

NW Rota-1 2010 Cruise Report

R/V Kilo Moana Cruise KM-1005

March 16-30, 2010

Guam – Guam

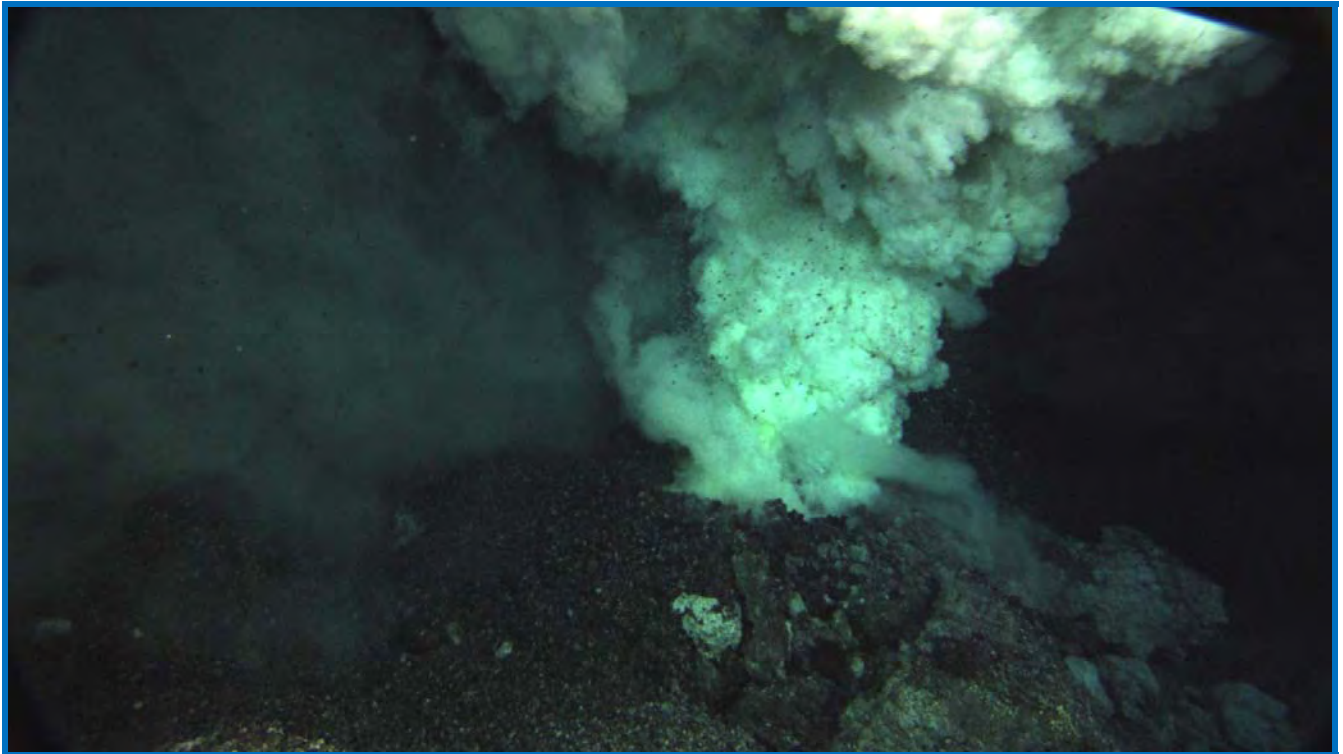
JASON Dives J2-486 to J2-495

Chief Scientist: William Chadwick

R/V Kilo Moana Captain: Brian Wehmeyer

JASON Expedition Leader: Matt Heintz

Cruise report prepared by: Andra Bobbitt

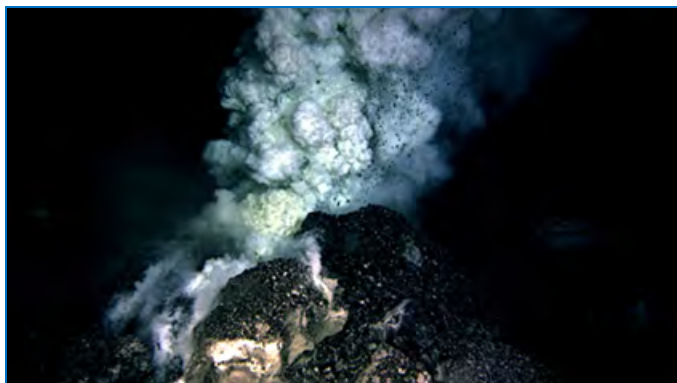


2010 Brimstone Vent on first descent, dive J2-487.

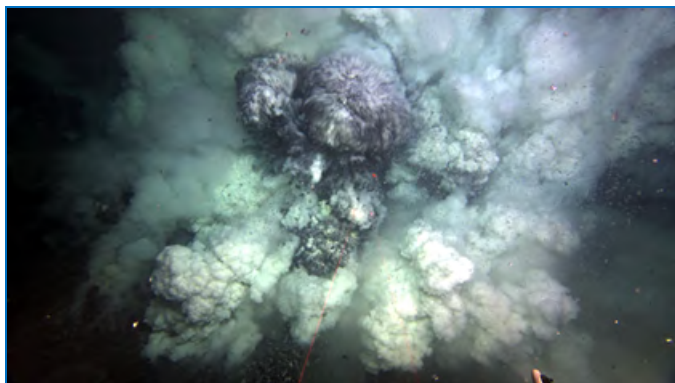
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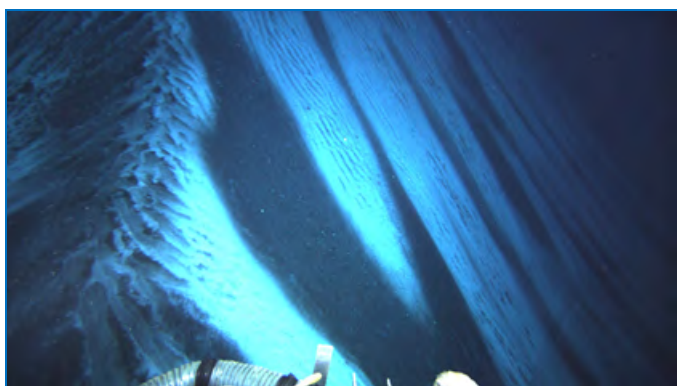
Image Highlights



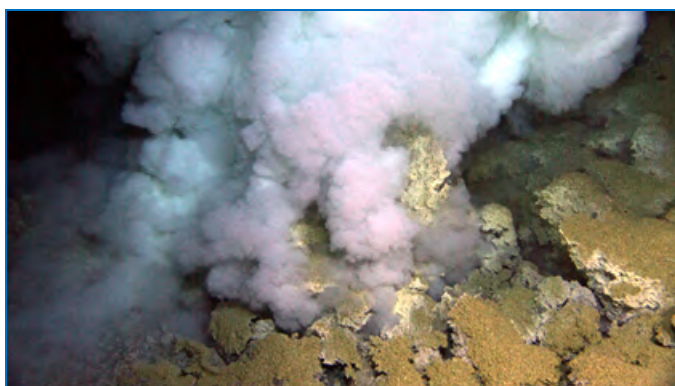
Phantom Vent, 3/17/2010 23:57:20 J-487.



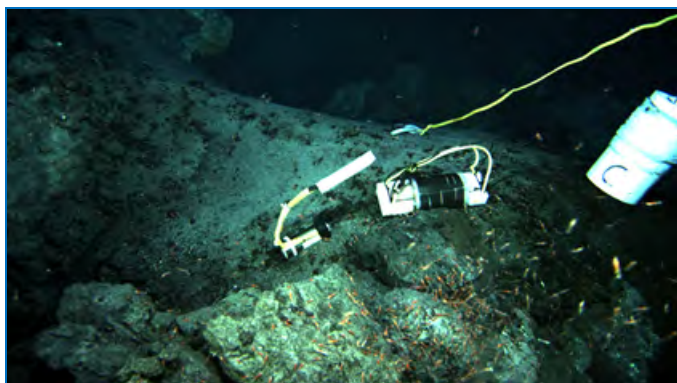
Large eruption at Styx Vent with tephra, gas bubbles and extensive plume. 3/27/2010 04:28:56 J-494.



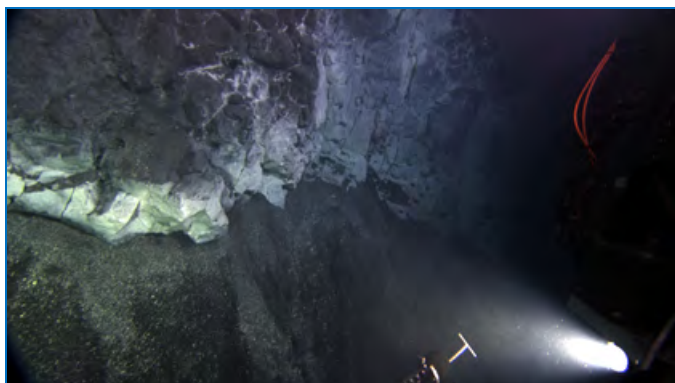
Steep sedimented slopes west of Mkr109/Mkr112 while heading to lost RAS mooring site, 3/21/2010 00:35:00 J-489.



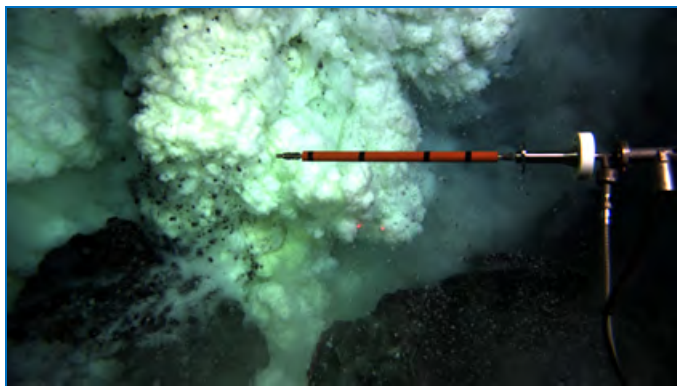
Venting at Sulfur Crust with freshly erupted sulfur, 3/24/2010 18:54:24 J-492.



Hydrophone, MTR and Tephra sampler at the summit rim, 3/26/2010 18:45:14 J-494.



Vertical wall north of Brimstone Vent and south of the summit rim, 3/19/2010 19:20:32 J-488.



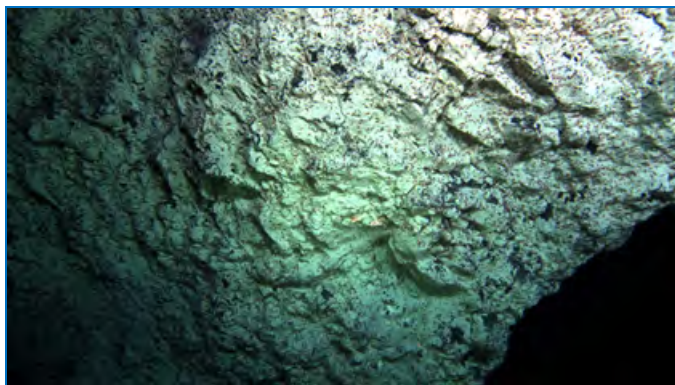
Fluid sampling with the HFS Beast at Phantom Vent. 3/18/2010 00:13:10 J-487.



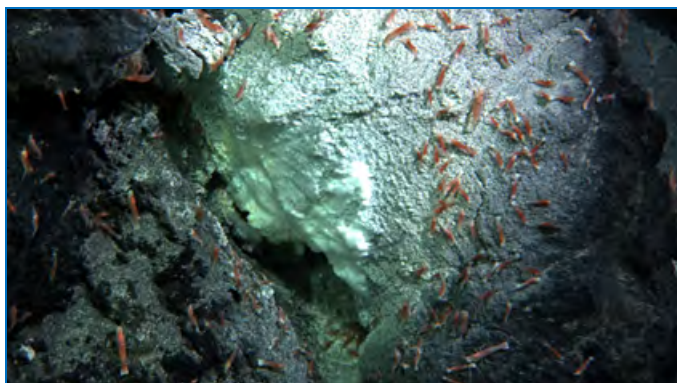
Gas-tight bottle fitted with funnel to capture gas bubbles at Styx Vent, 3/29/2010 00:11:22 J-495.



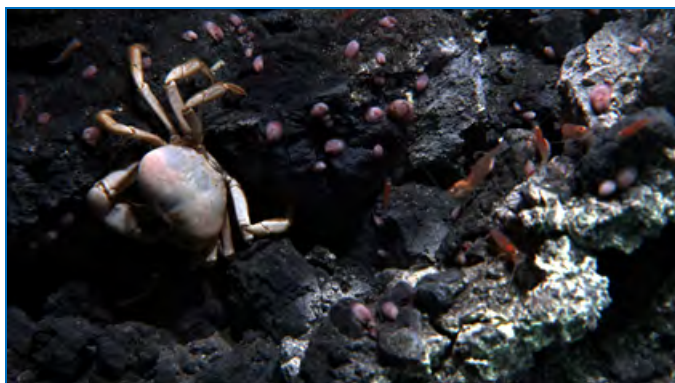
Opaepele loihi shrimp 5m upslope from Mkr-110 (Iceberg09). 3/26/10 21:39:00, J-494.



Cliff face covered in sulfur on wall presumably sheered from the landslide, 3/26/10 23:05:00, J-494.



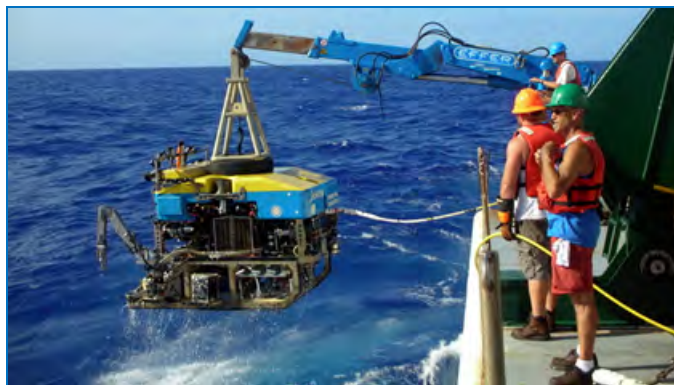
Iceberg09 site (Mrk-110) with diffuse venting, bacterial mat and *Opaepele loihi* shrimp. 3/22/2010 23:55:48, J-490.



Biology at Mkr-109 (Limpet Lair): crab (*Austinograea*), limpets (*Shinkailepas* n. sp.) and shrimp (*Opaepele loihi*). 3/22/2010 20:35:36, J-490.



Small boat recovery of the 2009 Hydrophone mooring; the only 2009 mooring which survived the landslide event.



JASON recovery on the R/V Kilo Moana.

1.0 Expedition Summary

Bill Chadwick, Oregon State University

The Good News: Great scientific results from NW Rota-1 Volcano

The 2010 expedition to NW Rota-1 submarine volcano was a great success, despite the challenges we faced at sea. We found that the volcano was still activity erupting even though it had experienced a major landslide since our previous visit a year ago. The landslide was a mixed blessing, because on the one hand it gave us a unprecedented view of how arc volcanoes grow by the cyclic process of eruption, collapse, and regrowth, how the volcano's magmatic and hydrothermal systems responded to such a large perturbation, and how the resident chemosynthetic biological community was impacted. On the other hand, the landslide destroyed some of the instrument moorings that we left last year to monitor the volcano's activity, and that is a major loss and disappointment. We had hoped to capture just this kind of event, but this one turned out to be much larger than we thought possible. Still, we were able to recover one hydrophone mooring and we will be examining the sound recordings it made. It is safe to say that these processes have never been documented in such detail and we are sure to learn new things about submarine eruptions as well as large mass-wasting events and their impacts. Special thanks to the captain and crew of the R/V Kilo Moana, the Jason ROV team, and the National Science Foundation for supporting our research!

The Bad News: Problems we experienced with R/V Kilo Moana that affected our science operations:

The cruise plan was to have one 12-hour Jason dive each day and the other 12-hours would be used for CTD casts and tows (8-10 hrs/day), along with plankton net hauls, multibeam sonar surveys, and mooring recoveries (2-4 hrs/day). The CTD operations during the cruise were a complete loss, due to a hydraulic leak on the Caley crane the first day, the failure of a solenoid on the crane the second day, and a catastrophic failure of the CTD winch motor on the third day of the cruise, rendering CTD operations impossible during the rest of the cruise. This failure prevented us from meeting some of the major science objectives of the cruise, and left 3 members of the science party completely unable to conduct the research they had planned and NSF had funded. The CTD winch failure sent an electrical surge through the ship that also damaged the bow-thruster controller, caused smoke to come from parts of the crane control systems, tripped a breaker on one of the ship's generators, and caused a complete power outage on the ship (at night) for several minutes. During this event, the CTD was still over the side with 700 m of wire out, which had to be brought back on board by the ship's crew and the Sea-Mac winch, but then it too failed and was unavailable for plankton net hauls for the next 3 days. The back-up unit for the bow-thruster controller was faulty and did not work and so the ship was without a bow-thruster for the rest of the cruise, which compromised its maneuverability and what we could accomplish during subsequent Jason dives. The Jason dive scheduled for the day after the CTD winch failure was canceled due to the ship's problems and another Jason dive was canceled because of weather, but the Jason expedition leader said that we could have made that dive if the bow thruster had been working, so this is another Jason dive lost due to the ship's equipment failures. Two other Jason dives were lost to vehicle electrical problems. Nine Jason dives were successfully made, eight of these without the aid of the ship's bow-thruster.

The Jason team deserves special acknowledgment because of their heroic efforts to repair the vehicle after a major electrical failure. While Jason was on its way to the surface after the second to last dive a high-voltage transformer on the vehicle failed. This was a major repair that had never been performed at sea before, but they successfully accomplished it in 24 hours, which enabled us to have one key final dive before the end of the cruise. This was extremely valuable to the science party because we still had many experiment and instruments on the seafloor that still needed recovering and some critical samples and observations to make.

2.0 Operations Log

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
3/16/2010	8:15	3/15/2010	22:15	R/V Kilo Moana departs Guam
	9:38		23:38	Arrive at JASON engineering dive site
	11:27	3/16/2010	1:27	XBT
	13:10		3:10	Conducting USBL calibration
	16:30		6:30	JASON in water Engineering Dive J2-485
	16:51		6:51	JASON on deck; recovered USBL transponder.
	17:30		7:30	Transit back to Guam harbor.
	18:25		8:25	Transferred personnel from ship to shore
	18:34		8:34	Start EM122 survey between Guam and Seamount X
	21:18		11:18	Start water column data collection
	21:39		11:39	End EM122 and water column data collection, arrived at Seamount X.
	21:45		11:45	CTD night ops and equipment testing.
	23:08		13:08	CTD failure, back on deck.
3/17/2010	4:15		18:15	Begin JASON dive J2-486 at Seamount X
	7:27		21:27	Dive aborted; JASON/Medea on deck. End J2-486
	11:47	3/17/2010	1:47	EM122 logging on; start survey from Seamount X to NW Rota
	11:51		1:51	XBT
	21:19		11:19	Continuing EM122 logging at NW Rota; begin water column logging
	21:39		11:39	End of EM122 and water column survey.
	22:00		12:00	Begin CTD operations.
	22:54		12:54	CTD in water
3/18/2010	00:00		14:00	CTD failure, back on deck.
	4:00		18:00	JASON Dive J2-487 at NW Rota.
	16:02	3/18/2010	6:02	End JASON dive J2-487
	17:00		7:00	Attempt to communicate with 2009 moorings.
	19:05		9:05	EM1002/EM122/water column survey to locate moorings.
	19:34		9:34	Stop EM1002 logging
	20:06		10:06	End multibeam survey. Search inconclusive.
	21:11		11:11	CTD in water.
3/19/2010	01:38		15:38	Catastrophic failure of CTD winch/crane system. Ship lost power; CTD at 600m depth.
	3:30		17:30	CTD back on deck. Jason dive postponed.
	6:50		20:50	EM122 & EM1002 survey of NW Rota started.
	10:50	3/19/2010	0:50	EM122 & EM1002 survey completed.
	11:00		1:00	Attempt to conduct Plankton Tows. Aborted due to Sea Mac winch being inoperative.
	14:25		4:25	XBT
	14:40		4:40	Heading west for multibeam survey.
	15:07		5:07	Start EM122 survey west of NW Rota.
	17:26		7:26	End EM122 survey.

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
	19:00		9:00	Begin search for moorings by attempted ranging to acoustic releases. Start at hydrophone site. Point #1
	19:15		9:15	End search at hydrophone site. No signals.
	19:30		9:30	Start acoustic search at '1000-m' site. Point #2.
	19:45		9:45	End search at '1000-m' site. No signals.
	20:10		10:10	Start acoustic search at '1500-m' site. Point #3.
	20:30		10:30	End acoustics search. Signal detected for 1500-m mooring.
	21:07		11:07	Start acoustic search at 1800m contour. Point #4.
	21:14		11:14	End acoustic search. 1500-m mooring signal detected.
	21:30		11:30	Start acoustic search at 2000-m contour. Point #5.
	21:34		11:34	End acoustic search. 1500-m mooring signal detected.
	22:15		12:15	Start acoustic search. 2500-m cntour. Point #7 (skipped #6)
	22:21		12:21	End acoustic search. 1500-m mooring signal detected.
	22:45		12:45	Start acoustic search. 2700-m contour. Point #8
	22:50		12:50	End acoustic search. 1500-m mooring signal detected.
	23:13		13:13	Start acoustic search. Point #9
	23:20		13:20	End acoustic search. 1500-m mooring signal detected.
	23:50		13:50	Start acoustic search. Point #10
	23:55		13:55	End acoustic search. 1500-m mooring signal detected
3/20/2010	0:10		14:10	Start acoustic search
	0:15		14:15	End acoustic search. No signal from Hydrophone, 500m, 1000m moorings.
	4:15		18:15	Begin dive J2-488
	16:08	3/20/2010	6:08	End dive J2-488
	16:43		6:43	Start logging EM122 enroute to multibeam survey of Esmeralda
	19:40		9:40	Begin Esmeralda EM122/EM1002 multibeam survey.
	22:28		12:28	Begin water column data collection
	22:43		12:43	End water column data collection
3/21/2010	1:46		15:46	End Esmeralda EM122/EM1002 multibeam survey.
	4:15		18:15	Jason Dive J2-489 begin.
	16:00	3/21/2010	6:00	Jason Dive J2-489 end.
	16:31		6:31	Begin logging EM122 enroute to multibeam survey west of NW Rota
	16:43		6:43	XBT KM1005-2010-080-064329.asvp
	17:35		7:35	Begin west Survey multibeam survey
3/22/2010	1:30		15:30	End west Survey multibeam.
	5:18		19:18	Begin EM122 plume mapping over NW Rota-1.
	6:34		20:34	End EM122 plume mapping (4 passes).
	6:58		20:58	Weather conditions cancel Jason dive.
	7:08		21:08	Begin EM122 plume mapping over NW Rota-1.
	11:47	3/22/2010	1:47	End EM122 plume mapping Survey. (16 passes)
	12:00		2:00	Preparing for Plankton Tows. Conducting weight test.
	15:15		5:15	Plankton Haul 1 NW Rota PL-NWRota-01
	17:05		7:05	Plankton Haul 2 NW Rota PL-NWRota-02
	19:02		9:02	Plankton Haul 3 NW ROTA PL-NWRota-03

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
	20:47		10:47	Plankton Haul 4 NW Rota PL-NWRota-04
	21:44		11:44	EM122 shut down for ranging to 1500m mooring.
	22:28		12:28	Mooring Search Station 1-'N' (ranges from 1500m-mooring)
	23:10		13:10	Mooring Search Station 2-'W' (ranges from 1500m-mooring)
	23:50		13:50	Mooring Search Station 3-'S' (ranges from 1500m-mooring)
3/23/2010	0:14		14:14	Mooring Search Station 4-'E' (ranges from 1500m-mooring)
	0:40		14:40	Mooring Search Station 5-'Top' (ranges from 1500m-mooring)
	4:00		18:00	Jason Dive J2-490 at NW Rota
	19:00	3/23/2010	9:00	Jason on deck; end dive J2-490
	19:28		9:28	Begin water column Summit Survey with EM122
	19:38		9:38	End water column data collection.
	20:53		10:53	EM122 Survey begin
	21:05		11:05	XBT.
3/24/2010	2:45		16:45	EM122 survey end.
	4:00		18:00	Jason Dive J2-491 1500m-mooring search
	16:00	3/24/2010	6:00	End Jason Dive J2-491
	16:12		6:12	Water column Summit Survey EM122 begin
	16:22		6:22	End water column survey.
	16:57		6:57	Begin EM122 data logging transit to Esmeralda East Survey
	19:18		9:18	XBT
	19:21		9:21	Begin EM122 multibeam data survey
3/25/2010	2:09		16:09	End EM122 multibeam survey
	3:19		17:19	Begin EM122 water column Summit Survey
	3:26		17:26	End EM122 water column survey
	4:00		18:00	Jason Dive J2-492 begin
	8:00		22:00	Start EM122 water column data collection during Jason dive
	14:26	3/25/2010	4:26	End EM122 water column data collection
	15:28		5:28	Hydrophone mooring release code sent/mooring released
	16:07		6:07	Jason Dive J2-492 end
	16:15		6:15	Hydrophone mooring recovered on ship
	17:42		7:42	Changing lines on SeaMac winch for plankton hauls
	17:52		7:52	Start EM122 and water column data logging
	17:57		7:57	End EM122 & water column logging
	19:35		9:35	Plankton Haul PL-NWRota-05 14deg 36.20N 144deg 46.41 w/MAPR
	20:26		10:26	Plankton Haul PL-NWRota-06 14deg 36.20 144deg 46.41 w/MAPR
	21:11		11:11	Water column data logging
	21:48		11:48	End water column data logging
	21:48		11:48	Plankton Haul PL-NWRota-07 14deg 35.95N 144deg 46.61 w/MAPR
	22:40		12:40	Plankton Haul PL-NWRota-08 14 35.95 144 46.52 w/MAPR
	23:35		13:35	Plankton Haul PL-NWRota-09 14 35.95 144 46.41 w/MAPR
3/26/2010	00:36		14:36	MAPR M10A-01 lowering cast 14 35.95 144 46.
	01:19		15:19	MAPR M10A-02 lowering cast 14 35.95 144 46.202

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
	2:31		16:31	Begin EM122 and water column data collection over summit
	3:27		17:27	End EM122 and water column data collection
	4:07		18:07	Jason Dive J2-493 begin
	18:43	3/26/2010	8:43	J2-493 Jason on deck
	20:02		10:02	Plankton Haul PL-NWRota-10 14 35.95 144 46.61 w/MAPR
	21:06		11:06	Begin EM122 and water column data collection over summit
	21:22		11:22	End EM122 and water column data collection
	21:23		11:23	Plankton Haul PL-NWRota-11 14 35.95 144 46.51 w/MAPR
	22:31		12:31	Plankton Haul PL-NWRota-12 14 35.95 144 46.41 w/MAPR
	23:36		13:36	Plankton Haul PL-NWRota-13 14 35.95 144 46.31 w/MAPR
3/27/2010	00:45		14:45	MAPR M10A-03 14 35.95 144 46.21
	1:55		15:55	Begin EM122 and water column data collection
	3:28		17:28	End EM122 and water column data collection
	3:58		17:58	Jason Dive J2-494 begin
	4:25		18:25	Begin EM122 and water column data collection during Jason dive
	16:10	3/27/2010	6:10	End EM122 and water column data collection
	18:19		8:19	J2-494 end. Jason voltage converter damaged during ascent. Emergency repairs on Jason for next 24 hours.
	19:20		9:20	Plankton Haul PL-NWRota-14 14 35.95 144 46.21 w/MAPR
	20:16		10:16	Plankton Haul PL-NWRota-15 14 35.95 144 46.31 w/MAPR
	21:04		11:04	Plankton Haul PL-NWRota-16 14 35.95 144 46.41 w/MAPR
	22:17		12:17	MAPR M10A-04 14 35.95 144 46.51
	23:10		13:10	MAPR M10A-05 14 35.95 144 46.61
	22:39		12:39	Start EM122 and water column data collection during Plankton tows
	23:36		13:36	End EM122 and water column data collection
3/28/2010	0:14		14:14	Start E-W W-E EM122 and water column data collection
	9:09		23:09	End EM122 and water column data collection.
	9:50		23:50	Sent release code to 1500m mooring
	10:34	3/28/2010	0:34	Start EM122 and water column data collection over summit
	10:47		0:47	Honeybear thrown overboard attached to death shackle.
	19:40		9:40	Stop EM122 and water column data collection.
	19:45		9:45	Jason dip test
	21:06		11:06	MAPR M10A-06 14 35.95 144 46.206
	22:11		12:11	MAPR M10A-07 14 35.95 144 46.302
	23:11		13:11	MAPR M10A-08 14 35.95 144 46.406
3/29/2010	00:08		14:08	MAPR M10A-09 14 35.95 144 46.622
	00:55		14:55	MAPR M10A-10 14 35.95 144 46.509 w/hydrophone attached
	3:54		17:54	Jason Dive J2-495 begin
	5:40		19:40	Start EM122 water column data collection during dive
	15:28	3/29/2010	5:28	Stop EM122 water column data collection
	15:56		5:56	J2-495 end
	16:35		6:35	Begin EM122 data collection NW Rota to Guam
	17:56		7:56	XBT

Date (local)	Time (local)	GMT Date	GMT Time	Operations Log
3/30/2010	5:30		19:30	End EM122 survey NW Rota - Guam
	8:00		22:00	Arrive in Guam

3.0 Cruise Participants:

3.1 Scientists:

Scientist	Affiliation	Expertise
William Chadwick (Chief Scientist)	Oregon State University	Geology
Robert Embley	NOAA	Geology
Nick Deardorff	University of Oregon	Geology
Susan Merle	Oregon State University	Data management
Andra Bobbitt	Oregon State University	Data management
Dave Butterfield	University of Washington	Vent fluid chemistry
Kevin Roe	University of Washington	Vent fluid chemistry
My Christensen	University of Washington	Vent fluid chemistry
Leigh Evans	Oregon State University	Gas geochemistry
Eric Olson	University of Washington	Gas geochemistry
Julie Smith	Marine Biological Lab	Microbiology
Sharon Walker	NOAA	Plume mapping
Joe Resing	University of Washington	Plume mapping
Nathan Buck	University of Washington	Plume mapping
Verena Tunnicliffe	University of Victoria	Macrobiology
John Sherrin	University of Victoria	Macrobiology



Figure 3.1-1

front row (l-r): Dave Butterfield, Leigh Evans, Joe Resign, Verena Tunnicliffe, Bill Chadwick, Andra Bobbitt

middle: Julie Smith, My Christensen

back: Kevin Roe, Eric Olson, Bob Embley, Nathan Buck, Nick Deardorff, John Sherrin, Sharon Walker, Susan Merle

3.2 JASON Team:

JASON Team	Position
Matt Heintz	Jason Expedition Leader
Will Sellers	Jason Chief Pilot
Ben Tradd	Jason Pilot
Akel Sterling	Jason Navigator
Casey Agee	Jason Engineer/Navigator
Dara Scott	Jason Navigator
Jim Varnum	Jason Pilot
Scott Hansen	Jason Pilot/Engineer
Bob Hess	Jason Navigator
James Pelowski	Jason Data Manager

3.3 R/V Kilo Moana Crew:

R/V Kilo Moana	Position
Brian Wehmeyer	Captain
Dick Wisner	Chief Mate
Christian Berg Hansen	Second Mate
Jim Scancella	Third Mate
Roger Rios	AB
Thomas Perry	AB
Shane Elliott	AB
Frank Zellin	AB
Dave Spurgin	AB
Craig Harvey	AB
Joe Heise	Chief Engineer
David Roddy	First Assistant Engineer
Ted Kane	Second Assistant Engineer
Travis Souza	Third Assistant Engineer
Rob McDonough	QMED
Deren Atienza	QMED
Juan Diago	QMED
Shawn Lindenmuth	Chief Steward
Tony Ise	Cook
Karsten Murray	Steward Assistant
Dan Fitzgerald	Marine Technician
Vic Polidoro	Marine Technician

4.0 Discipline Summaries

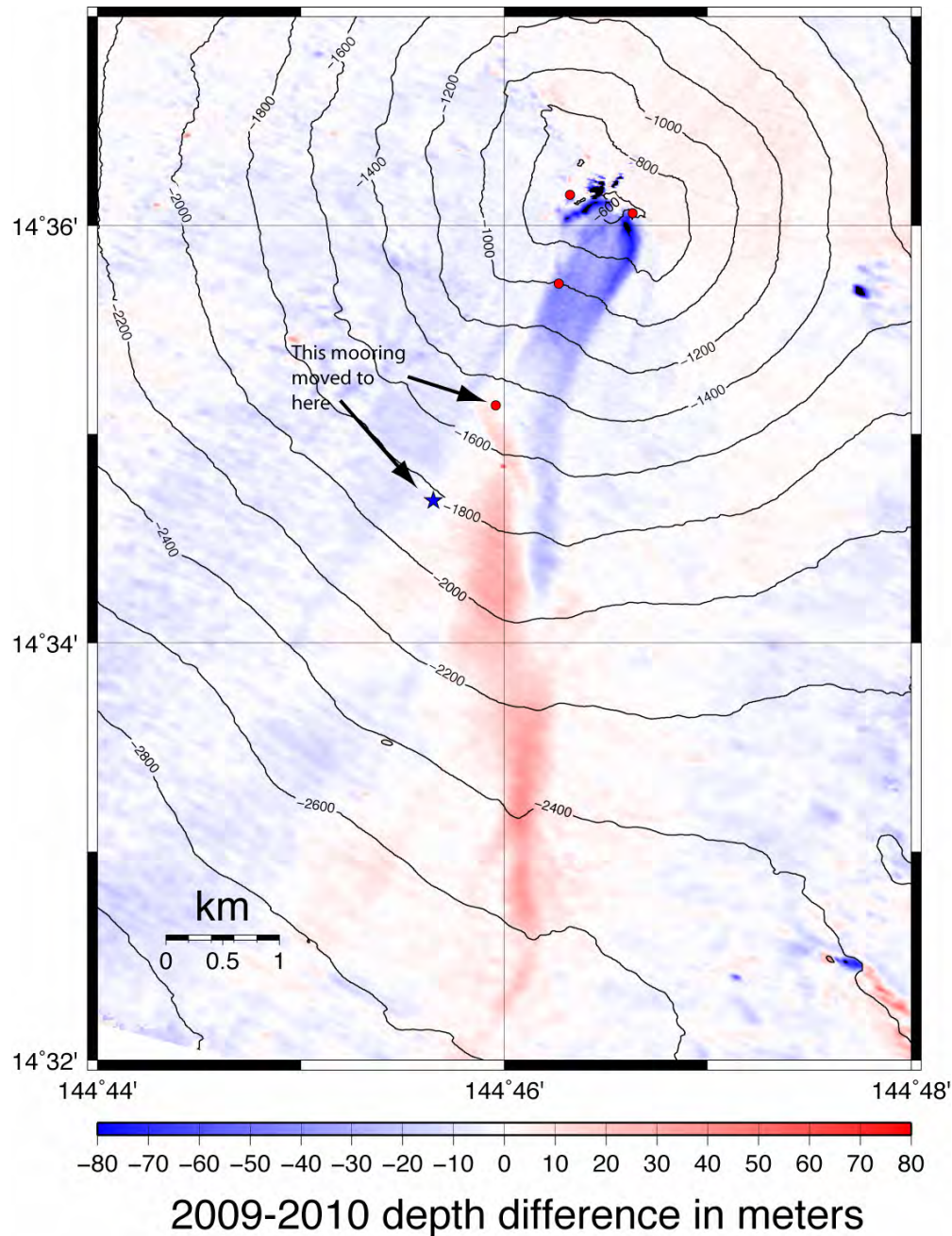
4.1 Geology

4.1.1 Volcanology, Mapping, Acoustics

Bill Chadwick

We remapped NW Rota-1 with the R/V Kilo Moana's EM122 multibeam sonar system and found that the volcano had experienced a major landslide since our expedition last year. Depth changes near the summit are about 90 m vertically (deeper) and the summit ridge has moved northward about 100 m (horizontally) as part of the headwall scarp of the slide. The upper south slope of the volcano was scoured downslope for about 3 km, and beyond that slide material was deposited to a distance of for at least another 3 km downslope. The positive depth changes from the slide deposits are up to 42 m thick. We also mapped the summit of the volcano with the SM2000 multibeam sonar on Jason and the comparison to last year's survey shows the dramatic topographic changes from last year.

Figure 4.1.1-1 Map showing differences between bathymetry mapped between 2009 and 2010.



Other mapping included using the Kilo Moana's EM1002 multibeam sonar, which appeared to be quite noisy. We also collected water column data with the EM122 system in order to map the plumes of bubbles rising from the eruptive vents on the volcano. We did this in two modes, either driving slowly over the summit along a straight line in various directions, or by simply collecting water column data during Jason dives while the ship was stationary or nearly so. The former method allowed us to map the 3-D shape of the bubble plumes by collecting multiple 2-D slides through them. The latter method will show how the plume shape and intensity varied with time at one location (in one 2-D slice), which hopefully can be correlated with visual observations of the eruptive vents by Jason and with the ship's ADCP data.

During our Jason dives we found that the lava cone that had grown at Brimstone vent last year is now completely gone. Brimstone vent itself was about 25 m deeper than last year, but about in the same location. However, we found that at least 4 other (deeper) eruptive vents were active this year, located within about 50 m of Brimstone in an E-W line. In general, the eruptive activity was much more variable this year, with individual vents turning on and off from day to day and even hour to hour. Clearly, the near-surface magmatic plumbing system is still re-establishing itself after the landslide. In general, all the loose ash and sandy sediment that existed in 2009 was gone this year (swept away by the slide), and that only the solid core of the summit remained, consisting mainly of massive lavas (or perhaps an intrusive

stock) that now form nearly vertical cliffs. Most of the hydrothermal vent sites we visited last year have been wiped out, but a few survived, and new ones have replaced the old.

We collected acoustic data again this year with two BProbe portable hydrophones that we deployed three times at the volcano summit (Marker 163). We also deployed one BProbe on a line during a plankton haul, as an experiment, but that record seems to be dominated by winch and/or ship noise. The record from the moored hydrophone that we recovered and had been recording since February 2009, shows that the landslide probably occurred on August 14, 2009, apparently in the middle of an intense eruptive episode that lasted more than 3 full days. More detailed analysis of the hydrophone data will follow.

Table 4.1.1-1 BProbe deployments

Dive	Date	Time	Comments
			<i>BProbe deployment #1</i>
	17-Mar	19:00	BProbe #23 started recording
J2-487	17-Mar	20:04	BProbe #23 Deployed (note: too light on bottom and visibly moving in current which could produce sound. Subsequent deployments were weighted)
	21-Mar	16:19	BProbe #23 stopped recording (duration = 3 days, 20 hours, 15 minutes)
J2-490	23-Mar	2:24	BProbe #23 Recovered
			<i>BProbe deployment #2 (on Plankton Haul line)</i>
	21-Mar	19:00	BProbe #36 started recording (started recording on deck and was in and out of the water)
	22-Mar	5:10	BProbe in water on Plankton Haul PL-1
	22-Mar	6:30	BProbe out of water on Plankton Haul PL-1
	22-Mar	7:03	BProbe in water on Plankton Haul PL-2
	22-Mar	7:40	Prope left at 600-700 m depth for 15 minutes
	22-Mar	8:25	BProbe out of water on Plankton Haul PL-2
	22-Mar	8:41	BProbe #36 stopped recording
			<i>BProbe deployment #3</i>
	22-Mar	19:00	BProbe #36 started recording
J2-490	23-Mar	2:32	BProbe #36 Deployed
	26-Mar	15:42	BProbe #36 stopped recording (duration = 3 days, 20 hours, 42 minutes)
J2-494	26-Mar	18:46	BProbe #36 Recovered
			<i>BProbe deployment #4</i>
	26-Mar	19:00	BProbe #23 started recording
J2-494	26-Mar	19:02	BProbe #23 Deployed
J2-495	29-Mar	4:27	BProbe #23 Recovered
	29-Mar	7:01	BProbe #23 stopped recording (duration = 2 days, 12 hours, 1 minute)

The BProbes this year (and last year) recorded at 1024 Hz with a gain setting of +20 dB

Note: Last year (2009) two different BProbe hydrophones were used at NW Rota: Serial numbers 22 and 34. This year serial numbers 23 and 36 were used. However, there are differences in the depth rating and the sensitivities between these four BProbes (all borrowed from the NOAA Acoustics Program):

Serial #	Depth rating	Sensitivity (dB re 1 uPa/V)
22	2000 m	-190.8
23	500 m	-172.1
34	2000 m	-190.2
36	2000 m	-190.8

(so this one is almost 20 dB more sensitive)

4.1.2 Rock/Sediment Sampling

Nick Deardorff

Synopsis

34 rock, sediment and sulfur samples were collected from numerous localities at NW Rota-1, but most were collected at three of the four observed active vents (Brimstone, Phantom, Sulfur, and Charon). Samples were collected with ROV manipulators, scoop bags, and tephra sampling buckets. Most rock samples consist of freshly extruded lava or lava fragments with limited alteration, low vesicularities, and crystallinities of 5-15%. Phenocrysts are dominantly plagioclase 1-5mm in diameter, with lesser olivine and clinopyroxene. External surfaces of lava are rough, mildly frothy with stretched vesicles, while the interiors are massive, poorly vesiculated and more crystalline.

Samples from scoops and tephra samplers consist of coarse ash and lapilli that appear to be fragments of extruded lava; fragmentation possibly due to water-hot rock interaction. Individual clasts of all sizes are mostly equant and blocky with angular faces. Altered clasts are present in all samples from scoop and tephra samplers with morphologies similar to non-altered lava clasts but differing in color, ranging from dark grey to white.

Elemental sulfur was present at all vents and was particularly prevalent at the Sulfur Crust and Sulfur Vent sites, spatially only a few meters apart. At these locations, we observed a pre-existing sulfur flow (Sulfur Crust) 10s of centimeters thick and a thin sheet flow (Sulfur Vent) of sulfur <1-2cm thick, observed shortly after emplacement. Additionally, globules and stretched, fluidal sulfur clasts represent a significant portion of the surrounding sediment. The prevalence of molten sulfur within this area suggests a shallow repository of elemental sulfur beneath the seafloor, through which degassed volatiles from the volcano are traveling.

Dive J2-487

Tephra-1

Scoop from Phantom Vent. Sample is poorly sorted and very coarsely grained with clasts ranging mostly from ~5mm to several cm in diameter. Clasts are massive and angular with a large range in crystallinity (5-20%) and a large range in alteration; from fresh black to white heavily altered pieces. What little sulfur is present has a dirty, grayish look and are globules or spheres.

Sulfur-9

Multiple pieces collected from remnant sulfur extrusion (Sulfur Crust). The sulfur flow was ~1-2m wide and a few meters long, but looks to be the last in place section of a larger extrusion of unknown dimensions. The two largest pieces collected are described here.

1st piece- This clast is composed of sulfur with many entrained basaltic clasts. Grain sizes of vary from each side of the clast, with one side ranging 3-5mm and another side from 1-2mm. If one holds the sample at an angle the clasts appear to grade from coarser bottom clasts to finer at the top, although the correct orientation is unknown. Sulfur spherules are also present, annealed to the sample.

2nd piece- The top of the clast has ropy flow textures that look squeezed together with a glossy sheen. The interior is heavily vesiculated with coalesced bubble chambers mm to several cm in diameter. The vesiculated chambers are surrounded by crystalline sulfur with dendritic crystals <7mm long. Separating the interior and exterior of this clast is a grayish-yellow sulfur layer ~0.5-1cm thick. The bottom of the clast consists of yellow sulfur with numerous entrained basaltic clasts. Most clasts are a few mm in diameter with the exception of one large (7cm) entrained clast.

Tephra-10

From tephra sampler, collected ~5m NW of Brimstone. Very little material collected. Clasts are mostly 1-2mm diameter with a large range in alteration. Clasts are mostly equant and blocky.

Tephra-11

Scoop from ~5m NW of Brimstone (near marker 161). Clasts have a large range in alteration, from dark gray to white, with some fresh black clasts present. Larger clasts are mostly equant and blocky, massive with 5-15% crystallinities. Some clasts appear mildly frothy with fluidal textures and are quite glassy. Sulfur globules are present, many with fluidal, amoeboid-like morphologies and often have entrained basaltic clasts. Sulfur color ranges from yellow to dark gray with many clasts displaying a mixture of yellow and gray.

Dive J2-488

Rock-1

Collected at Brimstone. Dark unaltered basaltic andesite with folded cowpie-like structure. Exterior is rough, semi-frothy and mildly vesicular. Interior is massive, 10-15% crystalline and very low vesicularity. Plagioclase phenocrysts are ~1-2mm diameter.

Rock-2

Collected at Brimstone. Two pieces. Top piece is composed of semi-frothy, mildly vesiculated lava with a concave bottom and sulfur encrusted on the top. The bottom looks to have spalled off the lava interior. The sulfur consists of globules/spheres that have annealed to the rock and partially melted together. The bottom piece is convex massive and poorly vesiculated lava. Crystallinity is ~10% with plagioclase phenocrysts <3mm. These pieces were initially a single entity.

Rock-3

Collected at Brimstone. Two pieces of semi-frothy, black, glassy basalt. Surface is rough with stretched vesicles. No massive interior is visible in either piece. Plagioclase is the dominant mineral with crystallinity at ~5-10%, with lesser olivine also present.

Tephra-15

Scoop from new summit. Well sorted, finely grained (mostly <1mm) tephra with only a few larger clasts present. Sample consists of glassy brown clasts, small (~1mm) sulfur balls and individual crystals (mostly plagioclase).

Rock-26

Lava from Phantom Vent. Originally one large sample that broke into many during collection. The rocks are quite friable and easy to break with little pressure. Remaining pieces have a range in color, from medium gray to black. The (presumably) exterior surfaces have a rough 'cauliflower' texture. Massive areas are poorly vesiculated and have plagioclase crystallinities of 10-15%. Some sulfur globs present in crevices and annealed to surface.

Dive J2-489***Rock-4***

Collected from sulfur coated headwall(?) east of Brimstone. Sulfur lightly coats nearly the entire sample. The sulfur has a powdery look and is easily scraped off. The basalt interior is dark gray to black with ~5% plagioclase crystallinity.

Rock-6

Collected near the base of scarp headwall east of Brimstone. The entire unit looked mostly massive, well jointed and extensively fractured. There was evidence of pillow basalts nearby. Sample is grey basalt with some encrusted sulfur, massive, very poorly vesiculated and crystallinity of 10-15%.

Dive J2-490***Tephra-18***

Scoop from Brimstone. Sample is coarse and poorly sorted with many clasts <1cm in diameter. Largest clast is 9cm diameter. Clasts are mostly blocky is a small percentage of clasts with frothy or cauliflower textures. Very few sulfur globules are present. Clasts are mostly dark gray to black in color with a small component of altered clasts. Nearly entire sample is massive with very low vesicularities. Plagioclase crystallinities range ~10-20%.

Tephra-19

Tephra sampler from ~5m NW of Brimstone at marker 161. Very little material collected. Sample is composed of black coarse ash with very little sulfur or altered material.

Rock-26

Collected from Phantom Vent. Dimensions are ~5 x 14 x 15cm. Exterior surfaces are rough with the top displaying breadcrust-like cracking and cauliflower roughness while the bottom is extremely frothy and jagged with stretched vesicles and fluidal textures. The jagged bottom textures are gray-blue in color while the top is mostly dark gray to black. The interior is massive and slightly vesicular with crystallinity ~5-10%. Plagioclase phenocrysts are 1-5mm in diameter.

Tephra-27

Scoop at Phantom Vent, next to marker. Clasts are mostly dark gray-black with minority components of altered clasts and sulfur. Clasts are mostly angular and equant with a few clasts flat and tabular. There are also some clasts with rough, but fluidal textures. Crystallinities are ~10-15%.

Dive J2-491***Rock-1***

Rock collected during mooring search from what may have been an in place outcrop. Rock is potentially from early in the volcano's history. The sample is subrounded, dark grey, massive, with high crystallinity (15-20%). Phenocrysts consist of both plagioclase and olivine ~1-3mm in diameter.

Dive J2-492***Tephra-7***

Tephra sampler from Sulfur Crust. Small sample of medium to coarse ash. Clasts are angular and blocky and range in color from black to medium gray. A small component of sulfur is also present.

Sulfur-10

Scoop from Sulfur Vent. Main piece of sulfur is ~32cm long, 12-15cm wide and 1-3cm thick. The thin flow is composed of numerous worm-like structures, each 1-5cm long, that appear to be individual short sulfur flows. The bottom of the flow has numerous pieces of tephra entrained while the flow was still molten and moving. Additional pieces of sulfur collected within the scoop also show fluidal textures and range in color from bright yellow to gray. One massive piece has two surfaces that have gray coatings. The faces that are gray look like fracture faces but the gray is just a thin veneer and is easily scraped away.

Rock-14

Collected at Styx Vent. Dimensions: 12 x 12 x 6cm. Sample is black and glassy with semi-frothy exterior, on all sides, and massive interior with a crystallinity of ~15%. Phenocrysts are mostly plagioclase 1-3mm in diameter, but with a small component of a green mineral (olivine or clinopyroxene?). Vesicularity is low in the interior and moderate on the exterior surfaces. One side has aligned vesicle stretching.

Tephra-15

Tephra sampler collected from ~5m NW of Brimstone. Very little material collected. Sample is mostly composed of fine and medium grained ash black to medium gray in color.

Dive J2-494

Rock-8

Collected from sulfur encrusted wall, east of old marker 105. Sulfur encrusted basalt with massive gray interior. Originally collected for biologists. Shrimp feeding on rocks so may have microbial mat.

Tephra-17

Tephra sampler collected from N of Phantom Vent. Very little material collected. Sample is mostly composed of fine and medium grained ash black to medium gray in color.

Tephra-20

Tephra sampler collected from Sulfur Crust. Sample is composed mostly of sulfur globules (>60%) and stretched sulfur strands. Heavily altered ash and lapilli are also present with a minority component of black ash.

Tephra-21

Scoop from Styx Vent. Sample is very poorly sorted, coarsely grained with angular, blocky clasts and many large clasts (3-9cm) present. Most clasts are dark gray-black but there is a minority component of heavily altered clasts (light gray and white). Clasts are massive with a range in crystallinity, ~5-20%.

Rock-22

Bomb collected after voluntarily deposited on front of vehicle. Dimensions: 22 x 10-15 x 12cm. Rock is dense and mostly massive. The exterior has a rough, but not frothy texture. One side shows breadcrust-like cracking and the other side looks like it could have coated the rest of the rock, with an overlapping, overhanging mushroom top.

Volunteers-23 (should or could include rock-22)

Rocks collected from front of vehicle after voluntarily depositing in basket. The rocks collected are mostly massive and blocky with only a few frothy pieces. Several of the clasts are heavily altered gray.

Dive J2-495

Rock-1

Collected from older lava flow downslope, southeast of Brimstone. Sample is dark, very glassy basalt, slightly vesicular with some stretched vesicles in the interior. Crystallinity is ~5-10%. The outermost surface is slightly altered with brownish color.

Tephra-2

Scoop from Styx vent. Sample is very poorly sorted with a large range in alteration and clast size. Ash material is dark

gray to black while the larger clasts show the full range of alteration, black to light grey. The larger clast sizes have a larger component of altered material. Clasts, particularly lapilli, are blocky and angular with crystallinities ~5-15%.

Tephra-7

Tephra sampler collected at Sulfur Crust. Bucket was on its side downslope of deployed position. Sample discarded.

Sulfur-8

Collected at Sulfur Crust. Pieces of sulfur broken off top of sulfur flow. Sample has fluidal top with worm-like textures observed on other sulfur flow samples and small pieces of tephra (<5mm) embedded in between. The interior is partially vesiculated with cavities that have formed tubes 0.5-1cm in diameter.

Tephra-18

Tephra sampler collected from summit. Sample is composed of well sorted medium grained ash, more finely grained than any other sample collected. Ash is almost entirely black-brown glassy clasts with very little sulfur present.

Tephra-19

Scoop from 20m east of summit along smooth ridge beyond area affected by landslide. Sample is composed of well sorted black, medium grained ash (mostly ~1mm) with sulfur ball of similar diameter.

Tephra-20

Tephra sampler attached to Jason basket for entire dive. Closed at the end of dive but most of the sample should be from Styx vent at very beginning of dive. Sample composed of fine-medium grained black and gray ash with some sulfur balls.

Figure 4.1.2-1 2010 geologic samples. Inset at upper right shows the samples taken from the main venting area. Lower left shows all the samples to include the two rocks taken downslope south from the summit region.

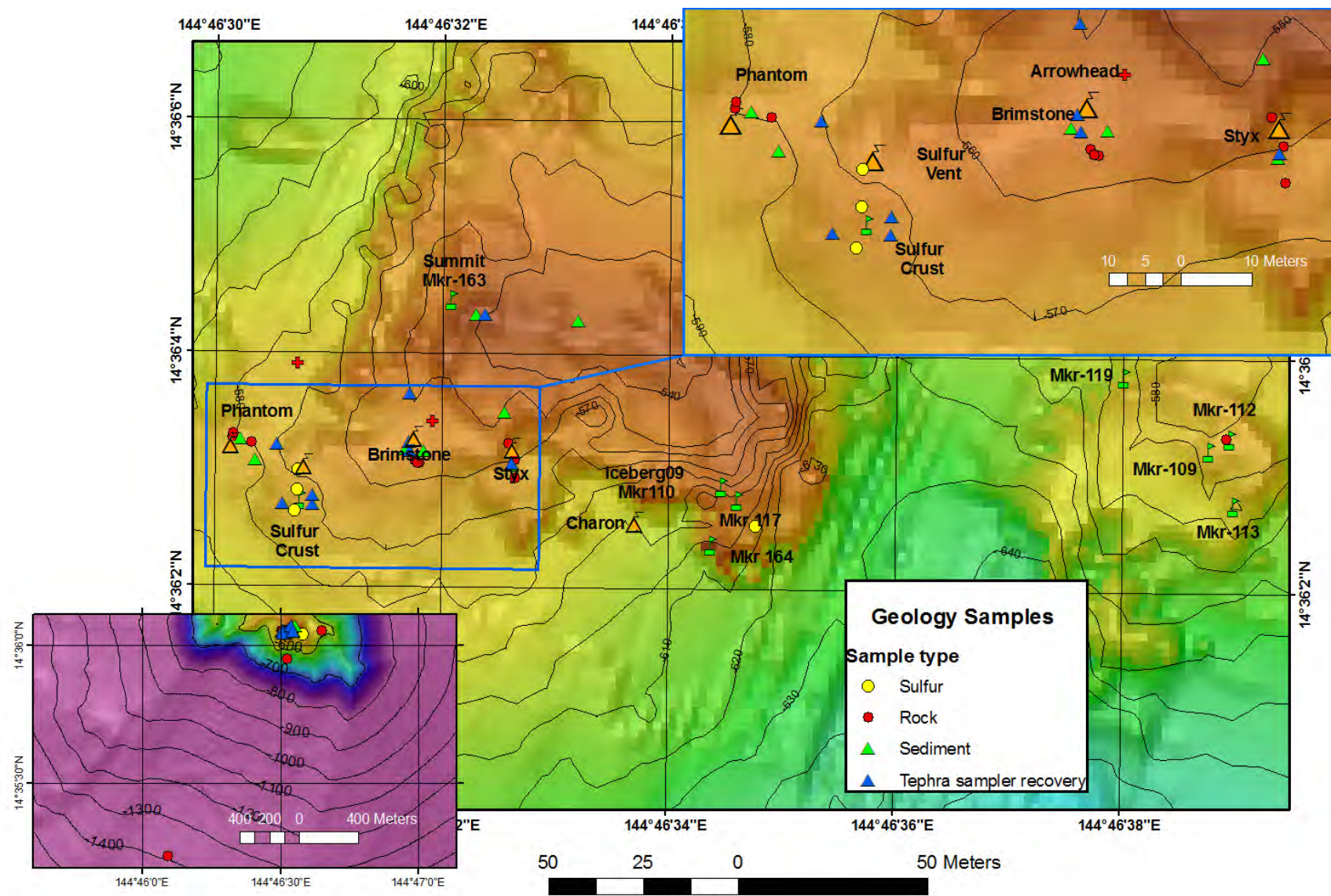


Table 4.1.2-1 Geology samples by location.

Sample ID	Location	Date Time	Latitude	Longitude	Jason Depth	Heading	comment	Virtual Van Record
J489-Rock-04	Mkr-109 N	3/20/2010 22:56	14.60092	144.77752	564.0	301.2	Grabbed a rock (more like a block of sulfur) from the slide chute western wall (Jason facing west on the wall). Wall appears freshly exposed (no alteration) and has shrimp on it. Medea in a tight spot (hole).	2533
J487-Sulfur-09	Mkr-120 Sulfur Crust	3/21/2006 19:21	14.60073	144.77525	556.8	356.4	Sample of sulfur crust for Cornel/Nick & Verena/John from Mkr-120 at Sulfur Crust site. (Some pieces will be used as substrate for biology). 4 pieces all together.	938
J495-Rock-08	Mkr-120 Sulfur Crust	3/29/2010 0:43	14.60078	144.77525	556.4	99.6	Piece of remaining, broken crust of sulfur flow at Sulfur Crust.	8312
J492-Tephra-07	Mkr-120 Sulfur Crust	3/24/2010 21:33	14.60075	144.77529	557.0	359.3	Recovered Tephra Sampler D at Mkr-120 (Sulfur vent area). Deployed J-488. Exchanged for Tephra Sampler H. Lots of Tephra filling the bucket as we watch.	5227
J494-Tephra-20	Mkr-120 Sulfur Crust	3/27/2010 4:06	14.60077	144.77529	328.8	328.8	Recovered Tephra-H sampler at Mkr-120. Deployed on J-492.	7377
J495-Tephra-07	Mkr-120 Sulfur Crust	3/29/2010 0:37	14.60075	144.77522	557.9	95.8	Tephra-D recovered at different location than deployed. Sampler had fallen downhill and off of the crust it had been on had broken. Sampler bucket not upright, on its side.	8301
J488-Rock-01	Mkr-161 Brimstone	3/19/2010 19:06	14.60086	144.77554	549.8	354.5	Rock from in the vent. Brimstone basically inactive. Little black rock.	1044
J488-Rock-02	Mkr-161 Brimstone	3/19/2010 19:08	14.60085	144.77555	549.8	354.6	Shiny black rock from inactive Brimstone. The rock is about 5 or 6 inches.	1046
J488-Rock-03	Mkr-161 Brimstone	3/19/2010 19:09	14.60085	144.77555	549.8	354.5	Smaller black shiny rock from the same site. Inside the inactive vent.	1047
J487-Tephra-11	Mkr-161 Brimstone	3/22/2006 1:27	14.60088	144.77552	548.6	40.2	Scoop sample of tephra at Mkr-161 Brimstone. Site of tephra sampler exchange.	972
J490-Tephra-18	Mkr-161 Brimstone	3/22/2006 4:12	14.60088	144.77556	547.7	45.0	Scoop sample of tephra.	3805
J487-Tephra-10	Mkr-161 Brimstone	3/21/2006 22:15	14.60088	144.77553	548.4	39.7	TEPHRA SAMPLER D recovered at Mkr-161 Brimstone. Deployed at 22:09 on this dive, J-487.	965

Sample ID	Location	Date Time	Latitude	Longitude	Jason Depth	Heading	comment	Virtual Van Record
J490-Tephra-19	Mkr-161 Brimstone	3/22/2006 4:26	14.60090	144.77552	547.7	37.0	Recovered Tephra bucket-H. Temp probe measured 62.5 deg C, 45 deg C and 26.0 deg C at spots within reach around tephra bucket and marker. Deployed J-487.	3830
J492-Tephra-15	Mkr-161 Brimstone	3/25/2010 0:40	14.60101	144.77553	543.6	11.7	Recovered Tephra sampler B from the base of Mkr-161 north of Brimstone. The bucket was deployed on dive J490.	5442
J495-Tephra-19	Mkr-163 20m E Summit	3/29/2010 4:41	14.60119	144.77594	525.7	179.8	Scoop of sediment from approximately 20m east and a meter south of Mkr-163. Facing south on a sandy ridge on ridge top.	8704
J488-Sediment-15	Mkr-163 Summit	3/19/2010 23:13	14.60120	144.77569	520.2	6.2	Scoop of volcanoclastic sediment very close to where the shrimp trap was sitting. Bag is not full. Exact same location as previous sample.	1399
J495-Tephra-18	Mkr-163 Summit	3/29/2010 4:32	14.60120	144.77571	519.2	10.2	Recovered Tephra-C sampler at Summit Mkr-163 with a few shrimp inside. Deployed on J-487.	8688
J495-Rock-01	South flank of summit cone	3/28/2010 19:04	14.59919	144.77542	670.8	16.9	Sample collected as moving upslope to summit on the south side of the cone. Small rock, probably not in place and looks slightly altered. Older lava flow.	7715
J488-Rock-25	Phantom Vent	3/20/2010 1:41	14.60091	144.77509	565.3	70.5	Large rock from the edge of the pit. ~15 cm wide. (Due to ballast issues, rock removed from basket 02:36).	1668
J488-Rock-26	Phantom Vent	3/20/2010 1:51	14.60092	144.77509	565.4	51.2	Rock near Phantom vent with sulfur. Rock placed in outboard crate (crumbled a bit upon entry) with the gastights.	1687
J490-Rock-26	Phantom Vent	3/22/2006 6:00	14.60090	144.77514	563.2	80.0	Rock next to active flow at Phantom vent. 20cm rock. Thought there were bubbles that came out from under the rock (could have been trapped).	3950
J487-Tephra-01	Phantom Vent	3/18/2010 4:40	14.60090	144.77511	566.5	92.5	Scoop sample in area with lots of tephra deposits; a relatively sandy area.	457
J490-Tephra-27	Phantom Vent	3/22/2006 6:10	14.60085	144.77515	564.4	87.7	Scoop sample of sediment below marker anchor Mkr-118.	3964
J494-Tephra-17	Phantom Vent	3/27/2010 3:32	14.60089	144.77520	108.5	108.5	Recovered Tephra Sampler-A at Phantom. Deployed on J-490 and repositioned on J-492.	7319

Sample ID	Location	Date Time	Latitude	Longitude	Jason Depth	Heading	comment	Virtual Van Record
J491-Rock-01	south slope NW Rota	3/24/2010 3:46	14.58727	144.76818	1388.6	46.3	Rock taken enroute up the slope headed to the center of the scour zone from below an outcrop. This outcrop had white and yellow staining on it as did the surrounding area rocks.	4829
J489-Rock-06	Styx (near) on wall	3/21/2010 3:50	14.60086	144.77578	559.8	44.3	Rock (very breakable) from wall near Styx at 560m with 2m depth below (near base of wall). Knocked some sediments and pieces of rock from wall. Picking up more of the pieces from the wall-same sample. SW portion of the headwall site (E of Brimstone). Sample is in 2 pieces.	2792
J492-Rock-14	Styx Vent	3/25/2010 0:26	14.60090	144.77577	555.6	337.1	Rock from the base of Styx in the black unaltered sediments. Very fresh. Rounded on bottom flatter on top - about 6 inches long. Same location as samples 11-13.	5429
J494-Rock-22	Styx Vent	3/27/2010 5:10	14.60081	144.77579	16.7	16.7	Rock found on top of wand after large explosion at vent. White-out conditions with raining tephra.	7533
J494-Tephra-21	Styx Vent	3/27/2010 4:49	14.60085	144.77578	327.9	327.9	Scoop of tephra from the base of Styx Vent. South about 10m from the Styx position.	7472
J495-Tephra-02	Styx Vent	3/28/2010 20:15	14.60097	144.77576	559.2	353.1	Scoop of tephra at the base of Styx vent (just to the W of the vent).	7874
J495-Tephra-20	Styx Vent	3/29/2010 5:23	14.60085	144.77578	542.8	308.2	Tephra Sampler closed at end of dive. Sampler mounted in front portion of basket and had been collecting tephra all dive (most of sample probably from first visit at Styx Vent).	8791
J492-Sulfur-10	Sulfur Vent	3/24/2010 22:42	14.60083	144.77525	557.3	35.9	Scoop of pancake-thin sulfur flow. Sulfur-spaghetti on the sulfur plates surrounding Sulfur Vent.	5314
J494-Rock-8	Sulfur Wall	3/26/2010 23:21	14.60071	144.77637	8.1	8.1	Small piece of sulfur plate from the sulfur wall to determine what the shrimp are grazing upon. East of old Mkr-105 location.	6810

4.1.3 Ship Seafloor Mapping

EM122 multibeam system

The new EM122 multibeam system on the R/V *Kilo Moana* has the capability of mapping the water column as well as the seafloor. Kongsberg, the company who manufactures the system, state in their maintenance manual that compared with the EM120 the EM122 has up to 4 times the resolution in terms of sounding density. The EM122 has a possible 432 beams per ping. (The EM300 30 kHz system on the *Thompson* has 135 beams per ping.) The EM122 system on the *Kilo Moana* has 1x2 degree transducers, the same transducers as the EM120 but with new electronics and software.

Seafloor Data

As stated in the cruise blog (Section 4.), the highlight of the bathymetric mapping on this cruise was our ability to map the volcano when we arrived this year and compare it to the data we collected here last year. We could tell from differencing those datasets that there had been a major landslide event on the seafloor, even before we reached the bottom on our first Jason dive.

Surveys over NW Rota were repeated this year for surface differencing. Esmeralda bank was also surveyed with the EM122 and EM1002 systems. See the figure 4.1.3-4 below for comparison. The EM122 system collected better data, even in depths optimal for the shallower-water EM1002 system. Other areas within a reasonable distance of NW Rota were surveyed with the EM122, as time allowed. Bathymetry and amplitude data were also collected on the transits to and from Guam (Figure 4.1.2.1-2). Over 10,000 square kilometers were mapped.

There appears to be something wrong with the ship's EM1002 system related to how the ship's attitude data (heading, pitch, roll, heave) is combined with the sonar data (perhaps a timing issue or a software issue?). The current output from the EM1002 is very noisy with clear depth mismatches between adjacent pings within a swath related to ship's attitude. The EM1002 is not even worth using in its current state because the EM122 give better output, even in shallow water.

Table 4.1.3-1 Summary of EM122 and EM1002 Multibeam surveys.

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
								Do not use EM122 lines 1 - 5 (junk)
			6 - 13	3/16/10 8:34		144.61389	13.45527	Guam Harbor to Seamount X (lines 6 - 13)
					3/16/10 11:37	144.01876	13.25039	Seamount X
			14	3/17/10 1:47		143.98862	13.40454	SmntX to NWRota (lines 14 - 34)
						144.06581	13.51141	SmntX to NWRota
			21	3/17/10 5:03		144.26926	13.73363	SmntX to NWRota
				3/17/10 7:01		144.41344	14.02673	SmntX to NWRota
				3/17/10 8:47		144.46775	14.31185	SmntX to NWRota
				3/17/10 9:53		144.52278	14.53346	SmntX to NWRota

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
4kts		34	34	3/17/10 11:18		144.67081	14.79858	At NWRota summit. Start logging wcd. (line 34)
		34	34		3/17/10 11:39			End of survey. Stop logging wcd and bathy.
moving too fast (10kts?)	1	35	35	3/18/10 9:05				Mooring search (EM122 bathy and wcd) and summit map (EM1002). This line we were going too fast and didn't see much in the wcd.
moving @4kts	1	36	36	3/18/10 9:24				Resurvey summit from E to W at 4kts this time. (line 36)
	1				3/18/10 9:34			Stop logging EM1002.
?kts		37	37	3/18/10 9:46		144.80463	14.66393	N to S line to look for water column moorings. (line 37)
				3/18/2010 9:49:55				See the summit plume.
		37	37		3/18/10 10:06	144.74723	14.53937	End survey N to S line to look for water column moorings.
8+ kts	2, 3, 4	no wcd	38	3/18/10 20:50				At south end of NW Rota resurvey of EM300-2009 west line
8+ kts	2, 3, 4	no wcd	40		3/18/10 21:54			At north end of NW Rota resurvey of EM09 west line (EM122 lines 38 - 40)
8+ kts	5,	no wcd	41	3/18/10 22:21				At north end of NW Rota resurvey of EM09 middle line
8+ kts	6	no wcd		3/18/10 22:51				SOL 6 EM1002. Approaching summit.
8+ kts		no wcd	42	3/18/10 22:52				SOL 42 EM122. Watching bubbles from 225240 - 225425.
8+ kts	7	no wcd						SOL 7 EM1002. No good data now. Too deep for system.
8+ kts	8	no wcd			3/18/10 23:17			EOL 8 EM1002. At south end of NW Rota resurvey of EM09 middle line
8+ kts		no wcd	43		3/18/10 23:17			EOL 43 EM122. At south end of NW Rota resurvey of EM09 middle line (EM122 lines 41 - 43)
8+ kts	9	no wcd	44	3/18/10 23:44				SOL 44 EM122. SOL 9 EM1002. At south end of NW Rota resurvey of EM09 east line. EM1002 lines 9, 10, 11 no good. Too deep for that system.
8+ kts	11	no wcd	46		3/19/10 0:50			At north end of NW Rota resurvey of EM09 east line. End of survey. EM122 lines (EM122 lines 44-46)
								Total re-survey of NWRota: EM122 lines 38-46
13 kts		no wcd	47	3/19/10 5:07		144.68614	14.60133	logged from NW Rota to Westline survey start(EM122 lines 47, 48)
10 kts		no wcd	49	3/19/10 5:46				Turning onto actual survey line. Don't use line 49 (garbage).
10 kts		no wcd	50	3/19/10 5:54		144.54626	14.597461	west of EM300 edge-north of Rota. start westline survey 3 here
10 kts		no wcd	53		3/19/10 7:26	144.68614	14.60133	end survey (EM122 lines 50 - 53 - also use 47, 48 for transit to survey site)

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
	12-18 no good?	no wcd	54-60 no good?					Note: EM122 lines 47 - 60, and EM1002 lines 12 - 18 were logged during the night. Won't want to use them all. Sort out at home.
			61	3/20/10 6:43		144.797	14.616	logged from NW Rota to Esmeralda (EM122 lines 61 - 66 transit)
	25		67	3/20/10 9:40		145.238623	14.939469	Esmeralda-start-S
					3/20/10 9:54	145.238698	14.978315	n-Esmeralda
	27			3/20/10 10:00		145.243947	14.978165	n-Esmeralda
					3/20/10 10:16	145.244097	14.939319	s-Esmeralda
	28		68	3/20/10 10:22		145.249272	14.939394	s-Esmeralda
					3/20/10 10:38	145.249496	14.978090	n-Esmeralda
	29			3/20/10 10:42		145.253321	14.978240	n-Esmeralda
					3/20/10 10:57	145.253396	14.939469	s-Esmeralda
	30			3/20/10 11:04		145.257971	14.939469	s-Esmeralda
			70		3/20/10 11:17	145.257896	14.978165	n-Esmeralda
	31			3/20/10 11:23		145.260370	14.978165	n-Esmeralda
					3/20/10 11:39	145.260295	14.939469	s-Esmeralda
	32		71	3/20/10 11:45		145.256021	14.939394	s-Esmeralda
					3/20/10 12:00	145.256096	14.978240	n-Esmeralda
	33			3/20/10 12:06		145.251296	14.978090	n-Esmeralda
					3/20/10 12:21	145.251146	14.939394	s-Esmeralda
	x			x		145.246572	14.939469	skipped
					x	145.246721	14.978082	skipped
9 kts ?	34	72	72	3/20/10 12:28		145.241772	14.939469	Went from 16 to 20 to 19. Logging wcd during this line. (from 12:30 to 12:44
			73		3/20/10 12:43	145.241697	14.978165	WCD off. Ended survey with 19 (Esmeralda Bank survey EM122 lines 67 - 73)
			73	3/20/10 12:45		145.235	14.98	From Esmeralda Bank back to NW Rota (EM122 lines 73-79)
			79		3/20/10 15:46	144.8	14.624	Back at NW Rota. Logging off. End of survey
			80	3/21/10 6:31		144.75	14.64	Logging from NW Rota to Westline Survey #3 (EM122 lines 80-83)
			84	3/21/10 7:35		144.67081	14.79858	Start Westline3 survey (W and N of NW Rota)
				3/21/10 8:12				Red border flashing "position input missing" error.
			88	3/21/10 9:13		144.85113	15.0225	westline3 survey cont
			90	3/21/10 10:41		145.118813	15.037008	westline3 survey cont
			91	3/21/10 11:04		145.116586	15.100464	westline3 survey cont
			96	3/21/10 13:07		144.754772	15.093785	westline3 survey cont

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
			101		3/21/10 15:30	144.488699	14.721951	End Westline3 survey - W and N of NW Rota. (EM122 lines 84 - 101)
								KM1005-Mar22-Bubbles.txt Mar22 local Mar21 GMT. Water column data; EM122 (and ADCP all the time). Perpendicular lines over summit at 4 kts.
						144.77869	14.598484	point 1 (SE)
						144.771896	14.603617	point 2 (NW)
						144.778591	14.603612	point 3 (NE)
						144.772812	14.598633	point 4 (SW)
4 kts		102	102	3/21/10 1918				SOL start logging - point 1 to point 2 (SE to NW)
					3/21/10 1924			EOL stop logging
4 kts		103	103	3/21/10 1937				SOL start logging - point 3 to point 4 (NE to SW)
					3/21/10 1944			EOL stop logging
4 kts		104	104	3/21/10 2003				SOL start logging - point 1 to point 2 (SE to NW). bottom scattering layer
					3/21/10 2010			EOL stop logging
4 kts		105	105	3/21/10 2027				SOL start logging - point 3 to point 4 (NE to SW). seeing plume on the N side of summit
					3/21/10 2034			EOL stop logging wcd (~4 passes/hr @4 kts)
					3/21/10 2043			EOL stop logging bathy. Forgot to turn off bathy logging until 2043
								Bubble Plume Survey 2. Changed points so that the ship can drive 70° heading for one of the two lines.
						144.7765	14.5975	point 1 (SE)
						144.7741	14.6039	point 2 (NW)
						144.7788	14.6022	point 3 (NE)
						144.772	14.5997	point 4 (SW)
								Where is line 106??
5 kts		107	107	3/21/10 2108				SOL start logging - point 4 to point 3 (SW to NE). Increased speed to 5 knots due to seas.
					3/21/10 2112			EOL stop logging
5 kts		108	108	3/21/10 2115				SOL start logging - point 2 to point 1 (NW to SE)
					3/21/10 2132			EOL stop logging
5 kts		109	109	3/21/10 21:50				SOL start logging - point 4 to point 3 (SW to NE)
					3/21/10 21:55			EOL stop logging
5 kts		110	110	3/21/10 22:10				SOL start logging - point 2 to point 1 (NW to SE)
					3/21/10 22:15			EOL stop logging

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
5 kts		111	111	3/21/10 22:30				SOL start logging - point 4 to point 3 (SW to NE). Hardly any plume.
					3/21/10 22:35			EOL stop logging
5 kts		112	112	3/21/10 22:48				SOL start logging - point 2 to point 1 (NW to SE)
					3/21/10 22:53			EOL stop logging
5 kts		113	113	3/21/10 23:09				SOL start logging - point 4 to point 3 (SW to NE). Don't use line 113. Forgot to turn wcd off at turn - and only a small blip that's all.
					3/21/10 23:14			EOL stop logging
5 kts		114	114	3/21/10 23:24				SOL start logging - point 2 to point 1 (NW to SE)
					3/21/10 23:29			EOL stop logging
5 kts		115	115	3/21/10 23:43				SOL start logging - point 4 to point 3 (SW to NE).
					3/21/10 23:58			EOL stop logging
5 kts		116	116	3/21/10 23:58				SOL start logging - point 2 to point 1 (NW to SE)
					3/22/10 0:03			EOL stop logging
5 kts		117	117	3/22/10 0:18				SOL start logging - point 4 to point 3 (SW to NE).
					3/22/10 0:22			EOL stop logging
5 kts		118	118	3/22/10 0:33				SOL start logging - point 2 to point 1 (NW to SE)
					3/22/10 0:37			EOL stop logging
5 kts		119	119	3/22/10 0:53				SOL start logging - point 4 to point 3 (SW to NE).
					3/22/10 0:57			EOL stop logging
5 kts		120	120	3/22/10 1:07				SOL start logging - point 2 to point 1 (NW to SE)
					3/22/10 1:13			EOL stop logging
5 kts		121	121	3/22/10 1:26				SOL start logging - point 4 to point 3 (SW to NE).
					3/22/10 1:32			EOL stop logging
5 kts		122	122	3/22/10 1:42				SOL start logging - point 2 to point 1 (NW to SE)
					3/22/10 1:47			EOL stop logging
4 kts		123	123	3/23/10 9:28				Bubble Plume Survey #3 after J-489 (vents not active)
					3/23/10 9:38			EOL stop logging. Only saw a little blip.
								Bubble plume data agree with what we observed on the seafloor today. The vents were very low level and so were the bubble plume data.
			124	3/23/10 10:53		144.520284	14.637829	Spreading Center EM122 survey. No wcd. (lines 124 - 135)
						144.432812	14.505076	Spreading Center
			128	3/23/10 12:59		144.371067	14.317783	Spreading Center
			129	3/23/10 13:23		144.298002	14.341452	Spreading Center
			131	3/23/10 14:34		144.363863	14.541094	Spreading Center
			134	3/23/10 15:51		144.524010	14.733534	Spreading Center

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
			135		3/23/10 16:45	144.695229	14.645032	Spreading Center
4 kts		136	136	3/24/10 6:12	3/24/10 6:22			Bubble Plume Survey #4 after J-490 SE to NW (more bubbles than last night but less than before). 06:12-06:22 Survey
			137	3/24/10 6:57				Transit to survey East of Esmeralda Bank (lines 137-141)
			142-143	3/24/10 9:21		145.2717	14.92181	Survey East of Esmeralda Bank (lines 142 - 164)
			144	3/24/10- 10:00		145.324534	14.954093	
			145	3/24/10 10:00		145.367577	14.978223	
			146/147	3/24/10 10:00		145.38062	14.955723	skip it-mistake sgm lines 146 and 147 (check this)
			148	3/24/10 10:13		145.333664	14.938767	pt. 5 is missing but #4 listed twice-think this should be #5
			150	3/24/10 10:53		145.284426	14.90355	
			151	3/24/10 11:08		145.297469	14.886919	missed actual pt. clicked line count just past wp
			152-153	3/24/10 11:41		145.344099	14.920506	
			154	3/24/10 11:50		145.389751	14.934854	
			154	3/24/10 12:07		145.399207	14.914962	
			155			145.353555	14.899637	
			156	3/24/10 12:26		145.309208	14.869963	
			157	3/24/10 12:35		145.314099	14.849094	
			159	3/24/10 13:04		145.262904	14.78029	
			160	3/24/10 13:55		145.16768	14.667466	
			161	3/24/10 14:25				transit back to dive site (lines 161 - 164)
			164		3/24/10 16:09	144.775	14.6	EOL; end of survey
?? Kts		165	165	3/24/10 17:19	3/24/10 17:26			Bubble Survey #5 - not sure if stationary or moving. Saw bubbles.
								Bubble Survey #6 while sitting stationary over vents (lines 166 - 168)
stationary		166	166	3/24/10 22:00				J492 Water Column data captures 22:00-22:10
stationary				3/24/10 22:01				J492: Start logging
stationary				3/24/10 22:05				higher plume-not intense
stationary				3/24/10 22:06				steady-low intensity again
stationary				3/24/10 22:08				low intensity-height 100-150m
stationary				3/24/10 22:09				Little less intense-shorter ~100m
stationary					3/24/10 22:10			stopped logging
stationary								
stationary		167	167	3/24/10 22:20				J492: Higher plume after big tephra release at Sulfur Vent
stationary				3/24/10 22:22				Not much tephra in video

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
stationary					3/24/10 22:24			logging off -not seeing tephra
stationary		168	168	3/24/10 22:31				Plume more intense and easily 250m but nothing on dive screen. Logging on at 2231.
stationary				3/24/10 22:33				well defined but not intense
stationary				3/24/10 22:34				Plume is higher; video shows plume bending over and tephra rain.
stationary				3/24/10 22:35				more intense
stationary				3/24/10 22:38				More intense but not wider
stationary				3/24/10 22:39				Plume broken into 2 cells: one leaning other straight
stationary					3/24/10 22:41			Logging off.
stationary		169	169	3/25/10 4:15	3/25/10 4:26			Bubble plume Survey. Plume active on the seafloor at Sulfur Vent. Plume ascends ~100m on wcd.
stationary		170	170	3/25/10 7:52	3/25/10 7:57	144.7736	14.6035	Feature port side almost at edge. Ship sitting at site heading 099. Persistent.
stationary		171	171	3/25/10 11:11	3/25/10 11:48			PL-NWRota-06 Bubble plume logging during plankton tow - both EM122 and wcd.
				3/25/10 12:34				Intense well-defined plume even though ship is south of venting sites. Not logging.
0.5 kts?		172-175	172-175	3/25/10 16:31	3/25/10 17:27	144.775457	14.600895	Bubble Plume Mapping over summit at 0.5 knots. No line numbers in log book. Presuming logged to files 172 - 175.
??		176	176	3/26/10 11:06	3/26/10 11:22			post J2-493 Plankton Hauls.
??		177	177	3/26/10 15:55	3/26/10 15:59			During mooring line search.
4 kts?		178	178	3/26/10 16:16	3/26/10 16:44	144.775457	14.600895	Bubble mapping during ADCP survey. Several lines that went over the summit. 1626 see plume.
4 kts?		179	179	3/26/10 16:51	3/26/10 17:13			Plume visible at 1710.
4 kts?		180	180	3/26/10 17:21	3/26/10 17:28			Seeing plume 1725 - 1727.
stationary		181	181	3/26/10 18:25				Dive J2-494. Recording wcd and EM122 during dive. Ship is stationary. (lines 181-204)
stationary				3/26/10 21:31				Huge plume on Medea cam
stationary		191	191	3/27/10 0:49				Big event on seafloor-EM122 plume on bottom
stationary		196	196	3/27/10 2:02				White out @ Styx; EM122 plume to 285m and persistent
stationary				3/27/10 2:16				Jason in big burst; plume logging about the same (ship not over plume)
stationary				3/27/10 2:50				EM122 intense but small plume
stationary				3/27/10 3:02				Still intense venting
stationary		204	204		3/27/10 6:10			EOL after J2-494
stationary		205	205	3/27/10 12:39				Post J2-494 Plankton Haul logging; SOL
stationary				3/27/10 12:50				Intense plume ~150m tall

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
stationary		206	206	3/27/10 13:23				Ship moving to next MAPR cast site
stationary		206	206		3/27/10 13:36			EOL
0.5 - 1 kt		207	207	3/27/10 14:14		144.775457	14.600895	Bubble Mapping and ADCP Survey over summit - E to W and W to E drifting at ~0.5 kts. (lines 207 - 230)
0.5 - 1 kt		207	207	3/27/10 14:14				Summit mapping E-W & W-E; SOL drifting
0.5 - 1 kt								Really nice plume: bright red; 1/2 up water column
0.5 - 1 kt				3/27/10 14:19				Very intense; series of plumes
0.5 - 1 kt					3/27/10 14:34			End drift
0.5 - 1 kt		207	207	3/27/10 0:00				start forward line W-E
0.5 - 1 kt		208	208		3/27/10 0:00			end forward line
0.5 - 1 kt		209	209	3/27/10 14:56				start downwind line E-W
0.5 - 1 kt					3/27/10 15:23			end downwind line
0.5 - 1 kt		210	210	3/27/10 0:00				start forward line W-E
0.5 - 1 kt		211	211		3/27/10 15:56			end forward line
0.5 - 1 kt		212	212	3/27/10 0:00				start downwind line E-W
0.5 - 1 kt		212	212		3/27/10 16:25			end downwind line
0.5 - 1 kt		213	213	3/27/10 16:26				start forward line W-E
0.5 - 1 kt		214	214		3/27/2010 ?			end forward line
0.5 - 1 kt		215	215	3/27/10 17:02				start downwind line E-W
0.5 - 1 kt		216	216		3/27/2010 ?			end downwind line
0.5 - 1 kt		217	217	3/27/10 17:50				start forward line W-E
0.5 - 1 kt		219	219		3/27/10 18:58			end forward line
0.5 - 1 kt		220	220	3/27/10 18:59				start downwind line E-W
0.5 - 1 kt				3/27/10 19:24				plume approaching
0.5 - 1 kt				3/27/10 19:39				ship over summit; strong red plumes
0.5 - 1 kt				3/27/10 19:41				really strong now
0.5 - 1 kt				3/27/10 19:43				not as strong
0.5 - 1 kt		221	221	3/27/10 19:54				new data line auto-started
0.5 - 1 kt					3/27/10 19:55			end downwind line
0.5 - 1 kt		222	222	3/27/2010 ?				start forward line W-E
0.5 - 1 kt				3/27/10 20:07				great plume
0.5 - 1 kt		223	223		3/27/10 20:10			end forward line
0.5 - 1 kt		224	224	3/17/10 ?				start downwind line E-W
0.5 - 1 kt				3/27/10 20:42				strong plume over summit
0.5 - 1 kt		224	224		3/27/10 20:55			end downwind line
0.5 - 1 kt		225	225	3/27/10 20:55				start forward line W-E
0.5 - 1 kt				3/27/10 21:05				good bubbles
0.5 - 1 kt		225	225		3/27/10 21:23			end forward line

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
0.5 - 1 kt		226	226	3/27/10 21:23				start downwind line E-W
0.5 - 1 kt		227	227		3/27/10 21:55			end downwind line
0.5 - 1 kt		228	228	3/27/10 21:56				start forward line W-E
0.5 - 1 kt		229	229		3/27/10 22:32			end forward line
0.5 - 1 kt		230	230	3/27/10 22:32				start downwind line E-W
0.5 - 1 kt				3/27/10 22:34				spike in center for bow thruster
0.5 - 1 kt		230	230		3/27/10 23:09	144.775457	14.600895	end downwind line. End of bubble plume survey
bad		231	231	?				Don't use. forgot to turn off data logging; end survey
bad		232	232					Don't use. Started logging and software didn't work.
5 kts		233	233	3/28/10 0:34				Bubble Plume Survey. This time in more of a N/S direction. Ship was crabbing. start SW-NE line
				3/28/10 0:41	3/28/10 0:50			Plume within 100m of surface-crabbing to north
		234	234	3/28/10 0:50				changing ship direction NE-SW; SOL
1-2 kts		234	234		3/28/10 0:59			EOL-ship struggling and stopped logging
1-2 kts		235	235	3/28/10 1:12				SOL N-S 1-2 kts.
		235	235		3/28/10 1:24			EOL-turning around and try S-N
		236	236	3/28/10 1:36	3/28/10 1:39			SOL; forgot to log; only small amt. plume data
		237	237	3/28/10 1:48	3/28/10 1:58			SOL NE-SW 2-3 kts.
		238	238	3/28/10 2:03	3/28/10 2:15			SOL SW-NE 2-3 kts.
		239	239	3/28/10 2:22	3/28/10 2:32			SOL NE-SW 2-3 kts.
0.4 kts		240	240	3/28/10 2:52				SOL; W-E lines 0.4 kts
		241	241	3/28/10 3:31				EOL
		242	242	3/28/10 3:31				SOL; E-W 0.5 kts
		243	243	3/28/10 4:25				EOL
		244	244	3/28/10 4:25				SOL; W-E
		244	244	3/28/10 4:39				plume going SE along summit
				3/28/10 4:40				up within ~100m of surface
				3/28/10 4:49				very intense; ~100m off bottom
		245	245	3/28/10 5:18				EOL
		246	246	3/28/10 5:18				SOL; E-W
		247	247	3/28/10 6:08				EOL
		248	248	3/28/10 6:08				SOL; W-E
		249	249	3/28/10 6:44				EOL
		250	250	3/28/10 6:45				SOL; E-W
				3/28/10 7:01				intense
				3/28/10 7:04				2 plumes
				3/28/10 7:06				2 high plumes
				3/28/10 7:17				plume on west side?

Speed	EM1002 line	Water Column line	EM122 Line	SOL or start waypoint	EOL	Longitude	Latitude	Comments
		251	251	3/28/10 7:24				EOL
		252	252	3/28/10 7:24				SOL; W-E
				3/28/10 7:42				intense red plume
		253	253	3/28/10 7:58				EOL
		254	254	3/28/10 7:58				SOL; E-W
		255	255	3/28/10 8:34				EOL
		256	256	3/28/10 8:34				SOL; W-E
		257	257	3/28/10 9:06				EOL
		258	258	3/28/10 9:06				SOL; E-W
				3/28/10 9:32				straight tall plume
		259	259	3/28/10 9:40				EOL; end survey run
stationary		260-279	260-279	3/28/10 19:40				Bubble Plume watch during dive J2-495. Ship stationary. (lines 260 - 279)
stationary								Saw large plume in Medea cam over Styx. Not that impressive on the screen.
stationary				3/28/10 22:23				Intense low plume
stationary				3/28/10 22:55				Well defined plume about 1/3 water column. Ship closer to vents - Jason at Sulfur
stationary				3/28/10 23:26				Nice strong split plume - ship in good position. ROV at surface.
stationary			279	3/29/10 5:28				Stop logging wcd and EM122.
			280	3/29/10 6:35				Rota2Guam multibeam survey. Heading back to Guam. No water column data on this survey. (lines 280-309)
			290	3/29/10 10:00		145.02314	14.30798	W/SW of West Rota at 1012.
			294	3/29/10 11:48		144.77462	14.05672	Z=1538. Change course slightly to get to WP7.
			299	3/29/10 14:23		144.493	13.633	Just passed WP8.
			309		3/29/10 19:30	144.57	13.45	
								End of survey. Just offshore Guam.

Figure 4.1.3-1 EM122 data collected on the 2010 expedition.

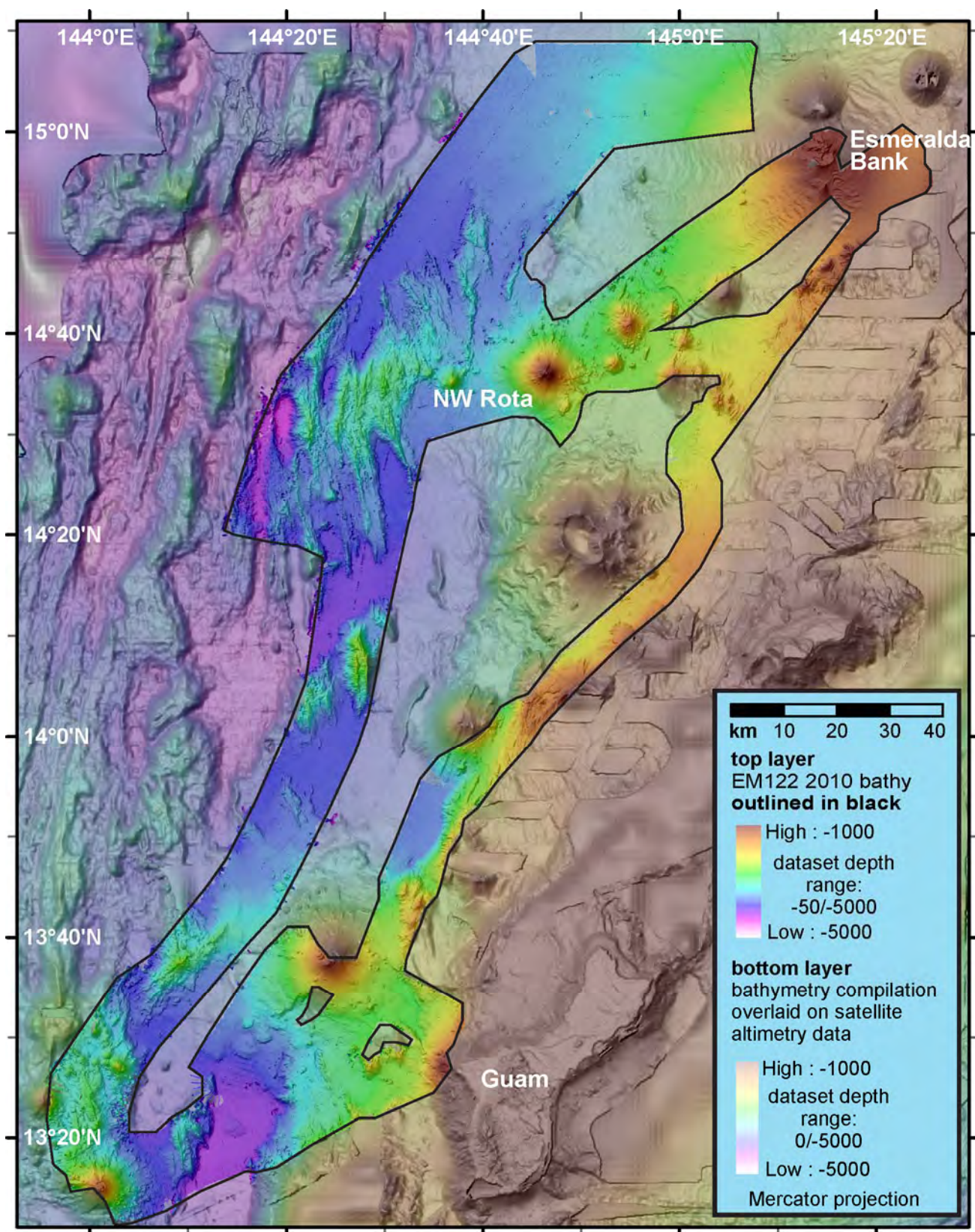
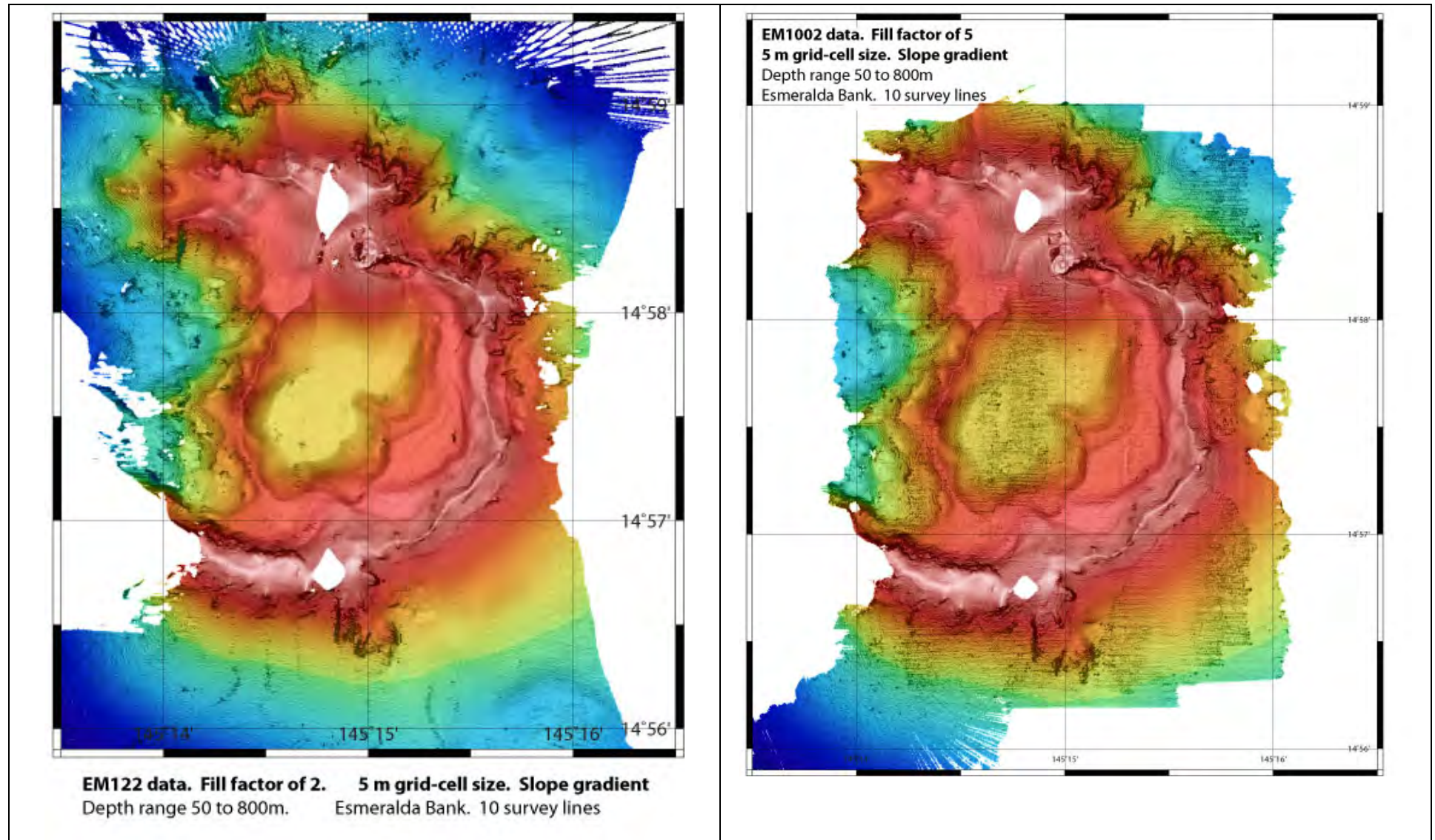


Figure 4.1.3-2 EM122 and EM1002 surveys of Esmeralda Bank.



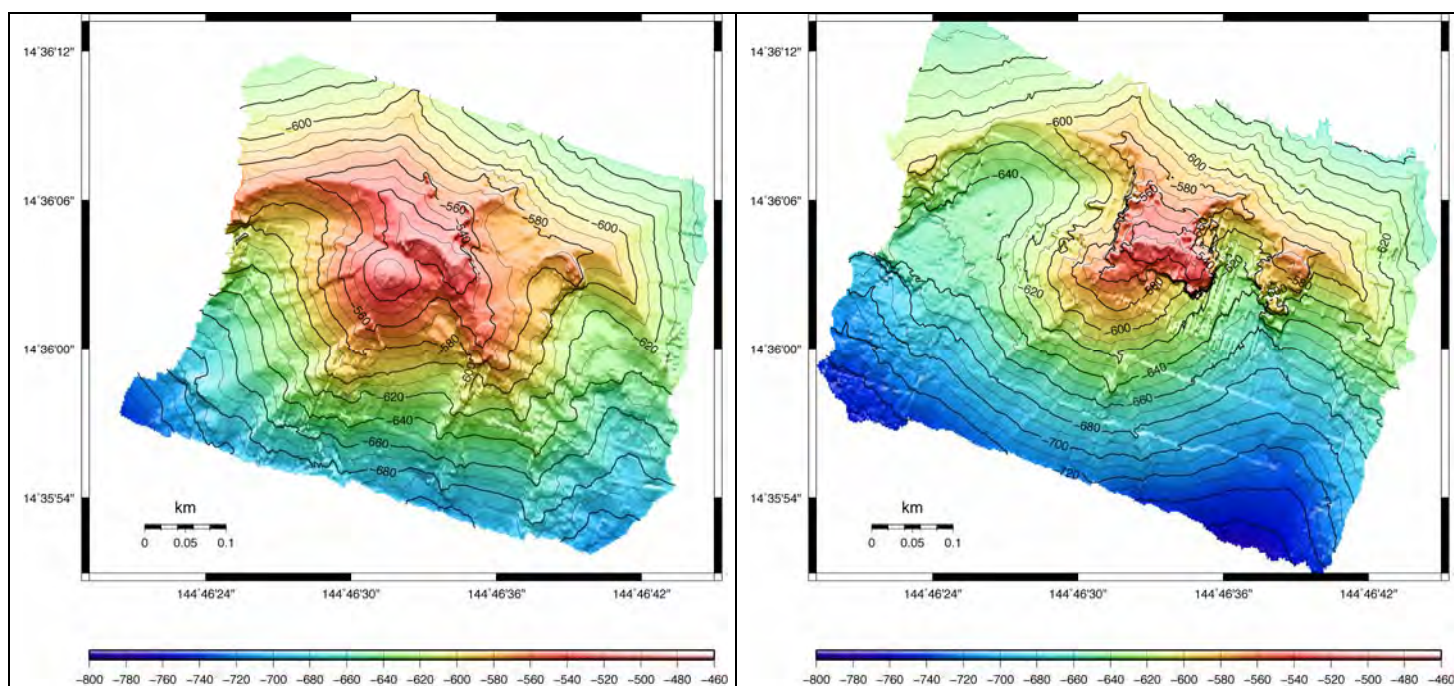
4.1.4 JASON SM2000 Mapping

Bill Chadwick

As we did last year, we resurveyed the summit of NW Rota with Jason's SM2000 multibeam sonar system to collect high-resolution bathymetry. We did this on Jason dive 493 and the survey occupied the entire dive. In contrast to last year, the USBL navigation was very good and even though we still had problems with the Doppler losing bottom lock when Jason went over steep cliffs, the Jason team was able to produce a preliminary map within a couple days that we used as an underlay on the navigation screen during the last dive, which was very useful.

Before this year's cruise (and after last year's cruise report was published) we did an additional shift to the SM2000 survey from last year to match a high-resolution EM122 survey (GPS navigated) collected by John Hughes Clarke. The original 2009 SM2000 data had been shifted 20m south and 10m west to better fit other 2009 JASON dive tracks. (That version of the bathymetry was displayed in the 2009 cruise report, Fig. 4.1.1-3). To better fit the Clarke EM122 multibeam bathymetry data, the 2009 grid was shifted again by 10m north and 20m east. (The overall shift of the 2009 original data to the best fit data for 2010 was 10m south and 10m east). We found that we did not need to shift the 2010 SM2000 survey relative to that shifted 2009 SM2000 survey, which shows that the USBL navigation from 2010 was very good.

Figure 4.1.4-1 Map of SM2000 data collected in 2009 (left) and 2010 (right). Maps are at the same scale and utilize the same color table for comparison.



4.2 Biology

4.2.1 Macrobiology

Verena Tunnicliffe, John Sherrin

The biological community at NW Rota is simple, only a few species can tolerate the rapidly changing conditions on the actively erupting summit. It is dominated by two species of shrimp that both feed on bacterial filaments which grow at the vents, though one species, an undescribed *Alvinocaris* sp., transitions into a predator/scavenger as an adult. My goal this year was to determine how the dominant shrimp populations at NW Rota respond to changes in volcanic and hydrothermal activity, what type of microbial filaments they eat, and how they recruit to the seamount.

Species encountered

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.

Barnacle (Family Neoverrucidae)

Neoverruca n. sp. (under description)

Surviving the Landslide

This year we saw a drastic change in the structure of the summit caused by a major landslide that wiped out many of the animal habitats from 2009 and has created new habitats available for recolonization. Sessile species such as limpets and barnacles have not survived in areas affected by the slide but are still present at vents that remain from last year. Some newly recruiting limpets at the top of the summit suggest that repopulation may well be underway. As in 2009, there were few deadfalls seen around the summit, again suggesting that some toxic substance may be lower than in 2006 when deadfalls were abundant.

The Shrimp

The landslide had a major impact on the two species of shrimp as well. Both species were likely wiped out from most of the areas affected by the slide but both still remain at vents unaffected by the slide. The major difference between these two species is how they've responded to the major changes to the seamount. Vast numbers of small *Opaepele loihi* shrimp have already recolonized the newly available habitats created by the slide. Absent from these new recruits is any trace of the *Alvinocaris* shrimp which suggests a difference in how these species respond to large-scale habitat changes at the seamount. We obtained several suction samples of shrimp and we deployed and recovered several traps baited with Spam aimed at catching the *Alvinocaris* shrimp. Interestingly neither sampling method came back with any *Alvinocaris* shrimp this year. We also deployed and recovered several shrimp exclusion traps aimed at growing the bacterial mat that grows at the vents where shrimp are which we will compare with mat samples from other parts of the volcano where there are no shrimp.

Figure 4.2.1-1 2010 Macrobiology samples. See individual dive maps for labeled biology sample locations.

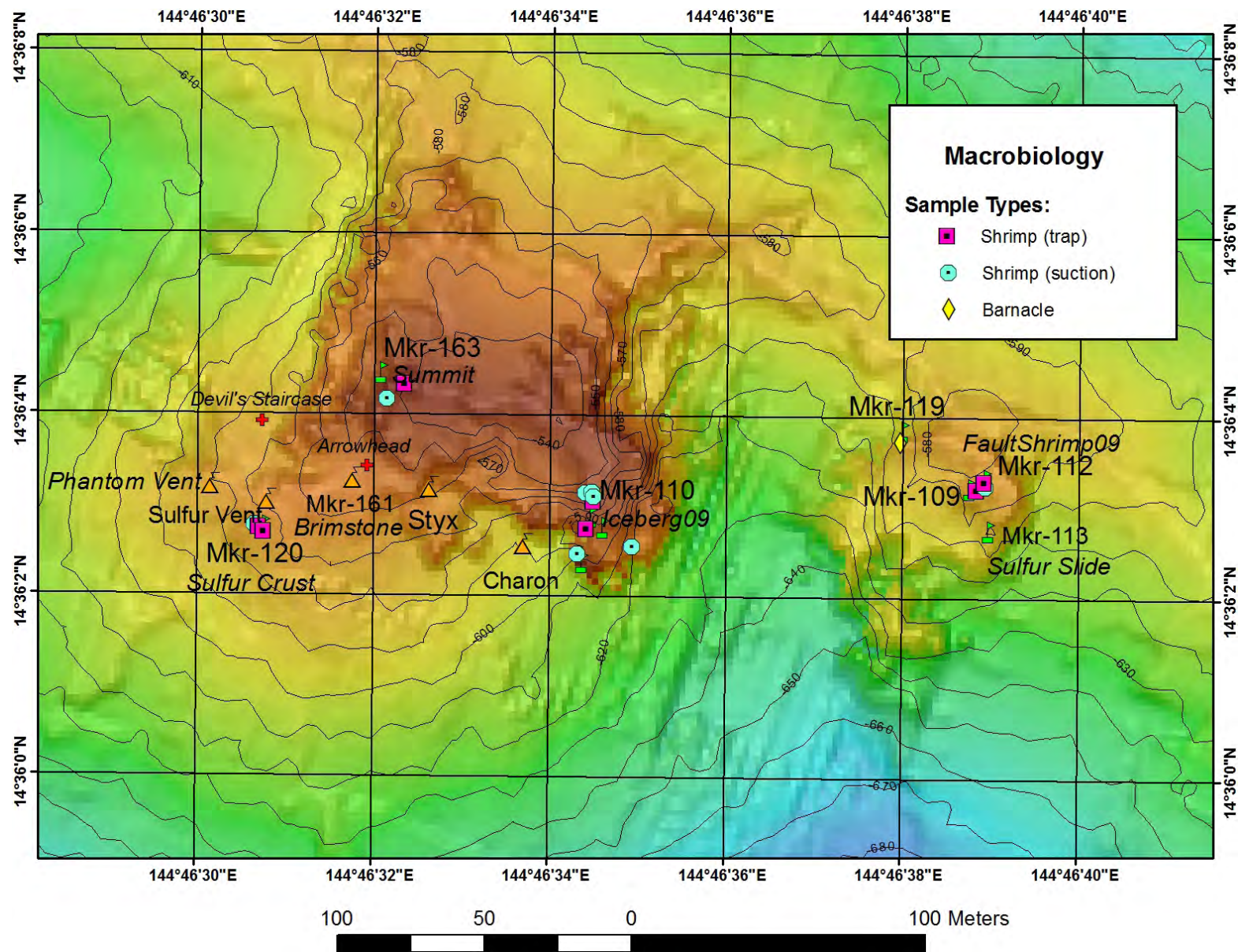


Table 4.2.1-1 2010 Biology samples by location.

Sample Name	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Heading	Dive log comments	PI	Virtual Van record
J490-Mat-28	Mkr-109 Limpet Lair	3/22/2006 8:07	14.60089	144.77749	563.1	567.9	3.1	Mkr-109 had a lot of mat growing on it, marker took as sample for mat. (Mkr-112 is very close to this marker on top of same ridge-within camera site).	Tunncliffe	4194
J495-Shrimp-16	Mkr-109 Limpet Lair	3/29/2010 3:35	14.60089	144.77750	562.9	567.2	68.7	Recovered shrimp trap at old Mkr-109 site (marker removed as mat sample) with Mkr-112 in background along ridge. Deployed on J-489.	Tunncliffe	8585
J489-Shrimp-02	Mkr-109/Mkr-112 Limpet Lair	3/20/2010 21:02	14.60090	144.77753	564.6	566.8	315.3	Suction sample of shrimp. Trying to get both species. ~2m SE Mkr-109, just W of Mkr-112. Hdg=315.	Tunncliffe	2175
J495-Mat-17	Mkr-109/Mkr-112 Limpet Lair	3/29/2010 3:47	14.60095	144.77752	562.5	566.0	114.8	Recovered mat cage located between Mkr-109 site and Mkr-112 (had some shrimp inside) Deployed on J-489 and relocated slightly on J-490.	Davis	8602
J490-Mat-13	Mkr-110 Iceberg09	3/22/2006 1:27	14.60083	144.77628	533.4	537.2	330.2	Suction white bacterial mat right above the crack with lots of flow. Exact same spot as HFS samples. Got a shrimp too.	Tunncliffe Davis	3554
J494-Shrimp-1	Mkr-110 Iceberg09	3/26/2010 20:17	14.60085	144.77630	335.1	533.2	335.1	Recovered shrimp trap #4 perched on the rock outcrop. Deployed on J490. Quite a lot of shrimp in the trap. (The honeybear is on this trap and did its job.)	Tunncliffe	6562
J495-Mat-11	Mkr-110 Iceberg09	3/29/2010 2:30	14.60078	144.77629	531.4	536.0	38.2	Recovered mat cage at Mkr-110 Iceberg09. Deployed on J-490.	Davis	8485
J495-Shrimp-12	Mkr-110 Iceberg09	3/29/2010 2:32	14.60076	144.77628	531.4	535.9	37.1	Recovered shrimp trap at Mkr-110 Iceberg09. Deployed on J-494.	Tunncliffe	8489
J495-Shrimp-13	Mkr-110 Iceberg09	3/29/2010 2:39	14.60087	144.77627	531.6	535.9	36.2	Black chamber shrimp suction at Mkr-110 Iceberg09. Some sediment was collected with the shrimp.	Tunncliffe	8499

Sample Name	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Heading	Dive log comments	PI	Virtual Van record
J495-Mat-14	Mkr-110 Iceberg09	3/29/2010 3:02	14.60088	144.77629	532.0	536.4	317.0	Green chamber shrimp suction at Mkr-110 Iceberg09. Mainly shrimp in sample but also some sediment.	Davis	8534
J495-Shrimp-15	Mkr-110 Iceberg09	3/29/2010 3:10	14.60086	144.77630	531.4	536.3	318.2	Orange (flush) chamber shrimp suction at Mkr-110 Iceberg09.	Tunnicliffe	8549
J489-Mat-01	Mkr-112	3/20/2010 19:46	14.60098	144.77754	565.9	580.9	243.9	Scoop of rocks covered in white fuzzy mat and some iron oxide mats. Eastern edge of wall north of Rusty Ridge. This position is north of old Mkr-109. Lots of the crumbling wall ended up on the basket.	Smith	2074
J490-Mat-01	Mkr-112	3/21/2006 19:01	14.60086	144.77759	565.9	595.9	310.1	Scoop of white furry mat from the steep wall at the base of Mkr110. Hdg=310. Orange on the wall is probably iron oxides. The white mat is very furry looking and moving in the current. Mat and crumbly black rock in sample.	Tunnicliffe	3046
J490-Shrimp-02	Mkr-112	3/21/2006 19:21	14.60091	144.77753	563.5	566.5	344.3	Recovered shrimp trap from edge of cliff in a precarious position. There are some shrimp in there (on Spam). Deployed J-489.	Tunnicliffe	3073
J490-Barnacle-08	Mkr-119	3/21/2006 22:15	14.60103	144.77726	566.6	573.3	356.5	Crumbly rock with barnacles (<i>Neolepas</i>), ~1cm. White patches on the rock that could be sulfur. Hdg=356.	Tunnicliffe	3303
J487-Shrimp-08	Mkr-120 Sulfur Crust	3/21/2006 19:01	14.60077	144.77523	556.8	558.0	4.9	Shrimp suction sample at Sulfur Crust. Start suction sample (04:40). Completed suction sampling (04:50).	Tunnicliffe	904
J488-Shrimp-27	Mkr-120 Sulfur Crust	3/20/2010 3:23	14.60076	144.77524	557.1	558.2	16.8	Shrimp Trap recovered at Sulfur Crust at Mkr-120. Trap looks good with shrimp inside. Deployed on J-487.	Tunnicliffe	1820
J489-Shrimp-07	Mkr-120 Sulfur Crust	3/21/2010 5:04	14.60075	144.77526	553.4	558.6	36.8	Shrimp trap recovered at Sulfur Crust. Deployed on J-488.	Tunnicliffe	2966

Sample Name	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Heading	Dive log comments	PI	Virtual Van record
J494-Mat-18	Mkr-120 Sulfur Crust	3/27/2010 3:55	14.60074	144.77527	319.6	556.8	319.6	Recovered mat cage at Mkr-120. Trap-1. Deployed on J-488.	Tunnicliffe	7361
J494-Mat-19	Mkr-120 Sulfur Crust	3/27/2010 3:58	14.60076	144.77530	320.1	556.8	320.1	Recovered mat cage at Mkr-120. Second cage also deployed on J-488 at same location.	Tunnicliffe	7367
J488-Shrimp-14	Mkr-163 Summit	3/19/2010 23:08	14.60120	144.77570	519.8	525.0	356.6	Recovered shrimp trap at Summit. The traps have been out for 2 days and are jam-packed with shrimp. Deployed J-487.	Tunnicliffe	1393
J488-Shrimp-13	summit above Brimstone	3/19/2010 22:33	14.60116	144.77565	523.5	527.4	356.8	Suction of shrimp on vertical wall above Brimstone, about 5m below summit rim. Whole cliff face covered with shrimp, certainly juveniles. Stop at 22:41.	Tunnicliffe	1347
J495-Shrimp-09	Sulfur Wall	3/29/2010 1:25	14.60069	144.77625	593.5	600.7	24.3	Blue chamber shrimp suction from Sulfur Wall area (probably W of marker) None to little sulfur coverage. Sample collected while continuing up the wall. Suction not strong at beginning of sampling.	Tunnicliffe	8384
J495-Shrimp-10	Sulfur Wall	3/29/2010 1:39	14.60071	144.77642	573.6	609.0	21.6	Red chamber shrimp suction 20m up the wall from J495-shrimp-09 at a sulfur-encrusted area. Opaepale (shrimp) juveniles.	Tunnicliffe	8395

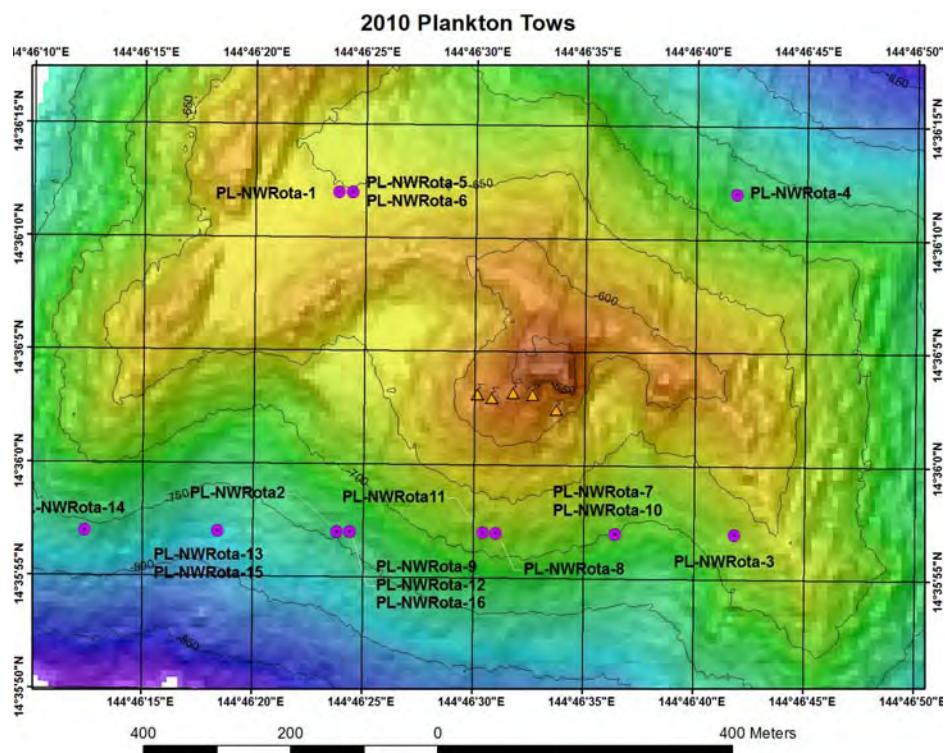
Plankton

This year we focused plankton sampling over the seamount in an attempt to obtain as many juvenile shrimp as possible for population studies. We made vertical hauls from 600m to surface in several locations around the summit.

