.
2461	20090407 145241	14.59948529	144.7740638	79.82	6.74	653.97	660.71	Very steep area here.
2462	20090407 145330	14.59952864	144.7741529	349.87	5.75	650.41	656.16	More stripes in rocks.
2463	20090407 145408	14.59961066	144.7740475	327.22	4.78	643.73	648.51	Jason zagging to west and north as we generally make our way north.
2464	20090407 145420	14.59964862	144.7739914	348.78	5.41	643.8	649.21	Pillows and tubes.
2465	20090407 145545	14.59984482	144.7739469	110.48	4.35	642.44	646.79	Zigging back over to the east. Looks like some sheet thick flows.
2466	20090407 145612	14.59977966	144.7739776	106.43	5.5	641.17	646.67	VIDEO Start recording HDCam
2467	20090407 145640	14.59972304	144.773985	97.58	5.96	639.56	645.52	Layers of pillows and tubes on steep slope.
2468	20090407 145712	14.59967235	144.7740307	72.48	6.5	639.45	645.95	Intact lava on steep slope.
2469	20090407 145752	14.59966627	144.7741179	47.82	7.39	635.87	643.26	Very steep intact lava flows.
2470	20090407 145930	14.59968415	144.7742377	336.05	8.66	632.5	641.16	Turning to zig west again.
2471	20090407 145954	14.59972524	144.7741489	336.55	6.45	630.72	637.17	Still intact lava but now getting more white coating. Particulates in water raining down more as well.
2472	20090407 150058	14.59982165	144.7740158	353.33	7.05	635.15	642.2	Changing Jason pilots.
2473	20090407 150205	14.59989416	144.7740143	356.23	4.91	636.01	640.92	Heading back north.
2474	20090407 150227	14.59995544	144.774022	353.26	5.89	635.29	641.18	Butt cam has steep wall.
2475	20090407 150324	14.60009029	144.7740149	339.77	3.34	634.57	637.91	Heading due north.
2476	20090407 150401	14.600139	144.774014	343.35	1.83	634.19	636.02	Lots more sediment coating the lava flow.
2477	20090407 150536	14.60018132	144.7739513	68.54	2.46	634.27	636.73	Turning toward east.
2478	20090407 150631	14.60012771	144.7739829	135.66	2.28	634.25	636.53	Driving across slope to the SE.
2479	20090407 150713	14.60005384	144.7740268	140.37	3.06	634.2	637.26	Looks like we are driving over old track.
2480	20090407 150757	14.59994064	144.7740833	137.96	4.41	634.16	638.57	Going to far downslope instead of across slope.
2481	20090407 150828	14.59990348	144.7741093	136.15	5.25	631.16	636.41	A lot of white sediment coating rocks.
2482	20090407 150913	14.59982038	144.7741582	127.67	5.81	624.93	630.74	Crossing over a ridge of lava.
2483	20090407 151024	14.59969402	144.77427	134.91	7.85	627.57	635.42	Looking downslope only view is off butt cam.
2484	20090407 151113	14.59973577	144.7742861	53.75	4.81	629.53	634.34	Lots of pillows here.
2485	20090407 151217	14.59979078	144.7744266	53.97	5.53	621.19	626.72	Pillows and tubes with white sediment (not as thick as a little while ago).
2486	20090407 151307	14.59979716	144.7744519	341.14	6.8	618.6	625.4	Big fat pillow lavas.
2487	20090407 151505	14.59996465	144.7743117	334.41	5.59	614.49	620.08	Top of a pillow pile. Longer pillow.
2488	20090407 151645	14.60011339	144.7741414	322.59	9.93	620.74	630.67	Butt cam showing big pillows-Jason looking downslope.
2489	20090407 152042	14.60037884	144.7739731	11.82	3.43	627.22	630.65	Sonar target was a big rock.
2490	20090407 152157	14.6003494	144.774074	122.73	1.75	623.62	625.37	Flat looking area. Slope is clastic here and eastern half was lava.
2491	20090407 152208	14.60032756	144.7740865	124.35	1.51	623.59	625.1	Most of the debris from the vent going to the west.
2492	20090407 152301	14.6001972	144.7741449	123.58	3.38	623.71	627.09	A few large lava pillows or boulders.
2493	20090407 152414	14.60009255	144.7743045	125.66	3.79	618.9	622.69	Large lava features with some pillows and tubes.
2494	20090407 152432	14.60007802	144.7743157	122.46	2.88	618.78	621.66	A lot more particulate-sediment on lava.
2495	20090407 152603	14.60005594	144.7743185	62.76	3.48	617.31	620.79	A shrimp but not much biology.
2496	20090407 152743	14.60006989	144.7743809	51.44	3.93	611.86	615.79	Moving in general to the north. Want to fill a gap in the lines that runs to the NW.
2497	20090407 152809	14.60007028	144.7744006	51.24	3.86	610.26	614.12	VIDEO Start recording HDCam
2498	20090407 152827	14.60007263	144.7744054	22.43	3.79	608.95	612.74	Climbing up a pillow ridge.
2499	20090407 152926	14.60013406	144.7743732	321	4.45	609.2	613.65	Looking downslope-butt cam has pillow wall view.
2500	20090407 153059	14.60022416	144.7742333	324.28	5.65	617.49	623.14	Filling the NW gap line in this sector.
2501	20090407 153127	14.60030612	144.7741931	320.79	4.69	616.8	621.49	Fairly flat consolidated slope.
2502	20090407 153200	14.6003857	144.7741597	322.39	3.03	617.1	620.13	A couple of lonely lava pillows on relatively flat surface.
2503	20090407 153241	14.60046218	144.774131	321.97	1.03	618.71	619.74	We are NW of Brimstone.
2504	20090407 153359	14.60050501	144.7740731	40.59	5.65	618.48	624.13	Turning toward East to fill a little more before heading over to Brimstone.



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2505	20090407 153622	14.6004498	144.7742076	132.95	3.1	613.05	616.15	Starting to head SSE to fill the area.
2506	20090407 153710	14.60031726	144.7742756	135.11	3.86	612.68	616.54	Large pillows and consolidated flow with light sediment coverage.
2507	20090407 153837	14.60013483	144.7743967	134.54	4.9	610.43	615.33	Some looser lava and blocky here.
2508	20090407 153857	14.60013754	144.77444	135.29	3.74	607.82	611.56	More sediment coverage and particulates in the water.
2509	20090407 154023	14.60010423	144.7744822	108.67	3.96	603.42	607.38	Finished covering gap and heading back to Brimstone area.
2510	20090407 154209	14.60027837	144.7743654	329.59	4	610.07	614.07	More rubble flow and steeper slope as we wait for Medea.
2511	20090407 154308	14.60029756	144.7741952	302.77	7.63	613.47	621.1	Some pillows. Back at medea and ready to go east.
2512	20090407 154929	14.60032317	144.7741897	78.4	5.01	616.93	621.94	WATCHSTANDERS Susan Merle logger
2513	20090407 155006	14.60032689	144.7742539	79.41	2.26	616.62	618.88	Bob Embley and Cornel deRonde on shift taking over for Bill Chadwick.
2514	20090407 155240	14.60033726	144.7744679	79.13	3.98	602.03	606.01	J2-400 Data DVDs start Blue set 018
2515	20090407 155307	14.60033573	144.774503	79.05	4.99	599.06	604.05	Still continuing the survey pattern. Lots of huge blocky talus here SW of Brimstone.
2516	20090407 155631	14.60036212	144.774729	78.74	3.51	586.43	589.94	Strewn talus everywhere.
2517	20090407 155729	14.60037504	144.7747766	79.7	6.33	580.71	587.04	J2-400 Data DVDs stop Red set 017
2518	20090407 155902	14.60037566	144.7748586	79.17	9.7	569.78	579.48	Heading upslope to Brimstone.
2519	20090407 160213	14.60041613	144.775087	79.01	2.96	560.61	563.57	We're looking for the CTD. Continuing the search pattern. It was over Brimstone when it fell.
2520	20090407 160402	14.60040646	144.7752114	81.5	4.16	558.12	562.28	Pillow lavas with white sediment and a lot of talus.
2521	20090407 160452	14.60040407	144.775193	78.82	4.39	558.11	562.5	Visibility around Brimstone was not good earlier. We're going back to have a look again.
2522	20090407 161012	14.60049665	144.7751757	1.1	2.36	553.69	556.05	The plan is to look around Brimstone.
2523	20090407 161027	14.60050793	144.775162	0.06	2.71	552.95	555.66	Getting back in the plume here.
2524	20090407 161036	14.60050796	144.7751672	359.99	2.53	552.76	555.29	Visibility is not so good.
2525	20090407 161308	14.60070391	144.7751454	0.78	3.28	546.58	549.86	The plume is pretty thick here.
2526	20090407 161817	14.60132953	144.7751453	0.28	5.91	539.25	545.16	The plume is all around us and thick. Visibility is poor.
2527	20090407 161938	14.60137038	144.7751148	359.58	4.38	545.18	549.56	Talus rubble here.
2528	20090407 162013	14.60137045	144.7751156	0	4.43	545.12	549.55	Looks more sandy now on the pilot cam.
2529	20090407 162245	14.60143193	144.775117	358.68	3.14	549.94	553.08	We're NW of the pit now. Mostly sands up ahead of us.
2530	20090407 162421	14.60148951	144.7751175	357.22	2.78	552.07	554.85	Beautiful steep sandy slope.
2531	20090407 162504	14.60151914	144.775104	4.32	3.28	552	555.28	J2-400 DVCAM 015 stop DVCAM 016 start
2532	20090407 162518	14.60151928	144.7751034	4.28	3.34	551.96	555.3	Not sure if the gold color here is iron oxide seds. The white is probably sulfur and the black is ash??
2533	20090407 162611	14.60151929	144.7751034	4.14	3.33	551.97	555.3	The slope looks to be about 45 degrees here near the summit.
2534	20090407 162739	14.60151989	144.7751044	129.3	3.14	551.99	555.13	Snapping some frame grabs here NW of the pit.
2535	20090407 162935	14.60146825	144.7751539	129.47	1.68	550.79	552.47	Looks like we have not been getting the 2 minute frame grabs that are supposed to happen.
2536	20090407 163137	14.60136599	144.7752063	129.56	3.75	545.25	549	Iron oxide covered outcrops. NW of Brimstone.
2537	20090407 163151	14.60135285	144.7752087	129.62	4.41	544.11	548.52	Blocky talus here.
2538	20090407 163307	14.60129406	144.7752512	130.4	3.46	539.29	542.75	Swarm of shrimp rising up off the seafloor. NW of Brimstone.
2539	20090407 163527	14.60115709	144.7753498	132.19	2.34	526.96	529.3	40m 162 deg from Jason to Brimstone. From brimstone to here is 40m 350 degrees. Shrimp all over the rocks here.
2540	20090407 163601	14.60115954	144.7753506	130.39	2.58	526.83	529.41	Swarms of shrimp here.
2541	20090407 163729	14.60108763	144.7754669	134.4	4.01	520.91	524.92	The bottom is coated with shrimp. Headed back SE now toward Brimstone.
2542	20090407 163931	14.60119129	144.7754979	48.64	7.23	522.82	530.05	Visibility is poor.
2543	20090407 164822	14.60124867	144.7754397	59.29	9.75	512.56	522.31	No ASNAPs.
2544	20090407 164844	14.60127429	144.7754691	50.77	11.01	513.94	524.95	Visibility is not good here again.
2545	20090407 164937	14.60132331	144.775456	330.45	9.08	518.64	527.72	Surveying around Brimstone again.

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2547	20090407 165031	14.60131868	144.7754193	322.6	2.15	524.03	526.18	Discussing the survey plan.
2548	20090407 165114	14.60133736	144.7753842	322.72	0.74	524.93	525.67	Snapping DSCs and HD grabs to try to get something.
2550	20090407 165520	14.60150164	144.775378	88.27	1.99	530.75	532.74	Travelling along the summit ridge. Heading 88 deg.
2552	20090407 165721	14.60139431	144.7755409	179.01	4.21	534.11	538.32	This slope is incredibly steep. Along the summit ridge heading SE.
2554	20090407 165850	14.60129603	144.7756207	165.18	6	528.95	534.95	Scottie got the ASNAPs up and working again.
2556	20090407 170016	14.6012954	144.7754706	224.22	3.08	526.57	529.65	This slope is covered with volcanoclastic seds and iron oxides.
2557	20090407 170107	14.60129605	144.7753466	161.75	3.14	521.98	525.12	The DSC menu is not overlaid on the screen.
2558	20090407 170122	14.60126104	144.7753485	154.96	4.68	520.21	524.89	Heading along the summit ridge.
2559	20090407 170147	14.60124881	144.7753647	141.16	7.98	515.79	523.77	We're at Marker 107 again at the summit ridge.
2560	20090407 170154	14.60123678	144.7753756	141.31	7.49	515.46	522.95	VIDEO Stop recording HDCam
2562	20090407 170316	14.6011466	144.7755017	143.77	1.45	519.79	521.24	We want the DSC monitor back. Scottie is working on it.
2564	20090407 170407	14.60108013	144.7755833	110.81	2.86	525.56	528.42	Can see the plume in the background.
2566	20090407 170803	14.6012605	144.7758581	110.21	4.01	535.92	539.93	Outcrop up ahead at the crest of the ridge.
2568	20090407 170817	14.60127287	144.7758538	107.51	3.73	536.47	540.2	Rugged topography.
2569	20090407 170913	14.60125911	144.775877	95.54	4.19	535.68	539.87	Driving parallel to the slope.
2570	20090407 170953	14.60119599	144.7758534	91.16	5.59	529.15	534.74	We're on the north side of the summit. Just barely.
2573	20090407 171256	14.6011482	144.7757062	133.96	3.26	522.19	525.45	Visibility is not so great here.
2574	20090407 171305	14.60113105	144.7756823	163.16	3.14	520.84	523.98	This is the crest of the ridge right here.
2576	20090407 171525	14.60106011	144.7756357	184.6	0.74	525.96	526.7	We're debating a plan.
2578	20090407 171739	14.60101624	144.7755833	358.24	4.98	527.83	532.81	CTD depth at the base of the last cast was 534m. Position appears to be directly over Brimstone.
2580	20090407 171852	14.60112583	144.7755832	359.18	4.06	524.39	528.45	Getting back into lots of ash.
2582	20090407 172156	14.60119594	144.7758152	113.58	6.45	525.81	532.26	We're looking on the north side of the ridge again.
2584	20090407 172339	14.60106955	144.7757858	128.53	3.83	519.44	523.27	Koichis instruments are in the distance.
2586	20090407 172600	14.60097522	144.7757147	124.23	1.61	529.84	531.45	Jason has stirred up a cloud of muck.
2588	20090407 172800	14.6010447	144.77563	8.37	2.79	526.39	529.18	Heading NE to the summit.
2591	20090407 173135	14.60086571	144.7756577	164	6.98	532.09	539.07	Visibility is nil.
2594	20090407 173523	14.60078005	144.7755629	348	2.63	538.23	540.86	Outcrop here with black sand on one side just SE of Brimstone. Iron oxide staining on the outcrop.
2596	20090407 173657	14.60076359	144.775678	34.49	2.43	538.05	540.48	We're heading NE now. Still on the southern slope.
2597	20090407 173807	14.6006576	144.7757928	114.07	5.24	536.65	541.89	Pillows with white staining. About the depth of the CTD recording when it was last on the bottom.
2600	20090407 174046	14.60067645	144.7757689	63.91	6.08	537.21	543.29	We're at Marker 108. It's about 10m S of the plotted position.
2601	20090407 174058	14.60071376	144.7757464	50.47	5.04	537.13	542.17	Lateralling to port looking NE.
2602	20090407 174116	14.60074222	144.7757059	50.97	4.38	536.78	541.16	Looks like lots of mat in this area.
2605	20090407 174509	14.6008013	144.7757643	74.31	4.93	530.9	535.83	Jason is changing watch. Bob (Buddha) coming on as pilot.
2608	20090407 174834	14.60082433	144.7757873	73.57	4.44	527.7	532.14	Outcrops along this SE slope.
2609	20090407 174849	14.60079925	144.7758011	74.57	5.14	527.48	532.62	J2-400 Data DVDs start DVDs 018
2611	20090407 175028	14.60074044	144.7758319	65.68	4.1	529.14	533.24	Pretty extensive white stuff covering the rocks in this area. Looks like there could be venting here.
2613	20090407 175215	14.60055499	144.7758531	67.52	15.81	526.89	542.7	J2-400 Data DVDs stop blue set Dvds 018
2614	20090407 175234	14.60051326	144.7758503	73.13	20.72	527.08	547.8	Visibility is decreasing. Plume wafting by. Comes and goes.
2615	20090407 175332	14.60057924	144.7757116	66.89	16.28	527.09	543.37	Cornel entering the hotseat.
2616	20090407 175404	14.60059964	144.7756676	65.73	8.93	532.76	541.69	Lateralling back and forth. Working our way toward Brimstone again. Can't see much.
2618	20090407 175529	14.60066101	144.775709	63.86	2.7	541.99	544.69	We're still heading E/NE. Bottom in sight again.
2621	20090407 175815	14.60070691	144.7757593	63.11	2.83	538.82	541.65	Bob (Buddha) is figuring out where to go.

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2622	20090407 175832	14.60068653	144.7757739	63.95	3.79	538.8	542.59	That big cliff of mat just passed by us (we passed by it).
2625	20090407 180242	14.60051538	144.7757104	311.95	4.81	544.37	549.18	We're now SE of the pit at 545m.
2628	20090407 180717	14.60060532	144.7754187	311.48	4.29	527.95	532.24	SAMPLE Fluid 1. Filtered bag #16. In the plume. Start 1807.
2630	20090407 180851	14.60085007	144.7753967	296.24	4.3	522.96	527.26	Sample 1. Z=526. About 5 meters west.
2631	20090407 180914	14.60086437	144.7753959	295.89	3.83	522.52	526.35	Lots of gas coming out of the pit right now. Still sampling while driving through the plume.
2632	20090407 180921	14.60086381	144.7753957	298.6	3.63	522.36	525.99	Still sampling.
2633	20090407 181002	14.60081807	144.7753604	296.35	6.53	521.42	527.95	Sample 1. Stop 130930. 7.8 degrees. 320 ml.
2635	20090407 181024	14.60080835	144.7753254	295.42	5.68	522.62	528.3	SAMPLE Fluid 2.
2636	20090407 181155	14.60081251	144.7752738	296.37	4.88	522.49	527.37	Filtered bag #17. Start at 181045.
2638	20090407 181225	14.60081603	144.7752541	295.29	6.24	522.02	528.26	Sample 1. Fluid (HFS). Still sampling.
2639	20090407 181248	14.60081851	144.7752294	295.87	4.68	522.13	526.81	Correction . The last entry was Sample 2 not Sample 1.
2640	20090407 181322	14.60085606	144.7752092	296.93	3.93	522.3	526.23	Sample 2. cont. HFS filtered bag #17.
2642	20090407 181506	14.60095139	144.7752245	277.49	52.72	520.32	573.04	Sample 2. cont. Stop 181335. Tmax=8.4. Tavg=7.5. 503 ml.
2643	20090407 181514	14.60095806	144.7752347	282.74	1.23	519.73	520.96	Shrimp all over in the water column here.
2644	20090407 181600	14.60106061	144.7752105	294.86	4.88	520.47	525.35	Can't see a thing here.
2646	20090407 181609	14.60107641	144.7752038	295.52	5.38	521.63	527.01	We're in the plume.
2647	20090407 181800	14.60122475	144.7751164	294.81	3.59	536.85	540.44	Sample 2. cont. pH after the sample is 6.70. That's actual pH. not voltage.
2649	20090407 181822	14.60127083	144.7751261	296.47	5.74	537.43	543.17	That pH is below background seawater. A little bit of a pH anomaly.
2650	20090407 181901	14.60130317	144.7751128	296.5	6.7	538.47	545.17	We're now west of the pit and going to search downslope a bit.
2652	20090407 182054	14.60128449	144.775007	296.17	4.98	544.94	549.92	Going to head downslope to the west of this spur and then lateral upslope.
2654	20090407 182259	14.60112803	144.7748795	288.98	1.18	545.9	547.08	pH in the background is 7.1. That's real pH instead of voltage. We will be getting pHs from here on.
2655	20090407 182350	14.60106308	144.7748403	279.43	3.13	545.91	549.04	Moving down the slope due west of the drop point and will work out way back up. Searching.
2658	20090407 182715	14.60107063	144.7746266	250.77	9.98	554.43	564.41	J2-400 DVCAM 016 stop
2659	20090407 182741	14.60111249	144.7746037	231.55	11.68	556.08	567.76	J2-400 DVCAM 017 start
2662	20090407 183135	14.60080488	144.774444	212.62	7.86	570.76	578.62	Still moving downslope.
2664	20090407 183344	14.60062957	144.7743845	212.42	8.78	580.14	588.92	Koichi has a \$147000 instrument on the CTD. The CTD package is probably worth that also. Looking at \$300000 package on the seafloor.
2667	20090407 183615	14.60053887	144.7744482	95.72	8.65	581.29	589.94	Heading E/SE right now to check out this gap in the survey. Will move upslope after this.
2670	20090407 184008	14.60048207	144.7744817	95.47	9.63	579.02	588.65	Waiting for the ship.
2671	20090407 184039	14.60048197	144.7744818	95.49	7.56	581.09	588.65	WATCHSTANDERS Nick Deardorff video Nick came on shift a bit late. Forgot to log him.
2675	20090407 184644	14.60085712	144.7742837	93.56	9.76	585.06	594.82	Going sideways right now (heading E).
2681	20090407 185650	14.60046102	144.7742071	93.13	9.14	599.99	609.13	Starting to head upslope a bit.
2682	20090407 185801	14.6004475	144.7743039	94.63	5.7	596.6	602.3	Heading east now going obliquely upslope. We're at almost 600 \m.
2685	20090407 190021	14.60067335	144.7743776	92	5.33	587	592.33	Talus slope. Varied sizes. Some large blocks.
2687	20090407 190219	14.60094789	144.7744146	91.87	6.26	578.06	584.32	Heading up this chute.
2689	20090407 190535	14.60053821	144.7745114	95.19	6.96	577.41	584.37	Beautiful jelly just swam by.
2691	20090407 190734	14.6005729	144.7745477	93.65	5.43	576.15	581.58	This is the 3-Bob watch. Bob the pilot. Bob the navigator. Bob Embley the watch leader.
2694	20090407 191159	14.60048485	144.7745886	92.46	3.1	579.49	582.59	Possible venting down there.
2696	20090407 191224	14.60054789	144.7745668	90.08	3.61	578.25	581.86	We went into the gap and out. We're heading north again.
2699	20090407 191650	14.60086395	144.7745578	93.3	3.64	568.42	572.06	We are lateralling to the east at 568m.

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2701	20090407 191848	14.60110533	144.7745227	93.33	10.64	566.32	576.96	We're looking at the main slope here. It's steep.
2703	20090407 192149	14.60080757	144.7746388	95.11	8.03	562.11	570.14	The slope is covered with fine sed (probably ash?)
2706	20090407 192541	14.60133646	144.7747873	92.71	15.59	550.26	565.85	Lateralling (crabbing) along the slope. Heading north up this chute.
2708	20090407 192728	14.60118189	144.7748643	92.99	4.29	549.47	553.76	Long tubular pillow in the foreground.
2709	20090407 192754	14.60113272	144.7748663	92.23	7.84	546.58	554.42	Assorted pillows here. Looks like volcanic ash here.
2711	20090407 192928	14.60091555	144.7748609	92.12	5.66	543.55	549.21	Searching.
2713	20090407 193126	14.60122487	144.7750023	95.68	12.05	537.23	549.28	Visibility is decreasing again.
2715	20090407 193230	14.60147528	144.7750186	93.95	12.21	541.89	554.1	We're at 542m here. Steep slopes. Here are lots of sediments.
2716	20090407 193357	14.60145022	144.775121	91.26	8.23	539.76	547.99	We're at the end of that survey pattern.
2718	20090407 193414	14.60141137	144.7751273	90.95	5.74	542.11	547.85	Going to come down between 2 previous lines.
2719	20090407 193437	14.60139273	144.775134	91.04	5.19	541.23	546.42	Heading back south toward Brimstone. Sharp ridges here with outcrops.
2721	20090407 193639	14.60114518	144.7751259	95.06	5.3	533.53	538.83	Filling a gap south of Brimstone.
2725	20090407 194243	14.60103523	144.7751519	94	4.61	525.82	530.43	Moving again.
2726	20090407 194351	14.60099735	144.7751748	92.95	3.03	524.5	527.53	We're NW of Brimstone. Looks like diffuse venting here and bacterial mat.
2728	20090407 194501	14.60099488	144.7751833	93.03	3.14	523.68	526.82	Lots of shrimp here. 30 m from Brimstone bearing 297. Diffuse venting. Shimmer. Shrimp.
2729	20090407 194525	14.60102423	144.7752046	92.68	6.7	519.85	526.55	J2-400 Data DVDs start 020 blue set
2731	20090407 194747	14.60103388	144.7752399	92.21	5.59	519.65	525.24	Lots of shrimp here. Quite a fair bit of venting and mat.
2733	20090407 194832	14.60097307	144.7752479	92.71	3.2	517.94	521.14	Approaching the top of the ridge. Can see Brimstone plume in the distance. It's actually quite close.
2734	20090407 194915	14.600904	144.7752442	92.68	4.86	517.28	522.14	J2-400 Data DVDs stop 019 red set
2735	20090407 194926	14.60089536	144.7752389	95.11	5.34	517.23	522.57	Beautiful shot of Brimstone plume and the vent area.
2738	20090407 195244	14.60088795	144.7751526	93.58	9.13	520.02	529.15	Waiting for the ship.
2746	20090407 200633	14.60067902	144.7751559	91.29	6.75	533.13	539.88	Moving now to fill in some gaps in the search pattern to the southeast of
2747	20090407 200700	14.60066302	144.7751548	90.98	5.65	535.14	540.79	Heading southeast of Brimstone.
2749	20090407 200950	14.60060648	144.7751811	2.02	11.18	536.13	547.31	We're about to go due east of Brimstone.
2752	20090407 201226	14.60062631	144.7754044	359.56	9.05	536.29	545.34	Crabbing over going east. Our heading is north but we are moving east.
2755	20090407 201621	14.60063244	144.7756682	0.28	10.99	544.32	555.31	We are still hoping to find the CTD.
2757	20090407 201821	14.60054975	144.7757284	0.21	6.81	554.54	561.35	Visibility is decreasing a bit. Talus and pillows with sediment patches.
2758	20090407 201901	14.60051059	144.7757138	359.93	5.24	556.93	562.17	SE of Brimstone about 50/60m.
2759	20090407 201929	14.60050277	144.7756374	359.47	5.84	556.04	561.88	Black volcanoclastic sand and white coating. Outcrops and talus. No signs of biology here.
2762	20090407 202328	14.60043106	144.7755596	357.05	12.78	551.14	563.92	Searching E/SE of Brimstone. Visibility is decreasing.
2765	20090407 202700	14.60035618	144.7757159	357.94	9.01	564.18	573.19	Talus covered slopes.
2766	20090407 202717	14.60034968	144.7756769	0.17	11.16	563.43	574.59	White coating on solid pillows here.
2767	20090407 202808	14.60035428	144.775537	0.36	7.08	561.92	569	J2-400 DVCAM 017 stop
2769	20090407 202814	14.60035473	144.77552	0.03	7.64	561.84	569.48	In more talus here - various sizes.
2770	20090407 202831	14.60035338	144.7754725	359.03	6.9	561.46	568.36	J2-400 DVCAM 018 start
2774	20090407 203535	14.60029525	144.7754256	359.66	7.55	563.74	571.29	Still maneuvering about searching for the CTD.
2776	20090407 203745	14.60029513	144.7752371	359.68	7.1	563.54	570.64	We're now in the more active chute area. We're at 563m.
2778	20090407 203945	14.60029662	144.7750955	359.94	7.71	560.63	568.34	Passing over a ridge here. Pretty broken up and covered with talus of various sizes.
2782	20090407 204514	14.60029681	144.7747906	0.17	8.01	566.85	574.86	We're waiting for the ship again. At the end of this traverse. Will head south a bit and then east again.
2785	20090407 204832	14.6002551	144.7747901	359.41	9.98	567.25	577.23	Bill is here now. Debating what we should do next.
2788	20090407 205346	14.60016072	144.7747774	359.17	7.19	574.03	581.22	Lots of intact lavas on this slope.
2791	20090407 205615	14.60016081	144.774941	359.85	5.88	571.26	577.14	Crabbing to the east at 570m.

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2792	20090407 205647	14.60016055	144.7749749	359.84	5.36	572.23	577.59	Tubular pillows going downslope. Big intact lava flow that erupted on this slope.
2794	20090407 205912	14.60016076	144.7751314	359.52	7.26	572.6	579.86	Intact lava flow here. Heavily sedimented.
2795	20090407 205922	14.60016128	144.7751424	359.68	4.96	572.92	577.88	Looks like a spur coming out of the ridge here.
2797	20090407 210149	14.60016135	144.7753014	0.03	7.4	573.61	581.01	A bit of staining here.
2799	20090407 210227	14.60016112	144.7753418	359.91	7.66	573.62	581.28	Lots of staining around the pillows here. Could be an alteration zone.
2800	20090407 210254	14.6001614	144.7753711	359.95	7.29	573.82	581.11	Going back over a big talus pile.
2802	20090407 210456	14.60016176	144.7755026	359.99	8.31	575.12	583.43	Obviously still searching.
2804	20090407 210639	14.60016214	144.7756347	358.95	8.36	576.44	584.8	Seems like we are creeping along.
2806	20090407 210839	14.60002669	144.7756477	0.12	7.85	587.4	595.25	Have been flying autopilot ab out 8 - 9 meters off the seafloor.
2807	20090407 210848	14.60002833	144.7756304	0.07	7.65	587.22	594.87	Still no luck - obviously.
2809	20090407 211133	14.60002593	144.7753603	359.43	7.89	584.15	592.04	Crabbing west along the slope at 585m.
2810	20090407 211143	14.60002581	144.775344	359.51	8.13	583.93	592.06	Some staining here again. Mostly talus slope.
2814	20090407 211617	14.60002597	144.7750366	359.57	8.81	582.58	591.39	A few more shrimp in the area here..
2815	20090407 211644	14.6000252	144.7749918	359.65	8.41	580.89	589.3	Some of the troops are heading to breakfast. We're still searching.
2816	20090407 211711	14.60002473	144.77495	358.7	9.55	577.91	587.46	Pillows lavas again. Mostly intact outcrops. Relatively unconsolidated.
2818	20090407 211911	14.59998581	144.7747968	0.7	6.89	583.05	589.94	We'll continue to survey this part of the slope heading downslope from here as long as time permits.
2820	20090407 212050	14.59988717	144.7748359	356.97	10.4	587.57	597.97	Starting another line to the south parallel to the others. Heading from west to east.
2822	20090407 212230	14.59988902	144.7750062	359.23	6.79	596.18	602.97	Rugged terrain all over this volcano. And where that is not the case the slopes are steep and covered in volcaniclastic sands etc.
2823	20090407 212402	14.59988966	144.7751188	0	8	595.77	603.77	Fluid lavas in place that moved down the slope.
2826	20090407 212614	14.59988918	144.7752711	359.7	7.9	591.62	599.52	Passing over another sharp ridge. Lots of talus on the east side of that ridge.
2827	20090407 212645	14.59988976	144.7753129	359.18	8.03	592.29	600.32	Bill says the ridge looks like a lava channel.
2828	20090407 212757	14.59988969	144.7753823	359.67	7.1	595.23	602.33	Talus area of various size blocks. From fine grained to boulder size.
2832	20090407 213222	14.59981404	144.7757199	0.39	8.5	603.99	612.49	Crossing over another dike. Looks a bit fresher here. Dark lavas with no sediment coming down slope in a band.
2833	20090407 213311	14.59975399	144.7757222	0.13	7.34	609.38	616.72	Still searching.
2834	20090407 213347	14.59975441	144.7756638	0.07	7.96	608.08	616.04	We are now heading along another line parallel to the last few. Depth is about 610m. Heading E to W this time.
2835	20090407 213400	14.59975438	144.7756412	359.98	7.49	607.93	615.42	Jumbled talus slope in front of us.
2837	20090407 213511	14.59975452	144.7755269	359.93	7.29	606.24	613.53	No sign of the CTD yet.
2838	20090407 213602	14.5997541	144.7754447	359.83	7.28	605.45	612.73	Depth is 606m. Our altitude is 9m.Heading due west.
2842	20090407 214026	14.5997553	144.7750212	359.18	5.35	607.5	612.85	Still heading due west and looking upslope.
2843	20090407 214122	14.59975359	144.7749331	359.58	8.83	605.71	614.54	J2-400 Data DVDs start red set DVD 021
2845	20090407 214405	14.59975421	144.7748516	0.05	9.15	599.59	608.74	Continuing down slope. Depth is 600m. Still moving due west.
2847	20090407 214456	14.59975451	144.7748013	358.97	9.05	595.29	604.34	J2-400 Data DVDs stop DVD 020 blue set
2848	20090407 214555	14.59970648	144.7747836	1.42	7.91	599.39	607.3	Moving due south now.
2850	20090407 214750	14.59966358	144.774734	0.09	10	605.29	615.29	Just going to go a little farther west before heading further south.
2852	20090407 214911	14.5996626	144.7746137	359.33	17.98	602.63	620.61	Depth is 603m. Still moving to the west.
2854	20090407 215113	14.59966278	144.774655	359.7	15.23	602.71	617.94	Moving directly back to the east now.
2857	20090407 215453	14.59966371	144.7748699	0.21	12.74	602.73	615.47	Trying to decide which way to go.
2861	20090407 220145	14.59957203	144.7744294	359.1	19.2	610.62	629.82	Heading to the east again.
2863	20090407 220407	14.59957326	144.774319	13.88	18.97	616.66	635.63	JASON off bottom
2866	20090407 220703	14.5996099	144.7741994	271.76	27.79	608.49	636.28	J2-400 Data DVDs stop DVD 021 red set stop
2867	20090407 220714	14.5996106	144.7741619	272.26	32.23	606.43	638.66	J2-400 DVCAM 018 stop
2868	20090407 224021	14.5994612	144.7744566	269.24	badvalue	2.32	badvalue	Medea on deck.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-400 Logger Comment
2869	20090407 224737	14.5994308	144.7745462	249.63	badvalue	1.08	badvalue	JASON on deck

**J2-401 - Fluid Sampling.** JASON equipped with HFS Beast (including 2 gas-tights), single-chamber suction, HOMER receiver, 2 tephra samplers, 8 markers, 3 scoop bags, 2 gas-tight bottles, Eh sensor, Niskin. Searched for CTD downslope of Brimstone before fluid sampling. Deployed tephra sampler and took sulfur-rock sample from underneath sampler. Recovered tephra sampler near Brimstone vent. Took 7 HFS/gas samples at Brimstone. Moved east toward Mkr108 site but poor visibility and moved further east to Barnacle target at base of one of the knife-edge ridges. Took barnacle sample on rock substrate then deployed Mkr111 (Barnacle Block). Moved north to recover shrimp trap at Mkr109 ("Fault Shrimp"). Moved up ridge to other side and took fluid samples (4). Headed east to Scarp Top. Nav depths indicate Fault Shrimp should be Scrap Top. Moved to Mkr111 (Barnacle Block) and explored area finding very-low temp flow. Took 3 HFS samples at this site and named it Iron599. Transited west to Iceberg finding area with high shrimp concentration. Took 8 HFS samples and deployed Mkr-110, calling site Iceberg09 (30m E of Iceberg06 site). Moved west toward Mat Mecca and deployed Mkr104 (near Iceberg06) in area with large mat. Didn't find Mat Mecca area and moved back west to Brimstone. Explored area NW of Brimstone and made visual observations of vent.

**Table 6.4-6 JASON Dive J2-401**

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
2893	20090408 094634	badnav	badnav	292.25	badvalue	2.86	badvalue	JASON in water Good.
2894	20090408 094645	badnav	badnav	286.86	badvalue	2.94	badvalue	Driving away STBD from ship.
2895	20090408 094810	badnav	badnav	301.22	badvalue	3.63	badvalue	Medea in water.
2897	20090408 094910	badnav	badnav	286.27	badvalue	4.56	badvalue	Jason starting down.
2898	20090408 095437	badnav	badnav	292.69	badvalue	107.66	badvalue	NW Rota-1 Brimstone Dive
2899	20090408 095626	badnav	badnav	281.09	badvalue	168.63	badvalue	Tools on Jason: Beast (with 2GT); single chamber suction; Homer receiver; quad milk crate; 2 tephra samplers; 9 markers; 3 scoop bags; 2 gas-tights
2900	20090408 095641	badnav	badnav	278.91	badvalue	177.39	badvalue	On every dive: 1 Niskin; Temp probe; Eh sensor
2901	20090408 095722	badnav	badnav	276.01	badvalue	201.4	badvalue	Pan-tilt on Pilot cam is NOT working for this dive.
2902	20090408 095741	badnav	badnav	268.26	badvalue	211.43	badvalue	Without pan/tilt-can't see Beast exhaust.
2903	20090408 095846	badnav	badnav	274.61	badvalue	241.99	badvalue	Beast is happy-all checks clear.
2904	20090408 100117	badnav	badnav	272.81	badvalue	302.61	badvalue	Bottom target is 14deg36'N 144deg46.5E at 620m depth
2905	20090408 100924	badnav	badnav	298.91	61	526.55	587.55	Beast has normal tip on it.
2906	20090408 101024	badnav	badnav	300.26	54.98	526.57	581.55	Holding at 60m off bottom.
2908	20090408 101611	badnav	badnav	105.79	8.26	546.71	554.97	There is the bottom.
2910	20090408 101628	badnav	badnav	48.64	4.94	549.52	554.46	JASON on bottom
2911	20090408 101646	badnav	badnav	48.77	5.98	548.42	554.4	J2-401 Data DVDs start blue set 022
2912	20090408 101656	badnav	badnav	49.04	5.9	548.74	554.64	Looking at some large lava boulders on a slope-looks like slide (chute) area.
2914	20090408 101854	badnav	badnav	49.13	5.75	549.02	554.77	J2-401 Start DVCAM 019
2916	20090408 102043	14.6002015	144.77514	49.03	5.58	548.56	554.14	Doing system checks on bottom.
2919	20090408 102438	14.6002575	144.7751515	4.63	9.5	545.56	555.06	Going to drive east-west zigzag on the way up the slope to look for CTD.
2920	20090408 102505	14.6002547	144.7751809	12.46	9.56	545.6	555.16	Will spend about 30 minutes looking for CTD before beginning work at Brimstone.
2921	20090408 102523	14.6002535	144.775212	12.72	8.49	546.47	554.96	Medea HD camera has great view of Jason.
2922	20090408 102545	14.6002517	144.7752466	13.1	7.25	546.51	553.76	Current seems not as strong as last dive and going in the opposite direction.
2925	20090408 102700	14.6002553	144.7752472	13.4	7.23	546.1	553.33	Just lost Medea camera output.
2926	20090408 102722	14.6002553	144.7752473	13.36	7.24	546.07	553.31	Medea camera is back.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
2928	20090408 102827	14.6002555	144.7752471	26.11	7.34	546.02	553.36	ASNAPS are working and at 1 minute interval.
2930	20090408 102918	14.6002284	144.7753055	24.72	8.85	546	554.85	Heading off and ready to go up to Brimstone.
2933	20090408 103100	14.60017821	144.7754202	25.27	12.19	545.98	558.17	We are 60m south of Brimstone and moving slowly up the slope.
2934	20090408 103126	14.6002198	144.775434	25.67	8.94	545.9	554.84	Seeing some plume wisps.
2936	20090408 103217	14.60027144	144.7754337	25.93	7.61	543.09	550.7	Swinging to port doing a search pattern.
2938	20090408 103247	14.60028551	144.7754005	25.14	6.28	543.48	549.76	See mixture of altered and blackened lava boulders in the talus slope. Large-medium sized pieces.
2942	20090408 103635	14.60043951	144.7750641	20.03	11.16	537.21	548.37	Talus pieces are smaller and more blocky on this part of the slope.
2945	20090408 103756	14.60050078	144.7751513	24.26	10.36	529.39	539.75	Starting sweep over to east.
2949	20090408 104051	14.60035009	144.7754811	26.39	15.45	531.48	546.93	Rose too high off bottom and can't see as well right now.
2950	20090408 104106	14.60035639	144.7754788	25.68	9.59	537.39	546.98	Some plume (like fog) up off bottom as well.
2951	20090408 104112	14.60036055	144.7754785	25.37	8.09	538.94	547.03	Moving closer to slope.
2954	20090408 104315	14.6004308	144.7755476	24.82	6.29	537.68	543.97	Even with current apparently going in opposite direction we are seeing plume fog over here to the SE of Brimstone.
2955	20090408 104332	14.6004297	144.7755477	24.77	5.89	538.14	544.03	Coming off bottom again and hard to see.
2957	20090408 104342	14.60042962	144.7755472	25.72	6.05	537.91	543.96	Heading a bit up slope before heading west.
2958	20090408 104350	14.6004369	144.7755339	27.18	5.2	538.12	543.32	Starting sweep to west again.
2960	20090408 104504	14.60050801	144.7753729	19.39	8.54	524.68	533.22	Can see plume in Medea and HD sci camera.
2961	20090408 104524	14.60051993	144.7753784	24.66	8.51	523.54	532.05	VIDEO Start recording HDCam
2963	20090408 104556	14.60054986	144.7753139	23.55	8.38	520.96	529.34	Plume looks like it is heading straight up. No CTD in site but heading to west for a look around.
2964	20090408 104626	14.60057946	144.7752474	24.09	8.79	519.74	528.53	Can see some CO2 bubbles and a tephra sampler (which is upright).
2966	20090408 104641	14.60059503	144.7752146	23.77	9.84	519.57	529.41	Looks like a rim here and open to the south.
2967	20090408 104719	14.60060073	144.7752612	21.39	7.64	518.3	525.94	Looked over to west and no CTD. Heading back to Brimstone.
2968	20090408 104733	14.60058405	144.7752846	22.17	8.94	517.78	526.72	Since we are here-we will exchange the tephra sampler.
2971	20090408 104841	14.60057278	144.7752645	16.79	4.88	522.16	527.04	Want to use the new STBD tephra sampler.
2972	20090408 104853	14.60057445	144.7752656	15.92	4.59	522.43	527.02	The current is blowing to the north-good view on the Medea camera.
2973	20090408 104935	14.60056391	144.7753039	15.42	6.73	522.28	529.01	In place sampler is straight out of the slope but not sticking straight up. Looking for a better place to put out the new sampler.
2976	20090408 105037	14.60054724	144.77537	7.18	7.89	522.35	530.24	Low-average activity but about the same as dive 398.
2977	20090408 105054	14.6005356	144.7754066	21.59	8.81	522.08	530.89	VIDEO Stop recording HDCam
2978	20090408 105121	14.60055486	144.7753953	346.1	10.43	519.78	530.21	Didn't see any better deployment area to the east.
2982	20090408 105335	14.60059051	144.775338	341.98	3.36	521.47	524.83	Looks like a diffuse cloud all around the west side of the major plume-Dave would like to sample some of that diffuse flow.
2983	20090408 105409	14.60060182	144.7753314	330.05	3.96	519.86	523.82	Looking at the rim top to the west of the main plume area.
2984	20090408 105415	14.60060584	144.7753287	329.32	4.49	519.31	523.8	These outcrops are sulfur.
2985	20090408 105432	14.60061034	144.7753276	329.8	4.93	518.62	523.55	The saddle looks like a good place for the new tephra deployment.
2987	20090408 105504	14.60060936	144.7753284	329.67	4.7	518.85	523.55	Putting out STBD swing arm
2989	20090408 105536	14.60060935	144.7753287	329.68	4.68	518.79	523.47	VIDEO Start recording HDCam
2991	20090408 105700	14.60060951	144.7753287	329.76	4.75	518.85	523.6	Retrieving tephra from biobox. This is Tephra sampler G.
2993	20090408 105826	14.60060924	144.7753285	329.63	4.85	518.82	523.67	Tephra sampler's top closed so can't use this one. Going to use the Port Tephra sampler instead.
2995	20090408 105845	14.60060914	144.7753285	329.56	4.68	518.85	523.53	Port biobox is out.
2996	20090408 105906	14.60060939	144.7753289	329.51	4.84	518.86	523.7	Cycling sharps power on both Medea
2998	20090408 105951	14.60060899	144.7753287	329.51	4.83	518.85	523.68	Biobox is open.
2999	20090408 110011	14.60060892	144.7753286	329.53	4.81	518.87	523.68	VIDEO Stop recording HDCam

Virtual Van Record #	timestamp yyyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
3001	20090408 110134	14.600609	144.7753287	329.52	4.75	518.85	523.6	Biobox closed and trying to grab white loop of tephra sampler.
3004	20090408 110308	14.60060902	144.7753287	329.52	4.81	518.84	523.65	Tephra sampler B removed from biobox.
3006	20090408 110339	14.60060914	144.7753288	329.44	4.85	518.87	523.72	VIDEO Start recording HDCam
3008	20090408 110449	14.60060935	144.7753285	329.52	4.59	518.92	523.51	Tephra sampler B transferred to other arm.
3009	20090408 110458	14.60060923	144.7753288	329.41	4.65	518.85	523.5	Closing biobox.
3011	20090408 110556	14.60060931	144.7753289	329.42	4.65	518.84	523.49	Trying to place sampler in small saddle on rim top.
3012	20090408 110618	14.60060943	144.7753284	329.22	4.64	518.83	523.47	Port swing arm stowed.
3014	20090408 110712	14.60063707	144.775324	320.48	3.96	519.64	523.6	Approaching saddle and moving into position.
3016	20090408 110817	14.60064352	144.7753243	309.07	2.56	520.51	523.07	DEPLOY Tephra Sampler Tephra B perfectly placed.
3018	20090408 110854	14.60064283	144.775324	309.8	2.58	520.56	523.14	Looks like fresh material underneath the Tephra sampler.
3019	20090408 110906	14.6006429	144.775324	309.81	2.59	520.56	523.15	Looking for some yellow-sulfur rock to sample.
3021	20090408 111019	14.60063186	144.7753165	328.98	3	520.75	523.75	Looking at yellow sulfur structure adjacent saddle (small outcrop) to sample.
3024	20090408 111147	14.60063177	144.7753164	328.2	3.03	520.7	523.73	SAMPLE Geology Very brittle but got a large piece. Looks like sulfur-coated.
3025	20090408 111207	14.60063154	144.7753164	327.68	2.99	520.72	523.71	SAMPLE Geology J2-401-sulfur-01
3027	20090408 111259	14.60063153	144.7753161	328.54	2.99	520.84	523.83	Rock could be coated in sulfur or composed of sulfur. Sample in SE quad of milkcrate. J2-401-sulfur-01.
3029	20090408 111435	14.60058396	144.7753152	353.21	6.28	519.48	525.76	Looking for the other tephra sampler to be retrieved.
3031	20090408 111440	14.60057753	144.7753133	353.81	6.26	519.73	525.99	VIDEO Stop recording HDCam
3032	20090408 111443	14.60057361	144.7753127	354.31	7.04	519.94	526.98	
3033	20090408 111525	14.60056281	144.7752981	356.94	4.31	523.93	528.24	There is the other tephra sampler to be retrieved.
3035	20090408 111616	14.60057026	144.7753002	355.06	2.45	525.28	527.73	This sampler is just south of where the new one was placed in the southern part of the crater.
3036	20090408 111632	14.6005701	144.7753	354.94	2.46	525.28	527.74	The new sampler is up on the crater rim NW of the plume.
3038	20090408 111654	14.60057035	144.7753002	354.79	2.5	525.28	527.78	Getting ready to retrieve the tephra sampler.
3039	20090408 111704	14.60057032	144.7753002	354.4	2.49	525.24	527.73	First the tephra sampler needs to be closed.
3041	20090408 111750	14.60056948	144.775301	353.63	2.54	525.21	527.75	VIDEO Start recording HDCam
3042	20090408 111816	14.60056888	144.7753022	356.06	2.83	524.96	527.79	RECOVER Tephra Sampler Tephra sampler E has been closed and in Jason's arm.
3043	20090408 111827	14.60056714	144.7753043	356.61	3.23	524.6	527.83	Sample looks good.
3045	20090408 111903	14.60056792	144.775306	356.94	3.63	523.93	527.56	J2-401-tephra-02 was recovered from just south of Brimstone Pit.
3048	20090408 112052	14.60056753	144.7753067	356.75	3.43	523.96	527.39	SAMPLE Geology J2-401-tephra-02 Geology sample Tephra bucket E placed in Port biobox.
3049	20090408 112107	14.60056755	144.7753064	356.51	3.46	523.98	527.44	Sample placed nicely in the biobox.
3051	20090408 112210	14.60056781	144.7753068	357.75	3.61	523.97	527.58	Stowing port biobox.
3052	20090408 112231	14.60056755	144.7753065	356.92	3.65	524.03	527.68	Switching to HFS sampling.
3055	20090408 112353	14.6005929	144.7753174	356.58	5.08	520.17	525.25	Moving back to Pit to look for the diffuse fluid to the west (and adjacent) the white plume.
3056	20090408 112356	14.60059478	144.7753207	356.02	5.31	519.96	525.27	That is plume.
3058	20090408 112438	14.60057578	144.7753514	348.46	5.85	519.91	525.76	Nice shot of the new tephra sampler location. Tephra is just NW of the main plume source.
3060	20090408 112544	14.60058257	144.7753621	339.81	3.79	521.85	525.64	Would like to sample the dirty looking plume adjacent to the white plume but a tricky location.
3061	20090408 112605	14.60058945	144.7753518	10.89	2.55	521.88	524.43	Looks like dirty plume is coming out of the sediment.
3062	20090408 112623	14.60059838	144.775346	27.45	1.89	522.06	523.95	Seems like activity level is increasing and the plume color is changing more to a white color.
3064	20090408 112702	14.60061086	144.7753499	23.59	0.96	523.23	524.19	Basket just bumped the rock that is in the way of sampling.
3065	20090408 112728	14.60060419	144.7753481	29.79	0.78	522.86	523.64	Knocked the rock over to better sample the diffuse flow. Some change in the plume.



Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
3067	20090408 112755	14.60060447	144.7753482	29.49	0.86	522.89	523.75	Water is dirtied up and view not as clear.
3068	20090408 112819	14.60060454	144.7753487	29.41	0.91	522.87	523.78	Water here is a degree warmer than ambient.
3070	20090408 112841	14.60060312	144.7753496	29.09	0.74	522.88	523.62	Seeing CO2 bubbles at this diffuse site.
3071	20090408 112853	14.60060329	144.7753508	31.07	0.74	523.32	524.06	Waiting to see if activity will increase as degassing.
3073	20090408 112942	14.60060918	144.7753472	29.59	0.74	523.23	523.97	Bubbles have stopped but no major increase in activity.
3074	20090408 112956	14.60060983	144.7753479	29.62	0.74	523.21	523.95	Going to go ahead and sample.
3075	20090408 113032	14.60060854	144.7753475	29.97	0.85	523.2	524.05	VIDEO Stop recording HDCam
3077	20090408 113119	14.6006084	144.775347	29.81	0.86	523.21	524.07	Retrieving Beast wand from basket.
3080	20090408 113237	14.60060377	144.7753491	29.86	0.88	523.27	524.15	Rotating clockwise to unfurl the Beast hose.
3082	20090408 113358	14.60059325	144.7753208	29.55	0.84	523.19	524.03	Will place wand into sand for sample.
3084	20090408 113533	14.60059069	144.7753171	30.15	0.94	523.17	524.11	Seeing some CO2 bubbles when basket hit surface.
3086	20090408 113542	14.60058978	144.7753167	30.16	0.94	523.16	524.1	Tip is in sediment.
3087	20090408 113551	14.60059006	144.7753214	30.29	0.93	523.15	524.08	Not getting much temperature increase.
3089	20090408 113636	14.60058545	144.7753255	30.19	0.93	523.13	524.06	Can see plume changing in this diffuse area. Different colors pulse out.
3090	20090408 113644	14.60058594	144.7753272	30.16	0.94	523.13	524.07	Not seeing temperature change.
3091	20090408 113659	14.60058436	144.7753275	30.23	0.94	523.14	524.08	Placing wand further down in sediment.
3093	20090408 113741	14.60057867	144.7753324	30.06	0.91	523.12	524.03	Temperature is only 8deg and going up only slightly. Want to put wand in deeper.
3094	20090408 113751	14.60057753	144.7753324	30.09	0.91	523.12	524.03	pH is just starting to go down and temperature is up to 10deg.
3095	20090408 113827	14.60057404	144.7753359	29.93	0.94	523.1	524.04	Trying another spot in the sand. Further out in more flow.
3097	20090408 113844	14.60057523	144.7753329	29.9	0.91	523.11	524.02	Temperature went up to 12....13deg...20....
3098	20090408 113857	14.60057461	144.7753324	29.89	0.91	523.1	524.01	Temp up to 25deg.
3099	20090408 113915	14.60057419	144.7753317	29.93	0.91	523.08	523.99	pH has gone down.
3101	20090408 113945	14.60057338	144.7753305	30.03	0.91	523.1	524.01	pH down to 3.1.
3102	20090408 114003	14.60057312	144.7753291	30	0.91	523.1	524.01	Temperature is fluctuating between 20-28.4.
3103	20090408 114022	14.60057271	144.77533	29.99	0.93	523.12	524.05	Waiting for pH to get to its stable low.
3104	20090408 114028	14.60057257	144.7753306	29.97	0.93	523.12	524.05	Looks good.
3106	20090408 114043	14.60057227	144.7753308	29.89	0.9	523.12	524.02	Quit measuring pH.
3107	20090408 114101	14.6005724	144.7753316	30.06	0.91	523.12	524.03	SAMPLE Fluid Piston #1 unfiltered. J2-401-fluid-03
3108	20090408 114124	14.60057117	144.775332	29.95	0.91	523.09	524	Can see exhaust...temp up to 40deg.
3110	20090408 114158	14.60056997	144.7753323	29.87	0.99	523.05	524.04	J2-401-fluid-03 started at 11:41:07
3112	20090408 114252	14.60056896	144.7753351	29.81	0.85	523.1	523.95	J2-401-fluid-03 seeing some CO2 bubbles while sampling.
3113	20090408 114308	14.60056863	144.7753364	29.82	0.89	523.1	523.99	J2-401-fluid-03 with up
3114	20090408 114314	14.60056832	144.7753374	29.82	0.89	523.1	523.99	SAMPLE Fluid Stopping.
3116	20090408 114336	14.60056662	144.7753391	29.79	0.9	523.1	524	Tmax 46.9 Average 37.7 vol=294 J2-401-fluid-03
3118	20090408 114450	14.60056736	144.7753422	29.72	0.9	523.1	524	SAMPLE Gas Triggered gas-tight J2-401-gas-04 temp=47
3119	20090408 114459	14.60056667	144.7753434	29.68	0.9	523.1	524	GT retracted.
3120	20090408 114520	14.60056724	144.775344	29.75	0.88	523.09	523.97	pH down to 1.3 for this site.
3122	20090408 114617	14.60056657	144.7753458	29.69	0.89	523.14	524.03	GT was port #15 fired for J2-401-gas-04
3123	20090408 114626	14.60056577	144.7753456	29.7	0.88	523.13	524.01	VIDEO Start recording HDCam
3125	20090408 114642	14.60056503	144.7753458	29.62	0.89	523.14	524.03	Filtered piston #2 start
3126	20090408 114700	14.60056471	144.7753478	29.64	0.9	523.15	524.05	SAMPLE Fluid J2-401-fluid-05 is happening.
3128	20090408 114752	14.60056459	144.7753515	29.56	0.89	523.16	524.05	This is J2-401-fluid-05..looking for exhaust....not seeing anything.
3129	20090408 114811	14.60056417	144.7753506	29.56	0.89	523.16	524.05	See the exhaust now.
3131	20090408 114849	14.60056386	144.7753508	29.58	0.9	523.18	524.08	Something now working well with this sample. Exhaust doesn't keep going.
3133	20090408 114940	14.60056238	144.7753518	29.62	0.88	523.16	524.04	SAMPLE Fluid J2-401-fluid-05 either clogged or leaking.
3134	20090408 114956	14.60056211	144.7753537	29.59	0.9	523.19	524.09	SAMPLE Fluid J2-401-fluid-05 stopped.

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3135	20090408 115028	14.60056193	144.7753539	29.57	0.89	523.18	524.07	SAMPLE Fluid Tmax=58.4 49.8 vol=228 but don't believe volume fluid-05
3136	20090408 115030	14.60056174	144.7753545	29.71	0.91	523.16	524.07	
3138	20090408 115046	14.60056115	144.7753545	29.67	0.9	523.17	524.07	J2-401-fluid-06 starting piston #3 filtered
3139	20090408 115101	14.60056054	144.7753543	29.66	0.91	523.16	524.07	SAMPLE Fluid J2-401-fluid-06 is going
3140	20090408 115113	14.60056045	144.7753527	29.73	0.9	523.16	524.06	Exhaust is good from this sample.
3143	20090408 115248	14.60055773	144.7753521	30.02	0.94	523.09	524.03	SAMPLE Fluid J2-401-fluid-06 seeing some bubbles.
3144	20090408 115330	14.60055556	144.7753539	29.83	0.94	523.1	524.04	SAMPLE Fluid J2-401-fluid-06 lowering wand a bit more into sand. Looks better.
3146	20090408 115406	14.60055426	144.7753554	30.04	0.91	523.11	524.02	SAMPLE Fluid J2-401-fluid-06 stopped. Tmax=41.9 Av=35.1 vol=345
3147	20090408 115410	14.60055399	144.775354	30.06	0.9	523.12	524.02	
3150	20090408 115631	14.60054451	144.7753327	29.79	0.93	523.13	524.06	pH reading 1.29 now.
3152	20090408 115649	14.60054224	144.7753308	29.93	0.91	523.13	524.04	SAMPLE Fluid pH reading steady.
3154	20090408 115817	14.6005336	144.775311	30.07	0.9	523.1	524	SAMPLE Fluid J2-401-fluid-07 starting. #10 sterivex filter.
3155	20090408 115833	14.60053204	144.7753085	30.04	0.91	523.1	524.01	Looking for microbes but unlikely with this low pH.
3157	20090408 115916	14.60052847	144.7752955	30.23	0.91	523.13	524.04	J2-401-fluid-07 visibility is degraded now but still in the same location.
3159	20090408 115940	14.60052736	144.775292	30.42	0.91	523.14	524.05	150 ml/minute rate on this sample.
3162	20090408 120139	14.60052225	144.775286	30.56	0.93	523.16	524.09	Long microbe sample.
3163	20090408 120156	14.60052181	144.7752851	30.34	0.93	523.18	524.11	Better visibility as plume is blowing away from Jason.
3165	20090408 120250	14.60052561	144.7752902	30.55	0.91	523.19	524.1	Seeing some gas bubbles again.
3166	20090408 120334	14.60052748	144.7752972	30.65	0.9	523.19	524.09	Turned strobes off of DSC but looks like they still fired.
3168	20090408 120411	14.60053028	144.7753027	30.6	0.91	523.19	524.1	Strobe did turn off.
3170	20090408 120456	14.60053335	144.7753082	30.56	0.89	523.18	524.07	Lowering intake while still sampling. Filter is slowing down to 85 ml/minute.
3171	20090408 120527	14.60053561	144.7753118	30.66	0.91	523.17	524.08	Really slowing down and now stopped. 760 ml when stopped.
3173	20090408 120600	14.60053629	144.7753141	30.66	0.91	523.17	524.08	J2-401-fluid-07 restarted and got up to 55 deg in temperature.
3176	20090408 120741	14.60053794	144.7753164	30.69	0.91	523.14	524.05	SAMPLE Fluid J2-401-fluid-07 recording Medea HD
3177	20090408 120751	14.60053859	144.7753159	30.69	0.9	523.16	524.06	VIDEO Start recording HDCam Stop recording HDCam
3178	20090408 120802	14.60053762	144.7753153	30.71	0.9	523.15	524.05	HD was only on for a few seconds.
3180	20090408 120910	14.60054167	144.7753184	30.58	0.91	523.14	524.05	J2-401-fluid-07 lowering wand a bit more while sampling.
3182	20090408 120940	14.60053882	144.7753179	30.64	0.9	523.13	524.03	Wand as far as it will go into sediment.
3183	20090408 120958	14.60053848	144.7753186	30.97	0.93	523.14	524.07	Stopping sample for a moment while repositioning wand.
3184	20090408 121035	14.60066735	144.7754199	30.14	0.76	523	523.76	Moving ahead slightly to get a better position (want another foot or so).
3186	20090408 121124	14.60066376	144.7754208	30.2	1.11	522.88	523.99	Placing wand down in smoke and sediment again.
3188	20090408 121152	14.60066162	144.7754194	30.23	1.11	522.86	523.97	Temperature is going up to 105...a bit hot for Sterivex.
3189	20090408 121221	14.60066185	144.7754176	30.15	1.1	522.85	523.95	SAMPLE Fluid Max 55.1 Ave 42.3 vol=1368 sample stopped. J2-401-fluid-07 stopped.
3192	20090408 121252	14.60065951	144.7754163	30.21	1.1	522.86	523.96	J2-401 Data DVDs start red set 23
3194	20090408 121402	14.60065737	144.7754132	30.18	1.11	522.84	523.95	SAMPLE Gas J2-401-gas-08 (too hot for pH reading) starting STBD #11 fired.
3195	20090408 121417	14.60065622	144.7754121	30.32	1.1	522.84	523.94	SAMPLE Gas Temp=200deg for J2-401-gas-08
3196	20090408 121424	14.60065754	144.7754112	30.22	1.11	522.84	523.95	GT is retracted.
3198	20090408 121511	14.60065352	144.7754103	30.16	1.09	522.84	523.93	pH doesn't seem to go below 1.5 volts (limit of instrument)
3200	20090408 121603	14.60064801	144.7754092	30.1	1.1	522.81	523.91	SAMPLE Fluid J2-401-fluid-09 started #6 unfiltered.
3202	20090408 121709	14.60063941	144.7754095	30.02	1.1	522.81	523.91	J2-401 Data DVDs stop blue set 22
3203	20090408 121733	14.60063737	144.7754097	30.03	1.1	522.8	523.9	SAMPLE Fluid J2-401-fluid-09 This is a hot sample
3205	20090408 121813	14.60063511	144.7754106	29.96	1.1	522.79	523.89	SAMPLE Fluid Stopping. fluid-09 Tmax=207.4 Av=201.3 vol=193
3207	20090408 121841	14.60063155	144.7754107	30.03	1.1	522.78	523.88	Done sampling with Beast at this spot.
3208	20090408 121902	14.6006293	144.7754111	29.78	1.1	522.78	523.88	Just picking up wand but not stowing in case another good location is nearby.
3210	20090408 121957	14.60062882	144.7754113	29.92	1.08	522.82	523.9	Wand tip has vent snot on it.

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3211	20090408 122011	14.60062876	144.7754105	29.87	1.06	522.82	523.88	String of sulfur (molten?)
3213	20090408 122125	14.60063503	144.7754082	29.83	1.06	522.8	523.86	Pumping Beast in reverse to try to remove sulfur on tip. Not working.
3215	20090408 122155	14.60063683	144.7754072	29.75	1.05	522.84	523.89	Dragged out some molten sulfur out of the sediment.
3216	20090408 122219	14.60063961	144.7754067	29.59	1.04	522.88	523.92	J2-401 DVCAM 19 stop and 20 start
3221	20090408 122555	14.6006488	144.7754095	40.83	1.66	522.39	524.05	Going to Marker 108 site next to the east of Brimstone but first will look a bit at the main Brimstone Pit.
3222	20090408 122619	14.60063407	144.7754218	38.43	1.68	522.36	524.04	Moving over to main pit. Passively degassing and sluggish.
3224	20090408 122644	14.6006302	144.7754311	18.11	2.34	522.82	525.16	Plume looks a bit more vigorous than where just sampled but not a lot of activity.
3226	20090408 122804	14.60062962	144.7754333	18.19	2.24	522.93	525.17	Plume doesn't look very white and low activity level.
3230	20090408 123051	14.60058811	144.7754768	85.23	2.21	525.23	527.44	Moving over to Marker 108 Jason is heading due east.
3232	20090408 123231	14.6004988	144.775544	84.04	1.55	534.77	536.32	Jason is looking East but traveling downslope (south) a bit.
3234	20090408 123247	14.60051233	144.7755649	85.09	0.86	535.5	536.36	Jason under a bit of plume.
3236	20090408 123339	14.60052742	144.7756027	85.57	0.85	536.06	536.91	Visibility is just not very good on this side of the volcano and current looks like plume is following Jason.
3237	20090408 123405	14.60055356	144.7756001	85.78	3.24	532.17	535.41	Jason now moving a bit upslope (north) while looking east.
3238	20090408 123431	14.60057941	144.7755983	85.77	3.34	530.6	533.94	Turning of Medea HD.
3240	20090408 123439	14.60058699	144.7755981	85.81	3.16	530.11	533.27	Best view is in butt cam.
3243	20090408 123718	14.60073599	144.775586	85.47	1.69	527.71	529.4	pH did get down to 1.15 at the sampling site.
3248	20090408 124055	14.60073692	144.7756756	85.58	1.55	533.96	535.51	Can't see anything in the fog. No sign of CTD. Big boulder in butt cam.
3252	20090408 124542	14.60065213	144.7757771	85.92	99.56	540.26	639.82	Nav added barnacle target.
3254	20090408 124653	14.60065312	144.7757744	85.68	3.01	537.33	540.34	Can't see anything here so going to go to Fault Shrimp. Barnacle site is over there as well.
3258	20090408 124949	14.60073591	144.775881	85.58	6.08	536.55	542.63	Jason was on the bottom and we can't see anything. Amazing with the low output from the vent.
3259	20090408 125020	14.60074834	144.7759083	85.53	5.84	535.67	541.51	Jason is over the Marker 108 area but we can't see anything.
3261	20090408 125043	14.60075458	144.7759295	85.27	5.64	534.96	540.6	Moving ship and Jason enroute to Fault Shrimp.
3263	20090408 125224	14.60077797	144.7760413	85.72	6.19	522.71	528.9	Can see a bit of the bottom but only briefly.
3271	20090408 125904	14.6007576	144.7765374	86	8.48	548.7	557.18	Still in fog...better visibility here last night.
3273	20090408 125957	14.60075791	144.7765806	85.55	1.7	558.38	560.08	Good view of bottom in butt cam.
3274	20090408 130005	14.60075881	144.77659	85.54	1.91	558.66	560.57	Can see bottom and out of the fog!
3275	20090408 130027	14.60075927	144.7766179	85.31	2.19	559.75	561.94	Looks like a flat area.
3277	20090408 130125	14.60073652	144.776747	85.92	2.7	563.98	566.68	Seeing lots of white deposits on bottom with long striations and some dark outcrops.
3279	20090408 130158	14.60073233	144.7768045	85.59	2.41	564.96	567.37	Most places that are white are actually sulfur from the plume.
3280	20090408 130227	14.60073335	144.7768502	85.44	2.26	566.04	568.3	Can see some yellow in the cameras now as we come closer to bottom.
3282	20090408 130238	14.60073386	144.7768604	84.59	2.4	566.36	568.76	Ripples of white-yellow-dark.
3284	20090408 130340	14.60074257	144.7769476	84.8	2.23	568.65	570.88	Smooth looking bottom.
3285	20090408 130356	14.60074889	144.7769713	85.36	2.11	568.57	570.68	Some fast biology wriggled by.
3287	20090408 130459	14.60075431	144.777055	85.34	1.93	571.22	573.15	Some bright staining on rock-shiny.
3288	20090408 130515	14.60075155	144.777082	85.74	3.01	571.44	574.45	Smooth slope with lots of sulfur.
3291	20090408 130734	14.60081262	144.7772537	5.09	5.9	572.11	578.01	Sheet wall of sulfur with lots of shrimp.
3293	20090408 130753	14.60078029	144.7772388	10.17	5.65	574.36	580.01	Still 20m at least away from Shrimp Fault.
3294	20090408 130806	14.60077172	144.7772289	6.7	5.64	575.16	580.8	Shrimp are evenly spread out which is typical of grazers.
3295	20090408 130810	14.60077035	144.7772259	6.59	5.53	575.32	580.85	Lasers on.
3298	20090408 130947	14.60071802	144.7772686	78.53	4.9	576.46	581.36	Looking for Fault shrimp which looks like a bow of a ship.
3299	20090408 131013	14.60070172	144.777301	78.5	3.95	577.02	580.97	Turning Medea HD on.
3300	20090408 131032	14.60069555	144.7773117	77.36	4.13	576.89	581.02	Big contact between white sulfur and darker area.

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3302	20090408 131053	14.60069218	144.7773291	66.72	4.48	576.44	580.92	Looking a bit up to the top of ridge.
3303	20090408 131108	14.60068913	144.7773532	68.38	4.69	575.56	580.25	Looking up to find the wall.
3304	20090408 131136	14.60066396	144.7773678	64.95	6.05	574.98	581.03	Medea cam has great overview of the site (ship's bow).
3306	20090408 131149	14.60065204	144.7773714	62.2	6.41	575.01	581.42	There is the tip of the ridge-very sharp point.
3307	20090408 131215	14.60064977	144.777385	29.71	5.8	575.46	581.26	Going to approach one side of the wall.
3308	20090408 131237	14.60065349	144.777398	5.22	4.4	576.07	580.47	This side is proper heading.
3310	20090408 131250	14.60065239	144.7774065	6.3	3.76	576.76	580.52	VIDEO Start recording HDCam
3313	20090408 131440	14.60065821	144.7773952	24.23	3.48	577.04	580.52	Verified that this is the same location for barnacles from the Virtual Van photos
3315	20090408 131537	14.60066869	144.7773986	39.88	3.2	576.57	579.77	Looking closely at face of wall.
3316	20090408 131547	14.6006697	144.7773987	41.73	3.23	576.57	579.8	White dots are the barnacles.
3317	20090408 131622	14.60066994	144.7773988	42.59	2.94	576.65	579.59	Nav will put new target here Barnacles J2-401.
3319	20090408 131653	14.60066998	144.7773986	42.7	2.93	576.66	579.59	Looks like some mat as well. Trying to figure out how to sample the barnacles.
3320	20090408 131711	14.60066993	144.7773986	42.73	2.93	576.65	579.58	Need to grab a piece of rock with some animals on it.
3322	20090408 131745	14.60066991	144.7773985	42.67	2.93	576.65	579.58	Don't look like stalked barnacles. Big-arm barnacles.
3323	20090408 131801	14.60066986	144.7773983	42.4	2.93	576.66	579.59	Would be a great place to video with camera on the arm maybe later.
3324	20090408 131815	14.60066426	144.7773956	40.07	3.35	576.68	580.03	Need to stow the Beast wand before sampling.
3326	20090408 131913	14.60065564	144.7773871	40.71	3.83	576.98	580.81	Looks like a fish below the ledge sticking out.
3328	20090408 131937	14.60065607	144.7773878	40.01	4.14	576.78	580.92	Stopping Medea HD.
3329	20090408 132027	14.60065591	144.777388	39.99	3.98	576.92	580.9	VIDEO Stop recording HDCam HD has been off for awhile.
3331	20090408 132052	14.60065655	144.7773879	39.64	3.81	576.95	580.76	Beast wand is stowed and STBD biobox is opened.
3333	20090408 132159	14.6006588	144.777388	39.46	4.21	576.54	580.75	Moving Jason back into position for sampling.
3335	20090408 132335	14.60067121	144.777397	62.64	2.45	577.08	579.53	Bumped into ship's bow.
3337	20090408 132347	14.6006712	144.7773969	62.63	2.41	577.13	579.54	Looking for a piece of rock to grab with barnacles.
3338	20090408 132417	14.60067125	144.7773968	62.59	2.46	577.08	579.54	Going to put sample in STBD biobox on top of failed tephra sampler.
3340	20090408 132440	14.60067087	144.7773969	62.68	2.45	577.04	579.49	Diamante had a small patch of barnacles but they don't look like these.
3343	20090408 132649	14.60067052	144.7773963	62.04	2.46	577.02	579.48	J2-401-biology-10 very small barnacle sample on the west face of the ship's bow. Substrate is very fragile. Maybe another sampling method.
3345	20090408 132810	14.60066894	144.7773931	61.19	2.96	576.84	579.8	Taking the "Deardorff" scoop back on the back-right of the milk crate to sample.
3347	20090408 132914	14.60066937	144.7773916	60.85	2.78	577.08	579.86	SAMPLE Biology Scooping the wall. Need to move to the left off of the crust. J2-401-biology-10.
3349	20090408 132948	14.60066948	144.7773914	61.01	2.83	577.09	579.92	SAMPLE Biology Going to take some more to ensure barnacles make it in scoop bag as well as the rock.
3352	20090408 133152	14.60068226	144.7773857	89.11	1.51	577.43	578.94	SAMPLE Biology J2-401-biology-10 Repositioned vehicle.
3353	20090408 133157	14.60068223	144.7773857	89.17	1.54	577.41	578.95	Medea HD on.
3354	20090408 133230	14.60068242	144.7773856	89.42	1.5	577.44	578.94	SAMPLE Biology Good piece. J2-401-biology-10 looks like a good quantity of sample material.
3356	20090408 133336	14.60068235	144.7773855	89.2	1.5	577.5	579	SAMPLE Biology Stowing J2-401-biology-10 biology sample with rock placing it in basket behind milk crate where it originally was located.
3358	20090408 133409	14.60068281	144.7773858	89.59	1.45	577.51	578.96	Taking some DSC images of the area.
3360	20090408 133536	14.60069929	144.7773822	72.86	1.89	576.59	578.48	Going to take temperature of the white part and then place marker.
3362	20090408 133547	14.60070002	144.7773842	60.26	2.01	576.5	578.51	White material slid down very easily.
3363	20090408 133623	14.60069944	144.7773849	52.78	2.05	576.77	578.82	Could be sulfur snow. Very soft as Jason gently touched.
3365	20090408 133642	14.60069936	144.7773849	52.48	2.04	576.74	578.78	Turning Medea HD off.
3366	20090408 133652	14.60069925	144.7773849	52.41	2.04	576.74	578.78	Lasers off.
3367	20090408 133705	14.60069923	144.7773848	52.36	2.06	576.74	578.8	Retrieving temp probe.
3368	20090408 133723	14.60069912	144.7773847	52.46	2.06	576.68	578.74	Temperature probe reading of white area. Background is 7.0.

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3372	20090408 134008	14.60069983	144.7773843	52.63	2.09	576.64	578.73	Temperature is up to 13.9 Probe is pushed down in soft white material/sediment.
3373	20090408 134022	14.60069978	144.7773841	52.65	2.09	576.63	578.72	VIDEO Start recording HDCam Has been on for a bit.
3375	20090408 134119	14.60069966	144.7773838	52.67	2.1	576.62	578.72	Sci cam observations see many barnacles. Temp is up to 14.2 degrees.
3377	20090408 134146	14.60069971	144.7773837	52.66	2.1	576.64	578.74	Removing temperature probe.
3379	20090408 134323	14.6008022	144.7773624	52.6	2.08	576.64	578.72	Getting Marker 111 out of basket. Interesting swimming biology in science camera.
3382	20090408 134523	14.60080239	144.7773619	53.16	2.03	576.72	578.75	Marker 111 being placed at Barnacle Block. Jason shift change...will be placed after change.
3384	20090408 134538	14.60080243	144.777362	53.14	2.03	576.71	578.74	VIDEO Stop recording HDCam
3387	20090408 134804	14.60080355	144.7773619	53.06	2.04	576.71	578.75	DEPLOY Marker 111 is in place at sampling site of Barnacle Block.
3389	20090408 134850	14.60080378	144.7773619	53.04	2.04	576.72	578.76	Finished at this site. Want to head to Marker 109 site upslope from here and to the East.
3391	20090408 134941	14.600803	144.7773607	54.64	2.45	576.42	578.87	Marker is on top of ridge covered with shrimp. Shrimp trap is located there at a depth of 566.
3393	20090408 135038	14.60078011	144.7773359	54.67	2.33	578.61	580.94	Backing away from Barnacle Block.
3394	20090408 135053	14.6007764	144.7773385	54.72	2.05	578.96	581.01	Fish-rattail.
3395	20090408 135129	14.6007758	144.777338	54.99	2.25	578.74	580.99	Close-up up of fish in sci camera.
3397	20090408 135221	14.60076509	144.7773453	54.57	3.59	577.75	581.34	DEPLOY Marker (not sure if deploy button was used for Marker deployment)
3399	20090408 135320	14.60076624	144.7773655	39.37	4.28	576.17	580.45	The marker is along the white layer on the west face of the rock.
3400	20090408 135336	14.60078976	144.7773502	38.74	4.14	575.79	579.93	Nice shot of sample site with marker. Barnacle Block.
3402	20090408 135407	14.60083134	144.7773481	38.48	4.06	573.79	577.85	Moving to Marker 109 to retrieve the shrimp trap. Should be just 10m shallower and not far away.
3403	20090408 135416	14.60084161	144.7773451	37.41	4.78	572.62	577.4	VIDEO Start recording HDCam
3405	20090408 135505	14.60089672	144.7773578	38.94	4.93	568.62	573.55	Lots of shrimp all over the white material.
3406	20090408 135532	14.60088013	144.7773702	87.92	7.21	565.42	572.63	Follow the ridge to the right to locate trap. There is Marker 109.
3408	20090408 135545	14.60087376	144.7773729	86.29	7.34	565.75	573.09	Marker 109 and shrimp trap.
3409	20090408 135557	14.6008739	144.7773846	86.11	7.86	564.81	572.67	Want to recover trap and fluid sample here.
3410	20090408 135621	14.60087144	144.7774114	64.54	2.74	565.04	567.78	Can see many shrimp in trap (they like cat food).
3412	20090408 135643	14.60086966	144.7774171	64.62	1.8	565.57	567.37	Shrimp and fish cat food is very popular with these shrimp.
3413	20090408 135727	14.6008747	144.7774169	53.6	1.75	565.64	567.39	Positioning vehicle to recover the trap. Tremendous quantity of shrimp. Current is much less than during deployment.
3414	20090408 135737	14.60087463	144.7774168	52.65	1.76	565.57	567.33	Amazing amount of shrimp.
3416	20090408 135759	14.6008749	144.7774168	52.51	1.74	565.57	567.31	RECOVER Shrimp Trap Jason has shrimp trap. Trap has been down for 2 days.
3417	20090408 135824	14.60087383	144.7774139	52.81	1.73	565.57	567.3	Looks like over a dozen shrimp in trap.
3420	20090408 140012	14.60087381	144.7774136	53.18	1.74	565.64	567.38	RECOVER Shrimp Trap Placed trap on top of geo-01 sample in back-right quadrant of milk crate.
3421	20090408 140022	14.60087358	144.7774134	53.18	1.74	565.64	567.38	Want to do some fluid sampling here.
3423	20090408 140045	14.60087312	144.7774135	53.19	1.73	565.65	567.38	Wonderful shrimp habitat.
3425	20090408 140149	14.60090315	144.7774122	116.4	2.49	565.33	567.82	SAMPLE Biology J2-401-biology-11 is the shrimp trap with shrimp
3426	20090408 140204	14.6009046	144.777409	115.27	3.58	564.66	568.24	SAMPLE Biology Sample taken at Fault Shrimp near marker 109.
3427	20090408 140235	14.60090377	144.7773916	133.9	2.74	565.37	568.11	Looking for water flow along break in the white.
3429	20090408 140249	14.60090315	144.7773929	130.87	2.03	566.12	568.15	J2-401 Data DVDs start
3430	20090408 140305	14.60090306	144.7773939	128.37	2.18	566.03	568.21	J2-401 DVDs not actually start yet
3432	20090408 140436	14.6008978	144.7774046	132.75	2.51	564.96	567.47	Going to move up the ridge and over to other side where more water was observed flowing last visit.
3434	20090408 140442	14.6008926	144.7774119	140.72	2.1	564.63	566.73	VIDEO Stop recording HDCam
3435	20090408 140455	14.60088232	144.7774309	173.97	0.83	563.85	564.68	Nice view of Marker 109 at top of ridge.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
3436	20090408 140519	14.60086328	144.7774603	274.1	1.26	564.85	566.11	Coming over to other side of ridge.
3439	20090408 140653	14.60085209	144.7774376	300.36	2.78	565.78	568.56	Found a bright white spot with some water flow.
3440	20090408 140711	14.60085048	144.7774372	300.5	2.94	565.77	568.71	J2-401 Data DVDs start blue set 024
3441	20090408 140711	14.60085048	144.7774372	300.5	2.94	565.77	568.71	A few crabs in with the shrimp.
3443	20090408 140823	14.60085646	144.7774401	294.1	2.8	565.3	568.1	Water is just below the marker (good view on sci cam).
3447	20090408 141039	14.6008698	144.7774324	301.54	2.25	565.48	567.73	VIDEO Start recording HDCam
3448	20090408 141107	14.60086964	144.7774324	302.18	2.01	565.48	567.49	Shrimp covering little knobs-very interesting looking.
3450	20090408 141208	14.60086929	144.7774323	302.15	2.28	565.43	567.71	Retrieving HFS wand. Need to be careful not to kink it.
3451	20090408 141221	14.60086927	144.7774324	302.15	2.36	565.43	567.79	J2-401 Data DVDs stop red set 023
3453	20090408 141252	14.60086863	144.7774325	302.15	2.26	565.44	567.7	Wand hose looks good and not folded.
3455	20090408 141431	14.6008677	144.7774333	302.14	2.26	565.45	567.71	Looking for a good flow of water.
3457	20090408 141504	14.60086757	144.7774333	302.13	2.26	565.43	567.69	We are sampling at Fault Shrimp with Marker 109.
3459	20090408 141602	14.60086765	144.7774335	302.13	2.36	565.45	567.81	Temp just above 8.0 at this place.
3460	20090408 141612	14.60086774	144.7774333	302.13	2.29	565.43	567.72	VIDEO Stop recording HDCam Changing HD tape.
3461	20090408 141623	14.60086743	144.7774335	302.13	2.26	565.43	567.69	Wand tip in new crack.
3463	20090408 141657	14.60086763	144.7774333	302.13	2.28	565.43	567.71	Pump is on and temperature is going up.
3464	20090408 141718	14.60086767	144.7774331	302.14	2.28	565.43	567.71	15deg and slowly going up.
3466	20090408 141747	14.60086724	144.777433	302.14	2.28	565.43	567.71	18deg and rising.
3467	20090408 141755	14.60086718	144.777433	302.15	2.29	565.43	567.72	Doing a pH measurement.
3469	20090408 141923	14.60086645	144.777434	302.17	2.26	565.43	567.69	pH here is 5.57
3471	20090408 142007	14.60086655	144.777434	302.19	2.26	565.43	567.69	ph here is really 5.17 (new reading).
3473	20090408 142107	14.60086675	144.7774342	302.21	2.25	565.46	567.71	SAMPLE Fluid J2-401-fluid-12 starting bag unfiltered #24.
3474	20090408 142130	14.60086663	144.7774339	302.22	2.25	565.44	567.69	SAMPLE Fluid Steady temperature-good sample site.
3477	20090408 142242	14.60086659	144.7774342	302.26	2.28	565.43	567.71	Shrimp move quickly away from the crab.
3480	20090408 142451	14.60086675	144.777434	302.36	2.25	565.44	567.69	SAMPLE Fluid J2-401-fluid-12 stopping.
3481	20090408 142519	14.60086683	144.7774342	302.37	2.26	565.42	567.68	SAMPLE Fluid Tmax=18.8 Av=18.4 vol=520 T2=11.1
3484	20090408 142553	14.60086675	144.7774341	302.4	2.25	565.43	567.68	SAMPLE Fluid Starting J2-401-fluid-12 unfiltered bag #23
3485	20090408 142624	14.60086694	144.7774339	302.42	2.25	565.41	567.66	SAMPLE Fluid correct number this is j2-401-fluid-13 unfiltered bag #23
3487	20090408 142644	14.60086691	144.7774337	302.42	2.26	565.41	567.67	SAMPLE Fluid This is #13 unfiltered bag #23.
3488	20090408 142649	14.60086701	144.7774338	302.42	2.25	565.43	567.68	VIDEO Stop recording HDCam
3489	20090408 142700	14.60086713	144.7774337	302.44	2.26	565.41	567.67	J2-401 DVCAM 020 stop and DVCAM 021 start
3491	20090408 142742	14.60087021	144.7774425	302.45	2.25	565.41	567.66	Blank monitors.
3492	20090408 142747	14.60087072	144.777444	302.45	2.25	565.41	567.66	Beast has stopped.
3493	20090408 142749	14.60087092	144.7774446	302.45	2.25	565.41	567.66	Lost power.
3495	20090408 142919	14.60086377	144.7774388	302.45	2.25	565.41	567.66	Power and cameras are back on.
3496	20090408 142928	14.60085866	144.7774222	302.45	2.25	565.41	567.66	Wand was withdrawn from site.
3498	20090408 142946	14.60084363	144.7773944	302.45	2.25	565.41	567.66	SAMPLE Fluid J2-401-fluid-13 stopped during power outage.
3504	20090408 143506	14.60083266	144.7775545	49.57	2.25	574.99	577.24	Looks like Jason is down near Barnacle Block again.
3506	20090408 143609	14.60093688	144.7774664	2.44	2.25	571.5	573.75	There is marker 111 at Barnacle Block.
3508	20090408 143734	14.60109585	144.7773505	3.35	2.25	571.43	573.68	start moving Medea back with ship
3510	20090408 143746	14.60110148	144.7773611	2.42	2.25	571.29	573.54	Doppler is way off
3512	20090408 143859	14.60109295	144.7775011	74.06	2.25	564.84	567.09	Fiber optic gyro is resetting
3513	20090408 143936	14.60102609	144.7775432	37.66	2.25	562.89	565.14	Coming back to sampling site
3515	20090408 144017	14.60103316	144.7775678	307.35	2.25	563.28	565.53	We're back at marker 109
3518	20090408 144159	14.60104491	144.7775678	310.71	2.25	565.65	567.9	Looking for that good water hole again.
3521	20090408 144405	14.60104502	144.777567	310.61	2.25	565.71	567.96	Will resume the previous sample J2-401-fluid-13

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3524	20090408 144545	14.60104549	144.7775677	310.5	2.25	565.75	568	Wind is up to 20-25 outside.
3525	20090408 144601	14.60104558	144.7775675	310.49	2.25	565.78	568.03	SAMPLE Fluid Resuming J2-401-fluid-13
3526	20090408 144628	14.60104579	144.7775676	310.46	2.25	565.78	568.03	Ship position is not holding very tight with the increase in winds.
3529	20090408 144806	14.60104607	144.7775671	310.34	2.25	565.8	568.05	SAMPLE Fluid Stopping J2-401-fluid-13
3530	20090408 144830	14.60104596	144.7775671	310.31	2.25	565.79	568.04	SAMPLE Fluid Tmax=16.7 Ave=16.3 Vol=503 T2=11.0
3533	20090408 144925	14.60104582	144.7775673	310.24	2.25	565.78	568.03	SAMPLE Fluid Filtered sample J2-401-fluid-14 Bag #16 starting.
3536	20090408 145103	14.60092084	144.7774762	310.13	2.25	565.8	568.05	NAV Doppler reset
3537	20090408 145129	14.60092086	144.7774765	310.1	2.25	565.78	568.03	Medea position just jumped after doppler reset.
3540	20090408 145249	14.60092048	144.7774766	310.01	2.25	565.78	568.03	VIDEO Start recording HDCam
3541	20090408 145314	14.60092032	144.7774766	309.98	2.25	565.78	568.03	SAMPLE Fluid J2-401-fluid-14 stopping.
3543	20090408 145341	14.60092034	144.7774767	309.95	2.25	565.78	568.03	Tmax=16.1 Av=15.6 vol=501 T2=10.8
3544	20090408 145425	14.60091984	144.7774766	309.9	2.25	565.79	568.04	SAMPLE Fluid J2-401-fluid-15 Sterivix filter 15 starting.
3549	20090408 145823	14.60091947	144.7774756	309.68	2.25	565.76	568.01	VIDEO Stop recording HDCam
3552	20090408 145942	14.60091891	144.777475	309.61	2.25	565.78	568.03	J2-401-fluid-15 Steady temperature
3557	20090408 150405	14.60091594	144.7774752	309.47	2.25	565.77	568.02	VIDEO Start recording HDCam
3559	20090408 150442	14.60091595	144.7774749	309.45	2.25	565.78	568.03	Taking HD of crab and biology.
3562	20090408 150722	14.60091607	144.7774749	309.4	2.25	565.78	568.03	SAMPLE Fluid Not much other than shrimp here. Few limpets but not as many egg cases as seen at other site.
3563	20090408 150728	14.60091596	144.777475	309.39	2.25	565.78	568.03	VIDEO Stop recording HDCam
3566	20090408 150929	14.6009145	144.7774737	309.37	2.25	565.78	568.03	SAMPLE Fluid Not as many of the large shrimp. Some sub-adults.
3568	20090408 151003	14.60091475	144.7774733	309.37	2.25	565.78	568.03	(that wasn't a sample but the button was pressed down)
3570	20090408 151044	14.60091395	144.7774726	309.36	2.25	565.78	568.03	Depth at Fault Shrimp was 583 in 2006 and is now 565.
3572	20090408 151152	14.60091292	144.7774723	309.36	2.25	565.8	568.05	Crab captured another crab. Shrimp getting in the middle of it all.
3573	20090408 151228	14.60091213	144.7774729	309.36	2.25	565.78	568.03	Crab cannibal-it is eating one of its own. Shrimp are getting the leftovers.
3576	20090408 151437	14.60091181	144.7774718	309.35	2.25	565.76	568.01	SAMPLE Fluid Great video of crab eating crab. C
3578	20090408 151517	14.60091191	144.7774717	309.35	2.25	565.76	568.01	SAMPLE Fluid J2-401-fluid-15 stopped.
3580	20090408 151548	14.60091168	144.7774716	309.36	2.25	565.78	568.03	SAMPLE Fluid Tmax=18.0 Av=16.9 vol=3012 T2=11.0 J2-401-fluid-15
3581	20090408 151616	14.60091126	144.7774716	309.35	2.25	565.78	568.03	Taking pH reading.
3585	20090408 151925	14.6009098	144.7774707	309.37	2.25	565.78	568.03	pH is 5.29 at this site.
3587	20090408 151954	14.6009096	144.7774706	309.37	2.25	565.78	568.03	Done sampling at Shrimp Fault.
3593	20090408 152445	14.6009095	144.7774711	309.45	2.25	565.88	568.13	Going to go to Scarp Top . Retrieving the HFS wand.
3594	20090408 152532	14.60090972	144.7774711	309.8	2.25	565.85	568.1	Crab really tore apart the smaller crab.
3597	20090408 152646	14.60090902	144.7774722	311.8	2.25	565.33	567.58	Wand is stowed. Basket is in.
3598	20090408 152726	14.60092024	144.7775234	74.45	2.25	562.04	564.29	Going east to Scarp Top.
3599	20090408 152733	14.60092212	144.7775336	73.21	2.25	562.27	564.52	Moving over ridge.
3602	20090408 152859	14.6009616	144.7776731	315.21	2.25	564.87	567.12	Bottom is sloping away from Jason.
3604	20090408 153037	14.60091428	144.7776732	194.26	2.25	565.41	567.66	Can't see bottom as head over to Scarp Top.
3606	20090408 153133	14.60082538	144.7776536	187.21	2.25	581.89	584.14	Sharp ridge to STBD.
3608	20090408 153218	14.60079302	144.7776591	228.67	2.25	591.46	593.71	Can see bottom in butt camera.
3609	20090408 153228	14.60079156	144.7776571	272.05	2.25	591.1	593.35	Sedimented slope in butt cam.
3611	20090408 153251	14.60079509	144.7776652	346.74	2.25	591.31	593.56	Can see bottom a bit now in brow cam.
3613	20090408 153345	14.60087521	144.7775863	349.82	2.25	589	591.25	Lots of light coating/sediment.
3614	20090408 153406	14.60090985	144.7775658	342.99	2.25	583.35	585.6	See large targets on sonar.
3615	20090408 153435	14.60096561	144.7775138	281.82	2.25	579.73	581.98	Face of scarp-very vertical.
3617	20090408 153458	14.60098619	144.7774877	270.24	2.25	576.41	578.66	Mat is growing and see fish.
3618	20090408 153507	14.6009875	144.7774843	265.6	2.25	574.91	577.16	Looks like big breccia wall with alteration.

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3619	20090408 153518	14.60099403	144.7774804	262.03	2.25	573.02	575.27	White stuff is filamentous mat-must have some fluid flow.
3620	20090408 153527	14.60099561	144.7774814	262.05	2.25	571.61	573.86	Moving up wall face.
3622	20090408 153540	14.60099522	144.7774866	261.75	2.25	569.04	571.29	Quite a vertical wall.
3624	20090408 153706	14.60097462	144.7774518	243.57	2.25	562.45	564.7	Here is the top at 565 and can see marker 109 in the background where we just were.
3625	20090408 153715	14.60096394	144.7774587	227.29	2.25	562.1	564.35	Nice view of ridge line.
3627	20090408 153825	14.6008116	144.77751	272.64	2.25	566.53	568.78	Vertical ridge.
3629	20090408 153905	14.6007784	144.777474	354.64	2.25	568.11	570.36	Following ridge line along 340. Knife edges on top of ridge.
3631	20090408 153949	14.60078961	144.7774467	3.16	2.25	567.78	570.03	Sulfur features on top.
3632	20090408 154015	14.60082349	144.7774462	18	2.25	564.72	566.97	Scarp Top was probably Marker 109 and we probably never were at Fault Shrimp.
3634	20090408 154043	14.60085607	144.7774118	14.93	2.25	563.8	566.05	Depths are wrong for Marker 109 being Fault Shrimp----Marker 109 is Scarp Top!
3635	20090408 154123	14.60085952	144.7773686	351.28	2.25	562.6	564.85	Decided to go deeper to the old Fault Shrimp depth of 586.
3636	20090408 154131	14.60086183	144.7773587	351.23	2.25	562.21	564.46	There is Marker 109 again.
3638	20090408 154159	14.60082905	144.7772996	22.96	2.25	564.33	566.58	Want to go down (deeper) and WSW to find the real Fault Shrimp.
3640	20090408 154304	14.6007905	144.777237	31.92	2.25	576.19	578.44	There is Barnacle block at Marker 111.
3642	20090408 154356	14.60076109	144.7772328	25.33	2.25	579.64	581.89	Medea is on the move to follow Jason already. Looking for Fault Shrimp and figuring out relative nav.
3648	20090408 154938	14.60076893	144.7772508	5.94	2.25	579.84	582.09	WATCHSTANDERS Nick Deardorff video
3650	20090408 154942	14.60076892	144.7772509	5.94	2.25	579.86	582.11	WATCHSTANDERS Susan Merle logger
3651	20090408 155021	14.60076897	144.7772507	5.97	2.25	579.84	582.09	Bob Embley is on watch now replacing Bill Chadwick.
3653	20090408 155041	14.60076893	144.7772506	6.05	2.25	579.82	582.07	Kevin Roe is replacing Dave Butterfield.
3654	20090408 155128	14.60076849	144.7772516	14.43	2.25	579.84	582.09	Cornel deRonde is on watch now as well as Sheryl Murdock.
3657	20090408 155332	14.60076162	144.7772542	48.42	2.25	579.56	581.81	We are somewhere near Fault Shrimp. The place we were calling Fault Shrimp previously is probably actually Scarp Top.
3662	20090408 155646	14.60067367	144.7773334	48.96	2.25	581.32	583.57	Looking for the "real" Fault Shrimp. It should be 584 - 586m deeper.
3665	20090408 155850	14.60067998	144.7773639	38.33	2.25	582.82	585.07	This is beautiful here. Quite an extreme steep outcrop here.
3667	20090408 155946	14.60067657	144.7773684	6.63	2.25	582.72	584.97	Looking around this outcrop for venting.
3669	20090408 160111	14.60067405	144.7773725	350.62	2.25	583.64	585.89	Lots of mat on this pointy outcrop. Don't see much shimmer yet.
3671	20090408 160209	14.60064751	144.7773773	57.35	2.25	582.31	584.56	Searching for Fault Shrimp.
3672	20090408 160237	14.60063385	144.7773833	64.93	2.25	582.42	584.67	J2-401 Data DVDs start red set DVDs 025
3674	20090408 160331	14.60062063	144.7773872	18.34	2.25	582.84	585.09	This is a really steep outcrop.
3676	20090408 160350	14.60061719	144.7773906	8.77	2.25	583.5	585.75	The outcrop is almost vertical.
3677	20090408 160412	14.60061313	144.7773897	341.43	2.25	583.93	586.18	Lots of mat on this nearly vertical outcrop.
3679	20090408 160533	14.60059508	144.7773952	344.72	2.25	587.03	589.28	There is a fish on this outcrop. They've seen a lot of fish here today.
3681	20090408 160610	14.60057558	144.7773888	344.87	2.25	589.2	591.45	The mat is almost totally covering this outcrop on this side.
3683	20090408 160721	14.60058999	144.7773815	344.29	2.25	590.53	592.78	J2-401 Data DVDs stop blue set DVDs 024
3685	20090408 160740	14.60058952	144.7773829	341.6	2.25	591.21	593.46	Mat-covered outcrop. Don't see any warm water coming out.
3687	20090408 160916	14.60057022	144.7773532	326.6	2.25	591.01	593.26	Exploring this area a bit more.
3689	20090408 160956	14.60056449	144.7773484	327.81	2.25	591.11	593.36	VIDEO Start recording HDCam
3690	20090408 161037	14.60056476	144.7773497	327.89	2.25	590.95	593.2	Still looking for the source of venting here.
3693	20090408 161210	14.60056366	144.7773515	327.62	2.25	592.52	594.77	Zooming in on the brighter white area here. Looking for venting.
3694	20090408 161224	14.60056188	144.77735	327.85	2.25	591.94	594.19	Some little red things in the water column.
3697	20090408 161359	14.60055008	144.7773509	327.89	2.25	593.34	595.59	Little fish down here.
3700	20090408 161559	14.60054642	144.7773419	348.46	2.25	596.74	598.99	Searching some more. Can't locate the source of venting here.
3701	20090408 161605	14.60054609	144.7773427	348.88	2.25	596.42	598.67	VIDEO Stop recording HDCam
3703	20090408 161730	14.60051394	144.7773402	343.73	2.25	596.33	598.58	Looks like a dead end as far as water sampling here.
3705	20090408 161750	14.600514	144.7773404	344.02	2.25	596.29	598.54	Priorities are Iceberg vent.



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3707	20090408 161928	14.60051792	144.7773197	314.31	2.25	597	599.25	We may have seen some flow here. It was probably the mat waving.
3709	20090408 162003	14.60051444	144.7773193	315.27	2.25	597.12	599.37	Another fish here.
3711	20090408 162046	14.60051007	144.7773185	316.18	2.25	597.32	599.57	Going to try a temp measurement in one of these little holes.
3712	20090408 162105	14.60050975	144.7773185	318.69	2.25	597.28	599.53	Looks like low-temp iron oxide seds here.
3713	20090408 162133	14.60050989	144.7773184	319.19	2.25	598.07	600.32	Iron floc being knocked loose.
3715	20090408 162213	14.60050978	144.7773184	319.13	2.25	598.04	600.29	Lots of silica in these iron oxide seds.
3717	20090408 162248	14.60050973	144.7773187	317.57	2.25	597.88	600.13	Grabbing the HFS temp probe.
3720	20090408 162449	14.60050986	144.7773185	317.07	2.25	598	600.25	Nozzle placed in a hole here. Tamb=6.6. Super-low temp venting.
3721	20090408 162511	14.6005099	144.7773186	317.3	2.25	597.99	600.24	A fish in the HD Cam.
3722	20090408 162528	14.60050978	144.7773187	317.09	2.25	597.99	600.24	The temp is slowly going up.
3724	20090408 162632	14.60050956	144.7773188	317.06	2.25	598.04	600.29	J2-401 DVCAM 022 start and 021 stop
3726	20090408 162717	14.60050963	144.7773187	316.92	2.25	598.03	600.28	We're going to take a temp or two. A very orange shrimp here.
3728	20090408 162800	14.60050936	144.7773189	316.32	2.25	598.03	600.28	SAMPLE Fluid 16. Unfiltered bag#22. HFS. Tamb=6.6. Temp now is 8.2.
3732	20090408 163135	14.60049984	144.7773181	315.09	2.25	598.09	600.34	Sample 16. HFS unfiltered bag#22. The computer was unplugged so need to start over. 50m south of Mkr-109 (Scarp Top - not Fault Shrimp).
3735	20090408 163309	14.60049768	144.7773177	315.34	2.25	598.09	600.34	50m south of Mkr-109. Depth is 590 meters.
3736	20090408 163314	14.60049766	144.7773177	315.38	2.25	598.08	600.33	VIDEO Start recording HDCam
3738	20090408 163403	14.60049804	144.7773174	315.88	2.25	598.08	600.33	Here in this very diffuse flow. Mat-covered rocks. Lots of iron oxide cover here. Some small fish and a very bright orange shrimp.
3740	20090408 163519	14.60049857	144.7773173	315.42	2.25	598.08	600.33	rebooting the HFS computer.
3743	20090408 163712	14.60049698	144.7773172	316.92	2.25	598.03	600.28	VIDEO Stop recording HDCam
3747	20090408 163955	14.60049666	144.7773173	316.79	2.25	598.02	600.27	Diffuse flow 50m S of Mkr-109 (now determined that Mkr-109 is at Scarp Top - not Fault Shrimp)
3750	20090408 164201	14.60049645	144.7773176	316.46	2.25	598.06	600.31	SAMPLE Fluid 16. HFS re-start. Unfiltered bag#22. Depth is 599. Naming this area Iron599. Stop 164148. Tmax=8.6 Tavg=8.3.
3751	20090408 164234	14.60049669	144.7773177	316.25	2.25	598.03	600.28	Moving the valve.
3754	20090408 164439	14.60050021	144.777318	315.83	2.25	598.03	600.28	SAMPLE Fluid 17. HFS Filtered bag#17. Here at Iron599. Start 164315. Vent is 2deg above ambient.
3758	20090408 164719	14.60050069	144.7773184	316.02	2.25	598.02	600.27	SAMPLE Fluid 17. HFS Filtered bag#17 cont. Temp is going down. Stop 163656. Tmax=8.6 Tavg=8.1. Vol=499ml.
3762	20090408 165036	14.60050456	144.7773188	316.14	2.25	598.01	600.26	SAMPLE Fluid 18. HFS sterivex filter#11. Start 164850. Iron 599 "Vent" again. Temp=8.4. 1.5deg over ambient.
3769	20090408 165552	14.60051642	144.7773185	315.36	2.25	597.99	600.24	Sample 18. HFS sterivex filter#11. Iron599 site. Still sampling.
3774	20090408 165947	14.60051626	144.7773191	312.87	2.25	597.94	600.19	HFS sterivex filter#11 cont. Iron 599 site. 2 liters so far.. time is 1700 UTC.
3778	20090408 170315	14.60051577	144.7773175	312.19	2.25	597.92	600.17	Sample 18 cont. 2.5 liters @ 1702. Iron 599 site.
3781	20090408 170531	14.60051546	144.7773176	312.91	2.25	597.94	600.19	Sample 18 cont. Iron 599 site. Stop at 170450. 3005 ml. Tmax=8.6. Tavg=8.3.
3786	20090408 170848	14.60051525	144.7773175	314.96	2.25	598.02	600.27	Sample 18 cont. Iron 599 site. Moving the valve to do a pH reading. Tamb=6.6.
3788	20090408 171006	14.60051488	144.7773175	315.21	2.25	598.05	600.3	Sample 18 pH. Iron 599 site. pH is 5.67. Temp is 8.3.
3790	20090408 171127	14.60051492	144.7773175	315.9	2.25	598.14	600.39	Stowing the wand.
3793	20090408 171254	14.6005131	144.7773215	316.96	2.25	597.3	599.55	Finished up here at Iron599 site. The plan is to head to Iceberg next.
3797	20090408 171632	14.60063506	144.777239	291.9	2.25	581.41	583.66	The depth at Iceberg is 534m. Heading out to Iceberg for more fluid sampling.
3801	20090408 171857	14.60071657	144.7771515	290.19	2.25	581.41	583.66	Beautiful sediments here. Small ripple features on this light seds with interspersed dark patches.
3803	20090408 172008	14.6007576	144.7770423	275.18	2.25	580.42	582.67	Volcanic outcrop covered with white and black volcanoclastic seds. Quite steep. Heading W and climbing.
3806	20090408 172204	14.60077874	144.7769682	275.01	2.25	577.49	579.74	Steep slope here. Climbing off this bench and heading up the slope.

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3807	20090408 172240	14.60079235	144.7769392	275.34	2.25	575.07	577.32	Altered outcrop (stockwork).
3809	20090408 172316	14.60080421	144.7769041	275.61	2.25	572.34	574.59	Proceeding up slope of white sed. Probably lots of sulfur covered over by white material.
3812	20090408 172444	14.60082018	144.7768333	276.55	2.25	568.83	571.08	Interesting ripple pattern. At a local top here. Winnowing of black volcanoclastic sand into lower areas.
3813	20090408 172509	14.60082575	144.7767782	277.74	2.25	565.93	568.18	Ripple patterns are quite complex here. Probably due to current patterns.
3815	20090408 172544	14.60083158	144.7766674	276.3	2.25	564.56	566.81	Ripples seem to run perpendicular to the steep slope in most cases. At the tops it is more complex.
3816	20090408 172626	14.60081454	144.7765842	275.13	2.25	561.43	563.68	Lots of yellow sulfur here. Perhaps it is iron oxide. Hard to tell.
3818	20090408 172730	14.60082648	144.7765173	277.69	2.25	559.45	561.7	Could be some active patchy venting here. Could be some mats?
3820	20090408 172802	14.60083279	144.7764669	276.98	2.25	555.61	557.86	We are on the approach here. There is a feature ahead of us. Could be it.
3822	20090408 172857	14.60084277	144.7764055	276.32	2.25	551.5	553.75	Lot steeper here. Seeing some shrimp here. Tamb is rising. It's 7.1deg now.
3824	20090408 172950	14.60084661	144.7763875	277.22	2.25	547.3	549.55	Outcrop on the sonar here. It's quite covered with shrimp.
3826	20090408 173104	14.60084153	144.776326	281.18	2.25	537.3	539.55	Going up a wall of pillow lavas here. Most are quite intact on this scarp.
3828	20090408 173217	14.60080619	144.7763088	297.1	2.25	536.17	538.42	We're at the right depth now. Lateralling around the outcrop searching for Iceberg.
3830	20090408 173302	14.60082203	144.7762565	296.13	2.25	536.2	538.45	The slope is covered with shrimp here.
3831	20090408 173328	14.60082438	144.7762529	296.46	2.25	536.68	538.93	We are just a few meters off the correct depth here.
3833	20090408 173434	14.60083894	144.7762189	296.03	2.25	533.88	536.13	Shrimp are covering this slope.
3836	20090408 173558	14.60086852	144.7762437	321.17	2.25	533.43	535.68	Lots of shrimp here on this slope.
3838	20090408 173652	14.60091795	144.776259	305.41	2.25	533.59	535.84	Large areas of white sed covering this slope.
3841	20090408 173911	14.60095864	144.7762775	290.17	2.25	534.2	536.45	Searching around here for Iceberg. Crab on this slope.
3843	20090408 174028	14.60096559	144.7762773	290.13	2.25	534.07	536.32	There is a crab and lots of shrimp here.
3845	20090408 174045	14.60097033	144.7762777	289.81	2.25	534.05	536.3	Moving along this outcrop area.
3846	20090408 174108	14.60097681	144.776284	282.92	2.25	533.99	536.24	This doesn't look like it. Iceberg was very white in the past.
3848	20090408 174237	14.60096451	144.7762891	273.68	2.25	533.95	536.2	Still searching. Watch change for the Jason group now.
3852	20090408 174513	14.60098318	144.776289	264.84	2.25	533.75	536	Bob "Buddha" taking over for Will. Bob the navigator replace Jon.
3854	20090408 174557	14.600996	144.7762817	248.08	2.25	533.89	536.14	Moving around this wall to the north. Loads of shrimp here.
3857	20090408 174752	14.60101596	144.7762567	248.16	2.25	533.11	535.36	Looks like we're getting out of it here. Lots of shrimp but not much flow here.
3858	20090408 174819	14.60101646	144.7762523	245.02	2.25	532.86	535.11	Crabs interspersed among the shrimp.
3860	20090408 174856	14.60101594	144.7762508	247.39	2.25	532.71	534.96	Several crab hanging out under that ledge.
3863	20090408 175045	14.60099523	144.7762745	248.51	2.25	531.48	533.73	We seem to be getting out of the flow here. Will head south around this cliff.
3864	20090408 175121	14.60095934	144.7762934	245.32	2.25	533.51	535.76	Heading back to the south where there was more white sed etc.
3866	20090408 175153	14.6009564	144.7763071	246.39	2.25	535.16	537.41	Altered rock here.
3868	20090408 175333	14.60091953	144.7763197	248.32	2.25	536.19	538.44	Lateralling to the south. Still searching for Iceberg.
3870	20090408 175432	14.60086705	144.7763142	247.47	2.25	536.27	538.52	Seeing a few shrimp in the water column. More white sed on the slope now. Less outcrop right here.
3873	20090408 175611	14.60083688	144.7762786	247.26	2.25	537.97	540.22	There are lots of shrimp on the sed here. Some white on the crust.
3876	20090408 175808	14.60078445	144.7762349	336.68	2.25	536.81	539.06	Not very obvious flow here.
3877	20090408 175828	14.60078184	144.7762311	339.47	2.25	537.16	539.41	J2-401 Data DVDs start blue set DVDs 026
3881	20090408 180119	14.60076827	144.7762361	339.49	2.25	536.17	538.42	We want to go back north. Sheryl has a pic of the spot in 2006. Looks like something we passed earlier along this cliff face.
3882	20090408 180139	14.6007674	144.7762357	339.55	2.25	536.02	538.27	Several lights are out right now.
3885	20090408 180306	14.60076752	144.7762358	339.63	2.25	536.14	538.39	We're zoomed out here and waiting for the lights to come back on.
3886	20090408 180308	14.60076753	144.7762358	339.65	2.25	536.11	538.36	J2-401 Data DVDs stop red set DVDs 025
3887	20090408 180340	14.60077886	144.7762306	339.62	2.25	537.84	540.09	There are certainly tons of shrimp here.
3891	20090408 180556	14.60078368	144.7762282	339.63	2.25	536.01	538.26	We're going back to the place that we think was Iceberg here.

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3893	20090408 180738	14.60081724	144.7762076	339.98	2.25	534.67	536.92	Things on this east side are cooler than previously. Lots more biology this year.
3898	20090408 181054	14.60084863	144.7761879	339.11	2.25	534.1	536.35	We see some diffuse flow here. We're going to call it Iceberg'09 and will put out a marker.
3900	20090408 181212	14.60084582	144.7761886	340.23	2.25	533.81	536.06	Preparing to sample here in this little crack.
3902	20090408 181323	14.60084569	144.7761885	340.08	2.25	533.79	536.04	We're measuring the temp here.
3906	20090408 181549	14.60084542	144.7761882	340.55	2.25	533.74	535.99	Lots of floc coming out of that crack.
3907	20090408 181600	14.6008454	144.7761882	339.62	2.25	533.79	536.04	The temp is increasing here.
3908	20090408 181631	14.60084531	144.7761883	339.81	2.25	533.7	535.95	Now up to temp of 20 degrees.
3910	20090408 181717	14.6008453	144.7761883	339.75	2.25	533.66	535.91	Tmax=22 right now. Rising up to 25 now.
3915	20090408 182132	14.60084493	144.7761881	338.24	2.25	533.64	535.89	SAMPLE Fluid 19. HFS unfiltered bag#21. Iceberg09. Start 182045. Temp=25. In a little crack under a small shelf in the wall here.
3919	20090408 182417	14.60084483	144.7761874	339.57	2.25	533.6	535.85	Sample 19. HFS unfiltered bag#21. Iceberg09-2. 32m west of first Iceberg09 target. Tmax=27.3. Tavg=20.0 346ml.
3920	20090408 182434	14.60084495	144.7761877	338.34	2.25	533.68	535.93	Stopped sample at ~1824.
3924	20090408 182647	14.60084173	144.7761895	338	2.25	534.33	536.58	J2-401 DVCAM 022 stop and 023 start
3926	20090408 182754	14.60084153	144.7761895	337.49	2.25	534.44	536.69	This is not Iceberg09. We will put down a marker here and give it that name.
3929	20090408 182955	14.60084186	144.7761891	338.51	2.25	534.45	536.7	The flow has decreased here. Poking the nozzle around to find a temp increase.
3932	20090408 183223	14.60084241	144.7761884	337.71	2.25	534.52	536.77	Poking around here. Can see the shimmer but not getting much for a temp increase.
3934	20090408 183316	14.60084158	144.7761886	338.4	2.25	534.52	536.77	Flushing it. Rising again.
3935	20090408 183334	14.60084133	144.7761892	338.47	2.25	534.52	536.77	Have the nozzle back in that little crack under that very small ledge.
3940	20090408 183720	14.6008415	144.7761888	337.88	2.25	534.49	536.74	SAMPLE Fluid 20. HFS unfiltered piston#8. Temp is rising. Start 183540. Temp is at 35.5.
3944	20090408 183944	14.60084139	144.7761884	338.11	2.25	534.49	536.74	Sample 20. HFS unfiltered piston#8. Stop183920. Tmax=36.7. Tavg=35.9. 502ml.
3947	20090408 184213	14.60084116	144.7761879	338.52	2.25	534.42	536.67	SAMPLE Fluid 21. HFS filtered bag#18. Start 184125. Temp=38.4.
3950	20090408 184355	14.6008411	144.7761874	338.8	2.25	534.41	536.66	Sample 21. HFS filtered bag#18. Here at Iceberg09-2. This spot is directly behind the ship at the old Iceberg'06 location.
3952	20090408 184529	14.6008411	144.776187	338.8	2.25	534.42	536.67	Sample 21. HFS filtered bag#18. Stop 184525.
3954	20090408 184606	14.60084101	144.7761869	338.8	2.25	534.43	536.68	Sample21. Tmax=39.0. Tavg=35.6. 510ml.
3957	20090408 184752	14.60084039	144.7761878	338.72	2.25	534.46	536.71	SAMPLE Fluid 22. HFS filtered piston#4. Same location. We believe this is Iceberg or darn close to it. I'll call it Iceberg09-2. We'll put a marker here.
3961	20090408 185102	14.60083999	144.7761884	338.72	2.25	534.46	536.71	Sample 22. HFS filtered piston#4. Start 183803.
3962	20090408 185133	14.60083992	144.7761882	338.72	2.25	534.46	536.71	These samples (19 - 22 so far) have been taken at Iceberg09-2. Will deploy Mkr110 here.
3964	20090408 185216	14.60084007	144.7761877	338.71	2.25	534.47	536.72	Sample 22. HFS filtered piston#4. Stop 185140. Tmax=38.8. Tavg=35.9. vol=511ml. Iceberg09-1 Mkr110.
3966	20090408 185321	14.60084057	144.7761865	338.72	2.25	534.44	536.69	This is Iceberg09-2. Will deploy Mkr-110 here. Starting with sample 19 will be located at Iceberg09-2 Mkr110.
3969	20090408 185453	14.60084014	144.776187	338.71	2.25	534.49	536.74	Iceberg09-2 Mkr110: voltage is 2.6708.
3971	20090408 185615	14.60084136	144.7761842	338.76	2.25	534.52	536.77	SAMPLE Fluid 23. HFS filter#20. Start 185550. Iceberg09-2 Mkr110.
3974	20090408 185755	14.60084484	144.776176	338.72	2.25	534.52	536.77	Sample 23. HFS filter#20. Sampling in the same little crack in this wall that have taken all previous samples here. T=36.3.
3982	20090408 190519	14.60085468	144.7761533	338.7	2.25	534.49	536.74	Sample 23. HFS filter#20. pH was 4.6.
3988	20090408 190950	14.60085801	144.7761455	338.91	2.25	534.5	536.75	Sample 23. HFS filter #20 stopped 190920 Tmax=36.7 Tavg=34.9 Vol=3005.
3989	20090408 191041	14.60085846	144.7761441	338.98	2.25	534.5	536.75	SAMPLE Fluid 14. HFS Sterivex filter #14. Start 191036.
3996	20090408 191601	14.60085564	144.7761485	338.97	2.14	534.53	536.67	Sample 14 is a Sterivex filter for DNA.
4009	20090408 192841	14.60085808	144.7761406	338.88	2.14	534.57	536.71	Sample 14. Stopped 192813 Tmax=39.0 Tavg=36.7 Vol=3003.

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4012	20090408 192956	14.6008591	144.7761377	338.88	2.14	534.57	536.71	SAMPLE Fluid 13. HFS filter #13. Start 192940. Sample is for RNA.
4015	20090408 193213	14.6008585	144.7761384	338.83	2.1	534.59	536.69	This is actually SAMPLE 25. The previous (filter#14) is SAMPLE 24.
4018	20090408 193348	14.60085917	144.7761367	338.88	2.13	534.58	536.71	SAMPLE Fluid SAMPLE 25. HFS filter#13. Started previously. Iceberg09-2 Mkr 110. Z=535.5. Same sampling site.
4029	20090408 194346	14.6008662	144.7761214	338.87	2.14	534.59	536.73	SAMPLE 25. HFS filter#13. cont. Iceberg09-2 Mkr110. Continuing sampling.
4030	20090408 194421	14.60086627	144.7761213	338.82	2.13	534.61	536.74	We see diffuse flow in the background here.
4036	20090408 194850	14.60086589	144.7761214	338.83	2.14	534.61	536.75	SAMPLE 25. HFS filter#13. cont. Stop 194812. Vol=3003ml. Tmax=39.3. Tavg=37.2.
4037	20090408 194928	14.60086624	144.7761212	337.97	2.15	534.63	536.78	We plan to a gastight here.
4039	20090408 194951	14.60086632	144.7761214	337.62	2.14	534.61	536.75	SAMPLE Other 1000 test.
4044	20090408 195344	14.6008666	144.7761195	338.41	2.15	534.6	536.75	J2-401 Data DVDs start red set DVD 027
4045	20090408 195406	14.60086681	144.7761194	337.62	2.14	534.6	536.74	SAMPLE Gas red gastight. Positioning it in the same crack as the previous samples here. Fired at 195337. Tmax=39.3 (see previous samples)
4047	20090408 195500	14.60086684	144.7761192	337.6	2.14	534.63	536.77	SAMPLE 26 gastight (red) Iceberg09-2 Mkr-110.
4049	20090408 195552	14.60085806	144.7761166	339.58	3.35	533.53	536.88	DEPLOY Marker 110. Marker deployed here where we have sampled (samples 19 - 26).
4050	20090408 195637	14.60082909	144.7760712	304.47	6.34	529.39	535.73	Leaving this site to go to Mat Mecca and suction some mat for Sheryl.
4054	20090408 195853	14.60080523	144.7760029	132.61	2.66	530.81	533.47	J2-401 Data DVDs stop blue set DVD 026
4055	20090408 195930	14.60079636	144.775967	129.93	1.63	530.76	532.39	We're flying above the bottom here.
4057	20090408 200038	14.60079832	144.7759161	69.36	6.71	532.66	539.37	Will move to the west over this sediment covered area.
4061	20090408 200326	14.60081853	144.7759247	69.05	4.13	533.9	538.03	Lots of flow coming out of this area. The depth here is 535m. We're just over the hill from Mkr-110.
4063	20090408 200430	14.60081859	144.7759247	69.75	4.05	533.87	537.92	This spot is about 30m due west of Mkr110. Lots of mat here. Looks very promising. Lots more venting and mat here.
4067	20090408 200706	14.60082681	144.7759205	69.15	3.55	534.15	537.7	Doing a temp reading here. Flow coming out all over this slope. Temp=47.8 in lesser flow here. Temp=
4070	20090408 200842	14.6008275	144.7759209	68.77	3.46	534.18	537.64	Temp reading here 30m due west of Mkr 110. Very few shrimp here. Less shrimp. Temp in this area 46.5.
4073	20090408 201100	14.60081792	144.775904	68.61	7.04	532.02	539.06	DEPLOY Marker 104. Area of more intense diffuse venting here. 30m west of Mkr 110. Just over the hill. Hdg is 69 deg.
4074	20090408 201135	14.60080697	144.7758834	69.03	7.24	533.05	540.29	Depth at Marker 104 was 534.
4077	20090408 201329	14.60072767	144.7758637	68.32	11.56	537.95	549.51	We probably re-located the original Iceberg at the last site where we placed Mkr 104. Depth at Mkr-104 was 534m.
4082	20090408 201726	14.60073847	144.7758711	42	6.25	542.48	548.73	Heading to Mat Mecca to slurp some mat. Depth was 538 m.
4087	20090408 202101	14.60075407	144.7758749	42.86	3.98	543.61	547.59	Lots of mat here and more venting.
4091	20090408 202414	14.60069835	144.7758103	0.29	8.54	538.82	547.36	We located Mkr-108-j2-400. It slid downhill from the original location and was relocated on that dive. mat Mecca should be just upslope.
4094	20090408 202622	14.60073161	144.7758418	359.45	4.83	537.04	541.87	Searching for Mat Mecca.
4096	20090408 202741	14.60068867	144.7758993	11.36	5.91	537.31	543.22	J2-401 DVCAM 024 start and 023 stop
4098	20090408 202801	14.60068677	144.775895	17.15	7.29	535.89	543.18	It should be here someplace. Very near to h343 here.
4100	20090408 202849	14.60069948	144.7759008	16.7	5.19	536.92	542.11	Temp here was in the high 45 last time.
4101	20090408 202936	14.60066645	144.7759278	20.63	6.26	536.67	542.93	There is a ton of diffuse venting coming out of this slope.
4103	20090408 203002	14.6006507	144.7759465	21.7	5.26	537.28	542.54	Lots of diffuse venting and shrimp here.
4105	20090408 203110	14.60063245	144.7759643	7.38	5.7	537.82	543.52	This looks like the right area. We're seeing lots of shrimp here. Could be molten sulfur on the surface of this rock.
4108	20090408 203318	14.60068562	144.7758843	8.09	6.91	537.99	544.9	The smoke is pouring in from Brimstone.
4111	20090408 203515	14.60073793	144.7758399	8.49	3.23	539	542.23	Visibility of fading. The smoke has wafted in in the last 5 minutes or so.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
4115	20090408 203824	14.60069351	144.7759142	36.94	4.66	537.92	542.58	Having problems with the Navigation. No pings from Medea or Jason. LBL problem.
4117	20090408 203844	14.60068974	144.7759225	346.61	4.45	538.13	542.58	LBL problems.
4120	20090408 204050	14.60067165	144.7759083	9.71	4.25	540.44	544.69	Lots of smoke here.
4124	20090408 204400	14.60076953	144.7758725	338.19	5.14	533.49	538.63	Going to the site to the NW of Brimstone that we located on the last dive (dive j2-400).
4126	20090408 204509	14.60081045	144.775705	302.59	12.11	532.93	545.04	The vent is 30m from Brimstone at a hdg of 297 from Brimstone. Depth is 525.
4127	20090408 204531	14.60081552	144.7756919	303.42	5.69	538.89	544.58	The plume is thick here.
4131	20090408 204807	14.60082564	144.7756391	304.25	2.14	542.19	544.33	NAV Lost bottom lock No LBL now.
4133	20090408 204918	14.60082884	144.7756202	304.25	1.54	541.97	543.51	An eel just swam by.
4136	20090408 205136	14.6008414	144.7755366	299.92	1.99	536.76	538.75	Can see Brimstone in the Medea camera.
4139	20090408 205245	14.60081534	144.7753674	266.81	4.01	523.83	527.84	Just upslope from Brimstone.
4140	20090408 205303	14.60079096	144.775336	265.46	5.8	520.09	525.89	Do have Doppler.
4141	20090408 205339	14.60086796	144.7754112	275.91	2.85	521.89	524.74	Brimstone is in the foreground. Looks like there are 2 separate types of smoke.
4143	20090408 205355	14.60086409	144.775406	277.43	2.68	521.91	524.59	There is yellow and white smoke coming out of it.
4145	20090408 205500	14.60086547	144.7754128	308.31	2.61	522.26	524.87	VIDEO Start recording HDCam here at Brimstone.
4147	20090408 205606	14.6008662	144.7754128	307.89	2.68	522.2	524.88	Looking at Brimstone. 2 distinct colors of smoke here. Yellow and white.
4149	20090408 205648	14.6008666	144.7754127	307.98	2.65	522.19	524.84	See some bubbles coming out. Bulbous pieces of lava at the edge.
4152	20090408 205846	14.60086851	144.7754124	308.1	2.64	522.17	524.81	Pretty incredible video here at Brimstone.
4153	20090408 205917	14.60086802	144.7754124	307.69	2.58	522.21	524.79	Looks like some lava has extruded out of the pit. those rocks weren't there before.
4155	20090408 205952	14.60086739	144.7754127	307.93	2.59	522.22	524.81	The yellow is probably extruding more.
4157	20090408 210127	14.60086351	144.7754135	307.71	2.63	522.23	524.86	We're observing Brimstone for awhile. Zoomed out. Lots of bubbles.
4158	20090408 210141	14.60086301	144.7754136	307.83	2.59	522.22	524.81	VIDEO Stop recording HDCam
4161	20090408 210257	14.60085978	144.7753646	296.94	4.01	519.52	523.53	Heading to the diffuse vent that we saw NW of Brimstone yesterday on J2-400.
4162	20090408 210312	14.60087535	144.7753176	296.37	4.59	518.6	523.19	Hope to collect a few fluid samples.
4168	20090408 210815	14.60099165	144.775196	121.64	3.74	526.05	529.79	We're searching for the diffuse venting that we saw on the last dive. It was NW of Brimstone.
4171	20090408 210949	14.60097764	144.7752106	122.26	2.61	525.87	528.48	Lots of shrimp here. Looking for diffuse flow.
4180	20090408 211829	14.60094571	144.7752056	99.84	3.68	524.63	528.31	Blobs of sulfur on top of the boulders here.
4182	20090408 211857	14.60095846	144.7752078	99.16	3.19	524.96	528.15	A swarm of shrimp here.
4183	20090408 211903	14.60096027	144.7752082	98.19	3.23	524.86	528.09	VIDEO Start recording HDCam
4185	20090408 212042	14.60096721	144.7752257	95.7	4.25	522.82	527.07	VIDEO Stop recording HDCam
4190	20090408 212429	14.60090335	144.775264	94.89	4.19	520.31	524.5	Having a hard time finding any source of diffuse venting here NW of Brimstone.
4200	20090408 213250	14.60097652	144.7752474	108.64	3	523.01	526.01	We're searching for the source of venting here. Looks like lots of mat and shrimp in this area.
4202	20090408 213438	14.6009742	144.7752541	107.28	2.89	522.81	525.7	Seems that there may be some variation in flow. Bob wonders if it has something to do with the tidal cycle.
4207	20090408 213835	14.60107564	144.7752445	127.9	2.89	530.3	533.19	The frustration level is building. Let's go back to Brimstone and look it over. No more time for fluid sampling.
4210	20090408 214004	14.60094132	144.7753041	125.96	3.29	518.15	521.44	Heading toward Brimstone for final observations on this dive.
4213	20090408 214234	14.60086983	144.7754593	280.65	5.7	520.19	525.89	Our view is from the east. Looking almost due west.
4215	20090408 214244	14.60087166	144.775453	279.33	3.86	521.96	525.82	VIDEO Start recording HDCam
4216	20090408 214313	14.60087902	144.7754405	283.2	2.19	523.24	525.43	Looks like it is coming out the bottom of the rim.
4219	20090408 214501	14.60087906	144.7754409	282.37	2.45	523.02	525.47	Watching Brimstone. The bubbles have increased dramatically.
4220	20090408 214529	14.60087917	144.7754411	281.81	2.44	523.05	525.49	Lasers off. Still recording HD.
4223	20090408 214655	14.600879	144.7754409	283.04	2.41	523.06	525.47	Looks like there may be lava being extruded in the pit right now. Huge degassing - bubbles.
4227	20090408 215011	14.60087885	144.7754412	282.36	2.41	523.04	525.45	J2-401 Data DVDs start blue set DVDs 028

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-401 Logger Comment
4229	20090408 215113	14.60087904	144.7754413	281.47	2.4	523.06	525.46	Still observing Brimstone
4233	20090408 215348	14.60087891	144.7754411	282.03	2.43	523.03	525.46	Brimstone pit plume increasing very yellow
4235	20090408 215452	14.60087895	144.7754411	282.31	2.44	523.01	525.45	Plan to watch Brimstone until time to end dive
4237	20090408 215618	14.60087885	144.7754411	281.97	2.45	523.03	525.48	J2-401 Data DVDs stop red set DVDs 027
4239	20090408 215722	14.60087889	144.7754412	281.65	2.43	523.04	525.47	Still recording HD
4242	20090408 215851	14.60088906	144.7754373	232.17	2.26	522.02	524.28	Jason starting to move laterally for view around vent
4243	20090408 215911	14.60090208	144.7754343	201.37	2.2	521.42	523.62	Visibility decreasing
4244	20090408 215936	14.60089231	144.7754455	249.03	3.43	521.46	524.89	Plume streaming up side of scarp above vent
4246	20090408 220039	14.60084992	144.7754059	1.84	2.65	521.07	523.72	Plume bending over strongly due to current
4248	20090408 220055	14.60084997	144.7754117	1.55	3.33	521.07	524.4	Bubbles coming out of vent
4250	20090408 220154	14.60084539	144.7754056	2.75	2.91	521.12	524.03	Plume is venting from large area streaming around boulders
4252	20090408 220311	14.60083985	144.7754035	12.6	3.05	521.17	524.22	Jason swinging around vent from left to right
4253	20090408 220326	14.60084945	144.7754213	332.52	3.15	521.29	524.44	Current is coming from East
4255	20090408 220428	14.60090943	144.7754372	212.46	3.05	521.38	524.43	Very clear view of vent area with plume streaming out and moving up wall
4257	20090408 220456	14.60090916	144.7754405	213.76	2.35	522.15	524.5	Bubbles rising out of plume
4258	20090408 220540	14.6009026	144.7754013	276.01	9.98	512.32	522.3	JASON off bottom
4261	20090408 220602	14.6009212	144.7752864	276.83	0.91	507.98	508.89	Ascending through plume - HD still on
4262	20090408 220651	14.6009789	144.7749863	275.84	34.52	505.34	539.86	VIDEO Stop recording HDCam
4263	20090408 220837	14.6009807	144.7749535	273.68	83.8	465.47	549.27	Out of thick plume by 470m
4264	20090408 220913	14.6009801	144.7749544	274.73	103.7	447.38	551.08	J2-401 Data DVDs stop blue set DVD 028
4265	20090408 221651	14.6009599	144.7749873	277.35	badvalue	257.6	badvalue	J2-401 DVCAM 024 stopped
4266	20090408 223200	14.6008899	144.7751989	277.47	badvalue	126.89	badvalue	New fish out there today. Not the typical damsel fish.
4267	20090408 224348	14.6007451	144.7754225	302.01	badvalue	3.47	badvalue	Medea on deck.
4268	20090408 225443	14.600474	144.7756479	274.8	badvalue	2.82	badvalue	The recovery is taking an unusually long time due to strong currents etc.
4269	20090408 225702	14.6004791	144.7756532	303.78	badvalue	1.36	badvalue	JASON on deck

**J2-402 - Bio/Geo Sampling.** JASON equipped with single-chamber suction sampler, Biobox, HOMER receiver, Koichi data loggers, 1 tephra sampler, 4 markers, 3 scoop bags, shrimp trap, Eh sensor, Niskin. Began dive at Brimstone making visual observations and taking 2 geology samples. Searched for CTD then headed east to Mat Mecca area, took a geology sample of yellow outcrop on the way. Near Mkr-108 (Bubbler) took a suction sample of microbial mat. Deployed marker at sample site (Mkr106, Wailing Wall). Went east stopped at area with an abundance of shrimp/limpets and deployed shrimp trap. Deployed Mkr105 at sample site, named Limpet Lair. Took limpet sample. Headed east to Barnacle Block area (Mkr111) and took sample of yellow, sulfur rock further upslope. Moved over scarps and took orange (iron oxide) rock sample. Moved west and upslope along ridge and sampled barnacles/limpets on rock. Deployed Mkr101 at sample site, Barnacle Ridge. Headed west to recover Koichi samplers on summit ridge. Went further west along summit ridge to recover hydrophones at summit ridge (Mkr107). Headed east toward Iceberg. Headed north from base of wall which had flow. High concentration of shrimp as moved up wall. Placed marker on top of vertical outcrop (Mkr102 Amphitheater) with filamentous white mat. Headed NW over outcrops with thick lava flows but no animals. Drove south to summit then on to Brimstone. Swapped out tephra samplers 20m N/NW from vent. Finished dive making visual observations at vent after taking 2 geology samples.

**Table 6.4-7 JASON Dive J2-402**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-402 Logger Comment
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Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-402 Logger Comment
4270	20090409 095211	badnav	badnav	308.48	badvalue	2.7	badvalue	JASON in water Start J2-402 Brimstone Pit at NW Rota-1
4271	20090409 095307	badnav	badnav	291.11	badvalue	3.13	badvalue	Jason moving away from ship; grounds clear.
4272	20090409 095341	badnav	badnav	281.69	badvalue	2.78	badvalue	Deployment location 14deg 36.0'N 144deg 46.5'E depth=620m
4273	20090409 095438	badnav	badnav	282.49	badvalue	2.75	badvalue	Tools on board: single-chamber suction; biobox; Homer receiver; milk crates; 1 tephra; 4 markers; 3 scoop bags; shrimp trap
4274	20090409 095452	badnav	badnav	283.6	badvalue	3.18	badvalue	On every dive: Niskin; temp probe; Eh sensor.
4275	20090409 095508	badnav	badnav	278.02	badvalue	5.72	badvalue	Medea is in water and Jason is diving.
4276	20090409 095529	badnav	badnav	277.29	badvalue	10.16	badvalue	Main goals: bio/geo sampling
4277	20090409 095742	badnav	badnav	296.62	badvalue	49.89	badvalue	WATCHSTANDERS Andra Bobbitt logger Heidi Berkenbosch video
4278	20090409 095810	badnav	badnav	287.27	badvalue	61.92	badvalue	All stop at 50m; switch Medea control to van.
4279	20090409 100554	badnav	badnav	282.91	badvalue	249.83	badvalue	Starting DVDs
4282	20090409 102353	badnav	badnav	84.3	15.81	507.02	522.83	Plume is sight-right on target.
4284	20090409 102423	badnav	badnav	92.98	7.16	514.43	521.59	JASON on bottom Good view of Brimstone Pit.
4285	20090409 102427	badnav	badnav	78.61	6.98	514.74	521.72	JASON on bottom
4286	20090409 102429	badnav	badnav	78.13	7.33	514.74	522.07	J2-402 DVCAM 25 start
4287	20090409 102444	badnav	badnav	80.28	6.43	515.25	521.68	Jason is light in water without the Beast; has 6 plates on board but needs to get a rock.
4289	20090409 102458	badnav	badnav	76.81	4.85	517.62	522.47	Plume is fairly active and going straight up from pit.
4290	20090409 102525	badnav	badnav	66.4	3.73	520.73	524.46	Looks like new lava in center of vent.
4291	20090409 102540	badnav	badnav	64.18	4.31	519.93	524.24	VIDEO Start recording HDCam
4293	20090409 102615	badnav	badnav	64.14	3.89	520.38	524.27	Lots of gas bubbles and plume increasing.
4294	20090409 102645	14.6008325	144.7754128	64.82	2.26	521.7	523.96	Big pile of lava at the vent. Didn't look like this before on this expedition.
4296	20090409 102717	14.6008317	144.7754131	65.27	2.36	521.78	524.14	More lava blocks and quite a mound.
4297	20090409 102732	14.6008345	144.7754199	63.51	1.8	522.4	524.2	On the right the lavas are bulbous.
4298	20090409 102745	14.6008344	144.77542	62.73	1.79	522.5	524.29	Can see sulfur deposits on the foreground on rocks.
4300	20090409 102819	14.600836	144.7754203	63.94	1.9	522.28	524.18	Plume is starting to lean a bit to the west.
4302	20090409 102902	14.6008352	144.7754197	64.06	1.94	522.2	524.14	Almost look like pillows or cabbage (cauliflower).
4303	20090409 102916	14.6008348	144.7754195	64.02	1.94	522.17	524.11	Jason is looking east so plume is to north.
4304	20090409 102950	14.6008341	144.7754191	63.96	1.94	522.14	524.08	A lot of yellow in the plume today.
4307	20090409 103057	14.6008342	144.7754189	64.03	1.94	522.09	524.03	Big burst and probably new lava coming to surface.
4309	20090409 103208	14.60084168	144.7754227	58.57	1.81	521.82	523.63	Not seeing ash but increasing plume activity.
4310	20090409 103218	14.60084175	144.7754227	58.91	1.83	521.82	523.65	See some tephra now.
4311	20090409 103234	14.60084193	144.7754225	59.57	1.78	521.81	523.59	Big tephra pieces coming out now.
4312	20090409 103247	14.60084205	144.7754226	59.19	1.76	521.79	523.55	Seeing very large pieces of tephra now.
4314	20090409 103314	14.60084229	144.7754226	59.29	1.84	521.74	523.58	Jason getting ready to pick up some black fresh lava (for science and ballast).
4315	20090409 103334	14.60084226	144.7754231	59.3	1.85	521.72	523.57	Lots of yellow and some ash again.
4318	20090409 103525	14.60084201	144.7754234	58.84	1.78	521.76	523.54	Lot of tephra.
4319	20090409 103551	14.60084197	144.7754235	58.7	1.79	521.72	523.51	Lasers on.
4321	20090409 103609	14.60084222	144.7754235	58.26	1.65	521.81	523.46	Going to back Jason out a bit to get better look at plume area.
4322	20090409 103637	14.60084207	144.7754233	58.32	1.66	521.8	523.46	Having some issues with arm master and going to switch it out before sampling.
4323	20090409 103650	14.60084228	144.7754232	58.14	1.66	521.81	523.47	Turn lasers off.
4325	20090409 103707	14.60083858	144.7754194	55.08	3.14	520.67	523.81	Bright yellow in plume.
4327	20090409 103827	14.60083627	144.7754178	59.18	1.53	522.28	523.81	Plume is only leaning slightly to north.
4329	20090409 103900	14.60083736	144.7754178	59.36	1.51	522.26	523.77	Looks like there may be a rim on the right view of the Pit so on the more south side.
4330	20090409 103918	14.60083871	144.7754181	59.01	1.54	522.24	523.78	More degassing on the left where sampled last night.
4331	20090409 103924	14.60083905	144.7754181	59.24	1.51	522.27	523.78	Lots of bubbles now.
4332	20090409 103950	14.60084	144.7754181	59.42	1.5	522.24	523.74	Bigger plume now but still seeing lots of bubbles.

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4334	20090409 104010	14.60084039	144.7754182	59.47	1.51	522.22	523.73	Getting more vigorous and more ash or pieces of lava.
4335	20090409 104052	14.60084063	144.7754177	59.54	1.51	522.23	523.74	Very vigorous plume without ash.
4337	20090409 104110	14.600842	144.7754185	59.57	1.5	522.22	523.72	Fuming subsided in front and looks like more in the back of this view.
4339	20090409 104220	14.60084124	144.7754175	59.85	1.51	522.19	523.7	Some pieces of rock mooring in pilot cam.
4340	20090409 104238	14.60084124	144.7754173	59.77	1.51	522.19	523.7	Small avalanches and seeing lots of ash and big chunks of lava.
4341	20090409 104253	14.6008412	144.7754171	59.88	1.51	522.18	523.69	Still big lava chunks.
4343	20090409 104324	14.60084171	144.7754169	59.83	1.58	522.09	523.67	Switched out controller for arm.
4344	20090409 104336	14.60084181	144.7754169	60.08	1.6	522.07	523.67	Lots of ash now while sampling.
4346	20090409 104425	14.60084197	144.7754169	60.11	1.61	522.04	523.65	SAMPLE Geology J2-402-geology-01 lava sample in front of plume of black fresh lava.
4348	20090409 104512	14.60084216	144.7754167	59.71	1.53	522.13	523.66	SAMPLE Geology J2-402-geology-01 placed in front port milk crate.
4352	20090409 104822	14.60083545	144.7754136	59.66	1.53	522.11	523.64	Most vigorous we've seen on this cruise.
4353	20090409 104833	14.60083423	144.7754132	59.68	1.53	522.12	523.65	More cyclic this visit as well.
4355	20090409 104920	14.60083199	144.7754122	59.73	1.53	522.13	523.66	Every plankton tow has black bits in it-even in 3000m of water.
4357	20090409 104956	14.6008318	144.7754121	59.73	1.53	522.11	523.64	Large plume in Medea cam.
4358	20090409 105016	14.60083005	144.7754115	59.76	1.54	522.09	523.63	Another burst of activity.
4360	20090409 105104	14.6008272	144.7754103	60	1.54	522.08	523.62	Looks like yellow fog behind pit on pilot cam.
4362	20090409 105210	14.6008225	144.7754084	60.1	1.56	522.08	523.64	Keep rolling HD.
4363	20090409 105235	14.60082133	144.7754079	60.05	1.59	522.06	523.65	Turning off Medea cam to see if lighting is better.
4366	20090409 105400	14.60081958	144.7754071	60.29	1.6	522.07	523.67	Lots of bubbles.
4368	20090409 105526	14.60081673	144.7754056	60.35	1.5	522.07	523.57	Turning on lasers for scale.
4370	20090409 105556	14.60081619	144.7754054	60.33	1.51	522.07	523.58	Lasers on rock in front for scale.
4371	20090409 105630	14.60081418	144.7754044	60.21	1.51	522.05	523.56	Lasers off.
4372	20090409 105651	14.60081249	144.7754038	60.21	1.51	522.05	523.56	Getting cameras set for video observation.
4374	20090409 105710	14.60081049	144.7754029	60.28	1.49	522.07	523.56	Medea camera is great view of Jason and plume.
4377	20090409 105913	14.60080497	144.7754005	60.09	1.48	522.07	523.55	ASNAPS not working but have been typing a lot. Scotty is fixing.
4379	20090409 105955	14.60080209	144.7753992	60.12	1.46	522.07	523.53	ASNAPS are fine.
4380	20090409 110040	14.6007991	144.7753982	60.14	1.48	522.07	523.55	Big yellow burst.
4382	20090409 110103	14.60079887	144.775398	60.16	1.5	522.04	523.54	Seems like a second rock in front that wasn't there before.
4383	20090409 110118	14.60079896	144.775398	60.07	1.46	522.07	523.53	Plume is going more straight up.
4386	20090409 110254	14.6007963	144.7753967	60	1.46	522.07	523.53	Seeing some rock movement.
4388	20090409 110422	14.6007956	144.7753958	60.04	1.45	522.08	523.53	Haven't seen much ash falling out of plume for awhile.
4390	20090409 110551	14.60079299	144.7753947	60.22	1.43	522.11	523.54	Good Medea view after moving ship and vehicle.
4392	20090409 110630	14.60079254	144.7753941	60.26	1.41	522.12	523.53	Seeing bubbles and yellow bursts.
4394	20090409 110722	14.60079289	144.7753936	60.26	1.41	522.13	523.54	A lot of bubbles in front now.
4396	20090409 110829	14.60079373	144.7753933	60.42	1.43	522.11	523.54	Degassing in front quite a bit.
4398	20090409 110915	14.60079396	144.7753933	60.49	1.41	522.11	523.52	Degassing in front turned off again.
4399	20090409 110953	14.6007945	144.7753932	60.61	1.38	522.15	523.53	VIDEO Stop recording HDCam HD is stopped-out of tape.
4401	20090409 111029	14.60079463	144.7753929	60.63	1.4	522.12	523.52	More bubbles in front again.
4402	20090409 111040	14.60079454	144.7753928	60.67	1.36	522.14	523.5	Then seeing plume in front.
4404	20090409 111129	14.60079437	144.7753922	60.77	1.4	522.1	523.5	bubbles again but still have plume in front.
4406	20090409 111154	14.60079413	144.7753918	60.82	1.38	522.14	523.52	Rocks moving in front-the white rock rolled toward jason in pilot cam.
4407	20090409 111230	14.60079406	144.7753916	61.09	1.4	522.08	523.48	Rocks are moving right in front.
4409	20090409 111259	14.60079336	144.7753911	61.35	1.38	522.08	523.46	Rocks are really moving in front of pilot cam.
4410	20090409 111315	14.60079331	144.775391	61.7	1.38	522.07	523.45	VIDEO Start recording HDCam changed tape it has been running for a bit.
4411	20090409 111322	14.6007936	144.7753909	61.72	1.39	522.06	523.45	More ash now.
4413	20090409 111400	14.60079483	144.7753911	61.94	1.35	522.09	523.44	Lots of ash now in plume and some bubbles-big movement in rocks.



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4414	20090409 111413	14.60079525	144.7753911	62	1.38	522.07	523.45	bubbles not bubbles
4415	20090409 111433	14.60079481	144.7753909	62.07	1.36	522.08	523.44	Sudden movements in rock-the big ones.
4417	20090409 111531	14.60079253	144.77539	62.06	1.36	522.1	523.46	Seeing some small ash movement from the larger rocks.
4419	20090409 111557	14.60079197	144.7753897	62.15	1.36	522.06	523.42	Pause in the activity.
4420	20090409 111622	14.60079184	144.7753896	62.21	1.35	522.08	523.43	Bubbles are more in the back and center.
4422	20090409 111659	14.60078936	144.7753887	62.16	1.39	522.05	523.44	some ash in plume now and bubbles in front.
4423	20090409 111737	14.60078802	144.7753882	62.22	1.34	522.09	523.43	Plume obscuring front view again.
4424	20090409 111747	14.60078806	144.7753881	62.25	1.35	522.07	523.42	Ash in plume again.
4426	20090409 111802	14.60078774	144.775388	62.2	1.35	522.07	523.42	Lots of ash and large pieces.
4427	20090409 111829	14.60078687	144.7753876	62.23	1.35	522.07	523.42	Great medea views still.
4429	20090409 111916	14.60078517	144.7753867	62.21	1.35	522.09	523.44	Ash gone from plume-just yellow and some bubbles.
4430	20090409 111940	14.60078506	144.7753864	62.22	1.39	522.04	523.43	Rocks in front are spreading apart.
4432	20090409 112030	14.60078596	144.7753864	62.28	1.36	522.06	523.42	Lasers on
4434	20090409 112134	14.60078609	144.7753858	62.47	1.35	522.06	523.41	Lull in front activity.
4436	20090409 112209	14.6007861	144.7753858	62.67	1.38	522.05	523.43	Mainly slow extrusion instead of explosive.
4437	20090409 112227	14.60078627	144.7753858	62.63	1.38	522.06	523.44	Brow cam has a new crack that wasn't there minutes ago
4439	20090409 112256	14.60078633	144.7753858	62.7	1.43	522.02	523.45	Increase in plume.
4440	20090409 112307	14.60078638	144.7753858	62.66	1.41	522.02	523.43	Lasers off.
4442	20090409 112418	14.60078681	144.7753856	62.79	1.41	522.04	523.45	Seeing slow rock movement.
4443	20090409 112432	14.60078689	144.7753855	62.74	1.39	522.05	523.44	No bubbles in front and plume is away from Jason.
4444	20090409 112443	14.60078692	144.7753856	62.81	1.39	522.05	523.44	No ash in plume at moment.
4447	20090409 112611	14.60078767	144.7753852	62.77	1.39	522.05	523.44	Getting some sliding on the left.
4449	20090409 112728	14.60078788	144.775385	62.65	1.41	522.02	523.43	Rock on left is higher than when we arrived.
4450	20090409 112746	14.60078785	144.7753851	62.7	1.39	522.04	523.43	Can see big rock being pushed away. Big chunk fell down.
4452	20090409 112758	14.60078801	144.7753852	62.66	1.39	522.04	523.43	Lots of shimmering water in foreground.
4454	20090409 112943	14.600789	144.7753853	62.64	1.4	522.04	523.44	Seeing more bubbles and big rock movements.
4456	20090409 112955	14.60078914	144.7753852	62.64	1.43	521.99	523.42	big bubble burst and seeing rock movement.
4457	20090409 113027	14.60078924	144.7753849	62.62	1.41	522.02	523.43	Large bubble burst.
4458	20090409 113038	14.60078936	144.7753849	62.56	1.41	522.02	523.43	Moved right after bubbles.
4460	20090409 113115	14.60078967	144.7753848	62.49	1.4	522.02	523.42	Wasting of front rocks as they fall down.
4461	20090409 113129	14.60078983	144.7753848	62.46	1.34	522.06	523.4	Some bubbles in front again.
4462	20090409 113147	14.60078976	144.7753847	62.44	1.38	522.04	523.42	More bubbles in back.
4465	20090409 113258	14.60079021	144.7753843	62.56	1.39	522.04	523.43	Rock in front looks like some breccia thing.
4466	20090409 113341	14.6007902	144.7753844	62.55	1.38	522.05	523.43	Best Boy on Medea controls keeping the view of the plume.
4468	20090409 113415	14.60079057	144.7753843	62.51	1.38	522.05	523.43	Bubbles again. Movement.
4470	20090409 113522	14.60079096	144.7753837	62.49	1.39	522.02	523.41	More plume in front.
4472	20090409 113643	14.6007909	144.7753833	62.52	1.38	522.04	523.42	Crack is opening up.
4474	20090409 113747	14.60079078	144.7753829	62.58	1.38	522.04	523.42	Haven't seen much ash for awhile now.
4476	20090409 113801	14.60079085	144.7753828	62.55	1.38	522.04	523.42	Bubbles in back of plume.
4478	20090409 113858	14.60079029	144.7753823	62.56	1.38	522.04	523.42	Bubbles increasing in back.
4479	20090409 113912	14.6007902	144.7753821	62.6	1.38	522.02	523.4	Front activity is much diminished.
4481	20090409 114003	14.60079021	144.7753817	62.59	1.38	522.04	523.42	Bubbles in front.
4482	20090409 114016	14.60079046	144.7753817	62.6	1.38	522.04	523.42	Activity is increasing.
4484	20090409 114108	14.60079027	144.7753813	62.56	1.33	522.07	523.4	Didn't see much rock movement but many bubbles in back of rock in front right.
4486	20090409 114219	14.60078992	144.7753811	62.57	1.36	522.05	523.41	Constant smaller bubbles in back.
4488	20090409 114257	14.60079002	144.7753808	62.59	1.36	522.05	523.41	Plume increased in front again and back plume looks vigorous.

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4489	20090409 114302	14.60079009	144.7753808	62.57	1.36	522.05	523.41	No ash at moment.
4490	20090409 114329	14.60079017	144.7753806	62.6	1.38	522.06	523.44	Increase in bubbles and larger to the back.
4492	20090409 114439	14.60079029	144.7753801	62.62	1.36	522.04	523.4	Big shaking of right boulder.
4494	20090409 114534	14.60079024	144.7753798	62.68	1.39	522.02	523.41	Seeing large boulder move up.
4495	20090409 114548	14.60079015	144.7753797	62.68	1.38	522.04	523.42	The left rock is starting to fall over toward vehicle.
4499	20090409 114810	14.60078932	144.7753795	62.79	1.38	522.02	523.4	Plume increasing over front view and seeing more bubbles again.
4500	20090409 114853	14.60078865	144.7753791	62.81	1.34	521.99	523.33	Can see the rocks splitting apart from each other and bubbles increase in between.
4504	20090409 115109	14.6007883	144.7753785	62.99	1.34	522	523.34	Lots of shaking and movement.
4505	20090409 115122	14.60078823	144.7753786	62.96	1.33	522	523.33	More bubbles after the shaking.
4507	20090409 115204	14.60078793	144.7753784	62.92	1.35	521.98	523.33	More 'dirty' plume in front left.
4509	20090409 115301	14.600788	144.7753783	62.92	1.35	522	523.35	Rock on right is splitting further apart. Left rock rose and is falling toward us.
4511	20090409 115401	14.60078796	144.7753778	62.83	1.38	521.99	523.37	No DSCs. Rock is pulsing.
4512	20090409 115425	14.60078813	144.7753776	62.77	1.43	521.96	523.39	Still not much ash in plume.
4514	20090409 115501	14.60078821	144.7753774	62.61	1.44	521.98	523.42	Bubbles in front and more dirty plume.
4515	20090409 115550	14.60078805	144.7753773	62.49	1.41	521.99	523.4	Lull in activity.
4517	20090409 115602	14.60078808	144.7753772	62.59	1.4	522	523.4	Seeing some more CO2 and more shimmer in foreground.
4518	20090409 115623	14.60078818	144.7753771	62.55	1.43	521.99	523.42	More dirty plume on left again (thinner or different composition?)
4519	20090409 115646	14.60078839	144.775377	62.2	1.41	522	523.41	More bubbles. and now getting rock moving.
4521	20090409 115701	14.60078838	144.7753768	62.23	1.41	522.01	523.42	New rock in middle.
4522	20090409 115716	14.60078841	144.7753767	62.21	1.43	522	523.43	Large rock on left is crashing toward us.
4523	20090409 115728	14.60078851	144.7753767	62.09	1.4	522.01	523.41	Its breaking up.
4525	20090409 115811	14.60078831	144.7753764	61.9	1.39	522	523.39	Plume in front again.
4526	20090409 115852	14.60078819	144.7753763	60.81	1.41	522.02	523.43	Small window in rock on left.
4528	20090409 115933	14.60078751	144.775376	60.3	1.43	522.03	523.46	Small white piece on left rock has been in place since beginning.
4529	20090409 115940	14.60078755	144.775376	60.23	1.45	522.04	523.49	Large rock movements.
4530	20090409 115948	14.60078765	144.775376	60.19	1.45	522.02	523.47	Nice view of window in rock.
4532	20090409 120015	14.60078822	144.775376	60.13	1.4	522.05	523.45	Rock is a conglomerate of rock types that are being extruded.
4533	20090409 120045	14.60078828	144.775376	59.67	1.45	522.04	523.49	Moving again.
4534	20090409 120053	14.60078787	144.7753758	59.63	1.43	522.07	523.5	Left rock is almost on its side.
4536	20090409 120127	14.60078448	144.7753748	59.57	1.45	522.03	523.48	Originally the two rocks were only laser distance apart and now quite far apart.
4537	20090409 120129	14.60078414	144.7753747	59.54	1.45	522.04	523.49	Lasers on.
4538	20090409 120132	14.60078385	144.7753746	59.45	1.44	522.02	523.46	J2-402 Data DVDs start
4539	20090409 120147	14.60078285	144.7753742	59.24	1.45	522.02	523.47	J2-402 start blue set 30
4540	20090409 120148	14.60078276	144.7753741	59.2	1.44	522.02	523.46	Measuring left rock. Light colored rock is about 10cm across.
4542	20090409 120229	14.60077881	144.7753728	59.07	1.43	522.07	523.5	Lasers off.
4543	20090409 120239	14.60077794	144.7753725	59.07	1.43	522.05	523.48	Incredible.
4546	20090409 120416	14.60076924	144.7753697	58.84	1.41	522.06	523.47	Plume is pulsing but no ash.
4547	20090409 120441	14.60076755	144.7753692	58.81	1.41	522.07	523.48	Dead fish.
4549	20090409 120507	14.60076562	144.7753681	58.82	1.4	522.08	523.48	Fish is moving a bit.
4550	20090409 120528	14.60076512	144.7753676	58.84	1.4	522.08	523.48	Fish in middle.
4551	20090409 120537	14.60076427	144.7753674	58.82	1.41	522.06	523.47	Fish does not look healthy at all.
4553	20090409 120603	14.60076274	144.7753669	58.79	1.39	522.08	523.47	Filming fish with sci cam. Its dead.
4554	20090409 120611	14.60076246	144.7753668	58.8	1.41	522.06	523.47	J2-402 Data DVDs stop red set 29
4555	20090409 120635	14.60076239	144.7753665	58.78	1.38	522.11	523.49	Fish is lying on the rock.
4557	20090409 120722	14.60075928	144.7753653	58.81	1.41	522.07	523.48	Seeing some increase in plume in front.
4559	20090409 120808	14.60075824	144.7753647	58.58	1.41	522.07	523.48	Looked like fish swam off-rose from the dead?

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4562	20090409 121035	14.6007639	144.7753653	58.58	1.41	522.04	523.45	Plume activity is increasing and plume is more yellow.
4564	20090409 121107	14.60076281	144.775365	58.57	1.43	522.03	523.46	More bubbles in front. Vent is shoving the big rocks aside.
4566	20090409 121206	14.60076268	144.7753648	58.57	1.43	522.02	523.45	Source of degassing moves around the pit-continually finding a way out.
4567	20090409 121232	14.60076375	144.775365	58.51	1.43	522.03	523.46	Rocks are shifting again.
4569	20090409 121330	14.60076533	144.7753653	58.48	1.48	522.05	523.53	Seeing some rock in peaking out between the large rocks now.
4571	20090409 121420	14.60076636	144.7753654	58.45	1.48	522.04	523.52	Seeing movement on left and sediment falling down.
4572	20090409 121449	14.60076717	144.7753654	58.44	1.46	522.05	523.51	Plume is increasing yellow color.
4574	20090409 121513	14.60076644	144.775365	58.44	1.46	522.05	523.51	Rock in middle is new and getting higher-more visible.
4575	20090409 121534	14.6007669	144.7753651	58.41	1.45	522.05	523.5	Shrimp floating down.
4576	20090409 121549	14.6007671	144.7753652	58.41	1.45	522.06	523.51	Big chunk on right fell.
4577	20090409 121554	14.60076716	144.7753652	58.37	1.44	522.06	523.5	More gas came out.
4580	20090409 121710	14.60076778	144.7753651	58.32	1.4	522.09	523.49	Rock in gap in center is getting higher.
4582	20090409 121833	14.6007686	144.775365	58.32	1.41	522.08	523.49	Seeing increase in shimmering water in the port pilot utility camera.
4584	20090409 121903	14.60076857	144.775365	58.3	1.39	522.1	523.49	Pieces are falling off the window rock.
4586	20090409 122044	14.60076788	144.7753642	58.2	1.36	522.11	523.47	More bubbles and shimmer in front of pilot cam.
4588	20090409 122151	14.60076775	144.7753639	58.15	1.36	522.11	523.47	Increase in yellow plume and still bubbling in front.
4590	20090409 122207	14.60076781	144.7753637	58.2	1.38	522.1	523.48	Left rock is almost completely on its side.
4591	20090409 122228	14.60076797	144.7753639	58.1	1.35	522.11	523.46	More shaking and movement.
4594	20090409 122407	14.60076793	144.7753636	58.11	1.36	522.09	523.45	Can see gentle movement of rocks in brow cam as it goes pushed aside from center.
4595	20090409 122429	14.60076801	144.7753636	58.11	1.35	522.09	523.44	Can see new rock in center better.
4596	20090409 122435	14.60076801	144.7753636	58.1	1.35	522.1	523.45	Left rock fell more in its side.
4598	20090409 122516	14.60076774	144.7753633	58.12	1.38	522.08	523.46	Increase in yellow plume
4601	20090409 122713	14.60076752	144.7753627	58.11	1.38	522.07	523.45	Rock in center is growing.
4602	20090409 122734	14.60076736	144.7753626	58.11	1.36	522.08	523.44	Another fish falling down.
4605	20090409 122914	14.60076707	144.775362	58.11	1.38	522.07	523.45	Good views of new rock in center.
4606	20090409 122926	14.6007671	144.7753619	58.1	1.39	522.07	523.46	J2-402 Stop DVCAM 25 start DVCAM 26
4607	20090409 122940	14.60076706	144.7753618	58.12	1.39	522.06	523.45	Pilot cam view now has the old left rock almost out of view and new rock in old position relative to rock on right.
4610	20090409 123059	14.60076734	144.7753616	58.1	1.38	522.06	523.44	Nice views of the new rock now.
4612	20090409 123214	14.60076742	144.7753613	58.02	1.4	522.04	523.44	Big rock movements in front.
4613	20090409 123235	14.60076729	144.7753611	58	1.39	522.06	523.45	More bubbles again.
4615	20090409 123306	14.60076718	144.7753608	58	1.4	522.06	523.46	Lots of degassing around the new rock in center.
4616	20090409 123318	14.60076722	144.7753608	58	1.39	522.05	523.44	Another dead fish dropping by.
4617	20090409 123342	14.60076744	144.7753608	57.96	1.38	522.05	523.43	More bubbles in front and plume is wider.
4619	20090409 123423	14.60076762	144.7753608	57.92	1.38	522.07	523.45	Increase in all-over plume with bubbles in front.
4620	20090409 123431	14.60076765	144.7753608	57.91	1.39	522.04	523.43	Plume increasing in front.
4622	20090409 123509	14.60076751	144.7753607	57.68	1.4	522.02	523.42	New rock is really moving in brow cam.
4624	20090409 123606	14.60076744	144.7753602	57.68	1.39	522.05	523.44	Plume increasing again.
4625	20090409 123653	14.60076735	144.7753599	57.5	1.4	522.05	523.45	Cornel and Nick want a scoop of a sulfur rock.
4627	20090409 123657	14.60076735	144.7753599	57.5	1.39	522.06	523.45	Big rock fell finally.
4629	20090409 123825	14.60076769	144.7753596	57.48	1.39	522.06	523.45	Use stronger scoop with metal around top-bright white bag no canvas outer.
4630	20090409 123847	14.60076762	144.7753596	57.51	1.39	522.04	523.43	right front rock is really steaming.
4632	20090409 123910	14.60076774	144.7753595	57.45	1.39	522.04	523.43	Plume increasing behind as well.
4634	20090409 124005	14.60076839	144.7753592	57.49	1.39	522.04	523.43	Ash in plume now (not much).
4635	20090409 124023	14.60076852	144.7753591	57.5	1.39	522.04	523.43	Action in front again.
4637	20090409 124059	14.60076874	144.775359	57.44	1.39	522.04	523.43	Front new lava is as high as left rock now.

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4641	20090409 124442	14.60077031	144.7753584	57.39	1.4	522.02	523.42	Jason has been observing Pit for over 2 hours.
4643	20090409 124513	14.60077031	144.775358	57.38	1.4	522.04	523.44	Activity is diminished.
4644	20090409 124531	14.6007702	144.7753579	57.36	1.4	522.04	523.44	Plume is stead and just a few bubbles. Not much yellow.
4647	20090409 124745	14.60077103	144.7753574	57.11	1.45	522.05	523.5	VIDEO Stop recording HDCam Thinking of moving over to another side of the pit. First will want to get the scoop sample for Deardorff and deRonde.
4649	20090409 124814	14.6007692	144.7753552	56.22	1.54	522.04	523.58	Want to get some tephra and sulfur in the sturdy scoop.
4650	20090409 124836	14.60076855	144.7753533	56.44	1.46	522.15	523.61	Basket is out.
4653	20090409 125040	14.60076905	144.7753514	56.13	1.49	522.11	523.6	Going to use the Deardorff scoop from the right milkcrates on the port side (next to deRonde's scoop).
4655	20090409 125058	14.60076909	144.7753513	56.18	1.49	522.13	523.62	Going to slightly reposition Jason to get closer to target rock.
4656	20090409 125130	14.6007686	144.7753511	55.52	1.38	522.26	523.64	Dropped scoop bag to stbd of basket. It rolled down under Jason to stbd.
4657	20090409 125140	14.60076874	144.7753511	55.47	1.39	522.26	523.65	Going to back up to find it.
4659	20090409 125156	14.60076283	144.7753485	55.73	1.8	522.01	523.81	There it is just off right corner of basket.
4660	20090409 125241	14.60076492	144.775347	57.46	1.69	522.07	523.76	Good grab of scoop.
4662	20090409 125334	14.60076483	144.7753468	55.93	1.65	522.13	523.78	Getting a better grip on scoop.
4664	20090409 125359	14.60076496	144.7753467	56.12	1.64	522.13	523.77	More tephra falling out of plume again.
4665	20090409 125438	14.60076314	144.7753447	54.96	2.21	521.72	523.93	Basket retracted.
4667	20090409 125515	14.60078354	144.775359	27.36	1.78	521.26	523.04	Brief glimpse of upright tephra sampler nearby.
4670	20090409 125744	14.60078528	144.7753551	29.68	2.23	521.09	523.32	SAMPLE Geology J2-402-geology-02 Scoop of yellow material and tephra under in place rock. Perfect.
4672	20090409 125814	14.60078099	144.7753546	27.19	3.24	520.3	523.54	SAMPLE Geology Nice chunk of in place rock above as well. J2-401-geology-02.
4675	20090409 125929	14.60074836	144.7753656	33.18	3.99	519.5	523.49	Placing scoop in port biobox (swingarm).
4679	20090409 130221	14.60074843	144.7753653	33.22	3.96	519.49	523.45	SAMPLE Geology scoop is in the box
4680	20090409 130253	14.60074847	144.7753654	33.5	4.01	519.45	523.46	plume has picked up again
4682	20090409 130317	14.60074914	144.7753652	33.07	3.98	519.44	523.42	port swing arm returned to position
4684	20090409 130401	14.60074882	144.7753655	33.33	4.36	519.07	523.43	can see new lava from center of pit really well
4685	20090409 130425	14.60074903	144.7753669	33.06	4.45	519.09	523.54	we're going to go east to Mat Mecca from here
4686	20090409 130436	14.60074519	144.775371	38.32	5.33	518.31	523.64	VIDEO Start recording HDCam
4689	20090409 130559	14.60072898	144.7753551	30.66	7.04	517.88	524.92	We are starting to leave the vent
4691	20090409 130710	14.60067599	144.775323	29.48	12.85	517.95	530.8	Great view pulling away from vent.
4693	20090409 130836	14.6007038	144.7754111	89.02	5.7	520.1	525.8	Moving away from Brimstone.
4694	20090409 130850	14.60069426	144.775434	90.32	5.66	521.32	526.98	Will look for CTD enroute to Mat Mecca.
4696	20090409 130900	14.60069742	144.7754323	90.73	5.94	520.64	526.58	VIDEO Stop recording HDCam Medea HD off as well.
4698	20090409 130958	14.60069723	144.7754297	88.91	5.35	521.11	526.46	Heading 090 and at 521m. Need to go down the cone a bit then across.
4699	20090409 131033	14.60069677	144.7754312	89	3.74	523.2	526.94	Great view in Medea camera.
4700	20090409 131042	14.60069683	144.7754315	89.27	4.96	521.94	526.9	Moving the ship and then we'll head east.
4702	20090409 131146	14.60071078	144.7755213	145.66	4.08	526.61	530.69	Tall outcrops or rock.
4704	20090409 131231	14.60075548	144.7755569	180.32	2.53	529.49	532.02	Visiting the rock but now obscured a bit by plume or thruster dust.
4706	20090409 131309	14.60070931	144.7755748	152.71	2.9	530.75	533.65	Boulders look very yellow.
4707	20090409 131316	14.60071061	144.775587	151.8	2.36	532.02	534.38	Want a sample of the yellow rock if possible.
4708	20090409 131321	14.600712	144.7755876	147.34	0.99	533.31	534.3	Very yellow.
4709	20090409 131412	14.60069724	144.7755853	149.26	84.96	534.05	619.01	While waiting for ship to move-getting a yellow rock sample. Yellow may just be a coating.
4710	20090409 131444	14.60069107	144.7755845	149.64	91.15	534.06	625.21	Yellow looks like a coating when arm grabs it.
4712	20090409 131605	14.6006774	144.7755845	153.57	0.74	534.33	535.07	Moving Jason for a better sampling position.

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4714	20090409 131743	14.60071217	144.775634	152.29	0.79	534.38	535.17	SAMPLE Geology Rock is coated and the part buried in sediment was all black. J2-402-geology-03
4716	20090409 131818	14.60071074	144.7756331	152.27	0.79	534.39	535.18	SAMPLE Geology 3: Want to place sample in Port biobox on top of scoop geology-sample 2
4719	20090409 131957	14.60069596	144.775653	151.63	0.85	534.41	535.26	SAMPLE Geology 3: Biobox is open and rock on top. We are 20m east of Brimstone and 10m deeper.
4720	20090409 132045	14.60070197	144.7756533	151.63	138.79	534.4	673.19	Sample area was highly sedimented with rough-yellow rock outcrops scattered below.
4723	20090409 132340	14.60069851	144.7757927	76.89	1.18	540.7	541.88	Very craggy here and close to Mat Mecca site. (depth there is 528 and we are at 540)
4725	20090409 132429	14.60070603	144.7757946	77.09	2.01	540.17	542.18	Interesting fish hit bottom and dispersed the sediment.
4726	20090409 132452	14.60071632	144.7758193	75.51	1.7	540.49	542.19	Sediment was black underneath when fish touched.
4728	20090409 132511	14.60070712	144.7758331	75.1	2.7	540.45	543.15	Looking for marker in top of screen.
4729	20090409 132533	14.60068438	144.7758592	65.34	4.19	540.52	544.71	Looks like Marker 108 which slid off from its original location. Great view in pilot cam.
4731	20090409 132621	14.60069107	144.7758897	35.68	2.76	544.6	547.36	Looks like a lot of mat in middle of light area.
4732	20090409 132641	14.60069892	144.7758965	52.19	1.86	545.64	547.5	Looks very thick and chalky.
4734	20090409 132722	14.60069894	144.7758958	51.41	1.85	545.03	546.88	Will look around the area for a thick area of mat.
4736	20090409 132808	14.60071172	144.7758975	51.41	4.13	542.5	546.63	Driving 050 up slope over the mat area. See shimmering water to left of brightest area.
4737	20090409 132816	14.60071133	144.7758964	50.97	4.3	542.25	546.55	Lots of shimmering water.
4739	20090409 132910	14.60071079	144.7758969	51.28	3.98	542.58	546.56	Great water sampling spot and can see Marker 108 in Medea camera.
4740	20090409 132936	14.60071097	144.7758971	51.28	3.95	542.65	546.6	Going to suction sample some of the mat here.
4743	20090409 133106	14.60071108	144.775897	51.17	3.69	542.85	546.54	Marker 108 at 130deg about 6-7m away from this site.
4744	20090409 133123	14.60071091	144.775897	51.29	3.68	542.87	546.55	Really good flow here for water sampling out of the crack.
4746	20090409 133214	14.60071087	144.7758967	51.2	3.66	542.86	546.52	Marker 108 has same depth as here.
4748	20090409 133321	14.60071113	144.7758968	51.33	3.63	542.97	546.6	No shrimp here. Looking for the best amount of mat.
4749	20090409 133341	14.60072462	144.7758917	70.16	3.25	542	545.25	Lasers are on.
4751	20090409 133425	14.6007225	144.7758922	70.46	3.09	542.3	545.39	Fish.
4753	20090409 133500	14.60072966	144.7758906	70.91	2.35	543.01	545.36	Good fluid sampling site.
4756	20090409 133726	14.600736	144.7758976	69.57	1.81	544.32	546.13	SAMPLE Biology 4: Suction sample of mat material on ledges with a lot of diffuse water. Not mecca-too shallow here but good mat.
4757	20090409 133756	14.6007351	144.7758977	70.23	1.81	544.31	546.12	Suctioning mat. Saw shrimp swim by.
4760	20090409 133857	14.60073468	144.7758984	70.81	1.83	544.24	546.07	Rock is reddish underneath. Suction is clogged and turned off to get material off of filter.
4763	20090409 134117	14.60073505	144.7758978	70.98	1.73	544.22	545.95	SAMPLE Biology 4: Mat suction clogging filter.
4765	20090409 134251	14.60073523	144.7758983	70.97	1.71	544.24	545.95	Changing Jason watch-sampling suspended.
4769	20090409 134542	14.60073528	144.7758983	70.72	1.84	544.23	546.07	Mesh on suction is maybe too fine for this sampling.
4771	20090409 134609	14.60073519	144.7758979	69.57	1.83	544.27	546.1	There's a shrimp. Looks like a worm as well.
4772	20090409 134623	14.60073536	144.7758975	69.3	1.84	544.3	546.14	Polychaete worm of some sort.
4773	20090409 134649	14.6007346	144.7758985	70.79	1.7	544.24	545.94	Getting a Marker to deploy at the great water sampling site.
4775	20090409 134738	14.60073512	144.7758979	70.25	1.75	544.24	545.99	DEPLOY Marker Deploying Marker 106 at depth 544 where mat sample was taken. Want to water sample here.
4777	20090409 134825	14.60074236	144.7758963	81.08	1.65	543.73	545.38	Moving the marker to place anchor with some rocks.
4779	20090409 134902	14.60074217	144.7758992	69.05	1.48	543.99	545.47	Jason has kicked up a lot of sediment and visibility is poor for placing marker.
4781	20090409 135015	14.60073274	144.775897	58.34	2.8	543.22	546.02	Letting dust settle to view marker 106.
4782	20090409 135041	14.60072833	144.7758782	56.3	0.93	543.81	544.74	Marker 106 site is Wailing Wall.
4784	20090409 135113	14.60069825	144.7758954	56.1	2.7	544.99	547.69	DEPLOY Marker 106 at Wailing Wall (new site name). We are very near Marker 108.
4786	20090409 135200	14.60069026	144.7759021	43.56	2.36	545.42	547.78	Nav looks good here.
4788	20090409 135339	14.60066127	144.775929	65.24	1.96	545.86	547.82	Going to be heading for Marker 109 next to retrieve the Shrimp Trap. Heading east.

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4790	20090409 135430	14.60061544	144.775967	91.14	4.48	545.31	549.79	Moving out of plume.
4792	20090409 135457	14.60060124	144.7759939	91.99	6.58	545.25	551.83	Rocky wall face as we head due east.
4793	20090409 135540	14.60055505	144.776028	69.36	11.34	545.86	557.2	Amazing cliff face with lots of white coating.
4795	20090409 135622	14.60054869	144.7761018	68.99	13.9	542.48	556.38	Particulates gently falling down-current doesn't seem very strong.
4796	20090409 135646	14.60055252	144.7761427	70.13	10.09	539.79	549.88	J2-402 Data DVDs start red set 031
4798	20090409 135712	14.60056429	144.7761666	52.19	9.23	539.07	548.3	Interesting rock formation with tons of shrimp and limpets-very craggy.
4799	20090409 135740	14.60056423	144.7761663	66.26	9.45	539.06	548.51	Stop the ship-want to place shrimp trap here. Great site.
4801	20090409 135813	14.60053862	144.7761756	26.44	10.71	538.98	549.69	Jason is doing a do-si-do here while ship is coming to a stop.
4803	20090409 135859	14.60056717	144.7761631	38.18	10.98	538.76	549.74	Moving back to craggy rock.
4804	20090409 135923	14.60056433	144.7761622	37.39	12.51	538.63	551.14	VIDEO Start recording HDCam HD had been on but turned off briefly and restarted.
4806	20090409 140007	14.60058407	144.7761636	57.61	7.76	538.57	546.33	Lots of limpets and shrimp at this site.
4807	20090409 140049	14.60058333	144.776164	57.58	8.19	538.98	547.17	Depth is 538.5 at this rock projected from slope (altitude is 8).
4809	20090409 140116	14.60058358	144.7761639	58.03	8.74	538.64	547.38	This is the Limpet Lair (new name) site. Placing trap.
4810	20090409 140132	14.60058349	144.7761638	58.04	8.26	538.83	547.09	J2-402 Data DVDs stop blue set 030
4812	20090409 140200	14.60057148	144.7761485	58.61	8.65	540.23	548.88	DEPLOY Shrimp Trap Shrimp Trap placed on enter ledge of craggy rock--fell down and now looking for it.
4813	20090409 140213	14.60057751	144.77615	34.92	6.16	542.34	548.5	J2-402 oops accidentally stopped BC-W on red set instead of blue. started right away again. Heidi
4815	20090409 140329	14.60058328	144.7761553	23.29	6.3	541.65	547.95	Fell to depth 542 in an area with lots of shrimp. This is double-baited with Spam and Fancy Feast (tuna)
4816	20090409 140344	14.60059374	144.7761512	23.1	6.64	541.15	547.79	Retrieved the trap and now looking for a more stable site with lots of shrimp.
4818	20090409 140429	14.60059532	144.7761508	23.64	5.26	541.14	546.4	Moved up to depth of 541. Trap doesn't want to stay there either.
4821	20090409 140557	14.60060727	144.7761354	27.84	4.49	540.58	545.07	DEPLOY Shrimp Trap 3 years ago they could hardly find any shrimp and now the population has exploded.
4823	20090409 140737	14.60060723	144.7761435	74.6	3.13	538.64	541.77	DEPLOY Shrimp Trap At top of outcrop and found a bit of a saddle for trap. Depth 538.
4825	20090409 140840	14.60060664	144.7761421	77.48	3.3	538.31	541.61	DEPLOY Marker 105 Limpet Lair deployed at shrimp trap site.
4826	20090409 140852	14.60060299	144.7761323	75.38	7.14	537.42	544.56	Depth was 538.
4828	20090409 140906	14.60060045	144.7761312	72.24	7.06	537.73	544.79	Next want a sample of rock with white dots (limpets) on it.
4829	20090409 140918	14.60059386	144.7761377	64.72	7.38	538.41	545.79	Shrimp everywhere.
4830	20090409 140941	14.60059421	144.7761388	75.11	5.64	538.79	544.43	HD was not on but it is now on.
4832	20090409 141018	14.60060261	144.7761342	75.41	3.41	539.14	542.55	VIDEO Stop recording HDCam No-the HD was turned off at last entry.
4834	20090409 141114	14.60060446	144.776139	74.87	3.63	538.47	542.1	SAMPLE Biology Pink limpets on top of crag.
4835	20090409 141128	14.60060451	144.776139	75.04	3.73	538.36	542.09	VIDEO Start recording HDCam Looking at limpets and shrimp at top of crag.
4836	20090409 141152	14.60060506	144.7761389	75.23	3.58	538.48	542.06	Pink limpet Shinkailepas n. Sp.
4837	20090409 141156	14.60060513	144.7761389	75.33	3.48	538.48	541.96	VIDEO Stop recording HDCam
4840	20090409 141300	14.60058994	144.7761411	66.02	8.58	537.7	546.28	SAMPLE Biology Nice images from HD of top of crag.
4841	20090409 141346	14.60058955	144.7761405	65.92	8.8	537.64	546.44	Opening biobox on basket.
4842	20090409 141350	14.60058955	144.7761405	65.7	8.83	537.62	546.45	VIDEO Start recording HDCam
4844	20090409 141420	14.60058977	144.7761406	65.84	10.14	537.61	547.75	Lots of egg cases and limpets with the shrimp.
4846	20090409 141524	14.60058985	144.7761406	66.37	8.91	537.63	546.54	SAMPLE Biology 5:Nice piece with limpets placed in biobox.
4847	20090409 141529	14.60058987	144.7761406	66.54	9.98	537.64	547.62	VIDEO Stop recording HDCam
4849	20090409 141621	14.60059005	144.7761406	66.75	8.94	537.63	546.57	Limpet rock collected from top of crag at Limpet Lair Marker 105 site where shrimp trap was placed.
4850	20090409 141636	14.60059012	144.7761406	67.79	8.8	537.69	546.49	Closing biobox.
4852	20090409 141747	14.60058872	144.7761326	66.82	8.36	537.53	545.89	Visibility has dropped again.
4854	20090409 141846	14.60059993	144.7761582	74.93	3.45	535.58	539.03	Now will head over to Marker 9.

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4855	20090409 141849	14.60060133	144.7761616	75	3.44	535.53	538.97	Lasers off
4856	20090409 141856	14.60060503	144.7761721	74.41	3.4	535.59	538.99	Lasers on.
4859	20090409 142032	14.60060792	144.7763487	74.91	2.04	547.61	549.65	Heading east again.
4860	20090409 142045	14.60060247	144.7763623	76.82	1.68	548.83	550.51	Bottom covered in white and fairly flat.
4865	20090409 142430	14.60063431	144.7765645	39.1	0.78	561.15	561.93	Less sediment on bottom as we traverse over to Marker 109.
4866	20090409 142436	14.60063446	144.7765639	39.43	0.74	561.37	562.11	Dropping a weight
4869	20090409 142601	14.60069344	144.7767597	67.43	3.55	565.3	568.85	Bit more white sediment with small outcrops.
4870	20090409 142637	14.60073253	144.7769236	67.64	2.83	571.22	574.05	Jason and ship moving quickly across.
4871	20090409 142650	14.6007497	144.7769829	69.03	4.41	572.18	576.59	Larger rock outcrops here.
4873	20090409 142657	14.60075768	144.7769973	67.56	5.23	571.72	576.95	Steep sedimented slope.
4874	20090409 142714	14.6007645	144.7770024	62.66	6.85	570	576.85	Jason has caught up with ship.
4875	20090409 142750	14.60075494	144.7770025	46.41	2.51	575.55	578.06	Taking a look at rock outcrops where Jason stopped to wait for ship.
4877	20090409 142831	14.60073913	144.7770153	341.88	5.63	576.21	581.84	Some crabs on rocks.
4879	20090409 142919	14.60073896	144.7770502	326.99	5.89	578.01	583.9	Medea is above Jason--nav screen shows Medea 10m north.
4880	20090409 142940	14.60075184	144.7770662	309.91	5.98	578.34	584.32	No shrimp on this outcrop. Some yellow staining and mat on the rock.
4882	20090409 143021	14.60072011	144.7770447	294.92	5.98	578.5	584.48	Great view of rocks on sonar.
4884	20090409 143104	14.60070432	144.77703	342.92	5.96	577.87	583.83	Turned on Medea cam.
4885	20090409 143124	14.60068777	144.7770783	72.38	7.25	576.78	584.03	Jason is on the move again to the east.
4886	20090409 143145	14.60069944	144.7771601	67.79	6.91	577.94	584.85	Ripple like forms in sediment.
4888	20090409 143203	14.60071134	144.7772393	78.73	5.65	577.97	583.62	Medea cam off.
4889	20090409 143224	14.600707	144.7773188	40.2	3.36	578.44	581.8	Area of less sedimentation-abrupt contact. Wall coming up. Different fish.
4891	20090409 143323	14.60073152	144.7773239	20.84	4.98	575.45	580.43	Before going up wall-looks like the barnacle site of marker 111.
4892	20090409 143342	14.60072649	144.7773552	24.49	4.69	575.18	579.87	There is Marker 111 at the Barnacle site. Good picture on sci cam.
4893	20090409 143344	14.60072848	144.7773565	22.49	4.79	574.85	579.64	J2-402 Stop DVCAM 026 and start DVCAM 027
4895	20090409 143412	14.60069339	144.7773806	11.9	9.16	573.35	582.51	This is a series of ribs and looking for site perhaps on next rib over to the right.
4896	20090409 143425	14.60066822	144.7774137	16.53	11.59	572.85	584.44	Moving across another rib and now on back face of it.
4898	20090409 143519	14.60069326	144.7774382	346.28	13.38	571.47	584.85	Looking at east face while heading is west.
4899	20090409 143528	14.60069815	144.7774385	348.22	13.28	571.74	585.02	Want to collect some of the sulfur here.
4900	20090409 143556	14.60070207	144.7774386	347.13	7.29	570.79	578.08	This is the next rib over east from the Marker 111 rib.
4902	20090409 143651	14.60072339	144.777434	348.17	6.24	570.84	577.08	This rock may be very fragile-need to test before sampling. Looking to sample sulfur chunks resting on top of ridge/rib.
4905	20090409 143804	14.60072422	144.7774339	347.64	5.64	570.82	576.46	Want to use deRonde scoop and then place sample in milk crate to the right of the basket biobox.
4907	20090409 143904	14.60072407	144.7774336	348.14	5.93	570.78	576.71	Got scoop. Depth here is 571.
4909	20090409 143957	14.60072401	144.777434	347.8	5.73	570.8	576.53	Scooping yellow-looks like some good chunks in bag.
4910	20090409 144018	14.6007235	144.777434	347.61	5.74	570.83	576.57	SAMPLE Geology 6: J2-402-geology-06. Going for a second scoop.
4912	20090409 144144	14.6007229	144.7774329	348.17	6.01	570.89	576.9	SAMPLE Geology 6: J2-402-geology-06 Good piece of yellow rock in scoop bag. What a great sample-very dramatic.
4915	20090409 144312	14.60072279	144.777433	347.48	5.94	570.87	576.81	SAMPLE Geology 6: Placed in milk crate next to biobox on basket.
4916	20090409 144348	14.60071534	144.7774325	348.27	6.79	570.37	577.16	No marker needed here.
4919	20090409 144546	14.60063634	144.7773696	347.28	8.85	579.25	588.1	Want to head to depth 584 called Fault Shrimp (true Fault Shrimp) and maybe visit Iron 599.
4921	20090409 144644	14.60063681	144.7773671	345.46	5.61	582.05	587.66	Sheer cliffs with white coating small ledges.
4923	20090409 144738	14.60062976	144.7773784	2.42	7.63	581.61	589.24	Want to stay at this depth and drive along slope/scarp.
4925	20090409 144757	14.60060409	144.7773837	28.75	8.68	581.52	590.2	Turning right and heading toward east..
4926	20090409 144810	14.60059509	144.7773729	19.51	9.38	581.4	590.78	Sharp rib edge sticking out.

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4928	20090409 144932	14.60068066	144.777274	346.18	3.23	581.4	584.63	2006 Fault Shrimp site was at depth 584 while Jason was looking at 328.
4930	20090409 145004	14.6006642	144.7772729	47.84	2.58	581.89	584.47	Heading back east to where last rib stuck out.
4931	20090409 145048	14.60060846	144.7773473	51.1	4.76	583.2	587.96	Coming up on fin edge and another one just beyond.
4933	20090409 145119	14.60057975	144.77736	51.96	6.88	583.74	590.62	Just as pass one fin-there is another one. This one is very white.
4934	20090409 145131	14.60057982	144.7773599	51.82	7.33	583.54	590.87	Waiting for Medea.
4936	20090409 145217	14.60058023	144.7773592	51.49	4.43	586.03	590.46	Coming up for a close look at white fin. Covered in white mat.
4938	20090409 145323	14.60057651	144.7773605	22.35	11.23	587.31	598.54	Waiting for Medea to cross ridge.
4939	20090409 145343	14.60057605	144.7773613	22.73	11.39	587.2	598.59	Looks like limpets in mat.
4941	20090409 145412	14.60057586	144.7773609	22.79	11.26	587.29	598.55	The Iron-599 site is at the bottom of this buttress.
4948	20090409 150000	14.600595	144.7773648	31.16	11.78	585.58	597.36	Medea has caught up.
4949	20090409 150028	14.60058346	144.7774156	31.09	17.26	585.74	603	We will not go down to look at the Iron-599 site at the bottom here.
4951	20090409 150115	14.60059584	144.7774609	12.85	17.41	588.88	606.29	Heading along 584 depth for Fault Shrimp.
4952	20090409 150130	14.60058692	144.7774764	33.25	17.46	589.55	607.01	This is the vertical face and very narrow Buttress.
4953	20090409 150153	14.60059643	144.7775162	32.39	16.66	590.78	607.44	Looking at 017 there is a featureless slope.
4955	20090409 150234	14.60064861	144.7775693	0.67	15.46	590.56	606.02	Medea cam on.
4958	20090409 150413	14.60068097	144.7776429	87.92	10.81	590.96	601.77	Butt cam has good view of buttress.
4959	20090409 150421	14.60067797	144.7776728	86.54	11.34	591.12	602.46	Medea cam off.
4960	20090409 150447	14.60069742	144.7776986	4.86	12.75	590.6	603.35	Going to head a bit north and then traverse along depth. Featureless.
4963	20090409 150654	14.60087785	144.7776867	7.05	3	586.7	589.7	Crust on surface that appeared to be a ripple-formed by currents in 2 directions.
4965	20090409 150706	14.60088685	144.7776878	6.43	2.95	586.1	589.05	Driving along slope.
4966	20090409 150753	14.60090691	144.7777072	12.86	2.48	584.95	587.43	Big fish.
4969	20090409 150919	14.60097108	144.7777275	5.95	3.03	580.12	583.15	Slope is steeper here and the crust pattern less pronounced.
4970	20090409 150956	14.60099499	144.7777391	5.87	3.29	577.96	581.25	Here is top of slope at 478. Few fish hanging out at top.
4972	20090409 151023	14.60099646	144.7777514	6.85	2.75	578.11	580.86	Fish in holes on top. Two of them together.
4973	20090409 151040	14.60100177	144.7777528	7.2	2.23	578.25	580.48	Actually 3 fish in the hole.
4975	20090409 151059	14.60100178	144.7777523	5.45	1.68	578.84	580.52	VIDEO Start recording HDCam Recording fish video with lasers off.
4976	20090409 151133	14.6010019	144.7777522	5.42	1.31	579.18	580.49	They sync their turns.
4978	20090409 151220	14.60100152	144.7777523	5.49	1.35	579.15	580.5	VIDEO Stop recording HDCam
4979	20090409 151236	14.60100152	144.7777525	5.48	1.35	579.16	580.51	Done with fish while waiting for ship to move.
4982	20090409 151435	14.60100788	144.7777453	275.1	2.11	577.33	579.44	Looking along top of ridge. A bit broad and smooth.
4984	20090409 151504	14.60101127	144.7777342	272.96	1.79	577.49	579.28	Heading SW toward Marker 109.
4985	20090409 151546	14.60102885	144.777695	280.21	2.1	576.75	578.85	Looks like fish are excavating holes.
4987	20090409 151618	14.60103334	144.7776666	278.57	2.21	576.59	578.8	Going downhill as head along top. Seeing fish in holes.
4989	20090409 151711	14.60104214	144.7776131	278.87	2.16	575.72	577.88	Can see many fish at top.
4992	20090409 151913	14.60104054	144.7775013	278.92	2.78	574.33	577.11	See scarp off to left on sonar-strong return.
4993	20090409 151928	14.60102638	144.7774775	279.49	2.75	575.08	577.83	Turning left into scarp.
4995	20090409 152030	14.60100759	144.7774289	280.12	4.41	573.34	577.75	Outcrop with lots of red/yellow stuff. Fish on outcrop.
4996	20090409 152050	14.60100258	144.7774248	277.27	6.06	571.98	578.04	Also bacteria on the outcrop.
4999	20090409 152102	14.60099658	144.7774132	279.75	7.11	570.67	577.78	We are facing into the scarp on the sonar now.
5000	20090409 152121	14.60098123	144.7774429	255.72	8.11	570.77	578.88	Face has bacteria coating.
5002	20090409 152239	14.60100796	144.7774307	277.78	3.88	573.99	577.87	Returning to the rock outcrop seen just before the wall to get a sample for Cornel. (iron oxide)
5003	20090409 152250	14.60100839	144.7774286	279.26	4.61	573.62	578.23	Back at outcrop with fish and bacteria.
5005	20090409 152344	14.60102037	144.7774275	282.99	4.95	573.06	578.01	Want piece of rock with orange (iron oxide) on it.
5007	20090409 152420	14.60103091	144.7774287	281.41	4.93	573.08	578.01	Rock is very brittle.
5009	20090409 152458	14.60103243	144.7774271	276.44	5.49	572.28	577.77	Might have to come back with a scoop for this.



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5010	20090409 152511	14.60103314	144.7774229	277.75	5.99	571.42	577.41	VIDEO Stop recording HDCam
5011	20090409 152517	14.60103478	144.7774187	274.19	5.05	571.91	576.96	HD was on for a few minutes.
5014	20090409 152711	14.60103491	144.7774205	272.31	3.76	572.65	576.41	SAMPLE Geology 7: Small piece of rock. Iron oxide J2-402-geology-07 in milk crate next to basket biobox.
5016	20090409 152817	14.601008	144.7774513	236.41	10.44	567.95	578.39	SAMPLE Geology 7: too fragile to get more. Depth is 572. Outcrop from ridge top just before large buttress encountered as going west.
5017	20090409 152834	14.60098704	144.7774552	236.64	14.51	565.13	579.64	Want to continue west. Medea cam is on.
5019	20090409 152914	14.60096782	144.7774501	261.43	19.75	561.74	581.49	Jumping over scarp-depth of 561.
5020	20090409 152927	14.60096605	144.7774357	259.7	19.47	561.9	581.37	Waiting for ship and Medea behind jason.
5022	20090409 153014	14.60100638	144.7773509	232.99	3.36	562.47	565.83	Good view along buttress (270).
5023	20090409 153021	14.60100979	144.7773429	270.58	2.48	562.31	564.79	Medea cam off.
5024	20090409 153047	14.60102655	144.777292	268.41	2.06	562.37	564.43	This ridge runs west-not the buttress.
5026	20090409 153059	14.60103432	144.777263	270.25	2.04	562.45	564.49	Very knife-edged.
5027	20090409 153137	14.60103363	144.7772542	268.02	2.85	562.03	564.88	Very dramatic edge.
5030	20090409 153324	14.60102906	144.7771167	268.47	4.6	564.32	568.92	Still heading 268 along edge. Very fragile looking. More white coating top at this end.
5032	20090409 153413	14.60098894	144.7770565	261.44	7.23	565.48	572.71	Looks like ridge edge is about to disappear.
5033	20090409 153429	14.60097171	144.7770485	262.24	8.59	565.27	573.86	Heads down and goes away.
5035	20090409 153523	14.60097032	144.7770474	290.76	9.85	565.21	575.06	Butt cam view of Medea.
5036	20090409 153548	14.60099447	144.7770662	300.07	7.14	566.88	574.02	So many things are covered in mat.
5038	20090409 153612	14.60099839	144.7770722	300.42	4.43	569.15	573.58	Looking at ridge more closely.
5039	20090409 153645	14.60098998	144.7770741	333.02	4.96	569.35	574.31	Could be barnacles on rock. Trails in sediment.
5041	20090409 153737	14.60099053	144.7770744	351.09	4.85	569.49	574.34	Barnacles may be easier to pick up here.
5042	20090409 153745	14.60098946	144.7770756	350.63	4.99	569.5	574.49	Great barnacle location.
5043	20090409 153754	14.60099069	144.7770751	350.48	4.69	569.65	574.34	There are limpets but lots of barnacles.
5045	20090409 153845	14.60098832	144.7770751	350.47	4.75	569.9	574.65	Great barnacles.
5048	20090409 154007	14.60098899	144.7770749	350.79	4.61	569.89	574.5	Want to sample here. Could fit rock in PORT biobox on top of scoop and Brimstone rock.
5050	20090409 154133	14.60098885	144.7770752	350.18	4.63	569.94	574.57	Looking at PORT biobox.
5052	20090409 154204	14.60098985	144.7770747	350.6	4.49	569.93	574.42	Don't know which animal made trails.
5055	20090409 154432	14.60099765	144.7770735	350.3	3.65	570.11	573.76	Arm is twitching.
5056	20090409 154448	14.60099762	144.7770741	351.48	3.79	570.13	573.92	Grabbing a rock with bio.
5058	20090409 154522	14.60099782	144.7770737	350.37	3.66	570.18	573.84	SAMPLE Biology 8: J2-402-biology-08 has a lot of barnacle/limpets.
5060	20090409 154600	14.60099268	144.777074	349.91	4.73	569.69	574.42	SAMPLE Biology 8: 569m depth. Putting in Port biobox on top of 2 other samples-not much room.
5062	20090409 154742	14.60099382	144.7770738	350.65	4.31	569.8	574.11	SAMPLE Biology 8: barnacles from west running ridge due west of the Fault Scarp area. Would like to put a marker here.
5065	20090409 154933	14.60099281	144.7770739	350.73	4.76	569.65	574.41	DEPLOY Marker 101 Barnacle Ridge at barnacle sampling site at end of west running ridge. Depth is 570m.
5067	20090409 155007	14.6009944	144.7770733	350.72	4.09	569.93	574.02	Good view of Marker 101 at Barnacle Ridge. Good bio site.
5072	20090409 155400	14.60091971	144.777025	334.33	7.61	569.35	576.96	J2-402 Data DVDs start blue set DVD 032
5075	20090409 155603	14.60094894	144.7768917	282.29	1.68	569.37	571.05	Going to retrieve Koichis samplers.
5077	20090409 155658	14.6010526	144.7768301	282.03	3.21	570.15	573.36	J2-402 Data DVDs stop red set DVD 031
5078	20090409 155725	14.60103359	144.7767855	237.32	2.08	569.73	571.81	VIDEO Start recording HDCam on traverse to Loichi's instruments.
5081	20090409 155955	14.60079446	144.7766058	321.05	1.93	562.93	564.86	Can really see the difference between the iron oxide seds and sulfur here.
5085	20090409 160208	14.60099938	144.7764337	290.79	4.55	556.88	561.43	VIDEO Stop recording HDCam
5088	20090409 160422	14.60110395	144.7763228	233.55	8.43	552.29	560.72	Volcaniclastic sand on right and white to the left is probably mostly sulfur.

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5089	20090409 160447	14.60109645	144.7762874	227.12	10.81	547.74	558.55	Outcrop. Probably truncated pillows lavas.
5091	20090409 160523	14.60110452	144.7762508	224.4	12.9	543.31	556.21	Climbing up the nose of this ridge. Shrimp covering the ridge.
5093	20090409 160644	14.60105775	144.7762558	259.5	28.93	526.48	555.41	Amazingly steep wall here. 27m below us now.
5094	20090409 160703	14.60105425	144.7762521	260.37	29.17	523.42	552.59	It's STEEP. A headwall scarp
5095	20090409 160730	14.60104162	144.7762272	259.47	11.36	520.94	532.3	Now we're on the smoother area on top of the ridge. Still incredibly steep. The cliff was > 23m.
5097	20090409 160842	14.60102246	144.7761503	282.31	3.63	521.69	525.32	A white blob of sulfur crust is below.
5098	20090409 160858	14.60101893	144.7761213	282.61	3.66	519.9	523.56	The ridge on this side is covered in shrimp.
5100	20090409 160921	14.60100134	144.7760798	282.65	3.23	519.46	522.69	Look at this block of lava on this sedimented ridge.
5101	20090409 160955	14.6010014	144.7760135	298.8	4	518.07	522.07	It just slid downslope. Obviously not in place.
5103	20090409 161022	14.6010066	144.7759945	30.46	8.76	517.54	526.3	Koichi's logger is just ahead.
5104	20090409 161056	14.60100992	144.7759985	31.64	5.11	518.08	523.19	We need some closeups of the instrument before we pick it up.
5106	20090409 161125	14.60101191	144.7759974	32.21	5.33	517.86	523.19	Turning the lasers on. About 40cm.
5108	20090409 161257	14.60103156	144.776006	34.03	3.34	518.7	522.04	Crabs and shrimp covering this instrument.
5110	20090409 161326	14.60103095	144.7760056	33.7	3.49	518.53	522.02	RECOVER Koichi Sensors Logger has a #148 on the pressure case.
5112	20090409 161408	14.60103094	144.7760053	33.71	3.54	518.47	522.01	RECOVER Koichi Sensors this one has a #148 on the pressure case. On the summit ridge.
5114	20090409 161536	14.60104118	144.7759978	32.88	5.56	517.18	522.74	Placed Koichis sensor in the port biobox behind the milk crates.
5116	20090409 161604	14.60104096	144.7759986	57.08	5.45	518.3	523.75	The other Koichi is laying on the ridge at an angle. Barely holding on.
5118	20090409 161738	14.60104034	144.7759982	58.01	5.99	517.89	523.88	Will wants to run the "offload camera". It's the HDCam on Medea.
5121	20090409 161906	14.60104316	144.7759994	57.55	2.23	519.71	521.94	VIDEO Medea HDCam turned on. The recording is on the vehicle.
5123	20090409 162000	14.60104274	144.7759997	57.76	2.63	519.39	522.02	the second of Koichi's sensors on the ridge.
5124	20090409 162012	14.6010427	144.7759997	57.76	2.63	519.4	522.03	RECOVER Koichi Sensors
5125	20090409 162021	14.60104273	144.7759998	57.79	2.73	519.38	522.11	VIDEO Start recording HDCam
5126	20090409 162051	14.60104167	144.7759988	57.42	3.4	519.07	522.47	RECOVER Koichi Sensors and placing it in the biobox. Not sure which one yet.
5128	20090409 162111	14.60104329	144.7760004	57.75	5.11	518.59	523.7	The float (marker) is still on the seafloor.
5130	20090409 162205	14.60104449	144.7760009	57.59	5.1	517.19	522.29	The sensor says H952A
5132	20090409 162337	14.60103914	144.7759904	58.06	12.29	515.62	527.91	Placed the Koichi sensor in next to the first one in the port biobox.
5133	20090409 162346	14.60103923	144.7759904	57.93	12.19	515.62	527.81	Dropped a weight.
5135	20090409 162416	14.60103212	144.7759688	58.29	14.04	514.74	528.78	We want to recover the hydrophone next.
5136	20090409 162444	14.60102585	144.7759337	57.85	13.56	518.7	532.26	Great view of the summit ridge here.
5137	20090409 162457	14.60102431	144.7759247	57.6	14.19	518.97	533.16	VIDEO Stop recording HDCam
5140	20090409 162558	14.60108537	144.7758816	317.83	9.25	520.15	529.4	Heading for Mkr-107 next to the hydrophones. Will recover them next.
5142	20090409 162736	14.6012063	144.7757331	313.9	7.94	518.52	526.46	We're travelling along the south side of the summit.
5144	20090409 162758	14.601235	144.7757574	277.94	5.53	517.69	523.22	We're looking at a spur coming off the NE ridge.
5145	20090409 162838	14.6012913	144.7756867	209.55	9.46	517.45	526.91	Arete ridge (to use glacier terminology).
5146	20090409 162857	14.601299	144.7756691	210.03	12.31	515.08	527.39	This volcano is degrading as well.
5148	20090409 162926	14.60128225	144.7756318	209.83	8.28	515.38	523.66	There is a tephra trap precariously perched on the ridge.
5149	20090409 162935	14.60127246	144.7756302	209.36	6.95	516.1	523.05	Nick wants to move it.
5151	20090409 163012	14.60125893	144.7756226	199.63	3.31	518.31	521.62	The bucket is half buried. It looks pretty empty.
5152	20090409 163045	14.60124964	144.7755997	81.7	5.73	516.55	522.28	The volcano is not explosively erupting these days.
5154	20090409 163137	14.60123537	144.7756062	59.97	2.06	518.75	520.81	VIDEO Start recording HDCam The hydrophone is ahead of us.
5156	20090409 163208	14.60123392	144.7756042	62.87	2.71	518.25	520.96	The bucket looks much less precarious here.
5157	20090409 163251	14.60123419	144.775604	64.42	2.59	518.33	520.92	RECOVER Hydrophone
5159	20090409 163313	14.60123419	144.7756039	64.25	2.58	518.34	520.92	The hydrophone has been down here since the first dive.
5160	20090409 163357	14.60123424	144.7756038	64.67	2.56	518.48	521.04	RECOVER Hydrophone It's been placed at the front of the stbd biobox.

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5162	20090409 163437	14.60123414	144.7756038	63.65	2.64	518.37	521.01	The bioboxes now are holding 2 Koichi sensors and the hydrophone package.
5163	20090409 163453	14.60123413	144.7756039	63.77	2.74	518.29	521.03	Dropping a weight.
5165	20090409 163514	14.60123424	144.7756039	63.52	2.68	518.38	521.06	J2-402 DVCAM 027 stop and 028 start
5168	20090409 163704	14.60124296	144.7755832	100.14	7.85	515.61	523.46	Pulling out. Heading to the general area of Iceberg. Will gravel northwest along that ridge.
5169	20090409 163746	14.60124283	144.7755833	99.69	7.01	516.46	523.47	We want to travel along the base of that wall to look for unusual stockwork.
5171	20090409 163759	14.60124311	144.7755839	100.41	7.21	516.33	523.54	Nature's own slice through the crust.
5174	20090409 164003	14.60114171	144.7756267	103.61	4.79	521.18	525.97	Close call with an outcrop.
5175	20090409 164029	14.60113968	144.7756884	102.92	3.68	523.02	526.7	Medea HDCam turned off.
5178	20090409 164241	14.60107017	144.7757638	119.37	2.18	529.76	531.94	Heading east to Iceberg then will traverse to the bottom of the cliff and head N/NW around the outcrop.
5182	20090409 164541	14.60101805	144.7759193	109.76	5.84	526.52	532.36	The Brimstone cloud is really messing with the visibility. It's pretty murky.
5184	20090409 164605	14.60100565	144.7759816	111.64	3.65	527.09	530.74	Don't see any ash in the cloud. Not the same as in 2006.
5186	20090409 164743	14.60094106	144.7761104	112.06	5.19	517.58	522.77	Getting out of the plume a bit here. On the other side of the ridge now.
5187	20090409 164757	14.6009381	144.7761057	111.95	5.99	517.09	523.08	Stepping down on the other side of the ridge here.
5189	20090409 164853	14.60092664	144.7761262	109.28	4.53	518.6	523.13	We're still not down on the table. Sort of at the top heading down.
5195	20090409 165353	14.60084893	144.7764675	108.08	4.59	537.56	542.15	We want to head down to the base of the cliff.
5197	20090409 165435	14.6008647	144.7764974	108.93	2.78	542.17	544.95	Dropping down the cliff.
5199	20090409 165544	14.60087271	144.7765812	109.53	7.55	549.28	556.83	The bottom is in sight.
5201	20090409 165600	14.60088347	144.7765868	49.41	6.66	549.71	556.37	Need to move Medea. Turning to face the cliff.
5203	20090409 165726	14.60087289	144.7765183	253.17	5.2	550.57	555.77	Looking at the base of the cliff now.
5204	20090409 165746	14.60086917	144.7765164	261.82	4.88	550.65	555.53	We'll be moving to the north along this steep cliff.
5206	20090409 165840	14.6008678	144.7765146	261.7	4.44	550.79	555.23	The cliff base is covered with shrimp. The occasional crab as well.
5208	20090409 165916	14.60086786	144.7765143	261.68	4.21	551.02	555.23	There is a bit of venting coming out at the base of the cliff.
5209	20090409 165956	14.60086387	144.7765049	257.6	2.3	552.23	554.53	Quite a few crabs here among the shrimp.
5212	20090409 170111	14.60086372	144.7765063	258.19	1.39	553.31	554.7	Looking at a white "thing" sticking to the base of the cliff. Egg case?
5214	20090409 170220	14.60086336	144.7765062	258.27	1.38	553.31	554.69	We're close to the Iceberg'09 target.
5215	20090409 170230	14.60086436	144.7765081	258.65	2.05	552.88	554.93	Will start moving now.
5216	20090409 170248	14.60086883	144.7765066	256.45	3.14	551.79	554.93	We generated a small landslide as we lifted up.
5218	20090409 170308	14.60088943	144.7764953	255.44	3.83	551.24	555.07	Starting north now looking at the base of this wall.
5219	20090409 170321	14.60089876	144.7764853	255.51	3.8	551.24	555.04	Sulfur at the base and perhaps mat.
5220	20090409 170334	14.60090589	144.7764797	255.74	3.8	551.13	554.93	The wall looks like volcanic breccia.
5221	20090409 170357	14.60090479	144.776481	255.55	3.98	551.13	555.11	Looks like venting all along the base of the wall. Weak shimmer along the white crack.
5224	20090409 170546	14.60092199	144.776464	255.75	3.65	551.14	554.79	Looking at the base of the wall. Lots of white particles (probably sulfur).
5226	20090409 170611	14.60093331	144.7764558	252.12	3.49	551.11	554.6	Water is coming out the base. the shrimp are a couple meters up the rock.
5227	20090409 170625	14.60093323	144.776455	237.73	3.63	551.13	554.76	The main flow is at the interface between the sand and the rock.
5230	20090409 170800	14.60095992	144.7764486	241.82	4.46	550.92	555.38	Older outcrop sticking through the sand now. Lots of shrimp yet.
5231	20090409 170841	14.60096138	144.7764476	241.92	4.55	550.81	555.36	NAV - Sharps has not been working for most of this cruise. Sporadic at best.
5233	20090409 170914	14.60096527	144.7764474	241.87	3	552.44	555.44	The shrimp seem to be everywhere.
5235	20090409 171038	14.60098818	144.776441	255.6	3	552.9	555.9	The slope becomes more gradual as we go deeper. We are looking at the outcrop so travelling at about 550m.
5237	20090409 171146	14.60098769	144.7764376	257.16	2.21	553.61	555.82	Looking at a huge concentration of shrimp in one place. Eating? Or on an area of flow? The shrimp are very red.
5240	20090409 171308	14.60098501	144.7764375	268.37	1.98	553.54	555.52	VIDEO Stop recording HDCam VIDEO. Changing HD tapes.
5241	20090409 171326	14.60098461	144.7764379	271.22	1.91	553.53	555.44	The little white balls on the rock are limpets or egg cases?
5246	20090409 171707	14.6009833	144.7764394	289.09	1.09	554.02	555.11	What are they eating? Deadfall? It's a mass of shrimp all in one spot.

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5247	20090409 171714	14.6009833	144.7764394	289.08	1.09	554.02	555.11	VIDEO Start recording HDCam
5248	20090409 171741	14.60098333	144.7764393	288.99	1.09	554.02	555.11	We're back in business.
5250	20090409 171807	14.6009792	144.7764368	289.67	1.86	552.79	554.65	These shrimp are really red.
5251	20090409 171846	14.60097882	144.7764372	292.57	0.96	553.72	554.68	They are eating on something.
5253	20090409 171939	14.60097851	144.7764391	291.58	1.71	552.81	554.52	Looks like garbage. Perhaps an eggshell?
5254	20090409 171949	14.60097271	144.7764354	274.77	2.13	552.36	554.49	Slide down the slope.
5255	20090409 171958	14.60097215	144.7764371	264.45	2.3	552.49	554.79	Shrimp are scattering.
5258	20090409 172137	14.60097464	144.7764368	256.53	1.31	553.87	555.18	VIDEO Stop recording HDCam
5259	20090409 172154	14.60097455	144.7764367	256.54	1.31	553.86	555.17	VIDEO - running Medea HDCam
5262	20090409 172322	14.60097407	144.7764373	257.07	1.45	553.78	555.23	Manipulator arm is going to see what they are feasting on.
5265	20090409 172508	14.60097286	144.7764367	256.79	1.3	553.87	555.17	It's a bone of some type. It's a bird? And there's an eggshell.
5267	20090409 172608	14.60101766	144.776445	256.48	5.24	552.29	557.53	Bob thinks we should move on here.
5268	20090409 172626	14.60103566	144.7764399	256.89	6.08	551.91	557.99	Quite a bit of venting here along the base of these outcrops.
5269	20090409 172643	14.60105158	144.776444	256.3	6.74	551.82	558.56	Chutes and slides
5270	20090409 172652	14.60106054	144.776442	249.62	6.85	551.93	558.78	Most of the rocks here are brecciated.
5273	20090409 172841	14.60111101	144.776374	221.72	3.1	553.05	556.15	Crabs and bacterial mat? A few shrimp.
5275	20090409 172911	14.60111111	144.776373	221.7	3.2	552.88	556.08	Zoomed in on some barnacles? Cornel and Nick think they saw little feelers.
5277	20090409 173031	14.60110984	144.7763704	222.08	1.63	554.06	555.69	This area looks more like massive blocky lavas.
5278	20090409 173046	14.60110988	144.7763704	221.96	1.6	554.09	555.69	There are limpets and barnacles on these rocks.
5280	20090409 173101	14.60110985	144.7763701	222.02	1.6	554.08	555.68	Both species of shrimp here.
5281	20090409 173138	14.60110982	144.77637	222.02	1.6	554.09	555.69	VIDEO Start recording HDCam
5283	20090409 173207	14.60110968	144.7763701	222.11	1.6	554.1	555.7	HD recording the shrimp and barnacles. A big shrimp here.
5284	20090409 173214	14.60110962	144.77637	222.07	1.6	554.1	555.7	VIDEO Stop recording HDCam
5285	20090409 173250	14.60110943	144.7763707	222.08	1.66	554.08	555.74	The tocks here are barnacle covered.
5287	20090409 173327	14.60112965	144.7763698	221.15	3.59	552.42	556.01	We're moving on.
5289	20090409 173416	14.60114702	144.7763507	230.84	3.58	551.13	554.71	There is probably still venting at the base of this outcrop.
5291	20090409 173516	14.60115647	144.7763378	231.24	3.09	550.74	553.83	There are still lots of shrimp here.
5293	20090409 173604	14.6011942	144.7763324	237.57	3.39	550.87	554.26	We're at the edge of the outcrop?? Still lots of shrimp on the slope here. Continuing north.
5294	20090409 173616	14.60120168	144.7763221	243.92	3.18	550.62	553.8	Big sand chute here between the outcrops.
5295	20090409 173641	14.60121835	144.7763223	246.4	3.58	550.79	554.37	Shrimp all over the outcrops and lots of barnacles or limpets? Not sure. They are sessile.
5298	20090409 173811	14.60121965	144.7763204	275.4	1.6	552.09	553.69	At the base of this cliff there are lots of pieces of shattered rock. Flaking off the crap along the base.
5299	20090409 173821	14.60121904	144.776321	282.95	1.31	552.33	553.64	Quite a few shrimp here as well.
5300	20090409 173849	14.60121953	144.7763214	282.16	1.05	552.72	553.77	Lasers are on.
5304	20090409 174130	14.60121847	144.77632	282.14	1.04	552.79	553.83	Crab is about 4 cm wide. Waiting for Medea to catch up.
5305	20090409 174145	14.6012184	144.7763202	282.13	1.04	552.8	553.84	Barnacles and limpets on these massive rocks.
5308	20090409 174335	14.60121806	144.7763198	281.92	0.98	552.82	553.8	Shrimp are dragging something off.
5310	20090409 174411	14.60121775	144.7763194	281.89	0.99	552.83	553.82	The shrimp are tearing up a black fish. There are probably 6 or more shrimp dragging it around.
5311	20090409 174418	14.60121752	144.7763193	281.88	0.98	552.83	553.81	Was the fish deadfall?
5313	20090409 174511	14.60121704	144.776319	281.83	0.99	552.84	553.83	The shrimp battle over the dead black fish is recorded on the pilot cam.
5314	20090409 174553	14.60121699	144.776319	281.2	1.06	552.81	553.87	The rock faces are home to lots of limpets and barnacles. Shrimp are scattered about.
5316	20090409 174615	14.60121695	144.7763192	281.14	1.05	552.83	553.88	Big shrimp climbing up the rock face.
5317	20090409 174640	14.60121707	144.7763192	281.13	1.05	552.82	553.87	The barnacles are probably no bigger than a cm.

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5319	20090409 174740	14.60122565	144.7763226	282.1	2.51	551.59	554.1	No big alteration zones so far. There must be fluid seeping out.
5321	20090409 174819	14.60124836	144.7763199	282.72	3.79	551.33	555.12	The base of the wall is probably just alteration and seds. Not a lot of mat.
5322	20090409 174852	14.60125846	144.7763319	282.71	4.74	551.38	556.12	Huge overhang here.
5324	20090409 174901	14.60125963	144.7763363	282.75	5.23	551.22	556.45	J2-402 Data DVDs start red set DVDs 033
5325	20090409 174915	14.60126196	144.7763452	283.36	5.51	551.39	556.9	Looks like the flow is around all the cracks.
5326	20090409 174932	14.60126672	144.7763542	281.19	5.85	551.86	557.71	The whole top of the volcano seems to be permeable.
5328	20090409 175006	14.60128406	144.7763442	282.93	7	551.06	558.06	Massive outcrop here. The venting is concentrated in the fracture systems here.
5330	20090409 175111	14.60128107	144.7763441	282.67	6.64	551.15	557.79	Looks like sulfur on the rocks. Could just be alteration or possibly mat?
5331	20090409 175134	14.6012748	144.7763563	281.85	5.5	552.6	558.1	All the white stuff in the san is probably low flow seepage.
5333	20090409 175203	14.60127285	144.7763592	282.46	5.41	552.8	558.21	Waiting for Medea.
5335	20090409 175342	14.60130809	144.7763379	283.27	5.49	553.31	558.8	J2-402 Data DVDs stop blue set DVDs 032
5336	20090409 175354	14.60130544	144.7763338	282.87	5.33	553.17	558.5	The composition of the rocks here is mostly basalt - at least at the top.
5338	20090409 175459	14.60131459	144.7763237	282.56	4.83	553.59	558.42	Basalt is 48 to 50% silica. Andesite is ~55 - 58%% silica.
5341	20090409 175609	14.60131441	144.7763238	282.53	4.71	553.59	558.3	Most of the white stuff in the cracks is sulfur precipitating with sea water.
5342	20090409 175634	14.60131445	144.7763238	282.45	4.75	553.58	558.33	About 60m north of Iceberg.
5343	20090409 175650	14.6013144	144.7763238	282.52	4.74	553.58	558.32	Some lumps of sulfur in the middle.
5346	20090409 175850	14.60136485	144.7763248	268.68	5.11	553.43	558.54	The sulfur we see is from the sulfur gas out of the magma mixing with seawater. That precipitates as sulfur and acid.
5348	20090409 175950	14.60137783	144.7763313	267.55	5.66	553.16	558.82	Sulfur impregnated fluid comes out of the cracks and precipitates. That is the white staining we are seeing.
5350	20090409 180044	14.60139807	144.7763343	268.37	4.91	553.19	558.1	We are now changing direction. Heading more NW instead of due north.
5352	20090409 180112	14.60140933	144.7763329	268.81	4.4	553.24	557.64	Having a bit of an issue with Medea.
5354	20090409 180218	14.60141473	144.7763348	268.58	7.15	550.89	558.04	We have to come up to avoid a Medea crash.
5355	20090409 180237	14.60142216	144.776338	268.75	5.01	550.86	555.87	Local top of this outcrop.
5356	20090409 180257	14.60142947	144.7763458	269.66	4.51	550.91	555.42	Still lots of shrimp in this area. Seems like the whole top of this volcano is leaking fluid.
5358	20090409 180325	14.60145794	144.7763653	268.52	5.56	550.98	556.54	Doing a bit of maneuvering here.
5360	20090409 180444	14.60149604	144.7763897	268.6	8.64	552.04	560.68	Brecciated lavas on top of blocky lavas. Looks like an arch.
5362	20090409 180525	14.60151275	144.7763751	268.63	6.25	553.11	559.36	Eruptions and brecciations and solid lavas.... A series of things.
5363	20090409 180538	14.60151945	144.7763728	268.74	5.85	553.27	559.12	Still some shrimp up here. Crabs and stained rock.
5366	20090409 180744	14.60156566	144.776384	268.82	5.38	554.05	559.43	This entire outcrop has had shrimp and barnacles
5368	20090409 180856	14.60157958	144.7763758	268.56	3.2	555.61	558.81	white mat on vertical outcrop
5370	20090409 180915	14.60157687	144.7763726	268.64	2.51	556.22	558.73	filamentous white mat
5371	20090409 180933	14.60157566	144.7763751	268.78	2.71	556.09	558.8	very furry
5372	20090409 180949	14.60157577	144.7763754	268.74	2.86	555.93	558.79	looks like a pelt
5374	20090409 181034	14.60157578	144.7763751	268.75	2.84	555.98	558.82	HD is on
5376	20090409 181136	14.60157246	144.7763617	268.53	3.33	554.82	558.15	placing marker 102
5380	20090409 181441	14.60156739	144.7763447	268.6	4.1	553.45	557.55	Marker 102 Mat - new site
5381	20090409 181459	14.60156735	144.7763446	268.99	4.09	553.46	557.55	Marker is sitting above the mat
5383	20090409 181513	14.60156735	144.7763446	268.96	4.08	553.46	557.54	H=269 D=553
5385	20090409 181618	14.60156701	144.7763551	267.9	4.7	553.38	558.08	extensive mat area - greater than 4m high and a few meters wide
5386	20090409 181627	14.60156761	144.7763566	268.4	4.74	553.32	558.06	mat is densest at bottom
5389	20090409 181800	14.60157483	144.7763647	266.09	5.28	553.31	558.59	continuing along outcrop to north
5396	20090409 182436	14.60165191	144.7762691	209.36	4.75	560.85	565.6	DEPLOYED Marker 102 Mat at 1810 in area of extensive mat.
5398	20090409 182514	14.60165119	144.7762686	209.35	4.45	561.12	565.57	There's some mat on this outcrop also.
5399	20090409 182529	14.60165128	144.7762687	209.33	4.46	561.06	565.52	Rattail here.
5402	20090409 182718	14.60162407	144.7763126	209.75	6.33	557.22	563.55	Going back to take a peak at this area of extensive mat. Sheryl is in the lab now.

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5404	20090409 182810	14.60160388	144.7763475	208.67	5.29	556.14	561.43	The area of mat is right in front of us. We're at 557 meters.
5406	20090409 182935	14.60158717	144.7763477	219.51	5.14	554.81	559.95	This blocky lava outcrop is covered with mat. Probably 10 meters up. The marker is at the top of this cliff.
5409	20090409 183132	14.60159887	144.7763388	231.29	5.23	555.2	560.43	We're going down to the base of this wall again and mooring on.
5410	20090409 183143	14.60160394	144.7763367	231.28	4.39	556.39	560.78	This mat seems to be at the periphery of the venting area.
5413	20090409 183347	14.60165161	144.77628	227.3	5.03	560.09	565.12	We're following this little spur around the corner. Heading NW around this outcrop.
5415	20090409 183423	14.60165833	144.7762744	226.56	3.3	562.43	565.73	J2-402 D
5416	20090409 183443	14.60166833	144.7762658	225.55	4.24	562.13	566.37	Deposits of rained down sulfur on the rocks.
5418	20090409 183522	14.60168279	144.7762366	226.43	5.5	561.96	567.46	This area has been getting some ash? Strip of black. We're on the backside of this spur on NE part of the summit.
5420	20090409 183616	14.60169848	144.7762043	226.41	6.16	562.18	568.34	J2-402 DVCAM 029 start and 028 stop
5421	20090409 183616	14.60169848	144.7762043	226.41	6.16	562.18	568.34	We see what appears to be a fracture in the sonar.
5423	20090409 183708	14.60173145	144.7761331	226.2	6.26	562.29	568.55	This geology looks a bit older. A bit of sliding and it's patchy.
5424	20090409 183730	14.60175099	144.7761074	225.77	5.98	563.06	569.04	Another outcrop coming up. The "fracture" line on the sonar has almost disappeared.
5428	20090409 184010	14.60175209	144.7760952	226.39	6.03	562.97	569	Rattail on the pilot cam.
5429	20090409 184040	14.60176009	144.7760877	225.71	6.45	562.83	569.28	Moving again.
5431	20090409 184101	14.60177403	144.7760729	226.21	6.49	562.96	569.45	Kinder gentler outcrop. Lobates?
5432	20090409 184146	14.60179968	144.7760211	226.69	6.05	563.29	569.34	This is a "buggered up place" Bob Embley...
5434	20090409 184201	14.60180933	144.7760119	226.09	6.71	562.73	569.44	Granular white sed on the rocks.
5435	20090409 184241	14.60182278	144.7759963	226.46	6.49	563.24	569.73	Large columnar outcrop of blocky lavas.
5437	20090409 184353	14.60185023	144.7759549	226.47	5.68	564.74	570.42	Not sure there is any venting here now. No animals.
5440	20090409 184522	14.60183709	144.7759427	212.1	4.59	564.72	569.31	Contorted lavas here. Looks like pillows and curved flows. Exposed lobe forms here. Highly fractured.
5442	20090409 184609	14.60183155	144.775946	211.98	5.16	564.18	569.34	A lot of this is probably formed by cooling. The best example of a flow here. Possibly seeing a dike here as well.
5443	20090409 184617	14.60183108	144.7759454	212.04	5.51	563.68	569.19	VIDEO Start recording HDCam
5444	20090409 184652	14.60183006	144.7759448	214.26	6.71	562.41	569.12	This is a big lava flow. By far the best flow since we've been here.
5446	20090409 184742	14.60182699	144.7759418	214.91	8.19	560.82	569.01	Probably one big extrusion of lava here with vertical columnar basalts on top.
5449	20090409 184953	14.60182348	144.7759374	214.61	10.63	557.95	568.58	Massive flow here. We're putting a target here. Has been called "massive lava flow" target 47.
5451	20090409 185007	14.60182336	144.7759375	214.68	10.86	557.7	568.56	VIDEO Stop recording HDCam
5452	20090409 185033	14.601823	144.7759371	214.83	10.93	557.7	568.63	Very impressive massive lava flow here.
5456	20090409 185300	14.60182046	144.7759358	214.48	11.28	557.36	568.64	We are going to traverse from here to the summit.
5457	20090409 185313	14.60182103	144.7759368	212.27	11.8	556.73	568.53	Target 47 was called "massive lava flow".
5458	20090409 185350	14.6018105	144.7759272	215.57	9.19	552.62	561.81	Heading straight up the cliff toward the summit.
5460	20090409 185439	14.60181206	144.7759158	222.7	16.4	549.64	566.04	Seeing more brecciated lavas here. Some iron oxide sed.
5462	20090409 185511	14.60181022	144.7759152	223.1	12.18	549.75	561.93	Looks like a different fish. A Chimera.
5463	20090409 185541	14.60181171	144.7759108	232.7	10.09	549.08	559.17	It looks like there could be mat here in this iron oxide area. Zooming in
5465	20090409 185609	14.60181075	144.7759069	232.17	11.55	547.96	559.51	Zooming in to check this out more.
5466	20090409 185630	14.601808	144.7759032	231.28	9.84	547.92	557.76	It looks like there is mat on these rocks. There is mat on these rocks.
5467	20090409 185654	14.60180791	144.775903	231.92	11.1	547.91	559.01	This is active iron oxide sed and mat.
5470	20090409 185839	14.60180922	144.7759039	224.03	20.19	547.48	567.67	This is like a little breccia chimney. Orange mat (?) with white filamentous stuff.
5472	20090409 185919	14.601809	144.7759046	222.51	21.23	547.42	568.65	VIDEO Start recording HDCam
5473	20090409 185947	14.60180886	144.7759044	222.58	20.75	547.43	568.18	Going to use the temp probe here.
5475	20090409 190056	14.60180873	144.7759044	222.29	20.59	547.45	568.04	This is about 10 meters up the slope from target 47 on a line to Mkr 107 at the summit.
5477	20090409 190109	14.60180876	144.7759045	222.25	20.79	547.45	568.24	There is definite orange mat here.

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5478	20090409 190155	14.60180866	144.7759045	222.15	20.3	547.47	567.77	Lots of orange mat and some wispy white mat on this outcrop.
5482	20090409 190421	14.60180452	144.7759032	217.78	19.84	547.5	567.34	Going to take a temp in a hole that is surrounded by white filamentous bacterial mat. Bottom depth is 567. Vehicle Z is 548.
5483	20090409 190444	14.60180425	144.7759032	217.37	18.77	547.63	566.4	That is fluffy orange mat.
5486	20090409 190634	14.60180288	144.7759016	216.12	19.55	547.54	567.09	Tambient=7.9. Temp on top of mat is about 8.2. The substrate here is blocky lavas with sands.
5490	20090409 190943	14.60181073	144.7759087	216.8	19.4	547.37	566.77	No obvious flow but there was about 0.5 degrees increase in temp over ambient.
5494	20090409 191221	14.60180935	144.7759063	216.94	19.69	547.47	567.16	Stowing the temp probe.
5495	20090409 191236	14.60180894	144.7759073	216.02	19.92	547.36	567.28	The HDCam was turned off quite some time ago.
5497	20090409 191349	14.60180948	144.7759068	217.03	19.72	547.37	567.09	Having a little problem stowing the temp probe. Bob (Buddha) is on it now.
5502	20090409 191720	14.60177159	144.7758853	215.19	5.49	542.88	548.37	And we're off. Continuing on over the ridge now.
5504	20090409 191801	14.60163765	144.7758082	216.19	5.79	543.28	549.07	Looks like lot of haze in the water here.
5505	20090409 191827	14.60161101	144.7757868	215.7	5.25	541.31	546.56	This slope seems to covered in that mat (iron oxide sed?).
5508	20090409 192100	14.60140992	144.7755762	218.98	3.5	522.94	526.44	The slope is now sediment covered.
5511	20090409 192234	14.60120591	144.7754447	182.42	3.14	527.59	530.73	Still climbing.
5513	20090409 192311	14.60120081	144.77539	163.94	5.23	529.55	534.78	Seeing the Brimstone plume here.
5514	20090409 192331	14.60122397	144.7753603	163.98	5.95	531.35	537.3	Very intense plume. not moving much. Just hugging the slope.
5516	20090409 192409	14.60118498	144.7753406	163.65	3.34	534.83	538.17	We're almost at the summit.
5517	20090409 192450	14.60110555	144.7753468	162.98	4.38	533.25	537.63	Talus slides here.
5519	20090409 192534	14.60108757	144.7753372	163.13	3.66	532.77	536.43	We're on a spur here looking toward the summit (to the south).
5521	20090409 192602	14.6010371	144.7753373	163.37	3.44	529.31	532.75	Seeing a few shrimp here.
5523	20090409 192724	14.600945	144.7753264	163.09	4.23	522.82	527.05	We're down the other side of the summit.
5524	20090409 192800	14.60093185	144.7753299	104.83	5.53	521.37	526.9	We're in the area to the NW of Brimstone.
5526	20090409 192835	14.60093931	144.7753316	106.31	5.99	520.3	526.29	The Medea cam has a great shot of Brimstone plume.
5527	20090409 192900	14.60093419	144.7753381	106.47	4.88	520.96	525.84	VIDEO start Medea HD.
5529	20090409 192915	14.60093426	144.7753425	105.76	4.41	520.98	525.39	Stopping Medea HD.
5530	20090409 192930	14.60093495	144.7753448	105.79	4.16	520.88	525.04	Seeing lots of shrimp here now.
5531	20090409 192949	14.60093192	144.7753589	106.41	5.29	519.32	524.61	Looking at lots of bubbles coming out of the plume toward Medea.
5532	20090409 192958	14.60094103	144.7753598	105.63	6.65	518.29	524.94	Tons of bubbles in the water.
5535	20090409 193141	14.60106375	144.7751993	105.21	9.35	534.2	543.55	The bubbling in the plume has calmed down now.
5537	20090409 193249	14.60099466	144.7752562	106.41	5.48	531.55	537.03	We're going to Brimstone now.
5540	20090409 193453	14.60087525	144.77532	53.42	3.95	524.2	528.15	Cornel is recording now.
5542	20090409 193556	14.60086538	144.7753782	53.15	3.86	521.05	524.91	typical Brimstone geology. Blocky lavas. Hydrothermally altered sediments.
5544	20090409 193609	14.6008579	144.775378	54.51	4.84	520.32	525.16	Seeing shrimp now. Not lots.
5545	20090409 193616	14.6008607	144.7753774	54.04	4.94	520.09	525.03	The plume is wafting our way.
5547	20090409 193710	14.6008439	144.7753993	42.54	3.83	519.89	523.72	We see Nick's bucket in the background.
5549	20090409 193829	14.6008405	144.7754338	44.32	2.03	520.2	522.23	He wants to swap out the bucket on the seafloor with the bucket in the right swing arm.
5551	20090409 193911	14.6008343	144.7754348	44.14	2.81	519.74	522.55	Honing in on the bucket. Looks like it is bucket B.
5552	20090409 193943	14.60083424	144.7754403	46.46	2.13	520.04	522.17	Brimstone in the background.
5555	20090409 194143	14.60083379	144.7754409	44.42	2.28	520.02	522.3	Tephra Sampler B from the seafloor. The vent is SW about 20m.
5557	20090409 194215	14.60083352	144.7754404	44.16	2.24	520	522.24	RECOVER Tephra Sampler B from the seafloor. We are N/NW of the vent about 20m.
5558	20090409 194247	14.60083369	144.7754405	43.92	2.3	520.05	522.35	Cinching up the net and stuffing it in the stbd swing arm.
5560	20090409 194342	14.60083397	144.7754382	45.03	2.44	519.99	522.43	DEPLOY Tephra Sampler E. We are N/NW of Brimstone ~20m.
5563	20090409 194523	14.60083662	144.7754198	47.16	1.43	520.92	522.35	J2-402 Data DVDs start blue set DVDs 034
5564	20090409 194554	14.60083666	144.7754194	46.82	1.44	520.9	522.34	SAMPLE Geology 9. Tephra Sampler B. N/NW of Brimstone ~20m.
5566	20090409 194607	14.60083664	144.7754198	47.27	1.41	520.89	522.3	Strong current blowing around here.

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5569	20090409 194833	14.60083697	144.7754394	52.77	2.16	520.04	522.2	We are repositioning to take a scoop now.
5571	20090409 194924	14.60083872	144.7754332	46.01	1.86	520.29	522.15	J2-402 Data DVDs stop red set DVD 033
5572	20090409 194931	14.60083869	144.7754332	45.54	1.9	520.21	522.11	SAMPLE Geology 10. Scoop of volcaniclastic seds. Right next of the Tephra sampler just deployed (TSF). 20m N/NW of Brimstone.
5577	20090409 195312	14.60083822	144.7754268	44.04	2.78	519.58	522.36	Finished sampling for now.
5578	20090409 195340	14.60082181	144.7754425	42.66	3.35	518.86	522.21	We will set up to get the best view we can of Brimstone. Will sit there for a couple hours.
5579	20090409 195351	14.60081446	144.7754513	42.56	3.49	518.5	521.99	Moving SE toward Brimstone.
5581	20090409 195426	14.60080601	144.7754846	43.43	3.28	520.25	523.53	The vent is in view now. The base of the plume is yellowish. Can still see sheets of CO2 bubbles.
5582	20090409 195441	14.60080928	144.7754893	44.65	2.23	521.63	523.86	We want to sit here for a while.
5586	20090409 195637	14.60080824	144.7754893	43.52	2.21	521.63	523.84	We're pretty close to where we were yesterday. Our heading is 44 degrees.
5589	20090409 195807	14.60080814	144.7754895	43.34	2.28	521.57	523.85	The level of activity is down now.
5590	20090409 195826	14.60080816	144.7754895	43.33	2.29	521.56	523.85	It has changed since we were here earlier.
5592	20090409 195917	14.60080837	144.7754893	43.69	2.28	521.59	523.87	It did move in the center. CO2 on the margins of the picture. HD coomed on it.
5595	20090409 200143	14.60080879	144.7754891	43.33	2.33	521.53	523.86	Bob Embley is in control of the HD Cam. The plume is spiraling.
5597	20090409 200221	14.60080868	144.7754891	43.57	2.3	521.55	523.85	Right in the center it is extruding a piece of lava.
5600	20090409 200413	14.60079188	144.7755021	3.97	3.54	520.39	523.93	We're moving around the vent.
5601	20090409 200449	14.60079798	144.775528	325.17	2.68	521.01	523.69	VIDEO Start recording HDCam
5603	20090409 200530	14.60079785	144.7755305	323.34	2.61	521.13	523.74	The video is on again.
5604	20090409 200600	14.60079684	144.775531	322.88	2.46	521.13	523.59	We're looking at the vent. We are looking toward the N/NW. our heading is 323.
5606	20090409 200616	14.60079695	144.7755314	322.78	2.51	521.12	523.63	The ground is moving.
5607	20090409 200657	14.60079537	144.7755327	322.18	2.49	521.16	523.65	The field of view is about 2 meters.
5609	20090409 200701	14.60079477	144.7755331	321.85	2.45	521.17	523.62	The lasers are on.
5611	20090409 200814	14.60079098	144.7755361	321.81	2.26	521.26	523.52	We've seen a bit of ground movement on the camera. Great view from the brow cam.
5612	20090409 200832	14.60079067	144.7755357	322.79	2.28	521.25	523.53	This is being recorded very well on the hydrophone in the basket.
5614	20090409 200917	14.60079119	144.775535	323.24	2.35	521.22	523.57	The plume is coming at us.
5615	20090409 200930	14.60079128	144.7755345	323.32	2.33	521.25	523.58	VIDEO Stop recording HDCam
5618	20090409 201111	14.6007952	144.7755296	322.81	2.33	521.28	523.61	Zooming out a bit.
5620	20090409 201219	14.6007979	144.7755282	323.31	2.34	521.29	523.63	Good bubble action.
5624	20090409 201600	14.60079043	144.7755161	332.58	1.95	521.35	523.3	VIDEO Start recording HDCam Now we're looking to the N/NW. It's really moving.
5626	20090409 201617	14.60079086	144.7755159	332.59	1.83	521.37	523.2	Lots of shaking action. Can see the big rocks moving.
5629	20090409 201819	14.60079125	144.7755155	332.38	1.85	521.35	523.2	Dead-looking fish falling down - but it just swam away. Obviously not dead yet.
5630	20090409 201831	14.60079138	144.7755153	332.51	1.85	521.35	523.2	VIDEO Start recording HDCam
5632	20090409 201922	14.60081267	144.7754766	69.97	3.44	519.09	522.53	Moving around again to get a better view of the pit.
5634	20090409 202022	14.60082081	144.7754815	80.94	0.8	521.27	522.07	Better view here. Our heading is 81.
5635	20090409 202037	14.60082171	144.77548	80.94	0.8	521.27	522.07	Turned the lasers on.
5636	20090409 202129	14.60082516	144.7754744	81.38	100.25	521.3	621.55	The big rock on the right is about 80cm across. The other rock about 1 meter across (the one we were looking at earlier).
5637	20090409 202142	14.60082533	144.7754741	81.41	0.78	521.31	522.09	The base of the plume is yellower now.
5639	20090409 202226	14.60082837	144.7754705	81.43	151.01	521.3	672.31	Saw lava extruding out the center of the vent.
5640	20090409 202236	14.6008301	144.7754683	81.42	151.01	521.29	672.3	The plume is swirling.
5644	20090409 203118	14.60086276	144.7756105	82.17	0.85	521.29	522.14	There is ash (lapilli) falling out of the plume.
5645	20090409 203126	14.60086318	144.77561	82.18	0.85	521.29	522.14	Not a lot but a bit.
5646	20090409 203335	14.6008637	144.7756084	82.34	149.65	521.31	670.96	adjusting HD video gain
5647	20090409 203447	14.60086432	144.7756071	82.42	150.96	521.31	672.27	Rocks moving bubbles increasing



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5648	20090409 203457	14.60086506	144.7756062	82.43	150.96	521.31	672.27	Plume vigor increasing
5649	20090409 203845	14.60090452	144.7755506	82.48	162	521.33	683.33	Discussing issues with HD cam
5650	20090409 203905	14.60090907	144.7755444	82.48	148.82	521.34	670.16	Brightness and contrast set just right
5651	20090409 203942	14.60091759	144.7755325	82.48	198.74	521.34	720.08	J2-402 DVCAM 029 stop and 030 start
5655	20090409 204521	14.60094051	144.775495	82.75	0.74	521.14	521.88	Preparing to take rock sample
5656	20090409 204539	14.60094042	144.7754952	82.33	0.74	521.16	521.9	Removing weight
5659	20090409 204741	14.60094001	144.7754988	83.27	0.74	521.38	522.12	Want to collect large rock from edge of Brimstone Pit fresh lava
5660	20090409 204755	14.60094065	144.7754983	83.16	155	521.37	676.37	Tephra falling out of plume
5661	20090409 204816	14.60094243	144.7754957	83.16	155	521.37	676.37	Ash falling out of plume
5662	20090409 204905	14.60094545	144.7754917	83.13	187.29	521.36	708.65	Plume swirling as it comes out of vent
5663	20090409 204951	14.60094829	144.7754886	83.02	165.05	521.36	686.41	Cornel noted this level of activity would have been considered quiet during 2006
5664	20090409 205027	14.60094988	144.7754859	83.03	198.23	521.36	719.59	More bubbles
5665	20090409 205039	14.60094985	144.7754858	82.99	198.23	521.37	719.6	Big bubbles
5666	20090409 205213	14.60095358	144.77548	82.99	179.52	521.37	700.89	Lots of ash falling out of plume
5667	20090409 205236	14.60095443	144.7754792	82.96	156.75	521.37	678.12	Plume is brightest yellow we've seen recently
5668	20090409 205400	14.600955	144.7754792	83.11	157.15	521.38	678.53	Big bubbles rising from between rocks
5669	20090409 205521	14.6009514	144.7754847	83.29	198.01	521.37	719.38	Bursts are a couple of minutes long
5670	20090409 205531	14.60095135	144.7754848	83.34	194.24	521.37	715.61	Rocks bulging again
5671	20090409 205546	14.60095155	144.7754848	83.31	195.16	521.36	716.52	Putting in tape 5 dive 402
5672	20090409 205627	14.60095151	144.7754846	83.26	0.74	521.37	522.11	VIDEO HD tape change
5674	20090409 205730	14.60095234	144.7754862	82.28	167.17	521.35	688.52	SAMPLE Geology 11. Taking rock sample Brimstone Pit right where plume is rising
5675	20090409 205749	14.60095249	144.7754818	81.55	0.76	521.27	522.03	Rock is being placed where weights were
5677	20090409 205836	14.60095197	144.775485	82.66	132.97	521.32	654.29	11. Rock is triangular in shape about 15cm from center of crater at Brimstone.
5678	20090409 205854	14.60095265	144.7754858	81.36	169.4	521.37	690.77	12. Getting another rock right from center of crater
5679	20090409 205903	14.60095174	144.7754869	81.54	171.24	521.37	692.61	Reaching into plume
5680	20090409 205959	14.6009534	144.7754844	84.24	168.11	521.4	689.51	SAMPLE Geology 12. Reaching arm into plume Cannot see what is being picked up until they pull out of the plume
5681	20090409 210059	14.60095294	144.7754861	80.92	0.95	521.35	522.3	12. Grabbed a very large rock from edge of plume. Not a keeper
5683	20090409 210106	14.60095251	144.7754863	80.9	0.95	521.36	522.31	Set aside big rock
5684	20090409 210121	14.60095176	144.7754874	80.99	149.07	521.38	670.45	12. Trying again
5686	20090409 210205	14.60094926	144.7754913	81.22	0.76	521.33	522.09	12. grabbed nice rock about 25cm more square will sit on top of first rock in sample basket
5687	20090409 210231	14.60094719	144.7754928	80.88	0.74	521.37	522.11	SAMPLE Geology 12. Rock sample in basket
5688	20090409 210441	14.60093682	144.7755079	81.09	151.22	521.38	672.6	Rocks bulging again plume increasing
5690	20090409 210839	14.6009077	144.7755417	81.12	0.74	521.38	522.12	Plume seems to be distinctly 2 parts with vigorous swirling rising plume out of pit and more murky lazy plume to left
5691	20090409 210955	14.60090596	144.7755412	81.16	127.65	521.38	649.03	Curtain of bubbles rising from rocks in front of plume
5692	20090409 211210	14.60092031	144.7755204	81.26	169.86	521.38	691.24	Burst of plume through rocks behind area in front view
5693	20090409 211342	14.60092579	144.7755144	81.26	142.94	521.4	664.34	Rock to right of plume is shaking
5695	20090409 211404	14.60092615	144.7755152	81.29	0.75	521.39	522.14	Bill relieved Cornel for breakfast
5696	20090409 211423	14.60092712	144.7755148	81.28	0.74	521.38	522.12	Rocks around edge of pit are heaving
5697	20090409 211441	14.60092647	144.7755165	81.27	0.83	521.38	522.21	Ash falling out of plume again
5698	20090409 211512	14.60092578	144.7755194	81.27	140.92	521.38	662.3	Plume is leaning strongly to left
5699	20090409 211536	14.60092565	144.7755209	81.27	143.99	521.4	665.39	Jason heading is currently 081
5700	20090409 211620	14.60092839	144.7755181	81.29	135.67	521.39	657.06	Rocks heaving again
5701	20090409 211730	14.60092962	144.7755182	81.3	138.63	521.4	660.03	We've been getting lots of HDCam here at Brimstone.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-402 Logger Comment
5703	20090409 212058	14.60093995	144.7755037	81.25	149.26	521.4	670.66	Still observing the pit.
5704	20090409 212144	14.60094088	144.7755033	81.37	0.74	521.38	522.12	It's fresh lavas because the gases are coming to the surface. It's more like viscous lava coming to the surface.
5707	20090409 212501	14.60093696	144.7755128	81.21	0.88	521.38	522.26	The plume is wafting our way right now.
5709	20090409 212527	14.60093411	144.7755176	81.2	0.86	521.39	522.25	Hopefully it will go the other way briefly.
5711	20090409 212620	14.60093269	144.7755203	81.22	0.74	521.38	522.12	There are 3 new rocks in the brow cam.
5712	20090409 212637	14.60092807	144.7755155	79.85	0.88	520.83	521.71	We want to hover around the vent for the last few minutes of this dive.
5713	20090409 212653	14.60091748	144.7755122	61.98	3.1	520.25	523.35	Circling around the vent.
5715	20090409 212737	14.60089305	144.7755453	349.27	5.19	520.22	525.41	Getting a great view of Brimstone as we back away and circle.
5716	20090409 212744	14.60089268	144.7755521	331.91	5.14	520.46	525.6	Looking due north now.
5719	20090409 212832	14.6008976	144.7755589	317.52	3.14	521.41	524.55	Coming around to face west.
5721	20090409 212923	14.60089627	144.7755672	318.93	5.54	520.65	526.19	Tito on shift now.
5722	20090409 212935	14.6008952	144.7755735	321.26	6.24	520	526.24	Backing out now to drop the weights.
5725	20090409 213145	14.60088342	144.7755976	324.73	11.64	518.49	530.13	We have backed off to the southeast. Sitting here observing the vent.
5728	20090409 213313	14.60088251	144.7756003	317.73	12.46	517.41	529.87	Dropping a few weights here.
5730	20090409 213403	14.60087874	144.7755953	291.75	11.1	517.65	528.75	Our fixes while here at the vent have been about 30m to the east of the Brimstone'09 position.
5731	20090409 213421	14.60084983	144.7755655	250	11	517.69	528.69	VIDEO Stop recording HDCam
5733	20090409 213607	14.6008513	144.7753692	249.39	41.57	482.09	523.66	End of dive J2-402.
5734	20090409 213619	14.6008511	144.7753688	249.59	48.22	475.59	523.81	J2-402 Data DVDs stop blue set DVDs 034
5735	20090409 213630	14.6008509	144.7753691	251.03	52.71	470.25	522.96	J2-402 stop DVCAM 030
5736	20090409 221138	14.6009022	144.7758684	262.01	badvalue	2.53	badvalue	Jason is at the surface in the background.
5737	20090409 221209	14.6009003	144.7758735	266.59	badvalue	2.36	badvalue	Medea is at the surface.
5738	20090409 221304	14.6008912	144.7758768	254.68	badvalue	2.44	badvalue	Medea on board
5739	20090409 222031	14.6009182	144.7760116	348.36	badvalue	1.25	badvalue	JASON on deck

**J2-403 - CTD Search/Fluid Sampling.** JASON equipped with HFS Beast (including 2 gas-tights), single-chamber suction sampler, 2 tephra samples, 4 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. Began dive at Brimstone and then searched for the CTD east of Brimstone for almost 3 hours. After search, went to summit ridge (Mkr 107), deployed hydrophone and set tephra-sampler F upright. Headed to Brimstone for fluid sampling. Took 4 HFS samples on backside of Brimstone rim. Beast wand clogged with sulfur during sampling at vent. Took 2 gas-tight bottles in vent (one with funnel) and made video observations. Swapped a tephra sampler at vent and put an additional one 10m E of vent. Headed to Limpet Lair and made biology observations (HD). Took shrimp sample with suction and recovered shrimp trap. Drove N/NE across bench and explored east side of summit. Took rock sample from older outcrop. Headed south to area named Rusty Rise (deployed Mkr114) and obtained sample of crusty material. Took another rock sample as headed south (south of Fault Shrimp). Explored further south along ridge before heading NW back to Brimstone. Made video observations of vent before ascending.