Table 4.2.1-2 2010 Plankton vertical net haul locations.

Plankton Tow	Date	Location	Latitude	Longitude	Depth
PL-NWRota-1	03/22/10	NW of Summit	14 36.20	144 46.40	645
PL-NWRota-2	03/22/10	SW of Summit	14 35.95	144 46.40	740
PL-NWRota-3	03/22/10	SE of Summit	14 35.95	144 46.70	660
PL-NWRota-4	03/22/10	NE of Summit	14 36.20	144 46.70	730
PL-NWRota-5	03/25/10	NW of Summit	14 36.20	144 46.41	651
PL-NWRota-6	03/25/10	NW of Summit	14 36.20	144 46.41	651
PL-NWRota-7	03/25/10	SE of Summit	14 35.95	144 46.61	702
PL-NWRota-8	03/25/10	SE of Summit	14 35.95	144 46.52	680
PL-NWRota-9	03/25/10	SW of Summit	14 35.95	144 46.41	743
PL-NWRota-10	03/26/10	SW of Summit	14 35.95	144 46.61	698
PL-NWRota-11	03/26/10	S of summit	14 35.95	144 46.51	681
PL-NWRota-12	03/26/10	S of summit	14 35.95	144 46.41	733
PL-NWRota-13	03/26/10	S of summit	14 35.95	144 46.31	781
PL-NWRota-14	03/27/10	S of summit	14 35.95	144 46.21	752
PL-NWRota-15	03/27/10	S of summit	14 35.95	144 46.31	781
PL-NWRota-16	03/27/10	S of summit	14 35.95	144 46.41	733

Figure 4.2.1-2 2010 Plankton tow locations.



4.2.2 Microbiology

Julie Smith

Objectives

The main objective for the 2010 cruise was to collect new microbial samples from vents of interest sampled in 2004, 2006, and 2009. Diffuse fluids were collected for cell counts, culturing, and DNA/RNA extractions. Microbial mat samples were collected for molecular analysis by Dr. Rick Davis.

Fluid Samples

A total of 26 diffuse fluid samples were collected with David Butterfield's Hot Fluid Sampler (HFS) from 7 different diffuse venting sites. The HFS was used to filter large volumes (2-3L) of diffuse flow for molecular analysis of microbial DNA and RNA. This year, a modification was added to the HFS so that RNA could be preserved at the seafloor through the use of 47mm flat filters mounted with a reservoir of the preservative RNA Later. Parallel samples of unfiltered HFS fluids were preserved for cell counts and used to inoculate anaerobic to microaerophilic culture media. Microorganisms targeted for enrichment include acidophiles, sulfur reducers, sulfur oxidizers, and methanogens. (See the Chemistry section 4.3 for a table of HFS samples.)

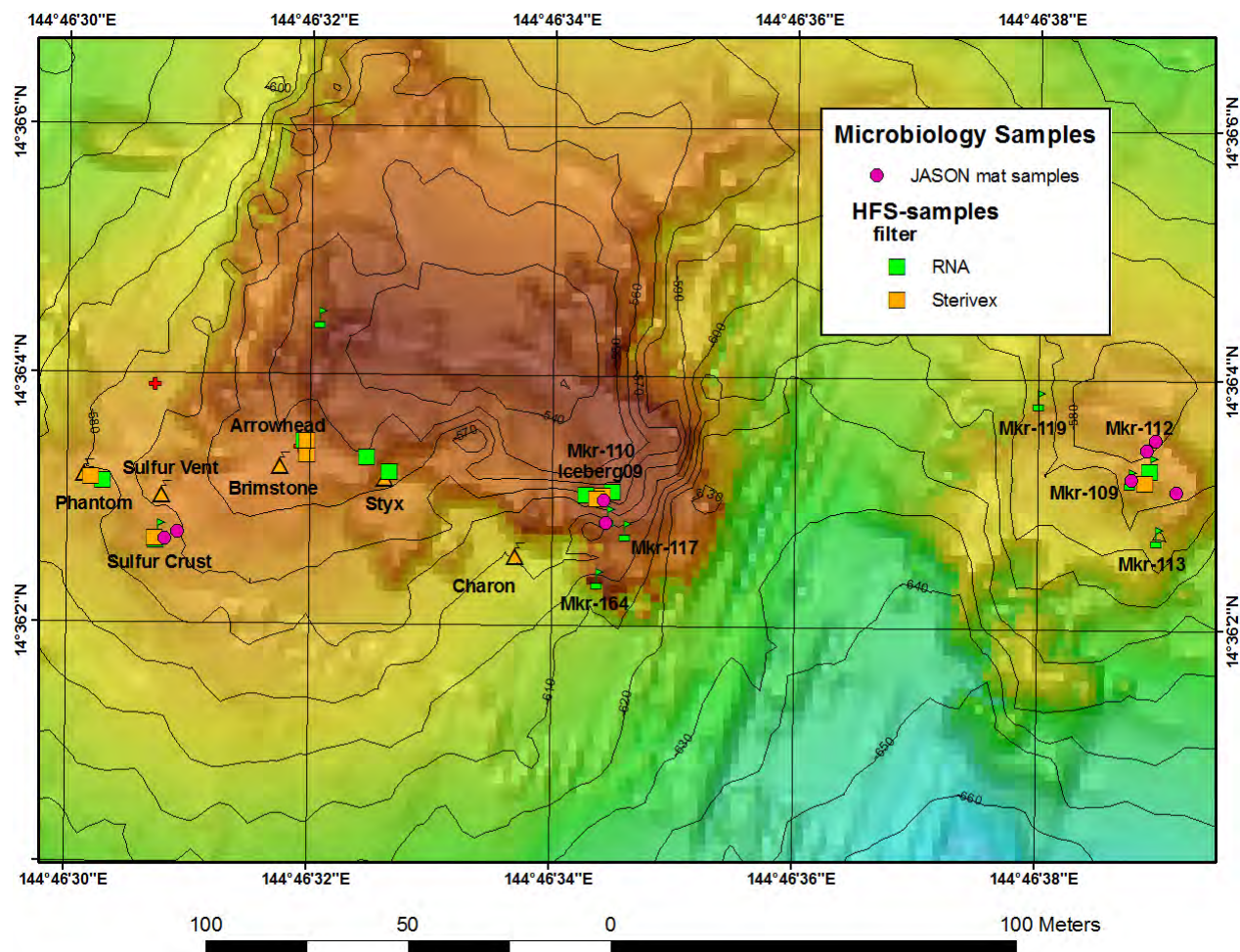
Microbial Mat Samples

Microbial mat samples were collected from 3 different venting sites using both suction sampling and scooping up mat-covered rocks.

Table 4.2.2-1 Microbial mat JASON sample table.

Dive	Sample #	Type	Vent	Virtual Van record
J2-489	J489-mat-1	scraped from rock wall	Marker 112	2069
J2-490	J490-mat-1	scraped from rock wall	Marker 112	3046
J2-490	J490-mat-13	slurp	Marker 110	3554
J2-494	J494-matcage-18	scraped from rock inside exclusion trap	Marker 120	7362
J2-495	J495-mat-14	slurp	Marker 110	8538

Figure 4.2.2-1 2010 microbiology samples.



4.3 Chemistry

4.3.1 Hydrothermal Fluid Sampling

Dave Butterfield

Summary of Hydrothermal Fluid Sampling

1. Sampling methods

During this 2010 Expedition to NW Rota volcano, our primary tool for collecting hydrothermal and volcanic fluids was again the PMEL Hydrothermal Fluid Sampler. The basic configuration of the sampler was the same as in 2009, with positions for 9 pistons, 9 collapsible bag samples, and 6 filter positions. However, one of the bag positions was given up to accommodate a new part with 4 filter holders capable of adding preservative (for RNA in this case) automatically by diffusion as soon as the samples are taken. We maintained the additional 3 “Sterivex” filters for DNA, so a total of 7 positions were occupied by filters. For most of the dives, we used 4 titanium pistons and 5 PVC pistons. We set the system up to have roughly an equal number of filtered and unfiltered water samples. All filters used on HFS water samples were Millipore 0.4 micron pore size polycarbonate membranes. 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 was relatively noisy this year, and repeat calibrations in the lab were not as consistent as in 2009. No H₂S sensor was deployed.

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. Distance between the HFS and the gas-tights this year was only about 20cm, so tubing lengths were shorter than in 2009. We deployed 2 major samplers on the last dive, and fired one.

There were two new additions to the HFS this year. A removable nozzle attachment of titanium with a strong magnetic coupler and o-ring seals allowed interchangeable use during a single dive of both the traditional short nozzle and an approximately 1-meter thermally-insulated extension to reach into active volcanic vent areas. Noah Lawrence-Slavas designed this part. A “kink-proof” flexible hose was also added to avoid stopping off flow. Both of these worked well throughout the cruise.

The components on the HFS frame were re-configured to make it easier to maintain (i.e. remove the particle trap and the sensors). The large volume cartridge filter kept sharp volcanoclastic material and sulfur away from the expensive flush pump head. However, entrainment of fine molten sulfur through the manifold resulted in temporary clogging on several occasions due to a buildup in the filter canister. Short bursts of reverse pumping generally relieved this problem. On one dive, a plug of molten sulfur was pulled into the extension nozzle and froze when it hit the short titanium intake nozzle just beyond the insulation. This effectively stopped sample flow through the extension nozzle for the remainder of that dive. In general, all components of HFS worked well during the cruise.

2. Shipboard analysis

Shipboard analysis was the same as in most previous cruises. We did spectrophotometric H₂S (modified Cline method) dissolved silica (silicomolybdate method of Froehlich), and ammonia (standard indophenol method), pH with Ross Sure-Flow semi-micro electrodes at lab temperature, and alkalinity by automated titration and Gran plot. Sample cuts were preserved for frozen nutrients, majors (filtered), trace metals, O/H isotopes, S isotopes, ¹³C-DIC, and sulfite measurement preserved with formaldehyde. Selected DOC samples will be sent to Aron Stubbins at Old Dominion for analysis. Eric Olson analyzed methane and hydrogen by GC on nearly all HFS fluid samples, using the new PMEL GC. See the sample split table for distribution volumes.

Personnel involved in fluid sampling/chemistry

Dave Butterfield

Kevin Roe – HFS setup, pre-dive checkout, sample processing, H₂S and ammonia analysis

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

Julie Smith – Sterivex and RNA filter processing, microbial culture

Eric Olson – methane and hydrogen analysis by gas chromatography

Leigh Evans – gas-tight sampler setup and extraction

3. Sampling summary

Our major goals for the expedition were:

- Recover the RAS time-series plume samples from the 500-m mooring
- Collect additional samples from the volcanic vent during different stages of activity
- Collect samples from the hydrothermal vents that were sampled during our previous expeditions
- Collect fluids from low-flow venting areas in volcanoclastic sands covered with orange or white mat

Because of the large landslide on NW Rota, the RAS mooring was lost and we were unable to collect our year-long time series. Furthermore, the extensive areas of volcanoclastic sand were no longer present, so our intention to combine heat flow measurements and fluid chemistry within these sandy areas was no longer possible. A significant number of the diffuse hydrothermal sites where markers were left in 2009 were also removed by the landslide, so direct time-series comparisons of those sites was also impossible.

We used HFS on 5 Jason dives and collected a total of 50 fluid samples, including two background seawater samples. We sampled 6 different volcanic vents along a line of activity (roughly from west to east): Phantom, Sulfur Vent, Sulfur Crust, Brimstone, Styx, and Charon. The vent that we called Brimstone this year was only marginally active. The other volcanic vents were highly variable in their level of activity. At Charon vent, we collected a time series (5 fluid samples) at a fixed point between loose rocks around the edge of the volcanic vent as the temperature rose from 30°C to 126°C, and followed this with 2 samples from the vigorous sulfur smoke venting less than 2 meters away. We also sampled 6 hydrothermal sites: Arrowhead cliff (2 distinct vents on a cliff face near Brimstone), markers 109 and 112 (sometimes referred to as Fault Shrimp), 110 (Iceberg-2009), and the area near former marker 105 (Limpet Lair, removed by landslide). We investigated the marker 102 Amphitheater area north of the summit, but found no visible venting this year, where there was venting and many small shrimp in 2009.

4. Brief description of results

We have not analyzed the 2010 samples in the shore-based lab yet, but from the shipboard data, several points are clear. Once again, there is virtually no hydrogen sulfide in the volcanic vent fluids. The pH in collected samples was as low as 1.35 in 2010, which is a function of how much seawater gets entrained into the sample as well as how much acid-producing SO₂ is injected into the water. With a brief look at the 2009-2010 shipboard data comparison, fluid composition at Iceberg marker 110 was very similar between years. Likewise, the composition of fluids from markers 109 and 112 (Scarp Top/Fault Shrimp area) were similar between years. The challenge and reward we face in comparing many other vents is that the 2009 landslide event has excavated the areas where the vents were sampled in 2009, exposing deeper parts of the system, and exposing several additional magma conduits. To what extent can we determine if the currently exposed 2010 vents were directly feeding the former 2009 vents? Can we infer what reactions were taking place within the rock matrix that has now been removed, and can we use that to better understand the plumbing system and chemical reactions in active submarine volcanoes? Although it cost us many valuable instruments and irreplaceable data, the landslide may allow us to learn something more about the structure of the volcano and hydrothermal system.

Table 4.3.1-1 Hydrothermal Fluid Samples sorted by location.

Dive Log Sample	HFS Sample number	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Virtual Van Record	Heading
J488-HFS-04	J2-488BF24	Arrowhead	3/19/2010 19:52	14.60096	144.77558	545.8	546.5	1120	36.3
J488-HFS-05	J2-488B19	Arrowhead	3/19/2010 19:58	14.60098	144.77559	545.8	546.5	1125	36.3
J488-HFS-06	no sample	Arrowhead	3/19/2010 20:01	14.60096	144.77559	545.8	546.5	1128	36.1
J488-HFS-07	no sample	Arrowhead	3/19/2010 20:05	14.60097	144.77558	545.8	546.5	1133	36.9
J488-HFS-08	no sample	Arrowhead	3/19/2010 20:37	14.60093	144.77560	546.0	546.7	1175	36.8
J488-HFS-09	J2-488F13	Arrowhead	3/19/2010 20:59	14.60096	144.77559	545.4	546.5	1191	36.8
J492-HFS-16	J2-492BF22	Arrowhead	3/25/2010 1:08	14.60096	144.77560	544.0	546.3	5474	34.4
J492-HFS-17	J2-492B18	Arrowhead	3/25/2010 1:14	14.60096	144.77560	544.0	546.3	5481	34.7
J492-HFS-18	J2-492F12	Arrowhead	3/25/2010 1:21	14.60096	144.77560	544.0	546.2	5487	36.5
J492-HFS-24	J2-492BF21	background	3/25/2010 4:50	14.60129	144.77416	554.6	629.6	5824	297.7
J492-HFS-25	J2-492PF9	background	3/25/2010 4:57	14.60172	144.77352	554.8	639.8	5827	297.9
J488-HFS-11	J2-488BF23	Brimstone Mkr-161	3/19/2010 21:49	14.60089	144.77561	547.4	548.6	1261	306.7
J488-HFS-12	J2-488B18	Brimstone Mkr-161	3/19/2010 21:54	14.60090	144.77560	547.4	548.6	1270	306.2
J494-HFS-9	J2-494BF22	Charon Vent	3/27/2010 0:25	14.60067	144.77607	327.3	588.6	6926	327.3
J494-HFS-10	J2-494B19	Charon Vent	3/27/2010 0:33	14.60069	144.77608	326.1	588.5	6935	326.1
J494-HFS-11	J2-494PF9	Charon Vent	3/27/2010 0:36	14.60069	144.77608	325.6	589.0	6943	325.6
J494-HFS-13	J2-494P8	Charon Vent	3/27/2010 0:43	14.60068	144.77608	325.2	589.0	6953	325.2
J494-HFS-14	J2-494PF7	Charon Vent	3/27/2010 0:49	14.60065	144.77607	324.1	589.0	6966	324.1
J494-HFS-15	J2-494PF1	Charon Vent	3/27/2010 1:07	14.60065	144.77605	334.4	587.6	7007	334.4
J494-HFS-16	J2-494P2	Charon Vent	3/27/2010 1:11	14.60065	144.77605	334.2	587.5	7014	334.2
J490-HFS-03	J2-490BF24	Mkr-109	3/21/2006 20:34	14.60089	144.77751	564.4	567.1	3171	314.7
J490-HFS-04	J2-490B17	Mkr-109	3/21/2006 20:39	14.60088	144.77752	564.4	567.1	3178	314.9
J490-HFS-05	J2-490F11	Mkr-109	3/21/2006 20:43	14.60088	144.77752	564.5	567.1	3183	315.1
J490-HFS-06	J2-490F14	Mkr-109	3/21/2006 21:03	14.60091	144.77753	564.4	567.2	3204	314.7
J490-HFS-09	J2-490B18	Mkr-110 Iceberg09	3/22/2006 0:20	14.60085	144.77629	532.8	539.2	3490	357.1
J490-HFS-10	J2-490BF22	Mkr-110 Iceberg09	3/22/2006 0:32	14.60085	144.77629	532.8	539.2	3503	357.4
J490-HFS-11	J2-490F15	Mkr-110 Iceberg09	3/22/2006 0:36	14.60085	144.77630	532.8	539.2	3508	357.5
J490-HFS-12	J2-490F12	Mkr-110 Iceberg09	3/22/2006 0:51	14.60085	144.77628	532.8	539.3	3525	357.2
J290-HFS-07	J2-490BF23	Mkr-112	3/21/2006 21:35	14.60091	144.77758	563.2	581.1	3248	249.8

Dive Log Sample	HFS Sample number	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Virtual Van Record	Heading
J494-HFS-6	J2-494BF23	Mkr-117	3/26/2010 22:34	14.60080	144.77629	27.6	537.0	6751	27.6
J494-HFS-7	J2-494B18	Mkr-117	3/26/2010 22:39	14.60080	144.77629	27.4	537.0	6757	27.4
J492-HFS-08	J2-492BF24	Mkr-120	3/24/2010 22:22	14.60077	144.77528	557.1	559.8	5288	336.8
J492-HFS-09	J2-492B20	Mkr-120	3/24/2010 22:27	14.60075	144.77527	557.1	559.8	5294	336.5
J487-HFS-02	J2-487P1	Phantom Vent	3/19/2010 22:33	14.60091	144.77512	566.2	567.6	488	102.7
J487-HFS-03	J2-487PF2	Phantom Vent	3/19/2010 23:08	14.60090	144.77511	566.2	567.6	493	102.6
J487-HFS-04	J2-487PF3	Phantom Vent	3/20/2010 3:23	14.60091	144.77512	566.3	567.5	512	102.9
J487-HFS-05	J2-487P4	Phantom Vent	3/20/2010 19:46	14.60094	144.77510	566.0	567.8	568	139.3
J488-HFS-16	no sample	Phantom Vent	3/20/2010 0:29	14.60092	144.77511	565.2	566.4	1545	99.7
J488-HFS-17	no sample	Phantom Vent	3/20/2010 0:33	14.60090	144.77510	565.3	566.4	1555	97.4
J488-HFS-18	no sample	Phantom Vent	3/20/2010 0:40	14.60091	144.77512	565.2	566.7	1577	104.6
J488-HFS-20	no sample	Phantom Vent	3/20/2010 0:49	14.60090	144.77511	565.2	566.8	1591	103.6
J488-HFS-21	no sample	Phantom Vent	3/20/2010 0:52	14.60091	144.77509	565.2	566.7	1602	105.1
J488-HFS-22	no sample	Phantom Vent	3/20/2010 0:57	14.60090	144.77508	565.2	566.7	1609	105.1
J490-HFS-20	J2-490BF21	Phantom vent	3/22/2006 4:59	14.60087	144.77511	563.3	566.6	3893	81.6
J490-HFS-21	J2-490P6	Phantom vent	3/22/2006 5:07	14.60087	144.77510	563.3	566.6	3903	81.4
J490-HFS-22	J2-490F10	Phantom vent	3/22/2006 5:12	14.60088	144.77511	563.2	566.6	3911	81.4
J490-HFS-23	J2-490F16	Phantom vent	3/22/2006 5:30	14.60087	144.77513	563.2	566.5	3923	81.4
J490-HFS-24	J2-490B19	Phantom vent	3/22/2006 5:47	14.60090	144.77513	563.1	566.5	3935	81.2
J490-HFS-25	J2-490B20	Phantom vent	3/22/2006 5:53	14.60090	144.77514	563.2	566.5	3941	80.4
J492-HFS-02	J2-492B17	5m east of Phantom	3/24/2010 19:49	14.60088	144.77521	560.5	562.3	5097	159.5
J490-HFS-14	J2-490PF9	Styx vent	3/22/2006 3:15	14.60091	144.77577	557.9	559.8	3727	16.8
J490-HFS-16	J2-490P8	Styx vent	3/22/2006 3:24	14.60090	144.77580	558.0	559.9	3743	16.9
J490-HFS-17	J2-490F13	Styx vent	3/22/2006 3:29	14.60090	144.77579	557.9	559.9	3750	17.3
J492-HFS-11	J2-492BF23	Styx vent	3/24/2010 23:50	14.60094	144.77574	556.7	558.8	5395	348.5
J492-HFS-12	J2-492B19	Styx vent	3/24/2010 23:51	14.60093	144.77574	556.7	558.8	5397	348.5
J492-HFS-13	J2-492F13	Styx vent	3/24/2010 23:56	14.60093	144.77574	556.7	558.8	5403	348.6
J488-HFS-28	J2-488BF22	Sulfur Crust Mkr-120	3/20/2010 3:42	14.60075	144.77524	557.0	558.1	1846	18.3
J488-HFS-29	J2-488B17	Sulfur Crust Mkr-120	3/20/2010 3:46	14.60074	144.77525	557.0	558.1	1853	18.3
J488-HFS-30	no sample	Sulfur Crust Mkr-120	3/20/2010 3:51	14.60074	144.77525	557.0	558.1	1862	18.3

Dive Log Sample	HFS Sample number	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Virtual Van Record	Heading
J488-HFS-31	J2-488F15	Sulfur Crust Mkr-120	3/20/2010 4:08	14.60074	144.77525	556.9	558.0	1879	18.2
J488-HFS-32	J2-488B20	Sulfur Crust Mkr-120	3/20/2010 4:27	14.60076	144.77525	556.9	558.1	1893	17.8
J492-HFS-03	J2-492P2	Sulfur vent	3/24/2010 20:12	14.60083	144.77530	554.6	556.6	5128	333.8
J492-HFS-04	J2-492PF5	Sulfur vent	3/24/2010 20:15	14.60082	144.77529	554.6	556.5	5133	333.7
J492-HFS-06	J2-492P6	Sulfur vent	3/24/2010 20:52	14.60086	144.77526	557.3	559.8	5179	137.3
J492-HFS-19	J2-492PF3	Sulfur vent	3/25/2010 4:15	14.60084	144.77525	557.2	560.6	5765	126.6
J492-HFS-21	J2-492P4	Sulfur vent	3/25/2010 4:25	14.60082	144.77525	557.2	560.4	5779	126.0
J492-HFS-22	J2-492P8	Sulfur vent	3/25/2010 4:28	14.60083	144.77524	557.2	560.5	5787	126.1
J492-HFS-23	J2-492PF7	Sulfur vent	3/25/2010 4:34	14.60083	144.77525	557.2	560.6	5798	127.0
J495-Major-04	J2495Major	Sulfur Vent	3/28/2010 23:20	14.60082	144.77529	555.7	557.4	8191	30.6
J495-Major-05	no sample	Sulfur Vent	3/28/2010 23:49	14.60084	144.77530	555.8	557.5	8228	40.8
J494-HFS-2	J2-494BF24	SW of Mkr-110	3/26/2010 20:46	14.60084	144.77624	13.6	532.1	6604	13.6
J494-HFS-3	J2-494B17	SW of Mkr-110	3/26/2010 20:49	14.60084	144.77626	13.8	532.0	6609	13.8
J494-HFS-4	J2-494F10	SW of Mkr-110	3/26/2010 21:25	14.60084	144.77626	10.9	531.8	6654	10.9
J494-HFS-5	J2-494F13	SW of Mkr-110	3/26/2010 21:33	14.60085	144.77624	11.9	531.8	6666	11.9
J492-HFS-01	J2-492PF1	upslope of Phantom	3/24/2010 19:43	14.60087	144.77521	560.5	562.3	5088	159.1

Figure 4.3.1-1 Hydrothermal Fluid Samples. Only good samples are plotted, samples which failed, listed as 'no sample' in table 4.3.1-1 are not displayed. See dive log for further descriptions as some samples were taken at the exact same location however the navigation could wander over time while stationary.

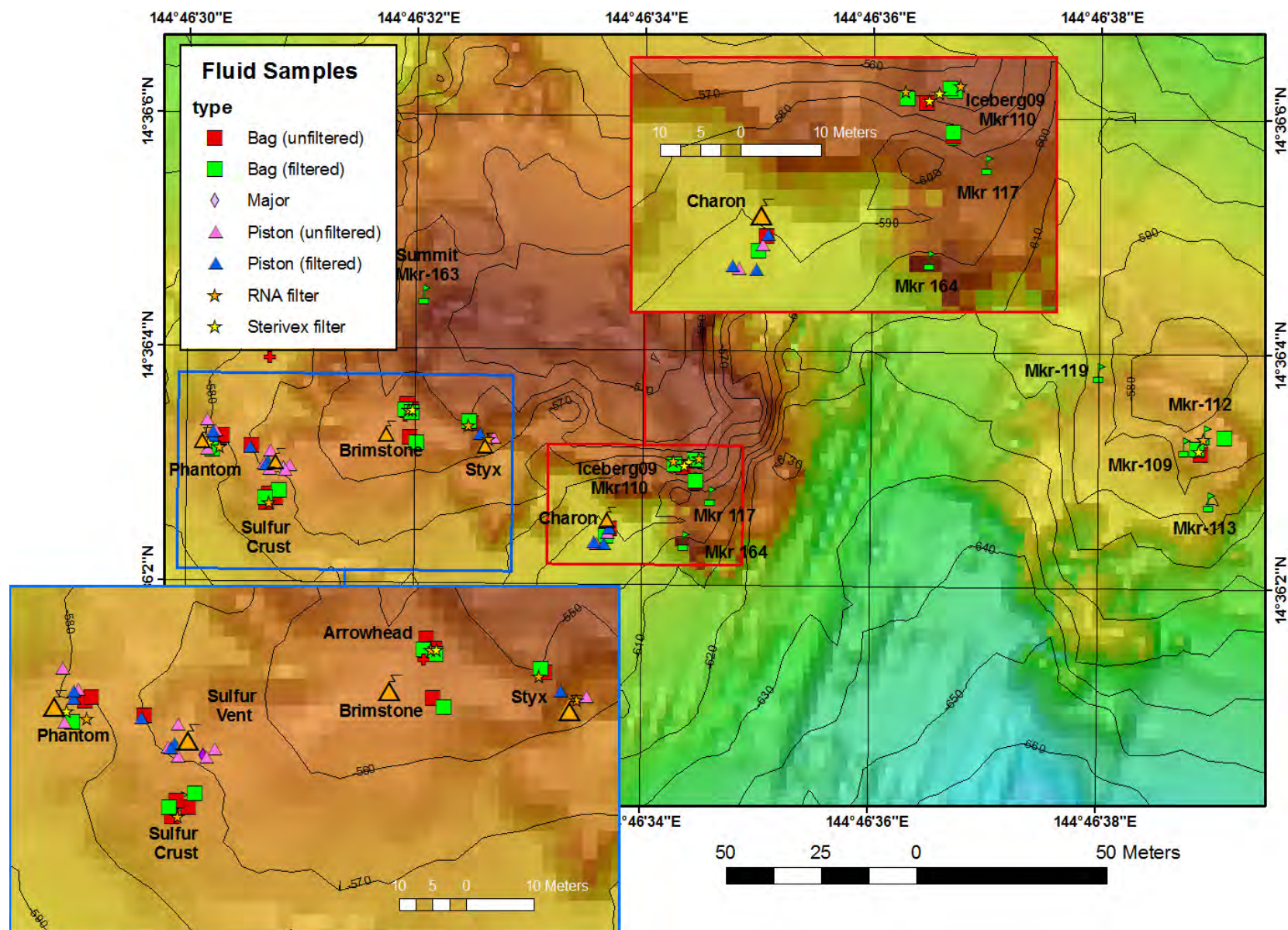


Table 4.3.1-2 Hydrothermal Fluid Sample Split Volumes (mL) and Distribution.

Cruise Report Sample ID	HFS Sample number	Vent site	Tavg, °C	meas vol ml	gas head space vol	gas H2O ali-quot	H2S/Si	pH/alk	Nutrients	Sulfite	Majors	Micro-biology	S isotopes	O/H iso	Trace Metal	DOC
J487-HFS-02	J2-487P1	Phantom Volc Vent	65.3	249	36	12	15	5		12	45	45	40	15	60	
J487-HFS-05	J2-487P4	Phantom Volc Vent	97.9	298	53	12	15	6		12	60		20		125	
J487-HFS-03	J2-487PF2	Phantom Volc Vent	62.8	82	0	12	10	5	0	12	20				15	
J487-HFS-04	J2-487PF3	Phantom Volc Vent	64.4	404	40	12	18	5		12	65		40	15	90	50
J488-HFS-29	J2-488B17	Sulfur Crust mkr 120	24.9	580	0	15	22	35	40	15	60			12	250	100
J488-HFS-12	J2-488B18	Brimstone quiescent	22.7	516	0	15	20	35	40	15	65				300	
J488-HFS-05	J2-488B19	Arrowhead cliff	45.2	496	2	14	20	35	30	25	65	90	20		125	45
J488-HFS-32	J2-488B20	Sulfur Crust mkr 120	24.9	555	0	14	20	35	45	12	60	90	40		225	
J488-HFS-28	J2-488BF22	Sulfur Crust mkr 120	24.4	578	0	14	20	35	45	12	65		45		250	90
J488-HFS-11	J2-488BF23	Brimstone quiescent	23.2	579	0	12	30	35	45	12	65		70		125	100
J488-HFS-04	J2-488BF24	Arrowhead cliff	45.3	398	4	14	20	5	40	14	65		25		200	
J488-HFS-09	J2-488F13	Arrowhead cliff	42.4													
J488-HFS-31	J2-488F15	Sulfur Crust mkr 120	25.0													
J490-HFS-04	J2-490B17	Mkr 109	20.2	495	18	14	30	35	40	14	60	70	45	17	125	17
J490-HFS-09	J2-490B18	Iceberg	33.4	246	49	14	25	35		15	35	65			35	
J490-HFS-24	J2-490B19	Phantom	28.5	205	0	14	30	6			30				?	
J490-HFS-25	J2-490B20	Phantom	28.0	290	0	14	25	35	35	15	50				105	
J490-HFS-20	J2-490BF21	Phantom	26.5	436	0	14	30	35	35	15	50		45	10	190	
J490-HFS-10	J2-490BF22	Iceberg	33.4	451	3	14	25	35	40	15	60		45	15	110	90
J290-HFS-07	J2-490BF23	Mkr 112	14.0	576	2	14	25	35	35	15	60				400	
J490-HFS-03	J2-490BF24	Mkr 109	20.9	475	5	15	25	35	40	14	60				250	50
J490-HFS-22	J2-490F10	Phantom	25.6													
J490-HFS-05	J2-490F11	Mkr 109	23.8													
J490-HFS-12	J2-490F12	Iceberg	33.3													
J490-HFS-17	J2-490F13	Styx	54.3													
J490-HFS-06	J2-490F14	Mkr 109	20.5													
J490-HFS-11	J2-490F15	Iceberg	33.0													
J490-HFS-23	J2-490F16	Phantom	24.7													
J490-HFS-21	J2-490P6	Phantom	25.8	640	6	14	25	35	35	15	55	70			350	50
J490-HFS-16	J2-490P8	Styx	56.6	507	9	14	25	10	35	30	60	70	25	10	250	
J490-HFS-14	J2-490PF9	Styx	51.8	395	0	14	25	5	40	15	50		25		225	
J492-HFS-02	J2-492B17	Sulfur Vent	41.0	354	0	12	25	35	35	14	65	70		10	80	
J492-HFS-17	J2-492B18	Arrowhead	33.8	547	0	18	25	40	40		50	70	45		150	90
J492-HFS-12	J2-492B19	Styx	31.1	543	0	14	25	6	45	14	50		25	10	250	

Cruise Report Sample ID	HFS Sample number	Vent site	Tavg, °C	meas vol ml	gas head space vol	gas H2O ali-quot	H2S/Si	pH/alk	Nutrients	Sulfite	Majors	Micro-biology	S isotopes	O/H iso	Trace Metal	DOC
J492-HFS-09	J2-492B20	Sulfur Crust	26.3	521	0	14	25	35	40	14	60	35	45		225	
J492-HFS-24	J2-492BF21	background	6.7	592	0	14	30	35	40		65		25	10	250	90
J492-HFS-16	J2-492BF22	Arrowhead	34.2	487	0	14	25	35	40	14	60		70	10	220	
J492-HFS-11	J2-492BF23	Styx	31.0	505	0	14	30	5	40	14	60		25			
J492-HFS-08	J2-492BF24	Sulfur Crust	27.9	532	0	15	25	35	40	14	65			10	225	90
J492-HFS-18	J2-492F12	Arrowhead	33.4													
J492-HFS-13	J2-492F13	Styx	31.6													
J492-HFS-03	J2-492P2	Sulfur Vent	57.6	626	0	14	25	6	25	14	65		25	10	250	45
J492-HFS-21	J2-492P4	Sulfur Vent	62.9	641	30	14	25	6	35	15	50		25	10	400	50
J492-HFS-06	J2-492P6	Sulfur Vent	36.3	499	4	14	25	6	40	15	60		25		250	
J492-HFS-22	J2-492P8	Sulfur Vent	56.5	365	15	14	25	7		15	50				250	
J492-HFS-01	J2-492PF1	Sulfur Vent	51.4	419	0	14	25	35	35	15	50		25	12	210	
J492-HFS-19	J2-492PF3	Sulfur Vent	176.9	333	0	14	25	5		15	40		45	10	175	
J492-HFS-04	J2-492PF5	Sulfur Vent	41.7	430	6	14	25	6	35	15	65		25	10	230	
J492-HFS-23	J2-492PF7	Sulfur Vent	26.4	253	0	14	25	35	35	15	55				30	
J492-HFS-25	J2-492PF9	background	6.7	780	0	12	30	35	40		60		25	20	475	90
J494-HFS-3	J2-494B17	Iceberg SW of 110	18.2	434	0	14	25	35	35		55	70			210	
J494-HFS-7	J2-494B18	Mkr 117	40.7	500	55	14	25	35	40	14	50	70	65	10	125	45
J494-HFS-10	J2-494B19	Charon	77.7	345.2	400	14	15	6	35	30	40		20	10	170	
J494-HFS-9	J2-494BF22	Charon	29.1	511.5	0	14	20	35	40	30	65		20	10	260	
J494-HFS-6	J2-494BF23	Mkr 117	40.4	540	42	14	25	35	45	14	65	0	65	10	260	
J494-HFS-2	J2-494BF24	Iceberg SW of 110	14.5	151	0	14	15	6		14	30				55	
J494-HFS-4	J2-494F10	Iceberg SW of 110	18.4													
J494-HFS-5	J2-494F13	Iceberg SW of 110	16.5													
J494-HFS-16	J2-494P2	Charon2	46.2	703	12	14	15	6	35	30	60	70	20	10	250	90
J494-HFS-13	J2-494P8	Charon	122.8	647	230	14	15	6	35	15	50		20	10	500	
J494-HFS-15	J2-494PF1	Charon2	52.1	54	0.5	15	10	6			15					
J494-HFS-14	J2-494PF7	Charon	110.4	446	245	14	15	6	35	15	55		20	10	260	
J494-HFS-11	J2-494PF9	Charon	106.0	490	168	14	15	6	45	30	50		20	10	130	
J495-Major-04	J2495Major	Sulfur Vent	none		0	0	20	6	30	14	60				100	

All sample volumes in milliliters

All filter samples (Sterivex and RNA-preserved) were given to the Huber lab

DOC samples go to Aron Stubbins, Old Dominion

All other fluid samples to the Butterfield lab

4.3.2 Gas Sampling

Leigh Evans

The 2010 expedition to NW Rota included gathering of samples in gastight bottles. Thirteen of them can be expected to yield useable data. Both fluids and gas bubbles were gathered. The main analyses will be helium isotopes, carbon dioxide, sulfur dioxide and hydrogen. As in 2006 and 2009 fluids exhibited gas concentrations from 20 to over 100 millimoles per kilogram. In contrast to previous years the sampling sites did not include Brimstone Vent proper. Similar expressions of NW Rota's volcanism were found. All were in the same neighborhood as Brimstone.

Table 4.3.2-1 Gas sample amounts.

Dive	GTB	tape color	Vent	wt. (g)	Vent T °C	m-mole/kg	Sampler Note
J2 487	GT 9	red	Phantom	164	none		
J2 487	GT 2	green	Phantom	159	none		
J2 488	GT 9	red	Phantom bubbles	0			clear funnel
J2 488	GT 6	none	Phantom bubbles	0			red funnel
J2 488	GT 5	stbd HFS	N. Brimstone	151	43	13	
J2 488	GT 2	port HFS	Phantom	153	138	112	
J2 489	GT 7	B&O	Mkr 109	190	low	22	
J2 489	GT 9	red	Iceberg Mkr 110	191	none	17	
J2 490	GT 5	stbd HFS	Styx	109	52	44	low weight / hydraulic ram problems
J2 492	GT 2	port HFS	Sulfur Vent	156	53	74	empirical gas concentration
J2 492	GT 2	port HFS	Sulfur Vent corr air	156	53	33	subtracted approx air in GTB trig on deck
J2 492	GT 5	stbd HFS	Sulfur Vent	148	47	21	
J2 494	GT 2	port HFS	Charon	156	126	107	
J2 495	GT 7	B&O	Sulfur Vent	pending		~25	
J2 495	GT 9	red funnel		not good		~2	gas bubble sample had been filled with seawater, NG

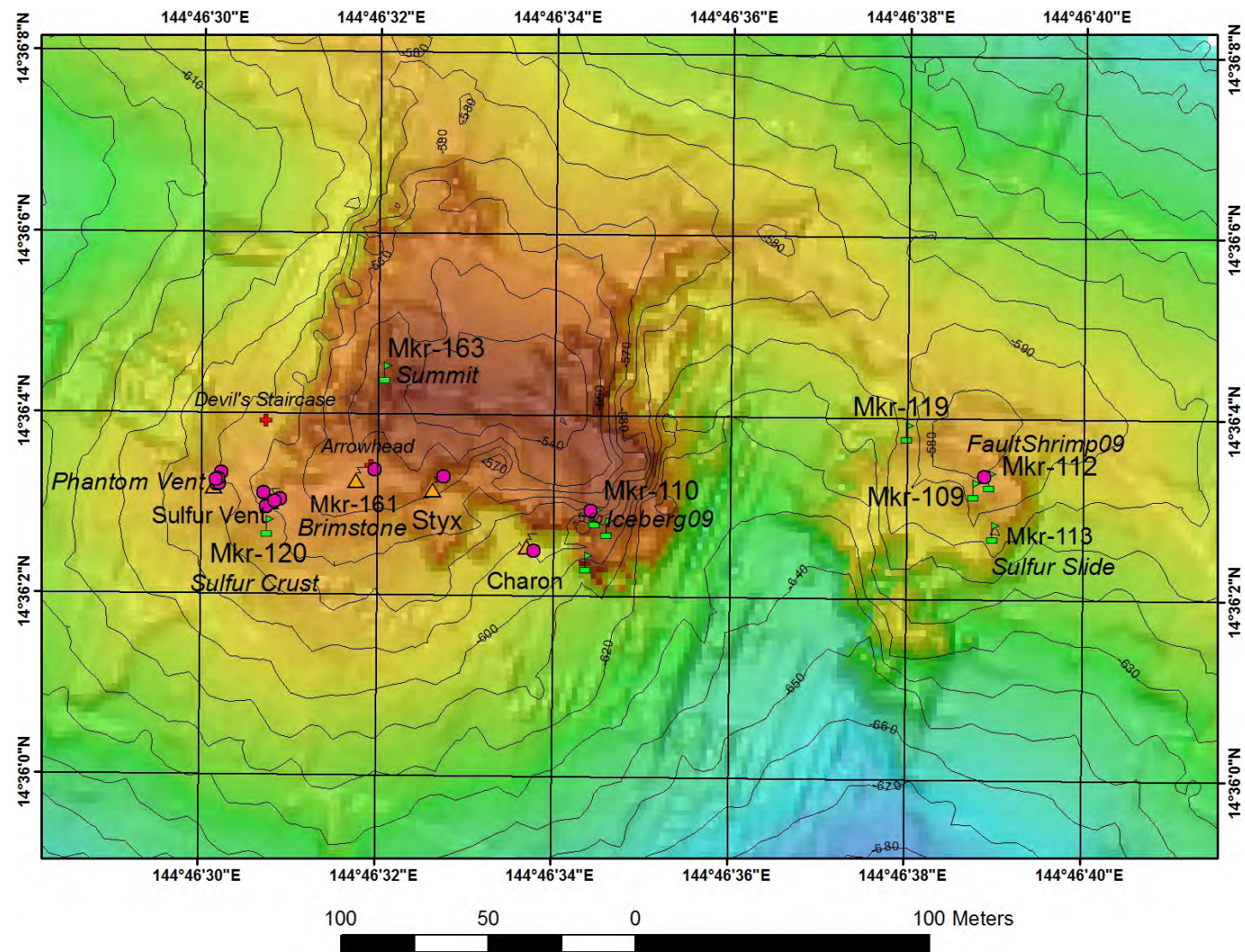
Table 4.3.2-1 Gas samples by location.

Sample Name	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Heading	Dive log comments	Virtual Van Record
J488-GTHFS-10	Arrowhead	3/19/2010 21:09	14.60094	144.77560	545.4	546.5	36.6	STBD gastight #5 on the beast. Temp was 43°. At Arrowhead in the same crack as other fluid samples.	1201

Sample Name	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Heading	Dive log comments	Virtual Van Record
J494-GTHFS-12	Charon Vent	3/27/2010 0:40	14.60069	144.77610	325.5	589.0	325.5	Port HFS bottle #2. Same crack as previous samples., fairly steady activity at vent. T=126deg.	6949
J489-GTB-03	Mkr-109	3/20/2010 23:59	14.60093	144.77752	563.6	666.2	222.6	Orange and Black tape bottle #7 at Mkr-109. Wand in the crack below Mkr-109. No temperature measurement, low.	2374
J489-GTB-05	Mkr-110 Iceberg09	3/21/2010 2:20	14.60082	144.77628	532.9	538.3	339.9	Red gastight bottle #9 at Mkr-110. Tip was in flow-not in sediment. HDG=340. No temperature measurement; low.	2609
J487-GTB-06	Phantom Vent	3/20/2010 21:02	14.60089	144.77510	566.9	570.3	106.1	Red gas-tight bottle #9 at Phantom Vent. Tip in yellow part of plume. Saw bottle jerk when fired. No temperature measurement.	615
J487-GTB-07	Phantom Vent	3/21/2010 5:04	14.60093	144.77511	566.3	568.9	130.6	Green gas-tight #2 at Phantom Vent. Getting temps from 40 - 106 deg C. Bottle in the bubbles. Shift change delay. GTB fired at 0148.	626
J488-GTHFS-19	Phantom Vent	3/20/2010 0:41	14.60089	144.77510	565.2	566.7	103.8	PORT bottle #2 fired during sample J488-HFS-18. T=138deg.	1582
J488-GTB-23	Phantom Vent	3/20/2010 1:16	14.60091	144.77510	565.1	566.3	96.5	Red tape-clear funnel bottle #9. Can see bubbles in the funnel and more entering. Could see level of bubbles go up when fired.	1640
J488-GTB-24	Phantom Vent	3/20/2010 1:30	14.60090	144.77510	565.3	566.7	70.9	Red bubble catcher funnel bottle #6. Temp was ~195°C when measured earlier. Funnel is right in the plume. Lots of bubbles coming out of the plume when fired (01:34). The gastight was taken in the plume.	1656
J490-GTHFS-15	Styx Vent	3/22/2006 3:22	14.60092	144.77581	558.0	559.9	16.8	Styx vent with good exhaust. Saw trigger. Very slow to fill. Odd. Extending and retracting again and still slow. Assume that the GTHFS was taken.	3739
J492-GTHFS-05	Sulfur Vent	3/24/2010 20:45	14.60087	144.77525	557.3	559.8	137.1	Fired (20:44:30). Temp 47° T2=12 Third sampling location here at Sulfur Vent (on the N/NW side of this large Sulfur Vent target). We are on the west side of Sulfur Vent. The wand may be plugged up. This sample was the starboard gas tight.	5174
J492-GTHFS-20	Sulfur Vent	3/25/2010 4:24	14.60082	144.77525	557.2	560.5	125.9	Wand in higher flow. Bubbles in front. Port fired. T=53.	5776

Sample Name	Location	Date Time	Latitude	Longitude	Jason Depth	Total Depth	Heading	Dive log comments	Virtual Van Record
J495-GTB-03	Sulfur Vent	3/28/2010 23:11	14.60085	144.77530	555.7	557.4	70.3	Red funnel on gas tight bottle. Lots of bubbles with funnel in the plume bubble stream. Activity here at this vent is continuous and sampler was burped prior trigger.	8183
J495-GTB-06	Sulfur Vent	3/29/2010 0:08	14.60084	144.77528	555.7	557.3	58.8	Fired at Sulfur Vent with tip in yellow part of plume. Orange-black tape on sampler bottle.	8258

Figure 4.3.2-1 2010 Gas samples



4.4 Water Column Operations

4.4.1 CTD/MAPR

Sharon Walker

2010 NW Rota – Plume mapping

We had intended to conduct CTD tows and vertical casts every night during the cruise to thoroughly survey the water column over NW Rota-1 and map the distribution of the volcanic/hydrothermal plumes over the summit. We also wanted to determine if there were any deep turbidity layers around the flanks of the volcano as had been seen in previous years. A new CTD handling crane and winch system had just been installed on the ship during the shipyard visit prior to this cruise. This system (crane and winch) experienced problems during each of the three casts we attempted (see Table 4.4.1-1). Shortly into the third deployment, all power was lost throughout the ship. The CTD winch was irreparably damaged during this incident and no further CTD operations were possible for the duration of the cruise.

However, we had one PMEL MAPR (Miniature Autonomous Plume Recorder), which measures temperature, pressure, optical backscattering and oxidization-reduction potential (ORP), and deployed it whenever possible: it was attached to MEDEA for every Jason dive (except J487); it was attached to every plankton net tow lowering (using the SeaMac winch and 600m of rope with a 400 lb weight at the bottom); and we did additional MAPR-only casts using the SeaMac winch and line without the plankton net attached. We were able to occupy one line of 6 stations south of the volcano summit four times during the cruise. Currents during the cruise (from ship-board ADCP) were predominantly to the south, southwest or southeast, so this line reasonably intersected the plume downstream of the vent. The resulting data shows both short-term consistency and variability in the intensity and distribution of the plume layers. No water samples for chemical characterization of the plume could be collected without the CTD.

Table 4.4.1-1 Plume Mapping Operations.

Operation	Station name	Start date/time	End date/time	Lat (deg)	Lat (min)	Long (deg)	Long(min)	Comments
CTD	test cast	16-Mar-2010 13:15	16-Mar-2010 14:08	13	14.5170	144	1.0090	CTD test cast at Seamount X - problems during cast - error lights on CTD deck box seemed to be related to winch speed. Carousel did not respond to bottle trips. Level wind messed up and wire wound onto drum unevenly and kinked. Marine techs will reterminate wire and change slip rings.
MAPR on Medea	J486	16-Mar-2010 18:19	16-Mar-2010 21:12	13	14.65	144	1.1	Seamount X - Jason dive aborted after reaching bottom due to hard ground faults. MAPR profile showed plume ~1160-1350m (max ~1220m) with both LSS and ORP anomalies
CTD	V10A-01	17-Mar-2010 12:54	17-Mar-2010 14:04	14	36.0760	144	46.4320	CTD test cast at NW Rota - was supposed to be at RAS mooring site but ship ended up at wrong position. Cast was successful (no error lights). Marine techs had not changed slip rings (spare on board was unusable) but checking and re-setting connection improved performance. 3 bottles were tripped in plume for water for Dave Butterfield and Eric Olson. All bottles closed during test of carousel near surface. Altimeter (SN 1035) did not work well. Crane failed during recovery and to get it functional again the Marine techs had to swap the solenoid that controls "boom" with that for the "knuckle" function. The crane will no longer be able to boom in/out.
CTD	V10A-02	18-Mar-2010 11:11	18-Mar-2010 15:38	14	34.3440	144	45.5420	This was to be a cast to 2000m downslope of Brimstone (NW Rota) to test second altimeter (SN 572) and look for deep plumes coming off flanks of NW Rota. Major power failure of entire ship occurred during this cast (CTD was at 694m). People smelled smoke in many parts of the ship. No fire was detected and power was restored to the ship, however, the CTD winch had suffered irreparable damage. Bow-thruster was also damaged. The CTD sat at 694m for several hours while the situation was resolved. The CTD had to be recovered using the SeaMac winch (on board for plankton net tows and mooring recoveries). No further CTD operations were possible.
MAPR on Medea	J489	20-Mar-2010 18:22		14	36.2517	144	46.8121	NW Rota - summit
			21-Mar-2010 05:48	14	36.1540	144	46.6547	J489 end
Plankton tow	PL-NWRota-01	22-Mar-2010 05:10	20-Mar-2010 06:08	14	36.1800	144	46.3800	MAPR on plankton net tows - also had a hydrophone attached to the MAPR
Plankton tow	PL-NWRota-02	22-Mar-2010 07:03	20-Mar-2010 08:15	14	35.9400	144	46.3800	MAPR on plankton net tows - also had a hydrophone attached to the MAPR

Operation	Station name	Start date/time	End date/time	Lat (deg)	Lat (min)	Long (deg)	Long(min)	Comments
Plankton tow	PL-NWRota-03	22-Mar-2010 08:52	20-Mar-2010 10:00	14	35.9400	144	46.6800	MAPR on plankton net tows - also had a hydrophone attached to the MAPR
Plankton tow	PL-NWRota-04	22-Mar-2010 10:53	20-Mar-2010 11:35	14	36.1800	144	46.6800	MAPR on plankton net tows - also had a hydrophone attached to the MAPR
MAPR on Medea	J490	22-Mar-2010 18:13		14	33.0047	144	44.0230	NW Rota - summit
			23-Mar-2010 08:52	14	36.0957	144	46.7400	J490 end
MAPR on Medea	J491	23-Mar-2010 18:06		14	36.0918	144	46.8638	NW Rota - deep dive to look for mooring. No deep plumes coming off flanks of volcano, however, appears there may be some venting ~1338m (Bob saw what he thought was mat and the ORP sensor had a response ~1331m)
			24-Mar-2010 05:42	14	35.6271	144	46.3994	J491 end
MAPR on Medea	J492	24-Mar-2010 18:02		14	34.1489	144	45.1169	NW Rota - summit
			25-Mar-2010 05:56	14	36.3370	144	46.4721	
Plankton tow	PL-NWRota-05	25-Mar-2010 09:30	25-Mar-2010 10:12	14	36.2000	144	46.4100	"NW" position
Plankton tow	PL-NWRota-06	25-Mar-2010 10:17	25-Mar-2010 11:01	14	36.2000	144	46.4100	"NW" position - repeated (for extra volume of sample)
Plankton tow	PL-NWRota-07	25-Mar-2010 11:44	25-Mar-2010 12:16	14	35.9500	144	46.6100	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-08	25-Mar-2010 12:36	25-Mar-2010 13:15	14	35.9500	144	46.5200	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-09	25-Mar-2010 13:35	25-Mar-2010 14:17	14	35.9500	144	46.4100	MAPR attached to plankton net tow
MAPR cast	M10A-01	25-Mar-2010 14:36	25-Mar-2010 15:05	14	35.9500	144	46.3020	MAPR only (plankton tows done for the day)
MAPR cast	M10A-02	25-Mar-2010 15:19	25-Mar-2010 15:56	14	35.9500	144	46.2020	MAPR only (plankton tows done for the day)
MAPR on Medea	J493	25-Mar-2010 18:05		14	36.3091	144	46.6715	NW Rota - SM2000 survey
			26-Mar-2010 08:32	14	35.9786	144	46.7148	J493 end
Plankton tow	PL-NWRota-10	26-Mar-2010 09:51	26-Mar-2010 10:51	14	35.9500	144	46.6000	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-11	26-Mar-2010 11:21	26-Mar-2010 12:07	14	35.9500	144	46.5100	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-12	26-Mar-2010 12:29	26-Mar-2010 13:13	14	35.9500	144	46.4100	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-13	26-Mar-2010 13:35	26-Mar-2010 14:29	14	35.9500	144	46.3100	MAPR attached to plankton net tow
MAPR	M10A-03	26-Mar-2010	26-Mar-2010 15:17	14	35.9500	144	46.2100	plankton tows done - MAPR only

Operation	Station name	Start date/time	End date/time	Lat (deg)	Lat (min)	Long (deg)	Long(min)	Comments
cast		14:45						
MAPR on Medea	J494	26-Mar-2010 18:02		14	35.9318	144	46.7996	NW Rota - summit
			27-Mar-2010 05:44	14	36.0527	144	46.5555	J494 end
Plankton tow	PL-NWRota-14	27-Mar-2010 09:18	27-Mar-2010 09:56	14	35.9500	144	46.2100	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-15	27-Mar-2010 10:20	27-Mar-2010 10:59	14	35.9500	144	46.3100	MAPR attached to plankton net tow
Plankton tow	PL-NWRota-16	27-Mar-2010 11:21	27-Mar-2010 11:59	14	35.9500	144	46.4100	MAPR attached to plankton net tow
MAPR cast	M10A-04	27-Mar-2010 12:17	27-Mar-2010 12:57	14	35.9500	144	46.5100	MAPR only (plankton tows done for the day)
MAPR cast	M10A-05	27-Mar-2010 13:10	27-Mar-2010 13:50	14	35.9500	144	46.6100	MAPR only (plankton tows done for the day)
MAPR cast	M10A-06	28-Mar-2010 11:06	28-Mar-2010 11:52	14	35.9500	144	46.2060	MAPR only (plankton tows done for the day)
MAPR cast	M10A-07	28-Mar-2010 12:11	28-Mar-2010 12:55	14	35.9500	144	46.3020	MAPR only (plankton tows done for the day)
MAPR cast	M10A-08	28-Mar-2010 13:11	28-Mar-2010 13:54	14	35.9500	144	46.4060	MAPR only (plankton tows done for the day)
MAPR cast	M10A-09	28-Mar-2010 14:08	28-Mar-2010 14:38	14	35.9500	144	46.6220	MAPR only (plankton tows done for the day)
MAPR cast	M10A-10	28-Mar-2010 14:55	28-Mar-2010 16:28	14	35.9500	144	46.5090	MAPR plus attached a hydrophone to the weight, sat @ 500m for ~1hr

Plume mapping results

Seamount X

The first CTD cast was attempted at Seamount X where we stopped on the way to NW Rota-1. The cast was aborted due to data transmission errors. The problem appeared to be related to winch slip rings since data transmission errors increased with increasing winch speed, and were absent when the winch was stopped. In lieu of a CTD cast, the MAPR was attached to MEDEA during the Jason dive at this location. Fortunately, Jason made it to the seafloor before developing problems which aborted the dive. The MAPR returned a complete profile near the summit of Seamount X (figure xx) which confirmed this site is still hydrothermally active. A particle plume was present between 1160-1290 m with both particle and ORP anomalies. The plume maximum occurred at ~1240 m.

Figure 4.4.1-1. Profiles of optical backscatter (LSS) and oxidation-reduction potential (ORP) from the MAPR mounted on MEDEA during Jason dive J486 at Seamount X. The offset in LSS voltage at ~700 m during the downcast and ~475 m during the upcast is correlated with the times when lights on MEDEA were turned on.

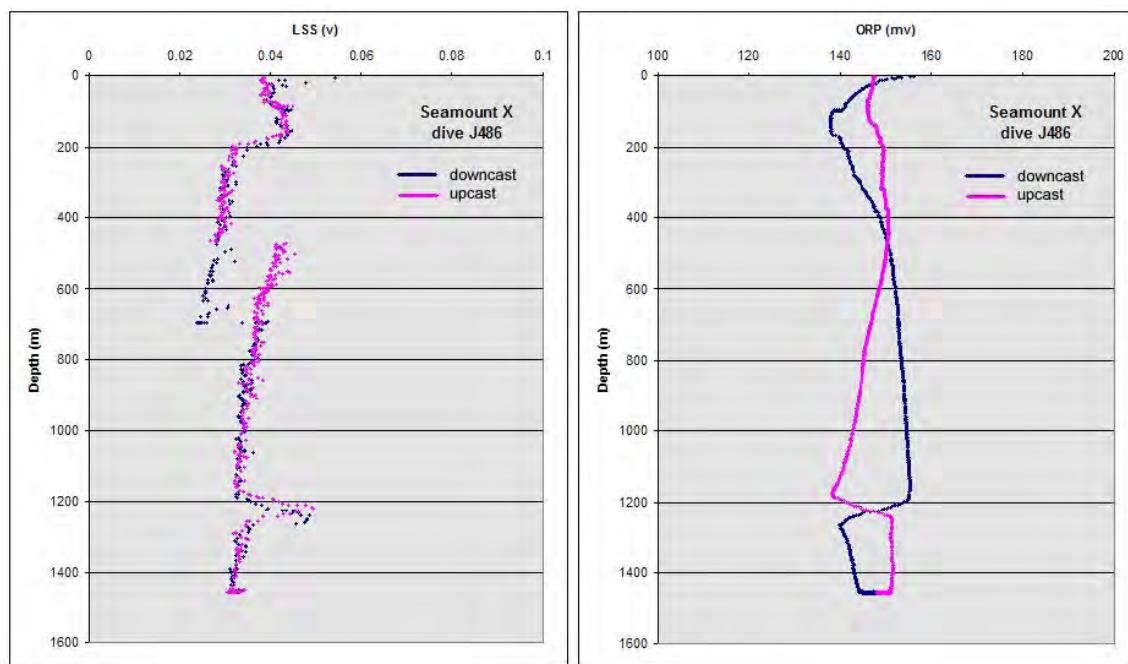
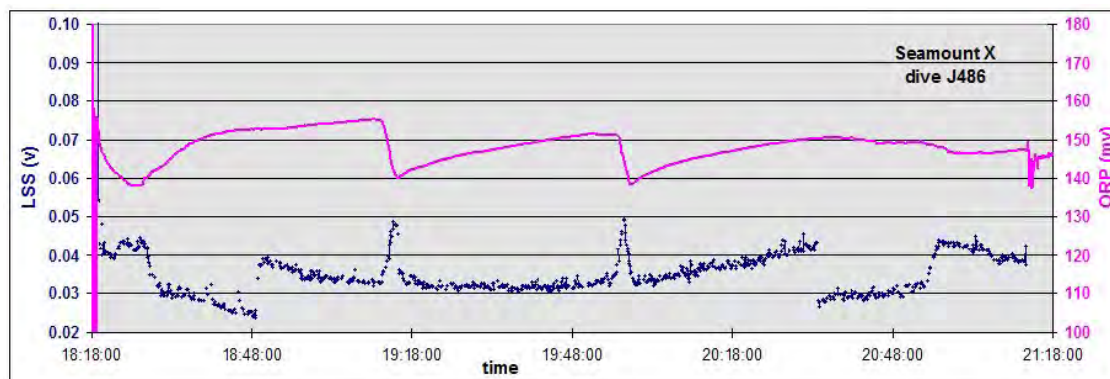


Figure 4.4.1-2. Optical backscatter (LSS) and oxidation-reduction potential (ORP) vs time during dive J486. The ORP anomalies occur coincident with LSS anomalies.

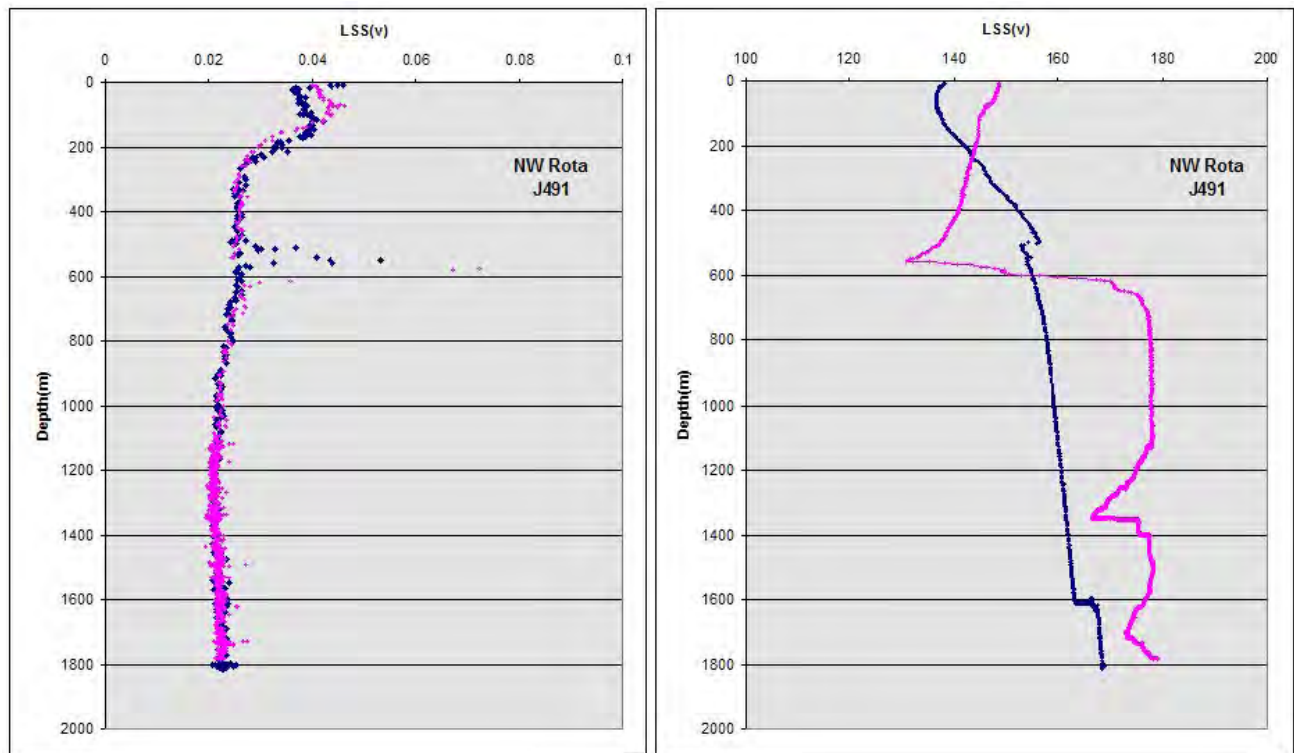


Deep plumes at NW Rota-1

Deep turbidity layers have been observed around the flanks of NW Rota-1 during previous surveys. These plume layers are characteristically absent of hydrothermal tracers and are believed to be the result of sediment gravity flows initiated by slope failure or eruption column collapse related to the eruptive activity at Brimstone Pit. Jason dive J491 was to survey the deposits downslope of Brimstone Pit, beginning at a depth of ~1800 m and travelling upslope to slightly shallower than 1100 m. The beginning of the dive was also dedicated to searching for the mooring that was originally deployed at the 1500 m contour on the flank of NW Rota-1. Jason was near the seafloor as the dive progressed upslope and no deep turbidity layers were detected.

An unexpected ORP anomaly occurred at a depth of ~1331 m; there was no corresponding LSS anomaly, however, dive notes include an observation of possible venting and bacterial mat at about the same depth as the ROV travelled upslope. The MAPR data provides supporting evidence of active venting deeper on the flank at NW Rota-1 almost 800 m deeper than the summit.

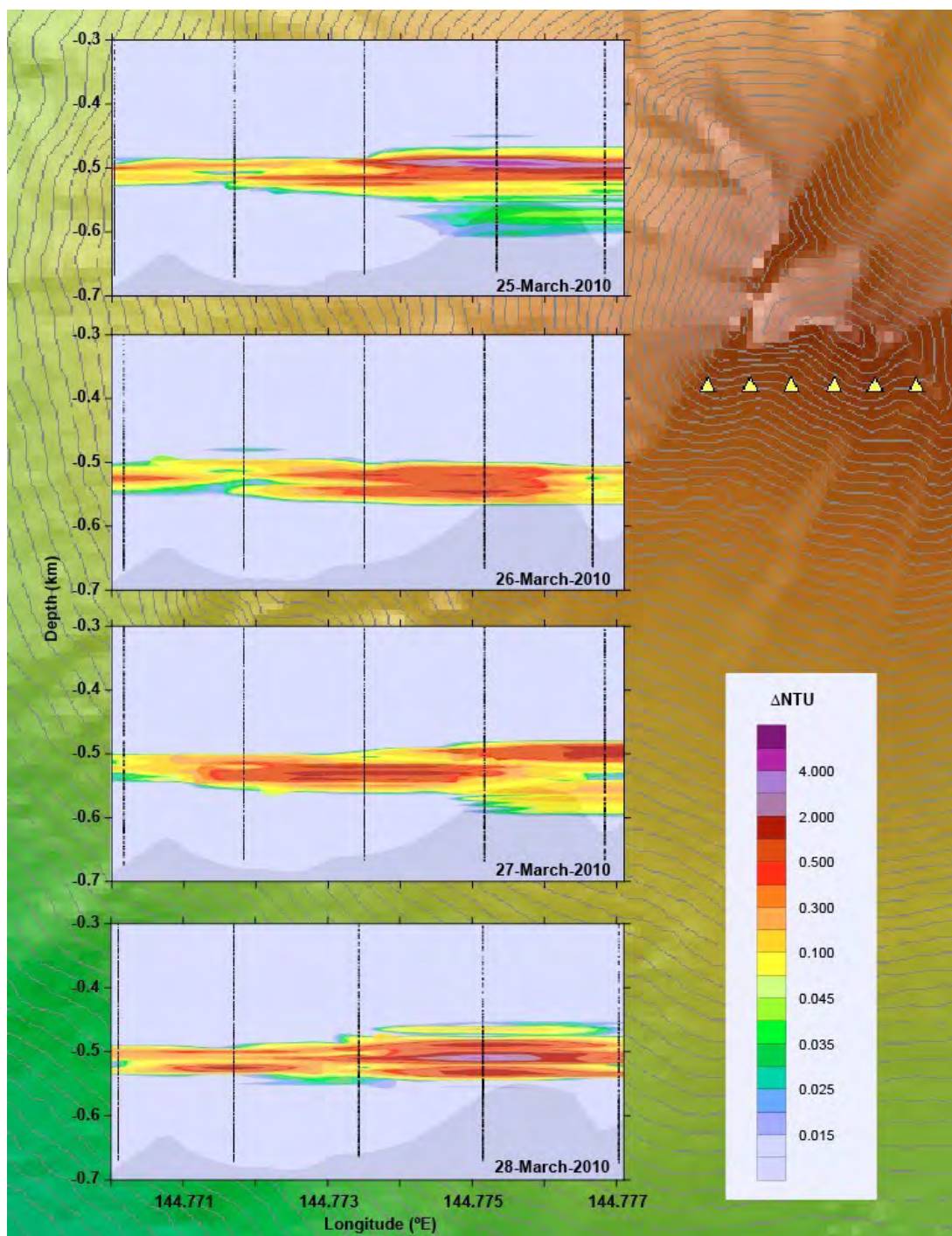
Figure 4.4.1-3. Optical backscatter (LSS) and oxidation-reduction potential (ORP) profiles from dive J491. There is no evidence of deep particle layers around the flanks of NW Rota-1, however, the ORP anomaly at 1331 m is correlated with observations of possible venting and bacterial mat near that same depth.



Short-term plume variability downstream of Brimstone Pit

MAPR profiles at 6 stations along a line south of the summit of NW Rota-1 were collected both in conjunction with plankton net tows and independently on four consecutive nights. The line was believed to largely transect the plume downstream of Brimstone Pit since currents (from hull-mounted ADCP) were predominantly to the south, southwest or southeast. The plume is consistently about 50-100 m thick, intense (dNTU max > 1 v) and centered at a depth of 500-550 m, with even thinner layers within this range. On two of the nights there is an additional plume layer slightly deeper (to 600 m) seen in the two eastern-most stations. The station line did not extend far enough to define the outer edge of the plume.

Figure 4.4.1-4. Particle anomaly (ΔNTU) from MAPR profiles at 6 stations south of the summit of NW Rota-1. Map of the summit area in the background; station locations indicated by yellow triangles on the map and by black lines in the transect plots; depth profile along a line over the summit (north of the station line) is shown in light grey.

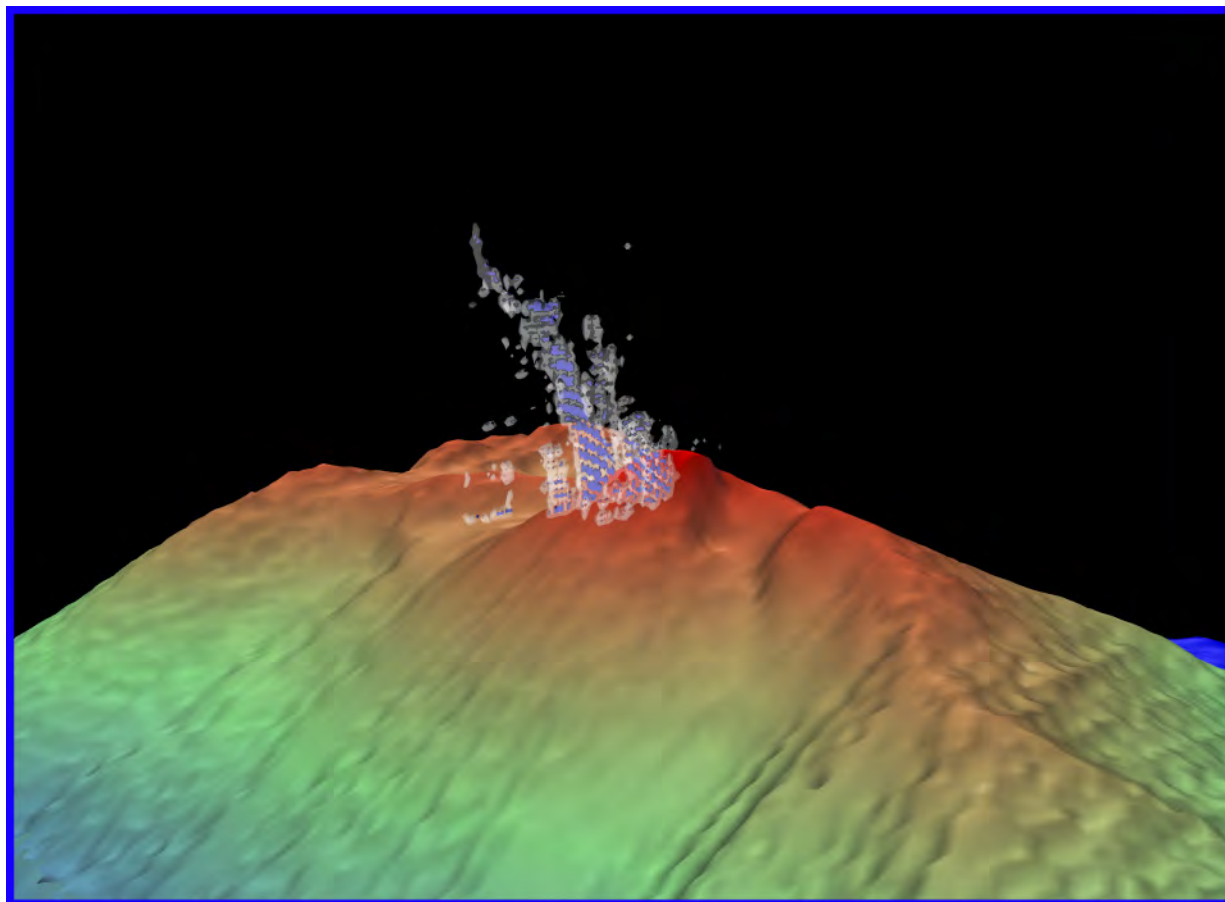


4.4.2 EM122 Water Column Mapping

Susan Merle

The new EM122 multibeam system on the R/V *Kilo Moana* has the capability of mapping the water column as well as the seafloor. The SIS (Seafloor Information System) water column display for real-time data logging on the *Kilo Moana* shows an image of biomass and other acoustic reflectors that might be present between the seafloor and sea surface. On our cruise to NW Rota-1 the bubble plumes rising from the eruptive vents near the summit were plainly visible. Due to problems with the ships crane we were not able to perform CTD operations on the cruise. Some of the time that would have been used for CTD work was instead used to image the bubble plumes. The spreadsheet accompanying this report shows the number of lines over the summit of the volcano during which water column data was collected. Various speeds and directions were tried. It was found that the best results were obtained by motoring into the seas and “drifting” back, not turning the vessel. This survey pattern allowed the ship to make controlled passes over the summit vents at a slow rate of speed. Due to prevailing winds, the plumes were mainly imaged in a NW/SE orientation at about 1 to 2 knots for best results. The NW/SE direction also proved best for imaging the individual vents and their contributions to the plume - due to the W/E orientation of the vents. ADCP data was also collected during water column surveys.

Figure 4.4.2-1 3-D map of NW Rota-1 showing gas bubbles mapped with the EM122 system. Water column data is from a single navigation line across the high-temperature vents.



4.4.3 Acoustic Doppler Current Profiling (ADCP)

Nathaniel Buck

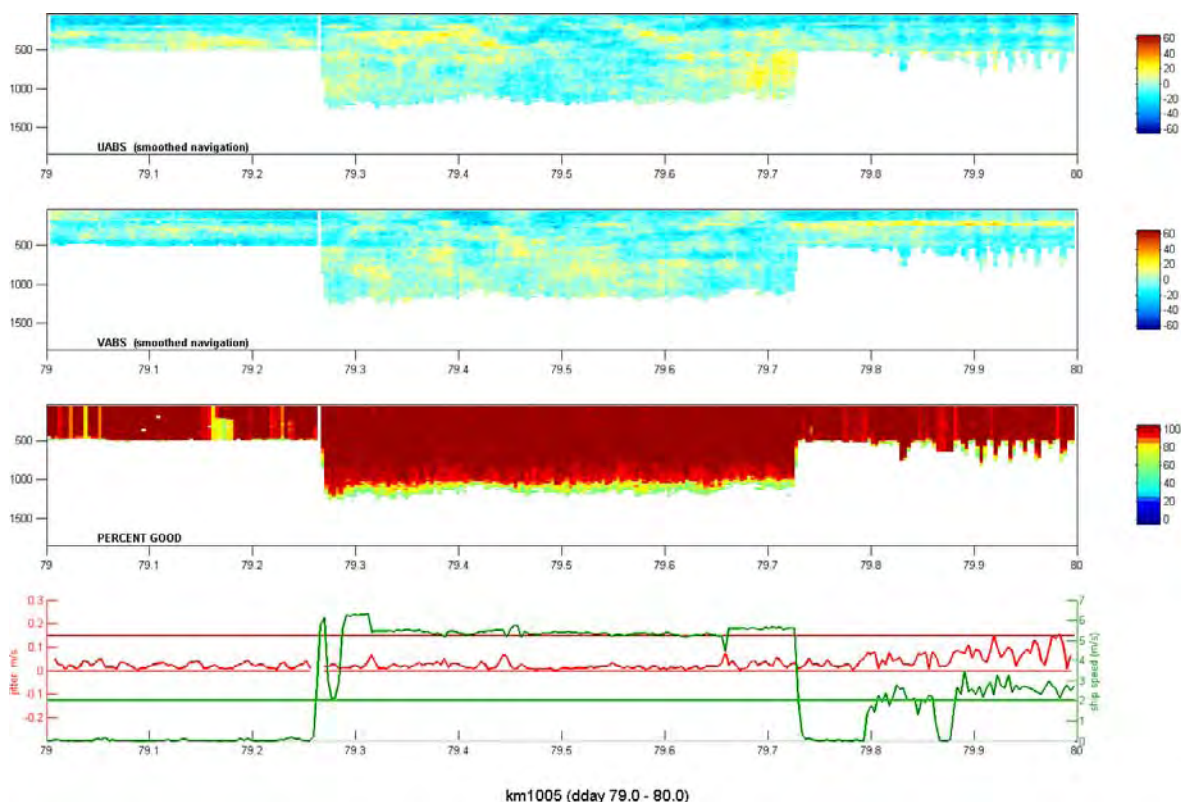
Acoustic doppler current profiling (ADCP) data were collected to provide current vector measurements to be used with continuous and discrete CTD data for flux calculations and for comparison with the EM122 water column data. The *Kilo Moana* is equipped with a RDI 38KHz “Ocean Surveyor” ADCP which was operated in both narrowband and broadband

modes. Current data was collected for the duration of the cruise using UHDAS (University of Hawaii data acquisition system) a suite of programs developed by the University Hawaii which performs at sea data acquisition, processing and monitoring. Post processing was done using a CODAS database (Common Ocean Data Access System) in conjunction with Gautoedit which is collection of Matlab programs for extracting and displaying velocity and other ancillary data and is also provided by the University of Hawaii.

Further details concerning ocean currents data can be found at the Joint Archive for Shipboard ADCP (<http://ilikai.soest.hawaii.edu/sadcp/>) which “is responsible for the acquisition, review, documentation, archival and distribution of shipboard ADCP sets.”

Both broadband and narrow narrowband data were processed to 5 minute averages. Broadband profiles reached a depth of 1000m; Narrowband profiles reached a depth of 1250m. Final processed outputs are written as Matlab files and provide time, x, y, z, u and v. All times are in UTC and the decimal day is a zero-based value (Noon on January 1 UTC is 0.5, not 1.5)

Figure 4.4.3-1 Panel Plots for narrowband data produced by Gautoedit displaying absolute u and v velocities (cm/sec) as well as PG(or ‘Percent Good,’ the number of accepted pings for a given ensemble) and ship speed.



2010/04/02 10:52:31

Figure 4.4.3-2 Panel Plots for narrowband data produced by Gautoedit displaying latitude and longitude (top panel) as well as the ships course (bottom panel) in Cartesian coordinates overlaid with vector plots for the average current between 450 and 500 meters. Bottom panel has ship track over simplified bathymetry (depth values indicated by legend).

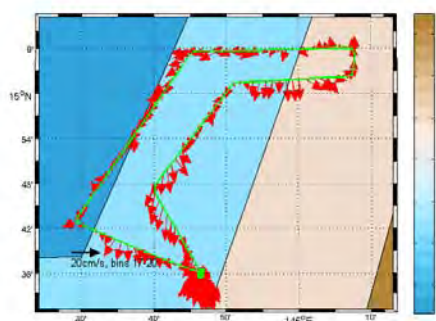
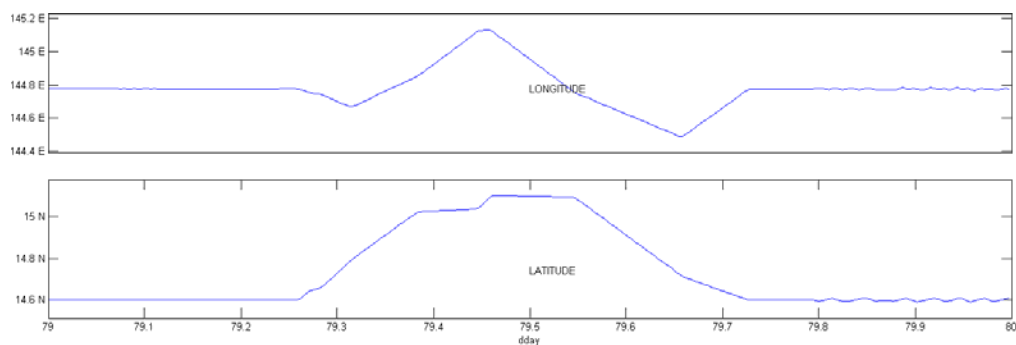
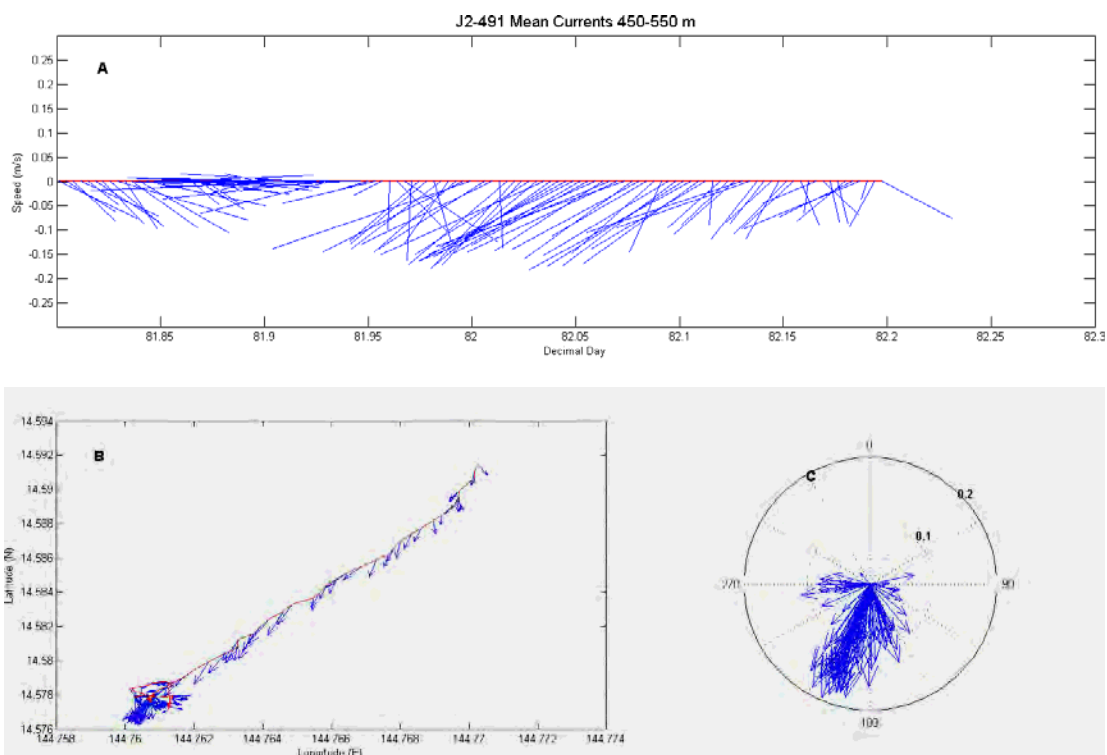


Figure 4.4.3-3 An example of processed ADCP data for Jason dive J2-491 between depths 450 and 550; **A** – current magnitude and directions vs. elapsed day; **B** – vector plot in Cartesian coordinates with ship track **C** – Compass.



4.5 HD video, HD framegrabs and DSC still imagery

Table 4.5-1 JASON DVD Videos Listing. Time and date are GMT. Cameras identifications are Pilot's Pan/Tilt (PC), Brow Cam (BC), and Science 3-Chip (SC).

Video DVD ID	Start Date/Time	End Date/Time	Lowering	Site	Comments	Time Rec
DVD-001-BC-A	2010/03/16 19:24	2010/03/16 19:48	J2-486	Seamount X		0:24:29
DVD-001-PC-A	2010/03/16 19:24	2010/03/16 19:48	J2-486	Seamount X		0:24:29
DVD-001-SC-A	2010/03/16 19:24	2010/03/16 19:48	J2-486	Seamount X		0:24:29
DVD-002-BC-A	2010/03/17 19:10	2010/03/17 21:09	J2-487	NW Rota-1		1:59:00
DVD-002-PC-A	2010/03/17 19:10	2010/03/17 21:09	J2-487	NW Rota-1		1:59:00
DVD-002-SC-A	2010/03/17 19:10	2010/03/17 21:09	J2-487	NW Rota-1		1:59:00
DVD-003-BC-A	2010/03/17 21:07	2010/03/17 23:07	J2-487	NW Rota-1		2:00:00
DVD-003-PC-A	2010/03/17 21:07	2010/03/17 23:07	J2-487	NW Rota-1		2:00:00
DVD-003-SC-A	2010/03/17 21:07	2010/03/17 23:07	J2-487	NW Rota-1		2:00:00
DVD-004-BC-A	2010/03/17 23:05	2010/03/18 01:05	J2-487	NW Rota-1		2:00:00
DVD-004-PC-A	2010/03/17 23:05	2010/03/18 01:05	J2-487	NW Rota-1		2:00:00
DVD-004-SC-A	2010/03/17 23:05	2010/03/18 01:05	J2-487	NW Rota-1		2:00:00
DVD-005-BC-A	2010/03/18 01:01	2010/03/18 03:02	J2-487	NW Rota-1		2:01:00
DVD-005-PC-A	2010/03/18 01:01	2010/03/18 03:02	J2-487	NW Rota-1		2:01:00
DVD-005-SC-A	2010/03/18 01:01	2010/03/18 03:02	J2-487	NW Rota-1		2:01:00
DVD-006-BC-A	2010/03/18 02:58	2010/03/18 04:58	J2-487	NW Rota-1		2:00:00
DVD-006-PC-A	2010/03/18 02:58	2010/03/18 04:58	J2-487	NW Rota-1		2:00:00
DVD-006-SC-A	2010/03/18 02:58	2010/03/18 04:58	J2-487	NW Rota-1		2:00:00
DVD-007-BC-A	2010/03/18 04:54	2010/03/18 05:28	J2-487	NW Rota-1		0:34:00
DVD-007-PC-A	2010/03/18 04:54	2010/03/18 05:28	J2-487	NW Rota-1		0:34:00
DVD-007-SC-A	2010/03/18 04:54	2010/03/18 05:28	J2-487	NW Rota-1		0:34:00
DVD-008-BC-A	2010/03/19 18:41	2010/03/19 20:40	J2-488	NW Rota-1		1:59:00
DVD-008-PC-A	2010/03/19 18:41	2010/03/19 20:40	J2-488	NW Rota-1	<i>pilot cam out 19:35</i>	1:59:00
DVD-008-SC-A	2010/03/19 18:41	2010/03/19 20:40	J2-488	NW Rota-1		1:59:00
DVD-009-BC-A	2010/03/19 20:36	2010/03/19 22:36	J2-488	NW Rota-1		2:00:00
DVD-009-PC-A	2010/03/19 20:36	2010/03/19 22:36	J2-488	NW Rota-1	<i>no pilot cam</i>	2:00:00
DVD-009-SC-A	2010/03/19 20:36	2010/03/19 22:36	J2-488	NW Rota-1		2:00:00
DVD-010-BC-A	2010/03/19 22:34	2010/03/20 00:34	J2-488	NW Rota-1		2:00:00
DVD-010-PC-A	2010/03/19 22:34	2010/03/20 00:34	J2-488	NW Rota-1	<i>no pilot cam</i>	2:00:00
DVD-010-SC-A	2010/03/19 22:34	2010/03/20 00:34	J2-488	NW Rota-1		2:00:00
DVD-011-BC-A	2010/03/20 00:31	2010/03/20 02:30	J2-488	NW Rota-1		1:59:00
DVD-011-PC-A	2010/03/20 00:31	2010/03/20 02:30	J2-488	NW Rota-1	<i>no pilot cam</i>	1:59:00
DVD-011-SC-A	2010/03/20 00:31	2010/03/20 02:30	J2-488	NW Rota-1		1:59:00
DVD-012-BC-A	2010/03/20 02:28	2010/03/20 04:28	J2-488	NW Rota-1		2:00:00
DVD-012-PC-A	2010/03/20 02:28	2010/03/20 04:28	J2-488	NW Rota-1	<i>no pilot cam</i>	2:00:00
DVD-012-SC-A	2010/03/20 02:28	2010/03/20 04:28	J2-488	NW Rota-1		2:00:00
DVD-013-BC-A	2010/03/20 04:25	2010/03/20 05:24	J2-488	NW Rota-1		0:59:00
DVD-013-PC-A	2010/03/20 04:25	2010/03/20 05:24	J2-488	NW Rota-1	<i>no pilot cam</i>	0:59:00
DVD-013-SC-A	2010/03/20 04:25	2010/03/20 05:24	J2-488	NW Rota-1		0:59:00
DVD-014-BC-A	2010/03/20 18:54	2010/03/20 20:54	J2-489	NW Rota-1		2:00:00
DVD-014-PC-A	2010/03/20 18:54	2010/03/20 20:54	J2-489	NW Rota-1		2:00:00
DVD-014-SC-A	2010/03/20 18:54	2010/03/20 20:54	J2-489	NW Rota-1		2:00:00
DVD-015-BC-A	2010/03/20 20:51	2010/03/20 22:51	J2-489	NW Rota-1		2:00:00
DVD-015-PC-A	2010/03/20 20:51	2010/03/20 22:51	J2-489	NW Rota-1		2:00:00

Video DVD ID	Start Date/Time	End Date/Time	Lowering	Site	Comments	Time Rec
DVD-015-SC-A	2010/03/20 20:51	2010/03/20 22:51	J2-489	NW Rota-1		2:00:00
DVD-016-BC-A	2010/03/20 22:49	2010/03/21 00:49	J2-489	NW Rota-1		2:00:00
DVD-016-PC-A	2010/03/20 22:49	2010/03/21 00:49	J2-489	NW Rota-1		2:00:00
DVD-016-SC-A	2010/03/20 22:49	2010/03/21 00:49	J2-489	NW Rota-1		2:00:00
DVD-017-BC-A	2010/03/21 00:45	2010/03/21 02:45	J2-489	NW Rota-1		2:00:00
DVD-017-PC-A	2010/03/21 00:45	2010/03/21 02:45	J2-489	NW Rota-1		2:00:00
DVD-017-SC-A	2010/03/21 00:45	2010/03/21 02:45	J2-489	NW Rota-1		2:00:00
DVD-018-BC-A	2010/03/21 02:42	2010/03/21 04:42	J2-489	NW Rota-1		2:00:00
DVD-018-PC-A	2010/03/21 02:42	2010/03/21 04:42	J2-489	NW Rota-1		2:00:00
DVD-018-SC-A	2010/03/21 02:42	2010/03/21 04:42	J2-489	NW Rota-1		2:00:00
DVD-019-BC-A	2010/03/21 04:38	2010/03/21 05:25	J2-489	NW Rota-1		0:47:00
DVD-019-PC-A	2010/03/21 04:38	2010/03/21 05:25	J2-489	NW Rota-1		0:47:00
DVD-019-SC-A	2010/03/21 04:38	2010/03/21 05:25	J2-489	NW Rota-1		0:47:00
DVD-020-BC-A	2010/03/22 18:39	2010/03/22 20:39	J2-490	NW Rota-1		2:00:00
DVD-020-PC-A	2010/03/22 18:39	2010/03/22 20:39	J2-490	NW Rota-1		2:00:00
DVD-020-SC-A	2010/03/22 18:39	2010/03/22 20:39	J2-490	NW Rota-1		2:00:00
DVD-021-BC-A	2010/03/22 20:35	2010/03/22 22:35	J2-490	NW Rota-1		2:00:00
DVD-021-PC-A	2010/03/22 20:35	2010/03/22 22:35	J2-490	NW Rota-1		2:00:00
DVD-021-SC-A	2010/03/22 20:35	2010/03/22 22:35	J2-490	NW Rota-1		2:00:00
DVD-022-BC-A	2010/03/22 22:33	2010/03/23 00:33	J2-490	NW Rota-1		2:00:00
DVD-022-PC-A	2010/03/22 22:33	2010/03/23 00:33	J2-490	NW Rota-1		2:00:00
DVD-022-SC-A	2010/03/22 22:33	2010/03/23 00:33	J2-490	NW Rota-1		2:00:00
DVD-023-BC-A	2010/03/23 00:31	2010/03/23 02:32	J2-490	NW Rota-1		2:01:00
DVD-023-PC-A	2010/03/23 00:31	2010/03/23 02:32	J2-490	NW Rota-1		2:01:00
DVD-023-SC-A	2010/03/23 00:31	2010/03/23 02:32	J2-490	NW Rota-1		2:01:00
DVD-024-BC-A	2010/03/23 02:27	2010/03/23 04:27	J2-490	NW Rota-1		2:00:00
DVD-024-PC-A	2010/03/23 02:27	2010/03/23 04:27	J2-490	NW Rota-1		2:00:00
DVD-024-SC-A	2010/03/23 02:27	2010/03/23 04:27	J2-490	NW Rota-1		2:00:00
DVD-025-BC-A	2010/03/23 04:22	2010/03/23 06:22	J2-490	NW Rota-1		2:00:00
DVD-025-PC-A	2010/03/23 04:22	2010/03/23 06:22	J2-490	NW Rota-1		2:00:00
DVD-025-SC-A	2010/03/23 04:22	2010/03/23 06:22	J2-490	NW Rota-1		2:00:00
DVD-026-BC-A	2010/03/23 06:19	2010/03/23 08:19	J2-490	NW Rota-1		2:00:00
DVD-026-PC-A	2010/03/23 06:19	2010/03/23 08:19	J2-490	NW Rota-1		2:00:00
DVD-026-SC-A	2010/03/23 06:19	2010/03/23 08:19	J2-490	NW Rota-1		2:00:00
DVD-027-BC-A	2010/03/23 08:16	2010/03/23 08:29	J2-490	NW Rota-1		0:13:00
DVD-027-PC-A	2010/03/23 08:16	2010/03/23 08:29	J2-490	NW Rota-1		0:13:00
DVD-027-SC-A	2010/03/23 08:16	2010/03/23 08:29	J2-490	NW Rota-1		0:13:00
DVD-028-BC-A	2010/03/23 19:27	2010/03/23 21:27	J2-491	NW Rota-1		2:00:00
DVD-028-PC-A	2010/03/23 19:27	2010/03/23 21:27	J2-491	NW Rota-1		2:00:00
DVD-028-SC-A	2010/03/23 19:27	2010/03/23 21:27	J2-491	NW Rota-1		2:00:00
DVD-029-BC-A	2010/03/23 21:25	2010/03/23 23:25	J2-491	NW Rota-1		2:00:00
DVD-029-PC-A	2010/03/23 21:25	2010/03/23 23:25	J2-491	NW Rota-1		2:00:00
DVD-029-SC-A	2010/03/23 21:25	2010/03/23 23:25	J2-491	NW Rota-1		2:00:00
DVD-030-BC-A	2010/03/23 23:23	2010/03/24 01:23	J2-491	NW Rota-1		2:00:00
DVD-030-PC-A	2010/03/23 23:23	2010/03/24 01:23	J2-491	NW Rota-1		2:00:00
DVD-030-SC-A	2010/03/23 23:23	2010/03/24 01:23	J2-491	NW Rota-1		2:00:00
DVD-031-BC-A	2010/03/24 01:19	2010/03/24 03:19	J2-491	NW Rota-1		2:00:00
DVD-031-PC-A	2010/03/24 01:19	2010/03/24 03:19	J2-491	NW Rota-1		2:00:00
DVD-031-SC-A	2010/03/24 01:19	2010/03/24 03:19	J2-491	NW Rota-1		2:00:00
DVD-032-BC-A	2010/03/24 03:16	2010/03/24 05:05	J2-491	NW Rota-1		1:49:00

Video DVD ID	Start Date/Time	End Date/Time	Lowering	Site	Comments	Time Rec
DVD-032-PC-A	2010/03/24 03:16	2010/03/24 05:05	J2-491	NW Rota-1		1:49:00
DVD-032-SC-A	2010/03/24 03:16	2010/03/24 05:05	J2-491	NW Rota-1		1:49:00
DVD-033-BC-A	2010/03/24 18:25	2010/03/24 20:25	J2-492	NW Rota-1		2:00:00
DVD-033-PC-A	2010/03/24 18:25	2010/03/24 20:25	J2-492	NW Rota-1		2:00:00
DVD-033-SC-A	2010/03/24 18:25	2010/03/24 20:25	J2-492	NW Rota-1		2:00:00
DVD-034-BC-A	2010/03/24 20:22	2010/03/24 22:22	J2-492	NW Rota-1		2:00:00
DVD-034-PC-A	2010/03/24 20:22	2010/03/24 22:22	J2-492	NW Rota-1		2:00:00
DVD-034-SC-A	2010/03/24 20:22	2010/03/24 22:22	J2-492	NW Rota-1		2:00:00
DVD-035-BC-A	2010/03/24 22:20	2010/03/25 00:20	J2-492	NW Rota-1		2:00:00
DVD-035-PC-A	2010/03/24 22:20	2010/03/25 00:20	J2-492	NW Rota-1		2:00:00
DVD-035-SC-A	2010/03/24 22:20	2010/03/25 00:20	J2-492	NW Rota-1		2:00:00
DVD-036-BC-A	2010/03/25 00:18	2010/03/25 02:18	J2-492	NW Rota-1		2:00:00
DVD-036-PC-A	2010/03/25 00:18	2010/03/25 02:18	J2-492	NW Rota-1		2:00:00
DVD-036-SC-A	2010/03/25 00:18	2010/03/25 02:18	J2-492	NW Rota-1		2:00:00
DVD-037-BC-A	2010/03/25 02:15	2010/03/25 04:16	J2-492	NW Rota-1		2:01:00
DVD-037-PC-A	2010/03/25 02:15	2010/03/25 04:16	J2-492	NW Rota-1		2:01:00
DVD-037-SC-A	2010/03/25 02:15	2010/03/25 04:16	J2-492	NW Rota-1		2:01:00
DVD-038-BC-A	2010/03/25 04:12	2010/03/25 05:32	J2-492	NW Rota-1		1:20:00
DVD-038-PC-A	2010/03/25 04:12	2010/03/25 05:32	J2-492	NW Rota-1		1:20:00
DVD-038-SC-A	2010/03/25 04:12	2010/03/25 05:32	J2-492	NW Rota-1		1:20:00
DVD-039-BC-A	2010/03/26 18:31	2010/03/26 20:32	J2-494	NW Rota-1		2:01:00
DVD-039-PC-A	2010/03/26 18:31	2010/03/26 20:32	J2-494	NW Rota-1		2:01:00
DVD-039-SC-A	2010/03/26 18:31	2010/03/26 20:32	J2-494	NW Rota-1		2:01:00
DVD-040-BC-A	2010/03/26 20:32	2010/03/26 22:32	J2-494	NW Rota-1		2:00:00
DVD-040-PC-A	2010/03/26 20:32	2010/03/26 22:32	J2-494	NW Rota-1		2:00:00
DVD-040-SC-A	2010/03/26 20:32	2010/03/26 22:32	J2-494	NW Rota-1		2:00:00
DVD-041-BC-A	2010/03/26 22:30	2010/03/27 00:29	J2-494	NW Rota-1		1:59:00
DVD-041-PC-A	2010/03/26 22:30	2010/03/27 00:29	J2-494	NW Rota-1		1:59:00
DVD-041-SC-A	2010/03/26 22:30	2010/03/27 00:29	J2-494	NW Rota-1		1:59:00
DVD-042-BC-A	2010/03/27 00:26	2010/03/27 02:26	J2-494	NW Rota-1		2:00:00
DVD-042-PC-A	2010/03/27 00:26	2010/03/27 02:26	J2-494	NW Rota-1		2:00:00
DVD-042-SC-A	2010/03/27 00:26	2010/03/27 02:26	J2-494	NW Rota-1		2:00:00
DVD-043-BC-A	2010/03/27 02:22	2010/03/27 04:22	J2-494	NW Rota-1		2:00:00
DVD-043-PC-A	2010/03/27 02:22	2010/03/27 04:22	J2-494	NW Rota-1		2:00:00
DVD-043-SC-A	2010/03/27 02:22	2010/03/27 04:22	J2-494	NW Rota-1		2:00:00
DVD-044-BC-A	2010/03/27 04:18	2010/03/27 05:22	J2-494	NW Rota-1		1:04:00
DVD-044-PC-A	2010/03/27 04:18	2010/03/27 05:22	J2-494	NW Rota-1		1:04:00
DVD-044-SC-A	2010/03/27 04:18	2010/03/27 05:22	J2-494	NW Rota-1		1:04:00
DVD-045-BC-A	2010/03/28 18:48	2010/03/28 20:48	J2-495	NW Rota-1		2:00:00
DVD-045-PC-A	2010/03/28 18:48	2010/03/28 20:48	J2-495	NW Rota-1		2:00:00
DVD-045-SC-A	2010/03/28 18:48	2010/03/28 20:48	J2-495	NW Rota-1		2:00:00
DVD-046-BC-A	2010/03/28 20:46	2010/03/28 22:46	J2-495	NW Rota-1		2:00:00
DVD-046-PC-A	2010/03/28 20:46	2010/03/28 22:46	J2-495	NW Rota-1		2:00:00
DVD-046-SC-A	2010/03/28 20:46	2010/03/28 22:46	J2-495	NW Rota-1		2:00:00
DVD-047-BC-A	2010/03/28 22:44	2010/03/29 00:44	J2-495	NW Rota-1		2:00:00
DVD-047-PC-A	2010/03/28 22:44	2010/03/29 00:44	J2-495	NW Rota-1		2:00:00
DVD-047-SC-A	2010/03/28 22:44	2010/03/29 00:44	J2-495	NW Rota-1		2:00:00
DVD-048-BC-A	2010/03/29 00:39	2010/03/29 02:39	J2-495	NW Rota-1		2:00:00
DVD-048-PC-A	2010/03/29 00:39	2010/03/29 02:39	J2-495	NW Rota-1		2:00:00
DVD-048-SC-A	2010/03/29 00:39	2010/03/29 02:39	J2-495	NW Rota-1		2:00:00

Video DVD ID	Start Date/Time	End Date/Time	Lowering	Site	Comments	Time Rec
DVD-049-BC-A	2010/03/29 02:36	2010/03/29 04:36	J2-495	NW Rota-1		2:00:00
DVD-049-PC-A	2010/03/29 02:36	2010/03/29 04:36	J2-495	NW Rota-1		2:00:00
DVD-049-SC-A	2010/03/29 02:36	2010/03/29 04:36	J2-495	NW Rota-1		2:00:00
DVD-050-BC-A	2010/03/29 04:32	2010/03/29 05:25	J2-495	NW Rota-1		0:53:00
DVD-050-PC-A	2010/03/29 04:32	2010/03/29 05:25	J2-495	NW Rota-1		0:53:00
DVD-050-SC-A	2010/03/29 04:32	2010/03/29 05:25	J2-495	NW Rota-1		0:53:00

Table 4.5-2 JASON Data DVDs Listing.

Data DVD ID	Data Type	Lowering(s)	Contents
Data-DVD-001	Processed Jason Data	J2-486- J2-488	Processed Lowerings J2-486, J2-487, J2-488
Data-DVD-002	Raw DVLNAV	na	Raw DVLNAV 20100316-20100321
Data-DVD-003	HD Stills	J2-487- J2-489	HD Stills J2-487- J2-489(raw and time stamped)
Data-DVD-004	Raw Jason Data	na	Raw Jason Data 20100316- 20100323
Data-DVD-005	Processed Jason Data	J2-489, J2-490	Processed Lowerings J2-489, J2-490
Data-DVD-006	Processed Jason Data	J2-491, J2-492	Processed Lowerings J2-491, J2-492
Data-DVD-007	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 calibration(all) survey(.001-.063)
Data-DVD-008	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.064-.150)
Data-DVD-009	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.151-.235)
Data-DVD-010	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.236-.320)
Data-DVD-011	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.321-.406)
Data-DVD-012	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.407-.492)
Data-DVD-013	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.493-.578)
Data-DVD-014	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.579-.664)
Data-DVD-015	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.665-.750)
Data-DVD-016	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.751-.836)
Data-DVD-017	Raw SM2000 Data	J2-493	J2-493 Raw SM2000 Survey(.837-.900, .smb)
Data-DVD-018	Raw DVLNAV	na	Raw DVLNAV 20100322-20100325
Data-DVD-019	Processed Jason Data	J2-493, J2-494	Processed Lowerings J2-493, J2-494
Data-DVD-020	DSC Pics	all	DSC Pics J2-487-J2-493, J2-494, J2-495
Data-DVD-021	HD Stills	J2-490- J2-492, J2-494	HD Stills J2-490-J2-492, J2-494
Data-DVD-022	Processed Jason Data	J2-495	Processed Lowering J2-495
Data-DVD-023	Parsed Jason Data	all	Parsed Jason Data J2-486- J2-495
Data-DVD-024	HD Stills	J2-495	HD Stills J2-495(raw and time stamped)
Data-DVD-025	Virtual Van	all	Virtual Van
Data-DVD-026	SM2000 survey data	J2-493	SM2000 Survey Data(code, .mat files, dvl, events, xyz files, grd files)
Data-DVD-027	Nav Backup	all	Nav Backup(ini files, targets, underlays, etc.)
Data-DVD-028	Raw Jason Data	na	Raw Jason Data 20100324- 20100329
Data-DVD-029	Raw DVLNAV	na	Raw DVLNAV 20100326- 20100329
Data-DVD-030	Documentation	all	Documentation

Table 4.5-3 JASON HD DVD Highlights Record Times

Tape	Dive Clip number	UTC time start	UTC time end	location	comments	Duration
1	J488-1	21:21:21	21:25:01	Brimstone approach	not very useful	0:03:40
1	J488-2	22:05:56	22:14:27	Brimstone to Summit	poor visibility-mostly sitting at Brimstone	0:08:31
1	J488-3	22:17:24	23:22:02	moving up wall to Summit	large suction sample; shrimp trap recovered and scoop taken at Summit	1:04:38
1	J488-4	23:52:07	23:54:46	between Brimstone & Phantom	sulfur-covered rock; shrimp on sulfur; diffuse flow	0:02:39
1	J488-5	23:59:13	0:15:30	Phantom	very active venting	0:16:17
1	J488-6	0:51:58	0:55:17	Phantom	rocks coming out	0:03:19
1	J488-7	0:58:32	1:00:31	Phantom	tephra; venting	0:01:59
1	J488-8	1:28:14	1:29:45	Phantom	bubbles; GTB funnel (red) collected	0:01:31
1	J488-9	2:06:33	2:10:15	Phantom	deploy Tephra bucket (not quite)	0:03:42
1	J488-10	3:06:22	3:25:15	Phantom	deploy Tephra bucket	0:18:53
2	J488-11	3:39:48	3:49:41	Sulfur Crust	fluid sampling	0:09:53
2	J488-12	3:54:21	4:02:00	Sulfur Crust	close-up shrimp observations	0:07:39
2	J488-13	4:06:00	4:11:44	Sulfur Crust	looking at sulfur rocks & shrimp	0:05:44
2	J488-14	4:51:22	5:02:29	Phantom Approach	poor visibility didn't reach Phantom	0:11:07
2	J488-15	5:06:07	5:06:55	Phantom	lots of bubbles	0:00:48
2	J489-1	19:52:36	19:57:33	Mkr-112	white mat	0:04:57
2	J489-2	20:00:38	20:33:33	Mkr-112	crabs, shrimp, limpets; deploy shrimp trap	0:32:55
2	J489-3	20:40:24	20:55:12	Mkr-109	shrimp & limpets	0:14:48
2	J489-4	21:00:48	21:11:45	Mkr-109	slurping shrimp	0:10:57
2	J489-5	21:55:27	22:22:06	Mkr-109	scarp below Mkr-109; shrimp	0:26:39
3	J489-6	22:28:17	22:40:36	Mkr-109	shrimp & crabs	0:12:19
3	J489-7	2:24:48	2:27:18	Mkr-110	Shrimp mosaic at Iceberg09	0:02:30
3	J489-8	2:40:21	2:42:57	near old Mkr-108	shrimp	0:02:36
3	J489-9	2:44:18	2:49:31	near old Mkr-108	yellow sulfur/mat	0:05:13
3	J489-10	3:59:23	4:22:36	Styx Mkr-116	New vent found	0:23:13
3	J489-11	4:45:20	4:51:54	Phantom Mkr-118	watching Phantom	0:06:34
3	J489-12	5:00:37	5:23:45	Sulfur Crust Mkr-120	Shrimp trap recovery; moving tephra sampler; Phantom watching	0:23:08
3	J490-1	18:52:14	18:56:57	Mkr-112	mat on wall	0:04:43

Tape	Dive Clip number	UTC time start	UTC time end	location	comments	Duration
3	J490-2	19:14:57	19:21:23	Mkr-112/113	swinging around to pick-up shrimp trap at Mkr-112	0:06:26
3	J490-3	19:46:55	19:48:02	Mkr-109	shrimp and diffuse flow	0:01:07
3	J490-4	20:29:43	21:08:53	Mkr-109	fluid sampling; shrimp, limpets, barnacles	0:39:10
4	J490-5	21:53:17	22:14:59	Mkr-119	former Mkr-101 site	0:21:42
4	J490-6	22:40:31	22:42:26	Mkr-119		0:01:55
4	J490-7	22:59:24	23:16:00	Mkr-119	shrimp	0:16:36
4	J490-8	23:52:48	23:59:36	Mkr-110		0:06:48
4	J490-9	0:33:34	0:54:02	Mkr-110	fluids	0:20:28
4	J490-10	7:00:43	7:17:30	Devil's Staircase	shrimp	0:16:47
4	J492-1	18:45:29	19:27:16	between Sulfur Crust and Phantom	Sulfur deposited around vent, new sulfur crust everywhere; also scanning area	0:41:47
5	J492-2	19:56:08	19:59:24	Sulfur Crust E of Mkr120	new vent, bubbles	0:03:16
5	J492-3	20:30:20	20:35:25	Sulfur Vent	NW side (facing SE)	0:05:05
5	J492-4	21:08:39	21:18:04	Sulfur Vent & Phantom		0:09:25
5	J492-5	22:37:02	23:18:49	Sulfur	sulfur spaghetti poset eruption	0:41:47
5	J492-6	23:22:49	23:33:35	Road to Brimstone	recognized as a suburb of Sulfur Vent	0:10:46
5	J492-7	4:40:07	4:41:11	Sulfur Vent	leaving Sulfur Vent	0:01:04
5	J492-8	5:24:21	5:28:37	Hydrophone Mooring	watching release of mooring	0:04:16
5	J494-1	18:45:43	18:47:54	Mkr-163 Summit	Shrimp	0:02:11
5	J494-2	19:02:52	19:08:12	Mkr-163 Summit	Shrimp; next to chain links; plume in background	0:05:20
5	J494-3	19:21:38	19:34:19	ridge leaving Mkr-163	Shrimp; knife edge of ridge; venting to side of ridge; "seething pile"	0:12:41
5	J494-4	20:26:07	20:33:59	Mkr-110 Iceberg09	Floc in diffuse flow	0:07:52
5	J494-5	20:54:31	21:00:25	Mkr-110 Iceberg09	Floc; diffuse flow collection	0:05:54
5	J494-6	22:14:24	22:26:43	Mkr-117 (old Mkr105 area)	Shrimps	0:12:19
6	J494-7	22:41:52	22:43:13	Mkr-117 (old Mkr105 area)	Shrimps in a frenzy	0:01:21
6	J494-8	23:02:09	23:22:39	Mkr-117 (old Mkr105 area)	Sulfur Wall	0:20:30
6	J494-9	23:31:58	23:35:14	Mkr-117 (old Mkr105 area)	Lower on Sulfur Wall	0:03:16
6	J494-10	0:01:04	0:09:28	Charon Vent	Newest vent: Charon	0:08:24
6	J494-11	1:11:15	1:16:09	Charon Vent	Charon during fluid sampling	0:04:54
6	J494-12	1:53:51	2:02:17	Styx Vent		0:08:26
6	J494-13	2:08:29	2:09:09	Styx Vent	Became murky quickly	0:00:40
6	J494-14	2:14:14	2:17:38	Styx Vent		0:03:24
6	J494-15	2:43:12	2:53:54	Styx Vent		0:10:42
6	J494-16	3:05:28	3:10:27	Styx Vent	Bubble catcher	0:04:59
6	J494-17	4:21:24	4:37:03	Styx Vent	Bursting; ~1/2m high	0:15:39
6	J494-18	4:56:12	5:00:21	Styx Vent	Bursting; ~1/2m high	0:04:09
6	J494-19	5:02:19	5:08:01	Styx Vent	Bursting; good visibility for short time	0:05:42
6	J494-20	5:11:31	5:16:01	Styx Vent	Small slide	0:04:30

Tape	Dive Clip number	UTC time start	UTC time end	location	comments	Duration
6	J495-1	19:45:41	20:14:15	Styx	active eruptions	0:28:34
7	J495-2	20:15:27	20:23:16	Styx	active eruptions	0:07:49
7	J495-3	20:40:18	21:36:58	Styx	active eruptions	0:56:40
7	J495-4	22:06:02	22:43:41	Sulfur Vent	active eruptions	0:37:39
7	J495-5	23:00:10	23:25:00	Sulfur Vent	active eruptions; sampling with gas funnel	0:24:50
8	J495-6	23:27:02	0:24:55	more Sulfur	Start doing major sample.	0:57:53
8	J495-7	0:25:52	1:09:15	Sulfur Vent	Working up slope to Sulfur Crust after large burst.	0:43:23
8	J495-8	1:22:27	1:47:19	Wall		0:24:52
9	J495-9	1:59:33	3:19:22	base of sulfur wall	Iceberg-shrimp/map sampling	1:19:49
9	J495-10	4:53:19	5:24:09	Styx	Styx-no activity	0:30:50

TOTAL HD highlights cumulative time: 18:34:29

Table 4.5-4 JASON Digital Still Images (DSC) and HD Frame Grab Summary.