**Table 6.4-8 JASON Dive J2-403**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
5740	20090410 062622	badnav	badnav	358.68	badvalue	1.57	badvalue	Dive J2-403 preparing to launch.
5741	20090410 062829	badnav	badnav	1.57	badvalue	1.59	badvalue	Main goals: First 4 hours will search for missing CTD. Last 8 hours fluid sampling.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
5742	20090410 062917	badnav	badnav	3.28	badvalue	1.57	badvalue	Tools: Single-chamber suction sampler. Fluid sampler (Beast). Niskin. Temp probe. Eh sensor.
5743	20090410 063132	badnav	badnav	265.67	badvalue	1.59	badvalue	JASON in water
5744	20090410 063256	badnav	badnav	276.39	badvalue	3.27	badvalue	Basket: 2 tephra samplers. 4 markers. 3 scoop bags. Empty milk crate for shrimp trap recovery.
5745	20090410 063700	badnav	badnav	271.57	badvalue	52.02	badvalue	SAMPLE Fluid 1. test this is a test. not the case
5746	20090410 065324	badnav	badnav	251.47	47.04	507.98	555.02	Jason descending into plume
5748	20090410 065429	badnav	badnav	239.39	21.58	528.62	550.2	J2-402 Data DVDs start DVDCAM 35
5751	20090410 065646	badnav	badnav	41.76	3.36	532.69	536.05	JASON on bottom 533m 5 mab
5753	20090410 065737	badnav	badnav	358.15	3.65	530.35	534	Visibility slightly cloudy
5756	20090410 065958	badnav	badnav	20.07	2.53	521.86	524.39	Brimstone in sight
5760	20090410 070211	14.60073935	144.7753221	303.31	5.25	519.78	525.03	Plume looks white-ish coming out of vent but portion to left in image is yellow not rising much
5761	20090410 070233	14.600743	144.7753275	304.71	4.3	520.38	524.68	Plume bending strongly to southwest and downslope
5763	20090410 070333	14.60076492	144.7753539	45.57	2.15	520.49	522.64	Begin search for CTD going East
5767	20090410 070659	14.60074461	144.7753377	0.09	3.14	520.54	523.68	Visibility pretty good
5769	20090410 070730	14.60074281	144.7753794	358.26	3.58	522.54	526.12	Starting to move
5771	20090410 070816	14.60074259	144.7754637	358.19	3.04	528.47	531.51	Bottom slope looks covered with ash some larger boulders
5773	20090410 070914	14.60074395	144.7755745	358.77	3.46	533.89	537.35	Large particles in water some smoke near seafloor
5774	20090410 071004	14.60074493	144.7756691	359.78	2.96	538.89	541.85	Into plume
5776	20090410 071011	14.60074435	144.7756681	359.58	3.19	539.14	542.33	Cannot see seafloor
5777	20090410 071048	14.60074552	144.7757519	0.41	3.44	542.63	546.07	Seafloor barely visible
5779	20090410 071127	14.60074094	144.7757848	341.96	3.1	541.62	544.72	Zero visibility again
5780	20090410 071153	14.60076918	144.7757811	3.07	5.1	539.76	544.86	Jason moving north
5781	20090410 071204	14.60079425	144.7757887	0.35	4.35	538.47	542.82	Seafloor visible
5783	20090410 071216	14.60080669	144.7757899	0.25	4.8	537.58	542.38	Pretty clear view now
5784	20090410 071307	14.60084397	144.7757351	0.61	3.83	538.18	542.01	Jason moving west
5786	20090410 071325	14.60084555	144.7757006	1.2	3.76	538.8	542.56	Visibility reduced
5787	20090410 071344	14.60084424	144.7756587	0.58	4.19	538.92	543.11	Can see seafloor OK
5788	20090410 071354	14.60084522	144.7756366	1.03	3.89	538.95	542.84	Thick plume
5790	20090410 071428	14.60084396	144.7755605	359.67	2.69	536.5	539.19	Seafloor mostly visible ash flow on seafloor around boulders
5791	20090410 071500	14.60084303	144.7754933	359.15	2.04	532.46	534.5	Visibility OK
5793	20090410 071546	14.60084228	144.7753846	359.29	2.1	525.38	527.48	White-ish deposit on seafloor covering like snow
5795	20090410 071633	14.60085631	144.7752941	3.26	3.85	517.51	521.36	Plume increasing
5796	20090410 071644	14.60088763	144.7752977	358.75	3.4	519.44	522.84	Jason moving north
5798	20090410 071722	14.60093563	144.7753169	354.68	3.75	523.43	527.18	Visibility low
5799	20090410 071759	14.60093366	144.7754087	357.58	3.26	528.01	531.27	Jason moving north
5800	20090410 071808	14.60093377	144.7754295	358.17	3.83	529.03	532.86	Jason moving east
5802	20090410 071813	14.60093342	144.7754412	358.73	3.83	529.71	533.54	Visibility OK
5803	20090410 071855	14.60093411	144.7755393	358.56	3.95	534.4	538.35	Passing over Tephra sampler
5805	20090410 071920	14.60093313	144.7755891	357.36	3.13	534.37	537.5	Convolutd rock sticking up off bottom
5806	20090410 071949	14.60092799	144.7756058	358.6	3.45	533.81	537.26	Slope is mostly smooth covered in white deposit
5808	20090410 072024	14.60092255	144.7756426	0.77	6.28	530.66	536.94	Thin plume wafting over seafloor
5810	20090410 072136	14.60093336	144.7757004	356.95	6.75	529.83	536.58	Going over a ridge
5812	20090410 072230	14.60093684	144.7757816	358.56	7.45	526.82	534.27	Visibility still good
5814	20090410 072322	14.60094923	144.775801	5.07	11.58	519.8	531.38	Plume increasing

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
5815	20090410 072332	14.60097922	144.7758067	3.44	8.38	519.68	528.06	Jason going north
5817	20090410 072502	14.60103057	144.7757273	359.83	11.45	517.59	529.04	Heading due north looking at white sedimented surface-steep.
5819	20090410 072521	14.60103116	144.7756869	0.49	8.56	520.63	529.19	Can see plume in Medea and just above Jason-good surface view.
5820	20090410 072534	14.60103003	144.7756568	359.6	9.09	519.61	528.7	Up on ridge top.
5821	20090410 072608	14.60103035	144.7755738	0.31	11.58	520.35	531.93	Plume obscuring view
5823	20090410 072626	14.60103135	144.7755363	0.24	10.28	523.14	533.42	No vis. high up-dropping down closer to surface to see.
5824	20090410 072634	14.60103077	144.7755251	359.65	11.26	522.09	533.35	Limited visibility.
5826	20090410 072731	14.60103065	144.7754594	0.47	9.66	521.98	531.64	Can see bottom through plume fog.
5827	20090410 072757	14.60103053	144.7753996	0.37	5.59	522	527.59	Big outcrop (almost pillar like). from slope.
5829	20090410 072828	14.60103084	144.7753282	359.87	11.08	521.96	533.04	Craggy outcrops north of pit. Still can see.
5831	20090410 072937	14.6010305	144.7752516	359.91	4.55	528.25	532.8	Starting to switch to east traverse. Plume is above us but wafts into view-limiting.
5834	20090410 073111	14.60108174	144.775251	0.07	6.01	528.71	534.72	Going to do one more sweep north of these tracks as head east. Then will go down to the SE quad from pit.
5835	20090410 073139	14.60112589	144.775251	359.51	4.41	528.62	533.03	Steep slope and visibility as move north.
5836	20090410 073204	14.60112119	144.7752744	355.07	3.75	527.46	531.21	Small outcrops on smooth slope. Seeing sed drift downslope with crabs. Crabs here.
5838	20090410 073222	14.60112012	144.7752993	355.97	3.05	524.63	527.68	Heading north with slope down to west.
5839	20090410 073252	14.60112105	144.7753423	359.11	7.61	519.82	527.43	Heading east with good visibility.
5841	20090410 073319	14.60112225	144.7753745	355.05	7.94	516.48	524.42	Spoke to soon-foggy visibility.
5842	20090410 073337	14.60112462	144.7754188	355.5	8.75	515.96	524.71	Tephra bucket in view on sci cam within fog. It is upright.
5844	20090410 073422	14.60112088	144.7754761	0.12	5.88	517.26	523.14	There is the marker (marker 107?)
5845	20090410 073437	14.60111475	144.7754999	359.99	8.86	517.19	526.05	Moving along craggy outcrops with visibility improving on the other side.
5847	20090410 073525	14.601122	144.7755952	359.57	9.89	517.27	527.16	Jason continuing east traverse along ridge top.
5848	20090410 073538	14.6011175	144.7756233	15.4	11.5	516.51	528.01	Visibility ok-not great.
5850	20090410 073637	14.6011371	144.775561	358.96	9.36	517.22	526.58	Sci cam best view.
5851	20090410 073659	14.60114122	144.775584	358.43	8.88	517.43	526.31	At the summit. Above summit the vis is so-so.
5853	20090410 073744	14.60115366	144.7756412	359.3	3.89	519.72	523.61	Pilot cam is looking straight out. Relying on brow cam and Medea cam for bigger view.
5856	20090410 074007	14.60119606	144.7758445	357.3	3.35	529.59	532.94	Visibility is OK but not great
5858	20090410 074048	14.60119756	144.7759084	1.54	3.45	530.48	533.93	Going over big rock
5861	20090410 074256	14.60121279	144.7761112	358.74	13.1	530.1	543.2	18 meters off seafloor
5862	20090410 074306	14.60121265	144.7761272	358.92	14.93	531.07	546	Cannot see seafloor
5865	20090410 074425	14.60121615	144.7761834	2.3	5.3	551.73	557.03	Seafloor in sight again
5867	20090410 074559	14.60112329	144.7761482	354.98	1.88	549.75	551.63	Jason moving south
5869	20090410 074621	14.60112227	144.7761382	307.51	7.84	544.56	552.4	Cliff
5870	20090410 074709	14.60109551	144.7760966	336.86	8.03	538.18	546.21	Moving up cliff
5872	20090410 074758	14.60107627	144.7760433	337.83	6.39	528.12	534.51	Visibility good
5874	20090410 074851	14.60104101	144.7759716	353.16	4.6	522.15	526.75	Slight plume
5876	20090410 074948	14.60104742	144.7759035	357.63	0.74	522.73	523.47	Jason moving west
5878	20090410 075143	14.60101382	144.7758502	358.47	2.93	521.18	524.11	Visibility pretty good
5880	20090410 075211	14.60094809	144.7758439	3.82	12.3	519.4	531.7	Plume present visibility low
5882	20090410 075351	14.60093718	144.7758069	64.62	6.09	526.53	532.62	Visibility low but can still see seafloor a bit
5884	20090410 075509	14.60085981	144.7758466	98.92	5.19	527.79	532.98	Jason moving south
5886	20090410 075609	14.60084134	144.7758538	97.49	5.49	528.04	533.53	Visibility still low but can see seafloor
5888	20090410 075701	14.60081882	144.7758504	96	1.96	532.84	534.8	Visibility improving
5890	20090410 075748	14.60075033	144.7758583	98.95	5.88	532.99	538.87	Changing search pattern to better manage steep slope
5892	20090410 075812	14.60072951	144.7758491	97.84	5.71	534.51	540.22	Visibility poor

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
5893	20090410 075843	14.60074455	144.775847	109.32	3.24	536.63	539.87	Visibility better
5896	20090410 080015	14.60065203	144.7759389	93.82	4.31	537.31	541.62	Jason facing east
5898	20090410 080150	14.6007258	144.7759764	4.02	4.1	529.67	533.77	Jason moving north
5901	20090410 080404	14.60086653	144.7759845	4.16	2.64	521.18	523.82	Visibility OK some smoke in water
5903	20090410 080447	14.60091412	144.7759975	3.78	2.01	519.41	521.42	Lots of shrimp hanging out on seafloor
5905	20090410 080523	14.60095065	144.7760001	359.2	180.3	520.82	701.12	Just went over crest of summit ridge
5906	20090410 080546	14.60100855	144.7760053	4.28	1.06	524.41	525.47	Plume thicker
5907	20090410 080552	14.60102032	144.7760127	2.86	1.19	525.16	526.35	Visibility low
5909	20090410 080614	14.60102144	144.7760664	5.5	1.38	525.13	526.51	Hard to see seafloor
5910	20090410 080647	14.60103255	144.7761138	5.31	3	522.48	525.48	No visibility
5912	20090410 080749	14.60101089	144.7761225	183.65	8.55	524.86	533.41	Seafloor more in view
5914	20090410 080828	14.60096766	144.7761171	184.03	2.28	524.08	526.36	Jason moving south
5915	20090410 080846	14.60095223	144.7761151	184.18	2.2	522.67	524.87	Jason heading is south
5917	20090410 080928	14.60092453	144.7761153	185.8	2.38	521.53	523.91	Slope is steep but relatively smooth
5918	20090410 080959	14.60086956	144.7761087	184.16	1.5	522.73	524.23	Visibility pretty good
5922	20090410 081228	14.60061686	144.7761699	150.08	2.34	536.09	538.43	Jason moving southeast
5923	20090410 081255	14.6005894	144.7762467	129.34	2.11	541.11	543.22	Sediments stirred up easily by Jason
5925	20090410 081339	14.60058029	144.7762592	218.2	6.89	539.99	546.88	Slope is very smooth and covered in white deposit like dusting of snow
5927	20090410 081424	14.6005211	144.7762118	240.92	4.45	540.25	544.7	Jason moving downslope to southwest
5928	20090410 081452	14.6005754	144.7762038	303.95	5.68	537.71	543.39	Jason moving northwest
5929	20090410 081459	14.60058144	144.7761999	301.62	6.04	537.02	543.06	Jason heading is 300
5931	20090410 081602	14.60055324	144.7761974	333.09	7.35	534.91	542.26	Visibility decreasing
5933	20090410 081700	14.60053915	144.7761705	311.91	7.23	534.93	542.16	Marker 105 visible
5935	20090410 081806	14.60060873	144.7761157	311.07	6.53	531.63	538.16	Visibility OK again
5937	20090410 081827	14.60064076	144.7760793	310.21	6.95	528.59	535.54	Plume increasing
5938	20090410 081855	14.60068133	144.7760289	310.91	9.5	526.85	536.35	Jason still moving northwest
5940	20090410 081920	14.60071877	144.7759866	310.08	5.21	527.3	532.51	Slope is much steeper off to right of view
5941	20090410 081949	14.60073428	144.7759556	6.85	13.43	523.68	537.11	Jason following contour 525m 10m above bottom
5943	20090410 082041	14.6007313	144.77594	321.79	5.71	527	532.71	Cannot see seafloor momentarily
5944	20090410 082109	14.60073859	144.7758963	321.42	9.01	528.82	537.83	Jason moving southwest
5947	20090410 082211	14.60073289	144.7758641	321.53	4.26	535.84	540.1	Jason disturbed slope
5948	20090410 082228	14.60074704	144.7758716	26.64	6.16	536.55	542.71	Plume obscuring seafloor
5949	20090410 082236	14.60074947	144.7758746	71.83	6.09	536.63	542.72	Seafloor visible again
5950	20090410 082249	14.60075433	144.7758752	117.74	4.79	536.44	541.23	Lots of orange staining on rocks
5951	20090410 082305	14.60075146	144.7758731	131.82	4.56	536.01	540.57	Jason heading is 135
5953	20090410 082330	14.60073076	144.7758548	125.38	6.09	536.8	542.89	Jason moving southeast
5954	20090410 082348	14.60072327	144.7758494	130.88	5.54	537.92	543.46	Bottom has sharp drop-off
5957	20090410 082513	14.60065492	144.7759334	131.71	3.28	537.95	541.23	Visibility OK with some smoke clouding water
5959	20090410 082619	14.60056251	144.7760191	128.57	4.54	538.76	543.3	Slope drops sharply to right of view Jason heading is 135
5960	20090410 082646	14.60052097	144.7760722	131.79	3.85	541.94	545.79	Jason still moving southeast
5963	20090410 082825	14.60043793	144.7760792	129.04	9.18	543.48	552.66	Plume increasing
5964	20090410 082846	14.60040917	144.7760521	130.94	8.59	547.28	555.87	Visibility low
5965	20090410 082909	14.60041541	144.7760554	80.74	6.49	551.05	557.54	Visibility better Jason moving Southwest
5967	20090410 083006	14.60041823	144.776048	309.45	3.94	552.62	556.56	Jason heading changing to 307
5969	20090410 083025	14.60043276	144.7760312	311.21	4.36	553.31	557.67	Jason moving northwest

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
5971	20090410 083111	14.60050094	144.7759478	309.77	6.89	553.77	560.66	Sulfur coating on some rocks
5972	20090410 083120	14.60051144	144.7759346	311.14	8.39	551.9	560.29	Visibility pretty good
5973	20090410 083139	14.60053921	144.7759016	309.96	9.39	548.39	557.78	Rocks look like pillow lavas
5976	20090410 083331	14.60068426	144.7757279	308.7	6.1	537.72	543.82	Plume is increasing
5977	20090410 083400	14.60068445	144.7756816	308.59	4.88	537	541.88	Visibility poor plume covering seafloor
5979	20090410 083442	14.60063884	144.7756328	306.85	6.04	534.58	540.62	Seafloor visible lots of blocky yellow rocks scattered around with black smooth sediments between rocks
5981	20090410 083520	14.60063913	144.7756346	84.29	3.49	533.4	536.89	Jason heading changing back towards 135
5982	20090410 083540	14.60063428	144.7756445	132.3	0.83	537.39	538.22	Jason had moved to southwest
5983	20090410 083554	14.60061131	144.7756751	130.99	1.85	539.04	540.89	Starting next line moving southeast
5985	20090410 083617	14.60057791	144.7757139	131.43	2.78	542.56	545.34	Visibility low in front better behind
5986	20090410 083706	14.60050431	144.7758004	130.78	4.83	549.6	554.43	Seafloor partly visible in front
5989	20090410 083828	14.60038519	144.7759441	130.56	4.86	560.41	565.27	Visibility so-so
5991	20090410 083929	14.60035717	144.7759724	335.25	8.53	561.98	570.51	Seafloor mostly black rubbly rock with some white sediment covering
5992	20090410 083954	14.60032937	144.775944	312.89	7.93	563.33	571.26	Visibility better
5994	20090410 084013	14.60033455	144.7759323	310.34	7.6	564.12	571.72	Jason moving southwest to position for next line
5995	20090410 084026	14.60035683	144.7759067	310.67	6.81	562.37	569.18	Jason heading is 311 moving northwest
5997	20090410 084115	14.60031824	144.775884	304.98	8.16	559.74	567.9	Jason moving southwest
5998	20090410 084141	14.60032204	144.7758757	312.97	5.63	562.13	567.76	Jason moving southeast
5999	20090410 084158	14.6003473	144.775847	310.29	9.98	558.79	568.77	Jason moving back northwest again
6000	20090410 084207	14.60036265	144.775828	310.28	10.84	558.11	568.95	Visibility OK
6003	20090410 084328	14.60045822	144.7757161	309.7	10.33	544.25	554.58	Still moving northwest visibility pretty good
6006	20090410 084611	14.60062523	144.775517	310.38	7.99	525.37	533.36	Passed over vertical spires
6008	20090410 084653	14.60066208	144.7755459	311.23	4.85	527.49	532.34	Jason moving upslope to northeast
6009	20090410 084702	14.60067102	144.7755544	300.87	4.89	527.88	532.77	Plume blocking view of seafloor
6011	20090410 084804	14.60072069	144.7755571	310.8	2.95	528.85	531.8	Jason stirs up sediments easily visibility low due to sediments kicked up from previous lines
6012	20090410 084816	14.60073685	144.7755351	305.04	1.44	529.52	530.96	Jason plowed up some ash
6014	20090410 084845	14.60074683	144.7755334	310.83	4.14	526.5	530.64	Ash layer on bottom seems soft and deep enough for Jason to dig in a little way
6015	20090410 084850	14.60074591	144.7755322	300.68	4.19	526.6	530.79	No visibility
6017	20090410 084924	14.60072679	144.7755146	219.91	3.6	526.64	530.24	Jason moving northwest
6018	20090410 084933	14.60071142	144.7755	220.52	3.89	525.42	529.31	Bottom slightly in sight again
6019	20090410 084946	14.60068724	144.7754808	219.91	4.11	523.75	527.86	Visibility better
6021	20090410 085026	14.60061712	144.7754197	219.56	2.19	523.56	525.75	Jason moving southwest
6022	20090410 085036	14.60060295	144.7754077	220.48	2.96	524.07	527.03	Moving downslope
6023	20090410 085113	14.60059279	144.7754138	130.09	0.89	526.13	527.02	Jason heading is 130
6025	20090410 085128	14.60057375	144.7754448	130.13	2.05	526.93	528.98	Moving southeast
6026	20090410 085135	14.60056366	144.7754566	130.99	2.58	527.15	529.73	bottom barely in sight
6028	20090410 085250	14.60045432	144.7755861	130.7	5.85	537.05	542.9	Cannot see seafloor
6030	20090410 085347	14.60037221	144.775683	129.39	5.16	548.01	553.17	Bottom slightly visible again
6032	20090410 085446	14.60033614	144.7756798	220.77	4.34	551.62	555.96	Jason heading changing to 221
6034	20090410 085524	14.60028532	144.7756335	217.21	3.14	555.25	558.39	Jason moving southeast
6035	20090410 085532	14.60029089	144.7756341	260.83	4.29	555.01	559.3	Bottom is rubbly rock
6036	20090410 085552	14.60029585	144.7756282	309.57	8.49	552.08	560.57	Jason heading changing to 313
6037	20090410 085609	14.6003224	144.7755904	312.33	8.7	548.52	557.22	Jason moving northwest

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6039	20090410 085656	14.60039475	144.775508	310.15	10.4	538.64	549.04	Visibility reasonably good
6043	20090410 085939	14.60062462	144.7752576	306.44	3.44	523.52	526.96	Jason still moving northwest visibility OK
6044	20090410 090018	14.60066101	144.7752909	302.02	4.23	520.66	524.89	Jason moving northeast
6046	20090410 090059	14.60069896	144.775273	305.41	3.49	519.08	522.57	Jason moving northwest
6047	20090410 090114	14.6007179	144.7752456	305.79	3.16	519.59	522.75	Heading straight into plume
6049	20090410 090157	14.60077188	144.7751678	306.05	2.74	524.41	527.15	Visibility limited
6051	20090410 090232	14.60081287	144.7751091	305.92	5.29	526.98	532.27	Cannot see seafloor
6052	20090410 090307	14.60083521	144.775073	305.58	4.63	530.79	535.42	Plume obscuring seafloor
6054	20090410 090415	14.60076063	144.7750255	27.84	7.75	534.02	541.77	Seafloor in sight again
6056	20090410 090442	14.60075669	144.7750324	129.08	6.5	534.03	540.53	Jason heading is moving to 130
6057	20090410 090455	14.60073686	144.7750584	127.5	6.1	532.4	538.5	Jason moving southeast
6059	20090410 090555	14.60065724	144.7751744	126.48	4.39	526.57	530.96	Visibility pretty good
6063	20090410 090836	14.60055091	144.7752193	214.96	3.38	527.8	531.18	Jason heading is 215
6064	20090410 090845	14.60053487	144.7752081	214.94	3.39	529.02	532.41	Jason moving southwest
6066	20090410 090922	14.60052681	144.7752026	308.9	2.83	532.66	535.49	Heading changing to 310
6067	20090410 090942	14.60055342	144.7751615	305.65	3.85	532.78	536.63	Jason moving northwest
6069	20090410 091030	14.60061685	144.7750731	305.6	3.66	535.38	539.04	Visibility OK
6070	20090410 091038	14.60062728	144.775058	305.59	3.81	535.97	539.78	Some cloudiness in water
6071	20090410 091109	14.60066694	144.775	305.77	2.86	539.79	542.65	Lots of large particles in water
6074	20090410 091243	14.60072886	144.7749128	35.18	8.96	539.38	548.34	Visibility better
6075	20090410 091256	14.60074859	144.7749274	36.52	8.46	537.83	546.29	Jason heading is 36
6076	20090410 091311	14.60078089	144.7749522	36.1	6.41	536.94	543.35	Jason moving northeast
6078	20090410 091405	14.60087677	144.7750242	35.49	3.39	538.06	541.45	Visibility diminished but marginally OK
6080	20090410 091517	14.60087567	144.7750165	274.17	1.75	538.74	540.49	Jason heading changing to 275
6082	20090410 091539	14.60087956	144.7749594	276.38	1.54	541.5	543.04	Jason moving west
6083	20090410 091547	14.60088191	144.7749414	276.06	1.21	542.58	543.79	Can barely see seafloor
6085	20090410 091700	14.6008915	144.7748374	275.56	2.1	550.44	552.54	Best view is in aft-looking cam
6087	20090410 091806	14.60091539	144.7748406	96.81	10.19	547.24	557.43	Jason heading changing to 97
6089	20090410 091837	14.6009369	144.7748428	95	11.24	547.25	558.49	Jason moving north
6090	20090410 091902	14.60093394	144.7748688	96.45	12.21	544.16	556.37	Visibility decreasing
6092	20090410 091921	14.60092791	144.7749245	94.53	8.2	541.27	549.47	Patches of black ash on seafloor
6093	20090410 091948	14.60092305	144.774986	95.2	6.31	539.19	545.5	Water is mostly cloudy
6094	20090410 092005	14.60091773	144.7750227	96.11	6.28	538.07	544.35	Visibility better
6095	20090410 092018	14.6009147	144.7750483	95.22	5.89	536.59	542.48	Jason moving east
6098	20090410 092147	14.6009053	144.7751595	93.77	4.89	530.79	535.68	Visibility decreasing
6099	20090410 092207	14.60090173	144.775196	95.31	5.28	528.4	533.68	Bottom is rock rubble
6101	20090410 092232	14.60090046	144.7751945	5.57	1.33	529.74	531.07	Jason heading changing to 000
6102	20090410 092307	14.60087833	144.7752054	27.42	1.88	529.37	531.25	Jason moving south
6104	20090410 092319	14.60088919	144.7752167	30.93	2.11	529.48	531.59	Lots of shrimp being kicked up off bottom by Jason
6105	20090410 092351	14.60088752	144.7752146	356.65	1.34	530.2	531.54	Can only see bottom in aft-looking cam shrimp flying all over the place
6107	20090410 092429	14.60088188	144.775172	4.49	3.15	529.41	532.56	Jason moving southeast
6108	20090410 092514	14.60095212	144.7751679	4.62	0.84	536.76	537.6	Hard to see in forward-looking cams
6110	20090410 092543	14.60099736	144.7751745	3.81	1.76	538.57	540.33	Bottom slightly more visible now
6112	20090410 092620	14.60099497	144.7751723	4.75	2.06	538.29	540.35	Jason is moving north
6113	20090410 092634	14.60099533	144.7751727	4.82	2.05	538.34	540.39	two vertical liking lines present on seafloor

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6115	20090410 092742	14.60100455	144.7750512	4.92	3.03	543.81	546.84	Jason moving west
6117	20090410 092849	14.60101658	144.7748974	5.39	3.86	551.24	555.1	Can barely see seafloor in forward looking cams aft cam reasonable
6119	20090410 093003	14.60102964	144.7747259	4.57	2.99	559	561.99	Seafloor now visible again
6122	20090410 093137	14.60108832	144.7746867	4.51	3.49	563.89	567.38	Jason moving north
6125	20090410 093323	14.60110881	144.7748885	2.18	1.31	557.96	559.27	Big boulder in view sitting on otherwise smooth terrain
6126	20090410 093343	14.6011048	144.7749336	1.75	1.75	555.33	557.08	Jason moving east
6127	20090410 093417	14.60109918	144.7749946	5.55	4.1	550.19	554.29	Mostly smooth slope with occasional boulder sitting on top
6129	20090410 093440	14.60109653	144.7750442	3.25	4.18	547.99	552.17	Visibility not too bad
6131	20090410 093523	14.60108882	144.7751007	2.72	8.95	539.71	548.66	moving upslope into large outcrop with almost vertical face
6133	20090410 093622	14.60107872	144.7752436	3.54	2.98	533.27	536.25	Lots of orange crust and ripples in sediment
6135	20090410 093810	14.60114057	144.775255	6.56	1.65	532.84	534.49	Jason moving north
6137	20090410 093848	14.60116787	144.7752552	6.61	2.99	533.44	536.43	Slope is smooth with finer sediments
6138	20090410 093915	14.60117378	144.775191	5.58	4.53	534.6	539.13	Cannot see seafloor
6140	20090410 093955	14.60118038	144.7751009	5.43	7	540.15	547.15	Bottom barely visible
6141	20090410 094015	14.60118384	144.7750553	4.97	6.99	544.43	551.42	Jason moving west
6143	20090410 094040	14.60118887	144.7749966	5.84	7.98	547.08	555.06	Visibility low some cloudiness in water 8m above bottom
6144	20090410 094114	14.60119431	144.7749188	4.98	7.66	552.32	559.98	Visibility a little better
6146	20090410 094145	14.6012001	144.7748453	4.67	8.3	555.42	563.72	Visibility poor
6148	20090410 094317	14.60123703	144.7747046	4.47	4.74	566.64	571.38	Seafloor in sight again
6151	20090410 094424	14.60131215	144.7747095	85.28	8.6	560.79	569.39	Yellow deposits in grooves as if from flowing downslope some ripples evident in sediments
6153	20090410 094521	14.60130662	144.7748237	92.94	7.66	555.89	563.55	Jason moving east
6154	20090410 094542	14.60129301	144.774839	100.87	7.2	556.08	563.28	Bottom is quite smooth except for ripples
6155	20090410 094556	14.60129427	144.7748677	99.04	7.38	554.47	561.85	A few larger rocks here and there
6159	20090410 094830	14.60125464	144.7751913	97.85	6.04	536.4	542.44	Steep slope mostly looks like ash has downslope directed streaked appearance
6160	20090410 094845	14.60125193	144.7752205	98.21	7.74	533.14	540.88	Some yellow patches
6162	20090410 094948	14.6012447	144.77528	98.78	9.15	527.81	536.96	Bottom sediments are rippled
6165	20090410 095146	14.60121638	144.7754041	81.45	4.48	524.24	528.72	Bottom strongly rippled
6166	20090410 095206	14.60122375	144.7754541	80.84	2.35	523.41	525.76	Andra taking over logging
6172	20090410 095644	14.6013008	144.776037	90	8.73	541.38	550.11	Coming up to summit rim.
6179	20090410 100003	14.60129941	144.776137	90.38	3.38	544.5	547.88	WATCHSTANDERS Andra Bobbitt logger Heidi Berkenbosch video
6180	20090410 100011	14.60129921	144.7761378	90.59	3.19	544.55	547.74	J2-403 Data DVDs start Last Data DVDs entry was actually to start red DVD set 35
6182	20090410 100029	14.60129923	144.7761374	90.63	3.2	544.56	547.76	J2-403 Since then have stopped red set 35 and started blue set 36
6183	20090410 100049	14.60129614	144.7761243	83.03	3.53	544.57	548.1	J2-403 DVCAM 031 start
6185	20090410 100218	14.6012154	144.7759006	236.69	9.7	535.39	545.09	We are near marker 107 (not in view at all) on summit
6188	20090410 100418	14.6011387	144.7760257	67.29	7.79	532.21	540	Looking for marker 107 to deploy hydrophone.
6191	20090410 100534	14.60113767	144.7758758	272.74	9.13	527.88	537.01	Following ridge at 270.
6192	20090410 100549	14.60113857	144.7758849	272.97	9.56	528.06	537.62	North side of the summit ridge-facing west.
6195	20090410 100750	14.6011253	144.7756966	271.6	8.09	522.56	530.65	Some rock outcrops on relatively smooth slope.
6197	20090410 100824	14.60109645	144.7756109	272.5	4.51	521.1	525.61	Upper ridge is weird-few outcrops and a lot of sediment.
6198	20090410 100839	14.60109311	144.7756002	270.14	2.94	521.42	524.36	Entering plume from Brimstone as summited the ridge.
6200	20090410 100943	14.60108489	144.7754553	268.15	3.76	526.39	530.15	Can't see much here with only 3.5 m above bottom.
6201	20090410 101007	14.60107992	144.7754018	272.94	2.53	531.81	534.34	Butt cam has best view and can see Jason in Medea cam.
6202	20090410 101015	14.6010805	144.7754037	273.39	2.64	531.65	534.29	Settling out of the plume.
6204	20090410 101057	14.6010808	144.7754167	176.84	3.81	530.71	534.52	Spinning around to look for marker-nav has it between us and Medea.



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6206	20090410 101155	14.6011088	144.7755468	136.91	5.9	521.46	527.36	On top of ridge-driving along.
6208	20090410 101238	14.60107246	144.7756021	146.26	4.38	519.04	523.42	There is the tephra sampler. It is Bucket F on the summit rim.
6209	20090410 101311	14.60105497	144.7755894	146.24	4.15	519.29	523.44	Visibility is poor up here today.
6211	20090410 101330	14.60101826	144.7755777	97.92	5.49	518.94	524.43	Lots of plume in Medea cam.
6212	20090410 101406	14.60097912	144.7756069	82.21	2.79	518.49	521.28	Coming up the rim where the marker should be.
6213	20090410 101417	14.6009797	144.7756083	80.19	3.29	517.71	521	There is Marker 107 on the summit rim.
6216	20090410 101532	14.6010297	144.7756073	123.63	6.61	515.3	521.91	Depth is same and nav right now is about 20m off to the SE.
6217	20090410 101543	14.6010378	144.7755967	115.07	5.5	517.05	522.55	Deployed hydrophone last time at 122 degrees.
6218	20090410 101552	14.60102529	144.7755897	122.98	4.85	517.99	522.84	There is not much visibility here at all.
6221	20090410 101726	14.60101093	144.7756018	125.42	1.96	520.04	522	The bucket is tilted.
6223	20090410 101837	14.60099555	144.7755996	61.68	2.85	519.01	521.86	Heading for hydrophone was actually 44 (hydrophone was moved after it was deployed)
6224	20090410 101848	14.60099126	144.7756141	64.09	1.91	519.02	520.93	Weight plate nearby.
6225	20090410 101906	14.60099376	144.7756152	48.62	1.93	519.2	521.13	Visibility much improved at new heading (shadowed by outcrop?)
6227	20090410 101944	14.60099553	144.7756146	50.68	1.84	519.35	521.19	All set up for hydrophone deployment. Heading is 50.7 with tephra E just to the left of view.
6228	20090410 101955	14.60099553	144.7756145	51.83	1.83	519.28	521.11	Lots of crabs and some shrimp in this location.
6230	20090410 102106	14.60099343	144.7756142	51.62	1.83	519.29	521.12	Navigation is actually good. Medea is positioned just a few meters from the target location and Medea is right above us.
6232	20090410 102121	14.60099351	144.7756142	51.62	1.81	519.28	521.09	Maybe need to reset after operations here.
6233	20090410 102141	14.60099264	144.7756141	51.62	1.8	519.3	521.1	Trying to figure out how to get hydrophone out of the basket with the big beast wand.
6235	20090410 102254	14.60099164	144.7756138	51.64	1.9	519.25	521.15	Moving Beast wand out of the way.
6237	20090410 102326	14.6009915	144.7756138	51.66	1.9	519.26	521.16	Long Beast wand is ungainly to handle.
6238	20090410 102402	14.60099123	144.7756136	51.68	1.9	519.26	521.16	Looks like Beast hose has a kink in it but couldn't rotate with it hitting the other arm.
6240	20090410 102439	14.60099093	144.7756132	51.76	1.9	519.26	521.16	Using other arm to retrieve the hydrophone from the basket.
6242	20090410 102532	14.6009886	144.7756122	51.83	1.93	519.23	521.16	Hydrophone out of basket.
6243	20090410 102614	14.60098833	144.7756121	51.79	1.91	519.21	521.12	Location looks fine where placed.
6245	20090410 102638	14.60098722	144.7756119	51.77	1.88	519.28	521.16	DEPLOY Hydrophone is place. Now need to put long wand back in the basket.
6248	20090410 102859	14.60098774	144.7755267	51.75	1.86	519.28	521.14	Wand is in basket.
6250	20090410 102932	14.60098669	144.7755264	51.73	1.81	519.29	521.1	Nice and tidy-bungee back over wand to hold it down.
6252	20090410 103049	14.60098949	144.7755268	51.26	1.93	519.32	521.25	Lots of crabs here.
6254	20090410 103140	14.60098774	144.7755275	47.77	1.95	519.27	521.22	Decided to move hydrophone slightly.
6255	20090410 103154	14.60098812	144.7755276	47.78	2.03	519.25	521.28	Wiggling the hydrophone in the sediment to bury it in place.
6257	20090410 103224	14.60098703	144.7755274	47.81	1.94	519.29	521.23	Want to look in bucket to see if there is any tephra in (Bucket F Tephra).
6259	20090410 103400	14.60102763	144.7755328	181.34	4.24	518.41	522.65	Getting a good overview of bucket-hydrophone-marker.
6260	20090410 103412	14.60102339	144.7755335	181.68	3.84	518.46	522.3	Brow cam has best view inside the bucket.
6262	20090410 103503	14.60102483	144.7755335	181.73	3.98	518.41	522.39	Not much tephra in bucket. Bucket is leaning away from the pit.
6264	20090410 103535	14.60102176	144.7755337	181.79	3.05	519.09	522.14	Would like to have bucket oriented straight up and down better.
6265	20090410 103541	14.60101737	144.7755349	181.87	2.45	519.54	521.99	Moving in to straighten it up.
6267	20090410 103713	14.60101534	144.7755361	182.58	1.71	519.97	521.68	Bucket Tephra F is now upright.
6270	20090410 103845	14.60102186	144.7754999	222.4	2.65	518.46	521.11	Heading back to Brimstone for fluid sampling.
6272	20090410 103944	14.60090583	144.7752955	205.85	7.5	528.34	535.84	Lots of plume and no visibility.
6274	20090410 104110	14.60087434	144.7752782	143.12	3.74	535.21	538.95	Lots of shrimp when came down to bottom on an outcrop. 50m deeper than Brimstone.
6276	20090410 104126	14.60085861	144.7752794	168.9	2.99	534.2	537.19	Need to go up and over cone enroute to Brimstone. Lots of shrimp.
6277	20090410 104140	14.60084604	144.7752777	164.87	3.76	532.54	536.3	Lava blocks that came out of the vent-look older and brown.
6278	20090410 104156	14.60082969	144.7752784	164.29	4.24	531.08	535.32	Just north of the vent (plume fog).

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6279	20090410 104219	14.60080958	144.7752871	165.13	3.9	529.11	533.01	Sulfur and alteration (white) in rocks. Shrimp.
6281	20090410 104316	14.60074323	144.7753058	164.03	4.48	522.91	527.39	Climbing up and increasing tephra sediment over the rocks.
6283	20090410 104338	14.60072285	144.7753047	137.66	6.09	519.92	526.01	Some shimmering water.
6284	20090410 104401	14.60068956	144.7752902	137.58	6.09	517.18	523.27	Brimstone is on the other side (we are on the high side).
6285	20090410 104411	14.60067319	144.7752829	122.21	5.14	516.94	522.08	Tephra sampler right there.
6287	20090410 104423	14.60067534	144.7752858	122.92	5.66	516.93	522.59	Hardly ever get to see this side of the vent.
6288	20090410 104431	14.60069962	144.7753049	127.69	6.58	516.74	523.32	Good view.
6289	20090410 104437	14.60071526	144.775323	141.6	8.3	516.66	524.96	VIDEO Start recording HDCam
6290	20090410 104506	14.60069509	144.7753964	192.38	6.39	519.2	525.59	Plume now engulfing Jason. Maybe just a brief view of this side of the vent.
6291	20090410 104517	14.60068058	144.7754088	218.72	5.6	519.93	525.53	J2-403 Data DVDs start
6292	20090410 104519	14.60067972	144.7754096	227.39	5.55	519.93	525.48	Coming down lower under plume.
6294	20090410 104534	14.60065856	144.7754128	270.37	4.53	519.68	524.21	J2-403 Start DVD red set 037
6295	20090410 104535	14.60065688	144.7754126	270.32	4.39	519.67	524.06	Looking west right now.
6296	20090410 104539	14.6006522	144.7754127	269.09	3.65	519.73	523.38	Fresh tephra on this side.
6297	20090410 104556	14.6006465	144.7754113	258.29	4.33	518.85	523.18	Vent is on left.
6298	20090410 104609	14.60063379	144.7754097	258.71	3.54	519.63	523.17	Looks like hot water between rocks below.
6300	20090410 104703	14.60064022	144.7754029	265.67	3.23	519.69	522.92	VIDEO Stop recording HDCam
6304	20090410 104937	14.60064352	144.7754027	265.26	3.45	519.5	522.95	Thinking we are going to go around to the right to get on the north side of the pit rim.
6305	20090410 104957	14.60066133	144.7753882	237.53	4.35	518.81	523.16	Moving right.
6306	20090410 105004	14.60066263	144.7753787	203.38	4.68	518.06	522.74	J2-403 Data DVDs stop blue set 36
6307	20090410 105019	14.60066733	144.7753476	139.07	3.23	517.39	520.62	Visibility is much better here on the north side.
6309	20090410 105057	14.60059405	144.7753278	74.79	4.38	517.19	521.57	Going around counter-clockwise of vent for a look.
6310	20090410 105103	14.60058253	144.7753294	46.31	4.23	517.62	521.85	East look.
6311	20090410 105118	14.60055956	144.7753534	26.56	5.53	518.83	524.36	Vent is up against the mound on the north side.
6313	20090410 105149	14.60053337	144.7753729	18.63	3.76	521.05	524.81	Looking sort of north (normal view that we have been sampling).
6315	20090410 105221	14.6005299	144.7753705	18.08	3.99	520.83	524.82	Pit has really changed dramatically-plume has moved over to the left of the rocks we watched yesterday.
6316	20090410 105247	14.60053178	144.7753634	15.64	5.28	519.65	524.93	VIDEO Start recording HDCam
6317	20090410 105258	14.6005354	144.7753647	15.85	4.3	520.18	524.48	Looks like a hole on left and higher on right compared to last night.
6318	20090410 105316	14.60054345	144.7753648	16.07	2.11	522.17	524.28	Vent looks like its on a slope than yesterday.
6321	20090410 105422	14.60057504	144.7753152	80.9	1.69	521.11	522.8	Lots of bubbles (continuous)
6323	20090410 105545	14.60061663	144.7753056	94.87	1.86	519.14	521	Good view of Bucket.
6324	20090410 105559	14.60063014	144.7753144	121.51	2.03	518.66	520.69	Going clockwise now.
6325	20090410 105612	14.60064414	144.7753206	125.27	1.65	518.69	520.34	Looking east again.
6327	20090410 105635	14.60066168	144.7753361	149.99	1.24	518.68	519.92	Shimmer in foreground.
6329	20090410 105748	14.60066458	144.7753408	148.92	1.95	519.11	521.06	Looking at area of shimmer on backside of Pit. Facing 149.
6330	20090410 105807	14.6006673	144.7753395	149.21	2.43	518.92	521.35	Basket knocked off some flock material. Shrimp are here.
6332	20090410 105823	14.60066693	144.7753401	149.78	2.36	518.96	521.32	Is the floc bacterial? What is it?
6333	20090410 105840	14.60066708	144.77534	149.79	2.34	518.98	521.32	VIDEO Stop recording HDCam
6334	20090410 105904	14.60066693	144.77534	149.88	2.31	518.99	521.3	Having a look at wand.
6338	20090410 110128	14.60066709	144.7753412	150.26	2.39	518.96	521.35	Holding wand to look at hose.
6341	20090410 110405	14.60066729	144.7753415	151.02	2.33	519.01	521.34	Having hose issues with wand.
6345	20090410 110705	14.6006656	144.775342	151.56	2.39	518.99	521.38	Going to lay it down and then pick it up another way.
6346	20090410 110712	14.60066618	144.7753421	151.66	2.38	519	521.38	Lots of bubbles coming up to Medea.
6347	20090410 110719	14.60066638	144.7753422	151.62	2.39	518.99	521.38	Turning on Medea HD.

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6349	20090410 110730	14.60066679	144.7753422	151.69	2.38	519	521.38	Lots of bubbles.
6350	20090410 110805	14.6006665	144.7753422	151.7	2.38	518.98	521.36	Plume looks like it has picked up.
6354	20090410 111037	14.60066723	144.7753433	150.71	2.51	519.01	521.52	Still trying to manage the wand and get the kinks out.
6355	20090410 111116	14.60066767	144.7753434	150.59	2.51	519	521.51	Taking Jason temp prove out of holster to use for the big wand.
6358	20090410 111246	14.60066723	144.7753429	150.59	2.41	519.13	521.54	Stop Medea HD.
6360	20090410 111322	14.60066715	144.7753432	153	2.45	519.24	521.69	Wand was bent a little.
6361	20090410 111420	14.6006663	144.7753418	151.68	2.25	519.22	521.47	Still trying to rotate without snagging tip.
6363	20090410 111504	14.60066363	144.7753421	153.77	2.49	519.19	521.68	Dropping temp probe from other arm so can use this arm to grab Beast wand
6365	20090410 111552	14.60066327	144.7753416	151.72	2.35	519.17	521.52	Port arm grasping Beast wand.
6366	20090410 111609	14.60066357	144.7753417	151.09	2.38	519.13	521.51	Plume direction changing a little-getting some smoke.
6368	20090410 111634	14.6006641	144.7753418	151.18	2.39	519.14	521.53	Clearing up again.
6369	20090410 111644	14.60066431	144.7753417	151.15	2.39	519.13	521.52	Passing wand back and forth.
6371	20090410 111819	14.60066431	144.7753414	150.16	2.31	519.08	521.39	Looks like it is all straightened out (except for a slightly bent wand).
6373	20090410 111828	14.60066435	144.7753415	150.92	2.34	519.06	521.4	Medea HD one.
6374	20090410 111916	14.60066393	144.7753414	149.42	2.33	519.1	521.43	Now picked it up for sampling. Stowing port arm.
6376	20090410 112014	14.60066262	144.7753425	156.44	2.31	519.13	521.44	Stowing basket. Checking hose.
6378	20090410 112020	14.60066261	144.7753424	156.16	2.26	519.15	521.41	Looks good.
6379	20090410 112115	14.60066246	144.7753424	156.58	2.35	519.09	521.44	Dropped wand but its in a good place.
6381	20090410 112213	14.60066194	144.7753426	158.47	1.8	519.09	520.89	Picked up wand and placing it in area of shimmer.
6382	20090410 112216	14.6006619	144.7753426	158.47	2.36	519.09	521.45	Temp is low.
6384	20090410 112235	14.60066205	144.7753428	158.42	1.8	519.1	520.9	Temp. 9.5 with a lot of floc.
6387	20090410 112439	14.60066194	144.7753429	157.47	2.28	519.18	521.46	Reverse pumping out of wand.
6388	20090410 112519	14.60066185	144.7753432	158.88	1.75	519.15	520.9	Resting red part of wand on rock and trying the waters here.
6390	20090410 112602	14.60066182	144.775343	157.21	2.31	519.14	521.45	Temp going up to 14deg.
6391	20090410 112612	14.60066184	144.7753431	157.62	2.3	519.14	521.44	Turning out to be a low-temp microbial site near the vent.
6393	20090410 112718	14.60066172	144.7753431	157.27	2.33	519.12	521.45	SAMPLE Fluid 1: J2-403-fluid-01 on the north side of back end of Pit.
6396	20090410 112847	14.60066161	144.7753431	159.13	1.8	519.08	520.88	SAMPLE Fluid 1:J2-403-fluid-01 Bag #24 with all things working well.
6397	20090410 112900	14.60066136	144.7753429	158.37	2.39	519.06	521.45	SAMPLE Fluid Unfiltered bag 24 J2-403-fluid-01
6399	20090410 112926	14.60066152	144.7753427	156.85	2.36	519.05	521.41	We are on the backside of the pit rim on the north looking south-ish.
6400	20090410 112951	14.60066143	144.7753428	156.72	2.38	519.03	521.41	SAMPLE Fluid Sudden obstruction messages from the Beast.
6401	20090410 113000	14.60066146	144.7753428	156.6	2.34	519.03	521.37	Plume is more vigorous now.
6403	20090410 113037	14.60066157	144.7753429	157.42	2.41	519.02	521.43	SAMPLE Fluid 1: J2-403-fluid-01 having some issues with obstructions.
6406	20090410 113247	14.60066129	144.7753431	157.55	2.49	518.99	521.48	SAMPLE Fluid J2-403-fluid-01 17deg...18. Could be sulfide dominated with so much bacteria here. Big chemistry differences over short distances.
6408	20090410 113325	14.60066135	144.775343	157.06	2.4	519.03	521.43	SAMPLE Fluid 1: J2-043-fluid-01 stopped.
6409	20090410 113401	14.60066143	144.775343	157.21	2.39	519.05	521.44	Tmax=20.5 Av=17.2 vol=468 T2=9.3
6411	20090410 113425	14.60066148	144.7753431	157.2	2.38	519.05	521.43	Going to try pH measurement.
6414	20090410 113629	14.60066116	144.7753436	158	2.53	519.04	521.57	pH is 2.9 here.
6415	20090410 113643	14.60066117	144.7753435	157.7	2.39	519.05	521.44	Impressive for 18deg water (pH of 2.9)
6418	20090410 113856	14.60066128	144.7753439	158.25	2.45	519.03	521.48	SAMPLE Fluid 2: Filtered piston #4
6421	20090410 114039	14.6006607	144.7753439	159.83	2.4	519.08	521.48	SAMPLE Fluid 2: temp dropping
6422	20090410 114046	14.60066066	144.7753439	159.93	2.53	519.07	521.6	VIDEO Start recording HDCam
6425	20090410 114236	14.60066055	144.7753438	159.66	2.35	519.12	521.47	SAMPLE Fluid 2: J2-403-fluid-02 stopped.
6426	20090410 114301	14.60066051	144.7753438	159.71	2.33	519.12	521.45	Tmax=17.6 Av=13.0 vol=402 T2=8
6430	20090410 114347	14.6006603	144.7753438	159.63	1.83	519.12	520.95	SAMPLE Fluid 3: Sterivex filter #10 J2-403-03

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6434	20090410 114630	14.6006599	144.7753438	160.11	1.78	519.12	520.9	SAMPLE Fluid 3: J2-403-03 big puffs from pit of plume
6436	20090410 114756	14.60065955	144.7753438	160.53	1.64	519.1	520.74	Activity is increasing at plume behind.
6439	20090410 115001	14.60065951	144.775344	159.82	1.83	519.09	520.92	Thinking of moving the tip down while sampling. J2-403-fluid-03
6441	20090410 115033	14.60065945	144.7753441	159.86	2.4	519.07	521.47	Tip moved straight down along axis.
6443	20090410 115122	14.6006594	144.7753442	159.58	1.85	519.07	520.92	Pump is not happy.
6444	20090410 115130	14.60065945	144.7753443	159.55	2.38	519.07	521.45	New position didn't improve things much.
6445	20090410 115149	14.60065946	144.7753444	159.77	1.83	519.08	520.91	Pit is back to quieter...then there is another big puff.
6447	20090410 115223	14.60065896	144.7753443	160.53	1.68	519.07	520.75	Lots of yellow plume coming out now.
6448	20090410 115302	14.60065891	144.7753446	161.29	1.8	519.06	520.86	Plume is coming a little more toward Jason.
6449	20090410 115313	14.60065894	144.7753446	161.26	1.8	519.05	520.85	Still sampling the sterivix.
6452	20090410 115515	14.60065888	144.7753442	158.99	1.81	519.05	520.86	SAMPLE Fluid 3: Turning pump on and off and only seeing a little exhaust.
6456	20090410 115722	14.60065959	144.7753446	158.68	2.39	519.03	521.42	Plume activity is away from Jason.
6458	20090410 115835	14.60065941	144.7753445	158.31	2.38	519	521.38	Plume is widening out.
6464	20090410 120325	14.60065864	144.7753448	160.09	2.54	518.98	521.52	SAMPLE Fluid 3: J2-403-fluid-03 stopping.
6465	20090410 120338	14.60065866	144.7753447	159.75	2.38	518.98	521.36	J2-403 DVCAM 031 stop and DVCAM 032 start
6466	20090410 120349	14.60065854	144.7753446	159.69	2.43	518.96	521.39	Tmax=19.7 Av=14.9 vol=3006 T2=8.0
6468	20090410 120436	14.60065811	144.7753448	160.74	1.89	518.96	520.85	Another.
6470	20090410 120522	14.60065827	144.7753448	160.61	1.86	519.01	520.87	SAMPLE Fluid 4: Unfiltered piston #1 J2-403-fluid-04 start.
6471	20090410 120546	14.60065811	144.7753448	161.32	1.84	519.04	520.88	Temp was up to 20 when started.
6476	20090410 120939	14.60065802	144.7753453	160.67	1.88	519.03	520.91	SAMPLE Fluid 4: J2-503-04 for microbiology stopping.
6477	20090410 121004	14.60065805	144.7753456	161.63	1.74	519.03	520.77	SAMPLE Fluid 4: Tmax=21.2 Av=18.5 vol=437 T2=9.1
6478	20090410 121009	14.60065805	144.7753456	161.1	1.74	519.03	520.77	Taking pH reading.
6480	20090410 121036	14.60065804	144.7753456	160.73	1.85	519.02	520.87	VIDEO Stop recording HDCam
6482	20090410 121133	14.60065809	144.7753455	160.9	1.71	519.03	520.74	We have been sampling on the north-outside of mound of pit (see the photos)
6483	20090410 121218	14.60065799	144.7753455	160.93	1.71	518.99	520.7	pH=2.87 (almost same as before).
6485	20090410 121225	14.600658	144.7753456	160.9	1.73	519.01	520.74	We are ready to move around to the big vent.
6487	20090410 121321	14.6006606	144.7753477	147.49	3.11	518.56	521.67	Picking up wand and will hold it out for transit around to other side.
6488	20090410 121333	14.60065333	144.7753391	150.38	2.01	517.95	519.96	Going counter-clockwise to the right for the approach.
6489	20090410 121406	14.60062289	144.775333	147.01	2.88	517.28	520.16	Skimming along with view down to plume center.
6490	20090410 121420	14.6006077	144.7753198	131.25	3.61	517.13	520.74	There is the Tephra bucket near pit.
6492	20090410 121448	14.60057657	144.7753165	76.15	3.41	518.66	522.07	Lots of yellow coming out of pit. Yellow coating of rocks.
6493	20090410 121459	14.60055516	144.7753291	75.18	3.93	518.26	522.19	Tephra sampler is not full.
6495	20090410 121542	14.60052159	144.7753653	27.78	4.34	520.06	524.4	Medea cam has nice view.
6496	20090410 121606	14.60053539	144.7753506	26.46	3.65	521.45	525.1	Plume is coming out of a slope today.
6498	20090410 121623	14.60053692	144.7753581	28	2.01	522.74	524.75	Looks like it has built up-yesterday it was flat.
6499	20090410 121659	14.60054327	144.7753581	31.16	1.39	522.88	524.27	Looking up a slope today.
6500	20090410 121713	14.6005426	144.7753546	31.37	1.38	522.9	524.28	Ground is shaking.
6502	20090410 121727	14.60054226	144.7753548	24.89	1.34	522.91	524.25	Material coming out and tumbling down.
6503	20090410 121740	14.60054327	144.7753567	22.31	1.45	522.84	524.29	Tephra is coming out.
6505	20090410 121837	14.60054603	144.7753544	21.46	1.44	522.97	524.41	Sample yesterday that was poked in sediment was full of yellow sulfur.
6506	20090410 121850	14.60054572	144.7753537	21.43	1.43	522.95	524.38	Want to place wand just above the sediment.
6507	20090410 121908	14.6005457	144.7753541	20.9	1.36	522.96	524.32	Area that is very vigorous nearby. Almost looks like it is boiling.
6509	20090410 122016	14.60055119	144.7753521	22.09	2.16	522.07	524.23	Very vigorous area that trying to position to.
6511	20090410 122024	14.6005537	144.7753515	19.27	1.68	522.3	523.98	Changing HD tapes.
6512	20090410 122044	14.60055619	144.7753532	17.43	0.91	523.06	523.97	Medea HD off.

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6514	20090410 122129	14.60055575	144.7753529	20.03	1.1	522.78	523.88	Looks like it is near boiling-like area.
6515	20090410 122143	14.60055566	144.7753531	19.45	1.13	522.8	523.93	Wand looks to be in vigorous area.
6516	20090410 122205	14.60055547	144.775353	19.57	1.09	522.81	523.9	Pump is on and temp rising-do not want to poke it in.
6518	20090410 122239	14.60055559	144.7753527	19.96	1.09	522.8	523.89	Pump on and temp rising.
6519	20090410 122307	14.60055581	144.7753524	20.71	1.11	522.79	523.9	Dropped the wand in the stuff.
6520	20090410 122320	14.60055585	144.7753526	20.42	1.13	522.78	523.91	Hard to see wand at 134 deg.
6522	20090410 122352	14.60055648	144.7753534	20.12	1.06	522.82	523.88	Very vigorous. Temp 110.
6523	20090410 122406	14.60055654	144.7753532	20.1	1.05	522.81	523.86	Piston 2 starting
6525	20090410 122433	14.60055687	144.7753534	19.84	1.09	522.77	523.86	SAMPLE Fluid 5: Filtered piston #2. Wand is laying in the plume J2-403-fluid-05
6526	20090410 122507	14.60055637	144.7753533	19.99	1.08	522.79	523.87	SAMPLE Fluid 5: J2-403-fluid-05 taking sample while wand is laying across the pit.
6528	20090410 122527	14.60055631	144.7753529	20.39	1.06	522.8	523.86	Wand is shaking on the ground.
6529	20090410 122539	14.60055649	144.7753526	19.98	1.06	522.78	523.84	Bubbles coming out around the wand back. Can't see tip at all.
6530	20090410 122554	14.60055595	144.7753526	20.22	1.09	522.81	523.9	SAMPLE Fluid 5:J2-403-fluid-05 stopped.
6531	20090410 122621	14.60055578	144.7753523	20.52	1.06	522.84	523.9	SAMPLE Fluid 5: may start again
6533	20090410 122657	14.60055577	144.7753524	20.27	1.03	522.86	523.89	SAMPLE Fluid 5: Wand in arm and will continue sample J2-403-fluid-05 Not sure if getting flow.
6534	20090410 122710	14.60055559	144.7753524	20.02	1.04	522.85	523.89	No flow-not seeing any exhaust.
6536	20090410 122728	14.60055544	144.7753522	21.04	1.01	522.86	523.87	Wand has a coating of sulfur on it.
6537	20090410 122735	14.60055555	144.775352	20.65	0.98	522.9	523.88	Tape on wand has melted.
6538	20090410 122812	14.60055506	144.7753521	20.51	1.01	522.86	523.87	Lots of liquid sulfur on wand with some drip features.
6540	20090410 122851	14.60055499	144.7753525	20.35	0.98	522.91	523.89	Red tape at tip is gone. May have a wand full of sulfur.
6541	20090410 122919	14.60055531	144.7753525	20.26	0.98	522.93	523.91	Reverse pump--see a little bit coming out. Meanwhile the pit is vigorous-blowing chunks up.
6543	20090410 122955	14.60055551	144.7753521	20.64	1.04	522.84	523.88	Putting wand back in hot stuff to heat it up and then reverse pump.
6544	20090410 123015	14.60055549	144.7753521	20.98	1.03	522.84	523.87	Wand is in the center and hopefully heating up.
6546	20090410 123054	14.60055495	144.7753521	20.54	1.08	522.78	523.86	Could be boiling water with ash being pushed up. Looks like churning not extrusion.
6548	20090410 123142	14.60055417	144.7753524	20.42	1.05	522.82	523.87	Bringing wand out and reverse pumping but not seeing anything come out tip.
6550	20090410 123311	14.60055423	144.7753532	20.37	1.03	522.82	523.85	Wisps of smoke coming out of tip.
6552	20090410 123341	14.60055364	144.7753532	20.38	1.08	522.8	523.88	Wand is definitely plugged.
6553	20090410 123405	14.60055324	144.7753514	19.61	1.14	522.72	523.86	Boiling point at this depth is 264.
6555	20090410 123434	14.60055264	144.7753507	19.49	1.14	522.68	523.82	Heating up wand again.
6556	20090410 123502	14.60055199	144.7753476	19.34	1.14	522.71	523.85	Lots of bubbles now.
6557	20090410 123514	14.60055248	144.7753465	19.6	1.14	522.69	523.83	Whoa.
6559	20090410 123522	14.60055199	144.7753449	19.36	1.15	522.69	523.84	Big explosion out of enter.
6560	20090410 123602	14.60055257	144.7753472	19.7	1.04	522.81	523.85	That was center. Very explosive burst just after the bubbles appeared.
6562	20090410 123655	14.60055054	144.7753421	19.04	1.14	522.71	523.85	Still pumping in reverse.
6564	20090410 123707	14.60055041	144.7753417	19.41	1.14	522.7	523.84	Going to lay it down in the center.
6565	20090410 123710	14.6005503	144.7753412	19.52	1.13	522.71	523.84	More bubbles.
6567	20090410 123729	14.60054944	144.775341	19.58	1.11	522.75	523.86	Very vigorous...lots of bubbles.
6568	20090410 123751	14.60055053	144.775341	19.62	1.13	522.73	523.86	Bubbles not stopping.
6569	20090410 123806	14.60055161	144.7753422	19.81	1.13	522.74	523.87	Wand still in center.
6570	20090410 123812	14.60055117	144.7753411	19.77	1.15	522.74	523.89	Still in center.
6572	20090410 123840	14.60054952	144.775341	19.25	1.25	522.67	523.92	T1 is going up and if up to 115 will melt everything out.
6573	20090410 123845	14.60054952	144.7753411	19.13	1.2	522.72	523.92	Lots of gas coming out.
6574	20090410 123852	14.60054975	144.7753412	19.2	1.23	522.71	523.94	J2-403 Data DVDs start

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6575	20090410 123854	14.60054963	144.7753411	19.23	1.18	522.69	523.87	Big plume.
6576	20090410 123909	14.60055209	144.7753407	19.29	1.15	522.71	523.86	J2-403 ignore the last DVD start entry
6578	20090410 123950	14.60055232	144.7753405	18.25	1.24	522.69	523.93	Piston #2 may be filled up now as we don't see exhaust from Beast.
6579	20090410 124001	14.6005514	144.7753413	18.48	1.24	522.7	523.94	Pulled wand out. Looks horrible.
6580	20090410 124021	14.60054996	144.775339	19.1	1.16	522.74	523.9	J2-403 Data DVDs start blue set 38
6583	20090410 124140	14.60054686	144.7753599	11.8	1.18	522.96	524.14	Pumping forward but not seeing anything. No exhaust-all clogged?
6584	20090410 124208	14.60054707	144.7753594	16.84	1.34	522.77	524.11	Highest temp was 140.
6586	20090410 124229	14.60054754	144.7753629	19.42	1.23	522.78	524.01	VIDEO Stop recording HDCam
6588	20090410 124408	14.60054821	144.7753693	18.83	1.21	522.82	524.03	Temp hose does not look good but it is still working.
6590	20090410 124445	14.60054904	144.7753677	18.86	1.29	522.78	524.07	VIDEO Start recording HDCam Plume changing.
6591	20090410 124459	14.60055131	144.7753688	19.02	1.39	522.73	524.12	Laying wand down again to try to dislodge the sulfur block.
6593	20090410 124530	14.60055746	144.7753679	18.92	1.25	522.78	524.03	J2-403 Data DVDs stop red set 37
6595	20090410 124621	14.60055699	144.775367	18.5	1.3	522.82	524.12	Heating up the wand. Seeing small bubbles again.
6598	20090410 124740	14.60055758	144.7753702	20.28	1	523.06	524.06	Temp is 115--should be at melting point.
6600	20090410 124849	14.60055805	144.77536	19.27	1.3	522.75	524.05	Pulling out and looking at tip.
6602	20090410 124939	14.60055813	144.7753611	19.2	1.24	522.84	524.08	Putting the first half back in.
6604	20090410 125053	14.60055493	144.7753581	19.07	1.24	522.82	524.06	That was 165 at T1...should have flushed everything out.
6607	20090410 125204	14.60054861	144.7753631	18.97	1.2	522.84	524.04	Trying to select another bottle to see if anything is being forced out.
6609	20090410 125304	14.60055192	144.7753646	18.99	1.28	522.8	524.08	Can't get valve to move.
6610	20090410 125317	14.60055434	144.7753648	18.93	1.21	522.82	524.03	Really flowing away from Jason now.
6613	20090410 125507	14.60055944	144.7753738	18.77	1.25	522.84	524.09	Still clogged. Seeing water coming out the back end exhaust from Beast.
6614	20090410 125518	14.60055981	144.775373	18.83	1.26	522.82	524.08	Done with fluid sampling for this dive.
6617	20090410 125625	14.60056154	144.7753758	18.92	1.25	522.82	524.07	Stowing wand.
6620	20090410 125822	14.60056041	144.7753731	18.96	1.36	522.74	524.1	Nice and tidy-putting bungee back on wand.
6621	20090410 125833	14.60056037	144.7753731	18.56	1.35	522.74	524.09	Maximum temperature during all of that is 174deg.
6622	20090410 125920	14.600558	144.775373	18.72	1.35	522.73	524.08	Looking to take GT with funnel.
6624	20090410 125939	14.60055695	144.7753732	18.69	1.36	522.73	524.09	This will be GT5 with funnel.
6626	20090410 130025	14.60055716	144.775373	18.6	1.35	522.71	524.06	Activity has really picked up since first arrived (and when came by before CTD search).
6627	20090410 130048	14.6005577	144.7753733	18.64	1.38	522.7	524.08	Jason has funnel and waiting for gas expulsion.
6628	20090410 130112	14.6005564	144.7753735	18.57	1.4	522.67	524.07	Here are some bubbles.
6633	20090410 130433	14.60055444	144.775374	18	1.43	522.65	524.08	gastight-06 here are some bubbles seeing ash slide away from pit.
6634	20090410 130440	14.60055412	144.7753741	18	1.44	522.65	524.09	Not enough bubbles yet for sample.
6638	20090410 130800	14.60055019	144.7753758	18.2	1.46	522.67	524.13	6: J2-403-gastight-06 bubble catcher Can see some bubbles on the lip and see bubbles when tipped (and sulfur)
6640	20090410 130856	14.60055038	144.7753755	18.2	1.45	522.69	524.14	Deciding better to look inside the funnel to see if it is clogged with sulfur.
6641	20090410 130914	14.60054988	144.7753757	18.06	1.43	522.65	524.08	Center of funnel is clear. There is some sulfur inside. It does catch bubbles.
6643	20090410 131016	14.60053586	144.7753808	21.87	2.73	521.16	523.89	6: J2-403-gastight-06 bubble catcher ground is moving-big burst.
6645	20090410 131033	14.60053449	144.7753894	22.45	2.95	520.95	523.9	Had to back off when ground moved.
6646	20090410 131043	14.60053904	144.7753818	23.29	2.73	521.05	523.78	Ash coming out of plume.
6647	20090410 131053	14.60054548	144.7753751	24.04	2.68	521.37	524.05	Did not get sample due to big burst.
6648	20090410 131102	14.60054468	144.7753768	23.44	2.69	521.31	524	Ash falling out of plume.
6650	20090410 131132	14.60054749	144.7753775	23.86	2.39	521.52	523.91	Ready to go back down to pit for sample.
6651	20090410 131201	14.60055275	144.775376	23.81	1.68	522.52	524.2	Bubbles are bigger now and activity increasing.
6655	20090410 131514	14.60055005	144.7753718	23.53	1.76	522.44	524.2	6: J2-403-gastight-06 funnel over bubbles (lots of bubbles) Rocks moving. Saw bubbles in funnel.

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6659	20090410 131802	14.60054907	144.7753711	24.31	1.86	522.4	524.26	SAMPLE Gas 6: J2-403-gastight-06 bubbles coming-fired.
6661	20090410 131831	14.60054888	144.7753715	24.61	1.81	522.48	524.29	SAMPLE Gas 6: J2-402-gastight-06 after fired tipped funnel-there was a big gas bubble let out.
6662	20090410 131911	14.60054616	144.7753702	25.55	1.73	522.54	524.27	SAMPLE Gas that was GT-5 and rocks are tumbling down as we stow the GT. J2-403-gastight-05.
6664	20090410 131942	14.60054513	144.7753679	25.81	1.69	522.58	524.27	Going to fire the other gas tight in the smoke. Rocks are still tumbling toward Jason.
6665	20090410 131957	14.60054513	144.7753679	25.89	1.65	522.6	524.25	Big tumbles of rock-pushing up lava.
6666	20090410 132017	14.60054387	144.7753682	24.86	1.7	522.56	524.26	VIDEO Start recording HDCam
6668	20090410 132101	14.60054195	144.7753635	25.22	1.69	522.54	524.23	Put tip in white smoke.
6669	20090410 132107	14.60054206	144.7753634	25.2	1.7	522.53	524.23	Second GT here.
6674	20090410 132432	14.60054119	144.7753555	21.99	1.91	522.3	524.21	SAMPLE Gas 7: J2-403-gastight-07 GT9 in white smoke near funnel sample. Fired. (rocks still tumbling) Need thick smoke near tip.
6675	20090410 132455	14.60054093	144.7753554	22.16	1.84	522.36	524.2	Retract-looks like fired.
6677	20090410 132535	14.60054112	144.7753564	22.87	1.86	522.44	524.3	That was Red GT9 J2-403-gastight-07.
6679	20090410 132638	14.60070826	144.775262	24.29	3.18	521.14	524.32	Going to watch Brimstone for awhile.
6680	20090410 132644	14.60070891	144.7752615	24.07	3.14	521.09	524.23	NAV Doppler reset
6682	20090410 132728	14.60070811	144.7752622	24.46	3.06	521.14	524.2	Lots of bubbles now.
6684	20090410 132835	14.60070831	144.7752621	24.43	3.05	521.14	524.19	Jason is hovering now-basket not resting on surface. Seeing rocks tumble toward us.
6686	20090410 132928	14.60070833	144.7752622	24.38	3.06	521.12	524.18	Big bubbles on left-constant.
6688	20090410 133024	14.60070846	144.7752622	24.46	3.06	521.14	524.2	Moving again. Watching big rock to left.
6690	20090410 133137	14.60070844	144.7752621	24.53	3.09	521.12	524.21	Watching rocks move and plume change.
6695	20090410 133610	14.60070888	144.775262	24.5	2.4	521.87	524.27	Big slumping of material.
6698	20090410 133741	14.60071028	144.7752591	25.1	2.65	521.84	524.49	Observing pit. Right side in view is very vigorous and yellow.
6699	20090410 133814	14.60071025	144.7752592	25.45	2.7	521.85	524.55	Slump away.
6702	20090410 134000	14.60071043	144.7752595	25.64	2.7	521.83	524.53	Material just keeps wasting away as you see it bulge up.
6704	20090410 134050	14.60071024	144.7752595	25.67	2.53	521.83	524.36	More bubbles off left side and seeing activity increase. bulging out again
6708	20090410 134335	14.60070455	144.7752566	25.44	2.75	521.87	524.62	Just saw large burst of gas and rock movement. Now seeing tephra in plume.
6713	20090410 134752	14.60071482	144.7752499	45.53	1.76	522	523.76	Moving Jason a little bit to the left. Rocks continue to slide off front.
6714	20090410 134818	14.6007158	144.775249	46.57	1.69	522	523.69	Looking at 46deg to see the plume in the back a bit.
6718	20090410 135032	14.60071586	144.7752492	47.32	1.71	521.96	523.67	Rocks continue to waste away.
6721	20090410 135306	14.60071573	144.7752494	47.39	1.7	521.95	523.65	Big push on the rocks.
6722	20090410 135320	14.60071577	144.7752493	47.3	1.71	521.97	523.68	Didn't see any bubble increase before that one.
6724	20090410 135338	14.60071579	144.7752492	47.22	1.73	521.96	523.69	Smoke behind changing to more yellow.
6725	20090410 135420	14.60071568	144.7752493	47.28	1.73	521.96	523.69	Big pushed and large rock tumbled down forward.
6727	20090410 135514	14.60071571	144.7752493	47.28	1.71	521.96	523.67	Seeing back side activity pick up.
6730	20090410 135638	14.60071783	144.7752563	42.6	2.16	521.6	523.76	Moving in closer as the activity is shifting to the back.
6731	20090410 135648	14.60071824	144.7752566	43.68	2.18	521.66	523.84	Plume is away from Jason at heading of 043.
6732	20090410 135721	14.6007182	144.7752565	43.82	2.13	521.67	523.8	Yellow plume has migrated back over to the right side.
6734	20090410 135737	14.60071836	144.7752562	43.78	2.2	521.68	523.88	A lot of bubbles right now.
6735	20090410 135747	14.60071614	144.775252	45.01	2.16	521.65	523.81	A lot of gas even in front.
6736	20090410 135805	14.600714	144.7752498	43.63	2.15	521.78	523.93	Increase in sulfur and rocks wasting.
6738	20090410 135912	14.60071386	144.7752498	43.44	2.19	521.72	523.91	Bulge in middle is growing and now sticking out
6741	20090410 140111	14.60071342	144.7752497	43.34	2.31	521.72	524.03	Plume moving a bit to the right and obscuring the new mound in middle.
6743	20090410 140159	14.60071346	144.7752496	43.34	2.26	521.72	523.98	HD Medea on.
6745	20090410 140307	14.60071321	144.7752499	43.26	2.31	521.72	524.03	Looks like an ash cone now whereas yesterday it was really blocky lava around pit.
6747	20090410 140419	14.60071328	144.7752497	43.3	2.28	521.73	524.01	Seeing tephra coming down.

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6748	20090410 140421	14.60071327	144.7752497	43.31	2.29	521.72	524.01	HD Medea off.
6750	20090410 140514	14.600715	144.775252	43.44	2.26	521.76	524.02	Plume to left turned more yellow and got a burst of rocks moving.
6753	20090410 140633	14.60071358	144.7752511	43.23	2.29	521.76	524.05	Lots of yellow right now.
6754	20090410 140639	14.60071355	144.7752511	43	2.25	521.72	523.97	Rocks are moving/wasting.
6756	20090410 140737	14.60071295	144.7752507	42.79	2.21	521.72	523.93	Plume activity shifted to right.
6758	20090410 140842	14.60071248	144.7752507	43.05	2.38	521.72	524.1	Increase in plume on left again.
6759	20090410 140844	14.60071243	144.7752507	43.08	2.38	521.71	524.09	J2-403 stop DVCAM 032 and start DVCAM 033
6762	20090410 141040	14.60071271	144.7752517	42.71	2.43	521.72	524.15	Ground is pushing up again.
6766	20090410 141348	14.60071257	144.7752516	42.43	2.51	521.74	524.25	Watching ground sway and push.
6769	20090410 141604	14.60071296	144.7752512	42.49	2.43	521.72	524.15	Plume has consolidated a bit-not spread out.
6771	20090410 141709	14.60071292	144.7752507	42.74	2.49	521.69	524.18	Big piece in front is really moving. Utility cam looking port shows some shaking of distant rocks.
6779	20090410 142349	14.60071608	144.7752479	43.16	2.28	521.71	523.99	Moving a little to the left for a slightly different view.
6780	20090410 142413	14.60071868	144.775251	43.13	2.2	521.68	523.88	HDV changing tape
6783	20090410 142559	14.60071755	144.7752508	43.24	2.33	521.7	524.03	Activity has slowed a bit. Not as much rock wasting or bubbles.
6784	20090410 142614	14.6007177	144.7752505	43.2	2.28	521.73	524.01	Not seeing boiling activity.
6786	20090410 142627	14.60071522	144.7752487	43.01	2.35	521.72	524.07	There is an increase in gas and big shaking.
6787	20090410 142657	14.60071302	144.7752463	42.9	2.4	521.69	524.09	Seeing some explosive activity in back.
6789	20090410 142803	14.6007136	144.7752465	43.25	2.31	521.73	524.04	Plume has widened at base but not as yellow.
6792	20090410 142925	14.60071271	144.775247	50.31	2.16	521.8	523.96	Seeing boulders tumble in back.
6793	20090410 142942	14.60072048	144.7752427	72.41	0.95	521.79	522.74	Moving around left some more.
6794	20090410 143001	14.60072203	144.7752419	74.11	0.89	521.72	522.61	HD off.
6796	20090410 143101	14.60072616	144.7752414	74.41	0.85	521.4	522.25	More vigorous plume to left back. Looks like more blocky rocks on that side and less tephra.
6798	20090410 143145	14.60072623	144.7752383	74.58	0.99	521.3	522.29	Big extrusion in the vigorous area. Lots of bubbles.
6800	20090410 143237	14.60072724	144.7752388	74.6	0.88	521.32	522.2	Black rocks underneath the yellow plume.
6801	20090410 143248	14.60072751	144.775239	74.83	0.89	521.31	522.2	Big gassing off.
6803	20090410 143342	14.6007286	144.7752396	74.14	0.84	521.3	522.14	Lots of bubbles in back.
6807	20090410 143646	14.60072868	144.775237	75.85	0.91	521.31	522.22	Big bubble burst.
6809	20090410 143741	14.60072534	144.7752285	76.55	0.74	521.46	522.2	Lasers on.
6810	20090410 143813	14.60072431	144.7752259	74.93	0.74	521.5	522.24	Another meter high and wide added since we have been here.
6813	20090410 143940	14.6007186	144.775233	69.78	1.19	521.8	522.99	Big tephra explosion in back and large boulder rolled down.
6817	20090410 144315	14.60071535	144.7752444	40.33	2.46	521.71	524.17	Circled around right and now going back to left.
6818	20090410 144322	14.60071341	144.7752444	54.27	2.43	521.5	523.93	Seeing black rock better (less plume)
6820	20090410 144333	14.60071859	144.7752403	66.99	1.84	521.42	523.26	Lots of rock tumbling and bulging.
6821	20090410 144411	14.60072665	144.7752382	68.45	1.18	521.32	522.5	Great view of how much stuff was pushed up.
6822	20090410 144420	14.60072864	144.7752379	67.86	0.99	521.31	522.3	Lots of bubbles and big gas release.
6825	20090410 144613	14.60072833	144.7752379	69.06	0.99	521.31	522.3	Big piece just broke. Large gas bubbles.
6830	20090410 145005	14.60072865	144.7752377	69.98	0.98	521.31	522.29	Looks like a big crack where plume is emitting.
6831	20090410 145018	14.60072859	144.7752376	70.08	0.98	521.31	522.29	Lots of tephra in plume and explosive activity.
6833	20090410 145048	14.60072856	144.7752375	70.35	0.99	521.31	522.3	J2-403 start red set DVDs at 14:35 stop blue set DVDs at 14:40
6834	20090410 145056	14.60072861	144.7752374	70.14	0.98	521.31	522.29	Dense plumes hanging.
6836	20090410 145152	14.60072859	144.7752375	70.17	0.96	521.31	522.27	Seen a few dense plumes coming out instead of the billowy constant plumes we've been observing.
6840	20090410 145441	14.60072857	144.7752377	70.74	1.13	521.31	522.44	VIDEO Stop recording HDCam HD off.
6841	20090410 145453	14.60072852	144.7752376	70.78	1.14	521.31	522.45	Little bit of lull here.



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6843	20090410 145550	14.60072857	144.7752375	70.76	1.18	521.31	522.49	Good shaking of the high rock.
6846	20090410 145743	14.60072748	144.7752353	71.35	1.14	521.36	522.5	Another large black lava piece in back.
6847	20090410 145813	14.60072738	144.7752354	71.34	1.19	521.32	522.51	View obscured a bit from plume wash.
6849	20090410 145850	14.60072744	144.7752353	71.37	1.16	521.32	522.48	Currents changing? Plume is swirling about.
6851	20090410 145950	14.60072746	144.7752352	71.44	1.19	521.33	522.52	Bulge is pulsing and breaking up.
6852	20090410 150012	14.60072746	144.7752352	71.37	1.2	521.33	522.53	Shaking. Piece in back is getting bigger.
6853	20090410 150018	14.60072746	144.7752352	71.38	1.19	521.32	522.51	Large tephra explosion.
6855	20090410 150058	14.60072747	144.7752353	71.44	1.29	521.32	522.61	Lots of tephra. Big explosions and increase in plume.
6858	20090410 150243	14.60072723	144.775235	71.26	1.28	521.33	522.61	Big pulsing and rock movement.
6859	20090410 150259	14.60072746	144.7752354	71.47	1.34	521.27	522.61	Activity has pushed up a large plug of lava in the back.
6861	20090410 150359	14.60072863	144.7752362	71.91	1.55	520.95	522.5	Activity increasing and explosion.
6862	20090410 150419	14.6007288	144.7752361	72.05	1.66	520.79	522.45	Seeing tephra and some movement.
6864	20090410 150500	14.60072878	144.7752361	72.05	1.7	520.8	522.5	Tephra raining down over new lava plug.
6866	20090410 150532	14.60072797	144.7752348	71.84	1.71	520.8	522.51	Plume obscuring view again.
6867	20090410 150539	14.60072795	144.7752343	71.79	1.73	520.81	522.54	Jason had moved a bit around to the left.
6868	20090410 150620	14.60072849	144.7752343	72.15	1.68	520.8	522.48	More tephra raining down.
6870	20090410 150646	14.60072828	144.7752342	72.04	1.71	520.79	522.5	Tephra is getting up pretty high in plume.
6873	20090410 150828	14.60072782	144.7752331	72.08	1.73	520.77	522.5	Small squall outside and ship wants to change heading slightly (winds 30kts.)
6875	20090410 150942	14.6007339	144.7752346	72.58	1.4	520.8	522.2	Great brow cam view of this new lava plug area.
6878	20090410 151146	14.60073259	144.7752321	74.96	1.56	520.66	522.22	Medea HD cam on.
6879	20090410 151158	14.60073259	144.7752322	74.88	1.51	520.68	522.19	Moving slightly to left (clockwise).
6880	20090410 151213	14.6007326	144.7752322	74.85	1.55	520.68	522.23	Looking at the black new lava we've been watching grow.
6881	20090410 151222	14.60073254	144.7752322	74.82	1.51	520.69	522.2	Here comes some more.
6883	20090410 151254	14.60073265	144.7752322	74.83	1.54	520.67	522.21	Plume increasing and surrounding new plug.
6884	20090410 151307	14.60073266	144.7752321	74.86	1.56	520.69	522.25	Not seeing tephra but lots of gas.
6887	20090410 151445	14.60073245	144.7752323	74.68	1.56	520.69	522.25	Big chunk/plug is shaking and lots of bubbles surrounding as they move.
6889	20090410 151530	14.60073215	144.7752325	74.68	1.59	520.68	522.27	Big tephra explosion.
6890	20090410 151538	14.6007321	144.7752325	74.65	1.6	520.67	522.27	Plug is growing very large.
6892	20090410 151626	14.60073202	144.7752327	74.52	1.64	520.68	522.32	Medea HD off.
6893	20090410 151710	14.60073182	144.7752331	74.48	1.63	520.69	522.32	Bubbles and increased activity.
6895	20090410 151740	14.60073148	144.7752333	74.45	1.73	520.68	522.41	Big plume engulfing lava again.
6896	20090410 151800	14.60073112	144.7752333	74.55	1.83	520.65	522.48	Bubbles and tephra-big plume.
6899	20090410 151941	14.60073571	144.7752335	76.95	1.05	520.66	521.71	Lots of tephra behind lava pillar.
6901	20090410 152044	14.60073734	144.7752327	75.51	0.93	520.66	521.59	Tephra low in plume.
6902	20090410 152116	14.60073748	144.7752327	75.61	0.91	520.66	521.57	Lots of gas and tephra now.
6904	20090410 152146	14.60073744	144.7752325	75.4	1	520.66	521.66	Top of pillar toppled off-huge explosion and tephra release.
6910	20090410 152716	14.60072496	144.7752226	65.43	2.08	520.7	522.78	Lots of bubbles.
6912	20090410 152812	14.60072666	144.7752271	64.93	2.21	520.73	522.94	Lots of gas bubbles.
6917	20090410 153202	14.60072549	144.7752269	65.56	2.58	520.53	523.11	Dropping a weight.
6919	20090410 153237	14.60072637	144.7752265	65.34	2.44	520.62	523.06	Lots of tephra and larger plume.
6922	20090410 153508	14.60072807	144.7752267	64.93	2.64	520.28	522.92	
6928	20090410 154017	14.60073663	144.7752281	66.87	2.53	520.02	522.55	Bigger plume burst.
6935	20090410 154605	14.60073704	144.7752274	67.51	1.25	521.34	522.59	The fluid sampler is out of commission. It's clogged.
6936	20090410 154618	14.60073687	144.7752273	67.35	1.23	521.34	522.57	WATCHSTANDERS Susan Merle logger
6938	20090410 154625	14.60073682	144.7752272	67.59	1.25	521.33	522.58	WATCHSTANDERS Nick Deardorff video

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6939	20090410 154648	14.60073639	144.7752264	67.29	1.53	521.01	522.54	Biology sampling and tephra sampling etc
6941	20090410 154757	14.60074058	144.7752111	47.49	2.45	519.25	521.7	Next we will swap out a tephler sampler for Nick.
6945	20090410 155117	14.60076802	144.7751933	59.04	2.63	519.13	521.76	Jason is trying to grab the tephra sampler out of the stbd biobox.
6947	20090410 155222	14.6007752	144.7751988	81.4	1.41	520.13	521.54	DEPLOY Tephra Sampler G. Just NW of the sampler we are about to recover.
6950	20090410 155400	14.60077572	144.7751992	81.01	1.26	520.19	521.45	RECOVER Tephra Sampler E. We deployed this one yesterday. May have been listed as TSF.
6952	20090410 155439	14.60076374	144.7751998	79.71	3.61	517.99	521.6	Will have to check the logs and make sure haven't mixed up these tephra sampler numbers. Just deployed TSG.
6953	20090410 155509	14.60077014	144.7752361	129.06	2.85	516.96	519.81	Now are going to deploy another tephra sampler.
6955	20090410 155554	14.60073634	144.7753242	178.54	4.88	518.47	523.35	SAMPLE Geology 8. Tephra sampler E. Has been here for about 24 hours.
6956	20090410 155608	14.60071898	144.7753456	245.26	6.49	520.21	526.7	VIDEO Stop recording HDCam
6961	20090410 155959	14.60068899	144.7753403	291	5.41	523.58	528.99	Will deploy a tephler sampler ~10m E of Brimstone next.
6963	20090410 160025	14.60067646	144.7753326	313.71	6.4	522.89	529.29	DEPLOY Tephra Sampler B. ~10m E of Brimstone. Rockier here than the previous site.
6966	20090410 160307	14.60070152	144.7753108	338.3	2.95	523.57	526.52	TSG was deployed on volcanislastic sed. TSB is in more rocky sed.
6969	20090410 160432	14.60069849	144.7753106	337.67	2.78	523.73	526.51	TSB was deployed 5 m E of Brimstone.
6974	20090410 160827	14.60063976	144.7754286	102.07	2.55	531.28	533.83	We're heading to Marker-105. About 95m east of Brimstone.
6975	20090410 160915	14.60066741	144.7755012	103.18	1.76	533.59	535.35	J2-403 DVCAM 033 stop and 034 start
6981	20090410 161414	14.60066774	144.7758227	32	6.46	542.62	549.08	Bottom in sight. Just passed Marker 108.
6984	20090410 161524	14.6005734	144.7759577	103.93	4.06	541.61	545.67	Continuing along this ridge heading toward Marker 105.
6985	20090410 161535	14.60056074	144.7759892	71.22	6.99	541.37	548.36	Marker 108 was right on the nav target.
6986	20090410 161621	14.60056735	144.7759953	68.08	9.19	537.29	546.48	Marker 105 is right ahead.
6988	20090410 161650	14.60056776	144.7760056	66.57	9.51	536.85	546.36	Verena wants to look at this area and do some observations before recovering the shrimp trap.
6990	20090410 161735	14.60056759	144.7760092	66.76	6.34	539.39	545.73	This little outcrop is covered in shrimp.
6992	20090410 161830	14.60056727	144.776013	67.1	5.75	539.66	545.41	There are flat sheet flows beneath this bulbous rock. Lots of shrimp land limpets.
6993	20090410 161853	14.60056976	144.7760091	55.09	5.39	540.47	545.86	Verena is on the mike now.
6994	20090410 161915	14.60056792	144.7760114	54.85	6.14	539.7	545.84	Looking at the trap. There are some shrimp in there. It is baited with spam and cat food.
6996	20090410 162016	14.60057414	144.77601	57.19	6.66	539.01	545.67	The color seems to be a bit better on the HD.
6999	20090410 162154	14.60058146	144.776012	54.97	5.18	539.59	544.77	There is an area of lower density but still are plenty of shrimp here.
7001	20090410 162245	14.60058589	144.7760135	53.43	4.44	540.06	544.5	The shrimp are on to us.. They are scattering a bit.
7002	20090410 162305	14.60058605	144.7760134	53.66	4.5	540.04	544.54	A little more populous area here.
7004	20090410 162341	14.60058623	144.7760135	53.4	4.39	540.04	544.43	Positioning the camera here for video observations.
7006	20090410 162458	14.60058639	144.7760133	53.26	4.45	540.08	544.53	Going to look at the ledge. Verena wants the lasers on for a bit for scale.
7008	20090410 162531	14.60058663	144.7760132	53.74	4.39	540.06	544.45	Focusing in.
7009	20090410 162606	14.60058655	144.7760131	52.99	4.44	540.07	544.51	Will sit here for about 15 minutes and observe the shrimp
7010	20090410 162624	14.60058663	144.7760132	53.35	4.4	540.08	544.48	VIDEO Start recording HDCam
7013	20090410 162729	14.60058671	144.7760132	53.06	4.41	540.09	544.5	There's a dumb (?) squid in the butt cam?
7015	20090410 162916	14.60058709	144.7760129	53.69	4.31	540.15	544.46	Now are a couple of the big shrimp in the HDCam view.
7017	20090410 162957	14.60058696	144.7760129	53.07	4.43	540.11	544.54	Cornel is counting the shrimp in the HDCam view. Cornel says there are about 100.
7019	20090410 163034	14.60058696	144.7760128	53.25	4.41	540.1	544.51	There are a couple of shrimp going at it - pairing up.
7020	20090410 163059	14.60058708	144.7760128	53.77	4.43	540.07	544.5	J2-403 Data DVDs start blue set DVD 040
7022	20090410 163140	14.60058727	144.7760127	53.54	4.39	540.11	544.5	Juvenile big guy and most of the other are the pink Opapepele.
7023	20090410 163212	14.60058736	144.7760127	53.21	4.36	540.1	544.46	Both of those are both eating bacterial mat. As the Alvinocaris get older they become carnivores.
7025	20090410 163236	14.60058745	144.7760127	53.38	4.38	540.1	544.48	Where are the old Alvinocaris? Just saw one so far walk in and out. A cameo appearance.

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7026	20090410 163242	14.60058744	144.7760126	53.13	4.4	540.1	544.5	VIDEO Stop recording HDCam
7028	20090410 163404	14.60058755	144.7760125	53.01	4.4	540.09	544.49	Seeing shrimp with others riding on their back.
7031	20090410 163545	14.6005878	144.7760124	53.92	4.4	540.06	544.46	Don't really see a lot of mat here. They must be grazing on some bacteria there?
7032	20090410 163611	14.60058789	144.7760123	52.91	4.4	540.08	544.48	J2-403 Data DVDs stop red set DVDs 039
7034	20090410 163625	14.60058786	144.7760123	53.1	4.4	540.07	544.47	They must be eating something on the mat.
7037	20090410 163854	14.60058835	144.7760122	52.73	4.31	540.07	544.38	A big guy just came in the scene.
7039	20090410 164020	14.60058868	144.7760119	53.44	4.19	540.09	544.28	They do internal mating so we could be seeing that here.
7041	20090410 164101	14.60058868	144.7760119	53.59	4.13	540.1	544.23	The Alvinocaris are a bit darker red. As they get older they get a bit of a humped back.
7043	20090410 164204	14.60058887	144.7760119	54.08	4.28	540.09	544.37	Looked at this spot for 15 minutes.
7045	20090410 164234	14.60058894	144.7760119	53.79	4.26	540.1	544.36	Verena is moving the lasers to the ledge we have been observing for scale.
7046	20090410 164301	14.60058897	144.7760119	53.84	4.25	540.08	544.33	Ending 15 minutes at that spot.
7049	20090410 164458	14.60058923	144.7760119	54.01	4.3	540.09	544.39	Looking around for another spot here to observe.
7050	20090410 164514	14.6005908	144.7759994	49.59	5.18	539.93	545.11	See some shimmer coming out from under the ledge.
7052	20090410 164604	14.60059597	144.7760017	34.93	4.93	540.06	544.99	Zoomed in on this flatter ledge now. Are seeing some venting coming out of a hole.
7054	20090410 164643	14.60059654	144.7760022	34.12	4.68	540.23	544.91	Verena is going to observe this spot here. Lasers are on.
7055	20090410 164651	14.60059649	144.7760022	33.83	4.68	540.21	544.89	Getting some scale.
7057	20090410 164800	14.60059721	144.7760022	33.2	4.46	540.24	544.7	Verena is zooming in on this flatter shelf. The shrimp density here is higher than the last observation site.
7060	20090410 164927	14.60059768	144.7760016	34.03	4.69	540.23	544.92	There are shrimp riding each other. With modified appendages under them.
7062	20090410 165047	14.60059572	144.7760041	33.92	4.69	540.23	544.92	If we were able to focus in there. They are picking up tiny bacteria here.
7063	20090410 165102	14.60059558	144.7760043	33.43	4.56	540.21	544.77	The bacteria are mostly autotrophs.
7065	20090410 165131	14.60059548	144.7760043	32.68	4.63	540.23	544.86	There is bacteria on those rocks but can't see much. Probably because they have grazed it off.
7067	20090410 165239	14.6005953	144.7760036	33.64	4.73	540.27	545	The larvae settle at about 1cm. Most of them have a plankton signature. As they get bigger the carbon signature starts as bacterial.
7068	20090410 165312	14.60059552	144.7760031	34.62	4.74	540.21	544.95	As the alvinocaris get older the carbon signature becomes more carnivorous.
7071	20090410 165458	14.6005952	144.7760026	34.23	4.51	540.23	544.74	A big guy came into the picture and he's cleared out a space.
7072	20090410 165518	14.60059506	144.7760027	33.03	4.61	540.23	544.84	Verena doesn't know if the big guys eat the littler one.
7075	20090410 165629	14.60059503	144.7760023	33.02	4.75	540.23	544.98	We have seen the big guys eat a polychaete in 2006. When a shrimp was damaged we saw a bigger one eating it.
7076	20090410 165651	14.60059512	144.7760021	33.62	4.63	540.23	544.86	The small shrimp do eat deadfall too. They are all opportunistic.
7079	20090410 165908	14.60059441	144.776001	32.69	4.64	540.19	544.83	The big guy has really long antennae. The smaller shrimp are filling in behind them as he moves down the rock.
7082	20090410 170106	14.6005946	144.7760009	33.23	4.53	540.24	544.77	There are orders of magnitude more of the little shrimp (Opaepele loihi) than big shrimp (Alvinocaris).
7087	20090410 170435	14.60059383	144.7760003	31.48	4.59	540.18	544.77	We are finished with this observation. Are now panning to the left for a sweep.
7088	20090410 170453	14.60059384	144.7759999	33.71	4.69	540.19	544.88	There is a BIG shrimp in the field of view now.
7089	20090410 170503	14.60059384	144.776	32.51	4.55	540.19	544.74	Continuing to pan to the left.
7090	20090410 170510	14.60059376	144.7759998	33.4	4.53	540.21	544.74	Now sweeping the camera to the right.
7091	20090410 170515	14.60059373	144.7759998	33.15	4.49	540.21	544.7	Big guy.
7093	20090410 170545	14.60059386	144.7759998	32.88	4.66	540.2	544.86	Focusing the camera now.
7094	20090410 170554	14.60059385	144.7759998	32.28	4.51	540.23	544.74	Lots of diffuse flow in view now.
7095	20090410 170608	14.60059364	144.7759997	32.78	4.56	540.19	544.75	Continuing to pan.
7097	20090410 170629	14.60059351	144.7759995	33.23	4.54	540.19	544.73	Still panning.
7098	20090410 170714	14.60059306	144.7759984	32.87	4.66	540.22	544.88	Taking it back to where we were last observing to put the lasers on.
7102	20090410 170938	14.6005927	144.7759979	33.24	4.44	540.25	544.69	Getting some perspective here. The big guys just clear out their area.

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7104	20090410 171109	14.60059265	144.775998	33.65	4.69	540.21	544.9	Done with the HD Com now. The pilot cam has a big guy who is clearing out the area.
7106	20090410 171126	14.60059258	144.7759978	33.58	4.44	540.21	544.65	Next Verena want to suction some shrimp.
7108	20090410 171225	14.60059273	144.7759979	33.53	4.53	540.18	544.71	Looking at a big pile up of shrimp here.
7109	20090410 171246	14.60059273	144.7759977	34.36	4.48	540.17	544.65	Preparing to suction shrimp here.
7112	20090410 171425	14.60059271	144.7759975	33.27	4.59	540.17	544.76	Getting at the suction sampler. it's a bit of a chore with all the other things in the biobox.
7114	20090410 171531	14.60059305	144.7759977	32.94	4.61	540.18	544.79	Have the sampler in the claw.
7117	20090410 171742	14.60059266	144.7759973	32.67	4.66	540.06	544.72	SAMPLE Biology 9. Suctioning shrimp off these rocks. Marker-105.
7119	20090410 171833	14.60059326	144.7759972	34.91	4.54	540.19	544.73	Sample 9. Biology suction of shrimp. There are a half a dozen in the suction jar.
7120	20090410 171905	14.60059303	144.775997	33.72	4.65	540.13	544.78	Trying to get a sample of females with eggs. Verena has not gotten any of either species with eggs.
7122	20090410 171926	14.60059299	144.7759968	33.84	4.61	540.14	544.75	Don't know if it is seasonal.
7125	20090410 172151	14.60059286	144.7759965	32.45	4.55	540.12	544.67	J2-403-biology-08. Suction for shrimp. A lot of shrimp in the jar. Opaepele loihi and perhaps 1 or 2 larger ones?
7128	20090410 172328	14.60059283	144.7759963	31.72	4.64	540.14	544.78	Correction to last entry. Sample name: J2-403-bio-09. Suction shrimp.
7132	20090410 172723	14.60059216	144.7759953	31.81	4.64	540.15	544.79	Sample 9 cont. Still suctioning shrimp here at Mkr-105.
7134	20090410 172752	14.60059209	144.7759952	32.77	4.61	540.14	544.75	Sample 9 finished. J2-403-bio-09 suction sampler looking quite full.
7135	20090410 172819	14.60059121	144.7759945	32.57	4.76	540.09	544.85	Stowing the suction hose now.
7138	20090410 172929	14.60058698	144.7759868	43.09	5.26	539.98	545.24	Sample 9. Verena estimates close to 50 shrimp in there.
7139	20090410 173001	14.60058232	144.7759974	65.69	5.19	538.57	543.76	The shrimp trap we will pick up was baited with Spam and cat food.
7142	20090410 173126	14.60058961	144.7760058	76.39	2.96	539.12	542.08	There are some shrimp in the cage. Not an abundance but some.
7143	20090410 173220	14.60058916	144.7760066	75.57	3.14	539.03	542.17	Looks like there are a couple on the spam bag.
7145	20090410 173237	14.60058922	144.7760066	75.56	3.1	539.05	542.15	RECOVER Shrimp Trap
7148	20090410 173513	14.60058841	144.7760035	76.5	3.19	538.98	542.17	Recovered shrimp trap from Marker-105. Placed in the back port milk carton.
7152	20090410 173735	14.60058541	144.7759965	77.33	3.5	539.2	542.7	SAMPLE Biology 10. j2-403-shrimp-trap-10. Mkr-105. Z=540.
7155	20090410 173933	14.60059374	144.7760001	40.35	7.03	536.04	543.07	Going to drive N/NE across the bench and then will drive about the 600m contour to the E/SE and then S/SW.
7156	20090410 173955	14.60060421	144.7760097	40.11	6.3	535.04	541.34	Will explore the east side of the volcano at about the 600m contour.
7159	20090410 174207	14.60078499	144.776092	37.44	4.08	532.05	536.13	Just passing a marker.
7160	20090410 174220	14.60081741	144.7761054	37.18	3.93	530.56	534.49	I think that was probably marker 110.
7162	20090410 174313	14.60091705	144.7761457	39.1	2.65	529.99	532.64	Outcrop ahead. Some shrimp cover.
7164	20090410 174330	14.60094811	144.7761687	38.42	3.59	529.38	532.97	Ledges covered with sediments and some small pillow sediments around.
7165	20090410 174340	14.60096336	144.7761834	39.09	5.73	529.64	535.37	Dropping over this ledge down onto the bench.
7166	20090410 174355	14.60096643	144.7761871	33.8	13	532.66	545.66	Lost bottom for a few....
7167	20090410 174407	14.60098134	144.7761962	36.02	17.38	534.97	552.35	Can see the bottom in the butt cam.
7169	20090410 174444	14.6010224	144.7762068	35.28	14.28	540.5	554.78	Descending down this east-facing scarp that we explored last night.
7173	20090410 174727	14.60105824	144.7764148	40.73	17.1	550.62	567.72	Still not seeing the bottom on the pilot cam.
7175	20090410 174832	14.60118496	144.7765184	41.82	6.23	567.27	573.5	Transiting.
7176	20090410 174842	14.60121488	144.7765462	40.81	5.64	568.16	573.8	Seeing the bottom again. Moving over this bench to the NE.
7177	20090410 174903	14.60126986	144.776583	39.99	4.49	570.59	575.08	Getting a little closer to the seafloor.
7179	20090410 174954	14.6013483	144.7766032	39.52	0.98	574.39	575.37	The sediments here look oldish.
7180	20090410 175018	14.6013762	144.7766123	39.44	0.74	574	574.74	More gentle slope.
7182	20090410 175110	14.60146087	144.7766498	37.55	1.69	572.11	573.8	Lots of current-winnowed sediments. Not much outcrop here.
7183	20090410 175227	14.60160982	144.7767181	14.7	189.23	580.47	769.7	Moving over to the outcrop to the west.
7184	20090410 175236	14.60161894	144.7767214	10.15	0.74	580.72	581.46	No sign of active venting here.
7185	20090410 175252	14.60162945	144.7767227	4.15	0.74	581.04	581.78	The rock is older here.
7186	20090410 175301	14.60163234	144.776723	353.88	0.85	581.04	581.89	Loads of fish here along this wall.

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7188	20090410 175327	14.60164536	144.7767222	352.25	1.26	580.79	582.05	Rattails and some other white fish.
7189	20090410 175346	14.60164615	144.7767197	355.11	0.79	581.02	581.81	There is mat growing on the top of this outcrop. Not very dense.
7190	20090410 175408	14.60164017	144.776718	354.92	0.74	581.09	581.83	The most fish we've seen here. Probably about 20 fish.
7191	20090410 175419	14.60163418	144.7767185	352.46	0.91	580.69	581.6	Really strong current here.
7194	20090410 175541	14.60169272	144.7768111	34.69	0.79	586.55	587.34	The plan is to head down to about 600m then follow the contour to the east then south.....
7198	20090410 175850	14.60178031	144.776889	201.38	3.53	597.51	601.04	Moving along this 600m contour.
7201	20090410 180032	14.60172675	144.7769036	188.96	3.3	597.45	600.75	We're looking at this large outcrop. Seeing lots of fish. Verena says they are all granadier.
7202	20090410 180049	14.60172188	144.7768949	189.48	3.03	597.08	600.11	VIDEO Start recording HDCam
7205	20090410 180241	14.60174735	144.7768899	146.94	3.1	596.14	599.24	Layered lavas. Moving along. Traverse along and look at the outcrop ahead.
7206	20090410 180252	14.60174676	144.7769075	146.85	3.8	596.81	600.61	VIDEO Stop recording HDCam
7207	20090410 180308	14.60172878	144.7769284	153.01	4.69	596.98	601.67	Moving on to the next outcrop a little bit upslope.
7209	20090410 180328	14.60170339	144.7769438	159.75	4.96	597.17	602.13	Nice view in the browcam.
7210	20090410 180357	14.6016873	144.7769519	170.98	4.08	598.59	602.67	Looks like may be some staining at the bottom of the outcrop ahead.
7212	20090410 180443	14.60168581	144.7769485	189.68	3.83	598.68	602.51	Doesn't look like much (any) flow. An anemone on this rock.
7213	20090410 180458	14.6016858	144.7769478	214.97	2.16	598.63	600.79	The white could just be from winnowing of the current.
7214	20090410 180508	14.60168608	144.7769474	230.76	2.35	598.58	600.93	Seeing more fish.
7215	20090410 180520	14.60168656	144.7769474	235.02	2.35	598.55	600.9	VIDEO Start recording HDCam
7218	20090410 180720	14.60162863	144.7769962	156.87	1.99	599.17	601.16	Heading upslope a bit to the outcrop.
7220	20090410 180740	14.60161558	144.777001	152.38	2	598.88	600.88	Fish along the slope.
7221	20090410 180820	14.60161136	144.7769966	149.94	2.23	598.42	600.65	The fish don't like the hydrothermal fluids (Verena).
7223	20090410 180909	14.6016118	144.7769916	217.93	4.71	596.59	601.3	Most of the deepsea rattails are feeding on pelagic shrimp.
7226	20090410 181115	14.60163816	144.7769031	273.2	3.64	592.62	596.26	Some of these deep species of grenadier don't produce until they are 20 and live for 50+ years.
7227	20090410 181122	14.60163239	144.7768999	270.86	4.19	591.92	596.11	J2-403 DVCAM 034 stop and 035 start
7230	20090410 181239	14.60167769	144.7768721	305.8	2.61	593.15	595.76	Outcrop is quite spectacular (possible fault?). No sign of any hydrothermal activity.
7231	20090410 181247	14.60168072	144.7768749	305.87	3	592.95	595.95	Right on this nose here.
7232	20090410 181300	14.60167817	144.7768716	307.17	2.66	593.08	595.74	Will follow this level around to the south here.
7234	20090410 181340	14.60166016	144.7768561	309.15	1.33	592.71	594.04	Much less brecciated here. These look a bit like lava flows.
7236	20090410 181457	14.601649	144.776844	312.04	2.44	590.2	592.64	Will sample this.
7238	20090410 181547	14.60166145	144.7768421	266.47	3.71	590.58	594.29	Possible fault here?
7239	20090410 181607	14.60166122	144.7768419	267.97	3.3	590.9	594.2	The sediments are very vesticulated. Brecciated.
7241	20090410 181640	14.60166183	144.7768439	265.96	3.79	590.76	594.55	Looking at very little patch of mat.
7242	20090410 181700	14.60166312	144.7768407	264.63	4.03	590.28	594.31	The flat area running down the middle of this could be a flow channel.
7244	20090410 181808	14.60166302	144.7768408	266.03	3.76	590.41	594.17	Looking at a couple loose pieces of rock here. Will try to collect one.
7246	20090410 181853	14.60166284	144.7768409	266.42	3.84	590.41	594.25	Was probably fairly fluid lava as believe that the previous feature we saw was a flow channel.
7255	20090410 182650	14.60192512	144.7767196	282.17	6.23	595.32	601.55	SAMPLE Geology There are 37 knot winds out and the ship is not holding position.
7256	20090410 182702	14.60193217	144.7766678	282.02	6.4	593.02	599.42	J2-403 Data DVDs start red set DVDs 041
7259	20090410 182842	14.60183274	144.7765639	258.09	16.64	574.95	591.59	Could not get the last geology sample. The winds are too strong and the ship is running amuck.
7262	20090410 183038	14.60177086	144.7766712	258.01	19.13	570.14	589.27	J2-403 Data DVDs stop blue set DVDs 040
7266	20090410 183338	14.60169508	144.7766628	257.53	5.14	573.31	578.45	We're now looking at the outcrops here.
7267	20090410 183424	14.601822	144.7768714	220.66	5.74	572.84	578.58	The only biology we have seen in this area have been grenadier.
7270	20090410 183528	14.60179596	144.7768701	226.47	2.16	574.25	576.41	Will sample this outcrop. Blocky pillow lavas. Massive bulbous vesticulated rock.

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7272	20090410 183629	14.601793	144.7768677	225.95	1.96	574.35	576.31	SAMPLE Geology 11. Rock from this outcrop of older vesplicated lavas. Weathered.
7274	20090410 183801	14.60180112	144.7768711	228.92	3.23	573.96	577.19	J2-403-rock-11. Position: 14 36.104 144 46.647 Z=575m. Massive weathered iron oxide-coated lava.
7276	20090410 183839	14.60180585	144.7768602	207.39	4.16	573.66	577.82	Sample 11. Massive means that there is not a lot of internal structure - not referring to the size of the sample.
7278	20090410 184016	14.60171935	144.7769504	146.5	5.51	580.19	585.7	Travelling across this "nose" down onto the bench. Will cross the bench and then go down the slope south of Fault Shrimp etc.
7281	20090410 184126	14.60167463	144.7770459	149.29	4.46	586.05	590.51	No snaps with the DSC this time. Will take some now.
7282	20090410 184156	14.60164593	144.777068	149.67	2.81	586.63	589.44	THE LAST DIVE WE HAD NO DIGITAL STILLS. THIS DIVE (THIS WATCH) ARE JUST STARTING THAT NOW.
7285	20090410 184417	14.60164126	144.7770856	151.6	3.28	587.36	590.64	We're sitting here waiting to see what will happen with the ship. It's blowing pretty hard out there. Average of 30 knots.
7288	20090410 184547	14.6015156	144.7772218	160.14	3.14	587.48	590.62	Ship is going to start up another generator so they can hold position better.
7290	20090410 184629	14.60145384	144.7772892	161.7	2.54	585.6	588.14	Moving toward the S/SE. Seeing lots of relatively old ash slope with iron oxide staining. No real outcrop here or on the sonar.
7291	20090410 184721	14.60134615	144.7773331	181.38	3.41	580.39	583.8	Looking at a patch of mat protruding out of the sands here.
7294	20090410 184832	14.60124278	144.7774196	150.36	4.98	574.16	579.14	Depth here is 581. Just came into quite a bit of bacterial mat. Could be some flow leaking out of these sediments here.
7295	20090410 184852	14.6011904	144.7774647	149.93	6.48	569.79	576.27	There is outcrop right under here.
7297	20090410 184931	14.60103773	144.7775581	152.69	8.5	571.34	579.84	We've come to the top of a ridge with strewn boulders.
7298	20090410 185017	14.60095768	144.7775831	225.48	15.89	571.18	587.07	This is a vertical wall. Some patchy mat on the wall. The orange is all iron oxide.
7300	20090410 185113	14.60092621	144.7775698	238.66	17.54	571.43	588.97	The orange is mostly iron oxide type of crust.
7302	20090410 185154	14.60092643	144.77757	239	17.61	571.45	589.06	Taking some DSCs. Good looking mat here.
7303	20090410 185157	14.60092642	144.77757	238.97	17.61	571.44	589.05	VIDEO Start recording HDCam
7304	20090410 185221	14.60092679	144.7775702	239.04	17.49	571.4	588.89	The active part of this is the active surface.
7306	20090410 185258	14.60092675	144.7775716	238.24	17.64	571.35	588.99	Looking what happens when we poke the stuff.
7308	20090410 185411	14.60092611	144.77757	239.1	17.25	571.43	588.68	Just a thin coating of mat and iron oxide (?). the mat is surficial and the orange coating is iron.
7310	20090410 185446	14.60092473	144.7775723	239.35	17.76	571.44	589.2	We have to move on. Losing station here due to weather.
7311	20090410 185506	14.60091861	144.7775829	224.46	18.08	571.45	589.53	Some type of low-temp diffuse venting at the base of this??
7313	20090410 185549	14.60076626	144.777618	185.25	25.53	572.6	598.13	Dropping down to the base of the scarp.
7314	20090410 185646	14.60068061	144.777604	170.59	26.03	577.72	603.75	Going to the case of this and will continue to the southwest.
7317	20090410 185902	14.60070687	144.7775665	326.51	6.93	598.84	605.77	We're just down slope from the last mat site.
7319	20090410 185950	14.60071323	144.7775664	326.42	9.53	595.81	605.34	Looks like hematitic mat here. it's a bit different than the stuff we saw earlier.
7320	20090410 190013	14.60071355	144.7775704	326.41	11.45	593.94	605.39	The mat upslope was marker by target 53.
7322	20090410 190120	14.60071569	144.7775575	326.49	13.46	591.39	604.85	Looks like several stages of alteration.
7324	20090410 190127	14.60071547	144.7775579	326.49	13.53	591.38	604.91	Rattails are grazing on the mat.
7326	20090410 190230	14.60067511	144.7775875	308.69	5.21	603.01	608.22	VIDEO Start recording HDCam Looks like this is a vertical wall here. 600m at the base of this cliff.
7327	20090410 190243	14.60066974	144.7775875	309.36	3.98	604.63	608.61	VIDEO Start recording HDCam
7329	20090410 190345	14.60066239	144.7775847	309.4	3.66	605.4	609.06	The base of this cliff is a brecciated vertical wall of lava. Depth is 600m.
7331	20090410 190430	14.6006732	144.7775683	308.96	3.45	604.61	608.06	The base of this wall is 606m. Will make a slow traverse up this wall.
7332	20090410 190503	14.60067848	144.7775667	309	3.29	604.39	607.68	We will get a bit closer to the wall.
7333	20090410 190519	14.60067805	144.7775671	308.91	4.11	603.62	607.73	Coming up the wall.
7335	20090410 190548	14.60067857	144.7775676	309.14	9.03	598.63	607.66	Has to come up fast because he doesn't want to crawl up the wall.
7338	20090410 190737	14.60067916	144.7775655	309.1	10.35	597.17	607.52	The dark is rock. Some oxidized surfaces. Nontronite?

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7340	20090410 190908	14.60068199	144.7775621	309.17	12.93	594.27	607.2	Looking good. We're at the top here.
7343	20090410 191059	14.60072194	144.7775621	309.02	14.74	589.59	604.33	The wall is permeated with mat. We are about 15m up now. This whole outcrop is diffusing fluids out through the breccia.
7345	20090410 191150	14.60072733	144.7775531	311.95	15.68	588.86	604.54	Checking this out.
7347	20090410 191230	14.60072727	144.7775526	315.54	16.39	588.72	605.11	What is that? A brittle star? Is it thick mat?
7348	20090410 191246	14.60072743	144.7775523	317.03	16.86	588.71	605.57	A molt of something that is covered with mat? Verena doesn't think it is alive?
7350	20090410 191401	14.60072449	144.777553	322.08	17.4	588.39	605.79	Rattail.
7352	20090410 191450	14.60072444	144.7775531	321.78	17.33	588.35	605.68	Will name this cliff Rusty Rise. It's an iron oxide crust over volcanoclastic sediments on this outcrop.
7354	20090410 191548	14.60072443	144.777553	321.85	17.31	588.37	605.68	The substructure is blocks of lava.
7356	20090410 191647	14.60072435	144.7775529	322.14	17.11	588.36	605.47	DEPLOY Marker Deployed Mkr-114 here at Rusty Rise. Heading 321. Marker is at about 590m.
7360	20090410 191932	14.60072196	144.7775479	323.58	17.64	588.26	605.9	SAMPLE Geology 12. J2-403-geo-12. Scoop sample of crusty material and perhaps some mat. Mkr-114.
7365	20090410 192336	14.60071548	144.7775598	317.1	19.4	586.03	605.43	Still moving up the cliff. We're now at 587m.
7366	20090410 192403	14.6007153	144.7775592	317.05	19.03	586.21	605.24	VIDEO Stop recording HDCam
7367	20090410 192415	14.60071497	144.7775594	317.08	19.59	586.06	605.65	Changing HD tape.
7372	20090410 192811	14.60073006	144.7775029	336.77	2.06	590.52	592.58	Amazing shot of a huge valley between these two ridges.
7374	20090410 192838	14.60072132	144.7775042	330.9	1.88	590.67	592.55	This next ridge is also completely coated with mat on orange crust.
7376	20090410 192946	14.6006781	144.7774808	344.21	7.09	594.4	601.49	We're to the SE of Fault Shrimp on the other side of that ridge feature.
7377	20090410 193018	14.60065844	144.7774696	345.69	9.86	594.2	604.06	This mat is whiter. Not as much iron oxide on the rocks.
7379	20090410 193028	14.60065385	144.777466	344.7	8.51	595.17	603.68	Large chute beneath us.
7380	20090410 193058	14.60064023	144.7774515	2.11	4.55	598.6	603.15	The nose of this ridge is just beneath us.
7382	20090410 193154	14.60064159	144.7774359	40.19	0.88	600.91	601.79	There is a boulder down at the bottom of this valley. Is the outcrop (boulder) intact?
7384	20090410 193244	14.60059991	144.7774119	12.93	1.65	599.86	601.51	Nontronite (a semi-nonsense word that means I don't know what it is) says Cornel.
7386	20090410 193330	14.60059593	144.7774199	310.47	2.68	601.67	604.35	There is more mat here on these rocks and sediments.
7388	20090410 193525	14.60059508	144.7774198	311.85	3	601.33	604.33	Rattails on the seafloor.
7390	20090410 193555	14.600591	144.7774412	313.79	5.71	600.08	605.79	We're pretty close to the wall.
7392	20090410 193646	14.60060457	144.7774349	314.12	5.59	599.21	604.8	There's a pretty large white patch to the right as well (may be the ridge we looked at earlier).
7393	20090410 193717	14.60061226	144.7774304	314.09	6.13	598.23	604.36	We're in a tight spot here. Have a sheer wall here.
7396	20090410 193911	14.60058423	144.7773949	326.45	4.43	598.44	602.87	We're trying to maneuver along this outcrop but have to go really slow because we're in a tight spot here and the tether is right near the wall.
7398	20090410 194000	14.6005391	144.7773666	326.47	5.13	599.41	604.54	Still seeing lots of these iron oxides and possibly silica. Seems to be some active mat in places.
7399	20090410 194016	14.60053044	144.777357	326.48	4.91	599.65	604.56	Large pillows lava outcrop.
7401	20090410 194039	14.60053171	144.7773461	319.89	2.59	601.5	604.09	This is lower down in the succession. The lavas are more pillow-like here.
7404	20090410 194315	14.60052844	144.7773408	290.32	2.46	601.45	603.91	13. J2-403-geo-13. Piece of pillow-like rock from the base of this wall. This piece is less-weathered.
7406	20090410 194409	14.60052844	144.777344	289.44	2.84	601.33	604.17	J2-403-geo-13. Shaped like a wedge. About 25cm. Placed in front port box.
7408	20090410 194446	14.60052229	144.7773527	274.69	3.18	601.62	604.8	J2-403-geo-13. Location: 14 36.032 144 46.671 Z=602.
7410	20090410 194543	14.600487	144.7773547	310.76	5.33	601.62	606.95	Moving again to the west around these outcrops.
7411	20090410 194620	14.60047076	144.7773334	310.63	6.13	600.52	606.65	The outcrops are still here. The mat has diminished.
7415	20090410 194855	14.60038674	144.7773057	244.37	3.03	604.33	607.36	J2-403-geo-13. From brecciated wall at SE point (S of Fault Shrimp).
7417	20090410 194940	14.60038165	144.7773086	243.5	3.43	604.28	607.71	Seeing another type of shrimp. It's not a vent shrimp. He's considerably bigger.
7419	20090410 195032	14.60038183	144.7773169	243.62	3.36	604.81	608.17	Will continue south for a bit then go west to Brimstone.