Dive	# of DSC images (jpg)	Total size of DSC files (MB)	# of HD frame grabs	Total size of HD files (MB)	comments
J2-486	0	0	0	0	dive aborted (Seamount X)
J2-487	355	343	383	604	
J2-488	179	174	200	320	
J2-489	445	440	447	791	
J2-490	397	387	446	790	
J2-491	255	235	380	642	
J2-492	268	266	265	434	
J2-493	0	0	0	0	SM2000 mapping dive
J2-494	517	498	405	639	
J2-495	499	489	326	475	

Totals: 2915 2832 11494 4695

4.6 Outreach

Similar to last year, we posted to a blog during the cruise at:

nwrota2010.blogspot.com

The site includes text, images, and some video clips.

5.0 Navigation and Positions

5.1 JASON Navigation

This year Jason used its new Sonardyne ultra-short baseline (USBL) acoustic navigation system, and it was a huge improvement over last year. The system included a USBL transducer installed on the Kilo Moana's through-hull pole, with an OCTANS (the sensors that measure the attitude of the USBL transducer) installed on the inside (dry) part of the through-hull pole. The system was calibrated once during the Jason engineering dive and performed excellently thereafter. With Jason stationary on the seafloor, the USBL positions generally produced a dot-cloud about 5 m across, and the positions were consistent from dive to dive. Jason also used its Doppler sonar and the USBL and Doppler were combined by renav software after each dive to produce the final navigation files. At first there was some concern that the ship's ADCP sonars might interfere with the USBL navigation, but that was found not to be the case.

Of course, how we are able to use Jason on the seafloor depends greatly on ship handling, and this year after the Kilo Moana's bow-thruster controller went out, this significantly affected our dive plans. In the first few dives after the failure, we were told that ship could basically only move in the upwind or downwind directions (the winds were from the east during most of the cruise). This greatly limited our movements with Jason and precluded a lot of exploration we would have liked to do. Our dive plans were reduced to minimal movements between the most important sampling and observation sites. Later in the cruise, as the winds decreased and the Kilo Moana's crew became more confident in their abilities to maneuver the ship without the bow-thruster, we were able to execute more complicated moves with Jason. However, it still took more time to do any movements of the ship without the bow-thruster and full dynamic positioning, so this still affected our use of Jason on the bottom. Also, the pilots had reduced confidence that the ship could maneuver precisely when needed and so were reluctant to work in difficult or challenging areas (like the landslide headwalls where there were lots of steep cliffs and canyons).

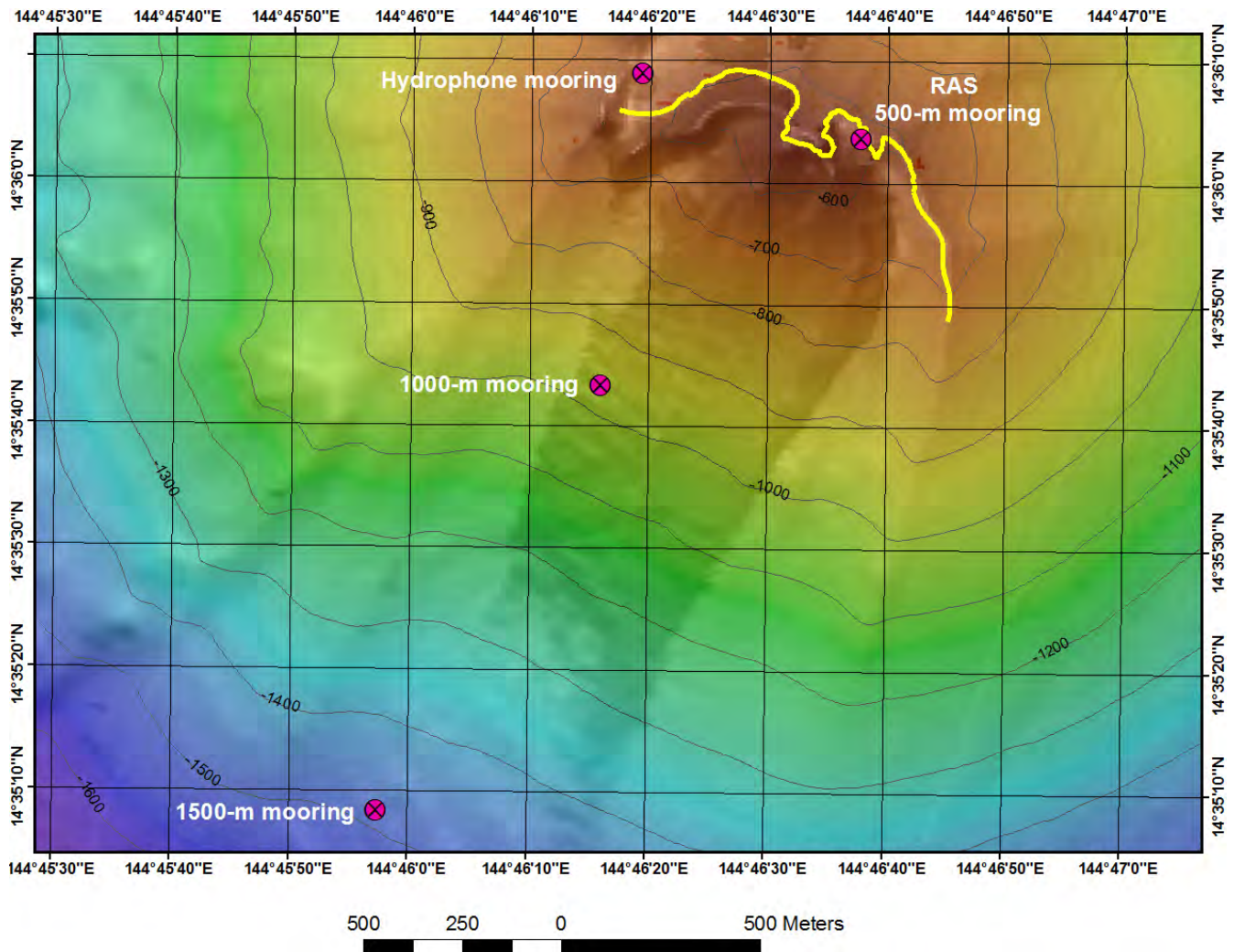
5.2 Search for instrument moorings deployed in 2009

Last year, we deployed four instrument moorings to record the activity at NW Rota over a year.

Table 5.2-1 2009 Moorings.

2009 Moorings	Anchor Depth	Moorings Height	Top Depth	Lat deg	Lat min	Long deg	Long min	Latitude	Longitude
Hydrophone mooring	635	230	405	14	36.1480	144	46.3240	14.60247	144.77207
550m (RAS) mooring	570	125	445	14	36.0600	144	46.6310	14.60100	144.77718
1000m mooring	970	172	798	14	35.7220	144	46.2690	14.59537	144.77115
1500m mooring	1487	620	867	14	35.1390	144	45.9580	14.58565	144.76597

Figure 5.2-1 Locations of mooring left in 2009. The Hydrophone mooring was the only mooring recovered in 2010. The map shows the approximate location of the collapse scarp (bold yellow line) and the dark shadow indicates loss of material found after differencing bathymetry data between 2009 and 2010.



Unfortunately, the landslide destroyed three of the four moorings and only the hydrophone mooring was recovered. We used Edgetech-compatible deck units with hand-deployed hydrophones (both PMEL's and the ship's) to attempt to communicate with the acoustic releases on the moorings (sending the enable command and then trying to range to them). We were only able to range to the 1500-m mooring, but it reported that it was horizontal on the seafloor, and from the ranges it was apparent that it had moved about 1 km downslope from its deployment position. We never received any ranges from the other moorings (even the hydrophone, which was later recovered after Jason located it on dive J2-492 and the acoustic release worked successfully). We dove with Jason at the 500-m mooring deployment location, and it was indeed located within the landslide scar and there was no sign of it. Since we could range on the 1500-m mooring we surveyed its position from the ship, using the slant ranges to calculate horizontal ranges at various assumed depths for the acoustic release and triangulate its new position. We then set up Medea to range to the acoustic release and dove on the target location with Jason during dive J2-491 (Jason could not be set up to range directly to the acoustic release, only Medea). We made a search pattern with Medea/Jason and minimum ranged so that we were confident we were right over the acoustic release location, but there was no sign of it, apparently because it was separated from the mooring and buried in sediment. The closest slant range between the release and Medea was 31m when Medea was 20m off the bottom at 23:53:04, Jason position 14.5778N/144.7597W (Virtual Van record 4600).

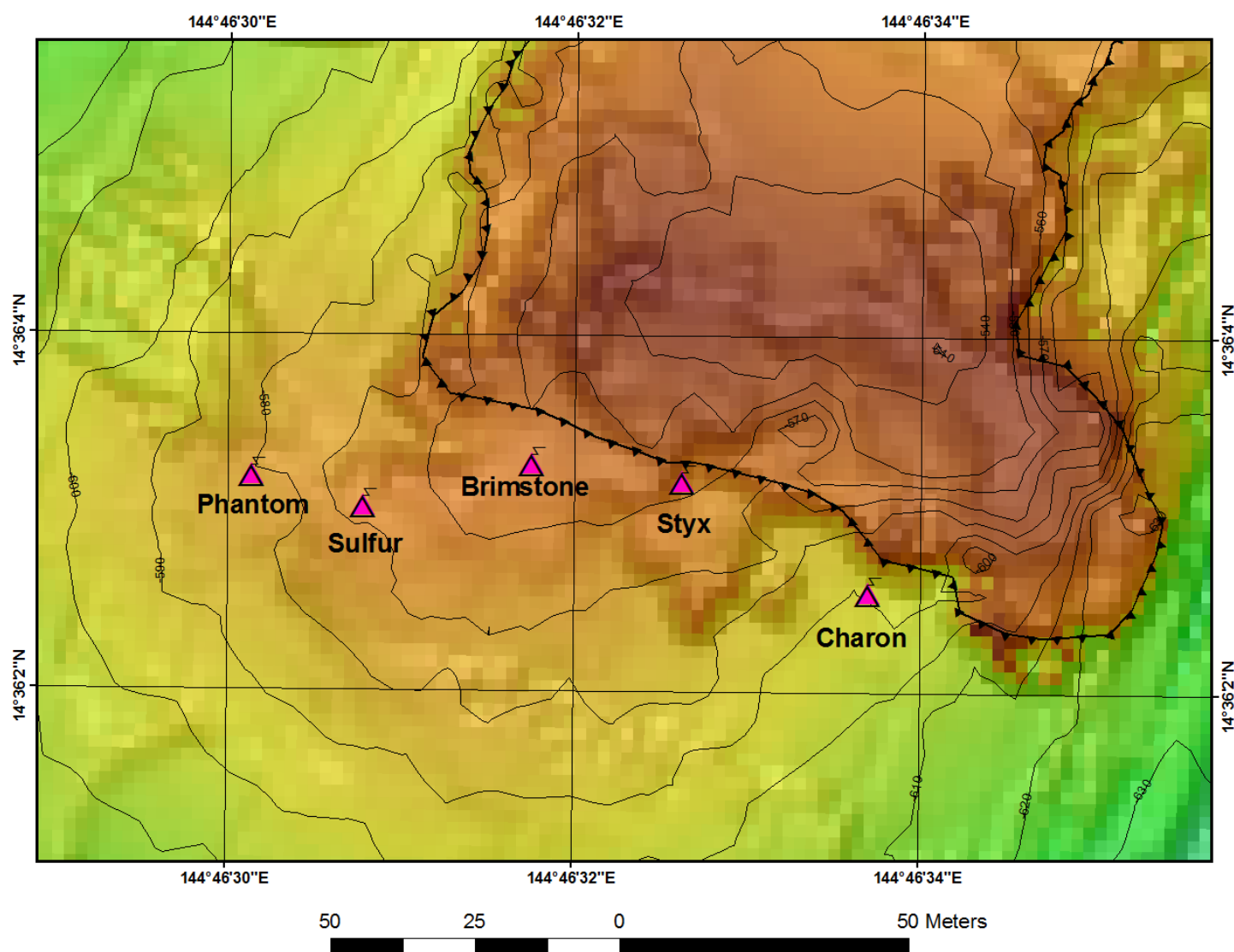
5.3 Vent Positions

Table 5.3-1 Vent locations

Vent	Marker	latitude	longitude	JASON depth	Total depth	Dives	Lat degree	Lat minute	Long degree	Long minute
Brimstone	Mkr-161	14.60091	144.77554	548.1	550.0	J487	14	36.05476	144	46.53217
Phantom	Mkr-118*	14.60089	144.77509	567.0	568.0	J487	14	36.05400	144	46.50500
Styx	Mkr-116*	14.60089	144.77578	558.3	560.2	J489	14	36.05318	144	46.54666
Sulfur	none	14.60085	144.77527	556.0	560.0	J492	14	36.05076	144	46.51602
Charon	none	14.60071	144.77608	586.4	590.5	J494	14	36.04285	144	46.56462

*marker lost due to venting activity

Figure 5.3-1 2010 High-temperature vent locations. Bold direction line indicates the approximate location of the collapse boundary between the 2009 and 2010 expeditions.



5.4 Marker/Site Positions

Last year, we deployed many markers on the seafloor to facilitate our navigation at NW Rota. Unfortunately, the landslide removed most of last year's markers (101, 102, 103, 105, 106, 107, 108, 111, 114, 115) but a few remained (109, 110, 113). We put out new markers at key sites (112, 117, 119, 120, 161, 163, 164). Marker 109 was recovered as a bacterial mat sample and had been intended to be redeployed, however, due to the proximity to Mkr-112, the marker was not redeployed.

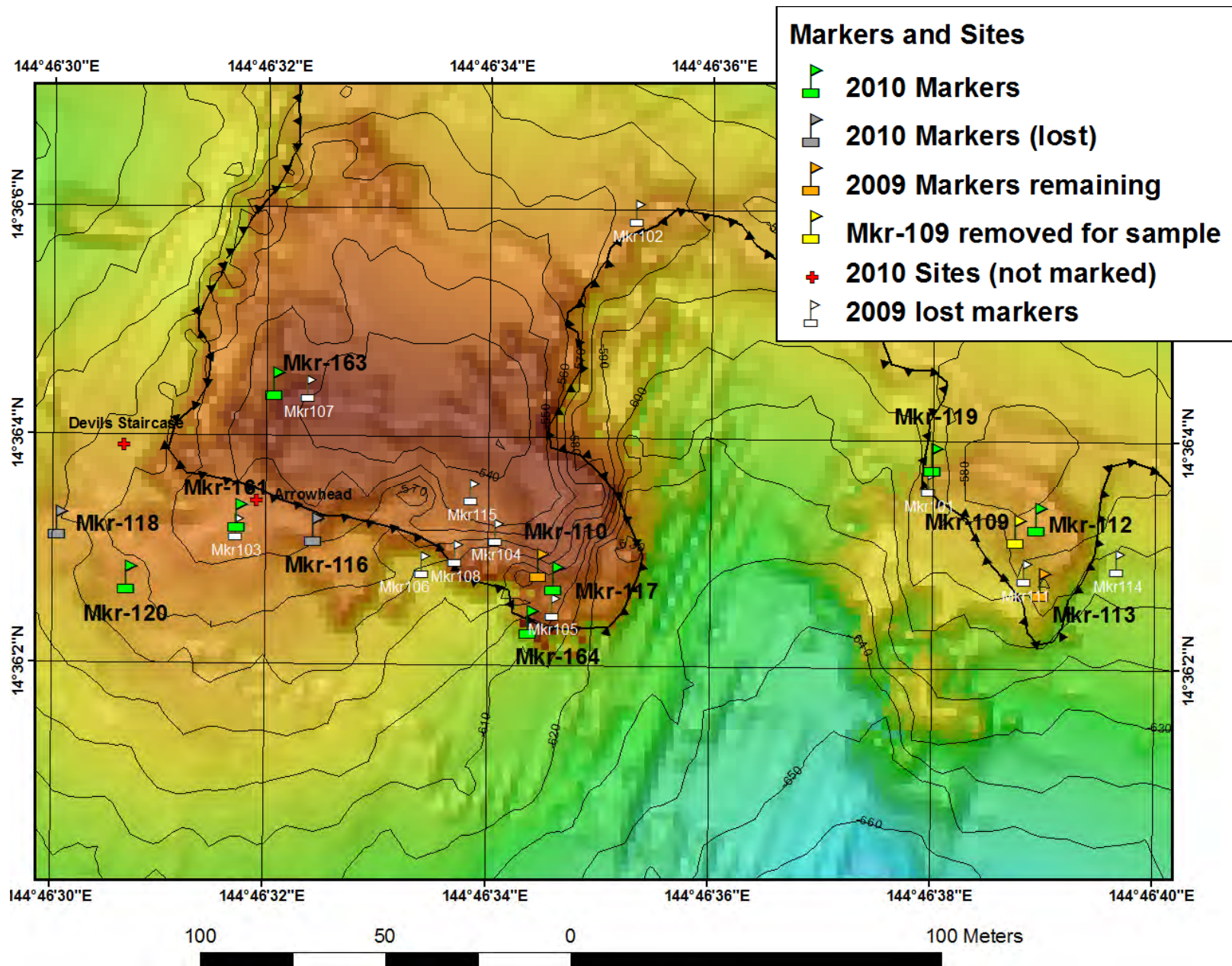
Table 5.4-1 2010 Marker locations.

2010 Markers	Vent/Site	latitude	longitude	Lat degree	Lat minute	Long degree	Long minute	JASON depth	Total depth	Heading	Dive	Virtual Van record
Mkr-163	Summit	14.60124	144.77563	14	36.07421	144	46.53764	519.9	522.7	330.8	J487	161
Mkr-161	Brimstone	14.60091	144.77554	14	36.05476	144	46.53217	548.1	550.0	50.8	J487	323
Mkr-120	Sulfur Crust	14.60076	144.77526	14	36.04566	144	46.51560	556.8	558.0	5.2	J487	926
Mkr-112	E-FaultShrimp09	14.60092	144.77753	14	36.05531	144	46.65206	563.2	565.4	1.0	J489	2132
Mkr-118*	Styx Vent	14.60088	144.77573	14	36.05285	144	46.54369	558.3	560.2	337.6	J489	2851
Mkr-116*	Phantom Vent	14.60089	144.77509	14	36.05354	144	46.50528	560.17 (554 J492)	564.7	119.3	J489	3000
Mkr-119	old09-Mkr101	14.60107	144.77727	14	36.06399	144	46.63644	567.3	568.4	50.2	J490	3311
Mkr-117	N-Limpet Lair	14.60077	144.77633	14	36.04597	144	46.57975	539.0	551.3	338.4	J2-494	6770
Mkr-164	Sulfur Wall	14.60066	144.77627	14	36.03960	144	46.57590	592.5	596.2	320.9	J2-494	6849
2010 Sites:												
no marker	Arrowhead	14.60095	144.77558	14	36.05705	144	46.53501	544.9	547.2	30.0	J488	1087
no marker	Devil's Staircase	14.60109	144.77525	14	36.06512	144	46.51506	566.0	572.5	154.5	J490	4098
2009 Markers still remaining in 2010:												
Mkr-110	Iceberg09	14.60080	144.77629	14	36.04796	144	46.57749	532.81	537.24	316.53	J489	2586
Mkr-109**	FaultShrimp09	14.60089	144.77748	14	36.05347	144	46.64902	565.35	568.56	346.38	J489	2139
Mkr-113	Sulfur Slide	14.60076	144.77755	14	36.04578	144	46.65271	570.11	576.29	346.41	J489	2200

*marker lost due to venting activity

**marker recovered as mat sample J490

Figure 5.4-1 Marker/Site Locations



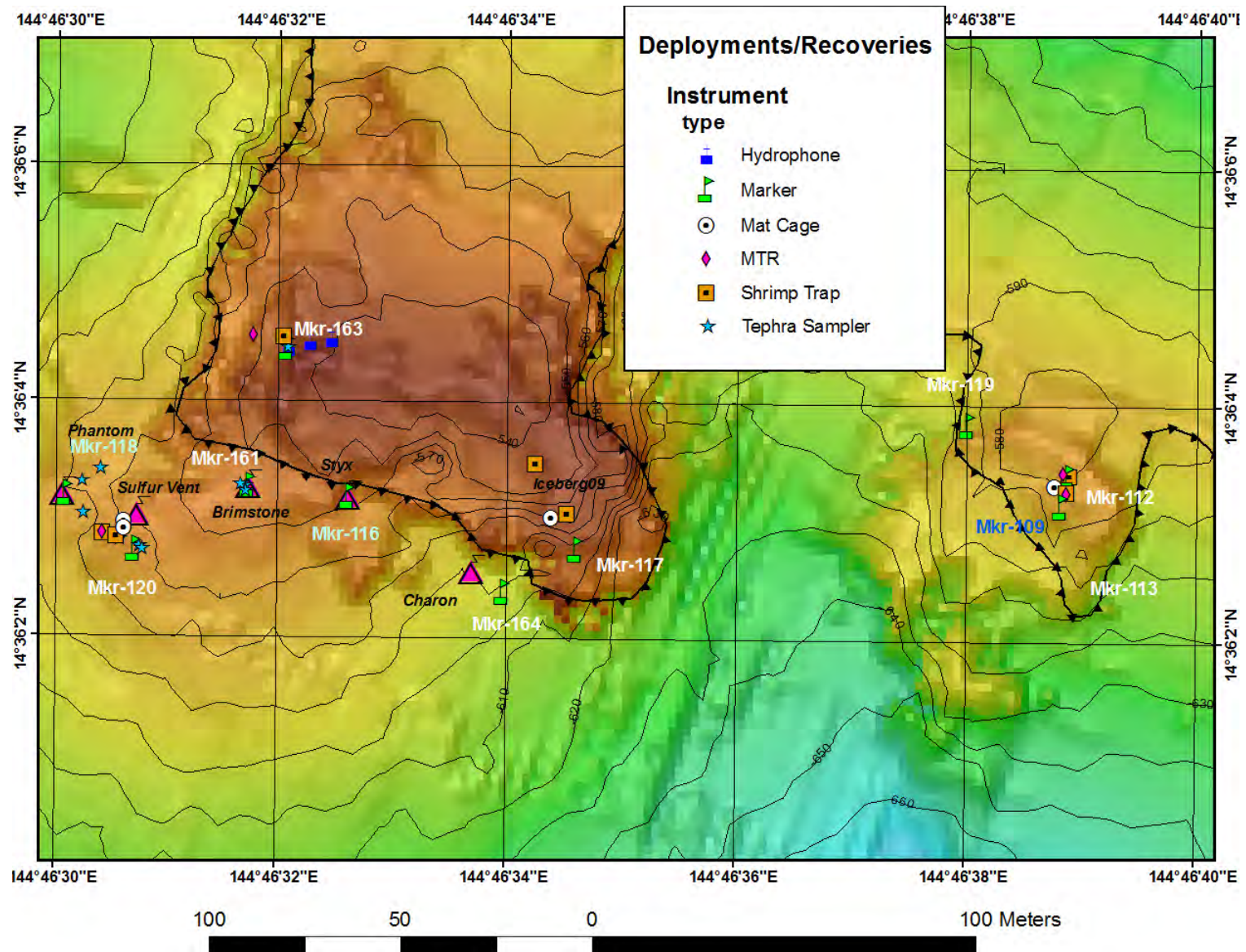
5.5 Experiment Deployments/Recoveries

Table 5.5-1 Experiments deployed and recovered. **Times are UTC (10 hrs behind local Guam time).**

Instrument	Site/Location	Latitude	Longitude	Jason depth	Total depth	Date-time m/dd/yyyy hh:mm:ss	Deploy	Recover	Principal Investigator
Hydrophone	Mkr-163 Summit	14.60124	144.77563	519.9	522.7	3/17/2010 20:09:08	J487	J490	Chadwick
Tephra-C	Mkr-163 Summit	14.60124	144.77563	519.9	522.9	3/17/2010 20:11:23	J487	J495-tephra-18	Deardorff
Mkr-163	Mkr-163 Summit	14.60124	144.77563	519.9	522.7	3/17/2010 20:16:52	J487	X	
Shrimp Trap	Mkr-163 Summit	14.60126	144.77562	519.8	523.6	3/17/2010 20:21:07	J487	J488-shrimp-14	Tunncliffe
MTR-5	Mkr-163 Summit	14.60127	144.77555	519.9	523.4	3/17/2010 20:30:21	J487	J495	Chadwick
Tephra-D	Mkr-161 Brimstone	14.60091	144.77553	548.1	550.1	3/17/2010 22:09:13	J487	J487-tephra-10	Deardorff
Mkr-161	Mkr-161 Brimstone	14.60091	144.77554	548.1	550.0	3/17/2010 22:18:17	J487	X	
Shrimp Trap A	Mkr-120 Sulfur Crust	14.60080	144.77519	556.8	558.0	3/18/2010 04:53:11	J487	J488-shrimp-27	Tunncliffe
Mkr-120	Mkr-120 Sulfur Crust	14.60076	144.77526	556.8	558.0	3/18/2010 04:55:48	J487	X	
MTR-6	Mkr-120 Sulfur Crust	14.60080	144.77519	556.8	558.0	3/18/2010 04:59:17	J487	J494	Chadwick
Tephra-H	Mkr-161 Brimstone	14.60090	144.77553	548.4	549.6	3/18/2010 05:20:21	J487	J490-tephra-19	Deardorff
Tephra-F	Mkr-118 Phantom Vent	14.60092	144.77514	564.9	565.6	3/20/2010 02:14:23	J488	lost	Deardorff
Tephra-D	Mkr-120 Sulfur Crust	14.60078	144.77523	555.7	557.3	3/20/2010 03:15:06	J488	J492-tephra-07	Deardorff
Shrimp Trap	Mkr-120 Sulfur Crust	14.60079	144.77522	557.1	558.2	3/20/2010 03:24:51	J488	J489-shrimp-07	Tunncliffe
Mat Cage	Mkr-120 Sulfur Crust	14.60082	144.77524	556.7	558.6	3/20/2010 04:42:29	J488	J494-matcage- 18	Tunncliffe
Mat Cage	Mkr-120 Sulfur Crust	14.60081	144.77524	556.7	558.5	3/20/2010 04:46:56	J488	J494-matcage- 19	Tunncliffe
Shrimp Trap- 2	Mkr-112 E- FaultShrimp09	14.60095	144.77752	563.1	565.2	3/20/2010 20:22:36	J489	J490-shrimp-02	Tunncliffe
Mkr-112	Mkr-112 E- FaultShrimp09	14.60095	144.77752	563.2	565.4	3/20/2010 20:30:15	J489	X	
MTR-1	Mkr-112 E- FaultShrimp09	14.60095	144.77751	563.2	565.1	3/20/2010 20:31:41	J489	J490	Chadwick
Mat Cage	Mkr-109 FaultShrimp09	14.60092	144.77748	564.0	564.8	3/20/2010	J489	J495-mat-17	Tunncliffe

Instrument	Site/Location	Latitude	Longitude	Jason depth	Total depth	Date-time m/dd/yyyy hh:mm:ss	Deploy	Recover	Principal Investigator
						23:08:41			
Shrimp Trap-3	Mkr-109 FaultShrimp09	14.60091	144.77751	564.4	568.2	3/20/2010 23:31:14	J489	J495-shrimp-16	Tunnicliffe
MTR-4	Mkr-109 FaultShrimp09	14.60091	144.77751	564.4	568.6	3/20/2010 23:34:17	J489	J495	Chadwick
Mkr-116	Mkr-116 Styx Vent	14.60089	144.77578	558.3	560.2	3/21/2010 04:21:09	J489	lost	Chadwick
Mkr-118	Mkr-118 Phantom Vent	14.60089	144.77509	560.2	564.7	3/21/2010 05:23:25	J489	lost	
Mkr-119	Mkr-119 old09-Mkr101	14.60107	144.77727	567.3	568.4	3/22/2010 22:24:59	J2-490	X	
Mat Cage	Mkr-110 Iceberg09	14.60084	144.77627	532.4	538.0	3/23/2010 01:20:56	J2-490	J495-mat-11	Tunnicliffe
Shrimp Trap	Mkr-110 Iceberg09	14.60097	144.77623	532.6	537.2	3/23/2010 01:49:18	J2-490	J494-shrimptrap-1	Tunnicliffe
Hydrophone	Mkr-163 Summit	14.60126	144.77574	519.5	530.2	3/23/2010 02:32:00	J2-490	J494	Chadwick
Tephra-B	Mkr-161 Brimstone	14.60091	144.77552	547.7	549.9	3/23/2010 04:23:58	J2-490	J492-tephra-15	Deardorff
Tephra-A	Mkr-118 Phantom Vent	14.60084	144.77514	564.4	566.6	3/23/2010 06:07:18	J2-490	(repositioned J492)	Deardorff
Tephra-A repositioned	Mkr-118 Phantom Vent	14.60095	144.77518	562.4	564.2		J2-492	J494-tephra-17	Deardorff
Mkr-109	Mkr-109 FaultShrimp09	14.60088	144.77750	563.1	567.8	3/23/2010 08:05:34	J2-398	J490-mat-28	Tunnicliffe
Tephra-H	Mkr-120 Sulfur Crust	14.60077	144.77528	555.8	559.0	3/24/2010 21:44:33	J2-492	J494-tephra-20	Deardorff
Hydrophone	Mkr-163 Summit	14.60125	144.77568	519.5	530.0	3/26/2010 19:02:25	J2-494	J495	Chadwick
Shrimp Trap-2	Mkr-110 Iceberg09	14.60085	144.77631	533.3	536.9	3/26/2010 20:22:30	J2-494	J495-shrimp-12	Tunnicliffe
Mkr-117	N-Limpet Lair	14.60077	144.77633	539.0	551.3	3/26/2010 22:50:21	J2-494	X	
Mkr-164	Sulfur Wall	14.60066	144.77615	592.5	596.2	3/26/2010 23:44:12	J2-494	X	
Tephra-D	Mkr-120 Sulfur Crust	14.60076	144.77528	555.3	557.4	3/27/2010 04:04:55	J2-494	J495-tephra-7	Deardorff

Figure 5.5-1 Map of experiments deployed and recovered. Shown are the instruments deployed and recovered for 2010. (Only the markers deployed for 2010 are shown, the remaining 2009 markers are not). Markers 116 and 118 were lost before the end of this year's expedition and are labeled in light blue. Marker 109 was deployed in 2009 but recovered in 2010 as a microbial mat sample and not redeployed.



6.0 JASON Dives

6.1 Dive Statistics

Table 6.1-1 Jason dive statistics.

JASON - Lowering Statistics (All Times GMT)

Dive	Start Launch	Start Data	End Data	End On Deck	Site	Data HH:MM	Dive HH:MM	Comments	on bottom position (lat/long)
J2-486	2010/03/16 18:15	2010/03/16 19:24	2010/03/16 07:47	2010/03/16 21:27	Seamount X	0:23	3:12	lowering aborted due to Medea ground fault	
J2-487	2010/03/17 18:21	2010/03/17 19:10	2010/03/18 05:26	2010/03/18 06:02	NW Rota-1	10:16	11:41		14.60171644, 144.77550586
J2-488	2010/03/19 18:05	2010/03/19 18:41	2010/03/20 05:22	2010/03/20 06:07	NW Rota-1	10:41	12:02	ship's bow thruster not working	14.60086307, 144.77557333
J2-489	2010/03/20 18:17	2010/03/20 18:54	2010/03/21 05:24	2010/03/21 05:59	NW Rota-1	10:30	11:42	ship's bow thruster not working	14.60116218, 144.77872498
J2-490	2010/03/22 18:08	2010/03/22 18:38	2010/03/23 08:28	2010/03/23 09:02	NW Rota-1	13:50	14:54	ship's bow thruster not working	14.60097374, 144.77743848
J2-491	2010/03/23 18:02	2010/03/23 19:27	2010/03/24 05:07	2010/03/24 05:53	NW Rota-1	9:40	11:51	ship's bow thruster not working, search for lost mooring	14.57791166, 144.76004954
J2-492	2010/03/24 17:58	2010/03/24 18:31	2010/03/25 05:30	2010/03/25 06:07	NW Rota-1	10:59	12:09	ship's bow thruster not working, release of mooring	14.60075403, 144.77524228
J2-493	2010/03/25 18:01	2010/03/25 18:37	2010/03/26 08:11	2010/03/26 08:42	NW Rota-1	13:34	14:41	ship's bow thruster not working, sm2000 survey	14.60155477, 144.77851609
J2-494	2010/03/26 17:58	2010/03/26 18:37	2010/03/27 05:18	2010/03/27 05:53	NW Rota-1	10:41	11:55	ship's bow thruster not working, transformer problem at end of dive, dead vehicle recovery	14.60111603, 144.77576098
J2-495	2010/03/28 18:00	2010/03/28 18:48	2010/03/29 05:25	2010/03/29 05:55	NW Rota-1	10:37	11:55	Instrument recovery; final dive for KM1005	14.59867, 144.7751

6.2 Dive Summaries

J2-485 Summary: Jason Engineering test dive. Testing of USBL transponder and dip test. (No dive map).

J2-486 Seamount X. Summary: Intended fluid sampling, shrimp sampling and exploration. Dive aborted after 25 minutes on bottom. MAPR profile obtained from instrument mounted on Medea frame. (No dive map.)

J2-487 NW Rota Summit Exploration/Fluid Sampling. Summary: Jason on bottom north of summit rim due north of Brimstone location. Drove south and searched for 2009's Mkr-107 on rim (not located). Deployed new summit marker (Mkr-163), hydrophone, Tephra sampler C, shrimp trap and MTR-5 on rim. Drove south and located actively venting Brimstone. Made visual observations, deployed marker (Mkr-161), and Tephra sampler D. Explored ridge NW of Brimstone and located new venting area due west of Brimstone, site named Phantom Vent. Made visual observations, took scoop sample of sediment, 4 HFS fluid samples and 2 gas-tight bottles at Phantom. Explored south of Phantom on cone and discovered flows of sulfur, named the area Sulfur Crust. Explored area due south of Brimstone (east of Sulfur Crust) then attempted to revisit Brimstone but plume obscuring view. Drove east to 2009's Mkr-105 (Limpet Lair) area, no marker but shrimp covering wall on south face but bare on east face. Drove north along wall, heading for 2009 Mkr-102. Searched for marker but did not locate. Drove SW back to Brimstone area, headed for Sulfur Crust site first. Took suction sample of shrimp at Sulfur Crust. Deployed 2 shrimp traps, marker (Mkr-120) and MTR-6 at Sulfur Crust. Returned to Brimstone and swapped Tephra samplers (recover D, deployed H). Took scoop sample of sediment at Brimstone. Dive ended at Brimstone.

J2-488 Brimstone Fluid Sampling/Observation. Summary: Jason on bottom at Mkr-161/Brimstone. Brimstone inactive. Tephra sampler empty after 2 days, left in place. Sampled 3 rocks from what was the active vent area. Headed north to summit wall. Found shrimp and shimmering water at wall base in a crack. Named site Arrowhead (due north of Brimstone). Took 6 HFS fluid samples and 1 gas HFS sample at Arrowhead. Returned to Brimstone and took 1 HFS fluid sample in shimmering water. Moved up to Summit, passed over Arrowhead site again. Took suction of shrimp just below summit at Mkr-163. At Mkr-163, recovered shrimp trap and took scoop of sediments next to marker. Headed back to Brimstone but lost visibility in a large plume (area was Styx location but did not locate Styx source on this dive). Returned west to Phantom Vent. At Phantom took 6 HFS fluid samples, 2 gas (one HFS and one bottle with funnel) samples, and 2 rock samples. Deployed Tephra Sampler F at Phantom. Moved east to Sulfur Crust, Mkr-120. Deployed Tephra Sample D and a shrimp trap. Recovered previously left shrimp trap. Took 5 HFS fluid samples then deployed 2 mat cages next to MTR. Returned to Phantom for last visual observations before dive ended.

J2-489 RAS search and locate west markers. Summary: Began dive due east of 2009 eastern-most marker locations. Traveled upslope and then along a ridge running west. Reached wall at ridge top covered in iron oxide and white mat same as 2009. Collected scoop sample of rocks with white mat. Nearby further west relocated Mkr-109 (Fault Shrimp09 site). On same ridge but further east (6.5m), deployed shrimp trap-2, new marker (Mkr-112) and MTR-1. Between Mkr-109 and Mkr-112, suctioned a sample of shrimp. Moved south and relocated Mkr-113 (Sulfur Slide) which had a few shrimp. Looked for Mkr-111 but did not locate and returned to Mkr-109. Deployed mat cage (shrimp exclusion trap). Deployed shrimp trap-3 and MTR-4 at Mkr-109 which was moved back to the top of the ridge (it had slid). Took gastight bottle sample at Mkr-109. Moved Mkr-112 back to ridge top (it also had slid down) and secured with marker anchor. Traveled due west to verify RAS is no longer in place. Site looked similar but no mooring visually seen or on radar. Drove midwater across southern chute to east-facing vertical wall chute boundary. Sampled rock from wall base, covered in white. Evidence of venting as climbed west wall. Relocated Mkr-110 (Iceberg09 site) at top of wall. Took gastight bottle sample and shrimp video at Mkr-110. Searched for Mkr-108 and Mkr-115 but neither located. Moved south to Mkr-105 site but not marker, site still stained in white. Moved further west and encountered basalt headwall. Tephra, sulfur globules and mat in cracks. Took rock sample from wall base. Moved few meters west along wall and discovered new venting site, Styx, at wall base. Observed vent then moved over wall and west toward Brimstone. No plume visible and moved west to Sulfur Crust then further west to Phantom, observe ring activity. Returned to Brimstone and viewed instruments but little venting. Returned to Sulfur Crust and up righted Tephra sampler and recovered shrimp trap. Moved back to Phantom and deployed marker, Mkr-118.

J2-490 Fluid Sampling at Mkr109/112; Mkr 110 and Eruptive Vents. Summary: Jason on bottom at Mkr-109. Scooped sample of mat from base of Mkr-112. Recovered MTR-1 and shrimp trap-2 from Mkr-112. Took 4 HFS fluid samples from Mkr-109. Moved over to Mkr-112 and took one HFS fluid sample. Moved west to Mkr-101 site and observed barnacles (2009 marker gone at Barnacle Block). Took a rock with barnacles on it, then deployed new marker, Mkr-119. Observed west face of east wall of collapse chute. Turned west and moved across chute to west wall of collapse-chute. Started at bottom of wall (lobates) and climbed about 100m up face. Took temperature reading of sediments at top of wall with probe. Moved west to Mkr-110. Took 4 HFS fluid samples, deployed mat cage, took suction sample of mat and deployed shrimp trap at Mkr-110. Drove mid-water to Mkr-163 (Summit). Swapped out hydrophone instruments at Summit then took temperature of sediments near Tephra sampler-C. Moved down to Styx vent and could not find recently deployed marker. Took 3 HFS fluid and 1 gas HFS sample at Styx. Moved up and over to Brimstone. Took scoop sample of Tephra, swapped out Tephra samplers (recover H/deploy B) at Brimstone (low activity). Took temperature probe readings of sediment at Brimstone. Went west to Phantom Vent. Collected 6 HFS fluid samples, one rock next to active flow and scoop of tephra below Mkr-118. Deployed Tephra-A just south of the anchor of Mkr-118. Tephra-F sampler now missing from Phantom. Explored region west of Phantom for other possible venting locations and geology observations. Then moved north along cone slope (west side of cone), discovered massive basalt block feature named Devil's Staircase north of Sulfur Crust and west of Summit. Drove east, midwater, back to Mkr-109 and recovered marker for mat sample growing on marker. Searched for Mkr-114 (Rusty Rise) to the east but did not locate.

J2-491 Deep mooring search (1500m mooring). Summary: Began dive at 1843 meters on south slope of Brimstone in slide area. Had a mooring target search area based on acoustic signals from 2009 mooring. Used acoustics signals to/from Medea and mooring for search on bottom. Using range data, narrowed search area and conducted transects in search of mooring. Area covered in fine sediments with small rubble visible. Data indicated we were within 41m or less of release but instrument not located. Headed upslope to original mooring location in a zig-zag pattern. Observed sediments, staining and outcrops. At a large outcrop with yellow and white staining, took rock sample. Ran out of time, 300m short of mooring deploy target at 1150m of depth, ending dive.

J2-492 (15-hour) Fluid sampling at eruptive vents, geology exploration north and west, hydrophone mooring search/recovery. Summary: On bottom 50m south of Phantom Vent. Moved upslope to Sulfur Crust area (very active), with new sulfur flows. Active venting site named Sulfur Vent, 10m west from Mkr-120 (Sulfur Crust). Moved over to Phantom Vent, located Tephra sampler and Mkr-118, area not very active. Moved between Mkr-118 and Mkr-120 (5m east of Phantom) and took 2 HFS fluid samples. Returned to Sulfur Vent and took 3 HFS fluid and 1 HFS gas sample. Moved back to Phantom and Mkr-118 half-buried. Returned to Mkr-120 (Sulfur Crust) and swapped tephra samplers (recover D/deploy H) on crust piece that newly collapsed. Took 2 HFS fluid samples at Mkr-120. Moved over to Sulfur Vent and took sample of sulfur flow. Returned to Phantom and marker completely buried and tephra sampler slid downslope. Repositioned Tephra-A 5m upslope of Phantom. Traveled east to Styx Vent (marker gone), plume white. Took 3 HFS fluid samples and a rock sample from Styx. Went to Brimstone and recovered Tephra-B. Next visited Arrowhead for fluid sampling, took 3 HFS fluid samples. Drove north along rim for geology observations, passed over Mkr-163, following rim until it begins to curve west. Drove midwater halfway across scarp basin, descended to bottom, traveling across sandy sediment until gradually began to ascend upslope of escarpment. At top of scarp, used sonar to search for hydrophone mooring and Medea pinged on release (no signals). Sonar found hydrophone instrument, setup Medea/Jason for approach on bottom. Observed anchor buried in sandy sediment (not in collapse area) then ascended to view release. Returned east to vents, found Phantom activity much diminished, moved to Sulfur Vent. Took 4 HFS fluid and 1 HFS gas sample. Drove midwater back to hydrophone mooring, took 2 background HFS fluid samples. Setup ship, vehicles and small boat ops for mooring release. Visually watched mooring release and instrument recovered after Jason on deck.

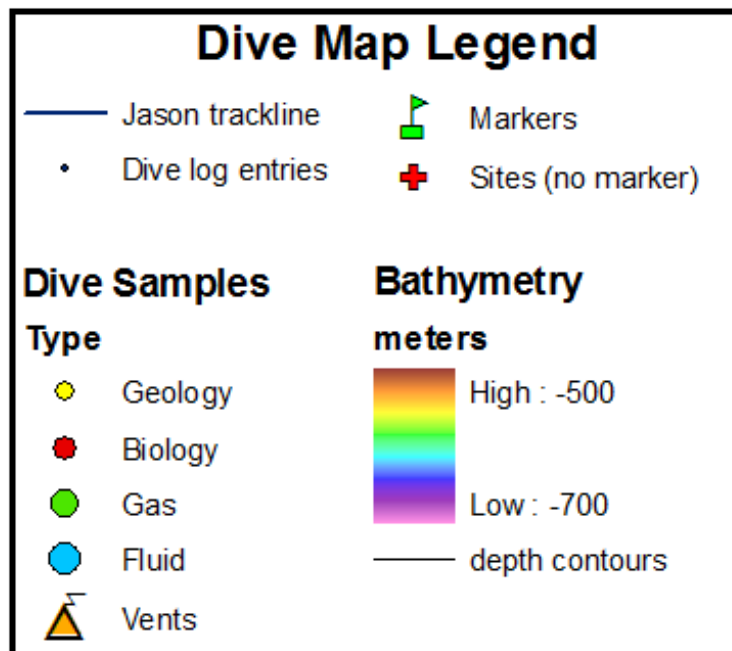
J2-493 SM2K mapping. Summary: Dive dedicated to mapping NW Rota-1 summit. Collected 13 east-west lines and 2 north-south lines of data without a working bow thruster. Note Jason altimeter was not engaged for most the survey for data quality/interference.

J2-494 Fluid sampling and visual observations. Summary: Began dive just south and west of Summit Mkr-163. Deployed and recovered hydrophones. Drove east to Mkr-110 (Iceberg09) site, recovered (4)/deployed (2) shrimp traps. Took 4 HFS fluid samples from a nearby crack under ledge (west) with large bursts of flock material. Moved just south to old Limpet Lair (Mkr-105) area to observe sulfur coated wall. Took 2 HFS fluid samples about 10m N/NW of old Mkr-105 position. Deployed new marker, Mkr-117 at site. Traveled down the wall from Mkr-117, coated in sulfur with large quantities of shrimp. Took rock sample of sulfur substrate about 20m above wall base. At right angle break in wall, one side sulfur, other bare. At base of wall, deployed Mkr-164 (Sulfur Wall). Moved west and discovered active (ash and plume) venting, named Charon Vent. Took 7 HFS fluid and 1 gas sample at Charon. Moved NW to Styx over eruptive lava and headwall. Styx very active (bubbles/ash/plume) and no visibility for sampling. Traveled west to Sulfur Vent (very active) and then moved over to Phantom. Recovered Tephra-A at Phantom. Went back to Sulfur area and recovered instruments at Mkr-120, Sulfur Crust, (hydrophone/2 mat cages/MTR). Swapped tephra samplers (H recovered/D deployed) at Mkr-120. Returned east to Styx (very active/explosions). Took scoop of tephra from base of vent. Kept rock from explosion that landed on basket.

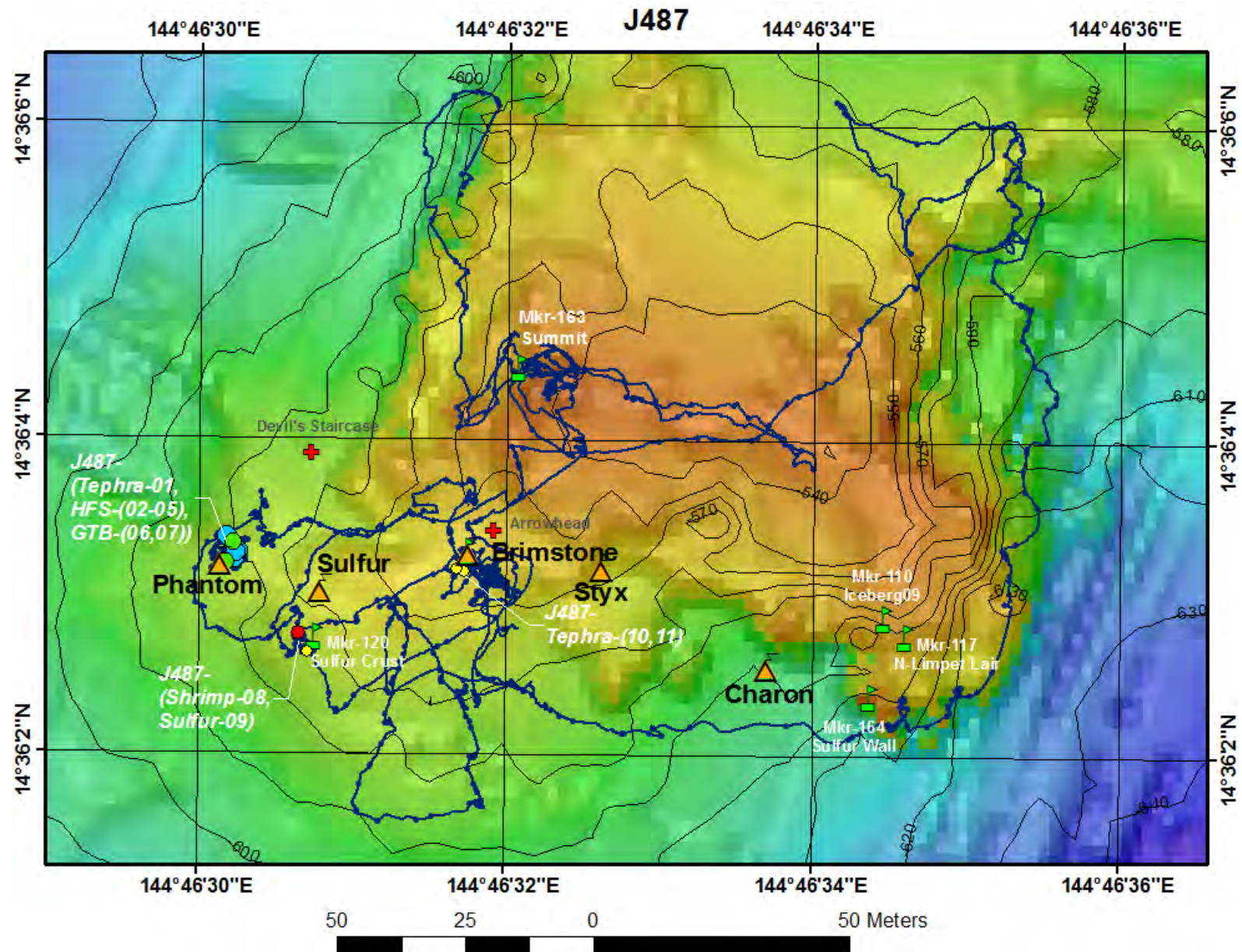
J2-495 Instrument recoveries and observations. Summary: Began dive ~100m south of Phantom and drove upslope for geology observations. Took 1 rock sample. Near top of slope encountered plume with tephra raining down as approached Styx Vent. Observed Styx (very active) and took one scoop sample of tephra between explosions. Tephra raining down and bucket in front of basket probably took tephra sample during these observations. Activity diminished and moved up/over to Brimstone which had no activity. Went further west to Sulfur Vent which was active and steady (tephra and sulfur). Observed Sulfur Vent and used Jason probe to take temperature. Took gas sample with funnel on bottle, 2 major fluid samples and one other gas bottle sample at Sulfur Vent. Moved over to Sulfur Crust and found tephra-D sampler knocked down and recovered it. Mkr-120 also knocked down and below piece of sulfur crust. Took sample of the sulfur crust. Moved over to Phantom which was not very active but began to steam while at site. Headed east to Charon (passed over Sulfur Vent which was still very active) and at Charon nav target, some white smoke and venting. Moved to Sulfur Wall and took 2 suction samples of shrimp from different wall locations. Could not find marker (Mkr-164). Headed up wall to Mkr-110 (Iceberg09) site. Recovered mat cage and shrimp trap at Mkr-110. Took 2 shrimp and 1 mat suction sample at Iceberg09. Headed east to Mkr-112 (Fault Shrimp) site. Recovered shrimp trap and MTR-4 from Mkr-109 location. (Intended to redeploy Mkr-109 but decided not to). Recovered mat cage between Mkr-109 site and Mkr-112. Drove west to Mkr-163/Summit and passed over Sulfur Wall and encountered Mkr-117. Reached Summit/Mkr-163 and recovered hydrophone, MTR and Tephra-C. Followed summit ridge to east and scooped sediment near ridge top. Ended dive with observations at Styx Vent (activity had diminished).

6.3 Dive Maps

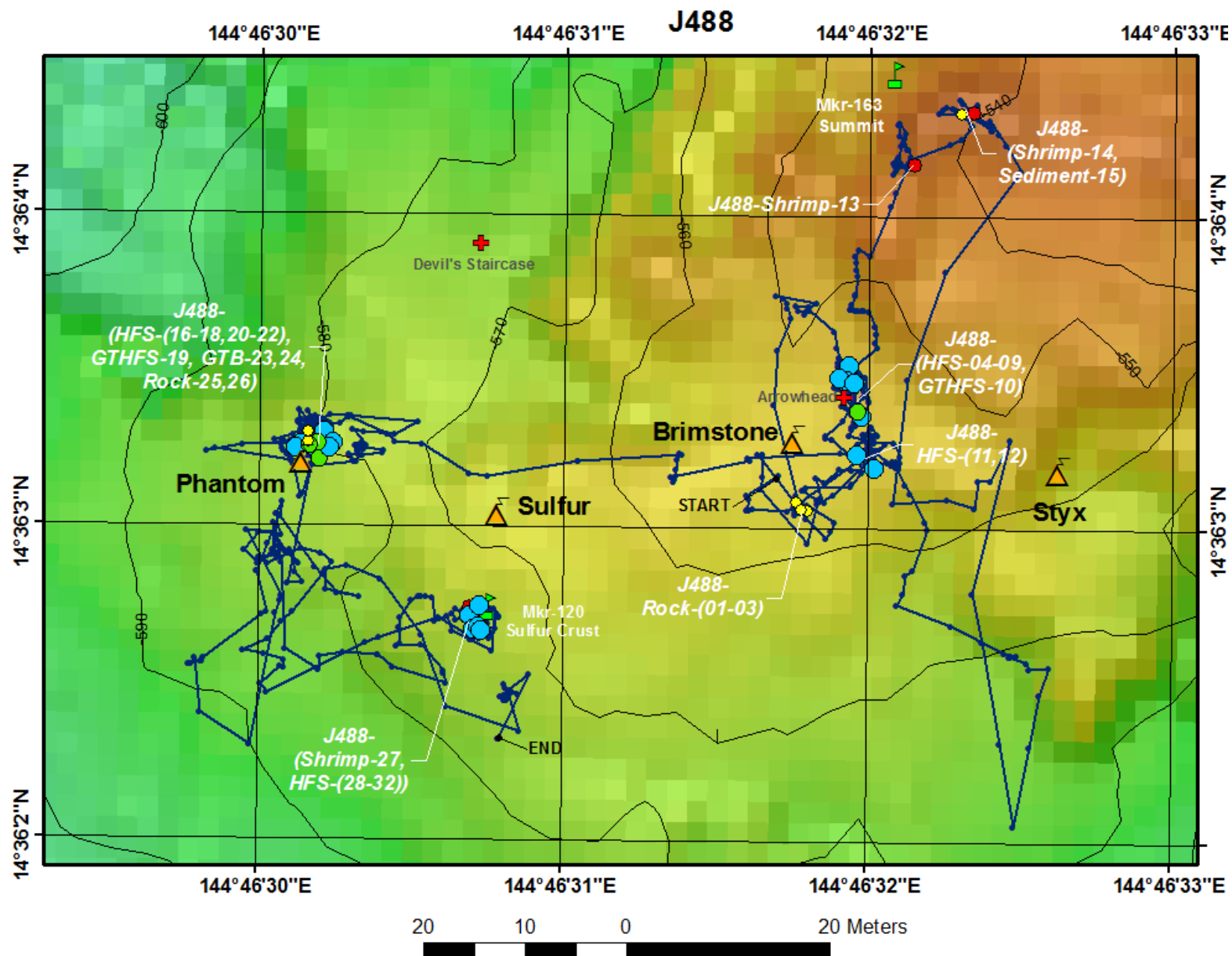
Unless otherwise noted the following legend applies to all the dive maps. All maps are displayed in a UTM Zone 55N projection. Each map has its own scale.



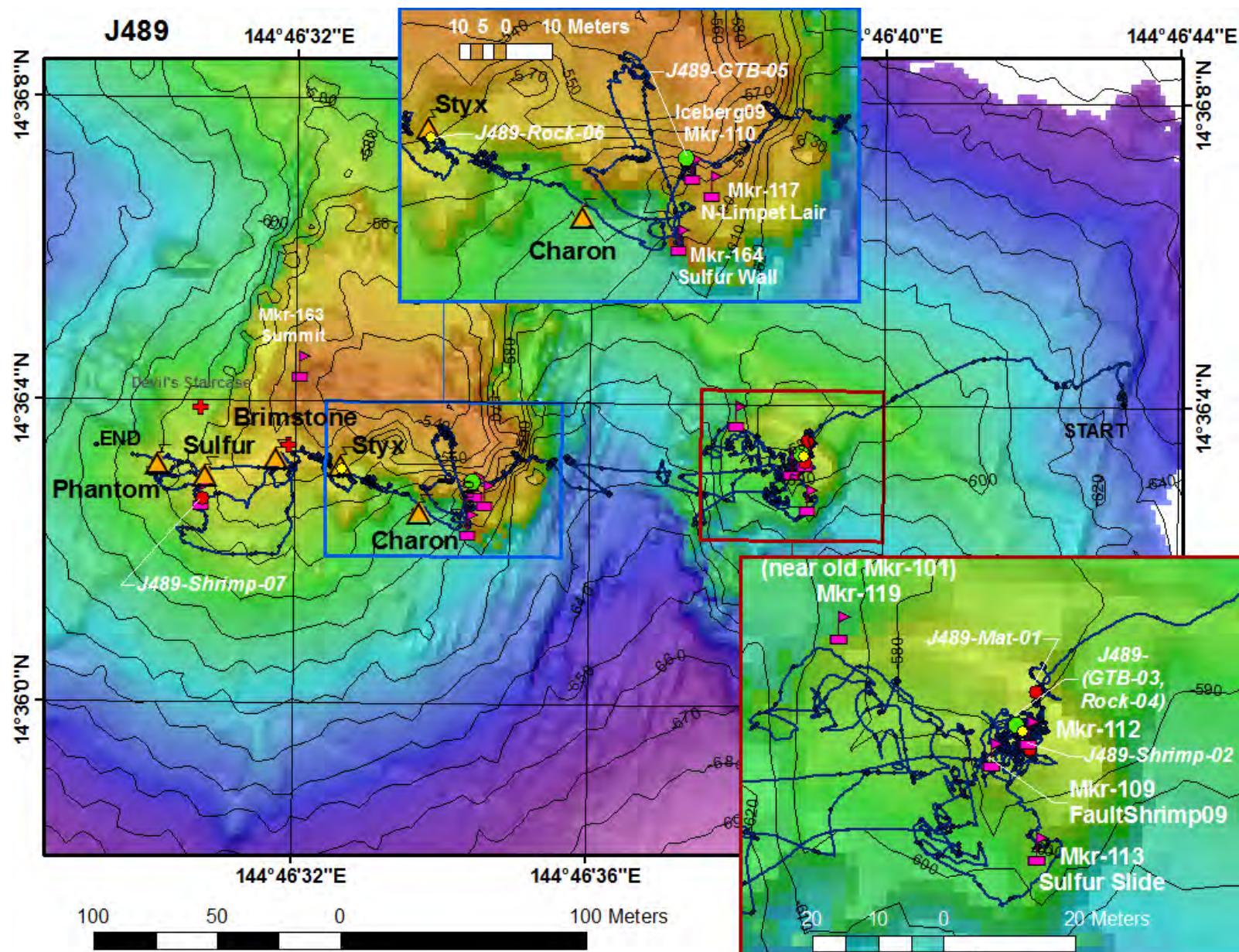
J2-487: Summit exploration, fluid sampling, search for Limpet Lair (Mkr-105).



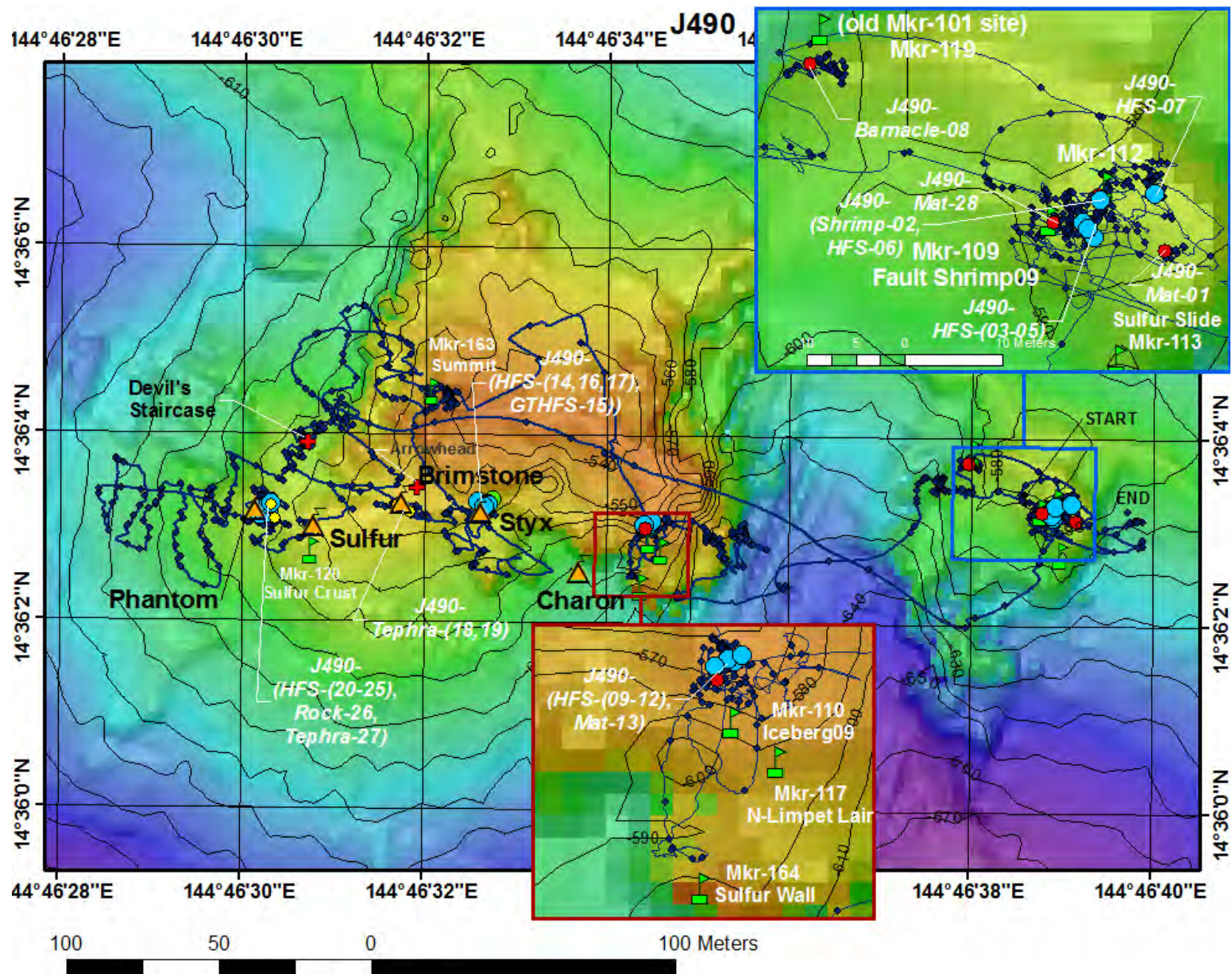
J2-488: Fluid sampling, vent observations.



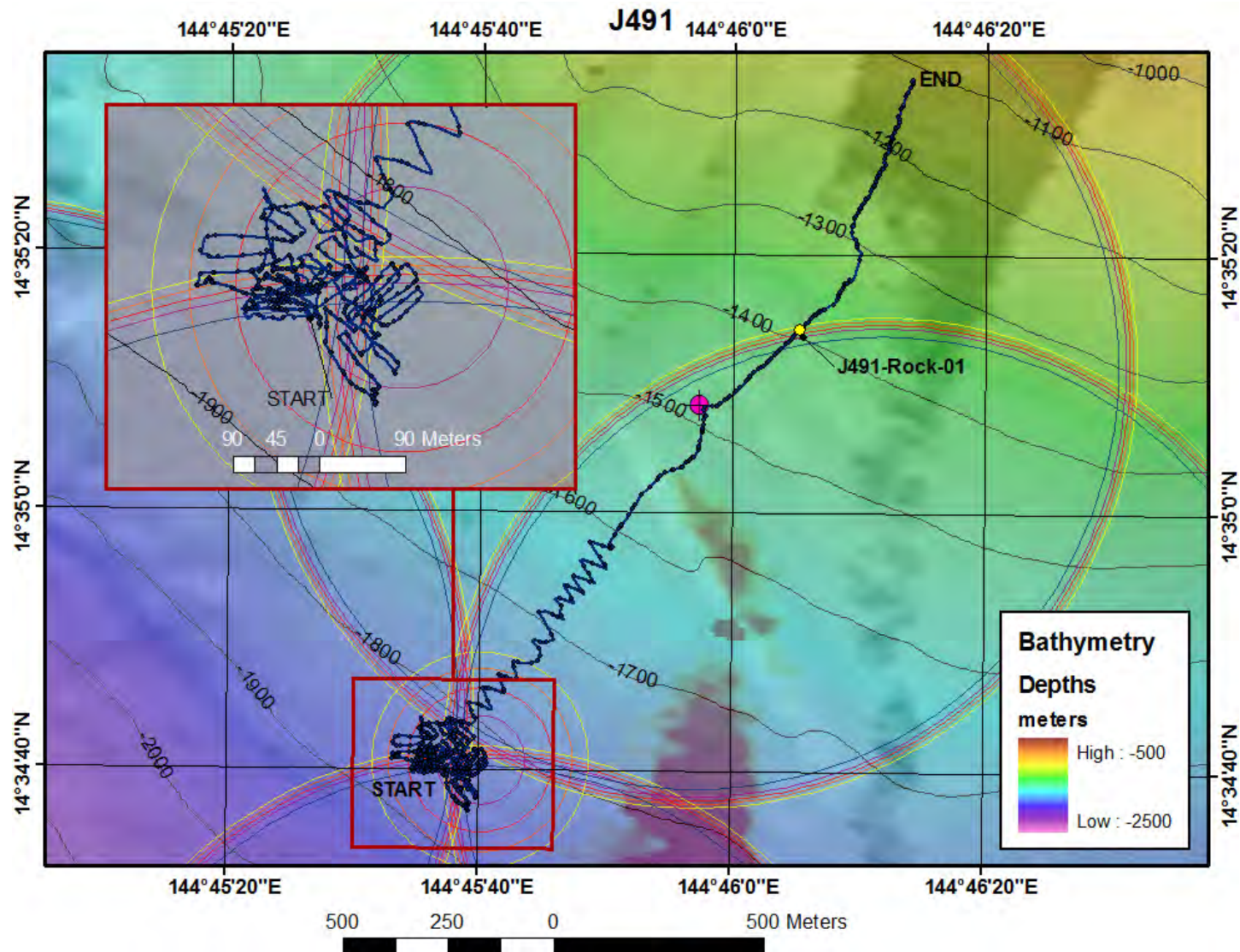
J2-489: Search for markers and RAS mooring.



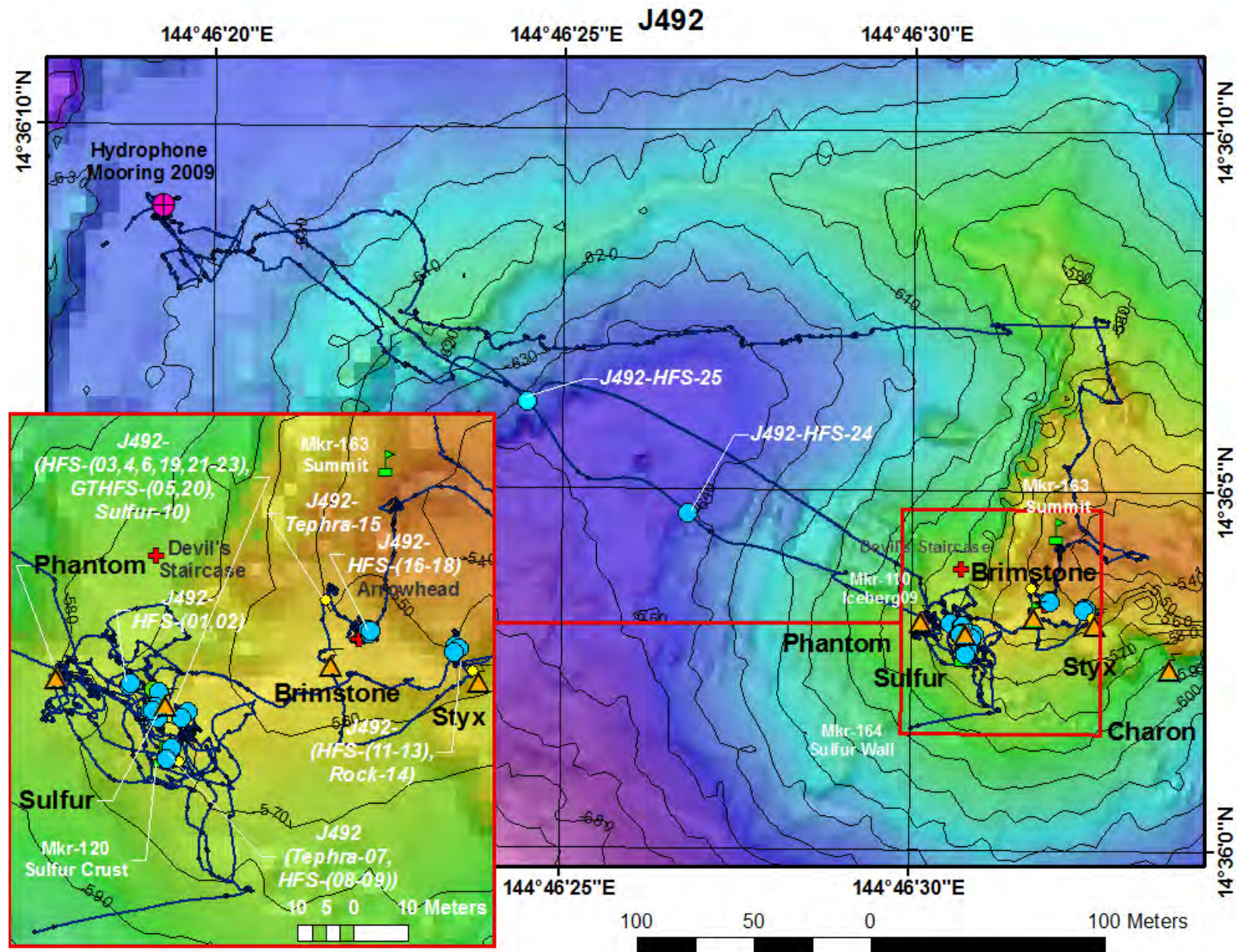
J2-490: Fluid sampling at diffuse areas and eruptive vents.



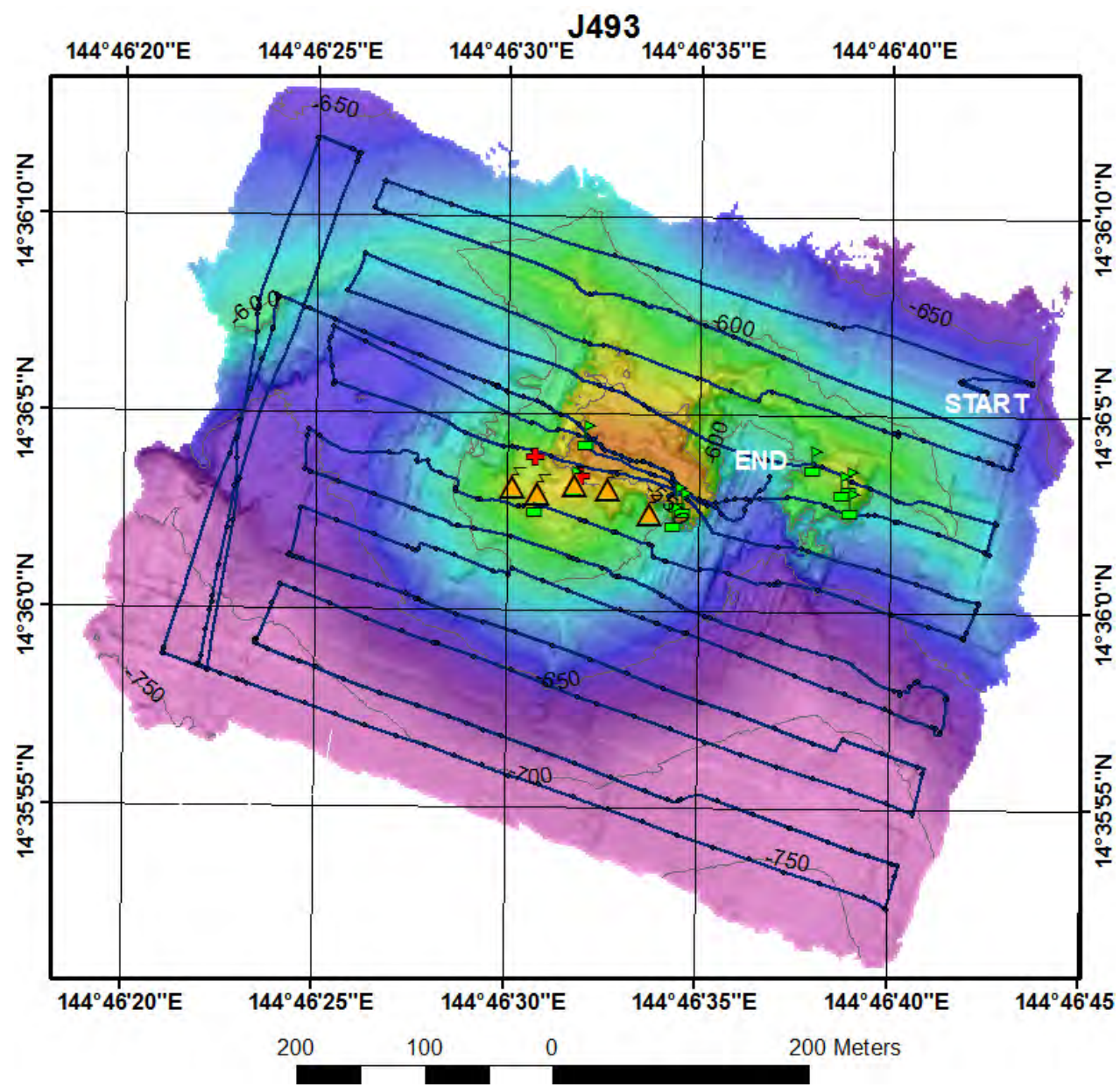
J2-491: 1500m mooring search. Note bathymetry scale is different compared to the other dive maps. Displayed are the bathymetry differencing results of the material removed (gray shadow) and material deposited (red shadow) from the landslide. Also shown are the results of the computed horizontal ranges (colored circles) from the ship's position to the mooring release obtained from the slant ranges obtained from the mooring's release signal. These ranges were used to narrow the bottom search area for the lost mooring.



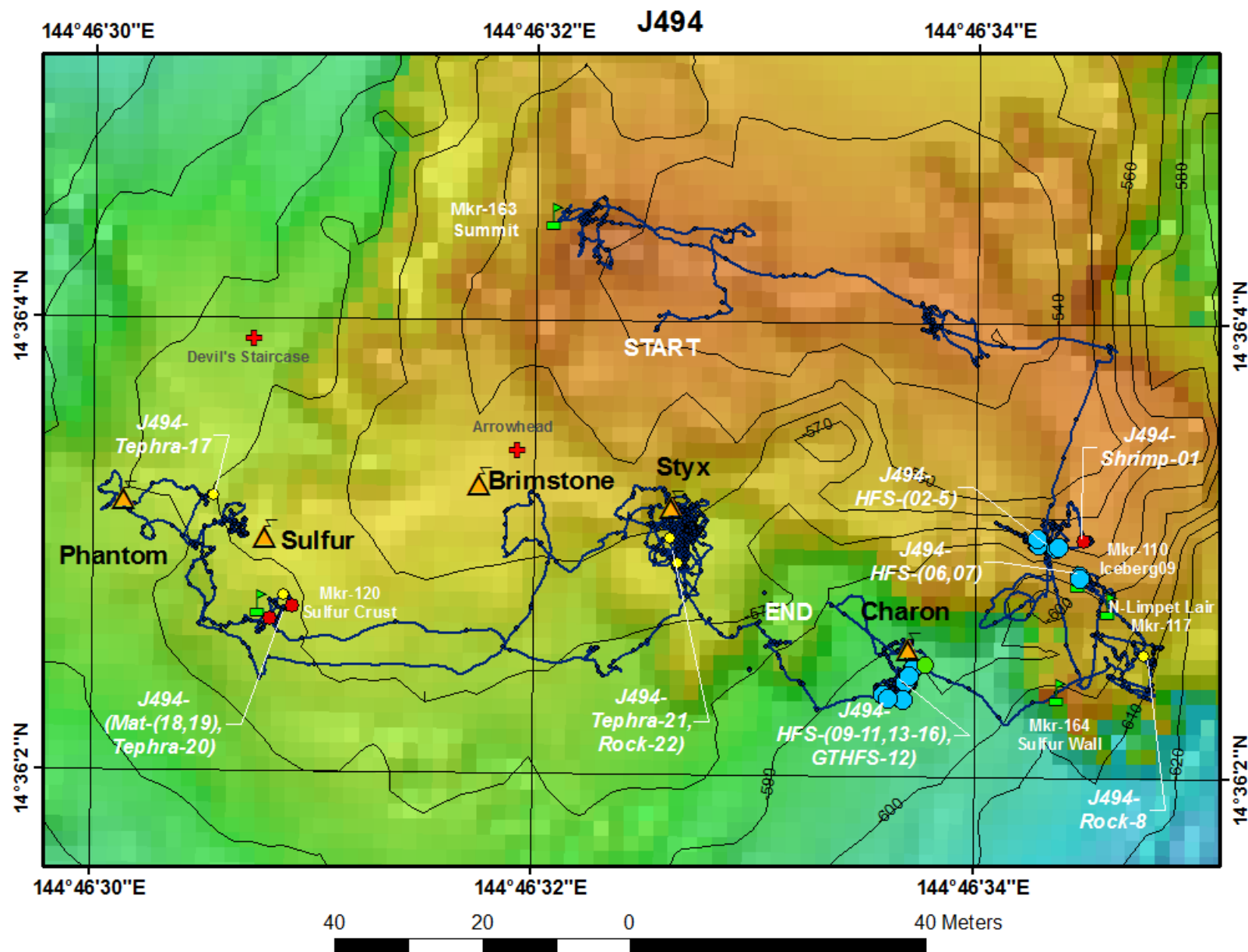
J2-492: Fluid sampling at eruptive vents, geology exploration and hydrophone mooring recovery.



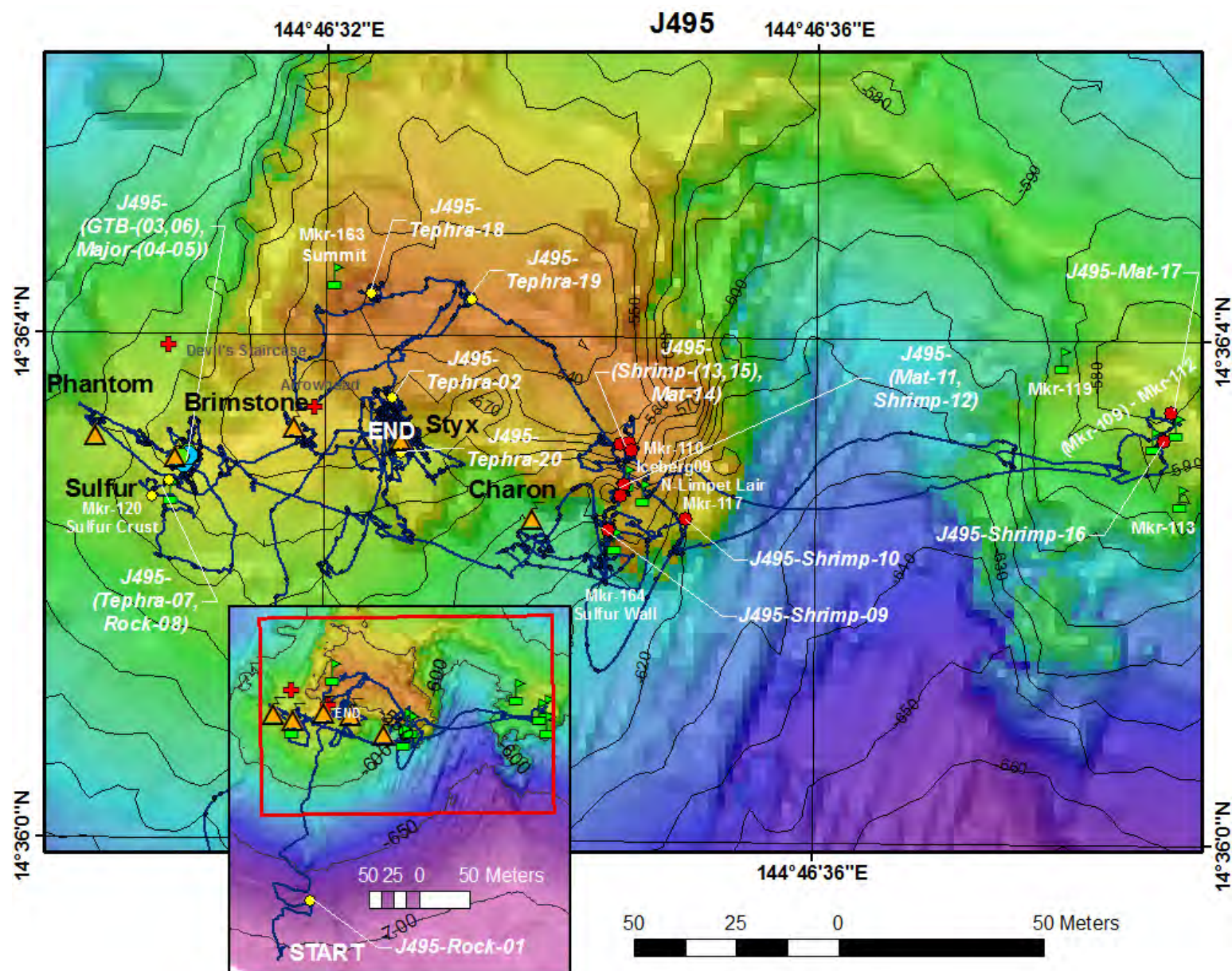
J2-493: SM2000 mapping dive.



J2-494: Fluid sampling and visual observations.



J2-495: Observations and instrument recoveries.



6.3 Dive Samples. Samples listed by dive number, all times and dates are GMT. Latitude and longitude positions are 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 146 samples: 75 fluid, 33 geology, 24 biology and 14 gas samples.

Table 6.3-1 J487 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J487	J487-Tephra-01	Phantom Vent	3/18/2010 4:40	14.60090	144.77511	566.5	569.5	92.48	Scoop sample in area with lots of tephra deposits-a relatively sandy area.	Deardorff	457
J487	J487-HFS-02	Phantom Vent	3/19/2010 22:33	14.60091	144.77512	566.2	567.6	102.74	Unfiltered piston #1 in vigorous plume at Phantom vent. (started 00:16) Lots of bubbles and tephra in yellow plume. (ended 00:17) Tmax=70.2 Tavg=65.3 vol=213 T2=24.	Butterfield	488
J487	J487-HFS-03	Phantom Vent	3/19/2010 23:08	14.60090	144.77511	566.2	567.6	102.61	Filtered piston #2 (started 00:18) at Phantom vent (stopped 00:21). Tmax=77.7 Tavg=59.8 vol=~350 T2=24	Butterfield	493
J487	J487-HFS-04	Phantom Vent	3/20/2010 3:23	14.60091	144.77512	566.3	567.5	102.87	Filtered piston #3 (started 00:28) Plume vigorous; positioned wand horizontally in center of plume. Saw puff form exhaust then stopped. Program crashed. Ground shaking and moving Jason so displaced nozzle. Lots of tephra while waiting for temperature to increase and restart this sample. Sampling started again (00:36). Moved wand tip slightly while sampling. Temp started coming up more rapidly (00:37) Sampling continued when temp got up to 60. Sample stopped (00:39). Tmax=74.1 Tavg=64 vol=250 T2=30.	Butterfield	512
J487	J487-HFS-05	Phantom Vent	3/20/2010 19:46	14.60094	144.77510	566.0	567.8	139.27	Sample: fluid J487-HFS-05 Unfiltered piston #4 (started 01:04). Plume is vigorous with lots of bubbles. Rock is moving; some explosions. Vent is pulsing. Sampling while vent is pulsing but then sampler malfunctioned (01:06). Then activity at part of plume being sampled decreased/stopped. Moved wand to more vigorous part of vent to the right. Temperature increased rapidly at new position. Sampling restarted (01:09) with temperature >100. Lots of bubbles. Stopped sampling (01:10). Tmax=106.6 Tavg=97 vol=235 T2=19.	Butterfield	568
J487	J487-GTB-06	Phantom Vent	3/20/2010 21:02	14.60089	144.77510	566.9	570.3	106.09	Red gas-tight bottle #9 at Phantom Vent. Tip in yellow part of plume. Saw bottle jerk when fired. No temperature measurement.	Evans	615

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J487	J487-GTB-07	Phantom Vent	3/21/2010 5:04	14.60093	144.77511	566.3	568.9	130.64	Green gas-tight #2 at Phantom Vent. Getting temps from 40 - 106 deg C. Bottle in the bubbles. Shift change delay. GTB fired at 0148.	Evans	626
J487	J487-Shrimp-08	Mkr-120 Sulfur Crust	3/21/2006 19:01	14.60077	144.77523	556.8	558.0	4.92	Shrimp suction sample at Sulfur Crust. Start suction sample (04:40). Completed suction sampling (04:50).	Tunncliffe	904
J487	J487-Sulfur-09	Mkr-120 Sulfur Crust	3/21/2006 19:21	14.60073	144.77525	556.8	558.6	356.38	Sample of sulfur crust for Cornel/Nick & Verena/John from Mkr-120 at Sulfur Crust site. (Some pieces will be used as substrate for biology). 4 pieces all together.	deRonde Deardorff Tunncliffe	938
J487	J487-Tephra-10	Mkr-161 Brimstone	3/21/2006 22:15	14.60088	144.77553	548.4	549.6	39.7	TEPHRA SAMPLER D recovered at Mkr-161 Brimstone. Deployed at 22:09 on this dive; J-487.	Deardorff	965
J487	J487-Tephra-11	Mkr-161 Brimstone	3/22/2006 1:27	14.60088	144.77552	548.6	549.8	40.2	Scoop sample of tephra at Mkr-161 Brimstone. Site of tephra sampler exchange.	Deardorff	972

Table 6.3-2 J488 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J488	J488-Rock-01	Mkr-161 Brimstone	3/19/2010 19:06	14.60086	144.77554	549.8	551.0	354.51	Rock from in the vent. Brimstone basically inactive. Little black rock.	Deardorff	1044
J488	J488-Rock-02	Mkr-161 Brimstone	3/19/2010 19:08	14.60085	144.77555	549.8	551.0	354.57	Shiny black rock from inactive Brimstone. The rock is about 5 or 6 inches.	Deardorff	1046
J488	J488-Rock-03	Mkr-161 Brimstone	3/19/2010 19:09	14.60085	144.77555	549.8	551.0	354.54	Smaller black shiny rock from the same site. Inside the inactive vent.	Deardorff	1047
J488	J488-HFS-04	Arrowhead	3/19/2010 19:52	14.60096	144.77558	545.8	546.5	36.32	Filtered bag #24. Sampling in this crack at Arrowhead (starting at 19:52:35). Stopped (19:55). Around 47°C. Tmax=48.2 Tavg=48.3 T2=22 Vol=327ml.	Butterfield	1120
J488	J488-HFS-05	Arrowhead	3/19/2010 19:58	14.60098	144.77559	545.8	546.5	36.27	Unfiltered bag #19 (started 19:56:23). Looks like a little bit of vague mat on the rock right near the tip (stopped 19:59). Tmax=46.5 Tavg=45.2 T2=21 Vol=419ml.	Butterfield	1125
J488	J488-HFS-06	Arrowhead	3/19/2010 20:01	14.60096	144.77559	545.8	546.5	36.08	Unfiltered piston #8 (started 20:00:54). Same spot in the crack just to the right of the Arrowhead. Not getting good flow out of the exhaust. Don't think that one worked.	Butterfield	1128

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J488	J488-HFS-07	Arrowhead	3/19/2010 20:05	14.60097	144.77558	545.8	546.5	36.88	Unfiltered piston #6 (started at 20:04:30). Repositioned nozzle (20:06). Still in same spot in the crack as for samples 04-06. Temp coming back up. Lowering tip just a bit to get back into the notch. Wand is in the crack just to the right and slightly above the "arrowhead". (restarted 20:09:00). Not much exhaust; pistons not working well. (Stopped 20:11:30). Tmax=44.6 Tavg=41.5 Vol=570.	Butterfield	1133
J488	J488-HFS-08	Arrowhead	3/19/2010 20:37	14.60093	144.77560	546.0	546.7	36.84	Sterivex filter #10. In the same spot at Arrowhead crack. (started 20:35:00). Temp is rising. Now up to 37°C. During sample current was changing and plume was wafting about. (stopped 20:54:40). Tmax=40.1 Tavg=35.3 Vol=2544ml T2=19.	Butterfield Smith	1175
J488	J488-HFS-09	Arrowhead	3/19/2010 20:59	14.60096	144.77559	545.4	546.5	36.75	RNA filter #13. Same exact spot in the crack as previous fluid samples. Temp is rising; about 43°C (started 20:59:10). Filter has red food coloring. Temp is about 45 deg C. Shimmer increased during filtering (stopped 21:16:08). Tmax=46.4 Tavg=42.4 Vol=2506ml T2=20 Voltage=0.7.	Butterfield Smith	1191
J488	J488-GTHFS-10	Arrowhead	3/19/2010 21:09	14.60094	144.77560	545.4	546.5	36.58	STBD gastight #5 on the beast. Temp was 43°. At Arrowhead in the same crack as other fluid samples.	Evans	1201
J488	J488-HFS-11	Mkr-161 Brimstone	3/19/2010 21:49	14.60089	144.77561	547.4	548.6	306.67	Filtered bag #23 (started 21:48:04). Right in the area that is the vent. Some shimmer but no smoke today and no degassing. Brimstone has not done much since our last visit because the tephra bucket is empty and the anchor is not covered. The wand is just above the sediment. (stopped 21:53). Tmax=26.8 Tavg=23.2 Vol=510ml T2=15.	Butterfield	1261
J488	J488-HFS-12	Mkr-161 Brimstone	3/19/2010 21:54	14.60090	144.77560	547.4	548.6	306.2	Unfiltered bag #18 (start 21:54:15). Right in the vent at Brimstone. Not much of a pH anomaly; looking at heated seawater if the pH reading is correct and consistent with no sulfur or CO2 coming out of the vent. (stopped 21:57). pH voltage was 1.86 Tmax=23.5 Tavg=22.7 Vol=438ml T2=15.	Butterfield	1270

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J488	J488-Shrimp-13	summit above Brimstone	3/19/2010 22:33	14.60116	144.77565	523.5	527.4	356.75	Suction of shrimp on vertical wall above Brimstone; about 5m below summit rim. Whole cliff face covered with shrimp; certainly juveniles. Stop at 22:41.	Tunnicliffe	1347
J488	J488-Shrimp-14	Mkr-163 Summit	3/19/2010 23:08	14.60120	144.77570	519.8	525.0	356.62	Recovered shrimp trap at Summit. The traps have been out for 2 days and are jam-packed with shrimp. Deployed J-487.	Tunnicliffe	1393
J488	J488-Sediment-15	Mkr-163 Summit	3/19/2010 23:13	14.60120	144.77569	520.2	524.1	6.15	Scoop of volcanoclastic sediment very close to where the shrimp trap was sitting. Bag is not full. Exact same location as previous sample.	Deardorff	1399
J488	J488-HFS-16	Phantom Vent	3/20/2010 0:29	14.60092	144.77511	565.2	566.4	99.74	Filtered piston #1. Sampling during big burst with activity increasing. Temp is 70°C while sampling. Lots of bubbles in plume and not so much tephra. Big burst of high temp. Getting hot but can't see wand temp (00:32). Temp coming down now (00:32). Stopped (00:33). Tmax=145 Tavg=86.7 vol=382 T2=45.	Butterfield	1545
J488	J488-HFS-17	Phantom Vent	3/20/2010 0:33	14.60090	144.77510	565.3	566.4	97.37	Unfiltered Piston #2 (started 00:33). Temperature is coming down while sampling. Less vigorous activity but good steady plume. Stopped (03:36). Tmax=100 Tavg= (maybe 70) Vol=400 T2=39.	Butterfield	1555
J488	J488-HFS-18	Phantom Vent	3/20/2010 0:40	14.60091	144.77512	565.2	566.7	104.64	Filtered piston #3 (started 00:40). Had to move wand a bit; tip was in the explosive area at vent. Pulse-like bursts; very explosive and concentrated. Temp is 117 deg C. Can't see if clear water is coming out of exhaust hose-looks a bit smokey. Stopped (00:42). Tmax=138 Tavg=123 vol=287 T2=45.	Butterfield	1577
J488	J488-GTHFS-19	Phantom Vent	3/20/2010 0:41	14.60089	144.77510	565.2	566.7	103.78	PORT bottle #2 fired during sample J488-HFS-18. T=138deg.	Evans	1582
J488	J488-HFS-20	Phantom Vent	3/20/2010 0:49	14.60090	144.77511	565.2	566.8	103.56	Unfiltered piston #4 (started 00:49). Moved wand around a bit to right. (pulsing has stopped). Plume encasing wand in good part of activity. Very hot sample. Bubbles are coming out of exhaust. (stopped 00:50). Tmax=151.5 Tavg=136 vol=252 T2=49.	Butterfield	1591

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J488	J488-HFS-21	Phantom Vent	3/20/2010 0:52	14.60091	144.77509	565.2	566.7	105.12	SAMPLE: fluid J488-HFS-21 Filtered piston #5 (started 00:52). Great view of sampling and overview of plume. Bubbles coming out of rock and see exhaust but no bubbles there. Seeing bubbles in exhaust (00:54). Stopped (00:54). Tmax=97 Tavg=82 vol=398 T2=33.	Butterfield	1602
J488	J488-HFS-22	Phantom Vent	3/20/2010 0:57	14.60090	144.77508	565.2	566.7	105.13	Filtered piston #7 (started 00:57). Same area as last sample. Lots of bubbles out of exhaust. Larger tephra raining down and more vigorous activity with tephra. Stopped (00:59). Tmax=196.4 Tavg=191 vol=287 T2=45.	Butterfield	1609
J488	J488-GTB-23	Phantom Vent	3/20/2010 1:16	14.60091	144.77510	565.1	566.3	96.49	Red tape-clear funnel bottle #9. Can see bubbles in the funnel and more entering. Could see level of bubbles go up when fired.	Evans	1640
J488	J488-GTB-24	Phantom Vent	3/20/2010 1:30	14.60090	144.77510	565.3	566.7	70.85	Red bubble catcher funnel bottle #6. Temp was ~195°C when measured earlier. Funnel is right in the plume. Lots of bubbles coming out of the plume when fired (01:34). The gastight was taken in the plume.	Evans	1656
J488	J488-Rock-25	Phantom Vent	3/20/2010 1:41	14.60091	144.77509	565.3	566.7	70.49	Large rock from the edge of the pit. ~15 cm wide. (Due to ballast issues; rock removed from basket 02:36).	Deardorff	1668
J488	J488-Rock-26	Phantom Vent	3/20/2010 1:51	14.60092	144.77509	565.4	567.0	51.19	Rock near Phantom vent with sulfur. Rock placed in outboard crate (crumbled a bit upon entry) with the gastights.	Deardorff	1687
J488	J488-Shrimp-27	Mkr-120 Sulfur Crust	3/20/2010 3:23	14.60076	144.77524	557.1	558.2	16.77	Shrimp Trap recovered at Sulfur Crust at Mkr-120. Trap looks good with shrimp inside. Deployed on J-487.	Tunnicliffe	1820
J488	J488-HFS-28	Mkr-120 Sulfur Crust	3/20/2010 3:42	14.60075	144.77524	557.0	558.1	18.31	Filtered bag #22 (started 03:42). pH 1.84 (not much different than background). Stopped (03:46). Tmax=25.2 Tavg=24.4 Vol=498 T2=15.	Butterfield	1846
J488	J488-HFS-29	Mkr-120 Sulfur Crust	3/20/2010 3:46	14.60074	144.77525	557.0	558.1	18.31	Unfiltered bag #17 (started 03:46). Sample exact same spot as previous sample. Good exhaust. Stopped (03:49). Tmax=25.7 Tavg=24.9 Vol=498 T2=15.0.	Butterfield	1853
J488	J488-HFS-30	Mkr-120 Sulfur Crust	3/20/2010 3:51	14.60074	144.77525	557.0	558.1	18.32	Sterivex #12 (started 03:51). This sample also at same place as previous samples. Stopped (04:07). Tmax=25.6 Tavg=24.6 Vol=25.49 T2=14.0.	Butterfield	1862
J488	J488-HFS-31	Mkr-120 Sulfur Crust	3/20/2010 4:08	14.60074	144.77525	556.9	558.0	18.15	RNA filter #15 (started 04:08). Stopped (04:26). Tmax=25.9 Tavg=25.0 Vol=2501 T2=14.0.	Butterfield	1879

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J488	J488-HFS-32	Mkr-120 Sulfur Crust	3/20/2010 4:27	14.60076	144.77525	556.9	558.1	17.8	Unfiltered bag #20 (started 04:27). Stopped (04:29). Tmax=25.4 Tavg=24.9 Vol=485 T2=14.	Butterfield	1893

Table 6.3-3 J489 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J489	J489-Mat-01	Mkr-112	3/20/2010 19:46	14.60098	144.77754	565.9	580.9	243.93	Scoop of rocks covered in white fuzzy mat and some iron oxide mats. Eastern edge of wall north of Rusty Ridge. This position is north of old Mkr-109. Lots of the crumbling wall ended up on the basket.	Smith	2074
J489	J489-Shrimp-02	Mkr-109 - Mkr-112	3/20/2010 21:02	14.60090	144.77753	564.6	566.8	315.25	Suction sample of shrimp. Trying to get both species. ~2m SE Mkr-109; just W of Mkr-112. Hdg=315.	Tunncliffe	2175
J489	J489-GTB-03	Mkr-109	3/20/2010 23:59	14.60093	144.77752	563.6	666.2	222.64	Orange and Black tape bottle #7 at Mkr-109. Wand in the crack below Mkr-109. No temperature measurement; low.	Evans	2374
J489	J489-Rock-04	Mkr-109 N	3/20/2010 22:56	14.60092	144.77752	564.0	623.2	301.24	Grabbed a rock (more like a block of sulfur) from the slide chute western wall (Jason facing west on the wall). Wall appears freshly exposed (no alteration) and has shrimp on it. Medea in a tight spot (hole).	Deardorff	2533
J489	J489-GTB-05	Mkr-110 Iceberg09	3/21/2010 2:20	14.60082	144.77628	532.9	538.3	339.91	Red gastight bottle #9 at Mkr-110. Tip was in flow-not in sediment. HDG=340. No temperature measurement; low.	Evans	2609
J489	J489-Rock-06	Styx near on wall	3/21/2010 3:50	14.60086	144.77578	559.8	561.7	44.33	Rock (very breakable) from wall near Styx at 560m with 2m depth below (near base of wall). Knocked some sediments and pieces of rock from wall. Picking up more of the pieces from the wall-same sample. SW portion of the headwall site (E of Brimstone). Sample is in 2 pieces.	Deardorff	2792
J489	J489-Shrimp-07	Mkr-120 Sulfur Crust	3/21/2010 5:04	14.60075	144.77526	553.4	558.6	36.79	Shrimp trap recovered at Sulfur Crust. Deployed on J-488.	Tunncliffe	2966

Table 6.3-4 J490 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J490	J490-Mat-01	Mkr-112	3/21/2006 19:01	14.60086	144.77759	565.9	595.9	310.09	Scoop of white furry mat from the steep wall at the base of Mkr110. Hdg=310. Orange on the wall is probably iron oxides. The white mat is very furry looking and moving in the current. Mat and crumbly black rock in sample.	Tunncliffe	3046
J490	J490-Shrimp-02	Mkr-112	3/21/2006 19:21	14.60091	144.77753	563.5	566.5	344.26	Recovered shrimp trap from edge of cliff in a precarious position. There are some shrimp in there (on Spam). Deployed J-489.	Tunncliffe	3073
J490	J490-HFS-03	Mkr-109	3/21/2006 20:34	14.60089	144.77751	564.4	567.1	314.69	Filtered bag #24 (started 20:34). Heading 315. Sampling in a crack under a meter down or so from the ledge just off the edge of Mkr-109; focused flow. Stopped (20:36) Tmax=20.9 Tavg=20.2 T2=9.4 Vol=403ml.	Butterfield	3171
J490	J490-HFS-04	Mkr-109	3/21/2006 20:39	14.60088	144.77752	564.4	567.1	314.94	Unfiltered bag #17 (started 20:37). Stopped (20:41). Tmax=20.3 Tavg=19.6 T2=9.3 Vol=401ml.	Butterfield	3178
J490	J490-HFS-05	Mkr-109	3/21/2006 20:43	14.60088	144.77752	564.5	567.1	315.05	Sterivex filter #11 (started 20:42:45). Stopped (21:02). Vol=2522ml Tmax=22.8 Tavg=20.6 T2=9.0.	Butterfield Smith	3183
J490	J490-HFS-06	Mkr-109	3/21/2006 21:03	14.60091	144.77753	564.4	567.2	314.72	RNA filter 14 (started 21:03). Stopped (21:19). Tmax=20.5 Tavg=19.0 T2=9.2 Vol=2502ml.	Butterfield Smith	3204
J490	J290-HFS-07	Mkr-112 East	3/21/2006 21:35	14.60091	144.77758	563.2	581.1	249.78	Filtered bag #23 (started 21:35). At base of Mkr-112 to the left and crack is just right in the frame. Just a small pH anomaly at 15deg. pH=1.82volts compared to 2.0 background. Stopped (21:38). Tmax=14.0 Tavg=12.7 Vol=494 T2=7.5.	Butterfield	3248
J490	J490-Barnacle-08	Mkr-119	3/21/2006 22:15	14.60103	144.77726	566.6	573.3	356.5	Crumbly rock with barnacles (Neolepas); ~1cm. White patches on the rock that could be sulfur. Hdg=356.	Tunncliffe	3303
J490	J490-HFS-09	Mkr-110 Iceberg09	3/22/2006 0:20	14.60085	144.77629	532.8	539.2	357.11	Unfiltered bag #18 (started 00:20). Temp is 33 right now. A few bubbles ce out of the hole when wand removed. Stopped (00:22). Tmax=33.4 Tavg=32.8 Vol=492 T2=9.4.	Butterfield	3490

J490	J490-HFS-10	Mkr-110 Iceberg09	3/22/2006 0:32	14.60085	144.77629	532.8	539.2	357.39	Filtered bag #22 (started ~00:29). Hdg 357. Stopped (00:32). Tmax=33.4 Tavg=31.6 Vol=530ml T2=10.	Butterfield	3503
Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head- ing	Comments	Principal Investigator	Virtual Van #
J490	J490-HFS-11	Mkr-110 Iceberg09	3/22/2006 0:36	14.60085	144.77630	532.8	539.2	357.45	RNA filter #15 (started 00:35). Stopped (00:49). Tmax=33.0 Tavg=31.3 Vol=2507ml T2=10.	Butterfield Smith	3508
J490	J490-HFS-12	Mkr-110 Iceberg09	3/22/2006 0:51	14.60085	144.77628	532.8	539.3	357.2	Sterivex filter #14 (started 00:50:20). Stopped (01:06). Tmax=33.3 Tavg=30 Vol=2516ml T2=9.5.	Butterfield	3525
J490	J490-Mat-13	Mkr-110 Iceberg09	3/22/2006 1:27	14.60083	144.77628	533.4	537.2	330.15	Suction white bacterial mat right above the crack with lots of flow. Exact same spot as HFS samples. Got a shrimp too.	Tunncliffe Davis	3554
J490	J490-HFS-14	Styx Vent	3/22/2006 3:15	14.60091	144.77577	557.9	559.8	16.8	Filtered piston #9 (started 03:15). Stopped (03:18). Tmax=51.8 Tavg=49.4 Vol=437 T2=7.	Butterfield	3727
J490	J490-GTHFS-15	Styx Vent	3/22/2006 3:22	14.60092	144.77581	558.0	559.9	16.79	Styx vent with good exhaust. Saw trigger. Very slow to fill. Odd. Extending and retracting again and still slow. Assume that the GTHFS was taken.	Evans	3739
J490	J490-HFS-16	Styx Vent	3/22/2006 3:24	14.60090	144.77580	558.0	559.9	16.91	Unfiltered piston #8 at Styx vent (started 03:24). Stopped (03:26). Tmax=56.6 Tavg=55.6 Vol=448 T2=10.	Butterfield	3743
J490	J490-HFS-17	Styx Vent	3/22/2006 3:29	14.60090	144.77579	557.9	559.9	17.31	RNA filter #13 (started 03:29). Styx vent. Sample started to clog so terminated prematurely. Stopped (03:44). Tmax=54.3 Tavg=47.6 Vol=2001 T2=7.	Butterfield Smith	3750
J490	J490-Tephra-18	Mkr-161 Brimstone	3/22/2006 4:12	14.60088	144.77556	547.7	549.3	44.95	Scoop sample of tephra.	Deardorff	3805
J490	J490-Tephra-19	Mkr-161 Brimstone	3/22/2006 4:26	14.60090	144.77552	547.7	549.9	37.04	Recovered Tephra bucket-H. Temp probe measured 62.5 deg C; 45 deg C and 26.0 deg C at spots within reach around tephra bucket and marker. Deployed J-487.	Deardorff	3830
J490	J490-HFS-20	Phantom Vent	3/22/2006 4:59	14.60087	144.77511	563.3	566.6	81.58	Filtered bag #21 (started 04:59). Activity is very low at Phantom vent. Stopped (05:02). Tmax= 26.6 Tavg=25.2 Vol=370 T2=7.5.	Butterfield	3893
J490	J490-HFS-21	Phantom Vent	3/22/2006 5:07	14.60087	144.77510	563.3	566.6	81.44	Unfiltered piston #6 (started 05:07). Stopped (05:10). TMax=25.8 TAVg=25.6 Vol=510 T2=7.	Butterfield	3903
J490	J490-HFS-22	Phantom Vent	3/22/2006 5:12	14.60088	144.77511	563.2	566.6	81.35	Sterivex filter #10 (started 05:12). Wand is in same position as previous samples. Weak plume coming out of vent. Stopped (05:28). Tmax=25.6 TAVg=25.2 Vol=2000 T2=7.	Butterfield Smith	3911
J490	J490-HFS-23	Phantom Vent	3/22/2006 5:30	14.60087	144.77513	563.2	566.5	81.43	RNA filter #16 (started 05:30). Stopped (05:46). Tmax=24.7 Tavg=23.7 Vol=2015 T2=7.	Butterfield Smith	3923

J490	J490-HFS-24	Phantom Vent	3/22/2006 5:47	14.60090	144.77513	563.1	566.5	81.18	Unfiltered bag #19 (started 05:47). At same location as previous samples here. Stopped (05:49). Not sure if worked well. Tmax=28.5 Tavg=28 Vol=220 T2=7.	Butterfield	3935
Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J490	J490-HFS-25	Phantom Vent	3/22/2006 5:53	14.60090	144.77514	563.2	566.5	80.4	Unfiltered bag #20 (started 05:53). Stopped (05:54). Tmax=28.0 Tavg=27.8 Vol=372 T2=7.	Butterfield	3941
J490	J490-Rock-26	Phantom Vent	3/22/2006 6:00	14.60090	144.77514	563.2	566.5	79.99	Rock next to active flow at Phantom vent. 20cm rock. Thought there were bubbles that came out from under the rock (could have been trapped).	Deardorff	3950
J490	J490-Tephra-27	Phantom Vent	3/22/2006 6:10	14.60085	144.77515	564.4	566.7	87.66	Scoop sample of sediment below marker anchor Mkr-118.	Deardorff	3964
J490	J490-Mat-28	Mkr-109	3/22/2006 8:07	14.60089	144.77749	563.1	567.9	3.08	Mkr-109 had a lot of mat growing on it; marker took as sample for mat. (Mkr-112 is very close to this marker on top of same ridge-within camera site).	Tunncliffe	4194

Table 6.3-5 J491 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J491	J491-Rock-01	south slope NW Rota	3/24/2010 3:46	14.58727	144.76818	1388.6	1392.0	46.26	Rock taken enroute up the slope headed to the center of the scour zone from below an outcrop. This outcrop had white and yellow staining on it as did the surrounding area rocks.	Deardorff	4829

Table 6.3-6 J492 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J492	J492-HFS-01	Phantom Vent upslope	3/24/2010 19:43	14.60087	144.77521	560.5	562.3	159.12	Filtered piston #1 (started 19:42). We are between Sulfur Crust and Phantom. 0.23 volts on pH sensor; pH of about 1. Stopped (19:44:45). Tmax=51.4 Tavg=45.2 Vol=350ml T2=20.	Butterfield	5088
J492	J492-HFS-02	Phantom Vent 5m E	3/24/2010 19:49	14.60088	144.77521	560.5	562.3	159.48	Unfiltered bag #17. Same location as previous sample; about 5m east of Phantom; just upslope from Phantom. Area leaking fluids; not in the large plume. Stopped (19:50). Tmax=41.0 Tavg=40.3 Vol=300ml T2=18.	Butterfield	5097

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J492	J492-HFS-03	Sulfur Vent	3/24/2010 20:12	14.60083	144.77530	554.6	556.6	333.79	Unfiltered piston #2 (started 20:10:40). Sulfur plates covered with sulfur spherules and bubbles coming out of the venting area. Sample is in the active venting area. Lots of smoke; bubbles; and sulfur. Stopped (20:13). Tmax=57.6 Tavg=38.5 Vol=448ml T2=20.	Butterfield	5128
J492	J492-HFS-04	Sulfur Vent	3/24/2010 20:15	14.60082	144.77529	554.6	556.5	333.7	Filtered piston #5 (started 20:14:30). Sulfur Vent. Same position as previous sample. Stopped (20:17). Tmax=41.7 Tavg=32.5 Vol=372ml T2=15.	Butterfield	5133
J492	J492-GTHFS-05	Sulfur Vent	3/24/2010 20:45	14.60087	144.77525	557.3	559.8	137.05	Fired (20:44:30). Temp 47° T2=12 Third sampling location here at Sulfur Vent (on the N/NW side of this large Sulfur Vent target). We are on the west side of Sulfur Vent. The wand may be plugged up. This sample was the starboard gas tight.	Evans	5174
J492	J492-HFS-06	Sulfur Vent	3/24/2010 20:52	14.60086	144.77526	557.3	559.8	137.32	Unfiltered piston #6 (started 20:41:20). Same location as J492-GTHFS-05 sample. Not getting warm water flowing very well. Stopped (20:57). Tmax=36.3 Tavg=37.4 Vol=447ml T2=7. After sampling there was a bit of molten sulfur on the tip of the wand.	Butterfield	5179
J492	J492-Tephra-07	Mkr-120 Sulfur Crust	3/24/2010 21:33	14.60075	144.77529	557.0	559.0	359.34	Recovered Tephra Sampler D at Mkr-120 (Sulfur vent area). Deployed J-488. Exchanged for Tephra Sampler H. Lots of Tephra filling the bucket as we watch.	Deardorff	5227
J492	J492-HFS-08	Mkr-120 Sulfur Crust	3/24/2010 22:22	14.60077	144.77528	557.1	559.8	336.77	Filtered bag #24 (started 22:20:30). Sample at the circular mat cages at the base of Mkr-120 to understand why not seeing any shrimp here today. The cages are below the marker tucked in the ledge over diffuse flow. Stopped (22:24). Tmax=27.9 Tavg=26.8 Vol=451ml T2=16.	Butterfield	5288
J492	J492-HFS-09	Mkr-120 Sulfur Crust	3/24/2010 22:27	14.60075	144.77527	557.1	559.8	336.45	Unfiltered bag #20 (start 22:24:30). Stopped (22:27). Tmax=26.3 Tavg=25.0 Vol=454 T2=15.	Butterfield	5294
J492	J492-Sulfur-10	Sulfur Vent	3/24/2010 22:42	14.60083	144.77525	557.3	560.3	35.88	Scoop of pancake-thin sulfur flow. Sulfur-spaghetti on the sulfur plates surrounding Sulfur Vent.	Deardorff	5314

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J492	J492-HFS-11	Styx Vent	3/24/2010 23:50	14.60094	144.77574	556.7	558.8	348.53	Filtered bag #23 (started 23:46:40). Styx is billowing a white plume but not much; a little more active than Phantom. The vent looks different and like it is farther away from the wall than on last visit. Stopped (23:49:40). Tmax=31 Tavg=28.3 Vol=426ml T2=16.	Butterfield	5395
J492	J492-HFS-12	Styx Vent	3/24/2010 23:51	14.60093	144.77574	556.7	558.8	348.49	Unfiltered bag #19 (started 23:50:35). Same spot as previous sample. The vent seems to be a little more active then when we arrived. Fresh black rock around Styx and no sulfur. Plume is much whiter than what we saw at Sulfur Vent and Phantom. Stopped (23:53). Tmax=31.1 Tavg=29.2 Vol=469 T2=15.	Butterfield	5397
J492	J492-HFS-13	Styx Vent	3/24/2010 23:56	14.60093	144.77574	556.7	558.8	348.57	RNA Filter #13 started 23:55:15). The visibility has decreased here at Styx. Not much change in the temp here. Stopped (00:13). Tmax=31.6 Tavg=27.3 Vol=2865 T2=14.	Butterfield Smith	5403
J492	J492-Rock-14	Styx Vent	3/25/2010 0:26	14.60090	144.77577	555.6	560.8	337.1	Rock from the base of Styx in the black unaltered sediments. Very fresh. Rounded on bottom flatter on top - about 6 inches long. Same location as samples 11-13.	Deardorff	5429
J492	J492-Tephra-15	Mkr-161 Brimstone	3/25/2010 0:40	14.60101	144.77553	543.6	546.5	11.65	Recovered Tephra sampler B from the base of Mkr-161 north of Brimstone. The bucket was deployed on dive J490.	Deardorff	5442
J492	J492-HFS-16	Arrowhead	3/25/2010 1:08	14.60096	144.77560	544.0	546.3	34.37	Filtered bag #22 (started 01:08:15). In a crack just to the west of the Arrowhead. This spot is on the wall north of Brimstone and is defined by a stain that looks just like an "Arrowhead". Temp is OK at about 30°. Lots of flow and no shrimp. Stopped (01:12). Tmax=34.2 Tavg=32.6 Vol=450ml T2=13.	Butterfield	5474
J492	J492-HFS-17	Arrowhead	3/25/2010 1:14	14.60096	144.77560	544.0	546.3	34.71	Unfiltered bag #18 (started 01:13:10). Arrowhead. Area of diffuse flow on the wall between Brimstone and the summit. Stopped (01:16). Tmax=33.8 Tavg=33.0 Vol=476ml T2=12.	Butterfield	5481
J492	J492-HFS-18	Arrowhead	3/25/2010 1:21	14.60096	144.77560	544.0	546.2	36.49	Sterivex filter #12 (started 01:19:30). At Arrowhead in the same location as the previous 2 samples. Quite a lot of flow . Stopped (01:37). Tmax=32.1 Tavg=31.7 Vol=2503 T2=11.4.	Butterfield Smith	5487

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J492	J492-HFS-19	Sulfur Vent	3/25/2010 4:15	14.60084	144.77525	557.2	560.6	126.57	Filtered piston #3 (started 04:15). Started at T>160deg. In great flow with bubbles and yellow with explosive activity in back of view. Flow has gone down during sampling and so has temperature. Stopped (04:18). Tmax=176 Tavg=141.8 Vol=292 T2=36.	Butterfield	5765
J492	J492-GTHFS-20	Sulfur Vent	3/25/2010 4:24	14.60082	144.77525	557.2	560.5	125.91	Wand in higher flow. Bubbles in front. Port fired. T=53.	Evans	5776
J492	J492-HFS-21	Sulfur Vent	3/25/2010 4:25	14.60082	144.77525	557.2	560.4	126.01	Unfiltered piston #4 (started 04:25). Same place as previous gas sample. Activity increasing and temperature increasing during sample. Have seen bubbles during sampling. Stopped (04:27). Tmax=62.9 Tavg=58.1 Vol=469 T2=16.	Butterfield	5779
J492	J492-HFS-22	Sulfur Vent	3/25/2010 4:28	14.60083	144.77524	557.2	560.5	126.06	Unfiltered piston #8 (started 04:28). At same site with good flow. Not as many bubbles at present. Stopped (04:31). Tmax=56.5 Tavg=53.9 Vol=388 T2=8.0.	Butterfield	5787
J492	J492-HFS-23	Sulfur Vent	3/25/2010 4:34	14.60083	144.77525	557.2	560.6	127	Filtered piston #7 (started 04:34). Just 26 deg. Stopped (04:37). Tmax=26.4 Tavg=17.4 Vol=285 T2=7.0 (noted: Lots of sulfur but not covering tip).	Butterfield	5798
J492	J492-HFS-24	background	3/25/2010 4:50	14.60129	144.77416	554.6	629.6	297.7	Filtered bag #21 (started 04:50). Background sample while driving midwater. Stopped (04:54). T=6.7 at 554m depth.	Butterfield	5824
J492	J492-HFS-25	background	3/25/2010 4:57	14.60172	144.77352	554.8	639.8	297.89	Filtered piston #9 (started 04:57). Background sample while driving midwater. Stopped (05:02). T=6.7deg Depth=555m to 600m at end of sample.	Butterfield	5827

Table 6.3-7 J494 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J494	J494-Shrimp-1	Mkr-110 Iceberg09	3/26/2010 20:17	14.60085	144.77630	335.1	533.2	335.08	Recovered shrimp trap #4 perched on the rock outcrop. Deployed on J490. Quite a lot of shrimp in the trap. (The honeybear is on this trap and did its job.)	Tunncliffe	6562
J494	J494-HFS-2	Mkr-110 SW	3/26/2010 20:46	14.60084	144.77624	13.6	532.1	13.57	Filtered bag #24. Snow-blower with lots of floc coming out. Mkr-110 is just on the east side of this knife edge (location here is ~5m upslope of Mkr-110). Lots of floc coming out of the hole where sampling. Temperature came down during sample. Tmax=17.0 Tavg=14.5 T2=6.8. Vol=400ml.	Butterfield	6604

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J494	J494-HFS-3	Mkr-110 SW	3/26/2010 20:49	14.60084	144.77626	13.8	532.0	13.84	Unfiltered bag #17. Temp started at 17.6 and was rising. Lots of floc and some shrimp. (Same location/hole as J494-HFS-2.) Tmax=20.0 Tavg=18.0 T2=6.7. Vol=363ml.	Butterfield	6609
J494	J494-HFS-4	Mkr-110 SW	3/26/2010 21:25	14.60084	144.77626	10.9	531.8	10.94	Sterivex filter #10. More flock again. (Same location/hole as previous samples). Temperature fluctuated during sample and eventually fell. Tmax=20.7 Tavg=18.4 vol=2503 T2=6.7	Butterfield	6654
J494	J494-HFS-5	Mkr-110 SW	3/26/2010 21:33	14.60085	144.77624	11.9	531.8	11.87	RNA filter #13. (Same location but slight repositioning of wand from previous samples). Tmax=19.8 Tavg=16.5 Vol=2612ml. T2=7.	Butterfield	6666
J494	J494-HFS-6	Mkr-117	3/26/2010 22:34	14.60080	144.77629	27.6	537.0	27.59	Filtered bag #23. ~10m N/NW of the old Mrk-105 position. Good flow here on the edge of this steep cliff face in a crack. Quite a few shrimp here. Tmax=40.6. Tavg=40.4. Vol=453. T2=16.	Butterfield	6751
J494	J494-HFS-7	Mkr-117	3/26/2010 22:39	14.60080	144.77629	27.4	537.0	27.38	Unfiltered bag #18. (Same location as previous sample. Mkr-117 deployed after sampling). Tmax=41.3. Tavg=40.7 Vol=457ml. T2=17.	Butterfield	6757
J494	J494-Rock-8	Sulfur Wall	3/26/2010 23:21	14.60071	144.77637	8.1	585.1	8.05	Small piece of sulfur plate from the sulfur wall to determine what the shrimp are grazing upon. East of old Mkr-105 location.	Sherrin Deardorff	6810
J494	J494-HFS-9	Charon Vent	3/27/2010 0:25	14.60067	144.77607	327.3	588.6	327.27	Filtered bag #22. Sample clogged a bit; probably not a good sample. Tmax=30.5 Tavg=29.1 vol=392 T2=7.0	Butterfield	6926
J494	J494-HFS-10	Charon Vent	3/27/2010 0:33	14.60069	144.77608	326.1	588.5	326.1	Unfiltered bag #19. Same crack as previous sample. Temperature increased and fluid became whiter during sampling. Tmax=85.3 Tavg=77.7 vol=379 T2=35.	Butterfield	6935
J494	J494-HFS-11	Charon Vent	3/27/2010 0:36	14.60069	144.77608	325.6	589.0	325.59	Filtered Piston #9 Same crack as previous samples. Temperature continues to climb. Tmax=126 Tavg=106 vol=423 T2=44.	Butterfield	6943
J494	J494-GTHFS-12	Charon Vent	3/27/2010 0:40	14.60069	144.77610	325.5	589.0	325.45	Port HFS bottle #2. Same crack as previous samples.; fairly steady activity at vent. T=126deg.	Evans	6949
J494	J494-HFS-13	Charon Vent	3/27/2010 0:43	14.60068	144.77608	325.2	589.0	325.19	Unfiltered Piston #8. Same crack. Tmax=124.7 Tavg=122.8 vol=529 T2=45.	Butterfield	6953
J494	J494-HFS-14	Charon Vent	3/27/2010 0:49	14.60065	144.77607	324.1	589.0	324.07	Filtered piston #7. Big explosion at vent; sampling at same crack. Tmax=112.3 Tavg=110.4 vol=431 T2=33.	Butterfield	6966
Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #

J494	J494-HFS-15	Charon Vent	3/27/2010 1:07	14.60065	144.77605	334.4	587.6	334.36	Filtered piston #1. Repositioned after event approximately 1m up the vent from previous samples. Tmax=54.0 Tavg=52.1 vol=480 T2=22.	Butterfield	7007
J494	J494-HFS-16	Charon Vent	3/27/2010 1:11	14.60065	144.77605	334.2	587.5	334.17	Unfiltered piston #2. Tmax=48.7 Tavg=46.2 vol=485 T2=20.	Butterfield	7014
J494	J494-Tephra-17	Phantom Vent	3/27/2010 3:32	14.60089	144.77520	108.5	562.9	108.49	Recovered Tephra Sampler-A at Phantom. Deployed on J-490 and repositioned on J-492.	Deardorff	7319
J494	J494-Mat-18	Mkr-120 Sulfur Crust	3/27/2010 3:55	14.60074	144.77527	319.6	556.8	319.59	Recovered mat cage at Mkr-120. Trap-1. Deployed on J-488.	Tunncliffe	7361
J494	J494-Mat-19	Mkr-120 Sulfur Crust	3/27/2010 3:58	14.60076	144.77530	320.1	556.8	320.1	Recovered mat cage at Mkr-120. Second cage also deployed on J-488 at same location.	Tunncliffe	7367
J494	J494-Tephra-20	Mkr-120 Sulfur Crust	3/27/2010 4:06	14.60077	144.77529	328.8	555.7	328.77	Recovered Tephra-H sampler at Mkr-120. Deployed on J-492.	Deardorff	7377
J494	J494-Tephra-21	Styx Vent	3/27/2010 4:49	14.60085	144.77578	327.9	560.8	327.94	Scoop of tephra from the base of Styx Vent. South about 10m from the Styx position.	Deardorff	7472
J494	J494-Rock-22	Styx Vent	3/27/2010 5:10	14.60081	144.77579	16.7	560.0	16.69	Rock found on top of wand after large explosion at vent. White-out conditions with raining tephra.	Deardorff	7533

Table 6.3-8 J495 Sample Log

Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J495	J495-Rock-01	South flank of summit cone	3/28/2010 19:04	14.59919	144.77542	670.8	674.5	16.87	Sample collected as moving upslope to summit on the south side of the cone. Small rock; probably not in place and looks slightly altered. Older lava flow.	Deardorff	7715
J495	J495-Tephra-02	Styx Vent	3/28/2010 20:15	14.60097	144.77576	559.2	561.4	353.09	Scoop of tephra at the base of Styx vent (just to the W of the vent).	Deardorff	7874
J495	J495-GTB-03	Sulfur Vent	3/28/2010 23:11	14.60085	144.77530	555.7	557.4	70.27	Red funnel on gas tight bottle. Lots of bubbles with funnel in the plume bubble stream. Activity here at this vent is continuous and sampler was burped prior trigger.	Evans	8183
J495	J495-Major-04	Sulfur Vent	3/28/2010 23:20	14.60082	144.77529	555.7	557.4	30.63	Major sampler with the white tape. Sample in the middle of the plume and same location as sample j495-GTB-03.	Butterfield	8191
Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J495	J495-Major-05	Sulfur Vent	3/28/2010 23:49	14.60084	144.77530	555.8	557.5	40.77	Blue major sampler right in the venting at Sulfur Vent. Did not trigger. Temperatures got up to 195° in the sediments here earlier.	Butterfield	8228

J495	J495-GTB-06	Sulfur Vent	3/29/2010 0:08	14.60084	144.77528	555.7	557.3	58.8	Fired at Sulfur Vent with tip in yellow part of plume. Orange-black tape on sampler bottle.	Evans	8258
J495	J495-Tephra-07	Mkr-120 Sulfur Crust	3/29/2010 0:37	14.60075	144.77522	557.9	562.6	95.82	Tephra-D recovered at different location than deployed. Sampler had fallen downhill and off of the crust it had been on had broken. Sampler bucket not upright; on its side.	Deardorff	8301
J495	J495-Rock-08	Mkr-120 Sulfur Crust	3/29/2010 0:43	14.60078	144.77525	556.4	561.1	99.59	Piece of remaining; broken crust of sulfur flow at Sulfur Crust.	Deardorff	8312
J495	J495-Shrimp-09	Sulfur Wall	3/29/2010 1:25	14.60069	144.77625	593.5	600.7	24.3	Blue chamber shrimp suction from Sulfur Wall area (probably W of marker) None to little sulfur coverage. Sample collected while continuing up the wall. Suction not strong at beginning of sampling.	Tunncliffe	8384
J495	J495-Shrimp-10	Sulfur Wall	3/29/2010 1:39	14.60071	144.77642	573.6	609.0	21.63	Red chamber shrimp suction 20m up the wall from J495-shrimp-09 at a sulfur-encrusted area. Opaapele(shrimp) juveniles.	Tunncliffe	8395
J495	J495-Mat-11	Mkr-110 Iceberg09	3/29/2010 2:30	14.60078	144.77629	531.4	536.0	38.24	Recovered mat cage at Mkr-110 Iceberg09. Deployed on J-490.	Davis	8485
J495	J495-Shrimp-12	Mkr-110 Iceberg09	3/29/2010 2:32	14.60076	144.77628	531.4	535.9	37.09	Recovered shrimp trap at Mkr-110 Iceberg09. Deployed on J-494.	Tunncliffe	8489
J495	J495-Shrimp-13	Mkr-110 Iceberg09	3/29/2010 2:39	14.60087	144.77627	531.6	535.9	36.19	Black chamber shrimp suction at Mkr-110 Iceberg09. Some sediment was collected with the shrimp.	Tunncliffe	8499
J495	J495-Mat-14	Mkr-110 Iceberg09	3/29/2010 3:02	14.60088	144.77629	532.0	536.4	316.97	Green chamber shrimp suction at Mkr-110 Iceberg09. Mainly shrimp in sample but also some sediment.	Davis	8534
J495	J495-Shrimp-15	Mkr-110 Iceberg09	3/29/2010 3:10	14.60086	144.77630	531.4	536.3	318.21	Orange (flush) chamber shrimp suction at Mkr-110 Iceberg09.	Tunncliffe	8549
J495	J495-Shrimp-16	Mkr-109	3/29/2010 3:35	14.60089	144.77750	562.9	567.2	68.71	Recovered shrimp trap at old Mkr-109 site (marker removed as mat sample) with Mkr-112 in background along ridge. Deployed on J-489.	Tunncliffe	8585
J495	J495-Mat-17	Mkr-109/Mkr-112	3/29/2010 3:47	14.60095	144.77752	562.5	566.0	114.84	Recovered mat cage located between Mkr-109 site and Mkr-112 (had some shrimp inside) Deployed on J-489 and relocated slightly on J-490.	Davis	8602
J495	J495-Tephra-18	Mkr-163 Summit	3/29/2010 4:32	14.60120	144.77571	519.2	523.2	10.19	Recovered Tephra-C sampler at Summit Mkr-163 with a few shrimp inside. Deployed on J-487.	Deardorff	8688
Dive	Sample ID	Location	Date Time	Latitude	Longitude	Jason depth	Total Depth	Head-ing	Comments	Principal Investigator	Virtual Van #
J495	J495-Tephra-19	Mkr-163 20m E Summit	3/29/2010 4:41	14.60119	144.77594	525.7	529.2	179.75	Scoop of sediment from approximately 20m east and a meter south of Mkr-163. Facing south on a sandy ridge on ridge top.	Deardorff	8704

Table 6.5-1 JASON Dive J2-487

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
73	J2-487	2010/03/17 19:11:44	14.60156	144.77553	36.8	550.3	556.6	We're on the bottom now. Looks like near the summit.
75	J2-487	2010/03/17 19:14:50	14.60170	144.77559	36.5	544.0	547.0	We are at the summit and the old SM2K says that we are at 540m. The nav says 545.
76	J2-487	2010/03/17 19:15:17	14.60171	144.77558	36.0	544.6	547.4	Looking at steep ridge and outcrop on the sonar.
78	J2-487	2010/03/17 19:15:39	14.60171	144.77558	36.1	544.5	547.5	We're getting our bearings now.
79	J2-487	2010/03/17 19:16:30	14.60172	144.77556	36.0	544.5	548.1	Nav: Doppler Reset
80	J2-487	2010/03/17 19:16:52	14.60172	144.77555	36.0	544.4	549.2	Just reset the doppler to the USBL.
81	J2-487	2010/03/17 19:17:15	14.60172	144.77551	349.3	544.6	552.2	Looks like we are ready to go.
83	J2-487	2010/03/17 19:18:12	14.60161	144.77545	212.4	544.7	569.2	We're north of the summit. Will turn around and head to Mkr-107.
85	J2-487	2010/03/17 19:19:58	14.60142	144.77551	149.1	543.7	547.5	We're heading at 145 degrees toward Mkr.107.
86	J2-487	2010/03/17 19:20:15	14.60141	144.77553	146.3	541.1	546.4	We see a beautiful pink/orange fish.
87	J2-487	2010/03/17 19:20:46	14.60138	144.77551	147.8	533.1	546.0	We're driving SE toward the summit ridge.
89	J2-487	2010/03/17 19:22:53	14.60117	144.77552	94.8	524.6	534.1	We are off the ridge now. The wall seems more sheer than before.
91	J2-487	2010/03/17 19:23:38	14.60113	144.77552	100.5	519.8	531.1	Looks like the plume from Brimstone is overtaking us. Visibility will be a problem.
92	J2-487	2010/03/17 19:24:56	14.60116	144.77557	58.8	517.9	528.3	The EM122 survey last night seemed to indicate that Brimstone may have merged with the summit....
94	J2-487	2010/03/17 19:25:29	14.60120	144.77558	21.8	517.0	527.8	Driving NE on the edge of this plume.
96	J2-487	2010/03/17 19:27:31	14.60123	144.77561	150.7	520.4	532.6	The plan is to find Mkr-107 and deploy the portable hydrophone at the summit.
97	J2-487	2010/03/17 19:27:55	14.60122	144.77565	121.3	518.0	533.8	Steep cliffs near the summit.
98	J2-487	2010/03/17 19:28:48	14.60122	144.77570	155.8	516.5	521.3	The plume is quite thick and obscuring our visibility.
101	J2-487	2010/03/17 19:31:59	14.60121	144.77562	34.5	515.0	523.7	See an outcrop poking out of the plume. The depth here is about 516m.
102	J2-487	2010/03/17 19:32:06	14.60123	144.77562	27.2	515.8	524.4	The current is strong.
103	J2-487	2010/03/17 19:32:41	14.60125	144.77569	95.4	520.6	527.2	The water is murky.
104	J2-487	2010/03/17 19:33:14	14.60124	144.77573	147.2	519.3	527.5	We're on the crest of the ridge looking east.
106	J2-487	2010/03/17 19:34:48	14.60119	144.77582	140.2	519.7	523.7	The summit ridge seems to be thinner than last year.
108	J2-487	2010/03/17 19:35:31	14.60119	144.77582	139.0	519.6	520.6	Will be moving Medea to the east to get more leash.
110	J2-487	2010/03/17 19:37:51	14.60119	144.77583	144.1	521.8	524.4	We're dropping a weight. Waiting for Medea to move.
111	J2-487	2010/03/17 19:38:53	14.60119	144.77584	144.6	521.1	523.7	On the crest of the summit ridge and will head east to explore and hopefully find the summit marker.
113	J2-487	2010/03/17 19:39:19	14.60118	144.77585	149.3	521.2	523.7	If we don't see the marker will turn around and head west again.
115	J2-487	2010/03/17 19:41:35	14.60116	144.77594	93.1	524.3	525.9	We're heading east along the ridge now.
116	J2-487	2010/03/17 19:43:12	14.60111	144.77611	99.3	523.3	525.3	We're travelling along the ridge. Lots of white sediments that are probably sulfur.
118	J2-487	2010/03/17 19:43:23	14.60110	144.77614	97.6	523.5	525.0	Great ripple marks on the sediments.
119	J2-487	2010/03/17 19:43:48	14.60106	144.77616	101.5	524.4	526.1	Shrimp just floated by.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
120	J2-487	2010/03/17 19:44:18	14.60107	144.77613	320.0	525.1	528.6	Will now turn around and follow the summit back to the west. No sign of a marker yet.
121	J2-487	2010/03/17 19:44:55	14.60110	144.77612	298.1	523.6	525.2	Spotting lots of crabs at/near the summit.
123	J2-487	2010/03/17 19:46:18	14.60115	144.77604	295.5	523.2	525.4	The current is flowing from the NE to the SW. Last year the current changed a lot.
124	J2-487	2010/03/17 19:46:41	14.60117	144.77602	264.7	523.1	526.3	Heading NW along the summit ridge.
126	J2-487	2010/03/17 19:47:59	14.60118	144.77587	268.7	521.7	525.9	The summit ridge looks like a spine - very narrow.
127	J2-487	2010/03/17 19:48:32	14.60121	144.77582	270.7	521.1	523.1	We're at 521m. Outcrops up ahead and below us.
129	J2-487	2010/03/17 19:50:07	14.60122	144.77570	231.5	518.0	522.8	We may be at the summit now.
132	J2-487	2010/03/17 19:53:43	14.60120	144.77559	187.6	517.8	534.6	This looks familiar. Like the summit last year.
133	J2-487	2010/03/17 19:54:44	14.60118	144.77555	86.7	520.8	534.8	We're at the summit bend. We're on the south side of the ridge.
135	J2-487	2010/03/17 19:55:53	14.60125	144.77560	125.6	519.2	538.9	What is the white stuff at the top of this peak. There are shrimp around.
136	J2-487	2010/03/17 19:57:01	14.60123	144.77570	171.0	518.4	527.8	Seeing patches of white. What is the bright white material.
138	J2-487	2010/03/17 19:58:03	14.60123	144.77570	194.2	520.0	524.8	Looks like the marker at the summit is gone. Also Nick's tephra sampler is not around.
139	J2-487	2010/03/17 19:59:01	14.60121	144.77572	332.3	520.2	521.9	Will try to deploy the hydrophone; marker; tephra sampler here. Maybe will deploy a shrimp trap as well.
141	J2-487	2010/03/17 20:00:59	14.60121	144.77571	330.0	519.9	522.5	We're at 520 meters. This may be a whole new place. Bill says that the summit is possibly deeper - or we're at a whole new place?
143	J2-487	2010/03/17 20:02:27	14.60120	144.77568	329.9	519.9	522.6	Verena is zooming in on lots of shrimp. Mostly seeing the Alvinocaris.
145	J2-487	2010/03/17 20:04:40	14.60120	144.77569	329.9	519.8	522.9	Seeing lots of juvenile Alvinocaris shrimp. The Alvinocaris are usually bigger and redder than the Opaapele.
146	J2-487	2010/03/17 20:05:17	14.60120	144.77569	330.2	519.7	523.0	We're now going to try to deploy the hydrophone. Need to pull as pin first to release the bungie cord. Will not be easy.
149	J2-487	2010/03/17 20:07:35	14.60121	144.77568	330.0	519.8	522.9	Will has the hydrophone in Jason's hand.
150	J2-487	2010/03/17 20:09:08	14.60121	144.77568	330.3	519.9	522.7	Deploy: hydrophones Deployed the hydrophone at the summit.
152	J2-487	2010/03/17 20:09:36	14.60120	144.77568	330.1	519.9	522.9	Next fill deploy the tephra sampler.
154	J2-487	2010/03/17 20:11:23	14.60121	144.77568	330.2	519.9	522.9	Deploy: tephra buckets . Deployed tephra sampler C.
155	J2-487	2010/03/17 20:12:20	14.60121	144.77568	329.7	519.9	522.5	Tephra sampler C is at the summit next to the hydrophone.
157	J2-487	2010/03/17 20:13:21	14.60120	144.77568	330.7	519.8	522.9	Preparing to deploy the shrimp trap - a large cage (trap).
158	J2-487	2010/03/17 20:14:02	14.60119	144.77568	330.2	519.9	522.8	The shrimp trap bait is mostly Spam - but one has a combo of Spam and salmon.
160	J2-487	2010/03/17 20:15:59	14.60120	144.77568	330.4	519.9	522.6	Grabbing the marker out of the basket. This marker is #163.
161	J2-487	2010/03/17 20:16:52	14.60121	144.77568	330.8	519.9	522.7	Deploy: markers . Deploying Mkr-163 at the summit next to the shrimp trap; hydrophone; and tephra sampler C.
164	J2-487	2010/03/17 20:18:42	14.60121	144.77569	302.8	518.5	524.5	Stirring up some sediments here.
165	J2-487	2010/03/17 20:19:06	14.60124	144.77567	220.3	518.1	524.3	The marker is really leaning in the current.

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167	J2-487	2010/03/17 20:20:09	14.60123	144.77565	93.1	519.9	529.6	Positioning to get some shots of the marker and instruments. The summit is steep. The bucket is looking good but the shrimp trap and hydrophone are a bit precarious.
168	J2-487	2010/03/17 20:21:07	14.60124	144.77566	80.9	519.8	523.6	Deploy: shrimp traps . Deployed shrimp trap earlier.
170	J2-487	2010/03/17 20:22:09	14.60124	144.77566	90.0	519.7	523.2	We're now on the west side of the summit looking at the deployed instruments and marker.
172	J2-487	2010/03/17 20:24:01	14.60124	144.77566	89.9	519.7	523.3	Moving the hydrophone slightly to make it more secure.
175	J2-487	2010/03/17 20:27:30	14.60123	144.77566	90.0	519.7	523.3	Next would want to deploy a MTR. The hydrophone seems to be moving in the current. Yikes.
176	J2-487	2010/03/17 20:28:01	14.60123	144.77566	90.0	519.7	523.3	Moving the marker a bit.
177	J2-487	2010/03/17 20:29:15	14.60123	144.77566	82.3	519.6	524.3	Next will deploy a MTR.
179	J2-487	2010/03/17 20:29:55	14.60123	144.77566	82.3	519.6	524.3	Removing the MTR from the basket and deploying it at the summit.
180	J2-487	2010/03/17 20:30:21	14.60123	144.77567	85.1	519.9	523.4	Deploy: MTRs . Deploying MTR #5 at the summit.
181	J2-487	2010/03/17 20:31:15	14.60123	144.77567	85.1	519.9	523.7	The summit rocks are really unstable.
183	J2-487	2010/03/17 20:32:15	14.60122	144.77566	85.1	519.9	522.0	The MTR #5 is deployed right at the base of the Mkr-163.
185	J2-487	2010/03/17 20:33:18	14.60124	144.77564	91.2	519.8	532.5	NAV. USBL position here at the summit with all the instruments; etc. 144 deg 56.5405' 14 deg 36.0737
186	J2-487	2010/03/17 20:34:54	14.60126	144.77566	161.5	519.1	530.4	Again: position at summit 144 deg 56.5405' 14 deg 36.0737'. Depth is 518m.
188	J2-487	2010/03/17 20:35:23	14.60126	144.77568	181.0	519.1	529.6	Next want to head to Brimstone - south - to see what is happening down there.
189	J2-487	2010/03/17 20:36:05	14.60127	144.77569	180.5	519.1	531.2	Grabbing some frames here. The marker is laying on its side the currents are so strong.
190	J2-487	2010/03/17 20:36:53	14.60124	144.77573	214.1	517.3	522.1	The current is coming out of the east. Plan is to come at Brimstone from the east. We're ready to move.
194	J2-487	2010/03/17 20:41:31	14.60111	144.77574	134.2	519.6	528.1	Visibility is poor. Moving the ship and Medea. Will approach Brimstone from the E/SE. Current is from the east heading west (a westerly current).
196	J2-487	2010/03/17 20:43:59	14.60110	144.77575	136.5	523.0	529.0	Moving Medea to the SE.
200	J2-487	2010/03/17 20:50:46	14.60102	144.77565	232.7	525.3	535.4	Nav: Doppler Reset . Doppler reset to USBL. Moved us about 15m east.
202	J2-487	2010/03/17 20:51:23	14.60096	144.77555	267.0	526.9	540.0	We're moving Jason now. We're on the S side of the summit ridge. Looking SW.
204	J2-487	2010/03/17 20:53:57	14.60094	144.77555	296.4	527.4	536.5	Seeing Brimstone plume.
206	J2-487	2010/03/17 20:56:08	14.60083	144.77563	323.9	542.1	554.8	We're about 20m above the bottom. Coming down to see what we can see. Cliff down to the right. Can see the vent in the pilot cam.
207	J2-487	2010/03/17 20:56:26	14.60082	144.77561	341.9	548.3	555.2	The plume has lots of yellow in it- especially near the vent.
209	J2-487	2010/03/17 20:57:56	14.60083	144.77555	10.0	550.4	553.5	There is a wall to the NE of the vent (the summit ridge). Looks like it is very near the vent.
210	J2-487	2010/03/17 20:58:13	14.60084	144.77556	355.1	550.2	553.8	Lots of sulfur on the rocks surrounding the vent. Lots of tephra also.

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211	J2-487	2010/03/17 20:58:57	14.60082	144.77554	10.9	549.6	553.7	A rock just fell down slope.
213	J2-487	2010/03/17 20:59:21	14.60083	144.77555	11.2	546.4	552.5	Bubbles apparent.
214	J2-487	2010/03/17 20:59:35	14.60084	144.77556	9.5	547.7	552.5	The HD needs rebooting.
215	J2-487	2010/03/17 21:00:04	14.60084	144.77555	7.2	547.1	551.5	Tons of ash coming out of the plume in the digital still camera.
216	J2-487	2010/03/17 21:00:16	14.60084	144.77556	11.0	547.5	551.6	Tephra falling out of the plume.
217	J2-487	2010/03/17 21:00:36	14.60084	144.77557	9.5	547.9	551.7	The vent is really putting out ash and some bubbles.
218	J2-487	2010/03/17 21:01:05	14.60085	144.77557	12.0	548.2	550.5	Lots of bubbles in the basket cam.
220	J2-487	2010/03/17 21:01:24	14.60085	144.77557	9.8	548.3	550.4	Brimstone is very active.
221	J2-487	2010/03/17 21:02:19	14.60086	144.77557	359.6	548.3	550.5	Looks like it drops off steeply in the brow cam.
222	J2-487	2010/03/17 21:03:14	14.60086	144.77557	359.5	548.3	550.5	To the west of the vent it looks flat. Drops off to the east.
224	J2-487	2010/03/17 21:03:58	14.60086	144.77557	359.7	548.3	550.3	Last year the depth was 522m. Now the depth is 548. The vent is 25m deeper than last year.
225	J2-487	2010/03/17 21:04:54	14.60086	144.77557	359.8	548.4	550.5	Clearly there was some slide activity since our last visit.
226	J2-487	2010/03/17 21:05:12	14.60086	144.77557	359.3	548.3	550.4	It could have taken the cone away and now it is building up again?? Speculating...
228	J2-487	2010/03/17 21:05:58	14.60086	144.77557	359.8	548.3	550.4	At some point we want to put a tephra bucket and a marker out here. We will look around to see where is the best place.
230	J2-487	2010/03/17 21:08:21	14.60086	144.77557	0.0	548.2	550.5	Swapping out the DVDs and DVCam now.
232	J2-487	2010/03/17 21:09:36	14.60086	144.77557	0.2	548.4	550.6	Lots of big pieces of tephra in the water column.
233	J2-487	2010/03/17 21:11:01	14.60086	144.77557	0.6	548.3	550.6	The cone is still here - seems to have moved to the east a bit and the depth has changed.
235	J2-487	2010/03/17 21:12:13	14.60086	144.77557	0.5	548.3	550.5	NAV Brimstone 2010 position: 144 deg 46.5339' 14 deg 36.0541'.
236	J2-487	2010/03/17 21:13:12	14.60070	144.77556	341.1	547.8	563.6	Backing out from Brimstone because we totally lost visibility.
239	J2-487	2010/03/17 21:16:20	14.60066	144.77555	49.5	562.1	565.4	Going to try to climb back up and get a better view of the vent.
241	J2-487	2010/03/17 21:17:18	14.60065	144.77555	19.7	552.3	567.6	Visibility is still poor.
243	J2-487	2010/03/17 21:19:47	14.60080	144.77559	24.5	550.8	555.2	Visibility is much better now.
244	J2-487	2010/03/17 21:20:46	14.60085	144.77557	31.1	548.0	550.3	The plume is straight ahead in the pilot and HD video. Our heading is 35 degrees.
246	J2-487	2010/03/17 21:22:12	14.60087	144.77558	31.9	547.9	549.7	Vigorous venting going on. Lots of sulfur in the plume.
248	J2-487	2010/03/17 21:23:18	14.60087	144.77558	32.0	547.5	550.0	Good view of the vent here. Heading is 32 degrees. Depth is 547.
249	J2-487	2010/03/17 21:23:41	14.60087	144.77558	31.9	547.3	550.1	Bob is in the hotseat. Bill is at breakfast. Susan has been logging since the beginning of the dive.
250	J2-487	2010/03/17 21:24:32	14.60088	144.77558	42.1	547.9	549.6	Bob is going in for a closer look now that the current is cooperating.
251	J2-487	2010/03/17 21:24:38	14.60088	144.77557	41.6	547.9	549.6	See some bubbling.
252	J2-487	2010/03/17 21:24:50	14.60088	144.77558	38.4	547.8	549.7	Lasers on. 10 cm separation.
253	J2-487	2010/03/17 21:25:11	14.60087	144.77558	38.2	547.7	550.0	CO2 bubbling increasing now.
255	J2-487	2010/03/17 21:25:47	14.60087	144.77558	38.3	547.2	549.8	The lasers are still on.
256	J2-487	2010/03/17 21:26:40	14.60086	144.77559	32.2	547.4	550.3	Looks like there is more than one orifice to the vent.
257	J2-487	2010/03/17 21:27:03	14.60086	144.77560	25.9	547.9	550.0	Seems like more bubbles this year.

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259	J2-487	2010/03/17 21:28:35	14.60088	144.77559	35.5	548.3	549.7	We're sitting here observing the vent. There is a shrimp floating through the plume.
261	J2-487	2010/03/17 21:29:20	14.60088	144.77558	35.5	548.3	549.7	Zooming out to look at the whole vent. Shutting the lasers off.
263	J2-487	2010/03/17 21:32:06	14.60087	144.77558	36.7	548.3	549.8	Depth is 548 this year. We saw this depth in 2004. 2006 depths were 550/560m.
264	J2-487	2010/03/17 21:32:26	14.60088	144.77558	37.6	548.3	549.8	We see some rocks moving downslope. Just saw a slide on the side of the cone near the vent.
266	J2-487	2010/03/17 21:35:05	14.60089	144.77559	37.9	548.2	549.7	Testing degree symbol. °
268	J2-487	2010/03/17 21:36:41	14.60089	144.77559	38.8	548.2	549.7	Good overview of the vent orifices.
269	J2-487	2010/03/17 21:36:54	14.60089	144.77558	32.5	547.4	550.3	Looks like it could be swelling a bit. Backing away from pit.
271	J2-487	2010/03/17 21:37:19	14.60088	144.77557	33.2	548.2	550.3	Not seeing much ash but some gas.
272	J2-487	2010/03/17 21:38:01	14.60088	144.77559	11.8	548.0	550.7	Back a bit and viewing more to right.
273	J2-487	2010/03/17 21:39:05	14.60088	144.77559	22.0	548.1	550.0	Jason is going to test if the ADCP will interfere with nav.
274	J2-487	2010/03/17 21:39:12	14.60087	144.77559	19.7	548.1	550.1	Big slump of large lava boulder.
276	J2-487	2010/03/17 21:39:36	14.60086	144.77558	19.9	548.2	551.6	ADCP should be pinging.
277	J2-487	2010/03/17 21:40:08	14.60087	144.77560	20.1	548.4	550.3	Jason nav is still getting good returns with ADCP on.
278	J2-487	2010/03/17 21:40:18	14.60086	144.77560	18.4	548.4	550.5	Telling KM to start logging ADCP.
281	J2-487	2010/03/17 21:43:21	14.60085	144.77560	12.4	548.8	550.5	Some ash raining down over vehicle.
282	J2-487	2010/03/17 21:43:38	14.60085	144.77560	12.7	548.9	550.5	No distinct plume visible-covered in plume with ash raining down.
283	J2-487	2010/03/17 21:44:44	14.60085	144.77560	12.8	548.9	550.5	Jason watch change.
285	J2-487	2010/03/17 21:45:39	14.60086	144.77560	12.7	548.9	550.6	View is clearing and still have a lot of ash.
286	J2-487	2010/03/17 21:46:32	14.60085	144.77560	12.7	548.9	550.6	Shrimp swimming by.
288	J2-487	2010/03/17 21:48:36	14.60086	144.77559	12.0	548.9	550.6	Steady plume away from vehicle. Large lava blocks on this side of vent.
289	J2-487	2010/03/17 21:49:05	14.60086	144.77558	12.1	548.9	550.6	Larger plume coming more toward Jason and lava breaking away.
291	J2-487	2010/03/17 21:49:51	14.60086	144.77558	12.3	548.9	550.5	Large pieces crumbling off pit wall.
292	J2-487	2010/03/17 21:50:10	14.60086	144.77558	12.2	548.9	550.6	Large burst of bubbles.
293	J2-487	2010/03/17 21:50:39	14.60086	144.77559	12.0	548.9	550.6	Going to take a tour around the vent moving left away from plume.
294	J2-487	2010/03/17 21:50:49	14.60086	144.77559	12.1	549.0	550.6	Looking for flat spot for the tephra sampler and marker.
295	J2-487	2010/03/17 21:51:16	14.60085	144.77560	15.9	548.2	550.5	Really clear view now and plume is swirling counter-clockwise.
297	J2-487	2010/03/17 21:51:29	14.60085	144.77559	16.6	548.0	550.5	Backing away and getting more ash rain.
298	J2-487	2010/03/17 21:52:26	14.60085	144.77559	13.7	548.2	550.9	Lava slumping SE or ESE as we are looking to north.
299	J2-487	2010/03/17 21:52:39	14.60085	144.77559	13.2	548.7	551.0	Going to look at the west and NW side of the vent.
303	J2-487	2010/03/17 21:58:33	14.60088	144.77557	30.9	548.3	550.0	Looks like the NW side of the cone is flatter than the SE.
304	J2-487	2010/03/17 21:58:42	14.60088	144.77557	30.9	548.3	550.0	See sulfur balls in the sediment.
306	J2-487	2010/03/17 22:00:10	14.60090	144.77556	30.7	546.9	550.1	The plume is quite yellow at the base. Dave says it is a job for the long nozzle.
308	J2-487	2010/03/17 22:02:02	14.60091	144.77554	47.0	547.9	550.6	Want to be about 5m away from the vent to deploy the tephra bucket.
309	J2-487	2010/03/17 22:03:17	14.60092	144.77553	50.3	548.3	550.1	Upslope of the vent it is not as flat as it looks.
313	J2-487	2010/03/17 22:07:42	14.60091	144.77553	50.8	548.2	550.2	Grabbing the tephra sampler out of the stbd swing arm.

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314	J2-487	2010/03/17 22:09:13	14.60090	144.77554	50.3	548.1	550.1	Deploy: tephra buckets . Deploying tephra sampler D at Brimstone.
317	J2-487	2010/03/17 22:12:27	14.60090	144.77553	50.9	548.0	550.0	NAV position for tephra bucket D NW of the vent. Position: 144° 46.5326' 14° 36.0550'. This will be the position for the marker also. Probably 5 meters from the vent.
318	J2-487	2010/03/17 22:13:07	14.60090	144.77552	51.1	548.1	550.0	NAV position for marker and tephra sampler: 144° 46.5326' 14° 36.0550'. About 5m NW of the vent.
321	J2-487	2010/03/17 22:15:50	14.60089	144.77553	50.8	548.2	550.0	Preparing to deploy a marker here.
323	J2-487	2010/03/17 22:18:17	14.60091	144.77554	50.8	548.1	550.0	Deploy: markers . Deploying Mkr-161 near the tephra bucket D. Position again is: 144° 46.5326' 14° 36.0550'.
325	J2-487	2010/03/17 22:19:43	14.60090	144.77554	47.8	548.4	550.1	Deciding if tephra bucket is tilted or not.
327	J2-487	2010/03/17 22:21:51	14.60089	144.77554	50.9	547.9	550.3	Looking good.
328	J2-487	2010/03/17 22:22:23	14.60088	144.77554	50.2	547.8	550.6	Looking things over now.
330	J2-487	2010/03/17 22:23:43	14.60086	144.77556	45.2	548.2	550.9	Lateralling back to the vent to see if there is an up-current side that is clearer.
331	J2-487	2010/03/17 22:25:03	14.60086	144.77557	13.1	548.7	550.7	Looking around. The vent is in the background.
333	J2-487	2010/03/17 22:26:07	14.60087	144.77557	14.6	548.4	550.5	See the vent in the background of the science cam. Our heading is 12 degrees now. Quite a nice view - except the rock in the way.
335	J2-487	2010/03/17 22:27:25	14.60089	144.77557	29.0	548.2	550.4	May push this big rock out of the way for a better view..... Going to park by the vent for a bit since the visibility is good. The heading is 30° now.
336	J2-487	2010/03/17 22:27:33	14.60089	144.77558	28.9	548.2	550.4	Lasers off.
337	J2-487	2010/03/17 22:28:11	14.60088	144.77558	30.2	548.1	550.4	Bubbles and tephra in the video now.
338	J2-487	2010/03/17 22:28:31	14.60088	144.77558	29.4	548.2	550.4	The vent is cyclic and the currents keep changing.
339	J2-487	2010/03/17 22:28:52	14.60088	144.77558	27.2	548.1	550.5	Lasers off now. Pervious entry was premature.
341	J2-487	2010/03/17 22:30:30	14.60086	144.77558	30.8	547.8	550.4	The plan is to explore to the east a bit; put out some shrimp traps; look for markers.
342	J2-487	2010/03/17 22:30:50	14.60087	144.77558	30.2	547.9	549.4	Right now still in front of the vent and there is flying rocks and bubbles and a very yellow plume.
343	J2-487	2010/03/17 22:31:02	14.60087	144.77558	29.9	547.8	550.6	Lots of ashing and bubbles going on.
345	J2-487	2010/03/17 22:32:01	14.60088	144.77558	29.9	547.9	550.5	See lots of sulfur spherules on the Jason frame - as well as tephra of course.
346	J2-487	2010/03/17 22:33:05	14.60088	144.77558	30.7	548.1	549.5	Will move out a bit and see if visibility improves.
348	J2-487	2010/03/17 22:35:02	14.60085	144.77561	29.7	548.2	551.4	Visibility is very poor - backing up.
350	J2-487	2010/03/17 22:35:55	14.60084	144.77563	348.0	550.2	553.4	Drops off very steeply to the SE. Lots of material falling away that way.
351	J2-487	2010/03/17 22:36:06	14.60085	144.77562	319.0	551.1	552.8	Now we're looking N/NW now.
353	J2-487	2010/03/17 22:37:35	14.60085	144.77561	322.2	551.0	552.9	We are sitting SE of the vent right now.
354	J2-487	2010/03/17 22:38:32	14.60086	144.77561	323.1	549.6	552.3	We will look around from different radials of the vent so that we can see what it looks like.
356	J2-487	2010/03/17 22:39:37	14.60086	144.77559	323.4	549.0	552.3	Want to work around the cone and see what's up.

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357	J2-487	2010/03/17 22:40:07	14.60086	144.77558	323.3	548.3	551.4	We're heading down slope a bit. Right now we are at the SE side of the vent.
358	J2-487	2010/03/17 22:40:55	14.60088	144.77553	15.3	548.1	551.0	We are at the marker now.
360	J2-487	2010/03/17 22:41:47	14.60093	144.77551	78.3	547.5	549.7	We're looking to the north (25 deg heading). The marker and bucket are in the foreground.
362	J2-487	2010/03/17 22:43:46	14.60095	144.77551	72.0	547.3	549.3	NAV location: From the marker to Brimstone. Heading is due east. Slant range is ~7.5 meters. Range is ~ 5 meters.
364	J2-487	2010/03/17 22:45:20	14.60095	144.77550	343.3	547.2	549.6	Looking to the NE is drops off. Quite a sharp drop off. We see outcrops to the N/NE.
365	J2-487	2010/03/17 22:45:40	14.60095	144.77550	9.0	546.8	549.7	We are following the ridge next ahead and to the right. We're at the same depth as the vent.
366	J2-487	2010/03/17 22:46:40	14.60100	144.77553	43.5	542.5	546.5	Looks like a big slide. Probably the rim of the cone. It seems to run into the summit ridge. The summit ridge is right ahead at 45 degrees.
368	J2-487	2010/03/17 22:47:38	14.60102	144.77554	41.5	539.8	545.3	Want to belly-up to the wall and see if there is any fluid flow.
369	J2-487	2010/03/17 22:48:14	14.60100	144.77554	43.5	539.9	545.3	This lava has been unburied.
370	J2-487	2010/03/17 22:48:33	14.60100	144.77554	43.0	539.8	544.8	See shimmering water and shrimp here.
372	J2-487	2010/03/17 22:49:33	14.60100	144.77555	43.0	539.8	544.6	The peak is above us and we are at the base of the wall.
373	J2-487	2010/03/17 22:49:46	14.60100	144.77555	43.1	539.8	544.7	The cone is gone. The vent is 25m deeper. We'
374	J2-487	2010/03/17 22:50:17	14.60101	144.77555	43.0	539.8	544.7	We're now just north of the vent by 10 to 15 meters.
375	J2-487	2010/03/17 22:51:12	14.60104	144.77555	42.9	539.8	544.7	Looking where the shrimp are swimming there. The rocks are white here. Quite a few shrimp in this shimmering area.
377	J2-487	2010/03/17 22:52:06	14.60104	144.77554	43.1	539.8	544.9	The rocks are white probably to fluid alteration from the hot water.
378	J2-487	2010/03/17 22:52:31	14.60104	144.77554	43.2	539.8	544.8	HCL sulfur hydrochloric acid in the fluid. Lots of stuff that will dissolve rock (Dave says).
380	J2-487	2010/03/17 22:53:34	14.60104	144.77550	12.7	541.3	546.4	Bill wants to go down this ridge (heading to the west and looking down that steep slope).
381	J2-487	2010/03/17 22:54:20	14.60102	144.77547	321.7	542.2	548.0	We're backing up and turning to the north at the summit ridge. It drops off to the west. We want to go down the slope here and take a look around.
384	J2-487	2010/03/17 22:57:51	14.60098	144.77543	128.4	549.7	554.1	Looking at this steep slope to the NW of the vent. The navigation is excellent this year.
385	J2-487	2010/03/17 22:58:26	14.60095	144.77538	128.3	549.8	555.2	We're trying to look around here. Sulfur on the rock ahead of us.
386	J2-487	2010/03/17 22:58:55	14.60094	144.77536	127.9	549.6	555.9	Lots of sulfur here.
388	J2-487	2010/03/17 22:59:20	14.60094	144.77532	128.2	551.0	558.8	Continuing down this sedimented slope to the west of the vent.
389	J2-487	2010/03/17 23:00:01	14.60095	144.77530	128.1	552.4	560.7	Seeing some large boulders here now on this sedimented slope. Lots of sulfur patches.
390	J2-487	2010/03/17 23:00:44	14.60096	144.77527	128.3	556.7	562.7	Seeing some lavas on the side. Moving down quite quickly.
392	J2-487	2010/03/17 23:01:27	14.60097	144.77525	128.6	558.8	564.7	Probably lavas everywhere here but they are just covered up by the tephra near the vent.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
393	J2-487	2010/03/17 23:02:52	14.60096	144.77523	128.4	560.7	565.4	Psychedelic colors in the HD cam.
395	J2-487	2010/03/17 23:04:11	14.60096	144.77522	128.5	560.5	565.4	We are now about 40m from the NW of the vent.
396	J2-487	2010/03/17 23:04:35	14.60095	144.77521	123.4	560.6	565.3	We want to lateral to the south and make our way around the cone to the vent.
398	J2-487	2010/03/17 23:06:29	14.60092	144.77518	181.2	563.5	565.4	Visibility is poor.
399	J2-487	2010/03/17 23:07:21	14.60094	144.77519	237.8	564.0	674.0	HD video is a bit off color...
400	J2-487	2010/03/17 23:08:29	14.60094	144.77518	237.5	564.0	695.7	Verena is messing around with the HD cam colors in this plume haze.
401	J2-487	2010/03/17 23:10:21	14.60093	144.77517	236.9	564.2	658.2	Visibility is next to nothing.
403	J2-487	2010/03/17 23:11:33	14.60093	144.77517	235.1	563.7	564.8	We're moving Medea - we're at the end of our rope.
406	J2-487	2010/03/17 23:16:44	14.60102	144.77516	185.5	564.8	569.3	The plan is to get out of the plume. Thinking about backing up.
408	J2-487	2010/03/17 23:17:28	14.60099	144.77517	165.7	565.8	567.5	Looking at chunks of rock coated with sulfur.
409	J2-487	2010/03/17 23:17:57	14.60099	144.77517	164.4	565.8	567.5	If there have been landslides here could be that has exposed some areas where water is coming out.
410	J2-487	2010/03/17 23:18:06	14.60099	144.77517	164.5	565.8	567.5	Looks like we are on the edge of a scarp.
412	J2-487	2010/03/17 23:20:59	14.60098	144.77515	132.9	566.6	569.0	This year the nav is great - a couple meters.
414	J2-487	2010/03/17 23:21:54	14.60097	144.77515	132.6	566.6	569.0	We're out of the plume now. Looking to the SE now. Looking upslope. Depth is 566m.
415	J2-487	2010/03/17 23:22:33	14.60097	144.77516	132.6	566.6	569.0	No video on the virtual van.
417	J2-487	2010/03/17 23:23:54	14.60095	144.77511	195.4	566.5	569.5	The frame grabs on the virtual van are back. We're now looking downslope to the SE now.
419	J2-487	2010/03/17 23:25:53	14.60090	144.77510	127.8	567.0	569.4	We're looking around and trying to see where this plume is coming from.
420	J2-487	2010/03/17 23:26:27	14.60089	144.77510	128.3	566.8	569.4	Looks like there is something straight ahead in the science camera.
421	J2-487	2010/03/17 23:27:11	14.60090	144.77511	133.0	566.4	567.9	We found a second vent. It is deeper. At 267 meters. Lots of bubbles and venting going on here.
423	J2-487	2010/03/17 23:27:26	14.60090	144.77511	132.5	566.5	568.0	Looks like a large area of venting.
424	J2-487	2010/03/17 23:27:38	14.60090	144.77512	134.0	566.4	568.0	The range and bearing to Brimstone from here.
425	J2-487	2010/03/17 23:28:30	14.60090	144.77512	134.5	566.6	567.8	We are due west of Brimstone 47 meters. This is anew vent - and it is really pumping it out.
427	J2-487	2010/03/17 23:29:30	14.60090	144.77513	135.2	566.6	567.7	This vent looks quite similar to Brimstone. Lots of bubbles.
431	J2-487	2010/03/17 23:37:02	14.60091	144.77511	134.0	566.6	567.8	NAV location: 144° 46.5086' 14° 36.0531'. New vent west of Brimstone about 50 meters. Depth is 567 meters. We're naming it Phantom.
433	J2-487	2010/03/17 23:38:46	14.60089	144.77512	89.5	566.7	567.7	Phantom is the name of the new vent. 144° 46.5086' 14° 36.0531'. Depth is 567m.
435	J2-487	2010/03/17 23:39:53	14.60089	144.77512	89.3	566.7	567.7	Phantom is quite a large area - seems to be as large as Brimstone. Lots of bubbles and plumage. Also have seen some tephra.
438	J2-487	2010/03/17 23:43:26	14.60089	144.77512	89.1	566.7	567.7	We are sitting here in front of Phantom vent. Heading is 90 degrees.
439	J2-487	2010/03/17 23:44:39	14.60089	144.77512	89.2	566.7	567.7	Bob Embley is now in the drivers seat.

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442	J2-487	2010/03/17 23:47:48	14.60088	144.77511	89.9	566.7	567.7	The plan is to continue on exploring the cone created by Brimstone. So far Brimstone is active. We have found another vent called Phantom 50m to the west of Brimstone.
443	J2-487	2010/03/17 23:48:21	14.60088	144.77511	89.9	566.7	567.7	After the exploration around here the plan is to continue on and check the markers.
444	J2-487	2010/03/17 23:49:10	14.60089	144.77511	90.0	566.7	567.7	. AVI: At this point have recorded 33 clips (including test clips). Have not logged them - but Verena says they will start now.
446	J2-487	2010/03/17 23:50:21	14.60090	144.77511	89.9	566.7	567.7	Look at the vent now. Exploding with tephra. Lots of sulfur here in the vent.
447	J2-487	2010/03/17 23:50:55	14.60090	144.77511	90.1	566.7	567.7	Clip number 33 AVI at Phantom.
450	J2-487	2010/03/17 23:54:15	14.60089	144.77510	90.6	566.5	569.2	Jason is now only following USBL on the screen. Instead of the Doppler.
453	J2-487	2010/03/17 23:58:49	14.60089	144.77511	89.5	566.7	569.5	Retrieving the STBD scoop from basket for sample.
454	J2-487	2010/03/17 23:59:05	14.60089	144.77511	88.9	566.7	569.2	At Phantom going to take a scoop sample.
456	J2-487	2010/03/17 23:59:51	14.60090	144.77511	94.0	566.7	569.1	Scoop of area with lots of tephra deposits-relatively 'sandy' area.
457	J2-487	2010/03/18 00:00:19	14.60090	144.77511	92.5	566.5	569.5	Sample: geo J487-tephra-01 sample at Phantom.
458	J2-487	2010/03/18 00:00:34	14.60091	144.77510	94.6	565.6	570.6	SAMPLE J487-tephra-01.
459	J2-487	2010/03/18 00:01:14	14.60091	144.77510	93.8	565.5	570.9	SAMPLE is J487-scoop-01....it is a scoop sample of tephra.
461	J2-487	2010/03/18 00:01:28	14.60091	144.77510	93.8	565.5	570.7	Putting sample in right biobox in swing arm compartment.
462	J2-487	2010/03/18 00:03:03	14.60090	144.77510	93.6	565.5	571.5	Scoop is in biobox.
464	J2-487	2010/03/18 00:03:26	14.60090	144.77510	93.6	565.5	571.2	Plume is very vigorous with yellow and tephra spewing forth.
465	J2-487	2010/03/18 00:04:12	14.60091	144.77510	93.7	565.5	570.7	Deciding what to do next.
466	J2-487	2010/03/18 00:04:54	14.60091	144.77510	93.8	565.5	571.1	Due to the current visibility we will try a fluid sample here.
468	J2-487	2010/03/18 00:06:34	14.60091	144.77512	101.3	565.9	568.7	Preparing for fluid sampling while facing vent at 089.
470	J2-487	2010/03/18 00:07:59	14.60091	144.77512	101.4	565.9	568.8	Nick would prefer to use scoop in the sample name instead of tephra.
471	J2-487	2010/03/18 00:08:23	14.60091	144.77511	101.4	565.9	568.8	Working to retrieve the long wand for the HFS sampler.
473	J2-487	2010/03/18 00:10:30	14.60091	144.77510	101.4	565.9	568.7	Plume is very vigorous with lots of yellow-plume-tephra.
475	J2-487	2010/03/18 00:12:16	14.60091	144.77511	101.4	565.9	568.7	Wand is out of the basket.
476	J2-487	2010/03/18 00:12:38	14.60092	144.77511	101.5	565.9	568.7	Fixing cameras for a good view of sampling site.
477	J2-487	2010/03/18 00:12:54	14.60091	144.77511	101.0	565.9	568.5	Moving in to sample plume.
479	J2-487	2010/03/18 00:13:32	14.60091	144.77512	103.8	566.3	567.6	Placing wand in the cloud of the plume
480	J2-487	2010/03/18 00:13:49	14.60091	144.77511	103.6	566.2	567.6	Lots of bubbles and tephra-a bit more vigorous since retrieving the wand.
481	J2-487	2010/03/18 00:14:22	14.60091	144.77511	103.6	566.2	567.6	Need to bring out the basket to get more extension on the wand.
482	J2-487	2010/03/18 00:14:39	14.60091	144.77512	103.4	566.2	567.6	Wand in and the temp is going up.
483	J2-487	2010/03/18 00:14:48	14.60091	144.77512	103.4	566.2	567.6	Temp is 38 and going up.
485	J2-487	2010/03/18 00:15:27	14.60091	144.77512	103.2	566.2	567.6	Temp is 57 deg.
486	J2-487	2010/03/18 00:15:42	14.60091	144.77512	102.9	566.2	567.6	Explosion is knocking the nozzle in the plume
487	J2-487	2010/03/18 00:16:00	14.60091	144.77512	102.9	566.2	567.6	Piston sample #1 will be taken and see out take.

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488	J2-487	2010/03/18 00:16:23	14.60091	144.77512	102.7	566.2	567.6	Sample: fluid SAMPLE J487-HFS-02 now.
489	J2-487	2010/03/18 00:16:39	14.60091	144.77512	102.7	566.2	567.6	Sample: fluid J487-HFS-02 is underway.
491	J2-487	2010/03/18 00:17:45	14.60090	144.77512	102.5	566.2	567.6	Sample: fluid Stopped. Piston #1 max=-70.2 avg=65.3 vol=213 T2=24. J487-HFS-02
492	J2-487	2010/03/18 00:18:16	14.60090	144.77512	102.6	566.2	567.6	Preparing for second HFS sample here.
493	J2-487	2010/03/18 00:18:36	14.60090	144.77511	102.6	566.2	567.6	Sample: fluid J487-HFS-03 Piston #2 start.
495	J2-487	2010/03/18 00:19:18	14.60090	144.77511	102.6	566.2	567.6	J487-HFS-03 at same spot as previous Piston #2.
496	J2-487	2010/03/18 00:19:37	14.60090	144.77512	102.7	566.2	567.6	This is a filtered piston J487-HFS-03. (last was unfiltered)
497	J2-487	2010/03/18 00:20:23	14.60091	144.77512	102.6	566.2	567.6	Took 035 here at Phantom.
499	J2-487	2010/03/18 00:21:51	14.60091	144.77512	102.5	566.2	567.6	Sample: fluid J487-HFS-03 Piston #2 filtered stopped.
500	J2-487	2010/03/18 00:22:48	14.60091	144.77511	102.5	566.3	567.6	Sample: fluid J487-HFS-03 Tmax=77.7 Tavg=59.8 vol=~350 T2=24 (not sure on volume Dave will get later)
501	J2-487	2010/03/18 00:23:06	14.60091	144.77511	102.6	566.2	567.6	Plume is still vigorous.
502	J2-487	2010/03/18 00:23:16	14.60091	144.77511	102.7	566.2	567.3	Pulling out wand to look at nozzle.
504	J2-487	2010/03/18 00:24:00	14.60091	144.77511	102.7	566.3	567.6	Nozzle has only a little bit of molten sulfur but otherwise looks good.
505	J2-487	2010/03/18 00:24:07	14.60091	144.77511	102.7	566.3	567.6	Putting back in for another sample.
506	J2-487	2010/03/18 00:24:58	14.60091	144.77512	103.1	566.2	567.6	Putting wand into another part of the plume without moving vehicle.
508	J2-487	2010/03/18 00:25:22	14.60091	144.77512	103.0	566.2	567.6	Putting nozzle in a fluid area visible in front not center of plume area.
509	J2-487	2010/03/18 00:25:37	14.60091	144.77512	103.0	566.3	567.6	Decided to go back into the center of the plume.
510	J2-487	2010/03/18 00:26:19	14.60091	144.77512	102.9	566.3	567.6	Trying to position wand more horizontally.
512	J2-487	2010/03/18 00:28:01	14.60091	144.77512	102.9	566.3	567.5	Sample: fluid J487-HFS-04 filtered Piston #3 starting.
513	J2-487	2010/03/18 00:28:27	14.60091	144.77511	102.8	566.3	567.5	Sample: fluid J487-HFS-04 saw puff from exhaust then stopped.
514	J2-487	2010/03/18 00:28:50	14.60092	144.77512	103.1	566.3	567.6	J487-HFS-04 rocks moving while sampling-may need to leave.
516	J2-487	2010/03/18 00:29:26	14.60092	144.77512	103.1	566.3	567.6	J487-HFS-04 not solid sample. Starting over program crashed.
517	J2-487	2010/03/18 00:31:07	14.60091	144.77511	103.0	566.3	567.6	Sample: fluid Ground shaking and moving Jason so displacing nozzle.
519	J2-487	2010/03/18 00:33:13	14.60091	144.77512	102.8	566.2	567.6	Sample: fluid J487-HFS-04 not restarted yet.
521	J2-487	2010/03/18 00:33:33	14.60091	144.77512	102.7	566.2	567.6	Sample: fluid J487-HFS-04 looking for better place to place wand and then restart this sample.
523	J2-487	2010/03/18 00:36:00	14.60090	144.77511	102.2	566.2	567.6	Sample: fluid J487-HFS-04 lots of tephra while waiting for temp to increase while pumping (not started yet)
524	J2-487	2010/03/18 00:36:18	14.60090	144.77511	102.1	566.2	567.6	Sample: fluid J487-HFS-04 started again.
525	J2-487	2010/03/18 00:36:35	14.60090	144.77511	102.1	566.2	567.6	Sample: fluid Moving wand tip slightly while sampling.
527	J2-487	2010/03/18 00:37:25	14.60091	144.77512	101.4	566.1	567.6	Temp is now coming up pretty fast.
528	J2-487	2010/03/18 00:38:13	14.60091	144.77512	101.3	566.1	567.6	Sample: fluid J487-HFS-04 continuing to sample.
529	J2-487	2010/03/18 00:38:35	14.60091	144.77512	101.3	566.1	567.6	J487-HFS-04 had been off and is now back on when temp got up to 60.
531	J2-487	2010/03/18 00:39:58	14.60091	144.77512	101.4	566.0	567.6	Sample: fluid Stopped. Tmax=74.1 Tavg=64 vol=250 T2=30 J487-HFS-04
532	J2-487	2010/03/18 00:40:24	14.60091	144.77512	101.5	566.0	567.5	Sample: fluid Going to do one more HFS sample here.
533	J2-487	2010/03/18 00:40:55	14.60091	144.77512	101.2	566.0	567.6	View has become obscured.

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534	J2-487	2010/03/18 00:41:17	14.60091	144.77512	101.7	566.0	567.6	Picking up nozzle since we can see much and looking at tip.
536	J2-487	2010/03/18 00:42:07	14.60091	144.77512	101.2	566.1	567.6	Wand tip looks a bit crusty but not too bad.
538	J2-487	2010/03/18 00:43:36	14.60091	144.77512	101.6	566.1	567.6	Going to try one more sample now that plume has cleared.
539	J2-487	2010/03/18 00:45:12	14.60091	144.77513	102.3	565.9	567.6	Wand is going in plume and pumps are on.
541	J2-487	2010/03/18 00:46:30	14.60090	144.77513	102.2	565.9	567.6	Switching on force-feedback to the arm to tell if it is touching anything.
542	J2-487	2010/03/18 00:46:51	14.60090	144.77513	102.3	565.9	567.6	Lots of bubbles right now and more vigorous.
543	J2-487	2010/03/18 00:47:05	14.60091	144.77513	102.3	565.9	567.6	Looking at temperature going up.
546	J2-487	2010/03/18 00:50:52	14.60090	144.77512	105.4	565.9	567.7	Temperature is not holding steady and can't see what is happening with tip.
548	J2-487	2010/03/18 00:51:30	14.60089	144.77513	100.4	565.9	567.7	All obscured so backing away.
549	J2-487	2010/03/18 00:52:20	14.60090	144.77513	100.9	565.9	567.7	Need view to clear before sampling.
550	J2-487	2010/03/18 00:52:30	14.60090	144.77513	100.9	565.9	567.7	HFS pump is off.
552	J2-487	2010/03/18 00:54:15	14.60090	144.77512	101.4	565.9	567.6	Starting to be able to see again-there is the arm.
554	J2-487	2010/03/18 00:56:20	14.60089	144.77513	102.0	566.0	567.5	Pump is on again for HFS.
555	J2-487	2010/03/18 00:56:30	14.60090	144.77513	101.7	566.0	567.5	View is obscuring again.
557	J2-487	2010/03/18 00:58:38	14.60090	144.77512	102.9	565.9	567.5	Better visibility again and lots of bubbles.
558	J2-487	2010/03/18 00:59:00	14.60090	144.77512	102.5	565.9	567.5	Looking for reachable intense part of plume-just out of reach.
560	J2-487	2010/03/18 00:59:45	14.60092	144.77511	98.6	565.6	567.6	Moving vehicle slightly for better reach into plume.
561	J2-487	2010/03/18 01:00:55	14.60093	144.77513	139.4	565.5	567.9	Getting an overview of vent as circling clockwise.
563	J2-487	2010/03/18 01:03:08	14.60093	144.77511	137.4	565.9	567.9	Nice view of the intense vent area.
565	J2-487	2010/03/18 01:03:32	14.60093	144.77510	138.7	566.0	567.8	Pump is on for HFS.
566	J2-487	2010/03/18 01:03:53	14.60093	144.77510	139.0	566.0	567.8	Placing wand in vent-it is pulsing.
567	J2-487	2010/03/18 01:04:11	14.60093	144.77510	139.4	566.0	567.8	Good explosion.
568	J2-487	2010/03/18 01:04:44	14.60094	144.77510	139.3	566.0	567.8	Sample: fluid J487-HFS-05 Piston #4 started. Rock is moving.
569	J2-487	2010/03/18 01:05:02	14.60094	144.77510	139.0	566.0	567.8	Sample: fluid Unfiltered piston #4 is sampling while rocks are pulsing.
571	J2-487	2010/03/18 01:06:26	14.60093	144.77511	139.3	566.0	567.8	Sampler malfunction.
572	J2-487	2010/03/18 01:07:05	14.60092	144.77511	137.8	566.0	567.8	Activity has changed dramatically (decreasing-stopped.)
574	J2-487	2010/03/18 01:07:32	14.60091	144.77511	137.4	566.0	567.8	Activity at the vent we were looking at stopped but adjacent activity.
575	J2-487	2010/03/18 01:07:43	14.60091	144.77511	137.5	566.0	567.8	Moving Jason to vigorous part of vent to the right.
576	J2-487	2010/03/18 01:07:53	14.60091	144.77510	137.6	566.0	567.8	Just moved wand-not Jason.
577	J2-487	2010/03/18 01:08:25	14.60091	144.77510	138.5	565.9	567.8	Temperature is going up fast in new position. Back to where we were temp-wise.
578	J2-487	2010/03/18 01:09:13	14.60092	144.77510	137.2	566.0	567.8	Sample: fluid J487-HFS-05 restarted. Temp is over 100. Start.
580	J2-487	2010/03/18 01:09:39	14.60092	144.77510	137.3	565.9	567.8	More vigorous now and temp went up to 106.
581	J2-487	2010/03/18 01:10:26	14.60092	144.77511	136.8	565.9	567.9	Lots of bubbles.
582	J2-487	2010/03/18 01:10:36	14.60092	144.77511	136.8	565.9	567.8	Be prepared for pulse.
583	J2-487	2010/03/18 01:10:39	14.60092	144.77511	136.8	565.9	567.8	Stopped.
585	J2-487	2010/03/18 01:11:30	14.60092	144.77512	135.8	565.9	567.7	J487-HFS-05 Tmax=106.6 Tavg=97 vol=235 T2=19.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
586	J2-487	2010/03/18 01:11:41	14.60092	144.77512	136.4	565.8	567.8	Big movement before removing wand.
587	J2-487	2010/03/18 01:12:01	14.60092	144.77512	136.1	565.9	567.6	Going to prepare to sample gastights (hand-held).
588	J2-487	2010/03/18 01:12:09	14.60092	144.77512	136.6	565.5	568.1	Need to store wand and hose.
589	J2-487	2010/03/18 01:12:34	14.60093	144.77512	174.4	565.0	567.4	Lots of bubbles again with good overview of vent area.
590	J2-487	2010/03/18 01:13:03	14.60093	144.77512	183.7	565.2	567.0	Vent area has spread out since we've been here. Spread to SW.
593	J2-487	2010/03/18 01:16:10	14.60093	144.77512	182.8	565.2	566.9	Hose wrapped and storing wand.
594	J2-487	2010/03/18 01:16:34	14.60093	144.77512	182.6	565.2	567.0	Going to take hand-held gas tights next (still trying to store wand).
596	J2-487	2010/03/18 01:18:00	14.60093	144.77511	182.6	565.2	567.0	Good views of vent and taking photos with DSC during storage.
597	J2-487	2010/03/18 01:18:43	14.60094	144.77511	183.1	565.2	566.9	Jason is heading 183 with good view of plume in background.
599	J2-487	2010/03/18 01:20:08	14.60093	144.77512	182.9	565.2	566.9	Wand is stowed.
601	J2-487	2010/03/18 01:21:43	14.60093	144.77512	182.7	565.2	566.8	Retrieving red GTB from basket for sampling. Need to removed bungee.
602	J2-487	2010/03/18 01:23:01	14.60093	144.77514	182.6	565.3	566.9	Bungee off. Red GTB retrieved.
604	J2-487	2010/03/18 01:23:23	14.60093	144.77514	182.6	565.2	566.8	Going to get some gas at Phantom vent.
605	J2-487	2010/03/18 01:24:32	14.60093	144.77512	182.8	565.2	566.8	Working on arm grab for sampling.
607	J2-487	2010/03/18 01:25:30	14.60092	144.77512	182.7	565.2	566.8	Activity at this view appears to be less vigorous hdg=183
608	J2-487	2010/03/18 01:26:27	14.60092	144.77513	182.7	565.2	566.8	Moving back into sampling position.
610	J2-487	2010/03/18 01:27:48	14.60089	144.77510	109.7	566.3	569.9	Moving back to old heading for sampling.
613	J2-487	2010/03/18 01:31:33	14.60088	144.77507	106.0	566.9	570.3	Placing GT in the plume.
615	J2-487	2010/03/18 01:33:50	14.60089	144.77510	106.1	566.9	570.3	Sample: gas J487-GTB-06 Red gas-tight bottle at Phantom. Tip in yellow part of plume. Fired.
616	J2-487	2010/03/18 01:34:43	14.60090	144.77510	105.9	566.9	570.0	Saw bottle jerk when fired.
618	J2-487	2010/03/18 01:35:21	14.60090	144.77508	103.1	566.1	571.2	Backing away and then will stow bottle.
619	J2-487	2010/03/18 01:36:25	14.60091	144.77507	102.5	566.0	570.9	Stowed bottle back in basket same place.
626	J2-487	2010/03/18 01:48:19	14.60093	144.77511	130.6	566.3	568.9	Sample: gas J487-GTB-07. Green. Getting temps from 40 - 106 here at Phantom. Bottle in the bubbles. Shift change delay. GTB fired at 0148.
627	J2-487	2010/03/18 01:48:45	14.60093	144.77511	130.4	566.4	568.9	While waiting for that sample the vent started putting out lots of bubbles and seeing a lot of sulfur in the plume.
629	J2-487	2010/03/18 01:49:40	14.60094	144.77509	131.1	565.1	570.3	NAV: Dara mentioned that Doppler is now being seen on the screen - linked up to the USBL.
630	J2-487	2010/03/18 01:50:11	14.60094	144.77509	131.3	564.9	570.3	There was a shift change in the midst of everything. Sort of hanging out now. Bob is back in the hotseat.
631	J2-487	2010/03/18 01:50:39	14.60094	144.77508	131.5	565.0	570.4	Another comment is that there have been ground faults on the pilot cam.
633	J2-487	2010/03/18 01:52:18	14.60093	144.77509	131.6	565.0	570.4	Stowing the gastight.
634	J2-487	2010/03/18 01:53:08	14.60094	144.77509	131.5	565.0	570.4	SAMPLE J487-GTB-07 was collected at Phoenix vent.
636	J2-487	2010/03/18 01:54:36	14.60093	144.77507	133.1	564.8	571.5	There are 2 vents here. Bob wants to look around the cone to the south here. We will try going up and down the cone.
638	J2-487	2010/03/18 01:55:33	14.60085	144.77504	100.7	565.0	572.9	Bill is taking over for Bob so he can have a lunch break.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
639	J2-487	2010/03/18 01:55:49	14.60082	144.77504	91.3	565.0	572.1	Plan is to circle around to the south but also do a bit of up and down the cone.
640	J2-487	2010/03/18 01:56:20	14.60081	144.77506	87.3	564.8	571.2	Bill wants to radial around the cone to the south.
642	J2-487	2010/03/18 01:58:38	14.60076	144.77518	51.8	559.8	571.6	Looks like many of these features are partially coated in sulfur.
643	J2-487	2010/03/18 01:58:55	14.60076	144.77518	51.3	558.0	570.6	Just saw some shrimp come up from the bottom.
645	J2-487	2010/03/18 01:59:50	14.60081	144.77523	51.8	555.3	557.9	Lots of sulfur evident on edges of rock-or sheets of sulfur with ash coating it.
646	J2-487	2010/03/18 02:00:06	14.60081	144.77523	51.8	555.5	558.7	Want to set down for a moment in the sulfur deposit area.
647	J2-487	2010/03/18 02:00:30	14.60081	144.77522	50.4	556.3	558.7	Sitting on the sulfur crust so it is pretty solid.
648	J2-487	2010/03/18 02:00:40	14.60081	144.77522	49.2	556.4	558.7	Shrimp down below to right.
649	J2-487	2010/03/18 02:01:17	14.60081	144.77522	49.4	556.4	558.7	Hdg is 050 looking at sulfur crust.
651	J2-487	2010/03/18 02:01:57	14.60080	144.77523	49.9	556.4	558.7	AVI: start AVI #040 of this shrimp area.
653	J2-487	2010/03/18 02:03:27	14.60080	144.77524	50.2	556.4	558.6	Putting target here and calling it Sulfur Crust.
654	J2-487	2010/03/18 02:04:25	14.60079	144.77523	50.0	556.4	558.6	Great sampling area with good diffuse flow and lots of shrimp.
656	J2-487	2010/03/18 02:05:46	14.60077	144.77523	50.2	556.4	558.6	Nav: Doppler Reset Doppler reset.
657	J2-487	2010/03/18 02:06:47	14.60079	144.77529	60.2	552.4	553.9	Left crust and now into jumbled area as we move to 060.
658	J2-487	2010/03/18 02:06:55	14.60079	144.77530	72.3	551.8	556.3	Lava blocks with sulfur coating and ash.
660	J2-487	2010/03/18 02:07:19	14.60079	144.77534	71.0	550.8	556.0	The shrimp are Opaepale (can't be trapped with spam or cat food).
661	J2-487	2010/03/18 02:07:29	14.60080	144.77534	70.8	550.3	555.6	Moving around south.
662	J2-487	2010/03/18 02:08:12	14.60083	144.77537	70.4	547.5	552.1	Great overviews of site with large ash deposits and sulfur coated outcrops.
664	J2-487	2010/03/18 02:09:23	14.60082	144.77541	66.2	548.7	551.1	Plume coming toward us is Brimstone's plume. HDG 066.
665	J2-487	2010/03/18 02:10:30	14.60080	144.77543	29.4	549.8	551.2	Moving ship and Medea to continue exploration around Phantom area.
667	J2-487	2010/03/18 02:11:31	14.60073	144.77542	31.4	552.3	558.0	Between Phantom and Brimstone on the south side.
668	J2-487	2010/03/18 02:12:08	14.60072	144.77542	31.0	554.1	559.2	Jason is back down south and keeping a heading of 031.
669	J2-487	2010/03/18 02:12:29	14.60070	144.77541	31.9	554.2	560.3	Large blocks interspersed with ash deposits.
670	J2-487	2010/03/18 02:13:00	14.60069	144.77541	31.0	556.1	559.1	Lots of rock extrusion or perhaps mass wasting.
671	J2-487	2010/03/18 02:13:11	14.60068	144.77540	31.6	556.7	562.0	Steep sediment flows downslope.
673	J2-487	2010/03/18 02:14:32	14.60063	144.77539	31.7	561.9	564.0	Lots of plume in Medea cam from Phantom vent.
674	J2-487	2010/03/18 02:14:57	14.60061	144.77539	31.5	563.2	565.5	Lots of blocks and sediment between the vents. One particular sulfur chunk that probably slid.
675	J2-487	2010/03/18 02:15:06	14.60061	144.77539	31.7	563.4	565.6	There are shrimp here as well.
677	J2-487	2010/03/18 02:16:17	14.60057	144.77538	31.1	564.4	566.2	Outcrop sticking out but leaning downslope.
679	J2-487	2010/03/18 02:18:13	14.60050	144.77534	31.3	569.4	574.8	Rubble slope as we back down south.
681	J2-487	2010/03/18 02:19:47	14.60045	144.77534	31.4	572.6	578.8	Zooming in with DSC of the white stained rocks on slope.
682	J2-487	2010/03/18 02:20:31	14.60044	144.77538	2.3	572.7	578.8	Going to move to east along this contour (toward downslope of Brimstone).
683	J2-487	2010/03/18 02:21:03	14.60044	144.77545	347.6	574.1	579.0	See patches of white staining in rubble.
685	J2-487	2010/03/18 02:22:01	14.60047	144.77554	335.4	575.8	580.2	More sulfur encoated rocks sticking out of the slope.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
686	J2-487	2010/03/18 02:22:23	14.60047	144.77556	334.1	576.0	580.7	No animals on that particular rock.
687	J2-487	2010/03/18 02:22:44	14.60047	144.77556	333.5	577.2	580.6	So far moved about 20m east along this bathy contour.
689	J2-487	2010/03/18 02:23:27	14.60046	144.77557	333.0	577.4	579.0	Jason doing ballast check before we continue to move.
690	J2-487	2010/03/18 02:24:36	14.60049	144.77556	333.3	575.0	578.1	Shrimp on this rubbly shrimp.
691	J2-487	2010/03/18 02:24:49	14.60049	144.77556	333.2	574.3	577.5	Scree slope. Medea is in out of plume.
693	J2-487	2010/03/18 02:25:56	14.60053	144.77554	333.4	571.6	575.0	Jason is climbing up slope now along big scree slide.
694	J2-487	2010/03/18 02:26:50	14.60055	144.77555	333.9	571.0	575.0	Nav: Doppler Reset Nav jump of about 10m.
695	J2-487	2010/03/18 02:27:02	14.60055	144.77555	333.2	570.9	575.1	We did not actually climb up the slope-nav problem.
697	J2-487	2010/03/18 02:27:20	14.60055	144.77555	333.2	570.9	572.8	Going to drop a weight.
698	J2-487	2010/03/18 02:27:58	14.60055	144.77554	333.0	571.0	575.1	Weight away.
699	J2-487	2010/03/18 02:28:43	14.60055	144.77555	333.2	570.5	574.9	Pulling basket in.
701	J2-487	2010/03/18 02:30:34	14.60060	144.77555	333.6	567.6	571.1	Going over mainly sand on scree slope.
702	J2-487	2010/03/18 02:30:58	14.60061	144.77554	332.9	566.0	570.3	Due south of Brimstone here.
704	J2-487	2010/03/18 02:32:01	14.60064	144.77553	333.4	564.2	568.6	Black streak look like flow chute.
705	J2-487	2010/03/18 02:32:32	14.60065	144.77553	333.5	564.1	568.2	Maybe small lava flow with boulder at top of chute.
706	J2-487	2010/03/18 02:32:50	14.60065	144.77553	333.7	563.4	568.0	Just a loose block.
707	J2-487	2010/03/18 02:33:01	14.60065	144.77552	333.2	563.3	567.5	Patchy venting and shrimp as we move upslope.
709	J2-487	2010/03/18 02:33:48	14.60067	144.77552	333.6	562.8	566.0	Some bits of yellow staining.
710	J2-487	2010/03/18 02:34:12	14.60066	144.77552	333.4	562.7	566.1	Can see active sliding in the dark chute.
711	J2-487	2010/03/18 02:34:44	14.60066	144.77553	333.9	562.2	566.2	Medea is running along edge of Brimstone's plume.
712	J2-487	2010/03/18 02:35:00	14.60066	144.77553	334.3	561.9	566.2	Looking at big outcrop hanging on the edge of the slope.
714	J2-487	2010/03/18 02:35:32	14.60067	144.77554	333.5	561.3	566.1	Sulfur staining and iron at some point in time.
715	J2-487	2010/03/18 02:36:00	14.60067	144.77553	334.1	560.6	566.2	Some shrimp are on the outcrop (very small shrimp)
716	J2-487	2010/03/18 02:37:08	14.60067	144.77554	333.8	561.1	566.3	Examining this outcrop.
718	J2-487	2010/03/18 02:39:16	14.60068	144.77549	333.5	559.3	562.1	Going to continue along upslope
720	J2-487	2010/03/18 02:39:46	14.60069	144.77549	334.0	559.0	561.8	Low flow here with some yellow sulfur and shrimp.
721	J2-487	2010/03/18 02:39:56	14.60068	144.77549	334.1	559.0	561.8	Sulfur looks like cheese curds.
722	J2-487	2010/03/18 02:40:42	14.60069	144.77549	334.0	558.0	561.6	Moving up very steep wall.
724	J2-487	2010/03/18 02:41:57	14.60074	144.77548	335.7	552.9	557.8	Getting into plume smoke.
726	J2-487	2010/03/18 02:44:59	14.60079	144.77541	333.9	550.1	551.4	Looks like we have reached the top of the slope here (leveled out).
728	J2-487	2010/03/18 02:45:41	14.60082	144.77540	333.5	548.9	551.1	Lots of sulfur coating top of the outcrops here on top.
729	J2-487	2010/03/18 02:46:27	14.60083	144.77539	333.8	547.8	551.5	Lots of shrimp on sulfur.
731	J2-487	2010/03/18 02:48:58	14.60079	144.77540	333.7	550.6	552.4	Plume is obscuring approach to Brimstone so we will go explore to the east to Mkr105.
733	J2-487	2010/03/18 02:50:17	14.60067	144.77539	331.9	552.9	562.9	Waiting for ship and Medea to get into position for moving.
735	J2-487	2010/03/18 02:53:04	14.60069	144.77553	23.9	556.2	564.2	Moving 089 with vehicle turning to match.
737	J2-487	2010/03/18 02:53:22	14.60069	144.77559	27.8	556.4	563.3	Moving now to Mkr105 at 70m away.
739	J2-487	2010/03/18 02:56:45	14.60064	144.77569	28.4	564.1	569.1	Looking at wall 030.

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740	J2-487	2010/03/18 02:56:58	14.60062	144.77570	30.8	563.8	570.8	Lots of plume in Medea cam.
742	J2-487	2010/03/18 02:59:07	14.60059	144.77582	30.6	564.1	576.6	Waiting for ship-Medea-Jason to settle up.
744	J2-487	2010/03/18 02:59:37	14.60059	144.77587	28.7	565.0	580.6	Vertical walls here. Hoodoos.
745	J2-487	2010/03/18 02:59:52	14.60059	144.77589	30.8	565.2	581.7	Volcanic hoodoos.
746	J2-487	2010/03/18 03:01:13	14.60060	144.77587	30.8	564.8	580.8	Stopping the ship and waiting for Medea.
748	J2-487	2010/03/18 03:02:18	14.60061	144.77594	33.5	577.6	580.0	Jason is on the move to the East.
750	J2-487	2010/03/18 03:04:27	14.60059	144.77623	45.3	582.3	595.3	Total depth now is 600m and used to be 540m according to old map.
751	J2-487	2010/03/18 03:04:42	14.60059	144.77624	46.7	581.8	601.0	Huge depth difference.
752	J2-487	2010/03/18 03:05:13	14.60061	144.77629	38.5	581.2	596.6	White coated wall in front of us (sulfur)-bottoms has dropped out here.
754	J2-487	2010/03/18 03:05:28	14.60061	144.77631	40.7	581.2	605.0	Sonar shows big wall or overhang.
755	J2-487	2010/03/18 03:05:46	14.60061	144.77630	36.4	581.1	605.0	Ship is stopped over Mkr105 and now Jason driving toward it.
756	J2-487	2010/03/18 03:06:41	14.60061	144.77630	40.3	581.2	605.3	Wall is covered in Shrimp!
757	J2-487	2010/03/18 03:07:09	14.60061	144.77631	40.4	581.2	605.3	Look like the smaller shrimp on overhang outcrop.
759	J2-487	2010/03/18 03:07:46	14.60061	144.77631	40.6	581.2	605.4	Grazer shrimp on white wall.
760	J2-487	2010/03/18 03:08:22	14.60061	144.77631	40.3	581.2	605.6	Shrimp look like new recruits.
761	J2-487	2010/03/18 03:08:49	14.60061	144.77631	40.3	581.2	605.6	Thinking of suctioning up some of these shrimp.
763	J2-487	2010/03/18 03:10:40	14.60064	144.77634	16.6	580.1	607.4	Lots of shrimp covering sulfur wall (altimeter shows us 26 m off bottom)
765	J2-487	2010/03/18 03:12:41	14.60066	144.77632	24.5	579.9	606.5	Basket is wedged up against overhanging wall.
766	J2-487	2010/03/18 03:13:09	14.60066	144.77632	25.0	579.9	607.3	Retrieving the suction sampling hose from basket.
770	J2-487	2010/03/18 03:17:26	14.60066	144.77633	24.7	579.8	607.1	Hose is out but shrimp just in front doesn't have many.
771	J2-487	2010/03/18 03:18:54	14.60066	144.77633	25.4	579.9	607.1	Shrimp are just out of reach.
773	J2-487	2010/03/18 03:19:49	14.60065	144.77632	27.1	579.9	607.2	This wall is pretty much at the old Mkr105 location which had a depth of 541. New total depth is 600m.
775	J2-487	2010/03/18 03:22:39	14.60061	144.77637	10.1	579.8	607.9	Going to swing around north here.
777	J2-487	2010/03/18 03:23:19	14.60063	144.77641	341.2	579.8	607.9	Other side of wall does not have any sulfur at all.
778	J2-487	2010/03/18 03:23:55	14.60064	144.77641	341.2	579.8	607.9	Bare rock side may be the part that wasted away.
780	J2-487	2010/03/18 03:25:29	14.60065	144.77641	340.9	579.8	607.9	Some shrimp still on the bare rock side of the wall.
781	J2-487	2010/03/18 03:26:12	14.60066	144.77642	341.4	579.8	607.9	May name this area Voodoo (Embley).
782	J2-487	2010/03/18 03:26:51	14.60067	144.77642	341.4	579.8	607.9	Can see recent piece of rock that slid off wall.
784	J2-487	2010/03/18 03:27:57	14.60068	144.77643	341.4	579.1	607.2	AVI: start Seeing patches of white sulfur with shrimp feeding. AVI 041
786	J2-487	2010/03/18 03:29:18	14.60068	144.77643	338.9	579.1	607.2	Going to look for a rock to grab while waiting for Medea to catch up.
787	J2-487	2010/03/18 03:29:57	14.60068	144.77642	331.5	578.3	606.4	There are two species of shrimp here.
788	J2-487	2010/03/18 03:30:07	14.60067	144.77642	333.2	577.2	605.3	Opapepele and Alvinocaris.
789	J2-487	2010/03/18 03:30:55	14.60067	144.77643	332.3	577.3	614.6	Another outcrop coated in white.
790	J2-487	2010/03/18 03:31:42	14.60067	144.77645	332.5	577.6	612.3	Not going to be able to get rock and still waiting for Medea.
791	J2-487	2010/03/18 03:32:05	14.60067	144.77646	333.0	577.6	616.6	Nav: Doppler Reset doppler
792	J2-487	2010/03/18 03:32:54	14.60071	144.77649	332.7	579.1	619.0	Moving along wall.
793	J2-487	2010/03/18 03:34:20	14.60083	144.77651	332.4	579.0	621.3	Moving Jason north with vehicle view heading of 332.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
794	J2-487	2010/03/18 03:35:08	14.60087	144.77652	306.5	579.0	607.8	In place lava.
796	J2-487	2010/03/18 03:36:21	14.60091	144.77651	292.4	577.0	594.4	Bad Jason nav right now-lost doppler.
797	J2-487	2010/03/18 03:36:28	14.60091	144.77651	292.3	577.1	594.6	Nav: Doppler Reset
798	J2-487	2010/03/18 03:36:36	14.60091	144.77651	292.3	577.2	586.5	Waiting on Medea.
799	J2-487	2010/03/18 03:37:08	14.60092	144.77650	292.3	577.1	588.3	Seeing some sand sediment between the rocks on wall.
803	J2-487	2010/03/18 03:41:36	14.60103	144.77654	306.1	594.6	602.1	Lots of white staining in rock cracks.
804	J2-487	2010/03/18 03:42:38	14.60106	144.77654	302.1	592.2	598.4	Didn't see shrimp on the rocks here. Continuing north.
805	J2-487	2010/03/18 03:43:05	14.60110	144.77655	333.0	593.9	595.5	Looks like remnants of slumping on the wall face as we head north to Mkr102.
807	J2-487	2010/03/18 03:44:32	14.60111	144.77658	274.0	600.9	608.5	White stained sediment slope ahead-smooth sonar return.
808	J2-487	2010/03/18 03:45:06	14.60117	144.77658	345.4	601.1	605.8	Turning sub around to look at slope HDG 322.
810	J2-487	2010/03/18 03:45:28	14.60119	144.77660	15.9	600.5	604.1	We're above the headwall.
811	J2-487	2010/03/18 03:45:53	14.60122	144.77658	15.0	599.0	602.0	This was beyond the rock wall embayment.
812	J2-487	2010/03/18 03:46:19	14.60125	144.77656	3.9	596.9	600.2	Chunks of out of place rock in sand sediment.
813	J2-487	2010/03/18 03:46:40	14.60128	144.77655	1.9	594.2	597.9	Heading up slope.
814	J2-487	2010/03/18 03:46:49	14.60129	144.77654	359.9	593.0	596.9	Mkr102 depth was 565m.
816	J2-487	2010/03/18 03:47:11	14.60131	144.77654	347.9	591.4	595.5	Outcrop in sediment-lots of yellow staining (iron).
818	J2-487	2010/03/18 03:47:35	14.60133	144.77655	347.5	590.3	594.6	Volcanic sand covered in sulfur.
819	J2-487	2010/03/18 03:47:55	14.60135	144.77655	347.2	590.5	593.2	Now going up into outcrop stained yellow.
820	J2-487	2010/03/18 03:48:23	14.60135	144.77655	347.8	589.8	593.0	There are a few shrimp on the outcrop.
822	J2-487	2010/03/18 03:49:26	14.60136	144.77653	3.3	585.0	590.5	Moving up the outcrop.
823	J2-487	2010/03/18 03:49:30	14.60136	144.77653	12.3	584.7	590.8	Nav: Doppler Reset
824	J2-487	2010/03/18 03:50:05	14.60137	144.77652	9.3	582.1	589.8	Lots of yellow iron oxide in fractures of rock.
825	J2-487	2010/03/18 03:50:49	14.60140	144.77648	56.6	579.4	586.9	Looks like massive flow. Bow of ship in brow cam.
827	J2-487	2010/03/18 03:52:35	14.60147	144.77654	14.7	573.0	580.9	Back end of Jason up against wall outcrop.
830	J2-487	2010/03/18 03:55:48	14.60158	144.77652	325.3	556.3	568.4	Reached the top of the wall.
831	J2-487	2010/03/18 03:56:09	14.60158	144.77653	300.9	555.0	569.4	Depth is within a few meters of the marker depth.
832	J2-487	2010/03/18 03:56:58	14.60162	144.77650	268.9	556.3	558.4	Jelly just flew by.
835	J2-487	2010/03/18 03:59:45	14.60154	144.77639	276.5	556.0	560.6	Looking along ridge top here at 281.
836	J2-487	2010/03/18 04:00:34	14.60150	144.77633	250.1	554.2	562.6	Looking for Marker 102.
838	J2-487	2010/03/18 04:02:32	14.60155	144.77632	276.7	554.6	560.9	Follow wall along to the north at the marker depth.
840	J2-487	2010/03/18 04:04:34	14.60171	144.77620	250.7	553.5	570.0	Lost outcrop wall.
841	J2-487	2010/03/18 04:05:00	14.60170	144.77620	250.6	553.6	569.6	We are due west of the marker position but at the correct depth.
843	J2-487	2010/03/18 04:05:25	14.60169	144.77622	250.2	553.6	563.4	Thinking about going back to the old marker position to the east for a further look.
844	J2-487	2010/03/18 04:06:35	14.60164	144.77634	123.6	561.2	566.2	Looking at sediment covered slope but no marker on an outcrop.
846	J2-487	2010/03/18 04:07:24	14.60167	144.77648	130.2	557.9	565.5	Jason is 10m away from target and there is a strong sonar return ahead.
847	J2-487	2010/03/18 04:07:31	14.60167	144.77650	129.5	557.5	566.7	Lots of staining between rocks.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
848	J2-487	2010/03/18 04:08:17	14.60164	144.77653	137.7	557.1	564.7	Moving Medea slightly to the SE.
849	J2-487	2010/03/18 04:08:23	14.60163	144.77654	137.6	555.9	563.6	At top of ridge again.
850	J2-487	2010/03/18 04:09:01	14.60159	144.77652	286.9	554.7	560.4	This is the tallest thing around here and depth is deeper than marker.
852	J2-487	2010/03/18 04:09:21	14.60158	144.77650	286.4	555.0	563.8	Stopping Medea as we will be heading back to Brimstone soon.
853	J2-487	2010/03/18 04:10:35	14.60153	144.77652	236.9	555.2	569.9	Did not find marker and now heading back to Mkr-161.
855	J2-487	2010/03/18 04:11:36	14.60149	144.77652	235.9	570.1	572.9	Fish in view-not a rat tail it is a big red fish.
856	J2-487	2010/03/18 04:11:46	14.60148	144.77652	238.0	570.8	573.0	Outcrop covered in white sulfur staining.
858	J2-487	2010/03/18 04:14:15	14.60146	144.77650	213.4	565.0	571.3	Looking at top of this outcrop getting ready to drive to Brimstone.
859	J2-487	2010/03/18 04:14:22	14.60145	144.77648	216.2	564.3	571.3	Shrimp flew by.
860	J2-487	2010/03/18 04:14:45	14.60146	144.77641	214.7	564.0	568.7	Large outcrop ahead.
862	J2-487	2010/03/18 04:15:37	14.60138	144.77634	215.4	550.9	568.8	Vertical outcrops to north.
863	J2-487	2010/03/18 04:17:05	14.60133	144.77626	215.8	542.0	549.3	Wall in front of Jason that we will have to go up and over.
865	J2-487	2010/03/18 04:17:42	14.60128	144.77624	215.8	533.8	551.1	Large crevices in vertical rock outcrops.
866	J2-487	2010/03/18 04:17:58	14.60127	144.77623	229.0	531.5	549.2	Some white staining. Vertical cliffs everywhere.
867	J2-487	2010/03/18 04:19:12	14.60119	144.77613	236.6	523.6	532.8	Got to top and heading over west some more-another big sonar target ahead of us.
869	J2-487	2010/03/18 04:19:29	14.60114	144.77608	237.9	523.3	526.9	Driving along top of outcrop.
870	J2-487	2010/03/18 04:19:40	14.60112	144.77606	237.0	523.1	525.8	Plume trapped on the other edge of wall.
871	J2-487	2010/03/18 04:19:53	14.60111	144.77605	235.5	523.0	524.5	Plume is trapped between outcrops.
872	J2-487	2010/03/18 04:20:31	14.60111	144.77598	235.9	524.4	525.5	Driving south toward Brimstone with lots of plume.
873	J2-487	2010/03/18 04:20:51	14.60112	144.77595	235.3	525.2	528.6	Butt cam shows craggy outcrop.
875	J2-487	2010/03/18 04:21:58	14.60109	144.77575	248.3	526.4	528.4	Driving through plume with no visibility.
876	J2-487	2010/03/18 04:22:25	14.60110	144.77564	247.8	528.8	530.8	Going to go to Sulfur Crust first to get shrimp before swapping tephra samplers at Brimstone.
877	J2-487	2010/03/18 04:23:09	14.60108	144.77562	239.0	528.9	531.4	See lots of shrimp in water at current location.
878	J2-487	2010/03/18 04:23:14	14.60107	144.77563	238.5	528.9	531.9	Waiting for Medea.
880	J2-487	2010/03/18 04:24:04	14.60101	144.77563	238.7	533.9	534.6	We are 10m from Brimstone.
882	J2-487	2010/03/18 04:25:46	14.60098	144.77544	245.4	540.1	545.1	No visibility while waiting for Medea-stuck in Brimstone's plume.
883	J2-487	2010/03/18 04:26:42	14.60095	144.77539	244.2	546.5	548.1	Still driving through plume to Sulfur Crust.
885	J2-487	2010/03/18 04:28:13	14.60095	144.77534	40.5	549.3	551.3	Visibility is improving-waiting for Medea which has a great view of the plume.
887	J2-487	2010/03/18 04:29:40	14.60085	144.77523	46.0	548.8	555.0	Approach to site.
888	J2-487	2010/03/18 04:30:25	14.60078	144.77519	46.0	554.3	557.2	Target was at 556m and hdg was 050.
890	J2-487	2010/03/18 04:31:22	14.60074	144.77521	45.4	553.8	561.7	Here we are. Deciding what to do.
891	J2-487	2010/03/18 04:32:25	14.60073	144.77521	45.6	554.3	561.1	Looking around for a good sampling site of shrimp.
893	J2-487	2010/03/18 04:33:48	14.60075	144.77523	45.8	556.3	559.7	Looking at good area of shrimp and diffuse flow.
894	J2-487	2010/03/18 04:35:10	14.60075	144.77523	44.0	557.2	559.2	Going to suction shrimp here at Sulfur Crust.
896	J2-487	2010/03/18 04:36:02	14.60076	144.77524	4.3	557.0	558.0	Waiting for Jason to park.
898	J2-487	2010/03/18 04:37:48	14.60076	144.77523	5.7	556.8	558.0	Can see more than one species of shrimp.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
899	J2-487	2010/03/18 04:38:21	14.60076	144.77523	5.4	556.8	558.0	Switching to S-video on the DVCam tape.
900	J2-487	2010/03/18 04:38:46	14.60076	144.77523	5.2	556.8	558.0	AVI: start AVI #043
902	J2-487	2010/03/18 04:39:27	14.60076	144.77523	5.1	556.8	558.0	Image on DVCam looks a lot different in S-video mode.
903	J2-487	2010/03/18 04:39:47	14.60077	144.77523	5.1	556.8	558.0	Have suction and getting ready to slurp.
904	J2-487	2010/03/18 04:40:25	14.60077	144.77523	4.9	556.8	558.0	Sample: bio J487-shrimp-08 with suction sampler.
905	J2-487	2010/03/18 04:40:55	14.60077	144.77523	4.8	556.8	558.0	Switched back to SDI on DVCam.
907	J2-487	2010/03/18 04:41:50	14.60076	144.77523	4.7	556.8	558.0	Have not seen shrimp go in the tube.
909	J2-487	2010/03/18 04:43:27	14.60077	144.77524	4.7	556.8	557.9	Still suctioning.
911	J2-487	2010/03/18 04:46:17	14.60076	144.77524	4.4	556.8	558.0	Switching back to S-video on the DVCam.
912	J2-487	2010/03/18 04:47:03	14.60076	144.77524	4.7	556.8	558.0	Still capturing the shrimp.
913	J2-487	2010/03/18 04:47:10	14.60076	144.77524	4.7	556.8	558.0	Switching back to SDI on DVCam.
916	J2-487	2010/03/18 04:49:31	14.60077	144.77523	4.8	556.8	558.0	Last few suctions before finishing here.
917	J2-487	2010/03/18 04:50:37	14.60076	144.77523	4.8	556.8	558.0	Completed sampling shrimp with suction J487-shrimp-08.
918	J2-487	2010/03/18 04:50:47	14.60076	144.77524	3.4	556.8	558.0	Stowing the hose.
920	J2-487	2010/03/18 04:52:16	14.60076	144.77524	2.5	556.8	558.0	Getting shrimp trap out of the basket to deploy here.
921	J2-487	2010/03/18 04:53:11	14.60076	144.77524	5.0	556.8	558.0	Deploy: shrimp traps Leaving a shrimp trap at Sulfur Crust.
923	J2-487	2010/03/18 04:54:02	14.60076	144.77524	5.1	556.8	557.9	Great placement of trap at Sulfur Crust.
924	J2-487	2010/03/18 04:54:39	14.60076	144.77524	5.1	556.8	557.9	Next going to deploy Mkr-120.
926	J2-487	2010/03/18 04:55:48	14.60076	144.77523	5.2	556.8	558.0	Deploy: markers Jason has Mkr-120.
927	J2-487	2010/03/18 04:56:11	14.60076	144.77524	5.2	556.8	557.9	Placing marker next to trap.
929	J2-487	2010/03/18 04:57:48	14.60075	144.77525	4.7	556.8	558.0	Placed marker on top of sulfur slab at Sulfur Crust.
930	J2-487	2010/03/18 04:58:16	14.60074	144.77526	4.7	556.8	558.0	Next going to deploy MTR here.
931	J2-487	2010/03/18 04:59:17	14.60074	144.77526	6.5	556.8	558.0	Deploy: MTRs MTR-6 deployed at Sulfur Crust near shrimp trap.
933	J2-487	2010/03/18 04:59:33	14.60074	144.77526	6.5	556.8	558.0	Next want a piece of sulfur crust.
935	J2-487	2010/03/18 05:02:18	14.60074	144.77525	356.1	556.8	558.6	Brining out STBD swing arm for sulfur crust sample.
936	J2-487	2010/03/18 05:02:52	14.60074	144.77524	356.4	556.8	558.6	Biobox is open.
938	J2-487	2010/03/18 05:03:41	14.60073	144.77525	356.4	556.8	558.6	Sample: geo Sample of crust for Cornel/Deardorff from Mkr-120.
939	J2-487	2010/03/18 05:04:12	14.60073	144.77525	356.3	556.8	558.6	Sample: geo Want a few more pieces for Verena/John. J487-sulfur-09.
941	J2-487	2010/03/18 05:06:02	14.60074	144.77524	356.3	556.8	558.6	Sample is in STBD biobox J487-sulfur-09 at Mkr120 Sulfur Crust. Another piece (#3)
942	J2-487	2010/03/18 05:06:33	14.60074	144.77524	356.7	556.8	558.6	Last piece of sulfur from this sample site. 4 pieces altogether J487-sulfur-09.
944	J2-487	2010/03/18 05:08:29	14.60066	144.77529	54.2	553.5	563.9	Heading back to Brimstone to swap out Tephra samplers.
946	J2-487	2010/03/18 05:09:22	14.60063	144.77530	54.1	561.2	564.6	Want to head to Mkr-161 at Brimstone for sampler recovery.
947	J2-487	2010/03/18 05:09:55	14.60064	144.77532	51.1	560.0	564.5	Moving.
948	J2-487	2010/03/18 05:10:06	14.60066	144.77533	52.1	559.0	561.8	We are running out of time-only 20 minutes left.
950	J2-487	2010/03/18 05:11:29	14.60075	144.77550	55.7	550.9	555.5	Nav: Doppler Reset
951	J2-487	2010/03/18 05:11:56	14.60078	144.77554	50.6	551.9	554.0	Moving quickly to Mkr-161.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
953	J2-487	2010/03/18 05:14:23	14.60089	144.77556	301.9	528.6	537.3	Approaching target (5m)
955	J2-487	2010/03/18 05:15:37	14.60086	144.77553	28.2	541.4	549.4	Seeing tephra raining down from plume .
956	J2-487	2010/03/18 05:15:53	14.60089	144.77555	59.5	542.4	547.5	Lots of plume making visibility negligible.
957	J2-487	2010/03/18 05:16:50	14.60088	144.77554	29.2	546.0	549.0	Looking for sampler.
958	J2-487	2010/03/18 05:17:01	14.60089	144.77553	29.8	546.2	549.0	Marker is 5m NW of bucket.
960	J2-487	2010/03/18 05:17:56	14.60087	144.77552	39.1	547.3	549.7	Found Mkr-161 and bucket.
961	J2-487	2010/03/18 05:18:26	14.60087	144.77551	39.5	548.5	549.6	Nothing in bucket that is resting in large tephra field.
963	J2-487	2010/03/18 05:20:21	14.60088	144.77552	40.1	548.4	549.6	Deploy: tephra buckets Tephra-H to be deployed at Mkr-161 at Brimstone.
964	J2-487	2010/03/18 05:20:53	14.60088	144.77553	40.2	548.4	549.6	TEPHRA SAMPLER H deployed at Mkr-161 Brimstone.
965	J2-487	2010/03/18 05:21:11	14.60088	144.77553	39.7	548.4	549.6	TEPHRA SAMPLER D recovered at Mkr-161 Brimstone.
967	J2-487	2010/03/18 05:21:50	14.60088	144.77553	40.3	548.4	549.6	Going to try to get a small scoop sample at same location.
968	J2-487	2010/03/18 05:21:57	14.60088	144.77553	40.1	548.4	549.6	Stowing biobox and swing arm.
969	J2-487	2010/03/18 05:22:43	14.60088	144.77552	40.7	548.6	549.8	Sample: geo J487-tephra-10 recovered Tephra Sampler at Mkr-161 Brimstone.
970	J2-487	2010/03/18 05:23:01	14.60088	144.77552	40.4	548.6	549.8	Jason getting scoop from basket.
972	J2-487	2010/03/18 05:24:11	14.60088	144.77552	40.2	548.6	549.8	Sample: geo J487-tephra-11 scoop of tephra at Mkr-161 Brimstone.
974	J2-487	2010/03/18 05:26:02	14.60088	144.77550	254.8	543.2	548.6	Scoop of tephra at site of tephra sampler swap.
975	J2-487	2010/03/18 05:26:11	14.60087	144.77548	253.9	542.0	549.3	We are done with J487.
976	J2-487	2010/03/18 05:26:31	14.60081	144.77538	253.2	543.3	550.5	Jason: Jason off bottom We are ascending.

Table 6.5-2 JASON Dive J2-488

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
991	J2-488	3/19/2010 18:15	14.55007	144.73416	264.2	46.4	195.5	Jason in the water ~1805. Medea in the water ~1813
992	J2-488	3/19/2010 18:16	14.55009	144.73431	267.3	59.5	213.6	Main goals: Work at Brimstone and vicinity - assuming ship/Medea can't move.
993	J2-488	3/19/2010 18:16	14.55011	144.73439	266.6	72.1	219.2	Tools: Single-chamber suction sampler. Beast with 2 gas-tights.
994	J2-488	3/19/2010 18:17	14.55013	144.73450	269.1	86.8	226.3	Basket: 3 scoop bags and 3 markers. 2 gastights. 1 MTR. 1 tephra sampler (D). 1 shrimp trap.
995	J2-488	3/19/2010 18:18	14.55017	144.73463	265.9	105.5	233.5	Tasks: Video of Brimstone. Scoop and lava samples near Brimstone. Swap out tephra sampler at Mkr-161 (5m NW of Brimstone).
996	J2-488	3/19/2010 18:18	14.55019	144.73474	264.9	110.1	237.9	Tasks cont: Fluid sample at crack in wall between Brimstone and summit.
997	J2-488	3/19/2010 18:19	14.55020	144.73478	256.3	117.7	248.1	Tasks cont: Explore up vertical wall between Brimstone and summit.
998	J2-488	3/19/2010 18:19	14.55022	144.73483	260.3	124.4	259.1	Tasks cont: Scoop of tephra at summit (Mkr-163)

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
999	J2-488	3/19/2010 18:19	14.55022	144.73485	256.1	127.8	256.4	Tasks cont: Exchange shrimp trap at summit.
1000	J2-488	3/19/2010 18:19	14.55024	144.73488	257.8	135.3	266.5	Tasks cont: Move to Sulfur Crust and collect sulfur rocks.
1001	J2-488	3/19/2010 18:23	14.55037	144.73542	265.6	226.4	416.6	Tasks cont: Recover shrimp trap. Deploy both shrimp exclusion traps.
1002	J2-488	3/19/2010 18:24	14.55043	144.73555	270.0	248.9	446.6	Tasks cont: fluid sampling and 2 gas-tights (hydraulic) and 2 gas-tights with funnels (basket). at Sulfur Crust; Phantom; and Brimstone.
1003	J2-488	3/19/2010 18:24	14.55044	144.73559	266.4	256.0	404.1	Tasks cont: Scoop of tephra near Phantom and deploy tephra sampler.
1004	J2-488	3/19/2010 18:24	14.55046	144.73563	275.2	264.6	444.3	Tasks cont: Opportunistic single-chamber suction of shrimp.
1005	J2-488	3/19/2010 18:25	14.55048	144.73566	267.1	275.3	474.1	Tasks cont: Shrimp video observation. Deploy 1 MTR.
1006	J2-488	3/19/2010 18:25	14.55049	144.73569	276.0	283.6	394.0	Tasks cont: Video of Brimstone and Phantom vent.
1007	J2-488	3/19/2010 18:25	14.55051	144.73572	275.6	291.9	384.9	Tasks cont: HDCAM tape deck is working now!
1009	J2-488	3/19/2010 18:37	14.55124	144.73661	66.8	490.5	506.7	descending through plume
1010	J2-488	3/19/2010 18:39	14.55140	144.73675	347.5	494.5	547.0	Continuing down into the plume.
1011	J2-488	3/19/2010 18:40	14.55139	144.73677	20.7	523.1	552.1	Starting to see some outcrops forward looking.
1012	J2-488	3/19/2010 18:41	14.60088	144.77552	26.8	543.8	551.0	We see the bottom in the brow cam.
1013	J2-488	3/19/2010 18:41	14.60086	144.77550	23.6	547.3	550.5	There's the marker. Mkr-161 near Brimstone.
1015	J2-488	3/19/2010 18:43	14.60085	144.77550	23.1	546.8	552.2	VERSION 3.2
1017	J2-488	3/19/2010 18:44	14.60085	144.77550	23.3	546.6	552.2	Bill Chadwick is in the hot seat. Susan is logging. Julie is video. Verena is HDCam.
1019	J2-488	3/19/2010 18:46	14.60085	144.77553	54.7	546.8	550.8	NAV: Doppler Reset
1020	J2-488	3/19/2010 18:47	14.60089	144.77560	25.4	546.4	550.3	Looking around and approaching the vent.
1022	J2-488	3/19/2010 18:49	14.60086	144.77557	314.7	547.6	551.2	Brimstone is pretty much inactive right now - even though we went through a large plume coming down here (Phantom?).
1023	J2-488	3/19/2010 18:49	14.60086	144.77556	319.9	548.2	550.9	Heading over to the marker.
1025	J2-488	3/19/2010 18:50	14.60087	144.77551	334.5	548.1	550.8	Here we want to exchange the tephra bucket with the one in the stbd swing arm. Also want to scoop sample.
1027	J2-488	3/19/2010 18:53	14.60090	144.77551	13.9	547.7	550.2	It doesn't look like there is anything in the bucket (H) so we will not retrieve it this time.
1029	J2-488	3/19/2010 18:54	14.60090	144.77551	14.0	547.0	550.2	We're going to go back to the vent and grab a rock or two.
1030	J2-488	3/19/2010 18:54	14.60090	144.77550	14.1	547.3	550.3	The bucket has been down there 2 days and there is not much in there.
1031	J2-488	3/19/2010 18:55	14.60086	144.77554	68.9	547.7	550.1	Looking at the vent right now and not much going on. A bit of plumage.
1033	J2-488	3/19/2010 18:56	14.60083	144.77557	44.4	549.1	551.8	Not much of a plume coming out of there. Seeing a few bubbles but not much activity today.
1035	J2-488	3/19/2010 18:58	14.60084	144.77557	342.6	549.5	552.1	Our heading is 345. Trying to look at the vent from the SE side.
1036	J2-488	3/19/2010 18:59	14.60085	144.77555	327.4	548.5	551.1	The area is a little smokey. Seeing the occasional shrimp. Actually quite a few shrimp.
1038	J2-488	3/19/2010 18:59	14.60085	144.77555	329.7	549.4	551.3	Looking for a rock to grab.
1040	J2-488	3/19/2010 19:03	14.60085	144.77555	351.4	549.9	551.3	The white rock is altered (cooked).
1041	J2-488	3/19/2010 19:03	14.60085	144.77555	351.5	549.9	551.3	Grabbing a different rock. Trying that is. It just disintegrated. Looking for a darker rock.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1044	J2-488	3/19/2010 19:06	14.60086	144.77554	354.5	549.8	551.0	SAMPLE: geo Got a nice little black rock. J488-rock-1. Brimstone. We're actually in the vent.
1046	J2-488	3/19/2010 19:08	14.60085	144.77555	354.6	549.8	551.0	SAMPLE: geo J488-rock-2. Nice shiny black rock. The rock is about 5 or 6 inches.
1047	J2-488	3/19/2010 19:09	14.60085	144.77555	354.5	549.8	551.0	SAMPLE: geo J488-rock-3. Smaller black shiny rock from the same site. We are basically in the vent. It is inactive.
1049	J2-488	3/19/2010 19:10	14.60085	144.77554	353.6	549.8	551.1	All three rocks went into the left milk crate. Various sizes. The vent is right here or right behind us.
1050	J2-488	3/19/2010 19:11	14.60085	144.77555	350.2	549.0	551.0	Our next task is to head up to the vertical wall (cliff) just north of Brimstone.
1052	J2-488	3/19/2010 19:12	14.60086	144.77554	339.7	549.3	550.6	The first 3 samples were from the northern rim of the vent. There was some shimmering water and a little bit of plume. Pretty much shut off for now.
1053	J2-488	3/19/2010 19:13	14.60094	144.77552	338.4	545.8	547.8	We're on the way to the wall.
1055	J2-488	3/19/2010 19:14	14.60102	144.77553	37.2	541.3	544.0	We're looking at the wall at the edge of a crest. To the west is a steep sedimented slope.
1056	J2-488	3/19/2010 19:15	14.60103	144.77553	43.5	539.9	544.0	We're looking directly at the cliff face - vertical wall N of Brimstone; S of the summit.
1058	J2-488	3/19/2010 19:16	14.60104	144.77553	42.9	540.3	544.0	Looking around for shimmering water. Some shrimp on the cliff face.
1059	J2-488	3/19/2010 19:16	14.60104	144.77552	42.8	540.7	543.9	Lots of altered rock. Don't see any shimmering here.
1060	J2-488	3/19/2010 19:17	14.60103	144.77556	43.0	540.2	543.8	There was visible shimmering coming out of the crack ahead of us on the last dive.
1061	J2-488	3/19/2010 19:17	14.60103	144.77555	42.1	539.0	543.5	Looking for some shimmering water.
1063	J2-488	3/19/2010 19:18	14.60103	144.77554	42.0	539.6	543.6	We will come down slowly and look for shimmering water.
1064	J2-488	3/19/2010 19:19	14.60103	144.77554	41.5	540.3	543.7	Lots of little shrimp here.
1065	J2-488	3/19/2010 19:19	14.60103	144.77555	42.1	541.6	544.0	BIOLOGY: Alvinocaris(shrimp) . See quite a few shrimp here.
1067	J2-488	3/19/2010 19:20	14.60103	144.77555	41.4	541.8	544.3	We are lateralling around a little to check out the situation.
1068	J2-488	3/19/2010 19:21	14.60101	144.77557	39.9	542.0	544.4	Exploring around a bit
1070	J2-488	3/19/2010 19:22	14.60099	144.77558	41.2	542.8	545.2	Dave is convinced that the spot we were looking at a few minutes was shimmering on the last dive.
1071	J2-488	3/19/2010 19:22	14.60097	144.77559	42.8	543.1	545.9	The shrimp were still there.
1072	J2-488	3/19/2010 19:22	14.60097	144.77559	43.0	543.2	546.0	We're lateralling around a corner to the NE.
1073	J2-488	3/19/2010 19:23	14.60096	144.77560	42.7	544.8	546.6	Zooming in a bit to look for shimmer.
1074	J2-488	3/19/2010 19:23	14.60096	144.77560	41.1	544.9	546.7	There is shimmering here.
1075	J2-488	3/19/2010 19:23	14.60096	144.77560	41.1	545.2	546.7	We see a crack with warm water coming out. No mat; no shrimp; just warm water.
1077	J2-488	3/19/2010 19:25	14.60097	144.77559	33.8	545.2	546.6	We see water coming out of the base here.
1078	J2-488	3/19/2010 19:25	14.60097	144.77559	33.9	545.2	546.6	There's 1 shrimp here.