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7421	20090410 195139	14.60037713	144.7773207	243.84	3.93	604.65	608.58	Want to move SW along this scarp. These pillows are distinctly more pillow-like than what we have seen on this cruise.
7423	20090410 195236	14.60037406	144.7773222	243.94	4.01	604.66	608.67	Looks like a lava tube perhaps.
7425	20090410 195405	14.60031362	144.7773204	244.18	4.44	604.63	609.07	Still looks a bit pillow-like. Old broken up pillows.
7427	20090410 195510	14.60023506	144.7772982	243.34	5.41	604.59	610	going along an old pillow lava flow front. It's broken up and see some tubular features. Between that is black volcanoclastic sand.
7429	20090410 195528	14.60021645	144.777292	243.65	4.66	604.57	609.23	Not much for sulfur particles in this area. Too far from Brimstone.
7431	20090410 195654	14.6001448	144.7772681	244.14	4.94	604.59	609.53	Now flatter pillows that are flatter.
7432	20090410 195723	14.60012115	144.7772759	242.83	4.61	604.54	609.15	Rattails are abundant on this slope
7435	20090410 195910	14.60006971	144.7772919	243.55	5.15	604.66	609.81	Moving southwest over contorted pillows.
7437	20090410 200021	14.60006432	144.7772954	244.67	4.53	604.53	609.06	Traverse another 50m to southwest at this contour.
7441	20090410 200258	14.5999088	144.7771543	305.35	2.45	601.44	603.89	Lobate pillow lobes here.
7443	20090410 200339	14.59990141	144.777076	312.98	2.24	599.8	602.04	Great pillows in front of us.
7444	20090410 200349	14.59989344	144.7770605	316.63	1.34	599.85	601.19	Now the pillows appear more broken up.
7446	20090410 200516	14.59991767	144.7769768	313.76	3.26	591.56	594.82	The slope is more broken up here.
7448	20090410 200531	14.59990915	144.7769681	313.91	2.83	590.82	593.65	A little red fish in front of us.
7449	20090410 200627	14.59988264	144.7769367	304.56	5.24	588.11	593.35	We are now going to head directly to Brimstone. 199m Bearing 304 to Brimstone.
7451	20090410 200627	14.59988264	144.7769367	304.56	5.24	588.11	593.35	
7452	20090410 200651	14.59991766	144.7768965	305.05	3.89	584.71	588.6	Here there is a lot of gas in the lavas which may control what the lavas look like.
7453	20090410 200711	14.59994444	144.7768424	303.89	4.68	580.73	585.41	Will traverse to the NW from here to Brimstone.
7454	20090410 200724	14.59995483	144.7768139	304.73	4.74	578.67	583.41	Broken up pillow lavas beneath us.
7456	20090410 200821	14.59999038	144.7767671	305.71	2.33	577.47	579.8	We are seeing more white in the rocks here. Probably sulfur sed.
7459	20090410 201019	14.59999593	144.77665	304.83	2.24	567.71	569.95	The flows here are tubular/lobate and quite worn.
7462	20090410 201132	14.60003019	144.776537	305.01	3.7	562.75	566.45	More and more white particles on the surface now. The currents was stuff from Brimstone this way.
7464	20090410 201248	14.60010622	144.7764465	307.79	2.79	559.41	562.2	Paralleling the slope along this deep SE facing knob.
7465	20090410 201322	14.60014487	144.7764044	307.45	3.3	558.79	562.09	J2-403 DVCAM 035 stop and 036 start
7467	20090410 201353	14.60019971	144.7763319	307.57	2.38	557.31	559.69	Can see the sulfur balls raining down from Brimstone.
7468	20090410 201404	14.60021912	144.7763006	306.74	4.26	559.12	563.38	Nice image in the browcam.
7470	20090410 201521	14.60040839	144.7760265	308.72	7.73	564.75	572.48	Bottom is in and out of view.
7472	20090410 201605	14.60051101	144.7759001	307.7	7.65	561.01	568.66	Lots more of the sulfur particles on the rocks here.
7474	20090410 201714	14.60062378	144.7757301	308.21	5.13	546.84	551.97	The Brimstone cloud is coming at us.
7477	20090410 201852	14.60059198	144.7754726	278.05	4.28	539.9	544.18	The plume seems to stay to the SE of Brimstone. Verena says that seems to say that the circulation maintains in a cyclonic fashion (ccw).
7480	20090410 202031	14.60065309	144.775369	352.55	4.06	534.71	538.77	The Medea cam has a great shot of the vent.
7482	20090410 202159	14.60076535	144.7753726	305.5	3.73	525.4	529.13	J2-403 Data DVDs start blue set DVDs 042
7486	20090410 202450	14.60068793	144.7752813	267.59	2.24	532.79	535.03	Now in a fogbank.
7488	20090410 202610	14.60070759	144.7752895	281.33	2.16	531.55	533.71	Shrimp in water; maneuvering into BP.
7490	20090410 202653	14.60073341	144.7752163	280.94	2.69	531.49	534.18	J2-403 Data DVDs stop red set DVDs 041
7492	20090410 202746	14.60071903	144.7752041	25.64	5.46	532.68	538.14	Visibility very low.
7495	20090410 202958	14.60072115	144.775239	103.73	2.01	532.73	534.74	Having difficulty getting into Pit as the vis is near nil.
7498	20090410 203151	14.60067052	144.7754389	106.91	6.05	534.33	540.38	Can't see a darn thing.
7501	20090410 203331	14.60067532	144.7754322	316.99	4.48	539.65	544.13	We're circling around the vent site trying to find a place to sit down and get a view.
7507	20090410 203917	14.60074518	144.7753287	5.29	3.81	531.46	535.27	Can see Brimstone plume in the Medea cam.
7509	20090410 203959	14.60077177	144.7753498	8.24	4	529.02	533.02	The plume from Medea looks thicker than we have seen previously.



Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
7512	20090410 204143	14.60081691	144.7753703	12.93	2.91	527.44	530.35	The plume is very thick. It's hugging the seafloor. We're right at slack tide now according to Guam tide tables.
7514	20090410 204250	14.60083769	144.7753674	24.52	2.75	525.79	528.54	The Medea cam image is really huge.
7516	20090410 204415	14.60083576	144.7753363	211.81	1.6	524.76	526.36	All directions are socked in. Can't see the vent.
7518	20090410 204502	14.60082968	144.7753387	254.31	1.58	525.3	526.88	Setting down and looking for the vent.
7520	20090410 204603	14.60084275	144.7753874	332.75	5.65	522.58	528.23	Still looking around for the vent.
7521	20090410 204626	14.6008549	144.7753634	335.78	4.89	521.87	526.76	The vent is straight ahead.
7523	20090410 204653	14.60086959	144.775359	333.55	3.49	521.82	525.31	Huge plume in the water column and not a lot of plumage coming out of the vent.
7525	20090410 204742	14.6008698	144.7753515	342.13	3.55	521.61	525.16	Looks like some new lava here.
7526	20090410 204819	14.6008703	144.7753354	355.22	3.41	521.31	524.72	There's another vent behind it and a third vent close off.
7528	20090410 204837	14.60087091	144.7753308	6.67	3.25	521	524.25	There are 3 separate orifices ahead.
7529	20090410 204913	14.60088116	144.7753158	15.72	2.81	521.05	523.86	Can see 2 of the orifices in one field of view and another one off in the distance.
7530	20090410 204920	14.60088292	144.775312	21.38	2.56	521.04	523.6	VIDEO Start recording HDCam
7532	20090410 205027	14.60088655	144.7753064	57.34	3.21	520.65	523.86	Going to go around and check the other venting area.
7535	20090410 205148	14.60088856	144.7753827	336.51	3.15	521.53	524.68	It's a bigger area. Each of the 3 areas cover 1.5 meters and there are 4 or more area.
7536	20090410 205201	14.60089317	144.7753795	337.04	2.76	521.44	524.2	The area that is covered now is about 4 - 5 meters.
7539	20090410 205356	14.60089224	144.7753805	340.47	2.93	521.4	524.33	We can see CO2 bubbles. from this area in the back.
7540	20090410 205401	14.60089235	144.7753804	340.5	2.93	521.37	524.3	VIDEO Stop recording HDCam
7542	20090410 205451	14.60089154	144.7753803	338.87	3.04	521.4	524.44	The visibility is decreasing here again.
7544	20090410 205559	14.60090722	144.7753966	302.71	3.89	521.16	525.05	Circling around the venting area again. CO2 bubbles coming of this orifice.
7546	20090410 205631	14.60091059	144.7753953	300.42	4.31	521.01	525.32	Looking around at the base of this part of the plume.
7547	20090410 205638	14.60091045	144.7753958	300.5	4.24	520.96	525.2	VIDEO Start recording HDCam
7550	20090410 205906	14.60091972	144.775399	266.03	3.94	521.84	525.78	The smoke is still quite thick. Circling around to the south side.
7553	20090410 210035	14.60092869	144.7753894	252.08	2.63	522.7	525.33	This is the most vigorous of the 3 area of venting. Not sure if 2 of them have merged.
7554	20090410 210109	14.60092864	144.7753893	252.5	2.54	522.75	525.29	Large blocky lavas piled around the base of the vent.
7556	20090410 210135	14.6009286	144.7753896	251.84	2.55	522.73	525.28	VIDEO Stop recording HDCam
7558	20090410 210231	14.60093474	144.7753669	223.99	1.81	521.7	523.51	Circling around it again to try to get a better shot.
7560	20090410 210333	14.60092194	144.7753379	190.45	1.23	520.31	521.54	Much higher activity than we have seen before.
7561	20090410 210357	14.60089827	144.7753211	196.34	2.73	518.84	521.57	Looks like some ash in the plume.
7564	20090410 210610	14.60094275	144.7753654	207.53	2.08	521.03	523.11	A little better view now. At least for a second.
7566	20090410 210637	14.60094087	144.7753642	209.55	2.1	521.18	523.28	Settling down now. Can't see much.
7569	20090410 210846	14.60094018	144.7753653	206.18	1.71	521.43	523.14	Our heading is 206. Looking toward the S/SW. The plumage is obscuring our view.
7571	20090410 210938	14.60094679	144.7753663	205.88	2.24	521.16	523.4	CO2 bubbling.
7572	20090410 210949	14.60094539	144.7753654	208.06	1.68	521.57	523.25	VIDEO Start recording HDCam
7573	20090410 211002	14.60094571	144.7753656	207.41	1.43	521.79	523.22	Turning the lasers off.
7574	20090410 211020	14.60095324	144.7753689	206.84	1.48	521.83	523.31	Considerably more active than any time that we have seen during the cruise.
7576	20090410 211102	14.6009532	144.7753702	206.47	1.51	521.81	523.32	There were 3 orifices when we approached - looks like 2 have merged.
7577	20090410 211122	14.6009533	144.7753702	206.49	1.41	521.8	523.21	Field of view is about 2 meters and it is consumed by Brimstone.
7579	20090410 211141	14.60095322	144.7753703	206.5	1.5	521.79	523.29	Can see a bit of ash from time to time.
7580	20090410 211209	14.60095366	144.7753706	206.55	1.53	521.77	523.3	There is a lava dome in the center.
7582	20090410 211255	14.60095462	144.7753715	206.68	1.55	521.76	523.31	VIDEO Stop recording HDCam
7584	20090410 211355	14.6009554	144.7753736	206.78	1.5	521.67	523.17	VIDEO Start recording HDCam Will record through the end of the dive.
7589	20090410 211754	14.60095794	144.7753769	206.38	1.55	521.74	523.29	The vent is much more active than we have seen in the past.
7591	20090410 211845	14.60095811	144.7753778	206.38	1.39	521.76	523.15	We're up on the rim on the north side looking down.
7595	20090410 212211	14.60095686	144.7753884	212.5	2.83	520.97	523.8	Let's have one last go circling off to the left.

Virtual Van Record #	timestamp yyymmdd hhmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-403 Logger Comment
7597	20090410 212323	14.60087628	144.7753482	53.56	3.6	520.21	523.81	Running into the plume again.
7599	20090410 212402	14.60094103	144.77533	124.31	153.07	519.85	672.92	Visibility is next to nothing.
7600	20090410 212454	14.60094936	144.7753288	143.62	0.74	518.37	519.11	The butt cam looks like we are up against a small wall or something.
7601	20090410 212518	14.60097072	144.7753438	174.33	2.95	517.9	520.85	We have done a full circle.
7604	20090410 212707	14.60096946	144.7753688	185.63	1.6	521.16	522.76	Observing the vent from the north looking almost due south.
7606	20090410 212807	14.60096941	144.7753687	185.83	1.69	521.18	522.87	Big spire in the center of the pit.
7607	20090410 212824	14.6009694	144.7753686	185.88	1.73	521.18	522.91	
7609	20090410 212839	14.60096926	144.7753689	185.93	1.74	521.18	522.92	Lots of shimmer coming out of the sands around the vent.
7612	20090410 213127	14.60096881	144.7753675	186.65	3.58	519.44	523.02	We are going to leave the bottom. Will run HD until can't see plume
7614	20090410 213203	14.6009688	144.7753688	340.25	11.71	509.18	520.89	VIDEO Stop recording HDCam
7616	20090410 213248	14.6009337	144.7752487	278.43	15.64	505.94	521.58	J2-403 Data DVDs stop blue set DVDs 042
7617	20090410 213248	14.6009344	144.7752425	278.7	15.58	506.13	521.71	J2-403
7618	20090410 213313	14.6009355	144.7751058	275.28	22.29	505.64	527.93	J2-403 DVCAM 036 stop
7620	20090410 220416	14.6009512	144.7750529	286.9	badvalue	2.44	badvalue	VIDEO Start recording HDCam Medea on deck.
7621	20090410 220432	14.6009485	144.7750603	278.8	badvalue	2.22	badvalue	medea on deck
7622	20090410 221225	14.6009223	144.7751763	309.29	badvalue	1.13	badvalue	JASON on deck

**J2-404 - CTD Search/Fluid Sampling (aborted).** JASON equipped with HFS Beast (with long intake), single-chamber suction sampler, 2 tephra samples, 4 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. Started on bottom SE of Brimstone in chute. Began CTD search but dive aborted after 20 minutes due to problem with HFS sampler.

**Table 6.4-9 JASON Dive J2-404**

Virtual Van Record #	timestamp yyymmdd hhmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-404 Logger Comment
7624	20090411 054648	badnav	badnav	9.72	badvalue	1.51	badvalue	Main goals: first 4 hrs for CTD search then last 8 hrs Fluid sampling.
7625	20090411 054748	badnav	badnav	10.58	badvalue	1.51	badvalue	Tools for dive: Single-chamber suction sampler and Beast with long intake. Niskin (manual) temp probe Eh sensor.
7626	20090411 054905	badnav	badnav	10.8	badvalue	1.54	badvalue	Basket for J2-404: 2 gastights (one with funnel). 2 tephra samplers. 4 markers. 3 scoop bags. empty crate for shrimp trap.
7628	20090411 073839	badnav	badnav	296.15	badvalue	1.1	badvalue	JASON in water
7629	20090411 074047	badnav	badnav	296.11	badvalue	2.8	badvalue	MEDEA in water
7630	20090411 074133	badnav	badnav	295.97	badvalue	3.55	badvalue	Starting down
7631	20090411 074230	badnav	badnav	295.53	badvalue	22.19	badvalue	2 weights removed
7632	20090411 074340	badnav	badnav	296.2	badvalue	52.58	badvalue	2 more weights removed - 4 total
7633	20090411 074352	badnav	badnav	295.86	badvalue	57.71	badvalue	filling suction sampler
7634	20090411 080121	badnav	badnav	263.45	81.77	512.51	594.28	JASON on bottom
7635	20090411 080529	badnav	badnav	260.5	62.83	512.38	575.21	Late start so Bill gave 3 hrs for CTD search
7636	20090411 080754	badnav	badnav	272.55	33.87	537.9	571.77	Starting nav system
7639	20090411 080949	badnav	badnav	78.1	25.95	547.66	573.61	Jason not on bottom at 08:01
7642	20090411 081159	14.60014702	144.7759357	89.13	7.49	569.37	576.86	JASON on bottom in sight

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-404 Logger Comment
7643	20090411 081222	14.60014438	144.7759396	89.26	5.94	571.18	577.12	J2-403 blue set DVDs 043
7645	20090411 081326	14.60022454	144.7760054	45.89	4.99	566.44	571.43	Jason heading 049 and begin moving northeast
7647	20090411 081427	14.60023833	144.7760562	48.65	6.48	564.74	571.22	Jason heading swinging around. Back to 048
7650	20090411 081606	14.60028042	144.7761621	334.85	6.61	565.86	572.47	Visibility pretty good
7654	20090411 081916	14.60043691	144.7760537	223.03	7.64	559.53	567.17	Pillow lavas with sand and ash between lobes
7656	20090411 081945	14.60037926	144.7760989	148.1	8.26	560.72	568.98	Jason heading is 150
7657	20090411 081959	14.60036398	144.7761072	150.41	7	562.16	569.16	Lines will alternate between 150 and 330
7658	20090411 082019	14.60032155	144.7761311	150.2	2.79	566.15	568.94	Jason moving southeast
7662	20090411 082332	14.60008693	144.7762166	145.72	3.35	575.49	578.84	Jason stopped while they work out orientations
7665	20090411 082459	14.60004994	144.7761568	328.85	8.78	575.34	584.12	Jason heading is 329
7666	20090411 082509	14.60005187	144.7761571	329.52	11.01	573.18	584.19	Jason moving southwest
7669	20090411 082715	14.60030341	144.7760061	330.07	11.78	557.57	569.35	Bottom is very rocky
7674	20090411 083055	14.60031847	144.7758898	329.64	9.46	552.6	562.06	Stopping survey while they discuss options for lines on fluid sampler that were not set before deployment
7679	20090411 083444	14.600331	144.7757726	283.47	10.7	547.28	557.98	Recovering Jason to fix fluid sampler problem
7680	20090411 083533	14.6003211	144.7756769	276.7	25.27	531.49	556.76	JASON off bottom
7682	20090411 083847	14.6003378	144.7756006	279.23	103.54	445.86	549.4	Problem was with the gas tights not the fluid sampler
7683	20090411 083929	14.6003345	144.7756019	279.35	121.6	426.61	548.21	J2-403 stop blue set DVD 043
7684	20090411 090139	14.6002689	144.7759088	289.64	badvalue	3.88	badvalue	Jason at surface
7685	20090411 090220	14.6002581	144.775923	287.7	badvalue	1.84	badvalue	MEDEA out of water
7686	20090411 090307	14.6002475	144.7759416	280.54	badvalue	1.93	badvalue	MEDEA on deck
7687	20090411 091124	14.6001684	144.7760445	276.53	badvalue	0.92	badvalue	Jason out of water
7688	20090411 091233	14.6001699	144.7760448	281.89	badvalue	1.03	badvalue	JASON on deck

**J2-405 - CTD Search/Fluid Sampling (continued).** JASON equipped with HFS Beast (with long intake, including 2 gas-tights), single-chamber suction sampler, HD offload camera, 2 tephra samples, 3 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. Beginning of dive searched for CTD south of Brimstone. Near end of search found fluid sampling site near Mat Mecca location, took fluid(3)/gas(1)/mat(1) samples. Deployed Mkr-115 at sample site, named Flying Floc. Drove to top of ridge passing over leftover Koichi sensor base (large nav offset, 30m) en route to Mkr-102 Amphitheater (reset Doppler, nav improved). Sampled 5m below Mkr102 on scarp face taking fluid (6)/gas(1) samples also observed barnacles at site. Headed west to Brimstone. Took 10 fluid samples, 2 gas samples, 2 rocks, 1 sediment scoop and swapped out tephra samplers. Headed east to Limpet Lair (Mkr-105) to deploy shrimp trap. Recorded video of shrimp before deploying shrimp trap on rock beneath Mkr-105.

**Table 6.4-10 JASON Dive J2-405**

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-405 Logger Comment
7690	20090411 094143	14.6001291	144.7762606	274.5	badvalue	331.37	badvalue	Jason went into water 0930
7691	20090411 095659	14.6001002	144.7763076	204.41	46.62	510.47	557.09	Jason Dive #405: carry on after gas tights fixed
7692	20090411 095707	14.6001014	144.7763234	164.96	45.19	510.61	555.8	Main goals: fluid sampling
7693	20090411 095733	14.6000978	144.776321	173.03	47.49	513.73	561.22	Tools for dive: Single-chamber suction sampler. Beast with long intake.
7694	20090411 095759	14.6000982	144.7763202	174.44	36.92	521.88	558.8	Other tools on all dives: Niskin (manual). Eh sensor. Temp probe.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-405 Logger Comment
7695	20090411 095859	14.600048	144.7763117	177.51	35.89	525.2	561.09	Basket for this dive: 2 gastights (one with funnel). 2 tephra samplers. 4 markers. 3 scoop bags. Empty crate for shrimp trap recovery.
7697	20090411 100026	14.6001792	144.7759246	179.39	7.49	555.2	562.69	Bottom in sight
7699	20090411 100043	14.60017945	144.7759252	179.56	7.09	555.82	562.91	JASON on bottom
7700	20090411 100051	14.60017935	144.7759249	179.62	7.31	555.36	562.67	J2-405 start blue set DVD 044
7702	20090411 100216	14.60017753	144.7759223	330.47	14.19	555.57	569.76	Jason heading changing to 331
7706	20090411 100537	14.60023359	144.7758918	330.66	10.91	551.73	562.64	Jason moving northwest
7710	20090411 100743	14.60031894	144.7758877	154.32	8.1	544.8	552.9	Changing heading to 154
7711	20090411 100758	14.60028114	144.7759049	150.04	9.99	545.92	555.91	Jason moving southeast
7713	20090411 100858	14.60016559	144.7759727	150.05	6.91	557.96	564.87	Visibility is low
7714	20090411 100912	14.60013718	144.7759902	151.24	6.26	559.89	566.15	Aft cam is better than forward looking ones
7717	20090411 101045	14.59996789	144.7760869	150.16	2.08	571.23	573.31	Brow cam is OK too.
7718	20090411 101138	14.59991723	144.7761156	240.37	6.6	572.22	578.82	Jason heading changing to 244
7720	20090411 101154	14.59989706	144.7760741	240.35	5.24	573.63	578.87	Jason moving southwest
7722	20090411 101245	14.59987322	144.7760334	329.81	6.03	578.49	584.52	Jason heading changing to 351
7723	20090411 101302	14.59990884	144.7760144	332.65	6.3	575.6	581.9	Jason moving northwest
7724	20090411 101310	14.59992379	144.7760067	331.69	7.55	573.28	580.83	Visibility good
7727	20090411 101441	14.60010471	144.7759003	330.91	12.64	558.96	571.6	Some pillow lavas and rubble
7729	20090411 101621	14.60026672	144.7758042	236.98	5.85	546.56	552.41	Jason heading changing to 240
7730	20090411 101632	14.60026511	144.7757802	237.17	4.05	547.11	551.16	Jason moving southwest
7732	20090411 101708	14.60021817	144.775724	167.55	4.76	546.69	551.45	Jason heading changing to 130
7733	20090411 101716	14.60021873	144.7757228	149.97	4.1	546.84	550.94	Jason moving southeast
7736	20090411 101848	14.60003441	144.7758315	147.82	6.26	560.56	566.82	Visibility poor except for aft cam
7737	20090411 101933	14.59994544	144.7758854	148.73	4.75	571.44	576.19	Visibility better
7740	20090411 102055	14.59983233	144.7759477	239.2	1.86	582.29	584.15	Jason heading changing to 240
7741	20090411 102105	14.59982954	144.7759557	239.84	2.45	581.47	583.92	Jason moving southwest
7743	20090411 102222	14.59980276	144.7758603	332.71	8.78	579.76	588.54	Bottom is rocky rubble
7744	20090411 102235	14.59983284	144.7758444	331.14	8.66	576.85	585.51	Jason heading is 332
7746	20090411 102240	14.59984235	144.77584	331.39	9.05	575.51	584.56	Jason moving northwest
7750	20090411 102559	14.60017524	144.7756436	232.76	7.51	544.26	551.77	Jason heading changing to 240
7751	20090411 102608	14.60018149	144.775641	239.85	5.56	546.27	551.83	Jason moving southwest
7753	20090411 102716	14.60021412	144.7756222	331.75	8.04	543.49	551.53	Jason heading changing to 330
7754	20090411 102728	14.60023633	144.7756093	330.24	8.54	541.02	549.56	Jason moving northwest
7756	20090411 102752	14.60025787	144.7755936	241.2	5.93	538.41	544.34	Jason heading changing to 240
7757	20090411 102759	14.60026223	144.7755948	242.28	4.86	539.41	544.27	Jason moving southwest
7758	20090411 102818	14.60023455	144.7755515	239.42	4.53	541.12	545.65	Visibility pretty good
7760	20090411 102912	14.60021445	144.7755176	142.69	1.95	544.34	546.29	Jason heading changing to 140
7761	20090411 102918	14.6002039	144.7755192	149.13	2.25	544.52	546.77	Jason moving southeast
7763	20090411 103023	14.60007175	144.7755978	149.7	3.33	554.43	557.76	Aft cam much better than others
7767	20090411 103245	14.59981876	144.7757455	242.84	4.59	576.9	581.49	Jason heading changing to 240
7768	20090411 103255	14.5998135	144.7757423	240.85	5.79	575.96	581.75	Jason moving southwest
7770	20090411 103343	14.59977712	144.7756632	329.07	7.04	577.94	584.98	Jason heading changing to 330
7771	20090411 103351	14.59977606	144.7756639	328.34	7.84	577.81	585.65	Jason moving northwest
7772	20090411 103403	14.59980545	144.7756478	332.57	8.21	575.68	583.89	Bottom still rocky rubble
7777	20090411 103801	14.60021341	144.7755193	330.33	6.58	543.39	549.97	Jason moving northeast
7778	20090411 103815	14.60021374	144.775518	331.59	6.53	543.01	549.54	without changing heading

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7779	20090411 103833	14.60024984	144.7754933	331.38	6.88	540.49	547.37	Jason moving northwest again
7781	20090411 103932	14.600292	144.7754696	330.17	7.38	535.68	543.06	Bottom rocky rubble of mixed sizes
7786	20090411 104315	14.6006031	144.7753598	34.87	7.43	520.75	528.18	Bottom changed from rocky rubble to covered with thin layer of white sediment
7787	20090411 104326	14.60069251	144.7751979	29.59	7.98	521.01	528.99	Jason heading changing to 032
7788	20090411 104333	14.60069343	144.7751913	24.2	7.9	521.7	529.6	Jason moving northeast
7790	20090411 104406	14.60069041	144.7751695	11.51	7.96	523.08	531.04	Actually Jason is moving west
7792	20090411 104455	14.60071198	144.7751955	67.68	7.91	522.11	530.02	Jason heading changing to 068
7793	20090411 104519	14.6007213	144.7752223	68.62	6.1	521.63	527.73	Visibility good
7795	20090411 104601	14.60065803	144.7751142	70.26	5.08	520.58	525.66	Approaching Brimstone
7796	20090411 104614	14.60066907	144.7751118	70.61	5	520.64	525.64	Tephra sampler in foreground
7798	20090411 104713	14.60072041	144.775089	68.82	6.89	520.56	527.45	Jason moving west past Brimstone
7800	20090411 104811	14.60063253	144.7750919	85.4	6.71	520.51	527.22	Jason moving south
7801	20090411 104818	14.60062448	144.7750922	89.04	6.86	520.47	527.33	Jason heading is 88
7803	20090411 104908	14.60062901	144.7750919	88.33	6.75	520.54	527.29	Jason is looking east. Brimstone plume is flowing north close to seafloor
7805	20090411 104941	14.60062994	144.7750824	268.64	4.51	520.55	525.06	Jason heading changing to 270
7806	20090411 104949	14.60063113	144.7750574	266.24	5.16	521.51	526.67	Brimstone plume now visible in aft cam
7808	20090411 105041	14.60063003	144.774943	272.17	5.06	530.65	535.71	Visibility of Brow cam faint. Aft cam is better. Other cams not so good.
7809	20090411 105057	14.60063473	144.7749445	358.44	6.53	531.72	538.25	Jason changing heading to 000
7810	20090411 105114	14.60063578	144.7749071	1.85	8.95	531.91	540.86	Jason looking upslope while moving west
7812	20090411 105144	14.60062859	144.7748472	352.58	11.16	534.34	545.5	Visibility in main cameras better
7815	20090411 105434	14.60054424	144.774812	359.25	6.2	545.26	551.46	Jason moving south
7817	20090411 105450	14.60054248	144.7748306	358.43	6.59	543.46	550.05	Jason moving east. Heading still 000
7818	20090411 105519	14.60053925	144.7748808	353.31	4.21	542.13	546.34	Bottom is rocky rubble of mixed sizes
7819	20090411 105537	14.60053908	144.7748989	4.06	4.25	540.8	545.05	Visibility good
7822	20090411 105717	14.60053799	144.7749969	6.25	5.21	532.56	537.77	One large white rock standing out amongst the others
7825	20090411 105850	14.60052324	144.7750912	4.82	7.1	525.62	532.72	Jason still moving east
7827	20090411 105941	14.60051503	144.7751619	2.29	8.68	521.48	530.16	Brimstone plume visible in background again
7829	20090411 110047	14.60049589	144.7752761	16.14	11	519.29	530.29	Plume looks to be coming from one source. Leaning over not far from seafloor and advecting north
7830	20090411 110102	14.6004793	144.7752679	359.04	13.93	519.04	532.97	Jason swinging heading to look around some
7831	20090411 110120	14.60045534	144.775265	359.08	14.14	520.49	534.63	Jason moving south
7835	20090411 110343	14.60046077	144.7751432	14.99	11.01	523.32	534.33	Jason guys think we are seeing a different plume not Brimstone
7836	20090411 110356	14.60046993	144.7751014	7.74	12.25	522.8	535.05	This plume is south relative to Brimstone
7838	20090411 110527	14.60047442	144.7749673	9.2	11.29	531.29	542.58	Jason moving west
7840	20090411 110546	14.6004917	144.7749075	5.77	13.63	531.43	545.06	Ko-Ichi asked for close line spacing. 8 meters instead of 10
7841	20090411 110604	14.60048669	144.7748775	356.84	13	533.93	546.93	Visibility not so good
7843	20090411 110737	14.60047559	144.7747869	356.3	13.69	540.71	554.4	Jason is 12 meters above bottom
7845	20090411 110812	14.60044542	144.7747832	358.59	12.34	542.58	554.92	Jason moving south
7848	20090411 110940	14.6004271	144.7749306	3.76	7.36	539.92	547.28	Big boulder looks like it has blocked flow of smaller rubble rocks that have gone downslope around it
7850	20090411 111114	14.60040071	144.7750539	0.52	12.76	529.69	542.45	Jason moving east
7853	20090411 111247	14.6004002	144.7752101	358.17	13.13	526.1	539.23	Something big just floated up off the seafloor. Did not look like a fish but seemed to swim away.
7855	20090411 111422	14.60034451	144.7753354	9.31	11.6	532.78	544.38	Jason moving south
7857	20090411 111441	14.60032426	144.7753297	7.73	11.41	534.33	545.74	Jason is 16 meters above seafloor
7858	20090411 111455	14.6003329	144.7752984	6.95	9.31	535.03	544.34	Jason moving west

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7861	20090411 111724	14.60037197	144.774959	3.69	16.04	535.93	551.97	Jason 15 meters above bottom and loosing visibility
7863	20090411 111838	14.60034031	144.7749173	5.72	14.64	542.28	556.92	Jason getting closer to seafloor again
7865	20090411 111850	14.60032621	144.774916	4.03	14.15	543.65	557.8	Jason moving south
7866	20090411 111928	14.60032133	144.7750014	2.5	7.04	545.51	552.55	Visibility good. Altitude is 6 meters above bottom
7869	20090411 112112	14.60031833	144.7750745	26.03	8.31	541.23	549.54	Looks like chute of fine material going downslope amongst larger rubbly rocks
7872	20090411 112304	14.60029007	144.7753459	358.86	9.2	539.02	548.22	Jason still moving east
7875	20090411 112448	14.60026843	144.7755031	7.59	10.99	544.24	555.23	Jason moving south
7876	20090411 112529	14.60024253	144.7754657	2.17	9.03	547.06	556.09	Jason moving west
7878	20090411 112613	14.60024816	144.7753192	1.88	6.91	545.3	552.21	Visibility good
7881	20090411 112820	14.60026593	144.7749756	347.66	8.48	542.59	551.07	Rubbly rocks of mixed sizes interspersed with streaks (channels) of finer material oriented downslope
7884	20090411 112942	14.60021017	144.7749847	3.72	7.84	543.27	551.11	Jason watch changing
7887	20090411 113216	14.60019567	144.7753404	358.27	13.18	543.35	556.53	Jason is 15 meters above the seafloor
7889	20090411 113239	14.60018832	144.7754221	359.48	14.48	544.8	559.28	Jason maintaining heading of 000
7890	20090411 113321	14.60015816	144.7754524	10.65	17.04	544.3	561.34	Best visibility from Brow cam at the moment
7891	20090411 113332	14.60014406	144.77545	13.93	16.69	545.77	562.46	Jason 21 meters above seafloor
7893	20090411 113354	14.60014042	144.7754154	6.8	15.41	547.14	562.55	Jason moving south
7894	20090411 113411	14.60013746	144.7753803	1.55	14.04	547.86	561.9	Jason moving closer to seafloor
7897	20090411 113545	14.60014857	144.7751272	0.13	11.91	547.36	559.27	Jason moving west
7899	20090411 113737	14.60013691	144.7749708	356.57	12.24	544.16	556.4	Passing over ridge covered in fine white sediments. Out of rubbly area just as ridge rose up.
7901	20090411 113750	14.60013113	144.7749946	348.73	11.55	544.86	556.41	Jason moving east again
7902	20090411 113757	14.6001271	144.7750069	350.68	10.9	545.7	556.6	Line spacing is 6 meters
7903	20090411 113832	14.60007872	144.7750325	350.26	9.25	551.76	561.01	Ridge appears to channel rubble slides pretty well to east side.
7907	20090411 114136	14.60004579	144.7754004	9.76	13.63	555.03	568.66	Jason moving south
7909	20090411 114201	14.60001182	144.7753942	9.71	11.83	559.46	571.29	Jason moving west
7913	20090411 114523	14.59999166	144.7750494	345.2	12.05	555.74	567.79	Ridge is prominent. Looks like pillow lavas and some rubble. Rock debris flow to east well constrained by ridge.
7915	20090411 114636	14.59996821	144.775169	1.93	12.09	559.66	571.75	Ship moving southeast towards next line
7917	20090411 114647	14.5999635	144.7752023	358.65	12.6	560.48	573.08	Ship moving east
7918	20090411 114726	14.59995795	144.7753151	0.22	10.96	563	573.96	Jason is 15 meters above seafloor and visibility is pretty good
7921	20090411 114841	14.59990304	144.775389	8.7	11.46	567.51	578.97	Jason moving south
7924	20090411 115046	14.59991285	144.7751351	3.01	9.1	564.25	573.35	Jason moving west
7926	20090411 115145	14.59991734	144.775043	353.69	13.13	563.3	576.43	Ridge is actually a rather interesting lava flow.
7927	20090411 115220	14.59988532	144.7750519	6.16	14.05	563.99	578.04	Jason moving south
7929	20090411 115250	14.59985843	144.7750699	357.52	10.75	570.06	580.81	Jason moving east
7931	20090411 115410	14.59984731	144.7753308	2.11	11.9	570.85	582.75	Visibility good
7932	20090411 115420	14.5998481	144.7753408	8.58	11.28	571.33	582.61	I meant "good"
7934	20090411 115537	14.59980356	144.7754776	9.67	13.53	574.15	587.68	WATCHSTANDERS Andra Bobbitt logger
7938	20090411 115757	14.59980323	144.7750905	352.28	11.98	573.18	585.16	Traversing across west and over the solid lava ridge again.
7940	20090411 115854	14.59974643	144.7751333	358.07	11.86	577.65	589.51	J2-405 start blue set 45
7942	20090411 120007	14.59973458	144.7753919	3.94	11.16	580.39	591.55	Ridge is constraining the debris flow. That is Jason is traversing to the east.
7944	20090411 120050	14.5997301	144.7754711	2.29	12.33	580.46	592.79	Large debris flow.
7945	20090411 120051	14.59972941	144.7754705	3	12.21	580.46	592.67	
7954	20090411 120934	14.59979708	144.775585	3.51	10.89	579.67	590.56	Amazing slide area with an abrupt edge in the debris flow.
7956	20090411 121000	14.59979381	144.7756044	4.39	10.96	579.71	590.67	Marked delineation between fresher looking rocks and those with sediment coating.

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7958	20090411 121108	14.59979072	144.775657	3.13	12.28	580.2	592.48	Jason is positioning to head uphill (waiting for ship).
7959	20090411 121123	14.59982161	144.775661	6.24	9.03	580.89	589.92	Plan is to zigzag up the gap in search coverage.
7961	20090411 121225	14.59986862	144.7755743	3.08	10.45	574.62	585.07	Some very white staining on large lava pillows.
7962	20090411 121239	14.59986997	144.7755423	3.54	10.4	573.62	584.02	J2-405 Start DVCAM 037
7964	20090411 121251	14.59987273	144.775513	2.8	10.36	572.88	583.24	This slide looks very fresh.
7966	20090411 121341	14.599917	144.7754835	4.86	8.89	570.26	579.15	Starting a little up and to the east.
7969	20090411 121634	14.60003201	144.7754162	2.47	7.99	560.33	568.32	Crossing contact between black and sedimented talus.
7974	20090411 122029	14.6000953	144.7754353	36.73	11.56	551.69	563.25	Heading for Marker 104.
7978	20090411 122320	14.60021808	144.7755265	36.04	12.35	545.27	557.62	Gradual slope up as we are going 035 to Marker 104 (unnamed site?)
7983	20090411 122653	14.60045855	144.7757064	36.12	11.86	538.33	550.19	Monitor just showed surface-we are not on the surface.
7984	20090411 122724	14.60048587	144.7757268	36.06	9.74	538.31	548.05	Some mat or staining on the outcrops here.
7987	20090411 122932	14.60059833	144.7758111	36.1	6.28	532.64	538.92	Following a ridge up the slope with staining on top of ridge and less sediment on the slopes.
7990	20090411 123113	14.6006855	144.7758591	34.13	6.96	523.96	530.92	Seeing some shimmering water up near the top of ridge.
7991	20090411 123122	14.60068985	144.7758575	43.47	7.56	523.25	530.81	There is flow under the lip on the ridge.
7992	20090411 123130	14.60069306	144.7758554	36.53	7.66	523.44	531.1	We should be just south of Marker 108 area.
7995	20090411 123247	14.6006789	144.7758332	66.92	7.08	527.59	534.67	Stopping here to look at flow.
7998	20090411 123451	14.60068895	144.7758356	69.42	5.16	528.74	533.9	Current is very strong here. Jason bumped and stirred up some sediment.
8000	20090411 123551	14.60069284	144.775835	68.72	5	528.9	533.9	Looks like a promising diffuse flow sampling site.
8002	20090411 123651	14.60069302	144.7758338	68.75	5.04	528.83	533.87	We are 9m shallower than Mat Mecca so Dave wants to sample this area.
8005	20090411 123913	14.60069381	144.7758332	68.78	5.14	528.83	533.97	Heading is NE so we are SW of top of a ridge that is smoothly sedimented.
8006	20090411 123926	14.6006938	144.7758332	68.78	5.13	528.83	533.96	This is reading 22deg.
8009	20090411 124123	14.60069398	144.7758332	68.8	5.01	528.87	533.88	Site looks good for fluid sampling. Used Jason temp probe for the reading.
8011	20090411 124213	14.60069509	144.7758344	68.8	5.03	528.89	533.92	Trying to stow wand.
8013	20090411 124321	14.60069506	144.775835	68.84	5.06	528.85	533.91	Retrieving HFS wand.
8016	20090411 124445	14.60069256	144.7758232	84.68	5.05	528.51	533.56	Backing off hill as disturbed sediment which is really fine.
8017	20090411 124449	14.60069339	144.7758248	85.88	4.8	528.53	533.33	Lasers on.
8018	20090411 124512	14.60069718	144.7758263	85.67	4.56	528.66	533.22	Lasers targeting the sample target area of flow.
8020	20090411 124556	14.60069774	144.7758259	84.77	4.4	528.81	533.21	Lots of flow here-covering entire slope.
8022	20090411 124646	14.60069771	144.7758257	84.86	4.48	528.76	533.24	Great flow all around here-looks like current streaming up the face.
8023	20090411 124713	14.60069746	144.7758257	84.87	4.46	528.77	533.23	Checking HFS exhaust.
8025	20090411 124756	14.60069774	144.7758258	84.9	4.48	528.76	533.24	Not going to see any exhaust with the particle trap on.
8026	20090411 124821	14.6006978	144.7758256	85.31	4.39	528.79	533.18	Getting 18-20deg and want to look around for best water.
8028	20090411 124910	14.60069769	144.7758262	84.52	4.46	528.79	533.25	Resetting pump on Beast.
8030	20090411 124940	14.60069752	144.7758263	84.32	4.6	528.77	533.37	Good place in this crack (just poking around all in the general vicinity)
8031	20090411 124953	14.60069755	144.7758263	84.36	4.54	528.79	533.33	Looks like a good spot here with over 36deg and still going up.
8033	20090411 125044	14.6006971	144.7758262	84.78	4.59	528.79	533.38	Navigation has us between Marker 108 and Mat Mecca but depths are all wrong.
8034	20090411 125054	14.60069746	144.7758261	85.04	4.44	528.81	533.25	Nav hasn't been reset for awhile.
8035	20090411 125101	14.60069749	144.775826	85.01	4.45	528.81	533.26	Taking a pH reading first.
8038	20090411 125245	14.60069708	144.775826	83.83	4.55	528.81	533.36	pH=2.87 reading here (but something seems off about the measurement).
8040	20090411 125401	14.60069679	144.7758257	83.69	4.58	528.84	533.42	SAMPLE Fluid 1: Unfiltered bag #24 at this new site with depth 530 HDG=083 into ridge face.
8041	20090411 125432	14.60069683	144.7758257	83.57	4.5	528.85	533.35	Temperature went down a bit to 26. J2-405-HFS-01
8043	20090411 125449	14.60069643	144.7758257	83.43	4.58	528.87	533.45	Butt cam show plume coming at Jason.
8044	20090411 125500	14.60069629	144.7758253	83.6	4.56	528.9	533.46	While sampling looking below and seeing even more flow.
8045	20090411 125537	14.60069749	144.7758261	85.62	4.45	528.84	533.29	Flow is shifting around and so in Jason-temperature is falling.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-405 Logger Comment
8047	20090411 125601	14.60069758	144.7758263	85.03	4.54	528.81	533.35	Sample was not started!-Still in pH mode.
8048	20090411 125618	14.60069764	144.7758264	84.88	4.54	528.81	533.35	Will move to a higher flow.
8051	20090411 125836	14.60069583	144.7758272	89.59	3.29	530.12	533.41	Getting more vertical pull on Medea.
8056	20090411 130221	14.60069661	144.7758272	89.56	3.3	530.1	533.4	Can't get steady temperature in these flow areas. Going to poke around.
8058	20090411 130305	14.60069676	144.7758273	89.55	3.29	530.14	533.43	Lots of plume behind vehicle (vent fog)
8060	20090411 130354	14.60069689	144.7758272	89.57	3.28	530.14	533.42	Mat pieces flying all over. Poked hole and got rid of some debris-temp going up now.
8061	20090411 130408	14.60069697	144.7758273	89.55	3.26	530.15	533.41	At top of crack in excavated area.
8063	20090411 130454	14.600697	144.7758273	89.57	3.3	530.16	533.46	Beast pump keeps stopping.
8064	20090411 130533	14.60069702	144.7758272	89.54	3.26	530.18	533.44	1: Unfiltered bag #24 starting. J2-405-HFS-01
8065	20090411 130539	14.60069705	144.7758273	89.55	3.24	530.16	533.4	SAMPLE Fluid
8067	20090411 130612	14.60069719	144.7758274	89.53	3.24	530.17	533.41	SAMPLE Fluid 1: J2-405-HFS-01 with good exhaust in back at Beast.
8070	20090411 130801	14.600698	144.7758276	89.53	3.26	530.19	533.45	Butt camera is thruster moving the sediment off the wall.
8072	20090411 130939	14.60069853	144.7758276	89.51	3.25	530.19	533.44	SAMPLE Fluid 1: Steady temperature. Stopped.
8074	20090411 131012	14.60069887	144.7758276	89.51	3.23	530.23	533.46	SAMPLE Fluid 1: Tmax=41.5 Tavg=39.7 vol=484 T2=12.2
8077	20090411 131141	14.60069939	144.7758273	89.53	3.21	530.17	533.38	SAMPLE Fluid 2: Filtered Piston #4 J2-405-HFS-02 started (same place but temp increased)
8079	20090411 131301	14.6006999	144.7758273	89.47	3.23	530.19	533.42	Lat/Long (prob not really good) 14deg 36.042'N 144deg 46.550'E
8083	20090411 131553	14.60070085	144.7758273	89.51	3.25	530.17	533.42	SAMPLE Fluid 2: Stopped.
8084	20090411 131613	14.60070111	144.7758273	89.51	3.25	530.18	533.43	2: Tmax=46.4 Tavg=46.1 vol=518 T2=22.
8086	20090411 131706	14.60070142	144.7758274	89.48	3.21	530.21	533.42	SAMPLE Fluid 3: Sterivex 10 J2-405-HFS-03 started.
8103	20090411 133319	14.60070374	144.7758255	89.51	3.26	530.19	533.45	3: Stopped
8104	20090411 133336	14.60070383	144.7758256	89.51	3.2	530.19	533.39	Tmax=46.3 Tavg=46.1 vol=3002 T2=22.
8106	20090411 133352	14.60070387	144.7758255	89.53	3.28	530.19	533.47	Going to get a pH here and then suction sample.
8107	20090411 133426	14.60070399	144.7758256	89.54	3.25	530.2	533.45	SAMPLE Gas 3: Port GT fired
8110	20090411 133546	14.60070394	144.7758254	89.54	3.25	530.18	533.43	SAMPLE Gas 4: GT #15 retracted J2-405-GT-04 (change last entry...that is #4)
8111	20090411 133625	14.6007039	144.7758252	89.54	3.25	530.18	533.43	Taking pH reading: pH 2.55
8113	20090411 133701	14.600704	144.7758252	89.63	3.21	530.2	533.41	Port gastight on Beast #15 was J2-405-GT-04
8114	20090411 133715	14.600704	144.775825	89.59	3.21	530.18	533.39	Removed wand from this hole.
8116	20090411 133815	14.6007041	144.7758249	89.67	3.28	530.14	533.42	Next we are going to suction this area for mat.
8120	20090411 134124	14.60070417	144.7758239	89.49	3.31	530.19	533.5	5: J2-405-suction-05 Mat at same place as HFS samples. Started
8123	20090411 134248	14.60070452	144.7758238	89.36	3.25	530.16	533.41	SAMPLE Biology 5: J2-405-suction-05 Trying to get mat and not gravel.
8124	20090411 134314	14.6007045	144.7758237	89.46	3.24	530.18	533.42	Pulsing the pump as it gets clogged up.
8126	20090411 134440	14.60070444	144.7758234	89.08	3.24	530.23	533.47	Can't get it to suction any more. Trying one more time.
8129	20090411 134553	14.6007031	144.7758215	88.82	3.23	530.25	533.48	Getting a little flow. Good amount in now.
8132	20090411 134751	14.60070248	144.7758202	89.08	3.2	530.29	533.49	Done sampling as pump won't flow anymore.
8133	20090411 134807	14.60070243	144.7758201	89.11	3.19	530.31	533.5	Would like to deploy a marker here.
8136	20090411 134955	14.60070195	144.7758189	88.8	3.21	530.28	533.49	DEPLOY Marker 115 Flying Floc site (new marker and name)
8138	20090411 135055	14.60070193	144.7758185	89.02	3.18	530.33	533.51	Depth here is 530 and heading is 089 at Flying Floc just below ridge top.
8140	20090411 135150	14.60070157	144.7758177	88.98	3.24	530.18	533.42	Moving Marker to a flatter spot just to the right on top of a rock.
8141	20090411 135200	14.60070145	144.7758175	88.98	3.15	530.3	533.45	J2-405 Data DVDs start blue set 46
8142	20090411 135205	14.60070137	144.7758174	89	3.25	530.26	533.51	Passing Marker from one arm to the other for positioning.
8145	20090411 135438	14.60070153	144.7758167	89.04	3.23	530.17	533.4	Will have to move Jason slightly to the right to reach the flat rock.
8147	20090411 135538	14.60070184	144.7758188	88.13	3.21	530.19	533.4	J2-405 Data DVDs stop red set 45
8150	20090411 135658	14.60070722	144.7758169	88.57	3.46	529.49	532.95	Moved Marker 115 Flying Floc to top of flat rock ledge.
8151	20090411 135727	14.60070802	144.775823	87.48	4.01	528.66	532.67	Going to fine tune its position to get both chain links on flat ground.
8154	20090411 135931	14.60069549	144.7758188	85.57	3.43	528.53	531.96	Nice position for Marker 115.



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8157	20090411 140126	14.6006966	144.775801	85.92	4.58	528.56	533.14	Backing off site to get a good overview of its location. Need to wait for dust to settle.
8159	20090411 140238	14.60068763	144.7757684	77.74	7.65	528.12	535.77	Finished here and going to look below to see if Marker 108 is just below this area.
8161	20090411 140253	14.60068263	144.7757532	79.44	7.64	529.67	537.31	We are facing east as we back down.
8163	20090411 140350	14.60065905	144.7756944	65.1	8.04	534.41	542.45	The red rocks here look similar to the Marker 108 site.
8164	20090411 140417	14.60067215	144.7756957	60.68	7.44	534.41	541.85	We are at 535 and marker is at 541m.
8167	20090411 140606	14.60067694	144.7756421	13.24	5.6	538.05	543.65	No visibility right now-in the Jason cloud or other?
8168	20090411 140622	14.60069538	144.7756583	12.97	5.61	536.47	542.08	There is the slope again
8172	20090411 140843	14.6007026	144.7756358	337.3	2.3	539.73	542.03	Looking for Marker 108 in poor visibility.
8174	20090411 140944	14.60071112	144.7756035	356.63	4.86	537.13	541.99	Heading and depth are the same but can't locate the marker.
8176	20090411 141053	14.60075266	144.7756724	26.8	2.71	535.69	538.4	Visibility too bad for this area so going to head up to Marker 102 where there is a lot of mat. 120m at 040.
8177	20090411 141121	14.60074853	144.7757048	28.49	5.53	532.43	537.96	Came out of plume as we rose and Jason is stirring up sediment as we climb the ridge.
8178	20090411 141129	14.60074613	144.7757084	23.16	6.14	531.69	537.83	White staining on top of ridge.
8180	20090411 141157	14.60076311	144.7757321	36.77	13.4	522.87	536.27	Some rocky outcrops and red-brown rocks.
8181	20090411 141219	14.60080273	144.7757753	47	13.08	515.42	528.5	Top of ridge is smooth and 517m.
8183	20090411 141321	14.60082823	144.7758093	47.75	2.94	519.46	522.4	There is the leftover Koichi marker from the instrument already recovered. Koichi base. Adding nav target.
8185	20090411 141409	14.60082941	144.7758041	47.51	3.84	518.85	522.69	Koichi marker at depth 520m
8187	20090411 141526	14.6008423	144.7758264	48.42	2.44	518.37	520.81	Navigation is really off as the old Koichi marker H952 is far north of us on nav screen. Bogus nav or target location.
8189	20090411 141542	14.60084278	144.7758264	44.3	2.7	518.2	520.9	Current strong.
8190	20090411 141608	14.60084134	144.7758253	46.39	2.51	518.32	520.83	As crested the ridge-we could see the dust plume rising from where we were looking from 108 and sampling beforehand.
8192	20090411 141644	14.60084181	144.7758253	45.57	3.03	517.86	520.89	Navigation issues matching where we are-new bathy-old targets.
8193	20090411 141710	14.60084264	144.7758249	45.23	3.24	517.63	520.87	Haven't reset doppler since first visited Brimstone on the dive (never reset during CTD search)
8194	20090411 141722	14.60084234	144.7758266	45.11	3.08	517.65	520.73	J2-405 Stop DVCAM 037 start DVCAM 038
8197	20090411 141912	14.6011026	144.7761779	86.43	11.48	515.54	527.02	NAV Doppler reset
8198	20090411 141925	14.60111472	144.7762087	86.42	10.28	515.64	525.92	Position of Jason jumped 40m with the doppler reset.
8200	20090411 141954	14.60114064	144.7762464	81.42	17.14	515.62	532.76	Definitely seeing navigation move with transponders and current.
8201	20090411 142035	14.60115256	144.7762551	75.89	16.86	516.12	532.98	Bathymetry is not matching Jason depth.
8206	20090411 142419	14.60127275	144.7763092	328.24	7.1	548.13	555.23	Heading to Marker 102 (lots of mat) at depth 553 and see at hdg 268
8207	20090411 142430	14.60127492	144.7763111	319.33	7.43	548.07	555.5	About 33m to go.
8209	20090411 142447	14.60127337	144.7763128	329.66	5.16	550.23	555.39	Cliff in front of us with some white staining.
8210	20090411 142518	14.60135728	144.7762903	333.26	5.19	552.77	557.96	We are going to fly along at this depth and hopefully run into it.
8212	20090411 142552	14.60140177	144.7763011	330.92	6.65	552.57	559.22	Looking at outcrop and wall. Waiting a bit for Medea.
8215	20090411 142749	14.60151197	144.7763392	320.67	6.66	552.43	559.09	There is the Marker. Navigation good after doppler reset.
8217	20090411 142931	14.60158172	144.7763136	273.31	5.91	552.67	558.58	Marker 102 site is covered in mat. Fuzzy Wall site (new name)
8219	20090411 143004	14.60158201	144.7763136	272.84	5.96	552.66	558.62	Looking at site while waiting for Medea and dust settling.
8220	20090411 143033	14.60158227	144.7763138	272.99	5.91	552.66	558.57	Fuzzy Wall 14deg36.038'N 144deg 46.744'E
8222	20090411 143101	14.60158347	144.776289	272.57	4	553.57	557.57	Looking for flow on wall.
8225	20090411 143334	14.60159823	144.7763019	247.71	2.74	556.16	558.9	Can see some crabs in the mat but not seeing any apparent flow.
8227	20090411 143429	14.6015834	144.7763048	230.51	1.71	556.97	558.68	Can see some shrimp as well in the rocks.
8229	20090411 143512	14.60158135	144.7763046	233.01	0.81	558.11	558.92	Shrimp are leading the way to the flow.
8230	20090411 143520	14.60158118	144.7763048	232.99	0.83	558.11	558.94	Looks like low temperature.
8233	20090411 143722	14.60157911	144.7763052	230.91	2.24	556.4	558.64	Scott traded with Will. Scott is pilot again

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8235	20090411 143752	14.60158002	144.7762983	221.28	1.29	557.2	558.49	We are looking for an area with good flow to sample
8236	20090411 143832	14.60157155	144.776308	248.53	2.19	556.29	558.48	We accidentally hit the right side of Jason against the wall
8240	20090411 144048	14.60157779	144.7763	252.72	1.46	556.83	558.29	It is difficult to get into this area because of the cliff
8242	20090411 144200	14.60157821	144.776299	251.7	0.95	557.42	558.37	There is shimmering in the crack to the right of the crab
8245	20090411 144422	14.6015802	144.776299	252.41	1.03	557.29	558.32	Navigation matched target after doppler reset..
8247	20090411 144511	14.60158305	144.7763039	251.18	1.85	556.42	558.27	Retrieving wand from basket.
8252	20090411 144940	14.60158323	144.7763031	252.27	1.43	556.87	558.3	Got the wand in the arm securely and now searching for flow.
8256	20090411 145153	14.60158033	144.7763003	242.61	1.21	557.2	558.41	Background temperature is 6.7deg.
8257	20090411 145230	14.60158034	144.7763	242.55	1.21	557.2	558.41	Just one degree higher than background.
8260	20090411 145415	14.6015793	144.7762998	242.65	1.19	557.17	558.36	Renamed by request...no longer a fuzzy wall...it is the Amphitheater!
8261	20090411 145425	14.60157912	144.7762996	242.63	1.19	557.17	558.36	Tiny-tiny shrimp.
8262	20090411 145429	14.60157909	144.7762996	242.65	1.19	557.16	558.35	Getting 12deg.
8264	20090411 145525	14.60158051	144.7762998	242.67	1.19	557.16	558.35	SAMPLE Fluid First a pH measurement.
8267	20090411 145705	14.6015815	144.7763002	242.63	1.19	557.18	558.37	We are 5m below the Marker 102 at the Amphitheater.
8268	20090411 145713	14.60158166	144.7763002	242.7	1.19	557.18	558.37	ph is 5.48
8270	20090411 145754	14.60158257	144.7763004	242.62	1.2	557.17	558.37	SAMPLE Fluid 6: J2-405-HFS-06 Unfiltered bag #23 starting
8271	20090411 145837	14.60158323	144.7763009	242.61	1.2	557.18	558.38	6: Steady at 12.3 and T2 is 9.7 so far.
8275	20090411 150122	14.60158415	144.7763011	242.55	1.23	557.19	558.42	SAMPLE Fluid 6: Stopping.
8276	20090411 150140	14.60158417	144.7763011	242.5	1.19	557.18	558.37	Tmax=13.2 Avg=12.8 vol=462 T2=10.
8278	20090411 150229	14.60158435	144.7763006	242.39	1.19	557.19	558.38	SAMPLE Fluid 7: J2-405-HFS-07 Unfiltered piston #1.
8282	20090411 150514	14.60158356	144.7762993	242.38	1.23	557.17	558.4	There are some really small shrimp here (smaller than the normal small ones).
8284	20090411 150544	14.60158327	144.776299	242.51	1.19	557.17	558.36	Opapepe loihi--small shrimp
8286	20090411 150727	14.60158383	144.776299	242.73	1.2	557.14	558.34	Looked like a scale worm. Crab carried long string of mat down into a hole.
8287	20090411 150739	14.60158403	144.7762988	242.82	1.23	557.13	558.36	7: Stopped.
8289	20090411 150758	14.60158406	144.776299	242.82	1.2	557.13	558.33	Tmax=13.3 Avg=12.8 vol=594 T2=10.2
8291	20090411 150856	14.60158441	144.7762991	242.85	1.21	557.12	558.33	8: J2-405-HFS-08 Filtered bag #17 starting
8296	20090411 151320	14.60158299	144.7762996	242.73	1.23	557.15	558.38	Stopped.
8298	20090411 151350	14.60158183	144.7762991	242.68	1.24	557.16	558.4	8: Tmax=13.2 Avg=12.7 vol=555 T2=10.0
8299	20090411 151356	14.6015814	144.7762988	242.68	1.23	557.15	558.38	over-filled bag
8303	20090411 151651	14.60158013	144.7762982	242.57	1.2	557.15	558.35	9: J2-405-HFS-09 Sterevix #12
8304	20090411 151710	14.60158024	144.7762986	242.59	1.23	557.16	558.39	Started 15:14:34...missed Dave's quiet start voice.
8308	20090411 151957	14.60158093	144.7762992	242.59	1.18	557.14	558.32	9: sample for DNA
8309	20090411 152014	14.60158056	144.7762992	242.65	1.23	557.14	558.37	Pilot cam has great shot of fuzzy mat-looks like animal fur.
8313	20090411 152253	14.60157225	144.776297	242.87	1.23	557.14	558.37	Red scale worms in some places (Polynoid)
8314	20090411 152312	14.60157179	144.7762967	242.84	1.23	557.16	558.39	Cat face in Pilot cam
8315	20090411 152336	14.60157084	144.7762966	242.88	1.23	557.14	558.37	Barnacles are here as well.
8318	20090411 152424	14.60156913	144.7762963	242.92	1.24	557.13	558.37	Barnacles.
8319	20090411 152431	14.60156884	144.7762961	242.9	1.23	557.14	558.37	VIDEO Start recording HDCam HD on
8321	20090411 152455	14.60156666	144.7762956	242.89	1.24	557.12	558.36	Getting HD and DSC of barnacles and mat.
8323	20090411 152544	14.60156396	144.7762945	242.87	1.24	557.12	558.36	Good view of barnacles on wall.
8326	20090411 152609	14.60156245	144.776294	242.84	1.23	557.12	558.35	Good photo in Pilot cam of barnacle profiles.
8328	20090411 152631	14.60156162	144.7762938	242.98	1.24	557.12	558.36	Good patch.
8330	20090411 152657	14.60156074	144.7762935	242.91	1.23	557.12	558.35	Iris brought down.
8331	20090411 152736	14.60156061	144.7762932	243	1.23	557.12	558.35	Great views of critters.
8333	20090411 152800	14.60156078	144.7762928	242.95	1.23	557.12	558.35	Good HD of animals-especially barnacles.
8336	20090411 152929	14.60155905	144.7762921	242.86	1.23	557.13	558.36	No idea what that last entry was-wall of barnacles it was supposed to be!

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8339	20090411 153054	14.60155681	144.776291	242.93	1.23	557.12	558.35	9: J2-405-HFS-09 stopped.
8340	20090411 153111	14.60155686	144.776291	242.88	1.23	557.12	558.35	Tmax=13.5 Tavg=12.9 vol=3005 T2=10.2
8341	20090411 153135	14.60155663	144.776291	242.85	1.23	557.12	558.35	10: J2-405-HFS-10 Sterivex #13 started.
8343	20090411 153146	14.60155626	144.7762907	242.87	1.23	557.12	558.35	VIDEO Stop recording HDCam
8347	20090411 153445	14.60155521	144.7762892	242.77	1.23	557.13	558.36	HD is watching a crab.
8349	20090411 153551	14.60155104	144.7762888	242.76	1.24	557.12	558.36	WATCHSTANDERS Nick Deardorff video
8351	20090411 153648	14.60155079	144.7762885	242.55	1.24	557.12	558.36	10: We are still at 5m below Marker 102 at the Amphitheater site.
8356	20090411 154119	14.60154838	144.7762899	242.41	1.2	557.15	558.35	10: still pumping this one for RNA analysis
8362	20090411 154601	14.60155334	144.7762927	242.28	1.18	557.12	558.3	J2-405 Data DVDs start red set DVDs 047
8367	20090411 155030	14.60155746	144.7762939	242.23	1.16	557.08	558.24	J2-405 Data DVDs stop blue set DVD 046
8368	20090411 155034	14.60155745	144.776294	242.24	1.16	557.08	558.24	Sample 10. HFS stop. 154930. Sterivex#13. Tmax=13.3. Tavg=12.7. Vol=3881ml. T2=9.6. Mkr102.
8372	20090411 155249	14.60156143	144.776296	242.28	1.18	557.07	558.25	SAMPLE Fluid 11. HFS GFF filter#20. Start 155125. Temp=13. Tbackground=6.9.
8375	20090411 155458	14.60156166	144.7762969	242.55	1.19	557.1	558.29	SAMPLE j2-HFS-11. filter#20. Amphitheater Mkr-102. A few shrimp. Barnacles. Mat.
8384	20090411 160337	14.60155569	144.7762965	243.07	1.23	557.07	558.3	SAMPLE j2-405-HFS-11 cont. PI is Murdoch.
8386	20090411 160343	14.60155584	144.7762968	242.99	1.23	557.07	558.3	Still sampling here.
8388	20090411 160536	14.60155585	144.776297	242.91	1.23	557.08	558.31	SAMPLE j2-405-HFS-11 stop 1605. Tmax=12.6. Tavg=12.2. Vol=3066ml.
8391	20090411 160643	14.60155442	144.7762965	242.89	1.23	557.09	558.32	12. j2-405-gas-12. Stbd gastight fired at1606. Tmax=12.6. Amphitheater Mkr102.
8393	20090411 160751	14.60155399	144.7762963	242.85	1.2	557.14	558.34	Stowing the HFS sampler. Next destination is Brimstone.
8397	20090411 161126	14.60157103	144.7763039	236.75	3.61	555.29	558.9	We're heading toward Brimstone now.
8400	20090411 161250	14.60150989	144.7763941	187.79	3.44	558.84	562.28	SAMPLE j2-405-gas-12 was the stbd gastight.
8402	20090411 161345	14.60142839	144.7764128	188.51	2.91	562.09	565	Huge difference in the sediment colors here. White and black.
8405	20090411 161635	14.60129075	144.7764152	188.49	2.51	563.04	565.55	Moving over the seafloor.
8407	20090411 161731	14.601265	144.7764153	188.92	2.45	562.24	564.69	J2-405 DVCAM 038 stop and 039 start
8416	20090411 162528	14.60115515	144.7762715	213.34	30.87	522.17	553.04	Shrimp on the seafloor.
8417	20090411 162533	14.60115346	144.7762673	214.2	30.62	522.57	553.19	We're in the plume now.
8420	20090411 162814	14.60105764	144.7761655	215.92	1.88	522.5	524.38	The plume is thick again today.
8422	20090411 162845	14.60103164	144.7761383	213.17	1.96	522.11	524.07	Kathy says we are in the "vog" (volcanic fog).
8423	20090411 162852	14.60103194	144.7761384	212.84	1.95	522.23	524.18	The bottom is in sight again.
8425	20090411 163010	14.60100997	144.776121	213.15	2.25	520.46	522.71	We're still a little east of Iceberg. About 100m east of Brimstone.
8432	20090411 163612	14.60088516	144.7756346	249.71	3.74	534.24	537.98	The seafloor is in sight. Still in the plume and visibility is poor.
8436	20090411 163851	14.60076939	144.7756067	291.75	2.69	533.04	535.73	Sand is pretty rippled here. ripples are perpendicular to the slope. Brimstone cloud is thick.
8438	20090411 164021	14.60077027	144.7754975	291.05	3.78	526.18	529.96	Lots of talus here. Approaching Brimstone from the east. Visibility is poor.
8440	20090411 164046	14.60077477	144.7754913	291.56	4.04	525.24	529.28	Buddha thinks that we passed it.
8441	20090411 164126	14.60078316	144.7754507	321.7	4.79	522.18	526.97	Brimstone is now in plain sight.
8442	20090411 164142	14.6007987	144.7754438	324.7	4.08	521.5	525.58	Looks a bit wimpy today.
8444	20090411 164212	14.6008035	144.7754422	328.29	3.61	521.64	525.25	Dave wants a gradient of fluid samples from the outside in.
8446	20090411 164313	14.60080318	144.7754416	332.44	3.2	521.79	524.99	Not a lots of action out of Brimstone today. Some bubbles coming up.
8447	20090411 164340	14.60080291	144.7754419	332.44	3.11	521.81	524.92	Fluid sampling gradient is the goal.
8449	20090411 164350	14.60080292	144.7754418	332.43	3.1	521.81	524.91	The ground is shaking and a rock just fell downslope.
8450	20090411 164406	14.60080589	144.7754467	307.1	3.05	521.11	524.16	Checking out the flow around here.
8451	20090411 164428	14.60083052	144.7754522	257.13	3.06	520.88	523.94	it looks like it is picking up a bit. Lots of bubbles in the Medea cam.
8453	20090411 164508	14.60085046	144.7754352	221.46	3.1	520.53	523.63	Looks like the flow is more focused today.
8454	20090411 164518	14.60085247	144.7754295	210.66	2.09	520.97	523.06	Lots of yellow at the base of the flow.
8456	20090411 164638	14.60084644	144.7754272	207.4	1.06	521.72	522.78	We're looking at the pit from the NE toward the SW.

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8459	20090411 164748	14.60084124	144.7754298	206.15	1.09	521.65	522.74	we are preparing to sample. Dave doesn't want to put the sampler in the ground or it will plug up with sulfur again.
8460	20090411 164836	14.60084235	144.7754314	210.23	1.55	521.46	523.01	Nice shot of the bubbles coming out.
8461	20090411 164843	14.60084221	144.7754315	209.83	1.51	521.39	522.9	VIDEO Start recording HDCam
8463	20090411 164852	14.60084234	144.7754308	206.53	1.05	521.67	522.72	Setting up to sample.
8465	20090411 164954	14.60083472	144.7754333	203.91	1.16	521.68	522.84	SAMPLE Fluid Explosion going on right now.
8466	20090411 165024	14.600837	144.7754336	196.61	1.19	521.58	522.77	See lots of ash in the plume.
8471	20090411 165345	14.60083719	144.7754338	196.36	1.23	521.56	522.79	SAMPLE Fluid There was a very large burst here. The action has subsided a bit. Dave wants to keep the wand in the plume not the fluid.
8472	20090411 165408	14.6008279	144.7754439	222.46	2.33	521.07	523.4	HAVE NOT ACTUALLY STARTED THE SAMPLE YET. STILL SETTING UP.
8473	20090411 165419	14.60082361	144.7754446	222.68	1.19	521.86	523.05	Watching the plume action.
8475	20090411 165523	14.60082356	144.7754431	213.03	1.68	521.58	523.26	Lasers back on. Dave is setting up. Lasers back off within a minute. Temp staying around 25C in the plume.
8476	20090411 165542	14.60082335	144.7754433	212.33	1.79	521.55	523.34	Still bubbling quite vigorously.
8478	20090411 165552	14.60082317	144.7754433	212.67	1.69	521.55	523.24	There is quite a bit of ash coming out.
8480	20090411 165651	14.60082262	144.775444	212.82	1.7	521.5	523.2	13. j2-405-HFS-13. HFS unfiltered piston#3. Positioned in the plume about 1.5 feet above the rocks. Start 165550.
8482	20090411 165744	14.60082521	144.7754441	211.81	1.66	521.5	523.16	VIDEO Stop recording HDCam
8483	20090411 165804	14.60082487	144.7754442	211.97	1.7	521.47	523.17	SAMPLE 13. j2-405-HFS-13. HFS piston#3. Positioned in the plume. The temp is variable.
8484	20090411 165838	14.60082521	144.775444	209.18	1.81	521.43	523.24	SAMPLE 13. j2-405-HFS-13. HFS piston#3. Positioned in the plume. Stop 165809. Tmax=24.5. Tavg=20.9. Vol=250ml. T2=10.
8486	20090411 165905	14.6008259	144.7754436	209.26	1.8	521.46	523.26	T2 is back inside where all the samples are.
8488	20090411 170039	14.60082661	144.7754431	211.82	1.79	521.5	523.29	SAMPLE Fluid 14. Unfiltered piston #5. Start 165945. J2-405-HFS-14. Stopped at 170022. Restarted.
8490	20090411 170058	14.60082659	144.7754433	213.68	1.8	521.53	523.33	J2-405-HFS-14. Not sure if getting any flow. Trying it again.
8491	20090411 170130	14.60082612	144.775443	214.59	1.76	521.51	523.27	J2-405-HFS-14 cont. Something a bit wrong. Try one more time.
8493	20090411 170155	14.60082588	144.7754437	215.87	1.74	521.5	523.24	J2-405-HFS-14 cont. Jut a little puff and then it stops.
8495	20090411 170251	14.60082502	144.7754443	215.19	1.78	521.52	523.3	J2-405-HFS-14 cont. Trying one more time. Stop 170220. Tmax=34.7. Tavg=19. Vol=212ml but not sure it worked. T2=8.
8496	20090411 170310	14.60082505	144.7754445	215.01	1.75	521.54	523.29	Right now the temp is dropping. May need to reposition.
8497	20090411 170315	14.6008251	144.7754444	214.49	1.78	521.52	523.3	Repositioning.
8498	20090411 170335	14.60082521	144.775444	212.17	1.81	521.54	523.35	Visibility is really poor.
8500	20090411 170410	14.60083276	144.7754216	177.43	1.31	520.62	521.93	Bubble action is increasing.
8502	20090411 170451	14.60083928	144.7754352	207.82	2.84	520.11	522.95	Wobbly CO2 bubbles in the brow cam video.
8503	20090411 170509	14.60083742	144.7754349	197.25	1.23	521.52	522.75	The plume is really vigorous.
8506	20090411 170706	14.60083822	144.7754354	196.02	1.24	521.57	522.81	OK. looking better now. We have moved almost due north. Our heading is 196.
8507	20090411 170713	14.60083844	144.7754356	195.77	1.26	521.57	522.83	Dave is trying it again.
8510	20090411 170852	14.60083462	144.7754372	198.31	1.18	521.59	522.77	Still manipulating the wand.
8511	20090411 170925	14.6008348	144.7754375	199.35	1.21	521.6	522.81	VIDEO Start recording HDCam at Brimstone.
8513	20090411 171002	14.60083286	144.775435	199.73	1.25	521.61	522.86	Pump back on. Big burst of ash chunks etc.
8514	20090411 171014	14.60083249	144.7754359	199.76	1.24	521.62	522.86	lots more ash than on previous visits this year.
8517	20090411 171204	14.60083112	144.7754406	199.91	1.2	521.66	522.86	Pretty vigorous eruption going on here. The wand is not positioned correctly. Moving it again.
8519	20090411 171322	14.60083182	144.7754436	208.25	1.38	521.62	523	Lasers on for a moment. Then turned them off.
8521	20090411 171350	14.60083183	144.775444	208.37	1.65	521.59	523.24	Dave is still positioning. The temp in the vog is only about 11 degrees.

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8522	20090411 171356	14.60083173	144.775444	208.37	1.55	521.59	523.14	VIDEO Stop recording HDCam
8527	20090411 171823	14.60082692	144.7754442	202.7	1.16	521.59	522.75	The ash is continuing to fall out of the plume.
8529	20090411 171854	14.60082705	144.7754466	203.04	1.18	521.59	522.77	The ash and bubbles are continuing for at least a half hour now.
8531	20090411 171953	14.60082764	144.7754484	211.18	1.48	521.5	522.98	Looking at the sampler hose. The black tape on the sampler hose is starting to burn off.
8532	20090411 172031	14.60082728	144.7754474	211.39	1.73	521.48	523.21	T2 is not rising at all. Visibility is next to nothing.
8536	20090411 172316	14.60079478	144.7754466	209.58	1.53	521.39	522.92	15. j2-405-HFS-15. Start 172240. Filtered piston #2. Temp went up to 40.
8538	20090411 172440	14.6008151	144.7754625	211.03	1.43	521.41	522.84	SAMPLE Fluid 15. j2-405-HFS-15. Filtered piston #2. Don't seem to be getting good flow. It starts and then it stop.
8541	20090411 172613	14.6008073	144.775471	209.57	1.58	521.6	523.18	j2-405-HFS-15 cont. Starts and stops. Not going too well. Stop 172545. Tmax=44.5. avg=40.6. Vol=242. Didn't look good.
8543	20090411 172737	14.60080658	144.7754709	210.79	1.64	521.64	523.28	SAMPLE Fluid 16. HFS Unfiltered bag#22. j2-405-HFS-16. Start 172645. Temp around 35.
8546	20090411 172849	14.60080753	144.7754647	211.31	1.36	521.61	522.97	Sample j2-405-HFS-16. Unfiltered bag#22. Seems to be working. Stop 172820. Tmax=38.7. ave=35.2. Vol=175ml.
8551	20090411 173330	14.60080254	144.7754939	210.74	1.65	521.62	523.27	Switching to port 0 and flushing the pumps. Lots of ash in this outburst.
8553	20090411 173419	14.60082956	144.7754844	201	4.83	518.06	522.89	The pumps seem to be working. It may be a little bit clogged on the from end. Dave wants to see the end of the nozzle.
8555	20090411 173520	14.60083549	144.775485	200.45	5.05	518.31	523.36	Zooming in on the rip to the sampler to check if it is clogged. It's pretty sulfur coated.
8556	20090411 173533	14.60083623	144.7754849	200.43	5.18	517.99	523.17	Flushing the tube.
8559	20090411 173656	14.6008452	144.7754752	157.85	1.76	520.65	522.41	We're now up on the north side.
8560	20090411 173726	14.60084566	144.7754755	159.99	1.64	520.87	522.51	We see shimmering water coming right up through the sands here on the edge of Brimstone.
8562	20090411 173757	14.6008462	144.7754756	160.01	1.58	520.75	522.33	Putting the tip near the sed surface to check it out.
8564	20090411 173848	14.60084626	144.7754758	159.98	1.58	520.53	522.11	Dave doesn't want to put the tip in the seds. We're just above the seabed with the nozzle.
8566	20090411 174024	14.60084716	144.7754757	159.86	1.63	520.39	522.02	The temp in the back is actually warmer than the temp in the front. Jason temp is 10.7 the same as T2 at the back of the beast.
8568	20090411 174110	14.60084803	144.7754755	159.84	1.61	520.49	522.1	Repositioning the wand again. The temp is increasing.
8570	20090411 174222	14.60084589	144.775475	160.05	1.63	520.74	522.37	Temp at the sed surface is now 20.
8571	20090411 174224	14.60084559	144.7754754	160.07	1.61	520.74	522.35	J2-405 Data DVDs start blue set DVD 048
8573	20090411 174319	14.60084676	144.7754761	160.34	1.63	520.84	522.47	
8576	20090411 174446	14.60084885	144.7754763	160.06	1.65	520.96	522.61	SAMPLE Fluid 17. j2-405-HFS-17. unfiltered bag#21. Start 174335. Just above the seds. About 2m N of the vent.
8577	20090411 174539	14.60084873	144.7754763	160.06	1.59	521	522.59	j2-405-HFS-17 cont. It's acting a bit strange. Might be clogging up a little.
8579	20090411 174621	14.60084914	144.7754747	160.05	1.64	521.02	522.66	j2-405-HFS-17 cont. Stop 174547. Tmax=21.5. ave=19.2. Vol=250ml. T2=9.
8581	20090411 174645	14.6008498	144.7754736	160.24	1.63	521.05	522.68	J2-405 Data DVDs stop red set DVDs 047
8582	20090411 174716	14.60085066	144.7754738	160.21	1.6	521.05	522.65	Sampler was probably clogging up with gravel Dave thinks.
8583	20090411 174741	14.60084451	144.775479	157.85	2.94	519.74	522.68	The plume is wafting this way so need to reposition.
8585	20090411 174753	14.60083061	144.7754711	159.21	2.19	519.55	521.74	Ash falling out of the plume.
8586	20090411 174840	14.60078454	144.7754478	56.9	2.03	519.59	521.62	Pretty large pieces of ash raining down. It really hasn't stopped with the ash for 2 hours.
8589	20090411 174944	14.60077791	144.7754551	20.6	1.66	521.38	523.04	The last large burst of debris probably came off the vehicle.
8590	20090411 175001	14.60077826	144.7754549	20.57	1.7	521.37	523.07	Dave is going to try to sample above Brimstone again.
8592	20090411 175045	14.60077859	144.7754549	20.56	1.69	521.42	523.11	Bubbling pretty good.
8595	20090411 175313	14.6007728	144.7754593	25.97	2.06	521.4	523.46	Lots of bubbles coming out of the pit.
8596	20090411 175336	14.60077234	144.7754596	25.98	2.09	521.38	523.47	The mound to the left is moving. Some really yellow smoke.

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8599	20090411 175528	14.60077067	144.7754605	26.13	2.05	521.31	523.36	The front end is warm but it's just not warming up the back.
8600	20090411 175543	14.6007707	144.7754604	26.17	2.04	521.31	523.35	We also need to collect bubbles with the gastight.
8602	20090411 175626	14.6007708	144.7754604	26.66	2	521.29	523.29	Quite active.
8604	20090411 175711	14.60077053	144.7754607	26.85	1.99	521.28	523.27	Dave is taking the wand out to check it out. Lots of ash in the pilot cam.
8605	20090411 175732	14.60077025	144.7754608	26.89	2	521.27	523.27	The tip looks cleaner than it did before.
8606	20090411 175741	14.60076989	144.7754609	26.88	2	521.27	523.27	Lots of ash raining down.
8608	20090411 175747	14.60076986	144.7754609	26.95	2	521.28	523.28	VIDEO Start recording HDCam
8609	20090411 175815	14.60076888	144.7754612	26.94	2	521.28	523.28	Want to catch this large burst of ash. It's raining down.
8611	20090411 175844	14.60076721	144.7754617	27	1.99	521.27	523.26	Lots of yellow is seen in the HD cam now.
8614	20090411 180051	14.60077484	144.7754591	27.35	1.99	521.18	523.17	Amazing amount of ash pouring down. Must be lava extruding.
8616	20090411 180210	14.60080703	144.775437	102.5	1.03	519.44	520.47	VIDEO Stop recording HDCam
8619	20090411 180443	14.60081277	144.7754834	211.82	1.28	521.76	523.04	Repositioning again for more fluid sampling.
8621	20090411 180516	14.60081247	144.7754834	209.84	1.31	521.65	522.96	HFS pumps are on.
8626	20090411 180855	14.60080607	144.7754843	209.79	1.26	521.8	523.06	HFS being stowed. It's not making sense.
8627	20090411 180943	14.60081327	144.7754949	211.58	3.5	520.38	523.88	Something must be clogged. T1 will heat up but T2 doesn't do anything. The warm water is not getting to the back of the beast.
8631	20090411 181205	14.60081339	144.7754948	211.32	3.4	520.59	523.99	Will try to fire a couple gastight bottles next. The wand has been stowed.
8635	20090411 181448	14.60081306	144.7754945	211.56	3.51	520.35	523.86	Hand-held gastight bottle next. Will be GTB#2 (green). Without funnel.
8638	20090411 181727	14.60080747	144.7754856	200.96	1.39	521.31	522.7	J2-405 DVCAM stop 039 start 040
8641	20090411 181904	14.60080926	144.7754885	199.15	1.4	521.32	522.72	Trying to get a clear view of sampling spot. Not much chance of that.....
8643	20090411 181959	14.60078729	144.7754433	119.7	3.31	518.08	521.39	Moving around to check a different angle.
8644	20090411 182035	14.60077065	144.775413	61.13	2.78	520.36	523.14	Just bumped into a rock on the edge of the vent.
8648	20090411 182302	14.60075525	144.7754801	341.99	4.45	520.9	525.35	Still deciding where to sample the pit for gas.....
8650	20090411 182359	14.60078067	144.7755068	282.13	3.29	520.6	523.89	The area of smoke (plumage) is quite large today. Lots of yellow smoke down low.
8652	20090411 182451	14.60079958	144.7755011	258.36	1.58	521.56	523.14	Another attempt her eat the edge of the pit.
8654	20090411 182552	14.60079923	144.7755007	256	1.4	521.61	523.01	SAMPLE Gas 18. 18. j2-405-gas-18. Fired 182500. No temp measurement right now.
8657	20090411 182844	14.60079987	144.775501	255.44	1.41	521.68	523.09	j2-405-gas-18. Using the Jason temp probe in the position where the gastight was just collected. Temp was about -50 at the gastight position.
8660	20090411 183009	14.60080014	144.7755009	256.35	1.44	521.66	523.1	Probing at the edge of the vent for temp. Got up to 116 degrees. T=120.
8661	20090411 183021	14.60080022	144.775501	256.2	1.45	521.75	523.2	Will try to catch some bubbles next.
8664	20090411 183243	14.60080077	144.7755007	257.17	1.56	521.51	523.07	The gastight with the funnel (bubble catcher) is #7.
8670	20090411 183729	14.60079718	144.7755051	256.66	1.6	521.51	523.11	SAMPLE Gas 19. j2-405-gas-19. GTB#7 with funnel. Big bubbles going in the funnel. Fired at 183716.
8672	20090411 183820	14.60079758	144.7755045	256.37	1.45	521.6	523.05	j2-405-gas-18 tilting it up to see lots of big bubbles coming out. Those gas bubbles came from the same place as previous sample.
8676	20090411 184118	14.60079866	144.7755028	256.12	1.45	521.57	523.02	Dave is going to give the fluid sampler another try.
8680	20090411 184406	14.60079708	144.7755045	252.39	2.73	520.3	523.03	At last outlet temperature is going up - perhaps sampler is working now.
8681	20090411 184426	14.60077097	144.7754951	311.79	4.58	519.93	524.51	Ash falling again.
8683	20090411 184459	14.6007627	144.7754714	3.45	2.64	521.1	523.74	Hunting for sample site.
8688	20090411 184856	14.600773	144.7754738	351.96	1.28	521.19	522.47	Parking in front of vent and inserting sampler tip. Plume is wafting in all directions.
8689	20090411 184932	14.60077499	144.7754711	352.05	1.29	521.19	522.48	Going to be piston #6; t1 at 39deg.
8691	20090411 185037	14.60077653	144.7754698	352.08	1.29	521.18	522.47	SAMPLE Fluid j2-405-hfs-20 is an unfiltered piston sample; Piston #6 - start.
8697	20090411 185455	14.6007835	144.7754229	352.27	1.29	521.18	522.47	Sample stopped max 55.7 ave 48deg; volume 503 T2 was 19deg.
8698	20090411 185517	14.60078246	144.775424	352.31	1.29	521.2	522.49	Another sample; starting filtered piston #7.
8702	20090411 185801	14.60077741	144.7754317	352.33	1.29	521.26	522.55	SAMPLE Fluid 21. j2-405-HFS-21 cont.
8703	20090411 185845	14.60077603	144.7754337	352.35	1.29	521.27	522.56	j2-405-HFS-21 cont. Samples 13 thru present have all been at Brimstone.

Virtual Van Record #	timestamp yyyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-405 Logger Comment
8706	20090411 185946	14.60077514	144.7754352	352.36	1.29	521.27	522.56	j2-405-HFS-21 cont. Stop 185930. Tmax=57.9. ave=46.4. Vol=499ml. T2=20.
8709	20090411 190240	14.60077761	144.775433	352.38	1.29	521.27	522.56	SAMPLE Fluid 22. j2-405-HFS-22. Unfiltered piston #8. Start 190033. In the smoke. Temp is fluctuating a lot.
8713	20090411 190504	14.60078476	144.7754228	350.92	2.65	519.87	522.52	j2-405-HFS-22 cont. Stop 190428. Tmax=48.4. ave=41.2. Vol=507. T2=19.
8714	20090411 190528	14.60078626	144.7754349	319.49	4.4	519.51	523.91	Repositioning again. The bubbles are increasing.
8716	20090411 190634	14.6007916	144.7754357	319.64	2.84	520.75	523.59	We were sampling around the edge in the whitish smoke not the yellowish (For samples 16 - 20). Brimstone. Gas samples were for Evans. HFS for Butterfield.
8719	20090411 190821	14.6007904	144.775438	318.58	2.79	520.75	523.54	SAMPLE Fluid 23. j2-405-HFS-22. Filtered piston#9. Start 190801.
8723	20090411 191106	14.60079201	144.7754361	317.93	2.69	520.81	523.5	j2-405-HFS-22 cont. Repositioned for this but still in (above) the vent. Stalled and restarted.
8726	20090411 191331	14.60079111	144.775437	316	2.88	520.84	523.72	j2-405-HFS-22 cont. Stop 191255. Tmax=39.5. ave=35.2. Vol=327ml. T2=15.
8730	20090411 191625	14.60078827	144.775436	313.71	2.8	520.83	523.63	SAMPLE Fluid 24. J2-405-HFS-24. Filtered bag #18. Start 191455. Same position as previous. It's clearing a bit.
8733	20090411 191753	14.60079057	144.7754353	313.77	2.86	520.83	523.69	J2-405-HFS-24 cont. Bubble action increasing. Stop 191713. Tmax=35.1. avg=28.8. Vol=203ml. T2=15.
8734	20090411 191817	14.60079166	144.775435	313.86	2.79	520.84	523.63	End of fluid sampling at Brimstone for dive j2-405.
8736	20090411 191937	14.60079152	144.775435	314.14	2.75	520.9	523.65	Stowing the HFS wand. Lots of sulfur on the wand.
8738	20090411 192014	14.60079088	144.7754348	313.75	2.75	520.9	523.65	Dave is standing down as watch leader. Bob Embley is in charge now.
8743	20090411 192420	14.60078989	144.7754267	317.78	3.11	520.32	523.43	Going to fire the Niskin next. Want to be in the plume not far above.
8746	20090411 192614	14.60078257	144.7754253	314.5	1.81	521.02	522.83	Panning the science cam to get the Niskin.
8749	20090411 192818	14.60078395	144.7754254	315.17	1.83	521.03	522.86	Can't figure out how to fire the Niskin. Don't know where it is. We're going to get a Niskin on another dive.
8752	20090411 192953	14.60079074	144.7754405	309.23	3.51	520.41	523.92	Next want to get a lava sample from Brimstone Vent for Nick.
8755	20090411 193244	14.60082756	144.7754413	230.58	1.39	521.7	523.09	SAMPLE Geology 25. j2-232-rock-25. Rock sample from the edge of Brimstone vent. Recently extruded. ~20cm long and fresh. PI Deardorff.
8761	20090411 193726	14.60083108	144.775439	186	1.44	521.14	522.58	J2-405 Data DVDs start red set DVDs 049
8765	20090411 194017	14.60083332	144.7754333	181.39	1.86	520.68	522.54	SAMPLE Geology 26. j2-405-rock-26. Grabbing another rock sample from the edge of Brimstone. Right in the smoke. Small rock (~10cm) with sulfur coating. de Ronde and Deardorff.
8769	20090411 194259	14.60086339	144.7754183	257.12	2.73	520.03	522.76	J2-405 Data DVDs stop blue set DVD 048
8772	20090411 194451	14.60086399	144.7754191	258.53	2.9	519.94	522.84	The sample has been stowed in the port biobox.
8775	20090411 194709	14.60085547	144.7753988	205.07	7.86	513.46	521.32	The plume seems to have died down a bit compared to when we arrived here. Less vigorous.
8777	20090411 194822	14.60083763	144.7754531	229.24	7.68	517.11	524.79	Lateraling around the vent trying to find an area with good visibility.
8780	20090411 195011	14.60075569	144.7753819	11.53	5.63	519.14	524.77	Starting to get a bit more ash and smoke now.
8783	20090411 195241	14.60086209	144.7754596	233.73	3.33	522.45	525.78	It looks like Brimstone has built up a meter or two since we arrived here a week ago.
8789	20090411 195745	14.60086453	144.7754635	229.23	3.23	522.22	525.45	SAMPLE Geology 27. J2-405-rock-27. Scoop of sed; ash; and volcanoclastic sed. NE of Brimstone. PI Deardorff. Brimstone. Z=523.
8795	20090411 200223	14.60070922	144.7754063	275.48	5.34	523.36	528.7	We are now moving to recover one of the tephra samplers.
8798	20090411 200419	14.60079337	144.7753033	82.08	4.7	520.43	525.13	We could see the vent off in the distance.
8800	20090411 200643	14.60083588	144.7753402	114.6	0.81	521.06	521.87	We will recover this tephra sampler (TS?) and will deploy another one here. Positioning.
8803	20090411 200845	14.60084055	144.7753331	114.9	0.8	521.07	521.87	There is a little bit of "flying rock" on the rim and in the bottom of this one.
8805	20090411 200852	14.60084067	144.7753333	114.91	0.8	521.06	521.86	DEPLOY Tephra Sampler E.
8806	20090411 200859	14.60084044	144.7753329	114.91	0.8	521.07	521.87	RECOVER Tephra Sampler G.
8810	20090411 201208	14.6008391	144.7753193	90.13	1.85	520.13	521.98	SAMPLE Geology 28. j2-405-geo-28. Tephra Sampler G. Location from nav: 144 46.5198 14 36.0505. Z=522. We are 10m west of Brimstone. PI Deardorff.
8812	20090411 201322	14.60083631	144.7753335	89.32	0.74	520.93	521.67	Relocating it slightly.

Virtual Van Record #	timestamp yyyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-405 Logger Comment
8816	20090411 201610	14.60083404	144.7753213	94.55	1.46	520.4	521.86	Finished with geology sampling here.
8818	20090411 201717	14.60082337	144.7753018	49.87	2.55	519.95	522.5	We are going to go downslope of Brimstone about 20m and look for the plume that Sharon and Tito say they saw while searching for the CTD.
8819	20090411 201721	14.6008199	144.7753052	50.48	2.83	519.61	522.44	We're departing
8821	20090411 201846	14.60078006	144.7753486	345.36	4.5	519.95	524.45	J2-405 DVCAM 040 stop and 041 start
8823	20090411 201944	14.60072074	144.7753856	346.7	7.2	521.46	528.66	We are preparing to move downslope from Brimstone in search of another "Brimstone-type" vent.
8830	20090411 202526	14.60057967	144.7754308	225.29	4.26	533.75	538.01	Turning the sub around to head south in search of the vent??
8838	20090411 203238	14.60062681	144.7753278	74.12	2.25	533.23	535.48	Didn't find another vent here. After 10 minutes or so of searching we are heading to Mkr108 to deploy the shrimp trap.
8843	20090411 203621	14.6007389	144.775647	42.95	1.6	534.9	536.5	CORRECTION REGARDING SAMPLE NUMBERS. SAMPLE 28 WAS RECORDED AS SAMPLE 29.
8847	20090411 203924	14.6007774	144.7756904	190.88	7.98	531.46	539.44	We found the other vent. We are about 30m due east of Brimstone. Z=535. We're still not convinced that we see a vent.
8853	20090411 204326	14.60094259	144.7758656	130.99	5.73	532.58	538.31	We're moving toward Mkr-108 to deploy Verena's shrimp trap.
8855	20090411 204406	14.6009302	144.7759079	134.49	2.6	534.56	537.16	All of a sudden we see the steep slope in front of us.
8858	20090411 204549	14.6008266	144.7758971	133.7	3.83	540.09	543.92	Heavy duty venting here.
8860	20090411 204723	14.6007864	144.7758763	90.51	4.8	541.17	545.97	We're in the area of the original Mkr-108. Lots of flow all along this steep ridge.
8862	20090411 204843	14.60074978	144.7759215	34.87	5.5	542.94	548.44	There's Mkr-108 ahead. Lots of flow at the base of these rocks.
8865	20090411 205044	14.60078858	144.775872	36.71	3.35	543.53	546.88	We now see Mkr-106.
8868	20090411 205147	14.600718	144.7758905	123.15	3.51	544.35	547.86	Decided that we will head along this ridge to the SE.
8869	20090411 205241	14.60062942	144.7759902	111.37	10.66	544.69	555.35	Going to Mkr-105. It's at 541 meters says Verena.
8873	20090411 205506	14.60067596	144.7761439	39	5.31	538.4	543.71	We found Marker 105. Verena sill take over in the hot seat.
8875	20090411 205620	14.60068048	144.776148	40.07	4.79	538.2	542.99	Verena wants to pan across this area first.
8877	20090411 205710	14.60068284	144.7761558	12.32	5.49	538.38	543.87	This rock is crawling with shrimp.
8879	20090411 205819	14.60068554	144.7761595	326.66	0.83	538.32	539.15	Lateraling around to settle in here for a good look.
8881	20090411 205905	14.60068855	144.7761632	324.52	0.74	538.53	539.27	The shrimp are congregating in one spot on this rock.
8883	20090411 205959	14.60068927	144.776163	324.28	0.74	538.51	539.25	The shrimp are also on the seafloor.
8887	20090411 210317	14.60068658	144.776163	324.5	0.74	538.5	539.24	VIDEO Start recording HDCam Doing a bit of a shrimp survey here for Verena at Mkr-105 (Limpet Lair).
8890	20090411 210452	14.60068678	144.7761627	325.22	0.74	538.51	539.25	We're seeing both species here. On the rock is mainly the big one. Alvinocaris is the big guy.
8892	20090411 210612	14.60068706	144.7761626	325.79	0.74	538.51	539.25	We see them riding piggyback. Perhaps the one on top is grazing on the other. Seeing some limpets on the rocks.
8895	20090411 210758	14.6006869	144.7761615	326.74	0.74	538.51	539.25	The shrimp are less dense on the sulfur sed. These sed. are mainly sulfur and ash.
8897	20090411 210900	14.60068562	144.776161	326.14	0.74	538.55	539.29	Lots of shimmer coming out from under this rock.
8900	20090411 211105	14.60068459	144.7761621	325.76	0.74	538.55	539.29	Looking at the shrimp scamper across this slope.
8901	20090411 211125	14.60068425	144.7761624	326.29	0.74	538.58	539.32	Lots of them are concentrated on this rock shelf.
8905	20090411 211411	14.60068197	144.776166	327.25	1.04	538.41	539.45	The camera range had been max'd out. Verena wants to use the lasers to get some scale on the sand and on the rocks.
8906	20090411 211423	14.60068081	144.7761668	327.38	0.99	538.45	539.44	Next will deploy the shrimp trap.
8908	20090411 211451	14.60068183	144.7761661	327.36	1	538.44	539.44	The bait is spam and cat food.
8910	20090411 211623	14.60068146	144.7761559	328.99	5.51	538.18	543.69	DEPLOY Shrimp Trap on the flat(ish) rock here at Mkr-105 (Limpet Lair).
8913	20090411 211839	14.60062015	144.7762568	339.29	5.56	540.55	546.11	VIDEO Stop recording HDCam A huge flurry of shrimp when the Jason guys tried to place the shrimp trap.
8916	20090411 212029	14.60061097	144.7762314	9.48	9.34	539.52	548.86	The vehicle lost auto pilot and pulled off the spot for a minute. Working our way back.



Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-405 Logger Comment
8917	20090411 212035	14.60061114	144.7762306	9.57	9.74	539.15	548.89	VIDEO Stop recording HDCam
8926	20090411 212654	14.60060608	144.7762398	4.53	9.06	539.66	548.72	Tito is on shift. He this rock. will set the shrimp trap down where we were before (we hope).
8929	20090411 212850	14.60061743	144.776287	278.04	2.13	539.62	541.75	Lat and Long: 144 46.5394 14 36.0451. Range and bearing from Brimstone to the possible Brimstone-like vent: 29 m Bearing 119 degrees.
8932	20090411 213108	14.6006192	144.7761107	283.74	16.34	531.41	547.75	Tito is placing the shrimp trap on the rock right beneath Mkr-105.
8933	20090411 213117	14.6006318	144.7760757	283.35	16.69	530.45	547.14	J2-405 Data DVDs stop red set DVDs 049
8934	20090411 213118	14.6006352	144.7760648	282.92	17.98	530.58	548.56	JASON off bottom
8936	20090411 213209	14.6006932	144.7758963	282.9	16.83	530.13	546.96	J2-405 DVCAM 041 stop
8939	20090411 220453	14.6006893	144.7759828	258.51	badvalue	2.41	badvalue	Medea on the deck.
8940	20090411 221451	14.6007838	144.7760618	275.06	badvalue	1.17	badvalue	JASON on deck
8941	20090411 221509	14.6007838	144.7760618	275.06	badvalue	1.17	badvalue	End of dive J2-405.

**J2-406 - CTD Search/Brimstone Observations/SM2K Mapping.** Searched for CTD south of Brimstone ~3 hours on bottom. Moved to Brimstone and took rock sample from south side of Brimstone (needed some ballast). Made visual observations of north side (normally covered by plume). After power problem decided to conduct SM2K survey of north side of Brimstone (~9 hours). Headed back to Brimstone after survey. Recovered tephra sampler which had slid SE downslope from vent. Returned to vent and swapped tephra samplers 5m NW of Brimstone. Took rock from edge of vent before ascending.

**Table 6.4-11 JASON Dive J2-406**

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-406 Logger Comment
8942	20090412 063251	14.6008088	144.7760878	6.68	badvalue	1.38	badvalue	JASON in water
8943	20090412 063401	14.6007979	144.7760696	313.88	badvalue	2.6	badvalue	: Main goals: CTD search (first 4 hrs). Brimstone observations. SM2000 mapping.
8944	20090412 063434	14.6007971	144.7760576	305.02	badvalue	3.22	badvalue	Tools for dive: Single chamber suction sampler. SM2000.
8945	20090412 063457	14.6007962	144.7760507	309.94	badvalue	2.73	badvalue	Other tools on all dives: Niskin (manual). Eh sensor.
8946	20090412 063522	14.6008003	144.7760435	303.07	badvalue	3.14	badvalue	Basket: 2 tephra samplers. 3 markers. 2 scoop bags.
8947	20090412 063713	14.6008059	144.7760399	303.95	badvalue	8.85	badvalue	MEDEA in water
8948	20090412 065946	badnav	badnav	269.36	86.6	575.23	661.83	J2-406 start blue set DVDs 050
8949	20090412 071237	badnav	badnav	278.54	72.48	536.89	609.37	Dinner relief.
8950	20090412 071302	badnav	badnav	280.31	71.66	536.84	608.5	There's some vog.
8951	20090412 071555	badnav	badnav	281.57	48.24	536.93	585.17	We are holding at depth waiting for Medea.
8959	20090412 072409	badnav	badnav	80.88	26.53	568.69	595.22	Lots of floc in the water (larger particles than normal vog)
8967	20090412 073223	14.5998512	144.775528	88.43	19.25	568.35	587.6	Just above bottom with no visibility but doesn't look like a lot of current.
8971	20090412 073533	14.5998503	144.7755284	88.21	14.44	573.33	587.77	Jason at depth of 570m 20 meters above bottom
8972	20090412 073540	14.5998512	144.7755294	88.92	11.69	576.8	588.49	Descending
8974	20090412 073559	14.5998535	144.7755295	87.28	7.55	581.09	588.64	Bottom in sight
8977	20090412 073836	14.59985421	144.7757065	359.3	7.21	585.01	592.22	Jason 5 meters above bottom. Heading is 000. Visibility is good.
8978	20090412 073848	14.59985421	144.7757149	357.38	8.13	584.03	592.16	Jason moving east
8983	20090412 074209	14.59977405	144.7759825	357.31	7.78	596.44	604.22	Jason 16 meters above seafloor. Visibility poor
8984	20090412 074244	14.5997724	144.7759177	357.96	9.21	593.9	603.11	Back under 10 meters above seafloor. Visibility OK as long as close enough to bottom. Lots of large particles floating about.
8987	20090412 074448	14.59976417	144.775644	358.7	12.91	585.89	598.8	Jason on second line moving west

Virtual Van Record #	timestamp yyyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-406 Logger Comment
8991	20090412 074716	14.59967324	144.7755854	353.24	11.36	593.81	605.17	Jason moving east
8996	20090412 075100	14.59959084	144.7759713	357.16	18.04	597.29	615.33	Jason moving south
8998	20090412 075201	14.59958811	144.7758012	359.28	13.48	597.08	610.56	Jason moving west
9003	20090412 075636	14.5994965	144.7757827	358.31	13.21	608.36	621.57	Jason moving east
9006	20090412 075845	14.59941036	144.7759999	1.53	16.99	607.98	624.97	By the way... Sharon Walker is logging
9008	20090412 075945	14.59940721	144.7758389	359.17	16.49	607.91	624.4	Jason moving west
9012	20090412 080233	14.59930415	144.7755409	358.4	14.31	617.62	631.93	Jason moving south
9013	20090412 080402	14.59931505	144.7757774	357.71	11.61	621.78	633.39	Jason moving east
9014	20090412 080610	14.59926338	144.7759977	357.4	13.68	612.33	626.01	Jason moving south
9015	20090412 080747	14.59922466	144.7757764	358.21	16.24	621.96	638.2	Jason moving west
9016	20090412 081212	14.59913642	144.7758909	356.83	6.98	632.61	639.59	Jason moving east
9017	20090412 081232	14.59913761	144.7759391	355.97	4.91	629.71	634.62	Bottom is a bit less rubbly and is covered with white fine sediment
9018	20090412 081303	14.59913819	144.7760133	17.48	7.54	625.62	633.16	Going over a lava ridge
9019	20090412 081315	14.59911728	144.7760056	355.12	9.23	625.01	634.24	Jason moving south
9020	20090412 081329	14.59908062	144.7760098	5.32	11.88	624.04	635.92	Jason heading is staying at 000
9021	20090412 081407	14.59904778	144.7759303	357.23	10.16	627.3	637.46	Jason moving west
9022	20090412 081414	14.59904693	144.7759106	357.83	9.81	627.73	637.54	That should have been "west"
9023	20090412 081744	14.59894642	144.7756272	356.09	13.63	644.53	658.16	Jason moving east
9024	20090412 081909	14.59895544	144.7758744	356.72	10.45	638.79	649.24	Slope is very steep here
9025	20090412 082414	14.59885794	144.7755894	358.9	18.43	646.5	664.93	Jason moving west
9026	20090412 082801	14.59876585	144.7755577	357.5	19.25	652.64	671.89	Jason moving south
9027	20090412 082902	14.59876911	144.7756726	356.78	17.68	656.29	673.97	Jason moving east
9028	20090412 082933	14.5987724	144.7757597	357.02	17.21	653.05	670.26	Bottom looks less rubbly and more sediment covered
9029	20090412 083302	14.59868442	144.7758498	358.03	20.58	654.4	674.98	Jason moving west
9030	20090412 083500	14.59867395	144.7755516	356.1	13.86	666.22	680.08	Jason got up to 23 meters above bottom. Harder to see bottom up there.
9031	20090412 083723	14.5985951	144.7758494	356.88	12.7	673.22	685.92	Bottom looks like we just passed the edge of a sheet lava flow with some collapse beneath the edge.
9032	20090412 083801	14.59859833	144.7759557	356.48	10.76	670.42	681.18	Jason moving east
9033	20090412 083852	14.59857453	144.776023	356.56	8.95	663.72	672.67	Jason moving south
9034	20090412 083953	14.59850846	144.775981	358.83	16.08	668.06	684.14	Jason moving west
9035	20090412 084201	14.59849785	144.775623	357.35	9.25	683.68	692.93	Bottom is rubbly rock of mixed sizes
9036	20090412 084708	14.59857925	144.7751906	358.7	10.96	681	691.96	Jason moving north
9037	20090412 084725	14.59858029	144.7752052	350.65	11.51	679.68	691.19	Jason moving east
9038	20090412 085315	14.59866279	144.7750574	359.49	16.01	667.98	683.99	Jason nearly at end of next west-moving line
9039	20090412 085620	14.59876123	144.7753247	357.36	11.16	661.07	672.23	J2-406 start red set DVD51
9040	20090412 085731	14.5988113	144.7754668	355.81	4.05	658.6	662.65	Jason moving north
9041	20090412 085812	14.59885678	144.7754382	355.88	9.83	654.79	664.62	Jason moving west
9042	20090412 085909	14.5988495	144.7752684	359	12.48	653.64	666.12	Just passed large rock face and dropoff
9043	20090412 090011	14.59884266	144.7750744	357.62	11.6	655.56	667.16	J2-406 stop blue set DVD 50
9044	20090412 090133	14.59890318	144.7749995	350.57	9.5	649.06	658.56	Jason moving north
9045	20090412 090400	14.59894171	144.7753561	357.24	11.03	642.89	653.92	Some large rocks in rubble
9046	20090412 090427	14.59894323	144.7754332	357.08	11.6	642.1	653.7	Jason near end of eastward moving line
9047	20090412 090518	14.59897789	144.7755056	357.97	12.44	639.27	651.71	Jason moving west
9048	20090412 090801	14.59902621	144.7751385	359.01	16.79	633.65	650.44	Water seems to be getting a little cloudier as Jason comes upslope. Jason now at 634m. 29 meters above bottom.
9049	20090412 090954	14.59911413	144.775007	348.23	12.09	630.68	642.77	Jason moving north

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9050	20090412 091052	14.59911814	144.7751894	356.55	12.21	629.38	641.59	Jason moving east
9051	20090412 091259	14.59916729	144.775497	356.77	11.04	626.83	637.87	Jason moving north
9052	20090412 091451	14.59921018	144.7752608	357.46	15.5	617.82	633.32	Jason moving west
9053	20090412 091658	14.59926226	144.774982	358.53	11.3	615.92	627.22	Jason moving north
9054	20090412 091737	14.5992925	144.7750144	352.96	13.95	611.6	625.55	Bottom looks more like lava flow than rubble but hard to tell
9055	20090412 091754	14.5992953	144.7750619	352.59	15.71	612.51	628.22	Jason moving east
9056	20090412 091820	14.59929747	144.7751449	355.77	14.61	612.61	627.22	Jason maintaining a north heading
9057	20090412 091932	14.59930188	144.7753459	356.93	10.79	614.73	625.52	Passing streaks of trails of finer black ash winding downslope
9058	20090412 091952	14.59930361	144.7754021	356.88	9.69	615.1	624.79	Now over rubbly rocks again of mixed sizes
9059	20090412 092117	14.59938802	144.7754885	0.81	8.48	610.66	619.14	Jason moving north
9060	20090412 092244	14.59939218	144.7752833	358.49	15.54	603.36	618.9	Jason moving west
9061	20090412 092321	14.59938887	144.7751845	358.71	14.65	604.62	619.27	Bottom is smoother and more even covered with white sediment.
9062	20090412 092348	14.59938685	144.7751048	358.29	14.95	605.13	620.08	Darker streaks from flows downslope. Mostly looks like finer material.
9063	20090412 092528	14.59947652	144.7749875	348.66	12.49	600.55	613.04	Jason moving north
9064	20090412 092540	14.59947589	144.7750233	353.45	15.15	599.96	615.11	Jason moving east
9065	20090412 092716	14.59948433	144.7752998	356.13	12.99	598.52	611.51	Ridge of lavas not rubble
9066	20090412 092822	14.59948986	144.7754626	356.97	11.85	599.28	611.13	Now back over rubbly rock bottom
9067	20090412 092851	14.59954807	144.7754847	358.46	8.94	597.76	606.7	Jason moving north
9068	20090412 093040	14.59957506	144.7752499	356.27	12.23	590.9	603.13	Jason moving west
9069	20090412 093139	14.59956893	144.7750863	356.48	15.29	589.92	605.21	Interesting lava flows
9070	20090412 093322	14.59966013	144.7749743	359.2	11.5	583.69	595.19	Jason moving north
9071	20090412 093341	14.59965508	144.7749731	358.5	10.94	584.69	595.63	Jason moving west
9072	20090412 093505	14.59966329	144.7751947	355.51	11.64	585.31	596.95	Slide debris field visible in draw on hillside.
9073	20090412 093543	14.59966656	144.7752808	354.43	11.14	585.78	596.92	Going over edge that looks like it broke off.
9074	20090412 093730	14.59974246	144.7754896	358.41	10.41	582.7	593.11	Jason moving north
9075	20090412 093813	14.59976187	144.7754488	357.23	12.45	578.55	591	Jason moving east
9076	20090412 094022	14.59975142	144.7750683	358.05	16.45	571.98	588.43	Jason moving west
9077	20090412 094052	14.59974527	144.7749891	357.71	20.12	569.05	589.17	Bottom covered in sediments
9078	20090412 094152	14.59984701	144.7749691	0.34	9.93	570.52	580.45	Jason moving north
9079	20090412 094304	14.59983898	144.7750943	357.35	11.25	568.2	579.45	Jason moving east
9080	20090412 094551	14.5999772	144.7753449	0.82	7.2	565.57	572.77	Jason moving north
9081	20090412 094709	14.60015259	144.7752543	23.33	6.24	550.87	557.11	Completed lines downslope of yesterday's search. Now moving upslope towards Brimstone. Will try to stay in low part of draw.
9082	20090412 094751	14.6001887	144.7751729	21.87	2.26	548.12	550.38	Jason heading is 021 and Jason is moving slightly northwest
9083	20090412 094903	14.60045352	144.7754886	25.59	4.49	539.88	544.37	Lots of big and small rock rubble
9084	20090412 094921	14.6004604	144.7754931	25.09	3.45	540.85	544.3	Visibility is quite good/
9085	20090412 095035	14.60045973	144.7754929	24.58	4.19	540.08	544.27	Moving ship to continue upslope
9086	20090412 095158	14.60047424	144.7755024	53.74	5.15	537.28	542.43	WATCHSTANDERS Andra Bobbitt logger
9087	20090412 095501	14.60054416	144.7758953	47.42	8.89	546.37	555.26	Working across slope and starting to head north.
9088	20090412 095532	14.60057908	144.7759534	108.74	3.45	546.74	550.19	This part of slope is a lot more pillow forms than rubble.
9089	20090412 095537	14.60057807	144.7759509	147.16	3.18	546.97	550.15	Shear drop offs.
9090	20090412 095544	14.60056775	144.7759588	133.76	3.75	547.63	551.38	That is shear drop offs.
9091	20090412 095622	14.60049525	144.77597	111.27	5.68	553.41	559.09	Aft camera has best view of surface.
9092	20090412 095638	14.60052785	144.7759958	9.64	7.39	552.66	560.05	Swinging left with slope in view.
9093	20090412 095719	14.60060175	144.7759464	15.84	7.49	543.62	551.11	Steep sediment chutes among the pillows.
9094	20090412 095756	14.60065751	144.7758957	327.23	4.86	542.81	547.67	Just saw a marker-probably Marker 108.

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9095	20090412 095815	14.60070757	144.7758788	326.79	5.86	541.56	547.42	Really cool rock structure below marker.
9096	20090412 095841	14.60077818	144.775817	311.24	3.84	540.51	544.35	A bit of plume.
9097	20090412 095902	14.6008167	144.7757737	310.59	3.35	539.64	542.99	Lava on left and slope on right between pit and cone in a little valley.
9098	20090412 095913	14.60083114	144.7757493	309.23	4.28	538.19	542.47	Debris slides on right slope.
9099	20090412 100008	14.6008324	144.7756765	260.85	5.16	534.27	539.43	Big slide on left slope-some outcrops.
9100	20090412 100037	14.60088573	144.7756383	281.13	5.5	531.75	537.25	Looking west and following little valley between cone and rim.
9101	20090412 100153	14.60097544	144.775485	300.76	2.04	530.1	532.14	Had fairly good visibility on this run up slope.
9102	20090412 100217	14.60101432	144.7754714	305.41	2.15	531.7	533.85	Back looking at valley.
9103	20090412 100238	14.60101215	144.7754288	305.07	0.75	532.06	532.81	Valley really smooth here.
9104	20090412 100334	14.60100396	144.7754128	172.91	5.98	528.34	534.32	At top of slope and ready to head over to Brimstone.
9105	20090412 100413	14.60093435	144.7754142	175.69	3.73	524.29	528.02	WATCHSTANDERS Heidi Berkenbosch video
9106	20090412 100450	14.60087363	144.7754209	207.31	6.43	518.97	525.4	Brimstone at 217 50m away according to nav.
9107	20090412 100500	14.60085343	144.7754394	213.21	8.09	517.56	525.65	We are just north of Brimstone.
9108	20090412 100516	14.6008299	144.7754279	194.8	6.84	515.75	522.59	Craggy outcrops with sediment.
9109	20090412 100525	14.60081321	144.7754435	195.62	7.34	516.05	523.39	There is the plume on the other side of the crag.
9110	20090412 100541	14.60078134	144.7754494	193.94	3.55	518.53	522.08	Ignore range/bearing on previous fix. something else.
9111	20090412 100553	14.60078	144.7754332	175.58	2.23	518.89	521.12	Plume is currently straight up as we approach from the north.
9112	20090412 100558	14.60077716	144.7754235	167.97	1.7	518.39	520.09	Lots of haze in area.
9113	20090412 100608	14.60076644	144.7754083	145.64	0.81	517.82	518.63	Plume is swirling clockwise.
9114	20090412 100618	14.60075579	144.7754019	100	2.79	517.54	520.33	First look at Brimstone Pit on this dive.
9115	20090412 100623	14.60074942	144.7753986	101.54	2.69	517.67	520.36	J2-406 Start DVCAM 042
9116	20090412 100630	14.60075201	144.7753975	52.31	3.14	518.22	521.36	Circling around to the south side of vent.
9117	20090412 100657	14.60072165	144.7754144	53.63	3.48	518.81	522.29	Can see some areas of bubbles and little bit of ash.
9118	20090412 100708	14.60072587	144.7754115	16.98	2.06	520.81	522.87	Jason is being yanked by Medea.
9119	20090412 100718	14.60071734	144.7754093	18.81	3.31	519.89	523.2	Can see Tephra sampler in port utility camera.
9120	20090412 100742	14.60071044	144.7754192	7.45	1.51	521.74	523.25	Settling on surface-Jason needs some rocks for weight.
9121	20090412 100800	14.60071021	144.7754187	7.51	1.71	521.54	523.25	Today there are a lot of big lava blocks around the vent. Yesterday there was more tephra.
9122	20090412 100830	14.60070857	144.7754182	5.68	1.73	521.6	523.33	Plume looks fairly reduced right now but there is a lot of ash coming out to the right side.
9123	20090412 100853	14.60070891	144.775418	5.68	1.79	521.57	523.36	We are on the south side looking for good rocks for ballast.
9124	20090412 100901	14.60070891	144.775418	5.89	1.74	521.61	523.35	Gentle ash flow in the back of the plume.
9125	20090412 100928	14.60070877	144.7754176	6.44	1.74	521.66	523.4	Rocks are somewhat crumbly.
9126	20090412 101110	14.60070959	144.775416	6.65	1.64	521.75	523.39	SAMPLE Geology 1: Big rock
9127	20090412 101236	14.60071137	144.7754139	6.98	1.5	521.83	523.33	SAMPLE Geology 1: J2-406-rock-01 Black lava block adjacent flow area on south side of Brimstone Pit.
9128	20090412 101258	14.60071556	144.7753913	57.67	3.99	519.95	523.94	We are going to position for better viewing and then pick up Tephra sampler.
9129	20090412 101307	14.60073612	144.7753841	76.41	1.31	520.09	521.4	VIDEO Start recording HDCam Lots of tephra raining down.
9130	20090412 101336	14.60075141	144.7753945	99.47	1.56	519.2	520.76	Looking east with a much clearer view.
9131	20090412 101359	14.60074711	144.7754571	97.36	1.78	519.46	521.24	Driving through the plume.
9132	20090412 101515	14.60073625	144.7754751	280.87	3.83	520.24	524.07	Circling around for better position. Looking west.
9133	20090412 101536	14.60075732	144.7754705	287.51	4.56	518.81	523.37	Heading north and see shimmering water in the NE side of crater.
9134	20090412 101550	14.60076496	144.775475	228.77	5.71	519.15	524.86	Usually this side has been in the plume.
9135	20090412 101716	14.60076063	144.7754209	193.6	1.3	520.04	521.34	We are looking south and can see north side of plume.
9136	20090412 101727	14.60076496	144.775422	196.55	1.16	520	521.16	Backing up so we can find the tephra bucket.
9137	20090412 101804	14.60073885	144.7753772	115.35	2.58	518.17	520.75	Bubbles looking at 150.

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9138	20090412 101830	14.6007049	144.7753682	83.77	4.18	518.75	522.93	Some really black lavas up at top of plume.
9139	20090412 101857	14.60069705	144.7753814	62.04	4.39	519.4	523.79	Can see bucket Tephra sampler to the left.
9140	20090412 101910	14.60071102	144.7753767	65.82	3.75	519.72	523.47	Now looking for best viewing area.
9141	20090412 101916	14.60071176	144.7753762	64.38	3.46	519.86	523.32	Nice large rock center in the vent.
9142	20090412 101941	14.60070907	144.7753773	65.37	3.75	519.83	523.58	Lasers on.
9143	20090412 102110	14.60072166	144.7753817	77.79	1.95	520.75	522.7	Great view looking at the west side of the pit (looking east at 078)
9144	20090412 102127	14.6007217	144.7753816	77.83	1.94	520.76	522.7	Bubbles coming out of yellow part of plume.
9145	20090412 102149	14.60072197	144.7753813	77.81	1.94	520.76	522.7	All white without many bubbles or ash at the moment.
9146	20090412 102245	14.60072203	144.775381	78.52	1.91	520.75	522.66	Bubbles around big center rock-engulfed in plume.
9147	20090412 102305	14.60072206	144.7753808	78.82	1.91	520.74	522.65	Big bubble burst on left.
9148	20090412 102316	14.60072195	144.7753807	79.03	1.9	520.75	522.65	More vigorous on left.
9149	20090412 102334	14.60072199	144.7753804	77.98	1.91	520.76	522.67	Tephra after bubbles on left.
9150	20090412 102353	14.60072198	144.7753803	77.82	1.9	520.77	522.67	Revvng up and getting active.
9151	20090412 102358	14.60072201	144.7753805	77.58	1.88	520.79	522.67	Lots more ash.
9152	20090412 102424	14.60072209	144.7753805	77.86	1.89	520.79	522.68	Plume is much wider than first approach.
9153	20090412 102526	14.60072218	144.7753805	78.13	1.88	520.79	522.67	Ground shaking (Jason is on surface).
9154	20090412 102617	14.6007221	144.7753801	78.35	1.9	520.81	522.71	Bubbles and burst and then ash.
9155	20090412 102628	14.60072206	144.7753803	78.17	1.86	520.81	522.67	Good sized pieces of ash.
9156	20090412 102743	14.60046087	144.7755319	78.67	1.89	520.84	522.73	Waxing and waning in short periods.
9157	20090412 102855	14.60070992	144.7753829	78.88	1.8	520.85	522.65	Yellow area is the active area. Increasing yellow.
9158	20090412 102947	14.60070935	144.7753838	78.88	1.8	520.87	522.67	Great video in pilot cam of ash raining down.
9159	20090412 103123	14.60071546	144.7753758	78.68	1.89	520.91	522.8	Shrimps are daredevils-living on the edge.
9160	20090412 103143	14.60071619	144.7753751	78.53	1.89	520.9	522.79	Plume wafting over us and no visibility at present.
9161	20090412 103151	14.60071639	144.7753748	78.35	1.85	520.91	522.76	Tephra raining down on Jason.
9162	20090412 103255	14.60071488	144.7753699	78.77	1.79	520.9	522.69	Starting to clear up a little-or not.
9163	20090412 103321	14.60070636	144.7753635	78.77	1.79	520.9	522.69	VIDEO Stop recording HDCam
9164	20090412 103334	14.60070718	144.7753587	78.77	1.79	520.9	522.69	Problem with Jason-no driving ability.
9165	20090412 103347	14.60071312	144.7753544	78.77	1.79	520.9	522.69	Moving Medea up-no power at Jason?
9166	20090412 103358	14.60072032	144.7753502	78.77	1.79	520.9	522.69	Depth is not changing on jason.
9167	20090412 103425	14.6007418	144.7753441	78.77	1.79	520.9	522.69	Jason is off the bottom but no readings from Jason (depth is constant)
9168	20090412 103436	14.6007511	144.7753454	78.77	1.79	520.9	522.69	Have video but no data readings.
9169	20090412 103447	14.60076095	144.775349	78.77	1.79	520.9	522.69	Medea can see Jason.
9170	20090412 103516	14.60077795	144.7753577	78.77	1.79	520.9	522.69	Lost control of Jason.
9171	20090412 103535	14.60078278	144.7753581	78.77	1.79	520.9	522.69	Everything is locked up right now.
9172	20090412 103607	14.60078927	144.7753547	78.77	1.79	520.9	522.69	Medea is looking down at Jason and vehicle is all in plume.
9173	20090412 103631	14.60079053	144.7753516	78.77	1.79	520.9	522.69	Lots of bubbles in plume in Medea cam-really cool.
9174	20090412 103657	14.60078975	144.7753492	78.77	1.79	520.9	522.69	Medea is at 430m of payout.
9175	20090412 103720	14.60078905	144.775347	78.77	1.79	520.9	522.69	Can see Jason in Medea camera.
9176	20090412 103725	14.6007889	144.7753465	78.77	1.79	520.9	522.69	Powering down.
9177	20090412 103745	14.60078829	144.7753446	78.77	1.79	520.9	522.69	Pulling Medea up.
9178	20090412 103747	14.60078823	144.7753444	78.77	1.79	520.9	522.69	Powering up.
9179	20090412 103858	14.60078607	144.7753376	78.77	1.79	520.9	522.69	No power.
9180	20090412 104101	14.60078234	144.7753258	0	0	0	0	Power is coming back. Thrusters disabled.
9181	20090412 104406	14.60077673	144.7753081	61.37	135.82	390.89	526.71	Found problem and systems are coming back.
9182	20090412 104452	14.60077534	144.7753037	336.76	142.02	383.61	525.63	Stopping driving Medea to surface.
9183	20090412 104457	14.60077518	144.7753032	354.85	141.41	383.46	524.87	Systems back on.