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1080	J2-488	3/19/2010 19:25	14.60097	144.77559	33.8	545.2	546.6	There is shimmering coming out of the base and the hole near the "arrow head".
1081	J2-488	3/19/2010 19:26	14.60097	144.77559	26.1	546.0	546.7	Dave will do some fluid sampling here at the wall between Brimstone and the summit.
1083	J2-488	3/19/2010 19:28	14.60096	144.77559	29.1	544.9	547.1	We're calling this area "Arrow Head" because of the crack in the wall that looks like an arrow head near a hole with shimmering water.
1084	J2-488	3/19/2010 19:28	14.60095	144.77559	29.3	545.3	547.5	Preparing to sample.
1085	J2-488	3/19/2010 19:29	14.60095	144.77559	30.8	545.5	547.4	We are calling this area "Arrow Head".
1087	J2-488	3/19/2010 19:31	14.60095	144.77558	30.0	544.9	547.2	NAV: Location . Arrow Head: 144° 46.5353' 14° 36.0583'. Z= 545. At the vertical wall. Heading 30°.
1089	J2-488	3/19/2010 19:33	14.60097	144.77558	30.1	544.4	547.2	Messing around trying to take the hose off. There is a rubber band on the nozzle.
1091	J2-488	3/19/2010 19:34	14.60097	144.77558	30.0	543.9	547.1	We just lost the pilot cam for some reason.
1092	J2-488	3/19/2010 19:35	14.60096	144.77558	30.1	543.6	547.0	Pilot cam stopped working. Will have to go with the brow cam and high def.
1093	J2-488	3/19/2010 19:35	14.60096	144.77558	30.1	543.5	547.2	It could be the converter says Akel...
1094	J2-488	3/19/2010 19:35	14.60096	144.77558	29.9	543.5	547.2	Cycling power to that camera.
1096	J2-488	3/19/2010 19:37	14.60096	144.77558	29.6	543.7	547.1	The Jason gang is trying to diagnose the problem with the pilot cam. It's totally black right now.
1098	J2-488	3/19/2010 19:38	14.60097	144.77558	29.9	544.6	547.1	Lots of white altered rock here. Not many shrimp.
1099	J2-488	3/19/2010 19:38	14.60098	144.77558	30.2	544.9	546.8	The pilot is now going to fly by the HD cam so our ability to zoom etc has diminished.
1101	J2-488	3/19/2010 19:41	14.60096	144.77558	61.3	545.1	546.1	There is a white arrow head-looking thing on the wall. It's really quite distinct.
1103	J2-488	3/19/2010 19:42	14.60097	144.77559	9.5	544.5	547.1	Zooming in on the hole to the right of the arrowhead.
1105	J2-488	3/19/2010 19:44	14.60096	144.77558	34.4	545.7	546.5	The HD camera is now the main cam for the pilot and everyone else. Zooming in.
1106	J2-488	3/19/2010 19:44	14.60097	144.77558	34.7	545.7	546.5	Grabbing the HFS wand.
1107	J2-488	3/19/2010 19:45	14.60097	144.77559	34.9	545.6	546.4	Can see shimmering water.
1109	J2-488	3/19/2010 19:46	14.60097	144.77558	34.5	545.7	546.5	Attempting to put the tip into the crack.
1110	J2-488	3/19/2010 19:46	14.60097	144.77558	34.9	545.7	546.4	Taking the temp now with the HFS.
1111	J2-488	3/19/2010 19:47	14.60097	144.77558	35.4	545.7	546.5	Temp is 34° now.
1112	J2-488	3/19/2010 19:47	14.60096	144.77558	35.3	545.7	546.4	Letting it warm a bit. Now up to 41C.
1113	J2-488	3/19/2010 19:47	14.60096	144.77558	35.9	545.7	546.4	Want to rest the tip on the rock.
1115	J2-488	3/19/2010 19:49	14.60096	144.77558	36.1	545.8	546.5	After attempting to find the problem with the pilot cam it seems that the Jason guys have probably given that up.
1117	J2-488	3/19/2010 19:50	14.60096	144.77558	35.9	545.8	546.5	Temp here is 45°. We're at the top of this main crack just to the NE of the arrowhead tip.

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1118	J2-488	3/19/2010 19:51	14.60096	144.77559	36.1	545.8	546.5	Checking the pH but it is not calibrated. All we will get is voltage. Low pH is Dave's guess. 0.6 volts.
1120	J2-488	3/19/2010 19:52	14.60096	144.77558	36.3	545.8	546.5	SAMPLE: fluid J488-HFS-4. Filtered bag #24. Here in this crack at Arrowhead. Starting at 195235.
1122	J2-488	3/19/2010 19:55	14.60097	144.77558	36.7	545.8	546.5	J488-HFS-4 cont. Sampling in the crack. Around 47°C here. Stop 1955. Tmax=48.2. Tavg=48.3. T2=22. Vol=327ml.
1125	J2-488	3/19/2010 19:58	14.60098	144.77559	36.3	545.8	546.5	SAMPLE: fluid J488-HFS-5. Unfiltered bag #19. Start 195623. Looks like a little bit of vague mat on the rock right near the tip.
1126	J2-488	3/19/2010 19:59	14.60097	144.77558	36.6	545.8	546.5	J488-HFS-5 stop 11959. Tmax=46.5. Tavg=45.2. T2=21. Vol=419ml.
1128	J2-488	3/19/2010 20:01	14.60096	144.77559	36.1	545.8	546.5	SAMPLE: fluid J488-HFS-6. Unfiltered piston #8. Start 200054. Same spot in the crack just to the right of the arrowhead. Arrowhead vent. Z=546.
1130	J2-488	3/19/2010 20:02	14.60097	144.77558	36.5	545.8	546.5	J488-HFS-6. Not getting good flow out of the exhaust. Don't think that one worked.
1132	J2-488	3/19/2010 20:04	14.60097	144.77558	36.5	545.8	546.5	NAV: Doppler Reset . Moved the nav about 5m.
1133	J2-488	3/19/2010 20:05	14.60097	144.77558	36.9	545.8	546.5	SAMPLE: fluid J488-HFS-7. Starting unfiltered piston 6 at 200430.
1134	J2-488	3/19/2010 20:05	14.60097	144.77558	36.9	545.8	546.5	TXT:
1135	J2-488	3/19/2010 20:05	14.60097	144.77558	36.9	545.8	546.5	TXT:
1137	J2-488	3/19/2010 20:06	14.60098	144.77558	37.8	545.8	546.6	J488-HFS-7. Repositioning nozzle a bit. Still in same spot in the crack as for samples 4 - 6. Temp coming back up.
1138	J2-488	3/19/2010 20:07	14.60098	144.77558	37.8	545.8	546.5	J488-HFS-7. Lowering the tip just a bit. Back in the notch and back in action.
1140	J2-488	3/19/2010 20:08	14.60098	144.77558	37.8	545.8	546.6	J488-HFS-7. Arrowhead vent. In the crack just to the right and slightly above the "arrowhead". Heading is 38°.
1142	J2-488	3/19/2010 20:10	14.60098	144.77558	37.6	545.8	546.6	J488-HFS-7. Re-starting unfiltered piston 6. 200900. Arrowhead. Z=546. Hdg 37°.
1143	J2-488	3/19/2010 20:11	14.60099	144.77558	37.8	545.8	546.6	J488-HFS-7. Dave doesn't see much exhaust. He says it looks like the pistons are not working very well.
1144	J2-488	3/19/2010 20:11	14.60098	144.77558	37.4	545.9	546.6	J488-HFS-7 cont. Stop at 201130.
1146	J2-488	3/19/2010 20:12	14.60097	144.77558	37.1	545.9	546.6	J488-HFS-7 cont. Probably didn't work well. Tmax=44.6. Tavg=41.5. Pumped 570ml. Not sure what actually have in there.
1147	J2-488	3/19/2010 20:13	14.60096	144.77558	38.5	545.9	546.6	Re-positioning the nozzle a bit for another sample.
1149	J2-488	3/19/2010 20:15	14.60097	144.77558	38.1	545.9	546.6	SAMPLE: fluid J488-HFS-8. Starting 201512. Sterivex filter #10.
1151	J2-488	3/19/2010 20:17	14.60096	144.77557	38.1	545.9	546.6	Dave lost his power. Somehow the laptop became unplugged. Will have to restart the sample (J488-HFS-8 Sterivex filter #10).
1154	J2-488	3/19/2010 20:21	14.60097	144.77558	38.0	545.9	546.6	Dave's computer is still booting up. He had to re-start it twice.
1156	J2-488	3/19/2010 20:23	14.60096	144.77558	36.2	545.9	546.7	We're all booted up again.
1158	J2-488	3/19/2010 20:23	14.60096	144.77558	36.4	545.9	546.7	Just looking around.
1159	J2-488	3/19/2010 20:24	14.60097	144.77558	36.5	546.0	546.7	Dave's laptop is slow..... It's taking a long time to boot up the program.

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1161	J2-488	3/19/2010 20:26	14.60097	144.77558	36.7	545.9	546.7	This is looking promising now. The nozzle is in the hole and Dave's program is booted. up.
1163	J2-488	3/19/2010 20:27	14.60097	144.77558	36.6	545.9	546.7	Will re-try sample J488-HFS-8. Sterivex filter #10. In the same spot at Arrowhead crack. Z=546.
1165	J2-488	3/19/2010 20:30	14.60097	144.77558	37.2	545.9	546.7	Are trying the same small crack just about 6 inches lower. It may hold the probe better.
1166	J2-488	3/19/2010 20:30	14.60097	144.77558	37.3	545.9	546.7	Looks like some sort of white filmy stuff that is floating around after poking the nozzle in the big part of the hole.
1167	J2-488	3/19/2010 20:31	14.60097	144.77558	37.2	545.9	546.7	There are a few shrimp on the ledge just above.
1169	J2-488	3/19/2010 20:32	14.60097	144.77559	37.2	545.9	546.7	Attempting to put the nozzle right back where it was for samples 4-7. The larger hole below was not warm. This smaller part of the crack has lots of shimmer.
1170	J2-488	3/19/2010 20:33	14.60096	144.77560	37.4	545.9	546.7	Waiting for the temp to rise.
1172	J2-488	3/19/2010 20:34	14.60095	144.77560	37.5	545.9	660.7	Temp is rising.
1173	J2-488	3/19/2010 20:35	14.60094	144.77559	37.5	545.9	546.7	SAMPLE: fluid J488-HFS-8. Sterivex filter #10. In the same spot at Arrowhead crack. Z=546 Start 203500. Temp is rising. Now up to 37°C. Heading is also 37°.
1175	J2-488	3/19/2010 20:37	14.60093	144.77560	36.8	546.0	546.7	J488-HFS-8 cont. This will be a 20 min sample.
1176	J2-488	3/19/2010 20:37	14.60093	144.77560	36.6	546.0	546.8	The current is changing and the plume is starting to waft in on us.
1177	J2-488	3/19/2010 20:38	14.60094	144.77560	36.2	546.0	676.0	Brimstone is right behind us. We're north of Brimstone 7 or 8 meters.
1178	J2-488	3/19/2010 20:40	14.60093	144.77560	36.0	546.0	682.3	Quite a bit of shimmer going on here. Lots of plumage in the butt cam. We could see the marker and the tephra bucket much better before.
1179	J2-488	3/19/2010 20:42	14.60094	144.77558	36.0	546.0	679.8	Arrowhead location relative to Brimstone.... we went a little bit to the east on the vertical wall - maybe 5 meters. Mkr-161 visible in butt cam.
1180	J2-488	3/19/2010 20:42	14.60094	144.77558	36.2	546.0	672.4	J488-HFS-8 cont. This is a sterivex sample so is taking some time.
1181	J2-488	3/19/2010 20:46	14.60093	144.77560	36.1	546.0	683.7	J488-HFS-8 cont. Temp has been 35°C with this attempt.
1182	J2-488	3/19/2010 20:49	14.60092	144.77559	36.5	546.0	546.7	This is one of those looooooonnnngggg samples.
1185	J2-488	3/19/2010 20:53	14.60094	144.77559	37.0	546.0	546.8	The next sample will be a RNA filter is a flat membrane filter 0.2 micron. Sterivex filters are 0.2 microns also but they are easier to flow through.
1187	J2-488	3/19/2010 20:55	14.60093	144.77560	36.2	545.3	546.5	J488-HFS-8 cont. Stop 205440. Tmax=40.1 Tavg=35.3. Vol=2544ml. T2=19.
1189	J2-488	3/19/2010 20:56	14.60093	144.77560	36.4	545.3	546.5	Repositioning and then we have one more filter. We will also take a gastight.
1191	J2-488	3/19/2010 20:59	14.60096	144.77559	36.8	545.4	546.5	SAMPLE: fluid J488-HFS-9. Same exact spot in the crack at Arrowhead. Temp is rising - about 43°C. RNA flat filter #13. Start 205910.
1193	J2-488	3/19/2010 21:01	14.60095	144.77558	36.8	545.4	546.5	We're still here in the same spot sampling with the HFS. Another large sample for RNA analysis. This filter has red food coloring. So Julie can see is the RNA has soaked through the filter.

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1195	J2-488	3/19/2010 21:03	14.60096	144.77559	36.7	545.4	546.5	J488-HFS-9 cont. Dave says it's chugging right along 160 ml/min. Temp is about 45.
1198	J2-488	3/19/2010 21:07	14.60095	144.77559	36.7	545.4	546.5	J488-HFS-9 cont. Still sampling....
1200	J2-488	3/19/2010 21:08	14.60095	144.77559	36.7	545.4	546.5	Next we will take a look at Brimstone to see if anything has changed. Then we will head up to the summit.
1201	J2-488	3/19/2010 21:09	14.60094	144.77560	36.6	545.4	546.5	SAMPLE: gas . J488-GTHFS-10. Stbd gastight on the beast. Temp was 43. At Arrowhead in the same crack. Z=545.
1204	J2-488	3/19/2010 21:11	14.60095	144.77559	36.5	545.4	546.5	J488-HFS-9 cont. Still doing the RNA filter.
1206	J2-488	3/19/2010 21:14	14.60096	144.77559	36.4	545.4	546.5	It seems like the shimmer has increased now. The system certainly changes.
1207	J2-488	3/19/2010 21:14	14.60096	144.77559	36.4	545.4	546.5	Dave may want to sample Brimstone next.
1211	J2-488	3/19/2010 21:20	14.60096	144.77559	39.4	544.8	547.1	J488-HFS-9 stop 211608. Tmax=46.4. Tavg=42.4. Vol=2506ml. T2=20. Voltage=0.7.
1212	J2-488	3/19/2010 21:20	14.60093	144.77558	345.8	546.9	548.1	We're moving back toward Brimstone.
1213	J2-488	3/19/2010 21:21	14.60092	144.77557	254.5	547.0	548.0	Brimstone was really quiet when we arrived.
1214	J2-488	3/19/2010 21:21	14.60091	144.77557	254.6	546.6	547.7	HD_CAM: start
1216	J2-488	3/19/2010 21:21	14.60091	144.77557	254.8	547.0	547.7	Dropping the sampler out of the way for the HD cam.
1218	J2-488	3/19/2010 21:24	14.60090	144.77561	8.3	547.2	549.7	We're right at Brimstone now. It's pretty benign.
1219	J2-488	3/19/2010 21:25	14.60091	144.77560	308.2	546.9	548.8	There is no evidence of shimmer right now.
1220	J2-488	3/19/2010 21:25	14.60092	144.77560	263.2	547.3	548.6	HD_CAM: stop . Clip 1. The approach to Brimstone from the wall.
1222	J2-488	3/19/2010 21:26	14.60092	144.77561	263.6	547.2	548.6	Brimstone is shimmering. Dave is going to sample.
1224	J2-488	3/19/2010 21:28	14.60092	144.77561	263.2	547.2	548.6	Still looking for a good place to sample water.
1225	J2-488	3/19/2010 21:29	14.60092	144.77561	252.7	546.9	547.9	Sitting practically on top of Brimstone to reach shimmering water for sampling.
1227	J2-488	3/19/2010 21:30	14.60092	144.77561	252.9	546.9	548.5	Looks like sulfur on top of the rock.
1228	J2-488	3/19/2010 21:30	14.60092	144.77560	237.5	547.1	548.5	Hard to distinguish any source of water flow.
1229	J2-488	3/19/2010 21:31	14.60091	144.77560	238.0	547.5	548.6	We are looking at the vent from the west and last year usually viewed from the south.
1230	J2-488	3/19/2010 21:31	14.60091	144.77560	238.0	547.5	548.6	Moving wand into position.
1232	J2-488	3/19/2010 21:32	14.60091	144.77560	238.4	547.5	548.6	Placing wand in shimmer near sulfur with background t=7.
1233	J2-488	3/19/2010 21:33	14.60091	144.77561	238.5	547.5	548.6	Poking around at base of large rock for water.
1235	J2-488	3/19/2010 21:35	14.60092	144.77561	238.7	547.5	548.6	Getting a T=12 at base of rock.
1236	J2-488	3/19/2010 21:35	14.60092	144.77561	238.7	547.5	548.6	Water here is not very warm only 13deg.
1238	J2-488	3/19/2010 21:36	14.60091	144.77561	239.5	547.1	548.6	Can barely see Tephra bucket in background.
1239	J2-488	3/19/2010 21:36	14.60090	144.77561	243.3	547.1	548.7	Changing our heading a bit to find some water.
1240	J2-488	3/19/2010 21:37	14.60088	144.77561	5.3	546.1	549.7	Scanning around the vent top-good overview
1241	J2-488	3/19/2010 21:37	14.60089	144.77559	3.2	547.0	549.6	Looking due north.
1243	J2-488	3/19/2010 21:38	14.60089	144.77558	1.6	546.4	549.6	No obvious water source. Plugged up?
1244	J2-488	3/19/2010 21:38	14.60087	144.77557	261.5	547.5	549.4	Bucket is about 5m NW.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1245	J2-488	3/19/2010 21:38	14.60088	144.77556	264.0	548.1	549.4	Bright sulfur patch-going to look for water there.
1246	J2-488	3/19/2010 21:39	14.60086	144.77556	189.5	548.1	548.9	Shrimp swimmer.
1248	J2-488	3/19/2010 21:40	14.60086	144.77556	19.5	549.4	550.8	Did not see shimmer.
1249	J2-488	3/19/2010 21:40	14.60087	144.77555	8.8	548.8	550.7	Little pit in the sand-tephra.
1250	J2-488	3/19/2010 21:41	14.60087	144.77555	14.8	548.6	550.6	Dive weight on top.
1252	J2-488	3/19/2010 21:42	14.60087	144.77559	29.6	547.8	549.5	There is the sulfur topped rock again-best bet for sampling.
1253	J2-488	3/19/2010 21:43	14.60088	144.77560	353.6	547.3	549.6	Looking around the few large boulders on top of the tephra.
1255	J2-488	3/19/2010 21:44	14.60090	144.77560	348.2	547.0	549.3	Some small bit of shimmer in the center of the pit.
1256	J2-488	3/19/2010 21:45	14.60090	144.77561	307.4	547.4	548.6	Settling down at Brimstone with heading 307
1258	J2-488	3/19/2010 21:46	14.60090	144.77561	307.3	547.4	548.6	Brimstone is completely inactive. No plume but there is shimmering water.
1259	J2-488	3/19/2010 21:46	14.60090	144.77561	307.2	547.4	548.6	Going to take a fluid sample.
1261	J2-488	3/19/2010 21:49	14.60089	144.77561	306.7	547.4	548.6	SAMPLE: fluid J488-HFS-11. Filtered bag #23. Start 214804. Brimstone. Right in the area that is the vent. Some shimmer but no smoke today. Sitting right in the volcanic vent.
1263	J2-488	3/19/2010 21:50	14.60089	144.77561	306.6	547.4	548.6	Brimstone is not de-gassing today. When a new blob of lava comes up it de-gases. Within 15 minutes that piece of lava will stop de-gassing.
1264	J2-488	3/19/2010 21:51	14.60089	144.77561	306.5	547.4	548.6	We've seen a big change in a short amount of time. It hasn't done much since our last visit because the tephra bucket is empty and the anchor is not covered. Brimstone.
1266	J2-488	3/19/2010 21:52	14.60089	144.77560	306.4	547.4	548.6	Since we arrived at the dive site the whole area has cleared up.
1267	J2-488	3/19/2010 21:52	14.60089	144.77560	306.4	547.4	548.6	J488-HFS-11 cont. Getting 20 - 25 here. The wand is just above the sediment.
1268	J2-488	3/19/2010 21:53	14.60090	144.77560	306.3	547.4	548.6	J488-HFS-11 stop. Bag 23. Tmax=26.8. Tavg=23.2. Vol=510ml. T2=15.
1270	J2-488	3/19/2010 21:54	14.60090	144.77560	306.2	547.4	548.6	SAMPLE: fluid J488-HFS-12. Unfiltered bag #18. Start 215415.
1272	J2-488	3/19/2010 21:57	14.60090	144.77560	306.1	547.4	548.6	J488-HFS-12 cont. Brimstone vent. Right in the vent. Tmax=23.5 Tavg=22.7. Vol=438ml. T2=15.
1274	J2-488	3/19/2010 21:58	14.60090	144.77561	306.0	547.4	548.6	Dara is having a few problems with the nav. So no new position for the vent today.
1275	J2-488	3/19/2010 21:59	14.60090	144.77560	306.0	547.4	548.6	J488-HFS-12 pH - not much of a pH anomaly. We're looking at heated seawater if the pH reading is correct. Consistent with no sulfur or CO2 coming out of the vent.
1276	J2-488	3/19/2010 21:59	14.60090	144.77560	306.0	547.4	548.6	pH voltage was 1.86.
1278	J2-488	3/19/2010 22:00	14.60090	144.77560	306.0	547.4	548.6	Finished with HFS sampling here at Brimstone. Stowing the wand.
1279	J2-488	3/19/2010 22:00	14.60090	144.77561	306.0	547.4	548.6	Lots of smoke came out when removed the wand from the sediments.
1281	J2-488	3/19/2010 22:02	14.60090	144.77561	306.0	547.4	548.6	The shimmering seems to be increasing quite a bit.
1282	J2-488	3/19/2010 22:02	14.60090	144.77561	306.0	547.5	548.7	Still stowing it.
1283	J2-488	3/19/2010 22:03	14.60091	144.77561	306.0	547.4	548.6	Looks like the wand snapped into the holder.

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1285	J2-488	3/19/2010 22:03	14.60091	144.77561	306.0	547.4	548.6	Bill Chadwick is taking over the drivers seat. Dave is taking a break from fluid sampling.
1286	J2-488	3/19/2010 22:05	14.60089	144.77562	307.2	547.4	548.6	We're going to head up to the summit. Would like to do HD footage. Backing up from the vent go over it past the marker. Then go right to the wall. Up the wall to the summit.
1288	J2-488	3/19/2010 22:06	14.60089	144.77563	304.0	546.5	549.5	HD_CAM: start . Recording at 220555. Backing out from Brimstone.
1289	J2-488	3/19/2010 22:07	14.60089	144.77563	304.0	547.7	550.8	See a few shrimp in the HD. Actually quite a lot of shrimp right over Brimstone.
1290	J2-488	3/19/2010 22:07	14.60089	144.77563	304.5	547.6	550.6	HD (science cam) and DSC are zoomed out.
1292	J2-488	3/19/2010 22:08	14.60089	144.77563	304.8	547.4	550.8	Fiddling with DSC. Now the pilot cam screen has been replaced with the DSC cam.
1294	J2-488	3/19/2010 22:10	14.60089	144.77563	301.3	547.5	551.2	The visibility is a bit smokey. Not too great.
1295	J2-488	3/19/2010 22:10	14.60090	144.77563	301.8	547.5	551.3	BIOLOGY: Alvinocaris(shrimp) swimming by. Not many but a few.
1296	J2-488	3/19/2010 22:11	14.60091	144.77563	304.1	547.6	550.9	We just dropped a weight here.
1298	J2-488	3/19/2010 22:13	14.60091	144.77561	304.8	546.6	549.3	We're ready to go now. Bill thinks that the smoke is something we stirred up while sampling....Actually it is increasing when you look in the Medea cam.
1299	J2-488	3/19/2010 22:13	14.60092	144.77559	304.6	546.1	548.1	Visibility went to heck here. It must be coming from Phantom (or maybe another vent??)
1301	J2-488	3/19/2010 22:14	14.60093	144.77559	28.6	546.0	548.1	We can't see the marker or the bucket. Visibility is poor.
1302	J2-488	3/19/2010 22:14	14.60094	144.77560	23.1	545.8	548.0	HD_CAM: stop . The visibility decreased.
1303	J2-488	3/19/2010 22:15	14.60095	144.77561	20.8	545.6	547.9	We're at the wall now. We are climbing up the wall to the summit.
1304	J2-488	3/19/2010 22:15	14.60095	144.77561	20.9	545.5	547.9	Moving up the wall slowly.
1305	J2-488	3/19/2010 22:15	14.60095	144.77560	20.9	544.8	547.8	Occasional shrimp swimming by.
1306	J2-488	3/19/2010 22:15	14.60097	144.77560	20.6	544.3	547.2	There are some polychaetes swimming around every once in a while.
1308	J2-488	3/19/2010 22:16	14.60097	144.77560	20.6	542.5	545.4	Passing Arrowhead sampling site.
1309	J2-488	3/19/2010 22:16	14.60098	144.77559	21.0	541.7	546.5	Heading up the wall.
1310	J2-488	3/19/2010 22:17	14.60099	144.77561	29.1	535.8	545.3	Getting out of the plume a bit now. About 10m up from Brimstone.
1311	J2-488	3/19/2010 22:17	14.60100	144.77561	7.3	534.7	545.7	HD_CAM: start . Moving up the wall.
1312	J2-488	3/19/2010 22:17	14.60101	144.77561	7.1	534.0	541.9	Visibility has improved.
1314	J2-488	3/19/2010 22:18	14.60101	144.77561	1.2	533.3	541.2	This wall appears to be vertical.
1315	J2-488	3/19/2010 22:18	14.60101	144.77561	358.0	530.8	540.4	Some iron staining on the wall. Mostly white-ish altered rock.
1316	J2-488	3/19/2010 22:19	14.60103	144.77560	353.9	528.9	537.5	Looking at a hoodoo.
1317	J2-488	3/19/2010 22:19	14.60103	144.77560	353.5	530.1	535.4	Hoodoo's are erosional remnants.
1319	J2-488	3/19/2010 22:20	14.60103	144.77560	353.7	530.2	535.3	Panning and zooming.
1320	J2-488	3/19/2010 22:20	14.60103	144.77559	353.5	530.2	535.1	There is a bit of shimmer on the wall.
1321	J2-488	3/19/2010 22:20	14.60103	144.77559	354.1	530.2	535.1	Zooming in and out with the HD cam.
1322	J2-488	3/19/2010 22:20	14.60103	144.77559	354.9	530.2	535.3	BIOLOGY: Alvinocaris(shrimp)
1323	J2-488	3/19/2010 22:20	14.60103	144.77559	352.6	530.1	535.9	Not much biology but the occasional shrimp.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1324	J2-488	3/19/2010 22:21	14.60103	144.77559	351.0	530.1	537.5	Continuing up this steep cliff face.
1326	J2-488	3/19/2010 22:22	14.60103	144.77559	352.1	529.6	536.2	We're about 15m off the bottom. Z=530. About 10m from the top.
1327	J2-488	3/19/2010 22:22	14.60104	144.77559	353.0	528.7	535.1	Beautiful geology. There are a few shrimp here.
1328	J2-488	3/19/2010 22:23	14.60104	144.77559	352.3	528.5	534.5	A little slide moving downhill.
1330	J2-488	3/19/2010 22:24	14.60106	144.77559	354.5	526.5	531.6	Getting closer to the summit. Still climbing.
1331	J2-488	3/19/2010 22:24	14.60107	144.77559	356.4	526.8	529.2	We see the top. Our heading is 355.
1332	J2-488	3/19/2010 22:25	14.60108	144.77559	354.3	526.3	529.4	The marker is not in sight yet.
1333	J2-488	3/19/2010 22:25	14.60108	144.77560	356.4	524.8	528.5	Still climbing. The summit is shallower right behind this hoodoo.
1335	J2-488	3/19/2010 22:26	14.60112	144.77562	356.7	524.8	526.9	We're just passing the false-summit that we saw. Travelling along the ridge to the real summit. Heading due north.
1336	J2-488	3/19/2010 22:26	14.60113	144.77563	357.3	524.1	527.3	Want to get a close look at the cliff face.
1337	J2-488	3/19/2010 22:27	14.60116	144.77564	356.4	524.0	527.5	There are patches of volcanoclastic sand in pockets.
1338	J2-488	3/19/2010 22:27	14.60116	144.77564	356.4	524.1	527.6	Lots of shrimp on this cliff face.
1340	J2-488	3/19/2010 22:28	14.60116	144.77564	356.5	524.1	527.6	See lots of shrimp here.
1341	J2-488	3/19/2010 22:29	14.60115	144.77564	356.5	524.0	526.5	Shrimp covering the cliff face. Looks like there may be both species here.
1342	J2-488	3/19/2010 22:29	14.60116	144.77563	356.4	523.8	527.4	BIOLOGY: other . Cliff quite covered with shrimp. Not sure which are which.
1344	J2-488	3/19/2010 22:30	14.60116	144.77563	356.3	523.7	527.6	Contemplating a suction sample here.
1346	J2-488	3/19/2010 22:32	14.60116	144.77563	356.5	523.5	527.5	Z=525. Hdg=356. Vertical wall about 5m below the summit. According to nav we are about 10m away from the Marker.
1347	J2-488	3/19/2010 22:33	14.60116	144.77565	356.8	523.5	527.4	SAMPLE: bio J488-shrimp-13. Suction of shrimp on vertical wall above Brimstone just below the summit about 5m. The whole cliff face here is covered with shrimp.
1350	J2-488	3/19/2010 22:36	14.60115	144.77563	354.9	523.5	527.4	J488-shrimp-13. Location: 144 46.5390 14 36.0696. Z=523.5. Hdg=356.
1352	J2-488	3/19/2010 22:37	14.60116	144.77563	356.5	523.5	527.4	J488-shrimp-13 cont. Tons of shrimp here and being sucked up the tube. They are certainly recruitment.
1353	J2-488	3/19/2010 22:39	14.60116	144.77563	356.7	523.5	527.6	They seem to be in two distinct places. This area is dominated by Alvinocaris we think. The sulfur wall was covered with Opaepele. Distinct separation dependent on habitat?
1355	J2-488	3/19/2010 22:41	14.60116	144.77563	356.4	523.5	528.1	J488-shrimp-13 cont. Still sampling. Tons of shrimp going up the suction hose. Stop at 2241. Cliff Face. Z=357. 5-10m below summit. About 10m SW of the marker.
1358	J2-488	3/19/2010 22:45	14.60116	144.77563	356.5	523.5	527.9	Excellent sample. Will continue up this cliff face after Verena zooms in a bit to look for limpet eggs. Don't see any dote (limpet eggs).
1360	J2-488	3/19/2010 22:46	14.60116	144.77563	356.2	522.5	527.6	Continuing up the cliff face now.
1361	J2-488	3/19/2010 22:47	14.60117	144.77563	356.2	521.5	527.0	Lots of shrimp on the top of this hoodoo. Shrimp high0rise apartment.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1363	J2-488	3/19/2010 22:48	14.60119	144.77564	356.4	521.2	527.0	BIOLOGY: Opapepe(shrimp) Shrimp covering the top of this edifice. They are taking off.
1364	J2-488	3/19/2010 22:49	14.60119	144.77563	356.5	521.1	527.0	BIOLOGY: other Looks like quite a collection of shrimp. Not sure of which species. They are all over.
1365	J2-488	3/19/2010 22:49	14.60119	144.77563	356.5	521.1	527.0	The shrimp are really red.
1367	J2-488	3/19/2010 22:50	14.60118	144.77563	356.5	521.1	527.0	See lots of little dots. The consensus is that it is sulfur sed.
1368	J2-488	3/19/2010 22:51	14.60118	144.77564	356.5	521.1	526.8	The lasers are in the bottom of the screen.
1369	J2-488	3/19/2010 22:51	14.60117	144.77564	356.5	521.1	527.0	The butt cam is showing a large plume.
1370	J2-488	3/19/2010 22:51	14.60117	144.77564	356.5	521.1	526.7	Still looking at this plethora of shrimp.
1372	J2-488	3/19/2010 22:52	14.60116	144.77564	356.6	521.1	527.0	Better get up to the marker while we can see it.
1373	J2-488	3/19/2010 22:53	14.60116	144.77564	355.9	520.6	527.0	The marker should be just the other side of the pinnacle.
1375	J2-488	3/19/2010 22:54	14.60118	144.77569	356.8	520.1	524.3	Very great Iron oxide on the cliff face here. Sampler and marker in the distance.
1376	J2-488	3/19/2010 22:54	14.60119	144.77570	357.0	520.0	525.3	Deciding what to do here. Still have HD cam on.
1378	J2-488	3/19/2010 22:55	14.60121	144.77568	356.4	520.2	524.5	BIOLOGY: other . Shrimp everywhere. In the trap. All around the trap. Under the rock. Everywhere.
1379	J2-488	3/19/2010 22:56	14.60121	144.77568	356.4	520.1	525.2	Tons of shrimp here.
1381	J2-488	3/19/2010 22:58	14.60120	144.77569	355.9	520.1	525.9	The plan is to retrieve this shrimp trap. The marker; bucket; and hydrophone are still here.
1383	J2-488	3/19/2010 23:00	14.60119	144.77572	356.0	520.1	521.9	Will recover the shrimp trap here at the summit.
1384	J2-488	3/19/2010 23:01	14.60120	144.77570	356.4	520.1	525.8	Do not want to deploy another trap here.
1385	J2-488	3/19/2010 23:01	14.60120	144.77570	356.5	520.0	525.9	Understanding the extent of recruitment across the seamount is what is important to Verena.
1387	J2-488	3/19/2010 23:03	14.60122	144.77569	356.5	519.7	524.8	Still continuing with the high def.
1389	J2-488	3/19/2010 23:04	14.60121	144.77569	356.5	519.8	524.8	We're right on the edge of the plume from the looks of the view in the butt cam.
1390	J2-488	3/19/2010 23:05	14.60120	144.77570	356.3	519.8	524.5	RECOVER: shrimp traps at the summit. It is jam-packed with shrimp.
1393	J2-488	3/19/2010 23:08	14.60120	144.77570	356.6	519.8	525.0	SAMPLE: bio . J488-shrimp-trap-14. Position today: 14 36.0722. 144 46.5420. Z=520m. Summit Mrk-161. The traps have been out for 2 days.
1394	J2-488	3/19/2010 23:09	14.60121	144.77570	357.0	519.8	524.5	The trap has been stowed.
1396	J2-488	3/19/2010 23:11	14.60121	144.77570	356.8	519.8	525.0	Going to take a volcanoclastic sediment scoop sample next in the same position.
1399	J2-488	3/19/2010 23:13	14.60120	144.77569	6.2	520.2	524.1	SAMPLE: geo J4788-sediment-15. Scoop of sediment very close to where the shrimp trap was sitting. Mkr-161 Summit.
1400	J2-488	3/19/2010 23:15	14.60121	144.77567	6.7	520.2	524.1	J4788-sediment-15 cont. Scoop of sediment - bag is not full. Exact same location as previous sample. Z=520.
1402	J2-488	3/19/2010 23:16	14.60120	144.77567	11.1	520.2	524.5	J488-sediment-15. Correction to sample name. It is J488-sediment-15.
1403	J2-488	3/19/2010 23:17	14.60120	144.77570	334.6	520.3	525.8	J4788-sediment-15 location. 14 36.0722 144 46.5420.
1406	J2-488	3/19/2010 23:19	14.60119	144.77572	335.2	520.5	526.3	Stowing an empty scoop bag and then will travel downslope.

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1407	J2-488	3/19/2010 23:21	14.60120	144.77571	335.9	520.5	526.4	We want to head back down to Brimstone next to see what is happening there.
1409	J2-488	3/19/2010 23:22	14.60118	144.77573	335.8	520.8	527.8	HD_CAM: stop .
1410	J2-488	3/19/2010 23:22	14.60115	144.77574	335.4	523.4	529.2	HD shut off at 2322. Were recording for an hour.
1411	J2-488	3/19/2010 23:23	14.60106	144.77567	42.3	526.3	533.8	Going to check out the action at Brimstone next.
1413	J2-488	3/19/2010 23:24	14.60086	144.77563	25.7	537.3	551.0	The plume looks quite large. Bill thinks it is from Brimstone.
1414	J2-488	3/19/2010 23:25	14.60086	144.77568	23.2	546.9	553.8	The plume does not seem to be coming from Brimstone.
1416	J2-488	3/19/2010 23:26	14.60088	144.77571	89.8	548.9	550.1	We're near Brimstone now. Not sure where the plume is coming from yet.
1417	J2-488	3/19/2010 23:27	14.60088	144.77572	91.4	548.9	549.9	Seeing lots of ash in the DSC. The current in the summit was coming from the west.
1419	J2-488	3/19/2010 23:29	14.60078	144.77570	10.3	546.6	552.7	We're going to the bottom to investigate the source of the plume.
1421	J2-488	3/19/2010 23:30	14.60064	144.77573	11.8	546.6	566.6	We see ash in the brow cam.
1422	J2-488	3/19/2010 23:31	14.60057	144.77574	14.4	556.0	575.3	We are now south of Brimstone about 40m and will now go down to the bottom. Still on the edge of the plume.
1424	J2-488	3/19/2010 23:32	14.60069	144.77576	13.2	562.1	570.9	Found the bottom. Clunk.
1426	J2-488	3/19/2010 23:34	14.60071	144.77575	285.2	556.4	564.0	We are swinging around the cone now in search of the plume source.
1427	J2-488	3/19/2010 23:34	14.60072	144.77575	291.8	556.0	563.5	This is mostly altered lava as opposed to tephra.
1429	J2-488	3/19/2010 23:36	14.60072	144.77574	293.0	555.7	563.9	We're going to get rid of a weight while we still have visibility.
1430	J2-488	3/19/2010 23:37	14.60072	144.77574	293.1	555.7	564.3	TXT:
1432	J2-488	3/19/2010 23:39	14.60072	144.77573	292.1	549.9	559.5	Doing some housekeeping here.
1434	J2-488	3/19/2010 23:40	14.60077	144.77563	341.1	555.4	561.9	
1435	J2-488	3/19/2010 23:40	14.60078	144.77564	348.2	555.2	562.4	We're looking at Brimstone.
1436	J2-488	3/19/2010 23:41	14.60079	144.77564	346.2	556.0	562.2	The visibility is quite poor.
1438	J2-488	3/19/2010 23:42	14.60083	144.77566	346.4	552.4	557.5	Will head up to Brimstone and check that one out first.
1439	J2-488	3/19/2010 23:42	14.60084	144.77566	343.6	552.0	557.2	Lots of ash raining down.
1440	J2-488	3/19/2010 23:43	14.60087	144.77564	340.0	551.1	554.5	Slowly driving north toward Brimstone about 10m away. Visibility is poor.
1441	J2-488	3/19/2010 23:43	14.60087	144.77564	340.5	550.4	553.3	Coming up slope.
1442	J2-488	3/19/2010 23:43	14.60089	144.77563	346.3	548.0	552.7	Brimstone should be NW of us.
1445	J2-488	3/19/2010 23:46	14.60090	144.77560	281.7	548.0	551.7	According to the nav we are right at Brimstone. The plume is not coming from here.
1446	J2-488	3/19/2010 23:47	14.60090	144.77559	269.9	546.2	551.1	We're at Brimstone and it is still not active. The plume that we are seeing is not coming from there. We are heading west toward Phantom.
1449	J2-488	3/19/2010 23:50	14.60089	144.77550	270.2	546.2	549.7	We are heading to Phantom now.
1450	J2-488	3/19/2010 23:51	14.60088	144.77543	274.6	547.9	551.3	We're seeing lava blocks with sulfur ahead.
1452	J2-488	3/19/2010 23:53	14.60088	144.77543	277.1	548.0	551.3	Lots of shrimp here and shimmering. Rock covered with sulfur here.
1453	J2-488	3/19/2010 23:53	14.60088	144.77543	277.0	548.0	551.3	HD_CAM: start . About 1 minute ago.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1455	J2-488	3/19/2010 23:54	14.60089	144.77543	277.0	548.0	551.3	Sulfur coating on lava. Came out of the water and rained down. Shrimp are grazing on something.
1456	J2-488	3/19/2010 23:55	14.60090	144.77543	277.3	548.0	551.3	HD_CAM: stop
1458	J2-488	3/19/2010 23:57	14.60089	144.77534	276.3	546.1	550.1	Moving along west again.
1460	J2-488	3/19/2010 23:58	14.60088	144.77526	284.2	551.3	555.0	Last year the distribution of tephra was 5-10m away from source.
1461	J2-488	3/19/2010 23:58	14.60088	144.77524	275.7	551.9	556.6	Coming right at Phantom which does have a plume.
1462	J2-488	3/19/2010 23:58	14.60091	144.77520	271.9	553.7	559.1	Great plume at Phantom.
1463	J2-488	3/19/2010 23:59	14.60091	144.77517	270.4	556.3	561.2	Approach is from the east.
1464	J2-488	3/19/2010 23:59	14.60091	144.77517	267.2	557.6	562.1	HD_CAM: start Plume.
1465	J2-488	3/19/2010 23:59	14.60093	144.77513	225.2	562.8	565.3	Very distinct plume with bubbles and tephra
1467	J2-488	3/20/2010 0:00	14.60093	144.77513	215.0	565.1	565.8	Coming closer and down.
1468	J2-488	3/20/2010 0:00	14.60093	144.77513	227.5	565.3	566.1	Seems it may have grown since last dive about 3m. Check.
1469	J2-488	3/20/2010 0:00	14.60093	144.77513	225.1	565.2	638.0	Back end of vehicle is up against a rock.
1470	J2-488	3/20/2010 0:00	14.60092	144.77512	228.5	564.9	565.8	Large wall behind vehicle.
1471	J2-488	3/20/2010 0:01	14.60092	144.77510	241.4	564.5	565.5	Panning around counter clockwise.
1472	J2-488	3/20/2010 0:01	14.60094	144.77509	210.1	563.2	565.6	Going to bring Medea up it is only 17m above bottom.
1474	J2-488	3/20/2010 0:02	14.60091	144.77509	89.8	564.9	567.5	Check heading for depth difference.
1475	J2-488	3/20/2010 0:02	14.60091	144.77509	85.5	565.2	567.4	Lots of yellow and bubbles here.
1476	J2-488	3/20/2010 0:02	14.60091	144.77509	85.3	565.0	566.3	Really pumping out yellow plume.
1477	J2-488	3/20/2010 0:03	14.60093	144.77509	85.7	564.9	567.2	Moving around a bit to look for best place to get fluid sample.
1479	J2-488	3/20/2010 0:04	14.60092	144.77510	75.9	565.5	567.6	Watching big explosion.
1480	J2-488	3/20/2010 0:04	14.60092	144.77510	75.8	565.5	567.6	Lots of tephra and bubbles.
1481	J2-488	3/20/2010 0:04	14.60093	144.77510	75.8	565.5	567.7	No rock movement at moment.
1482	J2-488	3/20/2010 0:05	14.60093	144.77510	75.8	565.5	567.8	Tilted up camera to get better view of plume.
1483	J2-488	3/20/2010 0:05	14.60093	144.77510	75.5	565.5	567.5	Shrimp flew by and turned lasers on.
1484	J2-488	3/20/2010 0:05	14.60093	144.77510	75.9	565.6	567.7	Lots of tephra.
1486	J2-488	3/20/2010 0:06	14.60093	144.77510	75.8	565.6	567.6	Plume is starting to lay over a bit to one side so can see base.
1487	J2-488	3/20/2010 0:06	14.60093	144.77510	75.1	565.6	567.7	Rock is moving now.
1488	J2-488	3/20/2010 0:07	14.60093	144.77510	75.0	565.6	567.7	Big explosion.
1489	J2-488	3/20/2010 0:07	14.60093	144.77510	75.0	565.6	567.7	Turn lasers off.
1490	J2-488	3/20/2010 0:07	14.60093	144.77510	74.9	565.6	567.7	Lots of yellow and sideways plume.
1491	J2-488	3/20/2010 0:07	14.60093	144.77510	74.9	565.6	567.7	Jason is resting on the bottom.
1492	J2-488	3/20/2010 0:07	14.60093	144.77510	74.9	565.5	567.6	Lost all view-plume covered ROV.
1494	J2-488	3/20/2010 0:08	14.60093	144.77510	74.6	565.6	567.6	Just observing plume and tephra.
1495	J2-488	3/20/2010 0:09	14.60092	144.77509	88.2	564.8	568.5	Going to try to fluid sample so backing away a bit for better positioning.
1497	J2-488	3/20/2010 0:10	14.60092	144.77510	89.0	564.9	568.4	Leaving HD on.
1498	J2-488	3/20/2010 0:11	14.60092	144.77510	89.1	564.9	568.3	Plume has fairly steady and strong plume.
1499	J2-488	3/20/2010 0:11	14.60092	144.77510	89.5	564.9	567.6	Plume is wafting toward vehicle now.

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1501	J2-488	3/20/2010 0:12	14.60092	144.77510	89.0	564.8	567.5	Main plume is still blowing away from Jason.
1502	J2-488	3/20/2010 0:12	14.60092	144.77509	89.1	564.9	568.0	Retrieving wand from basket.
1503	J2-488	3/20/2010 0:13	14.60093	144.77508	89.3	564.9	567.9	Flying shrimp.
1505	J2-488	3/20/2010 0:14	14.60093	144.77509	89.4	564.9	567.5	Wand out but moved suction hose.
1506	J2-488	3/20/2010 0:14	14.60093	144.77509	89.0	564.9	568.1	Putting hose back.
1507	J2-488	3/20/2010 0:15	14.60092	144.77509	89.8	564.9	567.9	Bubbles coming out of plume.
1508	J2-488	3/20/2010 0:15	14.60092	144.77510	89.3	564.9	567.9	HD_CAM: stop Off.
1510	J2-488	3/20/2010 0:16	14.60092	144.77510	89.1	564.9	567.8	Positioning wand for sampling.
1511	J2-488	3/20/2010 0:16	14.60091	144.77510	89.4	564.9	567.5	Lots of bubbles right now in HD view.
1513	J2-488	3/20/2010 0:18	14.60092	144.77510	96.7	565.2	567.2	Larger yellow smoke in plume with bubbles following.
1514	J2-488	3/20/2010 0:19	14.60093	144.77510	96.7	565.2	567.4	View a big obscured after that burst-no clear view into high flow.
1516	J2-488	3/20/2010 0:20	14.60093	144.77511	96.1	565.2	567.2	Smoke in and out obscuring the view.
1517	J2-488	3/20/2010 0:20	14.60093	144.77511	96.3	565.2	567.3	Good view and placing wand in plume.
1518	J2-488	3/20/2010 0:20	14.60093	144.77511	96.4	565.2	567.3	Pump is on HFS.
1519	J2-488	3/20/2010 0:20	14.60093	144.77511	96.3	565.1	567.4	Background just over 7deg.
1520	J2-488	3/20/2010 0:20	14.60093	144.77511	96.0	565.1	567.3	At the end of HFS hose.
1521	J2-488	3/20/2010 0:21	14.60092	144.77511	96.2	565.1	567.2	Not enough reach to get to high flow part of plume.
1522	J2-488	3/20/2010 0:21	14.60092	144.77511	95.7	565.1	567.2	No view.
1524	J2-488	3/20/2010 0:21	14.60092	144.77512	96.2	565.1	567.2	Waiting for water to clear again.
1525	J2-488	3/20/2010 0:22	14.60092	144.77512	96.9	565.1	567.3	Moving into position again with wand-bit more visibility.
1526	J2-488	3/20/2010 0:23	14.60092	144.77511	98.1	565.1	567.3	Temp is going up-25deg.
1527	J2-488	3/20/2010 0:23	14.60092	144.77511	97.1	565.1	567.3	Temp is rising.
1528	J2-488	3/20/2010 0:23	14.60092	144.77511	97.7	565.1	567.3	Activity seems to be increasing.
1530	J2-488	3/20/2010 0:24	14.60092	144.77511	96.9	565.1	567.3	Temp looks good for sampling.
1531	J2-488	3/20/2010 0:24	14.60092	144.77510	97.2	565.1	567.3	Want to move wand to a place that we can see wand better.
1532	J2-488	3/20/2010 0:25	14.60091	144.77510	96.7	565.1	567.3	Poking wand in another part of plume.
1534	J2-488	3/20/2010 0:26	14.60091	144.77509	96.3	565.1	567.4	Touched rock and backed off slightly to be clear.
1535	J2-488	3/20/2010 0:26	14.60091	144.77509	96.7	565.1	567.4	Only 27deg here.
1536	J2-488	3/20/2010 0:26	14.60091	144.77509	95.9	565.1	567.2	Going to try to reach the yellow-intense part of the plume.
1537	J2-488	3/20/2010 0:27	14.60091	144.77510	102.7	565.2	566.4	Lots of bubbles again. Wand away from plume.
1539	J2-488	3/20/2010 0:28	14.60091	144.77510	100.5	565.2	566.4	Pointing wand down into intense part of plume (more vertical).
1540	J2-488	3/20/2010 0:28	14.60091	144.77510	100.5	565.3	566.4	Temp is only 8deg here-move it again.
1541	J2-488	3/20/2010 0:28	14.60091	144.77510	100.5	565.3	566.4	Need to wait for smoke to clear again.
1542	J2-488	3/20/2010 0:28	14.60091	144.77511	100.3	565.3	566.4	Can see vigorous plume behind smoke screen.
1543	J2-488	3/20/2010 0:29	14.60092	144.77511	100.3	565.2	566.3	Temp is going up now with big burst.
1544	J2-488	3/20/2010 0:29	14.60092	144.77511	100.3	565.2	566.3	Shrimp flying around.
1545	J2-488	3/20/2010 0:29	14.60092	144.77511	99.7	565.2	566.4	SAMPLE: fluid Piston #1 filtered.
1547	J2-488	3/20/2010 0:30	14.60091	144.77511	99.3	565.3	566.4	Sampling during big burst with activity increasing.

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1548	J2-488	3/20/2010 0:31	14.60091	144.77511	98.7	565.3	566.4	Temp is 70deg while sampling. Lasers are on.
1549	J2-488	3/20/2010 0:31	14.60091	144.77511	98.1	565.3	566.4	Lots of bubbles in plume and not so much tephra.
1550	J2-488	3/20/2010 0:31	14.60090	144.77511	98.0	565.3	566.4	Big burst of high temp.
1552	J2-488	3/20/2010 0:32	14.60090	144.77510	97.9	565.3	566.4	Getting hot. but can't see wand temp.
1553	J2-488	3/20/2010 0:32	14.60090	144.77510	97.7	565.3	566.4	Temp coming down now.
1554	J2-488	3/20/2010 0:33	14.60090	144.77510	97.5	565.3	566.5	Stop. Tmax=145 Tavg=86.7 vol=382 T2=45
1555	J2-488	3/20/2010 0:33	14.60090	144.77510	97.4	565.3	566.4	SAMPLE: fluid Start Piston #2 unfiltered.
1557	J2-488	3/20/2010 0:34	14.60090	144.77510	96.4	565.3	566.9	J488-HFS-16 and J488-HFS-17. This is 17 and last was 16.
1558	J2-488	3/20/2010 0:34	14.60090	144.77510	96.6	565.3	566.5	Noticed sample sheet named last sed sample was written as #16 but should be #15.
1559	J2-488	3/20/2010 0:35	14.60091	144.77511	96.8	565.3	566.9	SAMPLE: fluid Temp is coming down while sampling.
1560	J2-488	3/20/2010 0:35	14.60090	144.77511	97.0	565.3	566.9	Less vigorous activity but good steady plume.
1562	J2-488	3/20/2010 0:36	14.60091	144.77511	97.1	565.3	566.5	SAMPLE: fluid Stopping J488-HFS-17.
1563	J2-488	3/20/2010 0:36	14.60091	144.77512	97.4	565.3	566.5	J488-HFS-17 Tmax=100 Tavg=messed up maybe 70 vol=400 T2=39.
1564	J2-488	3/20/2010 0:37	14.60091	144.77512	97.3	565.3	566.4	Big bursts from small area.
1565	J2-488	3/20/2010 0:37	14.60091	144.77512	98.1	565.3	566.9	Want a sample of that.
1566	J2-488	3/20/2010 0:37	14.60091	144.77511	97.0	565.2	567.1	Very pulse-like bursts. Very explosive and concentrated.
1568	J2-488	3/20/2010 0:38	14.60091	144.77511	97.8	565.4	567.2	Can't reach wand to that spot from here.
1569	J2-488	3/20/2010 0:38	14.60091	144.77511	109.8	564.8	566.6	Continuous explosive bursts.
1570	J2-488	3/20/2010 0:38	14.60091	144.77512	108.2	565.2	565.9	Moving around clockwise with great view.
1571	J2-488	3/20/2010 0:38	14.60091	144.77512	107.9	565.1	565.8	Can see large rock movement. Looks fresh.
1572	J2-488	3/20/2010 0:39	14.60091	144.77512	106.8	565.2	566.5	Nozzle was clean after last sample and explosions are rocking the wand.
1573	J2-488	3/20/2010 0:39	14.60091	144.77512	106.8	565.2	566.5	Wand is getting beat up by explosions.
1574	J2-488	3/20/2010 0:39	14.60091	144.77512	106.9	565.2	566.5	Temp is going up.
1575	J2-488	3/20/2010 0:39	14.60091	144.77512	106.9	565.2	566.5	SAMPLE: fluid Wand tip is in the explosive area now.
1577	J2-488	3/20/2010 0:40	14.60091	144.77512	104.6	565.2	566.7	SAMPLE: fluid J488-HFS-18 start filtered piston #3 (had to move wand a bit).
1578	J2-488	3/20/2010 0:40	14.60090	144.77512	105.3	565.2	566.7	Temp is 117deg.
1579	J2-488	3/20/2010 0:40	14.60090	144.77511	104.7	565.2	566.7	Can't see if clear water is coming out of exhaust hose-looks a bit smokey.
1580	J2-488	3/20/2010 0:41	14.60090	144.77511	104.4	565.2	566.7	Our view is obscured right now during this sample.
1581	J2-488	3/20/2010 0:41	14.60090	144.77511	104.6	565.2	566.7	White-out. Temp is still 130deg.
1582	J2-488	3/20/2010 0:41	14.60089	144.77510	103.8	565.2	566.7	SAMPLE: gas J488-GTHFS-19 fired during sample #18.
1583	J2-488	3/20/2010 0:41	14.60089	144.77510	104.4	565.2	566.7	Port gas retracted.
1585	J2-488	3/20/2010 0:42	14.60089	144.77511	104.9	565.1	566.7	Stopping. Tmax=138 Tavg=123 vol=287 T2=45.
1586	J2-488	3/20/2010 0:43	14.60090	144.77511	104.1	565.2	566.0	Can't see explosions at present-view obscured.
1587	J2-488	3/20/2010 0:43	14.60090	144.77511	103.5	565.2	566.7	That was the port GTHFS

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1591	J2-488	3/20/2010 0:49	14.60090	144.77511	103.6	565.2	566.8	SAMPLE: fluid Piston #4 unfiltered J488-HFS-20 Start-moved wand around a bit to right. (pulsing has stopped)
1592	J2-488	3/20/2010 0:49	14.60090	144.77511	104.3	565.2	566.8	Plume encasing wand in good part of activity.
1593	J2-488	3/20/2010 0:49	14.60090	144.77511	104.4	565.2	566.8	Very hot sample
1595	J2-488	3/20/2010 0:50	14.60090	144.77510	104.6	565.2	566.8	J488-HFS-20 Bubbles are coming out of exhaust!
1596	J2-488	3/20/2010 0:50	14.60090	144.77510	104.4	565.2	566.8	Stopping.
1597	J2-488	3/20/2010 0:51	14.60091	144.77509	104.1	565.2	566.8	J488-HFS-20 Tmax=151.5 Tavg=136 vol=252 T2=49.
1598	J2-488	3/20/2010 0:51	14.60091	144.77509	104.3	565.2	566.8	Wand is in a great spot.
1599	J2-488	3/20/2010 0:51	14.60091	144.77509	104.1	565.2	566.8	Rocks are moving and pushing out.
1601	J2-488	3/20/2010 0:52	14.60090	144.77509	104.9	565.2	566.8	HD_CAM: start Want HD of rock movement.
1602	J2-488	3/20/2010 0:52	14.60091	144.77509	105.1	565.2	566.7	SAMPLE: fluid J488-HFS-21 Piston #5 filtered.
1603	J2-488	3/20/2010 0:53	14.60091	144.77509	104.9	565.2	566.8	Great view of sampling and overview of plume.
1605	J2-488	3/20/2010 0:54	14.60090	144.77510	105.1	565.2	566.7	Bubbles coming out of rock and see exhaust but no bubbles there.
1606	J2-488	3/20/2010 0:54	14.60090	144.77511	105.5	565.2	566.7	SAMPLE: fluid J488-HFS-21 now seeing bubbles in exhaust. Stop.
1607	J2-488	3/20/2010 0:55	14.60089	144.77511	105.5	565.2	566.7	J488-HFS-21 Tmax=97 Tavg=82 vol=398 T2=33.
1609	J2-488	3/20/2010 0:57	14.60090	144.77508	105.1	565.2	566.7	SAMPLE: fluid J488-HFS-22 Filtered Piston #7. Start-same area as last. Start.
1610	J2-488	3/20/2010 0:57	14.60090	144.77508	104.9	565.2	566.7	Lots of bubbles out of exhaust J488-HFS-22.
1612	J2-488	3/20/2010 0:58	14.60090	144.77509	104.8	565.1	566.7	Larger tephra now raining down.
1613	J2-488	3/20/2010 0:58	14.60090	144.77509	104.5	565.1	566.7	More vigorous activity with tephra.
1614	J2-488	3/20/2010 0:58	14.60090	144.77509	104.9	565.1	566.7	HD_CAM: start Recording HD of tephra in plume.
1615	J2-488	3/20/2010 0:59	14.60090	144.77508	105.5	565.2	566.7	SAMPLE: fluid Stopping J488-HFS-22 Tmax=196.4 Tavg=191 vol=287 T2=45.
1617	J2-488	3/20/2010 0:59	14.60090	144.77508	105.7	565.2	566.7	Need to check the wand-may be clogged up a bit.
1618	J2-488	3/20/2010 0:59	14.60090	144.77508	105.3	565.2	566.7	Wand out.
1619	J2-488	3/20/2010 1:00	14.60090	144.77507	105.9	565.2	566.7	Lasers were turned off after HD started.
1620	J2-488	3/20/2010 1:00	14.60090	144.77507	105.9	565.2	566.7	HD_CAM: stop
1621	J2-488	3/20/2010 1:00	14.60090	144.77507	106.0	565.2	566.7	Flushing out the Beast with lots of gas coming out.
1622	J2-488	3/20/2010 1:01	14.60091	144.77507	105.9	565.2	566.7	Plume is really pumping again.
1623	J2-488	3/20/2010 1:01	14.60091	144.77507	105.9	565.2	566.7	Going to stow wand to prepare for bubble catching.
1625	J2-488	3/20/2010 1:02	14.60091	144.77508	106.0	565.2	566.7	Almost steady amount of bubbles coming out.
1626	J2-488	3/20/2010 1:03	14.60089	144.77509	106.2	565.2	566.7	Wand is stowed.
1628	J2-488	3/20/2010 1:04	14.60090	144.77509	106.4	565.2	566.7	Going to do GT bubble catchers.
1630	J2-488	3/20/2010 1:06	14.60090	144.77508	106.2	565.2	566.7	Retrieving GTB with funnel and some more tephra coming out.
1632	J2-488	3/20/2010 1:08	14.60091	144.77508	106.5	565.2	566.7	GTB red tape with clear funnel. (checked piston firing on arm-looks ok).
1634	J2-488	3/20/2010 1:09	14.60091	144.77508	106.8	565.2	566.7	Activity is picking up while looking for bubble catching position.
1636	J2-488	3/20/2010 1:12	14.60092	144.77509	96.3	565.2	566.4	In plume and then will check for bubbles.
1637	J2-488	3/20/2010 1:13	14.60091	144.77510	96.3	565.1	566.4	Can see bubbles in the funnel and more entering.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1640	J2-488	3/20/2010 1:16	14.60091	144.77510	96.5	565.1	566.3	SAMPLE: gas J488-GTB-23 Red tape-clear funnel. Moved around a bit while sampling to fill funnel. Fired.
1641	J2-488	3/20/2010 1:16	14.60091	144.77510	96.5	565.1	566.3	Could see level of bubbles go up when fired.
1642	J2-488	3/20/2010 1:17	14.60090	144.77510	96.5	565.1	566.3	Stowing bottle. Zooming out with HD.
1643	J2-488	3/20/2010 1:17	14.60090	144.77510	95.2	565.1	566.7	Going to fire the other GTB here as well.
1645	J2-488	3/20/2010 1:19	14.60089	144.77510	94.6	565.1	566.8	Stowing GTB and then will get the next one.
1649	J2-488	3/20/2010 1:25	14.60090	144.77501	128.5	569.2	573.3	We're getting out of the smoke so that we can see the bottles in the basket.
1652	J2-488	3/20/2010 1:28	14.60090	144.77509	79.8	563.0	567.5	We're going back to the vent for a second round of bubbles.
1653	J2-488	3/20/2010 1:28	14.60091	144.77510	76.1	564.7	566.7	HD_CAM: start Looking at Phantom.
1654	J2-488	3/20/2010 1:29	14.60090	144.77509	70.7	565.3	566.7	We're going to take a gastight funnel sample
1656	J2-488	3/20/2010 1:30	14.60090	144.77510	70.9	565.3	566.7	SAMPLE: gas J488-GTB-24. Catching some bubbles with the red bubble catcher funnel.
1658	J2-488	3/20/2010 1:32	14.60091	144.77509	70.9	565.2	566.7	J488-GTB-24 cont. Temp here was ~195°C when measured earlier. Funnel is right in the plume. Checking for bubbles.
1659	J2-488	3/20/2010 1:32	14.60091	144.77509	71.0	565.2	566.7	J488-GTB-24 cont. Seeing some bubbles now.
1660	J2-488	3/20/2010 1:33	14.60091	144.77509	71.0	565.2	566.7	HD cam turned off after 1 minute.
1662	J2-488	3/20/2010 1:34	14.60091	144.77509	71.0	565.2	566.6	Lots of bubbles coming out of the plume.
1664	J2-488	3/20/2010 1:36	14.60091	144.77511	72.1	565.3	566.6	J488-GTB-24 cont. Firing the gastight at 0134. There are lots of bubbles in there. The temp would be a guess. The gastight was taken in the plume.
1665	J2-488	3/20/2010 1:37	14.60090	144.77510	72.0	565.2	566.6	Next task is to get a rock sample.
1668	J2-488	3/20/2010 1:41	14.60091	144.77509	70.5	565.3	566.7	SAMPLE: geo J488-rock-25. Large rock from the edge of the pit. ~15 cm wide. Phantom vent. Z=565.
1670	J2-488	3/20/2010 1:42	14.60090	144.77509	70.5	565.3	566.7	Jim Varnum taking over for Matt.
1671	J2-488	3/20/2010 1:42	14.60090	144.77509	70.5	565.3	566.7	Tephra raining down now.
1673	J2-488	3/20/2010 1:44	14.60091	144.77511	70.4	565.2	566.7	Lots of bigger bubbles and yellow in center of plume.
1674	J2-488	3/20/2010 1:45	14.60091	144.77511	70.4	565.2	566.7	Jason watch change.
1676	J2-488	3/20/2010 1:46	14.60091	144.77511	70.4	565.2	566.7	Looking to get a rock with yellow sulfur on it.
1677	J2-488	3/20/2010 1:46	14.60091	144.77510	71.5	565.3	566.7	Looking for a rock with lots of bubbles at the moment.
1679	J2-488	3/20/2010 1:48	14.60090	144.77509	68.8	565.2	566.8	Very vigorous plume and bubbles. Yellow rocks are out of reach.
1680	J2-488	3/20/2010 1:48	14.60091	144.77509	68.9	565.2	566.8	Ground is moving under vehicle.
1681	J2-488	3/20/2010 1:48	14.60090	144.77509	66.1	564.5	566.8	Seeing a lot more plume coming out of cracks.
1682	J2-488	3/20/2010 1:49	14.60090	144.77509	49.6	563.9	567.0	Backing away from vent to find a yellow-sulfur rock.
1683	J2-488	3/20/2010 1:49	14.60092	144.77509	50.3	565.2	566.8	Moving closer to the sulfur rocks.
1685	J2-488	3/20/2010 1:50	14.60092	144.77510	51.7	565.4	566.8	Large plume bursts now.
1686	J2-488	3/20/2010 1:50	14.60092	144.77510	51.9	565.3	566.9	Jim has his eye on a good one.
1687	J2-488	3/20/2010 1:51	14.60092	144.77509	51.2	565.4	567.0	SAMPLE: geo J488-rock-26 near vent. Rock with sulfur.

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1689	J2-488	3/20/2010 1:53	14.60092	144.77510	51.1	565.4	567.0	Rock placed in outboard crate (crumbled a bit upon entry) with the gastights.
1691	J2-488	3/20/2010 1:54	14.60092	144.77510	50.9	565.4	566.8	Basket management-putting GTBs on top of the rocks a bit more. Nicely tucking everything in.
1692	J2-488	3/20/2010 1:55	14.60093	144.77510	50.9	565.4	566.8	Looks like rock in back right corner of crate.
1693	J2-488	3/20/2010 1:55	14.60093	144.77510	50.8	565.4	566.8	Very vigorous plume with bubbles and tephra now.
1696	J2-488	3/20/2010 1:58	14.60091	144.77510	52.2	565.0	566.8	Need to find a sandy area for the tephra sampler.
1697	J2-488	3/20/2010 1:59	14.60089	144.77510	48.0	564.9	567.6	Want to back up and lateral right to look.
1699	J2-488	3/20/2010 2:00	14.60086	144.77509	52.4	563.6	570.0	Rocks are moving.
1700	J2-488	3/20/2010 2:01	14.60089	144.77508	77.6	562.7	569.9	Moving up and lateralling left again to look at that sandy area again.
1701	J2-488	3/20/2010 2:01	14.60091	144.77506	80.4	562.4	571.1	To the right it was too unstable looking.
1703	J2-488	3/20/2010 2:02	14.60092	144.77509	121.4	562.7	569.7	Looking at the upslope of the vent.
1704	J2-488	3/20/2010 2:02	14.60093	144.77511	96.7	562.3	568.5	Great overview and can see a large wall. on one side.
1705	J2-488	3/20/2010 2:03	14.60093	144.77519	99.4	558.6	565.5	Slope goes up a ways-not just a tephra deposit.
1706	J2-488	3/20/2010 2:03	14.60091	144.77517	106.2	558.5	563.5	Here's the top at 9m above the vent.
1707	J2-488	3/20/2010 2:03	14.60092	144.77515	102.4	559.1	565.9	Going back down to the vent to look around.
1709	J2-488	3/20/2010 2:04	14.60090	144.77515	170.4	564.0	565.3	Going to try and tuck the tephra sampler up against the upslope and vent.
1710	J2-488	3/20/2010 2:05	14.60090	144.77514	172.6	564.8	565.5	Bringing out STBD bio box which may bring it right over the plume.
1712	J2-488	3/20/2010 2:06	14.60090	144.77514	172.6	564.8	565.5	Made it out of the plume and getting ready to open it up.
1713	J2-488	3/20/2010 2:06	14.60090	144.77514	172.6	564.7	565.5	HD_CAM: start On for bucket deployment.
1715	J2-488	3/20/2010 2:08	14.60090	144.77514	172.5	564.7	565.4	NAV: Doppler Reset Tephra Sampler E east side of vent deployed at Phantom Vent (looking south).
1716	J2-488	3/20/2010 2:08	14.60090	144.77514	172.2	564.7	565.4	Vehicle is sitting up high-trying to position bucket on bottom.
1718	J2-488	3/20/2010 2:09	14.60091	144.77514	180.7	564.3	565.2	Still positioning the bucket.
1719	J2-488	3/20/2010 2:10	14.60090	144.77514	177.9	564.5	565.3	Swinging biobox back inside.
1720	J2-488	3/20/2010 2:10	14.60090	144.77514	175.2	565.1	565.8	HD_CAM: stop
1721	J2-488	3/20/2010 2:10	14.60090	144.77514	178.0	565.0	565.7	Jason's arm is coated in sulfur.
1722	J2-488	3/20/2010 2:11	14.60090	144.77515	176.7	564.9	565.7	Changing arms for placing the bucket down.
1725	J2-488	3/20/2010 2:14	14.60090	144.77516	176.3	564.9	565.6	DEPLOY: tephra bucket Dropped in good spot. Tephra Sampler F at Phantom Vent.
1726	J2-488	3/20/2010 2:15	14.60090	144.77514	173.0	564.9	565.7	That is bucket F (previous record mentions E).
1727	J2-488	3/20/2010 2:15	14.60090	144.77514	173.3	564.9	565.7	Lots of big rock shaking.
1729	J2-488	3/20/2010 2:17	14.60090	144.77513	177.9	564.6	565.9	Vehicle is still high off bottom. Want to get reading on gauges.
1730	J2-488	3/20/2010 2:17	14.60089	144.77513	174.6	564.3	565.8	We are on the west side of the vent looking a bit south.
1731	J2-488	3/20/2010 2:17	14.60089	144.77514	167.9	564.6	565.9	Tephra F is on west side of vent.
1732	J2-488	3/20/2010 2:17	14.60089	144.77514	171.3	565.3	566.0	White out.
1735	J2-488	3/20/2010 2:21	14.60078	144.77508	65.1	568.7	571.9	Little sediment slide while moving around.
1737	J2-488	3/20/2010 2:22	14.60079	144.77508	49.7	567.4	571.5	Need to do some weight management before doing anything else.

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1738	J2-488	3/20/2010 2:23	14.60081	144.77508	50.2	567.8	571.2	Sediment appears to be shimmering a bit.
1740	J2-488	3/20/2010 2:24	14.60080	144.77507	50.9	567.8	571.2	Moving scoop to look for weights.
1741	J2-488	3/20/2010 2:25	14.60081	144.77507	51.2	567.7	571.2	Doesn't look there are any weights left. Jason is negative weight now.
1746	J2-488	3/20/2010 2:33	14.60080	144.77509	50.9	567.7	571.2	dropped rock from starboard aft milk crate originally from phantom possibly rock sample 25
1749	J2-488	3/20/2010 2:36	14.60081	144.77507	50.9	567.3	571.1	Believe we have removed J488-rock-25 from basket (no sample now).
1751	J2-488	3/20/2010 2:38	14.60081	144.77507	51.6	567.7	571.2	Removing the other rock from Phantom (sulfur one) out of basket. J488-rock-26 removed from basket.
1752	J2-488	3/20/2010 2:38	14.60081	144.77507	50.6	567.5	571.2	White out. Removed both the rock samples from Phantom for vehicle weight management.
1754	J2-488	3/20/2010 2:40	14.60083	144.77504	50.5	566.6	572.9	Going to back out and spin around to see if vehicle has a lot of tephra sediment to shake off.
1755	J2-488	3/20/2010 2:41	14.60077	144.77507	88.0	566.9	571.5	There may be some remnant pieces of sample J488-rock-25
1757	J2-488	3/20/2010 2:42	14.60075	144.77507	91.5	566.7	571.6	Shaking vehicle and a lot of tephra is raining down.
1758	J2-488	3/20/2010 2:43	14.60064	144.77504	93.7	566.7	579.6	White out again. Plume is changing.
1761	J2-488	3/20/2010 2:46	14.60071	144.77499	26.8	573.1	579.5	Secured GTBs in basket again.
1762	J2-488	3/20/2010 2:46	14.60071	144.77499	26.7	573.1	579.2	Visibility is all clear now.
1765	J2-488	3/20/2010 2:50	14.60071	144.77500	26.7	573.2	579.1	Still at Phantom Vent. Basket management after weight management.
1767	J2-488	3/20/2010 2:53	14.60075	144.77505	48.0	569.7	573.8	Looking for another place for an additional tephra sampler. Prefer to be away from the other one.
1769	J2-488	3/20/2010 2:54	14.60079	144.77505	64.1	567.9	572.7	Lots of sediment with boulders around.
1770	J2-488	3/20/2010 2:55	14.60082	144.77506	67.9	566.7	571.1	Vent is straight ahead a few meters away.
1771	J2-488	3/20/2010 2:55	14.60083	144.77506	71.6	566.6	570.9	See more sulfur the closer we move into the vent.
1774	J2-488	3/20/2010 2:58	14.60072	144.77507	67.9	565.3	573.7	We are going to swing around counterclockwise through the plume and south side of vent.
1775	J2-488	3/20/2010 2:59	14.60071	144.77511	10.0	567.2	575.9	Want to end up on the east or SE side of the vent to place bucket.
1777	J2-488	3/20/2010 3:00	14.60072	144.77513	357.3	568.5	575.3	Looking north at sedimented slope up to vent.
1778	J2-488	3/20/2010 3:01	14.60072	144.77516	351.5	558.4	564.5	Coming up over a large rock as we continue to circle around.
1780	J2-488	3/20/2010 3:02	14.60071	144.77517	353.7	556.7	568.8	Out of the plume. Lots of sulfur coating on rocks.
1781	J2-488	3/20/2010 3:03	14.60069	144.77522	20.4	559.2	565.9	Nav has us looking at sulfur crust and it does look like this is it.
1783	J2-488	3/20/2010 3:04	14.60071	144.77522	16.7	557.6	564.9	There is the marker Mkr-120.
1784	J2-488	3/20/2010 3:04	14.60073	144.77520	354.0	556.7	562.0	Sulfur Crust 14 deg 36.043 144deg 46.513 z=557
1785	J2-488	3/20/2010 3:04	14.60073	144.77518	29.5	557.5	562.6	We are at sulfur crust.
1786	J2-488	3/20/2010 3:05	14.60073	144.77518	55.2	558.2	567.2	Sulfur Crust is very close to Phantom Vent.
1787	J2-488	3/20/2010 3:05	14.60074	144.77518	66.7	558.7	566.3	We are on the west side of Sulfur Crust.
1789	J2-488	3/20/2010 3:06	14.60077	144.77519	97.3	558.2	561.9	Butt cam has view of Phantom plume.
1790	J2-488	3/20/2010 3:06	14.60077	144.77520	101.4	558.7	560.4	HD_CAM: start HD cam of Sulfur Crust.
1792	J2-488	3/20/2010 3:08	14.60077	144.77520	109.0	558.6	560.4	Going to deploy a tephra sampler here first. Tephra D.

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1793	J2-488	3/20/2010 3:08	14.60077	144.77520	109.4	558.4	560.4	Bubbles were under the bucket. Looks like there is some tephra already in the bucket.
1795	J2-488	3/20/2010 3:11	14.60075	144.77521	42.2	556.2	562.2	Bucket fell back into basket.
1796	J2-488	3/20/2010 3:11	14.60075	144.77522	34.7	556.7	560.2	There is Mkr-120 again.
1798	J2-488	3/20/2010 3:12	14.60074	144.77523	36.0	555.3	559.4	There is the marker anchor and would like the bucket next to the marker.
1799	J2-488	3/20/2010 3:13	14.60072	144.77526	331.3	553.9	560.5	Good view of Mkr-120
1801	J2-488	3/20/2010 3:14	14.60075	144.77527	326.7	555.7	557.3	Shrimp swimming around.
1802	J2-488	3/20/2010 3:14	14.60075	144.77527	326.6	555.7	557.3	Picking bucket back out of the basket again.
1803	J2-488	3/20/2010 3:14	14.60075	144.77527	326.6	555.7	557.3	In position at marker to deploy sampler.
1804	J2-488	3/20/2010 3:15	14.60076	144.77527	326.3	555.7	557.3	DEPLOY: tephra bucket Deployed on edge of crust next to marker. Tephra Sampler D.
1806	J2-488	3/20/2010 3:16	14.60074	144.77525	24.7	557.1	558.4	Next we are going to deploy the shrimp trap and then bring back the one left here.
1807	J2-488	3/20/2010 3:16	14.60075	144.77526	17.7	557.1	558.4	Can see the other shrimp trap and the MTR.
1808	J2-488	3/20/2010 3:16	14.60075	144.77526	17.8	557.1	558.3	Not going to get MTR-just shrimp trap.
1809	J2-488	3/20/2010 3:17	14.60075	144.77526	17.8	557.1	558.3	Shrimp inside and a lot outside.
1811	J2-488	3/20/2010 3:18	14.60075	144.77526	17.8	557.1	558.3	Trap out of basket.
1812	J2-488	3/20/2010 3:18	14.60075	144.77526	17.8	557.1	558.3	Shrimp Trap in about the same space as the other one.
1813	J2-488	3/20/2010 3:18	14.60075	144.77525	17.6	557.1	558.4	DEPLOY: shrimp trap Shrimp trap in place.
1814	J2-488	3/20/2010 3:18	14.60075	144.77525	17.7	557.1	558.3	Good view of MTR-6 next to traps and Mkr-120 anchor.
1816	J2-488	3/20/2010 3:20	14.60075	144.77525	18.0	557.1	558.4	Going to get the shrimp trap left here on last dive.
1817	J2-488	3/20/2010 3:21	14.60074	144.77525	17.0	557.1	558.1	Lots of shrimp everywhere here.
1819	J2-488	3/20/2010 3:21	14.60075	144.77525	16.5	557.1	558.1	RECOVER: shrimp traps Trap looks good with shrimp inside.
1820	J2-488	3/20/2010 3:23	14.60076	144.77524	16.8	557.1	558.2	SAMPLE: bio J488-shrimp-27 Shrimp Trap recovery is a bio sample at Sulfur Crust at Mkr-120.
1822	J2-488	3/20/2010 3:24	14.60075	144.77525	17.5	557.1	558.2	Deployed Shrimp Trap A at Sulfur Crust.
1823	J2-488	3/20/2010 3:25	14.60075	144.77525	17.5	557.1	558.2	HD_CAM: stop Tape is off.
1825	J2-488	3/20/2010 3:26	14.60076	144.77525	17.7	557.0	558.2	Great view of Phantom plume in Medea cam.
1826	J2-488	3/20/2010 3:27	14.60076	144.77525	18.8	557.1	558.2	Swung out port biobox but didn't clear the rock.
1828	J2-488	3/20/2010 3:28	14.60076	144.77526	18.7	557.0	558.2	Looks like we are going to do some HFS sampling here at Sulfur Crust Mkr-120.
1829	J2-488	3/20/2010 3:29	14.60076	144.77526	18.3	557.1	558.2	Going to use the short nozzle for these samples.
1832	J2-488	3/20/2010 3:33	14.60076	144.77525	18.5	557.0	558.1	Trying to grab the short HFS wand.
1834	J2-488	3/20/2010 3:34	14.60075	144.77525	18.4	557.0	558.1	Got the wand.
1835	J2-488	3/20/2010 3:35	14.60075	144.77525	18.4	557.0	558.1	Looking for a good flow of water for sampling.
1837	J2-488	3/20/2010 3:37	14.60075	144.77525	18.3	557.0	558.1	Looking at area just between MTR and shrimp trap. Below MTR looks the best.
1839	J2-488	3/20/2010 3:38	14.60075	144.77525	18.3	557.0	558.1	Temp is up to 10deg. at this spot.

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1840	J2-488	3/20/2010 3:38	14.60076	144.77525	18.3	557.0	558.1	Going to move the wand a bit for better temp and flow.
1841	J2-488	3/20/2010 3:38	14.60076	144.77525	18.3	557.0	558.1	Temp is higher here...going up.
1842	J2-488	3/20/2010 3:39	14.60076	144.77525	18.3	557.0	558.1	NAV: Doppler Reset J488-HFS-28 at Sulfur Crust with some white floc coming out where wand was placed.
1844	J2-488	3/20/2010 3:41	14.60075	144.77525	18.3	557.0	558.1	J488-HFS-28 Sulfur Crust Mkr-120 pH 1.84 (not much different than background). Not started yet.
1846	J2-488	3/20/2010 3:42	14.60075	144.77524	18.3	557.0	558.1	SAMPLE: fluid J488-HFS-28 Sulfur Crust Mkr-120 Filtered bag #22.
1847	J2-488	3/20/2010 3:42	14.60075	144.77524	18.3	557.0	558.1	Sample was started.
1848	J2-488	3/20/2010 3:43	14.60075	144.77524	18.3	557.0	558.1	Lasers are already on.
1849	J2-488	3/20/2010 3:43	14.60075	144.77524	18.3	557.0	558.1	Looking at shrimp during sample.
1852	J2-488	3/20/2010 3:46	14.60075	144.77525	18.3	557.0	558.1	J488-HFS-28 stopped. Tmax=25.2 Tavg=24.4 vol=498 T2=15
1853	J2-488	3/20/2010 3:46	14.60074	144.77525	18.3	557.0	558.1	SAMPLE: fluid J488-HFS-29 unfiltered bag #17 Start.
1854	J2-488	3/20/2010 3:47	14.60073	144.77524	18.3	557.0	558.1	Sample exact same spot as previous. J488-HFS-28
1855	J2-488	3/20/2010 3:47	14.60073	144.77524	18.3	557.0	558.1	Good exhaust.
1857	J2-488	3/20/2010 3:49	14.60074	144.77526	18.3	557.0	558.1	HD_CAM: stop J488-HFS-29 stopped.
1859	J2-488	3/20/2010 3:50	14.60074	144.77526	18.3	557.0	558.1	Tmax=25/7 Tavg=24.9 vol=498 T2=15.0
1860	J2-488	3/20/2010 3:50	14.60074	144.77526	18.3	557.0	558.1	Mosaic of the slab was during the sample.
1861	J2-488	3/20/2010 3:50	14.60074	144.77526	18.3	557.0	558.1	Photo mosaic of the slab.
1862	J2-488	3/20/2010 3:51	14.60074	144.77525	18.3	557.0	558.1	SAMPLE: fluid J488-HFS-30 Sterivex #12 at same place. Started.
1864	J2-488	3/20/2010 3:52	14.60074	144.77525	18.3	557.0	558.1	Still at Sulfur Crust Mkr-120.
1866	J2-488	3/20/2010 3:54	14.60074	144.77526	18.3	557.0	558.1	HD_CAM: start Shrimp observations.
1868	J2-488	3/20/2010 3:57	14.60074	144.77525	18.4	557.0	558.1	That temperature for last Tmax should be Tmax=25.7
1872	J2-488	3/20/2010 4:02	14.60076	144.77525	18.1	557.0	558.1	HD_CAM: stop
1875	J2-488	3/20/2010 4:06	14.60074	144.77525	18.1	556.9	558.1	HD_CAM: start Looking at coating on sulfur that looks light colored-fiber like.
1876	J2-488	3/20/2010 4:07	14.60074	144.77525	18.1	556.9	558.0	J488-HFS-30 stopped. Phantom Vent Mkr-120
1878	J2-488	3/20/2010 4:08	14.60074	144.77525	18.1	556.9	558.1	SAMPLE: fluid Tmax=25.6 Tavg=24.6 vol=25.49 T2=14.0
1879	J2-488	3/20/2010 4:08	14.60074	144.77525	18.2	556.9	558.0	SAMPLE: fluid J488-HFS-31 started. RNA filter #15
1881	J2-488	3/20/2010 4:11	14.60075	144.77524	18.2	556.9	558.0	HD_CAM: stop
1886	J2-488	3/20/2010 4:18	14.60076	144.77523	18.0	556.9	558.0	J488-HFS-31 still pumping.
1891	J2-488	3/20/2010 4:26	14.60075	144.77525	17.9	556.9	558.0	Stopped. J488-HFS-31.
1892	J2-488	3/20/2010 4:26	14.60076	144.77525	17.8	556.9	558.0	Tmax=25.9 Tavg=25.0 vol=2501 T2=14.0 J488-HFS-31.
1893	J2-488	3/20/2010 4:27	14.60076	144.77525	17.8	556.9	558.1	SAMPLE: fluid J488-HFS-32 unfiltered bag #20 start.
1895	J2-488	3/20/2010 4:28	14.60076	144.77525	17.6	556.9	557.6	Last fluid sample for this site. Next we will put out the exclusion traps to try to grow bacteria.
1896	J2-488	3/20/2010 4:29	14.60075	144.77525	17.5	556.8	558.0	J488-HFS-32 stopped.
1897	J2-488	3/20/2010 4:29	14.60075	144.77525	17.5	556.9	558.0	J488-HFS-32 Tmax=25.4 Tavg=24.9 vol=485 T2=14.
1899	J2-488	3/20/2010 4:31	14.60074	144.77525	16.9	556.9	558.1	Stowing the wand for HFS.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1902	J2-488	3/20/2010 4:34	14.60076	144.77525	17.0	556.9	558.1	Looking at nozzle for HFS. Doesn't look bad but is sticking when trying to stow.
1903	J2-488	3/20/2010 4:34	14.60076	144.77525	17.4	556.9	558.1	Wand Stowed.
1904	J2-488	3/20/2010 4:35	14.60075	144.77526	21.2	556.0	558.9	Need to retrieve mat cage from Port biobox. Must move vehicle to open swing arm.
1905	J2-488	3/20/2010 4:35	14.60075	144.77526	21.6	556.0	559.3	Box out and opening.
1907	J2-488	3/20/2010 4:37	14.60073	144.77526	21.7	556.1	559.4	Have cage in arm and going to place in basket to get into position.
1909	J2-488	3/20/2010 4:38	14.60074	144.77526	21.8	556.1	559.5	Getting the other mat cage out of biobox.
1910	J2-488	3/20/2010 4:39	14.60074	144.77526	21.9	556.1	559.3	Stowing basket.
1912	J2-488	3/20/2010 4:40	14.60076	144.77525	345.0	556.6	558.6	Swinging round to get MTR in view .
1913	J2-488	3/20/2010 4:40	14.60076	144.77525	342.8	556.6	558.5	Marker is floating right into brow cam view. Mkr-120.
1915	J2-488	3/20/2010 4:42	14.60076	144.77525	346.4	556.7	558.6	DEPLOY: mat cage Placing first mat cage near MTR-6. On bottom and repositioning.
1917	J2-488	3/20/2010 4:44	14.60075	144.77525	344.8	556.7	558.6	Mat cage #1 pushed near MTR-6.
1918	J2-488	3/20/2010 4:44	14.60075	144.77525	345.1	556.7	558.5	Mat cage is at Sulfur Crust Mkr-120 next to MTR-6.
1919	J2-488	3/20/2010 4:45	14.60075	144.77525	345.1	556.7	558.5	Getting second mat cage out of basket.
1921	J2-488	3/20/2010 4:46	14.60075	144.77526	345.2	556.7	558.5	DEPLOY: mat cage Placing second mat cage on top of sulfur crust but fell down in a great place.
1922	J2-488	3/20/2010 4:47	14.60075	144.77526	345.3	556.7	558.5	Mat cage #1 was deployed first (has a marker on it). The other is unmarked.
1924	J2-488	3/20/2010 4:48	14.60074	144.77526	344.9	556.3	558.9	Would like to go to Phantom for video survey but only have about 30 minutes left.
1925	J2-488	3/20/2010 4:48	14.60074	144.77526	344.8	556.4	558.9	Basket coming in.
1926	J2-488	3/20/2010 4:49	14.60073	144.77524	345.0	555.6	559.1	Heading back over to Phantom.
1927	J2-488	3/20/2010 4:49	14.60075	144.77521	344.1	556.1	559.4	Lots of crusty sulfur rocks as we lift off.
1929	J2-488	3/20/2010 4:50	14.60073	144.77515	312.4	562.1	568.0	In plume with no visibility.
1930	J2-488	3/20/2010 4:51	14.60069	144.77506	359.3	573.8	577.7	HD_CAM: start
1931	J2-488	3/20/2010 4:51	14.60069	144.77505	352.0	573.0	577.0	Starting HD for video survey of Phantom on the approach.
1932	J2-488	3/20/2010 4:51	14.60071	144.77507	12.5	571.1	575.1	Coming over a rocky rise. There is the white egg-shaped rock.
1934	J2-488	3/20/2010 4:52	14.60071	144.77507	10.7	569.1	574.7	Large boulders with sediment between.\
1935	J2-488	3/20/2010 4:52	14.60072	144.77506	3.3	568.4	575.0	Coming up slope to Phantom.
1936	J2-488	3/20/2010 4:52	14.60072	144.77504	16.5	572.0	575.7	NAV: Doppler Reset 0452 reset doppler.
1937	J2-488	3/20/2010 4:53	14.60073	144.77506	34.4	570.4	574.5	Ended up south of the vent.
1938	J2-488	3/20/2010 4:53	14.60075	144.77507	35.9	568.8	572.6	Heading upslope to the vent-approach from south.
1940	J2-488	3/20/2010 4:54	14.60080	144.77512	33.4	564.7	567.8	Lots of tephra as we climb up slope should be within 10m.
1941	J2-488	3/20/2010 4:54	14.60081	144.77511	6.2	564.1	567.6	There it is-Phantom Vent.
1942	J2-488	3/20/2010 4:55	14.60081	144.77509	358.2	565.9	566.9	Lots of tephra raining down at the south side.
1943	J2-488	3/20/2010 4:55	14.60080	144.77506	33.2	566.9	571.7	Going to swing around to the NW to get out of plume and tephra shower.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
1945	J2-488	3/20/2010 4:55	14.60080	144.77505	74.9	567.1	572.2	Sand flow.
1946	J2-488	3/20/2010 4:56	14.60081	144.77506	87.8	566.5	571.5	Sediment is channeling down the sides of the vent.
1948	J2-488	3/20/2010 4:58	14.60081	144.77504	89.5	567.5	573.3	Lots of plume smoke in front of us.
1949	J2-488	3/20/2010 4:58	14.60083	144.77505	92.7	569.4	572.6	More sand flows.
1951	J2-488	3/20/2010 5:00	14.60083	144.77507	96.8	565.8	571.1	Can't get view with all the smoke.
1952	J2-488	3/20/2010 5:00	14.60084	144.77507	96.2	566.1	571.2	NAV: Doppler Reset
1953	J2-488	3/20/2010 5:01	14.60085	144.77507	75.6	566.0	570.6	Big boulders to left making passage difficult. Plume in front with now visibility in that direction.
1955	J2-488	3/20/2010 5:02	14.60084	144.77507	74.2	566.0	571.0	HD_CAM: stop
1956	J2-488	3/20/2010 5:02	14.60084	144.77507	73.8	565.9	571.1	No good views so stopped HD.
1958	J2-488	3/20/2010 5:04	14.60077	144.77512	347.0	563.4	565.3	Trying to find better visibility.
1959	J2-488	3/20/2010 5:04	14.60077	144.77514	294.8	563.7	567.3	Wall and plume are limiting our access to the vent.
1960	J2-488	3/20/2010 5:05	14.60078	144.77511	291.2	555.8	558.3	Butt cam has bucket at Sulfur Crust in view.
1962	J2-488	3/20/2010 5:05	14.60079	144.77511	289.7	555.3	562.5	Looking at plume and lots of bubbles.
1963	J2-488	3/20/2010 5:06	14.60080	144.77513	293.9	554.7	562.3	HD_CAM: start Huge bubble burst.
1964	J2-488	3/20/2010 5:06	14.60079	144.77516	294.9	554.8	560.1	Bubbles everywhere.
1965	J2-488	3/20/2010 5:06	14.60074	144.77520	291.8	555.6	559.7	10m above when the bubbles burst.
1966	J2-488	3/20/2010 5:07	14.60067	144.77522	290.6	556.4	565.0	HD_CAM: stop .
1967	J2-488	3/20/2010 5:07	14.60065	144.77529	324.4	558.4	564.8	Never saw the vent bottom but the amount of bubbles was incredible.
1969	J2-488	3/20/2010 5:08	14.60069	144.77528	328.7	558.9	562.2	Back at Sulfur Crust.
1970	J2-488	3/20/2010 5:08	14.60069	144.77528	326.7	558.9	562.1	Basket coming out for basket management.
1971	J2-488	3/20/2010 5:09	14.60068	144.77528	326.7	558.8	562.1	Putting suction hose back in basket.
1973	J2-488	3/20/2010 5:11	14.60068	144.77528	326.6	558.8	561.9	Putting empty scoop away in a better location.
1976	J2-488	3/20/2010 5:15	14.60069	144.77528	326.7	558.8	562.2	Stowing the gastight bottles.
1979	J2-488	3/20/2010 5:19	14.60069	144.77528	326.8	558.9	562.2	Bringing basket in a bit.
1981	J2-488	3/20/2010 5:20	14.60068	144.77527	326.8	558.8	562.2	Lasers off.
1983	J2-488	3/20/2010 5:22	14.60065	144.77527	256.9	554.3	563.5	JASON: Jason off bottom J488 coming off bottom. Gear stowed.
1984	J2-488	3/20/2010 5:39	14.60058	144.77560	226.4	121.1	249.3	possibly seeing lots of bubbles during ascent (130m) don't know if they are coming off basket or from below
1986	J2-488	3/20/2010 5:42	14.60083	144.77593	246.6	95.6	271.0	saw bubbles up to ~94m
1987	J2-488	3/20/2010 5:51	14.60102	144.77665	234.0	52.2	248.7	bubbles appear to be coming off Jason as it ascends
1988	J2-488	3/20/2010 5:54	14.60114	144.77683	252.2	2.0	2.8	Medea at surface
1989	J2-488	3/20/2010 5:56	14.60114	144.77682	258.0	1.5	2.2	Medea on deck
1990	J2-488	3/20/2010 6:07	14.60116	144.77683	309.0	0.0	135.0	Jason out of water
1991	J2-488	3/20/2010 6:08	14.60112	144.77687	154.0	0.0	1.1	Jason on deck

Table 6.5-3 JASON Dive J2-489

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2002	J2-489	3/20/2010 18:17	14.60438	144.78044	288.2	1.1	1.8	JASON: Jason in water
2003	J2-489	3/20/2010 18:20	14.60426	144.78067	256.0	1.2	2.6	JASON: Medea in water
2004	J2-489	3/20/2010 18:21	14.60426	144.78075	257.2	1.2	2.0	Beginning of dive J2-489
2008	J2-489	3/20/2010 18:53	14.60613	144.78230	257.7	600.5	638.7	We are 60m off the bottom.
2009	J2-489	3/20/2010 18:53	14.60614	144.78229	256.1	607.4	630.4	Heading down for dive J2-489
2011	J2-489	3/20/2010 18:54	14.60116	144.77872	259.6	631.6	635.3	JASON: Jason on bottom
2012	J2-489	3/20/2010 18:55	14.60116	144.77873	259.5	631.6	635.3	The first task is to try to find the mooring.
2013	J2-489	3/20/2010 18:55	14.60116	144.77873	259.4	631.6	635.2	That would be the RAS mooring.
2014	J2-489	3/20/2010 18:55	14.60116	144.77873	259.5	631.5	635.2	Other tasks are to work at Mkr109 and vicinity.
2015	J2-489	3/20/2010 18:55	14.60116	144.77873	259.6	631.5	635.2	Tools: Single-chamber suction sampler.
2018	J2-489	3/20/2010 18:56	14.60116	144.77872	259.6	631.5	635.2	Basket: milk crates; 3 scoop bags and 3 markers; 2 gas-tights; 3MTRs; 2 shrimp traps; rope cutter (for mooring).
2019	J2-489	3/20/2010 18:57	14.60116	144.77873	259.3	631.5	635.2	Tasks: Determine if RAS mooring is there or not. Locate Mkr101; 113; 111; 114.
2021	J2-489	3/20/2010 18:58	14.60116	144.77873	259.5	631.5	635.2	Tasks cont. Suction at Mkr109 for shrimp. Deploy shrimp traps at Mkr109. Pick up rocks in shrimp area and put in exclusion trap; close lid; deploy trap.
2022	J2-489	3/20/2010 18:58	14.60116	144.77873	259.2	631.5	635.2	Tasks cont: Are barnacles and limpets still there? Sample of mat on rock from east-facing wall. Explore slide scar etc.
2027	J2-489	3/20/2010 19:06	14.60115	144.77872	258.8	631.4	635.4	We still have no bow thrusters on the ship so our ability to maneuver is limited.
2028	J2-489	3/20/2010 19:07	14.60115	144.77872	258.7	631.2	635.1	We're to the east of the mooring.
2031	J2-489	3/20/2010 19:10	14.60113	144.77874	259.5	630.9	636.0	The plan is to first head to Mkr-114 (Rusty Rise) and see what things look like over there.
2032	J2-489	3/20/2010 19:10	14.60115	144.77874	258.8	631.0	635.8	The new bathymetry seems to indicate that area has changed too. We will find out.
2035	J2-489	3/20/2010 19:14	14.60126	144.77867	262.3	627.7	632.1	We're off.
2036	J2-489	3/20/2010 19:15	14.60119	144.77855	248.6	619.3	623.9	We're moving upslope and traveling almost due west.
2038	J2-489	3/20/2010 19:16	14.60119	144.77851	249.8	616.9	621.0	Lots of white particles in the sediments. Not sure what it is. Zooming in.
2039	J2-489	3/20/2010 19:17	14.60119	144.77848	249.8	616.7	618.8	BIOLOGY: other Polychaete swam by. Not sure what the white in the seds are.
2041	J2-489	3/20/2010 19:18	14.60122	144.77844	247.8	614.4	617.1	Polychaetes and some clear blobs that look like jellyfish.
2043	J2-489	3/20/2010 19:20	14.60128	144.77820	250.0	603.1	606.0	The ship is moving to the SW; moving with the current.
2044	J2-489	3/20/2010 19:20	14.60128	144.77820	249.8	603.0	605.7	We'
2045	J2-489	3/20/2010 19:20	14.60128	144.77816	249.5	600.4	603.1	We're up on a ridge. See some iron mat here.
2046	J2-489	3/20/2010 19:21	14.60124	144.77807	249.6	596.5	599.3	This ridge runs SW/NE. We will continue on.
2048	J2-489	3/20/2010 19:23	14.60115	144.77788	249.1	584.4	586.7	We see some rocky outcrops. Rattail fish on the slope.
2050	J2-489	3/20/2010 19:24	14.60113	144.77786	227.0	583.3	585.8	There are a couple more rattail fish.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2052	J2-489	3/20/2010 19:25	14.60114	144.77786	228.6	583.5	584.3	BIOLOGY: other Rattails (several) and polychaetes here in the area on the east side of the Mkr109 and others cluster.
2053	J2-489	3/20/2010 19:26	14.60114	144.77786	231.1	582.6	585.5	Some bacterial mat on the edge of this ridge.
2054	J2-489	3/20/2010 19:27	14.60108	144.77771	247.8	574.6	578.0	Moving on. Look at this ridge ahead. It's like a knife edge.
2056	J2-489	3/20/2010 19:28	14.60099	144.77755	250.3	572.6	581.2	We have reached the top of a ridge and ahead we see the wall that Bill says is that wall that was covered in mat before.
2057	J2-489	3/20/2010 19:28	14.60097	144.77757	250.0	566.1	581.6	Iron oxide mats on this wall. Looks similar to last year.
2058	J2-489	3/20/2010 19:29	14.60100	144.77754	242.7	565.9	578.9	This side of the ridge looks very similar to last year.
2060	J2-489	3/20/2010 19:30	14.60101	144.77754	242.5	566.0	578.6	Some nice iron oxide mats on this east-facing ridge.
2062	J2-489	3/20/2010 19:32	14.60101	144.77755	242.2	566.0	579.0	Plan to grab a rock covered with mat. We have white and orange mat here.
2064	J2-489	3/20/2010 19:34	14.60102	144.77755	242.4	566.0	579.1	Hope to grab a bit of mat to determine what the shrimp like to eat or don't. We don't see any shrimp here. The white mat is blowing in the current.
2066	J2-489	3/20/2010 19:36	14.60098	144.77755	244.2	565.8	580.6	This side of the wall is quite coated with white filamentous bacteria. "White fuzzy rocks". The wall crumbles when we pick it off.
2069	J2-489	3/20/2010 19:41	14.60097	144.77754	244.2	565.8	580.5	Doing a little housekeeping here. The T-handle is missing on the scoop bag.
2071	J2-489	3/20/2010 19:42	14.60097	144.77754	244.2	565.8	580.6	Not sure if we plan to use the scoop bag for this sample for just pick up a rock.
2074	J2-489	3/20/2010 19:46	14.60098	144.77754	244.2	565.9	580.9	SAMPLE: bio J489-mat-1. Scooping up rocks covered in white fuzzy mat and some iron oxide mats. Location: 144.77754 46.6511 36.0576 Z=566. Hdg 244. Eastern edge of wall north of Rusty Ridge.
2075	J2-489	3/20/2010 19:47	14.60097	144.77754	244.2	565.8	580.6	This position is north of old Mkr109. Hopefully it is still there. Lots of the crumbling wall ended up on the basket.
2077	J2-489	3/20/2010 19:49	14.60097	144.77754	243.8	566.1	580.6	After a bit of housekeeping (pulling rocks off the basket) we will zoom in on the wall and do a bit of HD footage.
2080	J2-489	3/20/2010 19:52	14.60098	144.77756	243.7	566.1	581.3	Will do a bit of HD now.
2082	J2-489	3/20/2010 19:54	14.60098	144.77755	243.8	566.0	581.2	HD_CAM: start Video of white fuzzy mat on this NE-facing wall. Our heading is 244 looking straight at the wall.
2083	J2-489	3/20/2010 19:55	14.60097	144.77755	243.8	565.2	581.2	Zoomed in on the white mat. Interspersed patches of red (iron oxide?) mat as well here.
2085	J2-489	3/20/2010 19:57	14.60097	144.77755	244.5	566.4	581.8	Still observing the mat moving in the current (perhaps generated by Jason?).
2086	J2-489	3/20/2010 19:57	14.60097	144.77755	243.6	566.0	581.5	HD_CAM: stop
2088	J2-489	3/20/2010 19:58	14.60097	144.77755	243.9	563.8	581.3	On to Mkr198?
2089	J2-489	3/20/2010 19:58	14.60097	144.77755	244.7	563.3	581.2	We're at the top of the ridge.
2090	J2-489	3/20/2010 19:58	14.60096	144.77754	243.4	562.6	581.8	BIOLOGY: other Crabs and shrimp here. Possibly the Mkr109 area in the distance.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2091	J2-489	3/20/2010 19:59	14.60096	144.77754	241.6	563.2	580.6	BIOLOGY: other Shrimp everywhere here on the NE side of the ridge. Crabs here as well.
2093	J2-489	3/20/2010 20:00	14.60096	144.77754	241.5	563.2	580.7	BIOLOGY: Austinograea(crab) and lots of shrimp.
2095	J2-489	3/20/2010 20:01	14.60097	144.77754	241.6	563.2	580.6	Looks like a bit of venting here too. Lots of shrimp; some crabs. This area looks unchanged so far.
2096	J2-489	3/20/2010 20:02	14.60096	144.77754	241.6	563.2	580.6	BIOLOGY: Opaepele(shrimp)
2097	J2-489	3/20/2010 20:02	14.60096	144.77755	241.6	563.2	580.8	The Opaepele shrimp are quite red this year. They were a paler color last year. Verena thinks it has to do with what they are eating.
2098	J2-489	3/20/2010 20:03	14.60096	144.77754	242.1	563.3	580.8	Zooming in on the white stuff on the rocks. Could just be staining on the rocks rather than mat. The shrimp do not seem interested.
2100	J2-489	3/20/2010 20:04	14.60096	144.77754	244.8	562.6	579.5	Moving over to the area where Bill saw venting.
2101	J2-489	3/20/2010 20:04	14.60096	144.77755	245.2	562.1	580.7	Only a few meters away.
2102	J2-489	3/20/2010 20:05	14.60094	144.77755	255.4	563.0	580.0	Looks like the Mkr109 ridge ahead of us. Our heading is 245. We are NE of the outcrop. Lots of shrimp in this area.
2103	J2-489	3/20/2010 20:05	14.60094	144.77755	254.8	563.0	579.4	Zooming in on shimmering water here.
2105	J2-489	3/20/2010 20:06	14.60094	144.77755	254.8	563.0	574.1	BIOLOGY: other Looks like both species of shrimp are here in this area of shimmering water. Quite intense flow here.
2106	J2-489	3/20/2010 20:07	14.60094	144.77755	254.9	563.0	580.0	HD_CAM: start HD started at 2000. Video of shrimp in shimmering water.
2108	J2-489	3/20/2010 20:08	14.60093	144.77755	255.0	563.1	580.0	BIOLOGY: limpets 2 limpets on the rocks in view. Looking in the shimmering area. There are several limpets here but certainly not a whole lot.
2109	J2-489	3/20/2010 20:09	14.60094	144.77755	254.9	563.1	579.6	Going to put a trap; marker; MTR here.
2111	J2-489	3/20/2010 20:11	14.60096	144.77755	254.6	563.1	578.2	BIOLOGY: other Both species of shrimp are here. Limpets as well. Don't see many egg cases? Could be egg cases?
2113	J2-489	3/20/2010 20:12	14.60096	144.77755	254.3	563.1	578.2	Panning around a big. More limpets here.
2114	J2-489	3/20/2010 20:13	14.60095	144.77755	254.4	563.1	578.1	BIOLOGY: other squid just went by.
2116	J2-489	3/20/2010 20:15	14.60092	144.77753	3.8	562.3	566.2	Incredible giant wall here visible in the brow cam.
2118	J2-489	3/20/2010 20:16	14.60092	144.77753	0.3	563.2	565.2	It's quite steep here. This area looks quite unchanged. We will get a better idea when we go to Mkr109.
2120	J2-489	3/20/2010 20:18	14.60093	144.77753	359.6	563.2	565.2	NAV: Location We're straight east of the ridge that was where Mkr109 was last year. Not too bad an offset from last years nav.
2121	J2-489	3/20/2010 20:18	14.60092	144.77753	359.6	563.1	565.2	Lots of shrimp here.
2124	J2-489	3/20/2010 20:22	14.60092	144.77754	1.0	563.1	565.2	DEPLOY: shrimp trap Shrimp trap #2. Deployed on this ridge crest to the east of the old Mkr109 outcrop. Lots of both types of shrimp here; some limpets and crabs too. 144.77754 46.6520 14.60092 36.0569. Z=360.
2125	J2-489	3/20/2010 20:23	14.60093	144.77754	2.5	563.1	565.1	Placing the shrimp trap #2 on this ridge edge.
2127	J2-489	3/20/2010 20:24	14.60094	144.77754	1.0	562.8	564.9	Ripple marks in the sediments here.
2129	J2-489	3/20/2010 20:26	14.60093	144.77754	2.9	563.2	565.4	Correction on depth here. It is 563. The heading is 360..actually 4.0

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2132	J2-489	3/20/2010 20:30	14.60092	144.77753	1.4	563.2	565.4	DEPLOY: marker 112 here with the shrimp trap #2. Will also deploy and MTR. 144 46.6520 14 36.0569. Z=563. Just east of the old Mkr109 site (we think - though we haven't been there yet).
2133	J2-489	3/20/2010 20:31	14.60092	144.77752	15.7	563.2	565.1	DEPLOY: MTR # 1. 144 46.6520 14 36.0569. Z=563. Same position as the shrimp trap and marker.
2135	J2-489	3/20/2010 20:33	14.60092	144.77752	15.9	563.1	565.1	This site now has MTR#1; Mkr112; Shrimp trap #2. 144 46.6520 14 36.0569. Z=563.
2136	J2-489	3/20/2010 20:33	14.60092	144.77753	15.9	563.1	565.1	The MTR is hopefully in the flow now.
2138	J2-489	3/20/2010 20:34	14.60088	144.77750	320.2	562.7	568.7	Looking for another rocky ridge downslope and to the SW.
2139	J2-489	3/20/2010 20:35	14.60089	144.77748	346.4	565.4	568.6	Halleluia. We just spotted a marker. It is Mkr-109!! Still perched on the edge of this steep slope. Lots of shrimp.
2141	J2-489	3/20/2010 20:37	14.60089	144.77747	346.2	565.3	568.6	We are about 10m west of last year's position. The trap is about 10m NE of this position.
2143	J2-489	3/20/2010 20:38	14.60088	144.77748	345.9	565.4	568.4	BIOLOGY: other Lots of biology here. Crabs; barnacles and their egg sacs; both species of crabs. Searching with the HD cam for fluid flow.
2144	J2-489	3/20/2010 20:39	14.60087	144.77748	345.7	565.4	568.4	We see wispy mat and weak fluid flow.
2146	J2-489	3/20/2010 20:40	14.60087	144.77751	350.1	563.1	569.2	NAV: Location Marker 109 2010 position: 144 46.6479 144 36.0539.
2147	J2-489	3/20/2010 20:41	14.60089	144.77752	319.7	564.0	567.1	HD_CAM: start Marker 109 area and environs. Looking for fluid sampling sites.
2149	J2-489	3/20/2010 20:42	14.60087	144.77751	318.2	564.8	566.9	Lots of fluid coming out of the sediments here. A whole bunch of shrimp; limpets.
2150	J2-489	3/20/2010 20:43	14.60087	144.77752	317.5	564.8	567.0	BIOLOGY: other Shrimp. Not sure if they look paler than the shrimp we saw in the eruption area. Maybe?
2152	J2-489	3/20/2010 20:44	14.60089	144.77753	318.3	564.8	566.9	Let's keep looking around here. Zooming in on 2 crabs.
2153	J2-489	3/20/2010 20:45	14.60090	144.77754	318.2	564.8	567.0	Zooming in on the crab here. Looks like there may be others in the crack.
2154	J2-489	3/20/2010 20:45	14.60090	144.77754	317.9	564.8	566.9	BIOLOGY: Austinograea(crap) zoom.
2156	J2-489	3/20/2010 20:46	14.60089	144.77752	318.3	564.8	566.9	The survivors. Some large limpets here. Lots of shrimp.
2158	J2-489	3/20/2010 20:48	14.60088	144.77752	318.1	564.8	566.9	There are lots of limpets here. The shrimp may be less dense. The big shrimp are on the high spots.
2159	J2-489	3/20/2010 20:48	14.60089	144.77752	317.9	564.8	567.0	A little shrimp is hitching a ride on the big guy.
2160	J2-489	3/20/2010 20:49	14.60090	144.77754	317.8	564.8	567.0	BIOLOGY: Alvinocaris(shrimp) Here comes the big guy.
2162	J2-489	3/20/2010 20:50	14.60090	144.77754	317.5	564.8	566.0	Great video of the shrimp. Many more of the Opaepale shrimp than the Alvinocaris.
2163	J2-489	3/20/2010 20:51	14.60090	144.77754	317.6	564.8	566.9	Putting the lasers on.
2164	J2-489	3/20/2010 20:51	14.60090	144.77754	317.7	564.8	566.9	Lots of the shrimp could have been swept away with the avalanche?
2167	J2-489	3/20/2010 20:54	14.60090	144.77754	318.0	564.7	567.0	BIOLOGY: other Seeing lots of limpets and their egg sacs. Mainly Opaepale and they look lighter here. May be because of the mat that gets stuck on their carapace. They are also lighter when they molt.

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2168	J2-489	3/20/2010 20:54	14.60090	144.77754	317.4	564.7	567.0	BIOLOGY: Opaepele(shrimp) They are larger here than at the eruption site.
2169	J2-489	3/20/2010 20:55	14.60090	144.77754	316.6	564.7	567.0	HD_CAM: stop
2173	J2-489	3/20/2010 21:00	14.60090	144.77753	315.3	564.6	566.8	We Are only a couple meters to the SE of the Mkr109 on the other side of the outcrop. Z=565. Just west of Mkr112. Hdg=315.
2175	J2-489	3/20/2010 21:02	14.60090	144.77753	315.3	564.6	566.8	SAMPLE: bio J489-shrimp-3. Suction of shrimp. Trying to get both species. ~2m SE Mkr109. Z=565. Just W of Mkr112. Hdg=315.
2176	J2-489	3/20/2010 21:03	14.60090	144.77753	315.2	564.7	567.0	HD_CAM: start Started at 2100. Shrimp slurping. Trying to get both species here.
2181	J2-489	3/20/2010 21:10	14.60090	144.77750	315.1	564.7	567.0	SAMPLE NUMBER CORRECTION This is sample 2 not sample 3. J489-shrimp-2 cont. Sample for John Sherrin and Verena. Z=565.
2182	J2-489	3/20/2010 21:11	14.60089	144.77752	315.0	564.7	567.0	HD_CAM: stop 2111.
2188	J2-489	3/20/2010 21:21	14.60089	144.77751	331.5	562.7	567.2	Stowing the suction sampler.
2192	J2-489	3/20/2010 21:26	14.60085	144.77751	227.5	567.2	567.9	Going to look for Mkr-113 just south of here at Sulfur Slide.
2193	J2-489	3/20/2010 21:26	14.60085	144.77750	227.4	567.4	568.2	Lasers off.
2194	J2-489	3/20/2010 21:27	14.60081	144.77754	105.2	564.7	572.9	There it is! Mkr-113 14 36.051 144 46.651.
2196	J2-489	3/20/2010 21:28	14.60078	144.77753	344.4	569.5	576.1	Great overview of knife ridge on approach.
2197	J2-489	3/20/2010 21:29	14.60077	144.77754	346.3	570.1	576.3	Depth is the same and heading. Looking for any animals.
2198	J2-489	3/20/2010 21:29	14.60076	144.77755	346.5	570.1	576.3	There are a few shrimp still here.
2200	J2-489	3/20/2010 21:30	14.60076	144.77755	346.4	570.1	576.3	Looks about the same as last year.
2201	J2-489	3/20/2010 21:30	14.60076	144.77754	346.3	570.1	576.3	Looks like all these shrimp are grazers so do not want to put a trap here.
2202	J2-489	3/20/2010 21:31	14.60077	144.77756	341.7	569.4	575.0	Problem with frame grabber.
2204	J2-489	3/20/2010 21:32	14.60077	144.77757	325.5	569.2	572.3	Position is about the same as the pre-cruise marker position.
2206	J2-489	3/20/2010 21:34	14.60070	144.77751	340.6	576.3	584.4	Moving along the knife edge over to the other face.
2207	J2-489	3/20/2010 21:35	14.60069	144.77751	346.2	576.5	582.3	At the nose of the ridge-great view.
2209	J2-489	3/20/2010 21:37	14.60077	144.77738	55.0	575.7	582.8	Shear cliff with great layers.
2211	J2-489	3/20/2010 21:38	14.60078	144.77742	63.6	575.6	583.0	Lots of shrimp on the side of this cliff.
2212	J2-489	3/20/2010 21:39	14.60079	144.77742	63.4	576.0	582.7	Great layers of sulfur with shrimp covering the slope.
2214	J2-489	3/20/2010 21:40	14.60082	144.77741	81.8	575.6	581.1	Going to go to the base of this cliff before heading back to Mkr-109.
2215	J2-489	3/20/2010 21:41	14.60080	144.77741	61.3	577.9	583.1	Amazing wall of layers with large sediment slope near base.
2217	J2-489	3/20/2010 21:42	14.60076	144.77743	45.6	581.8	586.0	Bill thinks this looks different than last year-maybe it was eroded or scoured.
2218	J2-489	3/20/2010 21:43	14.60076	144.77744	46.0	582.2	585.5	Getting a close-up view of the wall with the DSC.
2219	J2-489	3/20/2010 21:43	14.60076	144.77744	45.8	581.9	585.6	Lots of grazer shrimps on the wall.
2224	J2-489	3/20/2010 21:50	14.60077	144.77738	62.4	581.6	585.2	This area looks different and a lot deeper than it was last year.
2225	J2-489	3/20/2010 21:51	14.60075	144.77741	326.7	581.6	586.1	Looking for Marker 111. It was at the base of this cliff. We could be on the edge of this slide. The wall didn't look like this last year.

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2228	J2-489	3/20/2010 21:54	14.60077	144.77746	16.3	579.3	586.0	Looking at the ridges and in between the ridges here. The old sulfur slide area would be to the right on the scene.
2229	J2-489	3/20/2010 21:55	14.60075	144.77746	16.0	579.5	586.7	It looks like a fresh slide in front of us between the 2 main ridges here.
2230	J2-489	3/20/2010 21:55	14.60078	144.77739	35.0	579.8	585.7	HD_CAM: start Looking at this area where the markers were all clustered. Looking for Mkr-111.
2232	J2-489	3/20/2010 21:56	14.60080	144.77741	46.0	579.6	583.9	It looks like the edge of the cliff face was scoured out.
2233	J2-489	3/20/2010 21:57	14.60080	144.77742	47.3	576.9	583.0	Bill thinks the debris flow scoured past here on the west side of this steep ridge.
2235	J2-489	3/20/2010 21:59	14.60084	144.77744	64.5	575.7	580.2	Looks like sulfur-cemented ash plates along this western side of the westernmost ridge here.
2236	J2-489	3/20/2010 21:59	14.60084	144.77744	63.2	575.3	580.4	See shrimp and a scaleworm.
2238	J2-489	3/20/2010 22:01	14.60085	144.77745	63.7	575.3	580.4	BIOLOGY: Opaepele(shrimp) up against this western wall face with plates of sed/sulfur?
2241	J2-489	3/20/2010 22:04	14.60086	144.77744	63.9	575.3	580.5	BIOLOGY: other Scaleworms here. Several of them. Shrimp here too (Opaepele).
2242	J2-489	3/20/2010 22:04	14.60085	144.77744	63.9	575.3	580.5	The scaleworm just punched a shrimp.
2243	J2-489	3/20/2010 22:05	14.60084	144.77744	63.9	575.3	580.5	BIOLOGY: The same group of scaleworms that munch on the tubeworms at Axial.
2245	J2-489	3/20/2010 22:06	14.60083	144.77745	64.0	575.3	580.5	Looking at scaleworms with the HD cam.
2247	J2-489	3/20/2010 22:08	14.60084	144.77744	64.1	575.3	580.5	BIOLOGY: other scaleworms. Only about 2cm long. Not sure what they eat. We have seen a few individuals on Rota before so not a total surprise.
2248	J2-489	3/20/2010 22:09	14.60084	144.77742	68.7	574.1	579.7	A minor little slide created by Jason. This is quite a fragile surface.
2250	J2-489	3/20/2010 22:10	14.60085	144.77743	81.6	574.3	578.3	We haven't seen the new species of barnacles yet. Hopefully it is still here but no sign of it.
2251	J2-489	3/20/2010 22:11	14.60086	144.77743	80.7	574.3	578.2	Zooming in with the HD and looking around.
2253	J2-489	3/20/2010 22:13	14.60087	144.77743	81.2	574.3	578.3	Two scaleworms; shrimp and limpet egg cases.
2255	J2-489	3/20/2010 22:14	14.60087	144.77743	81.2	574.3	578.3	Lots of shrimp feces.
2257	J2-489	3/20/2010 22:16	14.60085	144.77743	81.2	565.8	577.8	We're going to follow the ridge crest up to Mkr109. Did not see Mkr111.
2259	J2-489	3/20/2010 22:18	14.60086	144.77747	71.8	563.1	571.4	Looked like Mkr109 right here. Looking at Mkr112 up ahead in the HDCam. That one was deployed on this dive.
2262	J2-489	3/20/2010 22:22	14.60092	144.77749	167.3	563.8	566.3	Moving around to travel up the western side of this ridge. There are some very black sediments along the western edge of this ridge. Bill thinks it eroded out here.
2263	J2-489	3/20/2010 22:23	14.60092	144.77750	186.4	563.4	565.0	BIOLOGY: Opaepele(shrimp) A plethora of shrimp right here on the wall by Mkr109.
2265	J2-489	3/20/2010 22:24	14.60092	144.77750	185.9	563.5	565.0	HD_CAM: stop Ran out of HD tape.
2266	J2-489	3/20/2010 22:25	14.60091	144.77750	186.9	564.0	565.0	HD_CAM: start We just inserted another HD tape. This is tape #3. Our 3rd HDCam tape of the cruise.

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2268	J2-489	3/20/2010 22:26	14.60091	144.77750	186.4	564.0	565.0	We are going to put a shrimp trap out; and MTR out; and possibly a shrimp exclusion trap.
2269	J2-489	3/20/2010 22:27	14.60091	144.77749	187.1	564.0	565.0	We're looking at the white mat on these rocks that the shrimp are grazing upon. Lots of shimmering water here.
2271	J2-489	3/20/2010 22:28	14.60092	144.77750	185.5	564.0	565.1	We're on the other side of the outcrop from the marker.
2272	J2-489	3/20/2010 22:28	14.60092	144.77750	185.6	564.0	565.1	HD_CAM: start
2273	J2-489	3/20/2010 22:28	14.60092	144.77750	186.3	564.0	565.0	Looking at the spot where we hope to deploy the shrimp trap etc.
2274	J2-489	3/20/2010 22:29	14.60092	144.77750	185.3	564.0	565.1	Lots of limpets here.
2276	J2-489	3/20/2010 22:30	14.60091	144.77750	185.7	564.0	565.1	BIOLOGY: Opaepele(shrimp) Lots of white mat on their carapaces. Hardly see any of the Alvinocaris. There is one in the view. This is limpet heaven. They are everywhere in the field of view.
2277	J2-489	3/20/2010 22:31	14.60091	144.77750	185.7	564.0	565.1	There are lots of sizes of limpets here.
2278	J2-489	3/20/2010 22:31	14.60091	144.77749	186.1	564.0	565.1	Lasers on. Panning the camera straight up the rock.
2279	J2-489	3/20/2010 22:31	14.60091	144.77749	185.2	564.0	565.1	Zooming up.
2281	J2-489	3/20/2010 22:32	14.60091	144.77749	186.2	564.0	565.1	BIOLOGY: Alvinocaris(shrimp) The Alvinocaris nabbed an Opaepele.
2282	J2-489	3/20/2010 22:33	14.60092	144.77749	185.2	564.0	565.1	Here comes a crab up the rock. The shrimp are scattering. Lots of shimmer apparent in the pilot cam.
2284	J2-489	3/20/2010 22:34	14.60092	144.77750	185.7	564.0	565.1	One of the limpets is moving. It's quite large and we're not sure what it's doing.
2285	J2-489	3/20/2010 22:34	14.60092	144.77751	185.4	564.0	565.1	We see scaleworms here too. It's abundant with life here.
2286	J2-489	3/20/2010 22:35	14.60092	144.77751	186.1	564.0	565.1	Huge crab on the top of that rock. A ton of shrimp up above him.
2288	J2-489	3/20/2010 22:36	14.60092	144.77751	186.5	564.0	565.1	BIOLOGY: Austinograea(crap) Two crabs in the view. See more than one here.
2289	J2-489	3/20/2010 22:36	14.60092	144.77751	186.1	564.0	565.1	Crab ambush. The one didn't want to fight.
2290	J2-489	3/20/2010 22:37	14.60093	144.77751	186.2	564.0	565.2	Lots and lots of biology here. Shrimp; limpets; scaleworms; crabs.
2291	J2-489	3/20/2010 22:37	14.60093	144.77751	186.4	564.0	565.1	BIOLOGY: Alvinocaris(shrimp)
2293	J2-489	3/20/2010 22:39	14.60093	144.77751	186.5	564.0	565.1	Going to deploy the exclusion trap here.
2295	J2-489	3/20/2010 22:40	14.60093	144.77752	186.2	564.0	565.1	Verena is in the hotseat now. Bill is manipulating the HD now.
2296	J2-489	3/20/2010 22:40	14.60093	144.77752	186.2	564.0	565.1	HD_CAM: stop
2298	J2-489	3/20/2010 22:43	14.60093	144.77752	186.1	564.0	565.1	Zooming out to get a good look at this spot.
2300	J2-489	3/20/2010 22:44	14.60093	144.77753	186.2	562.7	564.9	The "exclusion" trap is like a little garbage can with a lid to keep the shrimp out. Will place a rock with mat in the trap and hope to grow the mat that the shrimp eat.
2301	J2-489	3/20/2010 22:45	14.60093	144.77753	185.9	562.6	565.0	The exclusion trap is an experiment to actually collect the mat that the shrimp eat without the shrimp grazing it.
2303	J2-489	3/20/2010 22:47	14.60093	144.77752	184.8	562.6	565.0	Jason is working to get the exclusion trap out of the milk crate.
2305	J2-489	3/20/2010 22:49	14.60093	144.77752	184.4	562.7	565.0	Good job opening the lid of the mesh garbage can. It has been slightly dented.
2307	J2-489	3/20/2010 22:50	14.60093	144.77753	184.4	562.8	565.0	Next will pick up a rock with mat on it.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2309	J2-489	3/20/2010 22:53	14.60093	144.77751	211.3	564.1	565.9	Marker 109 is just a few meters to the south (heading 187) from our deployment site.
2311	J2-489	3/20/2010 22:56	14.60092	144.77752	211.4	564.0	623.2	Got a nice rock here. Jason placed it in the can and it going for another on. Lots of mat has been stirred up.
2312	J2-489	3/20/2010 22:56	14.60092	144.77752	211.5	564.1	623.2	The outcrop is very fragile and crumbles in Jason's claw.
2315	J2-489	3/20/2010 23:03	14.60093	144.77752	211.5	564.0	564.8	Trying to get 1 more piece.
2317	J2-489	3/20/2010 23:04	14.60093	144.77752	211.6	564.0	564.8	There are several rocks in the exclusion trap now. They are mat-coated - at least partially. A couple of big rocks in there.
2320	J2-489	3/20/2010 23:08	14.60093	144.77752	211.8	564.0	564.8	DEPLOY shrimp exclusion trap there in the Mkr109 area. 144.77752 46.6512 14.60093 36.0560. Z=564m. Hdg211.5
2322	J2-489	3/20/2010 23:10	14.60092	144.77754	247.4	563.3	564.1	Dropped the trap and it is upside down now.
2324	J2-489	3/20/2010 23:12	14.60090	144.77754	339.3	565.3	568.2	Maneuvering around the outcrop to retrieve the upside-down exclusion trap. The rocks are not in there.
2326	J2-489	3/20/2010 23:14	14.60090	144.77754	341.2	565.2	568.2	The rocks are in there after all. The exclusion trap is upside down. Next need to bungee it closed.
2329	J2-489	3/20/2010 23:19	14.60089	144.77754	339.0	565.3	568.1	Pretty amazing maneuvering with the manipulator There are several shrimp inside. Zoomed in with the HD cam to look for shimmer.
2331	J2-489	3/20/2010 23:20	14.60089	144.77754	339.1	565.3	568.1	See a bit of shimmer in this area. Will just leave it here. Taking some HD frame grabs here.
2333	J2-489	3/20/2010 23:21	14.60090	144.77753	339.0	565.3	568.1	There are shrimp in there. Bill and Verena think there is just one shrimp inside.
2334	J2-489	3/20/2010 23:22	14.60089	144.77756	336.5	564.5	567.7	The next task is to put out another shrimp trap and an MTR.
2336	J2-489	3/20/2010 23:24	14.60088	144.77751	54.0	561.6	567.1	Marker 112 slid down the ledge a bit. Will want to reposition the one that slide down slope.
2337	J2-489	3/20/2010 23:25	14.60089	144.77750	53.9	558.7	568.3	Mkr112 is halfway down the slope floating sideways.
2338	J2-489	3/20/2010 23:25	14.60089	144.77750	53.7	557.7	568.8	Still don't see Mkr109.
2341	J2-489	3/20/2010 23:28	14.60090	144.77750	75.0	562.6	569.5	We see Mkr109 which slid downslope a bit. We will move them both back up hill.
2342	J2-489	3/20/2010 23:29	14.60090	144.77751	77.6	564.2	568.0	First we will finish the deployment of instruments.
2343	J2-489	3/20/2010 23:29	14.60091	144.77750	70.2	564.5	568.0	There are tons of shrimp here on top of this ledge where the shrimp trap will be deployed.
2345	J2-489	3/20/2010 23:31	14.60091	144.77750	74.3	564.4	568.2	DEPLOY: Shrimp trap #3 deployed in an area with lots of shrimp on this outcrop where Mkr109 will be re-deployed (it slid downhill) after this deployment.
2346	J2-489	3/20/2010 23:31	14.60091	144.77750	73.9	564.4	565.2	Shrimp trap #3 on the top of the rise near Mkr109.
2349	J2-489	3/20/2010 23:34	14.60091	144.77750	74.6	564.4	568.6	DEPLOY: MTR#4 being deployed right next to shrimp trap 3.
2350	J2-489	3/20/2010 23:34	14.60091	144.77750	74.4	564.5	568.6	We are thinking of taking a gastight right here where the flow is.
2353	J2-489	3/20/2010 23:38	14.60090	144.77749	59.9	564.2	568.3	Grabbing Mkr109 back on top of this outcrop.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2354	J2-489	3/20/2010 23:39	14.60090	144.77749	63.0	564.0	567.5	Dara is seeing noise in the USBL. He wants to secure the broad-band and only use the narrow-band ADCP.
2356	J2-489	3/20/2010 23:40	14.60093	144.77748	96.1	563.9	568.1	The marker has been moved to the other edge of the ridge right next to the instruments.
2357	J2-489	3/20/2010 23:41	14.60091	144.77752	202.6	564.0	564.7	It looks like this whole slope has been scoured out to the W/NW of this ridge.
2359	J2-489	3/20/2010 23:42	14.60092	144.77752	202.7	563.9	564.7	Tons of shrimp here. Looking for some flow to do a gastight.
2360	J2-489	3/20/2010 23:43	14.60092	144.77752	202.6	563.9	564.7	The ADCP is now only operating in the lower frequency.
2361	J2-489	3/20/2010 23:43	14.60092	144.77752	202.7	563.9	564.7	There is lots of slow here.
2363	J2-489	3/20/2010 23:45	14.60091	144.77753	199.6	562.9	564.2	Please disregard the last entry. I have no idea what I was typing.
2365	J2-489	3/20/2010 23:47	14.60093	144.77751	216.8	563.6	752.2	They are experimenting with the low and high frequency bands for ADCP to see what may be causing some nav noise.
2369	J2-489	3/20/2010 23:53	14.60093	144.77752	217.0	563.2	563.9	Shift change here. Bob is taking over for Leigh. Andra taking over for Susan.
2371	J2-489	3/20/2010 23:56	14.60093	144.77751	225.4	563.7	669.9	Setting up for gastight sample.
2372	J2-489	3/20/2010 23:57	14.60093	144.77751	224.9	563.6	641.9	Arm having hard time reaching the crack that the higher flow is coming from.
2373	J2-489	3/20/2010 23:58	14.60093	144.77751	224.7	563.6	646.8	Wand is in the crack below Mkr-109. Looking for best spot.
2374	J2-489	3/20/2010 23:59	14.60093	144.77752	224.6	563.6	666.2	SAMPLE: gas J489-GTB-03 Orange and Black tape at Mkr-109. Fired.
2375	J2-489	3/21/2010 0:00	14.60094	144.77753	225.2	563.4	595.9	Stowing the GTB back in the basket.
2376	J2-489	3/21/2010 0:02	14.60094	144.77754	224.0	563.4	680.2	Basket out and in-bottle secure.
2377	J2-489	3/21/2010 0:03	14.60095	144.77754	226.9	563.4	626.4	Nice view of the trap; marker; exclusion trap; MTR
2378	J2-489	3/21/2010 0:03	14.60095	144.77753	230.9	563.1	666.1	Going back to Mkr-112 to put it back up on top of the ridge.
2379	J2-489	3/21/2010 0:04	14.60095	144.77752	222.6	562.4	563.5	NAV: Doppler Reset
2380	J2-489	3/21/2010 0:05	14.60094	144.77751	229.4	559.4	563.4	Positioning to get the marker which we saw just after backing away from Mkr-109 gear.
2381	J2-489	3/21/2010 0:05	14.60090	144.77749	26.5	560.5	570.1	Great view of how Mkr-112 slid down away from other shrimp traps. Very close to Mkr109.
2384	J2-489	3/21/2010 0:08	14.60089	144.77753	355.1	564.6	568.2	Jason grabbed Mrk-112.
2385	J2-489	3/21/2010 0:08	14.60090	144.77753	348.0	564.3	567.7	Can see the trap and MTR where it should be placed back at.
2387	J2-489	3/21/2010 0:10	14.60092	144.77753	8.1	562.7	567.5	Very precarious location for instruments. Looks like trap in current location could fall down as well.
2388	J2-489	3/21/2010 0:11	14.60093	144.77755	3.7	562.6	566.3	Looks like Jason is under the ship-Medea is aft.
2390	J2-489	3/21/2010 0:12	14.60093	144.77756	2.0	562.6	566.1	Placed anchor on rock at top of ridge. Mkr-112 14 36056 155 46.654.
2391	J2-489	3/21/2010 0:13	14.60093	144.77755	348.8	562.8	566.0	Wait-need to move marker out of the way to get that shrimp trap into a better position.
2393	J2-489	3/21/2010 0:14	14.60093	144.77755	344.4	562.8	565.8	Crab climbing up the slope during ops.
2394	J2-489	3/21/2010 0:14	14.60093	144.77755	344.9	562.9	564.8	Port arm is grabbing trap while Stbd arm is holding marker out of the way.

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2395	J2-489	3/21/2010 0:15	14.60093	144.77756	345.2	562.9	565.8	Moved trap up on to the ridge again-wants to slip down.
2397	J2-489	3/21/2010 0:15	14.60092	144.77756	346.0	562.8	565.4	New placement of trap on top of ridge on the flattest-largest piece available.
2398	J2-489	3/21/2010 0:17	14.60092	144.77755	345.1	562.8	565.5	Putting the marker back next to trap. Mkr-112 z=562.8 14deg 36.056 144deg 46.653. Hdg=345.
2399	J2-489	3/21/2010 0:17	14.60092	144.77755	345.2	562.8	565.5	Nice view of the Mkr-112 instrument site.
2402	J2-489	3/21/2010 0:20	14.60093	144.77754	345.4	562.8	565.6	Target on Medea sonar 40m away at 345 that has been steady-could be RAS or what?
2404	J2-489	3/21/2010 0:23	14.60092	144.77755	345.2	562.4	566.0	Going to drive due west to look for RAS mooring but heading for the sonar target seen on Medea.
2406	J2-489	3/21/2010 0:24	14.60091	144.77752	338.0	560.3	567.5	Nice overview of the site.
2407	J2-489	3/21/2010 0:24	14.60090	144.77750	335.7	560.3	568.7	There is Mkr-109 in brow cam.
2408	J2-489	3/21/2010 0:24	14.60089	144.77747	334.6	560.4	570.1	Jason is turning toward sonar target and will scan.
2409	J2-489	3/21/2010 0:25	14.60088	144.77746	274.1	560.3	566.6	Mkr-109 was laying down flat-bit of a current around the ridge.
2411	J2-489	3/21/2010 0:27	14.60089	144.77746	289.5	559.9	569.1	Target is 30m away on Jason sonar.
2412	J2-489	3/21/2010 0:27	14.60089	144.77745	289.7	559.9	568.6	Bit murky view with Jason-better view with Medea.
2413	J2-489	3/21/2010 0:27	14.60089	144.77740	284.1	560.4	571.3	Getting closer.
2415	J2-489	3/21/2010 0:28	14.60085	144.77707	275.9	561.3	589.4	Thought saw something but lost it.
2416	J2-489	3/21/2010 0:29	14.60084	144.77707	277.1	562.8	590.8	Going down deeper.
2417	J2-489	3/21/2010 0:29	14.60084	144.77706	275.6	567.8	589.1	Jason is high off bottom mid-water 566.
2419	J2-489	3/21/2010 0:29	14.60079	144.77714	269.9	578.5	584.2	Bottom at 578.
2420	J2-489	3/21/2010 0:31	14.60078	144.77713	270.5	578.0	584.1	Need to do some vehicle management.
2422	J2-489	3/21/2010 0:33	14.60078	144.77713	270.4	578.4	584.1	Need to drive Medea down to give us some more maneuvering capability.
2423	J2-489	3/21/2010 0:33	14.60078	144.77714	270.2	578.2	584.1	Going to move Jason nearer to Medea before searching for target again.
2425	J2-489	3/21/2010 0:33	14.60076	144.77724	275.0	577.6	589.8	Rubbly bottom looking due west-no Jason sonar targets at this heading-clear water.
2426	J2-489	3/21/2010 0:34	14.60082	144.77726	270.7	579.5	585.0	Can see sediment slope in brown camp and butt cam. Streaks of white sediment.
2427	J2-489	3/21/2010 0:34	14.60087	144.77731	323.7	578.7	583.2	Big scarp with streaks.
2428	J2-489	3/21/2010 0:35	14.60087	144.77731	66.7	578.5	582.0	Beautiful.
2431	J2-489	3/21/2010 0:35	14.60087	144.77731	74.4	578.1	582.4	Recent sliding-black
2432	J2-489	3/21/2010 0:35	14.60087	144.77733	74.1	578.1	581.0	Jason is south of Mkr101 target looking east.
2434	J2-489	3/21/2010 0:36	14.60087	144.77735	78.3	578.2	580.8	Lots of shrimp on the white sediment.
2435	J2-489	3/21/2010 0:36	14.60087	144.77738	74.3	577.8	580.3	Can see the Mkr109 area in the Medea cam.
2436	J2-489	3/21/2010 0:36	14.60086	144.77739	60.7	576.0	580.7	Swinging around to the NW for a view to the mooring site.
2437	J2-489	3/21/2010 0:36	14.60086	144.77738	355.8	574.3	581.8	Great views.
2440	J2-489	3/21/2010 0:37	14.60090	144.77736	356.6	574.2	580.2	Ripples perpendicular to slope probably due to the current

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2441	J2-489	3/21/2010 0:37	14.60093	144.77736	356.0	574.0	578.6	Lots of recent sulfur disposition.
2442	J2-489	3/21/2010 0:37	14.60096	144.77733	349.0	570.6	577.2	Rock ridge coming up with sediment slope below.
2444	J2-489	3/21/2010 0:38	14.60093	144.77725	326.4	571.5	581.2	Mooring used to be west of this location.
2445	J2-489	3/21/2010 0:38	14.60093	144.77727	330.6	571.7	580.4	Jason going to do a 360 to look for sonar
2446	J2-489	3/21/2010 0:39	14.60095	144.77726	330.8	571.5	581.8	Sharp sonar target is probably the rock in front of us at the top of the sediment ridge.
2448	J2-489	3/21/2010 0:40	14.60096	144.77724	274.1	571.6	579.7	Looking at profile of ridge top.
2449	J2-489	3/21/2010 0:40	14.60095	144.77716	270.9	571.9	579.1	We are looking west and marker deployment was at hdg350 just below ridge top.
2450	J2-489	3/21/2010 0:41	14.60093	144.77716	270.5	571.5	579.5	No sonar targets due west-all water above ridge top.
2452	J2-489	3/21/2010 0:43	14.60095	144.77717	36.6	571.7	578.6	Have not seen Mkr-101 yet.
2453	J2-489	3/21/2010 0:43	14.60096	144.77718	40.7	572.2	578.8	Looks like rock cap on top of the summit with sediment streaking down.
2455	J2-489	3/21/2010 0:43	14.60098	144.77719	26.7	571.3	577.5	Ridge is 572m and knife-like.
2456	J2-489	3/21/2010 0:44	14.60101	144.77721	32.3	567.3	572.0	Following the ridge line at z568 hdg029.
2458	J2-489	3/21/2010 0:46	14.60098	144.77731	105.8	556.5	573.5	Jason is looking at Medea in pilot cam.
2459	J2-489	3/21/2010 0:47	14.60092	144.77732	175.1	556.3	575.6	Going to head due south to look for Mkr-101 again. We are higher than the marker depth at present.
2461	J2-489	3/21/2010 0:48	14.60092	144.77735	166.6	562.2	571.1	NAV: Doppler Reset We are on top of the old marker position. Doppler is not tracking.
2463	J2-489	3/21/2010 0:51	14.60093	144.77741	37.3	567.4	571.2	Looking along the ridge.
2464	J2-489	3/21/2010 0:51	14.60095	144.77740	43.8	567.1	571.0	Looks like a big sediment slide from ridge.
2466	J2-489	3/21/2010 0:52	14.60097	144.77725	14.8	571.1	578.8	Terrain looks fairly similar here to last year.
2467	J2-489	3/21/2010 0:53	14.60095	144.77724	8.7	572.9	580.3	Looking up and down the ridge face. at 570m.
2468	J2-489	3/21/2010 0:53	14.60095	144.77724	8.0	575.0	579.0	Sharp contact between rippled sediment and the rock top.
2470	J2-489	3/21/2010 0:54	14.60098	144.77724	10.8	570.8	578.8	Looks like the same place but no Marker. Scanning entire face of ridge.
2471	J2-489	3/21/2010 0:55	14.60097	144.77732	5.0	567.5	575.8	Dropping down one more time to look for the marker.
2473	J2-489	3/21/2010 0:57	14.60095	144.77733	10.9	570.7	576.5	At 570 again and do not see it anywhere. The slope below the top is steep and looks freshly slid.
2474	J2-489	3/21/2010 0:57	14.60095	144.77733	10.8	570.7	573.5	There is shrimp here but so far no barnacles seen.
2476	J2-489	3/21/2010 0:58	14.60100	144.77735	7.6	568.2	573.4	Lots of sulfur on ridge top and shrimp.
2477	J2-489	3/21/2010 0:59	14.60099	144.77735	7.6	568.2	573.5	Crust or plate like rock.
2478	J2-489	3/21/2010 0:59	14.60099	144.77735	7.5	568.1	573.5	Did not see barnacles.
2480	J2-489	3/21/2010 1:00	14.60094	144.77740	123.1	565.7	572.5	Going to maneuver to get to base of this structure and look at geology.
2481	J2-489	3/21/2010 1:00	14.60093	144.77741	115.8	566.3	573.0	Good view behind vehicle of the Mkr-109 site.
2482	J2-489	3/21/2010 1:01	14.60092	144.77742	115.7	566.0	572.9	good view of the vertical slices of rocks.
2483	J2-489	3/21/2010 1:01	14.60092	144.77744	116.1	564.8	569.5	Pilot cam view of Mkr-112 and Mkr-109.
2485	J2-489	3/21/2010 1:02	14.60092	144.77744	115.9	561.0	569.4	Nice view of all the instruments.
2486	J2-489	3/21/2010 1:02	14.60092	144.77745	116.0	558.0	563.7	Need to move about 50m west so we can get down to the base of the hole.

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2487	J2-489	3/21/2010 1:03	14.60092	144.77745	118.2	557.9	568.0	Ship is going to move west.
2489	J2-489	3/21/2010 1:04	14.60091	144.77745	264.9	557.8	565.0	Floating jelly.
2490	J2-489	3/21/2010 1:04	14.60090	144.77745	264.8	557.8	565.2	Waiting for ship
2493	J2-489	3/21/2010 1:09	14.60079	144.77744	267.6	568.0	578.3	Butt cam view of the markers again.
2494	J2-489	3/21/2010 1:09	14.60079	144.77743	267.8	565.9	578.6	Pilot view of sediment streaks.
2495	J2-489	3/21/2010 1:09	14.60079	144.77743	267.5	564.7	573.4	Waiting for ship
2497	J2-489	3/21/2010 1:11	14.60072	144.77714	263.9	566.5	587.4	Jason is now driving west mid-water with totalZ=580+. Can still see ridge behind us barely.
2500	J2-489	3/21/2010 1:12	14.60067	144.77711	267.7	566.7	584.4	Visibility is a bit cloudy.
2501	J2-489	3/21/2010 1:12	14.60067	144.77713	268.0	573.7	586.7	Seeing smoke in Medea cam.
2502	J2-489	3/21/2010 1:13	14.60067	144.77715	267.8	578.1	588.0	Ridge below us that looks intact. Maybe smoke is from Brimstone ~100m away.
2504	J2-489	3/21/2010 1:14	14.60078	144.77715	268.0	578.2	585.9	Had to wait for Medea before continuing west.
2505	J2-489	3/21/2010 1:15	14.60078	144.77716	268.1	578.2	585.8	Butt cam has views of streaky sediment slope.
2507	J2-489	3/21/2010 1:17	14.60084	144.77698	268.2	585.9	611.6	Going to move the ship 50m further to the west.
2509	J2-489	3/21/2010 1:19	14.60089	144.77699	270.0	591.5	608.2	Medea wench cable is overheating need to shut down operations
2511	J2-489	3/21/2010 1:20	14.60086	144.77702	261.0	597.4	609.3	limiting movement of ship and Medea
2513	J2-489	3/21/2010 1:23	14.60089	144.77665	81.0	611.3	621.5	We are about where we wanted to get west-few more meters.
2514	J2-489	3/21/2010 1:23	14.60089	144.77664	121.8	611.4	620.2	Doing sonar scan of the site before surveying.
2516	J2-489	3/21/2010 1:25	14.60090	144.77665	13.2	611.4	622.4	Searching for the RAS. Looking down a shoot with walls all around.
2518	J2-489	3/21/2010 1:26	14.60090	144.77663	246.5	611.4	621.8	We're down in a hold here. The wall is vertical. It looks like we are on the west side of the collapse.
2519	J2-489	3/21/2010 1:26	14.60091	144.77664	112.6	611.4	619.7	See lots of sulfur on the edges of the wall.
2520	J2-489	3/21/2010 1:27	14.60078	144.77679	130.9	619.0	629.4	We're heading 130° down toward the southern shoot. 620m water depth here.
2522	J2-489	3/21/2010 1:28	14.60077	144.77679	165.4	618.9	629.8	We are 82m from Mkr109.
2523	J2-489	3/21/2010 1:29	14.60078	144.77679	274.1	619.1	631.0	Walls on either side looking sort of downslope. It's an open chute.
2525	J2-489	3/21/2010 1:30	14.60088	144.77657	277.1	619.1	622.9	Let's have a look at this western wall.
2527	J2-489	3/21/2010 1:32	14.60088	144.77657	274.5	619.0	622.7	Sediment on the bottom and sulfur or mat?? Lots of shrimp on the wall. Not sure what the white stuff is.
2529	J2-489	3/21/2010 1:34	14.60087	144.77656	301.0	615.1	623.8	Maybe there is hydrothermal flow coming out of the base of the wall.
2530	J2-489	3/21/2010 1:35	14.60090	144.77659	303.4	615.0	622.8	That wall looks pretty freshly exposed. No altering on it. All the white stuff is on the bottom and none as we go up.
2532	J2-489	3/21/2010 1:36	14.60090	144.77659	303.3	615.7	622.8	Lasers on.
2533	J2-489	3/21/2010 1:37	14.60090	144.77659	301.4	617.9	622.9	Zooming in on the shrimp on the wall. Will try to grab a rock here with the white coating.
2535	J2-489	3/21/2010 1:38	14.60089	144.77658	301.4	617.9	622.9	We can't move Medea right now. Something about the winch overheating.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2538	J2-489	3/21/2010 1:43	14.60089	144.77657	301.2	617.9	623.1	SAMPLE: geo J489-rock-04. Grabbed a rock (more like a block of sulfur) from the slide chute western wall. Z=618. 144.77657/5943 14.60089/36.0536.
2540	J2-489	3/21/2010 1:44	14.60088	144.77657	301.3	617.9	623.1	Going to maneuver the ship so that Medea can get out of this tight spot.
2542	J2-489	3/21/2010 1:47	14.60089	144.77653	283.1	575.2	621.6	Jason watch change while Medea is in the hole. Going to move Medea out of danger.
2547	J2-489	3/21/2010 1:51	14.60090	144.77648	250.3	568.1	586.7	We are facing the wall at 250deg. Want to come up the wall.
2548	J2-489	3/21/2010 1:51	14.60090	144.77647	249.8	566.1	576.0	We were base of wall facing west-sampling rock
2551	J2-489	3/21/2010 1:51	14.60090	144.77647	249.8	565.5	575.9	Great pinnacle in view-straight up.
2553	J2-489	3/21/2010 1:52	14.60090	144.77646	249.8	564.8	576.3	Sampled sulfur covered rock at base then came up since Medea in a tight spot.
2554	J2-489	3/21/2010 1:52	14.60090	144.77645	249.8	564.0	576.4	Facing west looking at upper part of wall.
2555	J2-489	3/21/2010 1:52	14.60090	144.77645	249.7	560.8	574.9	Still part of the slide-newly exposed rock. Guts of volcano laid bare.
2556	J2-489	3/21/2010 1:52	14.60090	144.77645	247.5	559.2	571.2	Bit of venting here as we climb up.
2557	J2-489	3/21/2010 1:52	14.60091	144.77644	249.9	558.7	573.6	Check for shrimp.
2558	J2-489	3/21/2010 1:53	14.60091	144.77644	249.8	557.5	574.2	Medea is in the clear here.
2560	J2-489	3/21/2010 1:54	14.60092	144.77643	249.6	555.5	565.8	Moving along the wall seeing some evidence of venting.
2561	J2-489	3/21/2010 1:55	14.60093	144.77643	249.9	554.2	564.2	Watches changed and lunch relief over.
2563	J2-489	3/21/2010 1:56	14.60093	144.77643	250.0	549.8	571.7	Still facing the wall but near the top.
2564	J2-489	3/21/2010 1:56	14.60092	144.77644	249.9	548.8	573.1	Wall is fairly bare here.
2565	J2-489	3/21/2010 1:56	14.60092	144.77644	249.2	548.2	572.9	Undercutting from scouring below.
2566	J2-489	3/21/2010 1:56	14.60092	144.77644	249.9	547.4	572.3	Layers of volcanic ash and lava here with scouring to create the overhangs.
2567	J2-489	3/21/2010 1:57	14.60091	144.77645	244.9	543.8	574.3	Some sulfur on top.
2568	J2-489	3/21/2010 1:57	14.60091	144.77646	244.7	542.0	575.2	Lots of overhang here at top-great view.
2569	J2-489	3/21/2010 1:57	14.60090	144.77645	245.1	540.3	573.3	Some venting evidence on top. Big block that survived.
2570	J2-489	3/21/2010 1:58	14.60090	144.77645	245.3	538.8	567.5	Looking down the scarp top with blocks of lava and light sediment coating.
2571	J2-489	3/21/2010 1:58	14.60090	144.77645	245.4	538.4	572.3	Top is 538m.
2572	J2-489	3/21/2010 1:58	14.60089	144.77644	245.2	537.9	542.7	We are just east of the old Mkr-115.
2573	J2-489	3/21/2010 1:59	14.60087	144.77643	245.1	537.9	543.0	Remnants of pillow basalts here-bit weathered.
2574	J2-489	3/21/2010 1:59	14.60087	144.77642	245.0	538.0	542.4	Large tube with sediment slides between.
2576	J2-489	3/21/2010 2:00	14.60086	144.77642	244.9	538.0	543.0	Large pillow lavas on top of ridge with flow direction downslope.
2577	J2-489	3/21/2010 2:01	14.60085	144.77639	245.2	537.4	541.9	Depths here are much shallower than the new bathymetry map.
2578	J2-489	3/21/2010 2:01	14.60084	144.77640	234.3	537.1	541.9	We are east of Mkr-115 where it should be 600m depth and instead it is 537.
2580	J2-489	3/21/2010 2:02	14.60083	144.77637	255.2	537.2	541.6	Big slabs and sediment reaching downslope.
2581	J2-489	3/21/2010 2:02	14.60082	144.77636	257.3	537.0	540.5	Lots of shrimp as we go up slope heading west.
2582	J2-489	3/21/2010 2:02	14.60082	144.77636	255.2	536.0	539.7	Sand ridge crest with depth still shallow.

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2583	J2-489	3/21/2010 2:03	14.60081	144.77634	255.2	535.7	538.3	Crab below near the shrimp which are clustered on the outcrop.
2585	J2-489	3/21/2010 2:05	14.60080	144.77629	304.2	532.8	537.3	There is an old marker! Marker 110 at the correct depth.
2587	J2-489	3/21/2010 2:06	14.60079	144.77629	315.2	532.8	537.6	Mkr-110 is at 14deg 36.049'N 144deg 46.577'E depth is 533.
2588	J2-489	3/21/2010 2:07	14.60078	144.77628	339.2	532.9	540.8	Bathymetry map is off-marker is at same depth as last year and looks very similar.
2589	J2-489	3/21/2010 2:07	14.60078	144.77627	339.3	532.8	537.6	Little more staining on the rock to the right as we face 338.
2590	J2-489	3/21/2010 2:07	14.60078	144.77627	339.2	532.8	541.1	Lots of shrimp here.
2592	J2-489	3/21/2010 2:09	14.60079	144.77627	339.2	532.4	535.9	Great view of site on Pilot cam.
2594	J2-489	3/21/2010 2:10	14.60080	144.77627	339.0	532.4	538.3	Good flow here in crack.
2596	J2-489	3/21/2010 2:11	14.60079	144.77627	339.1	532.4	538.1	We are at Mkr-110 Iceberg-09 site with shrimp and flow.
2597	J2-489	3/21/2010 2:12	14.60079	144.77627	339.6	532.8	538.6	Going to take a temperature of the flow spot and a gastight.
2599	J2-489	3/21/2010 2:14	14.60080	144.77628	339.9	532.9	538.2	Getting into position for sampling. Taking photos of the shrimp (both kinds) at crack.
2600	J2-489	3/21/2010 2:15	14.60081	144.77630	339.4	533.0	538.2	Temperature probe is not working (over 600deg!)
2601	J2-489	3/21/2010 2:15	14.60081	144.77630	339.4	533.0	538.2	Placing probe back into basket.
2603	J2-489	3/21/2010 2:17	14.60079	144.77629	339.6	533.0	538.2	This is the red tape gastight.
2604	J2-489	3/21/2010 2:17	14.60079	144.77629	339.5	533.0	538.2	Removing GTB from basket.
2606	J2-489	3/21/2010 2:18	14.60080	144.77629	339.4	533.0	538.2	Arm is having a bit of shaking problem.
2608	J2-489	3/21/2010 2:20	14.60082	144.77628	339.5	532.9	538.1	Zooming in with camera for sampling site.
2609	J2-489	3/21/2010 2:20	14.60082	144.77628	339.8	532.9	538.3	J489-GTB-05 Fired red gastight.
2610	J2-489	3/21/2010 2:21	14.60081	144.77628	340.0	533.0	538.2	Tip was in flow-not in sediment. Sample is 14deg 36.048'N 144deg 46.577'E z=533 HDG=340.
2612	J2-489	3/21/2010 2:23	14.60080	144.77627	340.0	533.0	538.2	Placing GTB back in basket.
2613	J2-489	3/21/2010 2:23	14.60080	144.77627	339.9	533.0	537.9	Going to take some close-up video of the shrimp here.
2615	J2-489	3/21/2010 2:24	14.60080	144.77628	326.7	532.7	537.1	HD_CAM: start Shrimp video.
2616	J2-489	3/21/2010 2:25	14.60080	144.77628	326.5	532.7	537.1	HD video of shrimp at Iceberg-09 Mkr-110.
2617	J2-489	3/21/2010 2:25	14.60080	144.77628	327.0	532.6	537.1	Larger orange shrimp concentrated on sulfur and flow.
2619	J2-489	3/21/2010 2:27	14.60081	144.77628	327.0	531.9	537.1	HD_CAM: stop Done with video survey. Stop HD.
2621	J2-489	3/21/2010 2:29	14.60066	144.77627	108.5	532.0	547.6	Heading to Mkr-105 due south of us.
2622	J2-489	3/21/2010 2:29	14.60065	144.77627	66.0	537.2	552.8	Lasers off.
2624	J2-489	3/21/2010 2:31	14.60072	144.77626	17.5	536.1	544.3	NAV: Doppler Reset
2626	J2-489	3/21/2010 2:32	14.60073	144.77627	39.9	535.3	543.7	At the area and this looks steeper than before.
2627	J2-489	3/21/2010 2:32	14.60072	144.77629	39.8	535.6	546.3	Lots of shrimp on the outcrop.
2628	J2-489	3/21/2010 2:32	14.60072	144.77628	32.7	535.3	546.9	Large boulder poised on edge of slope.
2630	J2-489	3/21/2010 2:34	14.60070	144.77620	32.1	537.7	552.4	Scanning the slope moving vehicle to the left along slope.
2631	J2-489	3/21/2010 2:35	14.60074	144.77614	36.3	537.6	558.9	Shear drop-off here
2633	J2-489	3/21/2010 2:36	14.60079	144.77609	14.9	537.3	549.5	Moving a bit around the corner here to get the correct heading.
2634	J2-489	3/21/2010 2:36	14.60080	144.77609	17.1	537.3	544.9	We are at the end of our rope here.
2635	J2-489	3/21/2010 2:36	14.60079	144.77612	50.4	537.5	547.6	Looks very fresh and steep. Could be in Brimstone smoke.

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2636	J2-489	3/21/2010 2:37	14.60082	144.77615	77.9	537.5	539.3	Taking some close-up of the wall here.
2637	J2-489	3/21/2010 2:37	14.60082	144.77616	77.7	537.4	544.6	NAV: Doppler Reset
2638	J2-489	3/21/2010 2:37	14.60082	144.77616	78.3	537.4	544.8	Lasers on.
2639	J2-489	3/21/2010 2:37	14.60082	144.77617	78.0	537.4	544.5	Looking for limpets here.
2641	J2-489	3/21/2010 2:38	14.60082	144.77617	68.7	537.4	544.6	We are in deep water-no evidence of any other markers surviving.
2642	J2-489	3/21/2010 2:38	14.60082	144.77618	69.1	537.4	544.8	Maybe Mkr-110 is the only survivor.
2643	J2-489	3/21/2010 2:38	14.60082	144.77618	68.7	537.4	544.7	Lots of shrimp (probably 2-3 year old).
2644	J2-489	3/21/2010 2:39	14.60082	144.77618	68.5	537.4	544.8	Haven't seen any limpets.
2645	J2-489	3/21/2010 2:39	14.60082	144.77618	68.8	537.5	544.8	Looking at gauges.
2646	J2-489	3/21/2010 2:39	14.60082	144.77618	68.8	537.5	544.9	Looks like mainly big shrimp here.
2648	J2-489	3/21/2010 2:40	14.60082	144.77619	68.6	537.3	544.3	HD_CAM: start Shrimp video.
2650	J2-489	3/21/2010 2:43	14.60082	144.77618	69.7	536.9	544.6	HD_CAM: stop
2651	J2-489	3/21/2010 2:43	14.60082	144.77618	68.7	536.8	544.6	Backing off of wall-turned off HD.
2652	J2-489	3/21/2010 2:43	14.60082	144.77619	68.9	536.1	543.6	Ship is going to move further west before we can head up to Mkr-115 area.
2654	J2-489	3/21/2010 2:44	14.60082	144.77619	68.8	536.0	543.6	Stained boulders with a lot of shrimp.
2655	J2-489	3/21/2010 2:44	14.60082	144.77619	69.1	535.6	543.5	Is it drips of sulfur?
2656	J2-489	3/21/2010 2:44	14.60082	144.77619	69.3	535.4	543.6	Boulders at top of ridge hanging over lip.
2657	J2-489	3/21/2010 2:45	14.60082	144.77619	69.2	536.0	542.5	Sediment on top of ridge. Overhanging pillows.
2659	J2-489	3/21/2010 2:46	14.60082	144.77619	69.1	536.2	542.2	We are at nav location for Mkr-108 which had a lot of sulfur staining and this area has it still.
2660	J2-489	3/21/2010 2:47	14.60082	144.77619	69.1	536.2	543.3	We are shallower the old Mkr-108 (we are at 536 and it was at 544).
2662	J2-489	3/21/2010 2:48	14.60082	144.77620	69.2	536.1	543.1	Sonar shows we are at top of ridge.
2663	J2-489	3/21/2010 2:48	14.60082	144.77620	58.4	536.1	543.6	Looks like sulfur coating-shrimp are flying away.
2664	J2-489	3/21/2010 2:48	14.60082	144.77620	63.2	536.1	539.8	Stirred up the shrimp.
2666	J2-489	3/21/2010 2:50	14.60084	144.77619	4.9	534.7	543.2	Going to Mkr-115 area north of here.
2667	J2-489	3/21/2010 2:50	14.60091	144.77615	340.8	534.9	539.9	Should be about 15m away.
2668	J2-489	3/21/2010 2:50	14.60096	144.77613	339.4	534.6	537.1	Driving off bottom with cloudy visibility z=535.
2670	J2-489	3/21/2010 2:52	14.60098	144.77614	45.3	532.6	535.7	Bright sulfur outcrop.
2671	J2-489	3/21/2010 2:52	14.60098	144.77614	76.3	532.7	534.9	Shear cliff and wall.
2672	J2-489	3/21/2010 2:53	14.60100	144.77616	27.6	530.6	533.9	We are at 531 near top of this ridge and not seeing anything.
2673	J2-489	3/21/2010 2:53	14.60098	144.77617	103.5	528.7	531.9	NAV: Doppler Reset
2675	J2-489	3/21/2010 2:54	14.60098	144.77620	74.6	528.3	532.5	At right depth and heading at the nav location for the site.
2676	J2-489	3/21/2010 2:54	14.60098	144.77619	75.8	528.3	533.5	Looking at steep sediment slope.
2677	J2-489	3/21/2010 2:55	14.60097	144.77618	76.7	528.1	534.7	Looks like this area collapsed downhill.
2679	J2-489	3/21/2010 2:56	14.60101	144.77616	75.0	528.0	532.0	Just a steep sandy slope at the depth and heading.
2680	J2-489	3/21/2010 2:56	14.60101	144.77616	74.2	528.1	531.8	Some outcrops on the steep slope.
2681	J2-489	3/21/2010 2:57	14.60102	144.77615	75.1	528.0	530.4	Little bit of bright staining. Bright yellow outcrops.

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2682	J2-489	3/21/2010 2:57	14.60102	144.77615	54.5	528.2	532.3	Seeing shrimp on the outcrops.
2684	J2-489	3/21/2010 2:58	14.60101	144.77615	355.4	528.3	533.2	Going to look at white dots on rock.
2685	J2-489	3/21/2010 2:58	14.60102	144.77616	359.0	528.3	532.0	Just sulfur and shrimp on the white rock.
2688	J2-489	3/21/2010 3:03	14.60099	144.77619	37.0	528.3	532.8	Lots of plume smoke in butt cam.
2689	J2-489	3/21/2010 3:03	14.60099	144.77619	36.9	528.3	532.9	Trying to decide what to do next with limited ship movement.
2692	J2-489	3/21/2010 3:06	14.60096	144.77620	83.0	528.4	532.4	We are going to setup Medea on top of Mkr-105 area.
2693	J2-489	3/21/2010 3:06	14.60096	144.77620	83.1	528.3	532.3	Looks at the slab in the sediment with shrimp covering it.
2694	J2-489	3/21/2010 3:06	14.60096	144.77621	82.6	528.5	532.3	Very precarious crust/slab on the sediment slope.
2695	J2-489	3/21/2010 3:06	14.60096	144.77621	82.2	528.6	532.2	Lots of plume in butt cam.
2696	J2-489	3/21/2010 3:07	14.60095	144.77621	82.6	528.5	532.3	Don't see any shimmering water on the slab.
2698	J2-489	3/21/2010 3:08	14.60096	144.77621	82.6	528.6	532.3	Crust they are on looks like half tephra and half sulfur.
2699	J2-489	3/21/2010 3:08	14.60097	144.77620	82.2	528.6	532.2	Close-up view of shrimp.
2700	J2-489	3/21/2010 3:09	14.60097	144.77620	82.3	528.6	532.4	Need to bring Jason under Medea.
2701	J2-489	3/21/2010 3:09	14.60095	144.77620	82.1	528.7	533.5	Medea is at Mkr105 site-we are under way.
2702	J2-489	3/21/2010 3:09	14.60094	144.77620	82.2	528.6	534.1	Look at the overhang.
2703	J2-489	3/21/2010 3:09	14.60093	144.77620	81.2	528.8	535.6	Staining in cracks under the overhang.
2704	J2-489	3/21/2010 3:09	14.60091	144.77620	81.2	528.8	537.1	Probably percolation through the wall.
2705	J2-489	3/21/2010 3:09	14.60087	144.77621	83.0	528.4	539.6	White out in smoke as we turn and move.
2707	J2-489	3/21/2010 3:10	14.60077	144.77624	83.1	528.3	536.7	Lots of plume-we are looking east.
2708	J2-489	3/21/2010 3:11	14.60072	144.77626	77.0	527.7	544.5	Going to turn into the wall and then head down.
2709	J2-489	3/21/2010 3:11	14.60068	144.77621	256.5	527.8	539.7	Jason is almost under Medea.
2710	J2-489	3/21/2010 3:11	14.60069	144.77623	347.0	527.8	597.7	Turning clockwise to face the wall.
2711	J2-489	3/21/2010 3:12	14.60065	144.77623	348.1	527.9	593.6	No visibility. Depth is 528 and altimeter is not registering.
2712	J2-489	3/21/2010 3:15	14.60077	144.77603	8.2	559.1	576.7	There's the wall in front of us-looks like overhang.
2713	J2-489	3/21/2010 3:15	14.60077	144.77603	6.1	559.2	576.8	NAV: Doppler Reset
2714	J2-489	3/21/2010 3:15	14.60077	144.77602	3.6	559.2	581.5	NE facing wall we are looking due north.
2716	J2-489	3/21/2010 3:16	14.60078	144.77599	4.5	559.1	581.6	Lots of white sulfur on shear wall.
2717	J2-489	3/21/2010 3:16	14.60078	144.77596	3.3	559.1	577.9	Angular lava blocks.
2718	J2-489	3/21/2010 3:17	14.60082	144.77589	3.0	559.1	571.7	We are at Mkr-106 area and the wall we saw briefly looked very similar (wall with white staining).
2719	J2-489	3/21/2010 3:17	14.60083	144.77589	0.6	559.0	571.2	Angular pieces.
2721	J2-489	3/21/2010 3:18	14.60083	144.77589	7.9	558.3	571.1	We are deeper (20m) than the old Mkr-106 site.
2722	J2-489	3/21/2010 3:18	14.60083	144.77589	6.3	557.8	570.9	Heading north as we head up wall.
2723	J2-489	3/21/2010 3:19	14.60083	144.77589	16.2	556.9	568.0	Overhang as we work up the wall.
2724	J2-489	3/21/2010 3:19	14.60083	144.77589	22.7	557.3	570.7	Need to back away to clear the overhang.
2726	J2-489	3/21/2010 3:20	14.60083	144.77588	15.3	558.9	570.5	Tephra is raining down on Jason. Lots of tephra on ledge.
2727	J2-489	3/21/2010 3:21	14.60083	144.77588	15.1	560.1	570.6	We are within 37m of Brimstone (it is due west)
2728	J2-489	3/21/2010 3:21	14.60083	144.77588	16.7	560.1	570.5	Angular rock faces on wall.

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2729	J2-489	3/21/2010 3:21	14.60082	144.77587	16.2	560.6	570.6	Lots of jointed wall.
2730	J2-489	3/21/2010 3:21	14.60082	144.77587	15.2	561.0	570.3	Vertical joints.
2732	J2-489	3/21/2010 3:22	14.60082	144.77587	16.3	561.5	570.5	Filaments of mat on the wall between the cracks.
2733	J2-489	3/21/2010 3:23	14.60081	144.77587	17.1	563.6	570.7	Going down the scarp. Heavily stained with mat.
2734	J2-489	3/21/2010 3:23	14.60081	144.77587	339.5	563.6	572.3	Looking at rock wall at z=564.
2736	J2-489	3/21/2010 3:24	14.60081	144.77588	343.6	565.1	572.7	Lot of jointing and overhangs (big dike).
2737	J2-489	3/21/2010 3:24	14.60081	144.77589	335.4	565.4	573.3	Sand slides on top of the cliff (tephra source maybe).
2738	J2-489	3/21/2010 3:24	14.60081	144.77589	337.8	565.4	573.1	Mat blowing off wall.
2739	J2-489	3/21/2010 3:25	14.60081	144.77588	356.2	566.0	571.8	Lost visibility.
2740	J2-489	3/21/2010 3:25	14.60081	144.77587	356.2	565.2	571.0	Tephra looking wall.
2742	J2-489	3/21/2010 3:26	14.60081	144.77587	355.4	565.7	570.9	Could be shimmer coming out of wall.
2743	J2-489	3/21/2010 3:26	14.60081	144.77587	352.6	565.8	571.0	Lost jointing here.
2744	J2-489	3/21/2010 3:27	14.60080	144.77589	1.1	563.8	572.4	Back in jointing and going to head back up the wall.
2745	J2-489	3/21/2010 3:27	14.60082	144.77591	19.2	561.2	572.4	Ledge with tephra and mat on it.
2747	J2-489	3/21/2010 3:28	14.60082	144.77590	19.4	560.9	571.9	Mat looks degraded or dying.
2748	J2-489	3/21/2010 3:28	14.60082	144.77591	20.0	559.3	572.5	Top of ridge.
2749	J2-489	3/21/2010 3:28	14.60082	144.77590	20.0	557.9	572.4	Lost angularity on the rocks on the top.
2750	J2-489	3/21/2010 3:29	14.60083	144.77590	19.1	556.9	572.5	More angular rocks on overhang.
2752	J2-489	3/21/2010 3:31	14.60081	144.77589	19.1	556.8	571.8	Chute off to right?
2753	J2-489	3/21/2010 3:31	14.60081	144.77590	18.6	556.0	572.2	Looking at the wall.
2754	J2-489	3/21/2010 3:31	14.60080	144.77591	19.2	556.4	572.9	Moving toward right to see the interface between wall and slope perhaps.
2755	J2-489	3/21/2010 3:31	14.60080	144.77592	19.2	556.3	573.1	Looks like one big massive piece of fractured lava.
2757	J2-489	3/21/2010 3:32	14.60079	144.77593	15.1	556.3	573.9	Looking along wall that looks freshly sheared off.
2758	J2-489	3/21/2010 3:32	14.60079	144.77594	15.1	556.3	574.5	Moving east along wall face as we are looking north.
2759	J2-489	3/21/2010 3:33	14.60080	144.77597	17.5	556.2	575.4	Lost wall as we moved east but target dead ahead.
2761	J2-489	3/21/2010 3:34	14.60081	144.77596	353.6	556.1	564.1	Lost visibility.
2762	J2-489	3/21/2010 3:34	14.60080	144.77597	346.4	556.0	576.4	On the top of the headwall.
2763	J2-489	3/21/2010 3:35	14.60080	144.77590	25.0	556.3	572.2	Can see the wall again.
2765	J2-489	3/21/2010 3:36	14.60080	144.77590	18.2	556.3	572.5	Poor visibility here. Angular joints again at z=556.
2766	J2-489	3/21/2010 3:36	14.60080	144.77590	18.1	556.3	572.8	Changing pilots now. Scott taking the helm.
2768	J2-489	3/21/2010 3:38	14.60082	144.77586	14.6	556.7	570.5	We are waiting on word about the people working at the winch before moving over to Brimstone.
2769	J2-489	3/21/2010 3:39	14.60085	144.77581	13.7	554.9	565.7	Still staring at the wall.
2770	J2-489	3/21/2010 3:39	14.60085	144.77581	14.7	554.8	565.3	Mat in the cracks of rocks on wall.
2771	J2-489	3/21/2010 3:39	14.60085	144.77581	14.5	554.6	563.6	See some tephra between the rocks.
2773	J2-489	3/21/2010 3:39	14.60085	144.77580	13.5	554.4	565.1	Some sulfur globs.
2774	J2-489	3/21/2010 3:40	14.60085	144.77581	31.4	554.2	564.4	Crest of small ridge on wall.
2776	J2-489	3/21/2010 3:42	14.60082	144.77582	32.5	556.4	565.8	Panning and zooming around the wall.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2777	J2-489	3/21/2010 3:43	14.60084	144.77580	32.6	555.3	563.9	Angular pieces of rock.
2778	J2-489	3/21/2010 3:43	14.60084	144.77580	29.8	555.9	564.1	Overhanging lava.
2780	J2-489	3/21/2010 3:43	14.60083	144.77579	32.7	558.3	564.2	Going to go to the base of the feature to look for a good rock.
2781	J2-489	3/21/2010 3:44	14.60083	144.77578	32.3	559.9	563.7	Looks unstable but going down.
2782	J2-489	3/21/2010 3:45	14.60084	144.77578	32.1	561.1	562.8	Scanning for a rock-4m off bottom.
2784	J2-489	3/21/2010 3:46	14.60085	144.77578	32.3	560.6	562.3	Basket is out for sampling.
2785	J2-489	3/21/2010 3:47	14.60085	144.77577	45.0	560.2	561.9	We are under and overhang-not good.
2786	J2-489	3/21/2010 3:47	14.60085	144.77577	45.6	560.0	561.7	Going up a little bit.
2788	J2-489	3/21/2010 3:48	14.60086	144.77577	43.2	559.8	561.5	Facing wall. A few pillow basalt structures.
2789	J2-489	3/21/2010 3:48	14.60086	144.77577	43.1	559.8	561.7	In position for rock sample.
2790	J2-489	3/21/2010 3:49	14.60086	144.77578	42.5	559.7	561.7	Grasping wall for rock sample.
2792	J2-489	3/21/2010 3:50	14.60086	144.77578	43.7	559.8	561.7	Knocking some sediments down and pieces of rock.
2793	J2-489	3/21/2010 3:50	14.60086	144.77578	45.4	559.8	561.6	Going for another.
2794	J2-489	3/21/2010 3:51	14.60085	144.77579	44.1	560.1	561.6	SAMPLE: geo Very breakable. J489-rock-06 in the milk crate from wall at 560m with 2m depth below (near base of wall).
2796	J2-489	3/21/2010 3:52	14.60085	144.77578	44.1	560.0	561.8	Picking up more of the pieces from the wall-same sample (J489-rock-06) 14 36.051 144 46.547.
2797	J2-489	3/21/2010 3:53	14.60086	144.77578	44.3	558.0	561.3	SW portion of the headwall site (E of Brimstone).
2800	J2-489	3/21/2010 3:56	14.60081	144.77583	43.0	561.5	564.9	J489-rock-06 is in 2 pieces.
2801	J2-489	3/21/2010 3:56	14.60081	144.77583	36.5	562.4	565.1	Looking at wall still while waiting to move.
2802	J2-489	3/21/2010 3:57	14.60079	144.77580	43.6	564.4	565.6	Taking gauge readings on Jason.
2803	J2-489	3/21/2010 3:57	14.60079	144.77579	43.5	564.2	565.5	Basket is in.
2805	J2-489	3/21/2010 3:58	14.60082	144.77575	346.5	559.3	560.6	Bringing Medea up to get ready to move.
2806	J2-489	3/21/2010 3:59	14.60087	144.77571	343.1	555.8	558.9	Looking north (NW) on wall.
2807	J2-489	3/21/2010 3:59	14.60087	144.77572	343.9	556.3	559.6	Venting below!
2808	J2-489	3/21/2010 3:59	14.60087	144.77574	340.7	557.5	560.0	HD on.
2809	J2-489	3/21/2010 3:59	14.60087	144.77574	340.2	557.2	559.9	New venting area 14 36.052 144 46.543
2810	J2-489	3/21/2010 3:59	14.60087	144.77574	334.4	557.2	559.4	depth is 557 Looking at 335.
2812	J2-489	3/21/2010 4:00	14.60087	144.77574	339.2	557.2	559.4	We are west of Brimstone.
2813	J2-489	3/21/2010 4:00	14.60087	144.77574	337.4	556.9	559.2	Lots of bubbles and vent is at base of wall.
2814	J2-489	3/21/2010 4:01	14.60087	144.77574	350.4	557.6	559.4	Looks like venting is coming out of tephra.
2816	J2-489	3/21/2010 4:01	14.60087	144.77574	349.1	557.5	559.4	Extensive area of venting. Tephra and bubbles.
2818	J2-489	3/21/2010 4:02	14.60088	144.77574	349.0	557.5	559.4	This is Styx Vent.
2819	J2-489	3/21/2010 4:02	14.60088	144.77574	349.2	557.5	559.4	Named after some river to Hell.
2821	J2-489	3/21/2010 4:03	14.60089	144.77574	350.0	556.5	559.3	big puff from vent.
2822	J2-489	3/21/2010 4:04	14.60091	144.77574	309.0	557.4	558.4	Rotated around for view of vent.
2824	J2-489	3/21/2010 4:05	14.60091	144.77573	309.6	557.3	558.3	Can See staining on wall.
2825	J2-489	3/21/2010 4:05	14.60091	144.77573	312.7	557.2	558.4	Pilot feels that we are at base with a sediment floor.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2826	J2-489	3/21/2010 4:06	14.60090	144.77570	327.6	557.1	558.7	Lots of bubbles all of a sudden.
2828	J2-489	3/21/2010 4:07	14.60090	144.77570	327.6	557.1	558.7	That is sudden.
2829	J2-489	3/21/2010 4:07	14.60091	144.77570	327.8	557.1	558.8	Increase in plume.
2830	J2-489	3/21/2010 4:07	14.60088	144.77571	327.7	555.2	560.8	Backing away from vent to try to get view.
2831	J2-489	3/21/2010 4:07	14.60089	144.77571	340.8	557.2	560.7	Lots of large lava rocks around base.
2833	J2-489	3/21/2010 4:09	14.60089	144.77570	337.5	558.2	560.3	We are at the base of the new wall from the big slide event.
2834	J2-489	3/21/2010 4:10	14.60090	144.77569	337.6	558.2	560.2	We are about 21m from Brimstone.
2835	J2-489	3/21/2010 4:10	14.60090	144.77569	337.5	558.2	560.2	Fairly explosive pulsing plume in center.
2837	J2-489	3/21/2010 4:11	14.60090	144.77568	337.4	558.2	560.2	Sitting and watching activity at Styx. In E-W line with Brimstone.
2838	J2-489	3/21/2010 4:11	14.60089	144.77568	337.3	558.2	560.2	There's a big burst of plume.
2839	J2-489	3/21/2010 4:11	14.60089	144.77568	337.5	558.2	560.2	Lots of gas and bubbles.
2842	J2-489	3/21/2010 4:16	14.60090	144.77567	337.5	558.2	560.1	Looking around to the right for blocky lava.
2843	J2-489	3/21/2010 4:16	14.60090	144.77567	337.2	558.2	560.3	Looks like it mainly producing tephra and a small cone.
2845	J2-489	3/21/2010 4:17	14.60091	144.77568	337.5	558.2	560.1	Activity is changing.
2847	J2-489	3/21/2010 4:19	14.60091	144.77570	337.4	558.2	560.2	Activity is increasing again.
2848	J2-489	3/21/2010 4:19	14.60091	144.77570	337.8	558.3	560.2	Getting ready to deploy a marker here.
2849	J2-489	3/21/2010 4:20	14.60089	144.77572	338.1	558.2	560.2	Venting is wide spread against wall base.
2851	J2-489	3/21/2010 4:21	14.60088	144.77573	337.6	558.3	560.2	DEPLOY: Marker Mkr-116 at Styx. 14 deg 36.053 144deg 46.543 z=558
2852	J2-489	3/21/2010 4:21	14.60088	144.77573	336.6	558.2	560.1	Pulling in basket.
2853	J2-489	3/21/2010 4:22	14.60088	144.77573	337.7	558.3	560.2	The marker is just south of the vent along the base of wall.
2854	J2-489	3/21/2010 4:22	14.60088	144.77573	337.5	558.3	560.1	HD_CAM: stop Styx HD.
2855	J2-489	3/21/2010 4:22	14.60088	144.77573	337.6	558.3	560.1	Good pan of site.
2857	J2-489	3/21/2010 4:23	14.60088	144.77573	337.8	558.2	560.1	Deciding what to do next.
2858	J2-489	3/21/2010 4:23	14.60088	144.77573	338.5	557.1	560.2	More bubbles and floc.
2859	J2-489	3/21/2010 4:23	14.60089	144.77573	338.4	556.8	560.1	Really going now.
2860	J2-489	3/21/2010 4:23	14.60090	144.77574	337.7	556.7	558.7	Looking down on vent and moving a bit closer.
2861	J2-489	3/21/2010 4:24	14.60090	144.77573	320.7	557.0	558.7	Overview shows venting through the sediments. Bubbles coming from center.
2862	J2-489	3/21/2010 4:24	14.60090	144.77573	320.1	557.0	558.7	Shrimp flying through plume
2863	J2-489	3/21/2010 4:24	14.60090	144.77573	320.0	557.0	558.7	Lots of tephra coming out and building a cone.
2865	J2-489	3/21/2010 4:25	14.60090	144.77574	322.7	557.0	558.6	Looking down at site.
2866	J2-489	3/21/2010 4:25	14.60090	144.77573	324.9	555.4	558.6	Want to move over to Brimstone to see activity.
2867	J2-489	3/21/2010 4:25	14.60090	144.77572	314.4	552.5	558.6	Looked like a plug of lava in back of vent next to wall.
2868	J2-489	3/21/2010 4:25	14.60090	144.77572	311.1	550.2	558.6	Going up the big wall.
2869	J2-489	3/21/2010 4:26	14.60089	144.77572	310.9	548.4	558.6	Looks like the headwall.
2870	J2-489	3/21/2010 4:26	14.60090	144.77569	309.0	541.5	557.2	Wall is 15m high.
2871	J2-489	3/21/2010 4:26	14.60092	144.77564	284.7	541.4	544.3	Headed over to Brimstone-cleared the wall.

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2873	J2-489	3/21/2010 4:27	14.60093	144.77564	284.9	543.1	544.7	Now dropping down on the other side. Lots of plume in butt cam from Styx.
2874	J2-489	3/21/2010 4:27	14.60093	144.77564	285.3	543.5	544.8	Moving ship to the west.
2875	J2-489	3/21/2010 4:28	14.60092	144.77560	286.8	544.5	547.3	Slope ahead of us on sonar.
2876	J2-489	3/21/2010 4:28	14.60091	144.77560	287.3	544.5	547.6	NAV: Doppler Reset
2877	J2-489	3/21/2010 4:28	14.60089	144.77562	285.0	545.9	553.2	Jason is at Brimstone target-should be just ahead.
2879	J2-489	3/21/2010 4:29	14.60088	144.77561	285.7	546.7	552.2	Looking for Brimstone Mkr-161. Looking west-clear view-no plume.
2880	J2-489	3/21/2010 4:30	14.60085	144.77559	292.4	549.2	553.3	Looks like slope of cinder cone.
2882	J2-489	3/21/2010 4:31	14.60083	144.77558	292.4	549.2	553.6	Waiting for ship and Medea.
2883	J2-489	3/21/2010 4:32	14.60076	144.77560	296.1	553.4	561.0	Panning around and getting into smoke.
2884	J2-489	3/21/2010 4:32	14.60071	144.77558	293.6	556.6	562.7	Ship is all stop here.
2886	J2-489	3/21/2010 4:33	14.60067	144.77559	291.7	559.3	565.2	Looks like Jason is south of Brimstone.
2887	J2-489	3/21/2010 4:34	14.60057	144.77555	295.8	569.3	571.0	Tephra slope with few rocks.
2888	J2-489	3/21/2010 4:34	14.60054	144.77553	297.2	570.0	575.3	Need to move the ship again.
2889	J2-489	3/21/2010 4:34	14.60055	144.77546	294.4	567.7	572.1	Looks like some fresh lavas on crest of sediment ridge.
2891	J2-489	3/21/2010 4:35	14.60054	144.77538	294.9	569.0	571.6	Jason is 35m south of Brimstone.
2892	J2-489	3/21/2010 4:36	14.60056	144.77526	294.0	567.5	570.6	Ship is going to be able to move in a more favorable direction.
2893	J2-489	3/21/2010 4:36	14.60059	144.77519	340.5	569.4	573.8	Bow thruster happens to be locked into the position we need at the moment.
2895	J2-489	3/21/2010 4:37	14.60062	144.77518	353.0	568.2	576.2	Large lava boulders.
2896	J2-489	3/21/2010 4:37	14.60064	144.77519	10.6	566.0	574.9	Escarpment here with white staining (sulfur).
2897	J2-489	3/21/2010 4:38	14.60064	144.77521	9.6	565.2	570.6	We are due south of Sulfur Crust.
2898	J2-489	3/21/2010 4:38	14.60064	144.77523	9.1	565.2	568.9	Jason is looking due north.
2899	J2-489	3/21/2010 4:38	14.60063	144.77525	8.8	564.6	568.8	Lots of tephra sediment coating rock outcrops with evidence of sliding.
2901	J2-489	3/21/2010 4:39	14.60065	144.77527	8.7	561.7	562.4	Fractured pillows and lava rubble.
2902	J2-489	3/21/2010 4:39	14.60068	144.77527	9.6	558.1	563.4	Round white stained rock.
2903	J2-489	3/21/2010 4:40	14.60071	144.77524	11.4	556.9	562.1	Larger lava boulders at top of outcrop and now seeing Sulfur Crust with the Tephra bucket.
2904	J2-489	3/21/2010 4:40	14.60073	144.77524	12.8	555.6	561.0	NAV: Doppler Reset
2905	J2-489	3/21/2010 4:40	14.60075	144.77524	10.8	554.9	558.8	Sulfur Crust with Tephra-D and shrimp traps and exclusion traps.
2907	J2-489	3/21/2010 4:41	14.60078	144.77523	11.6	554.0	557.6	We are headed over to Phantom for a look.
2908	J2-489	3/21/2010 4:41	14.60078	144.77524	10.8	554.0	557.3	Lots of sulfur with ash on top.
2909	J2-489	3/21/2010 4:41	14.60079	144.77525	11.8	555.7	557.3	Flow in between the rocks here.
2910	J2-489	3/21/2010 4:42	14.60084	144.77524	10.3	554.7	557.6	We are higher than Phantom.
2911	J2-489	3/21/2010 4:42	14.60087	144.77522	10.3	556.2	558.6	Dropping down over this small ridge.
2912	J2-489	3/21/2010 4:42	14.60088	144.77520	13.1	557.8	560.4	Vent should be due east of Jason.
2914	J2-489	3/21/2010 4:43	14.60087	144.77517	13.9	560.2	562.4	Moving boulders with Jason.
2915	J2-489	3/21/2010 4:43	14.60086	144.77515	11.2	561.2	564.4	Plume and smoke-there it is.
2916	J2-489	3/21/2010 4:43	14.60084	144.77514	7.2	563.2	564.5	It is very smokey here.

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2917	J2-489	3/21/2010 4:44	14.60081	144.77510	74.9	564.7	568.9	We are circling around the vent (ship is stopped).
2918	J2-489	3/21/2010 4:44	14.60085	144.77507	75.6	565.7	568.2	Looks like a new piece of lava that has been extruded in the center.
2920	J2-489	3/21/2010 4:45	14.60085	144.77507	75.5	565.7	568.2	HD_CAM: start Phantom.
2921	J2-489	3/21/2010 4:46	14.60084	144.77508	75.4	565.7	568.3	Large area of venting.
2922	J2-489	3/21/2010 4:46	14.60084	144.77508	75.4	565.7	568.3	Wall to the SE of the vent.
2924	J2-489	3/21/2010 4:47	14.60085	144.77508	106.9	565.2	567.1	We are going to pan around the vent clockwise.
2925	J2-489	3/21/2010 4:47	14.60089	144.77510	132.3	564.6	565.4	Large lava blocks around the vent.
2926	J2-489	3/21/2010 4:48	14.60090	144.77513	180.4	563.7	567.3	We are on the high side of the vent.
2927	J2-489	3/21/2010 4:48	14.60088	144.77517	218.9	563.3	695.5	Looking from the north.
2929	J2-489	3/21/2010 4:49	14.60089	144.77508	120.8	565.0	568.9	Want to go look at Brimstone (instead of scoop or marker).
2930	J2-489	3/21/2010 4:50	14.60087	144.77508	117.6	563.7	567.2	Going to Brimstone-great view on this side.
2931	J2-489	3/21/2010 4:50	14.60084	144.77512	113.6	562.8	566.1	Lots of bubbles and sulfur staining adjacent rocks.
2932	J2-489	3/21/2010 4:50	14.60083	144.77516	114.0	561.7	565.2	Heading to Brimstone due east.
2933	J2-489	3/21/2010 4:50	14.60084	144.77521	88.6	557.9	561.9	Large lava rock ridge.
2934	J2-489	3/21/2010 4:50	14.60085	144.77526	82.7	555.9	559.4	Good view of plume in butt cam.
2936	J2-489	3/21/2010 4:50	14.60085	144.77527	85.4	555.1	559.0	HD_CAM: stop
2937	J2-489	3/21/2010 4:51	14.60085	144.77529	86.8	552.0	556.9	30m to brimstone driving mid-water with no view.
2938	J2-489	3/21/2010 4:51	14.60086	144.77534	86.8	548.6	552.5	There's some peaks of rock now and then.
2939	J2-489	3/21/2010 4:51	14.60086	144.77547	85.8	547.5	549.7	Crested small ridge.
2940	J2-489	3/21/2010 4:52	14.60088	144.77553	57.9	547.0	549.1	There is Tephra H and the marker (it is NW of Brimstone).
2941	J2-489	3/21/2010 4:52	14.60088	144.77554	82.9	546.9	548.7	Brimstone should be to the right.
2942	J2-489	3/21/2010 4:52	14.60085	144.77553	129.1	547.9	549.1	A bit of venting.
2944	J2-489	3/21/2010 4:53	14.60084	144.77552	113.4	548.1	550.3	Visibility is not good.
2945	J2-489	3/21/2010 4:54	14.60087	144.77560	51.6	546.9	548.0	Brimstone should be 5m SE of the marker.
2946	J2-489	3/21/2010 4:54	14.60091	144.77554	35.8	546.6	548.5	Is this it? A pile of rocks with no venting.
2948	J2-489	3/21/2010 4:55	14.60087	144.77560	129.6	546.7	547.4	Nothing is here-no plume. Can see Marker in but cam. If it were active-we would see it here.
2949	J2-489	3/21/2010 4:56	14.60086	144.77558	13.3	547.0	549.6	Going to go back to Sulfur Crust and get the shrimp trap.
2950	J2-489	3/21/2010 4:56	14.60086	144.77557	13.2	546.8	549.9	36m away from here.
2952	J2-489	3/21/2010 4:57	14.60078	144.77546	237.0	548.9	552.8	Turning around and aligned to go to Sulfur Crust.
2953	J2-489	3/21/2010 4:58	14.60077	144.77533	350.8	550.8	556.5	Ridge of rock with sulfur staining.
2955	J2-489	3/21/2010 4:59	14.60075	144.77525	1.6	554.4	557.7	Lots of plume streaming across.
2956	J2-489	3/21/2010 4:59	14.60075	144.77525	7.8	554.7	558.2	Almost landed on top of it.
2957	J2-489	3/21/2010 5:00	14.60075	144.77525	36.6	555.6	557.9	Tephra sampler got knocked over.
2958	J2-489	3/21/2010 5:00	14.60074	144.77525	349.6	555.5	558.8	Need to upright the bucket and pickup the shrimp trap.
2959	J2-489	3/21/2010 5:00	14.60074	144.77526	357.6	556.0	559.1	HD_CAM: start Trap recovery at Sulfur Crust.
2961	J2-489	3/21/2010 5:01	14.60074	144.77526	353.5	556.8	558.7	The crust broke and the bucket fell down.
2962	J2-489	3/21/2010 5:01	14.60074	144.77525	353.2	556.8	558.7	Picking up the bucket first to upright it.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
2964	J2-489	3/21/2010 5:03	14.60074	144.77525	353.2	556.8	558.7	Upright Tephra D sampler.
2965	J2-489	3/21/2010 5:03	14.60075	144.77525	353.2	556.8	558.7	Picking up the trap.
2966	J2-489	3/21/2010 5:04	14.60075	144.77526	358.3	553.4	558.6	RECOVER: Shrimp Trap J489-shrimp-07 at Sulfur Crust.
2968	J2-489	3/21/2010 5:05	14.60079	144.77519	335.1	554.8	560.9	Heading over quickly to Phantom to place a marker.
2969	J2-489	3/21/2010 5:06	14.60078	144.77513	337.5	560.5	565.9	Trap is in the basket.
2970	J2-489	3/21/2010 5:06	14.60078	144.77511	342.5	562.4	565.9	Going to deploy Marker 118 at Phantom.
2972	J2-489	3/21/2010 5:07	14.60084	144.77508	37.8	565.5	569.2	Want to watch the vent from this angle-very clear.
2973	J2-489	3/21/2010 5:07	14.60084	144.77508	30.7	565.7	568.9	Fresh looking lavas near top.
2974	J2-489	3/21/2010 5:07	14.60084	144.77508	30.8	566.4	568.7	Taking DSC and HD of the plume
2975	J2-489	3/21/2010 5:08	14.60084	144.77508	33.2	566.3	568.7	Some larger bubbles coming out now.
2977	J2-489	3/21/2010 5:09	14.60084	144.77508	33.1	566.3	567.3	Increase in activity. and venting downslope.
2978	J2-489	3/21/2010 5:10	14.60084	144.77509	32.9	566.3	568.7	Would like to put the marker upslope (opposite side that we are now).
2980	J2-489	3/21/2010 5:11	14.60083	144.77508	33.0	566.3	568.8	Watching the vent looking for rock movement.
2983	J2-489	3/21/2010 5:13	14.60083	144.77508	33.1	566.3	568.7	5 minute left in the dive.
2984	J2-489	3/21/2010 5:13	14.60083	144.77508	33.2	566.3	568.7	Not a lot of tephra today but a lot more degassing.
2985	J2-489	3/21/2010 5:14	14.60083	144.77508	33.5	566.2	568.7	Increase in activity of the plume but not more bubbles.
2987	J2-489	3/21/2010 5:15	14.60083	144.77508	33.8	566.2	568.7	More bubbles.
2989	J2-489	3/21/2010 5:18	14.60084	144.77506	33.1	565.3	569.0	Steady state of large bubbles coming out of vent.
2991	J2-489	3/21/2010 5:19	14.60085	144.77507	29.3	564.4	568.7	To the left looks downslope as well.
2992	J2-489	3/21/2010 5:19	14.60084	144.77510	28.3	564.3	567.1	Changing direction and going around to the right.
2993	J2-489	3/21/2010 5:19	14.60084	144.77510	27.4	564.3	567.2	Still downslope.
2994	J2-489	3/21/2010 5:20	14.60084	144.77512	107.2	561.8	565.3	Getting marker out of basket to deploy on the upslope side of vent.
2996	J2-489	3/21/2010 5:21	14.60083	144.77513	111.5	560.7	565.3	NAV: Doppler Reset Mkr-118 Phantom Vent
2997	J2-489	3/21/2010 5:21	14.60083	144.77514	111.9	561.1	565.0	Mkr-118 Phantom Vent at south side
2998	J2-489	3/21/2010 5:22	14.60083	144.77515	111.7	561.7	565.0	Going to move the marker-looks unstable perched on top of the rock.
3000	J2-489	3/21/2010 5:23	14.60089	144.77509	119.3	560.2	564.7	DEPLOY: Marker 118. New spot for marker just a bit more on terra firma. 14 deg 36.049 144deg 46.510 560m Hdg=117
3001	J2-489	3/21/2010 5:23	14.60090	144.77502	113.5	559.4	565.1	HD_CAM: stop
3002	J2-489	3/21/2010 5:24	14.60091	144.77500	96.9	559.6	567.9	Dropping a weight for ascent.
3004	J2-489	3/21/2010 5:24	14.60094	144.77486	207.8	560.7	574.4	JASON: Jason off bottom
3005	J2-489	3/21/2010 5:25	14.60095	144.77486	214.0	560.4	571.6	Ship is on the move.
3007	J2-489	3/21/2010 5:50	14.60257	144.77758	244.7	0.7	139.2	Medea out of water.
3008	J2-489	3/21/2010 5:51	14.60277	144.77789	246.8	0.9	3.1	Medea on deck.
3009	J2-489	3/21/2010 5:59	14.60323	144.77884	216.7	-0.3	0.7	JASON: Jason out of water
3010	J2-489	3/21/2010 5:59	14.60327	144.77885	163.1	-0.2	185.9	JASON: Jason on deck
3011	J2-489	3/21/2010 6:00	14.60327	144.77885	162.6	-0.2	183.9	End of Dive J2-489.

Table 6.5-4 JASON Dive J2-490

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3012	J2-490	3/22/2010 18:38	14.60095	144.77735	108.8	558.0	576.0	JASON: Jason on bottom
3014	J2-490	3/22/2010 18:39	14.60092	144.77745	109.6	560.1	574.6	Main goals: Work at Brimstone and vicinity; assuming ship/Medea can't move.
3015	J2-490	3/22/2010 18:39	14.60092	144.77745	109.7	560.0	574.6	We're on the bottom at Mkr-109.
3016	J2-490	3/22/2010 18:40	14.60092	144.77744	109.7	559.9	574.6	Tasks cont: Scoop bag from wall NE of Mkr109/1112 of rocks with fuzzy mat?
3017	J2-490	3/22/2010 18:40	14.60092	144.77743	109.7	559.9	574.4	Tasks cont: Fluid sampling and recover 2 shrimp traps at Mkr109/Mkr112. Explore slide scar as drive east to...
3019	J2-490	3/22/2010 18:41	14.60092	144.77743	109.7	559.9	574.5	Tasks cont: Iceberg. Suction of bac mat. Deploy shrimp trap
3020	J2-490	3/22/2010 18:41	14.60092	144.77743	109.7	559.9	574.4	Tasks cont: Summit: Exchange hydrophone scoop sample of tephra at summit.
3021	J2-490	3/22/2010 18:42	14.60093	144.77743	109.6	559.8	574.8	Tasks cont Eruptive vents: Fluid sampling and gas-tights. Collect sulfur rocks at sulfur Crust. May exchange tephra samplers.
3023	J2-490	3/22/2010 18:43	14.60093	144.77743	109.7	559.8	574.7	NAV: Doppler Reset
3024	J2-490	3/22/2010 18:43	14.60093	144.77742	109.9	559.9	574.6	Tasks cont: Scoop of tephra near eruptive vents. Shrimp video. Deploy 1 or 2 MTRs. Video of eruptive vents.
3025	J2-490	3/22/2010 18:44	14.60094	144.77742	110.5	559.9	571.9	Mkr109 in the foreground and Mkr112 in the background. Lots of instruments/experiments here.
3026	J2-490	3/22/2010 18:44	14.60097	144.77744	120.4	560.0	568.7	Moving to Mkr112 and will turn 180 to face the wall.
3030	J2-490	3/22/2010 18:49	14.60095	144.77758	246.1	564.7	585.3	Looking at this nearly vertical wall beneath Mkr112. Want to scoop up some of the white mat on this wall beneath Mkr112.
3031	J2-490	3/22/2010 18:49	14.60094	144.77759	245.9	565.4	585.1	Pulled the scoop bag out of the right milk crate.
3032	J2-490	3/22/2010 18:50	14.60093	144.77758	246.9	565.8	585.7	There is visible venting.
3034	J2-490	3/22/2010 18:52	14.60093	144.77758	250.7	565.2	586.6	HD_CAM: start
3035	J2-490	3/22/2010 18:52	14.60093	144.77758	251.2	565.1	586.4	Looking at crabs on the wall with fuzzy white mat and probably iron oxides.
3037	J2-490	3/22/2010 18:54	14.60093	144.77757	251.8	565.0	586.8	Bill thinks that the orange on the wall is iron oxides. The white mat is very furry looking and moving in the current.
3039	J2-490	3/22/2010 18:55	14.60093	144.77758	252.6	564.9	587.1	We're going to pan around and see what the crabs are doing here.
3040	J2-490	3/22/2010 18:56	14.60094	144.77757	253.3	564.8	588.0	BIOLOGY: Austinograea(crab) climbing up the wall of white and orange mat. He has a bit of orange on his carapace.
3042	J2-490	3/22/2010 18:57	14.60094	144.77757	253.4	564.8	588.0	HD_CAM: stop
3043	J2-490	3/22/2010 18:57	14.60094	144.77757	253.8	564.7	588.0	There are quite a few crabs on the wall here.
3044	J2-490	3/22/2010 18:57	14.60094	144.77756	253.4	564.7	588.3	Grabbing the scoop.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3046	J2-490	3/22/2010 19:01	14.60086	144.77759	310.1	565.9	595.9	SAMPLE: bio J490-mat-1. Scoop of white furry mat from the steep wall at the base of Mkr110. Z=567. Hdg=310.
3047	J2-490	3/22/2010 19:03	14.60087	144.77761	310.0	566.1	596.4	The depths are off quite a bit on this vertical face.
3048	J2-490	3/22/2010 19:04	14.60087	144.77761	310.3	566.1	596.3	SAMPLE cont: J490-mat-1. Getting some mat and quite a lot of crumbly black rock. More mat on the attempt.
3049	J2-490	3/22/2010 19:05	14.60086	144.77759	310.7	566.1	596.0	SAMPLE cont: J490-mat-1. Location: 144° 46.655 14° 36.0525. Z=566. Mkr112 right above us.
3050	J2-490	3/22/2010 19:06	14.60086	144.77759	310.1	566.1	595.1	CORRECTION: The Marker above us is Mkr112 (not 110). Jason depth reads 566 and the map says 585m.
3051	J2-490	3/22/2010 19:07	14.60086	144.77760	310.4	566.1	595.9	Stowing the sample in the left milk crate.
3052	J2-490	3/22/2010 19:07	14.60086	144.77760	309.9	566.0	595.5	This is a vertical wall here. Our position relative to the marker looks good on the map.
3053	J2-490	3/22/2010 19:08	14.60087	144.77759	309.8	566.1	595.5	The honey bear is on the shrimp trap. Hope to break the hex out here by teaching him a lesson.
3054	J2-490	3/22/2010 19:09	14.60086	144.77759	309.1	566.1	594.3	Doing a bit of housekeeping removing rocks from the Jason basket.
3055	J2-490	3/22/2010 19:11	14.60086	144.77763	306.9	562.6	594.3	Climbing the wall up to Mkr-112 on the right on the edge of the cliff. Mkr 109 is in the background.
3056	J2-490	3/22/2010 19:12	14.60094	144.77754	242.4	561.1	583.7	Akel is updating the nav. Getting rid of the 2009 positions. They are confusing the issue.
3057	J2-490	3/22/2010 19:12	14.60093	144.77754	242.5	562.8	583.5	Mkr112 right ahead with a shrimp trap at its base. Shrimp are scattering.
3059	J2-490	3/22/2010 19:13	14.60093	144.77755	242.9	562.6	584.4	BIOLOGY: Opaepale(shrimp) . Scattering as we get near. The bottom is covered with shrimp.
3060	J2-490	3/22/2010 19:13	14.60093	144.77756	242.9	562.6	584.4	The trap has a few (?) shrimp in it.
3061	J2-490	3/22/2010 19:14	14.60093	144.77755	242.9	562.6	584.4	Zooming in on the trap with the HD Cam. Quite a few on the Spam in there.
3062	J2-490	3/22/2010 19:14	14.60092	144.77755	242.3	562.7	582.6	We will recover this shrimp trap #2 at the base of Mkr112.
3064	J2-490	3/22/2010 19:15	14.60086	144.77757	199.1	563.0	566.0	HD_CAM: start at Mkr112. Looking at the shrimp in the area and moving about to check out the vicinity. Mkr109 ahead perched on the outcrop.
3066	J2-490	3/22/2010 19:17	14.60084	144.77746	342.0	566.6	577.2	We see Mkr113 below us.
3067	J2-490	3/22/2010 19:18	14.60087	144.77745	13.6	562.5	572.1	Taking some stills.
3068	J2-490	3/22/2010 19:18	14.60087	144.77752	357.1	562.2	571.3	Mkr109 is ahead. Mkr112 is in the background.
3070	J2-490	3/22/2010 19:19	14.60091	144.77753	341.9	564.0	567.2	Mkr112 is ahead with the shrimp trap #2 perched precariously on the slope.
3071	J2-490	3/22/2010 19:20	14.60092	144.77753	344.0	563.5	566.7	RECOVER: shrimp trap at Mkr112.
3073	J2-490	3/22/2010 19:21	14.60091	144.77753	344.3	563.5	566.5	SAMPLE: bio J490-shrimptrap-2. Recovered shrimp trap from edge of cliff in a precarious position. there are some shrimp in there.
3074	J2-490	3/22/2010 19:21	14.60091	144.77753	344.5	563.5	566.5	HD_CAM: stop

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3076	J2-490	3/22/2010 19:23	14.60092	144.77754	359.2	562.8	566.4	SAMPLE J490-shrimp-trap-2. Z=563. Safely stored on Jason.
3077	J2-490	3/22/2010 19:24	14.60092	144.77754	0.1	563.1	566.2	RECOVER: MTR MTR#1. Recovered from Mkr112 area. was right next to the shrimp trap#2. Z=563.
3078	J2-490	3/22/2010 19:24	14.60092	144.77754	0.7	563.1	566.2	NAV: Doppler Reset
3080	J2-490	3/22/2010 19:26	14.60091	144.77748	76.7	563.5	569.2	Looking at Mkr109 now on the top of this outcrop. Shrimp trap and MTR right at the base.\
3082	J2-490	3/22/2010 19:28	14.60092	144.77748	99.8	563.4	566.7	Shrimp trap with lots of shrimp on the outside. The spam slid underneath the cone so they are getting at it from the outside. Not many inside the trap.
3084	J2-490	3/22/2010 19:29	14.60091	144.77748	98.6	563.6	566.7	NAV: One of the beams on the doppler may be going says Akel.
3086	J2-490	3/22/2010 19:31	14.60091	144.77748	99.6	563.5	566.7	Shaking up the shrimp trap to try to rearrange the Spam inside.
3087	J2-490	3/22/2010 19:32	14.60091	144.77749	99.2	563.4	566.7	The shrimp get in a little funnel on the side with a little tiny entrance. Shrimp trap #3 repositioned. Verena will leave it here for another day.
3089	J2-490	3/22/2010 19:33	14.60088	144.77750	32.4	562.7	570.8	Going to look at the shrimp exclusion trap next. They are going to look at it.
3090	J2-490	3/22/2010 19:34	14.60089	144.77752	322.9	562.8	568.3	See the trash can trap right in front of us. Looks like quite a bit of flow there (especially in the pilot cam).
3092	J2-490	3/22/2010 19:35	14.60089	144.77752	322.8	562.8	568.2	Next task will be fluid sampling. Kevin is taking over the hot seat from Bill.
3093	J2-490	3/22/2010 19:36	14.60089	144.77751	322.7	562.9	568.3	Setting up for fluid sampling.
3095	J2-490	3/22/2010 19:37	14.60089	144.77750	322.7	563.0	568.3	The marker has bacterial mat on it.
3096	J2-490	3/22/2010 19:37	14.60089	144.77750	322.4	562.9	568.3	Lots of shrimp on this wall.
3097	J2-490	3/22/2010 19:38	14.60088	144.77750	322.6	562.9	568.3	Zooming on MTR#4 at the base of Mkr109 . The marker is covered with white long filamentous bacterial mat.
3099	J2-490	3/22/2010 19:40	14.60090	144.77750	342.1	563.9	568.6	The exclusion trap has shrimp in it and that was not what they wanted. The point was to keep the shrimp out and let the mat grow.
3100	J2-490	3/22/2010 19:40	14.60089	144.77750	343.4	563.9	568.6	Shrimp covering this outcrop.
3102	J2-490	3/22/2010 19:41	14.60089	144.77750	327.1	565.3	568.4	Lots of flow here.
3103	J2-490	3/22/2010 19:41	14.60089	144.77750	325.3	565.1	568.0	Flying floc here. We stirred a bit of this up.
3104	J2-490	3/22/2010 19:42	14.60090	144.77750	318.1	564.5	567.7	Shrimp everywhere.
3106	J2-490	3/22/2010 19:44	14.60090	144.77751	318.5	564.8	567.5	See some focused flow now. Kevin is picking just the right spot to sample with the fluid sampler.
3108	J2-490	3/22/2010 19:45	14.60091	144.77750	316.4	564.9	567.5	There is a crab on the wall too.
3109	J2-490	3/22/2010 19:45	14.60091	144.77750	316.2	564.7	567.4	BIOLOGY: Opaapele(shrimp) and probably some Alvinocaris as well. See a crab too.
3111	J2-490	3/22/2010 19:47	14.60090	144.77750	315.5	564.6	567.5	HD_CAM: start at fluid sampling site here at the cliff face of Mkr109.
3112	J2-490	3/22/2010 19:47	14.60089	144.77752	317.8	564.4	567.5	Looking at the shrimp on the wall.
3113	J2-490	3/22/2010 19:48	14.60089	144.77752	318.4	564.6	567.3	Jason has to back up and reposition.
3114	J2-490	3/22/2010 19:48	14.60089	144.77751	317.6	564.7	567.8	HD_CAM: stop

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3118	J2-490	3/22/2010 19:53	14.60090	144.77751	317.2	564.6	567.6	Fiddling with the wand. Trying to get the long wand going.
3119	J2-490	3/22/2010 19:54	14.60089	144.77751	317.2	564.6	567.7	Will grabbed the black and white puck-looking things and it trying to push them together.
3121	J2-490	3/22/2010 19:56	14.60088	144.77751	317.2	564.6	567.7	Pulled the wand out a bit by grasping the T handle. Will now try to push it back in.
3124	J2-490	3/22/2010 19:58	14.60090	144.77751	317.1	564.6	567.7	Got it. The long wand is now in business. Can now get around to sampling here at the base of Mkr109.
3126	J2-490	3/22/2010 20:01	14.60089	144.77751	357.1	564.9	569.9	The probe has a rubber sheet to insulate it.
3127	J2-490	3/22/2010 20:02	14.60088	144.77750	357.5	566.5	571.3	The rubber acts as an insulator since this wand is so long. It keeps the fluid warm as it passes through the tube.
3129	J2-490	3/22/2010 20:03	14.60087	144.77750	357.5	566.5	570.9	The Jason guys are getting the Schilling arm out of the way before sampling.
3133	J2-490	3/22/2010 20:09	14.60090	144.77749	355.2	564.7	570.6	The wand is approaching the wall. Will try to find a spot for sampling.
3134	J2-490	3/22/2010 20:09	14.60090	144.77749	355.8	564.8	570.8	The new idea is to move the trash can (exclusion trap) out of the way for sampling.
3135	J2-490	3/22/2010 20:10	14.60089	144.77749	353.2	564.8	570.8	The exclusion trap experiment did not seem to work anyway; so will get it out of the way.
3138	J2-490	3/22/2010 20:13	14.60088	144.77750	353.0	564.8	570.1	Stowing the fluid sampler wand so they can move the exclusion trap.
3139	J2-490	3/22/2010 20:14	14.60089	144.77750	352.7	564.8	570.7	Bungying the wand down.
3141	J2-490	3/22/2010 20:16	14.60091	144.77752	7.7	564.4	568.7	The plan now is to reposition the exclusion trap up on top of the ridge.
3144	J2-490	3/22/2010 20:19	14.60091	144.77754	341.0	564.8	568.1	Jason is manipulating the can.
3145	J2-490	3/22/2010 20:20	14.60092	144.77753	349.5	563.7	568.0	Jason has the can in its claw.
3147	J2-490	3/22/2010 20:21	14.60094	144.77753	352.3	563.4	566.2	Mkr112 in sight.
3148	J2-490	3/22/2010 20:22	14.60093	144.77753	350.5	563.1	566.5	Re-deployed the exclusion trap in this area of markers. Positioned between Mkr112 and Mkr109.
3150	J2-490	3/22/2010 20:24	14.60092	144.77753	337.0	563.3	566.7	NAV: Location Repositioned the exclusion trap to: 144°46.651 14°36.056.
3151	J2-490	3/22/2010 20:24	14.60091	144.77750	305.8	564.3	566.8	Akel says that Mkr109 position should probably be a meter or so to the west. Bill says "a meter is fine".
3152	J2-490	3/22/2010 20:24	14.60091	144.77750	314.0	564.4	567.1	Going to get down to business now.
3154	J2-490	3/22/2010 20:25	14.60091	144.77750	314.0	564.4	567.1	BIOLOGY: Opaepele(shrimp) swimming around here and covering the rocks.
3155	J2-490	3/22/2010 20:26	14.60091	144.77750	314.1	564.4	567.1	Looking at the focused flow below the marker on the edge of this cliff.
3156	J2-490	3/22/2010 20:26	14.60092	144.77750	314.2	564.5	567.1	Locking in the vehicle.
3157	J2-490	3/22/2010 20:26	14.60092	144.77750	314.2	564.5	567.2	Temperature is still rising to 22 and rising.
3159	J2-490	3/22/2010 20:27	14.60092	144.77751	314.2	564.5	567.2	Ben is going to pilot for a bit. Will is taking a break.
3160	J2-490	3/22/2010 20:28	14.60090	144.77751	314.3	564.5	567.2	This looks like a good sampling spot. Kevin needs to "wake it up" again.

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3162	J2-490	3/22/2010 20:29	14.60090	144.77751	314.3	564.5	567.2	BIOLOGY: limpets lots of small limpets here. Verena thinks there was probably a recruitment of those as well. Last year the limpets were larger than the ones we see now.
3163	J2-490	3/22/2010 20:29	14.60090	144.77751	314.3	564.5	567.2	Lasers on.
3164	J2-490	3/22/2010 20:29	14.60090	144.77750	314.4	564.5	567.2	HD_CAM: start 38 minutes remaining on the tape.
3165	J2-490	3/22/2010 20:30	14.60091	144.77750	314.4	564.4	567.2	Kevin is waiting for the temperature to come back up. He had to re-boot everything.
3167	J2-490	3/22/2010 20:31	14.60090	144.77750	314.5	564.4	567.1	Kevin is doing a pH run while the system is coming back up.
3168	J2-490	3/22/2010 20:31	14.60090	144.77751	314.5	564.4	567.1	Little pink limpets in the HDcam.
3169	J2-490	3/22/2010 20:32	14.60090	144.77751	314.5	564.4	567.1	BIOLOGY: limpets lots of limpets on this cliff face.
3171	J2-490	3/22/2010 20:34	14.60089	144.77751	314.7	564.4	567.1	SAMPLE: fluid J490-HFS-3. Filtered bag #24. Mkr109. Z=564. Heading 315. Sampling in a crack under a meter down or so from the ledge just off the edge of Mkr-109.
3172	J2-490	3/22/2010 20:34	14.60088	144.77752	314.7	564.4	567.1	NAV: Location relocating Mkr109. It will be moved about 4m.
3174	J2-490	3/22/2010 20:36	14.60089	144.77751	314.8	564.4	567.2	SAMPLE cont. J490-HFS-3. Tmax=20.9 Tavg=20.2 T2=9.4. Vol=403ml. Mkr 109.
3175	J2-490	3/22/2010 20:36	14.60090	144.77751	314.8	564.5	567.2	BIOLOGY: Austinograea(crab) zoom on crab and limpets.
3178	J2-490	3/22/2010 20:39	14.60088	144.77752	314.9	564.4	567.1	SAMPLE: fluid J490-HFS-4. Unfiltered bag #17. Start 2037. Mkr109. Z=564. New position for Mkr109 144°46.649' 14°36.0548.
3179	J2-490	3/22/2010 20:40	14.60088	144.77752	315.0	564.4	567.1	NAV: Location Mkr109 moved about 3 meters to the west. 144° 46.649 14°36.0538.
3181	J2-490	3/22/2010 20:41	14.60089	144.77751	315.0	564.4	567.1	SAMPLE stop. J490-HFS-4. Tmax=20.3 Tavg=19.6 T2=9.3. Vol=401ml. Mkr-109. Z=564.
3183	J2-490	3/22/2010 20:43	14.60088	144.77752	315.1	564.5	567.1	SAMPLE: fluid J490-HFS-5. Sterivex filter #11. Mkr109. Start 204245. Mkr109.
3185	J2-490	3/22/2010 20:45	14.60087	144.77752	315.1	564.4	567.1	HD still recording. Looking around. Still have the lasers on. Lots of little limpets on the rocks. See some shrimp also.
3186	J2-490	3/22/2010 20:46	14.60087	144.77752	315.1	564.5	567.2	HDCAM. Sitting stationary recording shrimp video. Seeing a few shrimp and lots of limpets.
3189	J2-490	3/22/2010 20:49	14.60089	144.77750	315.1	564.4	567.2	Last year it was "wall to wall" shrimp here; crawling all over each other. This year it looks like the new baby limpets have taken over.
3190	J2-490	3/22/2010 20:50	14.60089	144.77750	315.0	564.5	567.2	A few shrimp moving about - roaming more than usual.
3192	J2-490	3/22/2010 20:52	14.60090	144.77752	315.0	564.5	567.2	Taking DSCs and HD grabs of the biology here.
3195	J2-490	3/22/2010 20:55	14.60091	144.77751	314.9	564.5	567.2	HD have the lasers in the HD view.
3196	J2-490	3/22/2010 20:56	14.60091	144.77752	314.9	564.4	567.2	BIOLOGY. See both species here. Actually lots of Alvinocaris here.
3199	J2-490	3/22/2010 21:00	14.60089	144.77753	314.8	564.4	567.2	BIOLOGY: barnacles Found a barnacle!! They are not extinct yet. Zooming in on the lone barnacle.
3201	J2-490	3/22/2010 21:01	14.60089	144.77753	314.8	564.4	567.2	Looking at the top of the rock.
3202	J2-490	3/22/2010 21:02	14.60090	144.77753	314.8	564.4	567.2	J490-HFS-5 stop. Vol=2522ml. Tmax=22.8 Tavg=20.6 T2=9.0. Mkr109.

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3204	J2-490	3/22/2010 21:03	14.60091	144.77753	314.7	564.4	567.2	SAMPLE: fluid J40--HFS-6. RNA filter. Start 2103.
3206	J2-490	3/22/2010 21:05	14.60091	144.77754	314.7	564.4	567.2	An Opapepele shrimp is eating a limpet whose shell has been broken. The limpet is trying to move away. The barnacle has it's feelers out...
3209	J2-490	3/22/2010 21:09	14.60089	144.77754	314.6	564.5	567.2	Still observing the biology. "Barnacle Bill Chadwick" found the first one of the cruise.
3210	J2-490	3/22/2010 21:09	14.60089	144.77754	314.6	564.4	567.2	Polychaete flying and flopping through the water.
3212	J2-490	3/22/2010 21:11	14.60090	144.77753	314.5	564.5	567.2	J490-HFS-6 cont. Correction to entry at 210328.
3213	J2-490	3/22/2010 21:11	14.60090	144.77753	314.5	564.5	567.2	HD_CAM: stop end of third HD cam tape.
3214	J2-490	3/22/2010 21:12	14.60090	144.77753	314.5	564.5	567.2	We now can see the lasers in the DSC and the HD cam.
3216	J2-490	3/22/2010 21:13	14.60090	144.77753	314.5	564.5	567.2	Lots of shimmer in the HD cam. Shrimp (both species) are not very abundant here. Lots of limpets and 1 lonely barnacle.
3217	J2-490	3/22/2010 21:14	14.60090	144.77753	314.5	564.4	567.2	J490-HFS-6 cont. Still filtering water....
3221	J2-490	3/22/2010 21:19	14.60089	144.77753	314.4	564.5	567.2	J490-HFS-6 stop. Tmax=20.5 Tavg=19.0 T2=9.2 Vol=2502ml.
3224	J2-490	3/22/2010 21:23	14.60090	144.77754	335.7	563.4	566.2	Finished fluid sampling here at Mkr-109. Will stow the probe. We are moving off the sampling site and taking a look at Mkr-109.
3225	J2-490	3/22/2010 21:23	14.60089	144.77756	39.1	562.8	567.5	Just moving over to Mkr-112 adjacent to Mkr-109 on the ridge top.
3226	J2-490	3/22/2010 21:24	14.60089	144.77759	312.7	561.4	565.4	We will be trying some fluid sampling at Mkr-112.
3227	J2-490	3/22/2010 21:24	14.60089	144.77760	261.8	561.3	586.2	Shear cliff below Mkr-112.
3229	J2-490	3/22/2010 21:25	14.60092	144.77758	233.5	562.6	583.1	Turning to face Mkr-112 with Jason's aft hanging over the ridge wall.
3230	J2-490	3/22/2010 21:26	14.60092	144.77758	232.9	563.1	583.5	Moving closer into the wall and can see Mkr-112 anchor close-up and Mkr-109 and instruments in the distance.
3232	J2-490	3/22/2010 21:27	14.60092	144.77759	232.8	563.1	583.3	Just below Mkr-112 and slightly to the right there is flow with a lot of shrimp.
3233	J2-490	3/22/2010 21:28	14.60092	144.77759	250.2	562.9	584.4	Repositioning Jason looking for a food flow site.
3234	J2-490	3/22/2010 21:28	14.60092	144.77758	249.3	562.7	584.1	Mkr-112 is streaming slightly away from Jason in the current.
3235	J2-490	3/22/2010 21:28	14.60092	144.77757	253.0	563.2	582.4	Looking along a crack covered in Shrimp near the top of the ridge and right of Mkr-112.
3237	J2-490	3/22/2010 21:30	14.60092	144.77758	250.7	563.2	582.0	Retrieving wand and checking flow and temperature.
3239	J2-490	3/22/2010 21:31	14.60092	144.77758	250.6	563.2	582.0	In pilot cam can see base of Mkr-112 just left and crack is just right in the frame.
3240	J2-490	3/22/2010 21:31	14.60092	144.77758	250.3	563.2	582.4	Bumping the white rock out of the way slightly with wand to get more flow.
3241	J2-490	3/22/2010 21:31	14.60092	144.77758	250.2	563.2	581.9	Getting about 9deg so going to excavate.
3242	J2-490	3/22/2010 21:32	14.60092	144.77758	250.1	563.2	581.9	Now about 11deg.
3243	J2-490	3/22/2010 21:32	14.60091	144.77758	250.1	563.2	581.9	Going to try to get deeper in the hole and flow.
3245	J2-490	3/22/2010 21:33	14.60091	144.77759	250.0	563.2	581.9	SAMPLE: fluid Temp is up to 14 so probably will take a sample here. Letting sampler chamber warm up.
3246	J2-490	3/22/2010 21:34	14.60091	144.77758	249.5	563.2	581.1	Just a small pH anomaly at 15deg. pH=1.82volts compared to 2.0 background.