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9184	20090412 104649	14.60078419	144.7753029	292.15	158.9	369.72	528.62	Everything is back on and we'll get ready to go back down.
9185	20090412 104929	14.60078517	144.7753135	288.55	174.94	359.21	534.15	Getting back to business.
9186	20090412 105115	14.6007838	144.7753455	278.74	151.57	378.42	529.99	Decided to get ready for SM2K survey instead of returning to Brimstone.
9187	20090412 105133	14.60078356	144.775351	280.29	144.16	383.58	527.74	It will take 20 minutes to get back to SM2K start location.
9188	20090412 105133	14.60078356	144.775351	280.29	144.16	383.58	527.74	J2-406 Data DVDs start blue set 52
9189	20090412 105220	14.60078295	144.7753652	177.24	150.06	389.16	539.22	Going to stop video as we aren't going back to bottom.
9190	20090412 105300	14.60077891	144.7753703	90.21	151.36	390.13	541.49	J2-406 Data DVDs stop red set 51
9191	20090412 105305	14.60077888	144.7753709	90.86	147.56	390.12	537.68	J2-406 Data DVDs stop
9192	20090412 105314	14.60077556	144.775371	89.5	145.41	390.01	535.42	J2-406 stop blue DVD set 52
9193	20090412 105321	14.60076593	144.7753681	125.33	142.42	389.99	532.41	J2-406 Stop DVCAM 042
9194	20090412 105402	14.60075776	144.7753611	156.07	133.31	389.94	523.25	J2-406 Since there is only a few minutes of blue ocean on DVDs 52 we will start recording on these when the survey is done
9195	20090412 105834	14.60077488	144.7753797	52.49	52.12	472.48	524.6	Jason is driving down again.
9196	20090412 105903	14.60077346	144.7753818	50.47	37.27	486.69	523.96	Driving through some plume. Ship never moved so we should come back to Brimstone again.
9197	20090412 105927	14.60074646	144.7753844	127.81	26.52	497.55	524.07	There is the plume-driving right down.
9198	20090412 110001	14.60071155	144.7753888	127.48	11.25	512.14	523.39	Looking east.
9199	20090412 110008	14.60069867	144.7753928	128.25	8.79	513.21	522	There's the Tephra bucket.
9200	20090412 110020	14.60068259	144.7753946	130.83	5.64	515.21	520.85	Lots of white rocks on this side (west side).
9201	20090412 110053	14.60068384	144.7753949	130.57	5.76	515.09	520.85	Bucket used to be above the rim and now its below (well maybe not-could be the view angle)
9202	20090412 110129	14.60066949	144.7753933	121.08	6.19	514.72	520.91	We are looking down on the plume and now approaching.
9203	20090412 110137	14.60064985	144.7753916	91.32	6.89	515.15	522.04	Cleared up again on this side.
9204	20090412 110206	14.60069213	144.7752963	71.68	5.65	518.21	523.86	Bucket is still above the rim-it was the angle.
9205	20090412 110214	14.60068577	144.7753018	57	6.89	518.1	524.99	Lots of big blocks around the plume
9206	20090412 110221	14.60067423	144.7753086	5.26	9.16	518.13	527.29	Great view.
9207	20090412 110245	14.60067614	144.775314	306.15	7.13	518.39	525.52	Starting cameras again.
9208	20090412 110313	14.60076549	144.7752051	310.13	3.16	520.59	523.75	Driving along the bottom to the start of the survey.
9209	20090412 110329	14.60080332	144.7751646	312.49	2.29	523.83	526.12	Driving NW to survey start.
9210	20090412 110342	14.60085384	144.7751264	317.4	2.31	527	529.31	Sedimented lava.
9211	20090412 110412	14.60086041	144.7751236	317.06	0.75	529.22	529.97	Rough lava with lots of shrimp when touched down (aft cam).
9212	20090412 110502	14.60090169	144.7750889	301.73	0.75	529.14	529.89	Not many shrimp in front at all (due to slope) but lots of shrimp flying aft of vehicle upslope.
9213	20090412 110534	14.60096139	144.7750536	311.86	2.86	530.72	533.58	Heading toward SOL 4 for survey.
9214	20090412 110550	14.60100507	144.7750259	312.16	2.51	535.43	537.94	Driving along rough lava with sediment-going down side of cone.
9215	20090412 110600	14.60103809	144.7749975	310.93	2.45	537.77	540.22	NW of vent driving downslope.
9216	20090412 110629	14.60109662	144.7749782	316.24	1.86	543.41	545.27	As go down cone-seeing mostly out aft camera.
9217	20090412 110649	14.60113005	144.7749722	316.77	1.68	545.81	547.49	Slightly hazy.
9218	20090412 110747	14.60119327	144.7749397	317.8	101	552.32	653.32	Great view from aft camera.
9219	20090412 110801	14.60120551	144.7749214	317.85	1.09	552.94	554.03	Large boulder ahead.
9220	20090412 110812	14.60121943	144.7749146	317.96	1	553.89	554.89	Problems with HD science cam iris/focus.
9221	20090412 110848	14.60125201	144.7748797	318.69	1.14	556.62	557.76	Flattening out her with some large outcrops.
9222	20090412 110857	14.60126472	144.7748704	319.09	1.7	557.1	558.8	Beyond cone and out of rubble and in smooth sediment.
9223	20090412 111005	14.60137627	144.774743	316.42	5.41	562.13	567.54	J2-406 Start blue DVD set 52 again at 11:02 when ended up at Brimstone.
9224	20090412 111018	14.60140039	144.7747091	319.76	5.98	563.73	569.71	J2-406 Will record DVD while travel along bottom to start of survey
9225	20090412 111034	14.60141298	144.7747051	316	5.54	563.99	569.53	J2-406 Also recording DVCAM 042 again from 11:02

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-406 Logger Comment
9226	20090412 111110	14.60148655	144.7746248	307.05	4.81	565.79	570.6	Lots of sediment and gentle slope.
9227	20090412 111121	14.60150913	144.7745938	307.47	4.44	566.38	570.82	Traversing along south slope that goes up the summit ridge.
9228	20090412 111131	14.60152631	144.774565	308.95	4.06	566.7	570.76	Outcrop with white staining.
9229	20090412 111151	14.60155596	144.7744952	312.13	2.53	566.73	569.26	Areas of white stain on outcrops-black sediment between on slope.
9230	20090412 111216	14.60159664	144.7744173	318.84	5.7	565.69	571.39	Outcrops with orange coating.
9231	20090412 111258	14.60165966	144.7743149	322.32	6.09	565.21	571.3	More white sediment as move upslope and getting steeper.
9232	20090412 111328	14.60170365	144.7742495	327.45	5.29	564.23	569.52	Crack in surface reaching downslope.
9233	20090412 111353	14.60174561	144.7741889	309.99	4.84	562.37	567.21	Black circular areas (small outcrops or mini-slides?)
9234	20090412 111406	14.60175381	144.774146	315.85	5.34	561.74	567.08	coming up to rim.
9235	20090412 111416	14.60176576	144.7741201	310.17	6.9	559.29	566.19	Large outcrops on the rim (summit ridge).
9236	20090412 111427	14.60177975	144.7740846	310.67	7.74	557.31	565.05	Great view of edge.
9237	20090412 111433	14.60178771	144.7740657	315.49	7.41	556.39	563.8	Other side drops off abruptly.
9238	20090412 111502	14.60189083	144.7739561	320.86	6.76	556.84	563.6	Brown cam has some view of the downslope. Not much.
9239	20090412 111514	14.60191815	144.7739439	320.03	10	555.69	565.69	Only aft cam has view on very steep slope.
9240	20090412 111623	14.60209462	144.7738768	280.83	6.39	574.39	580.78	Good view in aft cam with Medea lighting up the slope behind us.
9241	20090412 111650	14.60210871	144.7738491	308.61	3.49	578.77	582.26	Looks like we are at the start of SM2K line.
9242	20090412 111708	14.60211621	144.7738589	97.33	4.34	580.55	584.89	At start. Jason team taking over.
9243	20090412 111725	14.60213145	144.7738635	117.65	4.29	582.23	586.52	J2-406 Stop DVCAM 042 again at 11:17
9244	20090412 111829	14.60213629	144.7738648	117.52	4.25	582.56	586.81	J2-406 Data DVDs stop blue set 52
9245	20090412 112800	14.60227528	144.7737295	232.28	4.79	591.81	596.6	SM2K has been set to same operating parameters as used during J2-399
9246	20090412 113217	14.60227551	144.7737296	232.55	4.85	591.77	596.62	Doppler reset
9247	20090412 114139	14.60204329	144.773842	179.53	4.9	589.85	594.75	SURVEY Start line path test line 1 20 m 10 m alt .1 m/s
9248	20090412 114249	14.60198376	144.7738415	179.93	4.9	587.52	592.42	abort patch test #1
9249	20090412 114537	14.60212519	144.7738412	179.44	4.9	593.31	598.21	SURVEY Start line restart patch test line #1 auto altitude doppler 0.1 m/s speed 10 m altitude heading
9250	20090412 114604	14.60209961	144.7738414	179.43	4.9	592.09	596.99	Heading 180
9251	20090412 114858	14.6019422	144.7738404	179.21	4.9	582.35	587.25	SURVEY End line end of patch line #1
9252	20090412 114940	14.6019444	144.7738375	357.39	4.9	576.48	581.38	SURVEY Start line patch test line #1 return 10m alt 0.1 m/s heading 000
9253	20090412 115300	14.60212628	144.773842	0.28	4.9	588.06	592.96	SURVEY End line end patch test line #2 return of line #1
9254	20090412 115327	14.60212561	144.7738385	358.87	4.9	585.19	590.09	elevate to 20m
9255	20090412 115546	14.60212434	144.7738426	180.04	4.9	585.7	590.6	SURVEY Start line patch test line #3 20 m altitude 0.1 m/s heading 180
9256	20090412 115909	14.60194316	144.7738411	179.26	4.9	574.73	579.63	SURVEY End line end of line #3
9257	20090412 120119	14.60195942	144.7738382	359.75	4.9	568.13	573.03	SURVEY Start line heading 000 20m
9258	20090412 120642	14.60212408	144.7738423	0.02	4.9	578.63	583.53	SURVEY End line Heading to target SOL 4 (target from J2-399)
9259	20090412 121129	14.60210449	144.7738155	107.96	4.9	579.29	584.19	SURVEY Start line SOL4 108 degrees 524 meters 25m
9260	20090412 121957	14.60196297	144.7742656	107.44	4.9	559.11	564.01	LBL fixes currently appear dependable. NavDisp velocity filter 3 kn min travel time 0.4 sec
9261	20090412 122013	14.60195805	144.77428	107.5	4.9	558.69	563.59	Doppler 3 beams
9262	20090412 133835	14.60064577	144.7784297	108.33	4.9	585.61	590.51	LBL and DVL continue in close agreement.
9263	20090412 133900	14.60064404	144.7784358	108.12	4.9	586.07	590.97	SURVEY End line end of J2-399 line 4 repeat
9264	20090412 134705	14.60032114	144.7783228	283.19	4.9	575.62	580.52	Arrived at target SOL5 bottom lock lost
9265	20090412 134810	14.60032797	144.7783287	289.55	4.9	586.95	591.85	SM2k shows altitude ~30m
9266	20090412 134823	14.60032603	144.77833	288.6	4.9	585.84	590.74	3 beams reacquired
9267	20090412 134855	14.60032561	144.7783304	288.09	4.9	586.06	590.96	Altitude 25m
9268	20090412 134958	14.60032295	144.7783383	288.17	4.9	586.68	591.58	SURVEY Start line From SOL5 heading will be 288 degrees 525 meters 25 m altitude
9269	20090412 135857	14.60047458	144.7778602	287.88	4.9	572.88	577.78	LBL compared to DVL X ~OK Y 1000 meters long

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9270	20090412 140315	14.60052906	144.7776884	287.85	4.9	566.98	571.88	Upcoming feature pilot will probably move to auto-depth
9271	20090412 140431	14.60052951	144.7776893	287.97	4.9	565.9	570.8	Altitude at 30+ m by SM2K but DVL keeps lock with 3 beams.
9272	20090412 140722	14.6005593	144.7776114	286.78	4.9	563.39	568.29	Doppler lost
9273	20090412 140741	14.60056735	144.7775909	289.3	4.9	564.29	569.19	DVL back quickly
9274	20090412 141001	14.60063036	144.7774691	288.38	4.9	563.44	568.34	Bottom lock lost reacquired as Will keeps vehicle low
9275	20090412 141202	14.60067363	144.7773099	288.54	4.9	563.58	568.48	We see marker109 in the water marked as 14 m nw of our current position. Hint for renav.
9276	20090412 141534	14.60073495	144.7771237	288.57	4.9	563.53	568.43	Marker 101 appears to have moved. It's close to directly below our current position.
9277	20090412 141726	14.60076898	144.7770255	288.54	4.9	554.06	558.96	Altitude low (12m) coming back up will need overlap from other lines here!
9278	20090412 142046	14.60082604	144.7768498	288.83	4.9	547.79	552.69	We're approaching the problem spot from J2-399. The guys try to anticipate best ways to handle.
9279	20090412 142132	14.60083866	144.7768089	288.69	4.9	548.31	553.21	LBL fixes are within a few hundred meters status of fixes appears OK from NavDisp.
9280	20090412 142344	14.60087702	144.7766931	288.78	4.9	547.27	552.17	Will stays in auto-depth. SM2K shows ~30m altitude.
9281	20090412 143528	14.60113059	144.7759884	289.16	4.9	528.6	533.5	Rough terrain Will drives manually. DVL ranges from lost lock to 4 beams in rapid succession.
9282	20090412 145533	14.60147922	144.7749294	288.83	4.9	524.45	529.35	No Jason LBL for a significant time.
9283	20090412 151652	14.60180431	144.7737927	283.22	4.9	558.92	563.82	No Jason LBL for 1 hour 15 minutes
9284	20090412 151913	14.60182313	144.7737207	192.4	4.9	564.81	569.71	SURVEY End line End of rerun of line 5
9285	20090412 152041	14.6017834	144.7737078	198.28	4.9	561.21	566.11	Move to target SOL 6 35m bearing 198
9286	20090412 152731	14.60149803	144.7736095	119.7	4.9	544.52	549.42	LBL computer is hung
9287	20090412 152756	14.60149998	144.77361	119.3	4.9	544.66	549.56	Doppler bottom lock lost briefly
9288	20090412 154715	14.60150099	144.7736107	108.33	4.9	543.93	548.83	Jon gets the LBL computer running after a couple reboots and some uneasy moments
9289	20090412 154828	14.60150036	144.7736124	107.92	4.9	544.09	548.99	SURVEY Start line We're at SOL 6 bearing 108 545 m 25 m alt 0.1 m/s
9290	20090412 155837	14.60132496	144.7741513	108.53	4.9	550.07	554.97	LBL fixes are encouraging
9291	20090412 160138	14.60127121	144.7743094	108.68	4.9	553.84	558.74	Consistent delta of ~40m in Y (LBL north of DVL) implies that we're no longer on line 6 perhaps close to line 5. Where was line 5?
9292	20090412 163103	14.60076409	144.7758629	108.59	4.9	507.63	512.53	Change of watch
9293	20090412 171039	14.6000808	144.7779521	108.51	4.9	593.49	598.39	LBL fixes getting spotty less accurate
9294	20090412 171522	14.59999968	144.7782005	109.05	4.9	590.17	595.07	LBL computer has crashed again.
9295	20090412 171604	14.59999904	144.7782274	112.12	4.9	589.53	594.43	SURVEY End line End of line #6
9296	20090412 171720	14.59999913	144.7782206	13.21	4.9	589.61	594.51	Returning to repeat line #5. bearing 16 35 meters.
9297	20090412 171952	14.60010195	144.778264	18.12	4.9	586.71	591.61	LBL computer back up
9298	20090412 173311	14.60031791	144.778325	288.47	4.9	582.49	587.39	SURVEY Start line Repeat line #5 bearing 288 alto 25M
9299	20090412 173350	14.60032878	144.7782909	288.86	4.9	579.73	584.63	LBL OK for Medea poor for Jason
9300	20090412 173856	14.6003671	144.7781743	290.37	4.9	574.88	579.78	All stop. Jason and Medea positions don't jibe moving ship bearing 045 to come atop Jason
9301	20090412 174507	14.60039127	144.7780971	287.79	4.9	575.07	579.97	Continue with survey after ship move to the north head Medea 288
9302	20090412 180214	14.6006913	144.7771956	288	4.9	550.22	555.12	Experienced loss of bottom lock for ~30 secs Bob drives to reacquire manually
9303	20090412 180230	14.60069582	144.7771812	287.9	4.9	550.16	555.06	Still no Jason LBL
9304	20090412 180706	14.60077231	144.7769378	288.03	4.9	547.54	552.44	LBL computer dies again
9305	20090412 185321	14.60152279	144.774553	288.57	4.9	539.51	544.41	Semi-consistent LBL fixes for Jason last 10 minutes
9306	20090412 190932	14.60178654	144.7737025	275.08	4.9	565.35	570.25	SURVEY End line
9307	20090412 191021	14.60177414	144.7736995	197.09	4.9	566.49	571.39	Move to start of line 7 = target EOL 7 (reverse direction from J2-399)
9308	20090412 192237	14.60118594	144.7735153	108.01	4.9	551.15	556.05	SURVEY Start line
9309	20090412 192259	14.60118017	144.7735362	108.52	4.9	550.18	555.08	Line 7 heading 108 523 m
9310	20090412 192534	14.60114159	144.7736802	107.07	4.9	541.77	546.67	Ship position needs to be moved north



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9311	20090412 192921	14.60107958	144.7738829	106.72	4.9	539.97	544.87	Ship's line relative to map and Medea suggests that our line is further north than shown by DVLNav on underlay
9312	20090412 195117	14.60073395	144.7750118	107.34	4.9	535.81	540.71	Lost DVL lock
9313	20090412 195721	14.60060459	144.7752596	106.89	4.9	513.57	518.47	Lock lost again high relief area
9314	20090412 195950	14.6005405	144.7754034	106.15	4.9	504.82	509.72	Brimstone plume ahead
9315	20090412 200140	14.60050489	144.7754999	106.88	4.9	497.98	502.88	Lock lost
9316	20090412 201333	14.60025509	144.7761201	106.89	4.9	540.37	545.27	SURVEY End line End survey Break off. Head back to Brimstone.
9318	20090412 202012	14.6003495	144.7758472	290.12	13.91	540.6	554.51	Jason is on the bottom.
9319	20090412 202136	14.60039272	144.7757119	289.27	12.89	533.31	546.2	We're SE of Brimstone heading that way.
9320	20090412 202314	14.60040894	144.775609	298.6	2.45	538.94	541.39	RECOVER Tephra Sampler Found bucket Bon the bottom SE of Brimstone.
9321	20090412 202357	14.60040041	144.7755529	300.16	5.63	534.44	540.07	J2-406 Restop DVCAM 042
9322	20090412 202414	14.60041539	144.7755237	324.67	5.28	533	538.28	2. Tephra Sampler that tumbled downslope SE of Brimstone (about 75m).
9323	20090412 202505	14.60049969	144.7755907	348.97	5.21	528.45	533.66	SAMPLE Geology 2. Tephra Sampler B that tumbled downslope SE of Brimstone. Recovered after finish of SM2000 survey.
9324	20090412 202632	14.60059497	144.7755333	298.13	7.16	517.82	524.98	Bob has coined the geology here "extrusive breccia".
9325	20090412 202725	14.60059018	144.7755331	295.23	7.91	517.09	525	We're at Brimstone.
9326	20090412 202749	14.60059394	144.7755246	296.1	7.15	517.47	524.62	It looks pretty active. the plume is going straight up. Looking W/NW at the vent.
9327	20090412 202816	14.60059716	144.7755021	297.01	2.15	520.92	523.07	WATCHSTANDERS Susan Merle logger started about 10 minutes ago.
9328	20090412 202826	14.60059588	144.7755029	297.62	2.25	521.01	523.26	WATCHSTANDERS Nick Deardorff video started about 5 minutes ago.
9329	20090412 202837	14.6005976	144.7755044	297.58	2.25	521.01	523.26	Lots of ash coming out of Brimstone this morning.
9330	20090412 202928	14.60060413	144.7755069	295.88	2.21	521.01	523.22	Just saw a big pulse of tephra production. Now it has gone down a bit.
9331	20090412 202948	14.60060507	144.775507	295.82	2.2	521.02	523.22	Heading 295 degrees. Z=522.
9332	20090412 202958	14.60060528	144.7755068	295.81	2.2	521.04	523.24	VIDEO Start recording HDCam
9333	20090412 203039	14.6006061	144.775507	295.53	2.21	521.04	523.25	Activity varies. Producing ash again.
9334	20090412 203109	14.60060485	144.7755055	295.01	2.23	521.05	523.28	Lots of larger ash chunks coming out of the vent site.
9335	20090412 203141	14.60060487	144.7755056	294.36	2.23	521.03	523.26	The vent must be extruding at a higher rate right now. The last 2 days have been a change from our first observations here.
9336	20090412 203231	14.6006313	144.7754945	294.27	2.24	521.03	523.27	Much more activity in the last couple days. More ash and more vigorous venting.
9337	20090412 203251	14.6006304	144.7754944	294.24	2.24	521.03	523.27	Seems to fluctuate a lot.
9338	20090412 203331	14.60062693	144.7754951	294.18	2.24	521.05	523.29	Lasers on for a couple minutes.
9339	20090412 203620	14.60059937	144.7755044	294.03	2.24	521.03	523.27	The activity is picking up again. Lots of CO2 bubbles. Seems concentrated in the spot on the left of the screen.
9340	20090412 203710	14.60059702	144.7755047	294.12	2.24	521.05	523.29	Looks like more than 1 place is producing ash. Also see activity on the right.
9341	20090412 203801	14.60059432	144.7755048	294	2.21	521.05	523.26	Debating if we should move around the vent and look at other angles.
9342	20090412 203837	14.60059842	144.7755032	293.77	2.21	521.05	523.26	The plume is swirling around and almost straight up.
9343	20090412 203859	14.6005993	144.7755026	294.01	2.24	521.04	523.28	Lots of ash coming out. Some yellow color.
9344	20090412 203912	14.60060007	144.7755023	294.02	2.25	521.04	523.29	At least 2 areas of extrusion.
9345	20090412 203959	14.60060042	144.7755015	294.04	2.25	521.04	523.29	This is a unique submarine form of extrusion. It brecciates as it is forming. Bubbling tephra. Rota-style activity.
9346	20090412 204039	14.60060024	144.7755009	293.94	2.23	521.05	523.28	Lots of sulfur in the plume.
9347	20090412 204111	14.60060181	144.7755006	293.9	2.23	521.05	523.28	It's amazing how much gas comes out of the new rock.
9348	20090412 204125	14.60060306	144.7755002	293.93	2.23	521.04	523.27	It's throwing stuff up higher when you get an extrusion.
9349	20090412 204159	14.6006026	144.7755006	293.87	2.23	521.06	523.29	The plume is heading to the S/SW right now.
9350	20090412 204345	14.60063892	144.7754878	293.86	2.2	521.07	523.27	We're getting vlogged in here. It's starting to come at us a bit.
9351	20090412 204420	14.60063835	144.7754879	293.79	2.19	521.07	523.26	Right now we're looking NW.
9352	20090412 204450	14.60063761	144.7754886	292.92	2.19	521.06	523.25	The visibility is pretty poor.

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9353	20090412 204538	14.6006367	144.77549	292.13	2.21	521.06	523.27	Getting a rain of tephra coming down.
9354	20090412 204606	14.60066979	144.7754842	220.24	2.99	519.48	522.47	Moving around a bit looking for a better spot. The current may have changed.
9355	20090412 204623	14.6006715	144.7754701	227.35	1.29	520.46	521.75	Circling around.
9356	20090412 204647	14.60067125	144.7754712	229.03	1.2	520.51	521.71	The most ash we've seen coming straight down on us.
9357	20090412 204656	14.60067108	144.7754717	228.9	1.2	520.5	521.7	Tons of bubbles in the Medea cam.
9358	20090412 204716	14.60067668	144.7754753	222.94	0.89	520.78	521.67	Now our heading is 225.
9359	20090412 204721	14.60067678	144.7754754	222.89	0.93	520.73	521.66	VIDEO Stop recording HDCam
9360	20090412 204750	14.60064979	144.7754844	283.69	3.56	518.35	521.91	The ash is continuing to rain down.
9361	20090412 204809	14.60061181	144.7754616	19.4	5.76	518.4	524.16	The visibility is pretty poor.
9362	20090412 204828	14.60062505	144.7754425	47.64	3.76	519.82	523.58	The plume is going straight up right now.
9363	20090412 204919	14.60062963	144.7754465	44.93	1.94	520.72	522.66	We're now looking toward the NE. Earlier we were looking toward the NW.
9364	20090412 204939	14.60062897	144.7754465	44.59	1.88	520.86	522.74	The visibility is poor.
9365	20090412 205135	14.60062539	144.7754669	324.97	3.13	520.79	523.92	Circling around again.
9366	20090412 205230	14.60062658	144.7754828	330.86	5.29	520	525.29	It's pretty murky right now.
9367	20090412 205406	14.60063519	144.7754327	12.16	4.75	520.06	524.81	The delta in the medea cam is 29m. So the bubbles are getting up well beyond 39m.
9368	20090412 205430	14.60067479	144.7753932	81.02	1.91	520.21	522.12	We're going to swap out the tephra sampler buckets.
9369	20090412 205644	14.60068557	144.7753938	112.12	2.06	519.67	521.73	We're about 5m NW of Brimstone.
9370	20090412 205828	14.60068078	144.7753702	90.67	5.21	517.6	522.81	There is a trend here that the depth has shallowed. Looks like it is about 2-3 meters shallower at Brimstone compared to when we arrived.
9371	20090412 205904	14.60069532	144.7753987	115.7	1.71	520.04	521.75	By the way... the nav says that we are south of the vent when we know we are northwest.
9372	20090412 205924	14.60069515	144.7753997	115.65	1.19	520.5	521.69	Huge amount of bubbles in the Medea cam.
9373	20090412 210005	14.60069442	144.7754003	114.59	1.14	520.45	521.59	Will deploy one tephra sampler here and recover the one that is here. Swapping them out.
9374	20090412 210137	14.60069434	144.7753999	114.65	1.15	520.36	521.51	DEPLOY Tephra Sampler H. NW of Brimstone about 5m.
9375	20090412 210321	14.60069358	144.7754012	109.8	1.09	520.51	521.6	RECOVER Tephra Sampler E. Was 5m NW of Brimstone.
9376	20090412 210416	14.60069382	144.7754012	110.1	1.05	520.54	521.59	SAMPLE Geology 3. Tephra sampler E. Has been out here for 24 hours. 5m NW of Brimstone.
9377	20090412 210519	14.60070348	144.7754005	113.04	1.19	520.23	521.42	Looking at the tephra sampler bucket to make sure that it is upright and in the proper place.
9378	20090412 210531	14.60070082	144.775404	110.66	1.11	520.52	521.63	Shrimp on the seafloor here.
9379	20090412 210710	14.6006996	144.7754087	110.66	0.89	520.76	521.65	Debating if the bucket is level and in the correct location.
9380	20090412 210754	14.60069691	144.7753982	111.56	1.73	520.05	521.78	Jason moved the sampler upslope about a foot and made sure it was in there deep enough.
9381	20090412 210832	14.60061841	144.7754213	111.56	1.89	522.04	523.93	Will now swap out another tephra sampler. We believe it is east of the vent 10-20 meters.
9383	20090412 211359	14.60059131	144.7755632	267.48	3.81	529.11	532.92	We're now in the vog of the possible newly discovered vent. East of Brimstone.
9384	20090412 211915	14.60057593	144.7755414	264.27	4.85	526.53	531.38	We're going to set up here and watch Brimstone again until the end of the dive.
9385	20090412 212200	14.60063935	144.7754291	10.79	3.98	521.2	525.18	Brimstone is in view again. We're out of the vog here on the south side of the vent.
9386	20090412 212238	14.6006469	144.7754268	17.18	4.1	521.01	525.11	Depth here is 522. Lots of ash and sulfur on the rocks.
9387	20090412 212254	14.600668	144.7754247	49.94	3.09	520.57	523.66	Circling around the vent a bit.
9388	20090412 212302	14.60067682	144.7754249	52.84	2.46	520.6	523.06	VIDEO Start recording HDCam
9389	20090412 212333	14.60067929	144.7754256	65.09	1.15	521.65	522.8	Zooming out to observe the vent in full view.
9390	20090412 212358	14.60067931	144.7754255	65.05	1.16	521.64	522.8	Stopped on the bottom observing the vent from the SW looking NE. Depth here is 522m.
9391	20090412 212441	14.60067928	144.7754258	65.01	1.16	521.63	522.79	A striated rock near the vent.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-406 Logger Comment
9392	20090412 212501	14.60067914	144.7754262	64.73	1.15	521.65	522.8	Lots of gas coming out now.
9393	20090412 212539	14.60067943	144.7754263	64.13	1.18	521.66	522.84	Looking at the striped rock at the vent edge.
9394	20090412 212600	14.60067973	144.7754265	64.12	1.18	521.67	522.85	We're looking at the vent zoomed out to get the big picture.
9395	20090412 212628	14.6006799	144.7754264	63.78	1.15	521.68	522.83	Looks like the ground is shaking a bit.
9396	20090412 212709	14.60068006	144.7754266	63.65	1.15	521.69	522.84	Lasers on.
9397	20090412 212809	14.60067908	144.7754282	59.86	2.35	520.47	522.82	We want the striped rock. It's a bit too large we think.\
9398	20090412 212841	14.6006827	144.7754341	57.48	1.36	521.34	522.7	Lots of ash coming out now.
9399	20090412 213252	14.60068053	144.7754326	55.32	1.59	521.38	522.97	SAMPLE Geology 4. Rock from the edge of the vent. Nice striations on the rock. Rock is bigger than the milk crate.
9400	20090412 213321	14.60067169	144.7754349	58.87	5.18	517.58	522.76	Backing away from the vent a bit.
9401	20090412 213353	14.60059922	144.7754131	66.53	18.11	510.17	528.28	Not sure we will have the rock in the basket when we get to the surface. It has moved quite a bit in the front carriage.
9402	20090412 213404	14.600593	144.7754051	46.28	23.73	507.3	531.03	Dropping the weights away from the vent.
9403	20090412 213418	14.6005863	144.775372	298.96	24.04	505.36	529.4	Coming off the seafloor. See the plume in the distance.
9404	20090412 213436	14.6005703	144.775316	281.02	21.78	506.65	528.43	VIDEO Stop recording HDCam a couple minutes ago.
9405	20090412 213515	14.6005606	144.7751253	276.38	27.55	507.64	535.19	J2-406 Data DVDs stop
9406	20090412 213539	14.6005413	144.7750532	277.24	37.86	501.96	539.82	J2-406 Data DVDs stop red set DVD 053
9407	20090412 213606	14.6005412	144.7750517	278.47	48.28	493.46	541.74	J2-406 DVCAM 042 stopped on its own near end of dive
9408	20090412 213609	14.6005412	144.7750517	278.49	49.02	493.12	542.14	Looks like the rock is going to come up resting on the suction hose.
9409	20090412 213624	14.6005413	144.775052	279.46	51.91	488.07	539.98	End of dive J2-406.
9410	20090412 213702	14.6005402	144.7750495	280.76	71.11	469.77	540.88	J2-406 21:35
9411	20090412 220123	14.6005088	144.7753462	285.79	badvalue	1.83	badvalue	Medea on deck.
9412	20090412 220222	14.6005067	144.7753569	286.7	badvalue	2.07	badvalue	JASON on deck Jason was off the seafloor at 2134.
9413	20090412 220244	14.6005067	144.7753569	286.7	badvalue	2.07	badvalue	The video went out. No signal right now.
9414	20090412 220328	14.6005067	144.7753569	286.7	badvalue	2.43	badvalue	Getting one of the video cameras back. HD is frozen and the pilot cam is still out.
9415	20090412 220435	14.6005067	144.7753569	286.7	badvalue	1.97	badvalue	Butt cam is on but pilot and brow cams are out.
9416	20090412 220743	14.6005067	144.7753569	286.7	badvalue	2.18	badvalue	Port swing arm is out.
9417	20090412 221037	14.6005067	144.7753569	286.7	badvalue	0.92	badvalue	Looks like the swing arm is in.
9418	20090412 221104	14.6005067	144.7753569	286.7	badvalue	0.92	badvalue	JASON on deck

**J2-407 - CTD Search/Fluid Sampling.** JASON equipped with HFS Beast (including 2 gas-tights), single-chamber suction sampler, 2 tephra samples, 4 markers, 3 scoop bags, 2 gas-tight bottles (one with funnel), Eh sensor, Niskin. JASON began the dive NW of Brimstone, searching for the lost CTD. CTD search (~3 hours) conducted west of Brimstone. Science portion of dive began at Brimstone with visual observations of vigorous activity at vent, ~1 hour. Passed over Mkr-104 and Mkr-108 en route to Limpet Lair (Mkr-105). Took HD images for a mosaic at shrimp site then took suction sample of shrimp. Retrieved shrimp trap and then JASON had engineering time for ~2hr while recording more HD video at site. After JASON engineering time, took 4 HFS samples at same location. Drove east toward Scarp Top area while taking background pH reading. Furry mats and old yellow deposits found east of Mkr-109 on middle of the 3 ridges. Took 4 fluid samples at this site and 3 sulfur/sediment samples (Sulfur Slide). Moved west across the ridges and along summit. Found an area of venting in outcrop 9m below rim and took 3 HFS and 1 gas sample. Moved south toward Brimstone and found high concentration of shrimp, mat and flow north of Brimstone. Took 4 HFS and 1 gas-tight sample. Deployed Mkr-103 at site named Flock Rock. Drove ENE in search of source of apparent second plume and noted diffuse flow, no single source found. Took 2 fluid samples from cracks in area. Next went back west to Brimstone. Took 2 gas-tight samples, one with funnel. Took a background fluid sample while ascending.

**Table 6.4-12 JASON Dive J2-407**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-407 Logger Comment
9419	20090413 061456	badnav	badnav	50.32	badvalue	1.47	badvalue	JASON in water
9421	20090413 061614	badnav	badnav	326.06	badvalue	1.74	badvalue	JASON in water
9422	20090413 061634	badnav	badnav	357.69	badvalue	2.81	badvalue	Dive J2-407
9423	20090413 061643	badnav	badnav	336.75	badvalue	2.82	badvalue	Main goals: Fluid sampling
9424	20090413 061726	badnav	badnav	302.48	badvalue	4.27	badvalue	Tools: Single-chamber suction sampler. Beast with long intake. Off-load camera on port arm.
9425	20090413 061742	badnav	badnav	301.46	badvalue	2.92	badvalue	Other tools: Niskin (manual). Eh sensor.
9426	20090413 061821	badnav	badnav	303.76	badvalue	3.1	badvalue	Basket: 2 gastights (one with funnel). 1 tephra sampler. 3 markers. 3 scoop bags. Empty crate for shrimp trap recovery.
9427	20090413 061954	badnav	badnav	304.25	badvalue	30.83	badvalue	Tasks: CTD search for first 4 hours. Brimstone observations. Recover shrimp trap and shrimp observations. Engineering test on midwatch.
9428	20090413 062033	badnav	badnav	303.69	badvalue	47.92	badvalue	Tasks: Fluid sampling. Exchange tephra samplers. Video vent. Scoop and rock samples of new lava.
9429	20090413 062036	badnav	badnav	303.59	badvalue	49.18	badvalue	MEDEA in water
9430	20090413 064121	badnav	badnav	255.39	152.18	479.71	631.89	Plume in sight
9431	20090413 064134	badnav	badnav	255.02	150.71	479.65	630.36	Jason depth is 480m
9432	20090413 064352	badnav	badnav	256.78	143.21	479.7	622.91	MEDEA camera seeing top of plume. Seems pretty thick and extensive from this view.
9433	20090413 064407	badnav	badnav	257.94	142.47	479.77	622.24	Jason plunging through edge of plume
9434	20090413 064946	badnav	badnav	263.87	110.48	479.73	590.21	J2-407 start blue set DVD 054
9435	20090413 065208	14.60094188	144.7749011	258.62	98.14	479.8	577.94	JASON on bottom
9436	20090413 065959	14.60094188	144.7749011	96.31	34.82	507.01	541.83	Squaring up the position and instruments.
9437	20090413 070012	14.60094188	144.7749011	98.71	37.31	506.69	544	BEAST check out ok.
9438	20090413 070020	14.60094188	144.7749011	99.11	37.91	506.76	544.67	Ship is stopped.
9439	20090413 070040	14.60094188	144.7749011	98.79	39.73	507.69	547.42	Came off bottom and now driving down.
9440	20090413 070143	14.60094188	144.7749011	98.7	38.98	514.76	553.74	Dropping a weight.
9442	20090413 070559	14.60094188	144.7749011	98.91	24.47	530.88	555.35	Heading down.
9443	20090413 070623	14.60094188	144.7749011	99.56	13.38	538.71	552.09	Bottom in view.
9444	20090413 070631	14.60094188	144.7749011	100.4	11.06	541.14	552.2	And vog.
9445	20090413 070652	14.60094188	144.7749011	96.08	4.49	544.69	549.18	Heavily sedimented outcrop.
9448	20090413 070801	14.60094188	144.7749011	44.47	10.99	545.57	556.56	Looking east at large outcrop.
9450	20090413 070918	14.60094188	144.7749011	117.87	10.9	542.67	553.57	Driving east to Brimstone.
9451	20090413 070941	14.60094188	144.7749011	115.01	11.08	542.49	553.57	Lots of plume here and very low visibility.
9453	20090413 071007	14.60094188	144.7749011	156.03	14.41	542.25	556.66	Outcrop and vog.
9454	20090413 071040	14.60094188	144.7749011	152.03	2.54	546.48	549.02	Can't see a thing.
9455	20090413 071056	14.60094188	144.7749011	151.98	3.54	545.55	549.09	Piece of ridge hit and fell down.
9457	20090413 071128	14.60094188	144.7749011	94.84	4.94	542.03	546.97	Heading up slope of ridge.
9458	20090413 071135	14.60094188	144.7749011	84.46	4.56	541.72	546.28	there is the top of the ridge in the sci cam.
9460	20090413 071225	14.60094188	144.7749011	63.68	7.86	542.86	550.72	Huge plume is behind us? We are too deep and supposedly west of Brimstone.
9461	20090413 071231	14.60094188	144.7749011	52.61	8.74	543.17	551.91	What is the source.
9463	20090413 071313	14.60094188	144.7749011	114.97	8.3	544.03	552.33	Medea cam shows we are going to get loss is some plume.
9464	20090413 071327	14.60094188	144.7749011	113.18	6.9	543.17	550.07	Heading upslope (sedimented outcrop).
9465	20090413 071335	14.60094188	144.7749011	113.39	6.1	542.17	548.27	Lots of tephra raining down on us.
9466	20090413 071347	14.60094188	144.7749011	144.98	5.98	541.28	547.26	Clearing the ridge and getting visibility.
9468	20090413 071417	14.60094188	144.7749011	102.68	8.08	541.19	549.27	We are heading south and Medea is in plume.
9470	20090413 071542	14.60094188	144.7749011	20.56	3.05	542.01	545.06	Now in rubble debris looking area with impaired visibility.

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-407 Logger Comment
9472	20090413 071640	14.60094188	144.7749011	295.88	7.88	549.23	557.11	Headed downslope.
9477	20090413 072013	14.60094188	144.7749011	292.17	4.08	543.51	547.59	Driving west now. Visibility very poor\
9483	20090413 072505	14.60094188	144.7749011	302.55	5.94	531.07	537.01	Tephra is falling through the water
9486	20090413 072710	14.60094188	144.7749011	302.46	8.99	532.45	541.44	Need to check out if this plume is something new... vent near?
9488	20090413 072850	14.60094188	144.7749011	241.05	14.15	540.34	554.49	Jason is under Medea. Distinct big plume behind vehicle.
9490	20090413 072925	14.60095268	144.7748923	235.33	6.6	550.69	557.29	Bottom in sight
9491	20090413 072950	14.60095307	144.7748908	235.92	6.34	551.1	557.44	Jason is looking downslope.
9493	20090413 073009	14.60095155	144.7748932	235.06	5.78	551.54	557.32	Visibility is good here.
9494	20090413 073050	14.6009512	144.7748929	235.19	3.95	553.59	557.54	Dropping a weight.
9496	20090413 073144	14.60095163	144.7748931	235.02	4.25	553.35	557.6	Sharon is back at the keyboard logging
9499	20090413 073325	14.6009514	144.7748935	234.98	3.7	553.9	557.6	Jason is kicking up some sediments
9500	20090413 073342	14.60095101	144.7748933	234.77	3.46	554.3	557.76	Medea is up at edge of plume
9502	20090413 073412	14.60095125	144.7748937	234.81	3.08	554.71	557.79	Jason heading is 235
9504	20090413 073521	14.60095104	144.7748939	14.57	4.38	554.54	558.92	Lots of filamentous stuff in the water
9505	20090413 073526	14.60095385	144.7748928	15.08	5.61	553.39	559	Jason heading is 015
9507	20090413 073602	14.6009638	144.7748919	51.79	9.8	550.55	560.35	Seafloor is covered in layer of sediment that looks thicker than before
9508	20090413 073638	14.60102457	144.7749609	52.64	9.56	547.1	556.66	Jason is east of Brimstone 549 m deep and 9 meters above seafloor
9510	20090413 073709	14.60107542	144.775029	54.17	7.28	544.57	551.85	Jason is moving northwest
9511	20090413 073751	14.60108653	144.7750427	50.04	10	541.01	551.01	Scratch that... Jason is moving northeast to start CTD search pattern
9513	20090413 073840	14.60100691	144.7749291	35.61	14.21	544.29	558.5	Jason is moving southwest
9516	20090413 074010	14.60089447	144.7749376	45.71	8.64	546.42	555.06	Visibility is good. Medea is flirting with edge of plume.
9517	20090413 074022	14.60087935	144.774948	46.09	12.2	544.88	557.08	Jason is moving southeast
9520	20090413 074232	14.60078119	144.7749141	52.74	12.53	551.67	564.2	Bottom is mostly rock rubble of mixed sizes.
9522	20090413 074321	14.60088777	144.7748273	52.43	11.18	554.45	565.63	Going over blocky lavas
9525	20090413 074528	14.60105499	144.7746405	56.2	11.21	571.23	582.44	Jason moving northwest
9526	20090413 074554	14.60102141	144.7745968	55.67	12.96	572.94	585.9	Jason moving southwest
9528	20090413 074613	14.60099325	144.7746185	46.59	9.99	574.3	584.29	Jason moving southeast
9529	20090413 074629	14.60095971	144.7746498	50.31	7.83	573.34	581.17	Bottom is covered with sediment
9531	20090413 074734	14.60083986	144.774745	46.1	6.71	565.85	572.56	Some lavas that end abruptly with short drop-offs
9533	20090413 074813	14.60075635	144.7748142	45.59	8.88	563.79	572.67	Very steep slope
9534	20090413 074841	14.60068491	144.7748755	46.46	6.95	562.63	569.58	Bottom is rock rubble of mixed sizes
9536	20090413 074901	14.60066469	144.7748836	60.71	8.23	560.99	569.22	Some big boulders
9537	20090413 074916	14.60065263	144.7748526	52.08	10.69	561.33	572.02	Jason moving southwest
9538	20090413 074940	14.60061461	144.7748107	45.5	13.39	562.88	576.27	Jason moving northwest
9543	20090413 075317	14.6009422	144.7744934	59.21	13.03	579.79	592.82	Jason moving southwest
9545	20090413 075413	14.60085304	144.7744983	49.55	11.08	583.93	595.01	Big overhanging lava
9547	20090413 075515	14.60072125	144.7746059	48.24	7.98	580.23	588.21	Massive lava flow. Blocky and very rough\
9548	20090413 075550	14.60064886	144.7746672	47.01	6.69	579.99	586.68	Rubble
9550	20090413 075617	14.60059584	144.7747083	45.9	6.79	578.2	584.99	Lightly sedimented
9553	20090413 075815	14.6005801	144.7746042	51.64	12.64	579.85	592.49	Jason moving northwest
9557	20090413 080122	14.60079282	144.774304	51.39	11.14	596.87	608.01	Bottom is rough and steep
9558	20090413 080156	14.60073122	144.7743615	47.41	7.2	598.18	605.38	Jason is moving southeast
9560	20090413 080229	14.60066106	144.7744191	47.43	7.73	596.11	603.84	Continuing over lava flow
9562	20090413 080337	14.6005175	144.7745387	48.91	6.6	592.34	598.94	Moving over rubble
9564	20090413 080430	14.60044017	144.7745936	58.92	7.08	589.7	596.78	Rocky rubble of mixed sizes. Some larger boulders
9565	20090413 080441	14.60042923	144.7745744	45.39	9.54	589.01	598.55	Jason moving southwest

Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-407 Logger Comment
9567	20090413 080524	14.60039806	144.7745152	52.53	11.68	592.27	603.95	Jason moving northwest
9572	20090413 080911	14.60068198	144.7741632	50.87	8.98	609.35	618.33	Bottom looks more like lava flow t
9574	20090413 081011	14.6005585	144.7742647	49.1	6.7	608.6	615.3	Visibility is quite good
9575	20090413 081033	14.60051187	144.7743039	49.09	7.3	607.99	615.29	Looks like sulfur on rocks
9577	20090413 081116	14.60042177	144.7743785	50.2	5.56	606.87	612.43	Jason moving southeast
9578	20090413 081135	14.60038073	144.7744113	49.4	5	605.86	610.86	on 8th line
9580	20090413 081215	14.60031704	144.7744472	68.26	7.55	603.2	610.75	Looks like large rubble and pillow lava spire
9582	20090413 081301	14.60028051	144.7743739	51.64	10.2	605.96	616.16	Jason moving northwest
9583	20090413 081332	14.60035426	144.7743135	51.21	11.19	607.44	618.63	Rock rubble with some large boulders
9587	20090413 081624	14.60057954	144.7740335	54.36	12.63	615.42	628.05	Jason moving southwest
9588	20090413 081637	14.60056543	144.7740154	50.98	9.85	619.35	629.2	Jason moving southeast
9590	20090413 081711	14.60050446	144.7740721	49.23	6.11	621.54	627.65	Jason heading for survey down this slope is consistently 050
9592	20090413 081840	14.60031389	144.7742275	49.61	4.71	619.44	624.15	Looks like some lava spires
9594	20090413 081955	14.60019633	144.7742864	54.1	6.86	615.78	622.64	Jason moving southwest
9597	20090413 082101	14.60022198	144.7741845	52.12	7.06	620.84	627.9	Rocky rubble mostly smaller sizes
9599	20090413 082200	14.60034558	144.7740825	51.63	9.88	622.14	632.02	Jason moving northwest
9602	20090413 082429	14.60043529	144.7738903	42.8	6.35	633.23	639.58	Jason moving southwest
9603	20090413 082433	14.60042478	144.7738992	44.28	6.3	633.22	639.52	Jason moving southeast
9608	20090413 082857	14.60017044	144.7739897	53.14	7.43	632.14	639.57	10m snot wad floats past
9610	20090413 082946	14.60027536	144.7739012	51.43	9.56	633.81	643.37	moving northwest
9613	20090413 083115	14.60036634	144.7737658	56.39	7.75	640.38	648.13	moving southwest
9616	20090413 083307	14.60024288	144.7738096	49.7	4.33	644.42	648.75	moving southeast
9620	20090413 083602	14.59990643	144.7740612	59.72	5.95	637.19	643.14	moving southwest
9622	20090413 083729	14.59998696	144.7739024	51.39	6.74	639.32	646.06	Jason moving northwest
9626	20090413 084021	14.60024962	144.7736184	59.53	7.33	651.84	659.17	Jason moving southwest
9628	20090413 084125	14.6001445	144.7736536	48.27	3.91	654.65	658.56	Jason moving southeast
9629	20090413 084158	14.60007505	144.7737113	47.45	4.04	652.1	656.14	Passing over darks stripe going downhill
9631	20090413 084253	14.59995841	144.7738061	47.96	3.63	647.89	651.52	Rubble piles spaced between smoother slopes
9634	20090413 084449	14.59979836	144.7739393	47.24	5.08	646.83	651.91	Have now looked at northern part of slope southwest of Brimstone to 650m
9636	20090413 084534	14.59969689	144.7740227	50.24	8.1	646.14	654.24	J2-407 start red set DVD 055
9637	20090413 084545	14.59967447	144.7740416	49.47	8.65	645.87	654.52	Moving ship to go back upslope and cover southern part of this same side
9639	20090413 084642	14.59965577	144.774057	46.74	8.28	645.73	654.01	J2-407 stop blue set DVD 054
9642	20090413 084807	14.59952102	144.7741666	48.33	5.3	641.65	646.95	Shrimp swimming by
9643	20090413 084815	14.59951759	144.7741711	51.91	5.5	641.37	646.87	Big wall of blocky lavas
9645	20090413 084902	14.59956127	144.7742128	52.71	9.45	632.74	642.19	Very steep wall
9646	20090413 084921	14.59958333	144.7742421	52.52	9.69	628.9	638.59	Jason moving northeast
9647	20090413 084944	14.59962048	144.7742066	53.62	12.93	629.8	642.73	Jason moving northwest
9651	20090413 085203	14.59987074	144.7740015	40.65	8.28	638.65	646.93	Jason moving northeast
9653	20090413 085304	14.59990716	144.7740868	43.21	7.89	634.37	642.26	Jason moving southeast
9655	20090413 085418	14.59974313	144.7742237	50.01	6.19	634.68	640.87	Rubble with slide scars
9656	20090413 085430	14.59971998	144.7742435	51.23	4.79	634.27	639.06	Slope smoother now
9657	20090413 085438	14.599708	144.7742531	48.29	4.83	632.74	637.57	Still quite steep
9658	20090413 085449	14.59968604	144.7742712	45.51	5.15	630.65	635.8	Back over lumpy lavas
9660	20090413 085544	14.59956387	144.774372	51.19	9.28	625.92	635.2	Lavas in ridges and really large lumpy piles
9662	20090413 085641	14.59963892	144.7744371	58.32	4.5	621.72	626.22	Jason moving northeast
9664	20090413 085702	14.59967243	144.7744012	51.74	8.28	618.74	627.02	Jason moving northwest

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9668	20090413 090021	14.6000393	144.7741529	55.86	9.16	624.87	634.03	Jason moving northeast
9669	20090413 090030	14.60005331	144.7741797	50.12	9.9	622.74	632.64	Jason heading still set to 051
9670	20090413 090053	14.60006702	144.7741975	46.11	12.39	618.76	631.15	Heading allows Jason to be facing upslope along lines
9674	20090413 090306	14.59978523	144.7744287	49.08	8.44	619.73	628.17	Massive blocky lavas
9676	20090413 090417	14.59974912	144.7745278	52.78	7.93	611.07	619	Jason moving northeast
9679	20090413 090617	14.59995836	144.7744165	52.1	11.2	613.76	624.96	Jason moving northwest
9680	20090413 090626	14.59997633	144.7743999	49.72	10.71	614.38	625.09	Visibility continues to be good
9684	20090413 090921	14.60010712	144.7744099	49.7	9.74	609.87	619.61	Jason moving southeast
9687	20090413 091101	14.59991929	144.7745604	50.63	6.86	608.3	615.16	Rocks sparsely covered in white sediments
9689	20090413 091213	14.59984966	144.7746167	49.56	6.4	603.1	609.5	Jason moving upslope over big blocky lavas
9691	20090413 091317	14.599849	144.7747079	53.02	8.25	593.29	601.54	Jason moving northeast
9693	20090413 091410	14.59990299	144.774689	52.84	12.86	589.1	601.96	Jason moving northwest
9697	20090413 091711	14.60023811	144.7744115	52.57	9.91	603.87	613.78	Going over rocky rubble of mixed sizes with some larger rocks
9700	20090413 091906	14.60023068	144.7745367	48.14	6.83	599.13	605.96	Jason moving southeast again
9702	20090413 092054	14.60000587	144.7747223	49.48	6.75	596.03	602.78	Shrimp floated by
9704	20090413 092107	14.59999127	144.7747313	48.11	8.51	593.83	602.34	Over lava flow
9705	20090413 092138	14.59993984	144.7747728	46.35	6.15	589.86	596.01	Very steep slope
9707	20090413 092205	14.59991132	144.7747961	47.65	8.96	585.5	594.46	Mostly jumbled lava. The occasional shrimp floats by
9708	20090413 092225	14.59989362	144.774818	49.89	10.05	583.03	593.08	Jason moving northeast
9710	20090413 092319	14.59998531	144.7748622	51.24	8.93	580.78	589.71	Jason moving northwest
9712	20090413 092417	14.60010573	144.7747576	51.12	12.99	586.64	599.63	Very steep massive lava flow
9713	20090413 092441	14.60015568	144.7747153	51.51	10.1	588.79	598.89	Rubbly rocks of mixed sizes
9716	20090413 092654	14.60038814	144.7746269	52.77	6.94	589.28	596.22	Jason moving northeast
9718	20090413 092718	14.60037008	144.7746576	47.62	6.56	587.29	593.85	Jason moving southeast
9721	20090413 092932	14.60010494	144.7748787	51.47	8.19	581.54	589.73	Going over lava flow
9724	20090413 093112	14.60003957	144.7750145	53.56	10.93	572.1	583.03	Big blocky lavas with white sediments on top
9725	20090413 093145	14.60007376	144.7750216	53.6	6.25	570.35	576.6	Visibility still good coming upslope to 571m
9728	20090413 093337	14.60031439	144.7748239	51.48	9.56	575.56	585.12	Jason moving northwest
9730	20090413 093406	14.60038292	144.7747681	50.33	11.59	576.1	587.69	Rocky rubble with some large rocks
9732	20090413 093513	14.60049259	144.7747798	52.32	8.28	575.5	583.78	Jason moving northeast
9734	20090413 093614	14.60038918	144.7748845	49.16	8.9	569.93	578.83	Jason moving southeast
9736	20090413 093701	14.60029021	144.7749263	53.6	12	568.47	580.47	Water starting to be a bit cloudier
9737	20090413 093744	14.60041585	144.774816	72.19	8.41	572.16	580.57	NAV Doppler reset
9739	20090413 093857	14.60042274	144.7748377	70.83	8.28	570.84	579.12	Removing weight
9743	20090413 094113	14.60031823	144.7749258	67.91	10.55	568.48	579.03	White sediment increased dramatically
9744	20090413 094126	14.60027873	144.7749441	67.8	9.08	567.99	577.07	Jason moving southeast
9746	20090413 094249	14.6002749	144.7750891	60.52	7.94	561.53	569.47	Rocks covered in white sediment
9748	20090413 094321	14.60031928	144.7751363	61.08	7.56	557.24	564.8	Jason is currently at 560m
9749	20090413 094331	14.60034087	144.7751346	60.8	7.69	555.09	562.78	Heading remains 60 so view is upslope
9750	20090413 094342	14.60036984	144.7751359	58.22	7.4	552.94	560.34	Jason is moving northeast
9752	20090413 094449	14.6004291	144.7752596	8.34	9.75	548.59	558.34	Jason heading changing to 008
9754	20090413 094503	14.6004261	144.7753102	12.27	10.15	548.66	558.81	Rubbly rock of mixed sizes
9755	20090413 094537	14.60045764	144.7753423	341.55	8.66	546.65	555.31	Rocks piled up at end of slide chute
9757	20090413 094601	14.60051517	144.775326	344.36	10.1	541.16	551.26	Jason moving east
9758	20090413 094612	14.60052666	144.7752984	353.61	10.23	540.42	550.65	Jason moving northwest
9759	20090413 094618	14.60052818	144.7752755	354.94	10.3	540.35	550.65	Jason moving west

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9760	20090413 094656	14.60060565	144.775266	61.66	7.74	537.39	545.13	Jason heading changing to 063
9766	20090413 095125	14.60050328	144.7755858	327.43	9.06	544.04	553.1	Jason meandering east
9768	20090413 095222	14.60046423	144.7756045	35.41	5.46	549.4	554.86	Jason heading changing to 034
9769	20090413 095241	14.60046179	144.7756402	47.17	4.79	550.87	555.66	Water is cloudier
9772	20090413 095401	14.60042713	144.7756966	135.04	1.41	557.05	558.46	Jason stirring up sediments
9775	20090413 095656	14.60039086	144.7758867	128.24	7.15	559.71	566.86	WATCHSTANDERS Andra Bobbitt logger
9777	20090413 095743	14.60040132	144.7759169	128.42	4.68	561.38	566.06	Finishing up CTD search-looking down a small basin/hole.
9779	20090413 095812	14.60041895	144.77592	125.86	1.55	563.45	565	Going in to the hole.
9780	20090413 095830	14.6004034	144.7759555	128.64	2.58	565.86	568.44	Large pillows in aft camera.
9781	20090413 095854	14.60038161	144.7759734	128.54	2.58	566.58	569.16	Lava flows with some sediment.
9784	20090413 100023	14.60041295	144.7760264	16.75	2.39	565.64	568.03	Steep slope all around.
9786	20090413 100106	14.60044149	144.7759585	0.6	4.03	564.66	568.69	Staining in between rocks.
9787	20090413 100141	14.60054671	144.7759473	359.69	5.13	559.84	564.97	Heading upslope to Brimstone (due north).
9789	20090413 100212	14.60055916	144.7758789	306.31	5.21	556	561.21	CTD search was using Medea
9790	20090413 100236	14.60053164	144.7758154	317.89	5.59	553.65	559.24	Big pillows and lots of sediment.
9792	20090413 100336	14.60052794	144.7756481	317.11	5.38	548.52	553.9	Big plume and no visibility.
9794	20090413 100410	14.60055327	144.7755699	322.44	5.7	543.09	548.79	Coming out of this plume and heading 319.
9795	20090413 100428	14.60054534	144.7755295	18.73	5.29	542.53	547.82	There is a new vent source.
9797	20090413 100524	14.60058793	144.7755657	31.65	3.58	541.27	544.85	At top of this plume it does not look like a plume source but a stagnant diffuse source.
9799	20090413 100547	14.60060273	144.7756135	352.17	5.11	541.03	546.14	14deg 36.036 144 46.536 depth 541
9800	20090413 100558	14.60059834	144.7756254	294.01	6.88	540.7	547.58	Not sure if a real plume and source or not.
9803	20090413 100718	14.60058741	144.7755564	317.43	6.58	539.69	546.27	Should be 40m east of Brimstone.
9804	20090413 100739	14.60061553	144.7755493	335.61	5.58	537.56	543.14	Following plume around a bit-on southern edge of plume.
9806	20090413 100839	14.60071895	144.7755332	331.44	4.64	530.18	534.82	This was seen at the end of the other dive.
9807	20090413 100854	14.60073749	144.7755403	326.92	4.89	529.2	534.09	Getting closer to Brimstone
9809	20090413 100901	14.60074876	144.7755339	326.89	4.8	528.27	533.07	DSC may not be working at all on this dive.
9810	20090413 100911	14.60075182	144.7755156	327.84	5.65	526.74	532.39	Crossing debris/talus.
9811	20090413 100943	14.60072001	144.7754246	327.34	7.78	525.64	533.42	Out of vog and heading west to Brimstone.
9813	20090413 101025	14.600724	144.7753843	49.38	6.41	525.69	532.1	Dive J2-405 may have ran across 2 new plume-making sites at the beginning and end of the dive.
9814	20090413 101037	14.60072911	144.775372	48.84	6.06	525.77	531.83	Heading now up to Brimstone.
9816	20090413 101108	14.60078957	144.7753767	40.05	6.19	520.64	526.83	Maybe this is just something that fell down the slope and made a sediment cloud.
9818	20090413 101111	14.6007962	144.7753785	38.51	6.81	519.31	526.12	There is Brimstone.
9819	20090413 101120	14.60080126	144.7753876	35.9	7.45	518.23	525.68	J2-407 start DVCAM 043
9820	20090413 101126	14.60080585	144.7753951	37.57	7.73	518.03	525.76	We are approaching Brimstone looking NE and the plume is going NW.
9821	20090413 101132	14.60081062	144.775396	37.98	7.64	517.96	525.6	Bucket on left side.
9822	20090413 101140	14.60081548	144.7753944	36.7	7.19	517.94	525.13	We are observing Brimstone Pit.
9823	20090413 101145	14.60081793	144.7753935	31.75	7.24	517.91	525.15	We want to observe upwind.
9824	20090413 101153	14.60082003	144.7754034	33.64	7.68	517.58	525.26	Going to take images on approach.
9839	20090413 101302	14.60085397	144.7754198	45.17	2.5	520.18	522.68	VIDEO Start recording HDCam
9841	20090413 101322	14.60085815	144.7754193	71.19	1.35	521.06	522.41	Settling up.
9843	20090413 101331	14.60085815	144.7754192	71.93	1.3	521.14	522.44	Nice view on sci cam.
9846	20090413 101343	14.600858	144.7754192	72.68	1.3	521.08	522.38	Sitting at Brimstone at 073deg.
9847	20090413 101358	14.60085803	144.7754192	72.54	1.29	521.11	522.4	Plume is rotating clockwise and to left from us.
9849	20090413 101408	14.60085804	144.7754193	72.34	1.3	521.13	522.43	Looking East at Brimstone.
9850	20090413 101422	14.60085797	144.7754193	72.59	1.3	521.1	522.4	Bubbles in back of plume.



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9851	20090413 101431	14.60085798	144.7754194	72.69	1.29	521.1	522.39	Just saw some rocks move.
9852	20090413 101434	14.60085789	144.7754195	72.89	1.28	521.12	522.4	Plume is moderate.
9853	20090413 101445	14.60085787	144.7754195	72.55	1.29	521.12	522.41	Lots of bubbles.
9855	20090413 101503	14.6008581	144.7754197	72.79	1.29	521.12	522.41	Plume starting to come toward Jason.
9857	20090413 101652	14.60085809	144.77542	72.52	1.28	521.2	522.48	Seems to be a lot of glare on plume today.
9859	20090413 101711	14.60085814	144.7754201	72.61	1.26	521.17	522.43	Turned off a light and sci cam better.
9860	20090413 101736	14.60085902	144.7754208	72.48	1.3	521.19	522.49	Turned iris down on pilot cam and looks a lot better now.
9861	20090413 101751	14.60085918	144.775421	72.54	1.29	521.17	522.46	Still observing Brimstone at 073deg.
9863	20090413 101819	14.60085966	144.7754209	73.06	1.26	521.16	522.42	Lots more bubbles and plume heating up right now.
9864	20090413 101836	14.6008601	144.775421	73.91	1.26	521.15	522.41	Ash pick up and plume moving.
9866	20090413 101926	14.60086054	144.7754216	73.5	1.24	521.18	522.42	Little burst did not last long.
9867	20090413 101933	14.60086107	144.7754219	73.77	1.26	521.14	522.4	Can see some ash in the back of plume.
9868	20090413 101937	14.60086124	144.7754219	73.89	1.25	521.14	522.39	More bubbles.
9869	20090413 101945	14.60086143	144.7754221	73.74	1.26	521.16	522.42	Big shake.
9870	20090413 101954	14.60086146	144.7754223	73.84	1.26	521.14	522.4	Here comes the ash and steam now.
9872	20090413 102009	14.6008618	144.7754224	73.8	1.26	521.14	522.4	Plume is turning more yellow and ash in plume.
9874	20090413 102122	14.60086229	144.7754227	73.41	1.26	521.15	522.41	Little burst again.
9875	20090413 102138	14.60086207	144.7754226	73.75	1.28	521.14	522.42	Some ash fallout.
9876	20090413 102200	14.60086214	144.7754224	74.38	1.28	521.12	522.4	Rocks are shaking.
9878	20090413 102222	14.6008624	144.7754225	74.73	1.26	521.11	522.37	Saw whole thing lift up.
9879	20090413 102256	14.6008623	144.7754224	75.8	1.21	521.14	522.35	The big rock keeps having sudden movements.
9881	20090413 102330	14.60086233	144.7754223	75.68	1.21	521.14	522.35	Low level steaming obscuring the surface under main plume.
9882	20090413 102341	14.60086261	144.7754223	75.76	1.2	521.14	522.34	We are observing Brimstone at 075deg.
9884	20090413 102429	14.60086307	144.7754226	75.77	1.21	521.13	522.34	Low haze is clearing up a bit.
9885	20090413 102431	14.60086309	144.7754226	75.88	1.21	521.12	522.33	Another pulse.
9887	20090413 102509	14.60086331	144.7754227	76.08	1.21	521.12	522.33	Big increase. Lots of ash.
9888	20090413 102512	14.60086325	144.7754227	76.07	1.2	521.12	522.32	Good puffs.
9889	20090413 102528	14.60086325	144.7754227	76.23	1.21	521.12	522.33	Ash in front.
9890	20090413 102540	14.60086342	144.7754224	76.23	1.2	521.12	522.32	Wow-rocks falling off.
9892	20090413 102634	14.60086343	144.7754222	76.68	1.18	521.14	522.32	Lots of yellow in center right now.
9894	20090413 102715	14.60086344	144.7754222	77.07	1.19	521.14	522.33	Low level haze again.
9895	20090413 102747	14.60086313	144.7754224	74.65	1.35	521.05	522.4	Good view in Medea cam.
9897	20090413 102837	14.60086312	144.7754225	73.46	1.38	521.05	522.43	Low level haze seems to come from behind us (could be the other vent)
9899	20090413 102905	14.6008629	144.7754225	74.03	1.34	521.07	522.41	Big shake.
9900	20090413 102932	14.60086272	144.7754226	73.64	1.35	521.05	522.4	Lots of bubbles and the other haze is coming from behind us as well.
9901	20090413 102954	14.60086292	144.7754227	74.23	1.34	521.05	522.39	Lots of ash in that burst.
9903	20090413 103043	14.60086275	144.7754227	74.26	1.34	521.05	522.39	Too bad we can't take Medea video right now.
9905	20090413 103141	14.60086269	144.7754228	73.63	1.35	521.05	522.4	Problem with HD image-fixing.
9907	20090413 103217	14.60086255	144.7754225	73.32	1.34	521.05	522.39	DSC showed up.
9908	20090413 103222	14.60086253	144.7754224	73.08	1.34	521.05	522.39	Action increasing.
9909	20090413 103228	14.60086258	144.7754225	73.27	1.33	521.05	522.38	Ash and rocks.
9910	20090413 103244	14.60086237	144.7754225	73.09	1.31	521.07	522.38	Great video.
9912	20090413 103310	14.60086221	144.7754208	68.54	1.91	520.58	522.49	Moving Jason a tad for a better view.
9913	20090413 103315	14.60086046	144.7754177	59.5	2.41	520.22	522.63	Jason is moving.
9914	20090413 103348	14.60085012	144.7754225	62.7	2.71	520.66	523.37	Not seeing movement in HD cam but do see it in sci cam.
9915	20090413 103354	14.60085163	144.7754248	67.41	2.43	520.84	523.27	Repositioning for better view.

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9917	20090413 103427	14.60085194	144.775425	68.44	1.91	520.86	522.77	Had a great view as flew over the vent in brow cam of the actual vent hole.
9918	20090413 103442	14.60085217	144.7754251	68.53	1.9	520.89	522.79	Slightly new position at 068deg.
9920	20090413 103539	14.60085269	144.7754256	68.54	1.93	520.88	522.81	Working on HD cam but great views in other cams.
9922	20090413 103628	14.60085353	144.775426	68.44	1.94	520.86	522.8	Panning with pilot cam and can see top f of cone.
9923	20090413 103638	14.60085349	144.775426	68.54	1.93	520.88	522.81	Big shaking of entire cone top.
9924	20090413 103656	14.6008536	144.7754262	68.58	1.91	520.89	522.8	Looked like splitting open.
9926	20090413 103710	14.60085359	144.7754262	68.61	1.93	520.89	522.82	Big bubbles and most violent shake.
9927	20090413 103719	14.60085369	144.7754262	68.6	1.93	520.9	522.83	Kind of collapsed in before moving out.
9928	20090413 103757	14.60085315	144.7754259	68.59	1.91	520.9	522.81	Small lull again after the big shakes.
9930	20090413 103839	14.60085302	144.7754258	68.57	1.93	520.9	522.83	Lower plume clearing out again.
9931	20090413 103855	14.600853	144.7754257	68.58	1.91	520.9	522.81	Plume is moving more off to the left at our hdg of 068.
9933	20090413 103903	14.60085302	144.7754258	68.59	1.9	520.91	522.81	Plume is heading north.
9934	20090413 103909	14.60085299	144.7754257	68.6	1.91	520.9	522.81	Bubbles.
9935	20090413 103930	14.60085306	144.7754258	68.55	1.99	520.88	522.87	More bubbles.
9936	20090413 103935	14.60085302	144.7754258	68.53	1.91	520.9	522.81	shaking and more shaking.
9937	20090413 103959	14.60085307	144.7754257	68.54	1.9	520.91	522.81	Plume getting bigger and seeing ash again in plume.
9939	20090413 104007	14.60085304	144.7754257	68.56	1.99	520.91	522.9	Sudden motions.
9940	20090413 104013	14.60085305	144.7754257	68.49	2.04	520.88	522.92	J2-407 Data DVDs start blue set 56
9941	20090413 104024	14.60085305	144.7754257	68.55	1.9	520.92	522.82	Yellow increasing in back.
9943	20090413 104107	14.60085315	144.7754257	68.51	1.98	520.9	522.88	Going to try to switch Medea cam to brow cam recording.
9944	20090413 104144	14.60085255	144.7754255	68.53	1.96	520.91	522.87	Switch recording for only 5 minutes.
9945	20090413 104155	14.60085239	144.7754256	68.54	1.98	520.9	522.88	More bubbles coming;.
9947	20090413 104230	14.60085278	144.7754258	68.51	2.28	520.88	523.16	Plume condensing again and moving to north.
9949	20090413 104307	14.60085325	144.775426	68.56	1.98	520.89	522.87	Activity reduced again.
9950	20090413 104322	14.60085338	144.775426	68.54	1.98	520.88	522.86	Plume is getting some more dispersed yellow.
9951	20090413 104333	14.60085359	144.7754261	68.53	1.99	520.87	522.86	Still good Medea view.
9953	20090413 104454	14.60085433	144.7754264	68.52	1.98	520.88	522.86	Switching cameras around.
9955	20090413 104506	14.60085433	144.7754264	68.51	1.91	520.9	522.81	J2-407 Data DVDs stop red set 55
9956	20090413 104516	14.6008546	144.7754264	68.49	1.98	520.88	522.86	Plume is more mellow right now.
9957	20090413 104534	14.6008546	144.7754264	68.47	1.99	520.9	522.89	Still switching cameras around.
9959	20090413 104602	14.60085478	144.7754264	68.38	2.28	520.88	523.16	Moved Medea camera to brow cam recording.
9960	20090413 104622	14.60085481	144.7754264	68.33	1.9	520.92	522.82	Great Medea being recorded right now. Not recording Brow cam.
9961	20090413 104627	14.60085484	144.7754264	68.32	2.25	520.92	523.17	Working on HD camera.
9962	20090413 104641	14.6008546	144.7754261	68.32	2.04	520.9	522.94	Have been in a lull for an extended period.
9964	20090413 104711	14.60085439	144.7754261	68.31	2.26	520.91	523.17	Dispersed yellow in plume (pale yellow).
9965	20090413 104713	14.60085444	144.7754261	68.29	2.01	520.9	522.91	shaking.
9966	20090413 104725	14.60085434	144.775426	68.33	1.93	520.92	522.85	Bubbles now.
9967	20090413 104728	14.60085431	144.775426	68.26	2.26	520.92	523.18	More shaking.
9968	20090413 104743	14.60085431	144.7754261	68.19	2	520.91	522.91	Sci cam is now working.
9969	20090413 104753	14.60085419	144.775426	68.19	2.29	520.9	523.19	HD camera is working.
9971	20090413 104805	14.60085417	144.775426	68.19	2	520.92	522.92	See major rock movement on other side of cone.
9972	20090413 104813	14.60085417	144.775426	68.21	2	520.93	522.93	(South side).
9973	20090413 104837	14.60085436	144.7754262	68.19	2.01	520.92	522.93	Looking at Medea camera to see if changes in plume during bursts.
9974	20090413 104849	14.60085445	144.7754262	68.22	1.9	520.95	522.85	Plume still leaning north.
9975	20090413 104857	14.6008544	144.7754262	68.16	2.29	520.9	523.19	Great Medea view.
9977	20090413 104915	14.60085436	144.7754261	68.19	2	520.93	522.93	VIDEO Start recording HDCam

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9978	20090413 104934	14.6008544	144.7754262	68.04	1.91	520.93	522.84	Virtual van is also changed as to what is being recorded.
9979	20090413 104945	14.60085433	144.7754263	67.57	2.31	520.91	523.22	VV has sci/pilot/Medea photos now.
9981	20090413 105004	14.60085441	144.7754263	68.16	2.28	520.92	523.2	Medea cam is zoomed in.
9982	20090413 105038	14.60085457	144.7754263	68.14	2.28	520.92	523.2	Medea is twirling around a bit.
9983	20090413 105052	14.60085462	144.7754262	68.07	2.05	520.9	522.95	Shaking.
9984	20090413 105055	14.60085473	144.7754262	68.12	2.3	520.92	523.22	More shaking.
9985	20090413 105100	14.60085473	144.7754262	68.11	2.28	520.93	523.21	More.
9987	20090413 105115	14.60085485	144.7754263	68.09	2.3	520.92	523.22	Bigger bubbles.
9988	20090413 105128	14.60085506	144.7754264	68.06	2.3	520.92	523.22	Plume increasing.
9989	20090413 105152	14.60085525	144.7754264	68.07	2.29	520.92	523.21	Plume leaning a little more to left.
9991	20090413 105213	14.60085573	144.7754266	68.09	1.93	520.96	522.89	Great Medea shots.
9992	20090413 105217	14.60085577	144.7754266	68.08	2	520.96	522.96	Plume turning more yellow.
9993	20090413 105225	14.60085609	144.7754267	68.06	2.29	520.94	523.23	Plume seems more vigorous.
9995	20090413 105308	14.60085667	144.7754268	67.96	2.3	520.93	523.23	Big shaking.
9996	20090413 105316	14.60085673	144.7754269	67.99	2.29	520.92	523.21	More shaking.
9998	20090413 105439	14.60085668	144.7754268	67.93	2.03	520.92	522.95	More bubbles.
9999	20090413 105458	14.60085626	144.7754266	67.91	2.03	520.92	522.95	Seeing more surface around vent in Medea camera.
10001	20090413 105517	14.60085142	144.7754232	65.21	3.39	520.15	523.54	Going to reposition Jason around 90deg to be completely upwind.
10002	20090413 105524	14.60085106	144.7754243	43.23	3.51	520.13	523.64	Moving counterclockwise.
10003	20090413 105533	14.60085084	144.7754307	27.34	3.23	520.19	523.42	Should be looking to north.
10025	20090413 105649	14.60085131	144.775455	8.07	2.03	521.05	523.08	Stopping here at 008deg looking north.
10027	20090413 105711	14.60085215	144.7754553	8.21	2.23	521.01	523.24	Took a lot of snaps as repositioning the vehicle around (all those events with no comments!).
10028	20090413 105725	14.60085268	144.7754555	8.1	2.23	520.99	523.22	From here can see the rocks coming up and gas better from here.
10030	20090413 105812	14.60085384	144.7754576	7.79	2.03	521.05	523.08	Still recording Medea with a great overhead view.
10031	20090413 105820	14.60085341	144.7754569	7.82	2.03	521.04	523.07	Lots of yellow in plume directly in front of us.
10032	20090413 105841	14.60085312	144.7754565	7.7	2.04	521.02	523.06	Came up a bit with the camera to view the plume structure.
10033	20090413 105854	14.60085302	144.7754563	7.58	2.01	521.05	523.06	More vigorous.
10034	20090413 105901	14.60085266	144.7754556	7.58	2.03	521.04	523.07	Lots of tephra.
10036	20090413 105916	14.60084939	144.775451	7.45	1.99	521.07	523.06	Bottom of plume is trying to rotate the opposite than the top of the plume
10037	20090413 105955	14.60084985	144.7754516	7.51	2.01	521.06	523.07	Good lighting from here.
10039	20090413 110028	14.60085021	144.7754519	7.29	1.99	521.12	523.11	Great view from Medea as it spun a bit.
10040	20090413 110049	14.60085042	144.7754523	7.38	2	521.08	523.08	DSC is working.
10042	20090413 110134	14.60085021	144.7754521	6.96	2.18	521.1	523.28	More yellow at base.
10043	20090413 110147	14.6008479	144.7754493	7.17	2.13	521.14	523.27	More bubbles.
10044	20090413 110149	14.60084764	144.775449	7.14	2.14	521.14	523.28	More plume
10046	20090413 110259	14.60084666	144.7754473	6.61	2.06	521.18	523.24	More vigorous plume now.
10048	20090413 110303	14.60084674	144.7754473	6.62	2.05	521.18	523.23	some bubbles.
10049	20090413 110324	14.60084667	144.7754471	6.89	2.03	521.2	523.23	Turned off last light on Medea.
10050	20090413 110353	14.60084669	144.775447	7.11	2.03	521.2	523.23	Lull in the shaking of the rocks for last bit of time.
10052	20090413 110446	14.60084711	144.7754467	7.11	2	521.22	523.22	Some more low plume off to the right on the east side of vent.
10054	20090413 110513	14.6008472	144.7754466	6.92	1.99	521.22	523.21	shaking.
10055	20090413 110520	14.60084725	144.7754466	6.57	1.99	521.25	523.24	Big shake.
10056	20090413 110543	14.60084631	144.7754443	6.49	1.98	521.26	523.24	More plume.
10057	20090413 110552	14.60084614	144.7754445	5.91	1.98	521.27	523.25	Plume is folding over on itself and big shake.
10058	20090413 110556	14.60084513	144.7754431	5.9	1.96	521.29	523.25	Still moving.

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10060	20090413 110603	14.60084478	144.7754425	5.65	1.96	521.3	523.26	continuous shaking.
10061	20090413 110608	14.60084485	144.7754424	5.69	1.95	521.31	523.26	Still going.
10062	20090413 110627	14.6008452	144.7754415	6.94	1.95	521.28	523.23	Big swell.
10064	20090413 110723	14.60084527	144.775439	6.98	1.93	521.29	523.22	Switching cameras back to Brow recording and Medea is offline.
10065	20090413 110738	14.60084525	144.7754389	6.94	1.91	521.31	523.22	Now recording pilot/sci/brow cameras and in Virtual Van.
10066	20090413 110743	14.60084515	144.775439	6.95	1.93	521.29	523.22	Ash in plume now.
10067	20090413 110759	14.60084508	144.775439	6.9	1.95	521.28	523.23	Ash is revving up and tephra in back up higher.
10069	20090413 110805	14.60084441	144.7754387	6.76	1.95	521.29	523.24	Huge shake and lots of tephra.
10070	20090413 110823	14.60084286	144.7754335	6.75	1.95	521.29	523.24	Bubbles on port utility cam.
10071	20090413 110843	14.60084291	144.7754333	6.7	1.93	521.3	523.23	Really vigorous in center.
10072	20090413 110900	14.60084283	144.7754333	6.6	1.91	521.31	523.22	Plume cleared out in front of us and now all plume is behind the rocks.
10074	20090413 110907	14.60084268	144.7754334	6.61	1.93	521.33	523.26	We can see the rocks in front of us now.
10075	20090413 110911	14.60084273	144.7754334	6.59	1.91	521.32	523.23	Big burst behind.
10076	20090413 110923	14.60084276	144.7754334	6.57	1.91	521.33	523.24	Vent gets plugged in one area and then moves to another.
10077	20090413 110928	14.60084279	144.7754333	6.57	1.91	521.33	523.24	Big tephra in back.
10078	20090413 110945	14.60084264	144.7754332	7.65	1.94	521.27	523.21	Steam burst out side.
10079	20090413 110950	14.6008425	144.7754332	7.94	1.96	521.25	523.21	Bubbles in front now.
10080	20090413 111001	14.60084225	144.7754334	8.24	1.98	521.24	523.22	Shaking.
10082	20090413 111015	14.60084223	144.7754334	8.04	1.96	521.25	523.21	More bubbles in front again and plume covering rocks in front.
10083	20090413 111100	14.60084255	144.7754333	8.03	1.98	521.22	523.2	Volcano is breathing.
10085	20090413 111132	14.60084245	144.7754334	8.02	1.98	521.23	523.21	Fine sediment seen raining down in utility cameras.
10086	20090413 111140	14.60084244	144.7754335	8.04	1.98	521.23	523.21	Shaking.
10087	20090413 111157	14.60084258	144.7754335	8.09	1.98	521.22	523.2	Looks like shaking as far as can see in cameras--whole cone.
10089	20090413 111208	14.60084271	144.7754335	7.99	1.98	521.22	523.2	More yellow .
10090	20090413 111212	14.60084274	144.7754335	8.05	1.99	521.21	523.2	Really big shaking.
10091	20090413 111217	14.6008426	144.7754336	8.18	1.99	521.21	523.2	Again.
10092	20090413 111227	14.60084249	144.7754336	8.57	2.01	521.18	523.19	Rocks falling and jostling.
10093	20090413 111234	14.60084267	144.7754335	8.66	2.01	521.19	523.2	Plume more vigorous.
10094	20090413 111241	14.60084262	144.7754332	8.66	2.01	521.18	523.19	Really energetic right now.
10095	20090413 111248	14.60084266	144.7754331	8.62	2.01	521.18	523.19	Wow.
10096	20090413 111251	14.60084146	144.7754313	8.68	2.01	521.18	523.19	big movements.
10097	20090413 111300	14.60084137	144.7754311	8.67	2.01	521.18	523.19	Again.
10099	20090413 111313	14.60084076	144.7754301	8.7	2	521.18	523.18	Geez-moving boulder toward us (Chadwick).
10100	20090413 111341	14.60083991	144.7754282	8.71	2.01	521.16	523.17	Lava in vent is trying to shove everything else out of the way.
10101	20090413 111347	14.60083988	144.7754282	8.72	2.01	521.16	523.17	Really yellow.
10102	20090413 111358	14.60083986	144.7754282	8.74	2.01	521.14	523.15	shake.
10104	20090413 111413	14.60083945	144.7754275	8.78	2.01	521.14	523.15	Mainly sulfur in plume
10105	20090413 111422	14.60083956	144.7754276	8.8	2.04	521.14	523.18	Very vigorous plume in yellow area.
10106	20090413 111437	14.60083923	144.7754274	8.91	2.05	521.12	523.17	Tephra in vigorous part.
10107	20090413 111439	14.60083921	144.7754274	8.99	2.09	521.11	523.2	Big shake
10108	20090413 111444	14.60083927	144.7754275	9.01	2.08	521.13	523.21	bubbles.
10109	20090413 111454	14.60083926	144.7754277	9.06	2.1	521.11	523.21	Getting bigger.
10111	20090413 111502	14.60083897	144.7754272	9.19	2.09	521.12	523.21	Lots of tephra.
10112	20090413 111541	14.6008385	144.775427	9.37	2.13	521.1	523.23	Looks more steamy than vigorous.
10113	20090413 111548	14.60083887	144.7754274	9.37	2.13	521.1	523.23	But now here comes the yellow again.
10115	20090413 111625	14.60083869	144.7754274	9.99	2.11	521.06	523.17	Some bubbles to left and back.

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10117	20090413 111701	14.60083875	144.7754273	10.26	2.14	521.04	523.18	Seeing some bubbles migrate toward Jason.
10118	20090413 111713	14.60083899	144.7754274	10.52	2.15	521.01	523.16	Big shake and spreading out.
10119	20090413 111729	14.60083895	144.7754272	10.68	2.15	520.99	523.14	Moving again and settling.;
10120	20090413 111750	14.60083904	144.7754267	10.75	2.18	520.99	523.17	The big rock in front of us has been pushed toward us and starting rolling our way.
10122	20090413 111805	14.60083946	144.7754269	10.87	2.18	520.99	523.17	Rocks are getting closer to Jason.
10123	20090413 111808	14.6008397	144.7754272	10.92	2.18	520.99	523.17	Big shake.
10124	20090413 111817	14.60083997	144.7754274	10.97	2.19	520.96	523.15	Plume is in back again.
10125	20090413 111826	14.60084029	144.7754279	11.08	2.16	520.97	523.13	Shake
10126	20090413 111838	14.60084135	144.7754295	11.1	2.16	520.98	523.14	Here comes more plume and shake.
10128	20090413 111926	14.60084418	144.7754288	11.27	2.26	520.97	523.23	More bubbles in back and coming toward us.
10130	20090413 112005	14.60084642	144.775428	11.44	2.19	520.97	523.16	More vigorous flow starting in back again.
10131	20090413 112018	14.60084586	144.7754279	11.51	2.2	520.94	523.14	Yellow coming and some bubbles.
10132	20090413 112040	14.60084341	144.7754249	11.63	2.18	520.96	523.14	Strong yellow in center again.
10134	20090413 112108	14.6008435	144.7754249	12.14	2.21	520.94	523.15	Tephra in back and shaking.
10135	20090413 112127	14.60084076	144.7754202	12.32	2.2	520.94	523.14	Shaking and see big rock coming toward us.
10137	20090413 112207	14.60084159	144.7754195	12.61	2.23	520.93	523.16	Bubbles on left again and increasing yellow.
10138	20090413 112221	14.60084149	144.7754196	12.43	2.51	520.71	523.22	Shaking.
10139	20090413 112240	14.6008415	144.7754195	13.25	2.41	520.73	523.14	Jason moved a bit not the rock.
10140	20090413 112301	14.60084141	144.7754198	13.49	2.46	520.67	523.13	Lots of yellow-shaking.
10142	20090413 112339	14.60083863	144.7754187	13.88	2.44	520.66	523.1	Big rock just rolled.
10143	20090413 112343	14.60083852	144.7754185	14.03	2.43	520.69	523.12	Pulsing now.
10145	20090413 112411	14.60072982	144.7753043	16.27	2.54	520.34	522.88	Pushing toward us and Jason has to back away.
10146	20090413 112419	14.60072948	144.7753005	34.74	2.04	520.61	522.65	Moving away from Brimstone.
10147	20090413 112426	14.60073082	144.7752979	51.52	0.74	521.42	522.16	Brow cam showed big rock moving.
10149	20090413 112445	14.60073117	144.7753	39.73	1.2	520.88	522.08	Moved away just in time as rocks moved significantly.
10150	20090413 112447	14.60073126	144.7753001	39.74	1.23	520.86	522.09	Big burst.
10152	20090413 112515	14.6007318	144.7753005	39.91	1.21	520.88	522.09	Big rocks are falling away just where we were sitting.
10153	20090413 112530	14.60073147	144.7753002	39.87	1.21	520.88	522.09	Great view in brow cam of those rocks falling.
10154	20090413 112539	14.60073136	144.7753001	39.88	1.21	520.9	522.11	Another striated rock.
10156	20090413 112553	14.60073111	144.7753	39.92	1.21	520.9	522.11	DSC of striped rocks.
10158	20090413 112604	14.60073098	144.7752999	39.93	1.19	520.9	522.09	Plume is increasing.
10159	20090413 112618	14.60073059	144.7752998	39.78	1.2	520.9	522.1	Pulsing.
10160	20090413 112624	14.60073068	144.7752997	39.57	1.21	520.88	522.09	Brow cam is great.
10161	20090413 112628	14.60073069	144.7752996	39.3	1.21	520.87	522.08	Big rock moved.
10162	20090413 112637	14.60073054	144.7752992	39.4	1.2	520.89	522.09	Good job Tito of knowing when to back away!
10164	20090413 112705	14.60073064	144.7752989	39.26	1.21	520.88	522.09	Great shots of all the cone falling away.
10165	20090413 112725	14.60073097	144.775299	39.28	1.2	520.9	522.1	Smoke after falling is different color. Could be what we saw when first approached.
10168	20090413 112802	14.60073256	144.775302	39.25	1.21	520.88	522.09	Brimstone is getting more violent.
10169	20090413 112824	14.60073319	144.7753025	39.26	1.21	520.88	522.09	The gray plume where things fell is clearing away.
10170	20090413 112829	14.60073344	144.7753027	39.24	1.21	520.88	522.09	Plume itself is turning yellow.
10171	20090413 112848	14.60073392	144.775303	39.2	1.21	520.88	522.09	Some small crumbles in brow cam.
10173	20090413 112909	14.60073516	144.775304	39.11	1.21	520.88	522.09	Going to move to Marker 105
10176	20090413 112927	14.60073611	144.7753052	39.13	1.2	520.88	522.08	Going to take some VV images as back away.
10177	20090413 112954	14.60073777	144.7753065	38.98	1.2	520.9	522.1	Brown cam shows split and falling over.
10179	20090413 113010	14.60073793	144.7753066	38.97	1.2	520.9	522.1	Maybe wait a minute.
10180	20090413 113025	14.60073856	144.7753068	38.84	1.19	520.9	522.09	That was the brow cam and not the brown cam.

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10181	20090413 113048	14.60073875	144.7753069	38.65	1.19	520.9	522.09	Falling away and now seeing the plume form falling.
10182	20090413 113100	14.60073752	144.7753058	38.67	1.19	520.9	522.09	going to get some good video as we pull away.
10184	20090413 113114	14.60073589	144.7753051	38.6	1.16	520.92	522.08	Very strong plume right now.
10185	20090413 113140	14.60073245	144.7753046	38.55	1.16	520.94	522.1	Brow shows where it fell away.
10186	20090413 113146	14.60073134	144.7753049	38.49	1.14	520.94	522.08	Looks like cone now.
10187	20090413 113154	14.60073081	144.7753049	40.64	1.56	520.52	522.08	Ready to go.
10197	20090413 113220	14.6007309	144.7753048	34.54	2.5	519.69	522.19	Looks like crater now.
10199	20090413 113227	14.60073014	144.7753092	30.12	3	519.57	522.57	Moving away.
10201	20090413 113232	14.60072914	144.7753146	30.98	3.15	519.48	522.63	Leaving Brimstone.
10205	20090413 113240	14.60072865	144.7753132	18.62	3.44	519.54	522.98	Up 5m.
10210	20090413 113255	14.60072731	144.7753167	13.2	3.83	519.48	523.31	Brow cam is good.
10216	20090413 113314	14.60072724	144.7753148	18.03	3.68	519.38	523.06	filming.
10218	20090413 113323	14.60073356	144.7753153	6.68	3.29	519.22	522.51	Vigorous.
10220	20090413 113332	14.60073745	144.7753205	4.46	2.98	519.76	522.74	Going back down.
10221	20090413 113340	14.60073665	144.7753231	3.35	3.35	519.46	522.81	See rocks moving everywhere.
10230	20090413 113426	14.60073048	144.7753186	354.61	4.3	518.99	523.29	That was fun!-Chadwick
10233	20090413 113440	14.60073524	144.7753381	72.1	2.66	518.57	521.23	Last view of Brimstone.
10234	20090413 113451	14.60075429	144.7753702	63.01	3.19	518.04	521.23	VIDEO Stop recording HDCam
10236	20090413 113504	14.60077299	144.7754106	83.62	4.89	517.91	522.8	In gray cloud-could be where rocks tumbled down.
10237	20090413 113517	14.60078765	144.7754605	84.28	8.18	518.08	526.26	On our way to Marker 105.
10238	20090413 113528	14.60080114	144.7754962	85.95	9.89	518.92	528.81	Up high and not seeing anything.
10239	20090413 113532	14.60080328	144.7755079	91.37	10.33	519.33	529.66	Aft cam view of plume.
10240	20090413 113541	14.60080332	144.775533	99.64	11.48	519.97	531.45	Lots of low gray haze from rocks that fell down.
10241	20090413 113554	14.60078958	144.7755443	95.31	11.14	520.05	531.19	Heading due east.
10246	20090413 113808	14.60082636	144.7756853	103.98	7.06	535.4	542.46	Can see bottom and looks like outcrops and dusting.
10247	20090413 113827	14.60078725	144.7756816	102.27	5.89	535.87	541.76	Some long delineations in canyon.
10248	20090413 113850	14.60074935	144.7757284	109.24	5.19	538.24	543.43	In canyon between cone and ridge.
10249	20090413 113900	14.60072522	144.7757501	107.85	4.44	538.99	543.43	Lavas under vehicle from cone.
10251	20090413 113909	14.60070531	144.7757656	107.69	4.69	539.22	543.91	Just passed marker 104.
10252	20090413 113916	14.60069605	144.7757765	108.92	4.3	539.93	544.23	There is another up high.
10253	20090413 113930	14.60068363	144.7758011	108	5.75	540.57	546.32	There is Marker 108.
10254	20090413 113938	14.60067654	144.7758111	108	7.4	540.54	547.94	108 and 104 are close to each other.
10255	20090413 113941	14.60067101	144.7758159	109.24	7.53	540.49	548.02	Marker 108.
10257	20090413 114034	14.60063064	144.7759057	105.95	8.11	540.78	548.89	Depth of Marker 105 is 541.
10258	20090413 114042	14.60061876	144.7759212	107.02	7.73	540.66	548.39	Great visibility here.
10260	20090413 114113	14.60057681	144.7759703	102.96	7.58	539.08	546.66	Heading was 078 and depth 541 at marker 105 Limpet Lair.
10261	20090413 114123	14.6005595	144.7759893	89.87	8.64	539.2	547.84	There is the Marker ahead of us.
10262	20090413 114144	14.60055665	144.7759965	91.27	8.96	539.11	548.07	Going to get Verena's shrimp trap at Limpet Lair Marker 105.
10264	20090413 114203	14.60055648	144.7759966	91.73	8.89	539.07	547.96	Marker 105 on a little outcrop on slope.
10265	20090413 114239	14.60055705	144.7759965	91.1	9.06	539.09	548.15	Turned lights back on the vehicle.
10267	20090413 114334	14.60055746	144.7760274	90.46	8.63	538.7	547.33	When we get to Marker 105 we want a mosaic of the area in a couple of passes.
10268	20090413 114339	14.60055522	144.7760369	90.49	8.81	538.57	547.38	Approaching Marker 105.
10269	20090413 114348	14.60056274	144.7760513	90.96	7.91	538.46	546.37	Shrimp are everywhere.
10270	20090413 114355	14.60056974	144.7760574	90.61	6.2	539.22	545.42	Mosaic and then pick up trap.
10272	20090413 114406	14.60057413	144.7760613	90.22	4.1	540.47	544.57	Looking at 090.
10275	20090413 114430	14.60057249	144.7760592	89.88	2.64	542.66	545.3	Taking some images for the Virtual Van.

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10277	20090413 114514	14.60058053	144.7760631	98.7	0.98	540.82	541.8	Want to be close to do imaging.
10278	20090413 114527	14.6005805	144.7760678	96.93	1.25	540.84	542.09	Trap is just on the top out of view.
10279	20090413 114535	14.6005808	144.77607	97.29	0.91	540.78	541.69	Moving closer.
10280	20090413 114559	14.60058184	144.7760706	98.64	0.74	540.81	541.55	Marker 105 outcrop Limpet Lair.
10281	20090413 114609	14.6005814	144.7760701	98.23	0.74	540.73	541.47	rock is completely covered with egg cases.
10282	20090413 114634	14.60058221	144.7760712	94.63	0.74	540.98	541.72	Nice aa-aa block.
10283	20090413 114641	14.60058244	144.7760719	97.44	110.52	541.13	651.65	Getting closeups.
10285	20090413 114749	14.60054757	144.7760633	50.67	10.45	539.01	549.46	Setting up for HD mosaic of rock with shrimp at marker 105
10289	20090413 115010	14.60057197	144.7760856	34.68	5.4	540.56	545.96	Jason is up against the rock with the shrimp on it. Heading is 035
10290	20090413 115032	14.60057196	144.7760856	34.57	5.53	540.57	546.1	This is a good set up for the HD mosaic.
10293	20090413 115248	14.60057206	144.7760858	35.69	5.43	540.53	545.96	Starting HD mosaic with HD stills.
10295	20090413 115317	14.60057207	144.776086	35.42	5.41	540.54	545.95	Doing frame captures.
10296	20090413 115346	14.60057205	144.7760859	35.21	5.35	540.57	545.92	At 14deg36.034 144deg 46.565 at 541m depth Limpet Lair Mkr105.
10297	20090413 115356	14.60057202	144.7760859	35.09	5.35	540.55	545.9	Changing HD tape.
10299	20090413 115405	14.60057203	144.7760859	34.81	5.39	540.58	545.97	Limpets-eggs-shrimp.
10301	20090413 115525	14.60057204	144.7760858	34.22	5.55	540.56	546.11	Length of antenna can reach back to end of their tails.
10302	20090413 115541	14.60057202	144.7760858	34.21	5.51	540.57	546.08	Riding shrimp on backs.
10304	20090413 115619	14.60057202	144.7760857	34.22	5.41	540.57	545.98	As big one comes through the other ones clear out of the way.
10305	20090413 115626	14.60057198	144.7760857	34.22	5.43	540.56	545.99	Ready for HD video recording to tape now.
10306	20090413 115637	14.60057198	144.7760857	34.25	5.4	540.56	545.96	Starting mosaic.
10308	20090413 115705	14.60057206	144.7760856	34.18	5.6	540.53	546.13	Moving sci cam across rock face.
10309	20090413 115729	14.60057203	144.7760855	34.26	5.45	540.55	546	HD looks over exposed.
10310	20090413 115734	14.60057203	144.7760856	34.26	5.58	540.55	546.13	Bringing iris down on HD.
10312	20090413 115821	14.6005719	144.7760855	33.94	5.83	540.54	546.37	Trying to do density imaging.
10313	20090413 115830	14.60057194	144.7760855	34	5.53	540.56	546.09	Nice shot of limpets as well.
10314	20090413 115852	14.60057189	144.7760855	33.84	5.46	540.56	546.02	Getting thruster dust in aft camera.
10316	20090413 115933	14.60057187	144.7760855	33.52	5.5	540.53	546.03	Here come the big guys.
10317	20090413 115940	14.60057188	144.7760855	33.54	5.49	540.52	546.01	An even bigger one.
10319	20090413 120024	14.60057184	144.7760854	34.27	5.44	540.55	545.99	Lasers on.
10320	20090413 120032	14.60057184	144.7760855	34.25	5.58	540.56	546.14	Getting scale perspective.
10321	20090413 120049	14.60057179	144.7760854	34.21	5.4	540.59	545.99	See shrimp trap behind this wall.
10323	20090413 120104	14.60057178	144.7760854	34.1	5.41	540.59	546	Some HD stills with lasers.
10324	20090413 120127	14.60057179	144.7760854	33.94	5.4	540.6	546	Can a big shrimp be suctioned?
10326	20090413 120248	14.60057141	144.7760855	31.99	5.99	540.49	546.48	Going to try a suction sample of big shrimp.
10328	20090413 120317	14.60057124	144.7760855	31.65	6.05	540.47	546.52	VIDEO Stop recording HDCam
10329	20090413 120331	14.60057073	144.7760852	31.41	6.06	540.49	546.55	Getting ready to sample with the suction hose.
10330	20090413 120355	14.60057096	144.7760852	31.67	5.63	540.46	546.09	VIDEO Start recording HDCam
10332	20090413 120429	14.60057079	144.7760851	31.51	6.21	540.45	546.66	Good grip on suction hose.
10333	20090413 120456	14.60057034	144.7760847	31.82	6.06	540.46	546.52	Knocked tephra sampler and looks like it is closing up.
10335	20090413 120518	14.60057038	144.7760849	31.16	5.6	540.49	546.09	Ready to suction.
10336	20090413 120555	14.6005698	144.7760844	31.95	6	540.47	546.47	SAMPLE Biology 1:got some shrimp
10338	20090413 120608	14.60056962	144.7760842	31.76	6.24	540.46	546.7	We are at Limpet Lair Mkr-105.
10339	20090413 120628	14.60056932	144.776084	31.53	6.23	540.44	546.67	J2-407-suction-01 biology sample of shrimp.
10340	20090413 120646	14.60056927	144.776084	31.77	5.66	540.46	546.12	Still suctioning and got some.
10342	20090413 120717	14.60056921	144.7760841	31.69	6.21	540.45	546.66	Can see shrimp in chamber.
10343	20090413 120800	14.60056906	144.7760841	31.45	6.15	540.43	546.58	Got him!

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10345	20090413 120814	14.60056924	144.7760842	31.49	6.2	540.45	546.65	2mm mesh in suction.
10346	20090413 120826	14.60056932	144.7760842	31.37	6.11	540.44	546.55	Stopping suction.
10348	20090413 120923	14.60056944	144.7760842	31.46	6.24	540.42	546.66	Going to suction some more.
10349	20090413 120937	14.60056937	144.7760841	31.4	5.98	540.46	546.44	Getting more in by jiggling hose.
10350	20090413 120958	14.60056931	144.7760841	31.39	6.14	540.47	546.61	Excellent sampling method.
10353	20090413 121115	14.6005694	144.7760841	31.73	6.25	540.42	546.67	Still sampling.
10354	20090413 121138	14.60056931	144.776084	31.58	6.21	540.44	546.65	May have gotten a little rock in chamber.
10356	20090413 121210	14.60056889	144.7760838	31.27	6.06	540.42	546.48	Shrimp on the grill! (suction chamber grill).
10357	20090413 121246	14.60056857	144.7760836	31.15	6.16	540.42	546.58	Just a few more would be good.
10359	20090413 121322	14.60056831	144.7760835	30.97	6.41	540.41	546.82	Slurping sounds and satisfaction...good sampling.
10360	20090413 121332	14.60056837	144.7760835	31.11	6.41	540.4	546.81	got a big one.
10362	20090413 121419	14.60056828	144.7760835	30.66	6.48	540.38	546.86	Alvinocaris and Opaepele sampling of shrimp.
10363	20090413 121456	14.60056866	144.7760836	30.24	6.48	540.38	546.86	One more suction.
10365	20090413 121517	14.60056903	144.7760837	30.31	6.51	540.36	546.87	Got a few more.
10366	20090413 121524	14.60056902	144.7760838	30.46	6.51	540.36	546.87	Sample the other day didn't have any females.
10367	20090413 121534	14.60056902	144.7760838	30.45	6.43	540.36	546.79	J2-407 Data DVDs start Stop DVCAM 043 and start DVCAM 044
10368	20090413 121537	14.60056894	144.7760837	30.44	6.51	540.36	546.87	Not very many of the big shrimp.
10369	20090413 121542	14.60056879	144.7760836	29.99	6.51	540.36	546.87	Lots of juveniles.
10370	20090413 121553	14.60056898	144.7760837	30.31	6.53	540.36	546.89	Most are Opaepele.
10371	20090413 121601	14.60056899	144.7760837	30.58	6.53	540.36	546.89	In the trap most are Alvinocaris.
10373	20090413 121609	14.60056893	144.7760838	29.16	6.43	540.41	546.84	VIDEO Stop recording HDCam
10374	20090413 121618	14.60056901	144.7760836	30.84	6.54	540.32	546.86	Done sampling.
10375	20090413 121640	14.60056192	144.7760896	39.96	7.5	539.64	547.14	Moving off of outcrop.
10376	20090413 121656	14.60056723	144.7760975	40	6.54	539.11	545.65	Need to put hose back and then video site.
10379	20090413 121802	14.60058572	144.7761214	22.41	1.94	539.3	541.24	VIDEO Start recording HDCam
10380	20090413 121820	14.60059294	144.7761519	355.02	3.48	538.38	541.86	Taking video of the site and then of the shrimp trap will be picked up.
10381	20090413 121824	14.60059868	144.7761543	356.49	3.6	538.01	541.61	good view of the slope.
10382	20090413 121858	14.60060616	144.7761645	287.41	6.55	537	543.55	Top of ridge.
10384	20090413 121911	14.6005882	144.776193	285.65	7.6	538.17	545.77	Looking at Marker in sci cam HDG 285.
10385	20090413 121922	14.6005811	144.7761906	287.57	6.78	538.94	545.72	Looking at site from different angle.
10386	20090413 121943	14.60056704	144.7761769	294.29	4.83	539.88	544.71	Repositioning with a lot of current right now.
10387	20090413 121954	14.60056863	144.7761622	292.95	3.21	540.41	543.62	Nice view of ridge.
10388	20090413 122001	14.60056686	144.7761553	292.7	2.45	540.77	543.22	Tide should be slack right now.
10390	20090413 122016	14.60055942	144.7761412	296.26	1.5	540.94	542.44	Nice view in sci cam of trap.
10391	20090413 122024	14.60055508	144.7761327	305.32	2.01	540.78	542.79	Lasers off.
10393	20090413 122037	14.60054961	144.7761254	329.84	3.95	540.04	543.99	Approaching trap.
10396	20090413 122103	14.60055701	144.7761062	336.91	6.69	538.32	545.01	Pilot cam is dark.
10398	20090413 122140	14.60057259	144.7761032	307.82	4.45	538.36	542.81	Current is going to the north.
10401	20090413 122229	14.60058139	144.7760977	241.87	4.19	536.66	540.85	Viewing site from above
10402	20090413 122249	14.60057999	144.7760935	246.43	2.98	538.03	541.01	Brow cam has best view.
10403	20090413 122258	14.60058077	144.7760932	246.07	1.98	538.98	540.96	Looking in the trap.
10405	20090413 122310	14.6005818	144.7760932	240.63	1.59	539.26	540.85	There are some shrimp in the trap.
10406	20090413 122357	14.60058035	144.776094	244.57	1.74	539.05	540.79	Getting trap.
10408	20090413 122417	14.60057951	144.776094	245.59	1.69	539.13	540.82	Got it.
10409	20090413 122441	14.60058264	144.7761014	246.38	1.35	539.41	540.76	SAMPLE Biology 2: Placing shrimp trap in basket.
10411	20090413 122507	14.60058271	144.776102	248.11	1.38	539.47	540.85	J2-407-shrimp-02 Put in port front milk crate.



Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-407 Logger Comment
10412	20090413 122559	14.60058296	144.7761155	247.27	2.74	538.21	540.95	Now it is time for Jason engineering.
10414	20090413 122608	14.60058329	144.7761154	248.28	2.19	538.7	540.89	VIDEO Stop recording HDCam
10416	20090413 122737	14.60058423	144.7761138	246.26	2.1	538.7	540.8	2 hours of engineering time.
10418	20090413 122823	14.60058367	144.7761142	247.28	2.18	538.74	540.92	Going to turn off video recordings--going to let DVDs run out since they are at the end.
10419	20090413 122841	14.60058413	144.7761131	245.32	2.15	538.67	540.82	Not going to data log during engineering time.
10421	20090413 123000	14.60058322	144.776113	246.84	2.11	538.72	540.83	J2-407 Data DVDs stop blue set 56
10423	20090413 123034	14.60058297	144.7761132	246.92	2.23	538.71	540.94	J2-407 DVCAM 043 stop while doing engineering stuff
10424	20090413 123052	14.60058301	144.776113	246.98	2.16	538.74	540.9	J2-407 oops
10473	20090413 131832	14.60058653	144.7761108	246.94	2.44	538.63	541.07	Recorded 20 min of HDV tape on one spot to observe shrimp behavior. Stopped now.
10550	20090413 143413	14.60055402	144.7760688	33.53	5.05	542.34	547.39	Getting ready to resume science ops
10551	20090413 143438	14.60055364	144.7760683	32.23	5	542.41	547.41	J2-407 Data DVDs start red set 57
10553	20090413 143508	14.60055366	144.7760685	32.39	4.7	542.62	547.32	Videos back on
10554	20090413 143520	14.60055409	144.7760685	32.2	4.59	542.67	547.26	J2-407 DVCAM 044 restart after engineering stuff done
10555	20090413 143544	14.60055394	144.7760684	30.11	4.1	543.32	547.42	We have been at marker 105 the whole time (the engineering time).
10557	20090413 143609	14.60055677	144.7760675	30.11	3.9	543.33	547.23	We are going to take a fluid sample here since there is some flow coming up at the base of this rock outcrop.
10559	20090413 143759	14.60055885	144.7760672	31.35	3.71	543.46	547.17	Looking around for good fluid flow and positioning Jason.
10563	20090413 144005	14.60055594	144.776065	27.97	4.01	543.2	547.21	We have come straight down from marker 105 a few meters in depth.
10566	20090413 144230	14.60055502	144.7760687	20.98	3.28	544.06	547.34	The pH in the ambient water is significantly lower than it was in the water column. It is 6.7.
10567	20090413 144257	14.60055519	144.7760684	20.92	3.19	544.08	547.27	The pH in the water column was 7.75.
10575	20090413 144913	14.60055434	144.7760699	23.14	3.46	543.86	547.32	Putting the sampler in-take in various places to measure temperature.
10583	20090413 145634	14.60055443	144.7760715	22.84	3.54	543.77	547.31	Found a good spot for a fluid sample in a crack.
10585	20090413 145803	14.60055464	144.7760719	23.17	3.54	543.73	547.27	SAMPLE Fluid Getting a pH of 5.40 in this spot.
10588	20090413 145904	14.60055438	144.7760719	22.83	3.55	543.74	547.29	SAMPLE Fluid Unfiltered bag 24. Starting now.
10589	20090413 145931	14.60055453	144.7760715	22.79	3.54	543.74	547.28	SAMPLE Fluid 3 is the sample number.
10594	20090413 150351	14.60055449	144.7760723	23.05	3.8	543.72	547.52	SAMPLE Fluid 3. Sample stop.
10596	20090413 150436	14.60055424	144.7760724	23.05	3.75	543.72	547.47	SAMPLE Fluid 3. Tmax=16.2 Tavg=14.4 Vol=514 T2=10.8
10598	20090413 150526	14.60055389	144.7760728	22.99	3.79	543.73	547.52	SAMPLE Fluid 4. Filtered bag 18. Starting now.
10603	20090413 150957	14.60055429	144.7760711	23.21	3.7	543.7	547.4	SAMPLE Fluid Camera on arm has hard ground so we will not using.
10604	20090413 151002	14.60055436	144.7760712	23.19	3.79	543.71	547.5	Stopped #4.
10606	20090413 151041	14.60055408	144.7760709	23.32	3.58	543.71	547.29	SAMPLE Fluid 4: Tmax=16.4 Tavg=16.2 vol=582 T2=10.9
10608	20090413 151104	14.60055411	144.7760711	23.33	3.75	543.7	547.45	SAMPLE Fluid 5: Steverix #15 starting J2-407-HFS-05
10610	20090413 151230	14.60055429	144.7760703	23.53	3.78	543.68	547.46	We are sampling at Marker 105 Limpet Lair 5m below the shrimp trap at hdg 024deg (check trap depth..maybe just a couple meters below)
10613	20090413 151414	14.60055426	144.7760692	23.7	3.84	543.68	547.52	Looking to see if shrimp are avoiding the flow areas or not.
10614	20090413 151431	14.60055414	144.776069	23.67	3.58	543.68	547.26	Shrimp don't seem to mind being in the flow.
10618	20090413 151746	14.60055449	144.7760684	24.22	3.69	543.7	547.39	Crab is eating a shrimp in the hole.
10619	20090413 151758	14.60055455	144.7760683	24.37	3.71	543.68	547.39	Other shrimp are trying to get the crumbs from the crab.
10621	20090413 151849	14.60055426	144.7760682	24.25	3.66	543.72	547.38	Still sampling for microbes. Sterevix fluid sample #5
10625	20090413 152128	14.60055413	144.7760682	24.96	3.78	543.75	547.53	Watching the crab defend its catch from the other shrimp.
10627	20090413 152213	14.60055379	144.7760694	25.15	3.55	543.77	547.32	Sample temperature is dropping a bit.
10628	20090413 152220	14.60055368	144.7760696	25.16	3.6	543.77	547.37	Wand has not moved.
10629	20090413 152239	14.60055357	144.7760698	25.19	3.74	543.76	547.5	HFS sample #5 still going.
10631	20090413 152347	14.60055371	144.7760691	25.4	3.76	543.76	547.52	Back to crab watching. Shrimp still trying to get crumbs and crab kicks the shrimps with non-claw legs.

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10633	20090413 152413	14.60055349	144.7760695	25.39	3.71	543.76	547.47	Could see a shrimp in the crabs claw. Not sure if that is a new one or the old one.
10634	20090413 152459	14.60055351	144.7760691	25.35	3.8	543.72	547.52	Got a good view of the catch as crab backed into crack.
10637	20090413 152612	14.60055372	144.7760686	25.23	3.76	543.72	547.48	Temp was holding at 16 and then stepped down to 11deg during sample.
10638	20090413 152616	14.60055364	144.7760688	25.25	3.78	543.74	547.52	5: stopped
10639	20090413 152639	14.60055371	144.776069	25.23	3.76	543.76	547.52	5: Tmax=16.5 Tavg=14.4 vol=3013 T2=9.0
10641	20090413 152733	14.60055359	144.7760699	25.21	3.76	543.79	547.55	SAMPLE Fluid 6: Sterevix #14 starting (one for DNA
10643	20090413 152846	14.60055314	144.7760706	25.31	3.51	543.8	547.31	J2-407-HFS-07 at Limpet Lair a few meters below shrimp trap setting.
10647	20090413 153135	14.60055218	144.7760726	26.81	3.4	543.86	547.26	Crab is coming out of the crack but still eating shrimp.
10649	20090413 153246	14.60055212	144.7760724	27.06	3.36	543.91	547.27	Crab found another crack.
10651	20090413 153334	14.6005521	144.7760725	26.87	3.35	543.88	547.23	That is supposed to be J2-406-HFS-06 (not -07)
10653	20090413 153425	14.60055233	144.7760723	25.78	3.3	543.93	547.23	Nothing left of the shrimp-crab out in the open again.
10660	20090413 154003	14.60055173	144.7760727	25.89	3.54	543.79	547.33	Navigation has Jason on Marker 105 and we are using doppler.
10666	20090413 154427	14.60055176	144.7760719	27.28	3.6	543.81	547.41	WATCHSTANDERS Susan Merle logger
10668	20090413 154544	14.60055184	144.7760717	26.78	3.61	543.79	547.4	SAMPLE Fluid 6. stop 1544?. Tmax=14.4. avg=11.8. Vol=3266ml. T2=8.5. Mkr-105. j2-407-HFS-06.
10672	20090413 154845	14.6005513	144.7760721	25.33	3.53	543.85	547.38	Will leave Mkr-105 (Limpet Lair) and move to Mkr-109.
10673	20090413 154856	14.60055146	144.7760719	25.14	3.65	543.85	547.5	Stowing the HFS sampler.
10677	20090413 155202	14.60051603	144.7759773	28.63	15.66	542.06	557.72	Pulling away from Mkr-105.
10682	20090413 155547	14.60053356	144.7760989	78.43	9	537.3	546.3	Heading east at about 77 degrees heading. Moving over this plateau.
10687	20090413 155951	14.60058848	144.7764815	76.26	2.19	558.07	560.26	Traveling along across this flat area.
10690	20090413 160151	14.60060359	144.7766433	76.21	1.83	565.6	567.43	Dave will do some background readings for pH and water column.
10693	20090413 160350	14.60061062	144.7769024	77.09	1.94	576.85	578.79	BACKGROUND READINGS between Mkr105 and Mkr-109 on plateau. Z=566. Temp is 6.1 (T1) on Dave's probe. pH is not quite stable yet.
10695	20090413 160426	14.60059981	144.7769817	76.3	2.11	580.83	582.94	BACKGROUND READING cont. pH keeps going up.
10696	20090413 160449	14.60059968	144.777048	76.95	3.28	582.01	585.29	NOTE: There is no "off load" camera on this dive. That's the camera on Medea.
10698	20090413 160526	14.60066684	144.7771026	79.3	2.91	582.23	585.14	BACKGROUND READINGS: pH stable at 7.46.
10699	20090413 160554	14.60071292	144.7771343	82.37	2.7	582.36	585.06	Coming upon the edge of this plateau area.
10702	20090413 160730	14.60075005	144.7772593	80.6	2.98	577.94	580.92	SAMPLE Fluid 6. Start 1160620. HFS filtered piston #4 for background. j2-407-HFS-06.
10704	20090413 160859	14.60077992	144.7773596	79.9	9.08	565.76	574.84	SAMPLE j2-407-HFS-06 background. Going over large parallel ridges now.
10707	20090413 161006	14.60084096	144.7773717	324.6	5.31	563.21	568.52	SAMPLE j2-407-HFS-06 cont. We're at the top of this scarp. Really beautiful.
10708	20090413 161059	14.60085323	144.7773895	49.32	5.26	562.2	567.46	See a marker here. It's Mkr-109. Want to travel over the face of this scarp. Lots of shrimp in the area.
10711	20090413 161206	14.60085549	144.7774386	332.17	3.41	562.76	566.17	SAMPLE j2-407-HFS-06 finished at 161125. Tmax=6.4 avg-6.2. vol=657. Temp started to increase because we went up a bit in the water column.
10712	20090413 161301	14.60086036	144.7774997	78.57	21.9	565.28	587.18	We want to go down to the base of this large scarp and start at the base. Will work our way up. Just on the east side of this scarp.
10715	20090413 161458	14.60085939	144.7775009	78.37	22.1	565.34	587.44	The map shows Scarp Top to the NE of here. This is probably the Scarp Top of 2006 and 2004.
10719	20090413 161714	14.60085927	144.7775018	78.35	15.26	573.18	588.44	So there is a debate about where Scarp Top actually is. We believe that this area that we were calling Fault Shrimp is actually Scarp Top of old.....
10720	20090413 161740	14.60085876	144.7775021	78.27	12.99	575.48	588.47	Will just refer to it as Mkr-109 area.
10722	20090413 161822	14.60085863	144.777502	78.82	7.94	580.95	588.89	Heading down the edge of this slope.
10724	20090413 161957	14.60085064	144.7775064	270.51	4.65	586.75	591.4	We're at the base of this sharp ridge.
10726	20090413 162029	14.60083733	144.7774915	273.22	5.13	587.03	592.16	It's really incredibly steep here.
10727	20090413 162052	14.60083101	144.7774857	274.89	5.29	587.11	592.4	J2-407 DVCAM 044 stop and 045 start
10729	20090413 162145	14.6008332	144.7774813	309.5	5.01	587.58	592.59	We're at the base of this steep ridge which sits on a steep slope.

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10731	20090413 162206	14.60083063	144.7774842	313.08	4.63	588.21	592.84	Brecciated lava on the ridge wall and volcanoclastic seds at the base.
10732	20090413 162240	14.60083087	144.7774815	316.18	2.15	590.42	592.57	Cornel says he reckons these steep ridges are all fault controlled.
10734	20090413 162330	14.60083072	144.7774813	316.36	2.21	590.35	592.56	We're going to measure the temperature at the base of this steep scarp.
10736	20090413 162418	14.60083059	144.7774812	315.76	2.29	590.28	592.57	Will use the Jason probe. Background temp=7.1.
10738	20090413 162531	14.60083084	144.7774813	315.79	2.31	590.28	592.59	Location: over the ridge from Mkr-109 (Fault Shrimp on map but probably Scarp Top).
10740	20090413 162609	14.60083076	144.7774814	315.87	2.24	590.3	592.54	Location: over the ridge from Mkr-109 on the east side of this ridge (scarp)... Same location. Temp rising a bit.
10741	20090413 162637	14.60083067	144.7774813	315.88	2.24	590.3	592.54	Temp probe is 30cm long and it's down all the way into the seds.
10743	20090413 162751	14.60083018	144.7774813	315.36	2.45	590.22	592.67	Temp probe cont.... Probe all the way in. Temp is 8.9 in the seds.
10745	20090413 162806	14.60083017	144.7774814	315.35	2.45	590.22	592.67	Not much of a temp anomaly.
10746	20090413 162854	14.60083015	144.7774814	315.31	2.44	590.22	592.66	Jason watch change. Bob (Buddha) replacing Will. Bob (the navigator) replacing Jon.
10750	20090413 163107	14.60081932	144.7774835	267.24	3.51	589.41	592.92	J2-407 Data DVDs start blue set DVD 058
10751	20090413 163129	14.60080941	144.7774716	266.58	2.7	590.21	592.91	Still have the temp probe out. Temp was 8.9 in the seds. Now will measure the temp in the orange seds on the brecciated wall.
10754	20090413 163348	14.60080317	144.7774698	266.74	2.26	591.01	593.27	There is a little bit of wispy mat here on the wall.
10755	20090413 163357	14.60080313	144.7774696	266.88	2.24	591.06	593.3	J2-407 Data DVDs stop red set DVDs 057
10756	20090413 163358	14.60080315	144.7774696	266.91	2.24	591.06	593.3	Only 1 degree way down in the sediment.
10762	20090413 163820	14.60083292	144.7774762	298.52	3.25	588.99	592.24	Traveling north along the base of this scarp.
10763	20090413 163836	14.60081202	144.7774774	258.66	5.38	587.43	592.81	Depth is about 590 at the base of this wall.
10765	20090413 164001	14.6007702	144.7774648	264.82	13	582.09	595.09	Some varied types of mat here. Wispy mat on the rocks.
10767	20090413 164052	14.60074295	144.7774383	319.76	1.71	581.73	583.44	The mat is a bit thicker here. Coming around this point. Heading N/NW along this steep ridge.
10769	20090413 164125	14.6007462	144.7774331	329.43	2.28	581.14	583.42	This looks like some furry mat here.
10771	20090413 164205	14.60074557	144.7774342	328.81	2.56	581.11	583.67	We're about at the eastern point of this steep ridge. Depth is 582m. We have climbed up about 8m.
10772	20090413 164215	14.6007464	144.7774336	329.19	2.44	581.19	583.63	VIDEO Start recording HDCam
10775	20090413 164454	14.60075563	144.7774307	328.83	2.49	581.13	583.62	Grenadier here. A crab on the mat.
10777	20090413 164517	14.60075552	144.7774308	329.03	2.5	581.09	583.59	The brightest yellow stuff on the wall is probably iron oxides with silica.
10778	20090413 164547	14.60075601	144.7774276	328.88	2.4	580.83	583.23	Don't see any flow here but there is quite a lot of mat.
10780	20090413 164705	14.60075572	144.7774212	326.81	2.35	580.82	583.17	Dave is running the pump now to check for a temp anomaly. Background temp on Dave's probe is 6.2 degrees.
10783	20090413 164812	14.60075394	144.7774061	327.06	2.35	580.85	583.2	No temp anomaly. This is living off solid phase not water flow Dave says. Sheryl says they are "iron bugs".
10785	20090413 164945	14.6007523	144.777399	329.64	2.49	580.82	583.31	Probably the newer class of Proteobacteria "Zeta". Only 1 bug has been cultured so far. Called "Mariprofundus ferrooxidans".
10787	20090413 165019	14.60074541	144.7773973	330.15	7.21	576.44	583.65	Last quote was from Sheryl. This may not be it - who knows says Sheryl....
10788	20090413 165049	14.6007306	144.7773889	331.12	11.04	572.94	583.98	Moving up the wall again. Didn't find any temp anomaly. Sheryl says they might actually be iron reducers here.
10789	20090413 165059	14.60072389	144.7773838	330.82	13.23	571.26	584.49	Patches with no mat whatsoever.
10791	20090413 165121	14.60070936	144.777372	351.03	15.81	570.55	586.36	At the top of this steep ridge now. There are a series of ridges. here.
10792	20090413 165202	14.60073885	144.7773339	6.84	6.66	570.92	577.58	Cornel wants to travel up this little valley. The top of this ridge is covered with sulfur rocks.
10795	20090413 165333	14.60072952	144.7773044	33.74	9.79	569.83	579.62	Cornel is pretty excited about all of this. At one time he says it was molten sulfur.... Now it's sulfur rock.
10797	20090413 165409	14.60075937	144.7772858	46.49	10.54	569.86	580.4	This is more like Nikko or Daikoku here - says Cornel.
10798	20090413 165444	14.60074073	144.7773088	27.45	7.56	569.98	577.54	The pilot is a bit nervous about all these steep ridges and the tether.

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10800	20090413 165522	14.60075428	144.7773392	343.69	4.96	570.7	575.66	We're maneuvering around to find an easier position. Backtracking a bit.
10802	20090413 165620	14.6007583	144.777338	343.84	5.61	570.83	576.44	We're looking at sulfur crust pieces along the top of this ridge.
10803	20090413 165643	14.60075846	144.777338	343.54	5.6	570.83	576.43	Using the HFS probe to check for temp. See a few shrimp here.
10805	20090413 165739	14.60075839	144.7773379	343.68	5.6	570.84	576.44	Both type of shrimp here. No flow here. Will pick up a piece of sulfur crust here.
10807	20090413 165814	14.60075838	144.777338	343.39	5.65	570.81	576.46	There is flow here.
10808	20090413 165827	14.60075831	144.777338	343.41	5.64	570.82	576.46	We will check the temp here again.
10810	20090413 165955	14.60075823	144.7773381	343.33	5.64	570.83	576.47	The lasers are on the sampling spot.
10813	20090413 170106	14.60075849	144.7773379	343.69	5.65	570.81	576.46	We're on the top of this middle ridge (one ridge over from the east side). On the summit of the peak of that middle ridge. We think there are 3 ridges here.
10814	20090413 170153	14.6007585	144.7773378	344.17	5.64	570.82	576.46	The 3 ridges here are oriented NE to SW. We're not sure about the number of ridges.
10816	20090413 170216	14.60075856	144.7773379	344.06	5.64	570.82	576.46	Temp background here is 6.4. Temp is rising to 9.0 now.
10817	20090413 170305	14.60075871	144.7773379	343.89	5.63	570.82	576.45	Poking the temp probe into the sed's a bit. Temp is increasing. Up to 13 degrees now.
10819	20090413 170314	14.60075866	144.7773379	343.94	5.63	570.84	576.47	VIDEO Start recording HDCam
10820	20090413 170346	14.6007587	144.7773379	343.75	5.63	570.84	576.47	Don't see the flow now but the temp is still increasing. Up to 14 now.
10823	20090413 170523	14.60075884	144.7773378	343.6	5.64	570.84	576.48	SAMPLE Fluid 8. j2-407-HFS-08. See old sulfur flow here. Lots of diffuse flow in this area.
10824	20090413 170548	14.60075881	144.7773377	343.97	5.64	570.83	576.47	Still setting up to sample. Haven't actually started yet.
10826	20090413 170632	14.60075881	144.7773377	343.99	5.63	570.82	576.45	The dark stuff is probably sulfur flow with an ash component. It's overlaying the sulfur crust.
10828	20090413 170754	14.60075883	144.7773376	344.11	5.63	570.82	576.45	8. j2-407-HFS-08. Starting unfiltered piston #1 at about 131640.
10830	20090413 170817	14.6007589	144.7773377	344.26	5.61	570.82	576.43	SAMPLE Fluid 8.
10831	20090413 170834	14.6007589	144.7773377	344.24	5.61	570.83	576.44	East of Mkr-109.
10834	20090413 171019	14.60075895	144.7773378	344.1	5.61	570.84	576.45	Nice flow in sulfur-rich domain east of Mkr-109 on this sulfur strewn ridge.
10837	20090413 171256	14.600759	144.7773375	344.28	5.49	570.88	576.37	SAMPLE Fluid Stop 171030. Approximate location for this sample: 140 4 46.6418 14 36.045. Z=572. Tmax=14.9. avg=14.5 Vol=522ml. T2=10.
10839	20090413 171343	14.60075883	144.7773377	344.63	5.46	570.84	576.3	Repositioning. Trying nearby spot probably a half meter away.
10843	20090413 171610	14.60075925	144.7773378	344.72	5.45	570.84	576.29	SAMPLE Fluid 9. J2-407-HFS-09. Start filtered bag #17. Start 171543. Science cam on sampling site.
10847	20090413 171908	14.6007594	144.7773377	344.99	5.5	570.81	576.31	9 cont. J2-407-HFS-09. This adds to our distribution of where we are gathering fluids on this volcano.
10848	20090413 171930	14.60075951	144.7773376	345.02	5.5	570.81	576.31	This is a different type of site. Sulfur in this area and diffuse flow.
10850	20090413 172040	14.60075958	144.7773375	344.83	5.49	570.81	576.3	SAMPLE Fluid 9. Stop 171930. Tmax=16.6. avg=16. T2=11.4. Vol=496ml.
10853	20090413 172301	14.60075954	144.7773376	344.59	5.48	570.82	576.3	SAMPLE Fluid 10. J2-407-HFS-12. Sterivex filter #12. Start 172156. Temp is up to 17 deg now.
10855	20090413 172404	14.60075955	144.7773373	344.84	5.5	570.81	576.31	SAMPLE 10 cont. That is sterivex filter#12 (misspelled on last entry).
10858	20090413 172529	14.60075946	144.7773373	344.84	5.53	570.79	576.32	Same location as sample 9. Top of middle knife ridge in sulfur strewn area ridge east of Mkr=109.
10860	20090413 172609	14.60075947	144.7773372	344.85	5.53	570.82	576.35	Darker stuff (sulfur with ash welded to its surface?) has flown over the lighter colored sulfur.
10862	20090413 172743	14.60075936	144.7773371	345.06	5.54	570.82	576.36	SAMPLE Fluid 10 cont. Approximate location same as sample 9.
10868	20090413 173235	14.60075933	144.777337	345.01	5.54	570.81	576.35	SAMPLE 10 j2-407-HFS-10 cont. East of Mkr-109. One (?) ridge over. These ridges seem to converge on the northern end.
10872	20090413 173530	14.60075919	144.7773366	344.93	5.51	570.82	576.33	We're dubbing this spot "Sulfur Slide". 2 styles of sulfur. One is more fluid and the other more solid.. due to the viscosity.
10875	20090413 173748	14.6007592	144.7773368	344.84	5.5	570.81	576.31	SAMPLE Fluid 10 cont. j2-497-HFS-10 sterivex stop 173710. Tmax=17.9. avg=17.4. Vol=3006ml. T2=11.

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10879	20090413 174013	14.60075933	144.7773368	344.9	5.51	570.84	576.35	Taking a pH measure here at Sulfur Slide. This is the position of samples 7 thru 10. Will take a couple more samples here.
10881	20090413 174129	14.60075935	144.7773366	344.64	5.49	570.86	576.35	pH is 4.48 here at Sulfur Slide.
10884	20090413 174313	14.60075911	144.7773366	345.12	5.56	570.84	576.4	SAMPLE Fluid 11. Unfiltered bag#3. Start 174212. Sulfur Slide.
10886	20090413 174425	14.60075924	144.7773367	345.08	5.55	570.84	576.39	pH reading 2 entries ago was incorrect. See some shrimp in the area on this light-colored sulfur crust.
10889	20090413 174606	14.60075939	144.7773364	344.66	5.48	570.84	576.32	SAMPLE Fluid 11. Stop 174513. Tmax=16.7 avg=16.4 Vol=451ml. T2=11. j2-407-HFS-11 finished.
10890	20090413 174700	14.60075943	144.7773362	344.75	5.56	570.85	576.41	pH here at the position of sample 11 was 4.96
10893	20090413 174806	14.60075953	144.7773361	344.69	5.84	570.89	576.73	Depth here is 572m.
10896	20090413 175011	14.60075961	144.777336	344.6	5.56	570.84	576.4	SAMPLE Geology 12. Light-colored piece of sulfur. Right in the flow close to where collected samples 7 thru 11. Grabbing some of this light-colored sulfur.
10898	20090413 175205	14.60075957	144.7773357	345.32	5.59	570.83	576.42	SAMPLE 12 is going in the port-aft milk crate.
10900	20090413 175243	14.60075957	144.7773358	344.9	5.46	570.84	576.3	DEPLOY Marker 113. Here at the new venting site called Mkr-113.
10907	20090413 175853	14.60076661	144.7773405	3.35	7.78	570.77	578.55	SAMPLE Geology 13. Scoop of whatever we got here. Lighter and darker seds and crust. The darker stuff is actually quite hard.
10910	20090413 180037	14.60076588	144.7773388	349.26	7.08	570.77	577.85	SAMPLE Geology 14. Grab of darker colored flow ledge. Looks like it is mostly sulfur. Looks like a sulfur flow coated with ash. Sulfur Slide. Mkr-113.
10912	20090413 180121	14.60076622	144.7773387	349.22	6.76	570.9	577.66	Scale worm here in the screen. Polychaete.
10915	20090413 180338	14.60076383	144.7773388	349.39	7.96	570.45	578.41	The location of samples 7-14: Sulfur Slide Mkr-113. 144 46.6418. 14 36.045 Z=572m.
10917	20090413 180444	14.60076331	144.7773056	348.78	9.23	568.73	577.96	Heading west from this center ridge. May stop at the next ridge over. Will head to the summit of that ridge. Will head approx. 5m south and 20m to west.
10920	20090413 180645	14.60081197	144.7772396	10.75	5.04	574.69	579.73	The east ridge was totally cold. The middle ridge is Sulfur Slide. Going to take a look at the west ridge. See Mkr-111 on this ridge west side of this ridge.
10922	20090413 180736	14.60082022	144.7772511	12.48	9.03	569.94	578.97	Mkr-111 is the site of Barnacle collection on an earlier dive.
10927	20090413 181126	14.60078355	144.7771853	321.74	14.01	565.22	579.23	Still traveling west. From E to W. Marker 113 at Sulfur Slide. Mkr111 at base of that middle ridge. Mkr-109 at top of westernmost ridge.
10929	20090413 181253	14.60065238	144.7771511	256.77	16.15	567.95	584.1	To the north of this is another marker 101. Mkr-101 is lots of limpets.
10932	20090413 181414	14.6006482	144.7771498	287.02	16.68	568.11	584.79	Have sampled the east side so now are heading to the summit.
10940	20090413 182140	14.6008066	144.7763872	287.66	22.52	534.16	556.68	J2-407 DVCAM 045 stop and 046 start
10941	20090413 182154	14.60081746	144.7763591	288.35	26.44	529.23	555.67	Now we're coming up this eastern side of the summit.
10944	20090413 182320	14.60098593	144.7760812	288.39	8.24	521.5	529.74	This eastern-most part of the volcano could be a collapsed crater?
10946	20090413 182451	14.60103808	144.7759111	286.14	5.14	522.66	527.8	It could be a former eruptive center. The circular feature and presence of sulfur seem to indicate that.
10948	20090413 182603	14.6011029	144.7757081	284.67	4.33	521.33	525.66	J2-407 Data DVDs start blue set DVDs 059
10950	20090413 182651	14.60111828	144.7756043	267.31	5.01	517.77	522.78	These slopes are STEEP. We're driving along the knife edge of this ridge.
10952	20090413 182741	14.60107211	144.775559	270.93	6.09	515.02	521.11	We're at the summit. We see a tephra sampler and a marker. The plume is visible in the background.
10955	20090413 182909	14.60111564	144.7754891	174.13	3.73	518.06	521.79	We see the hydrophone and Marker 107. One of the tephra sampler here too.
10956	20090413 182943	14.60110833	144.7754815	151.82	3.06	519.21	522.27	J2-407 Data DVDs stop red set DVDs 059
10957	20090413 183002	14.60109674	144.775482	151.55	2.21	519.76	521.97	Spires here at the summit.
10959	20090413 183052	14.60109261	144.775484	146.19	1.89	520.04	521.93	No sign of venting here.
10961	20090413 183124	14.60109298	144.7754842	150.66	1.81	520.03	521.84	Great shots of the summit in the pilot cam.
10963	20090413 183225	14.60109571	144.7754834	159.76	1.74	519.95	521.69	Searching for signs of venting.
10964	20090413 183245	14.60109624	144.7754836	162.75	1.68	519.93	521.61	Shrimp at the top here.
10965	20090413 183303	14.60109645	144.7754839	165.12	1.4	519.97	521.37	There is a bit of mat at the base.

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10967	20090413 183357	14.6010952	144.7754843	171.54	1.21	520.06	521.27	Crabs at the summit here. Small amount of mat.... very small amount. A couple of wandering crabs here.
10970	20090413 183519	14.60109521	144.7754854	183.56	1.18	519.99	521.17	There were some beautiful shots of the summit ridge and hydrophone in the pilot cam. Science cam was too zoomed in.
10971	20090413 183539	14.60109528	144.7754855	184.55	1.18	519.95	521.13	Temp is 12.5 just in the sediments and rising. Summit ridge.
10972	20090413 183604	14.60109338	144.7754838	193.39	0.9	520.08	520.98	Temp is 14.3 in the sands with the temp probe just half in.
10974	20090413 183650	14.60109493	144.7754778	205.12	1.23	519.89	521.12	Moving about to probe the sands. We're on the north side of the ridge right now.
10976	20090413 183711	14.60107658	144.7754345	206.66	3.09	520.16	523.25	Nice views on both science cam and pilot cam.
10977	20090413 183737	14.6010137	144.7753977	178.5	2.74	522.73	525.47	Plume? in the background.
10978	20090413 183748	14.60099174	144.7754012	152.96	2.88	524.03	526.91	Want to look at the south summit face next.
10980	20090413 183848	14.60101381	144.7754155	86.31	2.38	524.39	526.77	See some white patches on the outcrops here at the top. Dave is looking for something a bit warmer.
10983	20090413 184023	14.60100949	144.7754211	11.14	5.5	525.49	530.99	See lots of shrimp here on the outcrops and some mat.
10984	20090413 184039	14.60100679	144.7754258	345.82	5.33	525.78	531.11	See shimmering water. Our heading is due north.
10986	20090413 184144	14.60100861	144.7754314	3.46	4.4	526.66	531.06	This outcrop is right at the summit - actually 9m below summit depth. Rocky outcrop just west of the summit.
10988	20090413 184217	14.60100885	144.7754338	7.66	4.5	526.48	530.98	Lots of shrimp on this outcrop. Dave wants a temperature here.
10991	20090413 184430	14.60099059	144.7754241	14.19	3.71	528.47	532.18	We've stirred it up here. Lots of stuff in the water. Looking around for a spot to sample.
10995	20090413 184729	14.60099553	144.7754156	320.5	2.83	528.85	531.68	Located some flow here. Lots of shrimp on the rock. Seem to be liking this flow.
10999	20090413 185056	14.6009931	144.7754124	315.55	2.76	529	531.76	Dave is taking a temp flow here on this outcrop. Probe is under a rock in this outcrop just west of the summit. Z=530.
11001	20090413 185128	14.60099317	144.7754127	315.34	2.75	529	531.75	Temp got up to 31 here.
11003	20090413 185259	14.60099363	144.7754128	315	2.74	529.01	531.75	This is our first trip to this part of the summit on this cruise. The diffuse flow is quite intense on this outcrop just west of the summit on the knife ridge.
11006	20090413 185446	14.6009939	144.7754126	315.4	2.78	528.99	531.77	pH is 4.65 here.
11009	20090413 185651	14.6009939	144.7754124	315.3	2.74	529	531.74	SAMPLE Fluid 15. j2-407-HFS-15. Unfiltered bag#22. Start 185450. Z=530.
11012	20090413 185845	14.60099438	144.7754126	315.32	2.78	528.99	531.77	j2-407-HFS-15 cont. Aprox location: 144 46.5254 14 36.0590. Stop 185814. Tmax=32.3 avg=31.6. vol=504ml. T2=16.7.
11015	20090413 190030	14.60099428	144.7754125	315.41	2.75	528.98	531.73	SAMPLE Fluid 16. HFS filtered piston#5. Start 190003.
11020	20090413 190412	14.60099506	144.7754123	315.29	2.78	528.98	531.76	Sample j2-407-HFS-16. Filtered piston#5. Stop 190328. Tmax=32.6 avg=32.0. Vol=532ml.
11021	20090413 190504	14.60099499	144.7754124	315.37	2.75	528.99	531.74	SAMPLE Gas 17. HFS Gastight port. Temp = 31.3.
11024	20090413 190702	14.60099504	144.7754124	315.72	2.8	528.99	531.79	SAMPLE Fluid 18. Sterivex filter #10. Start 190527. j2-407-HFS-18. Same location samples 15 thru present...
11028	20090413 190943	14.60099519	144.7754124	315.47	2.75	528.98	531.73	Sample 18. j2-407-HFS-18 cont. PI Murdock.
11030	20090413 191034	14.60099522	144.7754124	315.5	2.74	529	531.74	We are now 20 m west of marker 107. Doppler was reset when we were at 107.
11042	20090413 192113	14.60099203	144.7754146	316.98	2.93	529.09	532.02	Sample 18. j2-407-HFS-18. Stop 191956 Tmax=33 Tavg=31.8 vol=3002ml. T2=16.
11044	20090413 192233	14.60094656	144.7753578	51.2	4.29	529.16	533.45	Leaving this outcrop just west of the summit and heading down to the Brimstone area - actually NW a bit. Hope to find diffuse venting.
11046	20090413 192333	14.60087978	144.7753287	219.15	3.05	527.16	530.21	We're up on the summit ridge turning to the east. There is a little valley there and then comes back up.
11048	20090413 192422	14.60082713	144.7753012	179.45	5.78	521.29	527.07	Brimstone is to the east of us. We're headed south. huh?
11049	20090413 192440	14.60079218	144.7753006	172.77	5.16	519.37	524.53	Theoretically we've seen a bit of a wall here.
11051	20090413 192513	14.60078216	144.7753037	149.51	4.25	519.61	523.86	We can see a cloud in the background. Must be Brimstone....
11053	20090413 192609	14.60077149	144.77533	173.87	4.08	518.48	522.56	This rock is covered with shrimp. Looking for diffuse flow. Repositioning a bit. Plume in background

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11054	20090413 192700	14.60075774	144.7753335	169.73	3.06	519.27	522.33	We are north of Brimstone. Current is blowing away from us. Looks like some diffuse venting.
11059	20090413 193031	14.60075904	144.7753357	162.22	2.94	519.34	522.28	Searching for a sample site. Looks like there is flow all over the place.
11062	20090413 193221	14.60075958	144.7753364	162.62	2.96	519.3	522.26	Got the temp probe out. so far no anomaly.
11063	20090413 193245	14.60075916	144.7753361	162.53	2.99	519.35	522.34	Lots of bacterial floc in the water.
11066	20090413 193424	14.60076595	144.7753354	147.29	2.43	519.85	522.28	Looking near the base of this feature. See a hole with floc coming out of it.
11070	20090413 193709	14.60077076	144.7753421	125.21	2.41	519.89	522.3	10 to 20m north of Brimstone. White bacterial floc coming out of some of the holes in the rock. White floc on the rocks.
11072	20090413 193859	14.60077183	144.7753462	122.91	2.33	519.88	522.21	Temp probe here at this white floc site. Looks like we are probably about 10m north of Brimstone.
11075	20090413 194008	14.60077135	144.7753465	123.14	2.33	519.87	522.2	Friable rock. It moved when the temp probe was put in. Temp reading is 12.2.
11077	20090413 194131	14.60079158	144.7753446	136.48	5.39	518.34	523.73	It's not all mat here. It's mostly alteration of the mat.
11081	20090413 194435	14.60077614	144.7753555	131.6	1.95	520.92	522.87	Still probing around. Temp about 9 degrees.
11083	20090413 194508	14.60077615	144.7753555	131.07	1.94	520.91	522.85	The previous sample we got around this area on J-403 was 17 - 26 degrees. The temp here is now up to 31.
11084	20090413 194525	14.60077615	144.7753554	131.07	1.98	520.89	522.87	Temp here is 31. Checking pH now.
11087	20090413 194711	14.60077688	144.775355	130.56	1.98	520.9	522.88	Temp is 31 degrees. pH is 5.01.
11089	20090413 194906	14.60077669	144.7753551	130.22	1.8	520.89	522.69	SAMPLE Fluid 20. Piston#3 (unfiltered). Start 194812. j2-407-HFS-20. Lots of floc coming out of the holds in this outcrop.
11093	20090413 195112	14.60077447	144.7753555	130.84	1.94	520.89	522.83	j2-407-HFS-20 cont. Shrimp in the pic too. Z=522m.
11095	20090413 195300	14.60077139	144.7753559	131.39	1.86	520.9	522.76	SAMPLE Fluid 20. j2-407-HFS-20 stop 195230. Tmax=32.2 avg=29.7 Vol=538ml. T2=15.
11099	20090413 195527	14.60076882	144.7753566	132.82	1.9	520.92	522.82	SAMPLE Fluid 21. Filtered piston#7. Start 195340. j2-407-HFS-21.
11102	20090413 195713	14.60076726	144.7753572	134.04	1.9	521	522.9	j2-407-HFS-21 cont. Same site as samples 19 and 20.
11103	20090413 195754	14.60076744	144.7753569	134.31	1.93	521.01	522.94	j2-407-HFS-21 cont. Stop 195730. Tmax=31.9 avg=30.7
11105	20090413 195842	14.60076757	144.7753568	135.18	2.09	521.03	523.12	More end of sample info for sample 21. Vol=509. T2=15.8.
11107	20090413 195948	14.60076794	144.7753573	136.13	2.14	521.05	523.19	SAMPLE Fluid 22. j2-407-HFS-22. Start 195906. Sterivex filter #11. ~10m north of Brimstone.
11110	20090413 200157	14.60076985	144.7753573	136.95	2.08	521.08	523.16	j2-407-HFS-22 cont. Temp looking good right around 31. Lots of floc at this spot.
11118	20090413 200900	14.60077265	144.7753574	136.87	2.06	521.12	523.18	j2-407-HFS-22 cont. Still sampling.
11126	20090413 201519	14.60078132	144.7753576	136.35	2.08	521.09	523.17	j2-407-HFS-22 cont. Stop 201447. Tmax=32.2 avg=29.0 Vol=3059ml. T2=-17.
11127	20090413 201606	14.60078278	144.7753582	137.35	2.09	521.13	523.22	SAMPLE Gas 23. Stbd gastight. 201536. Temp=31. j2-407-gas-23.
11132	20090413 201945	14.60078411	144.7753579	137.25	2.09	521.14	523.23	SAMPLE Fluid 24. Filtered bag#16. j2-407-HFS-24. Start 201655.
11135	20090413 202112	14.60078541	144.7753579	137.76	2.13	521.09	523.22	j2-407-HFS-24 cont. Stop 202030. Tmax=31.1 avg=30.0 Vol=478ml. T2=16.
11136	20090413 202132	14.60078597	144.7753578	137.69	2.09	521.12	523.21	J2-407 Data DVDs start red set DVDs 060
11138	20090413 202240	14.60078657	144.7753578	138.25	2.16	521.14	523.3	J2-407 DVCAM stop 046 start 047
11141	20090413 202450	14.60078842	144.775358	138.16	2.09	521.12	523.21	Checking the pH 5.4. We are 10m NE of the vent. Position: 144 46.5215 14 36.0472 Z=522.
11143	20090413 202545	14.6007886	144.7753586	138.74	2.54	521.31	523.85	J2-407 Data DVDs stop red set DVDs 059
11144	20090413 202555	14.60078948	144.7753585	138.23	2.54	521.32	523.86	J2-407 correction previously started blue set
11145	20090413 202558	14.60078838	144.7753589	139	2.41	521.37	523.78	Going to deploy a marker here. Tons of shrimp came pouring out of the crack when we took the probe out. Floc-eaters.
11148	20090413 202734	14.60078329	144.7753584	139.11	1.91	521.25	523.16	Tons of floc coming out where we took the last several samples.
11150	20090413 202843	14.60079301	144.7753483	137.99	3.84	519.98	523.82	DEPLOY Marker 103 here at Flock Rock.
11153	20090413 203029	14.60079444	144.7753472	137.99	3.8	520.02	523.82	Stowing the wand. Taking some DSCs of this area.
11156	20090413 203226	14.60084562	144.7753763	197.29	12.91	515.75	528.66	Samples 19-24 were taken at Flock Rock Mkr-103.

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11157	20090413 203303	14.60080632	144.7754109	184.49	11.39	516.35	527.74	Heading to the southeast of Brimstone to look around for water sampling.
11160	20090413 203413	14.60080036	144.7755164	185.94	12.33	521.35	533.68	We are seeing the smoke from another vent to the east of Brimstone.
11162	20090413 203517	14.60086283	144.7756201	185.6	8.43	525.32	533.75	Brimstone is up on a mound to our right. Brimstone is to the west and the other source of smoke is east.
11163	20090413 203533	14.60088866	144.775637	185.07	5.4	527.5	532.9	Can see the Brimstone plume in Medea.
11165	20090413 203619	14.60091473	144.7756461	184.94	5.15	527.05	532.2	Brimstone appears to be up on top of a mound.
11166	20090413 203706	14.60085469	144.7756236	197.47	1.26	535.38	536.64	Lots of plumage in the area. Can't see much. We're now at 535 m.
11168	20090413 203734	14.60086752	144.7756344	286.28	1.34	535.21	536.55	We are out of the fog now.
11169	20090413 203743	14.60087016	144.7756343	326.01	2.3	535.13	537.43	There's a bucket ahead of us.
11171	20090413 203825	14.60086907	144.7756191	19.99	3.63	534.49	538.12	Not sure the rock is bubbling or if that is something we stirred up.
11174	20090413 204038	14.60076405	144.7754851	244.71	6.65	524.2	530.85	We travelled E/NE and got into the plumage.
11175	20090413 204049	14.60075224	144.775471	243.75	6.53	523.04	529.57	could be coming out of the ground.
11178	20090413 204241	14.60086001	144.7755858	245.68	8.46	529.05	537.51	Brimstone is directly upslope with a heading of 245 S/SW. So this vog is coming from about 45 degrees N/NE of brimstone.
11179	20090413 204356	14.60089487	144.7756611	246.13	2.39	530.36	532.75	We are 20m NE of Brimstone and right in this fog. It's coming out of the ground right here somewhere. This is Vogmaker.
11181	20090413 204455	14.60085223	144.7757061	251.13	0.81	532.78	533.59	The plume is coming out of the ground somewhere here. Quite a large plume here.
11183	20090413 204513	14.60085369	144.7756936	246.64	0.74	533.07	533.81	The rock is in our butt cam.
11185	20090413 204615	14.60080363	144.7757161	245.24	4.21	535.27	539.48	It's really thick here. The source still seems to be to the south. We're moving a bit south.
11187	20090413 204745	14.60074961	144.7756435	314.43	1.15	539.56	540.71	Several of the Jason team think that the vent is south of here.
11190	20090413 204936	14.60076599	144.7756361	314.02	3.65	537.01	540.66	We're on the search here.
11194	20090413 205225	14.60081857	144.7756253	325.4	2.44	537.95	540.39	Can't locate the source of this plume.
11196	20090413 205329	14.60079738	144.7756635	319.57	4.41	537.95	542.36	Let's head to the SE and see where the source of the plume is. Lots of smoke in the butt cam.
11199	20090413 205520	14.60068373	144.7757818	328.97	7.58	537.95	545.53	There's lots of smoke wafting by from the west now.
11202	20090413 205711	14.60070137	144.7757511	336.81	5.49	538.39	543.88	Still looking for the source of this smoke. We have some disbelievers in the crows.
11203	20090413 205737	14.60070136	144.7757508	336.93	5.49	538.38	543.87	We're down here now at 540 meters.
11206	20090413 205951	14.60069128	144.7757428	298.55	6.08	538.53	544.61	Smoke is wafting up from all around us. Seems to be just wafting up from the ground.
11211	20090413 210318	14.6006939	144.775725	289.32	2.18	542.04	544.22	Really have not found any finite source of all the smoke we see here. Perhaps it is just wafting out of the ground all over this area.
11212	20090413 210407	14.60069142	144.7757249	293.94	1.91	541.72	543.63	This site does have some shimmering water. We're down at 543m here.
11214	20090413 210439	14.60069327	144.7757244	266.07	2.69	541.72	544.41	Shrimp here but not a huge flow.
11217	20090413 210615	14.60069489	144.7757246	263.96	2.55	541.96	544.51	Have the probe in a crack area there.
11218	20090413 210651	14.60069509	144.7757245	263.53	2.54	541.95	544.49	Temp is 13 in the crack here. Floc on the end of the tube.
11220	20090413 210742	14.60069526	144.7757246	262.79	2.54	541.96	544.5	Gravel seds here. Lots of floc in the holes in the rock.
11222	20090413 210801	14.60069518	144.7757245	262.89	2.55	541.95	544.5	Lots of floc and mat in these cracks.
11226	20090413 211107	14.60069548	144.7757246	262.71	2.54	542	544.54	SAMPLE Fluid 25. Unfiltered piston #8. We are 91 degrees 50m from Brimstone. So pretty much 50m east of .
11228	20090413 211139	14.60069551	144.7757248	263.03	2.51	542.04	544.55	We are getting pulses of increasing and decreasing temperature here. Sort of like the waves of plumage that we see all over here.
11231	20090413 211311	14.60069758	144.7757246	259.36	2.55	542.01	544.56	SAMPLE Fluid 25. j2-407-HFS-25 cont. Stop 211219. Tmax=18.6 avg=13.7 Vol=458. T2=10.
11233	20090413 211442	14.60069787	144.7757246	260.75	2.51	542.04	544.55	SAMPLE Fluid 26. HFS filtered piston #9. Start 211320. j2-407-HFS-26.
11236	20090413 211624	14.60069856	144.7757299	264.55	2.03	542.55	544.58	j2-407-HFS-26 cont. Stop 211549. Tmax=16.2 avg=13.6. Vol=294. T2=10.
11237	20090413 211646	14.60069852	144.7757302	264.98	1.88	542.8	544.68	Stowing the wand and will zip over to Brimstone to take a couple gastights.



Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-407 Logger Comment
11240	20090413 211826	14.60066025	144.7756286	265.07	4.63	534.18	538.81	It is possible that the explosions up top send pulses that emit these sed.
11242	20090413 211952	14.60063981	144.775477	271.1	4.98	526.14	531.12	Now we're coming up the side of the cone. It's building the cone now.
11244	20090413 212100	14.60064768	144.7753928	276.27	4.99	519.36	524.35	Brimstone is just ahead.
11246	20090413 212112	14.60064644	144.7753751	303.82	5.53	519.59	525.12	It's laying on its side. We are approaching
11247	20090413 212146	14.60065752	144.7753554	311.12	2.84	520.86	523.7	Brimstone is right ahead. The plume is advecting to the east.
11249	20090413 212247	14.60065668	144.7753582	315.24	2.94	520.92	523.86	Preparing to take a handheld gastight sample here at Brimstone.
11252	20090413 212424	14.60065627	144.775358	315.63	3.15	520.84	523.99	SAMPLE Gas 27. Gastight with funnel. J2-407-Gastight-27. Brimstone. Depth is 521.7. We're on the S/SE side of the pit. Looking to the N/NW.
11256	20090413 212756	14.60065657	144.7753582	315.74	3.29	520.78	524.07	j2-407-Gas-27. Fired at 212456. Brimstone.
11258	20090413 212851	14.60065737	144.7753584	316.1	3.2	520.82	524.02	The doppler track puts samples 25 and 26 to the east of Brimstone about 40m - not 50m.
11260	20090413 212927	14.60065753	144.7753585	315.93	3.31	520.76	524.07	SAMPLE Gas Sample 27 end. 212911. Brimstone.
11261	20090413 212951	14.60065759	144.7753587	315.88	3.08	520.85	523.93	SAMPLE Gas HDCam has been on for about the last 5 minutes.
11268	20090413 213544	14.60066052	144.7753611	314.4	3.09	520.79	523.88	SAMPLE Gas 28. j2-407-gas-28. Red gastight bottle at Brimstone. Fired 213525.
11269	20090413 213601	14.60066069	144.7753612	314.54	2.95	520.88	523.83	The rocks on the edge of the pit are moving.
11271	20090413 213658	14.6006604	144.7753607	316.69	2.76	521.07	523.83	Jason is doing some housekeeping. Will head to the surface next.
11273	20090413 213755	14.60065701	144.7753662	318.05	4.65	520.25	524.9	Gas is coming out of the rocks. Smoking rock ahead of us. Occasional bubbles.
11275	20090413 213822	14.60065658	144.7753924	284.53	8.88	515.59	524.47	Jason is backing up. Will drop the weight when get away from the vent .
11276	20090413 213827	14.60065492	144.7753884	282.71	9.11	515.18	524.29	HD Video off.
11278	20090413 213924	14.6007087	144.7752106	284.98	4.99	517.62	522.61	J2-407 Data DVDs stop blue set DVDs 060
11279	20090413 213946	14.6007476	144.7751178	286.28	8.35	519.21	527.56	J2-407 DVCAM 047 stop
11281	20090413 214358	14.6008812	144.7749664	289.68	112.64	428.86	541.5	SAMPLE Fluid 29. J2-407-HFS-29. Unfiltered bag#21. For background. Dave will trip it when the pH comes up.
11282	20090413 214601	14.6008732	144.7749804	288.12	151.95	370.65	522.6	J2-407-HFS-29 cont. Stop 214531. pH is 5.4. Starting at 384m.
11283	20090413 214616	14.6008708	144.7749819	287.82	155.83	363.91	519.74	End of dive j2-407.
na	20090413 215213	14.6007969	144.7751347	na	na	180	na	J2-407-HFS-30 background water sample from Butterfield's HFS sample log: Filtered Piston #2-Ti background sw 180m end of dive Tmax=26.6 Tavg=24 vol=501 (not originally logged)
11284	20090413 220029	14.6007969	144.7751347	287.03	badvalue	25.95	badvalue	The water looks pretty foggy this morning.
11285	20090413 220121	14.6007882	144.7751496	285.4	badvalue	3.57	badvalue	Jason is at the surface.
11286	20090413 220812	14.6007406	144.7752752	306.71	badvalue	1.94	badvalue	Medea has been on deck for a while. Missed its touchdown.
11287	20090413 220917	14.6007317	144.7752884	297.54	badvalue	2.03	badvalue	Will film the Jason ascent on HD (Evan).
11288	20090413 221249	14.6007278	144.7753463	14.85	badvalue	0.99	badvalue	JASON on deck

**J2-408 - Deep traverse up landslide chute/Brimstone Observations.** JASON equipped with single-chamber suction sampler, small hydrophone, 2 tephra samplers, 2 gas-tights (one with funnel), shrimp trap, 2 markers, 2 scoops, Niskin, Eh sensor. JASON began dive at 1640m depth, south of Brimstone in landslide chute. Traverse up slope with small zig-zags (heading ~330) in primarily sediments with some outcrops. Viewed mooring site (1480m) with scattered rocks in sediment. Took a rock sample near mooring site. Turned east across slope at 1380m depth encountered areas with more rock than sediment. Alternated between rocky vs. sediment areas during traverse. Turned upslope (heading ~325) into area with large blocks. As moved upslope encountered areas with benthic shrimp, sediment and rock patches. Turned due west and took rock sample (depth 750m) from a rock pile which had intact pillows and rubble. Moved into area of blacker rocks and took another rock sample. Noted more intact pieces of lava in this area. Turned north to Brimstone and took a rock sample (pillow basalt) from the start of a slope. Transit up noted large, intact lavas. Stopped at Brimstone and viewed tephra bucket. Moved to summit rim (Mkr-107) to deploy hydrophone. Deployed small hydrophone and recovered other hydrophone. Left shrimp trap at site. Returned to Brimstone at north side and viewed cone from above then set down on south side looking NW (317deg). JASON conducted engineering tests (~1hr) while making visual

observations of Brimstone. Moved to left with a heading of 055deg. At end of engineering time, took HD with the off-load camera at Brimstone. Had to move vehicle due to white-out and then observed at 248deg with HD off-load camera. Moved north to recover and deploy tephra samplers 5m from vent. Next went back to summit and took HD images of shrimp trap area and left trap deployed at summit. Headed west along summit to observe shrimp. Encountered dense Brimstone plume. Vehicle lost power to a thruster. Returned to summit for video observations of high shrimp concentration area. Left summit for Mrk-103 (Flock Rock) site. Took sample of mat at Mkr-103 and then returned to summit. Recovered shrimp trap. Moved back to Brimstone to take gas-tight samples in the plume. Made visual observations and used off-load camera at vent. Took tephra sample of falling ash from JASON basket. Dive ended at Brimstone.

**Table 6.4-13 JASON Dive J2-408**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-408 Logger Comment
11292	20090414 065638	badnav	badnav	316.86	badvalue	2.57	badvalue	JASON in water
11293	20090414 065913	badnav	badnav	290.35	badvalue	3.36	badvalue	MEDEA in water
11296	20090414 075519	badnav	badnav	261.33	97.84	1499.74	1597.58	Main goals: Deep traverses up landslide chute then summit observations
11297	20090414 075541	badnav	badnav	261.77	142.64	1510.66	1653.3	Tools: Single chamber suction sampler
11298	20090414 075552	badnav	badnav	261.16	139.28	1515.13	1654.41	Other tools: Niskin (manual). Eh sensor.
11299	20090414 075737	badnav	badnav	265.59	92.15	1562.64	1654.79	Basket: Room for hydrophone recovery. Small BProbe hydrophone to be deployed. 1 tephra sampler secured in basket. 2 gastights (one with funnel). Shrimp trap. 2 markers. 2 scoop bags. 1 tephra sampler in starboard swing arm box.
11303	20090414 080523	badnav	badnav	98.17	7.15	1648.38	1655.53	J2-408 start DVD red set 061
11306	20090414 080814	badnav	badnav	334.5	6.11	1648.84	1654.95	JASON on bottom HD not on monitor
11308	20090414 080828	badnav	badnav	334.47	6.35	1648.79	1655.14	Scattered rocks and some ripples
11309	20090414 080839	badnav	badnav	334.3	6.88	1648.67	1655.55	Jason heading is 354
11312	20090414 081022	badnav	badnav	333.45	5.23	1647.32	1652.55	HD cam display in back of van is OK. Main display not showing though.
11313	20090414 081032	badnav	badnav	332.6	4.93	1647.28	1652.21	Jason moving along trackline
11314	20090414 081041	badnav	badnav	334.53	4.51	1647.35	1651.86	Rippled sediment
11317	20090414 081254	badnav	badnav	331.87	6.31	1643.09	1649.4	Coloration changes across the ripples
11319	20090414 081322	badnav	badnav	333.16	5.33	1641.95	1647.28	Complex ripple orientations
11320	20090414 081338	badnav	badnav	333.61	4.81	1641.89	1646.7	Especially around boulders
11321	20090414 081357	badnav	badnav	332.59	5.16	1640.45	1645.61	Change to more uniform coloration
11323	20090414 081459	badnav	badnav	331.91	4.23	1638.78	1643.01	Jason is 3 meters above bottom
11325	20090414 081600	14.5798511	144.7690407	334.72	4.41	1636.59	1641	80-90% fine pyroclastics and rocks
11327	20090414 081706	14.5799432	144.7689947	336.53	3.19	1634.64	1637.83	Sediments scoured around boulder
11329	20090414 081749	14.5799769	144.7689762	336.7	3.68	1633.16	1636.84	Hard to tell if light or dark sediments are on top. Contrasting colors between ripples
11331	20090414 081909	14.5800314	144.7689331	335.24	5.6	1630	1635.6	Ripples everywhere between scattered boulders
11333	20090414 081919	14.5800472	144.7689217	334.19	6.3	1628.71	1635.01	Fish in view
11335	20090414 082025	14.5800693	144.7688864	335.97	3.59	1631.04	1634.63	Dark ash appears to be on top of whiter colored sediment
11337	20090414 082127	14.5801667	144.7688747	333.78	3.36	1627.58	1630.94	Scouring around boulders
11338	20090414 082200	14.580232	144.7688711	338.35	2.91	1625.59	1628.5	Mostly light sediments now
11339	20090414 082214	14.5802642	144.7688547	339.53	3.29	1624.32	1627.61	Ripples are most prominent near rocks
11341	20090414 082306	14.5803497	144.7688067	340.21	3.48	1621.35	1624.83	Mostly larger rocks and fine materials. Not much in-between
11343	20090414 082406	14.5804492	144.7687118	337.99	3.43	1618.84	1622.27	Rock cover has increased
11345	20090414 082502	14.5805353	144.768607	336.59	3.76	1616.47	1620.23	Looks like ripples underneath covered with volcanoclastic fallout
11347	20090414 082519	14.5805693	144.7686045	341.52	2.46	1616.77	1619.23	Rock cover diminishing
11348	20090414 082546	14.5806004	144.7686143	343.49	2.35	1615.82	1618.17	Now almost all fine sediment.
11349	20090414 082557	14.5806133	144.7686116	344.33	2.79	1614.96	1617.75	Rocks are all scoured out around them
11352	20090414 082741	14.5807429	144.7685305	339.66	2.21	1612.02	1614.23	Rocks still sparse

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-408 Logger Comment
11353	20090414 082753	14.5807566	144.7685182	335	2.09	1611.89	1613.98	Amongst finer rippled sediments
11355	20090414 082900	14.5808002	144.7684408	340.74	1.95	1611.4	1613.35	Seems to be a different surface underneath fine dark sediments
11357	20090414 082940	14.5808414	144.7683984	338.35	2	1610.39	1612.39	Larger boulders scattered around are light grey
11358	20090414 082952	14.580856	144.7683987	340.1	1.85	1610.15	1612	Some rocks very vesicular
11360	20090414 083032	14.5808906	144.7684257	346.49	2.39	1608.08	1610.47	Rippled pattern with lighter sediment showing through especially prominent downslope of boulders
11362	20090414 083119	14.5809814	144.7684526	344.8	2.54	1604.2	1606.74	Lighter sediments covered by darker. Ripples all around
11364	20090414 083223	14.5811303	144.7683508	322.4	2.79	1599.43	1602.22	Large rock with deep scour and bi-colored ripples within scour
11365	20090414 083228	14.5811413	144.7683346	323.08	3.38	1599.59	1602.97	Black sand
11367	20090414 083335	14.5811911	144.7681666	329.92	1.76	1602.21	1603.97	Rocks are sometimes sparse
11369	20090414 083420	14.5812541	144.7681869	342.6	2.23	1599.62	1601.85	Going over area mostly void of larger rocks. Black sand and ripples
11370	20090414 083509	14.5813547	144.7681941	346.26	1.98	1596.88	1598.86	Ripples most prominent within and around scour area around larger boulders
11373	20090414 083619	14.5813913	144.7681187	316.45	3.05	1595.56	1598.61	Bright object is a paint thinner can (garbage)
11375	20090414 083739	14.5815323	144.7680332	341.81	2.85	1592.32	1595.17	Area between boulders sometimes smooth but near boulders is scoured out and rippled
11376	20090414 083746	14.5815432	144.7680277	342.33	2.78	1591.84	1594.62	Darker sediment is on surface
11377	20090414 083817	14.5815959	144.7680018	346.41	2.44	1590.63	1593.07	Get the impression that this is fluid flows with rocks mixed in
11379	20090414 083901	14.5816701	144.7679642	343.21	3.56	1587.57	1591.13	Dark sediment appears a bit thicker here
11381	20090414 083958	14.5817497	144.767859	327.93	2.54	1586.37	1588.91	Getting more rocky. Rocks are all larger. Few smaller rocks
11382	20090414 084017	14.5817808	144.7678484	328.96	2.78	1585.54	1588.32	Going over terrain mostly sand with scattered rocks
11385	20090414 084202	14.58197	144.7678172	330.68	2.85	1578.25	1581.1	Sediment still about the same. Fish disturbed by sub
11387	20090414 084259	14.5820405	144.7676745	328.29	2.43	1577.33	1579.76	Mostly black sand with ripples. Light sediment showing through only near boulders
11389	20090414 084323	14.5820753	144.7676678	327.71	2.03	1576.35	1578.38	Sand in between boulders
11390	20090414 084402	14.5821398	144.7676839	336.99	2.51	1573.52	1576.03	Dark fish on bottom spooked by ROV
11392	20090414 084450	14.5821986	144.7676753	339.07	2.79	1571.05	1573.84	Visibility excellent but sediments seem to be stirred up behind sub (aft cam cloudy)
11394	20090414 084531	14.5822747	144.7676728	337.56	3.35	1567.65	1571	Piles of rocks and some individual rocks with rippled black sand in between
11396	20090414 084709	14.5824052	144.7674901	332.72	2.66	1564.63	1567.29	Ripples in black sand and scattered rocks
11398	20090414 084735	14.5824352	144.7674296	332	2.88	1564.18	1567.06	Another black fish on bottom.
11399	20090414 084758	14.5824554	144.7673923	328.91	2.75	1563.81	1566.56	Long white fish seem less spooked by Jason
11401	20090414 084913	14.5825622	144.7674392	333.02	2.18	1559.68	1561.86	Some sets of ripples look like they are cross-cut by other sets of ripples
11403	20090414 084940	14.5825983	144.767439	319.6	2.53	1557.87	1560.4	Red animal scurries along bottom. Looks like it is using 2 legs. Sometimes jumps away/ Still mostly sandy bottom with rocks scattered about. Ripples almost everywhere with disorganized directions
11407	20090414 085242	14.582811	144.7672106	328.97	2.23	1551.97	1554.2	Dark sand seems thicker than at start of dive
11409	20090414 085325	14.5828737	144.7672185	330.02	2.26	1549.51	1551.77	Not so much lighter stuff showing through
11410	20090414 085337	14.5828937	144.7672216	330.71	2.63	1548.3	1550.93	At least one fish in view much of time
11412	20090414 085431	14.5829755	144.7672217	332.64	2.34	1545.54	1547.88	Larger rocks that stick above sediments have interesting ripple patterns around them
11413	20090414 085510	14.5830338	144.7671668	317.97	3.11	1542.98	1546.09	Still mostly sandy sediment with ripples and scattered rocks
11416	20090414 085624	14.5831095	144.7669832	316.73	2.93	1541.87	1544.8	Rocks with scouring around them sometimes have ripples in almost star-shaped pattern around them
11417	20090414 085700	14.5831212	144.7668832	324.9	3.13	1542.3	1545.43	dark sand over lighter sediments that show through ripples near boulders
11420	20090414 085833	14.5833082	144.7668302	333.32	3	1536.38	1539.38	More rocks here
11422	20090414 085936	14.5834239	144.766853	343.3	3.23	1531.75	1534.98	Rocks look vesicular
11423	20090414 085949	14.5834479	144.766855	344.03	3.3	1530.63	1533.93	Depth was about 1650m when started survey. Now at 1527m
11425	20090414 090115	14.5835877	144.7667708	335.97	3.21	1525.83	1529.04	About 200 m from mooring site for 1500m mooring
11428	20090414 090242	14.5837442	144.766646	336.04	2.83	1522.75	1525.58	Bottom looks pretty good for mooring.
11430	20090414 090345	14.5837639	144.7665084	341.61	3.39	1523.22	1526.61	

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-408 Logger Comment
11431	20090414 090414	14.5838087	144.7665088	347.26	3.1	1522.24	1525.34	Still areas of dark sand with scattered rocks. Some clusters of larger rocks
11433	20090414 090437	14.5838414	144.7665395	346.95	2.29	1521.27	1523.56	Ripples most prominent around rock but also evident where rocks are more widely spaced
11434	20090414 090458	14.5838651	144.766561	346.56	2.3	1520.21	1522.51	Rocks have sand deposited on top of them too
11436	20090414 090521	14.5838973	144.7665693	335.75	2.49	1518.81	1521.3	Some rocks are visibly vesicular
11438	20090414 090714	14.5840553	144.7664754	333.59	3.04	1513.65	1516.69	Bottom all very similar with mostly rippled dark sand and scattered rocks. Rocks have sand on top of them.
11441	20090414 090825	14.5841287	144.7663228	335.99	3.41	1513.19	1516.6	Some smaller rocks scattered around sand-dominated places now
11443	20090414 091005	14.5842592	144.7663824	340.35	1.95	1509.54	1511.49	Bottom still rippled sand with occasional rocks.
11445	20090414 091040	14.5843499	144.7663635	326.07	3.35	1505.27	1508.62	Bottom all the same. Now about 100m from 1500m mooring site
11446	20090414 091103	14.5844031	144.7663257	325.43	3.51	1504.05	1507.56	Larger rocks sometimes clustered together
11449	20090414 091235	14.5845722	144.7661706	332.42	3.21	1500.81	1504.02	Rocks with sand and ripples between
11451	20090414 091342	14.5846624	144.7660071	333.6	4.35	1499.9	1504.25	Rock with bright white striations
11452	20090414 091359	14.5846835	144.7659713	338.47	2.88	1501.29	1504.17	Jason flying about 3 meters above bottom
11453	20090414 091404	14.5846906	144.765961	337.16	2.73	1501.33	1504.06	Visibility good
11455	20090414 091455	14.5847697	144.765994	341.7	2.16	1498.86	1501.02	Most common critters are a black fish a white long-tailed fish and the red lobster-looking thing
11457	20090414 091548	14.5848443	144.766031	342.48	2.73	1495	1497.73	Getting closer to mooring site
11460	20090414 091746	14.5849546	144.7658701	344.92	3.59	1493.49	1497.08	Some rocks with prominent scours have ripples in scour area and two prominent ridges oriented down slope from the rock
11462	20090414 091827	14.5850347	144.7658302	333.89	3.48	1491.94	1495.42	Mostly sandy bottom with ripples and occasional rocks
11463	20090414 091844	14.5850706	144.7658231	335.02	3.23	1491.14	1494.37	Sand is all dark grey or black
11465	20090414 091959	14.5852344	144.7658291	342.55	2.85	1486.16	1489.01	Rocks are sometimes clustered together
11467	20090414 092033	14.5853088	144.7658133	336.75	3.61	1483.21	1486.82	Bottom getting rockier
11468	20090414 092050	14.5853303	144.7657731	330.76	3.76	1483	1486.76	Still mostly sand but rick clusters are larger
11470	20090414 092122	14.5853703	144.7656844	335.6	3.71	1483.51	1487.22	Jason going over mooring site
11472	20090414 092230	14.5854972	144.7656267	338.63	2.14	1482.1	1484.24	Bottom is mostly sandy with scattered rocks. Mooring probably won't slide when dropped for deployment but sand may allow it to move if strong flow passes by
11474	20090414 092322	14.585586	144.7655296	324.86	2.31	1480.28	1482.59	Jason heading is still 353. Still moving northwest
11475	20090414 092344	14.5856286	144.7655065	326.73	2.26	1479.57	1481.83	More scattered rocks present
11477	20090414 092445	14.5857271	144.7653924	309.65	3.24	1476.84	1480.08	Mooring site we just went over was the deeper (1500m) one
11479	20090414 092522	14.5858109	144.7653631	327.92	2.88	1475.3	1478.18	Area with more rocks
11480	20090414 092554	14.5858964	144.7653793	338.83	2.78	1472.67	1475.45	One black rock stands out amongst others
11484	20090414 092819	14.5862044	144.7652289	325.76	3.21	1464.68	1467.89	Planning on getting a rock sample when trackline makes turn
11485	20090414 092851	14.5862187	144.7652288	308.64	0.9	1466.25	1467.15	Setting Jason down to grab rock
11487	20090414 092955	14.5862397	144.7652109	319.49	2.64	1464.54	1467.18	SAMPLE Geology 01. Rock from seafloor at 1467 meters just past mooring site
11490	20090414 093214	14.5864585	144.7649608	304.55	1.61	1461.79	1463.4	Jason ploughed up sediment some
11492	20090414 093311	14.5866073	144.7648738	324.21	2.35	1457.61	1459.96	Seeing some darker colored rocks scattered with light grey rocks
11494	20090414 093356	14.5867327	144.7648561	331.92	2.55	1452.66	1455.21	Bottom is still mostly rippled sand with scattered rocks. Some rocks are smaller than before
11497	20090414 093540	14.586915	144.764692	332.54	2.15	1449.02	1451.17	Rocks are sometimes piled up together
11498	20090414 093613	14.5869798	144.7646884	330.25	2.5	1446.4	1448.9	Lasers coming on
11500	20090414 093716	14.5870911	144.7646131	338.07	2.19	1443.75	1445.94	Passing rock stream. Smaller rocks all deposited in a linear stream
11505	20090414 094117	14.5875457	144.7642244	334.42	3.65	1424.79	1428.44	Bottom is still mostly rippled sand with scattered rocks. Includes some smaller rocks now than at start of dive and fewer boulders
11508	20090414 094308	14.5877233	144.7640696	337.53	2.94	1416.75	1419.69	Rocks seem scattered above sand here and more gravelly

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11512	20090414 094525	14.5880085	144.7639893	325.86	2.81	1402.34	1405.15	Rocky areas now including more gravel
11513	20090414 094618	14.5881044	144.7638554	353.91	3.75	1395.54	1399.29	Most rocks seem to be 10-20cm with some larger and some areas with gravel sized
11515	20090414 094633	14.5881227	144.7638115	334.45	2.31	1396.03	1398.34	Ripples and lighter colored sediment showing thorough again
11517	20090414 094722	14.5881896	144.7637681	329.31	2.76	1392.51	1395.27	Bottom seems to be lighter colored sediments now
11520	20090414 094937	14.5883879	144.7636945	308.05	5.35	1381.92	1387.27	Starting the zag back east-turning Jason.
11522	20090414 095040	14.5883807	144.7637675	75.64	2.55	1383.98	1386.53	Heading upslope as Jason zigzags up the flank of NW Rota-1.
11525	20090414 095249	14.5885334	144.7638946	67.34	2.06	1376.11	1378.17	Lasers are still on.
11526	20090414 095310	14.5885541	144.7639689	71.91	2.24	1373.96	1376.2	ASNAPS are working fine.
11527	20090414 095318	14.5885581	144.7639919	73.87	2.2	1373.44	1375.64	Lots of sediment here.
11530	20090414 095440	14.5886196	144.764204	79.25	1.98	1368.94	1370.92	Not much outcrop-lots of sediment.
11531	20090414 095451	14.5886301	144.7642149	86.05	2.6	1367.63	1370.23	Fine-grained sand.
11534	20090414 095626	14.5888033	144.7642874	94.4	1.1	1360.31	1361.41	Definitely steeper here.
11535	20090414 095652	14.5888412	144.7643578	91.39	1.04	1358.44	1359.48	J2-408 DVCAM 048 start
11536	20090414 095712	14.5888624	144.7643884	94.55	1.35	1356.85	1358.2	Can see Medea lights in aft cam.
11538	20090414 095721	14.5888683	144.7643895	69.66	2.31	1356.12	1358.43	Big fish.
11539	20090414 095814	14.5889402	144.7645147	64.1	3.6	1351.38	1354.98	A bit more rubble here.
11541	20090414 095826	14.5889655	144.7645635	65.89	2.8	1351.14	1353.94	More rocks and less sediment.
11543	20090414 095932	14.5889802	144.7647228	66.59	4.03	1349.77	1353.8	We are 2km from the vent (Brimstone) and at 1350m depth.
11545	20090414 100024	14.5889695	144.7648413	75.7	2.36	1352.61	1354.97	J2-408 Data DVDs start blue set 62
11546	20090414 100115	14.588957	144.7649556	74.88	1.64	1354.83	1356.47	Back in more sediment with a few blocks of rubble.
11549	20090414 100242	14.5890018	144.7650881	74.58	2.1	1352.53	1354.63	Some particles floating around (some look to be swimming).
11550	20090414 100249	14.5890099	144.765109	74.24	1.94	1352.25	1354.19	Big-long fish.
11551	20090414 100257	14.5890099	144.7651358	76.14	2.13	1352.11	1354.24	Sand
11553	20090414 100419	14.5889783	144.7653396	72.24	1.59	1355.13	1356.72	Some very white rocks on seafloor (they don't look like garbage as first thought).
11555	20090414 100440	14.5890142	144.7653462	73.54	2.53	1352.6	1355.13	Sand everywhere.
11557	20090414 100531	14.5890462	144.7654386	75.2	2.14	1351.28	1353.42	J2-408 Data DVDs stop red set 61
11558	20090414 100609	14.5889834	144.7655325	73.55	3	1353.32	1356.32	Lots of ripples-shrimp with very long antenna (pelagic).
11560	20090414 100707	14.5889565	144.7656138	74.01	1.75	1355.59	1357.34	Fish.
11563	20090414 100847	14.5890606	144.7658425	74.01	2.91	1348.21	1351.12	A few more rocks but still mostly sand.
11565	20090414 101000	14.5890635	144.7659895	74.83	1.74	1347.97	1349.71	Shrimp and sand.
11566	20090414 101017	14.5891032	144.766003	72.99	2.48	1345.47	1347.95	Another shrimp.
11569	20090414 101135	14.5892197	144.7661508	74.18	2.8	1338.46	1341.26	Sand-sand-sand.
11570	20090414 101158	14.5892456	144.7662236	74.25	3.14	1336.11	1339.25	A pile of rocks! (with sand)
11571	20090414 101214	14.589264	144.7662736	73.96	2.26	1335.39	1337.65	Just a bit of rubble but now getting back into pure sand.
11574	20090414 101346	14.5893226	144.766457	74.41	2.35	1330.29	1332.64	Some rocks-blocky rocks-even some with white.
11576	20090414 101421	14.5892707	144.76655	74.21	2.5	1330.99	1333.49	Back to sand.
11577	20090414 101443	14.5892347	144.7666092	74.31	1.7	1332.44	1334.14	Shrimp.
11578	20090414 101501	14.5892083	144.7666602	75.58	2.09	1332.4	1334.49	Some bigger blocks.
11579	20090414 101517	14.5892188	144.7666957	73.87	2.74	1330.97	1333.71	Big rock-block.
11581	20090414 101535	14.5892537	144.7667098	74.86	2.71	1329.35	1332.06	Cracks -smashed in place.
11583	20090414 101624	14.5893079	144.7668343	74.81	2.53	1325.73	1328.26	All sand again.
11584	20090414 101643	14.5893311	144.7668782	74.23	1.69	1325.2	1326.89	Medea got a little low..28m.
11586	20090414 101750	14.589481	144.766917	74.96	1.76	1318.18	1319.94	Some big boulders but mainly and.
11587	20090414 101754	14.5894806	144.7669267	75.75	1.88	1317.88	1319.76	Fish.
11588	20090414 101812	14.5894581	144.7669738	74.3	2.76	1317.6	1320.36	Fish.
11590	20090414 101835	14.5894372	144.7670605	77.49	2.18	1317.77	1319.95	Shrimp.

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11591	20090414 101852	14.5894213	144.7671207	76.17	2.68	1317.22	1319.9	Seeing a few long-antenna shrimp (loners).
11592	20090414 101902	14.5894121	144.7671581	77.86	2.64	1316.84	1319.48	More pieces of rocks in the sand.
11594	20090414 102007	14.5894373	144.7673575	74.47	2.05	1313.39	1315.44	Rocks on top of sand.
11596	20090414 102053	14.5895399	144.7674158	72.41	2.05	1308	1310.05	Monotonous.
11598	20090414 102156	14.5896722	144.7675821	73.15	2.04	1299.35	1301.39	A few more rocks in the sand.
11599	20090414 102203	14.5896847	144.7676015	72.29	2.5	1297.88	1300.38	Coarser.
11601	20090414 102241	14.5896508	144.7677272	74.04	3	1296.95	1299.95	Bumped a boulder.
11602	20090414 102317	14.5896268	144.7678398	75.59	2.91	1296.17	1299.08	Just skimming the rocks.
11604	20090414 102352	14.5895742	144.767914	74.1	2.98	1296.71	1299.69	More sand again.
11606	20090414 102433	14.5896289	144.7679751	73.06	3.31	1293.14	1296.45	Missed a shrimp.
11608	20090414 102530	14.5897353	144.76812	72.49	3.56	1286.01	1289.57	Long fish.
11609	20090414 102558	14.5898019	144.7681505	72.96	2.14	1284.16	1286.3	A couple of boulders.
11610	20090414 102610	14.5898261	144.7681633	73.02	2.26	1282.93	1285.19	Medea a little low again.
11612	20090414 102634	14.5898513	144.7682328	77.52	3.15	1279.52	1282.67	Fish.
11613	20090414 102700	14.5898668	144.7683351	77.96	2.91	1277.24	1280.15	Back in the flat sediment (not the pronounced ripples as before but some)
11616	20090414 102857	14.5898675	144.7686081	76.4	2.34	1271.82	1274.16	Big boulders.
11618	20090414 102958	14.5899641	144.7687057	78.15	1.81	1266.11	1267.92	More sand-getting close.
11620	20090414 103026	14.5899696	144.7687847	78.72	2.38	1263.73	1266.11	Rubble-rough broken rocks.
11621	20090414 103034	14.5899702	144.7688095	78.26	2.78	1262.63	1265.41	fish.
11622	20090414 103112	14.5899008	144.7689177	78.92	3.69	1262.23	1265.92	A bit more rock.
11624	20090414 103126	14.5898736	144.768965	79.54	3.64	1262.09	1265.73	Slightly more rock.
11625	20090414 103200	14.5899065	144.7690294	79.25	2.29	1260.97	1263.26	Rocks all look like the same stuff (almost the same size).
11627	20090414 103247	14.5899925	144.7691057	86.3	1.99	1256.33	1258.32	Long eels.
11628	20090414 103308	14.5900182	144.7691546	85.31	1.6	1254.67	1256.27	Some fish (dispersed).
11630	20090414 103326	14.5900455	144.769188	84.22	2.65	1252.28	1254.93	Vertical fish.
11631	20090414 103342	14.5900784	144.769221	84.97	2.15	1251.08	1253.23	More rocks (some big ones)
11632	20090414 103413	14.5901341	144.7692771	89.73	1.8	1248.04	1249.84	Bigger pieces.
11635	20090414 103529	14.5901986	144.7694567	77.62	2.99	1241.05	1244.04	Going to stop the little zigzags and more straight traverse across.
11636	20090414 103537	14.5902061	144.7694884	77.33	3.39	1239.72	1243.11	Lots ore rocks and little sediment.
11637	20090414 103553	14.5902201	144.7695472	78.22	4.36	1236.33	1240.69	All rocks (that is more rocks).
11638	20090414 103611	14.5902383	144.7696213	77.32	3.8	1233.89	1237.69	Didn't last long-more sand with the rocks.
11640	20090414 103633	14.5902622	144.7697172	77.04	2.74	1231.9	1234.64	More rubble again with less sand.
11641	20090414 103644	14.5902719	144.7697547	76.97	3.69	1230.04	1233.73	In the middle of the line-more rocks.
11642	20090414 103654	14.5902795	144.7697924	77.72	3	1229.11	1232.11	Narrow patches-not very wide.
11643	20090414 103713	14.5902957	144.7698569	75.91	2.68	1226.92	1229.6	Out of it again and back in the sand.
11644	20090414 103719	14.5902994	144.7698684	77.08	2.76	1226.47	1229.23	That is sand.
11647	20090414 103826	14.5903352	144.7699989	73.95	2.2	1223.65	1225.85	Approaching rock patch.
11648	20090414 103859	14.5903441	144.7700501	73.71	2.66	1221.26	1223.92	Rubble patch.
11649	20090414 103917	14.5903608	144.7700571	73.22	2.8	1220.38	1223.18	Cool rock (almost looks like pillow rubble or layered some how).
11651	20090414 103935	14.5903533	144.7700839	72.42	3.19	1219.47	1222.66	Rounder shapes.
11652	20090414 103948	14.5903612	144.7701107	73.73	2.58	1218.62	1221.2	But now back into angular pieces.
11653	20090414 104006	14.5903725	144.7701569	73.3	2.49	1217.76	1220.25	Sand and rocks.
11654	20090414 104017	14.5903786	144.7701851	73.93	2.51	1217.12	1219.63	Shrimp.
11656	20090414 104042	14.5903949	144.7702461	73.48	2.88	1214.99	1217.87	Rubble and little sand.
11658	20090414 104135	14.5904303	144.7703844	73.27	2.99	1210.36	1213.35	Lots of rubble with med-large pieces.
11659	20090414 104157	14.5904267	144.7704266	70.57	2.84	1209.51	1212.35	Some darker sand between rocks.

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11661	20090414 104238	14.5904353	144.7705385	74.34	3.5	1206.2	1209.7	Deeper rock layer.
11662	20090414 104308	14.5904689	144.770649	73.43	3.74	1202.42	1206.16	These rocks look extrusive.
11664	20090414 104320	14.5904843	144.7706956	73.76	3.24	1201.45	1204.69	Same shape as seen at Brimstone.
11665	20090414 104330	14.5904941	144.770727	73.25	2.79	1200.84	1203.63	More dark sediment between rocks.
11666	20090414 104348	14.5904988	144.7707503	73.75	2.56	1200.45	1203.01	That is a piece of lobate in the rubble.
11668	20090414 104455	14.5905293	144.7708409	73.92	2.53	1197.56	1200.09	Rocks.
11669	20090414 104510	14.5905425	144.7708874	73.51	2.78	1196.18	1198.96	Rocks shedding from the top.
11671	20090414 104607	14.5906009	144.7710503	71.82	2.55	1191.37	1193.92	Some sediment patches between the rubble and increasing sediment (dark) here.
11673	20090414 104656	14.5906209	144.771078	72.75	2.86	1190.04	1192.9	None of the white rocks seen in this rubble.
11675	20090414 104731	14.590649	144.7711797	73.66	2.26	1187.63	1189.89	Bigger sediment patches.
11676	20090414 104745	14.5906639	144.771233	73.53	2.06	1186.67	1188.73	Back into rubble.
11677	20090414 104753	14.5906704	144.7712568	72.14	2.26	1185.98	1188.24	Lots of rocks here.
11679	20090414 104851	14.5907119	144.7714211	73.62	2.14	1182.1	1184.24	More sedimentation on these rocks.
11681	20090414 104941	14.5907252	144.7715149	73.83	1.7	1180.7	1182.4	Smaller pieces of rock.
11683	20090414 105050	14.5907344	144.7716385	73.56	2.19	1178.81	1181	Lots more sand.
11685	20090414 105128	14.5907441	144.771719	73.83	1.78	1177.91	1179.69	But still rocks (with sediment)
11686	20090414 105140	14.5907471	144.7717455	73.67	1.89	1177.43	1179.32	Coming to an edge with all sand now.
11687	20090414 105157	14.5907514	144.7717856	73.89	1.78	1176.83	1178.61	Coming to the edge of the shoot.
11689	20090414 105228	14.5907577	144.7718647	72.97	2.26	1175.05	1177.31	Edge of now an edge of rock.
11690	20090414 105318	14.5908016	144.7719499	71.94	1.43	1173.29	1174.72	Sand spreading onto rock.
11692	20090414 105345	14.5908355	144.7719857	71.1	2.66	1170.34	1173	More rocks again.
11693	20090414 105412	14.5908701	144.7720326	71.03	2.25	1168.29	1170.54	Abrupt edge of sand and rubble pile.
11695	20090414 105456	14.5909305	144.7721271	70.81	2.65	1164.26	1166.91	More rock.
11696	20090414 105511	14.5909496	144.772169	71.09	3.08	1162.35	1165.43	More sand.
11698	20090414 105606	14.5909973	144.7723651	72.97	2.43	1158.08	1160.51	Some large pieces of rock.
11700	20090414 105659	14.5910131	144.7725346	73.3	2.28	1154.61	1156.89	More rock.
11701	20090414 105714	14.5910148	144.7725706	74.06	2.31	1153.73	1156.04	Patches of rocks in the sand (dispersed).
11704	20090414 105821	14.5910132	144.772266	74.18	1.96	1151.86	1153.82	Shrimp (big).
11705	20090414 105834	14.5910091	144.7726529	73.93	2.2	1152.01	1154.21	Rocks and sand as we prepare to turn left upslope.
11706	20090414 105857	14.5910147	144.7726568	77.16	2.66	1151.23	1153.89	Shrimp is at least 10cm.
11707	20090414 105915	14.5910197	144.7727016	65.69	2.63	1150.49	1153.12	Rocks and sand.
11709	20090414 105951	14.5910322	144.7728184	76.17	3.48	1146.32	1149.8	More rock than sand again.
11710	20090414 110008	14.5910425	144.7728883	70.6	3.09	1145.16	1148.25	Couple of large boulders.
11712	20090414 110054	14.5911212	144.7729759	55.52	3.14	1140.62	1143.76	More rocks in a patch.
11714	20090414 110141	14.5911445	144.7731341	72.25	3.03	1136.03	1139.06	Rock patch again.
11716	20090414 110240	14.5911421	144.7731471	70.19	4.54	1134.65	1139.19	Just finished a run of Dara piloting.
11717	20090414 110256	14.5911645	144.7731511	76.14	3.08	1134.59	1137.67	Tito is back giving instruction to Kathy Cashman on piloting.
11719	20090414 110348	14.5912158	144.7732243	82.38	2.83	1130.53	1133.36	Changing heading to 329.
11720	20090414 110357	14.5912179	144.7732372	84.45	3.98	1128.91	1132.89	Going up a larger rubble patch.
11722	20090414 110440	14.5912323	144.773294	82.65	4.81	1127.07	1131.88	Kathy Cashman is piloting Jason.
11724	20090414 110522	14.5912319	144.7733668	77.85	4.26	1126.23	1130.49	Still driving 079.
11725	20090414 110529	14.5912411	144.7733764	77.21	4.31	1125.62	1129.93	Shrimp.
11726	20090414 110554	14.5912619	144.7734306	82.03	2.91	1124.52	1127.43	Slow down pilot Kathy.
11727	20090414 110611	14.5912655	144.7734142	82.01	4.4	1123.32	1127.72	Lots of sediment here.
11729	20090414 110707	14.5913055	144.773386	323.15	4.58	1122.26	1126.84	Jason turning left.
11731	20090414 110754	14.5913934	144.7732393	325.69	4.36	1121.18	1125.54	Some large blocks as we drive upslope at 323 (all rock)

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11733	20090414 110914	14.5915771	144.7730248	322.69	4.31	1116.79	1121.1	See some sediment patches bound with smaller sized rocks and large boulders in patches.
11736	20090414 111100	14.5917018	144.7729181	337.34	4.84	1112.86	1117.7	Excellent pilot going up rocky slope-no in place outcrops.
11738	20090414 111211	14.5917587	144.7728758	330.94	4.81	1110.96	1115.77	Large pieces of rock piled thick.
11739	20090414 111219	14.5917697	144.7728624	333.81	4.68	1110.54	1115.22	Fish.
11742	20090414 111354	14.5919422	144.7727395	333.31	5.29	1105.14	1110.43	Some large boulders.
11743	20090414 111410	14.5919722	144.7727241	332.55	4.7	1103.96	1108.66	Some large boulders (with correct spelling)
11747	20090414 111628	14.5922336	144.7726041	332.26	4.73	1094.13	1098.86	Lots of sediment in between angular rocks.
11748	20090414 111719	14.5923261	144.7725414	332.13	4.73	1090.11	1094.84	Some white patches.
11752	20090414 111933	14.5925835	144.7724162	332.62	3.7	1079.22	1082.92	More rock than sediment.
11753	20090414 111940	14.592598	144.7724046	332.96	4.36	1078.05	1082.41	Seeing some stained rock.
11756	20090414 112149	14.5928831	144.7722518	331.97	4.44	1066.04	1070.48	More rock and less sediment.
11758	20090414 112257	14.593011	144.7721926	332.39	4.93	1059.97	1064.9	Floating shrimp.
11760	20090414 112351	14.5931213	144.7721456	332.09	5.14	1054.53	1059.67	Smaller pieces of rock in a down chute.
11762	20090414 112423	14.5931867	144.7721112	331.93	4.61	1052.68	1057.29	More sediment.
11763	20090414 112435	14.5932232	144.7720921	332.3	4.85	1051.09	1055.94	All sediment again.
11764	20090414 112502	14.5932818	144.772043	329.46	4.84	1049.29	1054.13	Edge of rock-sand.
11766	20090414 112551	14.5933809	144.7719519	331.81	5.13	1044.59	1049.72	Sand sweeping downslope.
11768	20090414 112706	14.593525	144.7718544	330.35	5.09	1039.55	1044.64	More white in rock patches.
11769	20090414 112716	14.5935527	144.7718358	330.94	5.21	1038.86	1044.07	Now running out of rock again.
11771	20090414 112751	14.593621	144.771781	331.7	5.56	1037.19	1042.75	Jason shift change.
11772	20090414 112756	14.593625	144.7717774	331.58	5.58	1036.94	1042.52	Kathy releasing control.
11775	20090414 112927	14.5937409	144.7717498	332.31	5.45	1032.25	1037.7	Shrimp
11776	20090414 112944	14.5937817	144.7717352	334.8	5.93	1029.99	1035.92	Scott is pilot; John navigator; Will engineer.
11777	20090414 113013	14.5938441	144.7717027	335.5	6.1	1026.87	1032.97	Cruising up the slope.
11779	20090414 113059	14.5939635	144.7716771	338.61	5.05	1022.29	1027.34	No intact rock.
11782	20090414 113230	14.5941389	144.7716194	338.97	5.55	1013.77	1019.32	Up the talus slope approaching the mooring site. Big boulders on top of regular boulders.
11783	20090414 113248	14.5941811	144.7716004	341.81	4.54	1012.47	1017.01	Approx. 100m to the mooring target.
11785	20090414 113333	14.594295	144.7715611	342.98	4.35	1007.16	1011.51	Uniform sized rocks with big boulders. Edge of rock sand.
11786	20090414 113338	14.5943151	144.7715534	339.25	4.16	1006.61	1010.77	More sand sweeping down.
11787	20090414 113347	14.5943404	144.7715421	341.05	3.41	1006.08	1009.49	Mainly fine sand again.
11788	20090414 113355	14.5943597	144.771531	340.21	3.33	1005.15	1008.48	fish.
11789	20090414 113401	14.5943723	144.7715252	344.1	3.3	1004.38	1007.68	Shrimp.
11790	20090414 113414	14.5943942	144.7715157	338.27	3.83	1002.64	1006.47	Edge of fine sized rock (small patch)
11792	20090414 113511	14.5944914	144.7714498	329.28	3.28	999.01	1002.29	Some yellow around a rock (crust that fell off?)
11794	20090414 113605	14.5945771	144.7713756	329.6	4.19	994.11	998.3	Some big boulders in the sand with scattered rocks.
11796	20090414 113654	14.5946607	144.7713199	331.52	5.14	989.21	994.35	2003 map is showing 1050m and we are at 990m (it has filled in since 2003).
11797	20090414 113704	14.5946701	144.771317	331.96	6.03	988.04	994.07	Long fish/eel.
11798	20090414 113711	14.5946972	144.7713054	333.09	4.88	988.1	992.98	Scattered boulders in sand.
11800	20090414 113813	14.5948946	144.7712198	330.09	4.88	979.49	984.37	Mainly sand.
11803	20090414 113924	14.5950947	144.7710799	328.14	4.23	974.46	978.69	Lots of sand.
11805	20090414 114044	14.5952664	144.7709785	328.98	4.74	969.18	973.92	A few large boulders sitting in the sand with pieces sheared off.
11807	20090414 114147	14.5953301	144.7709348	327.15	3.71	968.43	972.14	This is the mooring spot. It is 970m not 1000m. Sandy slope with some boulders.
11808	20090414 114210	14.5953501	144.7709188	325.42	3.63	967.95	971.58	30m shallower.
11810	20090414 114241	14.5954039	144.7708748	326.38	4.21	965.48	969.69	Fish.



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11811	20090414 114300	14.5954398	144.7708375	322.86	4.28	964.88	969.16	Narrow chute of sand between rocks.
11813	20090414 114344	14.595549	144.7707688	327.84	3.41	962.46	965.87	White staining in some rocks here.
11815	20090414 114456	14.5957542	144.7706417	326.62	4.43	956.27	960.7	More sand here.
11816	20090414 114503	14.5957704	144.7706365	327.76	3.9	956.06	959.96	Still a fair amount of rocks.
11818	20090414 114606	14.5959311	144.7705401	329.09	3.88	951.69	955.57	Line of rocks. with sediment in patches.
11819	20090414 114619	14.5959841	144.7705127	327.99	3.89	950.34	954.23	Much more sediment here.
11822	20090414 114752	14.5962682	144.7703527	326.34	5.09	941.18	946.27	Patchy white rocks within boulders in a chute.
11824	20090414 114827	14.5963781	144.7703097	332.87	4.55	936.75	941.3	Back in sand with some smaller rocks.
11825	20090414 114908	14.5964624	144.7702663	330.39	5.08	932.56	937.64	A few larger angular rocks in the sand.
11827	20090414 114932	14.5964576	144.770255	308.72	4.89	932.68	937.57	Going to angle over left to see the sonar target.
11828	20090414 115005	14.5964854	144.7701721	308.88	3.73	934.5	938.23	First outcrop in 2 hours.
11829	20090414 115016	14.5964904	144.7701518	325.36	4.89	934.11	939	Large pieces of in place lava.
11831	20090414 115115	14.5965598	144.7700983	338.49	4.23	929.66	933.89	Heavily sedimented outcrop and outcrop itself is not large.
11833	20090414 115131	14.596594	144.7700903	320.2	2.89	928.63	931.52	Don't see much more outcrop in sonar.
11834	20090414 115146	14.5966011	144.7700775	317.66	3.44	927.54	930.98	Heading back upslope.
11835	20090414 115201	14.5966123	144.7700365	311.81	3.48	927.14	930.62	Shrimp swimming by.
11836	20090414 115220	14.5966355	144.7700058	312	3.36	926.18	929.54	Angular boulders. Steep slope.
11839	20090414 115333	14.5968415	144.7699036	330.34	6	911.56	917.56	Much more sediment here.
11841	20090414 115427	14.5970572	144.769807	333.21	5.66	898.59	904.25	Increasing rock in sand.
11842	20090414 115433	14.5970683	144.769802	332.85	5.48	897.7	903.18	Back to mainly sand.
11843	20090414 115518	14.5970833	144.7698022	334.06	6.34	895.87	902.21	There is a small ground in the arm camera so it is turned off until we get to where we want to use it.
11846	20090414 115659	14.5972694	144.7697212	333.89	5.45	884.95	890.4	Small yellow patches of staining around a few rocks.
11848	20090414 115748	14.5973711	144.769657	334.62	4.83	880.23	885.06	More rocks again.
11851	20090414 120008	14.5976789	144.7693912	343.55	4.31	864.36	868.67	More sandy again. Eels and shrimp
11853	20090414 120032	14.5977184	144.7693659	343.76	3.7	862.48	866.18	Lots of small black rocks
11855	20090414 120157	14.5978464	144.7692701	344.72	4.21	853.8	858.01	eel
11856	20090414 120220	14.5978828	144.7692469	341.8	5.48	848.89	854.37	Larger whiter blocks.
11858	20090414 120227	14.5978898	144.7692418	341.81	5.11	848.45	853.56	Slope is steeper here.
11859	20090414 120244	14.5979037	144.7692274	342.48	5.5	847.23	852.73	Slope angled up more towards port side too.
11860	20090414 120255	14.5979206	144.7692154	344.32	6.1	845.66	851.76	Eel.
11862	20090414 120334	14.597978	144.7691819	345.28	3.05	844.36	847.41	Steep sedimented slope.
11863	20090414 120343	14.5979901	144.7691745	345.99	3.44	843.41	846.85	Yellow colored sand.
11864	20090414 120405	14.5980247	144.7691673	358.17	5.69	838.7	844.39	Some ripples in the sand.
11866	20090414 120423	14.5980572	144.769157	13.33	5.51	836.67	842.18	turned right to head across east.
11867	20090414 120427	14.5980627	144.7691554	14.97	5.55	836.32	841.87	Large round boulder.
11868	20090414 120520	14.5981066	144.7691461	2.93	3.3	835.35	838.65	J2-408 Data DVDs start red set 63 at 11:54
11870	20090414 120539	14.5981064	144.7691462	7.04	2.74	835.92	838.66	J2-408 Stop DVCAM 048 and start DVCAM 049 at 11:56
11871	20090414 120549	14.5981007	144.7691428	3.53	3.43	835.84	839.27	Long-antenna shrimp on rock.
11872	20090414 120612	14.598113	144.7691343	4.26	4.54	833.76	838.3	J2-408 Data DVDs stop blue set 62 at 11:59
11874	20090414 120627	14.5981232	144.7691014	16.51	3.73	833.9	837.63	Heading 004 yellow sediment and black rocks.
11875	20090414 120648	14.5981112	144.7690611	86.3	2.01	834.88	836.89	Making the turn to the east.
11876	20090414 120711	14.5981093	144.7690625	96.1	0.96	835.84	836.8	Looks the same.
11878	20090414 120724	14.5981083	144.7690712	97.08	0.76	836.14	836.9	Sediment (yellow) and rocks with a shrimp here and there.
11880	20090414 120833	14.5981081	144.7690742	95.32	0.78	836.26	837.04	Close-up of shrimp on sci cam.
11881	20090414 120915	14.5981035	144.7691296	95.55	2.61	834.35	836.96	Very steep slope.

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11884	20090414 121037	14.598098	144.7691977	84.94	2.41	835.05	837.46	White patch on rock and another with a white band.
11887	20090414 121242	14.5980891	144.7692939	85.51	2.25	835.03	837.28	All settled up with ship
11888	20090414 121254	14.5980876	144.769312	85.78	3.45	835.29	838.74	Rocks and sediment.
11891	20090414 121446	14.5980789	144.7694036	85.39	3.64	836.36	840	Depth at turn is 836m as we are still sitting here.
11893	20090414 121612	14.5980737	144.7694589	85.54	3.04	837.22	840.26	Depth reading on Jason is corrected to the bottom of the frame. The bottom of the basket is within 10cm of that.
11896	20090414 121815	14.5980594	144.7696147	85.07	2.08	837.46	839.54	Depth calculated from pressure at 30deg latitude.
11898	20090414 121828	14.5980579	144.7696311	85.28	1.89	837.26	839.15	Altimeter is on the port aft of Jason.
11899	20090414 121841	14.5980564	144.7696476	85.57	2.66	836.21	838.87	Close-up view of the rocks with the sediment.
11900	20090414 121910	14.5980526	144.7696842	84.66	2.54	834.88	837.42	Some of these rocks may be outcrop.
11902	20090414 121931	14.5980493	144.7697046	83.82	2.33	835.67	838	Very steep-almost wall like.
11903	20090414 121936	14.5980493	144.769703	83.5	2.16	835.56	837.72	Bump.
11905	20090414 122021	14.5980539	144.7697891	83.45	3.53	830.87	834.4	White bands in rocks.
11906	20090414 122038	14.5980556	144.7698348	83.37	3.3	829.93	833.23	Thicker rubble with less staining.
11907	20090414 122116	14.5980443	144.7698729	90.48	3.44	830.16	833.6	Looks like an edge of a debris ridge.
11909	20090414 122141	14.5980259	144.7699516	90.36	1.1	833.7	834.8	Passed over ridge and more sediment on other side.
11912	20090414 122336	14.5979779	144.7701898	90.3	2.34	841.63	843.97	Steep slope with sand and rocks (some with white banding).
11915	20090414 122522	14.5979338	144.7702734	89.18	2.25	845.9	848.15	Can see Medea in aft camera.
11916	20090414 122527	14.5979305	144.7702852	89.38	2.51	846.49	849	More sediment-less rock.
11917	20090414 122533	14.597928	144.7702985	89.4	2.44	847.12	849.56	Long fish.
11919	20090414 122655	14.5978882	144.7704371	90.58	1.56	851.67	853.23	A few more fish around here.
11920	20090414 122701	14.5978874	144.7704396	89.95	1.5	851.78	853.28	Fish facing upslope.
11922	20090414 122756	14.5978875	144.7704979	87.83	1.46	851.71	853.17	Very little rock here.
11924	20090414 122822	14.5978866	144.7705362	88.03	1.28	851.78	853.06	Shrimp.
11926	20090414 122924	14.5978858	144.7706303	87.48	1.88	850.36	852.24	Some bigger boulders in the sand.
11927	20090414 123002	14.5978861	144.7706912	87.1	1.95	849.44	851.39	A large white rock.
11929	20090414 123101	14.5978854	144.7707838	87.36	1.88	848.11	849.99	Long fish/eel.
11931	20090414 123121	14.597885	144.7708149	87.8	2.16	847.3	849.46	Another fish and a shrimp.
11932	20090414 123205	14.597884	144.7708964	87.57	2.34	845.15	847.49	More rubble rock and less sediment.
11933	20090414 123215	14.5978837	144.7709172	88.8	2.14	844.73	846.87	Shrimp.
11935	20090414 123252	14.5978834	144.7710029	87.15	2.16	842.84	845	Don't see these shrimp on the top.
11936	20090414 123256	14.5978831	144.7710126	88.07	2.23	842.65	844.88	More sediment.
11938	20090414 123322	14.5978824	144.7710795	86.9	2.29	840.87	843.16	white blocks in the mainly black boulders.
11940	20090414 123439	14.5978804	144.771128	87.17	2.51	835.93	838.44	Pillow bud in rubble.
11941	20090414 123453	14.5978806	144.7713159	87.6	2.64	834.76	837.4	Steep.
11942	20090414 123505	14.5978798	144.7713481	85.48	2.78	833.96	836.74	Rocks in chutes with occasional big boulder.
11944	20090414 123603	14.597872	144.7714925	91.08	3.78	828.64	832.42	A few round pieces. Broken tube.
11947	20090414 123732	14.5978554	144.7717228	89.8	3.55	820.72	824.27	Sand-steep.
11948	20090414 123741	14.5978532	144.7717475	89.88	3.86	819.78	823.64	Fish.
11950	20090414 123906	14.597833	144.7720023	89.58	4.51	809.76	814.27	More rock.
11953	20090414 124049	14.5978118	144.772309	90.54	4.81	798.75	803.56	Sand-rock-steep.
11954	20090414 124104	14.5978095	144.7723475	90.42	4.75	797.52	802.27	Still heading east.
11956	20090414 124203	14.5977994	144.7725003	90.86	3.6	794.02	797.62	Bit more rock and less sediment (rock pieces small).
11959	20090414 124334	14.5977861	144.7727363	92.15	3.61	790.12	793.73	One pillow piece in talus.
11961	20090414 124457	14.5977907	144.7729834	89.79	2.06	788.71	790.77	Some pieces that may be intact.
11964	20090414 124635	14.5977473	144.7732601	75.74	3.36	782.49	785.85	Eel.

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11965	20090414 124640	14.5977488	144.773272	75.25	4.39	781.43	785.82	Big rock.
11966	20090414 124656	14.5977521	144.7733103	77.49	6.5	778.15	784.65	Rock pile.
11968	20090414 124747	14.5977704	144.7734368	79.47	4.31	773.92	778.23	Some rounder boulders but mainly angular.
11969	20090414 124756	14.5977708	144.7734683	77.07	4.06	773.14	777.2	Intact pillow lava.
11970	20090414 124759	14.5977699	144.7734787	76.81	4.36	772.86	777.22	And rubble.
11972	20090414 124846	14.59777	144.7736411	78.66	3.98	769.94	773.92	Rubble.
11973	20090414 124848	14.5977699	144.7736443	78.81	4.16	769.67	773.83	Jelly.
11974	20090414 124903	14.5977703	144.7736988	78.38	3.56	768.36	771.92	Thick piles of rock with some pillow forms.
11976	20090414 124951	14.5977686	144.7738232	57.73	2.36	769.49	771.85	Going to stop here for a rock sample in the rubble pile.
11977	20090414 125006	14.5977691	144.7738282	50.99	2.1	769.89	771.99	Rocks do have dusting of sediment.
11979	20090414 125036	14.5977692	144.7738281	52.77	2.05	769.91	771.96	Long antenna shrimp.
11980	20090414 125042	14.5977693	144.7738282	51.68	2.09	769.88	771.97	Two shrimp
11981	20090414 125048	14.5977693	144.773828	51.71	2.1	769.86	771.96	Arm keeps sticking.
11982	20090414 125054	14.5977693	144.773828	52.18	2.08	769.88	771.96	Low voltage on arm.
11984	20090414 125136	14.5977696	144.7738287	50.8	2.09	769.84	771.93	SAMPLE Geology 2: Rock from east traverse in rubble pile.
11989	20090414 125413	14.5978638	144.7742505	96.73	4.11	749.04	753.15	Flow edge.
11990	20090414 125418	14.5978626	144.7742632	97.56	5.36	748.06	753.42	Pillow exposed.
11992	20090414 125437	14.5978554	144.7743512	95.84	2.88	747.03	749.91	That was J2-408-rock-02
11994	20090414 125532	14.5978399	144.7746426	96.59	3.3	748.01	751.31	2: sample from the east traverse at 750m depth below Brimstone.
11995	20090414 125545	14.5978357	144.7747087	96.78	2.76	747.73	750.49	Nearing end of traverse line in 100mn.
11996	20090414 125555	14.5978312	144.7747529	95.86	2.59	747.61	750.2	Intact rock and rubble.
11997	20090414 125601	14.59783	144.7747726	95.49	3.51	746.83	750.34	White staining.
11998	20090414 125614	14.5978299	144.7748324	93.68	4.56	744.69	749.25	White stain.
12000	20090414 125644	14.597836	144.7749001	60.94	2.66	746.32	748.98	Staining in concentrated area of rock.
12002	20090414 125806	14.5978124	144.7749699	81.12	3.94	744.8	748.74	Moving into area of blacker rock.
12003	20090414 125820	14.5978036	144.7750267	104.73	3.68	743.83	747.51	Really coarse and darker.
12005	20090414 125841	14.5977991	144.7751135	96.2	3.05	743.11	746.16	Interesting enough-want another rock sample.
12007	20090414 125931	14.5977761	144.7751865	62.74	2.28	744.72	747	This will be a rock near the end of the traverse line to east (about 100m).
12010	20090414 130126	14.5977786	144.7753875	87	3.63	741.06	744.69	SAMPLE Geology 3: From east traverse near EOL (100m) at 745. Small round with white.
12011	20090414 130135	14.5977787	144.7754382	87.43	4.35	740.71	745.06	Putting next to GT with funnel.
12012	20090414 130219	14.5977751	144.7756568	89.01	1.89	744.16	746.05	Note that the record before the SAMPLE button is more accurate for position (forgot to hit enter after it was picked up and vehicle moved.)
12014	20090414 130235	14.5977634	144.775718	92.61	2.83	743.69	746.52	Some intact pieces. Lots of white stuff.
12015	20090414 130306	14.5977573	144.775825	92.19	3.48	739.26	742.74	Fresh looking rubble. Could be seepage underneath causing white stain.
12016	20090414 130309	14.597757	144.77583	91.93	3.93	738.8	742.73	(stain)
12018	20090414 130410	14.5977545	144.7758819	92.01	5.54	734.96	740.5	Very steep (steepest portions covered in sand)
12019	20090414 130417	14.5977544	144.7759125	92.69	4.65	735.15	739.8	Larger pieces.
12021	20090414 130441	14.5977568	144.7759469	95.02	4.95	733.23	738.18	Big boulders.
12023	20090414 130523	14.5977769	144.7759301	53.5	7.29	731.49	738.78	At EOL of east traverse.
12024	20090414 130532	14.5977771	144.7759218	51.21	7.93	731.25	739.18	From here we will head north up to Brimstone.
12027	20090414 130735	14.5977584	144.7759154	51.02	5.66	734.59	740.25	Changing pilot to Will.
12029	20090414 130852	14.5977369	144.776001	102.24	5.66	728.68	734.34	Going up to summit and exchanging hydrophone.
12034	20090414 131232	14.5977219	144.7763482	101.48	6.31	725.82	732.13	Changing map background.
12035	20090414 131245	14.5977207	144.7763488	101.42	6.34	725.82	732.16	NAV Doppler reset 35m jump.
12036	20090414 131317	14.5977243	144.7763492	344.08	4.46	728.42	732.88	Going to be heading north up to summit at 345deg and 392m away.

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12038	20090414 131419	14.5977757	144.7763124	338.91	3.89	727.25	731.14	Heading 340 and lots of rubble rocks.
12040	20090414 131501	14.5978288	144.7762297	349.64	5.06	727.72	732.78	Up slope with sand and rubble rock.
12043	20090414 131635	14.5978477	144.7761399	348.02	4.38	731.37	735.75	Waiting for ship and Medea to settle up before moving north.
12044	20090414 131646	14.5978692	144.7761325	347.47	4.1	730.73	734.83	Some large boulders in the rubble.
12045	20090414 131711	14.5979196	144.7761293	348.61	3.45	728.96	732.41	Some shrimp.
12048	20090414 131824	14.5980131	144.776113	349.96	4.08	723.31	727.39	Steep-lots of sand.
12049	20090414 131826	14.5980159	144.7761126	350.11	3.85	723.25	727.1	Fish
12052	20090414 132038	14.5980643	144.7761042	351.1	4.93	719.88	724.81	Few shrimp
12053	20090414 132105	14.5980926	144.7761	351.69	4.95	718.16	723.11	Looks like we are waiting for the shrimp.
12055	20090414 132128	14.5981222	144.7760957	350.88	4.55	716.4	720.95	White stain around rock.
12056	20090414 132135	14.5981302	144.7760943	353.04	4.38	715.6	719.98	Intact lava.
12057	20090414 132140	14.598127	144.7760946	350.9	5.68	714.84	720.52	Pillows.
12058	20090414 132216	14.5981581	144.7760966	351.61	4.44	712.94	717.38	Crab.
12060	20090414 132244	14.5981718	144.7760694	358.92	4.39	712.42	716.81	Only 6 legs on this type of crab.
12061	20090414 132320	14.5981802	144.7760646	0.87	3.1	712.37	715.47	Small ridge off port utility cam.
12063	20090414 132323	14.5981802	144.7760646	0.84	3.14	712.34	715.48	Nice crab.
12065	20090414 132448	14.5982323	144.7760752	353.03	4.68	707.33	712.01	Maybe seepage with white stain around pillows and in cracks of pillows.
12066	20090414 132516	14.5982423	144.7760707	359.36	3.59	707.7	711.29	Going to get some small pieces of pillow.
12068	20090414 132530	14.5982424	144.7760708	359.26	3.36	707.9	711.26	At 708m as just started upslope to Brimstone.
12069	20090414 132549	14.5982423	144.7760707	359.22	3.43	707.81	711.24	SAMPLE 4: J2-408-rock-04
12071	20090414 132646	14.5982428	144.7760691	8.05	4.18	707.34	711.52	Rock from start of up slope at end of east traverse line (piece of pillow basalt)
12073	20090414 132732	14.5982224	144.7760796	354.2	5.21	707.46	712.67	4: placing sample in crate with hydrophone.
12074	20090414 132749	14.5982161	144.7760842	354.23	5.7	707.27	712.97	Sample from 330m away from summit.
12076	20090414 132822	14.5982811	144.7760823	352.94	5.41	702.8	708.21	Heading back up to top.
12077	20090414 132839	14.5983247	144.7760819	351.57	5.03	700.28	705.31	Driving over small (<1m) ridge in upslope.
12078	20090414 132914	14.598395	144.7760664	351.33	4.15	696.81	700.96	Lava looks intact here-not a lot of rubble (few bumps with the basket).
12080	20090414 132949	14.5984594	144.7760379	352.81	4.21	693.79	698	Headed up slope to edge of cone and edge of valley east of Brimstone.
12081	20090414 132959	14.5984804	144.776032	349.1	3.64	692.46	696.1	Lots of white staining (seepage out of slope).
12083	20090414 133040	14.5985504	144.7760117	351.49	4.4	688.71	693.11	Still looks like intact and darker than debris.
12084	20090414 133112	14.5986154	144.7759985	1.05	4.89	684.08	688.97	Still seeing orange shrimp.
12085	20090414 133117	14.598628	144.7759891	354.64	5.01	683.6	688.61	Now some debris.
12087	20090414 133129	14.5986575	144.7759721	358.59	3.81	683.99	687.8	Intact again.
12088	20090414 133152	14.5986801	144.7759566	359.53	7.08	680.47	687.55	Overhang.
12089	20090414 133155	14.5986833	144.7759558	359.58	5.79	680.46	686.25	Big outcrop.
12090	20090414 133157	14.5986835	144.7759561	0.57	5.7	680.45	686.15	Thick.
12091	20090414 133218	14.5986942	144.7759523	359.62	11.14	674.55	685.69	On ridge.
12093	20090414 133226	14.598709	144.7759494	358.87	12.99	671.96	684.95	Steep vertical intact lava.
12094	20090414 133242	14.5987542	144.7759281	1.12	10.59	670.77	681.36	One big flow.
12096	20090414 133328	14.5988347	144.7758783	358.11	7.98	665.84	673.82	This white stuff is floc from above and not seepage.
12097	20090414 133336	14.5988453	144.7758705	359.5	9.14	664.87	674.01	One big block of lava with white dusting.
12099	20090414 133439	14.598955	144.7758509	359.37	3.31	658.04	661.35	Still intact and increase in white snow.
12100	20090414 133520	14.5990109	144.7758446	359.58	4.65	653.54	658.19	Nearing top of flow.
12102	20090414 133542	14.5990405	144.7758404	0.26	5.24	650.67	655.91	Lots of snow.
12103	20090414 133609	14.5991014	144.7758305	358.88	4.29	648.4	652.69	Fish.
12104	20090414 133620	14.5991277	144.7758291	0.91	4.61	646.87	651.48	Seems like we are east of debris chute.
12106	20090414 133627	14.5991346	144.7758282	1.32	4.86	646.21	651.07	Lava pillows on port.

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12107	20090414 133719	14.5991698	144.7758229	359.75	4.79	644.97	649.76	Perched boulders.
12109	20090414 133725	14.5991729	144.7758224	359.93	5.13	644.31	649.44	Big boulders.
12110	20090414 133738	14.5991844	144.7758206	358.53	5.26	643.33	648.59	Boulders look altered.
12111	20090414 133810	14.5992224	144.7758101	358.72	4.11	641.09	645.2	Rubble on left on top of white snowed intact lava.
12113	20090414 133830	14.5992569	144.7758028	359.68	3.58	640.26	643.84	Now in all rubble looking area.
12114	20090414 133900	14.599286	144.7757952	359.28	4.05	637.54	641.59	Can still see intact off stbd utility camera.
12116	20090414 133941	14.5993235	144.775784	359.45	3.45	635	638.45	Shrimp that can't swim away fast enough from us.
12118	20090414 134033	14.5993601	144.7757749	1.31	3.33	632.48	635.81	Some orange staining on rock pieces.
12119	20090414 134110	14.5993977	144.7757674	359.31	3.54	629.9	633.44	Looks like rubble maybe from Brimstone.
12121	20090414 134202	14.5994571	144.7757535	1.24	4.4	624.67	629.07	Small bump into rock slope.
12122	20090414 134217	14.5994715	144.77575	1.86	4.95	623.17	628.12	Bigger boulders in pile.
12124	20090414 134309	14.5995412	144.7757234	358.69	2.5	619.51	622.01	Still climbing up slope.
12125	20090414 134312	14.5995424	144.7757221	358.69	2.71	619.36	622.07	Rubble.
12128	20090414 134511	14.5996081	144.775614	358.56	3.74	612.08	615.82	Lots of rubble and not so much snow at all.
12130	20090414 134608	14.5996642	144.7755706	359.93	4.15	608.12	612.27	Sand chute to port.
12132	20090414 134645	14.5997256	144.775555	359.42	3.65	604.44	608.09	Some outcrop poking through.
12133	20090414 134657	14.5997211	144.7755464	359.21	6.76	602.25	609.01	Brimstone is 100m north of us.
12134	20090414 134711	14.5997261	144.7755387	1.67	9.01	599.79	608.8	Fish.
12136	20090414 134727	14.5997569	144.775534	359.8	5.48	598.46	603.94	Intact pieces and rubble.
12137	20090414 134737	14.5997729	144.7755325	0.36	4.93	597.83	602.76	Debris around the outcrop.
12139	20090414 134840	14.5998858	144.7755057	0.15	6.21	588.68	594.89	Distinct edge on port utility cam of white coated area vs. debris flow.
12140	20090414 134905	14.5999228	144.7754949	359.65	5.51	586.43	591.94	Boundary between coarse and fine (fine right).
12142	20090414 134926	14.5999431	144.7754651	358.82	6.41	584.5	590.91	Outcrop of lava.
12143	20090414 134937	14.5999621	144.7754593	359.76	5.71	583.26	588.97	Driving contact.
12144	20090414 134946	14.5999755	144.7754556	358.83	6.03	582.15	588.18	J2-408 Data DVDs start blue set 64
12145	20090414 135010	14.5999912	144.7754453	359.74	5.46	581.54	587	Debris around large intact outcrop.
12147	20090414 135036	14.60004	144.7754409	0.18	5.41	576.61	582.02	Outcrop is channeling the debris flow.
12149	20090414 135145	14.6001608	144.7754211	359.18	4.48	568.49	572.97	Large pillows in outcrop with rubble flowing alongside.
12152	20090414 135329	14.6002908	144.7754217	359.86	4.3	559.04	563.34	Slide chute of finer material.
12154	20090414 135445	14.6003815	144.7754225	358.62	5.35	551.22	556.57	J2-408 Data DVDs stop red set 63
12155	20090414 135448	14.6003844	144.775422	359.65	5.55	550.98	556.53	Still some intact pieces and rubble.
12157	20090414 135538	14.6004374	144.7754143	0.24	4.21	548.37	552.58	Rock bump.
12161	20090414 135823	14.6005986	144.775448	359.96	6.21	532.03	538.24	One white rock in rubble.
12163	20090414 135946	14.6007041	144.7754401	0.05	6.14	524.52	530.66	Outcrop to port.
12164	20090414 140014	14.6007436	144.7754093	0.81	4.11	523.27	527.38	rubble ridge.
12166	20090414 140037	14.6007624	144.7754086	7.47	4.89	520.94	525.83	Outcrop in debris field.
12167	20090414 140043	14.6007682	144.7754121	8.88	5.26	520.37	525.63	We are at 521m.
12168	20090414 140112	14.6007821	144.7754299	32.97	5.33	518.94	524.27	There is Brimstone and tephra bucket.
12169	20090414 140116	14.6007835	144.7754326	32.85	4.94	518.49	523.43	Nav is way off.
12171	20090414 140129	14.6007859	144.7754385	32.54	4.74	518.45	523.19	We are 20m off in nav right now.
12172	20090414 140138	14.6007881	144.7754412	32.84	4.21	518.28	522.49	J2-408 Data stop DVCAM 049 and start DVCAM 050
12173	20090414 140144	14.600788	144.775445	31.63	4.66	518.21	522.87	We are at Brimstone and the plume is straight up.
12174	20090414 140149	14.6007874	144.7754485	32.27	5.26	518.26	523.52	No swirl in plume.
12175	20090414 140156	14.600787	144.7754552	32.96	5.55	518.25	523.8	Great video.
12176	20090414 140212	14.6006736	144.7752232	33.12	5.39	518.3	523.69	NAV Doppler reset Moved 20m.
12178	20090414 140239	14.6006728	144.7752433	42.64	5.74	517.5	523.24	Going up to hydrophone and then coming back to Brimstone.

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12179	20090414 140253	14.6006981	144.7752281	46.7	7.21	514.89	522.1	Hydrophone is 55m away at 023deg.
12180	20090414 140300	14.6007196	144.7752289	48.01	6.53	514.21	520.74	Leaving Brimstone.
12181	20090414 140311	14.6007549	144.7752403	62.23	5.31	514.13	519.44	Last view of plume as we head to hydrophone.
12183	20090414 140352	14.6008849	144.7753315	59.16	12.04	515.15	527.19	Heading to ridge-we are east of pit and heading north.
12184	20090414 140412	14.6009032	144.7753241	63.64	13.04	515.56	528.6	Heading to Marker 107 and hydrophone.
12186	20090414 140424	14.6009148	144.7753164	29.16	11.85	515.88	527.73	There is a Tephra sampler up there as well.
12187	20090414 140434	14.6009167	144.7753128	28.57	11.18	517.32	528.5	Not seeing bottom right now as altitude is too high.
12188	20090414 140444	14.6009167	144.7753098	28.38	10.38	518.17	528.55	Moving 028 to target.
12189	20090414 140515	14.600903	144.7753121	28.58	6.09	522.22	528.31	Waiting for ship and Medea.
12191	20090414 140540	14.6008838	144.7753242	29.01	2.8	525.41	528.21	Sonar view of summit outcrops is interesting.
12192	20090414 140551	14.6008765	144.7753266	29.25	2.59	525.08	527.67	Can see north side of Brimstone cone in aft cam.
12193	20090414 140559	14.600878	144.7753275	28.65	2.21	525.39	527.6	In front of us is the slope to summit.
12196	20090414 140755	14.6009305	144.7752764	31.16	4.21	525.6	529.81	It is Wednesday now. Cruise ends on Friday.
12197	20090414 140813	14.6009613	144.7753051	32.57	4.46	527.43	531.89	No signs of CTD on the way up to top.
12199	20090414 140827	14.6009757	144.7753209	32.67	7.1	526.21	533.31	Slope of ridge and outcrop before us.
12200	20090414 140844	14.6009789	144.7753308	34.86	9.99	523.55	533.54	Great view of summit outcrops.
12202	20090414 140929	14.6009778	144.7753561	34.1	12.76	521	533.76	Summit outcrops.
12203	20090414 140940	14.600988	144.7753499	38.58	13.01	520.84	533.85	Jason still is 20m away.
12204	20090414 141010	14.6010534	144.7753272	40.14	8.45	520.21	528.66	Following ridge top.
12205	20090414 141019	14.6010659	144.7753339	42.14	6.8	520.24	527.04	Rocks are very orange.
12207	20090414 141025	14.6010732	144.7753387	41.12	5.86	519.87	525.73	Plume in Medea cam.
12208	20090414 141035	14.6010866	144.7753473	42.35	4.99	519.41	524.4	There is the bucket and hydrophone.
12209	20090414 141042	14.6010916	144.7753587	41.47	4.19	519.13	523.32	We are approaching Marker 107 area.
12210	20090414 141121	14.6010994	144.7753949	42.49	2.73	518.7	521.43	There is a Jason weight between bucket and hydrophone.
12212	20090414 141212	14.601105	144.7754081	41.11	2.16	519.11	521.27	Lots of equipment maneuvering to get things in and out of the basket.
12214	20090414 141227	14.6011051	144.7754081	40.69	2.45	518.92	521.37	This is about the same location as hydrophone in 2006.
12215	20090414 141238	14.601105	144.7754082	40.72	2.34	518.96	521.3	Crabs here.
12217	20090414 141345	14.6011039	144.7754086	40.33	2.43	518.93	521.36	Going to take shrimp trap out for awhile while replacing hydrophone.
12219	20090414 141444	14.6011042	144.7754086	40.2	2.48	518.92	521.4	Shrimp trap out.
12221	20090414 141551	14.6011043	144.7754088	39.61	2.46	518.94	521.4	DEPLOY Hydrophone Small hydrophone placed on ridge top next to bigger hydrophone to left.
12222	20090414 141558	14.6011043	144.7754088	39.82	2.51	518.9	521.41	Depth is 520.
12224	20090414 141624	14.6011044	144.7754088	39.63	2.46	518.96	521.42	RECOVER Hydrophone Picking up bigger hydrophone. This is the whale hydrophone.
12225	20090414 141647	14.6011046	144.775409	39.95	2.4	518.98	521.38	Swapped out hydrophones.
12226	20090414 141656	14.6011047	144.7754091	39.88	2.53	518.88	521.41	Dropping a weight here as well.
12228	20090414 141741	14.6011049	144.7754053	39.66	2.4	518.82	521.22	Later in dive we will move the shrimp trap.
12229	20090414 141749	14.601105	144.7754067	40.11	2.44	518.81	521.25	Taking some images of hydrophone deployment location.
12230	20090414 141758	14.6011043	144.7754061	39.99	2.68	518.66	521.34	Next-head back to Brimstone.
12231	20090414 141820	14.6011004	144.7753989	10.22	3.53	518.65	522.18	Marker is off to the right (did not see).
12233	20090414 141835	14.6010996	144.7753642	300.37	2.36	518.82	521.18	Didn't really look for the Marker.
12234	20090414 141841	14.6010981	144.7753533	282.42	2.73	518.69	521.42	See Marker in aft cam.
12235	20090414 141858	14.6011	144.775336	229.11	2.48	520.02	522.5	Going to Brimstone. Lots of plume in Medea.
12236	20090414 141906	14.6010993	144.7753356	211.38	2.74	520.33	523.07	Aft cam had good view of bucket and marker.
12238	20090414 141934	14.601041	144.7753028	197.3	5.08	520.06	525.14	Brimstone is at 194deg 43m away.
12240	20090414 142057	14.6010079	144.775246	187.36	3.93	528.23	532.16	Lots of shrimp in aft cam.
12242	20090414 142125	14.6009455	144.7752343	186.03	5.28	528.35	533.63	This is north side of cone going up to Brimstone.

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12243	20090414 142135	14.600931	144.7752307	185.52	5.25	527.72	532.97	Some yellow sulfur rocks.
12244	20090414 142202	14.6008981	144.7752231	184.1	5.73	524.95	530.68	Lots of shrimp here.
12246	20090414 142253	14.6008426	144.7752172	187.13	6.14	519.89	526.03	Altered patch.
12247	20090414 142314	14.6008194	144.7752364	185.49	5.88	518.38	524.26	Marker 103 (?) in port utility cam.
12249	20090414 142323	14.6008139	144.7752528	186.51	6.36	517.95	524.31	Approaching top of cone.
12250	20090414 142343	14.6007918	144.7752773	154.34	5.53	517.81	523.34	At north top of Brimstone cone.
12251	20090414 142357	14.6007823	144.7752819	185.32	6.73	517.78	524.51	At Brimstone. See yellow in center of plume
12252	20090414 142404	14.6007727	144.7752822	209.16	5.9	517.7	523.6	Plume is rotating.
12253	20090414 142414	14.6007595	144.7752801	221.3	5.33	517.64	522.97	Will probably set up on south side of cone.
12254	20090414 142422	14.600755	144.7752799	227.19	5.44	517.5	522.94	Lots of fresh black at 222 looking at cone.
12256	20090414 142437	14.6007465	144.7752826	243.98	5.14	517.35	522.49	Lasers off.
12257	20090414 142444	14.6007385	144.7752871	252.84	5.35	517.18	522.53	VIDEO Start recording HDCam
12258	20090414 142451	14.60073	144.7752912	260.25	4.84	517.8	522.64	Looking down at plume.
12259	20090414 142457	14.6007227	144.7752926	265.95	4.46	518.12	522.58	See lots of tephra around vent
12260	20090414 142502	14.6007174	144.7752917	265.76	4.6	517.95	522.55	We are due west right now.
12261	20090414 142511	14.6007032	144.7752879	277.33	4.09	517.75	521.84	Good view down into cone top.
12263	20090414 142523	14.600687	144.7752855	308.81	3.94	518.51	522.45	Looks like south side is clear.
12264	20090414 142535	14.6006772	144.7752702	338.28	4.85	518.81	523.66	some bubbles in plume
12265	20090414 142546	14.6006709	144.7752532	349.89	4.54	518.78	523.32	Plume is straight up and focused.
12266	20090414 142551	14.6006711	144.7752512	358.43	4.31	518.75	523.06	Good view withy bucket.
12267	20090414 142558	14.600669	144.7752488	2.78	4.23	518.57	522.8	Beginning of burst with tephra.
12268	20090414 142611	14.6006719	144.7752552	3.34	3.64	519.33	522.97	Settling down with a heading of 002.
12269	20090414 142614	14.6006718	144.7752556	2.68	3.84	519.11	522.95	Lots of bubbles.
12270	20090414 142622	14.6006727	144.775256	3.88	4.15	518.64	522.79	We are looking at Brimstone.
12272	20090414 142626	14.6006726	144.7752557	3.78	4.15	518.71	522.86	Lots of bubbles.
12273	20090414 142703	14.6006695	144.7752637	344.74	3.68	520.02	523.7	Do not see any rock movement.
12274	20090414 142708	14.6006704	144.7752642	345.71	3.93	519.82	523.75	Bubbles stopped.
12277	20090414 142826	14.6006703	144.7752658	344.17	3.21	520.41	523.62	Parking. It is a bit on the high side. Looks lower to left at Brimstone with heading of 344
12278	20090414 142844	14.6006703	144.7752658	345.08	3.29	520.4	523.69	Some rocks moving and tumbling off side.
12279	20090414 142904	14.6006703	144.7752659	345.08	3.2	520.44	523.64	We are south of vent looking a tad west of north.
12280	20090414 142915	14.6006704	144.7752658	345.31	3.26	520.42	523.68	One hour of engineering time for Jason.
12282	20090414 142933	14.6006703	144.7752658	345.74	3.25	520.42	523.67	Jason is parked on the surface.
12283	20090414 142958	14.60067	144.7752654	345.85	3.25	520.44	523.69	Activity is not vigorous right now.
12284	20090414 143004	14.60067	144.7752654	345.89	3.26	520.43	523.69	Here comes some small bubbles.
12285	20090414 143008	14.60067	144.7752654	345.88	3.26	520.43	523.69	Puff in back.
12288	20090414 143114	14.6006698	144.7752654	346.01	3.23	520.44	523.67	Some gas release.
12290	20090414 143222	14.6006691	144.7752653	347.97	3.15	520.46	523.61	Some small tumbles.
12292	20090414 143228	14.6006693	144.7752654	347.56	3.21	520.47	523.68	Bubbles increasing.
12293	20090414 143307	14.6006691	144.7752656	347.24	3.13	520.51	523.64	Big shake.
12295	20090414 143336	14.6006688	144.7752659	346.78	3.14	520.51	523.65	Shake.
12296	20090414 143343	14.6006687	144.7752658	347.23	3.2	520.49	523.69	Shaking still.
12297	20090414 143348	14.6006688	144.7752658	347.61	3.19	520.49	523.68	Picking up.
12299	20090414 143450	14.6006687	144.7752658	348.09	3.18	520.47	523.65	Bubbles.
12300	20090414 143512	14.6006686	144.7752658	348.12	3.19	520.47	523.66	More bubbles.
12301	20090414 143514	14.6006687	144.7752659	347.85	3.19	520.47	523.66	Shake.
12303	20090414 143524	14.6006686	144.775266	347.85	3.19	520.46	523.65	Still bubbles.

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12304	20090414 143537	14.6006686	144.775266	348.22	3.21	520.47	523.68	Shake.
12305	20090414 143541	14.6006685	144.775266	348.42	3.24	520.44	523.68	bubbles.
12306	20090414 143601	14.6006682	144.7752662	348.03	3.16	520.45	523.61	Lots of bubbles.
12307	20090414 143610	14.6006683	144.7752662	348.4	3.23	520.44	523.67	Shake.
12309	20090414 143634	14.6006682	144.7752663	348.03	3.16	520.47	523.63	No bubble.
12310	20090414 143649	14.600668	144.7752666	349.34	3.15	520.47	523.62	More plume and now bubbles and more vigorous in sci cam.
12311	20090414 143653	14.6006679	144.7752667	349.18	3.19	520.49	523.68	Pillar fell.
12313	20090414 143728	14.6006683	144.7752667	348.94	3.15	520.47	523.62	Big steam burst off to port
12314	20090414 143736	14.6006683	144.7752666	349.05	3.16	520.47	523.63	Things are crumbling and falling.
12315	20090414 143754	14.6006683	144.7752666	348.97	3.16	520.47	523.63	Plume more to west.
12316	20090414 143804	14.6006684	144.7752665	348.98	3.15	520.49	523.64	Yellow increasing in plume.
12317	20090414 143811	14.6006684	144.7752665	348.9	3.15	520.47	523.62	shake.
12318	20090414 143822	14.6006684	144.7752664	349.06	3.16	520.47	523.63	More yellow.
12320	20090414 143826	14.6006684	144.7752664	348.97	3.16	520.47	523.63	Seeing bubbles.
12321	20090414 143844	14.6006694	144.7752657	345.18	4.13	519.67	523.8	Going to rotate to west.
12322	20090414 143900	14.6006737	144.7752721	327.62	4.55	519.59	524.14	Jason moving counter clockwise to steer clear of plume.
12323	20090414 143904	14.6006764	144.7752729	317.64	3.76	519.55	523.31	Lots of bubbles.
12324	20090414 143906	14.6006776	144.7752735	318.18	3.48	519.62	523.1	More yellow.
12325	20090414 143921	14.6006806	144.7752772	314.53	2.7	520.35	523.05	Moved to 316 for a better view.
12327	20090414 143929	14.6006805	144.7752772	315.35	2.5	520.1	522.6	Great brow cam view.
12328	20090414 143937	14.6006805	144.7752769	317.08	2.93	520.19	523.12	Sitting on rock.
12330	20090414 144046	14.6006804	144.7752769	316.71	2.76	520.19	522.95	Bubbles off but lots of wispy plume (following us).
12331	20090414 144049	14.6006805	144.7752769	316.81	2.89	520.17	523.06	Little lull.
12332	20090414 144056	14.6006804	144.7752769	316.89	2.88	520.19	523.07	No yellow in plume.
12334	20090414 144137	14.6006803	144.7752769	316.8	2.9	520.18	523.08	Some small bubbles and shake.
12335	20090414 144146	14.6006803	144.7752769	316.68	2.75	520.19	522.94	More bubbles after shake.
12336	20090414 144158	14.6006803	144.775277	316.69	2.94	520.17	523.11	Plume increasing.
12337	20090414 144201	14.6006802	144.775277	316.72	2.94	520.17	523.11	Picking up.
12339	20090414 144232	14.6006797	144.775277	316.74	2.95	520.17	523.12	More bubbles and yellow.
12340	20090414 144244	14.6006796	144.7752771	316.8	2.89	520.17	523.06	More degassing.
12341	20090414 144250	14.6006795	144.7752771	316.84	2.94	520.18	523.12	More lava must be coming up vent.
12342	20090414 144255	14.6006793	144.7752771	316.94	2.93	520.18	523.11	Lots of yellow and ash.
12344	20090414 144351	14.6006786	144.7752771	317.04	2.88	520.17	523.05	See pillars of lava on left.
12345	20090414 144358	14.6006785	144.7752771	317.06	2.89	520.17	523.06	Shaking.
12346	20090414 144421	14.6006788	144.7752771	316.85	2.89	520.18	523.07	Bigger bubbles.
12348	20090414 144427	14.6006789	144.7752772	316.84	2.9	520.19	523.09	More yellow.
12349	20090414 144446	14.600679	144.7752771	316.25	2.9	520.19	523.09	Seems a little subdued compared to last night.
12350	20090414 144521	14.6006791	144.7752772	316.26	2.89	520.21	523.1	Ash in plume.
12352	20090414 144526	14.6006792	144.7752772	316.09	2.9	520.19	523.09	Good view of new pillars to right.
12353	20090414 144533	14.6006793	144.7752772	316.26	2.89	520.2	523.09	To the left actually.
12354	20090414 144605	14.6006794	144.7752771	316.51	2.9	520.18	523.08	Lot of bubbles in front.
12356	20090414 144629	14.6006792	144.7752771	316.69	2.95	520.19	523.14	Very vigorous around pillars.
12357	20090414 144646	14.6006792	144.775277	316.72	2.89	520.19	523.08	Tephra and plume-lost vis of pillars.
12358	20090414 144650	14.6006793	144.775277	316.79	2.88	520.18	523.06	Lots of tephra.
12359	20090414 144715	14.6006793	144.7752771	316.84	2.89	520.18	523.07	Big tephra rain.
12361	20090414 144808	14.6006794	144.775277	316.99	2.9	520.19	523.09	Continual ash.



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12363	20090414 144842	14.6006799	144.775277	317.04	2.91	520.18	523.09	Still have ash and more bubbles.
12365	20090414 144945	14.60068	144.775277	317.23	2.89	520.16	523.05	Doesn't seem to have as much shaking as last night.
12366	20090414 144959	14.6006801	144.775277	317.3	2.8	520.14	522.94	Shake.
12368	20090414 145050	14.60068	144.7752772	317.09	2.66	520.13	522.79	big burst.
12369	20090414 145054	14.60068	144.7752772	317.03	2.68	520.13	522.81	Lots of ash
12370	20090414 145103	14.6006798	144.7752772	317.09	2.68	520.14	522.82	Can't see pillar (rotated just before this).
12371	20090414 145115	14.6006798	144.7752772	317.19	2.68	520.13	522.81	Lots of plume with ash and still have bubbles.
12373	20090414 145140	14.6006797	144.7752772	317.31	2.65	520.12	522.77	Lots of gas on left.
12375	20090414 145235	14.6006793	144.7752772	317.11	2.96	520.17	523.13	Steamed off and more bubbles next to big rock to right.
12376	20090414 145313	14.6006793	144.7752772	317.21	2.96	520.16	523.12	Lots of bubbles.
12378	20090414 145328	14.6006792	144.7752772	317.54	2.88	520.16	523.04	Burst.
12379	20090414 145400	14.6006794	144.7752772	317.78	2.76	520.16	522.92	Tephra coming out of plume again.
12382	20090414 145553	14.6006801	144.7752773	317.71	2.93	520.18	523.11	Burst with ash.
12384	20090414 145633	14.60068	144.7752772	317.37	2.98	520.21	523.19	Shake
12385	20090414 145655	14.60068	144.7752772	317.44	3.05	520.16	523.21	Black pillar on left is getting bigger/fatter.
12386	20090414 145711	14.6006802	144.7752772	317.2	2.96	520.21	523.17	Plume swirling around an over us. Tephra raining down.
12388	20090414 145727	14.6006802	144.7752773	317.11	2.66	520.19	522.85	Big burst around pillar.
12390	20090414 145825	14.60068	144.7752772	317.31	2.88	520.19	523.07	Plume has grown much bigger-engulfing Medea.
12391	20090414 145844	14.6006801	144.7752773	317.38	2.98	520.21	523.19	Burst in back.
12392	20090414 145858	14.60068	144.7752773	317.4	2.99	520.21	523.2	We are observing Brimstone Pit during engineering testing of Jason.
12393	20090414 145904	14.60068	144.7752772	317.35	2.99	520.21	523.2	Plume base is getting wide.
12395	20090414 145939	14.6006802	144.7752772	317.46	3	520.23	523.23	Yellow around left pillars.
12396	20090414 150020	14.6006804	144.7752772	317.56	2.99	520.19	523.18	More violet and bubbles.
12398	20090414 150102	14.6006803	144.7752771	317.94	2.93	520.21	523.14	Plume gradually changing direction.
12400	20090414 150155	14.60068	144.7752772	317.77	2.76	520.18	522.94	HD tape is done.
12402	20090414 150243	14.6006804	144.7752772	318.02	2.76	520.17	522.93	Lots of Tephra
12403	20090414 150259	14.6006805	144.7752772	317.97	2.88	520.17	523.05	Not seeing much shaking.
12405	20090414 150354	14.6006806	144.7752772	317.75	3.03	520.19	523.22	More yellow around new lava pillar-block.
12406	20090414 150414	14.6006807	144.7752771	317.85	2.93	520.21	523.14	VIDEO Start recording HDCam New tape
12408	20090414 150447	14.6006805	144.7752771	317.88	2.93	520.2	523.13	More bubbles and yellow.
12409	20090414 150457	14.6006805	144.7752771	317.75	3.03	520.21	523.24	Getting busier.
12411	20090414 150540	14.6006802	144.7752771	317.9	3.01	520.22	523.23	Lot of big bubbles in front.
12413	20090414 150713	14.6006795	144.7752774	317.25	2.68	520.19	522.87	Bubbles.
12415	20090414 150724	14.6006794	144.7752773	317.31	2.66	520.19	522.85	Lava on left leaning further out and over.
12417	20090414 150842	14.6006795	144.7752776	317.1	2.68	520.18	522.86	Bubbles are fairly continuous.
12418	20090414 150848	14.6006794	144.7752776	317.17	2.66	520.18	522.84	Lots of yellow.
12419	20090414 150902	14.6006798	144.7752778	316.95	2.7	520.17	522.87	And now no bubbles but lots of wide plume
12420	20090414 150908	14.6006799	144.7752778	316.97	2.95	520.17	523.12	Then bubbles again.
12422	20090414 150929	14.6006804	144.7752779	316.84	2.89	520.17	523.06	Plume increase.
12423	20090414 150935	14.6006806	144.775278	316.89	2.78	520.19	522.97	Big right rock moved a bit.
12428	20090414 151228	14.6006806	144.7752784	315.61	2.4	520.13	522.53	Shake
12430	20090414 151340	14.6006824	144.7752785	315.15	2.36	520.15	522.51	Can see center rocks sway and fall.
12431	20090414 151353	14.6006821	144.7752785	315.05	2.36	520.14	522.5	Lava to left is almost completely pushed out of view.
12436	20090414 151725	14.6006833	144.7752787	314.69	2.45	519.98	522.43	Plume is now going off right.
12437	20090414 151819	14.6006839	144.7752786	315.36	2.4	520.11	522.51	Took light out of basket to try illuminating plume different.
12439	20090414 151829	14.600684	144.7752786	315.5	2.45	520.14	522.59	Too much glare.