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3248	J2-490	3/22/2010 21:35	14.60091	144.77758	249.8	563.2	581.1	SAMPLE: fluid Filtered bag #23 J290-HFS-07 at Mkr-112. Start.
3249	J2-490	3/22/2010 21:36	14.60092	144.77758	249.6	563.2	581.7	SAMPLE: fluid 14deg 36.0544' 144deg 46.653 z=563 head=250 at Mkr-112 J290-HFS-07
3250	J2-490	3/22/2010 21:36	14.60092	144.77758	249.6	563.2	582.2	Doing photo mosaic of the site with the HD
3252	J2-490	3/22/2010 21:38	14.60093	144.77758	249.5	563.2	582.3	SAMPLE: fluid Stop. J290-HFS-07 Mkr-112
3253	J2-490	3/22/2010 21:38	14.60093	144.77758	249.3	563.2	582.2	J490-HFS-07 Tmax=14.0 Tavg=12.7 vol=494 T2=7.5
3254	J2-490	3/22/2010 21:38	14.60093	144.77758	249.4	563.2	582.2	That is the only sample we will take at this flow crack.
3256	J2-490	3/22/2010 21:39	14.60093	144.77758	249.4	563.2	581.5	Stowing the wand.
3258	J2-490	3/22/2010 21:41	14.60093	144.77758	249.9	562.4	584.3	Still stowing the wand into the basket.
3260	J2-490	3/22/2010 21:43	14.60093	144.77757	249.9	562.4	583.2	Done with fluid sampler and now we'll do some geology exploring up near old Mkr-101 area.
3261	J2-490	3/22/2010 21:43	14.60092	144.77757	250.0	562.4	583.7	We should be able to reach the Mkr-101 area without moving the ship.
3263	J2-490	3/22/2010 21:45	14.60099	144.77753	294.7	559.8	563.0	Going to follow the ridge from Mkr-112 to Mkr-109 along ridge and then right to Mkr-101 area.
3264	J2-490	3/22/2010 21:45	14.60101	144.77748	295.3	561.2	563.9	Driving along the ridge top. Shear drop to either site with sulfur coating on outcrop.
3265	J2-490	3/22/2010 21:46	14.60105	144.77726	267.8	562.1	566.0	The ridge is dropping off. We are heading to Mkr101 area.
3267	J2-490	3/22/2010 21:48	14.60103	144.77728	7.8	566.3	571.7	We plan to head west to Iceberg'09 Mkr110.
3269	J2-490	3/22/2010 21:49	14.60103	144.77728	8.3	566.5	571.6	Limpet with little limpets on its back.
3270	J2-490	3/22/2010 21:50	14.60103	144.77728	6.5	566.7	572.0	BIOLOGY: barnacles in the DSC. They are still here. The barnacles are here..
3271	J2-490	3/22/2010 21:50	14.60102	144.77729	4.2	566.7	572.4	There are a bunch of barnacles here. We are close to where Mkr101 used to be. It used to be called Barnacle Block at one point.
3273	J2-490	3/22/2010 21:52	14.60103	144.77730	4.9	566.8	572.4	Mkr101 is not here anymore. These have the gooseneck top but not the stalk. Attached directly to the rock. They are not attached. Neolepas is the name.
3274	J2-490	3/22/2010 21:52	14.60103	144.77730	4.9	566.7	572.5	BIOLOGY: barnacles Neolepas barnacles are still here. We are sitting on top of the position where Mkr101 used to be.
3276	J2-490	3/22/2010 21:53	14.60104	144.77729	4.8	566.7	572.5	HD_CAM: start here where Mkr101 used to be. A couple of the barnacles have their cirri hanging out. Filter feeding.
3278	J2-490	3/22/2010 21:55	14.60103	144.77728	5.2	566.7	572.1	There is a group of these barnacles down in Lau Basin that are stalked but their cirri are covered with bacterial floc to help with filter feeding.
3280	J2-490	3/22/2010 21:57	14.60103	144.77729	5.0	566.7	572.1	These barnacles do not have bacteria on their cirri. They are 1cm long. Not sure what they are eating Bacteria in the water column? larvae??
3281	J2-490	3/22/2010 21:57	14.60103	144.77729	4.9	566.7	572.1	They are not pulling in their cirri. They are waving.
3282	J2-490	3/22/2010 21:58	14.60102	144.77729	5.1	566.7	572.4	Zooming out and looking around. White patches on the rock that could be sulfur.

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3284	J2-490	3/22/2010 21:59	14.60102	144.77729	5.2	566.7	572.3	BIOLOGY: barnacles a few shrimp; limpets; etc. here. Quite a diverse group of species. The limpet and barnacles are species not found anywhere else; at least yet.
3286	J2-490	3/22/2010 22:01	14.60103	144.77729	5.1	566.7	572.3	Polychaete (scaleworm) in the HD cam is bigger than the crab in the view. It is at least twice as long and 3 times as wide as the shrimp.
3287	J2-490	3/22/2010 22:01	14.60103	144.77729	5.0	566.7	572.3	Scaleworm with barnacles.
3288	J2-490	3/22/2010 22:02	14.60103	144.77729	5.0	566.7	572.3	The scaleworm looks like he is in search of a meal.
3290	J2-490	3/22/2010 22:03	14.60103	144.77729	4.8	566.7	572.3	This group of scaleworms often has parasites. This one has something on its scales.
3291	J2-490	3/22/2010 22:03	14.60103	144.77728	4.8	566.7	572.3	Seeing a bit of fluid flow here.
3292	J2-490	3/22/2010 22:03	14.60103	144.77728	4.7	566.7	572.3	A worm swimming around.
3294	J2-490	3/22/2010 22:05	14.60103	144.77728	4.7	566.7	572.3	Scaleworm just stuck out his "tongue".
3296	J2-490	3/22/2010 22:08	14.60104	144.77728	4.5	566.7	572.3	Want to collect barnacles here so will pick up a rock or two with barnacles on it.
3297	J2-490	3/22/2010 22:08	14.60104	144.77728	4.6	566.7	572.3	Looking for a smallish rock with barnacles on it.
3300	J2-490	3/22/2010 22:11	14.60104	144.77727	6.3	566.6	572.3	SAMPLE: bio Dropped the rock with the barnacles. going for it again.
3303	J2-490	3/22/2010 22:15	14.60103	144.77726	356.5	566.6	573.3	SAMPLE: bio J490-barnacles-8. Grabbed crumbly rock with barnacles on it. This is where Mkr101 used to be. Location: 144 46.636' 14°36.064. Z=567. Hdg=356.
3304	J2-490	3/22/2010 22:15	14.60103	144.77726	356.4	566.6	573.1	HD_CAM: stop
3305	J2-490	3/22/2010 22:16	14.60102	144.77726	357.3	566.7	572.9	J490-barnacles-8 cont. The barnacles are Neolepas. Barnacles stowed in the port swing arm.
3308	J2-490	3/22/2010 22:20	14.60103	144.77724	51.0	567.3	568.5	Looks like a long skinny spine. Much steeper than last year. Mass wasting.
3312	J2-490	3/22/2010 22:26	14.60103	144.77726	51.5	567.6	568.5	DEPLOY: marker 119 set down on top of this extremely narrow spine/like ridge. This is the area where Mkr101 used to be. Z=567m. Location 144°46.636 14°36.0625.
3315	J2-490	3/22/2010 22:29	14.60096	144.77725	84.7	570.5	576.7	Panning around as ship moves to west. We approached this ridge from the east.
3316	J2-490	3/22/2010 22:30	14.60095	144.77726	73.4	571.9	578.0	Moving ship west so we can look to east at this ridge. We had been looking to the west.
3317	J2-490	3/22/2010 22:30	14.60095	144.77728	33.4	572.4	579.9	Huge slide scarp.
3318	J2-490	3/22/2010 22:30	14.60095	144.77727	356.1	572.2	581.5	Panning north again to the west.
3320	J2-490	3/22/2010 22:31	14.60095	144.77719	6.4	572.5	578.9	Sediment slope is the east face and a shear drop down the west face.
3321	J2-490	3/22/2010 22:31	14.60095	144.77716	64.8	573.4	592.4	Head on view of the ridge.
3322	J2-490	3/22/2010 22:31	14.60095	144.77717	104.5	573.6	592.9	Panning and turning to face east now.
3323	J2-490	3/22/2010 22:31	14.60096	144.77717	111.6	575.0	600.7	Boulders at base of the sediment on the east in the pilot cam.
3324	J2-490	3/22/2010 22:32	14.60098	144.77717	105.6	575.2	599.9	Facing the west face now.
3325	J2-490	3/22/2010 22:32	14.60098	144.77716	122.9	575.2	599.0	SHEAR!

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3326	J2-490	3/22/2010 22:32	14.60099	144.77717	113.0	575.4	598.4	Facing a little south of east.
3327	J2-490	3/22/2010 22:32	14.60099	144.77719	115.7	575.3	598.2	BIOLOGY: barnacles here. And limpets.
3329	J2-490	3/22/2010 22:33	14.60099	144.77719	116.1	575.6	597.9	BIOLOGY: limpets Close up view of the ridge face with limpets and barnacles.
3330	J2-490	3/22/2010 22:33	14.60099	144.77719	115.2	575.8	597.9	There are also bright orange shrimp here.
3331	J2-490	3/22/2010 22:33	14.60099	144.77719	115.9	575.7	597.8	Looks like it goes straight down on the brow cam.
3332	J2-490	3/22/2010 22:34	14.60099	144.77719	115.3	575.7	597.5	Nothing but water on the butt cam.
3333	J2-490	3/22/2010 22:34	14.60099	144.77719	115.3	575.7	597.8	Ship is struggling to hold position here.
3334	J2-490	3/22/2010 22:34	14.60099	144.77718	115.8	575.7	597.8	Yellow dots are the barnacles.
3336	J2-490	3/22/2010 22:35	14.60098	144.77718	115.6	576.2	584.5	Examining the ridge wall while waiting for ship and Medea.
3337	J2-490	3/22/2010 22:35	14.60098	144.77718	115.5	576.0	584.6	Lots of biology on the wall.
3339	J2-490	3/22/2010 22:37	14.60096	144.77718	118.4	576.6	584.9	Ledge on right falls straight down.
3340	J2-490	3/22/2010 22:37	14.60096	144.77719	122.5	576.7	584.8	Can see mat in the rocks as well.
3341	J2-490	3/22/2010 22:38	14.60096	144.77719	122.5	576.6	584.8	Can see some crabs in the background on sediment.
3342	J2-490	3/22/2010 22:38	14.60097	144.77718	118.5	576.8	599.4	Waiting for Medea to come north. Ship is stabilizing.
3344	J2-490	3/22/2010 22:39	14.60097	144.77718	134.4	577.4	586.5	Great brown cam shot of the sediment slide that ends at a sheared off rock wall.
3345	J2-490	3/22/2010 22:39	14.60097	144.77718	133.7	578.1	598.5	Heading down the west face of the wall as we face south of east.
3346	J2-490	3/22/2010 22:39	14.60098	144.77718	133.5	578.4	598.4	Altimeter shows 20m below.
3347	J2-490	3/22/2010 22:40	14.60098	144.77717	133.8	580.3	598.6	Brow cam shows the flight straight down the cliff face.
3348	J2-490	3/22/2010 22:40	14.60098	144.77717	125.3	581.7	599.4	HD_CAM: start HD of the journey down the cliff. Tape 4 #2.
3350	J2-490	3/22/2010 22:41	14.60099	144.77714	122.9	581.9	600.2	Undercut portion of the rock with a sulfur stained cut.
3351	J2-490	3/22/2010 22:41	14.60099	144.77713	122.4	582.1	600.0	Backing up to go over a step in the wall.
3352	J2-490	3/22/2010 22:41	14.60099	144.77713	122.4	582.4	600.6	Get feeling that this topography was here before but covered in the sediment.
3353	J2-490	3/22/2010 22:42	14.60097	144.77711	121.1	582.5	602.9	At the end of Medea's tether.
3354	J2-490	3/22/2010 22:42	14.60096	144.77711	121.7	583.1	605.6	Need to wait for Medea to go further.
3355	J2-490	3/22/2010 22:42	14.60093	144.77710	120.4	584.5	607.0	Over that step we still have another 23m below us.
3356	J2-490	3/22/2010 22:42	14.60092	144.77711	122.1	584.9	607.3	HD_CAM: stop
3358	J2-490	3/22/2010 22:43	14.60083	144.77709	243.8	586.6	605.8	At top we were at 576 m-we came down 10 m and have 20m below us.
3359	J2-490	3/22/2010 22:43	14.60074	144.77684	270.8	587.3	626.3	Facing west while waiting for Medea and driving out away from wall before going down again.
3360	J2-490	3/22/2010 22:45	14.60067	144.77669	272.0	587.3	631.7	Waiting for the watch change.
3361	J2-490	3/22/2010 22:45	14.60067	144.77671	273.7	587.5	632.5	Fish or something in the butt cam.
3362	J2-490	3/22/2010 22:47	14.60066	144.77670	273.8	587.4	631.5	Jason watch change. Matt-Dara are here. Wind is coming up.
3364	J2-490	3/22/2010 22:51	14.60063	144.77638	357.3	587.4	612.1	Want to go to bottom of the wall that is to the west (with Mkr-110 wall).
3365	J2-490	3/22/2010 22:51	14.60063	144.77637	357.3	587.4	612.2	Looking at a sheer cliff face on the western wall of the collapse area.
3366	J2-490	3/22/2010 22:52	14.60064	144.77638	357.2	587.5	612.5	Polychaetes are swimming all over here.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3367	J2-490	3/22/2010 22:52	14.60070	144.77652	356.7	587.6	618.3	We're moving along the wall to the north and now are beyond the sulfur-encrusted edge to black unaltered slide-scarp.
3368	J2-490	3/22/2010 22:53	14.60072	144.77658	28.4	587.5	618.4	We're at 488m in the water column with 32m altitude.
3369	J2-490	3/22/2010 22:53	14.60072	144.77656	356.4	587.5	619.8	We would like to go to the bottom of the wall and check it out.
3370	J2-490	3/22/2010 22:54	14.60081	144.77654	299.9	587.8	625.3	Massive lavas in the view. Incredibly sheer with sulfur apparent on the rocks.
3371	J2-490	3/22/2010 22:55	14.60082	144.77654	301.2	590.6	624.9	Sulfur with some shrimp on it.
3372	J2-490	3/22/2010 22:55	14.60081	144.77655	301.1	594.2	626.0	The shrimp may be eating some bacteria that grows on the sulfur.
3373	J2-490	3/22/2010 22:56	14.60080	144.77657	294.7	597.9	626.3	We're going down the wall facing W/NW heading.
3374	J2-490	3/22/2010 22:56	14.60079	144.77660	302.5	603.2	626.9	Heading down.
3376	J2-490	3/22/2010 22:57	14.60079	144.77661	302.3	603.7	626.9	In the brow cam we can almost see the bottom??
3377	J2-490	3/22/2010 22:57	14.60077	144.77665	301.9	616.4	627.3	Continuing down.
3378	J2-490	3/22/2010 22:58	14.60083	144.77656	302.0	622.9	625.6	Want to belly up to the white area to take a good look at it. We're down here looking at the bottom now.
3379	J2-490	3/22/2010 22:58	14.60083	144.77657	302.1	623.0	625.6	We are 623 meters. The lava under this looks almost lobate. Shrimp and sulfur on the wall.
3381	J2-490	3/22/2010 22:59	14.60083	144.77658	302.1	622.9	625.6	Looking for flow.
3382	J2-490	3/22/2010 23:00	14.60083	144.77658	302.2	622.9	625.6	HD_CAM: start Here at the base of the wall. Z=623. Heading 302. Lots of shrimp here. All the loose geo is gone. Only the intact stuff is left.
3384	J2-490	3/22/2010 23:01	14.60082	144.77659	302.2	622.9	625.5	Looking at the bottom of the slide area up in the NW corner. Depth on the bathy map says we should be at 627m Jason depth is 623m. Only 5m off here.
3385	J2-490	3/22/2010 23:02	14.60082	144.77659	302.2	622.9	625.5	Lots of shrimp here.
3386	J2-490	3/22/2010 23:02	14.60082	144.77659	302.3	622.9	625.6	Saw a shrimp with a worm in its mouth.
3388	J2-490	3/22/2010 23:03	14.60081	144.77659	302.3	622.9	625.5	There's one shrimp here that is whiter than the others. Maybe he shucked his carapace. Another worm went swimming by.
3389	J2-490	3/22/2010 23:04	14.60082	144.77658	302.2	622.9	625.6	The seafloor here looks to be covered in volcanic sediments (of course).
3392	J2-490	3/22/2010 23:07	14.60085	144.77658	301.6	615.9	624.9	Moving up the wall again.
3393	J2-490	3/22/2010 23:08	14.60084	144.77657	291.4	604.4	624.7	Still moving up.
3395	J2-490	3/22/2010 23:09	14.60083	144.77657	295.5	600.1	625.1	There is an offset in the bathy about 10m. We're going right up the wall and it looks like it is 10m to the west in the bathy.
3396	J2-490	3/22/2010 23:09	14.60082	144.77655	299.1	597.1	625.3	Looking at the wall as we move up.
3397	J2-490	3/22/2010 23:10	14.60083	144.77655	313.6	594.5	624.9	The marker is 90m up from the bottom and 20m in.
3398	J2-490	3/22/2010 23:11	14.60082	144.77655	291.6	589.4	625.3	Shrimp swarming on this sulfur crust. They really pop out.
3399	J2-490	3/22/2010 23:12	14.60082	144.77655	289.4	586.4	625.2	Bacteria can use elemental sulfur. That must be what the shrimp are eating. They are covering the sulfur patches.
3400	J2-490	3/22/2010 23:13	14.60082	144.77655	282.5	582.5	624.5	This cliff is a vertical wall. The view in the brow cam is spectacular.
3401	J2-490	3/22/2010 23:13	14.60080	144.77658	340.7	580.4	623.7	Turning the vehicle a bit to go an idea of how vertical the cliff is.
3402	J2-490	3/22/2010 23:16	14.60073	144.77653	314.7	579.0	622.7	Looking into the abyss along this vertical wall. Still climbing.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3403	J2-490	3/22/2010 23:16	14.60073	144.77653	315.6	577.9	623.6	HD_CAM: stop 2316.
3404	J2-490	3/22/2010 23:16	14.60074	144.77652	311.4	575.0	622.4	Don't know what all the little dots are.
3405	J2-490	3/22/2010 23:17	14.60075	144.77652	310.3	573.2	623.4	Tons of shrimp in this area.
3406	J2-490	3/22/2010 23:18	14.60075	144.77653	303.8	569.0	623.6	Snapping HD frame grabs as we climb up this wall.
3407	J2-490	3/22/2010 23:19	14.60075	144.77652	302.5	565.4	623.1	The nice gentle slope that was here in this spot last year is now a cliff face.
3408	J2-490	3/22/2010 23:19	14.60075	144.77652	302.9	564.4	622.7	Correction: cliff face.
3409	J2-490	3/22/2010 23:20	14.60075	144.77651	307.6	561.2	622.1	Chopped off massive lavas here.
3410	J2-490	3/22/2010 23:21	14.60077	144.77652	347.0	558.5	616.9	Cliff edge shot. Piece of sulfur covered in shrimp.
3411	J2-490	3/22/2010 23:22	14.60078	144.77651	337.1	554.0	565.7	This cliff face is about 100m high.
3412	J2-490	3/22/2010 23:23	14.60079	144.77651	337.3	552.0	619.5	Shrimp all over this wall.
3413	J2-490	3/22/2010 23:24	14.60081	144.77651	337.4	549.1	565.2	There are places where you see a bit of mat.
3415	J2-490	3/22/2010 23:25	14.60081	144.77649	324.7	546.3	560.7	The slope is starting to mellow out and round off here.
3416	J2-490	3/22/2010 23:25	14.60081	144.77649	327.9	547.2	559.9	We're 80m up from the bottom of the cliff here.
3417	J2-490	3/22/2010 23:26	14.60081	144.77648	327.9	547.3	559.8	We haven't seen any mat - just sulfur patches.
3419	J2-490	3/22/2010 23:27	14.60080	144.77648	339.4	547.2	565.3	The sulfur is coming out of the magma. Wherever the volcanic gases are permeating. The sulfur builds up in all the cracks. It has a low melting point. Will solidify.
3420	J2-490	3/22/2010 23:27	14.60079	144.77649	339.5	547.2	565.6	Sulfur melts at 119°C - just over the melting point of water. It can melt and re-solidify.
3421	J2-490	3/22/2010 23:28	14.60078	144.77650	339.6	547.2	619.6	On these faces we don't know how it forms. It must have been during a warmer phase.
3422	J2-490	3/22/2010 23:28	14.60077	144.77651	339.5	547.2	621.4	Sulfur can form at weak points and fill large vertical or horizontal fractures.
3423	J2-490	3/22/2010 23:29	14.60077	144.77651	339.3	547.2	621.1	Jason is going for the temp probe.
3425	J2-490	3/22/2010 23:31	14.60080	144.77648	334.9	546.5	563.1	Dave wants to poke the Jason probe in the sediments here.
3426	J2-490	3/22/2010 23:32	14.60081	144.77648	335.3	546.5	561.3	We see pillows in the background. Barnacles and shrimp in the HD cam.
3428	J2-490	3/22/2010 23:33	14.60081	144.77647	334.9	546.0	562.8	We're looking at lobate flows in the HD cam.
3429	J2-490	3/22/2010 23:34	14.60081	144.77647	343.3	547.5	559.3	Here comes the temp probe.
3431	J2-490	3/22/2010 23:35	14.60080	144.77647	343.4	547.5	559.3	Temp is 8.3 which is ambient on the sulfur. The temp rose to 8.4°C.
3432	J2-490	3/22/2010 23:36	14.60080	144.77647	342.7	547.5	559.2	Temp is up to 8.6 now in the sediments.
3433	J2-490	3/22/2010 23:36	14.60080	144.77647	343.4	547.5	559.3	There is a 0.3 degree temperature anomaly in the sediments here.
3435	J2-490	3/22/2010 23:38	14.60080	144.77647	342.4	547.5	559.2	Poked the probe into the seds here. The temp0 in the seds is up to 8.9 now. 9.1 degrees now.
3437	J2-490	3/22/2010 23:39	14.60081	144.77647	343.1	547.5	559.4	Our heading is 343 degrees. The temp in the sediments got up to 9.1. That's a 0.8 degree anomaly. It's real.
3438	J2-490	3/22/2010 23:39	14.60081	144.77647	343.1	547.6	559.6	Stowed the probe.
3439	J2-490	3/22/2010 23:40	14.60082	144.77647	343.3	547.6	559.6	Heading up the wall toward Mkr110.

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3441	J2-490	3/22/2010 23:42	14.60083	144.77647	343.4	547.6	559.2	Fixing the port arm. It's not behaving properly.
3443	J2-490	3/22/2010 23:44	14.60082	144.77647	343.4	547.6	559.6	still fixing port arm.
3445	J2-490	3/22/2010 23:45	14.60083	144.77647	342.8	547.7	559.1	going back up; heading 343; z 547.8;
3446	J2-490	3/22/2010 23:46	14.60084	144.77646	333.8	543.4	555.3	looking for marker 110
3448	J2-490	3/22/2010 23:47	14.60086	144.77642	324.3	537.6	548.8	pillow lavas at top of summit; still intact
3449	J2-490	3/22/2010 23:47	14.60086	144.77635	320.2	533.7	537.9	heading west for marker search; heading 320; z 533.7
3450	J2-490	3/22/2010 23:48	14.60085	144.77634	321.5	533.9	538.1	marker sited
3452	J2-490	3/22/2010 23:49	14.60084	144.77629	337.7	533.3	539.6	marker 110; terrain not effected by land slide; lat 14 36.052 long 144 46.581;
3453	J2-490	3/22/2010 23:49	14.60084	144.77629	323.3	533.1	537.9	fluid spotted; preparing to take fluid sample.
3454	J2-490	3/22/2010 23:50	14.60086	144.77629	306.2	532.9	536.3	biology shrimp
3456	J2-490	3/22/2010 23:52	14.60086	144.77630	314.6	532.8	537.2	location marker 110; lat 14 36.052 long 144 46.577; z 532.8; heading 314;
3457	J2-490	3/22/2010 23:52	14.60085	144.77629	314.7	532.8	537.2	Hdg camera on
3459	J2-490	3/22/2010 23:53	14.60085	144.77629	314.3	532.8	537.2	HD_CAM: start
3460	J2-490	3/22/2010 23:54	14.60086	144.77630	314.4	532.8	537.1	Lasers off; HD camera filing shrimp and diffuse flow
3463	J2-490	3/22/2010 23:57	14.60086	144.77628	344.4	533.0	537.8	preparing for HFS sample at marker 110
3466	J2-490	3/23/2010 0:01	14.60085	144.77629	348.0	532.7	539.4	HD_CAM: start
3467	J2-490	3/23/2010 0:02	14.60086	144.77628	357.8	532.9	539.2	We're here at Mkr110 now. Same marker as last year (Iceberg'09).
3468	J2-490	3/23/2010 0:02	14.60086	144.77629	11.2	532.9	538.5	Re-positioning the wand. The probe is not in the hole.
3471	J2-490	3/23/2010 0:05	14.60086	144.77628	357.1	532.7	539.2	There is a bit of bacterial mat here. Could be a combo of sulfur and mat. This area is a nice lobate.
3472	J2-490	3/23/2010 0:05	14.60086	144.77629	357.1	532.8	539.2	Lots of flow coming out of here.
3474	J2-490	3/23/2010 0:07	14.60086	144.77628	357.0	532.8	539.2	The temp is rising now. Poking the probe around.
3475	J2-490	3/23/2010 0:07	14.60086	144.77628	357.0	532.8	539.2	HD_CAM: stop JHD Cam has been off for 5-10 minutes.
3476	J2-490	3/23/2010 0:08	14.60086	144.77628	356.9	532.8	539.2	Still manipulating the wand.
3478	J2-490	3/23/2010 0:09	14.60087	144.77628	357.1	532.8	539.3	Poking around trying to find the right temperature. Shrimp are quite extensive on the lobate lavas. Must be grazing something.
3480	J2-490	3/23/2010 0:11	14.60087	144.77627	357.2	532.8	539.2	BIOLOGY: Alvinocaris(shrimp) marching across the rock amongst the minions of Opaapele.
3481	J2-490	3/23/2010 0:11	14.60087	144.77628	357.2	532.8	539.2	Zoomed in on the sampling site.
3482	J2-490	3/23/2010 0:12	14.60086	144.77628	357.2	532.8	539.2	Nice placement of the temp probe.
3484	J2-490	3/23/2010 0:13	14.60086	144.77629	357.2	532.8	539.2	Temp is steady at 27°C or so.
3485	J2-490	3/23/2010 0:14	14.60086	144.77629	357.2	532.8	539.3	A few bubbles coming out of the hole when remove the wand.
3488	J2-490	3/23/2010 0:18	14.60085	144.77627	357.1	532.8	539.4	NAV: Location right at the marker. Mkr110 position: 144°46.576' 14°36.0512.
3490	J2-490	3/23/2010 0:20	14.60085	144.77629	357.1	532.8	539.2	SAMPLE: fluid J490-HFS-9. Filtered bag #18. Temp is 33 right now. Mkr110 Z=533. 144°46.576' 14°36.0512. Start at 001940.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3492	J2-490	3/23/2010 0:22	14.60086	144.77629	357.1	532.8	539.2	NAV: Location Mkr110 location is about 5m W of the previous location. Mkr110 Z=533. 144°46.576' 14°36.0512.
3493	J2-490	3/23/2010 0:22	14.60086	144.77629	357.1	532.8	539.2	J490-HFS-9 stop. Tmax=33.4 Tavg=32.8 Vol=492. T2=9.4
3495	J2-490	3/23/2010 0:23	14.60086	144.77628	357.1	532.8	539.2	pH measurement next.
3496	J2-490	3/23/2010 0:23	14.60086	144.77628	357.1	532.8	539.2	Lasers on.
3498	J2-490	3/23/2010 0:25	14.60085	144.77629	357.2	532.8	539.2	NAV: Doppler Reset
3500	J2-490	3/23/2010 0:28	14.60085	144.77629	357.4	532.8	539.2	NAV: Location New position for Mkr110. About 5m west of last years location. 144°46.577 14°36.0520. Z=533.
3503	J2-490	3/23/2010 0:32	14.60085	144.77629	357.4	532.8	539.2	SAMPLE: fluid J490-HFS-10. Filtered bag #42. Started ~0029. Mkr110. 144°46.577 14°36.0520. Z=533. Hdg 357.
3504	J2-490	3/23/2010 0:32	14.60085	144.77629	357.4	532.8	539.2	Stop J490-HFS-10. Tmax=33.4 Tavg=31.6 Vol=530ml. %2=10.
3506	J2-490	3/23/2010 0:33	14.60085	144.77628	357.4	532.8	539.2	HD_CAM: start Recording for shrimp behavior.
3508	J2-490	3/23/2010 0:36	14.60085	144.77630	357.5	532.8	539.2	SAMPLE: fluid J490-HFS-11. Start 0035. RNA filter #15. Mkr-110.
3510	J2-490	3/23/2010 0:37	14.60085	144.77630	357.5	532.8	539.2	The USBL nav is great.
3512	J2-490	3/23/2010 0:40	14.60085	144.77628	357.4	532.8	539.2	Beautiful shot of the shrimp on sulfur. Grazing on something that is coming out of this crack in the sulfur.
3514	J2-490	3/23/2010 0:41	14.60084	144.77629	357.4	532.8	539.3	The depth here is 534. The new EM1002 map shows it to be about 560m. We are on the steep slope here.
3517	J2-490	3/23/2010 0:45	14.60084	144.77629	357.3	532.8	539.3	BIOLOGY: Alvinocaris(shrimp) big guy in the middle of the HD cam screen.
3518	J2-490	3/23/2010 0:46	14.60084	144.77627	357.1	532.8	539.2	BIOLOGY: Alvinocaris(shrimp) have beady round eyes and a cockscomb. The Opaepele have longer "hourglass" type eye. All the smaller shrimp we have seen are the Opaepele. We haven't seen any juvenile Alvinocaris.
3520	J2-490	3/23/2010 0:48	14.60084	144.77627	357.2	532.8	539.2	BIOLOGY: Alvinocaris(shrimp) The bright red spot on the back is where the eggs are developing/or will be developing. The bright red spot probably indicates a females.
3522	J2-490	3/23/2010 0:49	14.60084	144.77628	357.3	532.8	539.2	Stop HFS-11. Tmax=33.0 Tavg=31.3 Vol=2507ml. T2=10. Mkr-110.
3523	J2-490	3/23/2010 0:49	14.60084	144.77628	357.3	532.8	539.2	We see a plume in the butt cam. It's coming from the E/NE.
3525	J2-490	3/23/2010 0:51	14.60085	144.77628	357.2	532.8	539.3	SAMPLE: fluid J490-HFS-12. Start 005020. Mkr110. Z=533. Same exact spot as the previous 3 samples.
3527	J2-490	3/23/2010 0:53	14.60085	144.77628	357.2	532.8	539.4	HD_CAM: stop
3530	J2-490	3/23/2010 0:58	14.60085	144.77627	356.5	532.8	539.4	Still filtering. We're trying to figure out where the plume is coming from. It's pretty intense.
3533	J2-490	3/23/2010 1:02	14.60084	144.77628	356.6	532.8	539.4	Still filtering water.
3536	J2-490	3/23/2010 1:06	14.60084	144.77628	356.3	532.8	539.2	J490-HFS-12 stop 0106. Tmax=33.3 Tavg=30. Vol=2516ml. T2=9.5.
3538	J2-490	3/23/2010 1:07	14.60084	144.77628	355.8	532.8	539.5	That's it for fluid sampling here. Stowing the wind next.
3539	J2-490	3/23/2010 1:08	14.60085	144.77631	349.1	532.8	536.8	Next tasks will be to deploy a shrimp trap and exclusion trap.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3543	J2-490	3/23/2010 1:14	14.60082	144.77630	349.1	532.8	539.3	Panning around with the DSC and HDCam. Preparing to deploy the biological experiments.
3547	J2-490	3/23/2010 1:20	14.60083	144.77630	358.9	532.4	538.0	DEPLOY: mat cage Little rocks inside a cage that Verena and John would like to see mat grow upon. Here At Mkr110 right near the flow.
3549	J2-490	3/23/2010 1:22	14.60083	144.77628	358.6	532.1	540.9	The mat cage is similar to the shrimp exclusion trap. Verena has decided the "mat cage" is a better name for it than "exclusion trap".
3551	J2-490	3/23/2010 1:24	14.60084	144.77628	330.7	533.0	537.2	Will do a suction sample for Rick Davis here.
3554	J2-490	3/23/2010 1:27	14.60083	144.77628	330.2	533.4	537.2	SAMPLE: bio J490-mat-13. Suction white bacterial mat right above the crack that with lots of flow. Exact same spot where Dave was fluid sampling. Suctioning the white mat. Mkr110. Z=533. 14°36.052 144°46.577.
3556	J2-490	3/23/2010 1:29	14.60084	144.77628	329.7	533.6	537.5	J490-mat-13 cont. Sample for Rick Davis and hopefully some for Verena and John too. Got a shrimp too.
3559	J2-490	3/23/2010 1:34	14.60085	144.77632	337.5	533.3	535.9	TXT:
3561	J2-490	3/23/2010 1:35	14.60086	144.77634	323.2	533.4	536.1	Driving north along top of sediment wall.
3562	J2-490	3/23/2010 1:36	14.60083	144.77634	318.5	533.9	538.6	Looking for Mkr-110-there it is.
3564	J2-490	3/23/2010 1:37	14.60083	144.77633	326.3	534.4	540.3	Mkr-110 Iceberg09 site approach to marker.
3565	J2-490	3/23/2010 1:38	14.60082	144.77629	327.3	535.1	539.0	Going to sample the Mkr-110 site.
3566	J2-490	3/23/2010 1:38	14.60082	144.77629	326.6	535.1	538.5	Dropping a weight.
3568	J2-490	3/23/2010 1:40	14.60083	144.77630	327.4	533.0	540.2	Preparing to remove shrimp trap from basket and deploy on top of ridge at Mkr-110.
3569	J2-490	3/23/2010 1:40	14.60082	144.77631	328.9	532.7	543.6	Honey bear is going out with the shrimp trap.
3571	J2-490	3/23/2010 1:41	14.60080	144.77631	328.6	532.0	542.5	Pull pin is to right of the trap on basket.
3572	J2-490	3/23/2010 1:41	14.60078	144.77631	328.6	530.3	549.9	Pin released.
3573	J2-490	3/23/2010 1:42	14.60074	144.77630	331.9	528.2	607.5	Pulled a bit off the site-driving north to relocate.
3575	J2-490	3/23/2010 1:45	14.60081	144.77627	5.3	533.6	539.8	Too deep-going up to top-there it is.
3576	J2-490	3/23/2010 1:45	14.60082	144.77627	359.0	533.9	540.5	Current is going strong to the south.
3577	J2-490	3/23/2010 1:45	14.60082	144.77626	358.1	533.4	541.6	At the marker again heading due north.
3578	J2-490	3/23/2010 1:46	14.60082	144.77626	358.4	533.3	541.8	Grabbed trap in port arm.
3580	J2-490	3/23/2010 1:47	14.60083	144.77627	17.2	532.4	538.4	DEPLOY: shrimp trap Want trap on top of ridge at the black rock which is just above the marker anchor Mkr-110.
3581	J2-490	3/23/2010 1:48	14.60083	144.77627	18.7	532.8	537.2	The mat cage is also on top of the rock-need room to place trap.
3583	J2-490	3/23/2010 1:49	14.60083	144.77626	17.9	532.6	537.2	DEPLOY: shrimp trap is adjacent to the mat cage precariously perched on the rock. Trap-4
3584	J2-490	3/23/2010 1:50	14.60083	144.77627	18.6	532.6	537.3	Just slightly moving the trap on the rock in hopes it won't fall down the slope.
3585	J2-490	3/23/2010 1:50	14.60083	144.77627	18.7	532.6	537.3	Getting frame grabs of the position of all the instruments.
3587	J2-490	3/23/2010 1:51	14.60083	144.77626	19.9	532.6	537.4	Next want to go to the Summit Mkr-163 which will require ship and Medea movement.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3589	J2-490	3/23/2010 1:53	14.60073	144.77623	21.9	518.5	595.1	Bringing vehicles up in the water to clear the summit ridge height of 520m.
3590	J2-490	3/23/2010 1:54	14.60070	144.77624	17.9	513.0	597.3	Jason is off bottom for moving.
3591	J2-490	3/23/2010 1:54	14.60069	144.77624	16.2	512.4	600.4	Ship is off to the new site at the summit.
3592	J2-490	3/23/2010 1:54	14.60068	144.77626	27.8	513.3	600.1	292deg at 78m to the Summit.
3593	J2-490	3/23/2010 1:55	14.60069	144.77627	22.1	513.3	597.5	Ship is moving west and Jason/Medea are SW of ship.
3594	J2-490	3/23/2010 1:57	14.60069	144.77624	19.1	513.3	600.3	Driving through water with nothing to see.
3597	J2-490	3/23/2010 2:03	14.60106	144.77615	20.7	508.6	537.7	NAV: Doppler Reset
3599	J2-490	3/23/2010 2:05	14.60138	144.77608	21.9	506.6	537.0	Hydrophone that we are recovering is almost neutrally buoyant so recovery must go into a swing arm box.
3600	J2-490	3/23/2010 2:07	14.60143	144.77592	21.9	509.0	537.2	TXT:
3603	J2-490	3/23/2010 2:11	14.60124	144.77570	21.9	507.9	520.5	NAV: Doppler Reset Ship is nearly at site.
3604	J2-490	3/23/2010 2:11	14.60124	144.77567	22.1	507.2	519.9	Going to start to bring Medea down.
3605	J2-490	3/23/2010 2:11	14.60123	144.77563	21.0	513.7	518.7	Plume in butt cam.
3606	J2-490	3/23/2010 2:11	14.60122	144.77563	30.0	517.7	522.2	Ship has arrived.
3607	J2-490	3/23/2010 2:12	14.60120	144.77563	73.5	516.3	537.0	There is the summit and instruments.
3608	J2-490	3/23/2010 2:12	14.60119	144.77562	102.6	514.8	540.3	Perfect driving and navigating.
3609	J2-490	3/23/2010 2:12	14.60117	144.77561	119.9	513.9	540.8	Lots of plume here so need to move 045 to get out of it.
3611	J2-490	3/23/2010 2:13	14.60121	144.77554	41.3	509.3	533.4	Top of plume.
3612	J2-490	3/23/2010 2:14	14.60121	144.77551	94.2	509.8	554.3	Driving back over to the summit marker Mkr-163.
3613	J2-490	3/23/2010 2:14	14.60122	144.77548	99.0	514.7	554.6	One of the vents is really pumping below us making it hard to see here.
3615	J2-490	3/23/2010 2:15	14.60127	144.77553	105.7	526.4	547.0	Trying to find an approach out of the plume
3616	J2-490	3/23/2010 2:15	14.60124	144.77560	143.5	527.6	539.0	Looking at the wall face to the east.
3617	J2-490	3/23/2010 2:15	14.60123	144.77561	139.5	525.0	537.2	Lots of shrimp on the wall.
3618	J2-490	3/23/2010 2:16	14.60123	144.77561	136.9	523.7	536.5	Fissure in the wall.
3619	J2-490	3/23/2010 2:16	14.60123	144.77561	136.4	521.7	536.5	Craggy top.
3621	J2-490	3/23/2010 2:17	14.60125	144.77561	117.4	518.0	538.8	There is the marker and instruments again on the top-better visibility now.
3622	J2-490	3/23/2010 2:17	14.60125	144.77565	152.5	519.3	531.4	Nice view of bucket-marker-hydrophone.
3623	J2-490	3/23/2010 2:18	14.60124	144.77566	145.3	518.9	531.3	Going to swap out hydrophones.
3624	J2-490	3/23/2010 2:18	14.60124	144.77567	138.2	518.8	531.1	Port swing arm is out.
3626	J2-490	3/23/2010 2:19	14.60123	144.77568	101.6	519.4	523.3	Plume is on the other side of the summit ridge.
3627	J2-490	3/23/2010 2:19	14.60123	144.77568	100.5	519.4	523.3	MTR-5 and shrimp crawling around the marker anchor and hydrophone.
3628	J2-490	3/23/2010 2:20	14.60123	144.77567	100.2	519.4	523.2	Need to hold onto the hydrophone while moving the marker away.
3629	J2-490	3/23/2010 2:20	14.60123	144.77567	100.6	519.3	523.3	Lots of shrimp
3630	J2-490	3/23/2010 2:20	14.60122	144.77567	100.2	519.3	523.5	Biobox is open (port) for hydrophone.
3632	J2-490	3/23/2010 2:21	14.60122	144.77567	102.7	519.4	529.8	Positioning for recovery.
3634	J2-490	3/23/2010 2:24	14.60122	144.77568	105.9	519.1	531.6	Port arm has hydrophone but the marker anchor is in the loop.
3635	J2-490	3/23/2010 2:24	14.60122	144.77568	106.1	519.1	531.9	Grabbed marker anchor with STBD arm and placed back at summit.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3637	J2-490	3/23/2010 2:25	14.60122	144.77568	104.9	519.1	532.1	RECOVER: hydrophone Swinging port box over and placing hydrophone is biobox.
3638	J2-490	3/23/2010 2:26	14.60123	144.77567	96.8	518.4	532.5	Almost knocked the bucket over.
3640	J2-490	3/23/2010 2:27	14.60123	144.77567	100.1	518.4	533.6	Next going to deploy the new hydrophone.
3642	J2-490	3/23/2010 2:29	14.60123	144.77568	132.8	519.3	531.0	Grabbing new hydrophone out of the basket. Pulled the pin.
3643	J2-490	3/23/2010 2:30	14.60124	144.77567	133.2	519.3	531.0	Grabbed the hydrophone.
3644	J2-490	3/23/2010 2:30	14.60124	144.77567	134.7	519.3	530.7	Pulling basket in.
3646	J2-490	3/23/2010 2:32	14.60124	144.77567	133.5	519.5	530.2	DEPLOY: hydrophone Placing the hydrophone between the MTR and bucket.
3647	J2-490	3/23/2010 2:32	14.60124	144.77567	133.3	519.5	530.1	Might want to fluid sample here but need to see if there is any flow.
3649	J2-490	3/23/2010 2:33	14.60123	144.77567	133.2	519.5	530.1	Looking around for flow with camera.
3650	J2-490	3/23/2010 2:33	14.60123	144.77567	133.5	519.4	530.3	Going to move away from the instruments to poke around with the probe.
3652	J2-490	3/23/2010 2:35	14.60121	144.77567	173.6	518.2	528.8	Positions now are a bit off but can't reset doppler.
3653	J2-490	3/23/2010 2:35	14.60121	144.77569	267.8	517.4	520.7	Positions at first were good.
3654	J2-490	3/23/2010 2:36	14.60120	144.77568	352.3	519.5	524.1	Twirling around the top to come around the other side looking for fluid to sample (head 350).
3655	J2-490	3/23/2010 2:36	14.60120	144.77568	353.2	519.6	524.0	We are on the other side of Tephra-C bucket.
3656	J2-490	3/23/2010 2:36	14.60120	144.77568	353.2	519.5	524.0	Looking at rocks for fluid flow.
3658	J2-490	3/23/2010 2:37	14.60121	144.77568	354.0	519.5	524.3	Preparing to take temperature with Jason probe.
3659	J2-490	3/23/2010 2:38	14.60121	144.77569	353.8	519.6	524.1	Background T=8.6 and now poking into sediment.
3662	J2-490	3/23/2010 2:41	14.60119	144.77567	353.9	519.6	524.1	Temp in sediment is 15.7.
3663	J2-490	3/23/2010 2:41	14.60119	144.77567	353.9	519.5	524.2	Ship has already positioned over Styx.
3664	J2-490	3/23/2010 2:42	14.60119	144.77567	353.5	519.5	524.1	Trying to take temperature of the small peaked-shaped mound.
3665	J2-490	3/23/2010 2:42	14.60119	144.77567	353.2	519.5	524.0	Probe in peak and no temperature .
3666	J2-490	3/23/2010 2:42	14.60119	144.77567	354.0	519.5	524.2	Poking into the crack with wand. Nothing there.
3668	J2-490	3/23/2010 2:43	14.60119	144.77568	353.8	519.6	524.1	Going to go to Styx after stowing wand.
3669	J2-490	3/23/2010 2:44	14.60120	144.77570	352.5	519.5	524.2	Lots of plume in Medea and butt cam.
3671	J2-490	3/23/2010 2:45	14.60120	144.77568	353.1	519.5	524.0	Styx is almost due south of Summit just over 30m.
3672	J2-490	3/23/2010 2:45	14.60121	144.77566	353.1	519.5	524.0	36m 170deg to Styx.
3673	J2-490	3/23/2010 2:45	14.60118	144.77563	349.5	517.8	527.8	Medea and ship are waiting for Jason.
3674	J2-490	3/23/2010 2:46	14.60113	144.77557	190.4	516.0	524.0	Here we go.
3676	J2-490	3/23/2010 2:47	14.60088	144.77574	134.6	516.7	541.0	Going through plume and some bubbles at 516.
3677	J2-490	3/23/2010 2:47	14.60083	144.77580	134.5	516.3	545.8	50m up and bubbles.
3678	J2-490	3/23/2010 2:49	14.60069	144.77586	237.4	518.0	571.3	Tangled in a bit of Medea tether.
3679	J2-490	3/23/2010 2:50	14.60071	144.77580	218.0	517.4	563.6	Just freed itself.
3680	J2-490	3/23/2010 2:50	14.60071	144.77575	217.6	520.0	558.8	Heading down to the bottom here.
3681	J2-490	3/23/2010 2:50	14.60072	144.77575	216.2	524.6	558.5	Have 30m to go down to bottom.
3682	J2-490	3/23/2010 2:50	14.60072	144.77576	216.0	528.0	558.6	No view-see plume in Medea cam.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3684	J2-490	3/23/2010 2:51	14.60075	144.77577	333.2	535.4	558.9	NAV: Doppler Reset
3685	J2-490	3/23/2010 2:51	14.60076	144.77579	336.3	537.9	552.5	Going down some more.
3686	J2-490	3/23/2010 2:52	14.60076	144.77579	318.3	552.0	552.8	Looking at sonar with a strong return showing an indentation in the cliff.
3687	J2-490	3/23/2010 2:52	14.60077	144.77579	318.0	552.3	555.6	North 20m to Styx.
3689	J2-490	3/23/2010 2:53	14.60081	144.77568	271.8	554.8	560.4	Sharp pinnacle with blocky lava in front of us at 555.
3690	J2-490	3/23/2010 2:53	14.60076	144.77570	270.7	554.5	558.8	NAV: Doppler Reset
3691	J2-490	3/23/2010 2:53	14.60076	144.77571	286.6	554.7	558.1	Styx is due north.
3692	J2-490	3/23/2010 2:54	14.60087	144.77580	340.0	559.0	564.1	Following base of the sediment slop with 5m altitude.
3694	J2-490	3/23/2010 2:55	14.60089	144.77578	40.7	558.7	560.5	Might be around the notch in the sonar.
3695	J2-490	3/23/2010 2:55	14.60089	144.77579	41.8	558.8	560.0	There it is below us and activity is much diminished.
3696	J2-490	3/23/2010 2:55	14.60088	144.77579	353.2	558.3	562.1	Sonar shows the indentation where the vent is.
3697	J2-490	3/23/2010 2:56	14.60088	144.77581	352.6	558.2	562.8	Marker was to left on the wall.
3699	J2-490	3/23/2010 2:57	14.60087	144.77579	353.5	558.2	561.9	Moving over to the left to find the marker.
3700	J2-490	3/23/2010 2:57	14.60085	144.77574	294.8	558.4	562.2	Following the depth contour to the left.
3702	J2-490	3/23/2010 2:59	14.60088	144.77580	311.2	558.1	564.2	TXT:
3703	J2-490	3/23/2010 2:59	14.60090	144.77578	306.4	557.0	562.8	Did not see the marker to the left and it was a shear drop down as we moved that direction.
3704	J2-490	3/23/2010 3:00	14.60090	144.77579	10.5	558.0	560.7	Moved back to right along the depth contour and backing into plume.
3705	J2-490	3/23/2010 3:00	14.60089	144.77579	61.7	558.3	559.1	Looks like it is just starting up again.
3706	J2-490	3/23/2010 3:00	14.60089	144.77579	89.4	557.6	558.5	On the bottom now with no drop off underneath.
3709	J2-490	3/23/2010 3:03	14.60090	144.77578	13.8	558.0	560.0	Activity much diminished and can't find the marker.
3710	J2-490	3/23/2010 3:03	14.60090	144.77578	14.6	557.9	560.1	NAV: Doppler Reset
3711	J2-490	3/23/2010 3:04	14.60091	144.77577	17.9	558.4	559.9	Much clearer plume and diminished activity.
3713	J2-490	3/23/2010 3:06	14.60090	144.77577	17.0	558.1	559.9	Vent at the notch in the cliff.
3715	J2-490	3/23/2010 3:07	14.60089	144.77578	16.8	558.1	559.9	Looking at the fluid and going to fluid sample here with the long wand.
3716	J2-490	3/23/2010 3:08	14.60089	144.77578	16.8	558.1	559.9	Going to sample in the small plume that is left.
3718	J2-490	3/23/2010 3:10	14.60090	144.77578	16.2	557.9	559.9	Getting the HFS wand out of the basket.
3720	J2-490	3/23/2010 3:11	14.60091	144.77579	17.8	557.9	559.8	Putting wand in plume.
3721	J2-490	3/23/2010 3:12	14.60091	144.77579	17.3	558.0	559.8	Temp is up to 35deg. Moving the wand again.
3723	J2-490	3/23/2010 3:13	14.60091	144.77578	17.1	557.9	559.9	See exhaust out the back.
3724	J2-490	3/23/2010 3:13	14.60091	144.77578	17.1	557.9	559.9	Temp is up to 58deg.
3725	J2-490	3/23/2010 3:13	14.60091	144.77578	17.1	557.9	559.9	Preparing to sample here.
3727	J2-490	3/23/2010 3:15	14.60091	144.77577	16.8	557.9	559.8	Piston filtered #9 J490-HFS-14
3728	J2-490	3/23/2010 3:15	14.60091	144.77577	17.0	557.9	559.9	Sample was started. Nav position is good.
3729	J2-490	3/23/2010 3:16	14.60091	144.77577	16.8	557.9	559.9	Sampling-good nav.
3731	J2-490	3/23/2010 3:17	14.60090	144.77578	16.7	557.9	559.9	Nav is changing the target 60 on the screen to the new position.
3732	J2-490	3/23/2010 3:18	14.60090	144.77579	16.7	557.9	559.9	SAMPLE: fluid J490-HFS-14 stopped.
3733	J2-490	3/23/2010 3:18	14.60091	144.77579	16.8	557.9	559.9	SAMPLE: fluid Tmax=51.8 Tavg=49.4 vol=437 T2=7

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3735	J2-490	3/23/2010 3:19	14.60091	144.77579	18.4	558.0	559.9	Moving wand around and poked into sediment.
3736	J2-490	3/23/2010 3:20	14.60091	144.77579	16.8	558.1	559.9	Looking at tip and it is fine.
3738	J2-490	3/23/2010 3:21	14.60091	144.77579	16.8	558.0	559.9	Going to take a HFS gastight here.
3739	J2-490	3/23/2010 3:22	14.60092	144.77581	16.8	558.0	559.9	SAMPLE: gas J490-GTHFS-15 at Styx with good exhaust. STBD fired. Saw trigger.
3741	J2-490	3/23/2010 3:23	14.60092	144.77581	16.9	557.9	560.0	SAMPLE: gas J490-GTHFS-15 very slow to fill. Odd.
3742	J2-490	3/23/2010 3:24	14.60090	144.77580	16.9	558.0	560.0	Extending and retracting again and still slow.
3743	J2-490	3/23/2010 3:24	14.60090	144.77580	16.9	558.0	559.9	SAMPLE: fluid Unfiltered piston #8 Start J490-HFS-16 at Styx.
3745	J2-490	3/23/2010 3:25	14.60090	144.77580	17.2	557.9	559.8	SAMPLE: fluid Assuming that the GTHFS was taken. Still sampling J490-HFS-16.
3746	J2-490	3/23/2010 3:26	14.60090	144.77578	17.7	557.9	559.8	SAMPLE: fluid J490-HFS-16 Stopped.
3748	J2-490	3/23/2010 3:27	14.60090	144.77578	17.5	557.9	559.8	J490-HFS-16 Tmax=56.6 Tavg=55.6 vol=448 T2=10
3750	J2-490	3/23/2010 3:29	14.60090	144.77579	17.3	557.9	559.9	SAMPLE: fluid J490-HFS-17 Styx RNA filter started.
3751	J2-490	3/23/2010 3:29	14.60089	144.77579	17.3	557.9	559.9	RNA filter #13 J490-HFS-17 long sample.
3757	J2-490	3/23/2010 3:39	14.60089	144.77578	18.2	558.0	559.8	Just over halfway with this one.
3759	J2-490	3/23/2010 3:42	14.60088	144.77578	17.2	557.9	560.0	Sample is starting to clog so it will be terminated prematurely.
3761	J2-490	3/23/2010 3:44	14.60089	144.77578	17.3	558.0	560.0	SAMPLE: fluid J490-HFS-17 Styx stopped.
3763	J2-490	3/23/2010 3:45	14.60089	144.77578	17.7	557.9	559.8	Tmax=54.3 Tavg=47.6 vol=2001 T2=7
3764	J2-490	3/23/2010 3:45	14.60089	144.77578	17.6	557.9	559.9	Jason watch change.
3766	J2-490	3/23/2010 3:47	14.60088	144.77580	16.7	558.0	559.9	Stowing the wand.
3767	J2-490	3/23/2010 3:48	14.60089	144.77579	16.0	558.1	559.9	Wand is stowed.
3769	J2-490	3/23/2010 3:49	14.60089	144.77579	15.7	558.1	559.8	Jim is driving; Bob navigating and Scott is the engineer for this watch.
3771	J2-490	3/23/2010 3:52	14.60088	144.77577	16.4	557.6	560.1	Going to back away from wall to look at sediment before scooping.
3774	J2-490	3/23/2010 3:55	14.60088	144.77579	2.2	559.9	562.1	Don't want to sample here as the sediment looks like it came down from the wall.
3775	J2-490	3/23/2010 3:55	14.60087	144.77579	5.2	559.2	562.3	Going to pull back and look around to the right.
3776	J2-490	3/23/2010 3:55	14.60086	144.77579	35.9	558.0	561.7	Big outcrop to the right.
3777	J2-490	3/23/2010 3:56	14.60085	144.77579	35.7	559.7	562.0	Drops off to the right. as we head down.
3778	J2-490	3/23/2010 3:56	14.60085	144.77579	19.8	560.9	563.0	Backing off from Styx with tephra in the water. Could be knocked off from thrusters.
3779	J2-490	3/23/2010 3:56	14.60086	144.77578	2.7	560.8	563.2	Too tight to get down further.
3781	J2-490	3/23/2010 3:57	14.60087	144.77577	325.4	559.2	563.0	Coming up the wall and going over to Brimstone.
3782	J2-490	3/23/2010 3:57	14.60089	144.77572	275.7	557.0	560.5	Rising up and then 20m to west.
3783	J2-490	3/23/2010 3:58	14.60089	144.77569	277.1	555.6	558.9	No sighting of the marker at Styx-didn't last long.
3784	J2-490	3/23/2010 3:58	14.60087	144.77568	284.4	553.8	558.6	Slides down the wall as we come up.
3785	J2-490	3/23/2010 3:58	14.60087	144.77567	284.4	553.0	558.0	Contact between wall and graben.
3787	J2-490	3/23/2010 3:59	14.60087	144.77567	283.2	551.4	557.2	Still rising.
3788	J2-490	3/23/2010 3:59	14.60085	144.77570	291.2	549.1	556.4	Pointed right at Brimstone as rising over the wall.
3789	J2-490	3/23/2010 4:00	14.60088	144.77556	304.1	545.4	550.9	Within 10m.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3790	J2-490	3/23/2010 4:00	14.60090	144.77553	298.0	544.5	547.9	There is the marker and maybe a little big of activity.
3791	J2-490	3/23/2010 4:00	14.60091	144.77552	285.4	543.6	547.6	Mrk-161 at Brimstone with smoke around but it could be from Phantom now that we're up here.
3793	J2-490	3/23/2010 4:01	14.60090	144.77558	254.4	544.9	548.0	Something is active here-there it is.
3795	J2-490	3/23/2010 4:03	14.60089	144.77551	43.4	547.3	550.1	Vent was SE of marker and 3m away.
3796	J2-490	3/23/2010 4:03	14.60087	144.77557	31.2	546.6	550.1	There are the rocks-that was the vent.
3797	J2-490	3/23/2010 4:04	14.60088	144.77554	45.1	547.6	549.4	Would like a scoop sample here.
3798	J2-490	3/23/2010 4:04	14.60088	144.77554	46.7	547.8	549.5	Settling down at the rocks with sediment to get a scoop sample.
3801	J2-490	3/23/2010 4:07	14.60089	144.77554	45.2	547.8	549.4	Andra has gone to do other work - Sharon is now logging
3803	J2-490	3/23/2010 4:10	14.60089	144.77555	46.7	547.7	549.4	Removing scoop sampler with grey bag blue twist tie
3805	J2-490	3/23/2010 4:12	14.60088	144.77556	45.0	547.7	549.3	Taking scoop sample J190-Tephra-18 going into left swing arm box
3807	J2-490	3/23/2010 4:13	14.60088	144.77556	45.1	547.7	549.3	Placed scoop in left swing arm box
3808	J2-490	3/23/2010 4:14	14.60088	144.77556	46.0	547.8	549.4	Position of scoop sample J2-490-Tephra-18 14 26.054'N 144 46.533'E
3810	J2-490	3/23/2010 4:16	14.60087	144.77556	46.3	547.8	549.4	Scoop sampler in box and closing lid
3811	J2-490	3/23/2010 4:16	14.60088	144.77556	45.8	547.8	549.4	Heading is 45.8
3812	J2-490	3/23/2010 4:16	14.60088	144.77556	45.8	547.8	549.4	Swinging left swing arm box back into place
3814	J2-490	3/23/2010 4:17	14.60088	144.77555	46.1	547.4	549.4	Looking around at Brimstone looks like no current activity
3815	J2-490	3/23/2010 4:18	14.60088	144.77556	46.3	546.3	549.6	Some smoke present but not clear where it is coming from
3817	J2-490	3/23/2010 4:19	14.60087	144.77561	30.3	545.9	549.2	Moving towards east
3818	J2-490	3/23/2010 4:19	14.60089	144.77549	10.4	546.7	550.6	Moving west now
3819	J2-490	3/23/2010 4:20	14.60090	144.77546	69.0	547.0	550.5	Visibility low around marker and bucket
3821	J2-490	3/23/2010 4:21	14.60090	144.77552	39.1	547.8	550.0	Looking at market 161 and bucket on seafloor
3822	J2-490	3/23/2010 4:21	14.60090	144.77552	39.5	547.4	550.1	Going to deploy Tephra sampler B and recover Tephra sampler H
3824	J2-490	3/23/2010 4:23	14.60090	144.77552	37.0	547.7	549.9	DEPLOY: tephra bucket Removing Tephra bucket B from basket
3825	J2-490	3/23/2010 4:23	14.60090	144.77551	37.0	547.7	549.9	DEPLOY: tephra bucket at Marker 161
3826	J2-490	3/23/2010 4:24	14.60090	144.77551	37.1	547.7	549.9	Tephra bucket B sitting upright at base of Marker 161
3827	J2-490	3/23/2010 4:24	14.60090	144.77551	37.1	547.7	549.9	RECOVER: tephra bucket Recovering Tephra bucket H off seafloor
3829	J2-490	3/23/2010 4:25	14.60090	144.77551	37.0	547.8	549.9	Placing Tephra bucket H in center of basket cover snapped closed OK
3830	J2-490	3/23/2010 4:26	14.60090	144.77552	37.0	547.7	549.9	J490-Tephra-19 bucket H recovered and placed in center of basket
3832	J2-490	3/23/2010 4:27	14.60090	144.77552	37.0	547.7	549.8	J490-Tephra-19 bucket H position 14 36.055'N 144 46.531'E
3833	J2-490	3/23/2010 4:28	14.60090	144.77552	37.0	547.7	549.8	Temperature probe taking temperature in sandy sediments
3835	J2-490	3/23/2010 4:29	14.60090	144.77552	37.0	547.7	549.9	Temperature up to 62.5 deg C
3836	J2-490	3/23/2010 4:29	14.60090	144.77552	37.4	547.8	549.8	Moved temperature probe slightly
3837	J2-490	3/23/2010 4:29	14.60089	144.77554	39.9	547.5	550.1	Temperature was down to 45 deg C
3838	J2-490	3/23/2010 4:30	14.60090	144.77551	43.9	548.1	549.8	Moving to NW of bucket and marker
3839	J2-490	3/23/2010 4:30	14.60090	144.77551	44.5	547.4	549.8	Substrate is mixed grains of tephra and sulfur spherules
3841	J2-490	3/23/2010 4:31	14.60090	144.77552	44.6	547.5	549.9	Temperature probe in sediments again
3842	J2-490	3/23/2010 4:32	14.60090	144.77551	44.6	547.4	549.8	Temperature is increasing now at 26.0 deg C

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3843	J2-490	3/23/2010 4:32	14.60090	144.77552	44.3	547.5	549.8	Temperature still climbing slowly when temperature probe removed
3845	J2-490	3/23/2010 4:33	14.60090	144.77554	44.1	547.3	549.9	Done here at Brimstone will move to Phantom
3846	J2-490	3/23/2010 4:33	14.60095	144.77544	330.1	547.0	549.4	Moving NW
3847	J2-490	3/23/2010 4:34	14.60095	144.77539	265.5	547.4	549.5	Heading towards Phantom
3848	J2-490	3/23/2010 4:34	14.60091	144.77535	258.9	549.6	551.0	Visibility cloudy
3850	J2-490	3/23/2010 4:36	14.60085	144.77523	262.2	549.6	556.3	About 10 m east of Phantom visibility very poor
3853	J2-490	3/23/2010 4:39	14.60080	144.77522	312.1	557.0	558.2	Plume still obscuring view of vent lots of yellow in plume
3854	J2-490	3/23/2010 4:39	14.60078	144.77518	322.6	559.6	563.1	Plume clearing
3855	J2-490	3/23/2010 4:39	14.60077	144.77517	322.8	560.1	564.3	Rocks with lots of sulfur staining
3856	J2-490	3/23/2010 4:40	14.60078	144.77509	345.3	566.0	568.8	Moving downslope to depth of 566m
3857	J2-490	3/23/2010 4:40	14.60079	144.77509	4.5	566.5	569.7	Visibility clear now
3859	J2-490	3/23/2010 4:41	14.60079	144.77511	54.6	565.3	569.8	Jason is about 10m SW of where Phantom vent is marked on nav screen
3860	J2-490	3/23/2010 4:42	14.60082	144.77514	41.9	563.8	567.6	Now have Marker 118 in view
3861	J2-490	3/23/2010 4:42	14.60082	144.77514	355.8	563.6	566.5	Phantom vent in view
3862	J2-490	3/23/2010 4:42	14.60083	144.77512	20.5	562.2	568.2	Activity at vent is very low
3863	J2-490	3/23/2010 4:42	14.60086	144.77509	35.6	561.8	568.4	Lazy plume rising from vent
3865	J2-490	3/23/2010 4:43	14.60091	144.77510	96.7	563.1	567.9	Water is far cloudier than would appear from activity at this vent
3866	J2-490	3/23/2010 4:44	14.60093	144.77512	122.1	564.6	568.9	Circling around Phantom vent looking for Nick's bucket
3868	J2-490	3/23/2010 4:45	14.60092	144.77514	81.5	562.3	567.3	Bucket not in sight
3869	J2-490	3/23/2010 4:46	14.60093	144.77512	347.5	563.4	565.0	Going back to observe vent
3871	J2-490	3/23/2010 4:47	14.60094	144.77508	316.8	562.0	565.0	Shrimp swimming by
3872	J2-490	3/23/2010 4:47	14.60093	144.77509	251.6	562.4	566.5	Visibility is low
3873	J2-490	3/23/2010 4:48	14.60087	144.77513	86.1	563.3	566.8	Vent in sight again very quite plume rising from vent
3874	J2-490	3/23/2010 4:48	14.60087	144.77512	78.9	563.4	566.6	Some shrimp on rocks around vent
3877	J2-490	3/23/2010 4:51	14.60087	144.77511	81.3	563.3	566.7	Getting ready for some water sampling in vent
3878	J2-490	3/23/2010 4:51	14.60087	144.77511	81.5	563.3	566.6	Jason is sitting at edge of Phantom vent heading 81.4
3879	J2-490	3/23/2010 4:52	14.60086	144.77511	81.5	563.3	566.7	Extracting wand from basket
3880	J2-490	3/23/2010 4:52	14.60086	144.77511	81.4	563.3	566.7	Placing wand into vent
3882	J2-490	3/23/2010 4:54	14.60087	144.77511	81.4	563.3	566.6	SAMPLE: fluid Wand in vent waiting for Dave to start sampling
3884	J2-490	3/23/2010 4:55	14.60087	144.77511	81.4	563.3	566.6	Checking temperature in vent
3885	J2-490	3/23/2010 4:56	14.60086	144.77511	81.4	563.3	566.6	Disturbing white coating on left wall of vent with wand
3886	J2-490	3/23/2010 4:56	14.60086	144.77511	81.4	563.3	566.6	White stuff disturbed easily
3887	J2-490	3/23/2010 4:56	14.60085	144.77511	81.5	563.3	566.6	Dave thinks looks like bacterial mat
3889	J2-490	3/23/2010 4:57	14.60085	144.77511	81.4	563.3	566.6	Max temp so far 23 deg C
3890	J2-490	3/23/2010 4:57	14.60085	144.77511	81.6	563.3	566.6	Raising wand a little bit
3891	J2-490	3/23/2010 4:58	14.60086	144.77511	81.5	563.3	566.6	Begin water sample
3893	J2-490	3/23/2010 4:59	14.60087	144.77511	81.6	563.3	566.6	SAMPLE: fluid J490-HFS-20 filtered bag 21
3894	J2-490	3/23/2010 4:59	14.60087	144.77511	81.6	563.3	566.6	SAMPLE: fluid Starting NOW Filtered bag 21

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
3896	J2-490	3/23/2010 5:02	14.60087	144.77511	81.4	563.3	566.6	SAMPLE: fluid Stop J490-HFS-20
3897	J2-490	3/23/2010 5:02	14.60087	144.77511	81.4	563.3	566.6	Tmax= 26.6 AveT=25.2 Vol=370 T2=7.5
3900	J2-490	3/23/2010 5:06	14.60088	144.77511	81.5	563.3	566.6	Want to start another sample but sampler is not moving
3902	J2-490	3/23/2010 5:07	14.60087	144.77510	81.5	563.2	566.6	SAMPLE: fluid Starting unfiltered piston sample number 6
3903	J2-490	3/23/2010 5:07	14.60087	144.77510	81.4	563.3	566.6	SAMPLE: fluid J490-HFS-21 unfiltered piston number 6
3905	J2-490	3/23/2010 5:10	14.60086	144.77510	81.3	563.2	566.5	SAMPLE: fluid Stop sampling J490-HFS-21
3906	J2-490	3/23/2010 5:10	14.60087	144.77510	81.3	563.2	566.5	MaxT=25.8 AveT=25.6 Vol=510 T2=7
3908	J2-490	3/23/2010 5:11	14.60087	144.77510	81.2	563.2	566.5	Getting ready to take a filter sample next
3909	J2-490	3/23/2010 5:11	14.60088	144.77511	81.4	563.2	566.5	Wand in same position weak plume coming out of vent
3910	J2-490	3/23/2010 5:12	14.60088	144.77511	81.4	563.2	566.5	SAMPLE: fluid Sterivex filter number 10
3911	J2-490	3/23/2010 5:12	14.60088	144.77511	81.4	563.2	566.6	SAMPLE: fluid J490-HFS-22 Sterivex filter 10
3920	J2-490	3/23/2010 5:28	14.60087	144.77513	81.4	563.2	566.5	SAMPLE: fluid J490-HFS-22 stopped
3921	J2-490	3/23/2010 5:28	14.60087	144.77513	81.4	563.2	566.5	Tmax=25.6 Tave=25.2 Vol=2000 T2=7
3923	J2-490	3/23/2010 5:30	14.60087	144.77513	81.4	563.2	566.5	SAMPLE: fluid Starting J490-HFS-23 RNA filter 16
3932	J2-490	3/23/2010 5:46	14.60088	144.77513	81.3	563.2	566.5	SAMPLE: fluid Stopped J490-HFS-23 RNA filter 16
3933	J2-490	3/23/2010 5:46	14.60089	144.77513	81.3	563.2	566.5	Tmax=24.7 Tave=23.7 Vol=2015 T2=7
3935	J2-490	3/23/2010 5:47	14.60090	144.77513	81.2	563.1	566.5	Unfiltered bag#19 J490-HFS-24 started.
3937	J2-490	3/23/2010 5:49	14.60090	144.77513	80.9	563.1	566.5	SAMPLE: fluid J490-HFS-24 still sampling.
3939	J2-490	3/23/2010 5:51	14.60090	144.77514	80.8	563.1	566.5	SAMPLE: fluid J490-HFS-24 stopped. Not sure if worked well. Tmax=28.5 Tavg=28 vol=220 T2=7
3941	J2-490	3/23/2010 5:53	14.60090	144.77514	80.4	563.2	566.5	SAMPLE: fluid Unfiltered bag #20 J490-HFS-25 started.
3942	J2-490	3/23/2010 5:54	14.60090	144.77514	80.4	563.1	566.5	SAMPLE: fluid 05:52 started sample J490-HFS-25 Tmax=28.0 Tavg=27.8 vol=372 T2=7
3944	J2-490	3/23/2010 5:55	14.60090	144.77513	80.3	563.1	566.5	Stowing fluid sampler wand.
3945	J2-490	3/23/2010 5:55	14.60090	144.77513	80.1	563.1	566.5	Next will look for a good place for a bucket sampler on the south.
3946	J2-490	3/23/2010 5:56	14.60090	144.77513	80.4	563.1	566.5	Haven't see any big plumes while observing here from anywhere else.
3948	J2-490	3/23/2010 5:58	14.60090	144.77515	80.1	563.2	566.5	Looking for a rock next to the active flow.
3950	J2-490	3/23/2010 6:00	14.60090	144.77514	80.0	563.2	566.5	SAMPLE: geo Great rock next to flow and set on top of crates for the moment. J490-rock-26 at Phantom.
3952	J2-490	3/23/2010 6:01	14.60090	144.77514	79.4	563.1	566.5	SAMPLE: geo Looks like a 20cm rock J490-rock-26.
3953	J2-490	3/23/2010 6:01	14.60089	144.77515	79.6	563.1	566.5	Dave thought he saw bubbles come out from under the rock (could have been trapped).
3954	J2-490	3/23/2010 6:02	14.60089	144.77515	79.7	563.1	566.5	Next will look for a tephra bucket deployment site.
3956	J2-490	3/23/2010 6:03	14.60086	144.77516	82.4	562.4	567.6	Didn't take any HD here-not enough activity.
3957	J2-490	3/23/2010 6:04	14.60083	144.77519	87.2	564.7	566.5	Good sediment sampling site here. STBD box is deployed and resting on sediment.
3958	J2-490	3/23/2010 6:04	14.60084	144.77518	88.0	564.5	566.6	Can see marker anchor in top of science cam.
3960	J2-490	3/23/2010 6:05	14.60084	144.77516	88.1	564.4	566.6	Biobox is open on STBD to deploy tephra sampler inside.

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3962	J2-490	3/23/2010 6:07	14.60084	144.77513	87.8	564.4	566.6	DEPLOY: tephra bucket Tephra-A deployed at Phantom just south of the marker anchor Mkr-118.
3964	J2-490	3/23/2010 6:10	14.60085	144.77515	87.7	564.4	566.7	SAMPLE: geo J490-tephra-27 Scoop of sediment below marker anchor Mkr-118.
3965	J2-490	3/23/2010 6:10	14.60085	144.77515	87.6	564.5	566.7	J490-tephra-27 put in STBD biobox.
3967	J2-490	3/23/2010 6:12	14.60085	144.77514	87.5	564.5	566.7	Did not see the Tephra sampler that had been left here on J488.
3969	J2-490	3/23/2010 6:14	14.60085	144.77514	90.2	564.5	567.4	J490-rock-26 now in STBD biobox with scoop.
3970	J2-490	3/23/2010 6:14	14.60085	144.77514	90.4	564.2	567.4	Dropped a weight at the sampling site.
3972	J2-490	3/23/2010 6:15	14.60085	144.77514	90.5	563.9	567.4	Looks like bucket is on a little bit of a high.
3973	J2-490	3/23/2010 6:16	14.60084	144.77515	93.5	562.3	567.2	Going to head north along the new rim line from the bathy differencing map.
3974	J2-490	3/23/2010 6:16	14.60084	144.77514	94.1	562.1	567.6	Need to move the ship to the north.
3976	J2-490	3/23/2010 6:17	14.60084	144.77510	111.4	561.0	568.2	First going to the west to see if there is any more venting along this line of vents.
3977	J2-490	3/23/2010 6:17	14.60084	144.77507	106.4	562.0	571.0	Plume in brow cam look like just wisps from Phantom.
3978	J2-490	3/23/2010 6:18	14.60084	144.77507	111.3	563.5	572.4	Some good overview of the site and instruments.
3979	J2-490	3/23/2010 6:18	14.60086	144.77503	107.9	567.2	574.4	Jason is headed west while looking to the east.
3981	J2-490	3/23/2010 6:19	14.60088	144.77499	109.9	569.9	578.4	Rocky outcrop on the slope.
3982	J2-490	3/23/2010 6:19	14.60088	144.77500	114.5	571.3	582.6	Looking back to the cone with white stained rocks.
3983	J2-490	3/23/2010 6:19	14.60090	144.77497	112.6	571.6	583.3	there is some smoke coming at us from the back or left.
3984	J2-490	3/23/2010 6:19	14.60091	144.77494	110.3	572.8	585.5	Where is the smoke coming from?
3985	J2-490	3/23/2010 6:20	14.60094	144.77474	109.4	583.5	594.8	We are deeper than any of the vents and the bottom is 15m below us.
3987	J2-490	3/23/2010 6:21	14.60094	144.77467	107.5	591.2	601.2	Steep rubbly slope.
3988	J2-490	3/23/2010 6:21	14.60094	144.77461	107.6	598.9	604.5	NAV: Doppler Reset
3989	J2-490	3/23/2010 6:22	14.60093	144.77461	104.3	598.9	604.8	Stopping at 600m on a steep slope.
3990	J2-490	3/23/2010 6:22	14.60086	144.77463	111.3	598.6	603.7	Sulfur and more sediment. Looks like a cone. No smoke here.
3992	J2-490	3/23/2010 6:23	14.60090	144.77465	113.8	597.8	603.7	Going to move toward the north at this contour-facing into the slope looking west.
3993	J2-490	3/23/2010 6:24	14.60102	144.77467	112.0	597.2	602.0	Very coarse here.
3994	J2-490	3/23/2010 6:24	14.60103	144.77467	111.2	597.2	602.2	Looks like material that could have come out of Phantom.
3996	J2-490	3/23/2010 6:25	14.60102	144.77467	111.9	597.2	601.4	Looks like the side of a cone from last year's Brimstone.
3997	J2-490	3/23/2010 6:25	14.60102	144.77469	111.9	596.3	601.2	Coming up a bit.
3998	J2-490	3/23/2010 6:26	14.60092	144.77475	112.0	592.8	598.0	Very fresh looking here-dark.
3999	J2-490	3/23/2010 6:26	14.60089	144.77474	111.2	592.8	598.0	Contact with older looking rock.
4000	J2-490	3/23/2010 6:26	14.60086	144.77472	112.2	592.7	597.3	More altered and layered.
4001	J2-490	3/23/2010 6:26	14.60083	144.77470	112.1	592.8	597.5	A lot more sediment here.
4003	J2-490	3/23/2010 6:27	14.60077	144.77470	110.3	591.9	598.0	Going to go upslope here which would be a direct line from the vents further east.
4004	J2-490	3/23/2010 6:27	14.60076	144.77474	109.4	590.4	596.9	Climbing upslope.

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4005	J2-490	3/23/2010 6:28	14.60079	144.77476	114.7	590.7	593.7	Some outcrops here through the sediment.
4006	J2-490	3/23/2010 6:28	14.60082	144.77477	119.3	590.1	592.6	A lot more sulfur on the slope.
4008	J2-490	3/23/2010 6:29	14.60088	144.77476	111.5	588.9	594.5	Bottom integrity check (sediment flows downhill)-Jimmy
4009	J2-490	3/23/2010 6:29	14.60089	144.77478	112.3	588.6	594.1	Here is the contact between the coarse material and older slope.
4010	J2-490	3/23/2010 6:29	14.60090	144.77479	113.4	588.5	593.8	Looks like a chute.
4011	J2-490	3/23/2010 6:29	14.60092	144.77480	112.0	588.2	592.5	Then white/black rubbly rocks that look fresh.
4012	J2-490	3/23/2010 6:30	14.60094	144.77481	112.7	588.1	592.8	Now back into older looking material.
4013	J2-490	3/23/2010 6:31	14.60096	144.77486	110.7	584.2	590.1	Big block here.
4015	J2-490	3/23/2010 6:31	14.60087	144.77486	111.1	582.5	589.3	Still going upslope.
4016	J2-490	3/23/2010 6:31	14.60085	144.77487	111.4	582.6	588.8	Steep much steeper here.
4017	J2-490	3/23/2010 6:32	14.60081	144.77485	115.7	582.4	586.9	Back into contact with white sediment.
4018	J2-490	3/23/2010 6:32	14.60077	144.77485	111.2	581.1	586.4	Contact with a recent landslide.
4020	J2-490	3/23/2010 6:33	14.60073	144.77486	109.4	580.0	587.2	Some larger boulders perched on the slope.
4021	J2-490	3/23/2010 6:33	14.60071	144.77486	112.7	580.2	588.5	Smoke coming from above-only 30m from Phantom.
4022	J2-490	3/23/2010 6:33	14.60066	144.77494	110.2	577.1	589.1	Coming up into smoke.
4023	J2-490	3/23/2010 6:34	14.60071	144.77498	112.7	579.1	582.7	About 10m below the vent.
4024	J2-490	3/23/2010 6:34	14.60074	144.77496	109.9	578.9	581.6	Moving north while still looking east.
4025	J2-490	3/23/2010 6:34	14.60076	144.77495	102.3	578.9	581.1	Altered looking rocks.
4027	J2-490	3/23/2010 6:35	14.60077	144.77495	84.7	578.8	581.6	Bottom check again-it stills goes downhill.
4028	J2-490	3/23/2010 6:35	14.60079	144.77494	85.3	578.8	581.1	Everything is coated in white (sulfur).
4029	J2-490	3/23/2010 6:35	14.60081	144.77492	83.4	578.8	582.2	Recent slide at top of little ridge on slope.
4030	J2-490	3/23/2010 6:36	14.60086	144.77493	84.0	578.8	584.0	Back into coarse lava blocks.
4031	J2-490	3/23/2010 6:36	14.60094	144.77489	85.9	580.1	584.9	Large lava rocks here adjacent to Phantom. Loose lava blocks.
4033	J2-490	3/23/2010 6:37	14.60094	144.77495	83.0	578.0	583.1	Just west of Phantom going to head north.
4034	J2-490	3/23/2010 6:37	14.60094	144.77496	82.1	577.5	581.1	Pilot change-Scott is driving now.
4035	J2-490	3/23/2010 6:38	14.60092	144.77495	83.0	575.5	581.2	Ship is on the move. Ship has to go north then east to get to where we want to go.
4036	J2-490	3/23/2010 6:38	14.60088	144.77496	82.7	575.2	581.9	Large loose lava rocks.
4038	J2-490	3/23/2010 6:39	14.60085	144.77496	86.0	571.4	578.4	Ship is moving and Jason/Medea just at stern.
4040	J2-490	3/23/2010 6:41	14.60089	144.77501	90.7	570.5	576.4	Jason and Medea following ship north.
4041	J2-490	3/23/2010 6:41	14.60090	144.77501	91.9	570.5	577.0	Talus with white stain.
4042	J2-490	3/23/2010 6:41	14.60093	144.77502	92.0	570.9	576.6	Rocks here must have come from Phantom.
4043	J2-490	3/23/2010 6:42	14.60100	144.77503	95.0	573.5	579.3	Lots of black and white rocks.
4045	J2-490	3/23/2010 6:43	14.60103	144.77502	100.5	573.8	578.7	A contact with a blacker region (slide).
4046	J2-490	3/23/2010 6:43	14.60101	144.77509	101.8	570.2	575.0	Going to move more easterly with Jason as ship moves north.
4047	J2-490	3/23/2010 6:44	14.60098	144.77516	105.7	567.3	572.1	Less intact blocks here-more sediment.
4048	J2-490	3/23/2010 6:44	14.60097	144.77518	103.2	566.4	571.1	Shadows in the sonar to left.
4049	J2-490	3/23/2010 6:44	14.60097	144.77518	104.3	565.4	570.4	Ridges to left (north).

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4050	J2-490	3/23/2010 6:44	14.60100	144.77518	128.5	565.1	569.4	Lots of fine sediment with a few intact outcrops.
4052	J2-490	3/23/2010 6:45	14.60102	144.77520	134.9	564.8	570.0	Turning to the sonar contact at left.
4053	J2-490	3/23/2010 6:45	14.60104	144.77519	127.7	564.3	571.2	Dark bands of recent slides with lots of sulfur coating.
4054	J2-490	3/23/2010 6:45	14.60105	144.77518	106.5	564.3	571.4	Here is a large outcrop with some staining in cracks.
4055	J2-490	3/23/2010 6:45	14.60105	144.77520	108.0	564.7	571.2	Going down for a look at the staining.
4056	J2-490	3/23/2010 6:45	14.60104	144.77522	108.0	564.8	570.7	There are shrimp here.
4057	J2-490	3/23/2010 6:45	14.60104	144.77523	108.5	564.8	570.6	Massive-thick outcrop here with big joints.
4058	J2-490	3/23/2010 6:46	14.60104	144.77523	108.0	564.7	570.5	Columnar joints.
4059	J2-490	3/23/2010 6:46	14.60107	144.77523	113.1	567.0	572.3	Going down to the base of this outcrop as we lateral north.
4061	J2-490	3/23/2010 6:47	14.60108	144.77524	114.2	567.3	572.8	Skeletal remains-backbone of NW Rota.
4062	J2-490	3/23/2010 6:47	14.60108	144.77525	114.5	567.3	572.8	Lots of shrimp on the white cracks in this outcrop.
4063	J2-490	3/23/2010 6:47	14.60107	144.77526	114.2	567.5	572.6	HD cam has good view.
4064	J2-490	3/23/2010 6:47	14.60107	144.77525	113.6	566.5	572.3	Medea has a big sonar contact.
4065	J2-490	3/23/2010 6:48	14.60106	144.77523	114.3	567.7	572.1	Looks like a spiral staircase in the outcrop on HD cam.
4066	J2-490	3/23/2010 6:48	14.60106	144.77522	114.0	567.8	572.1	Target here
4067	J2-490	3/23/2010 6:48	14.60103	144.77519	115.4	564.1	570.1	14deg 36.064 144deg 46.514
4068	J2-490	3/23/2010 6:48	14.60101	144.77519	114.0	561.8	568.5	Last position was a good fix for this interesting site without a name.
4070	J2-490	3/23/2010 6:49	14.60096	144.77532	113.5	554.8	561.1	Depth was 567 at that site.
4071	J2-490	3/23/2010 6:49	14.60094	144.77541	112.4	551.9	557.9	Huge cliff in front of us as we climbed.
4072	J2-490	3/23/2010 6:50	14.60096	144.77552	114.7	546.8	550.4	Medea overshot the target and is over the cliff so we'll need to go back.
4073	J2-490	3/23/2010 6:50	14.60097	144.77553	94.2	546.4	550.3	Lots of smoke in view.
4074	J2-490	3/23/2010 6:50	14.60098	144.77553	87.9	545.2	549.0	Bottom check and bumped off a lot of shrimp
4075	J2-490	3/23/2010 6:50	14.60098	144.77553	20.0	544.2	549.3	LOTS of shrimp on this sediment slope.
4077	J2-490	3/23/2010 6:51	14.60104	144.77545	345.9	544.5	548.6	Medea is headed west.
4078	J2-490	3/23/2010 6:51	14.60105	144.77544	344.4	542.4	548.4	Very steep rim or ridge here.
4079	J2-490	3/23/2010 6:51	14.60112	144.77535	341.0	539.8	542.3	Smoke-no view.
4080	J2-490	3/23/2010 6:51	14.60115	144.77534	48.3	541.1	547.7	The sonar shows a right-angle outcrop that we came over.
4081	J2-490	3/23/2010 6:52	14.60113	144.77539	122.4	545.7	564.5	More smoke at top than what we were seeing at the other vents.
4082	J2-490	3/23/2010 6:52	14.60114	144.77536	209.3	547.1	555.5	Huge dropoff as we move along north.
4083	J2-490	3/23/2010 6:52	14.60114	144.77536	208.2	548.6	555.8	Waiting for Medea.
4085	J2-490	3/23/2010 6:53	14.60115	144.77536	206.4	555.3	557.3	Keeping ship in place. Going to try to get back to the interesting target.
4086	J2-490	3/23/2010 6:54	14.60119	144.77536	138.9	557.1	576.0	Top of ridge here.
4088	J2-490	3/23/2010 6:55	14.60119	144.77534	114.6	561.0	575.1	Lots of sulfur sediment coating outcrops.
4089	J2-490	3/23/2010 6:55	14.60114	144.77529	119.6	563.6	575.7	Jason is moving south back to the target-Medea is to our west.
4090	J2-490	3/23/2010 6:56	14.60114	144.77527	119.5	564.7	575.6	Just came over the headwall with undercutting.
4091	J2-490	3/23/2010 6:56	14.60112	144.77527	120.5	567.1	574.5	This is Devils Staircase site
4093	J2-490	3/23/2010 6:57	14.60112	144.77529	151.2	567.2	575.6	Huge pinnacle like feature.
4094	J2-490	3/23/2010 6:57	14.60113	144.77529	171.4	567.1	575.6	14deg 36.069 144deg 46.516 is Devil's Staircase at 567m.

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4095	J2-490	3/23/2010 6:57	14.60113	144.77529	171.1	567.0	575.7	Lots of shrimp (shrimp everywhere).
4096	J2-490	3/23/2010 6:58	14.60112	144.77523	169.1	567.2	574.9	There is the base in the brow cam.
4097	J2-490	3/23/2010 6:58	14.60111	144.77521	167.8	567.0	574.9	NAV: Doppler Reset
4098	J2-490	3/23/2010 6:58	14.60109	144.77523	113.9	566.0	572.5	There are the cracks--this is it 14deg 36.064 144deg 46.514 567m HDG 111.
4100	J2-490	3/23/2010 6:59	14.60110	144.77524	154.5	565.3	573.5	Great jointing radiating from a center.
4101	J2-490	3/23/2010 6:59	14.60110	144.77524	154.2	566.6	573.1	Shrimp congregated in large quantities in the joints.
4103	J2-490	3/23/2010 7:01	14.60110	144.77523	150.5	566.1	572.9	HD_CAM: start HD of the Devil's Staircase (votes for Bob's Shrimp Joint as well).
4105	J2-490	3/23/2010 7:03	14.60110	144.77523	149.7	566.0	572.7	Taking some HD closeups of this new site.
4106	J2-490	3/23/2010 7:03	14.60109	144.77523	150.0	566.1	572.8	Temperature probe being placed in crack between rocks
4107	J2-490	3/23/2010 7:03	14.60109	144.77523	149.4	566.0	572.7	Steep wall white staining around cracks lots of shrimp
4108	J2-490	3/23/2010 7:04	14.60109	144.77523	149.5	566.0	572.7	Still looking for place to take temperature
4110	J2-490	3/23/2010 7:06	14.60109	144.77524	150.0	566.0	572.6	Temp probe in small crack in rocks with white staining and shrimp
4111	J2-490	3/23/2010 7:06	14.60109	144.77524	150.0	566.1	572.7	Temp only up to 9 deg C
4113	J2-490	3/23/2010 7:08	14.60108	144.77525	139.2	565.5	572.9	Temp probe at another crack lots of shrimp around T=8.6
4115	J2-490	3/23/2010 7:10	14.60108	144.77525	138.6	565.6	572.6	Still poking around with temp probe nothing very much warmer than 8.5
4117	J2-490	3/23/2010 7:11	14.60109	144.77524	138.6	565.7	572.6	Temp probe in another crack T=8.7
4118	J2-490	3/23/2010 7:12	14.60109	144.77524	138.9	565.7	572.6	Putting temperature probe away
4120	J2-490	3/23/2010 7:13	14.60108	144.77524	139.6	565.7	572.5	Looking at rock face white staining in cracks lots of shrimp
4123	J2-490	3/23/2010 7:17	14.60108	144.77525	139.5	565.7	572.5	Observing shrimp
4124	J2-490	3/23/2010 7:17	14.60107	144.77526	141.1	564.8	572.7	Stopped HD
4125	J2-490	3/23/2010 7:18	14.60110	144.77526	142.0	563.6	574.1	HD had started 07:00
4127	J2-490	3/23/2010 7:19	14.60112	144.77530	172.9	563.7	572.9	Moving north along scarp
4129	J2-490	3/23/2010 7:21	14.60114	144.77532	102.3	562.0	575.2	Want to follow 566 contour around scarp
4130	J2-490	3/23/2010 7:21	14.60116	144.77532	104.3	563.7	576.8	Terrain is steep with blocky face and overhangs
4131	J2-490	3/23/2010 7:22	14.60117	144.77532	103.2	564.9	577.4	More shrimp
4133	J2-490	3/23/2010 7:23	14.60123	144.77532	149.9	567.7	582.1	Rugged cliff face
4134	J2-490	3/23/2010 7:24	14.60127	144.77539	81.3	567.4	581.9	Very steep rock wall
4136	J2-490	3/23/2010 7:25	14.60134	144.77535	118.7	567.2	587.2	White sediment on ledges on wall maybe sulfur
4137	J2-490	3/23/2010 7:25	14.60140	144.77537	118.6	567.2	589.6	Jason is at 567m with altitude of 24m wall drops vertically
4139	J2-490	3/23/2010 7:27	14.60149	144.77542	113.6	561.8	590.4	Wall is s blocky broken massive lava flow
4140	J2-490	3/23/2010 7:27	14.60149	144.77542	113.7	559.1	591.0	Jason is at 560m
4142	J2-490	3/23/2010 7:29	14.60140	144.77547	91.6	550.9	559.2	Jason still climbing up wall
4143	J2-490	3/23/2010 7:30	14.60137	144.77547	91.8	551.0	555.7	Jason moving east up wall
4144	J2-490	3/23/2010 7:30	14.60134	144.77550	53.0	551.5	555.3	Passing a flow chute
4146	J2-490	3/23/2010 7:31	14.60131	144.77549	82.7	548.3	555.5	Ripple marks aligned vertically
4147	J2-490	3/23/2010 7:31	14.60131	144.77549	82.7	546.3	555.3	Layer of tephra

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4148	J2-490	3/23/2010 7:31	14.60129	144.77556	85.5	540.3	552.7	Volcaniclastic sediments with lots of ripple marks
4150	J2-490	3/23/2010 7:33	14.60137	144.77556	86.5	533.2	548.8	Bill now in hotseat
4151	J2-490	3/23/2010 7:34	14.60138	144.77555	97.3	540.5	550.8	Jason at 540m
4152	J2-490	3/23/2010 7:34	14.60139	144.77553	102.8	541.9	550.7	Heading to Marker 109 east of here
4154	J2-490	3/23/2010 7:36	14.60141	144.77528	81.1	546.0	590.4	Jason moved away from wall
4155	J2-490	3/23/2010 7:36	14.60140	144.77527	83.8	545.9	590.7	Repositioning ship
4156	J2-490	3/23/2010 7:39	14.60126	144.77522	112.1	493.9	583.2	Lots of smoke in water here.
4157	J2-490	3/23/2010 7:39	14.60124	144.77524	114.4	494.2	581.2	Got a long drive over to Mkr-109 to the east.
4158	J2-490	3/23/2010 7:40	14.60122	144.77526	113.3	494.1	579.7	Plan is to drive the ship hard to the target and get pulled over there.
4159	J2-490	3/23/2010 7:40	14.60120	144.77530	110.7	494.2	575.6	At 494m it looks like flying over clouds.
4160	J2-490	3/23/2010 7:41	14.60114	144.77543	98.6	494.0	552.8	Flying midwater to the east over big cloudy plumes.
4161	J2-490	3/23/2010 7:43	14.60114	144.77563	97.0	493.7	526.9	NAV: Doppler Reset
4163	J2-490	3/23/2010 7:45	14.60110	144.77605	98.9	493.6	528.8	Clearing out of the smoke.
4164	J2-490	3/23/2010 7:46	14.60102	144.77624	96.3	493.6	528.1	Butt cam is the only one showing the plume.
4165	J2-490	3/23/2010 7:52	14.60072	144.77696	96.8	493.2	627.7	Still driving east.
4166	J2-490	3/23/2010 7:54	14.60055	144.77726	96.9	532.4	583.6	Coming down in some plume (more like smoke).
4167	J2-490	3/23/2010 7:55	14.60058	144.77729	55.3	534.2	587.1	NAV: Doppler Reset
4168	J2-490	3/23/2010 7:55	14.60061	144.77738	55.0	533.9	602.1	40m 026 deg to the target at Mkr-109.
4169	J2-490	3/23/2010 7:56	14.60074	144.77748	12.0	534.2	580.4	Ship is stopped.
4170	J2-490	3/23/2010 7:56	14.60078	144.77749	355.7	533.9	580.9	Going to drive over to the target and going down.
4171	J2-490	3/23/2010 7:57	14.60087	144.77754	356.4	546.4	566.4	Wisps of smoke as we go down.
4172	J2-490	3/23/2010 7:57	14.60088	144.77754	355.8	555.1	566.8	There's the bottom and the ridge.
4173	J2-490	3/23/2010 7:58	14.60090	144.77754	355.8	559.5	566.2	That marker is Mkr-112 with a crab at its base.
4175	J2-490	3/23/2010 7:59	14.60087	144.77757	5.1	559.4	567.0	Mkrs-109 should just be behind Jason.
4176	J2-490	3/23/2010 7:59	14.60085	144.77750	11.0	560.8	571.1	There is the other marker-Mkr-109.
4177	J2-490	3/23/2010 7:59	14.60086	144.77749	46.6	561.2	570.7	Going to pick up Mkr-109 that has mat growing on it.
4178	J2-490	3/23/2010 7:59	14.60088	144.77746	60.9	561.5	569.2	Still murky in the water over here.
4179	J2-490	3/23/2010 8:00	14.60088	144.77745	60.1	562.1	568.0	There is the trap and MTR with the marker.
4180	J2-490	3/23/2010 8:00	14.60088	144.77747	58.2	563.6	566.5	Marker has a lot of mat growing on it.
4182	J2-490	3/23/2010 8:01	14.60087	144.77747	35.8	561.3	569.1	NAV: Doppler Reset
4183	J2-490	3/23/2010 8:02	14.60086	144.77749	34.6	558.6	572.7	STBD biobox has a rock and a scoop in it but the right swing arm does not want to come out.
4184	J2-490	3/23/2010 8:02	14.60088	144.77747	12.6	562.7	569.3	Approaching the marker.
4186	J2-490	3/23/2010 8:03	14.60089	144.77747	2.9	563.1	568.1	Going to try to put the marker in the Port biobox swing-arm.
4187	J2-490	3/23/2010 8:03	14.60090	144.77747	2.2	563.2	567.8	Basket is resting up against the cliff at the marker.
4189	J2-490	3/23/2010 8:05	14.60090	144.77747	3.6	563.1	567.8	Biobox is open.
4190	J2-490	3/23/2010 8:05	14.60090	144.77747	2.7	563.1	567.8	Grabbing the marker with the port arm and placed the anchor in the box.
4191	J2-490	3/23/2010 8:06	14.60090	144.77747	2.6	563.1	567.8	RECOVER: marker Mkr-109 is in the basket with mat growth on it.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4192	J2-490	3/23/2010 8:06	14.60089	144.77747	2.8	563.1	567.8	J490-mat-28
4194	J2-490	3/23/2010 8:07	14.60089	144.77749	3.1	563.1	567.9	SAMPLE: bio Mkr-109 sampled mat J490-mat-28 at now the former Mkr-109 site.
4195	J2-490	3/23/2010 8:07	14.60089	144.77749	2.7	563.1	567.8	MTR and shrimp trap remain at the site which is close to Mkr-112 on the same ridge within visual range.
4196	J2-490	3/23/2010 8:08	14.60089	144.77750	3.3	563.1	567.9	SAMPLE: bio STBD arm has marker over the box and port arm will slam it shut over it. J490-mat-28
4198	J2-490	3/23/2010 8:10	14.60089	144.77749	3.1	563.1	567.9	Port arm is pushing the marker into the box-oops!
4199	J2-490	3/23/2010 8:10	14.60089	144.77749	2.3	563.0	567.9	So close-will try it again.
4201	J2-490	3/23/2010 8:11	14.60089	144.77749	2.9	563.1	567.8	Trying it again. Stbd has it and port is going to close the box.
4203	J2-490	3/23/2010 8:14	14.60088	144.77751	2.9	563.1	567.8	Putting bungee over the lid and marker with marker sticking out slightly.
4205	J2-490	3/23/2010 8:15	14.60088	144.77752	2.7	563.1	567.8	Going to swing it back with the lid a little bit out.
4206	J2-490	3/23/2010 8:16	14.60088	144.77750	3.2	563.2	567.9	Looking at the trap and area for a few minutes.
4207	J2-490	3/23/2010 8:16	14.60089	144.77747	3.7	563.2	567.8	Going to try to take a peak at Mkr-114 which we have not looked at yet.
4209	J2-490	3/23/2010 8:17	14.60084	144.77748	104.0	561.7	567.2	Bearing 103 at 24m to Mkr-115.
4210	J2-490	3/23/2010 8:18	14.60078	144.77771	37.3	566.1	583.5	Went over the cliff and headed east to Mkr-114 on the next ridge.
4211	J2-490	3/23/2010 8:18	14.60081	144.77779	351.0	578.5	600.0	Nav is over the target but we are high.
4213	J2-490	3/23/2010 8:19	14.60079	144.77778	298.1	586.4	600.9	Going down to marker depth.
4214	J2-490	3/23/2010 8:20	14.60083	144.77772	343.7	589.7	597.4	Looking for the marker. Old heading 326 at 588 meters.
4216	J2-490	3/23/2010 8:21	14.60084	144.77768	346.1	589.8	596.1	Bottom of wall with a lot of mat on it.
4217	J2-490	3/23/2010 8:21	14.60085	144.77774	344.7	589.8	596.0	Very steep slopes where things have fallen down.
4218	J2-490	3/23/2010 8:22	14.60087	144.77779	347.1	589.9	596.4	Don't see anything here.
4219	J2-490	3/23/2010 8:22	14.60087	144.77778	346.7	590.0	596.4	Basket management before ascending.
4221	J2-490	3/23/2010 8:23	14.60087	144.77777	346.9	589.9	596.5	Tephra bucket and shrimp trap are not secure in the basket.
4223	J2-490	3/23/2010 8:25	14.60087	144.77777	346.6	589.9	596.2	Bucket tucks in right next to the shrimp trap.
4224	J2-490	3/23/2010 8:26	14.60087	144.77778	346.6	589.9	596.3	Securing both with a bungee.
4226	J2-490	3/23/2010 8:27	14.60087	144.77778	346.6	589.9	596.0	Weight away at the site. Basket in.
4227	J2-490	3/23/2010 8:28	14.60087	144.77776	346.5	589.7	596.0	At the end of the dive-all stowed away.
4228	J2-490	3/23/2010 8:28	14.60090	144.77775	347.1	587.9	593.3	JASON: Jason off bottom J490 is done at the seafloor.

Table 6.5-5 JASON Dive J2-491

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4275	J2-491	2010/03/23 19:27:19	14.57798	144.75983	89.1	1846.1	1854.2	JASON: Jason on bottom
4276	J2-491	2010/03/23 19:27:42	14.57797	144.75982	89.8	1845.3	1854.3	Volcaniclastic sediment covered slope.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4278	J2-491	2010/03/23 19:29:01	14.57797	144.75981	90.2	1845.2	1854.3	Getting Jason's arms out of the way. Doing a bit of housekeeping before starting off on our search.
4279	J2-491	2010/03/23 19:30:36	14.57797	144.75981	90.0	1845.0	1854.3	We're ready to roll here.
4281	J2-491	2010/03/23 19:31:04	14.57797	144.75986	93.4	1845.7	1853.3	NAV: Doppler Reset to USBL position.
4282	J2-491	2010/03/23 19:31:27	14.57796	144.75994	90.2	1845.6	1851.6	Lots of ripples in the sediments parallel to the slope.
4283	J2-491	2010/03/23 19:32:27	14.57792	144.76005	153.6	1844.8	1848.4	Stopping along the slope and turning around to look in all directions.
4284	J2-491	2010/03/23 19:32:46	14.57791	144.76005	154.0	1844.6	1848.6	Looking to the SE now.
4286	J2-491	2010/03/23 19:34:03	14.57790	144.76005	294.4	1844.8	1849.1	Turning back 180 degrees.
4287	J2-491	2010/03/23 19:34:23	14.57790	144.76005	90.3	1844.6	1850.0	We want to head toward the east (081 degrees).
4291	J2-491	2010/03/23 19:39:19	14.57790	144.76011	85.8	1839.6	1848.8	We're moving the ship to the east.
4293	J2-491	2010/03/23 19:41:09	14.57795	144.76024	85.1	1839.6	1845.3	The range to the release is decreasing from Medea. That's a good thing.
4294	J2-491	2010/03/23 19:41:48	14.57794	144.76033	69.0	1838.7	1843.1	We see something on the bottom. Looks like a rock.
4295	J2-491	2010/03/23 19:42:54	14.57794	144.76035	88.3	1837.2	1841.8	Scattered rocks on the bottom over this sedimented slope.
4297	J2-491	2010/03/23 19:44:00	14.57794	144.76040	85.6	1834.0	1840.7	Will is coming up off the bottom a few meters.
4299	J2-491	2010/03/23 19:45:41	14.57794	144.76039	144.3	1828.1	1839.5	Altitude is 11 meters now. Can't see the bottom.
4300	J2-491	2010/03/23 19:45:57	14.57794	144.76039	180.4	1828.3	1838.6	We see a repeatable target on the Jason sonar.
4302	J2-491	2010/03/23 19:47:02	14.57794	144.76039	134.5	1828.2	1839.6	We just lost the left arm cam.
4303	J2-491	2010/03/23 19:48:05	14.57797	144.76034	298.4	1831.6	1840.6	Going to get underneath Medea and head back down to the bottom.
4304	J2-491	2010/03/23 19:48:23	14.57800	144.76031	299.2	1835.2	1840.5	Then will proceed upslope.
4306	J2-491	2010/03/23 19:49:21	14.57800	144.76029	174.4	1837.6	1839.9	Ground fault.
4307	J2-491	2010/03/23 19:50:29	14.57801	144.76031	54.2	1835.5	1841.4	See scattered altered rocks but mainly sediments.
4309	J2-491	2010/03/23 19:51:01	14.57808	144.76036	33.6	1829.7	1838.5	Heading upslope a bit.
4312	J2-491	2010/03/23 19:55:23	14.57818	144.76050	100.7	1823.2	1829.5	Trying to figure out where to look next.
4313	J2-491	2010/03/23 19:55:47	14.57813	144.76049	204.0	1823.4	1829.8	Going to get back under Medea and head downslope.
4315	J2-491	2010/03/23 19:57:06	14.57799	144.76037	218.5	1836.0	1838.0	We should be within striking distance says Akel.
4316	J2-491	2010/03/23 19:58:53	14.57796	144.76026	216.3	1838.8	1841.4	Heading to the SW.
4319	J2-491	2010/03/23 20:01:17	14.57810	144.76001	209.8	1838.7	1843.0	See more altered rock on the bottom.
4322	J2-491	2010/03/23 20:05:59	14.57769	144.76041	244.3	1840.3	1846.0	Bottom in sight.
4324	J2-491	2010/03/23 20:07:49	14.57763	144.76040	185.7	1842.9	1847.1	Will sees a target. It could be a target.
4325	J2-491	2010/03/23 20:08:27	14.57765	144.76040	69.0	1842.8	1849.0	Looking around here.
4326	J2-491	2010/03/23 20:08:43	14.57764	144.76041	61.4	1842.1	1849.4	Seeing a bit more rubble
4328	J2-491	2010/03/23 20:09:31	14.57771	144.76038	57.3	1837.4	1849.5	Jason is moving to the east.
4330	J2-491	2010/03/23 20:12:54	14.57812	144.76081	48.8	1818.7	1825.6	Give us something here please. Looking around.
4332	J2-491	2010/03/23 20:13:28	14.57817	144.76085	48.1	1811.7	1821.9	We're ranging from Medea - not Jason. That gives us a larger area to search.
4333	J2-491	2010/03/23 20:13:46	14.57814	144.76081	47.2	1809.4	1824.4	Turning around and facing the other way. Doing another line back.
4334	J2-491	2010/03/23 20:14:12	14.57813	144.76077	350.5	1819.4	1824.9	There's the bottom again.
4335	J2-491	2010/03/23 20:14:52	14.57818	144.76068	298.3	1822.3	1825.0	Driving a bit to the W/NW now.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4337	J2-491	2010/03/23 20:15:30	14.57812	144.76062	307.9	1824.7	1828.6	More blocky rocks here. Looking to the NW.
4339	J2-491	2010/03/23 20:17:49	14.57800	144.76046	322.5	1834.2	1837.5	We are going to move east about 50m. Have to move the ship and Medea.
4341	J2-491	2010/03/23 20:19:10	14.57804	144.76041	324.2	1832.0	1837.2	Driving to the NW to look around a bit.
4348	J2-491	2010/03/23 20:31:14	14.57763	144.76101	77.9	1828.9	1834.7	Heading SE and now turning to the north.
4349	J2-491	2010/03/23 20:31:43	14.57763	144.76104	51.7	1830.2	1833.9	Not getting any ranges now.
4350	J2-491	2010/03/23 20:32:21	14.57766	144.76110	52.6	1827.5	1831.0	Seeing some larger blocks on the sediments.
4352	J2-491	2010/03/23 20:33:51	14.57776	144.76123	44.2	1819.1	1823.6	Much more rubble-strewn sediments here to the east of our landing spot. Blocks of altered lava in the view.
4355	J2-491	2010/03/23 20:37:42	14.57797	144.76132	47.1	1808.8	1815.9	Jogging to the NW and then will back down the slope because it is easier to see the bottom that way.
4359	J2-491	2010/03/23 20:44:12	14.57792	144.76114	47.8	1815.4	1820.7	Backing down the slope looking for the mooring.
4361	J2-491	2010/03/23 20:45:27	14.57803	144.76129	47.5	1808.4	1813.5	Correction: We're heading up slope with Jason pointing forward.
4362	J2-491	2010/03/23 20:45:39	14.57804	144.76131	47.3	1807.9	1812.5	Sediments and rocks.
4363	J2-491	2010/03/23 20:46:17	14.57811	144.76130	52.7	1806.0	1811.1	Jogging to the northwest.
4365	J2-491	2010/03/23 20:47:49	14.57817	144.76117	224.7	1805.8	1811.4	Turning around now. We will not back downslope because of entanglement possibilities.
4367	J2-491	2010/03/23 20:49:52	14.57793	144.76094	224.4	1820.3	1824.4	Heading SW now.
4369	J2-491	2010/03/23 20:51:38	14.57773	144.76075	224.0	1831.6	1835.7	Our altitude is 4 meters.
4371	J2-491	2010/03/23 20:53:46	14.57778	144.76064	46.0	1836.0	1839.2	Back on the bottom .
4372	J2-491	2010/03/23 20:54:00	14.57780	144.76066	46.2	1834.5	1838.2	Now are heading NE along the bottom.
4374	J2-491	2010/03/23 20:56:42	14.57805	144.76094	45.9	1820.7	1823.5	More ripple marks in the sediments here.
4376	J2-491	2010/03/23 20:58:43	14.57821	144.76108	43.6	1811.8	1815.1	Seeing some swimming copepods (?). Not much of anything down here.
4378	J2-491	2010/03/23 21:00:30	14.57819	144.76110	136.6	1809.1	1813.3	Jellyfish near the bottom.
4380	J2-491	2010/03/23 21:01:35	14.57810	144.76115	173.9	1810.1	1814.0	Correction: Verena says that the white guys in the water column are amphipods.
4385	J2-491	2010/03/23 21:10:54	14.57778	144.76092	197.2	1825.2	1829.6	Starting the ship. Want to head south.
4389	J2-491	2010/03/23 21:13:54	14.57753	144.76096	45.3	1834.6	1838.7	ASNAps going again.
4390	J2-491	2010/03/23 21:14:07	14.57754	144.76095	46.8	1834.1	1838.7	Bill would like to drive NW and then SE.
4397	J2-491	2010/03/23 21:25:17	14.57727	144.76114	224.6	1835.8	1838.0	Still looking at the SE end of the pattern.
4398	J2-491	2010/03/23 21:26:36	14.57717	144.76111	63.0	1841.9	1843.7	Turning to the NW now.
4399	J2-491	2010/03/23 21:27:14	14.57719	144.76111	64.2	1839.2	1843.5	Strange sulfur rock either rectangular imprint.
4403	J2-491	2010/03/23 21:31:39	14.57736	144.76079	344.1	1845.0	1847.9	See occasional white sulfur rocks in the sand deposits.
4404	J2-491	2010/03/23 21:32:02	14.57734	144.76080	58.5	1843.4	1848.5	No acoustic signal from Medea which is located at the SE corner of the pattern Jason is driving.
4409	J2-491	2010/03/23 21:40:20	14.57732	144.76073	47.1	1845.5	1850.3	The white rocks stand out in the sediment.
4413	J2-491	2010/03/23 21:46:45	14.57701	144.76091	225.2	1846.5	1852.6	Andra thinks that the mooring must be shallower than we are right now - based on all her calculations in Arc.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4415	J2-491	2010/03/23 21:48:47	14.57702	144.76092	225.7	1846.5	1852.7	Shift change for Jason. Matt taking over for Will and Ben. Dara taking over for Akel.
4417	J2-491	2010/03/23 21:50:25	14.57701	144.76091	225.4	1846.4	1852.7	Fresh minds.
4419	J2-491	2010/03/23 21:53:01	14.57701	144.76094	225.4	1846.4	1852.6	Dara thinks that we should try changing Medea's heading. He also thinks that we should head NW and upslope.
4422	J2-491	2010/03/23 21:56:20	14.57699	144.76093	223.5	1846.4	1852.6	We will head to the NW along the contour and then head to the north.
4424	J2-491	2010/03/23 21:58:52	14.57688	144.76093	210.0	1850.9	1857.0	We're waiting for Medea and then will proceed on a new search pattern.
4426	J2-491	2010/03/23 22:00:27	14.57690	144.76093	320.7	1853.4	1858.7	Jellyfish floating by.
4427	J2-491	2010/03/23 22:00:55	14.57694	144.76091	321.7	1852.8	1858.4	Want a heading of 350. Medea is heading to the NW.
4429	J2-491	2010/03/23 22:02:17	14.57700	144.76082	322.6	1852.1	1857.6	The bottom is coming in view now. Jason is closer to the bottom.
4430	J2-491	2010/03/23 22:02:41	14.57702	144.76080	322.1	1851.7	1857.4	Iris all the way open and the gains are all the way up on the HD Cam and it's still dark.
4432	J2-491	2010/03/23 22:03:51	14.57708	144.76071	322.1	1850.7	1856.5	Have the pilot cam looking off to the left a bit and the HD Cam looking off to the right - overlapping in the middle.
4433	J2-491	2010/03/23 22:04:01	14.57709	144.76070	321.8	1850.5	1856.3	Covering more ground now.
4434	J2-491	2010/03/23 22:05:02	14.57717	144.76063	322.1	1849.8	1855.6	Dara is looking at the ranges for the last hour now.
4437	J2-491	2010/03/23 22:07:18	14.57737	144.76051	322.6	1848.3	1854.2	The bottom depth on the map is ~10m deeper than what Jason is telling us.
4439	J2-491	2010/03/23 22:09:35	14.57747	144.76046	359.9	1848.6	1853.7	Turning and heading due north to fill a hole - and to get to the area where Andra and Dara think the mooring could be.
4440	J2-491	2010/03/23 22:11:03	14.57760	144.76047	360.0	1844.7	1850.1	Heading due north nor.
4442	J2-491	2010/03/23 22:11:36	14.57765	144.76047	0.2	1843.1	1848.4	Sediment covered slope with scattered rocks.
4443	J2-491	2010/03/23 22:13:09	14.57778	144.76046	38.9	1839.0	1844.8	Jason is going to head to the SE and cover this hole in our tracklines.
4445	J2-491	2010/03/23 22:13:53	14.57774	144.76050	45.6	1840.1	1844.9	Looking around here while waiting for Medea to catch up.
4448	J2-491	2010/03/23 22:18:50	14.57772	144.76084	38.9	1834.3	1838.1	Intense ripple marks here. Not as much in the way of rocks.
4449	J2-491	2010/03/23 22:19:08	14.57776	144.76086	44.5	1833.0	1836.0	Rubble pile ahead.
4451	J2-491	2010/03/23 22:19:51	14.57787	144.76090	33.1	1828.2	1831.7	This slope is incredibly steep.
4453	J2-491	2010/03/23 22:21:31	14.57802	144.76079	358.8	1822.6	1829.5	Jason is heading to the west a bit to fill another hole in the coverage.
4454	J2-491	2010/03/23 22:22:29	14.57799	144.76064	355.0	1827.7	1835.0	We lost sight of the bottom for a minute but are seeing it.
4456	J2-491	2010/03/23 22:24:49	14.57814	144.76070	29.0	1822.4	1829.0	Going to lateral off to the NW now and going to cover some ground.
4458	J2-491	2010/03/23 22:26:13	14.57829	144.76046	49.0	1824.4	1830.8	Dara thinks that we should try to change Medea's heading and see if we can get a direct range on the acoustic release.
4459	J2-491	2010/03/23 22:27:10	14.57836	144.76039	40.4	1824.9	1831.5	Amphipods swimming by.
4461	J2-491	2010/03/23 22:28:23	14.57844	144.76055	45.4	1819.5	1824.8	Odd looking ripples on the seafloor.
4462	J2-491	2010/03/23 22:28:42	14.57838	144.76060	44.6	1820.0	1825.3	Dara may have seen something.
4463	J2-491	2010/03/23 22:29:04	14.57832	144.76066	45.0	1820.2	1824.9	I mean Dara may have seen something on the sonar.
4465	J2-491	2010/03/23 22:30:28	14.57834	144.76076	51.2	1816.3	1820.7	Dara thinks that the range was 95m.
4467	J2-491	2010/03/23 22:32:46	14.57833	144.76093	78.2	1813.8	1817.8	Looking around in this area that we did not cover earlier.
4471	J2-491	2010/03/23 22:37:22	14.57875	144.76046	43.9	1813.5	1816.6	Medea is only about 20m off the bottom.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4472	J2-491	2010/03/23 22:38:58	14.57854	144.76073	41.9	1811.4	1815.7	We are headed NE now.
4474	J2-491	2010/03/23 22:39:27	14.57849	144.76081	46.8	1812.5	1815.3	We're pretty much to the west of target 2.
4475	J2-491	2010/03/23 22:40:23	14.57844	144.76090	44.9	1810.7	1814.6	The range suggests that the mooring is downslope of Medea.
4477	J2-491	2010/03/23 22:42:11	14.57848	144.76106	45.4	1804.3	1809.5	We're moving the ship to the W/SW.
4479	J2-491	2010/03/23 22:43:50	14.57872	144.76079	51.8	1802.7	1808.3	Jason is almost under Medea now heading to the NW.
4481	J2-491	2010/03/23 22:45:56	14.57875	144.76061	44.4	1806.2	1813.3	Medea is at 1765m. Jason is at 1806.
4482	J2-491	2010/03/23 22:46:58	14.57862	144.76068	218.7	1804.3	1812.8	We are getting direct ranges now.
4484	J2-491	2010/03/23 22:47:52	14.57852	144.76053	274.9	1813.9	1820.5	The ship has started moving.
4485	J2-491	2010/03/23 22:48:37	14.57851	144.76041	266.8	1816.8	1823.9	The ranges are travel times.
4486	J2-491	2010/03/23 22:49:10	14.57859	144.76035	266.6	1818.3	1823.2	Medea's heading is 330. Seems to be working.
4488	J2-491	2010/03/23 22:50:27	14.57873	144.76030	90.1	1818.6	1821.3	There is something shiny in the butt cam but now it is wrong.
4489	J2-491	2010/03/23 22:50:46	14.57873	144.76034	82.7	1816.5	1820.2	Looking around here.
4491	J2-491	2010/03/23 22:51:21	14.57874	144.76028	264.8	1816.6	1819.6	Nor able to see much in the pilot cam.
4492	J2-491	2010/03/23 22:51:28	14.57876	144.76027	265.1	1816.8	1819.4	The range is coming down.
4493	J2-491	2010/03/23 22:52:12	14.57877	144.76023	235.3	1815.5	1818.9	Pretty hard target on the sonar. Matt is going to chase it.
4494	J2-491	2010/03/23 22:53:13	14.57874	144.76009	257.0	1820.4	1823.9	It's gone now.
4496	J2-491	2010/03/23 22:53:54	14.57873	144.75996	250.7	1824.3	1827.8	It was probably a rock.
4497	J2-491	2010/03/23 22:54:01	14.57873	144.75994	255.6	1825.1	1828.6	The ranges are closing.
4498	J2-491	2010/03/23 22:54:33	14.57867	144.75988	253.0	1828.2	1832.1	Seeing a few targets in the Medea sonar.
4499	J2-491	2010/03/23 22:54:47	14.57863	144.75989	251.6	1829.4	1833.1	Another hard target.
4501	J2-491	2010/03/23 22:55:37	14.57864	144.75986	50.1	1832.9	1835.9	Going to do a 180 to look around and get an idea of the target location.
4502	J2-491	2010/03/23 22:57:08	14.57855	144.76003	43.8	1830.3	1834.5	Got another range from Medea to the release.
4504	J2-491	2010/03/23 22:58:09	14.57845	144.76017	42.7	1830.1	1833.2	Jason is now heading to the SE.
4505	J2-491	2010/03/23 22:58:25	14.57843	144.76017	38.3	1828.9	1833.4	There's a tock ahead of us.
4507	J2-491	2010/03/23 22:59:43	14.57845	144.76019	49.5	1827.9	1832.4	Matt and Dara are discussing whether or not we have passed over a certain area.
4508	J2-491	2010/03/23 23:00:05	14.57849	144.76024	49.9	1825.8	1829.9	Dara thinks we should look to the NW and we are heading that way now.
4509	J2-491	2010/03/23 23:00:49	14.57859	144.76019	64.5	1822.5	1827.5	Lateralling and looking around.
4511	J2-491	2010/03/23 23:01:33	14.57872	144.76001	53.2	1822.3	1828.3	Big rock in the brow cam.
4513	J2-491	2010/03/23 23:03:16	14.57883	144.75990	53.3	1822.7	1827.8	The plan is to head to the south.
4514	J2-491	2010/03/23 23:04:27	14.57874	144.75997	132.7	1824.7	1827.5	Panning around. Dara is still getting hits on the release.
4516	J2-491	2010/03/23 23:06:07	14.57832	144.75995	154.2	1834.6	1839.2	Hoping that it will be in the gap in coverage we are heading for.
4518	J2-491	2010/03/23 23:07:53	14.57844	144.75997	103.3	1833.6	1836.3	Dara is going to tell the ship to stop for a little bit so that we can range on the release again.
4519	J2-491	2010/03/23 23:08:53	14.57843	144.76007	274.8	1829.9	1833.5	It's incredibly steep here. The slope is about 45 degrees.
4521	J2-491	2010/03/23 23:09:21	14.57843	144.76000	273.5	1832.6	1835.6	Stirring up a bit of sediment.
4522	J2-491	2010/03/23 23:09:39	14.57845	144.75990	271.2	1834.9	1838.0	Out of the sediment cloud now.
4523	J2-491	2010/03/23 23:10:18	14.57847	144.75967	271.5	1840.4	1843.2	The ranges have opened up again.