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12442	20090414 152032	14.6006841	144.7752787	315.42	2.4	520.16	522.56	New light is not helping here with all the plume.
12443	20090414 152041	14.6006838	144.7752787	315.16	2.4	520.15	522.55	Ash in plume.
12444	20090414 152121	14.6006841	144.7752788	314.92	2.49	520.04	522.53	Left rock no longer a pillar but a bench as it leaned over completely.
12446	20090414 152134	14.6006842	144.7752788	314.67	2.46	519.99	522.45	Basket light off and put back in basket.
12447	20090414 152222	14.6006837	144.7752789	314.61	2.3	520.19	522.49	going to have to move as plume is coming to us.
12449	20090414 152232	14.6006765	144.7752819	323.4	3.33	519.26	522.59	Moving off this side of Brimstone.
12450	20090414 152240	14.6006694	144.7752764	325.72	5.99	518.79	524.78	Heading around clockwise.
12451	20090414 152246	14.6006613	144.775267	339.88	6.2	518.4	524.6	There is the old pillar.
12452	20090414 152306	14.6006665	144.7752382	38.27	5.08	518.55	523.63	Looking down the brand new lava.
12453	20090414 152314	14.6006786	144.7752319	58.89	4.48	518.71	523.19	Moving over clockwise a bit more.
12455	20090414 152324	14.6006838	144.7752317	54.02	3.88	519.04	522.92	Looking at 054.
12456	20090414 152327	14.6006838	144.7752323	53.51	3.56	519.31	522.87	Jason parking.
12457	20090414 152345	14.6006814	144.7752327	54.07	3.33	520.03	523.36	To right is the rock we watched grow from other angle.
12458	20090414 152405	14.6006793	144.7752323	54.21	3.18	520.08	523.26	Big rock is coming toward Jason.
12460	20090414 152435	14.6006789	144.7752328	54.5	3.16	520.07	523.23	Big shift in rocks.
12461	20090414 152445	14.6006788	144.7752328	54.61	3.29	520.08	523.37	Jason is at 521m.
12462	20090414 152453	14.6006787	144.7752328	54.67	3.19	520.06	523.25	Rocks are shifting in front of us.
12463	20090414 152502	14.6006783	144.7752328	54.82	3.2	520.06	523.26	This is the more active side compared to last angle.
12464	20090414 152515	14.6006778	144.7752332	54.85	3.19	520.05	523.24	Rock is being pushed out.
12465	20090414 152522	14.6006774	144.7752336	55.03	3.16	520.07	523.23	Lots of bubbles in front of us.
12467	20090414 152545	14.6006758	144.7752347	55.11	3.18	520.06	523.24	Pilot cam shows the rock creeping toward Jason.
12470	20090414 152743	14.6006733	144.7752362	55.66	3.16	520.04	523.2	Rock has stopped moving for awhile.
12471	20090414 152809	14.6006742	144.7752355	55.63	3.15	520.03	523.18	We are looking a bit east of north.
12474	20090414 152941	14.6006749	144.7752344	55.54	3.25	520.04	523.29	Shaking again.
12475	20090414 152958	14.6006748	144.775234	55.51	3.18	520.02	523.2	Close-up shows the little movements.
12477	20090414 153047	14.6006748	144.7752338	55.31	3.15	520.04	523.19	Big rock big move.
12478	20090414 153111	14.6006747	144.7752338	55.59	3.15	520.01	523.16	Lots of bubbles.
12481	20090414 153231	14.6006748	144.7752337	55.1	3.16	520.02	523.18	Gas in front.
12482	20090414 153309	14.6006747	144.7752338	54.9	3.16	520.02	523.18	Good shake.
12484	20090414 153355	14.6006746	144.7752338	54.59	3.15	520	523.15	Done with engineering part of dive.
12485	20090414 153402	14.6006745	144.7752338	54.53	3.14	520.02	523.16	We are still observing Brimstone.
12486	20090414 153406	14.6006745	144.7752338	54.52	3.15	520.02	523.17	Lots of gas in front.
12487	20090414 153419	14.6006745	144.7752337	54.41	3.16	520.01	523.17	Bigger burst.
12490	20090414 153546	14.6006748	144.775234	54.1	3.15	520.02	523.17	Next is experimenting with arm camera here at Brimstone.
12491	20090414 153557	14.6006748	144.775234	54.1	3.15	520.04	523.19	Still observing Brimstone at 054deg.
12493	20090414 153656	14.6006747	144.7752341	53.82	3.18	520.06	523.24	Turning arm camera on.
12494	20090414 153702	14.6006746	144.7752341	54.37	3.19	520.04	523.23	Shaking and swelling.
12496	20090414 153746	14.6006746	144.7752339	54.21	3.23	520.03	523.26	Big rock moving.
12497	20090414 153758	14.6006746	144.7752339	54.08	3.19	520.05	523.24	Really moving.
12498	20090414 153816	14.6006743	144.7752339	54.21	3.19	520.05	523.24	Picking up movement now.
12500	20090414 153843	14.6006744	144.7752338	54.25	3.21	520.04	523.25	Can see lava being pushed out.
12501	20090414 153853	14.6006745	144.7752338	54.08	3.2	520.05	523.25	More plume.
12502	20090414 153856	14.6006745	144.7752338	54.09	3.16	520.07	523.23	bubbles in front.
12503	20090414 153902	14.6006745	144.7752338	54.07	3.18	520.06	523.24	Bubbles on right.
12504	20090414 153916	14.6006747	144.7752339	53.92	3.15	520.11	523.26	The arm camera is on.
12506	20090414 153942	14.6006734	144.7752324	53.93	3.4	519.92	523.32	VIDEO Stop recording HDCam Off while using arm camera.

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12507	20090414 153954	14.600673	144.7752316	54.79	3.3	520.02	523.32	No lights on offload camera.
12508	20090414 154018	14.600673	144.7752317	54.16	3.4	519.87	523.27	Good views of bubbles on arm camera.
12510	20090414 154036	14.6006729	144.7752317	54.41	3.36	519.91	523.27	Getting light in other arm from basket.
12511	20090414 154102	14.6006727	144.7752315	54.86	3.35	519.93	523.28	Unfurling light.
12513	20090414 154136	14.6006728	144.7752315	55.2	3.3	519.98	523.28	Lots of yellow and bubbles.
12514	20090414 154209	14.6006731	144.7752315	55.23	3.33	519.96	523.29	Lots of degassing.
12518	20090414 154440	14.6006725	144.7752311	54.73	3.36	519.87	523.23	J2-408 Data DVDs start red set 65
12519	20090414 154518	14.6006727	144.7752311	54.74	3.33	519.89	523.22	Lots of ash falling.
12521	20090414 154623	14.6006732	144.7752314	54.81	3.3	519.95	523.25	WATCHSTANDERS Susan Merle logger
12523	20090414 154631	14.6006747	144.7752313	53.63	3.69	519.63	523.32	WATCHSTANDERS Nick Deardorff video
12524	20090414 154655	14.600665	144.775205	55.97	6.36	516.12	522.48	Waiting to get a bubble shot here.
12527	20090414 154827	14.6006582	144.7750924	81.62	8.99	522.38	531.37	We're experimenting with the offload camera here at Brimstone for an hour then another hour at the shrimp site.
12528	20090414 154840	14.600655	144.7750972	87.4	8.19	523.07	531.26	We were just whited out.
12529	20090414 154917	14.6006735	144.7751145	346.02	5.64	523.21	528.85	We just started this. Want to get a good close-up on the bubbles.
12531	20090414 155001	14.6006874	144.7751128	22.18	4.58	524.29	528.87	That's a beautiful squid in front of us.
12533	20090414 155033	14.6006933	144.7751181	20.86	4.89	523.64	528.53	The lovely squid shot was on the pilot cam. He was quite large.
12535	20090414 155130	14.6006394	144.7751495	20.73	6.98	521.84	528.82	J2-408 Data DVDs stop DVDs 054
12536	20090414 155137	14.6006416	144.775152	333.17	5.45	522.12	527.57	Can see the plume in the background.
12537	20090414 155146	14.6006537	144.775151	298.06	3.48	522.19	525.67	Now we have a whiteout again.
12538	20090414 155207	14.6006863	144.7751496	313.12	1.86	523.14	525	Brimstone was not as active as last night. Did see a pillar earlier that fell over.
12540	20090414 155256	14.6006892	144.7751909	44.68	3.94	520.56	524.5	Will moved out of the plume. We are now on the south side of the mound.
12542	20090414 155325	14.60065	144.7752268	61.21	5.35	519.71	525.06	Here comes the ash again.
12543	20090414 155351	14.600653	144.7752669	354.9	5.24	520.23	525.47	We have now circled around to the NE side of Brimstone. Looks a bit clearer here.
12546	20090414 155533	14.600721	144.7752959	247.3	2.3	520.04	522.34	Looking a bit better now. We're looking at Brimstone from the NE. Our bearing is 245 degrees.
12547	20090414 155553	14.6007209	144.7752962	248.08	2.71	519.9	522.61	We have a great shot from here.
12549	20090414 155654	14.6007209	144.7752969	247.75	2.83	519.8	522.63	Can't really see much inside the vent. Lots of smoke.
12551	20090414 155730	14.6007207	144.7752974	247.76	2.84	519.79	522.63	The offload camera has come fairly good shot of the bubbles.
12552	20090414 155754	14.6007208	144.7752972	248.04	2.83	519.82	522.65	Murky in the offload cam. The pilot cam looks good.
12554	20090414 155835	14.6007208	144.7752975	247.7	2.9	519.72	522.62	CO2 bubbles streaming out. 90%CO2 the rest are hydrogen and?
12555	20090414 155905	14.6007208	144.7752982	247.86	2.9	519.72	522.62	Bubbles are: CO2 hydrogen methane nitrogen and helium. In that order.
12557	20090414 155932	14.6007208	144.775298	247.85	2.94	519.66	522.6	Boulder just fell in the DSC cam.
12558	20090414 155945	14.6007208	144.775298	247.9	2.86	519.73	522.59	J2-408 Data DVDs stop correction stop DVDs 064
12560	20090414 160057	14.6007208	144.7752983	248.2	2.89	519.76	522.65	Looking good in the science cam too.
12562	20090414 160139	14.6007207	144.7752986	247.97	2.94	519.73	522.67	The offload cam can get 2.5 to 3 feet close. Covers about 4 - 5 inches across the screen.
12563	20090414 160150	14.6007206	144.7752988	248.19	2.93	519.73	522.66	J2-408 DVCAM 050 stop and 051 stop
12564	20090414 160213	14.6007206	144.7752988	248.16	2.93	519.76	522.69	VIDEO Start recording HDCam
12566	20090414 160253	14.6007205	144.7752989	248.21	2.91	519.76	522.67	Our heading is 248. We're looking at Brimstone from the NE.
12568	20090414 160349	14.6007206	144.7752983	247.74	2.9	519.72	522.62	The vent is just not cooperating.
12570	20090414 160519	14.6007205	144.7752986	248.58	2.96	519.76	522.72	We are looking at the offload cam. Tephra is coming down and the vog is in the background.
12572	20090414 160618	14.6007407	144.7753554	248.64	2.91	519.79	522.7	Tephra falling out of the plume into the tephra sampler.
12574	20090414 160638	14.6007411	144.775354	249	2.89	519.88	522.77	Vigorous bubbling in the offload cam image.
12575	20090414 160652	14.6007413	144.7753538	248.38	2.95	519.79	522.74	Quite amazing footage in the sci cam also.

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12577	20090414 160737	14.6007415	144.7753536	248.11	2.96	519.72	522.68	Lots of bubbling happening in the HDCam.
12578	20090414 160816	14.6007415	144.7753539	247.73	2.93	519.74	522.67	The HD Cam is still recording. Was off for a minute but back on now.
12580	20090414 160901	14.6007413	144.7753547	247.83	2.91	519.75	522.66	We haven't seen any molten sulfur pouring out of the vent. We know it's in there after dipping the probe in there and covering it with sulfur.
12582	20090414 161022	14.6007405	144.775345	248.28	2.88	519.78	522.66	Evan zoomed out on the HD Cam a bit.
12584	20090414 161041	14.6007406	144.7753449	248.4	2.89	519.8	522.69	Lots of ash falling out of the plume.
12585	20090414 161111	14.6007406	144.7753448	249.13	2.85	519.82	522.67	The offload camera is showing lots of tephra falling.
12587	20090414 161146	14.6007405	144.775345	249	2.86	519.82	522.68	Looking better now. A bit more explosive activity now.
12590	20090414 161422	14.6007503	144.7753716	248.42	2.93	519.8	522.73	The offload cam is showing tephra sitting on top of the hydrothermal rock and droplets of sulfur.
12593	20090414 161541	14.6007505	144.7753714	248.61	2.95	519.78	522.73	VIDEO Stop recording HDCam
12602	20090414 162327	14.6007649	144.7754107	249.18	2.2	520.12	522.32	We had decided to stay here for a bit. It has now cleared up a bit.
12603	20090414 162342	14.6007727	144.7754018	235.92	3.43	518.81	522.24	Lots of ash in the cam.
12604	20090414 162356	14.6007822	144.775379	212.99	2.64	518	520.64	We turned the offload cam off.
12605	20090414 162423	14.6007782	144.7753413	170.16	0.79	518.08	518.87	Quieter vigorous. The plume is going more straight up. We are looking at it from the north.
12607	20090414 162429	14.6007738	144.7753294	145.04	2.53	517.92	520.45	VIDEO Start recording HDCam
12608	20090414 162445	14.6007628	144.775317	109.49	3.35	518.32	521.67	We're moving around to the north to recover the tephra sampler.
12611	20090414 162649	14.6007615	144.7753263	98.99	1.25	520.32	521.57	Just NW of Brimstone. Probably less than 5m. Will swap out the tephra sampler here next.
12616	20090414 163106	14.6007617	144.7753264	100.37	1.28	520.19	521.47	DEPLOY Tephra Sampler E. Just NW of Brimstone. (5m away or less). Z=521.
12618	20090414 163134	14.6007617	144.7753269	101.79	1.26	520.23	521.49	DEPLOY Tephra Sampler H. Just NW of Brimstone. (5m away or less). Z=521.
12619	20090414 163224	14.6007621	144.7753269	102.17	1.21	520.19	521.4	RECOVER Tephra Sampler h. The last entry was an error. We actually recovered TSH. (and deployed TS)
12621	20090414 163308	14.6007627	144.7753266	102.51	1.21	520.18	521.39	Well - one more time. We have just deployed TSE and recovered TSH.
12623	20090414 163402	14.6007682	144.775322	104.04	1.86	519.58	521.44	SAMPLE Geology 5. Tephra sampler H. Was less than 5m NW of Brimstone.
12628	20090414 163744	14.6007667	144.7753279	102.87	1.35	520.07	521.42	Righting tephra sampler E. The latest estimate of location is that it is less than 5m west of Brimstone.
12629	20090414 163802	14.6007674	144.7753273	102.74	1.35	520.06	521.41	Using the lasers to get a better estimate of distance from the vent.
12630	20090414 163814	14.600768	144.7753273	103.31	1.31	520.13	521.44	Nice video of Brimstone from here.
12632	20090414 163914	14.6007694	144.7753262	103.15	1.3	520.15	521.45	CORRECTIONS FOR TEPHRA SAMPLER INFO: This deployment site is <5m to the west of Brimstone. Deployed TSE and recovered TSH.
12635	20090414 164045	14.6007806	144.7753049	104.85	3.14	517.97	521.11	Going up to the summit to the hydrophone location (Mkr-107).
12636	20090414 164053	14.6007967	144.7752983	82.01	5.11	516.66	521.77	Leaving Brimstone.
12638	20090414 164148	14.6009155	144.775375	70.85	10.25	514.13	524.38	Can't see much right now.
12639	20090414 164157	14.60092	144.7753798	70.71	9.46	515.48	524.94	Bottom out of site.
12642	20090414 164352	14.6009232	144.7753719	70.8	8.46	517.08	525.54	Ash coming down now. Could also be some biology also.
12645	20090414 164531	14.6009439	144.7754964	69.03	11.5	519.25	530.75	Verena says that we clearly see amphipods around Brimstone swimming around. Don't see them anywhere else. Don't know how to capture them.
12646	20090414 164604	14.6009712	144.7755502	71.69	13.38	520.96	534.34	The plume is obscuring our view.
12647	20090414 164621	14.6009956	144.7755681	60.74	11.99	520.78	532.77	Can see the bottom in the distance.
12649	20090414 164640	14.60104	144.7756024	62.52	10.54	520.39	530.93	Slope ahead. Climbing to the summit.
12650	20090414 164711	14.6010966	144.7756515	64.4	7.95	520.36	528.31	Climbing up the summit to the hydrophone site.
12652	20090414 164730	14.6011108	144.7756843	77.1	8.79	518.22	527.01	VIDEO Start recording HDCam
12653	20090414 164823	14.6010891	144.7757986	89.09	7.51	517.68	525.19	We're at the summit ridge now.
12655	20090414 164922	14.6009193	144.7756297	311.21	5.58	518.27	523.85	The pink critters we see in the water column could be juvenile shrimp Verena says.

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12657	20090414 165006	14.6009447	144.7755327	259.11	5.5	517.89	523.39	These outcrops are spectacular.
12659	20090414 165039	14.6009287	144.7754945	261.9	5.31	516.43	521.74	The marker is straight ahead.
12661	20090414 165222	14.6009467	144.7753887	70.63	5.3	516.68	521.98	Rugged looking outcrop here at the top. 517 meters. Tephra sampler and hydrophone at the summit. We want to look at some crabs with the offload cam.
12664	20090414 165331	14.6009328	144.7754069	18.33	1.66	518.8	520.46	Lots of experiments here at the summit. A shrimp trap. A tephra sampler. 2 hydrophones and a marker.
12665	20090414 165421	14.6009329	144.7754069	17.75	1.74	518.78	520.52	Shrimp are crawling on the outside of the shrimp trap. It was left here earlier but not opened so they can get in.
12667	20090414 165516	14.6009328	144.775407	17.48	1.73	518.71	520.44	The trap is open and there are many shrimp inside. Verena says that maybe she doesn't have to open it.
12669	20090414 165555	14.6009332	144.7754067	18	1.85	518.67	520.52	VIDEO Stop recording HDCam
12670	20090414 165619	14.6009334	144.7754066	17.7	1.88	518.62	520.5	Will do a bit of crab observation.
12673	20090414 165802	14.6009333	144.7754072	16.06	1.41	518.97	520.38	Floundering here a bit trying to figure out which cable is it.
12674	20090414 165819	14.6009333	144.7754071	16.04	1.4	518.96	520.36	Want to get the offload camera up and running.
12676	20090414 165911	14.6009336	144.7754074	16.33	1.44	518.95	520.39	Offload camera on the screen now.
12679	20090414 170049	14.600934	144.775407	15.65	1.46	518.9	520.36	We will be using the offload camera to look at the Austinograea yunohana (the white crab here).
12682	20090414 170254	14.6009153	144.7754047	41.55	1.96	519.35	521.31	A Jason weight here at the summit. Trying to position for crab observations.
12683	20090414 170305	14.6009156	144.7754048	41.55	1.99	519.36	521.35	Verena is on the mike now.
12685	20090414 170335	14.6009156	144.7754049	41.54	2	519.36	521.36	We're having a struggle with the arm right now.
12687	20090414 170444	14.6008977	144.7754099	65.69	3.41	517.67	521.08	Backing away from the ledge. Stirring up lots of sediment with the vehicle which has bumped into the seds up here.
12688	20090414 170454	14.6008965	144.7754126	66.76	3.44	517.74	521.18	VIDEO Stop recording HDCam
12690	20090414 170614	14.6009094	144.7754118	71.97	2.85	518.4	521.25	This is a crab species that is everywhere we have gone on the arc at vents. It's one of the few species that is consistent. It's also on the Izu-Bonin Arc.
12692	20090414 170707	14.6009096	144.7754115	71.86	2.99	518.38	521.37	The only place we saw a different species was at Ruby - the red crab.
12694	20090414 170755	14.60091	144.7754115	71.77	2.99	518.39	521.38	Wow - I'm getting dizzy.
12696	20090414 170906	14.6009086	144.7754108	71.74	2.88	518.47	521.35	The crabs migrate from one seamount to another in the larval stage.
12698	20090414 170939	14.6009085	144.7754109	71.7	2.93	518.4	521.33	Having some real issues with the offload camera. It has been swinging back and forth. Seems to have calmed down now.
12699	20090414 170953	14.6009084	144.775411	71.68	2.91	518.42	521.33	VIDEO Start recording HDCam
12701	20090414 171037	14.6009084	144.775411	71.8	2.9	518.42	521.32	This is a family of crabs that was only discovered when hot vents were discovered. They are a new family genus and species.
12704	20090414 171247	14.6009086	144.7754112	71.99	2.91	518.42	521.33	VIDEO Start recording HDCam They have 2 different size claws.
12705	20090414 171310	14.6009087	144.775411	72.01	2.9	518.44	521.34	2 big shrimp have a smaller shrimp and were fighting over it.
12706	20090414 171324	14.6009087	144.7754109	72.1	2.9	518.44	521.34	Looks like the crab in the offload cam has eggs on it.
12708	20090414 171424	14.6009087	144.7754109	72.21	2.94	518.38	521.32	Both HD cams are looking at the same crab - at least they were.
12710	20090414 171435	14.6009087	144.7754109	72.22	2.94	518.38	521.32	The crabs don't like the light from the looks of it.
12712	20090414 171526	14.6009088	144.7754108	72.01	2.95	518.41	521.36	The big shrimp are quite large when looking at them next to the crabs. The crabs are not that large. Probably 6 inches or so....
12713	20090414 171610	14.6009081	144.7754106	72.01	2.93	518.43	521.36	The crab in the HD cam is resting briefly then moving away from us. Great video in the HD Cam.
12715	20090414 171717	14.6009081	144.7754101	72.38	2.85	518.49	521.34	Offload cam has a nice image of 1 crab and many shrimp.
12719	20090414 171948	14.6009076	144.77541	72.44	2.83	518.51	521.34	There's a baby crab in the HD cam. See scaleworm (Polynoid).
12721	20090414 172107	14.6009077	144.7754103	72.49	2.85	518.49	521.34	When the camera is 28 inches away something 5 inches across will fill the field of view.
12724	20090414 172325	14.6009079	144.7754099	72.85	2.84	518.43	521.27	Great crab video coming to a close.

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12726	20090414 172344	14.6009078	144.7754099	72.82	2.84	518.43	521.27	Stopping the offload camera. Still recording HDCam.
12727	20090414 172418	14.600908	144.7754099	72.92	2.83	518.42	521.25	The offload cam shows a crab with a black eye.
12729	20090414 172503	14.6009084	144.7754097	73.1	2.81	518.42	521.23	Verena had decided to leave the shrimp trap here next to the marker and hydrophone.
12730	20090414 172508	14.6009084	144.7754098	72.84	2.83	518.4	521.23	VIDEO Stop recording HDCam
12732	20090414 172542	14.6009084	144.7754097	73.01	2.81	518.43	521.24	There are tons of shrimp in Verena's trap.
12734	20090414 172629	14.6009085	144.7754096	73.01	2.79	518.47	521.26	DEPLOY Shrimp Trap Verena has decided to leave her shrimp trap right here at the summit next to the hydrophone.
12736	20090414 172746	14.6010797	144.7755578	249.85	4.84	516.15	520.99	Departing this area and heading west along the ridge crest.
12737	20090414 172822	14.6011258	144.7755915	77.79	6.4	516.29	522.69	The Medea cam shows a huge plume over the summit.
12740	20090414 172928	14.6011969	144.7755463	269.94	4.85	520.75	525.6	Just leaving the hydrophone site and traveling west to observe shrimp.
12741	20090414 173013	14.6012395	144.7755437	269.9	1.96	524.94	526.9	Flying through a very dense Brimstone plume. The cameras are almost whited out.
12746	20090414 173424	14.601177	144.7754961	267.86	1.79	524.99	526.78	VIDEO Start recording HDCam
12752	20090414 173829	14.6011993	144.775515	95.84	4.86	524.25	529.11	VIDEO Stop recording HDCam
12753	20090414 173852	14.6011926	144.7755352	96.61	6.71	521.07	527.78	Coming back now up to the ridge summit. Area of the hydrophone.
12754	20090414 173921	14.6012122	144.775554	96.85	11.28	516.7	527.98	There is lots of smoke. Visibility is null.
12756	20090414 173928	14.6012161	144.7755427	95.74	11.11	516.68	527.79	J2-408 Data DVDs start blue set DVDs 066
12760	20090414 174241	14.601249	144.775609	96.74	3.16	524.83	527.99	The plume is pretty overwhelming. Can't see a thing.
12762	20090414 174348	14.6012422	144.7756434	101.21	5.06	524.91	529.97	J2-408 Data DVDs stop red set DVDs 065
12764	20090414 174457	14.6012447	144.7756517	105.33	5.48	524.91	530.39	Jason has lost a thruster.
12767	20090414 174630	14.6012303	144.7757745	105.44	10.16	525.53	535.69	Lost a lateral thruster so the ability to go sideways is affected. Can go forward just fine??
12768	20090414 174642	14.601231	144.7758112	103.83	11.63	525.32	536.95	So - where are you going now??
12769	20090414 174703	14.6012525	144.7758296	173.49	16.79	524.87	541.66	We would like to check out the summit first.
12771	20090414 174751	14.601223	144.7758016	215.21	14.35	525.34	539.69	Looking a bit better in the pilot cam.
12776	20090414 175155	14.601042	144.7756951	297.01	9.64	518.39	528.03	We're now heading to the SW up the slope again to the hydrophone position.
12779	20090414 175335	14.6010376	144.7755936	30.32	1.63	519.52	521.15	We're at the ridge crest a bit east of the marker. We need to
12786	20090414 175954	14.6009614	144.7755399	85.25	2.74	531.01	533.75	Beautiful geology here.
12788	20090414 180045	14.6009792	144.7755359	84.15	2.59	530.3	532.89	Looking for the higher shrimp concentration for Verena's observations.
12790	20090414 180127	14.6010053	144.7755341	84.45	1.76	529.41	531.17	This looks more like it. Don't see the huge concentrations of shrimp we saw last night.
12792	20090414 180226	14.6010166	144.7755367	85.08	1.06	528.85	529.91	J2-408 DVCAM 051 stop and 052 start
12793	20090414 180242	14.601019	144.7755362	85.21	0.79	528.85	529.64	We found the concentration of shrimp but the visibility is pretty poor.
12795	20090414 180333	14.6010196	144.7755362	85.24	0.74	529.21	529.95	We are sitting here at the summit.
12797	20090414 180443	14.6010175	144.7755301	87.12	93.46	528.96	622.42	All is against us it seems. The shrimp are her but the plume is too.
12799	20090414 180703	14.6010182	144.775529	87.04	139.77	528.95	668.72	Attempting to se up here for a bit of HD video and offload HD (on the Jason arm.
12800	20090414 180722	14.6010181	144.775529	87.85	36.69	528.98	565.67	Quite a lot of plume here tonight.
12802	20090414 180921	14.6010196	144.7755307	85.74	0.74	528.55	529.29	Setting up here. Quite a lots of shrimp on the wall and a bit less on the sediments.
12804	20090414 181045	14.6010232	144.7755327	87.52	175.04	529.32	704.36	Trying to set up and get some video of the shrimp here Nice video of them on the wall here..
12806	20090414 181218	14.6010244	144.7755321	87.67	161.46	529.34	690.8	Location here: From Mkr-107 to this position is 25m bearing 311 (slightly northwest).
12807	20090414 181335	14.6010249	144.7755318	87.69	136.42	529.31	665.73	Lots of diffuse flow visible in the offload video.
12808	20090414 181435	14.6010261	144.7755328	87.69	180.54	529.27	709.81	Going to mess with the sub lights. Killed sub lights.
12809	20090414 181528	14.6010275	144.7755341	87.69	154.56	529.26	683.82	Lots of discussion about lighting. Moving the strobe.
12810	20090414 181625	14.6010281	144.7755337	88.57	187.61	529.26	716.87	The strobe is quite strong and its a bit overexposed on the offload cam.
12811	20090414 181853	14.6010237	144.7755272	88.66	173.57	529.26	702.83	Looking for a new reference crab to film with both HD cameras
12814	20090414 182118	14.6010329	144.7755178	88.54	166.6	529.26	695.86	Moved camera up along wall bringing view closer to shrimp
12815	20090414 182151	14.6010396	144.7755116	88.53	0.83	529.26	530.09	Can see mouthparts of shrimp scraping the rocks

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12816	20090414 182407	14.6010534	144.7754906	88.49	175.17	529.31	704.48	Change mini cam tape 2 out and 3 in
12817	20090414 182857	14.6010713	144.7754592	88.37	171.61	529.33	700.94	The lighting is difficult but looks good.
12818	20090414 183021	14.6010771	144.7754602	88.34	180.27	529.34	709.61	The A drive on the offload cam is full and will swap out with the B drive automatically.
12819	20090414 183236	14.6010859	144.7754651	88.3	165.7	529.34	695.04	Large clump of shrimp in the HDCam.
12820	20090414 183315	14.6010833	144.7754599	88.29	184.24	529.33	713.57	Lots of the smaller shrimp here. A typical shrimp lives about 3 years. Verena can't remember for these 2 species.
12821	20090414 183400	14.6010797	144.7754596	88.28	168.96	529.35	698.31	Re-positioning the offload camera view.
12822	20090414 183540	14.6010815	144.7754601	88.32	0.79	529.33	530.12	Again: The 2 species are - Alvinocaris (big shrimp) and Opaepepe loihi (little shrimp). The white crab is Austinograea yunohana.
12824	20090414 183707	14.6010806	144.7754561	88.33	0.78	529.31	530.09	Doing video observations of the shrimp.
12825	20090414 183740	14.6010824	144.7754564	88.32	177.42	529.32	706.74	Evan is at the controls of both of the HD cameras.
12827	20090414 184109	14.601084	144.7754495	88.26	169.07	529.26	698.33	Watching shrimp behavior here.
12828	20090414 184127	14.6010852	144.7754484	88.29	0.79	529.25	530.04	Evan asked Bob to put one more light on the port side.
12829	20090414 184137	14.6010849	144.7754482	88.34	0.74	529.24	529.98	Lots of diffuse flow here.
12831	20090414 184425	14.6010835	144.7754424	88.26	0.75	529.26	530.01	We are finishing up with this video survey of shrimp.
12832	20090414 184433	14.6010833	144.7754415	88.22	148.01	529.25	677.26	There are some limpets on the rocks here too.
12833	20090414 184445	14.6010835	144.775441	88.21	161.18	529.3	690.48	VIDEO Stop recording HDCam
12834	20090414 184646	14.601088	144.7754439	87.94	0.74	529.34	530.08	Stop recording on the offload cam.
12836	20090414 184742	14.601084	144.7754115	86.98	5.25	523.57	528.82	Leaving this area at the summit and heading to Mkir-103 (Flock Rock).
12840	20090414 185124	14.6008026	144.7754654	234.75	7.08	520.36	527.44	We're now downslope a bit on our way to Mkr-103.
12842	20090414 185151	14.6008392	144.7754308	231.01	5.23	521.12	526.35	We see the marker in the pilot cam.
12845	20090414 185332	14.6008265	144.7753937	240.75	2.64	521.05	523.69	VIDEO Start recording HDCam
12846	20090414 185345	14.6008267	144.7753936	238.98	2.7	520.92	523.62	Found the marker and some mat on this big rock.
12849	20090414 185537	14.6008275	144.775395	238.59	2.96	520.72	523.68	Getting some close-ups with the HD Cam.
12850	20090414 185548	14.6008275	144.775395	238.62	3.06	520.7	523.76	VIDEO Stop recording HDCam
12852	20090414 185706	14.6008278	144.7753953	238.52	3.06	520.66	523.72	Plan to suction the mat(?) on this rock. Flock Rock - 10m NE of Brimstone.
12856	20090414 190025	14.6008277	144.7753957	240.98	2.95	520.74	523.69	SAMPLE Biology 6. Suction this white material on this large white rock. Lots of mat (?) going down the suction tube. Z=522. Mkr-103 Flock Rock. 10 m NE of Brimstone.
12859	20090414 190214	14.6008263	144.775395	240.64	3	520.72	523.72	Sample 6 cont. j2-408-bio-06. Suction sample of this white material on large rock. The surface is "probably mostly sulfur byproducts" Verena.
12863	20090414 190526	14.6008937	144.7754173	38.47	10.23	513.31	523.54	Finished up here. Will now head back up to the summit and pick up Verena's shrimp trap.
12866	20090414 190723	14.6009858	144.7756219	71.16	5.68	529.22	534.9	Back in the vog.
12869	20090414 190829	14.6010485	144.7757528	32.62	7.66	521.72	529.38	Now climbing up the slope. Out of the fog here again.
12870	20090414 190841	14.6010774	144.7757403	344.5	7.58	520.56	528.14	Headed back to the summit.
12872	20090414 190933	14.601124	144.7756922	305.4	7.38	518.98	526.36	Back at the top at this knife-edged ridge. Large outcrop ahead of us.
12875	20090414 191200	14.6011798	144.7755054	115.87	5.03	517.62	522.65	Looking at the summit with shrimp trap markers and tephra sampler.
12876	20090414 191226	14.6011578	144.7755188	60.59	2.86	518.01	520.87	See the small hydrophone on the bottom.
12878	20090414 191319	14.601157	144.7755275	55.05	2.11	518.58	520.69	Picking up the shrimp trap.
12880	20090414 191332	14.6011566	144.7755271	54.97	2.06	518.63	520.69	VIDEO Start recording HDCam
12881	20090414 191357	14.6011557	144.7755246	55.92	2.2	518.47	520.67	shrimp trap from summit (Mkr-107 area).
12885	20090414 191709	14.6011592	144.775527	53.36	2.03	518.62	520.65	SAMPLE Biology 7. j2-408-bio-07. Shrimp trap recovered after ~4 hours. The trap is loaded with shrimp (guessing >50).
12888	20090414 191923	14.6011602	144.7755271	52.63	1.51	519.23	520.74	SAMPLE Geology 8. j2-408-geo-08. Scoop of sediments here at the summit. Bag is quite full. Z=520. Mkr-107 summit area next to hydrophone.

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12891	20090414 192114	14.6010082	144.7754402	166.14	10.48	522.09	532.57	Heading back to Brimstone to take a couple gastights; do a scoop sample; a niskin; and of course observe Brimstone.
12894	20090414 192251	14.6008267	144.7754298	213.28	6.44	519.85	526.29	Just below Brimstone now. Turning to approach the vent from the south. Warm water seeping out of this cone base.
12895	20090414 192302	14.600801	144.7754166	215.63	5.56	518.55	524.11	VIDEO Start recording HDCam
12897	20090414 192352	14.600774	144.7753892	225.15	1.3	520.04	521.34	Looking at the vent from the NE. It looks a bit like a pit.
12898	20090414 192421	14.6007745	144.7753894	219.97	1.23	520.08	521.31	At Brimstone. On the NE. The pit looks relatively open right now. The depth here is 521.
12901	20090414 192616	14.6007761	144.7753885	216.98	1.49	520	521.49	9. j2-408-geo-09. Scoop of volcanoclastic sed. We're NE of the vent < 5m.
12903	20090414 192703	14.6007766	144.7753886	215.34	1.54	520.01	521.55	SAMPLE Geology 9. j2-308-geo-09. Scoop of volcanoclastic sed. NE of Brimstone < 5m.
12906	20090414 192839	14.60073	144.7753832	281.85	4.18	519.11	523.29	The plume is really blowing straight up and it's large. Bubbling. Vigorous bubbling. Lots of gas coming out.
12907	20090414 192914	14.6007331	144.7753841	282.88	2.96	520	522.96	VIDEO Stop recording HDCam
12910	20090414 193057	14.6007377	144.7753894	281.29	2.96	519.91	522.87	Preparing to take a gastight sample in the pit.
12913	20090414 193233	14.600739	144.7753885	278.77	2.11	519.75	521.86	SAMPLE Gas 10. j2-408-gas-10. Gastight 7 with the funnel bubble catcher.
12914	20090414 193256	14.6007371	144.7753865	286.15	3.36	519.72	523.08	The rim is really shaking now. Vigorous plume with bubbles.
12917	20090414 193447	14.6007403	144.7753876	293.57	4.01	519.2	523.21	j2-408-gas-10 cont. Seeing lots of yellow in the pilot cam. Still collecting bubbles. Sample for
12918	20090414 193455	14.6007427	144.7753874	275.1	1.84	519.74	521.58	J2-408 Data DVDs start DVDs 067
12919	20090414 193510	14.6007474	144.7753861	261.49	1.13	519.89	521.02	j2-408-gas-10. Sample for Evans.
12923	20090414 193805	14.6007488	144.7753908	277.99	1.65	520.09	521.74	j2-408-gas-10 cont. Still collecting bubbles.
12924	20090414 193812	14.6007486	144.7753906	278.86	1.73	520.06	521.79	VIDEO Stop recording HDCam
12926	20090414 193837	14.6007484	144.7753914	285.2	1.83	519.89	521.72	J2-408 Data DVDs stop DVDs 066
12928	20090414 194007	14.6007497	144.7753898	273.1	1.73	520.21	521.94	j2-408-gas-10 cont. Bubbler is full. Firing it at 193905. Not sure it fired or not.....
12931	20090414 194128	14.6007483	144.7753917	274.71	1.44	520.14	521.58	j2-408-gas-10 finish. Saw bubbles coming out the bottom of the funnel. It's done. Can't be sure it fired completely.
12932	20090414 194208	14.6007464	144.7753922	283.59	1.8	519.82	521.62	The next gastight we want to put into the vigorous part of the plume and fire it.
12936	20090414 194502	14.6007319	144.7753895	302.95	8.35	515.7	524.05	Not seeing a lot of ash right now but lots of bubbles. Vigorous plume.
12938	20090414 194609	14.6007413	144.7753772	303.78	2.86	519.69	522.55	Look at all the sulfur in the plume. Lots of degassing. Can see the degassing of the rim rock.
12941	20090414 194752	14.6007417	144.7753765	303.15	2.75	519.8	522.55	SAMPLE Gas 12. j2-408-gtb-11. Gastight bottle #2 fired in the vigorous plume. Not sure if the bottle fired. The plate and the pin are too far apart. Brimstone.
12943	20090414 194842	14.6007398	144.7753771	313.17	2.88	519.82	522.7	VIDEO Stop recording HDCam Finished up with sampling. The gastight fell off the vehicle.
12944	20090414 194914	14.6007417	144.7753721	336.87	3.49	519.55	523.04	The plume is shifting. Coming our way.
12947	20090414 195126	14.6006786	144.775248	35.43	7.89	527.79	535.68	The gastight is at the bottom of the basket. All fogged in now so will just have to sit here and wait until it clears.
12949	20090414 195143	14.6006988	144.7752542	76.06	5.06	527.79	532.85	Cleared up a bit. Where is the gastight?
12951	20090414 195313	14.6007274	144.7753237	64.06	7.06	520.31	527.37	Still don't see it but do have good glimpse of the seafloor below.
12954	20090414 195514	14.6007779	144.7754374	272.62	3.86	518.06	521.92	There's quite a lots of yellow smoke in the pilot cam. Seeing bubbles etc.
12956	20090414 195547	14.6007776	144.7754254	256.62	1	520.28	521.28	A gastight dropped off the front of the vehicle.
12957	20090414 195610	14.6007776	144.775426	256.34	1	520.25	521.25	It's in the vent. Right on the edge.
12961	20090414 195830	14.6007809	144.7754228	222.04	0.74	520.02	520.76	Plume enveloping attempt to get gas tight.
12962	20090414 195857	14.6007807	144.7754238	221.92	0.74	520.06	520.8	Got it! Bob snuck in there and grabbed it.
12964	20090414 200020	14.6007808	144.7754238	222.22	0.76	520.08	520.84	Rearranging front of basket.
12966	20090414 200113	14.600805	144.7754097	225.07	2.06	518.88	520.94	Moving to set up for video shots.



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12968	20090414 200142	14.6008228	144.7753955	211.45	2.29	517	519.29	Vigorous yellow clouds coming out. Lots of gas and lava being extruded.
12969	20090414 200214	14.6008309	144.7753929	202.73	4.24	514.38	518.62	Plume really billowing.
12972	20090414 200344	14.6008337	144.7753997	172.56	12.84	506.72	519.56	J2-408 DVCAM 052 stop and 053 start
12973	20090414 200411	14.6008271	144.775403	210.49	10.64	508.57	519.21	With the one lateral thruster not working is hard to position Jason.
12976	20090414 200615	14.6008117	144.7754037	157.53	0.85	517.8	518.65	South of Brimstone. Settling down to video the vent.
12978	20090414 200716	14.6008068	144.7753898	138.13	3.55	515.19	518.74	Hard to get into right position as tough with currents and thruster out.
12982	20090414 201003	14.6007386	144.7753927	354.19	4.04	520.13	524.17	Rock came tumbling down the cone.
12984	20090414 201035	14.6007375	144.7753974	63.19	2.85	519.95	522.8	The plume is laying quite low across the vent right now due to very strong currents.
12988	20090414 201337	14.6007341	144.7754246	252.98	1.86	519.57	521.43	The currents (tide?) have really shifted between now and the beginning of our shift (4 hrs ago). The plume was advecting straight up and now is practically laying over on its side.
12989	20090414 201353	14.6007547	144.7754247	208.83	1.8	520.28	522.08	Wouldn't you know - now its billowing straight up.
12991	20090414 201523	14.6007571	144.7754234	204.19	1.55	520.43	521.98	Zooming in on the extruding rocks.
12993	20090414 201530	14.6007575	144.7754232	204.17	1.6	520.41	522.01	VIDEO Start recording HDCam
12994	20090414 201614	14.6007584	144.7754227	204.2	1.58	520.43	522.01	Watching massive rocks extruding and degassing.
12997	20090414 201740	14.6007577	144.7754227	204.22	1.54	520.42	521.96	Big extrusive activity in the pit. Large rocks have formed since our arrival almost 2 weeks ago.
12998	20090414 201827	14.600758	144.7754229	204.22	1.55	520.42	521.97	Pretty amazingly vigorous activity.
13000	20090414 201839	14.6007579	144.7754228	204.23	1.55	520.42	521.97	It's really erupting now.
13001	20090414 201847	14.6007586	144.7754226	204.23	1.55	520.41	521.96	Lasers on and off.
13003	20090414 201945	14.6007611	144.7754219	204.23	1.5	520.43	521.93	Just saw an ash burst. An incredible amount of extrusive activity has occurred. Lots of yellow smoke billowing up.
13007	20090414 202256	14.6007601	144.7754209	204.04	1.61	520.36	521.97	Lots of CO2 bubbles in the offload camera. Seeing some tephra in that cam too.
13010	20090414 202439	14.6007563	144.775422	204.05	1.6	520.35	521.95	The plume id really yellowed..
13011	20090414 202526	14.6007533	144.7754231	204.01	1.61	520.34	521.95	The plume is roiling. Seeing lots of yellow in the plume.
13014	20090414 202633	14.6007521	144.7754233	202.46	1.78	520.17	521.95	The arm with the offload cam is ending up in the view of the science cam.
13017	20090414 202831	14.6007539	144.7754233	202.16	1.79	520.15	521.94	Zoomed out again with the HDCam. The arm with the offload cam is usually out of the way as well.
13018	20090414 202916	14.6007538	144.7754227	202.12	1.78	520.14	521.92	Our view right now is from the north looking toward a heading of 202 degrees. Close to the vent.
13020	20090414 202933	14.6007536	144.7754228	202.1	1.76	520.16	521.92	When the lava is first extruded we get ash in the plume as well.
13021	20090414 203005	14.6007528	144.7754234	202.13	1.78	520.15	521.93	CO2 (the gas) is driving the eruption.
13023	20090414 203032	14.6007531	144.7754233	202.08	1.79	520.14	521.93	From other places can track CO2 buttons for 200 or 300m in the water column. Haven't don't that here yet.
13024	20090414 203105	14.6007533	144.7754229	202.08	1.79	520.15	521.94	Enormous amount of gas bubbles. The activity increases from time to time.
13026	20090414 203210	14.6007515	144.7754227	202.04	1.78	520.14	521.92	In 2006 saw a lot more lava rocks extruded with molten sulfur.
13032	20090414 203714	14.6007396	144.7754256	201.84	1.8	520.11	521.91	Still sitting here in the same position at the edge of Brimstone. Our heading if 202.
13035	20090414 203831	14.6007394	144.7754252	200.64	1.81	520.08	521.89	Watching the venting action here.
13040	20090414 204240	14.6007401	144.775424	200.69	1.79	520.08	521.87	Brimstone has been pretty active on this shift.
13041	20090414 204312	14.60074	144.7754244	200.69	1.81	520.08	521.89	CO2 bubble close-up in the offload cam.
13043	20090414 204332	14.6007401	144.7754244	200.71	1.79	520.08	521.87	The plume is overtaking us a bit here.
13044	20090414 204353	14.6007403	144.7754241	200.76	1.78	520.08	521.86	There has been a constant stream of CO2 bubbles since we arrived.
13045	20090414 204407	14.6007402	144.775424	200.73	1.79	520.08	521.87	The level of activity seems to have increased.
13047	20090414 204438	14.6007401	144.7754241	200.66	1.71	520.04	521.75	The big rocks are shaking a bit.
								The big rocks are starting to obscure the view of the vent now.

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13048	20090414 204521	14.6007402	144.7754239	200.69	1.81	520.06	521.87	We're in the fog now. A big burst directed right at us. "In your face from Brimstone" says Embley.
13050	20090414 204603	14.6007403	144.7754236	200.76	1.79	520.07	521.86	VIDEO Stop recording HDCam
13054	20090414 204835	14.6007576	144.7754248	228.59	7.54	514.4	521.94	The plume is still pretty thick on us here. We have been sitting here to the N/NE of the vent.
13055	20090414 204917	14.6007279	144.775431	262.65	3.9	518.06	521.96	Nick just shut off the offload cam.
13057	20090414 204943	14.6007033	144.7754179	288.86	4.76	519.4	524.16	The current seems to have laid down quite a bit.
13060	20090414 205132	14.6006806	144.7753963	272.09	8.38	516.66	525.04	The current has picked up again and laid the plume over. It's pushing the plume to the west.
13061	20090414 205140	14.6006823	144.775401	285.3	8.34	517.09	525.43	VIDEO Start recording HDCam
13063	20090414 205253	14.6006947	144.7753721	325.54	2.81	521.05	523.86	The current is really pushing Jason around.
13064	20090414 205307	14.6006948	144.7753719	323.94	2.6	521.24	523.84	We don't want "baked Jason".
13067	20090414 205511	14.6006911	144.7754153	10.1	4.31	520	524.31	The current strength seems to pulse as well.
13069	20090414 205531	14.6006917	144.7754218	352.34	4.91	519.67	524.58	The plume is really dense. Can't really see any distance into the pit.
13073	20090414 205856	14.6007179	144.7754468	258.41	1.03	520.82	521.85	The plume has diminished a bit.
13075	20090414 205944	14.6007185	144.7754462	258.94	0.96	520.85	521.81	Odd that it has almost shut down in the front here on the east side. The main part of the plume is several meters behind that.
13077	20090414 210059	14.600717	144.7754488	260.59	0.96	520.82	521.78	Another big pile of rocks just slid downslope.
13079	20090414 210202	14.6007154	144.7754468	261.05	1.05	520.81	521.86	More rocks falling off the pile. Ground shaking going on.
13082	20090414 210426	14.6007101	144.775446	260.92	1	520.82	521.82	Bursts last for about 5 minutes and then it lays down.
13085	20090414 210555	14.6007075	144.775448	260.79	0.96	520.86	521.82	Quite a lot of yellow smoke off to the right side of the vent (from their perspective) We're looking at the vent from the east. The plume is heading W/SW now.
13087	20090414 210639	14.6007065	144.775446	260.65	0.95	520.87	521.82	The plume is quite dispersed at the base now. At the base we also see this low level ground-hugging smoke. Seems to be just coming out of the ground.
13089	20090414 210758	14.6007076	144.7754467	257.85	0.95	520.8	521.75	The base of the vents are all these massive blocky lavas.
13090	20090414 210816	14.6007061	144.7754479	257.75	0.95	520.81	521.76	The base is much wider than it was when we first arrived nearly 2 weeks ago.
13092	20090414 210836	14.6007047	144.7754482	257.67	0.95	520.79	521.74	Lasers on.
13093	20090414 210925	14.6007031	144.7754514	257.51	0.95	520.76	521.71	See ash going on at the base of the vent out of the yellow smoke.
13095	20090414 211024	14.6007	144.7754564	257.35	0.96	520.77	521.73	The lava in the vent seems to be growing.
13097	20090414 211059	14.6006992	144.7754571	256.74	0.93	520.77	521.7	Great shot going on in the HDCam.
13098	20090414 211106	14.6006993	144.7754571	256.74	0.93	520.77	521.7	Lots of bubbling now.
13099	20090414 211118	14.6006995	144.7754568	256.72	0.93	520.78	521.71	The plume is standing up more now.
13103	20090414 211353	14.6007014	144.7754529	256.29	0.95	520.81	521.76	A bit of ash in the pilot cam. Zoomed in on it on the science cam too.
13104	20090414 211402	14.6007014	144.775453	256.29	0.94	520.8	521.74	Now zoomed out on the science cam.
13110	20090414 211840	14.6007066	144.7754539	254.74	0.99	520.77	521.76	SAMPLE Geology 12. j2-408-geo-12. Closed up the tephra sampler that has been riding in the front basket for the entire dive. Brimstone now. Z=522.
13112	20090414 212013	14.6007062	144.7754609	254.7	0.99	520.79	521.78	We haven't had any large ashing events on this dive.
13114	20090414 212057	14.6007167	144.7754501	234.63	1.93	520	521.93	Buddha is maneuvering the vehicle a bit closer.
13116	20090414 212141	14.6007168	144.7754499	235.56	1.88	519.97	521.85	Panning down on the sci cam to get a nice view of the rim.
13119	20090414 212338	14.6007143	144.7754363	253.28	4.18	517.04	521.22	Our view here is from the NE. Our heading is 236. Here at Brimstone Vent edge.
13120	20090414 212411	14.6007161	144.7754215	247.8	4.05	516.66	520.71	Going to trip the Niskin sampler in the plume.
13123	20090414 212530	14.6005362	144.775175	244.97	22.07	515.04	537.11	J2-408 DVCAM 053 stop
13124	20090414 212559	14.6005177	144.7751127	244.96	25.87	515.31	541.18	J2-408 Data DVDs stop red set DVDs 067
13125	20090414 212702	14.6004342	144.7750549	227.43	43.99	503.31	547.3	SAMPLE Fluid 13. j2-408-niskin-13. Tripped the Niskin bottle in the plume. Z=517m.
13126	20090414 212719	14.6004331	144.7750521	228.14	49.28	499.91	549.19	Sample for Dearthoff. Wants ash from the plume. Above Brimstone. Jason off the bottom at 2124.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-408 Logger Comment
13127	20090414 220642	14.6004429	144.7753469	293.96	badvalue	2.18	badvalue	Medea on deck.
13128	20090414 222250	14.6003282	144.7755647	6.67	badvalue	1.3	badvalue	JASON on deck
13129	20090414 222301	14.6003285	144.7755644	5.61	badvalue	1.39	badvalue	End of dive J2-408.

## J2-409 – aborted before reaching bottom

**J2-410 - CTD Search/Brimstone observations (aborted).** JASON equipped with single-chamber suction sampler, 2 tephra samplers, HD off-load camera and light, 3 gas-tights (one with funnel), shrimp trap, 2 markers, 2 scoops, Ko-ichi logger, Niskin, Eh sensor. Dive began at Brimstone with a search for the CTD to the north (~4 hours). First part of search concentrated on the area north of Brimstone but south of the summit ridge. A smaller search was conducted on the north side of the ridge. NW of Brimstone a lost scoop bag was recovered with a geology sample of sediment. Nearby a tephra bucket was also recovered which had slid down the slope but did not have a sample. Conducted temperature readings using Ko-ichi instrument in orange sediments. NW ridge had striking orange and white sediment on a steep slope with lots of evidence of sliding. Moved toward Mkr-107 at summit and recovered tephra sampler with sediment sample. Deployed shrimp trap at summit. Dive aborted early due to seawater visible inside HD camera housing.

**Table 6.4-14 JASON Dive J2-410**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13154	20090415 065716	badnav	badnav	329.05	badvalue	1.64	badvalue	JASON in water Begin dive.
13155	20090415 065730	badnav	badnav	297.52	badvalue	1.9	badvalue	Grounds clear. Driving ahead.
13156	20090415 065928	badnav	badnav	290.75	badvalue	2.3	badvalue	Medea in water.
13157	20090415 065958	badnav	badnav	281.93	badvalue	2.23	badvalue	Starting down.
13158	20090415 070123	badnav	badnav	281.87	badvalue	36.32	badvalue	Dive deployment location is Brimstone: 14deg 36.0'N144deg 46.5'E depth=620m.
13159	20090415 070235	badnav	badnav	280.45	badvalue	52.22	badvalue	Science gear: Single-chamber suction; off-load HD camera on Port arm; T-handle light; milk crate; quad-box with cover; 3 gastights; 2 markers; 2 scoop bags; shrimp trap; Ko-ichi temperature logger
13160	20090415 070252	badnav	badnav	280.48	badvalue	52	badvalue	On every dive: Niskin; Eh sensor; Jason temperature probe.
13161	20090415 070310	badnav	badnav	280.86	badvalue	52.1	badvalue	Will start dive searching for CTD.
13162	20090415 070408	badnav	badnav	279.72	badvalue	52.13	badvalue	Suction sampler clear and pumping.
13163	20090415 070424	badnav	badnav	279.23	badvalue	54.9	badvalue	Jason is diving.
13164	20090415 070624	badnav	badnav	280.67	badvalue	121.2	badvalue	HD camera looks good.
13165	20090415 071032	badnav	badnav	281.38	badvalue	257.32	badvalue	Moving ship toward bottom target location.
13166	20090415 071042	badnav	badnav	281.56	badvalue	262.59	badvalue	Bottom target is 150m away at 070deg.
13167	20090415 071210	badnav	badnav	287.4	badvalue	318.2	badvalue	WATCHSTANDERS Andra Bobbitt logger
13168	20090415 071530	badnav	badnav	265.63	badvalue	432.8	badvalue	Nathan is video logging the CTD search.
13169	20090415 071747	badnav	badnav	268.09	148.28	505.09	653.37	Jason at 500m.
13170	20090415 071753	badnav	badnav	266.42	145.64	507.67	653.31	Target is 90m away at 070deg.
13171	20090415 072320	badnav	badnav	327.05	38.14	589.82	627.96	Medea lights on.
13173	20090415 072530	badnav	badnav	73.85	15.75	589.79	605.54	J2-410 start blue set DVD 67
13176	20090415 072657	badnav	badnav	73.7	9.51	582.97	592.48	JASON on bottom
13178	20090415 072749	badnav	badnav	72.8	8.1	578.09	586.19	About 400m southwest of Brimstone. Visibility good

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13179	20090415 072810	badnav	badnav	73.93	7.18	579.19	586.37	Jason depth is 580m and altitude is 714m
13180	20090415 072829	badnav	badnav	73.91	7.11	579.32	586.43	Correction: altitude is 7.4 m
13182	20090415 072923	badnav	badnav	75.82	7.95	575.96	583.91	Jason heading is 074. Moving west
13184	20090415 072949	badnav	badnav	47	8.8	571.76	580.56	Changing heading to 048
13188	20090415 073236	badnav	badnav	55.89	8.39	545.4	553.79	Correction: Jason was not 400m SW of Brimstone. Was much closer than that
13191	20090415 073512	badnav	badnav	71.62	8.68	518.01	526.69	Jason heading changing to something more towards east
13192	20090415 073516	badnav	badnav	75.46	8.63	517.7	526.33	Brimstone in view
13193	20090415 073528	badnav	badnav	76.14	10.29	516.5	526.79	Can see a tephra sampler in the foreground
13195	20090415 073551	badnav	badnav	84.38	9.61	515.91	525.52	Plume is rising almost straight up
13197	20090415 073722	14.6007638	144.7752712	91.96	2.91	515.77	518.68	Small explosions seem to be near base of plume
13200	20090415 073906	14.600893	144.7752623	136.36	2.84	515.69	518.53	Looking down at Brimstone
13202	20090415 074021	14.6008786	144.775247	136.63	2.58	515.77	518.35	Big explosion at base of Brimstone plume. Looked more like 2006 type of explosion with tephra visible rising in plume
13204	20090415 074127	14.6009065	144.775299	82.89	1.99	517.11	519.1	Jason moving east
13205	20090415 074133	14.6009044	144.775306	82.54	2.45	517.32	519.77	Heading is 083
13208	20090415 074252	14.6009316	144.7754279	60.4	3.2	524.9	528.1	Visibility east of Brimstone today is pretty good
13210	20090415 074409	14.6009882	144.7754904	58.75	1.65	532.69	534.34	View from aft cam is pretty cool at this time
13212	20090415 074458	14.6009641	144.7754493	61.43	3.11	527.82	530.93	Light from Medea is illuminating plume in background of image
13213	20090415 074524	14.600926	144.7753829	59.86	2.63	522.62	525.25	Jason backing up towards Brimstone
13215	20090415 074618	14.6008414	144.7754165	57.16	2.91	523.47	526.38	Jason moving southeast
13217	20090415 074636	14.6007972	144.7754454	57.92	3.03	526.88	529.91	Jason heading is 057
13218	20090415 074721	14.6007231	144.7754935	58.93	3.61	534.11	537.72	Discolored rocks and some smoke in water
13219	20090415 074735	14.6007222	144.7754947	56.63	4.78	532.98	537.76	Jason is at 535 meters
13222	20090415 074919	14.60071	144.775583	61.84	4.31	537.14	541.45	Rocks are discolored and stained
13224	20090415 074937	14.6007454	144.775555	60.03	2.54	535.76	538.3	Jason is moving northwest
13226	20090415 075126	14.6010114	144.7753897	58.41	6.48	522.42	528.9	Brimstone in view in aft cam again'
13229	20090415 075301	14.6011147	144.7753429	53.51	8.24	523.55	531.79	Looks like a soft ash flow around a large outcrop
13230	20090415 075325	14.6011329	144.7753806	56.27	12.96	520.23	533.19	Big blocky lava. Very steep sides and drops off
13233	20090415 075459	14.6009728	144.7754786	56.92	4.1	528.69	532.79	Jason moving southeast
13235	20090415 075537	14.6009	144.7755247	57.89	2.8	531.09	533.89	Looks like rocks left a trail when sliding
13239	20090415 075852	14.6009285	144.775583	54.54	2.39	536.29	538.68	All kinds of white floc is water streaming by
13240	20090415 075911	14.6009584	144.7755674	51.63	4.81	533.61	538.42	Slope is covered with streaked sandy flows
13243	20090415 080044	14.60115016	144.7754485	50.83	3.25	522.86	526.11	Jason near NW end of line
13244	20090415 080052	14.60116665	144.7754419	51.18	3.4	521.59	524.99	Big rock spire
13245	20090415 080110	14.60118616	144.775458	63.51	6.28	521.06	527.34	Jason moving northeast
13247	20090415 080157	14.60115888	144.7755208	60.6	7.76	523.14	530.9	Light and dark fine sediments under bug blocky rocks
13249	20090415 080244	14.6010667	144.7755815	61.57	9.6	526.24	535.84	Jason moving southeast
13253	20090415 080559	14.6008051	144.7758216	60.53	12.56	532.54	545.1	Passing over marker 106 or 108
13254	20090415 080623	14.60086131	144.7757826	57.74	13.71	531.18	544.89	Jason moving northwest
13258	20090415 080922	14.60121384	144.7755635	58.27	10.78	516.96	527.74	Jason at top of ridge
13261	20090415 081104	14.60121649	144.7756412	54.41	9.03	517.18	526.21	Lots of light sediment
13263	20090415 081203	14.60107233	144.7757319	53.21	14.75	519.33	534.08	Jason moving southeast along ridge
13266	20090415 081424	14.60087298	144.7759334	59.95	12.35	522.65	535	Jason at 16m above seafloor and visibility is good

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13268	20090415 081459	14.60086716	144.7759319	59.78	14.53	521.23	535.76	Jason heading is 060
13270	20090415 081610	14.60091377	144.7759005	59.9	16.34	517.3	533.64	Jason moving northwest
13272	20090415 081641	14.60098781	144.7758554	58.72	19.47	513.67	533.14	Slope is fairly smooth. Lots of light sediment
13277	20090415 082053	14.60126488	144.7757574	53.41	1.09	524.82	525.91	Jason moving southeast
13278	20090415 082134	14.60117458	144.7758131	54.33	3.64	519	522.64	Seafloor is covered with light sediment mostly
13281	20090415 082258	14.60103747	144.7758984	60.21	13.21	512.62	525.83	Lots of floc in water
13283	20090415 082527	14.60128006	144.7758218	53.96	4.43	521.64	526.07	moving northwest
13289	20090415 082941	14.60141315	144.7758145	65.68	4.5	530.95	535.45	suspicious item- just a stain
13293	20090415 083317	14.60127324	144.7759706	58.36	1.36	524.18	525.54	end of southeast move
13298	20090415 083658	14.60160763	144.7759426	73.41	5.41	546.93	552.34	Rock seafloor looks very vesicular
13299	20090415 083718	14.60156495	144.7759552	72.17	5.6	543.46	549.06	Jason moving south
13300	20090415 083734	14.6015213	144.7759638	74.81	4.86	540.79	545.65	Jason heading is 075
13302	20090415 083817	14.60148234	144.7759671	73.13	11.88	530.24	542.12	Rocky seafloor with lots of rough texture
13304	20090415 083924	14.60132821	144.7760045	80.24	6.49	525.86	532.35	Boulders sticking up
13307	20090415 084040	14.60123241	144.7760306	79.34	6.73	523.05	529.78	Now seeing a debris field
13309	20090415 084216	14.60134587	144.7758285	326.11	5.78	523.57	529.35	Jason moving northwest
13312	20090415 084401	14.60156303	144.7755572	344.81	81.19	537.19	618.38	Small lumpy looking field of something in view
13313	20090415 084431	14.60167061	144.7758498	42.44	3.54	538.57	542.11	Jason heading 045
13315	20090415 084505	14.60172814	144.7759037	42.81	3.81	543.83	547.64	Jason moving northeast
13318	20090415 084656	14.60180301	144.7760042	45.04	2.93	553.73	556.66	Setting up for search pattern along north side of ridge
13325	20090415 085241	14.60182683	144.7760198	43.76	1.56	557.1	558.66	Jason moving again
13327	20090415 085344	14.60181179	144.776144	45	2.61	559.57	562.18	Jason moving southeast
13328	20090415 085435	14.60187602	144.7761363	343.99	3.51	562.11	565.62	Seafloor has linear grooves and ridges in low relief mounds
13330	20090415 085458	14.60192807	144.776098	341.67	4.1	563.17	567.27	Jason heading changing to 341
13331	20090415 085510	14.60195164	144.7760847	310.38	4.91	563.88	568.79	Jason moving northwest
13333	20090415 085613	14.6020214	144.7759517	308.4	3.76	564.56	568.32	crust on seafloor
13334	20090415 085626	14.60203099	144.7759496	259.53	5.76	564.42	570.18	Crust on seafloor (strike last entry)
13336	20090415 085658	14.60206406	144.7759342	247.14	7.56	563.49	571.05	Rock face seems encrusted with something
13338	20090415 085828	14.60207936	144.7759551	312.27	3.71	567.24	570.95	Video screens are going off /on briefly
13339	20090415 085837	14.6020773	144.7759601	312.21	4.05	567.23	571.28	Not due to anyone taking pictures or anything
13341	20090415 085903	14.6020862	144.7759552	313.97	3.39	567.8	571.19	Jason is moving northwest
13344	20090415 090133	14.60217267	144.7759905	223.66	7.36	571.54	578.9	Jason heading changing to 223
13346	20090415 090146	14.60214144	144.7760249	222.81	8.7	571.1	579.8	Seafloor speckled with black
13347	20090415 090219	14.60208015	144.7760919	222.81	8.63	570.26	578.89	Jason moving southwest with heading 223 looking upslope
13350	20090415 090344	14.60194013	144.7761906	225.49	8.88	564.54	573.42	Jason moving southwest
13352	20090415 090508	14.60205076	144.7760304	222.19	9.71	565.34	575.05	Seafloor is rough and seems either highly vesicular
13354	20090415 090602	14.60213793	144.7759328	216.97	8.63	565.66	574.29	Dark chutes cutting into stained crusts and white sediments
13356	20090415 090726	14.60224288	144.7757635	220.88	8.06	565.75	573.81	Yellow-brown crust all over place'
13358	20090415 090809	14.60217818	144.7757194	228.22	8.55	560.05	568.6	Jason moving southwest
13360	20090415 090851	14.60210693	144.775661	228.17	7.35	553.9	561.25	Sediments and staining have distinct pattern and texture
13361	20090415 090927	14.60203861	144.7757477	223.03	6.54	554.56	561.1	Gives impression of very steep slope and that currents somehow directed resulting patterns
13363	20090415 091012	14.6019616	144.7758323	224.06	7.04	550.88	557.92	Seafloor has very unusual texture

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13365	20090415 091111	14.60189733	144.7758957	222.67	3.21	544.11	547.32	Perhaps highly corroded rock
13367	20090415 091139	14.60187276	144.775921	221.85	6.09	541.56	547.65	Slope seems very steep
13368	20090415 091158	14.60184078	144.775958	222.62	9.3	542.07	551.37	Jason nearing end of Southwest line
13370	20090415 091254	14.60178585	144.7760157	220.1	15	544.68	559.68	Visibility has been good
13371	20090415 091336	14.60178229	144.7759189	222.95	11.84	542.14	553.98	Slide area and debris at base of it
13373	20090415 091400	14.60174617	144.7758766	212.06	9	541.29	550.29	Jason moving southwest
13375	20090415 091503	14.60172455	144.7757686	222.24	4.01	538.01	542.02	More linear alignments of alternating yellow-brown staining and white sediments
13376	20090415 091511	14.60172411	144.7757582	224.91	2.94	538.56	541.5	Moving closer to slope
13377	20090415 091536	14.60175633	144.7757442	222.93	5.79	536.99	542.78	Jason rammed slope and it broke away very easily
13379	20090415 091603	14.60180492	144.7756885	223.51	7.76	536.87	544.63	Seems fluffy and flocky
13381	20090415 091704	14.60189497	144.7756297	217.19	10.58	538.08	548.66	From a distance the white covered areas look almost honeycombed texture
13382	20090415 091723	14.6018966	144.7756286	218.88	8.93	541.05	549.98	Jason moving northwest
13385	20090415 091858	14.60171624	144.7755432	225.31	8.46	540.25	548.71	This sort of cover continues
13386	20090415 091921	14.60175887	144.7754984	225.52	6.03	543.01	549.04	Jason moving northwest
13387	20090415 091930	14.60176926	144.7754878	222.37	6.38	543.77	550.15	Jason heading 221
13389	20090415 091954	14.6018039	144.7754516	231.59	5.76	547.16	552.92	Lots of floc in water
13390	20090415 092036	14.60179941	144.7754116	225.66	7.74	546.08	553.82	J2-410 start red set DVD 069
13392	20090415 092117	14.60172814	144.7753215	223.02	5.83	544.24	550.07	Animal floated by
13394	20090415 092140	14.60171461	144.7752905	219.21	8.5	541	549.5	Bottom texture continues to be very unusual
13395	20090415 092211	14.6016921	144.7752971	220.69	6.91	540.68	547.59	Jason moving southwest
13396	20090415 092216	14.60168819	144.7752973	219.73	7.13	540.26	547.39	J2-410 stop blue set DVD 068
13398	20090415 092336	14.60163729	144.7753005	128.65	6.36	537.84	544.2	Jason heading changing to 127
13400	20090415 092359	14.60162639	144.7753185	136.21	5.96	537.68	543.64	Sediment pattern looks rippled but also has other characteristics
13401	20090415 092431	14.60160773	144.7753377	136.49	5.63	536.6	542.23	Still alternates between light sediment and yellow-brown stuff
13403	20090415 092506	14.60160828	144.7753749	121.52	4.41	537.3	541.71	Jason heading is 122
13405	20090415 092542	14.60160945	144.7754214	117.9	4.65	536.09	540.74	Jason moving southwest
13407	20090415 092708	14.60158307	144.7755013	120.5	3.49	534.7	538.19	Strongly rippled texture
13409	20090415 092808	14.60146676	144.7755966	126.42	3.91	533.41	537.32	But ripples appear to be oriented parallel to slope
13411	20090415 092914	14.60144574	144.7756402	211.72	5.15	532.28	537.43	Just saw a mini-cyclone rip across sediment surface and leave scar behind it. Had nothing to do with sub (came towards sub).
13412	20090415 092933	14.60144597	144.7756269	220.79	5.73	531.11	536.84	Many other trails like that across rippled surface of slope
13414	20090415 093019	14.6013788	144.775565	219.1	2.2	529.33	531.53	Weird patterns of staining sediments dark sands
13416	20090415 093059	14.60134407	144.7755434	223.97	125.4	530.4	655.8	Surface of seafloor is pretty smooth other than rippled texture to sediment. No larger rocks sticking up off surface
13418	20090415 093141	14.60130298	144.7755004	214.43	0.74	532.54	533.28	Jason moving southwest
13420	20090415 093239	14.60141241	144.7753742	220.89	1.78	537.6	539.38	Large ripple pattern of substrate beneath surface ripples
13421	20090415 093301	14.60145135	144.7753281	220.06	1.11	538.76	539.87	Jason moving northwest
13423	20090415 093349	14.60146552	144.7753074	224.39	0.74	541.74	542.48	Jason just bumped into seafloor. Sediments stirred up
13425	20090415 093527	14.60133453	144.7752765	219.51	0.74	546.76	547.5	Sediments being stirred up behind sub
13426	20090415 093608	14.60127869	144.7753351	220.19	1.13	543.47	544.6	Jason heading is 220
13428	20090415 093654	14.60120299	144.7754244	221.57	2.13	537.49	539.62	Starting to see some big rocks. Looks like a rough lava flow
13430	20090415 093826	14.60116429	144.7753827	223.64	8.33	533.89	542.22	Ridge rock. striped patterns. honeycomb patterns.... it's a feast for the eyes
13433	20090415 094005	14.6013083	144.7753634	216.07	3.74	539.22	542.96	Jason's nearly back at top of ridge

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13435	20090415 094053	14.60137665	144.7752885	217.81	3.31	541.94	545.25	Tongue of flow visible
13437	20090415 094155	14.6014681	144.7751799	217.53	1.91	545.19	547.1	Big rocks]
13439	20090415 094240	14.60151405	144.7751233	218.85	2.04	545.38	547.42	Rocks are heavily stained or encrusted with yellow-orange crust
13440	20090415 094306	14.60155822	144.7750792	219.81	1.04	547.1	548.14	Strong flow looks like it causes disturbances.
13441	20090415 094329	14.60157141	144.7750468	220.61	1.39	547.28	548.67	Exposing dark sediments
13444	20090415 094502	14.60164986	144.7749458	218.5	4.01	545.92	549.93	Jason travelling along ridge
13446	20090415 094630	14.6015481	144.7748902	237.06	2.66	553.22	555.88	Jason moving southwest
13449	20090415 094748	14.60154737	144.7749398	47.88	3.49	552.55	556.04	Loads of yellow sediment. Very fluffy when disturbed by Jason
13451	20090415 094858	14.60143582	144.7750644	49.85	7.36	550.1	557.46	Bacterial mats?
13452	20090415 094922	14.60140239	144.7750999	50.35	7.89	549	556.89	Jason heading is 050. Moving southeast
13455	20090415 095038	14.60128454	144.7752257	49.61	7.7	546.18	553.88	Slump scar of soft sediments
13461	20090415 095544	14.60146773	144.7749484	48.15	4.18	556.3	560.48	Tephra bucket -not sure which one.
13462	20090415 095602	14.60148021	144.774945	31.83	4.35	555.81	560.16	Look at that entry and see what the position was.
13463	20090415 095622	14.60145202	144.7749967	70.19	4.03	555.01	559.04	Jason going back. Looking at 075
13465	20090415 095656	14.60143988	144.7750002	68.07	4.33	555.03	559.36	Bucket D which should be due north of us.
13466	20090415 095720	14.60144568	144.7749804	137.07	4.11	554.28	558.39	The position is 20m south of where it is supposed to be-nav put a target there.
13467	20090415 095735	14.60144319	144.7749627	233.67	2.11	555.99	558.1	Nav target 90 is the new location of Tephra bucket D on this dive.
13469	20090415 095813	14.60136437	144.7749213	155.79	4.44	559.9	564.34	Depth was 558 for target.
13470	20090415 095826	14.60132617	144.7749362	170.83	4.5	560.95	565.45	Looks like the bucket rolled down the hill.
13472	20090415 095920	14.60121718	144.7749538	121.7	3.9	566.3	570.2	There is the scoop that was lost out of the basket.
13473	20090415 095933	14.60119596	144.7749764	122.41	2.41	566.88	569.29	Depth is 567 heading is 118-can see slid marks.
13475	20090415 095938	14.60119027	144.7749825	121.43	2.06	566.77	568.83	Going to pick up the scoop
13476	20090415 095955	14.60119029	144.774984	120.82	1.53	567.29	568.82	Scoop fell off 2 days ago.
13479	20090415 100140	14.60118926	144.7749837	120.36	1.53	567.22	568.75	SAMPLE Geology 1: Base of cone where it meets the ridge wall north of Brimstone.
13481	20090415 100315	14.60119046	144.774983	120.49	2.94	565.99	568.93	1: Recovery of scoop and sample of sediment (has some orange) Lucky Scoop! J2-410-scoop-01
13484	20090415 100507	14.60119016	144.774982	121.49	3.31	565.54	568.85	Amazing placement of scoop in Port biobox using just the stbd arm. Base of cone NW of Brimstone.
13486	20090415 100615	14.60119012	144.7749807	121.63	3.81	565.14	568.95	Large scrape marks where scoop was recovered. Very black under initial coating of sediment on cone side.
13488	20090415 100644	14.60121293	144.7749545	359.02	4.16	564.74	568.9	Decided to go ahead and recover the tephra bucket D that fell down the cone.
13489	20090415 100704	14.60124416	144.7749158	22.33	6.23	565.56	571.79	Heading north 027 to get bucket.
13492	20090415 100843	14.6014195	144.774973	44.51	6.98	555.27	562.25	There is the bucket-Tephra sampler D.
13493	20090415 100859	14.60144015	144.7749933	44.62	5.54	554.6	560.14	There are skid marks where the bucket fell.
13494	20090415 100933	14.60145955	144.7750141	45.08	2.11	555.97	558.08	Unfortunately the sampler is upside down so there is no tephra sample inside.
13496	20090415 100950	14.60145928	144.7750142	45.58	2.05	556.04	558.09	This is NOT a sample; just a recovery.
13497	20090415 101031	14.6014592	144.775014	45.79	2.08	556.07	558.15	Sediment slides with slightest bump.
13499	20090415 101042	14.60145927	144.7750141	45.7	2.06	556.07	558.13	RECOVER Tephra Sampler Arm has bucket.
13501	20090415 101226	14.60145378	144.7750106	46.09	3.21	555.38	558.59	Placed Tephra bucket D in aft-port quad of quad basket. Tephra D was on top of ridge and fell down. Depth is 556 at recovery.
13505	20090415 101523	14.60145257	144.7750098	46.04	3.6	555.11	558.71	Going to take a Ko-ichi temperature measurement at the Tephra D recovery site.
13507	20090415 101540	14.6014545	144.775009	46.51	3.23	555.38	558.61	Fragile slope with iron oxide thin coating.
13508	20090415 101610	14.60146007	144.7750101	41.25	2.04	556.22	558.26	Probe needs to be placed fully in.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13509	20090415 101629	14.60145994	144.77501	41.12	2.05	556.21	558.26	Bucket was at 545 depth and recovered 20m deeper.
13510	20090415 101636	14.6014599	144.77501	41.09	2.05	556.2	558.25	Starting Ko-ichi reading.
13514	20090415 101909	14.60145987	144.7750093	40.83	2.09	556.18	558.27	Is the orange microbial or Iron?
13517	20090415 102111	14.60146133	144.7750099	40.7	2.1	556.17	558.27	Ko-ichi reading needs 15 minutes.
13519	20090415 102155	14.60146183	144.7750101	40.63	2.11	556.17	558.28	Sci cam has close-up of sediment with orange that is rolling down the hill.
13520	20090415 102230	14.60146166	144.7750104	40.62	2.11	556.17	558.28	J2-410 Start DVCAM 54 at 10:00
13525	20090415 102637	14.60146219	144.7750112	40.51	2.09	556.2	558.29	TEMPERATURE READING Ko-ichi probe stopped. READING on base of slope of summit ridge HDG 040. 10-minute reading.
13527	20090415 102659	14.60145985	144.7750095	40.95	2.36	556.15	558.51	Placing Ko-ichi probe back in basket.
13531	20090415 103000	14.60146045	144.7750096	41.06	2.11	556.31	558.42	Instrument secured and basket in.
13533	20090415 103048	14.60142988	144.7750164	46.94	3.98	555.98	559.96	Next target is Marker 107 to deploy shrimp trap.
13534	20090415 103052	14.60142686	144.775017	46.79	4.45	555.84	560.29	Great outcrop.
13535	20090415 103103	14.601604	144.7749074	49.25	4.7	555.84	560.54	NAV Doppler reset
13537	20090415 103148	14.60158853	144.7748984	132.33	2.66	556.94	559.6	Medea was stationary over Jason during reset.
13538	20090415 103209	14.60154832	144.7749248	131.5	2.66	557.93	560.59	Another yellow crusted outcrop on slope.
13539	20090415 103222	14.60152646	144.7749406	132.45	2.43	557.96	560.39	Heading 132deg to Marker 107.
13541	20090415 103243	14.60149641	144.774967	131.94	2.46	557.68	560.14	Contact between heavy orange coating and now mainly white.
13542	20090415 103250	14.60148863	144.7749732	132.23	2.51	557.73	560.24	White is probably sulfur.
13543	20090415 103259	14.6014814	144.7749778	132.2	2.66	557.69	560.35	Still some mat but not much.
13545	20090415 103401	14.60145975	144.7750086	132.23	2.08	557.34	559.42	Sulfur from tephra raining down.
13546	20090415 103412	14.6014641	144.7750136	131.89	2.83	556.33	559.16	Heading up to the summit at Marker 107.
13548	20090415 103522	14.60151246	144.7751075	131.66	2.46	549.84	552.3	Brow cam has big slide feature.
13549	20090415 103534	14.60151041	144.7751289	132.21	2.18	548.85	551.03	Lateraling NE to get to top of ridge.
13552	20090415 103709	14.60143445	144.775229	131.72	3.3	543.13	546.43	Very steep slope covered in white. Outcrop on stbd.
13553	20090415 103722	14.60142068	144.7752509	131.89	3.59	541.56	545.15	Still 20m to top.
13555	20090415 103743	14.60139929	144.7752843	131.79	4.13	539.39	543.52	Stripes of orange in the white-patches.
13556	20090415 103755	14.60138537	144.7753028	131.79	4.64	537.87	542.51	Can see some outcrop in sci cam on stbd.
13557	20090415 103808	14.60136811	144.7753243	132.06	4.68	536.43	541.11	Ash on top of outcrop.
13558	20090415 103833	14.60134703	144.7753536	132.02	5.89	533.13	539.02	Top of a spur as depth is still too deep for top.
13561	20090415 103949	14.60132962	144.7754175	132.88	4.51	530.04	534.55	Outcrop forms a small ridge with ash-snow on it.
13562	20090415 104006	14.60132245	144.7754355	132.32	4.05	529.16	533.21	VIDEO Start recording HDCam
13563	20090415 104023	14.60131302	144.7754508	132.35	4.34	527.67	532.01	Getting some HD of outcrop with orange and white covered steep slope.
13564	20090415 104037	14.60130802	144.7754594	132.64	4.69	526.56	531.25	Lots of evidence of slides.
13566	20090415 104110	14.6012743	144.7754918	145.63	3.73	524.18	527.91	Shrimp running around surface.
13568	20090415 104157	14.60125181	144.7755291	145.4	2.95	521.76	524.71	Large boulder-like outcrop.
13569	20090415 104230	14.60125228	144.7755394	144.74	4.03	520.05	524.08	Top of ridge with scenic outcrop spires.
13571	20090415 104258	14.60124408	144.7755494	145.57	4.33	518.86	523.19	Great spires.
13573	20090415 104414	14.60120388	144.7755846	145.63	3.49	517.39	520.88	Searching for Marker 107.
13575	20090415 104509	14.60112242	144.7756259	145.08	9.25	518.11	527.36	VIDEO Stop recording HDCam
13576	20090415 104528	14.60111643	144.7756178	145.41	4.63	523.4	528.03	Aft cam view of spires.
13578	20090415 104550	14.60109997	144.7756252	144.32	1.84	524.76	526.6	Bucket seen in brow cam.
13579	20090415 104628	14.60106521	144.7756401	130.43	6.04	525.46	531.5	Bucket should be near hydrophone at marker 107.
13581	20090415 104644	14.60106164	144.775644	128.94	6.89	525.04	531.93	Tephra bucket may have also slid.



Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-410 Logger Comment
13583	20090415 104802	14.60106174	144.7756677	350.04	1.69	534.86	536.55	Another bucket that fell down as well as a rock. Bucket looks upright.
13584	20090415 104838	14.60106178	144.7756677	349.82	2.04	534.56	536.6	Does not look like any skid marks.
13586	20090415 104845	14.60106179	144.7756678	349.01	2.04	534.52	536.56	Picking up bucket.
13588	20090415 104940	14.60106192	144.7756676	348.74	2.05	534.53	536.58	SAMPLE Geology 2: Recovery of Tephra bucket that was at summit but is now on the sediment slope. Depth is 535 and hdg is 349.
13590	20090415 105123	14.6010865	144.7756463	350.59	5.93	529.43	535.36	This is Tephra bucket C. Bucket closed. This bucket did NOT move as the depth is correct. Not the summit bucket.
13591	20090415 105134	14.60109616	144.7756409	349.66	6.71	527.51	534.22	Bucket did not move-forgot it was here.
13593	20090415 105154	14.601106	144.7756335	349.56	7.78	525.5	533.28	Can see other Tephra
13594	20090415 105202	14.60110951	144.7756311	349.55	7.66	524.98	532.64	Science cam has water in casing.
13595	20090415 105212	14.60111383	144.7756283	349.51	8.03	524.48	532.51	Shutting Sci Cam down-liquid in camera.
13597	20090415 105315	14.60113977	144.7756196	349.57	3.64	523.13	526.77	Camera being tilted down to minimize damage.
13598	20090415 105336	14.6011397	144.7756188	349.6	3.53	523.22	526.75	Did not notice water until just now.
13601	20090415 105505	14.6011733	144.7755955	357.87	8.49	516.2	524.69	There is the Marker and sampler.
13603	20090415 105634	14.60129031	144.7756065	206.24	5.63	517.34	522.97	Going to end the dive after finishing work at this Marker 107.
13605	20090415 105737	14.60125942	144.7755943	64.6	2.09	519.07	521.16	Putting Tephra C in stbd biobox and then deploy shrimp trap before recovery.
13608	20090415 105909	14.60125984	144.7755936	66.62	1.9	519.14	521.04	Change in plan with Tephra C storage-first placing it on surface.
13609	20090415 105923	14.60125977	144.7755936	66.61	1.89	519.18	521.07	Next will deploy shrimp trap.
13611	20090415 110019	14.60125982	144.7755932	68.63	1.91	519.24	521.15	We are 10m NW from nav Marker 107 position.
13614	20090415 110226	14.60125924	144.7755911	69.94	2.23	519.24	521.47	DEPLOY Shrimp Trap Placing shrimp trap next to Tephra samplers. Depth is 520m.
13616	20090415 110301	14.60125883	144.7755914	67.72	1.95	519.33	521.28	Picking up Tephra C to stow where shrimp trap was (aft-port quad).
13618	20090415 110351	14.6012606	144.7755936	74.85	2.1	519.31	521.41	Leaving Tephra E in place for now at summit ridge Marker 107 site.
13619	20090415 110419	14.60126052	144.7755938	74.73	2.06	519.31	521.37	Now will end dive to determine damage to HD camera.
13621	20090415 110439	14.6012692	144.7755865	66.95	6.69	515.61	522.3	Crabs are hungry and flocking to shrimp trap.
13622	20090415 110448	14.6012717	144.7755833	65.03	7.06	515.27	522.33	Jason is leaving the bottom-ending dive.
13623	20090415 110506	14.6012791	144.7755836	67.45	9.6	513.27	522.87	Last views of Marker 107 site.
13624	20090415 110521	14.6013236	144.7755686	333.22	11.66	509.6	521.26	JASON off bottom Ending dive.

**J2-411 - Brimstone observations (continued).** JASON equipped with single-chamber suction sampler, 2 tephra samplers, HD off-load camera and light, 3 gas-tights, 2 markers, 3 scoops, Ko-ichi logger, Niskin, Eh sensor. Dive began just north of Brimstone with a strong N. current. Settled at a Brimstone viewing location on south side during some JASON engineering time. Vigorous activity at Brimstone. Took measurements with Ko-ichi temperature sensor at vent. During activity took 3 gas-tights. (At recovery discovered one gas-tight sampler was lost). Used off-load HD camera to image plume and activity. Took lava sample after visual survey then recovered nearly full tephra sampler (after 1 day). Took rock sample with scoop of sulfur-coated rock. Headed to eastern scarps. Took HD off-load imagery of base of middle steep ridge and sulfur crusts. Took measurements with Ko-ichi probe at ridge base then took a scoop of pieces of sulfur crust from 2/3 up ridge. Moved to the western ridge (near Fault Shrimp) and used Ko-ichi probe at the nose of ridge top. Filmed shrimp at site with HD off-load camera and then took shrimp sample with suction. Headed back SW to Brimstone over area of lava flows. Collected rock in pillow/lobate flow area. Turned north following flow upslope and stopped at contact with rubble of Brimstone's cone. Took lava sample at contact of pillow lava. Followed ridge up to Brimstone then continued up to summit at Mkr-107. Deployed tephra sampler to be left until next cruise to site and recovered the other tephra sampler. Recovered shrimp trap and hydrophone from summit. Returned to Brimstone for final visual observations (~1.5 hrs) before ascent.

**Table 6.4-14 JASON Dive J2-411**

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-411 Logger Comment
13634	20090415 130434	14.6012749	144.775696	332.8	badvalue	2.27	badvalue	JASON in water Begin dive.
13635	20090415 130451	14.6012692	144.7756924	317.22	badvalue	2.44	badvalue	Grounds clear. Driving away from ship.
13636	20090415 130527	14.6012678	144.7756896	312.6	badvalue	5.22	badvalue	NW Rota-1 Summit Dive
13637	20090415 130552	14.6012587	144.7756901	307.84	badvalue	4.49	badvalue	Deployment Location: Brimstone Pit 14deg 36.0'N/144deg46.5'E depth 620m.
13638	20090415 130710	14.6012394	144.7756996	298.5	badvalue	1.84	badvalue	On board: single-chamber suction; off-load HD camera; t-handle light; 3 gas-tights; 2 markers; 3 scoop bags; Ko-ichi temperature logger; Niskin; Jason temp probe; Eh sensor
13639	20090415 130809	14.6012193	144.7757137	295.41	badvalue	2.98	badvalue	Jason starting down.
13640	20090415 131343	14.6011709	144.775804	296.26	badvalue	80.1	badvalue	Shrimp following Jason down.
13641	20090415 132448	14.6011446	144.7759131	295.9	136.41	400.73	537.14	400m and going down.
13642	20090415 132909	14.6011336	144.7759318	302.2	125.88	412.21	538.09	We were holding at 410 and are now going down.
13643	20090415 133057	14.6011297	144.7759393	306.94	101.09	435.11	536.2	Altimeter is 100m.
13644	20090415 133400	14.601127	144.7759549	333.84	86.77	435.77	522.54	Holding at 436 and working with Medea.
13645	20090415 133515	14.6011277	144.7759649	2.95	91.49	435.91	527.4	Can see Jason in Medea cam.
13646	20090415 133601	14.6011054	144.7759893	92.9	98.74	437.35	536.09	Heading down again.
13647	20090415 133734	14.6010796	144.7759591	210.83	56.87	471.4	528.27	Jason is coming down NE of Brimstone.
13648	20090415 133753	14.601082	144.7759541	224.64	45.48	480.44	525.92	50m off bottom.
13649	20090415 133804	14.6010825	144.775954	226.26	39.49	485.07	524.56	WATCHSTANDERS Andra Bobbitt logger Heidi Berkenbosch video
13650	20090415 133907	14.6010835	144.7758233	224.74	23.49	515.32	538.81	Plume in water.
13651	20090415 133933	14.6010976	144.7758028	225.73	15.34	526.66	542	J2-411 Data DVDs start Blue set 70
13652	20090415 133937	14.6010948	144.7757981	223.18	14.83	527.81	542.64	Jason is looking south.
13654	20090415 134014	14.6011157	144.7757622	228.48	3.93	541.2	545.13	JASON on bottom There is the bottom.
13656	20090415 134045	14.6010928	144.7757433	196.53	7.94	540.78	548.72	Landed on an outcrop with a slope.
13657	20090415 134051	14.6010821	144.775736	156.3	10.21	540.35	550.56	J2-411 Start DVCAM 055
13658	20090415 134136	14.6010931	144.775779	138.57	11.54	536.95	548.49	Steep slope to stbd as we head 140de.
13660	20090415 134154	14.6011423	144.7757744	46.35	11.55	537.63	549.18	Looking at summit ridge.
13661	20090415 134215	14.6011657	144.7757616	219.92	7.64	538.61	546.25	Can see plume in Medea cam.
13663	20090415 134244	14.6011291	144.7758038	173.36	6.23	538.67	544.9	Passing over outcrop again.
13664	20090415 134300	14.6011256	144.7758263	138.46	7.54	537.59	545.13	Outcrop oriented along 133deg.
13665	20090415 134312	14.6011229	144.7758421	139.17	6.98	536.72	543.7	VIDEO Start recording HDCam
13666	20090415 134324	14.6011254	144.7758491	139.7	8.81	534.53	543.34	Outcrop on summit ridge.
13668	20090415 134358	14.6010817	144.7758851	167.9	6.31	532.79	539.1	Jason is not under Medea directly yet.
13670	20090415 134537	14.6009285	144.7754208	155.06	4.88	533.78	538.66	NAV Doppler reset
13672	20090415 134544	14.6009212	144.7754272	158.34	3.78	534.13	537.91	Jason fully under Medea.
13673	20090415 134559	14.6009207	144.7754192	156.52	5.23	532.96	538.19	This is the edge of Brimstone's cone.
13674	20090415 134610	14.6009192	144.7754209	157.45	4.59	533.73	538.32	Can see edge of plume in Medea camera.
13675	20090415 134629	14.6009195	144.7754206	157.11	4.54	533.68	538.22	Dropping a weight.
13677	20090415 134641	14.60092	144.7754191	156.94	5.21	533.25	538.46	Shrimp on the rocks.
13678	20090415 134702	14.6009197	144.7754217	158.12	4.76	533.54	538.3	Looks like some current as plume is whizzing by Medea camera.
13679	20090415 134734	14.6009234	144.7754202	158.24	5.41	533.14	538.55	We are over the 2006 Brimstone target and Brimstone should still be south of us.
13681	20090415 134814	14.6008786	144.7754062	177.15	6.24	529.07	535.31	Heading a bit south to Brimstone.
13682	20090415 134820	14.6008671	144.775409	174.34	5.31	528.54	533.85	VIDEO Stop recording HDCam
13683	20090415 134837	14.6008363	144.7754157	177.24	4.45	526.56	531.01	Moving up north side of Brimstone's cone.
13685	20090415 134912	14.6008222	144.775454	179.99	4.63	524.6	529.23	Turning a little left to stay outside of plume.
13686	20090415 134940	14.6008095	144.7754631	186.16	4.73	523.57	528.3	Strong current-tether is swung out away.

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13688	20090415 134957	14.6007995	144.7754683	174.87	5.4	522.21	527.61	Moving along plume.
13689	20090415 135028	14.6007708	144.775495	180.04	4.39	521.2	525.59	There is Marker 103 on the NE side of the vent-marker lying flat in current.
13690	20090415 135035	14.6007676	144.775499	181.51	3.86	521.47	525.33	VIDEO Start recording HDCam
13692	20090415 135111	14.6007476	144.7755062	183.49	4.16	520.38	524.54	Marker 103.
13693	20090415 135131	14.6007444	144.7755152	187.26	5.48	519.61	525.09	Marker 103 is flock rock.
13695	20090415 135207	14.6007336	144.775522	195.74	5.5	519.48	524.98	Approaching Brimstone top but current is pushing us away.
13696	20090415 135232	14.6007269	144.7755316	165.81	4.65	519.94	524.59	Can see bubbles in Medea.
13698	20090415 135246	14.6007176	144.7755443	166.2	4.26	520.54	524.8	Driving around top of cone.
13699	20090415 135305	14.6007062	144.7755383	173.35	4.45	519.61	524.06	At north side and plume is laying down flat.
13700	20090415 135312	14.6006998	144.7755469	154.63	3.48	520.13	523.61	Big block just fell down.
13701	20090415 135331	14.6006944	144.7755639	178.55	5.5	519.54	525.04	Can see lava rocks piled on top of sandy base at Brimstone.
13703	20090415 135352	14.6006658	144.7755474	189.15	4.09	519	523.09	At Brimstone Pit in heavy current.
13704	20090415 135421	14.6006418	144.7755297	205.91	4.19	518.22	522.41	Dust in front is from rocks that just tumbled.
13705	20090415 135440	14.6006502	144.7755234	254.71	4.91	517.24	522.15	Looks like a lot of material is missing as vent is on edge of slope.
13707	20090415 135449	14.6006507	144.7755279	245.31	5.84	516.65	522.49	Lots of bubbles in plume.
13708	20090415 135508	14.600649	144.7755198	255.27	5.84	516.2	522.04	Lots of bubbles and vigorous plume.
13709	20090415 135519	14.6006446	144.7755131	253.82	5.36	515.99	521.35	Current is from the north.
13711	20090415 135557	14.6006689	144.775532	295.07	5.71	516.29	522	Can't see bubbles now.
13712	20090415 135610	14.600682	144.7755451	317.16	5.61	516.92	522.53	there is the marker again. Mkr103
13713	20090415 135625	14.6006919	144.7755632	305.77	8.63	515.85	524.48	Plume is screaming flat with current.
13715	20090415 135710	14.6006977	144.775588	301.71	7.94	518.04	525.98	Hdg is 310 looking at marker and cone slope. We are on the side of Brimstone.
13717	20090415 135834	14.6006511	144.7755753	236.74	5.58	516.72	522.3	Looks like half of the vent has slid down-looks completely different when viewed from 235.
13719	20090415 135857	14.6005987	144.7755106	233.66	6.04	517.88	523.92	Looking down a pile of lava rocks from top.
13720	20090415 135915	14.600566	144.7754537	237.28	5.89	521.09	526.98	Circling around by overshooting before turning.
13721	20090415 135936	14.6005897	144.7754224	38.63	6.84	523.21	530.05	Jason swinging to right.
13723	20090415 140000	14.600602	144.7754371	48.44	5.56	523.1	528.66	WE are looking at 060 at Brimstone.
13724	20090415 140011	14.6005977	144.7754545	50.73	4.99	522.53	527.52	We are now on the south side of the cone.
13725	20090415 140026	14.6005994	144.7754754	39.94	5.16	520.97	526.13	Lots of rocks and tephra.
13727	20090415 140054	14.6006227	144.7755042	40.41	4	520.59	524.59	Tephra bucket is buried almost-was not placed that far down in ash.
13728	20090415 140112	14.6006257	144.7755107	45.25	2.71	521.09	523.8	Looks like rock dust going from behind us.
13729	20090415 140130	14.600626	144.7755106	45.77	2.79	521.01	523.8	We have landed on Brimstone looking 045.
13732	20090415 140145	14.6006991	144.7753617	45.64	2.78	521.01	523.79	NAV Doppler reset
13733	20090415 140157	14.6006987	144.7753601	57.67	2.54	521.61	524.15	We are on SW side and seeing rock movement.
13734	20090415 140203	14.6006982	144.77536	58.38	2.88	520.97	523.85	Depth is 522.
13735	20090415 140222	14.6006969	144.7753587	65.29	2.25	521.57	523.82	Tumbling rocks and lots more tephra.
13736	20090415 140239	14.6006975	144.7753616	43.28	2.6	521.22	523.82	Jason is finding a good position.
13738	20090415 140257	14.6006926	144.7753555	50.59	3.15	521.38	524.53	rumbling and shaking.
13739	20090415 140333	14.6006933	144.775361	47.16	2.69	521.44	524.13	Having to find a good position to stay out of current.
13741	20090415 140401	14.6006987	144.7753651	17.94	2.8	520.92	523.72	There goes the rock-big boulder. Much better view here.
13743	20090415 140445	14.6006987	144.7753779	7.57	1.8	521.64	523.44	Large increase in plume.
13744	20090415 140518	14.6007003	144.7753799	5.65	2.18	521.18	523.36	All shaking and some small bubble release.
13745	20090415 140534	14.6006997	144.7753791	5.77	2.2	521.15	523.35	parked at Brimstone while looking at 006deg.
13747	20090415 140549	14.6006992	144.7753785	6.12	2.2	521.12	523.32	Lots of shaking and tumbling.
13748	20090415 140611	14.6006984	144.7753786	7.38	2.13	521.16	523.29	Big slab moving. Lots of bubbles released.
13749	20090415 140625	14.6006975	144.7753788	8.67	2.59	520.96	523.55	Big tephra explosion.

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13750	20090415 140635	14.6006975	144.7753788	8.61	2.51	521.02	523.53	Brimstone may kick us off of here.
13752	20090415 140648	14.6006975	144.7753788	8.6	2.54	520.99	523.53	Looks like some shiny black lava on left.
13753	20090415 140712	14.6006977	144.7753787	9.2	2.56	521.01	523.57	Very vigorous and lots of shaking.
13754	20090415 140735	14.6006985	144.7753786	9.52	2.54	521	523.54	this is the engineering portion of the dive.
13756	20090415 140743	14.600698	144.7753789	9.65	2.53	521.05	523.58	Large bubbles with all this shaking.
13757	20090415 140805	14.6006989	144.7753778	9.68	2.54	521.03	523.57	Looks like lobate on left.
13758	20090415 140811	14.6006988	144.7753776	9.76	2.51	521.05	523.56	Big shake and bubbles.
13760	20090415 140850	14.6007008	144.7753769	9.63	2.55	521.01	523.56	Increase in yellow in plume.
13761	20090415 140858	14.6007012	144.7753767	9.59	2.53	521.03	523.56	All is shaking again.
13762	20090415 140914	14.6007014	144.775377	9.6	2.55	521.02	523.57	Going to try Ko-ichi's probe first.
13764	20090415 140947	14.6007017	144.7753774	9.24	2.56	520.97	523.53	Lots of shaking and huge bubble release.
13766	20090415 141046	14.6007013	144.7753772	9.11	2.58	520.96	523.54	Have Ko-ichi wand in stbd arm.
13767	20090415 141115	14.6007002	144.775378	8.75	2.59	520.92	523.51	Wand in tephra.
13768	20090415 141132	14.6006985	144.7753795	8.89	2.56	520.91	523.47	Taking Ko-ichi measurement.
13770	20090415 141200	14.6006981	144.7753794	9.36	2.53	520.87	523.4	Probe in during shaking and large bubble release. Lots of Tephra in lower plume.
13771	20090415 141205	14.6006978	144.7753794	9.33	2.54	520.86	523.4	Strobe is off.
13773	20090415 141318	14.6006949	144.7753784	9.5	2.53	520.89	523.42	MEASUREMENT stopped. shaking.
13774	20090415 141330	14.6006946	144.7753783	9.56	2.51	520.89	523.4	Going to measure another spot.
13776	20090415 141348	14.6006939	144.7753783	9.53	2.53	520.88	523.41	Going to place it as far left as arm can move.
13777	20090415 141402	14.6006931	144.775378	9.3	2.46	520.89	523.35	MEASUREMENT: Ko-ichi wand in.
13778	20090415 141410	14.6006931	144.775378	9.27	2.46	520.92	523.38	That was wand.
13779	20090415 141429	14.6006932	144.7753781	9.48	2.46	520.91	523.37	Wand is up nearer the top in an area of white plume.
13781	20090415 141455	14.6006919	144.7753775	10.84	2.56	520.86	523.42	Looks like fresh lava in background.
13782	20090415 141459	14.6006915	144.7753772	11.1	3.1	520.81	523.91	Wand pulled out.
13783	20090415 141533	14.6006913	144.7753768	11.11	2.54	520.86	523.4	Wand placed in again.
13784	20090415 141538	14.6006914	144.7753769	11.1	2.53	520.88	523.41	MEASURING again.
13786	20090415 141550	14.6006916	144.7753766	11.18	2.54	520.88	523.42	Shaking again.
13787	20090415 141612	14.6006917	144.7753761	11.17	2.53	520.88	523.41	Vent looks like in small depression surrounded by slabs.
13788	20090415 141626	14.6006906	144.7753766	11.26	2.54	520.86	523.4	Bigger explosions in center. Big shakes.
13789	20090415 141637	14.6006909	144.7753766	11.3	2.53	520.9	523.43	Good place to look at hydrophone record.
13791	20090415 141659	14.6006916	144.7753767	11.29	2.54	520.87	523.41	Lots of activity just behind wand.
13792	20090415 141720	14.6006922	144.7753767	11.39	2.51	520.89	523.4	Lots of ash coming out.
13794	20090415 141746	14.600692	144.7753767	11.38	2.58	520.84	523.42	Wand out.
13796	20090415 141927	14.6006894	144.7753761	11.39	2.55	520.84	523.39	having hard time finding loose sediment to place wand in.
13797	20090415 141935	14.6006887	144.7753759	11.38	2.55	520.86	523.41	Explosive and large pieces of tephra.
13799	20090415 141955	14.6006874	144.7753756	11.65	2.58	520.84	523.42	Extremely vigorous.
13800	20090415 142002	14.6006874	144.7753744	11.8	3.78	520.33	524.11	Vent appears more open.
13801	20090415 142009	14.600689	144.7753721	5.56	4.14	519.89	524.03	Edges all unstable.
13802	20090415 142021	14.6006861	144.775372	359.86	5.11	519.61	524.72	Slight repositioning of Jason.
13803	20090415 142027	14.6006883	144.775374	7.13	3.93	520	523.93	Lots of bubbles in front and yellow smoke.
13805	20090415 142116	14.6006824	144.7753711	12.31	3.16	520	523.16	Current pushed Jason forward when rose.
13806	20090415 142129	14.6006825	144.775371	11.76	3.01	520.1	523.11	Placing wand in bright yellow patch of plume.
13807	20090415 142137	14.6006825	144.7753709	12.75	3.06	520.03	523.09	MEASURING.
13809	20090415 142154	14.6006825	144.7753709	12.11	3.05	520.04	523.09	Lots of bubble and ash where probe is measuring.
13810	20090415 142158	14.6006825	144.775371	12.41	2.95	520.05	523	Really yellow.
13811	20090415 142218	14.6006827	144.7753711	11.66	2.9	520.08	522.98	Just shut off a bit.

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13812	20090415 142237	14.6006825	144.7753711	11.98	3.04	520.06	523.1	Can still see bright yellow again.
13814	20090415 142249	14.6006827	144.7753712	11.63	2.96	520.08	523.04	Wand out.
13815	20090415 142258	14.6006824	144.7753703	13.46	3.21	520.06	523.27	Plume obscuring view.
13816	20090415 142336	14.6007055	144.7753356	15.16	3.73	518.28	522.01	Waiting for smoke to clear.
13818	20090415 142342	14.6007098	144.7753331	21.82	3.23	518.66	521.89	Tephra sampler is almost full.
13819	20090415 142358	14.6007085	144.7753315	45.83	4.01	518.52	522.53	Repositioning back to Brimstone.
13820	20090415 142417	14.6007039	144.7753324	74.3	5.58	516.95	522.53	Tephra sampler buried in tephra and filled with it.
13821	20090415 142429	14.6007013	144.7753408	105.32	4.08	517.2	521.28	Back to battling the current.
13823	20090415 142505	14.6006837	144.7753627	31.33	4.54	518.15	522.69	Above Brimstone and can see lots of bubbles releasing from vent.
13824	20090415 142517	14.6006857	144.7753681	17.21	3.74	519.22	522.96	Swirling around top of plume looking down.
13826	20090415 142543	14.600684	144.775367	40.7	1.99	520.19	522.18	Bubbles-yellow-plume
13827	20090415 142553	14.6006845	144.7753679	34.73	2.14	520.24	522.38	Looking down at 037deg.
13828	20090415 142601	14.6006848	144.7753685	31.32	1.94	520.4	522.34	Probe in Plume.
13829	20090415 142606	14.6006847	144.7753686	30.09	1.81	520.45	522.26	MEASURING.
13830	20090415 142614	14.6006853	144.7753688	28.75	1.79	520.46	522.25	Big swirl of bubbles.
13832	20090415 142709	14.6006844	144.7753642	19.07	3.43	519.67	523.1	Wand out.
13833	20090415 142718	14.6006771	144.7753616	9.44	5.49	518.4	523.89	Can't see anything-plume.
13835	20090415 142744	14.6006905	144.7753633	10.97	4.2	518.32	522.52	Jason has backed off and is above plume.
13836	20090415 142752	14.6006954	144.7753616	5.96	4.24	517.97	522.21	Plume is very large.
13837	20090415 142812	14.6006921	144.7753659	11.76	3.31	518.92	522.23	Large bubbles in plume again.
13838	20090415 142826	14.6006853	144.7753567	3.75	3.4	519.51	522.91	We are back on south side.
13839	20090415 142833	14.6006864	144.7753641	4.92	4.35	518.8	523.15	Very yellow and vigorous.
13842	20090415 142943	14.6006793	144.7753704	12.72	2.16	520.86	523.02	Settling back down on Brimstone.
13843	20090415 143000	14.6006787	144.7753709	8.43	2.06	520.97	523.03	Smoke is coming our way again but current blows it back.
13844	20090415 143027	14.6006787	144.7753709	9.79	2.09	520.94	523.03	Stowing the wand.
13845	20090415 143032	14.6006786	144.7753707	9.88	2.09	520.92	523.01	Very yellow plume in background.
13846	20090415 143040	14.6006785	144.7753707	10.05	2.05	520.98	523.03	Big burst in back.
13848	20090415 143105	14.6006784	144.7753705	10.45	2.19	520.87	523.06	Rocks are moving.
13849	20090415 143111	14.6006785	144.7753706	10.77	2.08	520.99	523.07	Ash burst in center.
13850	20090415 143133	14.6006794	144.7753673	15.94	2.75	520.59	523.34	Big burst coming at us-plume washed it back again.
13851	20090415 143140	14.6006797	144.775366	14.5	3.09	520.49	523.58	Lots of bubbles.
13853	20090415 143152	14.60068	144.7753651	14.13	2.85	520.51	523.36	Ko-ichi sampler in holster.
13854	20090415 143211	14.6006796	144.7753647	14.42	2.8	520.51	523.31	Lulls are small before activity resumes.
13855	20090415 143240	14.6006796	144.7753639	14.99	2.84	520.52	523.36	Ko-ichi sampler bungeed onto basket.
13857	20090415 143328	14.6006795	144.7753641	14.51	2.79	520.54	523.33	Getting ready for gastight sampling.
13859	20090415 143355	14.6006757	144.775363	2.67	3.75	520.07	523.82	Red-white-blue stars
13862	20090415 143641	14.6006742	144.7753735	1.48	2.03	520.78	522.81	Brimstone Pit J2-411-gas-01 in yellow smoke close to rocks. Lots of bubbles in front and more yellow.
13865	20090415 143805	14.6006747	144.7753728	1.64	2.94	520.75	523.69	SAMPLE Gas Ash explosion.
13866	20090415 143810	14.6006747	144.7753727	1.68	2.94	520.76	523.7	Activity has picked up.
13867	20090415 143817	14.6006747	144.7753726	1.69	2.93	520.77	523.7	Did not fire yet.
13868	20090415 143831	14.6006738	144.775372	0.37	3.81	520.19	524	Big shaking.
13869	20090415 143839	14.6006757	144.775372	1.21	2.13	520.68	522.81	Lots of big movements.
13871	20090415 143913	14.6006791	144.7753716	358.22	2.64	520.5	523.14	SAMPLE Gas Bubbles in front. Huge plume increase.
13872	20090415 143933	14.6006796	144.7753712	358.21	2.51	520.39	522.9	Still not fired.
13874	20090415 144000	14.6006761	144.7753752	358.6	2.48	520.43	522.91	SAMPLE Gas Fired now.

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13875	20090415 144025	14.6006755	144.7753755	358.32	2.61	520.49	523.1	SAMPLE Gas Fired red-white-blue gas tight in plume burst. Retracted.
13878	20090415 144222	14.6006701	144.775371	356.81	1.89	520.6	522.49	GT placed in port aft behind milkcrates.
13880	20090415 144248	14.6006697	144.7753715	356.25	1.86	520.6	522.46	Getting ready for second gastight at Brimstone. White Gastight.
13881	20090415 144315	14.6006693	144.7753717	356.7	1.94	520.58	522.52	Lots of bubbles.
13883	20090415 144344	14.6006694	144.7753711	356.65	1.98	520.56	522.54	SAMPLE Gas We are at 357deg at 521.7m (same location at Pit)
13884	20090415 144349	14.6006694	144.775371	357.1	2.03	520.54	522.57	Not fired yet.
13885	20090415 144400	14.6006707	144.775371	1.31	3.88	519.25	523.13	Plume is yellowing and increasing activity.
13886	20090415 144409	14.6006722	144.7753699	0.46	3.11	519.9	523.01	Bubbles and ash burst.
13889	20090415 144544	14.6006783	144.7753703	0.61	2.19	520.28	522.47	SAMPLE Gas J2-411-gas-02 White gastight at Brimstone. Firing.
13890	20090415 144608	14.6006788	144.7753701	0.49	2.21	520.28	522.49	Fired in vigorous yellow patch then engulfed by plume.
13891	20090415 144623	14.6006787	144.7753703	0.65	2.11	520.34	522.45	Retracted and looks good.
13893	20090415 144655	14.6006778	144.7753708	0.83	2.15	520.31	522.46	Placing gastight in basket in same place it came from.
13894	20090415 144724	14.6006767	144.7753711	1.22	2.11	520.33	522.44	GT secured with bungee.
13895	20090415 144733	14.6006769	144.7753709	1.74	2.21	520.26	522.47	Ready for third gastight at Brimstone.
13897	20090415 144806	14.6006776	144.7753705	2.94	2.16	520.27	522.43	Lots of bubbles and plume.
13898	20090415 144833	14.6006776	144.7753704	3.74	2.16	520.23	522.39	This is the red gastight.
13900	20090415 144910	14.6006792	144.7753701	3.91	1.99	520.32	522.31	Still on south side of Brimstone. Switching pilots from Scott to Will.
13901	20090415 144923	14.6006791	144.7753699	4.15	2	520.32	522.32	Gastight in arm ready for plume.
13902	20090415 144932	14.6006794	144.7753702	4.3	2.03	520.31	522.34	Plume currently obscuring the view.
13904	20090415 145038	14.6006848	144.7753514	352.87	3.45	519.06	522.51	Just over the Tephra sampler when plume cleared-need to reposition the vehicle a bit.
13906	20090415 145052	14.6006733	144.7753508	12.32	5.14	518.29	523.43	Moving back down to the south side of pit.
13907	20090415 145111	14.600667	144.7753455	359.74	6.3	517.98	524.28	Large plume in view with bubbles-yellow.
13908	20090415 145138	14.6006635	144.7753554	3.91	6.49	518.07	524.56	Good overview from above of plume
13910	20090415 145148	14.6006646	144.7753629	5.12	5.18	518.9	524.08	Moving down to base level on south side.
13911	20090415 145230	14.6006669	144.775369	11.05	2.45	520.66	523.11	Rocks are moving in front of us.
13913	20090415 145310	14.6006671	144.7753699	11.67	2.53	520.64	523.17	SAMPLE Gas Red GT in thick yellow plume to left. Fired. J2-411-gt-03.
13914	20090415 145321	14.6006668	144.7753699	12.13	2.44	520.64	523.08	Fired in big yellow plume--good one!
13915	20090415 145326	14.6006668	144.7753699	11.73	2.43	520.68	523.11	Retracted.
13917	20090415 145403	14.6006657	144.7753691	12.27	2.33	520.77	523.1	Stowing Red gastight back where it came.
13919	20090415 145517	14.6006667	144.7753697	12.29	2.3	520.79	523.09	Bungeed securely.
13921	20090415 145628	14.6006668	144.7753688	12.37	2.38	520.75	523.13	Lots of activity in back of plume.
13923	20090415 145654	14.6006658	144.7753686	12.59	2.44	520.71	523.15	Using the off-load HD camera.
13924	20090415 145704	14.6006659	144.7753684	12.79	2.44	520.72	523.16	Recording HD arm camera.
13925	20090415 145733	14.6006656	144.7753681	12.78	2.48	520.71	523.19	Vigorous yellow plume in front left.
13929	20090415 145944	14.6006647	144.7753657	12.3	2.4	520.77	523.17	Moving camera around.
13931	20090415 150103	14.600663	144.7753633	12.6	2.31	520.86	523.17	Stopping arm cam recording.
13933	20090415 150158	14.6006632	144.7753632	12.39	2.31	520.9	523.21	Plume has changed in front of us. Looks like activity is behind.
13934	20090415 150207	14.6006631	144.7753633	12.28	2.29	520.91	523.2	Less shaking than at beginning.
13936	20090415 150338	14.6006635	144.7753633	12.3	2.28	520.91	523.19	Looking up the plume a bit more in pilot cam
13938	20090415 150359	14.600664	144.775363	12.86	2.29	520.99	523.28	Plume is still pretty flat in current.
13940	20090415 150450	14.6006667	144.7753611	12.15	2.21	520.98	523.19	Ground hugging fog.
13941	20090415 150518	14.6006673	144.7753607	11.74	2.23	521.01	523.24	Big burst in background.
13942	20090415 150535	14.6006677	144.7753606	11.69	2.21	520.99	523.2	Better visibility after burst.
13945	20090415 150642	14.6006644	144.7753607	11.69	2.84	521.05	523.89	Stowing the port arm.
13946	20090415 150654	14.6006645	144.7753608	11.53	2.23	521.05	523.28	Stop recording arm cam.
13947	20090415 150703	14.6006645	144.7753607	11.47	2.8	521.04	523.84	Looking at science cam now.

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13949	20090415 150756	14.6006651	144.7753607	11.04	2.78	521.01	523.79	Grabbing the hand-held light in stbd arm.
13950	20090415 150818	14.6006641	144.7753591	11.06	2.79	521.03	523.82	Plume is vigorous with big bursts and bubbles in back.
13952	20090415 150847	14.6006653	144.775359	11.23	2.99	520.77	523.76	Going to experiment with light and plume.
13953	20090415 150853	14.6006651	144.7753588	11.53	2.9	520.83	523.73	Big rock shakes.
13954	20090415 150901	14.6006649	144.7753588	10.08	2.08	521.12	523.2	Rocks in front are moving.
13955	20090415 150911	14.600665	144.7753585	10.1	2.2	521.11	523.31	VIDEO Start recording HDCam
13956	20090415 150927	14.6006651	144.7753584	10.25	2.1	521.13	523.23	Uplighting the plume
13958	20090415 151008	14.6006648	144.7753586	10.43	2.05	521.14	523.19	Can see rocks shaking.
13960	20090415 151056	14.6006651	144.7753588	10.6	2	521.16	523.16	Big plug of lava in center is coming out.
13961	20090415 151116	14.6006652	144.7753589	10.48	2.03	521.15	523.18	Big burst in back with ash.
13962	20090415 151131	14.6006657	144.7753587	10.5	2.01	521.15	523.16	Turning of stbd lights.
13964	20090415 151158	14.6006663	144.7753582	10.35	2.01	521.2	523.21	Larger burst.
13965	20090415 151232	14.6006685	144.7753567	10.35	2.01	521.2	523.21	Experimenting with lighting.
13967	20090415 151247	14.6006699	144.775356	10.31	2.01	521.18	523.19	Lava block in center has moved.
13968	20090415 151336	14.6006703	144.7753559	10.41	2.05	521.17	523.22	Steaming off
13970	20090415 151356	14.6006701	144.7753565	10.46	2.03	521.2	523.23	Steam coming toward Jason.
13971	20090415 151409	14.60067	144.7753571	10.44	2.08	521.17	523.25	Still plume burst behind.
13972	20090415 151428	14.6006704	144.7753577	10.51	2.06	521.18	523.24	More vigorous plume with bubbles.
13974	20090415 151522	14.6006703	144.7753588	10.74	1.99	521.24	523.23	Ash-bubbles and vigorous plume.
13976	20090415 151608	14.6006714	144.7753593	9.92	2.04	521.25	523.29	Large bubbles.
13977	20090415 151617	14.6006716	144.7753591	10.09	2.01	521.26	523.27	big shaking.
13978	20090415 151623	14.6006717	144.7753593	10.11	2.03	521.26	523.29	Plume increasing.
13980	20090415 151644	14.6006729	144.7753601	10.27	2.03	521.26	523.29	Large bubbles in center.
13982	20090415 151757	14.6006776	144.7753642	10.18	2.01	521.26	523.27	A lot of fog at the moment.
13984	20090415 151918	14.6006851	144.7753724	10.19	1.94	521.27	523.21	Vigorous plume in back and lots of steam in front.
13986	20090415 152008	14.6006865	144.7753754	10.13	1.9	521.29	523.19	Going to move vehicle around for a better vantage point.
13988	20090415 152120	14.60069	144.7753933	326.31	3.9	519.9	523.8	Moving counterclockwise.
13989	20090415 152128	14.6006927	144.7753994	317.33	3.98	519.63	523.61	Jason is circling the plume
13990	20090415 152134	14.6006976	144.7754028	307.6	4	519.51	523.51	Nice view from 311.
13992	20090415 152147	14.6007066	144.7754091	280.33	2.28	519.48	521.76	Brown cam has good overview shot.
13993	20090415 152206	14.6007158	144.7754109	271.15	1.36	520.08	521.44	Big plume burst with ash. Plume is not as flat.
13994	20090415 152213	14.6007167	144.7754114	268.85	1.11	520.32	521.43	Current decreased?
13995	20090415 152222	14.600717	144.7754119	267.5	1.14	520.31	521.45	Lots of bubbles going up and ash coming down.
13996	20090415 152233	14.6007173	144.7754124	267.09	1.14	520.3	521.44	Looking at 267.
13998	20090415 152254	14.6007178	144.7754131	266.52	1.13	520.3	521.43	Rocks jostling in front of Jason.
13999	20090415 152258	14.600718	144.7754127	266.53	1.13	520.3	521.43	Bubbles in front.
14000	20090415 152316	14.600717	144.7754124	266.47	1.21	520.25	521.46	Moving out arm camera.
14001	20090415 152342	14.6007161	144.7754112	266.37	1.23	520.25	521.48	Steady stream of bubbles in front. Top is pulsing.
14003	20090415 152409	14.600716	144.7754108	266.48	1.25	520.25	521.5	Rocks are moving.
14004	20090415 152422	14.6007155	144.7754106	266.51	1.25	520.25	521.5	Nice bubbles in arm camera. Recording.
14005	20090415 152436	14.6007151	144.7754106	266.38	1.23	520.28	521.51	Big pulse in lava.
14007	20090415 152444	14.600715	144.7754105	266.42	1.25	520.26	521.51	bubbles in arm camera.
14008	20090415 152456	14.6007148	144.7754104	266.22	1.24	520.26	521.5	Following bubbles.
14010	20090415 152557	14.6007131	144.7754092	266.39	1.23	520.25	521.48	Bubbles diminished.
14011	20090415 152611	14.6007133	144.7754091	266.53	1.23	520.27	521.5	Bubbles are now increasing once again in front.
14012	20090415 152631	14.6007124	144.7754082	266.28	1.23	520.25	521.48	Looks like new lava is trying to get out.

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14014	20090415 152653	14.6007123	144.7754072	266.3	1.23	520.25	521.48	Lava in vent is rounder than previous days.
14016	20090415 152754	14.6007128	144.7754066	266.42	1.23	520.26	521.49	More bubbles.
14017	20090415 152806	14.6007127	144.7754063	266.37	1.23	520.27	521.5	Watching bubbles come out from sediment.
14018	20090415 152809	14.6007128	144.7754062	266.39	1.23	520.25	521.48	More bubbles.
14019	20090415 152820	14.6007132	144.7754059	266.37	1.23	520.25	521.48	More vigorous.
14022	20090415 152954	14.6007149	144.775403	266.44	1.24	520.25	521.49	Moving arm cam upward.
14023	20090415 153006	14.6007154	144.7754032	266.43	1.23	520.27	521.5	No bubbles in big plume right now.
14025	20090415 153046	14.6007168	144.7754025	266.41	1.23	520.27	521.5	Some bubbles starting.
14026	20090415 153104	14.6007172	144.7754021	266.44	1.23	520.28	521.51	Watching rock moving.
14027	20090415 153110	14.600717	144.775402	266.47	1.23	520.27	521.5	More bubbles.
14029	20090415 153150	14.6007164	144.7754018	266.55	1.23	520.28	521.51	No bubbles.
14030	20090415 153212	14.6007164	144.7754027	266.69	1.23	520.28	521.51	Some bubbles starting.
14031	20090415 153236	14.6007169	144.7754036	266.63	1.21	520.28	521.49	Shaking.
14033	20090415 153245	14.6007168	144.7754039	266.53	1.21	520.28	521.49	More plume release.
14034	20090415 153256	14.6007168	144.7754041	266.54	1.21	520.28	521.49	Ash falling in back right.
14035	20090415 153259	14.6007167	144.775404	266.47	1.21	520.28	521.49	Big shaking.
14036	20090415 153306	14.6007167	144.775404	266.51	1.23	520.27	521.5	Big bubble release.
14037	20090415 153320	14.6007167	144.7754047	266.46	1.23	520.28	521.51	Still bubbling.
14038	20090415 153340	14.6007162	144.7754046	266.4	1.21	520.29	521.5	Turning off side light.
14040	20090415 153358	14.6007171	144.7754035	266.59	1.19	520.29	521.48	Done with camera art for a bit. Science watch now.
14041	20090415 153416	14.6007188	144.7754014	266.52	1.19	520.3	521.49	Big steam release.
14042	20090415 153430	14.6007207	144.7753994	266.66	1.19	520.3	521.49	Some bubbles.
14043	20090415 153442	14.6007228	144.7753973	266.69	1.19	520.3	521.49	J2-411 Data DVDs start red set 71
14045	20090415 153445	14.6007232	144.7753968	266.64	1.2	520.3	521.5	Vigorous burst in back.
14046	20090415 153506	14.6007238	144.7753955	266.9	1.19	520.3	521.49	Arm cam has good shaking photos.
14047	20090415 153522	14.6007246	144.7753944	266.74	1.19	520.31	521.5	Lots of shaking then bubbles.
14049	20090415 153554	14.6007291	144.7753895	266.68	1.19	520.3	521.49	This must be showing up on hydrophone.
14050	20090415 153559	14.6007296	144.7753889	266.8	1.19	520.3	521.49	Lots of activity in back.
14052	20090415 153652	14.600734	144.7753851	266.85	1.19	520.29	521.48	Can see lava plug in center briefly.
14053	20090415 153701	14.6007352	144.7753844	266.77	1.19	520.3	521.49	Bubbles around plug.
14054	20090415 153722	14.600737	144.7753829	266.9	1.19	520.27	521.46	Shaking.
14055	20090415 153736	14.6007374	144.7753834	266.87	1.2	520.28	521.48	Couple good peaks of the big rock.
14057	20090415 153816	14.6007357	144.7753831	266.96	1.19	520.25	521.44	Yellow at right base of plug.
14059	20090415 153900	14.6007338	144.7753823	267.14	1.19	520.25	521.44	Ash falling in back.
14060	20090415 153905	14.6007337	144.7753823	267.07	1.2	520.25	521.45	J2-411 Data DVDs stop blue set 70
14061	20090415 153909	14.6007336	144.7753823	267.1	1.2	520.25	521.45	Bubbles still around plug.
14063	20090415 153947	14.6007324	144.7753821	267.04	1.2	520.23	521.43	Looks like splitting open when it shakes.
14064	20090415 154007	14.6007326	144.7753827	266.84	1.19	520.23	521.42	Striped rock in front of basket.
14066	20090415 154051	14.6007325	144.7753836	266.33	1.24	520.23	521.47	Stripes in rock almost look folded.
14067	20090415 154101	14.6007321	144.7753831	266.23	1.24	520.23	521.47	Pillows in the vent.
14068	20090415 154125	14.6007323	144.7753834	265.98	1.3	520.19	521.49	Going to stow the hand-held light.
14070	20090415 154145	14.6007323	144.775383	266.24	1.31	520.2	521.51	Sci camera has vigorous activity in view.
14071	20090415 154207	14.600732	144.7753829	266.22	1.26	520.21	521.47	Light is stowed.
14072	20090415 154227	14.6007318	144.7753829	265.16	1.18	520.27	521.45	Done with engineering portion of dive.
14074	20090415 154310	14.6007344	144.7753848	265.9	1.21	520.25	521.46	Bubbles in center.
14075	20090415 154330	14.6007339	144.7753838	265.68	1.24	520.23	521.47	J2-411 Stop DVCAM 55 and start DVCAM 56



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14076	20090415 154333	14.6007339	144.7753838	265.65	1.24	520.25	521.49	Searching for good rocks.
14078	20090415 154425	14.6007356	144.7753859	265.15	1.26	520.2	521.46	SAMPLE Geology good rock sample 4: Lava rock. From Brimstone at 265deg at 521m. J2-411-rock-04.
14084	20090415 154852	14.600724	144.7753854	264.9	1.31	520.25	521.56	WATCHSTANDERS Susan Merle logger
14085	20090415 154857	14.6007236	144.7753855	264.7	1.31	520.24	521.55	WATCHSTANDERS Nick Deardorff video
14087	20090415 154959	14.600722	144.7753851	263.07	1.31	520.29	521.6	VIDEO Stop recording HDCam
14088	20090415 155026	14.6007247	144.7753871	264.24	1.31	520.25	521.56	A bit of floundering now between watches.
14089	20090415 155030	14.6007253	144.7753874	264.17	1.31	520.27	521.58	VIDEO Start recording HDCam
14093	20090415 155319	14.6007292	144.7753878	263.64	1.34	520.24	521.58	There is a lot more tephra up here. Nick's bucket is almost full and buried.
14096	20090415 155529	14.6007293	144.7753895	264.31	1.3	520.25	521.55	The plan is to get the tephra sampler near the vent here.
14097	20090415 155536	14.6007303	144.7753901	264.05	1.29	520.25	521.54	VIDEO Stop recording HDCam
14100	20090415 155724	14.6007473	144.7753089	95.62	4.51	517.54	522.05	Pulling away from the vent now to retrieve the sampler.
14102	20090415 155821	14.6007507	144.7753236	108.77	2.03	519.39	521.42	The tephra sampler is almost buried. The sampler is about 2/3 buried.
14104	20090415 155847	14.6007483	144.7753215	101.72	0.98	520.3	521.28	We're on the W/NW side of the vent.
14106	20090415 160006	14.600748	144.7753211	101.41	1	520.23	521.23	It's put out loads of ash in the last 24 hours.
14108	20090415 160048	14.6007477	144.7753218	101.32	1	520.23	521.23	The tephra is covering the slope here and its deep.
14110	20090415 160219	14.6007495	144.7753214	101.02	1.03	520.2	521.23	RECOVER Tephra Sampler E. W/NW of Brimstone. About 5m or less.
14111	20090415 160229	14.6007502	144.7753211	101.05	1	520.2	521.2	VIDEO Start recording HDCam
14113	20090415 160335	14.6007518	144.7753207	101.79	0.96	520.3	521.26	SAMPLE Geology 5. Tephra sampler E. Nearly full sampler after 1 day. Sampler was about 2/3 buried. PI Deardorff.
14115	20090415 160401	14.6007568	144.7753125	42.62	2.66	519.2	521.86	Brimstone has tephra right up to the rim today - at least from this angle.
14116	20090415 160425	14.6007555	144.7753171	37.9	1.76	519.59	521.35	Cornel wants a sulfur coated flange.
14119	20090415 160602	14.6007583	144.7753142	40.71	1.1	520.13	521.23	Sub-horizontal layering of the lava. Sulfur-coated lava here.
14121	20090415 160649	14.6007614	144.7753138	40.57	1.13	520.1	521.23	The rock is breaking up as he tries to sample it.
14123	20090415 160810	14.6007604	144.7753113	39.02	1.13	520.08	521.21	The rock is pretty crumbly. Are going to use the scoop instead.
14125	20090415 160853	14.600757	144.7753089	38.99	1.15	520.08	521.23	Cornel is trying to grab another thing.
14126	20090415 160919	14.6007558	144.7753096	38.99	1.15	520.08	521.23	Still haven't decided what method to use for sampling here.
14131	20090415 161321	14.6007531	144.7753076	38.23	1.15	520.11	521.26	SAMPLE Geology 6. Attempting to sample this flange. Getting a lot of sulfur in the scoop bag.
14133	20090415 161429	14.6007444	144.7753034	37.88	1.1	520.16	521.26	SAMPLE Geology 6. Scoop of sulfur off this rock with flange W/NW of Brimstone next to the tephra sampler we just recovered (TSE).
14136	20090415 161554	14.600741	144.7752885	39.62	0.99	520.25	521.24	SAMPLE Geology j2-411-sulfur-06. Scoop bag with sulfur from this rock.
14138	20090415 161705	14.6007504	144.7752784	48.93	2.44	519.37	521.81	Heading to marker 113.
14139	20090415 161720	14.6007517	144.7752768	58.67	2.39	519.51	521.9	VIDEO Start recording HDCam
14143	20090415 162018	14.6007495	144.7752784	87.4	3.73	517.63	521.36	We can see the plume is the background on the HDCam.
14146	20090415 162209	14.6007723	144.7752886	88.55	9.03	511.55	520.58	Lifting off now. will head over to the multiple marker place on the eastern scarp wall. Series of 3 steep ridges over there.
14147	20090415 162232	14.6007871	144.7753496	90.86	8.2	512.71	520.91	The plume is quite cohesive.
14148	20090415 162242	14.600792	144.7753751	88.62	7.96	515.41	523.37	VIDEO Stop recording HDCam
14153	20090415 162637	14.6007138	144.7756764	88	3.31	537.3	540.61	Headed to the east.
14156	20090415 162820	14.6006597	144.7758131	90.22	8.56	537.62	546.18	Just passed a marker. It looks like marker 106.
14158	20090415 162854	14.6006647	144.7758734	88.09	5.08	534.36	539.44	Bob has turned the mike off because the conversation has become a bit too odd in here.
14159	20090415 162939	14.6006651	144.7758784	87.68	4.43	534.42	538.85	Jason shift change now. Will is ending his shift and Buddha is coming on. Jon is leaving and Bob the navigator is coming on.

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14165	20090415 163347	14.6006979	144.775948	88.2	8.24	525.86	534.1	The navigation is recording to dive 410. Must not have switched over the dive number in nav land.
14169	20090415 163701	14.6007593	144.7765475	87.01	10.15	552.57	562.72	The bottom is barely visible now. Our altitude is almost 10m.
14173	20090415 164036	14.6006834	144.7766902	87.97	10.11	557.33	567.44	The bottom is in sight ahead.
14176	20090415 164236	14.6006212	144.777013	88.57	20.65	561.58	582.23	Can't see the bottom now.
14178	20090415 164342	14.6007256	144.7771721	59.42	19.38	564.34	583.72	The bottom is in sight again.
14182	20090415 164610	14.6006769	144.7772958	67.62	14.98	566.15	581.13	Marker in the distance. It looks like Mkr109.
14184	20090415 164659	14.6006305	144.7773008	46.74	14.68	569.01	583.69	Mkr-109 is at the top of the first rise. Mkr-113 is at the top of the second rise. It's very steep.
14187	20090415 164941	14.6005841	144.7772965	35.55	6.4	580.23	586.63	VIDEO Start recording HDCam
14189	20090415 165016	14.6005648	144.7773307	352.68	9.06	581.02	590.08	We're at the base of this middle steep ridge. Sort of at the nose.
14191	20090415 165106	14.6005828	144.7773344	342.18	4.04	581.59	585.63	Cornel is on the mike.
14192	20090415 165128	14.6005836	144.7773346	342.28	2.56	581.93	584.49	Beautiful planar crust the is horizontal to the steep ridge.
14194	20090415 165159	14.6005799	144.7773352	339.94	2.61	581.95	584.56	These 2 eastern ridges are very steep.
14195	20090415 165220	14.6005799	144.7773384	343.47	2.5	581.91	584.41	There is some filamentous bacteria on this ridge.
14197	20090415 165257	14.6005791	144.777339	4.92	4.59	582.24	586.83	A couple layer of this strange horizontal (planar) crust.
14198	20090415 165340	14.6005754	144.7773424	4.66	4.61	582.19	586.8	We can see the eastern-most and middle ridge in the pilot cam.
14201	20090415 165451	14.6005748	144.7773439	4.64	4.26	582.26	586.52	The middle ridge and easternmost ridge both have this sulfur planar ridges.
14202	20090415 165512	14.6005749	144.7773446	4.57	3.96	582.22	586.18	Cornel would like to get a bit of the offload HD camera on the flange.
14204	20090415 165631	14.6005753	144.7773465	4.67	4.41	582.28	586.69	Spectacular image of the two steep ridges here on this easternmost curvilinear feature - perhaps an old collapsed caldera rim.
14206	20090415 165706	14.6005749	144.7773472	4.56	4.68	582.25	586.93	The offload image is quite beautiful. This flange has some filamentous mat on it.
14207	20090415 165733	14.6005748	144.7773436	2.32	4.35	582.26	586.61	Want to know if this sulfur was molten on the surface.
14209	20090415 165813	14.600574	144.7773452	4.92	4.33	582.32	586.65	The best way to establish it is to see flow patterns on the surface of this flange.
14210	20090415 165818	14.6005748	144.7773452	4.78	4.33	582.29	586.62	A couple eels here.
14212	20090415 165851	14.6005739	144.7773453	4.77	4.45	582.25	586.7	The only way this could be flow is if it came downslope.
14214	20090415 170010	14.6005745	144.7773452	4.76	4.98	581.68	586.66	Is it a paleo slope? Is the sulfur laid down on top of one lava flow then covered with another?
14215	20090415 170025	14.6005752	144.7773454	4.72	4.98	581.78	586.76	Now looking at the eastern ridge in the HD Cam.
14217	20090415 170109	14.6005751	144.7773456	4.81	4.98	581.73	586.71	Cornel thinks it also could have been a sulfur flow between the two layers.....
14219	20090415 170226	14.6005753	144.7773453	4.83	5.29	581.78	587.07	The sulfur is a time line. We see this at the top now.
14220	20090415 170239	14.6005748	144.7773452	4.84	5.11	581.7	586.81	Turned the offload camera off.
14223	20090415 170345	14.6005402	144.7773188	30.71	5.46	583.84	589.3	An amazing view in the pilot cam. Stirred up a bit of sediment in the HD (science cam).
14225	20090415 170459	14.6005619	144.7773181	0.21	1.83	586.78	588.61	Want to put the temperature probe in the seds here.
14228	20090415 170730	14.6005584	144.7773189	1.02	1.95	586.82	588.77	From this perspective we don't see a westernmost ridge. Must end farther to the north.
14230	20090415 170749	14.6005585	144.777319	0.81	1.98	586.8	588.78	VIDEO Stop recording HDCam
14231	20090415 170824	14.6005586	144.7773191	0.74	1.94	586.82	588.76	At the base of this ridge we see more sulfur. Could be the condensation of sulfur at the paleo slope.
14233	20090415 170907	14.6005587	144.7773192	0.63	2.01	586.75	588.76	The handle of the probe is not very secure. Ko-ichi says we can grab the body of the probe.
14234	20090415 170939	14.600559	144.7773192	0.84	1.95	586.8	588.75	We're about 2m from the base of the middle ridge.
14236	20090415 171018	14.6005599	144.7773186	0.56	1.84	586.85	588.69	DEPLOY Koichi Sensors This is the Koichi temperature probe. It has been pushed all the way into the seds here at the base.
14238	20090415 171126	14.6005368	144.7773253	358.77	8.8	582.64	591.44	Koichi probe is at the base of the steep middle ridge about 2m away from the base.

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14240	20090415 171217	14.6005411	144.7773254	7	8.53	582.76	591.29	Looking at the middle of two very steep knife-edge ridges that come down. We see planar horizons that bisect the ridge itself. Could represent paleo slopes.
14242	20090415 171337	14.600556	144.7773342	6.9	7.45	582.74	590.19	VIDEO Start recording HDCam a few minutes ago.
14244	20090415 171347	14.600557	144.7773348	6.89	7.35	582.89	590.24	Slowly descending.
14246	20090415 171503	14.6005685	144.7773419	6.97	5.65	583.64	589.29	Narrow gorge between the two is in front of us now.
14247	20090415 171522	14.6005749	144.7773429	6.72	5.46	583.44	588.9	Sulfur (?) debris and sediment between the ridges.
14249	20090415 171602	14.6005789	144.777343	1.9	5.38	583.11	588.49	Will attempt to sample some of this light planar material.
14251	20090415 171708	14.6005751	144.7773361	352.11	4.14	583.17	587.31	The rocks look similar to the stuff near brimstone. There is filamentous bac mat on the surface on the rock.
14252	20090415 171735	14.6005734	144.7773371	353.28	4.7	582.87	587.57	We know there was flow at the top of the ridge.
14254	20090415 171747	14.6005736	144.7773372	353.44	4.46	582.87	587.33	Looking at the planar surface now.
14255	20090415 171822	14.6005734	144.7773374	352.99	4.6	582.86	587.46	Attempted to grab a piece of this planar surface and it crumbled in the claw.
14257	20090415 171913	14.6005736	144.7773371	354.47	4.6	582.87	587.47	The top surface of this looks like globular sulfur. This is very crumbly. Looks like a scoop sample will be necessary.
14260	20090415 172103	14.6005734	144.7773367	354.93	4.56	582.87	587.43	Bob wants to leave some of this here.
14264	20090415 172401	14.6005655	144.7773391	348.11	4.6	582.83	587.43	SAMPLE Geology Sulfur layer (crust?) piece about 2/3 up this middle ridge at the nose of this ridge. Will go to the base of this feature now and collect anything that fell to the bottom.
14267	20090415 172605	14.6005703	144.7773453	6.82	2.03	584.99	587.02	SAMPLE Geology 7. j2-411-sulfur-7. A scoop of this planar surface on the middle ridge. Will go to the bottom and scoop off some of the flat stuff on the sed.
14268	20090415 172620	14.6005722	144.777346	7.04	2.09	584.94	587.03	HD Cam tapes changes.
14271	20090415 172830	14.6005721	144.7773508	6.26	2.2	585.16	587.36	Scooped up this planar sulfur surface off the sed at the base of this middle knife ridge. Just down the nose of the ridge (Mkr-113 is at the ridge top).
14275	20090415 173054	14.6005552	144.7773366	359.62	3.64	585.68	589.32	SAMPLE Geology 7. Scoop of sulfur planar surface about halfway up this middle knife-edged ridge.
14277	20090415 173235	14.6005578	144.7773378	357.53	2.65	586.38	589.03	J2-411 Data DVDs start blue set DVDs 072
14279	20090415 173312	14.6005577	144.7773377	357.51	2.58	586.43	589.01	RECOVER Koichi Sensors . Koichi's temperature probe. Was in the sed at the base of this ridge.
14280	20090415 173330	14.6005577	144.7773376	357.51	2.66	586.38	589.04	LOST POWER TO ONE OF THE DVD RECORDERS.
14282	20090415 173355	14.6005574	144.7773373	357.52	2.64	586.36	589	J2-411 lost power to DVD recorder PC-W red set
14283	20090415 173416	14.6005571	144.777337	357.56	2.58	586.41	588.99	Stowing the temp probe.
14285	20090415 173459	14.6005571	144.7773369	357.51	2.65	586.36	589.01	J2-411 Data DVDs stop red set DVD 071
14288	20090415 173710	14.6005577	144.7773371	357.64	2.54	586.46	589	Temp probe stowed.
14292	20090415 174013	14.6005896	144.7773125	55.68	5.8	578.83	584.63	The pilot cam DVD did not record totally. Had an issue. Seems to be working now.
14293	20090415 174040	14.6006235	144.777312	58.97	4.83	577.64	582.47	Beautiful view of the geometry of these ridges in all cameras.
14296	20090415 174148	14.6006484	144.7773171	59.26	3.94	576.98	580.92	Looking at the southwest side of the middle ridge we were just sampling.
14298	20090415 174327	14.6006806	144.7773033	26.72	11.71	569.09	580.8	J2-411 DVCAM 056 stop and 057 start
14299	20090415 174334	14.6006908	144.777309	29.98	11.23	568.4	579.63	Almost looks like a big huge pillow flow.
14301	20090415 174423	14.6007228	144.7773189	32.29	10.26	565.82	576.08	VIDEO Stop recording HDCam
14304	20090415 174547	14.6008604	144.7773666	112.79	2.3	562.26	564.56	We're at the top of this ridge to the west here.
14307	20090415 174756	14.6008619	144.7773601	93.76	1.99	563.49	565.48	This is a series of 3 ridges in this area. The easternmost and center are extremely steep. The westernmost is a bit more gradual and does not extend as far to the south as the other two.
14309	20090415 174919	14.6008604	144.7773598	72.21	2.34	563.88	566.22	Lots of shrimp in the sed here. Not rocky here as was previously noted.
14312	20090415 175050	14.6008597	144.777359	72.2	2.43	563.84	566.27	We're out at the edge of the western-most of these three steep ridges on the east side. Mkr-109 site on the outcrop to the north.

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14313	20090415 175136	14.6008596	144.777359	71.7	2.5	563.74	566.24	Will deploy Ko-ichi temp probe here at the nose of this westernmost ridge (southern point).
14316	20090415 175319	14.6007968	144.7773106	89.89	8.18	563.9	572.08	DEPLOY Koichi Sensors Koichi temperature probe in the sed at end of the top of the ridge.
14318	20090415 175401	14.6007913	144.7773213	90.96	7.48	564.21	571.69	We see the present-day equivalents of the crusts on the top of this ridge at the base of Mkr-109.
14320	20090415 175458	14.600793	144.7773242	90.74	6.65	564.29	570.94	Shrimp all over this sulfur covered ridge. The shrimp are on the rocks here.
14322	20090415 175603	14.6007866	144.7773293	73.48	7.99	564.48	572.47	We are going to do a bit of the offload HD cam on these shrimp in the diffuse flow. they are on the black sed and the sulfur blocks.
14323	20090415 175612	14.6007869	144.777329	73.43	7.26	564.48	571.74	VIDEO Start recording HDCam
14325	20090415 175703	14.6007867	144.7773291	73.33	8.01	564.49	572.5	Sheryl has the mike now. The purpose of our visit here is to film shrimp.
14327	20090415 175756	14.6007869	144.7773295	73.11	6.64	564.49	571.13	VIDEO Start recording HDCam to film the shrimp here at Mkr-109 (Fault Shrimp vent).
14329	20090415 175851	14.6007914	144.7773293	72.58	4.89	566.1	570.99	Setting up the offload cam.
14330	20090415 175927	14.6007914	144.7773294	72.54	4.95	566.06	571.01	The shrimp are all marching away from the camera.
14333	20090415 180054	14.6007914	144.7773297	72.24	4.94	566.1	571.04	We see a nice shot of the shrimp and a limpet in the DVcam.
14334	20090415 180135	14.6007912	144.7773297	72.41	4.95	566.09	571.04	We are now recording on the offload HD cam.
14336	20090415 180201	14.6007911	144.7773297	72.26	4.96	566.09	571.05	We are looking at the big shrimp and the little shrimp. Several limpets on the rocks here.
14337	20090415 180231	14.6007911	144.7773297	72.45	4.96	566.1	571.06	Nice footage on the HDCam (Sci cam) as well.
14339	20090415 180326	14.6007908	144.7773297	72.56	5.1	566.1	571.2	Tape 29 mini HDCam is back on.
14342	20090415 180447	14.6007905	144.7773298	72.52	4.99	566.09	571.08	Panning around in the HDCam.
14344	20090415 180557	14.6007904	144.7773297	72.61	5.14	566.11	571.25	Nice shot in HD Cam with the flow and an abundance of shrimp on the bare rocks and sulfur(?) slope.
14346	20090415 180742	14.6007902	144.7773297	72.48	5.01	566.14	571.15	The shrimp are really quite thick here. Nice shots on both HD Cams.
14349	20090415 180858	14.60079	144.7773298	72.6	5.14	566.11	571.25	Panning around a bit in the offload cam. Big shrimp (Alvinocaris) and little shrimp (Opaepele). Also limpets.
14351	20090415 181022	14.6007898	144.7773299	72.64	5.21	566.08	571.29	Taking a couple HD frame grabs here.
14355	20090415 181337	14.6007896	144.7773301	72.68	5.04	566.05	571.09	Wispy white stuff floating by in the offload camera. Bacteria?
14359	20090415 181556	14.6007884	144.7773268	72.09	5.29	566.03	571.32	Stop recording offload. Got about 12+ minutes of the offload HD cam. Stopped HDCam (Sci cam). This is at the base of Mkr-109 which we are now presuming is Scarp Top of old.
14361	20090415 181645	14.6007883	144.7773269	71.66	5.39	566.03	571.42	Next task is to suction some shrimp.
14363	20090415 181812	14.6007893	144.7773306	71.42	4.83	566.14	570.97	Depth here is 567m. Mkr-109 (the scarp top of old).
14365	20090415 181927	14.6007892	144.7773306	71.4	4.83	566.15	570.98	SAMPLE Biology 8. Suction sample shrimp. J2-411-bio-08. Shrimp on the rocks and plates (sulfur?)
14369	20090415 182235	14.6007904	144.777333	72.51	4.56	565.82	570.38	J2-411-bio-08 cont. Suction shrimp. Trying to get the big one. Definitely have some in the suction.
14373	20090415 182517	14.60079	144.7773331	72.73	5.21	565.73	570.94	Almost got a big one.
14375	20090415 182644	14.6007899	144.7773331	72.68	5.01	565.78	570.79	J2-411-bio-08 end. Looks like Buddha sucked up at least 2 of the big ones. This is the suction mother-lode.
14379	20090415 182929	14.6008489	144.7773459	84.21	4.76	562.8	567.56	Departing from Mkr-109 site.
14383	20090415 183151	14.6008544	144.7773576	84.36	3.29	563.27	566.56	RECOVER Koichi Sensors Koichi temperature probe out of sed at the tip of this ridge (Mkr-109 in background). It has been in the sed for about 45 minutes - check log....
14388	20090415 183553	14.6008547	144.7773479	341.88	3.55	562.78	566.33	Pulling out of here and heading back to Brimstone area.
14390	20090415 183708	14.6008287	144.7772626	249.8	2.45	567.69	570.14	Heading 275m to the W/SW. To look at the new? lava flows.
14394	20090415 184042	14.6006714	144.7768588	251.44	6.99	568.31	575.3	going over incredibly steep sediment slopes
14396	20090415 184145	14.6006045	144.7767189	249.38	6.56	564.14	570.7	proceeded to SW to lava flows

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14402	20090415 184629	14.6003866	144.776175	250.24	2.19	541.51	543.7	lava ridges sticking out southern sedimented slopes
14408	20090415 185226	14.6000573	144.7752894	250.8	4.39	564.53	568.92	We're en route to the area of lava flows SW of Brimstone. "Breccia - you betcha" says Bob.
14410	20090415 185306	14.59999	144.7751831	250.36	7.31	565.63	572.94	See some pillow lavas.
14412	20090415 185432	14.5999483	144.7751179	271.37	5.44	569.01	574.45	We just passed over what looked like and intact pillow flow. Lots of rubble and talus here.
14414	20090415 185508	14.5999464	144.7750928	275.11	3.83	573.57	577.4	Weird-looking flow here. Sort of like a fat sheet flow.
14416	20090415 185603	14.5999531	144.7750093	293.84	6.08	572.11	578.19	Looks like some tubular pillows here.
14418	20090415 185649	14.5999695	144.7749656	297.16	2.99	575.12	578.11	Looks like some lobate flows here.
14419	20090415 185700	14.5999696	144.7749647	296.76	2.46	575.76	578.22	Pile up of various flows here.
14420	20090415 185710	14.5999687	144.7749658	293.85	2.24	575.94	578.18	Pillow in front of us and lobates.
14422	20090415 185831	14.5999553	144.7749639	317.28	2.78	576.25	579.03	Quite spectacular lava here. Flatter flows underneath.
14424	20090415 185854	14.599958	144.774953	316.51	3.11	576.78	579.89	Look like pillow buds and some longer lobates here.
14427	20090415 190056	14.599957	144.7749538	317.2	3.21	576.37	579.58	VIDEO Start recording HDCam
14432	20090415 190448	14.5999564	144.7749539	316.48	3.29	576.32	579.61	SAMPLE Geology 9. Collecting a piece of this flow. Looks like pillows and lobates. These lobes have a coating of tephra (ash).
14435	20090415 190654	14.5999569	144.7749538	316.2	3.25	576.33	579.58	SAMPLE Geology 9. J2-411-rock-9. Small black rounded piece of this lava flow. Small piece that fits in the claw nicely.
14438	20090415 190926	14.5999576	144.7749539	316.31	3.26	576.33	579.59	SAMPLE 9. Friable piece of lava flow. Depth here is 577m. 144 46.4973 14 35.9977.
14441	20090415 191122	14.5999578	144.7749536	316.38	3.25	576.33	579.58	Plan to follow this flow upslope. We are looking up the flow at an angle of 316 degrees.
14443	20090415 191149	14.5999576	144.7749534	316.39	3.25	576.36	579.61	Want to follow this lava flow up. Heading out now.
14445	20090415 191345	14.6000085	144.7749534	0.08	4.44	570.63	575.07	We plan to follow these tubular pillows upslope. A whole series of pillow lavas and lobate flows draining down the slope.
14448	20090415 191511	14.6000594	144.7749259	336.4	3.03	567	570.03	Proceed up this ridge. Can see these overlapping lobes on the sonar.
14451	20090415 191731	14.6001555	144.7749166	46.55	5.29	558.5	563.79	The lavas are a bit more blocky now. We see lava tubes and unusual features. A little ridge here. These are really dark lavas.
14453	20090415 191811	14.6001771	144.7749312	43.79	4.85	555.35	560.2	This is a large lobe coming down off the main "pile".
14456	20090415 192016	14.6001734	144.774914	55.23	10.7	552.98	563.68	We may want to get one more sample of this flow. Will travel up here a bit.
14457	20090415 192023	14.6001734	144.774914	55.54	10.7	552.98	563.68	VIDEO Start recording HDCam
14459	20090415 192120	14.6001727	144.7749149	55.29	11.33	552.98	564.31	VIDEO Stop recording HDCam The last entry was incorrect. We have stopped video cam recording.
14463	20090415 192436	14.6002394	144.7749781	31.81	3.43	549.43	552.86	We are coming up to the contact with the cone. Will collect a rock here at the zone of the contact.
14466	20090415 192642	14.600242	144.7749359	86.83	9.41	550.77	560.18	J2-411 Data DVDs start DVDs 073 red set
14468	20090415 192703	14.6002492	144.7749602	86.87	5.25	551	556.25	This ridge appears to have been onlapped by the rubble up slope. Plumage over this ridge.
14470	20090415 192747	14.600253	144.7749652	92.94	6.1	550.61	556.71	We are looking due east now. Will sample this lava flow near the contact with Brimstone's cone.
14474	20090415 193144	14.600261	144.7749691	61.84	6.6	548.74	555.34	J2-411 Data DVDs stop blue set DVDs 072
14475	20090415 193144	14.600261	144.7749691	61.84	6.6	548.74	555.34	SAMPLE Geology 10. J2-411-rock-10. Round lava rock - part of a pillow from this fresh flow. Z=522m. 144 56.5045 14 36.0287.
14477	20090415 193232	14.6004901	144.7750478	65.29	9.23	547.79	557.02	J2-411-rock-10 info. We traveled a bit to the east following this lava ridge.
14480	20090415 193354	14.6005503	144.7750685	32.73	9.15	544.4	553.55	We are going to follow this ridge up to Brimstone.
14481	20090415 193428	14.600622	144.7751184	31.26	9.03	537.49	546.52	We're off the lava flow now and on the debris chute (cone) that has been created by Brimstone.
14483	20090415 193533	14.6006383	144.7751253	31.99	8.45	527.93	536.38	Active cone itself now - this cone onlapped the lava ridge that we just traveled up.
14486	20090415 193716	14.6007421	144.7751784	35.51	6.41	520.37	526.78	We're at 521m. Seeing some active venting here.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-411 Logger Comment
14489	20090415 193847	14.600702	144.7752507	57.79	3.3	518.61	521.91	Brimstone in the distance. Looks like the tephra is starting to cover up the lava blocks.
14490	20090415 193857	14.6006958	144.7752606	54.14	4.16	518.55	522.71	VIDEO Start recording HDCam about a minute ago.
14491	20090415 193937	14.6006928	144.7753013	346.45	4.15	518.81	522.96	The west side has lots of tephra. the east side is large rubble.
14495	20090415 194207	14.6009594	144.7753999	47.28	6.24	526.07	532.31	Can see lots of yellow in the plume now.
14497	20090415 194302	14.6010517	144.7754155	58.03	14.85	516.31	531.16	Heading up the summit ridge. Have a lot of housekeeping to do up here.
14498	20090415 194320	14.6010897	144.7754371	61.55	4.58	516.59	521.17	The plume is wafting around the summit but visibility is quite good.
14499	20090415 194330	14.601104	144.7754347	50.05	3.89	516.34	520.23	See Mkr-107.
14502	20090415 194512	14.601128	144.7754266	50.57	5.44	517.3	522.74	That marker is blowing to the NW. It's almost laid on its side.
14503	20090415 194525	14.6011291	144.7754253	50.46	5.59	517.23	522.82	Bob (Buddha) says he would look to the NW for the CTD.
14504	20090415 194537	14.6011499	144.7754185	76.09	5.63	518.36	523.99	J2-411 DVCAM 057 stop and 058 start
14507	20090415 194736	14.6011484	144.7754472	81.18	3.41	518.64	522.05	We're up here at the summit. Not many shrimp in the trap.
14509	20090415 194807	14.6011472	144.7754496	66.59	2.14	519.2	521.34	Have to pick up the shrimp trap and hydrophones. Also recover a tephra sampler and deploy another.
14512	20090415 195012	14.6011471	144.7754501	68.8	2.06	519.26	521.32	DEPLOY Tephra Sampler G at the summit ridge. At Mkr-107. Z=520. This sampler will be here until the next cruise here in June. Bob Embley will be on board.
14514	20090415 195136	14.6011478	144.7754502	71.88	2.11	519.33	521.44	RECOVER Tephra Sampler F. Mkr-107. Z=520. It's been out here for 1 dive I think.....(Deployed on J2-396 first dive)
14517	20090415 195316	14.6011642	144.7754704	192.43	2.5	519.71	522.21	SAMPLE Geology Tephra Sampler F. J2-411-TS-11. This one has been deployed at the summit for a day or so. Z=520.
14519	20090415 195358	14.6011646	144.77547	189.66	2.43	519.78	522.21	RECOVER Shrimp Trap The trap only has a few shrimp in it today. Yesterday it was jam-packed after only a few hours.
14521	20090415 195526	14.6011668	144.7754703	186.25	2.43	519.87	522.3	SAMPLE Biology Shrimp Trap. j2-411-bio-12. Recovered the shrimp trap at the summit. Z=521.
14526	20090415 195906	14.6011534	144.775456	113.73	3.3	519.16	522.46	The plume is wafting in from Brimstone.
14529	20090415 200109	14.6011418	144.7754594	84.61	2.59	519.13	521.72	RECOVER Hydrophone BProbe hydrophone from the summit (Mkr-107). This hydrophone has been up here for a day.
14532	20090415 200337	14.6011418	144.775461	85.28	2.26	519.33	521.59	Placed the hydrophone in the stbd swing arm.
14535	20090415 200513	14.6011511	144.7754456	128.67	4.75	518.4	523.15	We will head down to Brimstone and set up for observation until the end of this dive.
14536	20090415 200531	14.6011405	144.775437	182.36	3.2	518.68	521.88	Driving into the plume.
14539	20090415 200709	14.600988	144.7754924	188.95	5.29	522.91	528.2	This summit is spectacular. Volcaniclastic seds and rugged nearly vertical outcrops.
14542	20090415 200926	14.600861	144.7754524	186.41	9.08	524	533.08	Heading south now.
14545	20090415 201118	14.6008237	144.7754468	215.6	8.15	523.24	531.39	On our way to Brimstone.
14546	20090415 201131	14.6008058	144.7754359	246.16	7.75	522.46	530.21	Bubbles in the Medea cam.
14549	20090415 201250	14.6006837	144.7753628	303.59	5.99	519.54	525.53	The plume is in the foreground.
14550	20090415 201303	14.6006743	144.7753433	340.41	4.96	519.76	524.72	This is our last view of Brimstone on this cruise.
14551	20090415 201310	14.6006799	144.7753366	340.53	4.15	520.2	524.35	VIDEO Start recording HDCam
14554	20090415 201531	14.6006879	144.77531	12.84	3.03	520.58	523.61	We are settle in at Brimstone on the south side. Heading of 13 degrees. The plume is wasting up and to the north.
14556	20090415 201552	14.6006878	144.7753097	13.02	3.03	520.56	523.59	Bubbles - in one area.
14557	20090415 201603	14.6006878	144.7753097	13.1	3.05	520.56	523.61	The rock in front appears to be degassing.
14558	20090415 201634	14.6006874	144.7753085	13.24	3.06	520.56	523.62	See the CO2 coming straight out of the rock.
14560	20090415 201702	14.6006875	144.7753086	13.25	3.16	520.54	523.7	The bubbles are coming out of the rock. It's degassing. It's on the edge of the vent.
14561	20090415 201727	14.6006877	144.7753089	13.25	3.14	520.54	523.68	We're getting some ash in the plume now.
14563	20090415 201807	14.6006885	144.7753102	13.26	3.13	520.53	523.66	Quite a vigorous plume going on. A bit of ash and some yellow smoke.
14565	20090415 201924	14.6006907	144.7753134	13.11	3.1	520.54	523.64	We are wondering if we saw a bit of a red flash?? Probably not.
14568	20090415 202051	14.6006906	144.7753129	13.14	3.11	520.58	523.69	Zoomed in on the HDCam. The ground is vibrating.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-411 Logger Comment
14570	20090415 202152	14.6006915	144.7753155	13.42	3.06	520.62	523.68	The rocks are moving quite a bit. Lots of bubbles.
14572	20090415 202341	14.60069	144.7753158	13.99	2.91	520.62	523.53	Bubbles are migrating up. Quite large in the foreground.
14577	20090415 202726	14.6006892	144.7753148	15.94	3.36	520.5	523.86	VIDEO Start recording the offload cam. Looking at the bubbles at the edge of the pit.
14580	20090415 202903	14.6006892	144.7753144	16.15	3.35	520.5	523.85	Lots of ash falling out of the plume now.
14582	20090415 203037	14.6006879	144.775313	16.23	3.2	520.43	523.63	We're hoping for a big burst to end the observations here at Brimstone this year.
14585	20090415 203228	14.6006878	144.7753122	16.47	3	520.51	523.51	Stashing the offload arm cam. Can't get a nice pic of Brimstone with that arm in he way.
14589	20090415 203450	14.6006892	144.7753132	16.62	3.18	520.49	523.67	There are lots of bubbles in the pilot cam and some yellow puffs in the plume.
14592	20090415 203658	14.6006859	144.7753131	16.42	3.23	520.5	523.73	The rocks are really starting to vibrate in the front here.
14595	20090415 203931	14.6006846	144.7753108	19.31	3.21	520.58	523.79	Still shaking. Our heading is 17 degrees. Z=521.5m.
14598	20090415 204052	14.6006869	144.7753085	18.32	4.28	519.54	523.82	The pilot cam has some great footage. Can see the glass on the surface of the rock at the edge of the vent.
14601	20090415 204256	14.6007009	144.7753062	17.04	2.5	519.87	522.37	Seeing some ashing now and it looks like the level of activity is increasing.
14603	20090415 204406	14.6007009	144.7753059	17.75	2.49	519.89	522.38	Were going to grab a fresh piece of rock. It fell out of the claw. No sample.
14605	20090415 204527	14.6006998	144.7753026	348.6	2.69	519.9	522.59	mini DV 29 finished. Recording on miniDV 30.
14607	20090415 204619	14.6006888	144.7752858	352.66	4.29	520.09	524.38	We are going to reposition a bit.
14608	20090415 204644	14.6006864	144.7753006	10.77	4.63	519.5	524.13	The smoke was coming at us so are moving about....
14611	20090415 204748	14.6006955	144.77532	335.07	3.56	519.8	523.36	Brimstone is throwing out quite a plume.
14615	20090415 205056	14.6006978	144.7753148	330.21	3.38	519.52	522.9	SAMPLE Geology Rock. J2-411-rock-13. Sample was plucked from the smoke at the edge of the plume. Bob wants this for Rubin. Z=521. Hdg 334.
14617	20090415 205220	14.6007104	144.775346	292.19	1.49	519.98	521.47	Going to lateral around the corner to get a better view.
14619	20090415 205254	14.6007104	144.7753453	296.41	1.08	520.5	521.58	Now looking at Brimstone (291 degrees to the W/NW). We're on the southeast side of the vent.
14623	20090415 205548	14.6007181	144.7753427	296.1	0.99	520.61	521.6	the plume is circling up Sort of straight up and then wafting to the NW.
14625	20090415 205740	14.6007224	144.7753416	294.81	1.01	520.59	521.6	Looking at the billowing plume.
14627	20090415 205809	14.6007236	144.7753409	294.34	0.98	520.58	521.56	Looking a bit more active now.
14630	20090415 205952	14.600728	144.7753389	294.12	0.99	520.58	521.57	There is a bit of ash falling out of the plume.
14632	20090415 210121	14.6007261	144.7753445	293.49	0.96	520.58	521.54	Looking at what we think is a new rock forming in the foreground.
14634	20090415 210220	14.6007166	144.7753677	293.51	0.93	520.59	521.52	Zooming in on new rock with the HD DVcam.
14635	20090415 210240	14.6007145	144.7753736	293.49	0.93	520.59	521.52	We have a bit of ash again.
14638	20090415 210421	14.6006982	144.7754085	293.39	0.95	520.6	521.55	The plume is swirling around clockwise (again- just like we witnessed last night)
14639	20090415 210441	14.6006973	144.7754112	293.31	0.95	520.6	521.55	Watching the rock in the foreground (in the pit).
14643	20090415 210722	14.6006899	144.775428	291.31	1.04	520.47	521.51	We're sitting here observing Brimstone. A new rock is being formed in the foreground.
14647	20090415 211042	14.6006861	144.7754331	291.34	1.03	520.51	521.54	Still observing the vent here at Brimstone.
14649	20090415 211141	14.6006858	144.7754378	291.39	1.01	520.52	521.53	The activity has decreased.
14651	20090415 211241	14.6006689	144.7754286	326.61	4.13	519.73	523.86	We would like to do a bit of observing. Will fly around the vent. Our heading now was 304 deg.
14654	20090415 211351	14.6006659	144.775396	18.53	3.95	519.78	523.73	We are looking at the shape of the rim - rather than at the plume.
14655	20090415 211358	14.6006662	144.7753919	28.07	3.41	519.8	523.21	Now looking NE.
14656	20090415 211431	14.600679	144.775372	74.48	2.08	519.87	521.95	Now looking to 065 hdg.
14657	20090415 211440	14.6006834	144.7753691	87.16	2	519.87	521.87	Now 075.
14659	20090415 211449	14.6006878	144.7753702	93.79	1.91	519.87	521.78	90 degree heading.
14660	20090415 211516	14.6006997	144.7753689	111.15	1.25	519.92	521.17	Now at 111 degrees. See the plume ahead.
14662	20090415 211610	14.6007103	144.7753724	133.14	1.24	519.82	521.06	There's really a lot of tephra to the northwest of the vent. It has covered up many of the rocks on that side.
14663	20090415 211638	14.600698	144.7753648	99.8	1.55	519.85	521.4	Coming back around due to the plume.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-411 Logger Comment
14665	20090415 211652	14.6006911	144.7753677	92.91	1.75	519.89	521.64	095 hdg.
14666	20090415 211701	14.600685	144.7753666	89.03	2.21	519.83	522.04	090 hdg
14667	20090415 211722	14.6006762	144.7753724	70.69	2.38	519.69	522.07	070 hdg
14668	20090415 211738	14.6006701	144.775379	45.64	4.28	519.5	523.78	050 hdg
14670	20090415 211802	14.6006569	144.7753913	28.69	5.2	519.21	524.41	Now looking at it. 035 hdg
14671	20090415 211834	14.6006599	144.7754243	344.48	5	519.07	524.07	3450 hdg
14678	20090415 212029	14.6007421	144.7754321	183.21	2.44	519.31	521.75	More ash on this southern slope than previously.
14680	20090415 212109	14.6007415	144.7754413	214.85	3.65	519.09	522.74	There's quite a lot of yellow color in the plume.
14681	20090415 212138	14.6007176	144.7754407	233.32	2.36	519.93	522.29	Can really see the yellow in the plume looking at it from the NE (hdg 230).
14683	20090415 212212	14.6007188	144.7754385	228.94	1.58	520.33	521.91	Looks like 3 separate areas of focused.
14684	20090415 212222	14.600719	144.7754385	228.04	1.45	520.41	521.86	The smoke is quite yellow.
14686	20090415 212302	14.6006938	144.7754527	281.83	1.65	520.21	521.86	Looks like there is some ash in the plume now.
14687	20090415 212328	14.6006802	144.7754463	295.88	2.59	520.43	523.02	Not a lot and now it looks like it is gone.
14689	20090415 212402	14.6006803	144.7754497	290.8	1.59	520.64	522.23	The plume now appears to be swirling counter clockwise - opposite of previously on this shift.
14690	20090415 212428	14.6006804	144.7754498	290.47	1.54	520.67	522.21	Still looking at the vent. Quite a lot of yellow tint in the plume.
14693	20090415 212611	14.6006861	144.7754594	295.04	2.19	520.37	522.56	Pulling back from the vent slightly. Will put a net over the tephra sampler.
14694	20090415 212637	14.6006957	144.7754772	295.36	2.18	520.85	523.03	J2-411 Data DVDs stop red set DVDs 073
14697	20090415 212813	14.6007251	144.7755303	284.78	2.39	525.46	527.85	We're pulling the net over the basket.
14698	20090415 212825	14.600725	144.7755347	283.02	4.89	523.55	528.44	VIDEO Stop recording HDCam
14700	20090415 212852	14.600709	144.7755225	220.89	11.49	515.91	527.4	That's that I guess.
14701	20090415 212905	14.6007195	144.7755308	8.13	9.16	515.08	524.24	JASON off bottom
14702	20090415 212906	14.6007204	144.7755277	348.9	9.78	515	524.78	J2-411 DVCAM 058 stop
14704	20090415 212954	14.6006301	144.775398	260.58	7.91	515.73	523.64	Beautiful image of Brimstone in the background.
14706	20090415 220223	14.6005935	144.7753523	284.95	badvalue	1.95	badvalue	Medea on the deck.
14707	20090415 220856	14.60059	144.7754794	289.58	badvalue	2.36	badvalue	The smudges on the HDCam lenses are quite apparent here near the surface.
14708	20090415 220904	14.6005912	144.7754814	293.68	badvalue	2.23	badvalue	Left lateral is dead again.
14709	20090415 221305	14.6006047	144.7755477	1.24	badvalue	1.18	badvalue	JASON on deck
14710	20090415 221422	14.6006047	144.7755477	1.24	badvalue	1.18	badvalue	End of dive J2-411. Started the dive last night and it was J2-409. Had to come up on that. Then J-410. That was also aborted. So the majority of the dive was J2-411.

**J2-412 - Brimstone and NW Ridge.** JASON equipped with single-chamber suction sampler, 2 bioboxes, 2 scoop bags, Niskin, Eh sensor. Dive began at Brimstone searching for lost gas-tight bottle and observing vent activity. Activity remarkably different with less smoke and heavy tephra deposits. Searched to the east of Brimstone following path of last dive, gas-tight bottle not found. Headed NW over summit rim and along the NW trending spur ridge. On the east slope of ridge wall collected coral and anemone; later discovered a rock that fell into the basket during collection. Ridge outcrops at times obscured by heavy sediments, used sonar to locate outcrops along route. In an orange rock/sediment area collected an old, lava rock. At next outcrop collected an anemone. Scooped additional corals/anemones from another ridge/outcrop along same trend of spur. Further along at the base of the scarp's western wall, picked the blackest available rock in orange and black layered lavas. Picked up a coral hanging from an overhung ledge of the lava outcrop. Observed biology along ridge until dive ended.

**Table 6.4-15 JASON Dive J2-412**



Virtual Van Record #	timestamp yyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-412 Logger Comment
14712	20090416 060003	badnav	badnav	331.16	badvalue	2.12	badvalue	JASON in water
14713	20090416 060304	badnav	badnav	279.89	badvalue	3.93	badvalue	Medea in water
14714	20090416 062743	badnav	badnav	246.95	badvalue	400.46	badvalue	The ship was 900m off the target.
14715	20090416 065618	badnav	badnav	254.96	90.14	476.58	566.72	JASON on bottom Approaching the bottom.
14716	20090416 065932	badnav	badnav	19.65	70.63	491.9	562.53	We're in the plume.
14717	20090416 065953	badnav	badnav	279.57	57.05	496.33	553.38	J2-411 Data DVDs start
14718	20090416 070004	badnav	badnav	161.28	68.71	496.24	564.95	J2-411 start DVDs blue set 74
14719	20090416 070030	badnav	badnav	100	61.35	499.04	560.39	J2-411 start DVCAM 59
14721	20090416 070217	14.6008006	144.7753202	105.73	13.19	526.7	539.89	JASON on bottom
14723	20090416 070347	14.60081018	144.7753315	55.61	5.84	523.79	529.63	We are traveling up to Brimstone first to try to locate 2 missing gastights that dropped out of the Jason basket on the last dive.
14725	20090416 070430	14.60084499	144.7753786	57.66	2.53	522.39	524.92	This is dive j2-412. Main goals: Search for lost gastight sampler and explore area N of hydrophone.
14727	20090416 070533	14.60085962	144.7753904	73.52	2.34	522.24	524.58	That's it!! We found the gastight within 5 minutes of reaching the bottom. We hadn't even made it to the vent yet.
14728	20090416 070544	14.60085975	144.7753901	74.17	2.35	522.22	524.57	Oh my goodness.
14730	20090416 070630	14.60084682	144.7753737	57.7	5.33	520.58	525.91	Tools for this dive: Single-chamber suction sampler. Off-load HD camera on port arm. Niskin. Jason temp probe. Eh sensor.
14732	20090416 070655	14.60085681	144.7753902	66.43	3.16	521.48	524.64	Basket for this dive: milkcrates. 2 bioboxes. 2 scoop bags.
14734	20090416 070756	14.60079082	144.7753781	79.71	5.44	521.34	526.78	Correction: We didn't find the gastight sampler after all. It was a rock. Looked like a gastight to all in this room. Wishful thinking.
14736	20090416 070953	14.60083183	144.7755322	319.23	3.6	519.61	523.21	We are in the smoke here at 521m. Heading up slope toward Brimstone.
14738	20090416 071008	14.6008358	144.7755362	287.96	2.6	519.65	522.25	This is where the tephra sampler is.
14739	20090416 071036	14.6008806	144.7755055	264.79	2.51	518.32	520.83	Correction again (tired). This is where the tephra sampler WAS.
14740	20090416 071043	14.60088576	144.7755022	248.33	3.06	517.52	520.58	Arrived at Brimstone.
14742	20090416 071057	14.60090564	144.7754902	172.4	3.63	516.52	520.15	Will look for the gastight (again).
14743	20090416 071115	14.60091132	144.7754592	128.6	2.33	517.39	519.72	Low level of venting right now.
14745	20090416 071229	14.60083023	144.7754451	137.18	1.44	518.44	519.88	We all seem to have seen it - but we have all been mistaken.
14746	20090416 071240	14.60075808	144.7752159	136.63	1.45	518.44	519.89	Lots more water coming out of the vent now.
14747	20090416 071250	14.60075846	144.7752139	137.09	2.25	517.91	520.16	NAV Doppler reset again.
14749	20090416 071312	14.60076726	144.7752143	145.56	3.26	516.68	519.94	he water is much clearer now than we have seen on the whole trip.
14750	20090416 071351	14.60074286	144.7752606	273.23	4.09	516.45	520.54	Lots of clear water and the plume is much diminished.
14752	20090416 071429	14.60074222	144.7752565	255.56	1.36	518.77	520.13	When we came up the NW side it was quite visible with scattered chunks of sulfur on the slope.
14754	20090416 071530	14.60071641	144.7752461	336.52	2.43	517.86	520.29	The rocks at the vent have lots of sulfur coating them. Looks very different than it did at 7:30 am.
14755	20090416 071552	14.60070788	144.7752358	338.81	2.19	517.8	519.99	Much more sulfur on the vent rocks.
14757	20090416 071650	14.60071686	144.7752286	353.34	2.35	518.29	520.64	There is clear water shimmering all over the place and not just confined to the seafloor.
14759	20090416 071721	14.60070817	144.775214	354.25	3.2	518.49	521.69	The Jason depth now if 519.3 meters.
14761	20090416 071805	14.60071181	144.7751957	359.97	2.03	519.38	521.41	Searching around Brimstone for the gastight.
14763	20090416 071908	14.60070478	144.7752276	321.77	1.5	518.92	520.42	Lateraling around the vent. Lots of sulfur on the rocks and seafloor. Quite obvious that lots of sulfur was blown out of the vent in the last 10 hours.
14766	20090416 072124	14.60071783	144.7752568	329.34	1.51	518.83	520.34	The vent is a lot higher with lots of sulfur covering the rocks. A lot less smoke.
14768	20090416 072215	14.60071058	144.7752658	332.62	0.8	519.47	520.27	This looks more like a lot of hydrothermal circulation now. We can see the vent now and have not been able to see it in the past.

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14769	20090416 072252	14.6006967	144.7752485	326.93	1.39	519.07	520.46	HAVE BEEN RECORDING HIGH DEF VIDEO SINCE WE REACHED THE SEAFLOOR.
14772	20090416 072413	14.60068936	144.7751856	23.42	2.29	519.36	521.65	An amazing amount of tephra around the vent. The boulders strewn about the vent are sulfur coated.
14774	20090416 072501	14.60070834	144.7751632	22.4	2.49	520.46	522.95	Lots of sulfur in the sed and on the rocks.
14776	20090416 072605	14.60068881	144.7751794	24.38	1.44	519.93	521.37	The vent is higher now. Lots of diffuse flow percolating out of the sediments.
14781	20090416 073053	14.60073523	144.775183	60.71	2.34	518.73	521.07	Tephra
14784	20090416 073233	14.60068788	144.7751318	64.59	4.16	521.02	525.18	Tephra covering on nearly all the larger rocks
14787	20090416 073425	14.60067327	144.7750809	66.26	3.11	525.99	529.1	Shrimp on rocks
14789	20090416 073536	14.6006527	144.7750393	65.27	5.55	528.18	533.73	Jason heading is 065
14792	20090416 073700	14.60074234	144.77507	48.71	4.64	522.65	527.29	Sulfur covered rocks
14794	20090416 073838	14.60080107	144.7751783	85.46	5.65	515.86	521.51	Big sulfur covered rocks
14796	20090416 073918	14.60079802	144.7751791	84.5	5.79	515.84	521.63	Marker 103 in sight
14798	20090416 074041	14.60080023	144.775179	84.88	5.69	515.82	521.51	Removing one weight
14800	20090416 074147	14.60080784	144.7751878	91.99	6.49	515.43	521.92	Jason heading is still 085
14802	20090416 074210	14.60081285	144.775219	151.43	8.61	514.49	523.1	Heading turning to 151
14803	20090416 074233	14.60081689	144.7752465	186.91	9.43	514.8	524.23	Good view of Flock Rock
14805	20090416 074340	14.60074128	144.7752802	241.75	7.15	516.42	523.57	Rocks have thick sulfur covering on bottom sides
14807	20090416 074428	14.60070326	144.7751915	1.19	4.2	518.15	522.35	Looks completely different here. Tephra dominant on seafloor
14809	20090416 074500	14.60075149	144.7751591	66.25	3.34	517.93	521.27	Looks more hydrothermal now
14810	20090416 074512	14.60078076	144.77516	85.16	2.65	517.72	520.37	Vent looks more hydrothermal that is
14811	20090416 074543	14.60081786	144.7752247	96.79	5.08	515.96	521.04	Rocks heavily covered with sulfur
14813	20090416 074643	14.60077105	144.7753302	134.8	5.34	520.1	525.44	Square black area looks like a helio landing pad
14816	20090416 074803	14.60071449	144.7753795	139.93	3.38	524.09	527.47	Jason heading is 142
14817	20090416 074831	14.60069492	144.775421	96.64	3.88	525.18	529.06	Heading changing to 105
14818	20090416 074840	14.60068462	144.7754347	94.79	3.68	526.62	530.3	OOPS. Heading changing to -05
14819	20090416 074855	14.60068768	144.7754472	97.32	3.24	527.57	530.81	Darn - heading changing to 095
14821	20090416 074901	14.60069707	144.775441	90.17	2.94	527.63	530.57	Finally! got it right
14824	20090416 075119	14.60070967	144.7754219	273.2	6.11	525.73	531.84	Black sediments with sparse lighter covering and stained rocks around
14828	20090416 075439	14.60068248	144.7756469	79.3	0.8	541.12	541.92	We're on the east flank of Brimstone cone. We're going to follow last night's track about 100m to the east.
14830	20090416 075530	14.60066438	144.7756927	80.86	1.39	542.27	543.66	This is where Brimstone cone meets the volcanic ridge. The brown sed are Brimstone cone the others are the extruded lavas.
14832	20090416 075620	14.60062382	144.7757166	83.91	2.3	543.96	546.26	We just passed by Mkr-106.
14834	20090416 075715	14.60064374	144.7757114	12.47	5.34	541.79	547.13	We only see these little red swimmers around Brimstone. Verena wishes we had done a plankton haul.
14836	20090416 075756	14.60072396	144.775703	65.53	4.83	539.42	544.25	Lots of little red guys in the water. Verena has been calling them amphipods but now she says she doesn't know.
14839	20090416 080037	14.60070235	144.7758454	79.59	7.78	529.13	536.91	We have gone as far as we can. We have now seen Mkr-106.
14842	20090416 080200	14.60065818	144.7759048	7	9.38	530.8	540.18	Have decided that we will stop this search.
14843	20090416 080251	14.60072521	144.7758768	337.37	7.89	526.83	534.72	Whoops we just passed over Mkr-104.
14845	20090416 080317	14.60078376	144.7758522	339.93	6.06	525	531.06	Turning about and heading back.
14846	20090416 080335	14.60080647	144.7758433	338.01	5.63	524.95	530.58	We just passed over Mkr-115.
14847	20090416 080346	14.60082935	144.7758298	337.58	5.89	524.65	530.54	We have lots of markers out here!
14850	20090416 080504	14.60105432	144.7756496	333.3	6.58	519.26	525.84	Turning the strobe on the DSC camera.
14851	20090416 080513	14.6010895	144.7756284	334.94	5.39	518.98	524.37	Back in the plume here.

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14852	20090416 080545	14.60110302	144.7755925	327.89	5.16	519.83	524.99	Out of the plume now.
14856	20090416 080852	14.60126929	144.7754414	334.37	0.95	526.2	527.15	We're heading 335 degrees. Sulfur streaks on the slope.
14858	20090416 080929	14.60127721	144.7754424	334.53	1.03	526.6	527.63	Bill is going to drive now. Go Bill.
14860	20090416 081041	14.60139386	144.7754059	334.57	0.74	530.39	531.13	Bill is at the controls. Go Bill!!
14861	20090416 081112	14.60148347	144.7753594	335.29	0.75	532.66	533.41	Passing over a sulfur striated slope.
14864	20090416 081353	14.60196497	144.7751845	334.68	1.66	556.47	558.13	Lots of iron oxides on the slope. Correction: The slopes were not covered with sulfur-it's probably iron oxide.
14867	20090416 081523	14.602134	144.7750811	332.68	1.8	570.81	572.61	VIDEO Stop recording HDCam
14871	20090416 081819	14.60256679	144.7748228	316.36	3.99	598.31	602.3	We are on the northern side of the summit. Not sure when we crossed that. Too interested in Bill piloting Jason.
14872	20090416 081852	14.60261773	144.774815	335.62	4.93	600.7	605.63	We have no video now.
14878	20090416 082325	14.60314107	144.7745855	339.78	2.13	636.05	638.18	We are still transiting about 3 meters off the bottom.
14882	20090416 082617	14.6034973	144.7744949	0.55	0.94	654.45	655.39	Bill is still at the controls. The bottom is in sight.
14884	20090416 082732	14.60370258	144.7743947	343.75	111.98	662.3	774.28	We are looking at a fish on the seafloor now.
14885	20090416 082807	14.60377487	144.7743087	347.04	0.93	662.74	663.67	We're down to 665m now.
14887	20090416 082932	14.60391449	144.7741954	346.01	1.18	663.43	664.61	Now we have a new guy in the watch-leader's chair.
14889	20090416 083029	14.60391446	144.7741958	346.48	1.09	663.52	664.61	We are swapping out pilots now. Bill is turning over the controls to Scott.
14891	20090416 083104	14.60395749	144.7741913	349.19	2.19	663.11	665.3	Verena is in the watch leaders chair.
14893	20090416 083244	14.60426919	144.7741202	304.26	0.96	668.93	669.89	VIDEO Start recording HDCam
14895	20090416 083309	14.6043014	144.7741004	305.43	1.3	669.03	670.33	We're in a little saddle between the w summit ridges.
14896	20090416 083322	14.6043264	144.7740757	303.44	1.76	669.07	670.83	Seeing a bit of current here.
14898	20090416 083416	14.60436064	144.7740249	294.74	2.53	667.76	670.29	Quite a bit of iron (?) in between the current ripples. Call it orange staining.
14901	20090416 083627	14.60445431	144.7738316	290.48	3.13	663.56	666.69	It's amazing how featureless the north side is compared to the south.
14903	20090416 083658	14.60449306	144.7737797	300.93	3.74	660.97	664.71	We see a fish ahead.
14905	20090416 083807	14.60456305	144.7737324	308.46	3.79	657.02	660.81	We see a red fish.
14908	20090416 084000	14.60467966	144.7735725	3.06	3.68	645.28	648.96	We're heading up the steep slope to the NW of NW Rota-1 heading to Cnidaria Area. We're climbing the east slope of this spur ridge bearing N/NE to S/SW.
14909	20090416 084041	14.60468701	144.7735132	332.12	4.98	641.76	646.74	That is an eel. Verena knows the name of it but I can't spell it.
14912	20090416 084200	14.60475151	144.773457	314.31	4.56	636.89	641.45	Synaptobranchid is the eel we are seeing her.
14913	20090416 084213	14.60474993	144.7734613	306.84	8.33	633.34	641.67	We are climbing up this steep wall.
14914	20090416 084243	14.60474283	144.773449	310.61	19.44	622.82	642.26	Looks like a huge dike here. Quite a cliff face here.
14916	20090416 084306	14.60476767	144.7734142	310.37	4.19	621.72	625.91	We're now at 623 m.
14918	20090416 084356	14.60477063	144.7733884	308.8	6.23	618.13	624.36	Verena is snapping some digital stills now. Had forgotten that earlier.
14919	20090416 084408	14.60477445	144.7733807	308.64	5.8	616.78	622.58	HD Cam has been on.
14920	20090416 084430	14.6048009	144.7733306	310.02	5.73	614.04	619.77	Look at that ash chute. it's dark colored.
14922	20090416 084508	14.60484065	144.7732752	322.86	4.76	607.56	612.32	See lots of shrimp all of a sudden. They are not vent shrimp.
14923	20090416 084541	14.60485225	144.7732883	327.91	3.44	608.2	611.64	We see some corals and an anemone here.
14926	20090416 084701	14.60485188	144.7732877	327.48	3.61	608.54	612.15	We are looking at the soft coral hanging from these ledges. The bright red guy is a soft coral. The big orange guy is an anemone.
14927	20090416 084734	14.60485236	144.7732882	327.75	3.65	608.38	612.03	We also see hydroids hanging from the edge of these ledges.
14928	20090416 084747	14.60485233	144.7732878	326.84	3.71	608.11	611.82	Big shrimp here.
14930	20090416 084849	14.60484778	144.7732861	329.95	2.4	608.79	611.19	Messing with the iris and gain on the HDCam.
14932	20090416 084943	14.6048463	144.7732894	329.99	2.36	608.77	611.13	We are going to attempt to sample a bit of biology on this steep cliff face.
14936	20090416 085239	14.60484373	144.7732951	330.02	2.35	608.79	611.14	SAMPLE Biology 1 Anemone. J2-412-bio-01. Pulled an anemone off the edge of this cliff. Z=609m. 144 46.398 14 36.291. On our way to Cnidaria.
14938	20090416 085353	14.60484357	144.7732974	329.83	2.38	608.78	611.16	J2-412-bio-01 cont. We're calling it Prawn Precipace.

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14940	20090416 085418	14.60484376	144.773298	328.87	2.34	608.75	611.09	J2-411 Data DVDs start Red set 75
14943	20090416 085655	14.60484189	144.7732973	328.36	2.54	608.71	611.25	SAMPLE Biology 2. Scoop of soft coral from the steep cliff face. The coral is bright reddish-orangish. Grabbed 1 animal in the scoop bag. PI Tunnicliffe Z=610.
14945	20090416 085744	14.60484223	144.7732973	328.47	2.43	608.71	611.14	The actual name of that sample was J2-412-bio-02.
14947	20090416 085829	14.60483806	144.7732916	329.21	4.64	607.18	611.82	J2-412 oops
14949	20090416 085943	14.60484234	144.7732859	347.9	3.71	606.94	610.65	J2-412 Data DVDs stop blue set 74
14950	20090416 085955	14.60484224	144.7732857	347.9	3.69	606.97	610.66	Heading up to the top of this steep ridge face. At the summit is a spot we called Cnidaria Area when we were here in 2004.
14954	20090416 090228	14.60484199	144.7732834	347.95	3.63	607	610.63	Scott has pulled out the same scoop bag to try to drop another soft coral in the bag.
14956	20090416 090304	14.60484059	144.7732804	339.05	3.75	606.98	610.73	We broke the rock face off when grabbing the soft coral.
14958	20090416 090438	14.60484139	144.7732866	331.32	3.68	607.48	611.16	SAMPLE Biology 2 cont. J2-412-bio-2-cont. Got another soft coral in the same scoop bag as the last. Z=608m Traveling up the same cliff face.
14959	20090416 090439	14.60484141	144.7732864	331.99	3.2	607.5	610.7	J2-412 Stop DVCAM 59 and start DVCAM 60
14961	20090416 090525	14.60484213	144.7732836	345.19	3.26	607.39	610.65	Cnidaria is a phylum: anemone (corals): jellyfish and hydroid. These are a class.
14967	20090416 091007	14.6048426	144.7732858	333.93	3.68	607.29	610.97	SAMPLE Biology 2 cont. Scooping another soft coral (that's 3 now)....4..... Scooping more..J2-412-bio-2-cont.Another one in bag. 4 or 5 total. PI Tunnicliffe.
14969	20090416 091142	14.60492647	144.7731842	318.29	3.01	603.16	606.17	We are going to head up to the top now. "A reasonable cnidarian home" says Verena.
14971	20090416 091234	14.60494571	144.7731142	310.45	0.79	604.82	605.61	We're going to travel along this ridge crest to the N/NE. The depth here is 605 meters.
14973	20090416 091334	14.60492176	144.7730534	274.59	3.7	599.91	603.61	Lots of shrimp up here on this ridge crest.
14976	20090416 091502	14.60491776	144.7730089	266.21	4.65	597.01	601.66	Soft corals here and there. They are grouped on a rock here.
14977	20090416 091518	14.60492143	144.7730074	256.4	4.7	596.44	601.14	they look like flowers.
14979	20090416 091606	14.60492398	144.7729917	213.94	4.11	597.25	601.36	VIDEO Start recording HDCam
14981	20090416 091744	14.60492329	144.7729903	216.24	4	597.35	601.35	It is beautiful here. What are we seeing here? It looks a bit like floc on the rocks.
14984	20090416 091901	14.60492304	144.7729904	216.25	4.03	597.36	601.39	We are setting up to do a little video here in Cnidaria Area. Z=598. Lots of cnidaria. A few fish. Tiny hydroids also.
14985	20090416 091943	14.60492322	144.7729905	214.74	4.01	597.38	601.39	VIDEO recording HD with the arm cam now.
14987	20090416 092052	14.6049229	144.7729905	216.4	4	597.38	601.38	We're looking at a type of grenadier. It's more colorful than the ones we see at Axial. This one is more silver with a reddish back.
14989	20090416 092133	14.60492275	144.7729905	216.61	3.98	597.4	601.38	Having a bit of trouble with the HD arm cam. Seems to be working now.
14992	20090416 092321	14.60492272	144.7729904	216.98	4.03	597.38	601.41	Watching the grenadier feeding (?) on the bottom - tail in the air.
14994	20090416 092407	14.60492272	144.7729904	217.02	4.03	597.38	601.41	The fish is probably a bit longer than 6 inches.
14996	20090416 092522	14.6049228	144.7729902	217	4.03	597.41	601.44	Now we're looking at a shrimp sitting on hydroids. It has to have those little white knobs on it to be alive. Seeing a dead coral.
14998	20090416 092653	14.60492411	144.7729899	217	4	597.42	601.42	The little guy in the pilot cam is a soft coral that has pulled in its stalk.
15001	20090416 092815	14.60492552	144.7729895	217.04	4.03	597.41	601.44	Now we are looking at this soft coral from the side. Great shot.
15003	20090416 092926	14.60492622	144.7729892	217.07	4.04	597.4	601.44	Moving the arm cam around and catching different views of these corals.
15005	20090416 093008	14.60492645	144.7729889	217.07	4.01	597.42	601.43	Kathy called this an "Octopus's garden" and it looks like it. Could use a little bit of fertilizer.
15007	20090416 093130	14.60492681	144.7729885	217.1	4	597.41	601.41	Shrimp with a "big nose". Hydroids in the front of the view. Super long antennae on that shrimp.
15008	20090416 093141	14.60492702	144.7729886	217.09	4	597.42	601.42	Battle of the HD Cams here.
15011	20090416 093322	14.6049276	144.7729887	217.01	3.99	597.45	601.44	Huge shrimp in the HDCam.
15012	20090416 093354	14.60492795	144.7729886	217.04	4	597.44	601.44	He's backing away from the camera.
15015	20090416 093527	14.60492854	144.7729882	217.15	4.01	597.41	601.42	Lots of hydroids in the pilot cam. They have a polyp stage and then they have a jellyfish stage. Looks like both are in the last image.
15018	20090416 093700	14.6049287	144.7729879	217.19	3.95	597.45	601.4	Want to get a nice shot of the hydroids.

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15020	20090416 093809	14.6049291	144.7729875	217.23	3.95	597.46	601.41	The feather hydroids are hydrozoans.
15021	20090416 093831	14.60492935	144.7729874	217.2	3.95	597.45	601.4	We are going to move on now.
15023	20090416 093910	14.60492934	144.7729872	217.1	3.88	597.5	601.38	The shrimp is cleaning himself.
15025	20090416 094025	14.60493204	144.7729872	217.12	3.84	597.5	601.34	Stopping the HD off load camera.
15028	20090416 094210	14.60493912	144.7729185	324.38	2.25	591.55	593.8	We will meander along to the N/NE along this ridge. We're at 596m here. We must be at about the very peak of this ridge.
15030	20090416 094320	14.60497036	144.7728311	110.34	1.05	590.63	591.68	The sediment has got to be from the volcano.
15032	20090416 094421	14.60506707	144.7727877	1.96	3.39	589.25	592.64	What happened to the outcrop. All of a sudden we're looking at sediment ripples.
15034	20090416 094552	14.60516037	144.7727524	358.49	2.13	592.61	594.74	We are traveling along this sedimented ridge here.
15037	20090416 094709	14.60525092	144.7727236	4.7	2.04	595.95	597.99	Probably not much living in the sediments here.
15041	20090416 095015	14.60537604	144.7727001	351.17	1.96	599.33	601.29	VIDEO Start recording HDCam
15043	20090416 095146	14.60544018	144.7726736	76.14	1.96	603.12	605.08	Rocks.
15045	20090416 095234	14.60543959	144.7726805	181.19	2.05	602.61	604.66	Shrimp.
15047	20090416 095312	14.60543453	144.7726812	217.99	1.31	603.26	604.57	On the back face of the fault.
15048	20090416 095323	14.60543393	144.7726794	219.78	1.06	603.45	604.51	WATCHSTANDERS Andra Bobbitt logger
15049	20090416 095347	14.60543422	144.7726793	219.43	0.91	603.65	604.56	Incredible orange rocks adjacent other outcrop-sitting in sediment.
15051	20090416 095357	14.60543423	144.7726791	219.91	0.91	603.62	604.53	Like a black rock from outcrop.
15052	20090416 095452	14.60543565	144.7726799	228.01	0.8	603.69	604.49	Outcrop is not cooperating-very sturdy.
15054	20090416 095505	14.60543602	144.7726789	222.24	0.98	603.58	604.56	This is hard rock.
15056	20090416 095637	14.60542997	144.772687	214.09	1.38	603.07	604.45	Sand is very black but some lighter material is underneath.
15058	20090416 095718	14.60543141	144.7726861	217.29	0.99	603.52	604.51	Rock in sand is not loose.
15060	20090416 095809	14.6054325	144.7726858	214.01	1.06	603.49	604.55	Small piece broke off-trying to sample-too small.
15061	20090416 095857	14.60543273	144.7726857	213.55	1.05	603.49	604.54	Rocks are all attached. No-there's a good one! Great sampling.
15064	20090416 100030	14.60543588	144.7726908	188.13	1.61	603.1	604.71	SAMPLE Geology 3:old lava rock
15066	20090416 100101	14.6054628	144.7727192	56.7	3.09	601.53	604.62	14deg 36.326 144 46.362 is the site at 602m. J2-412-rock-03
15067	20090416 100136	14.60549741	144.7727461	7.62	2	603.01	605.01	Rocks from outcrop-buried in sediment-placed in stbd rock crate.
15068	20090416 100153	14.60553098	144.7727489	344.65	2.76	603.75	606.51	Continuing north. Looking for anemones and fan corals.
15070	20090416 100250	14.60562395	144.7727316	10.01	5.4	606.04	611.44	Drop off ahead so go back East-go down wall and come back to look at the wall.
15072	20090416 100319	14.60563079	144.772728	164.67	12.38	606.54	618.92	Jason is spinning around right.
15073	20090416 100338	14.60562892	144.7727176	175.97	12.58	606.32	618.9	Outcrop looks like layers of material.
15075	20090416 100418	14.60558616	144.772774	278.67	7.19	606.98	614.17	Looks like ropes (compression ridges-flow downhill?)
15076	20090416 100447	14.60556226	144.7727629	259.98	6.58	607.39	613.97	Galathea (sp?); corals on rock and shrimp.
15078	20090416 100522	14.60556344	144.7727642	260.77	6.15	607.76	613.91	Looks like vertical wall.
15079	20090416 100539	14.60558035	144.772772	268.35	6.51	607.85	614.36	Would like to continue north but keeping heading on wall.
15081	20090416 100654	14.6056039	144.7727729	244.05	6.73	608.64	615.37	Sonar shows nothing to the north-this outcrop ends.
15083	20090416 100751	14.60567947	144.7727688	349.36	8.36	609.37	617.73	Spinning around feature and will drive out north to see if the ridge comes back.
15085	20090416 100807	14.60569115	144.7727876	352.25	6.91	610.79	617.7	Going deeper to bottom-no sonar targets.
15086	20090416 100831	14.60569323	144.7728141	352.41	0.8	617.09	617.89	Heading is north and no sonar target.
15087	20090416 100854	14.60570781	144.7728256	350.26	1.43	616.59	618.02	At bottoms again-sedimented.
15089	20090416 100918	14.60577924	144.7728322	353	2.35	618.97	621.32	Sonar is looking out 50m and no targets.
15090	20090416 100928	14.60580424	144.7728312	350.78	2.46	619.97	622.43	Heading north.
15092	20090416 101019	14.60583847	144.7728007	25.43	2.51	621.89	624.4	Coming east of north to look for ridge.
15093	20090416 101027	14.60584329	144.7727975	24.11	2.54	622.13	624.67	Sediment covered bottom (flat).
15094	20090416 101054	14.60585715	144.7727945	25.87	2.21	623.14	625.35	VIDEO Stop recording HDCam
15096	20090416 101107	14.60585885	144.7728006	24.84	2.1	623.27	625.37	Slightly higher ridge to stbd.
15097	20090416 101113	14.60585594	144.7728052	46.43	2.34	623.17	625.51	Coming round to 045.

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15100	20090416 101302	14.60586359	144.7728652	42.61	2.15	622.78	624.93	Fish on surface.
15102	20090416 101402	14.60587696	144.7729188	42.54	1.66	623.7	625.36	Ripples in the sediment.
15103	20090416 101447	14.60589929	144.7729544	42.45	1.93	624.16	626.09	Lobster!
15105	20090416 101517	14.60591011	144.7729753	42.75	1.44	624.78	626.22	There is the edge of the ridge.
15106	20090416 101529	14.60591701	144.7729851	42.54	1.25	625.13	626.38	Heading to ridge top. Lots of ash here.
15107	20090416 101539	14.60592024	144.7729923	42.33	1.19	625.32	626.51	VIDEO Start recording HDCam
15109	20090416 101603	14.60592953	144.7730126	42.65	1.11	625.86	626.97	Frame Grab
15110	20090416 101632	14.60592867	144.7730228	98.1	1.45	626.11	627.56	Just testing Frame Grab button-nothing really interesting.
15111	20090416 101649	14.60592962	144.773032	88.12	0.96	626.64	627.6	op of ridge has shrimp
15113	20090416 101707	14.60593077	144.7730493	88.13	1.86	626.06	627.92	Top of ridge has shrimp; yellow crusting on rocks.
15114	20090416 101736	14.60592878	144.7730675	88.65	1.65	626.65	628.3	Going to go down 30-40 meters then face ridge and then come up looking at ridge wall.
15116	20090416 101849	14.60592508	144.7731093	88.24	1.53	629.36	630.89	DSC for all 407 are black. Maybe it is the HD--need to check.
15118	20090416 101923	14.60591918	144.7731268	88.9	1.65	630.8	632.45	Looking 090.
15119	20090416 101947	14.60592712	144.7731386	90.16	2.26	631.1	633.36	Floater in water-polychaete (pelagic).
15121	20090416 102011	14.60593651	144.7731501	89.59	2.58	631.73	634.31	Great images in HD of pelagic polychaete.
15123	20090416 102058	14.6059386	144.7731642	90.56	2.23	633.02	635.25	Aft cam as image of ridge wall.
15124	20090416 102105	14.60593829	144.7731684	90.45	2.23	633.26	635.49	Dropping down.
15126	20090416 102245	14.6059557	144.7732002	323.61	5.81	640.25	646.06	Turning around to face wall.
15127	20090416 102248	14.60595208	144.773199	282.73	7.73	640.21	647.94	Shrimp and outcrop.
15129	20090416 102345	14.6059582	144.7731814	271	7.59	638.46	646.05	Blocky lava and flow bands.
15131	20090416 102359	14.60595998	144.7731751	270.98	8.15	637.7	645.85	Sediment in places.
15132	20090416 102411	14.60596132	144.7731679	271	8.51	637.24	645.75	Some of this looks out of place.
15134	20090416 102525	14.60596683	144.7731515	273.33	3.59	634.81	638.4	Looking at 270 as moving along wall to port.
15135	20090416 102557	14.60596634	144.7731524	272.61	3.83	633.82	637.65	Just looks like shrimp and outcrop.
15137	20090416 102634	14.60596622	144.7731551	272.88	3.65	632.52	636.17	Highly sedimented (more sediment showing here than rock).
15139	20090416 102716	14.6059677	144.7731529	272.74	3.13	632.4	635.53	Climbing up eastern face of this ridge. Not much on it. Mass wasting.
15141	20090416 102814	14.60596673	144.7731418	273.06	3.63	630.14	633.77	Can see edges or top of ridge in port/stbd utility cams.
15142	20090416 102835	14.60596771	144.7731344	272.73	4.8	628.3	633.1	Moving up.
15144	20090416 102904	14.60597338	144.7731168	272.65	5.28	626.22	631.5	At the top-no good outcrops.
15145	20090416 102949	14.60597324	144.7731064	86.7	2.24	626.07	628.31	Scan or ridge top as we pull away from this ridge.
15147	20090416 103027	14.60597691	144.7730641	289.13	1.91	625.92	627.83	Going to head over to the west to look for the steep ridge a few hundred meters away.
15148	20090416 103050	14.6059817	144.7730443	286.64	1.6	625.89	627.49	Going to first get some close-ups of the eels.
15150	20090416 103108	14.60598402	144.7730296	277.21	2.15	625.37	627.52	Eels on sediment.
15152	20090416 103210	14.60597874	144.7729508	144.88	2.89	626.61	629.5	Getting some good eel shots in HD.
15153	20090416 103235	14.60598147	144.7729479	144.72	3.09	626.5	629.59	Trying to get some images on off-load camera as well.
15154	20090416 103257	14.60599563	144.7729371	146.53	3.15	626.95	630.1	Eel going under the vehicle (we are 3.3m up)
15156	20090416 103312	14.6059985	144.772933	144.57	3.29	627.07	630.36	Following eel a bit.
15159	20090416 103509	14.60599374	144.7728899	203.18	2.61	627.11	629.72	This eel is common in this area.
15160	20090416 103519	14.60599145	144.7728959	203.44	2.79	626.91	629.7	A couple of other eels are nearby.
15161	20090416 103541	14.60599367	144.7728981	203.55	2.56	627.13	629.69	Lobster in off-load camera.
15162	20090416 103547	14.60599367	144.7728983	203.97	2.63	627.07	629.7	Eel in regular HD.
15163	20090416 103551	14.60599344	144.7728985	203.84	2.54	627.17	629.71	Done filming here.
15165	20090416 103628	14.60599352	144.7728978	203.84	2.74	627.04	629.78	Going to rescue the rock resting on top of port biobox.
15167	20090416 103714	14.60599375	144.7728982	203.94	2.49	627.15	629.64	Rock is from the time the corals were sampled (bio-2). This will be sample #4 although out of order.

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15169	20090416 103759	14.6059937	144.7728983	204.05	2.4	627.2	629.6	SAMPLE Geology 4: Rescued rock from port biobox that came off wall while sampling bio-2.
15170	20090416 103838	14.60599364	144.7728983	203.8	2.41	627.2	629.61	4: J2-412-rock-04 is going in the stbd swingarm box.
15172	20090416 103937	14.605997	144.7728959	266.05	2.15	626.93	629.08	Off-load camera off.
15173	20090416 103957	14.60599159	144.7728977	292.31	3.06	625.28	628.34	Now heading over ridge that is NW 200m.
15176	20090416 104100	14.60600796	144.7728605	293.47	1.51	627.41	628.92	Heading over 303deg.
15177	20090416 104106	14.60601418	144.7728441	292.68	1.64	627.56	629.2	Driving over sediment.
15178	20090416 104132	14.60603914	144.7727907	299.69	1.66	628.85	630.51	See sonar target about 40m off to port.
15180	20090416 104208	14.60606338	144.7727415	299.57	1.5	630.71	632.21	A parallel spur to where we are headed.
15181	20090416 104217	14.6060681	144.7727306	297.03	1.69	630.96	632.65	It is 37m from us.
15182	20090416 104248	14.60607482	144.772696	215.67	1.1	633.72	634.82	Just a small rock in front of us-now turning to the sonar target.
15184	20090416 104314	14.60604495	144.7726587	220.62	1.03	634.47	635.5	Heading over 225 to catch the target.
15185	20090416 104322	14.60603443	144.7726418	222.99	1.1	634.81	635.91	Lots of sand.
15186	20090416 104330	14.60602506	144.7726223	222.53	1.35	635.14	636.49	Eel again.
15187	20090416 104334	14.60602191	144.7726129	224.35	1.36	635.51	636.87	Nice ripples.
15188	20090416 104346	14.60601167	144.7725895	222.25	1.09	636.46	637.55	Very striped-constant wave length.
15190	20090416 104359	14.60599867	144.772576	223.8	1.09	636.43	637.52	Interesting fish-deep red one.
15191	20090416 104416	14.60597936	144.7725661	223.81	1.16	635.98	637.14	Big eye and red. Good HD-roughy?
15192	20090416 104441	14.6059757	144.7725561	225.13	1.14	636.07	637.21	Lobster and fish.
15194	20090416 104538	14.6059603	144.772529	226.22	1.5	635.6	637.1	Herd of fish (not a school?)
15195	20090416 104548	14.60596037	144.7725265	224.54	1.53	635.67	637.2	There are about 4 of these fish.
15197	20090416 104631	14.60594635	144.7724912	226.69	1.7	635.21	636.91	Here is the outcrop.
15199	20090416 104658	14.60594105	144.7724817	225.74	1.64	635.18	636.82	Looking for anemones.
15200	20090416 104706	14.60594165	144.772482	225.72	1.7	635.17	636.87	Rock has corals.
15201	20090416 104734	14.60593868	144.7724808	227.38	1.58	635.11	636.69	Upside down fish.
15202	20090416 104746	14.60593865	144.7724812	227.71	1.61	635.21	636.82	Lots of corals.
15205	20090416 104924	14.60596672	144.7724495	232.34	3.1	635.77	638.87	J2-412 Data DVDs start blue set DVDs 076
15206	20090416 104933	14.60596719	144.7724483	231.98	2.99	635.88	638.87	Following the face of the outcrop near the base.
15207	20090416 104947	14.6059817	144.7724366	231.41	3.36	636.57	639.93	Looking at 230deg as traverse right.
15209	20090416 105007	14.60598935	144.7724193	231.62	3.31	637.67	640.98	Frame Grab
15210	20090416 105022	14.60599383	144.772407	232.6	3.04	638.54	641.58	Getting images of outcrop-looks like fluid lava layered.
15211	20090416 105032	14.60599867	144.7723977	233.18	3.23	638.92	642.15	Jelly fish in HD sci cam.
15213	20090416 105103	14.60602483	144.7723773	232.19	3.33	640.88	644.21	Seeing shrimp and soft corals.
15214	20090416 105119	14.60603051	144.7723634	231.39	3.21	641.63	644.84	May be current pulling on tether and pushing Jason into rock.
15215	20090416 105130	14.60603814	144.7723482	232.66	3.21	642.59	645.8	Looks like running out of outcrop.
15216	20090416 105149	14.60603579	144.7723494	232.94	3.04	642.76	645.8	Anemone on a rock--you've met your match.
15218	20090416 105231	14.60604624	144.7723323	229.68	3.13	643.8	646.93	Getting stbd swing arm out for sample.
15219	20090416 105242	14.60604343	144.7723315	230.35	2.31	644.62	646.93	Going to get some closeups of the anemone before sampling.
15221	20090416 105301	14.60604236	144.7723292	230.65	0.74	646.42	647.16	Beautiful anemone.
15222	20090416 105320	14.60604232	144.7723276	228.57	187.68	646.59	834.27	Getting good HD of the anemone.
15223	20090416 105339	14.60604214	144.7723286	228.55	187.68	646.57	834.25	J2-412 Data DVDs stop red set DVDs 075
15224	20090416 105345	14.60604181	144.7723281	228.55	187.68	646.57	834.25	Looks like a venus flytrap.
15225	20090416 105405	14.60604113	144.772328	228.35	175.94	646.55	822.49	Going to try off-load camera images.
15226	20090416 105440	14.6060422	144.7723287	229.04	0.74	646.57	647.31	Here comes the arm cam-beautiful.
15228	20090416 105503	14.60604243	144.772329	229.16	0.74	646.58	647.32	Record on.
15229	20090416 105545	14.60604632	144.7723299	229.01	0.74	646.59	647.33	Camera comparison with arm-hd-pilot cam.

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15231	20090416 105626	14.60604441	144.7723305	228.92	0.74	646.61	647.35	Now taking some nearby shrimp photos.
15233	20090416 105713	14.60604411	144.7723316	228.94	0.74	646.62	647.36	Shrimp on off-load and HD sci cams.
15235	20090416 105817	14.60604323	144.7723332	229.01	0.74	646.61	647.35	Nice closeups of shrimp from arm-cam.
15236	20090416 105839	14.60604294	144.7723335	228.97	0.74	646.62	647.36	Ok-ready to sample the anemone.
15238	20090416 105932	14.60604459	144.7723317	228.89	0.74	646.55	647.29	Going to record the sampling.
15239	20090416 105955	14.60604341	144.772331	228.92	0.74	646.57	647.31	Changing Jason team watch.
15241	20090416 110033	14.60604362	144.7723304	229.09	0.74	646.47	647.21	Biobox is open.
15243	20090416 110111	14.60603848	144.772327	230.27	0.9	645.99	646.89	Repositioning to sample.
15244	20090416 110146	14.60603673	144.7723237	207.69	1.49	646.06	647.55	Shrimp swam away.
15246	20090416 110227	14.60604007	144.7723232	205.79	1.35	646.51	647.86	Arm cam off.
15247	20090416 110248	14.60604091	144.7723234	205.8	1.35	646.49	647.84	Anemone closed up with sediment stirred up.
15250	20090416 110431	14.6060386	144.7723241	205.69	1.31	646.5	647.81	5: Anemone very attached to rock from 14 deg36.362'N 144deg 46.339'E at 647m from small outcrop.
15251	20090416 110445	14.60603957	144.7723236	205.11	1.34	646.56	647.9	J2-412 DVCAM 060 stop and 061 start
15252	20090416 110448	14.60603959	144.7723236	205.15	1.34	646.56	647.9	SAMPLE Biology 5: Place in stbd biobox J2-412-biology-05
15255	20090416 110655	14.60603967	144.7723236	200.5	1.88	646.01	647.89	Bob is now the Pilot.
15257	20090416 110729	14.60603895	144.7723032	189.01	4.2	644.48	648.68	Shrimp in cracks on rock wall.
15259	20090416 110817	14.60603887	144.7722618	147.86	5.49	645.65	651.14	Driving along the buttress.
15260	20090416 110853	14.60604349	144.772245	149.01	5.51	646.21	651.72	Sonar back on display to look for more outcrops.
15262	20090416 110955	14.60609856	144.77217	300.13	3.14	654.77	657.91	VIDEO Start recording HDCam Stop recording HDCam Stopped hd
15264	20090416 111020	14.60614294	144.7721188	301.09	3.48	658.72	662.2	Left outcrop and headed out over sediments at 301 to target outcrop.
15266	20090416 111121	14.60617032	144.7720894	300.29	3.93	661.62	665.55	Waiting for ship and Medea to head over to target.
15268	20090416 111236	14.6061892	144.7720584	300.51	2.8	666.29	669.09	Small outcrop in front of us-continuation of the bigger one we just left.
15270	20090416 111258	14.60620929	144.7720496	312.93	3.43	667.67	671.1	This could be the upward extension of the spur we are headed toward.
15272	20090416 111400	14.60628863	144.7719993	324.27	4.18	671.69	675.87	Driving along small outcrop at 324.
15273	20090416 111418	14.60630165	144.771978	324.74	4.3	672.61	676.91	This piece of outcrop is highly sedimented.
15274	20090416 111424	14.606304	144.7719715	324.37	3.71	673.68	677.39	Current is swift and behind us.
15276	20090416 111511	14.60631507	144.7719249	321.28	5.23	675.41	680.64	Some shrimp and coral.
15277	20090416 111520	14.60631369	144.7719162	320.61	6.26	674.87	681.13	Old lavas with oxidized surfaces.
15278	20090416 111526	14.60631382	144.7719124	320.64	6.91	674.42	681.33	Lobate pillows now.
15280	20090416 111606	14.60633447	144.7718782	320.91	3.94	673.48	677.42	Lobate constructional spur.
15281	20090416 111636	14.60634321	144.7718698	320.54	5.21	673.18	678.39	Old .
15282	20090416 111644	14.60635087	144.7718556	320.94	8.86	673.46	682.32	Audio is now recording-battery was out.
15283	20090416 111652	14.60635241	144.7718536	320.39	8.6	674.75	683.35	Lobate flows and outcrop with a lot of sediment.
15285	20090416 111715	14.60635313	144.7718532	320.86	9.93	675.18	685.11	Steep dropoff to port.
15286	20090416 111726	14.60635306	144.7718533	320.9	10.14	675.24	685.38	Pink and purple corals.
15287	20090416 111731	14.60635286	144.7718533	320.87	11.11	675.26	686.37	Shrimp.
15288	20090416 111749	14.60635724	144.7718517	320.47	10.69	675.69	686.38	Could be sponges on HD.
15290	20090416 111844	14.60635537	144.7718169	324.7	14.63	674.75	689.38	Can't stop-moving here.
15292	20090416 111901	14.60640223	144.7717623	324.39	12.81	674.42	687.23	Moving fast.
15293	20090416 111912	14.60643167	144.7717235	320.77	18.74	676.53	695.27	Pulled away from wall.
15295	20090416 112018	14.60661634	144.771576	328.26	15.18	694.48	709.66	Lost outcrop and driving 329. Ship had to change heading a bit due to winds.
15296	20090416 112031	14.60664173	144.7715662	326	13.81	695.51	709.32	Back down on outcrop of pillow lava.
15298	20090416 112105	14.60667109	144.7715465	14.8	7.31	694.46	701.77	Want to stop and get purple coral.
15299	20090416 112119	14.60668271	144.7715306	13.86	6.49	695.25	701.74	Looks more red in HD camera and purple in Pilot cam.
15300	20090416 112131	14.60668288	144.7715273	35.92	8.13	694.95	703.08	Basket out against rock wall.



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15301	20090416 112140	14.60668804	144.7715278	42.1	7.61	694.61	702.22	
15303	20090416 112203	14.60668918	144.7715308	33.62	9.53	694.33	703.86	There are 3 types all in one place.
15304	20090416 112224	14.60668912	144.7715321	36.06	8.98	694.41	703.39	Taking some good HD with sci cam before sampling.
15306	20090416 112306	14.60668922	144.7715342	35.16	9.14	694.37	703.51	HD is recording.
15307	20090416 112318	14.60668932	144.7715352	35.42	9.16	694.36	703.52	Setting up arm cam for imagery.
15308	20090416 112342	14.60668958	144.7715358	34.54	9.38	694.34	703.72	Record is on the off-load cam.
15309	20090416 112349	14.60668928	144.7715358	34.74	9.2	694.34	703.54	Great image of yellow coral.
15311	20090416 112435	14.6066902	144.7715377	34.59	9.38	694.35	703.73	Brittle star is within the red coral.
15312	20090416 112440	14.60669124	144.7715384	34.96	9.16	694.35	703.51	Brittle star.
15314	20090416 112522	14.60669191	144.7715401	34.23	9.41	694.34	703.75	Can see small shrimp in yellow coral. Recording on both cameras.
15315	20090416 112528	14.60669166	144.7715398	34.56	9.39	694.35	703.74	Moving arm to purple coral.
15316	20090416 112538	14.60669188	144.7715402	34.87	9.18	694.38	703.56	Good image on arm cam.
15318	20090416 112625	14.60669099	144.7715423	34.96	9.2	694.34	703.54	Purple coral with brittle star in foreground and then another coral behind it.
15319	20090416 112639	14.60669054	144.7715433	35.03	9.19	694.36	703.55	Reddish one is probably a known variety. Not the purple.
15322	20090416 112825	14.60668785	144.7715468	34.85	9.18	694.37	703.55	Really good hd close-up on the red coral all opened up.
15323	20090416 112836	14.60668739	144.7715469	34.97	9.2	694.36	703.56	Pilot cam has close-up of the purple one.
15324	20090416 112841	14.60668717	144.771547	34.86	9.19	694.36	703.55	Now at the red one.
15325	20090416 112847	14.60668731	144.771547	34.59	9.19	694.37	703.56	Good camera comparison.
15327	20090416 112932	14.60668612	144.771548	34.86	9.4	694.34	703.74	Pilot cam has yellow coral in view.
15329	20090416 113040	14.60668465	144.7715502	34.64	9.39	694.36	703.75	Shrimp in pilot cam.
15330	20090416 113051	14.60668405	144.7715509	35.21	9.16	694.37	703.53	Yellow coral in sci HD.
15332	20090416 113137	14.60668288	144.7715514	34.78	9.21	694.34	703.55	What is coating rock? Oxidation?
15334	20090416 113244	14.60668102	144.771552	34.84	9.46	694.29	703.75	Mineral deposit on rock.
15336	20090416 113312	14.60668154	144.771553	35.31	9.19	694.32	703.51	Ready now to sample the specimens.
15337	20090416 113354	14.60668177	144.7715531	35.68	9.36	694.33	703.69	Arm cam recording off.
15339	20090416 113404	14.60668171	144.7715532	35.7	9.35	694.35	703.7	Going to scoop off the cnidarians.
15341	20090416 113526	14.60667788	144.7715578	37.14	9.7	694.18	703.88	Using one of the port scoop bags.
15342	20090416 113557	14.60667766	144.7715579	36.79	9.69	694.22	703.91	Purple and yellow are highest priorities.
15344	20090416 113654	14.60667596	144.7715548	36.97	9.4	694.27	703.67	SAMPLE Biology 6: J2-412-scoop-06 695m 14deg 36.401 144 deg 46.293'E Got purple.
15346	20090416 113705	14.60667588	144.7715549	36.49	9.64	694.29	703.93	Can see purple in brow cam.
15347	20090416 113754	14.60667408	144.7715531	37.8	9.4	694.29	703.69	This is looking at 036 at a lava outcrop wall on the NW trending ridge on the bathy map.
15350	20090416 113941	14.60667394	144.7715587	37.9	9.1	694.36	703.46	6: Got a piece of the yellow one (need a pointy scoop).
15352	20090416 114029	14.60667303	144.7715555	36.75	9.61	694.29	703.9	Yellow one is pretty tough.
15354	20090416 114148	14.60667186	144.7715528	36.01	9.64	694.27	703.91	Got it.
15356	20090416 114213	14.6066704	144.7715519	35.62	9.65	694.27	703.92	That's all for this sample.
15358	20090416 114309	14.60667025	144.771549	34.82	9.58	694.31	703.89	Placed in port fwd crate next to weights.
15361	20090416 114518	14.60667964	144.7715169	340.18	11.89	690.93	702.82	Heading off at 340.
15362	20090416 114523	14.6066795	144.7715176	339.69	12.04	690.81	702.85	VIDEO Stop recording HDCam
15363	20090416 114552	14.60668844	144.7715051	348.19	10.05	691.85	701.9	Following along more of this outcrop at 348.
15365	20090416 114652	14.60671072	144.7714951	42.84	6.28	692.85	699.13	Seeing many of the red corals with some purple interspersed.
15367	20090416 114701	14.6067109	144.7714943	41.33	6.7	692.85	699.55	White coral.
15368	20090416 114713	14.60671076	144.771494	41	7.63	692.72	700.35	More purple here.
15369	20090416 114746	14.60671169	144.7714881	40.77	11.3	692.54	703.84	White coral would be too hard to sample.
15370	20090416 114756	14.60671359	144.7714879	40.49	7.8	693.06	700.86	Want to look at yellow on rock.
15372	20090416 114804	14.60671424	144.7714876	41.48	6.55	693.74	700.29	Very black sands between rock.

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15373	20090416 114854	14.60671393	144.7714876	40.79	6.38	693.95	700.33	What is on the HD? Something strange next to coral-mucous?
15375	20090416 114922	14.60671397	144.771487	40.51	6.31	693.96	700.27	Yellow looks like sponge (?)
15377	20090416 115002	14.60671409	144.7714868	40.96	6.4	693.94	700.34	VIDEO Start recording HDCam
15378	20090416 115039	14.60671432	144.7714863	40.9	6.39	693.96	700.35	Different kind of coral with separate polyps on sci cam HD.
15380	20090416 115100	14.60671444	144.7714863	41.14	6.29	693.95	700.24	Small crab on Pilot cam.
15381	20090416 115152	14.60671541	144.7714862	41.13	6.29	693.96	700.25	Zooming to the shrimp.
15383	20090416 115224	14.60671657	144.7714855	40.96	6.33	693.96	700.29	Shrimp and coral in the sci cam.
15384	20090416 115240	14.60671672	144.7714851	40.84	6.4	693.96	700.36	Pilot cam zoomed into pulled in coral.
15386	20090416 115300	14.60671229	144.7714798	40.95	6.33	693.94	700.27	Something different in pilot cam.
15387	20090416 115318	14.60671238	144.7714796	41.05	6.33	693.97	700.3	Lots of corals and anemones but no sponges.
15389	20090416 115431	14.60671964	144.7714777	68.16	6.5	693.92	700.42	Repositioning slightly to see if can get more of the purple and/or yellow coral hanging on wall just to port.
15390	20090416 115455	14.60672064	144.7714775	68.08	4.58	694.8	699.38	Nice yellow one begging to be plucked.
15392	20090416 115507	14.60672067	144.7714777	68.37	3.99	695.58	699.57	Going to sample.
15394	20090416 115608	14.6067193	144.7714783	68.1	2.95	696.22	699.17	Sampling at 697m at 14deg 36.403'n 144deg 46.289'E on lava outcrop.
15395	20090416 115622	14.60671929	144.7714785	67.75	2.94	696.22	699.16	Using the port biobox for storage.
15396	20090416 115632	14.60671911	144.7714783	67.62	3.03	696.2	699.23	Sampling with stbd arm.
15398	20090416 115710	14.60671929	144.7714788	66.79	3.04	696.18	699.22	7: J2-412-biology-07 Yellow coral. Looks more like a gorgonian coral. Got it.
15399	20090416 115737	14.60672041	144.7714813	66.82	3.01	696.2	699.21	SAMPLE Biology 7: Placed in port biobox.
15401	20090416 115845	14.6067214	144.7714824	68.96	2.98	696.25	699.23	Sampling some more coral at same site with eel swimming around arm.
15403	20090416 115911	14.60672092	144.7714826	67.85	3.04	696.22	699.26	Same yellow coral. In the biobox port.
15404	20090416 115958	14.60672134	144.7714832	68.07	2.93	696.24	699.17	Will also try to get some purple coral here. All one sample (Verena).
15406	20090416 120055	14.60671951	144.771477	67.57	4.34	695.05	699.39	Moving slightly to get closer.
15408	20090416 120119	14.60671923	144.7714777	68.48	4.61	694.73	699.34	VIDEO Stop recording HDCam
15409	20090416 120148	14.60671708	144.771479	69.74	5.23	694.16	699.39	Great shot in brow cam.
15411	20090416 120226	14.60671621	144.7714779	69.05	5.68	693.81	699.49	Great grab of the purple coral.
15412	20090416 120258	14.60671716	144.7714769	66.34	5.51	693.94	699.45	Placed in biobox with the yellow ones from this site. Maybe J2-412-coral-07.
15414	20090416 120307	14.60671684	144.7714772	67.05	5.53	693.88	699.41	Added a bit more yellow ones.
15416	20090416 120403	14.60671593	144.7714728	67.08	5.55	693.92	699.47	Dead coral covered with hydroids.
15417	20090416 120416	14.60671607	144.7714734	67.63	5.5	693.95	699.45	We are done sampling here.
15419	20090416 120536	14.60671204	144.7714648	63.47	15.75	690.73	706.48	Securing the basket.
15422	20090416 120722	14.60676521	144.7714129	321.01	5.06	705.87	710.93	Going to head down the NW ridge before us and then drive up it.
15423	20090416 120727	14.60677492	144.7714003	320.72	6.34	706.01	712.35	VIDEO Start recording HDCam
15425	20090416 120850	14.60689787	144.7712674	354.67	15.16	717.03	732.19	Moving down slope along the outcrop to the bottom
15429	20090416 121118	14.60695991	144.7712345	39.53	17.83	718.4	736.23	looking at broken pillow face
15430	20090416 121145	14.60695814	144.7712201	39.32	17.73	718.71	736.44	the lava is fractured displaying many different textures
15432	20090416 121247	14.60699609	144.77119	38.23	17.85	723.68	741.53	large cooling cracks
15435	20090416 121413	14.60702361	144.7711513	38.24	15.54	730.17	745.71	possibly dikes with cooling cracks
15437	20090416 121508	14.60702146	144.7711104	38.09	11.99	738.1	750.09	moving down rapidly now
15438	20090416 121520	14.60701828	144.7710954	38.35	10.73	740.41	751.14	outcrop is very steep near vertical
15439	20090416 121524	14.6070172	144.7710925	38.3	10.88	741.26	752.14	looking at flow front
15441	20090416 121607	14.60701557	144.7710748	36.21	9.24	746.17	755.41	slope is becoming more gradual and we are seeing more sediment
15442	20090416 121651	14.60704202	144.7709827	38.84	10.46	749.9	760.36	moving west
15444	20090416 121701	14.60706342	144.7709463	36.98	10.56	750.23	760.79	character of lava has changed
15445	20090416 121722	14.60709646	144.7708707	38.18	12.24	751.07	763.31	lava went from flow front to massive without texture and then rubbly
15446	20090416 121737	14.60711661	144.7708417	38.14	8.31	755.16	763.47	eels

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15448	20090416 121811	14.6071277	144.7708066	38.89	7.56	759.32	766.88	pillows and radial fracturing
15449	20090416 121856	14.60714211	144.7707532	37.86	7.99	763.44	771.43	offline
15451	20090416 121907	14.60714226	144.7707529	37.86	7.99	763.44	771.43	all screens just went blank but we still have power
15453	20090416 122004	14.60714307	144.770751	37.86	7.99	763.44	771.43	Moving the ship and pulling off the wall.
15454	20090416 122007	14.60714311	144.7707509	37.86	7.99	763.44	771.43	Lost power.
15455	20090416 122015	14.60714322	144.7707507	37.86	7.99	763.44	771.43	Still seeing Medea.
15456	20090416 122036	14.60714352	144.77075	37.86	7.99	763.44	771.43	Medea and science cam still working. No control of Jason.
15458	20090416 122112	14.60714195	144.7707355	25.02	29.09	748.43	777.52	We're back on.
15459	20090416 122314	14.6071167	144.7706676	328.83	44.44	741.16	785.6	Dropping a weight.
15460	20090416 122321	14.60711536	144.7706656	322.34	45.29	740.82	786.11	VIDEO Stop recording HDCam
15461	20090416 122450	14.60711448	144.7706659	322.26	45.34	740.64	785.98	Moving scoop from port outside crate.
15462	20090416 122619	14.60711897	144.7706694	322.04	48.22	740.63	788.85	Moving scoop on top of weights behind crates (bio6
15463	20090416 122645	14.60712248	144.7706735	331.23	48.36	741.34	789.7	Basket in. Continuing the dive (not sure why power went out).
15464	20090416 122658	14.60712423	144.7706756	349.36	47.17	744.48	791.65	Came up to 48m off bottom.
15465	20090416 122720	14.60712744	144.7706832	4.09	42.06	751.8	793.86	Going to go back down to bottom and the wall.
15467	20090416 122835	14.60719097	144.770633	24.41	13.88	784.95	798.83	Would like a rock from base of wall.
15468	20090416 122851	14.60720693	144.7706295	24.94	8.33	792.05	800.38	Wall is on sonar at 25m ahead of us.
15470	20090416 122920	14.60726001	144.7706164	26.13	2.63	799.76	802.39	There is the bottom.
15471	20090416 122924	14.6072679	144.7706192	27.15	2.71	799.78	802.49	There is the bottom.
15472	20090416 122933	14.60727599	144.7706273	45.68	3.6	799.4	803	Lots of sediment and angular rocks.
15473	20090416 122937	14.60728364	144.7706324	47.54	3.94	799.03	802.97	some white banding.
15475	20090416 123001	14.60731073	144.7706724	67.64	3.31	797.63	800.94	Base of spur off the main western fault scarp.
15476	20090416 123013	14.60732247	144.770685	60.29	3.8	796.24	800.04	Ripples of sand.
15477	20090416 123019	14.60732481	144.7706884	57.4	3.7	795.85	799.55	There is the wall.
15478	20090416 123038	14.60733007	144.7706953	15.23	3.24	795.33	798.57	Ledges
15479	20090416 123053	14.60733412	144.7707027	15.15	3.11	795.19	798.3	Layered lava.
15480	20090416 123055	14.6073338	144.7707038	15.01	3.14	795.1	798.24	Eel.
15482	20090416 123106	14.60733137	144.7707091	15.79	3.3	794.65	797.95	Some oxidized surface.
15483	20090416 123115	14.60732999	144.7707076	16.47	2.8	795.07	797.87	Blackest rock would be best sample.
15485	20090416 123210	14.60733632	144.7707078	17.29	3.35	794.95	798.3	Looking at the lava layers.
15486	20090416 123220	14.60733633	144.7707076	18.44	3.4	794.8	798.2	Preparing to sample.
15488	20090416 123308	14.60733585	144.7707081	15.64	3.44	794.74	798.18	This is 14deg 36.440'n 144deg 46.242'E at 795m.
15489	20090416 123321	14.60733587	144.7707081	15.74	3.41	794.73	798.14	Got a plate of lava but it has orange on it.
15490	20090416 123350	14.60733593	144.7707083	15.74	3.41	794.7	798.11	Dropped that piece-don't want it. Thin ones are too weathered.
15492	20090416 123400	14.60733567	144.7707084	15.1	3.34	794.84	798.18	Trying for a blockier piece.
15493	20090416 123534	14.60733521	144.7707092	14.7	3.34	794.7	798.04	SAMPLE Geology 8: Looks fresher underneath. J2-412-rock-08
15495	20090416 123546	14.60733102	144.7707075	17.72	3.24	794.78	798.02	Piece of oxidized pillow.
15496	20090416 123611	14.60732522	144.7706961	18.29	4.7	793.84	798.54	Going to take a series of pictures going up wall.
15499	20090416 123634	14.60735461	144.7706875	19.9	7.79	790.49	798.28	Taking images going up wall.
15500	20090416 123646	14.60736064	144.7706869	19.04	8.71	790.02	798.73	Ripples in sediment.
15502	20090416 123711	14.60737163	144.7706895	19.53	9.99	788.33	798.32	Tape #5 mini HD starting.
15504	20090416 123740	14.60738104	144.7706898	19.03	6.61	787.57	794.18	Lava
15505	20090416 123752	14.60738502	144.7706898	19.8	7.28	786.51	793.79	Up to 786 meters.
15506	20090416 123821	14.60738875	144.7706907	19.91	7.39	786.31	793.7	Crust peeled back on these lavas and can see fractures.
15508	20090416 123847	14.60740441	144.7706945	19.91	8	784.48	792.48	Great overhead shots with sediment working its way down.
15509	20090416 123904	14.60742091	144.7706928	19.62	6.59	782.59	789.18	Benches and ledges with outcrop/sediment.

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15511	20090416 124005	14.60742731	144.7706917	19.97	5.9	781.73	787.63	Pillow forms (fractured)
15513	20090416 124015	14.6074548	144.7706959	19.84	4.78	778.38	783.16	Ripples in sands at base of vertical lava walls where there are benches for accumulation.
15514	20090416 124038	14.60745479	144.7706962	19.03	5.49	777.61	783.1	Some more of the yellow coral on ledge.
15515	20090416 124145	14.60745693	144.7707009	19.91	5.61	776.41	782.02	Yellow corals and red. Shrimp.
15517	20090416 124220	14.6074661	144.7707053	26.7	8.64	772.32	780.96	Lava blocks-more massive flow. Columnar basalt.
15519	20090416 124258	14.60747131	144.7707098	26.52	5.69	769.68	775.37	Back to smoother forms.
15520	20090416 124310	14.60749553	144.7707181	26.48	5.55	766.94	772.49	Sediment ripple bench with lava piled on top-overlapping pillows.
15522	20090416 124326	14.60750124	144.7707226	26.72	6.43	766.12	772.55	White-yellow-red corals on underhang ledge.
15523	20090416 124415	14.60750158	144.7707226	26.84	7.45	764.6	772.05	Lots of corals as we climb to 764m
15525	20090416 124424	14.60750788	144.7707266	48.72	9.76	761.74	771.5	Would like whip coral.
15526	20090416 124432	14.60750946	144.7707244	47.81	9.96	761.7	771.66	Yellow coral just below the whip coral.
15527	20090416 124439	14.60750964	144.7707231	47.17	10.75	761.55	772.3	Stopping to sample coral.
15528	20090416 124439	14.60750959	144.7707232	47.3	10.51	761.68	772.19	J2-412 Data DVDs start red set DVDs 077
15529	20090416 124504	14.60750959	144.7707232	47.38	10.19	761.7	771.89	At 762m.
15531	20090416 124511	14.60750967	144.770723	46.58	9.26	761.59	770.85	14deg 36.451'N 144deg 46.243'E on wall.
15532	20090416 124612	14.60750968	144.7707229	45.87	8.36	761.52	769.88	Opening front-port biobox.
15534	20090416 124754	14.60753479	144.7707194	75.26	7.95	762.39	770.34	Great view of Jason with Medea.
15536	20090416 124829	14.60753905	144.7707214	76.42	8.75	761.94	770.69	SAMPLE Biology 9: Ship is working hard with engines. J2-412-coral-09 from wall at 762m. Whip coral.
15538	20090416 124908	14.60753933	144.7707219	76.35	10.06	761.89	771.95	J2-412 stop blue set DVDs 076
15540	20090416 125106	14.60753975	144.7707226	76.33	10.05	761.93	771.98	Placing in port bio box. Not cooperating.
15543	20090416 125141	14.60754146	144.7707237	78.93	5.04	762.16	767.2	Got it mostly in the box-just a tip outside. Box closed.
15544	20090416 125157	14.60751737	144.7707095	75.49	17.1	758.24	775.34	Top of ridge.
15545	20090416 125204	14.60751651	144.7707248	75.06	14.65	757.34	771.99	Massive lavas-pillow forms.
15547	20090416 125257	14.60752289	144.7707298	75.78	12.66	757.6	770.26	Ripples of sand at top.
15548	20090416 125306	14.60756507	144.7707842	63.52	0.74	757.75	758.49	Yellow corals at top on layered lava piece.
15550	20090416 125319	14.60756402	144.7707839	59.75	1.41	757.45	758.86	That is a cute collection of critters.
15551	20090416 125349	14.60756319	144.7707839	56.67	1.56	757.62	759.18	Hydrosome-fire coral at 758m.
15552	20090416 125356	14.60756305	144.7707833	58.48	1.61	757.62	759.23	Has calcium carbonate skeleton.
15553	20090416 125417	14.60756298	144.7707831	58.4	1.61	757.63	759.24	Image in HD cam.
15555	20090416 125449	14.60756289	144.7707832	58.84	1.64	757.59	759.23	Something has been nibbling the edges of the coral.
15556	20090416 125539	14.60756332	144.7707841	58.84	1.4	757.6	759	Enough photos of that.
15558	20090416 125625	14.60754824	144.7707732	71.47	8	755.27	763.27	Going back over to the edge of the wall-ridge. to stbd.
15560	20090416 125704	14.60753464	144.7707691	61.55	11.2	757.81	769.01	Outcrops have some coral on top. Looks like a bend in Medea tether.
15562	20090416 125712	14.60752766	144.7707666	61.11	11.78	758.14	769.92	Lots of coral on that piece of lobate flow.
15563	20090416 125726	14.60752638	144.7707688	61.2	11.64	758.75	770.39	Crab and corals in HD camera.
15564	20090416 125735	14.60752673	144.7707731	61.83	11.78	758.52	770.3	Eel in back.
15565	20090416 125752	14.60752606	144.7707726	62.22	11.96	758.52	770.48	Great imagery.
15566	20090416 125824	14.60752651	144.7707717	61.26	11.68	758.6	770.28	Crab-coral-second crab.
15568	20090416 125858	14.60752645	144.7707716	61.29	11.58	758.6	770.18	Great collection of corals and crab.
15569	20090416 125950	14.60752643	144.7707716	61.31	11.74	758.59	770.33	Bright yellow corals alongside of white.
15571	20090416 130015	14.60752636	144.7707715	61.23	11.73	758.6	770.33	Stony coral above crab and white things are bases of them.
15573	20090416 130025	14.60752645	144.7707715	61.1	11.71	758.61	770.32	Going to use the arm cam for some good images.
15574	20090416 130041	14.6075264	144.7707715	61.12	11.84	758.61	770.45	Arm cam is recording.
15575	20090416 130134	14.60752641	144.7707714	60.97	11.65	758.59	770.24	Not a true crab with only 6 walking legs.

Virtual Van Record #	timestamp yyyymmdd hhmmss	Latitude	Longitude	JASON Heading	JASON altitude	JASON depth	Total Depth	J2-412 Logger Comment
15577	20090416 130226	14.60752536	144.7707722	60.9	11.96	758.59	770.55	Arm cam is not in focus.
15579	20090416 130325	14.60752376	144.7707734	60.9	12.18	758.65	770.83	Arm cam close-up of corals and shrimp.
15581	20090416 130342	14.60752178	144.7707744	60.92	13.13	758.62	771.75	Close-up of crab in arm cam.
15582	20090416 130421	14.60752117	144.7707747	60.94	12.85	758.64	771.49	Yellow corals in arm cam.
15584	20090416 130515	14.60751999	144.7707752	60.97	13.19	758.64	771.83	Great HD in both cameras.
15586	20090416 130537	14.60751813	144.7707764	60.92	14.09	758.67	772.76	Dead coral above yellow one with hydroids colonizing.
15587	20090416 130559	14.60751735	144.7707767	60.9	14.09	758.67	772.76	J2-412 DVCAM 061 stop and 062 start
15588	20090416 130821	14.6075175	144.7707765	60.91	14.24	758.66	772.9	Sci HD has stony coral image.
15592	20090416 130831	14.60752022	144.7707748	60.59	13.23	758.68	771.91	Only 19min left on arm cam (second storage tape).
15593	20090416 130920	14.60752016	144.7707751	60.57	13.84	758.69	772.53	Stop imaging.
15595	20090416 130944	14.60751049	144.7707838	59.82	14.91	758.67	773.58	Turn off arm cam recording. Looks like it may have been on for some time.
15596	20090416 130956	14.60750465	144.7708052	49.44	13.43	758.57	772	Moving away from coral rock and looking at outcrops. Looks like band of corals on top.
15597	20090416 131011	14.6074971	144.7708147	48.7	13.05	758.57	771.62	Can't figure out how to turn off the arm cam.
15599	20090416 131050	14.60749718	144.7708197	38.39	12.8	758.52	771.32	Big pillow tubes coming down.
15600	20090416 131110	14.60749686	144.7708313	31.43	5.63	757.94	763.57	Brow cam really shows the corals hanging over the top edge.
15602	20090416 131124	14.60749744	144.7708275	19.19	9.66	757.72	767.38	Long line of corals on top edge.
15603	20090416 131139	14.60749661	144.7708287	21.4	9.04	757.6	766.64	Dense corals at top.
15604	20090416 131158	14.60749597	144.770829	21.63	9.83	757.66	767.49	Turning of arm cam from pilot console.
15605	20090416 131223	14.60748988	144.7708244	20.44	12.81	757.64	770.45	Sonar display is back on.
15607	20090416 131234	14.60750755	144.7708354	21.75	6.44	757.41	763.85	Round pillows on top with lots of corals.
15608	20090416 131310	14.60750755	144.7708358	21.93	6.71	757.05	763.76	White is base of broken coral.
15610	20090416 131354	14.60749451	144.7708553	20.76	10.49	757.23	767.72	Good look along top of basalt ridge.
15611	20090416 131417	14.60746067	144.7708792	27.41	15.26	757.08	772.34	Eel fish.
15613	20090416 131442	14.60745281	144.770895	28.27	12.95	757.16	770.11	Massive pillows here at 757m 028deg.
15614	20090416 131451	14.60744987	144.7709063	26.8	12.89	756.54	769.43	Sea star on top.
15615	20090416 131510	14.6074522	144.7709137	28.53	10.73	756.42	767.15	Corals hanging on edge.
15617	20090416 131532	14.60745552	144.770923	27.85	9.48	755.4	764.88	Dramatic edge with lots of red corals.
15618	20090416 131623	14.60745531	144.7709221	27.85	9.23	755.67	764.9	Puffy sea star.
15620	20090416 131811	14.60745378	144.7709241	27.78	9.38	755.51	764.89	Butt-sagging sea star.
15623	20090416 131912	14.6074486	144.7709449	343.26	7.43	755.02	762.45	Good hd image of balloon-like sea star.
15625	20090416 131936	14.60744498	144.7709637	359.76	5.96	754.79	760.75	Jason has swung around the edge of this pillow lava outcrop and is now facing 349deg.
15626	20090416 132054	14.60743142	144.7709611	18.57	7.63	754.93	762.56	Pillows trending downward.
15628	20090416 132101	14.60743077	144.7709598	18.15	7.69	754.94	762.63	Pillows reaching downward.
15630	20090416 132334	14.60743087	144.7709599	18.15	7.69	754.98	762.67	Waiting for the ship in order to move.
15633	20090416 132433	14.6074416	144.7709826	19.11	6.74	752.87	759.61	Lonely purple coral hanging on the edge. No-there's another one.
15635	20090416 132533	14.60744697	144.7710054	18.53	8.05	750.08	758.13	Traversing the edge at 018 and 750m.
15637	20090416 132545	14.60745827	144.7710085	17.35	13.1	744.16	757.26	Rising up along top again. More coral.
15638	20090416 132602	14.60746122	144.7710137	17.65	14.09	743.02	757.11	Pillow with corals.
15640	20090416 132626	14.60746502	144.7710237	17.94	9.63	741.69	751.32	Broken lobate flow.
15641	20090416 132655	14.60746931	144.7710312	18.37	10.73	739.45	750.18	That's all folks.
15642	20090416 132706	14.60745285	144.771007	282.33	10.38	738.54	748.92	Ending J2-412 and NW Rota-1 Expedition-Chief Scientist Bill Chadwick.
15644	20090416 132708	14.607456	144.7709947	283.48	10.2	738.96	749.16	J2-412 Data DVDs stop red set DVDs 077
15645	20090416 132714	14.6074568	144.7709913	284.03	10.29	739	749.29	VIDEO Stop recording HDCam All video off.
15646	20090416 132721	14.6074621	144.7709729	282.26	11.5	738.88	750.38	JASON off bottom
15647	20090416 132736	14.6074646	144.7709641	282.05	13.24	738.41	751.65	Managing tether and basket.
15648	20090416 132743	14.6074696	144.770937	281.05	14.58	738.79	753.37	Estimated time to surface ~30minutes.

<b>Virtual Van Record #</b>	<b>timestamp yyyymmdd hhmmss</b>	<b>Latitude</b>	<b>Longitude</b>	<b>JASON Heading</b>	<b>JASON altitude</b>	<b>JASON depth</b>	<b>Total Depth</b>	<b>J2-412 Logger Comment</b>
15649	20090416 132800	14.6074747	144.7709136	282.06	15.85	738.69	754.54	J2-412 DVCAM 062 stop