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4524	J2-491	2010/03/23 23:10:55	14.57847	144.75943	269.6	1846.5	1849.3	We're probably seeing out more than 5 meters in front of us.
4526	J2-491	2010/03/23 23:11:50	14.57833	144.75929	208.7	1852.8	1855.6	Turning to the south now. Rattail fish.
4527	J2-491	2010/03/23 23:12:49	14.57828	144.75937	110.4	1853.9	1856.0	Now we're heading to the E/SE.
4529	J2-491	2010/03/23 23:14:26	14.57828	144.75968	93.6	1845.9	1848.4	A long skinny fish that was not a rattail. A hagfish?
4531	J2-491	2010/03/23 23:15:57	14.57832	144.75993	139.4	1836.7	1841.4	Moving over the bottom here. Lots of ripples in the sediment.
4532	J2-491	2010/03/23 23:16:07	14.57833	144.75991	187.6	1836.0	1841.0	Medea is coming down a bit.
4533	J2-491	2010/03/23 23:16:38	14.57819	144.75987	183.9	1843.1	1846.5	Quiet right now. No ranges.
4534	J2-491	2010/03/23 23:16:45	14.57816	144.75986	165.8	1844.6	1847.8	We're heading south
4536	J2-491	2010/03/23 23:17:14	14.57814	144.75983	158.1	1845.2	1849.1	Now turning to the east.
4537	J2-491	2010/03/23 23:18:13	14.57813	144.75977	267.2	1845.8	1850.2	The pilot cam was really out of focus.
4538	J2-491	2010/03/23 23:18:20	14.57813	144.75976	265.3	1846.5	1850.5	Looking better now.
4539	J2-491	2010/03/23 23:18:40	14.57813	144.75963	268.6	1849.7	1853.3	Jason is heading due west.
4541	J2-491	2010/03/23 23:19:16	14.57812	144.75940	270.5	1854.7	1859.0	Changing the heading of Jason.
4542	J2-491	2010/03/23 23:19:47	14.57811	144.75929	176.1	1856.9	1861.0	Turning Jason due south.
4543	J2-491	2010/03/23 23:20:26	14.57800	144.75925	272.5	1861.3	1865.9	Turning back to the east.
4544	J2-491	2010/03/23 23:20:36	14.57800	144.75926	340.4	1861.8	1867.6	We're pretty deep here.
4546	J2-491	2010/03/23 23:21:25	14.57805	144.75934	55.8	1860.2	1865.4	Got a range on it and it again.
4547	J2-491	2010/03/23 23:21:55	14.57807	144.75937	93.9	1857.6	1863.3	Looking at some marks in the sand.
4548	J2-491	2010/03/23 23:22:03	14.57807	144.75936	94.9	1858.1	1863.5	Looks strange.
4549	J2-491	2010/03/23 23:22:12	14.57808	144.75937	94.9	1857.9	1863.4	It is a bottle.
4550	J2-491	2010/03/23 23:22:28	14.57806	144.75938	98.7	1858.0	1863.6	The sediments are disturbed. Could be a drag mark?
4552	J2-491	2010/03/23 23:23:42	14.57804	144.75939	62.9	1861.4	1864.2	The bottle on the seafloor is a glass jar.
4553	J2-491	2010/03/23 23:24:28	14.57802	144.75939	90.5	1860.9	1863.7	We are seeing a band of darker sediments. Matt thinks it may be a drag mark.
4555	J2-491	2010/03/23 23:25:50	14.57803	144.75939	55.8	1860.4	1863.4	Looking more closely at the darker sediment patch here.
4557	J2-491	2010/03/23 23:27:21	14.57797	144.75959	99.1	1856.6	1858.8	We're starting to see things now.
4558	J2-491	2010/03/23 23:27:56	14.57794	144.75969	106.5	1854.9	1857.2	56 meters from Medea now according to that last fix.
4559	J2-491	2010/03/23 23:28:09	14.57792	144.75972	104.8	1853.5	1856.8	The distance is a slant range.
4560	J2-491	2010/03/23 23:28:33	14.57791	144.75979	100.9	1852.3	1855.4	Some larger blocks in here.
4562	J2-491	2010/03/23 23:29:50	14.57792	144.76000	96.6	1849.1	1851.0	Dara wants Matt to go to the cursor. He's got a feeling.
4563	J2-491	2010/03/23 23:30:44	14.57792	144.76014	86.7	1845.6	1848.4	Heading to the east now.
4565	J2-491	2010/03/23 23:32:01	14.57800	144.76020	31.4	1840.3	1844.7	Dara is convinced that we are in the area.
4566	J2-491	2010/03/23 23:32:29	14.57807	144.76020	357.2	1837.4	1841.8	We're going to look around here.
4567	J2-491	2010/03/23 23:32:43	14.57807	144.76019	3.5	1836.0	1841.9	The ranges are coming down nicely.
4569	J2-491	2010/03/23 23:33:21	14.57816	144.76018	359.7	1835.5	1838.9	We're very close.
4570	J2-491	2010/03/23 23:33:54	14.57816	144.76017	327.6	1833.4	1838.1	Eel-like fish in front of us.
4571	J2-491	2010/03/23 23:34:18	14.57817	144.76016	323.4	1830.9	1838.1	Leave no stone unturned says Dara.
4573	J2-491	2010/03/23 23:35:17	14.57824	144.76014	235.1	1827.2	1835.0	Heading toward Medea now.

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4574	J2-491	2010/03/23 23:36:18	14.57829	144.76012	235.7	1832.2	1835.4	We are looking at a rock.
4575	J2-491	2010/03/23 23:37:09	14.57824	144.76002	236.4	1836.4	1839.5	We're within 41 meters of it according to Dara.
4577	J2-491	2010/03/23 23:38:25	14.57814	144.75977	143.9	1845.3	1848.9	Going to cover this area.
4578	J2-491	2010/03/23 23:39:13	14.57804	144.75983	143.4	1844.1	1850.3	Continuing the search in this area.
4580	J2-491	2010/03/23 23:39:47	14.57800	144.75982	184.7	1846.4	1851.4	The targets in Jason's sonar are tocks.
4581	J2-491	2010/03/23 23:40:17	14.57795	144.75978	187.9	1848.9	1853.7	There is quite a lot of sediment in the water now. We've stirred the place up.
4583	J2-491	2010/03/23 23:41:27	14.57783	144.75977	75.3	1853.9	1859.8	Jason is heading south and now turning east.
4584	J2-491	2010/03/23 23:41:46	14.57783	144.75979	90.6	1856.0	1859.2	More of the long skinny eel-like fish on the bottom.\
4585	J2-491	2010/03/23 23:42:35	14.57784	144.75993	99.0	1850.6	1854.2	Covering this area. Seeing lots of rocks and sediment. Still no mooring but we are in the area.....
4587	J2-491	2010/03/23 23:44:21	14.57788	144.76007	85.7	1845.1	1850.1	Jason is now stopped for a moment.
4590	J2-491	2010/03/23 23:47:35	14.57798	144.76041	105.3	1835.7	1838.2	We're gradually working our way south.
4591	J2-491	2010/03/23 23:49:08	14.57782	144.76026	264.7	1842.4	1846.1	We haven't seen any evidence of the mooring yet.
4593	J2-491	2010/03/23 23:49:19	14.57783	144.76020	264.4	1844.1	1847.7	Dara predicts that we will see it on this pass.
4594	J2-491	2010/03/23 23:49:56	14.57787	144.75996	261.5	1849.4	1853.1	Watch change.
4595	J2-491	2010/03/23 23:50:03	14.57787	144.75994	265.3	1849.6	1853.7	Pretty shrimp.
4596	J2-491	2010/03/23 23:50:32	14.57787	144.75988	267.5	1851.5	1855.7	Very angular block.
4598	J2-491	2010/03/23 23:51:47	14.57780	144.75971	185.1	1858.4	1861.4	Still getting the shortest ranges from Medea.
4599	J2-491	2010/03/23 23:51:58	14.57777	144.75971	165.1	1859.2	1862.5	Searching around the Medea target.
4600	J2-491	2010/03/23 23:53:04	14.57778	144.75973	92.1	1859.6	1862.4	Medea has dropped down in altitude (20m) and ranges are 31m.
4602	J2-491	2010/03/23 23:53:24	14.57779	144.75980	88.6	1856.6	1860.1	Shrimp swimmer.
4604	J2-491	2010/03/23 23:55:23	14.57778	144.76003	91.6	1851.0	1853.5	Jason under Medea.
4605	J2-491	2010/03/23 23:55:46	14.57778	144.76004	91.7	1850.0	1853.0	Medea came up 10m and ranges increased.
4607	J2-491	2010/03/23 23:57:32	14.57778	144.76027	94.8	1843.6	1846.3	Turning south to do another line under Medea.
4613	J2-491	2010/03/24 00:08:02	14.57770	144.76006	101.5	1852.3	1855.9	Going back under Medea which had the shortest range yet.
4621	J2-491	2010/03/24 00:21:43	14.57782	144.75998	16.9	1852.1	1855.5	Searching extensively around Medea.
4623	J2-491	2010/03/24 00:24:17	14.57785	144.75999	19.8	1852.2	1853.8	Poking a line in the sand
4624	J2-491	2010/03/24 00:24:59	14.57786	144.75998	25.8	1851.8	1854.0	Nothing.
4627	J2-491	2010/03/24 00:29:05	14.57784	144.76007	16.6	1848.9	1851.7	Some small rocks in the sediment.
4629	J2-491	2010/03/24 00:30:09	14.57784	144.76012	18.0	1846.6	1850.3	Slump lines across the slope.
4633	J2-491	2010/03/24 00:35:19	14.57790	144.76002	16.4	1848.3	1851.5	Strange looking rock with round crater on top.
4634	J2-491	2010/03/24 00:36:25	14.57795	144.75991	16.0	1849.5	1853.4	More rock rubble here.
4639	J2-491	2010/03/24 00:43:30	14.57795	144.76036	14.3	1838.3	1841.5	There is the bright white rock we saw before.
4641	J2-491	2010/03/24 00:45:56	14.57801	144.76014	19.9	1840.7	1844.6	shrimp around a rock.
4642	J2-491	2010/03/24 00:46:03	14.57801	144.76012	18.0	1840.4	1845.1	Sour patterns around rocks.
4644	J2-491	2010/03/24 00:48:33	14.57806	144.75997	19.2	1847.0	1849.2	Blocky rock by itself in the sand.
4646	J2-491	2010/03/24 00:51:10	14.57809	144.75989	14.9	1845.8	1849.5	Going to look upslope of Medea.

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4650	J2-491	2010/03/24 00:56:32	14.57805	144.76001	14.5	1842.6	1846.6	Big lava blocks with no sediment on rocks.
4661	J2-491	2010/03/24 01:17:03	14.57814	144.75997	16.9	1838.8	1844.7	When Medea is lowered here the slant range decreases. It is less than 40m away.
4663	J2-491	2010/03/24 01:17:19	14.57814	144.75997	13.5	1839.0	1844.6	The depth here is 1845 and the shortest slant range from the ship was 1843m.
4664	J2-491	2010/03/24 01:17:28	14.57814	144.75997	16.2	1838.7	1844.4	It must be here but we can't see it-buried?
4665	J2-491	2010/03/24 01:18:43	14.57813	144.75997	15.8	1838.8	1844.6	We are going to head up slope and zigzag.
4668	J2-491	2010/03/24 01:22:33	14.57816	144.75997	38.4	1840.0	1844.4	Calling the bridge to get the ship moving 036 heading. Will be for about 100m or so.
4670	J2-491	2010/03/24 01:23:38	14.57816	144.75997	38.0	1840.0	1844.5	Going to travel up slope along the chute.
4672	J2-491	2010/03/24 01:25:27	14.57815	144.76009	34.3	1837.2	1841.6	Jason can travel about 35 meters on each side so about 70 meters total.
4673	J2-491	2010/03/24 01:25:46	14.57815	144.76011	40.2	1836.8	1841.3	Starting up slope now. Heading 40 degrees.
4674	J2-491	2010/03/24 01:25:56	14.57816	144.76011	39.8	1836.8	1841.2	The ranges are opening right away.
4676	J2-491	2010/03/24 01:27:16	14.57818	144.76024	35.2	1832.6	1836.9	Jason can no longer control Bob's pan and tilt now.
4679	J2-491	2010/03/24 01:32:10	14.57806	144.76082	39.1	1821.9	1826.4	Moving up this sedimented slope with rocks here and there.
4680	J2-491	2010/03/24 01:33:09	14.57807	144.76085	43.2	1821.3	1825.8	Bob is in the hot seat.
4682	J2-491	2010/03/24 01:33:35	14.57814	144.76078	38.1	1820.6	1825.6	Not much to report. Larger blocks of rubble.
4683	J2-491	2010/03/24 01:35:00	14.57845	144.76065	72.7	1816.1	1820.4	The ripples are extensive in all places we have observed.
4684	J2-491	2010/03/24 01:35:06	14.57846	144.76064	73.1	1815.9	1820.2	Ripples are parallel to the slope.
4687	J2-491	2010/03/24 01:37:17	14.57857	144.76056	76.0	1814.0	1818.2	The consensus from Dara and others is that the mooring is buried.
4689	J2-491	2010/03/24 01:40:55	14.57885	144.76060	44.9	1805.4	1809.6	Searching far upslope.
4691	J2-491	2010/03/24 01:41:51	14.57878	144.76077	47.7	1803.2	1807.3	Jason watch change.
4692	J2-491	2010/03/24 01:42:41	14.57878	144.76078	47.8	1802.9	1807.0	Ship is having a hard time holding its position.
4694	J2-491	2010/03/24 01:43:45	14.57874	144.76095	43.7	1800.0	1803.9	Zigzags at a heading of 045.
4696	J2-491	2010/03/24 01:45:31	14.57891	144.76107	45.3	1793.4	1796.7	Jimmy is the pilot.
4697	J2-491	2010/03/24 01:46:23	14.57902	144.76101	46.8	1789.7	1795.2	Jason on the NW zig up the slope.
4699	J2-491	2010/03/24 01:48:52	14.57917	144.76117	39.1	1780.6	1786.0	Zag back down SE.
4702	J2-491	2010/03/24 01:52:26	14.57952	144.76124	45.8	1768.6	1775.6	NW again.
4704	J2-491	2010/03/24 01:53:28	14.57952	144.76139	39.8	1764.8	1772.3	Zig west.
4706	J2-491	2010/03/24 01:55:31	14.57949	144.76172	47.3	1757.2	1764.1	Last zig up to Medea.
4708	J2-491	2010/03/24 01:57:34	14.57979	144.76167	38.8	1748.9	1756.3	Nope-more room to zig back east again.
4709	J2-491	2010/03/24 01:58:00	14.57976	144.76177	39.8	1747.1	1755.2	Moving ship and Medea looking at the slide chute.
4710	J2-491	2010/03/24 01:58:55	14.57970	144.76197	41.7	1744.5	1752.1	Not much outcrop but lots of sand/sediment.
4712	J2-491	2010/03/24 02:00:24	14.57998	144.76193	46.6	1737.8	1745.3	A bit rougher here.
4714	J2-491	2010/03/24 02:01:46	14.58008	144.76201	40.3	1730.1	1740.6	Actually we are driving up the slope from the acoustic target of the mooring up to its original location.
4715	J2-491	2010/03/24 02:01:55	14.58007	144.76203	39.0	1729.8	1739.8	Reverse slalom up the slope.
4717	J2-491	2010/03/24 02:03:51	14.58011	144.76245	39.3	1720.5	1728.0	Fish.

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4718	J2-491	2010/03/24 02:04:22	14.58022	144.76250	43.0	1717.9	1722.8	Zag back to the west.
4721	J2-491	2010/03/24 02:07:52	14.58051	144.76264	45.3	1701.9	1708.9	Zag east.
4724	J2-491	2010/03/24 02:12:50	14.58111	144.76279	40.3	1678.3	1686.5	We've come 300+ meters upslope from the release and the mooring had 600m of line.
4726	J2-491	2010/03/24 02:14:26	14.58110	144.76296	46.7	1674.1	1682.4	Not much change as we start the zig to the west.
4734	J2-491	2010/03/24 02:28:38	14.58201	144.76356	46.1	1633.4	1640.5	Zig to NW and looks bout the same.
4738	J2-491	2010/03/24 02:33:49	14.58234	144.76380	46.2	1616.7	1623.9	Mostly sand.
4740	J2-491	2010/03/24 02:36:31	14.58260	144.76387	39.0	1607.8	1615.1	May have been on the western edge of the new slide scour zone.
4742	J2-491	2010/03/24 02:37:35	14.58255	144.76406	44.5	1607.1	1612.9	Done with zigzag and will head straight to the original mooring position (1500m).
4743	J2-491	2010/03/24 02:38:03	14.58257	144.76407	35.8	1605.8	1612.2	395m at 032deg to the mooring target.
4746	J2-491	2010/03/24 02:42:41	14.58298	144.76422	32.4	1587.8	1595.2	Flying shrimp.
4748	J2-491	2010/03/24 02:43:26	14.58306	144.76428	32.7	1584.4	1591.3	Patches of staining-white.
4750	J2-491	2010/03/24 02:46:25	14.58340	144.76452	32.7	1569.3	1576.0	Hardly any outcrops.
4755	J2-491	2010/03/24 02:53:23	14.58404	144.76506	32.4	1537.9	1544.6	One rock in a sea of sediment.
4756	J2-491	2010/03/24 02:53:50	14.58408	144.76510	32.2	1536.3	1542.9	Same stuff-rippled sediment with occasional rocks with scour marks.
4757	J2-491	2010/03/24 02:54:12	14.58411	144.76513	32.6	1535.0	1541.6	Very regular ripple pattern.
4759	J2-491	2010/03/24 02:56:59	14.58425	144.76539	33.0	1526.5	1533.2	Some white rocks in the sediment
4762	J2-491	2010/03/24 03:00:08	14.58431	144.76559	32.4	1521.3	1528.6	Fish-eel.
4765	J2-491	2010/03/24 03:03:46	14.58444	144.76573	33.8	1516.9	1521.3	Small pile of rocks.
4766	J2-491	2010/03/24 03:04:10	14.58446	144.76576	33.0	1515.5	1520.0	Big rock.
4767	J2-491	2010/03/24 03:05:03	14.58451	144.76584	32.8	1512.8	1517.7	Crossing the scour and deposition area.
4770	J2-491	2010/03/24 03:07:44	14.58473	144.76596	32.0	1504.2	1509.1	Ripples seem to be less white than they were (not as prominent) but we have come closer to the bottom.
4771	J2-491	2010/03/24 03:08:16	14.58477	144.76597	32.2	1502.6	1507.4	Looks like some scouring here.
4774	J2-491	2010/03/24 03:11:32	14.58508	144.76604	29.8	1492.3	1497.1	More rocks than before with scour evidence.
4775	J2-491	2010/03/24 03:11:48	14.58510	144.76604	31.8	1491.4	1496.1	Flying shrimp.
4776	J2-491	2010/03/24 03:12:15	14.58515	144.76605	31.8	1489.9	1494.7	Seeing more sonar targets indicating rock outcrop.
4777	J2-491	2010/03/24 03:12:19	14.58515	144.76605	31.8	1489.6	1494.4	Eel fish.
4778	J2-491	2010/03/24 03:13:10	14.58522	144.76606	32.3	1486.8	1492.2	Almost at the original mooring anchor target.
4780	J2-491	2010/03/24 03:14:14	14.58533	144.76608	31.1	1483.0	1488.2	Switching to manual flying.
4782	J2-491	2010/03/24 03:15:33	14.58542	144.76612	32.1	1478.9	1484.2	Bright white patch on boulder edge.
4783	J2-491	2010/03/24 03:16:41	14.58555	144.76605	32.7	1476.4	1480.5	Just about at the target.
4785	J2-491	2010/03/24 03:18:34	14.58562	144.76625	80.1	1469.6	1474.7	More white stained rocks.
4787	J2-491	2010/03/24 03:20:06	14.58564	144.76636	45.6	1467.8	1473.2	1065m 045 deg to next target (middle of scour area).
4789	J2-491	2010/03/24 03:22:13	14.58576	144.76653	45.6	1461.9	1467.0	Line in sediment with rocks along the way.
4790	J2-491	2010/03/24 03:22:36	14.58579	144.76657	45.8	1460.4	1465.6	Flying shrimp.
4792	J2-491	2010/03/24 03:24:31	14.58595	144.76678	44.1	1452.1	1457.0	Less white sediments on sand (sediment is darker).
4794	J2-491	2010/03/24 03:26:33	14.58618	144.76701	44.7	1440.9	1446.1	Bit more rocky debris here.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4795	J2-491	2010/03/24 03:27:00	14.58624	144.76705	44.9	1438.4	1443.4	Fish and shrimp
4796	J2-491	2010/03/24 03:27:12	14.58626	144.76707	45.0	1437.3	1442.2	larger boulder
4798	J2-491	2010/03/24 03:28:02	14.58636	144.76715	45.4	1431.9	1437.4	Larger pieces of rock.
4800	J2-491	2010/03/24 03:29:33	14.58646	144.76731	46.1	1426.6	1431.7	Lot more pieces of angular rock and larger.
4801	J2-491	2010/03/24 03:30:11	14.58649	144.76738	44.3	1423.5	1429.7	Almost more rock than sediment as we are over the scour zone on the bathy difference map.
4803	J2-491	2010/03/24 03:31:26	14.58659	144.76749	44.7	1419.4	1424.6	Passed through debris field and now just sediment.
4804	J2-491	2010/03/24 03:32:13	14.58666	144.76754	43.7	1416.4	1421.7	Coming into an area of large boulders.
4806	J2-491	2010/03/24 03:34:05	14.58679	144.76766	43.5	1410.0	1415.1	Large boulder patch but heading back into sediment.
4807	J2-491	2010/03/24 03:35:05	14.58686	144.76773	44.4	1406.5	1411.8	Still 800+m to the target.
4809	J2-491	2010/03/24 03:35:21	14.58687	144.76775	44.2	1405.5	1411.1	Scattered rocks in sediment.
4810	J2-491	2010/03/24 03:37:14	14.58697	144.76788	44.0	1400.4	1405.8	White patches in the sediment-look like white downslope streaks of staining.
4812	J2-491	2010/03/24 03:37:57	14.58701	144.76793	43.2	1398.2	1403.9	A few big boulders
4813	J2-491	2010/03/24 03:38:03	14.58702	144.76793	43.4	1397.9	1403.4	That is boulders.
4814	J2-491	2010/03/24 03:38:50	14.58707	144.76798	43.9	1395.6	1401.1	BIG boulders.
4815	J2-491	2010/03/24 03:38:56	14.58708	144.76799	44.4	1395.3	1400.8	More rounded shapes.
4817	J2-491	2010/03/24 03:39:43	14.58714	144.76804	44.8	1392.8	1398.0	Flying shrimp and white rock.
4818	J2-491	2010/03/24 03:40:30	14.58719	144.76808	44.1	1390.0	1395.3	Looks like sulfur deposits in cracks.
4820	J2-491	2010/03/24 03:41:18	14.58724	144.76813	44.0	1387.8	1393.4	White staining at bases of the boulders.
4821	J2-491	2010/03/24 03:42:22	14.58727	144.76815	43.5	1389.2	1391.9	.Don't see any critters in the sediment.
4822	J2-491	2010/03/24 03:42:50	14.58727	144.76815	44.4	1390.1	1391.9	Not sediment-in the sulfur deposits at bases of rock.
4824	J2-491	2010/03/24 03:44:13	14.58727	144.76816	44.3	1389.9	1391.9	Also some yellow staining in the crack.
4826	J2-491	2010/03/24 03:45:23	14.58727	144.76817	44.7	1389.8	1391.9	Attempting to take a sample of this outcrop while Medea is on the move.
4827	J2-491	2010/03/24 03:45:37	14.58727	144.76817	44.0	1389.9	1391.9	A loose piece at the outcrop.
4828	J2-491	2010/03/24 03:45:49	14.58726	144.76817	43.9	1389.1	1392.2	Not in place but directly below the in place.
4829	J2-491	2010/03/24 03:46:19	14.58727	144.76818	44.2	1388.6	1392.0	SAMPLE: geo J291-rock-01 taken enroute up the slope headed to the center of the scour zone.
4830	J2-491	2010/03/24 03:46:31	14.58728	144.76819	44.0	1387.9	1391.1	This outcrop had white and yellow staining on it.
4832	J2-491	2010/03/24 03:47:57	14.58733	144.76824	46.3	1384.8	1389.0	Surrounding area rocks have some white and yellow staining.
4834	J2-491	2010/03/24 03:49:23	14.58741	144.76831	45.1	1380.2	1385.3	Port biobox swung out. Going to put the rock in the port box.
4835	J2-491	2010/03/24 03:50:04	14.58746	144.76835	43.4	1377.7	1383.0	White pockets of white in sediment.
4836	J2-491	2010/03/24 03:50:58	14.58751	144.76840	43.7	1375.5	1380.6	Box open as we fly up slope.
4838	J2-491	2010/03/24 03:51:44	14.58758	144.76846	30.1	1373.7	1376.7	SAMPLE: geo J491-rock-01 is in the box.
4839	J2-491	2010/03/24 03:52:40	14.58760	144.76850	44.0	1371.6	1375.4	Larger patches of white stain
4840	J2-491	2010/03/24 03:52:53	14.58760	144.76850	43.8	1371.6	1375.4	Swing arm put back.
4842	J2-491	2010/03/24 03:53:26	14.58763	144.76854	47.5	1371.3	1374.0	Some kind of contact between black with white staining and then brown patch (both relatively flat).
4843	J2-491	2010/03/24 03:53:42	14.58765	144.76857	47.8	1369.1	1373.1	Fresher looking boulders.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4844	J2-491	2010/03/24 03:53:56	14.58766	144.76860	45.4	1367.3	1371.9	Lots of white in between black rocks.
4845	J2-491	2010/03/24 03:54:17	14.58767	144.76860	41.5	1369.1	1371.3	Very dark rock with round boulders.
4846	J2-491	2010/03/24 03:54:41	14.58767	144.76860	45.7	1368.4	1371.4	Looks like something venting here. Mat and shrimp.
4847	J2-491	2010/03/24 03:54:54	14.58768	144.76864	52.6	1367.3	1370.7	Can't stop as we are catching up to Medea.
4849	J2-491	2010/03/24 03:55:31	14.58773	144.76872	44.5	1364.5	1368.1	No light sediment here-just blacker rock and sand.
4851	J2-491	2010/03/24 03:58:26	14.58793	144.76897	48.5	1353.5	1357.4	Medium sized rubble rocks with black sediments and some small white rocks.
4853	J2-491	2010/03/24 03:59:40	14.58803	144.76902	46.9	1350.2	1353.0	Patches of sulfur here and there with black rubble and sediment.
4854	J2-491	2010/03/24 04:00:16	14.58807	144.76904	45.7	1348.2	1351.7	Seeing some sediment ripples with white staining in troughs.
4855	J2-491	2010/03/24 04:00:18	14.58807	144.76904	46.4	1348.1	1351.6	Eel fish.
4856	J2-491	2010/03/24 04:00:39	14.58810	144.76905	43.9	1347.4	1350.7	Less rocks here and more sediment with ripples.
4858	J2-491	2010/03/24 04:02:01	14.58821	144.76912	48.2	1342.8	1346.4	Bring ship to all stop.
4859	J2-491	2010/03/24 04:02:40	14.58826	144.76914	47.8	1339.8	1344.2	More rock accumulations here.
4860	J2-491	2010/03/24 04:02:51	14.58828	144.76915	46.5	1339.3	1343.3	Accumulations that is.
4862	J2-491	2010/03/24 04:03:30	14.58829	144.76919	50.9	1332.9	1342.6	Jason pulled off bottom.
4863	J2-491	2010/03/24 04:04:17	14.58837	144.76927	52.3	1332.7	1337.8	Back into a larger patch of small rubble rocks. One big boulder.
4865	J2-491	2010/03/24 04:05:40	14.58835	144.76929	184.7	1318.7	1335.4	Jason is being towed by the ship-got too far behind.
4868	J2-491	2010/03/24 04:11:34	14.58910	144.76942	350.5	1307.3	1310.3	We're going to change course for Waypoint 7 the location of the upper mooring - we're running out of time
4869	J2-491	2010/03/24 04:12:10	14.58916	144.76941	30.0	1303.6	1308.6	Large blocks 30 cm or so cover most of slope
4871	J2-491	2010/03/24 04:15:13	14.58939	144.76931	1.7	1297.3	1301.8	Patchy covering of cobble size rocks over sediment - lot of rocks have white staining on them
4873	J2-491	2010/03/24 04:16:20	14.58951	144.76931	1.1	1291.7	1297.3	Less sulfur staining here.
4874	J2-491	2010/03/24 04:16:37	14.58952	144.76931	0.6	1290.9	1297.0	Getting out of bigger blocks into smaller and going to change course more northerly.
4876	J2-491	2010/03/24 04:17:41	14.58952	144.76931	1.5	1294.8	1296.6	Dropping a weight.
4877	J2-491	2010/03/24 04:17:54	14.58952	144.76931	1.0	1294.6	1296.7	Heading to waypoint 7 on the target list.
4879	J2-491	2010/03/24 04:20:57	14.58953	144.76932	0.4	1291.3	1295.4	Fish.
4880	J2-491	2010/03/24 04:21:05	14.58953	144.76933	2.1	1291.2	1295.2	More sediment and less rock again.
4882	J2-491	2010/03/24 04:22:24	14.58967	144.76936	1.5	1287.2	1290.5	Boulders covered with sand. Some white patches at bases.
4884	J2-491	2010/03/24 04:23:59	14.58969	144.76935	0.1	1287.9	1290.4	Waiting for Medea and dropping a weight.
4885	J2-491	2010/03/24 04:24:59	14.58971	144.76935	1.7	1286.4	1289.6	.5m across boulders.
4887	J2-491	2010/03/24 04:25:43	14.58973	144.76939	21.5	1284.2	1287.9	Rocks are roundish.
4888	J2-491	2010/03/24 04:26:44	14.58981	144.76944	20.6	1280.7	1284.9	Eel fish.
4890	J2-491	2010/03/24 04:27:21	14.58989	144.76947	20.3	1277.4	1281.3	Much more rubble here and less sediment.
4891	J2-491	2010/03/24 04:28:19	14.58988	144.76948	19.8	1277.4	1281.0	no light sulfur sediment.
4893	J2-491	2010/03/24 04:29:39	14.58996	144.76952	18.1	1273.5	1277.7	Bit more pockets of sediment (black). Smaller rocks.
4894	J2-491	2010/03/24 04:30:31	14.59003	144.76956	21.0	1271.1	1274.5	More sand and a lot less rock.
4896	J2-491	2010/03/24 04:31:15	14.59010	144.76961	19.6	1268.2	1271.9	Entering another rubble pile.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4897	J2-491	2010/03/24 04:31:54	14.59014	144.76965	21.9	1265.4	1269.5	Was just a small rubble pile and now some more sediment.
4899	J2-491	2010/03/24 04:34:00	14.59033	144.76974	18.7	1257.9	1262.3	No sediment and big rock stacked on smaller rubble rocks.
4900	J2-491	2010/03/24 04:34:35	14.59033	144.76974	20.4	1258.2	1262.4	Boulder is about a meter across.
4902	J2-491	2010/03/24 04:35:18	14.59037	144.76977	19.5	1255.5	1258.7	Climbing up the rubble.
4903	J2-491	2010/03/24 04:35:39	14.59041	144.76979	17.2	1253.6	1258.5	Looks like talus.
4904	J2-491	2010/03/24 04:36:10	14.59045	144.76980	19.7	1251.3	1256.4	Still climbing in the talus.
4905	J2-491	2010/03/24 04:36:32	14.59050	144.76981	19.0	1250.3	1254.3	Now seeing some black sand.
4906	J2-491	2010/03/24 04:37:08	14.59055	144.76984	20.2	1247.3	1252.0	More sediment now.
4908	J2-491	2010/03/24 04:37:40	14.59061	144.76987	22.8	1245.4	1249.2	Eel fish.
4909	J2-491	2010/03/24 04:37:52	14.59063	144.76988	21.9	1243.8	1247.9	Larger rock pieces and irregular shapes.
4910	J2-491	2010/03/24 04:38:11	14.59066	144.76990	22.3	1242.2	1246.5	More uniform talus again.
4911	J2-491	2010/03/24 04:39:08	14.59075	144.76996	23.1	1236.6	1241.9	Hardly any sediment.
4913	J2-491	2010/03/24 04:40:11	14.59084	144.77003	22.8	1232.3	1237.2	All talus and very little sediment-fairly uniform size.
4914	J2-491	2010/03/24 04:40:54	14.59088	144.77001	22.4	1231.0	1235.8	More sediment between rocks again.
4916	J2-491	2010/03/24 04:41:45	14.59096	144.76999	21.4	1227.8	1232.8	More sediment and a few large boulders in talus.
4917	J2-491	2010/03/24 04:42:28	14.59105	144.77002	22.2	1224.3	1228.9	More sediment and some pillow pieces.
4919	J2-491	2010/03/24 04:43:15	14.59109	144.77006	23.2	1221.0	1226.9	Some sulfur blotches.
4920	J2-491	2010/03/24 04:43:27	14.59112	144.77008	23.2	1219.3	1225.8	More regular shaped talus.
4922	J2-491	2010/03/24 04:45:18	14.59119	144.77010	22.6	1217.6	1222.3	Checking weights.
4923	J2-491	2010/03/24 04:45:46	14.59123	144.77012	22.5	1215.8	1220.3	Talus with sediment.
4924	J2-491	2010/03/24 04:46:48	14.59132	144.77013	22.4	1212.2	1216.5	Lots and lots of talus.
4926	J2-491	2010/03/24 04:47:38	14.59137	144.77016	22.3	1211.1	1214.1	More sediment here with sulfur patches.
4927	J2-491	2010/03/24 04:48:55	14.59140	144.77018	22.2	1207.7	1212.2	Broken pillow and sulfur deposits.
4929	J2-491	2010/03/24 04:49:57	14.59145	144.77017	21.5	1207.1	1210.4	More sediment than rocks.
4930	J2-491	2010/03/24 04:50:40	14.59155	144.77020	23.0	1201.5	1206.4	More sandy sediment.
4932	J2-491	2010/03/24 04:51:18	14.59163	144.77025	26.7	1193.8	1201.9	15 minutes left in dive.
4933	J2-491	2010/03/24 04:51:49	14.59168	144.77030	25.7	1195.2	1198.9	Back into more rubble and less sediment
4934	J2-491	2010/03/24 04:52:38	14.59175	144.77034	37.2	1192.0	1195.5	Another couple pillows in otherwise uniform rubble.
4935	J2-491	2010/03/24 04:52:56	14.59177	144.77032	32.4	1191.9	1195.4	Eel.
4936	J2-491	2010/03/24 04:53:00	14.59176	144.77032	32.6	1191.8	1195.5	DSC of eel.
4938	J2-491	2010/03/24 04:53:34	14.59176	144.77032	44.5	1193.2	1195.8	Taking photos of the eel.
4939	J2-491	2010/03/24 04:54:27	14.59185	144.77031	39.3	1186.6	1192.5	Big rock in sand.
4940	J2-491	2010/03/24 04:55:08	14.59189	144.77030	39.2	1185.3	1190.5	More sand here with some larger boulders.
4942	J2-491	2010/03/24 04:56:16	14.59205	144.77035	23.3	1180.1	1182.9	Bottom check.
4944	J2-491	2010/03/24 04:57:15	14.59209	144.77037	24.8	1177.1	1180.7	More disperse rocks.
4945	J2-491	2010/03/24 04:58:25	14.59212	144.77040	21.8	1175.7	1178.6	Shrimp in hd cam.
4946	J2-491	2010/03/24 04:58:35	14.59212	144.77041	23.3	1175.5	1178.6	Patch of boulders but mainly sediment.
4947	J2-491	2010/03/24 04:58:51	14.59211	144.77041	23.8	1175.4	1179.0	About 10cm shrimp.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4949	J2-491	2010/03/24 04:59:15	14.59212	144.77041	22.6	1175.9	1178.2	Another shrimp photo.
4950	J2-491	2010/03/24 05:00:42	14.59231	144.77045	22.9	1165.5	1170.1	More rock than sediment again.
4951	J2-491	2010/03/24 05:01:02	14.59237	144.77048	22.2	1162.2	1167.2	Jelly.
4953	J2-491	2010/03/24 05:02:04	14.59249	144.77057	23.2	1155.4	1160.1	Lots more sediment now.
4955	J2-491	2010/03/24 05:03:47	14.59258	144.77061	21.5	1152.9	1155.2	On bottom.
4956	J2-491	2010/03/24 05:04:16	14.59261	144.77061	24.8	1150.5	1154.0	Flying again over sediment and rubble.
4957	J2-491	2010/03/24 05:04:34	14.59264	144.77060	22.6	1146.9	1152.7	Only 300m short of target.
4958	J2-491	2010/03/24 05:04:46	14.59266	144.77062	25.0	1144.2	1151.9	JASON: Jason off bottom

Table 6.5-6 JASON Dive J2-492

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
4983	J2-492	2010/03/24 18:31:38	14.60047	144.77505	80.2	586.4	593.7	JASON: Jason on bottom
4984	J2-492	2010/03/24 18:31:56	14.60048	144.77508	82.6	582.1	592.9	We're about 50m south of Phantom.
4986	J2-492	2010/03/24 18:33:16	14.60053	144.77537	79.1	567.1	573.5	Heading up the cone to Phantom. We saw some rocks that looked like it was in place.
4987	J2-492	2010/03/24 18:34:17	14.60054	144.77540	79.7	565.1	572.0	Doing Jason housekeeping.
4990	J2-492	2010/03/24 18:39:08	14.60060	144.77533	5.4	561.7	569.7	Impressive rubble-strewn cone with in-place lavas poking out from underneath the volcanoclastic sediments.
4992	J2-492	2010/03/24 18:39:54	14.60063	144.77533	5.1	558.2	568.4	Billowing plume in the Medea camera.
4994	J2-492	2010/03/24 18:42:33	14.60070	144.77531	5.2	558.1	563.2	We're going to move to the west first so that we can come at Phantom up the slope.
4996	J2-492	2010/03/24 18:44:39	14.60075	144.77524	5.4	553.3	561.5	This is Sulfur Crust right here. Phantom is behind it. Mkr120 is here at Sulfur crust. Phantom is in the background.
4998	J2-492	2010/03/24 18:45:35	14.60078	144.77529	12.6	553.4	557.2	It looks like the venting is coming out over an area at least 3 or 4 meters. Lots of sulfur has rained out from the vent. Yellow coating on the rocks around the vent.
4999	J2-492	2010/03/24 18:45:49	14.60079	144.77529	343.0	553.4	556.3	HD_CAM: start at Phantom/Sulfur Crust area.
5000	J2-492	2010/03/24 18:46:15	14.60080	144.77530	344.0	553.4	557.0	Looks like Yellowstone.
5001	J2-492	2010/03/24 18:46:39	14.60080	144.77530	344.4	553.4	556.9	The depth is about 10m shallower than before and closer to Sulfur Crust.
5003	J2-492	2010/03/24 18:47:46	14.60080	144.77531	344.5	553.3	556.9	The vent has build up. It was 566m earlier and now it is 553m. It's at least 10m shallower than it was the last time.
5004	J2-492	2010/03/24 18:48:25	14.60080	144.77531	344.4	553.4	556.9	It looks like there is new sulfur crust all around here. It must have been erupting a lot in the last day. Sulfur balls all over the crust here.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5006	J2-492	2010/03/24 18:49:26	14.60080	144.77531	344.4	553.4	556.9	Julie wants to know how fast the bugs change? This is very different than it was 2 days ago.
5008	J2-492	2010/03/24 18:51:22	14.60080	144.77531	344.4	553.4	557.0	The plume is coming up out of the sulfur crust here. Phantom might be farther downslope. Either Phantom moved or this opened up yesterday.
5009	J2-492	2010/03/24 18:52:09	14.60080	144.77532	344.5	553.4	556.9	Sulfur crust with little balls of sulfur on top.
5010	J2-492	2010/03/24 18:52:27	14.60081	144.77532	344.6	553.4	556.9	Bubbling going on.
5013	J2-492	2010/03/24 18:56:17	14.60080	144.77532	344.5	553.4	556.9	We are just upslope from Sulfur Crust marker.
5015	J2-492	2010/03/24 18:57:21	14.60080	144.77532	344.4	553.4	556.9	We are going to look around and make sure of where we are.
5016	J2-492	2010/03/24 18:57:33	14.60080	144.77532	344.4	553.4	556.9	Stowing the wand so that we can get a better look around first.
5018	J2-492	2010/03/24 18:59:16	14.60080	144.77531	344.1	553.4	556.8	Not sure where we are. If this is Sulfur Crust it has opened up since our visit a couple days ago.
5019	J2-492	2010/03/24 18:59:53	14.60080	144.77531	344.2	553.4	556.9	Taking off and backing up first.
5020	J2-492	2010/03/24 19:00:18	14.60079	144.77531	2.7	553.0	556.8	The marker is about 10m from the sulfur crust target.
5022	J2-492	2010/03/24 19:02:27	14.60077	144.77528	22.7	555.1	559.5	We see the tephra bucket and Mkr120 here Heading 023.
5023	J2-492	2010/03/24 19:02:47	14.60078	144.77529	21.9	554.8	559.0	This is Sulfur Crust here. Jason depth is 555m.
5024	J2-492	2010/03/24 19:03:06	14.60079	144.77530	21.8	554.5	557.6	Now are going to try to spot Phantom.
5026	J2-492	2010/03/24 19:04:23	14.60080	144.77537	339.7	552.8	555.0	This is the vent we were just at. So the active venting we saw when we arrived was just upslope from Sulfur Crust Mkr120.
5028	J2-492	2010/03/24 19:06:47	14.60076	144.77537	340.6	545.9	557.9	Dave is predicting a bigger eruption because of all the Sulfur that has been precipitated.
5030	J2-492	2010/03/24 19:07:37	14.60071	144.77536	356.4	553.4	561.7	SO2 comes out as a gas. First it is dissolved in water. Then it splits into sulfur and sulfate.
5031	J2-492	2010/03/24 19:08:06	14.60074	144.77525	15.3	554.4	566.1	Everywhere we look on the volcano and see that sulfur it's a former magmatic event/conduit (says Dave).
5032	J2-492	2010/03/24 19:08:32	14.60078	144.77523	55.7	555.5	564.8	We're back where we started with sulfur Crust tephra bucket and Mkr120.
5033	J2-492	2010/03/24 19:08:52	14.60082	144.77522	77.4	556.2	562.0	Looking NE at Mkr120 and the new vent right next to it.
5035	J2-492	2010/03/24 19:09:49	14.60089	144.77512	91.3	561.9	565.1	Want to head down and to the left (NW) and we should see Phantom about 10m deeper.
5036	J2-492	2010/03/24 19:10:28	14.60085	144.77507	107.1	563.0	569.7	We see Phantom marker below us and the tephra bucket.
5037	J2-492	2010/03/24 19:10:51	14.60083	144.77507	85.8	566.1	573.5	That was Phantom. It looks like it has all slid.
5039	J2-492	2010/03/24 19:11:37	14.60082	144.77507	82.7	566.0	573.4	It is a huge slide. It disappeared in a huge slide and is now gone. The eruptive vent moved upslope.
5040	J2-492	2010/03/24 19:12:49	14.60089	144.77508	78.7	561.6	568.6	That's an impressive slide. The tephra bucket is still there. The vent should be to the left of the marker.
5042	J2-492	2010/03/24 19:13:45	14.60091	144.77510	79.4	562.4	567.0	Correction. We see a little bit of smoke here. This is where Phantom was. Our depth is 562m.
5043	J2-492	2010/03/24 19:14:23	14.60089	144.77510	108.7	562.9	566.9	These lava blocks in front of us have a bit of venting but now much.
5044	J2-492	2010/03/24 19:14:36	14.60089	144.77510	113.8	562.8	565.6	The tephra bucket is just to the south of the vent.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5046	J2-492	2010/03/24 19:15:33	14.60092	144.77511	35.3	561.2	564.7	Looks like the majority of active venting has moved up to the Sulfur Crust area.
5047	J2-492	2010/03/24 19:16:21	14.60090	144.77514	104.7	561.1	564.4	There's the marker (118) with the tephra bucket to the south.
5049	J2-492	2010/03/24 19:17:31	14.60090	144.77509	107.6	562.5	567.7	Weakly venting here. Just a wisp of venting here in this rock pile. Depth is 563 here. It's piled up a bunch more rocks in this area.
5050	J2-492	2010/03/24 19:18:52	14.60079	144.77513	72.3	562.5	566.9	Right below the bucket is a steep slope.
5052	J2-492	2010/03/24 19:19:18	14.60072	144.77518	73.7	561.1	574.7	Big outcrops and massive - with sulfur covering.
5053	J2-492	2010/03/24 19:19:50	14.60072	144.77526	38.7	557.7	565.5	These are volcanic outcrops from the volcano and have been buried by the eruptive material.
5054	J2-492	2010/03/24 19:20:00	14.60071	144.77527	41.7	558.0	566.7	We see sulfur crust and the bucket here.
5055	J2-492	2010/03/24 19:20:37	14.60073	144.77533	356.6	555.9	560.3	We are looking for the eruptive vent.
5056	J2-492	2010/03/24 19:20:46	14.60073	144.77535	357.0	555.6	559.6	The slope is covered with sulfur.
5058	J2-492	2010/03/24 19:21:41	14.60079	144.77534	324.8	553.1	557.2	We're back in the area of the big venting today.
5059	J2-492	2010/03/24 19:22:07	14.60078	144.77531	324.3	553.5	557.5	Looks like something swimming around.
5060	J2-492	2010/03/24 19:22:21	14.60079	144.77531	323.6	553.4	557.3	The vent is right in front of us.
5061	J2-492	2010/03/24 19:23:14	14.60079	144.77531	247.3	553.4	556.0	The little balls are probably sulfur falling out of the plume.
5063	J2-492	2010/03/24 19:24:35	14.60083	144.77530	344.6	554.0	556.5	When we first approached there was venting coming out over a large area.
5065	J2-492	2010/03/24 19:25:34	14.60079	144.77527	20.0	554.3	558.3	Segue to the left. Looking around.
5066	J2-492	2010/03/24 19:26:57	14.60087	144.77520	132.6	559.2	562.8	Zooming around to look at this venting from the west with a heading of 90.
5068	J2-492	2010/03/24 19:27:19	14.60087	144.77521	129.1	559.5	562.9	The marker for Phantom is just downslope from us.
5069	J2-492	2010/03/24 19:27:35	14.60087	144.77521	128.8	559.6	563.0	This is a 10m area.
5070	J2-492	2010/03/24 19:28:43	14.60087	144.77521	129.3	559.6	563.0	We're between the markers here (between Phantom and Sulfur Crust).
5072	J2-492	2010/03/24 19:30:28	14.60087	144.77523	128.9	559.6	562.7	The eruptive activity was 553m and here is 560. The venting was over a 5-6 meter area at least. It's just a massive sulfur-coated area with venting coming out at various spots.
5074	J2-492	2010/03/24 19:32:49	14.60090	144.77521	129.7	559.4	562.8	Actually the depth range for the venting is more like 10 meters (Sulfur Crust at the peak and Phantom at the base). The large venting was straight north of Mkr120 today.
5076	J2-492	2010/03/24 19:33:24	14.60090	144.77521	129.4	559.4	562.8	The venting area is at least 5m across; probably more. And it covers about a 10m depth range.
5078	J2-492	2010/03/24 19:35:20	14.60088	144.77522	160.0	560.3	562.3	We are going to settle down and do a bit of fluid sampling now here between Mkr118 and Mkr120. Z=559m. We are between Sulfur Crust and Phantom.
5079	J2-492	2010/03/24 19:36:14	14.60088	144.77522	158.9	560.5	562.3	BIOLOGY: other See some shrimp swimming around. Not a lot but a few.
5081	J2-492	2010/03/24 19:37:39	14.60088	144.77522	158.8	560.5	562.3	Dave is manipulating the wand with the extension and trying to find a decent spot to sample. He will place the tip right next to the "ground".

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5083	J2-492	2010/03/24 19:40:41	14.60087	144.77521	159.2	560.5	562.3	We are upslope from Phantom here at 560m. 49° right here.
5085	J2-492	2010/03/24 19:41:24	14.60088	144.77521	159.2	560.5	562.3	The pH sensor is pretty much off the scale. Getting 0.23 volts on pH sensor. That's a pH of about 1.
5086	J2-492	2010/03/24 19:42:12	14.60087	144.77521	159.3	560.5	562.3	Location for sampling: 144°46.5131 14°36.0513.
5088	J2-492	2010/03/24 19:43:31	14.60087	144.77521	159.1	560.5	562.3	SAMPLE: fluid J492-HFS-1. Filtered piston #1 Start 1942. Z=560.
5089	J2-492	2010/03/24 19:43:42	14.60087	144.77521	159.2	560.5	562.3	NAV: Doppler Reset
5090	J2-492	2010/03/24 19:43:57	14.60087	144.77521	159.1	560.5	562.3	We're on the north side of the area of active venting.
5092	J2-492	2010/03/24 19:45:20	14.60089	144.77521	159.4	560.5	562.3	SAMPLE J492-HFS-1. Stop194445. Tmax=51.4 Tav=45.2 Vol=350ml. T2=20.
5093	J2-492	2010/03/24 19:45:31	14.60089	144.77521	159.4	560.5	562.3	Doppler reset only changed out position by 2m.
5094	J2-492	2010/03/24 19:46:16	14.60089	144.77520	159.5	560.5	562.3	We're about 5m east of Phantom upslope.
5097	J2-492	2010/03/24 19:49:17	14.60088	144.77521	159.5	560.5	562.3	SAMPLE: fluid J492-HFS-2. Unfiltered bag#17. Same spot about 5m east of Phantom. Z=560m. Location same as previous sample: Start 194740.
5098	J2-492	2010/03/24 19:50:33	14.60087	144.77521	159.4	560.5	562.3	SAMPLE J492-HFS-2 stop. Tmax=41.0 Tav=40.3 Vol=300ml. T2=18. This area is leaking fluids. Not in the large plume.
5100	J2-492	2010/03/24 19:52:04	14.60086	144.77522	159.4	560.5	562.3	We are at the north downslope part of the venting area. These 2 samples were just upslope from Phantom. Phantom was 564. This sampling site is only 560.5.
5101	J2-492	2010/03/24 19:53:04	14.60093	144.77522	126.8	559.4	563.1	Akel wants to come up a little bit and have a look off to the left - which is the area we have not investigated yet.
5103	J2-492	2010/03/24 19:53:33	14.60093	144.77525	125.9	554.3	561.7	Looks like fresh lava rocks here. They are much blacker than what we have been seeing.
5104	J2-492	2010/03/24 19:53:57	14.60089	144.77529	127.3	551.7	557.0	So we are traversing north of Phantom and Sulfur Crust.
5105	J2-492	2010/03/24 19:54:17	14.60084	144.77527	125.5	551.0	557.8	The active plume is right in front of us. Lots of bubbles in the plume.
5106	J2-492	2010/03/24 19:54:58	14.60078	144.77527	14.3	554.1	558.9	We came around the vent.
5107	J2-492	2010/03/24 19:55:14	14.60079	144.77530	329.9	554.1	556.0	Mkr120 in front of us. This is the way we came in from the beginning. Looking north.
5109	J2-492	2010/03/24 19:55:29	14.60079	144.77530	336.2	554.0	556.1	Large area of venting here.
5110	J2-492	2010/03/24 19:55:50	14.60080	144.77529	340.0	554.4	556.6	The marker is just to the left. Our heading is almost due north.
5111	J2-492	2010/03/24 19:57:08	14.60080	144.77531	338.9	554.2	556.6	HD_CAM: start video of this huge area of venting just to the NE of the marker at Sulfur Crust.
5113	J2-492	2010/03/24 19:57:56	14.60080	144.77530	338.5	555.0	556.8	We're OK as far as the nav goes.
5114	J2-492	2010/03/24 19:58:54	14.60082	144.77530	344.4	554.7	556.6	It looks like Yellowstone here. Sulfur plates covered with sulfur spherules and bubbles coming out of the venting area.
5115	J2-492	2010/03/24 19:59:06	14.60082	144.77530	344.4	554.8	556.6	Bill is panning around with the HD cam.
5117	J2-492	2010/03/24 19:59:32	14.60082	144.77530	344.4	554.7	556.6	HD_CAM: stop
5118	J2-492	2010/03/24 20:01:08	14.60082	144.77529	333.8	554.4	556.7	We are just east of the Sulfur Crust target ~4m and north of Mkr120 target ~6m.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5120	J2-492	2010/03/24 20:01:22	14.60082	144.77529	338.9	554.7	556.5	Lots of bubbling.
5122	J2-492	2010/03/24 20:03:27	14.60081	144.77530	334.7	554.7	556.6	Location of this sampling spot: 144°46.4183 14°36.0498. Z=555m. Target for this sampling location is Sulfur Vent.
5126	J2-492	2010/03/24 20:10:32	14.60084	144.77530	333.9	554.7	556.6	NAV: Location Sulfur Vent target relative to other targets here: 289° 18m Sulfur Vent to Phantom. 273° 18m Sulfur Vent target to Mkr118. 197° 10m Sulfur Vent target to Mkr120.
5128	J2-492	2010/03/24 20:12:05	14.60083	144.77530	333.8	554.6	556.6	SAMPLE: fluid J492-HFS-3. Start 201040. Unfiltered piston #2. Sulfur Vent target. 144°46.4183 14°36.0498. Z=555m. See location info on last entry.
5129	J2-492	2010/03/24 20:12:32	14.60083	144.77530	333.8	554.6	556.5	SAMPLEs here in the active venting area. Lots of smoke; bubbles; and sulfur.
5131	J2-492	2010/03/24 20:13:49	14.60082	144.77530	333.7	554.6	556.5	SAMPLE J492-HFS-3 stop. Tmax=57.6 Tavg=38.5 T2=20. Vol=448ml.
5133	J2-492	2010/03/24 20:15:19	14.60082	144.77529	333.7	554.6	556.5	SAMPLE: fluid J492-HFS-4. Start 201430. Unfiltered piston #5. Sulfur Vent target. Same position as previous sample.
5135	J2-492	2010/03/24 20:17:58	14.60082	144.77530	333.3	554.6	556.6	J492-HFS-4 Stop 2017. Tmax=41.7 Tavg=32.5 Vol=372ml. T2=15.
5137	J2-492	2010/03/24 20:19:16	14.60082	144.77530	333.4	554.6	556.6	The plume has shifted and we're in the thick of it.
5138	J2-492	2010/03/24 20:19:27	14.60082	144.77530	333.1	554.6	556.6	The plume is quite huge in Medea cam.
5139	J2-492	2010/03/24 20:19:40	14.60082	144.77530	333.3	554.6	556.6	Temp probe on Jason has gone down 1 degree.
5140	J2-492	2010/03/24 20:20:22	14.60079	144.77529	338.6	548.2	548.9	Will wants to lift the ROV up and look around. He's worried about the sulfur.
5141	J2-492	2010/03/24 20:20:52	14.60071	144.77534	336.1	546.3	560.3	We're in the bubbles. Backing up. Need to reassess the situation.
5143	J2-492	2010/03/24 20:22:28	14.60059	144.77532	340.8	544.8	572.2	If we go to the west should be able to get out of the plume.
5144	J2-492	2010/03/24 20:23:01	14.60057	144.77534	352.7	546.1	573.2	Sulfur coating on the wand. We came up 10m in the water column. Going back down now.
5146	J2-492	2010/03/24 20:24:23	14.60066	144.77537	350.0	555.0	563.8	Bottom coming into view again.
5147	J2-492	2010/03/24 20:25:00	14.60073	144.77537	352.6	554.9	559.9	Jason is just south of the sampling site (just E of the marker).
5149	J2-492	2010/03/24 20:26:09	14.60077	144.77533	352.8	555.0	558.1	Sulfur sediments and plumage here.
5150	J2-492	2010/03/24 20:26:49	14.60073	144.77531	359.5	555.1	561.5	The plume now seems to be advecting to the east. When we arrived it was advecting to the west.
5152	J2-492	2010/03/24 20:28:00	14.60071	144.77528	5.8	555.2	563.0	The marker is just ahead of us. That is the marker at Sulfur Crust. Mkr120 right ahead. It is really blowing over.
5153	J2-492	2010/03/24 20:28:22	14.60071	144.77525	19.2	555.1	563.7	Will want to sneak around it and approach it from the west side.
5154	J2-492	2010/03/24 20:28:53	14.60074	144.77522	27.5	555.2	562.7	NAV: Lost bottom lock
5156	J2-492	2010/03/24 20:29:41	14.60079	144.77521	59.3	555.2	561.2	Current is really coming from the W/NW now.
5157	J2-492	2010/03/24 20:30:57	14.60086	144.77524	136.9	557.3	559.8	We are still at Sulfur vent. We are now almost 180 degree heading change from our last set of samples. The first sampling site is just below us about 10 meters.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5159	J2-492	2010/03/24 20:32:14	14.60085	144.77525	137.2	557.3	559.8	We are just uphill from the last sampling site. We are on the NW side of this sulfur sampling site facing SE. The second set of samples we were on the other side of the vent facing NW. And just upslope from the first sampling site ~10m.
5160	J2-492	2010/03/24 20:32:24	14.60085	144.77525	137.2	557.3	559.8	NAV: Doppler Reset
5162	J2-492	2010/03/24 20:33:37	14.60086	144.77525	137.3	557.3	559.8	The Mkr120 target is probably a few meters off. Should probably be a few meters to the N/NE of where it is on the nav.
5164	J2-492	2010/03/24 20:35:26	14.60086	144.77525	138.0	557.3	559.8	Setting up to do more fluid sampling here on the N/NW side of this large Sulfur Vent target.
5165	J2-492	2010/03/24 20:35:35	14.60086	144.77525	138.0	557.2	559.8	HD_CAM: stop
5167	J2-492	2010/03/24 20:39:12	14.60085	144.77526	137.6	557.3	559.8	SAMPLE: fluid We are on the west side of Sulfur Vent. Phantom is about 10m downslope to the west. Sulfur Crust is about 8m to the south of us. The marker is on top of the Sulfur crust and the tephra bucket is right next to it.
5170	J2-492	2010/03/24 20:42:00	14.60085	144.77525	137.4	557.3	559.8	NAV: Location Sampling site: 144°46.4148 14°36.0508. Z=557m. We are on the west side of the Sulfur Vent site.
5172	J2-492	2010/03/24 20:43:18	14.60086	144.77524	137.1	557.3	559.8	Ben is swapping out seats with Will.
5174	J2-492	2010/03/24 20:45:19	14.60087	144.77525	137.1	557.3	559.8	SAMPLE: gas J492-GTHFS-5. Fired 204430. Temp 47°. T2=12. 144°46.4148 14°36.0508. Z=557m. Third sampling location here at Sulfur Vent.
5176	J2-492	2010/03/24 20:48:42	14.60087	144.77526	137.2	557.3	559.8	Bubbling in the background. The wand may be plugged up.
5179	J2-492	2010/03/24 20:52:27	14.60086	144.77526	137.3	557.3	559.8	SAMPLE: fluid J492-HFS-6. Unfiltered piston sample #6. Start 204120. Same position as GTHFS-5 sample.
5181	J2-492	2010/03/24 20:54:59	14.60087	144.77525	137.5	557.3	559.8	Dave is not pleased with this site.
5184	J2-492	2010/03/24 20:57:19	14.60088	144.77525	137.6	557.3	559.8	J492-HFS-6 stop. Tmax=36.3 Tavg=37.4 Vol=447ml. T2=7. We're not getting warm water flowing very well. Same sampling site as previous sample.
5185	J2-492	2010/03/24 20:58:14	14.60087	144.77526	137.7	557.3	559.8	Looking at the tip of the wand and see bit of molten sulfur. Will have to get that off.
5187	J2-492	2010/03/24 20:59:37	14.60086	144.77526	137.7	557.3	559.7	Nice HDcam footage.
5188	J2-492	2010/03/24 21:00:46	14.60086	144.77525	137.7	557.3	559.8	Ben got the sulfur off the tip by scraping it.
5190	J2-492	2010/03/24 21:02:31	14.60087	144.77526	137.7	557.3	559.8	SAMPLE INFO FOR GTHFS-5. J492-GTHFS-5 was the stbd gastight.
5193	J2-492	2010/03/24 21:06:14	14.60087	144.77526	138.1	557.3	559.7	Stowing the wand.
5195	J2-492	2010/03/24 21:07:40	14.60086	144.77526	138.3	557.4	559.8	Bill wants to back up and get another view of Phantom and see if anything has changed there. Then on to Mkr120 and exchange the tephra sampler. Then on to Brimstone.
5196	J2-492	2010/03/24 21:07:53	14.60086	144.77526	138.3	557.4	559.8	Lots of intense venting coming out but hard to get at it.
5197	J2-492	2010/03/24 21:08:58	14.60088	144.77525	164.5	556.7	559.6	HD_CAM: start Pulling back from Sulfur vent site. Backing up a bit to look at Phantom Vent.

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5199	J2-492	2010/03/24 21:09:52	14.60090	144.77523	262.7	556.7	558.4	Rotating to a southern view.
5200	J2-492	2010/03/24 21:10:32	14.60086	144.77517	135.2	557.0	564.0	We just took off from the NW side of Sulfur Vent. We are rotating so that we are looking to the west.\
5201	J2-492	2010/03/24 21:10:59	14.60088	144.77514	114.6	557.0	564.5	Now we are facing into the slope backed down the cone slightly.
5202	J2-492	2010/03/24 21:11:07	14.60089	144.77512	107.8	557.4	565.9	We need to come down deeper.
5205	J2-492	2010/03/24 21:13:17	14.60088	144.77510	94.2	562.4	568.2	We see the tephra bucket and marker 118. Just a little bit of fuming that we saw before.
5206	J2-492	2010/03/24 21:15:04	14.60082	144.77514	34.8	560.7	567.5	Mkr118 right below us. The Marker has been half buried in the last 2 hours.
5208	J2-492	2010/03/24 21:16:03	14.60077	144.77521	91.2	556.6	566.0	Travelling around the cone to the SE.
5210	J2-492	2010/03/24 21:17:31	14.60075	144.77527	354.0	556.0	559.8	Climbing up the slope to Sulfur Crust vent and Mkr122. We are calling this area Sulfur Vent.
5211	J2-492	2010/03/24 21:18:14	14.60075	144.77528	351.3	556.8	559.4	HD_CAM: stop
5214	J2-492	2010/03/24 21:21:45	14.60075	144.77527	354.2	555.3	559.9	Going to exchange the Tephra samplers at Mkr-120 (last entry has 122- it is 120).
5215	J2-492	2010/03/24 21:21:59	14.60075	144.77527	353.2	555.1	559.7	STBD swing arm out.
5217	J2-492	2010/03/24 21:23:41	14.60075	144.77527	3.2	557.0	559.0	We will pick up Tephra Sampler D and exchange it with Tephra Sampler H.
5218	J2-492	2010/03/24 21:24:17	14.60076	144.77528	359.7	557.0	559.0	Lots of Tephra filling the bucket as we watch.
5220	J2-492	2010/03/24 21:27:11	14.60074	144.77528	359.8	557.0	559.1	Opening biobox STBD.
5223	J2-492	2010/03/24 21:30:39	14.60074	144.77529	359.6	557.0	559.0	Grabbing the red loop for recovery on Tephra Sampler D. Bag not coming up.
5224	J2-492	2010/03/24 21:31:06	14.60075	144.77529	359.5	557.0	559.0	RECOVER: tephra bucket Wiggling bucket and got bag over bucket- placing in STBD biobox.
5227	J2-492	2010/03/24 21:33:42	14.60075	144.77529	359.3	557.0	559.0	SAMPLE: geo J492-tephra-07 recovered Tephra Sampler bucket at Sulfur vent. Been out since J488.
5228	J2-492	2010/03/24 21:34:31	14.60075	144.77529	2.7	555.9	559.3	Lifting up in order to open other swing arm to see if the new tephra sampler is in that biobox.
5230	J2-492	2010/03/24 21:35:26	14.60075	144.77529	2.6	555.7	559.1	Tephra Sampler D is in STBD biobox.
5231	J2-492	2010/03/24 21:35:40	14.60075	144.77529	3.0	555.7	559.2	Swung out PORT biobox.
5232	J2-492	2010/03/24 21:36:01	14.60075	144.77529	2.7	555.7	559.3	All the shrimp that were here have gone away.
5234	J2-492	2010/03/24 21:39:07	14.60077	144.77528	2.2	555.8	559.1	Going to put Tephra-H on top of the crust where Tephra-D originally was located.
5236	J2-492	2010/03/24 21:39:52	14.60077	144.77528	2.2	555.8	559.1	Closing biobox.
5237	J2-492	2010/03/24 21:40:38	14.60077	144.77527	2.4	555.8	559.1	DEPLOY: tephra bucket Tephra-H sampler placed on top of crust at Sulfur Vent where sampler D was just picked up.
5239	J2-492	2010/03/24 21:41:15	14.60077	144.77527	3.3	555.8	559.1	Tephra D originally had been on top but fell when crust broke and bucket uprighted on other dive.

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5240	J2-492	2010/03/24 21:41:32	14.60077	144.77527	2.2	555.8	559.1	Not quite deployed-going to swing around to the other side of the sulfur slab.
5241	J2-492	2010/03/24 21:42:43	14.60077	144.77527	353.0	555.8	557.9	Trying to place bucket without breaking the crust.
5243	J2-492	2010/03/24 21:44:33	14.60077	144.77528	354.2	555.8	559.0	DEPLOY: tephra bucket Tephra H Sampler deployed on crust adjacent Sulfur Vent and next to Mkr-120 (same crust as marker).
5244	J2-492	2010/03/24 21:44:59	14.60077	144.77527	355.0	555.8	559.0	14eg 36.047 144deg 46.516 depth was 556 was today's nav here.
5246	J2-492	2010/03/24 21:45:26	14.60076	144.77526	338.6	556.3	559.4	Looking under crust to see if any shrimp are still near the exclusion traps.
5247	J2-492	2010/03/24 21:45:48	14.60075	144.77527	339.9	557.1	559.5	Zooming in to look for shrimp.
5248	J2-492	2010/03/24 21:46:08	14.60075	144.77526	339.3	557.2	559.5	There is one shrimp.
5249	J2-492	2010/03/24 21:46:33	14.60075	144.77526	339.0	557.3	559.5	This area was covered and now they are scarce after eruptive vent opened up.
5250	J2-492	2010/03/24 21:46:58	14.60075	144.77526	339.3	557.2	559.5	Panning and zooming crust edge.
5252	J2-492	2010/03/24 21:47:22	14.60075	144.77526	339.4	557.2	559.4	Good view in pilot cam of traps-marker-bucket.
5253	J2-492	2010/03/24 21:47:41	14.60075	144.77526	339.4	557.2	559.5	Saw only one shrimp while panning/zooming.
5254	J2-492	2010/03/24 21:47:51	14.60075	144.77526	339.4	557.2	559.5	Would be a good fluid sampling site right now.
5256	J2-492	2010/03/24 21:50:11	14.60075	144.77527	339.5	557.2	559.6	Taking some DSCs here beneath Mkr120.
5261	J2-492	2010/03/24 21:58:10	14.60075	144.77527	339.3	557.1	559.6	Going to fluid sample here at the circular mat cages to try to understand why we are not seeing any shrimp here today. The cages are right below the marker tucked in the ledge over diffuse flow.
5263	J2-492	2010/03/24 22:01:09	14.60075	144.77527	338.3	557.1	559.6	Location here today at base of marker 120: 14°36.045 144°46.516. Z=557. Preparing to fluid sample.
5265	J2-492	2010/03/24 22:01:38	14.60075	144.77526	337.7	557.1	559.5	John wants to know why the shrimp aren't here today. Maybe it is the chemistry of the fluid.
5267	J2-492	2010/03/24 22:03:15	14.60075	144.77527	337.6	557.1	559.6	Major floc stream coming up. A bit of rock has fallen down.
5268	J2-492	2010/03/24 22:04:07	14.60076	144.77529	337.6	557.1	559.6	We see lots of floc and some ash. Some kind of explosion shook up this area too. It's probably in this area just not in our field of view.
5270	J2-492	2010/03/24 22:06:23	14.60076	144.77528	337.0	557.2	559.8	Now we just had a big burp of smoke come out of the ground here. We are losing visibility. Seeing ash and floc. Quite the changing environment.
5271	J2-492	2010/03/24 22:06:58	14.60076	144.77527	337.1	557.2	559.7	We see 2 shrimp swimming by.
5273	J2-492	2010/03/24 22:07:55	14.60077	144.77526	337.5	557.2	559.9	Lots and lots of floc here. We're waiting for things to clear out.
5274	J2-492	2010/03/24 22:08:54	14.60076	144.77526	337.4	557.2	559.9	All of a sudden we are engulfed in floc and ash.
5276	J2-492	2010/03/24 22:09:34	14.60075	144.77527	337.1	557.2	559.7	Ben saw a piece of rock break off and then not long after we saw all the floc and some ash. Visibility is very poor.
5279	J2-492	2010/03/24 22:14:00	14.60077	144.77527	337.3	557.2	559.8	The floc is amazing.
5280	J2-492	2010/03/24 22:15:13	14.60077	144.77527	337.3	557.2	559.9	It's clearing up a bit.
5282	J2-492	2010/03/24 22:15:36	14.60077	144.77527	337.2	557.2	559.8	The floc indicates that some kind of microbe likes it here in the sub-surface.

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5284	J2-492	2010/03/24 22:19:05	14.60077	144.77527	336.8	557.1	559.8	It is clearing up a bit. Preparing to fluid sample here next to the map cages at the base of Mkr120.
5286	J2-492	2010/03/24 22:19:59	14.60077	144.77527	336.9	557.1	559.9	Just saw a big long strand of molten sulfur raining down.
5288	J2-492	2010/03/24 22:22:40	14.60077	144.77528	336.8	557.1	559.8	SAMPLE: fluid J492-HFS-9. Filtered bag #24. 14°36.045 144°46.516. Z=557. Start 222030. Z=557. This sample is to help John Sherrin explain where have all the shrimp gone.
5290	J2-492	2010/03/24 22:23:30	14.60078	144.77528	336.7	557.1	559.8	CORRECTION SAMPLE PREVIOUS SHOULD HAVE BEEN J492-HFS-8.
5291	J2-492	2010/03/24 22:24:12	14.60078	144.77528	336.7	557.1	559.8	J492-HFS-8. Tmax=27.9 Tavg=26.8 Vol=451ml. T2=16.
5294	J2-492	2010/03/24 22:27:40	14.60075	144.77527	336.5	557.1	559.8	SAMPLE: fluid J492-HFS-9. Unfiltered bag #20. Start 222430. Z=557. Stop 2227. Tmax=26.3 Tavg=25.0 Vol=454. T2=15.
5295	J2-492	2010/03/24 22:28:01	14.60075	144.77527	336.5	557.1	559.8	We're finished with water sampling here.
5296	J2-492	2010/03/24 22:28:39	14.60075	144.77527	336.6	557.1	559.8	Stowing the wand.
5298	J2-492	2010/03/24 22:30:09	14.60076	144.77527	336.6	557.1	559.8	The floc and sulfur storm has subsided.
5299	J2-492	2010/03/24 22:31:13	14.60076	144.77527	336.3	557.2	559.8	That massive floc/sulfur/tephra plume lasted about a half an hour. Plumage is still wafting by but the visibility has improved.
5302	J2-492	2010/03/24 22:33:41	14.60077	144.77527	337.6	556.4	560.1	Bill wants to grab some sulfur from the new vent (Sulfur).
5303	J2-492	2010/03/24 22:33:56	14.60078	144.77528	337.8	555.4	558.7	NAV: Doppler Reset
5305	J2-492	2010/03/24 22:35:28	14.60080	144.77524	46.4	555.4	562.2	Approaching Sulfur Vent. Quite a lot of particulates in the water column. Nice shot of Mkr120 and tephra bucket in view.
5306	J2-492	2010/03/24 22:36:00	14.60082	144.77523	47.7	557.3	561.5	Deciding what bit of sulfur to grab.
5307	J2-492	2010/03/24 22:37:05	14.60082	144.77525	37.1	557.3	560.2	Sulfur-spaghetti on the sulfur plates surrounding Sulfur Vent.
5309	J2-492	2010/03/24 22:37:44	14.60083	144.77525	37.1	557.3	560.3	HD_CAM: start 2237. Here at Sulfur Vent. The sulfur looks like a thin layer.
5310	J2-492	2010/03/24 22:38:08	14.60083	144.77524	37.1	557.3	560.3	The sulfur sheet looks pancake thin.
5312	J2-492	2010/03/24 22:40:17	14.60082	144.77524	36.0	557.3	560.3	Preparing to sample a big of sulfur if we can.
5314	J2-492	2010/03/24 22:42:30	14.60083	144.77525	35.9	557.3	560.3	SAMPLE: geo J492-sulfur-10. Sulfur vent target location. 14°36.0498 144°46.4183. Z=557. Scooping up this pancake-thin sulfur flow. The sulfur flowed around a rock here to there is no sulfur just downslope in that one area.
5317	J2-492	2010/03/24 22:46:46	14.60082	144.77524	56.8	558.3	561.1	J492-sulfur-10 cont. The sulfur crust is harder than it looks. Looks like he got a decent sample in the bag.
5319	J2-492	2010/03/24 22:48:57	14.60082	144.77524	61.7	557.4	561.4	The sample J492-sulfur-10 went in the port swing arm.
5321	J2-492	2010/03/24 22:50:29	14.60082	144.77525	61.3	557.5	561.4	Zooming out on HD cam.
5322	J2-492	2010/03/24 22:51:02	14.60082	144.77524	61.3	557.5	561.6	Stowing the scoop with sulfur in the port swing arm. It is taking both of Jason's arms to do it.
5324	J2-492	2010/03/24 22:52:06	14.60082	144.77523	61.3	557.5	561.5	We're going to move over the Phantom Vent. 10m to the NW.
5325	J2-492	2010/03/24 22:52:32	14.60081	144.77523	55.3	557.4	562.1	Want to drive downslope a bit to the west and then go to the north.
5327	J2-492	2010/03/24 22:53:27	14.60087	144.77517	54.6	557.5	565.0	Nice HD footage of Sulfur Vent on the side of this mound.

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5328	J2-492	2010/03/24 22:54:49	14.60083	144.77514	35.4	559.2	568.7	We saw some venting here and then will move down to Phantom.
5330	J2-492	2010/03/24 22:55:38	14.60084	144.77507	49.0	563.6	573.0	Sulfur Suburb in the foreground.
5331	J2-492	2010/03/24 22:55:57	14.60082	144.77508	59.8	564.6	572.8	We see the tephra bucket and marker.
5332	J2-492	2010/03/24 22:57:01	14.60082	144.77507	57.3	565.0	574.6	The bucket has been knocked over and the marker was buried we believe. Earlier the bucket was right up by the marker.
5334	J2-492	2010/03/24 22:58:54	14.60083	144.77510	71.8	567.6	570.6	So now the marker is gone and the bucket has slid downhill and is upside down. So that was Phantom that we were seeing earlier. Phantom vent is at about 570m now.
5336	J2-492	2010/03/24 23:00:24	14.60083	144.77511	71.4	567.6	570.5	So maybe part of the particles we saw in the big floc plume was from this slide. But we also saw sulfur strands in the plume. Maybe it was a combination of both.
5337	J2-492	2010/03/24 23:01:05	14.60083	144.77511	71.5	567.6	570.5	Picking up tephra sampler A. We will move it somewhere else.
5339	J2-492	2010/03/24 23:03:14	14.60084	144.77512	31.3	563.0	569.1	RECOVER: tephra bucket Moving up the slope toward Sulfur Vent. Have tephra sampler A in tow. See the dive weight ahead.
5342	J2-492	2010/03/24 23:05:21	14.60089	144.77510	34.9	560.9	569.6	This is Phantom Vent. It is more than 5 meters shallower than it was. All that lava has come out of the vent since our last visit 2 days ago.
5343	J2-492	2010/03/24 23:06:58	14.60096	144.77517	127.8	560.8	568.0	We're looking east. Phantom is right up against the slope. It slopes down in each direction.
5345	J2-492	2010/03/24 23:08:33	14.60091	144.77519	176.6	562.7	564.5	Marker 118 is gone now. It has slid down slope with the tephra sampler. The tephra sampler was saved. Looks like the marker was not.
5347	J2-492	2010/03/24 23:10:11	14.60091	144.77519	176.7	562.9	564.5	NAV: Location Phantom Vent position has not moved it is just 5 meters shallower than it was before.
5352	J2-492	2010/03/24 23:17:30	14.60095	144.77518	151.1	562.4	564.2	DEPLOY: tephra bucket A. REDEPLOYED/REPOSITIONED at Phantom - just 5 meters up the slope just like the vent. Z=563m. This bucket was 5m downslope earlier.
5353	J2-492	2010/03/24 23:18:09	14.60095	144.77518	151.0	562.5	564.2	Tephra sampler A has been place on a flat rock.
5354	J2-492	2010/03/24 23:18:33	14.60095	144.77518	151.1	562.5	564.2	We're off to Brimstone next after doing a bit of housekeeping.
5355	J2-492	2010/03/24 23:18:53	14.60095	144.77518	151.1	562.5	564.2	HD_CAM: stop
5356	J2-492	2010/03/24 23:19:04	14.60095	144.77518	149.9	562.2	564.6	HDCam off at 2318.
5358	J2-492	2010/03/24 23:20:26	14.60100	144.77522	160.2	560.8	566.3	We are now moving to Brimstone.
5359	J2-492	2010/03/24 23:20:44	14.60101	144.77527	160.5	560.6	561.4	We're looking at the NW side of the cone.
5361	J2-492	2010/03/24 23:22:21	14.60095	144.77530	163.3	555.1	560.4	NAV: Location tephra sampler A. 144°46.5115 14°36.0553. Right next to Phantom Vent.
5362	J2-492	2010/03/24 23:22:43	14.60095	144.77530	161.3	554.4	560.8	We see a plume straight ahead.
5363	J2-492	2010/03/24 23:23:05	14.60095	144.77528	163.0	554.4	561.5	HD_CAM: start 2223.
5366	J2-492	2010/03/24 23:27:08	14.60088	144.77524	101.9	555.2	562.1	We see venting straight ahead. We are about 10m up. This is the NW side of Sulfur Vent. This is where we sampled earlier (samples 1 and 2). More vigorous now than when we were sampling and better visibility.
5368	J2-492	2010/03/24 23:27:39	14.60090	144.77527	102.0	555.0	559.9	Lots of sulfur in the plume.

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5369	J2-492	2010/03/24 23:28:21	14.60090	144.77529	101.4	552.9	558.4	We are going up and over sulfur vent toward Brimstone.
5370	J2-492	2010/03/24 23:29:02	14.60089	144.77531	101.2	550.5	555.3	You can really see the plume billowing up the south side of the cone. The cliff face is covered in sulfur.
5372	J2-492	2010/03/24 23:30:28	14.60088	144.77539	101.4	546.9	550.8	We're up against the wall heading straight east to Brimstone.
5373	J2-492	2010/03/24 23:30:41	14.60087	144.77540	100.9	546.4	550.2	Big plume in butt cam from Sulfur Vent.
5376	J2-492	2010/03/24 23:33:41	14.60089	144.77558	23.2	546.1	549.9	We see the tephra bucket and Marker 161 just north of Brimstone. There is a blanket of tephra around the vent but it does not appear to be doing much of anything. The action has moved off to other vents around the cone.
5377	J2-492	2010/03/24 23:33:50	14.60089	144.77560	24.5	546.0	550.9	HD_CAM: stop 2333.
5378	J2-492	2010/03/24 23:34:09	14.60087	144.77563	24.7	546.1	552.8	Next will head off to Styx. Straight east on this line.
5380	J2-492	2010/03/24 23:35:48	14.60087	144.77568	21.2	552.0	557.2	Lateralling around the wall.
5381	J2-492	2010/03/24 23:36:41	14.60094	144.77574	344.9	554.0	559.6	Styx is ahead. It is steaming a bit. Some sulfur in the plume here. It is not very vigorous though.
5384	J2-492	2010/03/24 23:40:24	14.60094	144.77575	344.2	555.3	559.7	Styx has dark black volcanoclastic seds at its base and it is up against the wall. Z=555. Just some wafting smoke but it is concentrated.
5385	J2-492	2010/03/24 23:40:53	14.60094	144.77573	347.9	556.3	559.0	The marker her at Styx has been gone for a couple dives.
5387	J2-492	2010/03/24 23:42:00	14.60094	144.77574	349.1	556.7	558.8	This was further up against the wall the last time we came here. Its position has changed a bit.
5388	J2-492	2010/03/24 23:42:12	14.60094	144.77574	349.0	556.7	558.8	TXT:
5390	J2-492	2010/03/24 23:43:55	14.60096	144.77574	349.0	556.7	558.8	NAV: Location New location for Styx. 144°46.5439 14°36.0569. Z=557. This position is about 5m west of the precious position. The vent looks different and like it is farther away from the wall than on last visit.
5391	J2-492	2010/03/24 23:44:55	14.60094	144.77574	348.9	556.7	558.8	Dave is checking out the temperatures here.
5395	J2-492	2010/03/24 23:50:09	14.60094	144.77574	348.5	556.7	558.8	SAMPLE: fluid J492-HFS-11. Filtered bag #23. Z=557. Styx. Start 234640. Styx is billowing a white plume but not much. This is a little more active than Phantom. Stop 234940. Tmax=31 Tavg=28.3 Vol=426ml. T2=16. position below.
5397	J2-492	2010/03/24 23:51:47	14.60093	144.77574	348.5	556.7	558.8	SAMPLE: fluid J492-HFS-11. Unfiltered bag #19. Start 235035. Styx. Same spot. The vent seems to be a little more active then when we arrived.
5398	J2-492	2010/03/24 23:52:22	14.60093	144.77574	348.5	556.7	558.8	It's all fresh black rock around Styx and no sulfur. The plume is much whiter than what we saw at Sulfur Vent and Phantom.
5399	J2-492	2010/03/24 23:52:32	14.60093	144.77574	348.5	556.7	558.8	SJ492-HFS-11 cont
5401	J2-492	2010/03/24 23:54:13	14.60093	144.77574	348.5	556.7	558.8	SAMPLE J492-HFS-11 cont. Stop 2353. Tmax=31.1 Tavg=29.2 Vol=469. T2=15.
5403	J2-492	2010/03/24 23:56:45	14.60093	144.77574	348.6	556.7	558.8	SAMPLE: fluid J492-HFS-13. Filter #13 for RNA. Start 235515.
5405	J2-492	2010/03/24 23:57:41	14.60093	144.77574	348.6	556.7	558.8	The USBL NAV has been great. The point scatter has been around 5m at the summit; about 10m on our deep mooring search yesterday at

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								>100m.
5408	J2-492	2010/03/25 00:02:42	14.60092	144.77573	348.9	556.7	558.8	The visibility has decreased here at Styx.
5413	J2-492	2010/03/25 00:09:54	14.60092	144.77573	348.8	556.7	558.8	J492-HFS-13 cont. Not much change in the temp here.
5414	J2-492	2010/03/25 00:10:21	14.60092	144.77573	348.8	556.7	558.9	Just saw a dazed shrimp floating upside down. A little too much CO2 perhaps?
5417	J2-492	2010/03/25 00:13:27	14.60092	144.77573	348.8	556.7	558.8	J492-HFS-13 stop. Tmax=31.6 Tavg=27.3 Vol=2865. T2=14.
5418	J2-492	2010/03/25 00:13:55	14.60092	144.77573	348.7	556.7	558.8	Finished with water sampling here.
5419	J2-492	2010/03/25 00:15:10	14.60092	144.77574	348.7	556.6	559.2	Stowing the wand.
5423	J2-492	2010/03/25 00:20:04	14.60092	144.77574	348.9	556.3	559.9	The next task will be to go over and explore the western fault zone.
5424	J2-492	2010/03/25 00:20:38	14.60093	144.77574	348.4	556.3	560.3	Before departing we will grab a rock from the base of Styx.
5426	J2-492	2010/03/25 00:21:37	14.60092	144.77575	336.3	557.1	560.4	There are a few shrimp here (that means 3).
5429	J2-492	2010/03/25 00:26:30	14.60090	144.77577	337.1	555.6	560.8	J492-rock-14. From the base of Styx in the black unaltered sed. Very fresh. Rounded on bottom flatter on top - about 6 inches long. Same location as samples 11-13.
5430	J2-492	2010/03/25 00:27:09	14.60088	144.77575	320.4	555.3	560.6	NAV: need to do a Doppler reset. We have drifted.....
5432	J2-492	2010/03/25 00:27:26	14.60085	144.77571	323.8	554.2	557.7	NAV: Doppler Reset
5433	J2-492	2010/03/25 00:28:59	14.60080	144.77555	11.8	552.4	555.4	We are driving back to the west to Brimstone. Along the wall. Very steep here.
5436	J2-492	2010/03/25 00:32:31	14.60091	144.77553	12.7	547.6	550.1	Now we have moved up the cone toward Brimstone to recover the .
5440	J2-492	2010/03/25 00:37:39	14.60093	144.77553	11.7	547.3	550.3	RECOVER: tephra bucket B at Mkr161 just north of Brimstone. .
5442	J2-492	2010/03/25 00:40:10	14.60101	144.77553	11.7	543.6	546.5	SAMPLE: geo J492-tephra-15. Recovered from the base of marker 161 north of Brimstone. The bucket was deployed on dive J490.
5443	J2-492	2010/03/25 00:40:33	14.60103	144.77553	12.6	542.2	545.6	Moving up the cone to look at the base of the vertical wall north of the cone.
5445	J2-492	2010/03/25 00:41:35	14.60103	144.77554	12.6	540.9	544.6	BIOLOGY: Opaepele(shrimp) The wall is quite covered with shrimp.
5446	J2-492	2010/03/25 00:42:11	14.60103	144.77554	65.3	541.0	544.6	BIOLOGY: other Shrimp are swimming around her and resting on the rock.
5448	J2-492	2010/03/25 00:43:19	14.60103	144.77554	46.2	540.4	544.1	Looking for flow in the cracks here.
5449	J2-492	2010/03/25 00:43:34	14.60103	144.77554	46.3	540.4	544.1	This one seems to vary.
5450	J2-492	2010/03/25 00:44:21	14.60103	144.77555	46.2	540.4	544.3	We will continue around d the wall to arrowhead - about 10m to the east at the base of the wall.
5453	J2-492	2010/03/25 00:47:23	14.60098	144.77556	70.1	540.3	545.4	Dropping a weight here.
5454	J2-492	2010/03/25 00:48:12	14.60095	144.77561	33.3	543.0	547.6	Just lost the still cam.
5455	J2-492	2010/03/25 00:49:05	14.60096	144.77560	31.7	543.6	547.3	Back on before.
5457	J2-492	2010/03/25 00:49:33	14.60096	144.77560	32.4	543.5	547.4	The arrowhead is still here. Lots of flow and no shrimp.
5458	J2-492	2010/03/25 00:50:03	14.60096	144.77559	32.4	543.4	547.3	This is an overhang here. Dave is going to sample in the crack next to the arrowhead.
5459	J2-492	2010/03/25 00:50:49	14.60096	144.77559	34.2	543.4	547.1	Seeing a few bubbles coming out of the crack to the left of Arrowhead.

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5461	J2-492	2010/03/25 00:52:40	14.60095	144.77560	34.4	543.3	547.1	We will do a bit of fluid sampling here at Arrowhead.
5463	J2-492	2010/03/25 00:53:29	14.60095	144.77560	34.2	543.4	547.0	We are making a target here at Arrowhead. We sampled here previously. This spot is on the wall north of Brimstone and is defined by a stain that looks just like an "Arrowhead".
5466	J2-492	2010/03/25 00:57:32	14.60095	144.77558	34.3	543.6	546.6	NAV: Location Arrowhead target: 144°46.5370 14°36.0590 Z=543m.
5468	J2-492	2010/03/25 01:00:22	14.60096	144.77557	33.5	544.0	546.3	We're looking around for a sampling site. This is taking a while. Not sure why we are not going to the exact same spot as on the previous dive.
5472	J2-492	2010/03/25 01:06:05	14.60097	144.77558	34.1	544.1	546.3	The vehicle is moving a bit. It is unstable. Lots of flow here. White rocks. Is it mat or sulfur or just altered?
5474	J2-492	2010/03/25 01:08:39	14.60096	144.77560	34.4	544.0	546.3	SAMPLE: fluid J492-HFS-16. In a crack just to the west of the Arrowhead. 14°36.059 144°46.537. Z=544. Temp is OK at about 30°. Filtered bag #22. Start 010815.
5476	J2-492	2010/03/25 01:09:22	14.60096	144.77560	34.4	544.0	546.3	BIOLOGY: Opaepele(shrimp) See a few shrimp on the cliff face here. Sampling with the fluid sampler.
5478	J2-492	2010/03/25 01:11:29	14.60095	144.77560	34.6	544.0	546.3	Verena says that the white rocks are coated in sulfur. Can see the plume behind us in the Medea cam.
5479	J2-492	2010/03/25 01:12:38	14.60096	144.77560	34.6	544.0	546.4	J492-HFS-16 stop. Tmax=34.2 Tavg=32.6 Vol=450ml. T2=13.
5481	J2-492	2010/03/25 01:14:39	14.60096	144.77560	34.7	544.0	546.3	SAMPLE: fluid J492-HFS-17. Unfiltered bag #18. Start 011310. Arrowhead target. Area of diffuse flow on the wall between Brimstone and the summit.
5483	J2-492	2010/03/25 01:16:25	14.60097	144.77560	35.0	544.0	546.3	J492-HFS-16 stop. Tmax=33.8 Tavg=33.0 Vol=476ml. T2=12.
5487	J2-492	2010/03/25 01:21:43	14.60096	144.77560	36.5	544.0	546.2	SAMPLE: fluid J492-HFS-18. Sterivex filter #12. Start 011930. Here at Arrowhead in the same location as the previous 2 samples.
5489	J2-492	2010/03/25 01:23:20	14.60097	144.77560	36.3	544.1	546.2	CORRECTION TO ENTRY 2010/03/25. That should read J492-HFS-17 stop (instead of J492-HFS-16 stop).
5496	J2-492	2010/03/25 01:36:49	14.60098	144.77558	36.4	544.0	546.2	Quite a lot of flow here at Arrowhead. Less than 200ml to go.
5498	J2-492	2010/03/25 01:37:35	14.60099	144.77558	36.4	544.0	546.2	Stopped.
5499	J2-492	2010/03/25 01:38:25	14.60098	144.77559	36.4	544.0	546.2	SAMPLE: fluid J492-HFS-18 Tmax=32.1 Tavg=31.7 vol=2503 T2=11.4 Arrowhead. Done fluid sampling.
5500	J2-492	2010/03/25 01:39:00	14.60097	144.77559	34.7	544.0	546.4	Stowing the HFS wand.
5502	J2-492	2010/03/25 01:40:09	14.60095	144.77559	33.4	543.7	546.6	The plan is to drive around the rim and then look for the hydrophone.
5503	J2-492	2010/03/25 01:40:45	14.60095	144.77559	33.5	543.8	546.5	There are pockets of tephra on the angular ledges of the rock face here.
5506	J2-492	2010/03/25 01:44:01	14.60096	144.77560	33.6	540.4	546.4	Moving up Arrowhead.
5507	J2-492	2010/03/25 01:44:15	14.60096	144.77561	33.5	538.0	546.4	Good view of the nose.
5508	J2-492	2010/03/25 01:44:26	14.60097	144.77561	10.3	536.2	546.5	Solid lava block.
5509	J2-492	2010/03/25 01:44:53	14.60100	144.77562	3.8	531.5	545.1	Going to the top of the rim before heading west around the rim.
5511	J2-492	2010/03/25 01:45:20	14.60103	144.77563	3.9	527.9	535.4	Plume in Medea camera.
5512	J2-492	2010/03/25 01:45:53	14.60104	144.77562	4.7	526.0	532.1	Top of the ridge has flattened lava with white sulfur dusting.

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5513	J2-492	2010/03/25 01:45:58	14.60105	144.77563	5.1	525.5	531.0	Great view of the peak at top.
5514	J2-492	2010/03/25 01:46:23	14.60109	144.77564	6.0	525.0	526.7	Looking down sediment slides downslope.
5515	J2-492	2010/03/25 01:46:27	14.60109	144.77564	7.7	524.8	526.9	Moving along the rim.
5516	J2-492	2010/03/25 01:46:53	14.60113	144.77564	5.3	522.4	527.5	Big block of lava.
5517	J2-492	2010/03/25 01:47:03	14.60113	144.77564	5.7	521.0	527.2	Almost look like a pinnacle.
5518	J2-492	2010/03/25 01:47:11	14.60113	144.77564	6.4	519.9	527.0	Top is 520ish meters.
5520	J2-492	2010/03/25 01:47:28	14.60114	144.77564	6.2	518.6	526.6	Top of rim is very craggy and starting to get into plume cloud.
5521	J2-492	2010/03/25 01:47:39	14.60114	144.77564	6.3	519.2	526.8	Very jagged series of hoodoos.
5522	J2-492	2010/03/25 01:47:55	14.60115	144.77564	5.6	518.6	525.7	Slides away on both sides of rim edge top.
5523	J2-492	2010/03/25 01:48:12	14.60116	144.77564	5.9	517.7	520.8	Rim used to be covered by volcanic sand but it has been removed due to the slide.
5525	J2-492	2010/03/25 01:49:56	14.60118	144.77564	6.1	518.0	520.6	Lots of shrimp swimming around the water.
5526	J2-492	2010/03/25 01:50:57	14.60117	144.77563	5.8	518.0	520.6	Waiting for Medea.
5529	J2-492	2010/03/25 01:53:28	14.60116	144.77564	47.2	515.9	520.4	We are the summit at Mkr163 looking at the marker and Tephra sampler.
5530	J2-492	2010/03/25 01:53:53	14.60116	144.77564	47.3	515.9	520.5	Can also see the hydrophone and MTR.
5531	J2-492	2010/03/25 01:55:06	14.60117	144.77564	46.9	515.9	520.5	Ship was headed in wrong direction so we have to wait for it now.
5534	J2-492	2010/03/25 01:57:50	14.60117	144.77565	46.9	515.9	520.4	Waiting for ship
5536	J2-492	2010/03/25 01:59:50	14.60116	144.77565	47.1	516.0	520.5	Just staring at the Summit site Mkr-163.
5538	J2-492	2010/03/25 02:01:19	14.60116	144.77565	63.6	516.0	520.2	Nice clear view of the Summit with the plume off to STBD (which is south).
5539	J2-492	2010/03/25 02:01:56	14.60118	144.77567	63.8	516.4	518.8	Starting to move along the ridge crest.
5540	J2-492	2010/03/25 02:02:21	14.60120	144.77572	64.9	516.3	520.0	Went right over the marker. Heading is 063 .
5541	J2-492	2010/03/25 02:02:29	14.60119	144.77574	64.9	516.4	519.4	Going to use the sonar to move peak to peak.
5542	J2-492	2010/03/25 02:02:54	14.60116	144.77579	63.7	516.3	524.7	Music is on and the journey around the rim begins.
5543	J2-492	2010/03/25 02:03:11	14.60113	144.77582	63.8	516.2	526.9	Very jagged top rim.
5545	J2-492	2010/03/25 02:03:26	14.60112	144.77583	63.3	516.3	528.4	Large plume cloud to the south.
5546	J2-492	2010/03/25 02:04:05	14.60115	144.77591	64.4	518.0	525.2	Shallowest depth here ever was 517m.
5547	J2-492	2010/03/25 02:04:14	14.60115	144.77593	63.6	519.2	525.3	We are at 517 but are above the rim at 12m.
5548	J2-492	2010/03/25 02:05:06	14.60114	144.77596	1.1	520.3	530.6	Turning away from this ridge and going to head more northerly.
5550	J2-492	2010/03/25 02:05:26	14.60113	144.77595	0.9	518.3	532.2	Sonar show ROV between 2 peaks.
5551	J2-492	2010/03/25 02:05:39	14.60114	144.77591	1.6	518.4	529.0	Looking at ridge face to north.
5552	J2-492	2010/03/25 02:06:23	14.60118	144.77581	310.7	521.1	525.1	Ridge at -31-/ Top of this was 521m +4m alt.
5553	J2-492	2010/03/25 02:06:29	14.60119	144.77580	311.7	520.7	524.5	That was ridge and top.
5554	J2-492	2010/03/25 02:07:03	14.60123	144.77575	313.6	518.8	524.6	We followed some other ridge to the east and now are heading north along the main ridge.
5555	J2-492	2010/03/25 02:07:11	14.60124	144.77573	314.1	518.4	522.4	There was the marker again.
5557	J2-492	2010/03/25 02:07:40	14.60129	144.77571	4.7	518.8	528.8	Heading due north with no sonar target as we descend.
5558	J2-492	2010/03/25 02:07:55	14.60136	144.77569	5.0	520.5	534.4	Summit marker in butt cam.

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5559	J2-492	2010/03/25 02:08:07	14.60143	144.77568	5.1	522.2	538.9	We are in the middle of the chute between ridges.
5560	J2-492	2010/03/25 02:08:21	14.60147	144.77567	4.3	523.7	541.8	No plumes here and no sonar targets at this depth of 523m.
5561	J2-492	2010/03/25 02:08:53	14.60148	144.77566	4.1	524.1	542.8	Starting to see sonar target to STBD at 524m depth.
5563	J2-492	2010/03/25 02:09:46	14.60153	144.77571	10.3	528.1	546.4	Turning STBD to get back on to the ridge.
5564	J2-492	2010/03/25 02:10:33	14.60159	144.77575	359.4	538.5	546.3	Getting close to rim top.
5566	J2-492	2010/03/25 02:11:38	14.60177	144.77571	4.9	548.9	560.2	Butt cam shows sedimented ridge with rock top at 548m.
5567	J2-492	2010/03/25 02:11:59	14.60179	144.77572	119.8	548.9	564.8	Turning STBD into wall.
5568	J2-492	2010/03/25 02:12:21	14.60174	144.77582	124.3	548.6	560.0	Wall in front of us.
5569	J2-492	2010/03/25 02:12:35	14.60174	144.77584	94.0	543.7	561.7	Solid lava with some white staining in pockets.
5570	J2-492	2010/03/25 02:12:47	14.60174	144.77587	85.3	542.4	558.4	There's the top at 543 and alt is 12m.
5571	J2-492	2010/03/25 02:13:07	14.60179	144.77584	346.4	543.2	549.5	Turning to top ridge line going to north.
5572	J2-492	2010/03/25 02:13:14	14.60182	144.77583	342.7	543.1	552.7	Looks like a series of hoodoos.
5574	J2-492	2010/03/25 02:13:40	14.60188	144.77582	358.9	542.7	547.9	No targets in sonar at end of hoodoo.
5575	J2-492	2010/03/25 02:14:35	14.60206	144.77577	357.3	555.9	569.5	Bottom is 25m below-no sonar target ahead of us anywhere.
5577	J2-492	2010/03/25 02:15:49	14.60205	144.77580	328.1	557.5	570.2	Plan B-start in the middle of the horseshoe and then go up to the ridge to follow it.
5578	J2-492	2010/03/25 02:16:02	14.60205	144.77580	328.2	557.5	570.2	Going to move everything to the west at the bottom of the slide area.
5579	J2-492	2010/03/25 02:16:36	14.60204	144.77582	328.2	557.5	570.2	Only about a 20m move to the west.
5581	J2-492	2010/03/25 02:18:28	14.60203	144.77538	267.6	557.3	584.3	Driving midwater to the west and waiting for ship
5584	J2-492	2010/03/25 02:23:56	14.60200	144.77488	268.3	591.9	612.8	Moving west midwater.
5585	J2-492	2010/03/25 02:24:29	14.60199	144.77482	268.4	606.4	616.3	We are descending and can see sonar targets surrounding now at over 600m depth.
5587	J2-492	2010/03/25 02:25:23	14.60198	144.77481	268.3	606.2	616.5	Medea has sonar target at 40m away and Medea is 568m deep.
5588	J2-492	2010/03/25 02:26:21	14.60198	144.77472	268.8	606.5	621.0	Bottom of this scar is about 80m wide.
5589	J2-492	2010/03/25 02:26:42	14.60198	144.77469	268.6	606.3	622.2	Using sonar to measure the width of this cove.
5590	J2-492	2010/03/25 02:27:01	14.60198	144.77464	266.0	606.8	623.1	That was 90m of ship movement going to go an additional 90m west.
5592	J2-492	2010/03/25 02:27:57	14.60196	144.77460	270.0	626.4	627.2	Seeing bottom in butt cam at 625m.
5593	J2-492	2010/03/25 02:28:08	14.60196	144.77460	269.7	626.6	627.9	Lots of talus at bottom and fine sediment getting kicked up.
5594	J2-492	2010/03/25 02:28:32	14.60196	144.77456	268.1	625.1	629.4	Medea has good view to Jason stretched out beyond.
5596	J2-492	2010/03/25 02:30:24	14.60195	144.77454	268.3	625.2	630.3	Sonar shows bottom contact 20m to either side but it is a sediment contact.
5597	J2-492	2010/03/25 02:30:48	14.60195	144.77453	268.4	627.5	630.9	Jason at 626 and 4m above bottom.
5599	J2-492	2010/03/25 02:31:39	14.60194	144.77437	267.6	635.1	636.1	At the bottom again in the sandy sediment.
5600	J2-492	2010/03/25 02:31:51	14.60195	144.77437	275.2	634.9	635.8	Heading over to the west to face the east-facing wall.
5601	J2-492	2010/03/25 02:32:02	14.60197	144.77437	324.2	632.9	636.1	Gravel slope has some white sulfur deposits.
5602	J2-492	2010/03/25 02:32:20	14.60201	144.77433	331.8	630.1	635.3	Turning north and looking at the slope ahead.
5603	J2-492	2010/03/25 02:32:33	14.60200	144.77430	265.7	629.4	634.2	Straightening up Jason
5604	J2-492	2010/03/25 02:32:45	14.60200	144.77424	270.3	630.6	635.8	Heading for bottom of headwall.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5605	J2-492	2010/03/25 02:33:09	14.60199	144.77415	269.4	634.0	637.8	Can see in sonar the opening to the south from the headwall where the slide went.
5607	J2-492	2010/03/25 02:33:18	14.60199	144.77415	268.2	633.5	637.8	Jelly biology floating.
5609	J2-492	2010/03/25 02:35:24	14.60198	144.77408	267.6	634.5	638.3	Ship made it here and we're going to move it another 40m west.
5610	J2-492	2010/03/25 02:35:53	14.60197	144.77403	269.6	637.1	639.1	Bottom looks gravelly with some sulfur globs and sand.
5611	J2-492	2010/03/25 02:36:42	14.60195	144.77401	269.5	637.1	639.5	Depth is matching bathy map at current location.
5613	J2-492	2010/03/25 02:37:22	14.60195	144.77400	269.3	637.1	639.5	At northern part of the slide zone with gravel sand deposits.
5614	J2-492	2010/03/25 02:37:49	14.60195	144.77399	269.4	637.1	639.3	NAV: Doppler Reset
5615	J2-492	2010/03/25 02:38:23	14.60194	144.77395	273.9	634.7	638.9	Hadn't done any doppler resets in a while-that was a significant one. Moved less than 10m to the south.
5616	J2-492	2010/03/25 02:39:07	14.60193	144.77374	270.6	632.3	636.0	Heading west and looking up a sandy slope and ripples from the currents.
5618	J2-492	2010/03/25 02:39:26	14.60192	144.77367	275.9	628.2	635.0	Gradually climbing the gravel slope.
5619	J2-492	2010/03/25 02:39:36	14.60193	144.77363	269.7	627.2	632.9	Slope covered in sulfur.
5620	J2-492	2010/03/25 02:39:51	14.60192	144.77359	270.4	624.4	631.3	Pits in sediment and scour marks.
5621	J2-492	2010/03/25 02:39:57	14.60193	144.77358	270.0	623.9	630.2	Scour channels.
5622	J2-492	2010/03/25 02:40:43	14.60197	144.77357	269.8	621.0	627.8	Going up steep contours and there is the top of a little knoll.
5623	J2-492	2010/03/25 02:41:13	14.60197	144.77358	269.9	620.7	628.2	Sonar indicating rockier as we go up.
5625	J2-492	2010/03/25 02:41:25	14.60196	144.77358	269.8	620.8	628.3	Little bench with hard sonar returns above.
5626	J2-492	2010/03/25 02:42:47	14.60197	144.77352	268.7	618.4	625.2	Rock on bench looks like intact outcrop-truncated lava flow.
5627	J2-492	2010/03/25 02:43:03	14.60196	144.77351	267.7	617.3	625.1	Sulfur deposits in outcrop.
5629	J2-492	2010/03/25 02:43:57	14.60194	144.77345	267.4	612.1	621.4	Intact lavas. Medea sonar has hard contact ahead at 580m depth-Medea is heading west as well with the ship.
5630	J2-492	2010/03/25 02:44:19	14.60193	144.77341	267.2	611.3	618.8	Top of wall is intact rock with sulfur.
5631	J2-492	2010/03/25 02:44:25	14.60192	144.77341	267.2	610.6	618.8	Truncated lava.
5633	J2-492	2010/03/25 02:45:53	14.60198	144.77335	277.0	604.5	612.2	Looking at white staining and it looks just like sulfur.
5634	J2-492	2010/03/25 02:46:11	14.60198	144.77335	275.7	602.2	610.4	Total bottom depth at bottom was 640 and we are now at 602 at the top of this edge.
5635	J2-492	2010/03/25 02:46:45	14.60200	144.77332	282.3	592.3	608.3	Sandy top draping over the truncated lava wall.
5636	J2-492	2010/03/25 02:46:57	14.60200	144.77328	284.3	590.3	604.7	May be original surface. Ridge at 282deg.
5638	J2-492	2010/03/25 02:47:28	14.60200	144.77318	283.9	588.9	596.0	Following sandy ridge top at 284deg.
5639	J2-492	2010/03/25 02:47:45	14.60201	144.77312	283.0	591.6	595.8	Heading over to the hydrophone location.
5640	J2-492	2010/03/25 02:48:09	14.60204	144.77308	282.4	592.6	596.3	Black non-sedimented patches with yellow-white sulfur covering top.
5641	J2-492	2010/03/25 02:49:13	14.60206	144.77307	283.2	592.3	596.6	We are 100m away from old hydrophone location. Bottom here looks intact (did not slide away).
5643	J2-492	2010/03/25 02:49:41	14.60205	144.77307	283.1	592.2	596.6	Want to first see if sonar has any contact with flotation then maybe go to bottom location to see if it slid or not.
5644	J2-492	2010/03/25 02:50:02	14.60205	144.77307	283.4	587.3	596.4	Going to drive midwater to flotation depth of hydrophones. Jason coming up.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5646	J2-492	2010/03/25 02:53:19	14.60217	144.77309	301.3	540.3	597.1	Jason looking 290deg for the floatation. We are at 541m depth.
5647	J2-492	2010/03/25 02:53:31	14.60220	144.77310	300.5	537.2	598.2	Floatation should be at 405m.
5648	J2-492	2010/03/25 02:54:24	14.60234	144.77310	300.6	534.7	603.8	Range is still 112m away to hydrophone target.
5649	J2-492	2010/03/25 02:55:16	14.60244	144.77301	307.5	530.0	608.7	Need to get closer to target for sonar to range on it.
5650	J2-492	2010/03/25 02:56:45	14.60243	144.77282	272.1	528.3	613.7	Waiting for Medea and ship.
5651	J2-492	2010/03/25 03:00:08	14.60235	144.77247	271.6	528.2	621.5	Stopping the EM122 pinging so we can ping to hydrophone with Medea.
5652	J2-492	2010/03/25 03:00:21	14.60235	144.77245	271.8	528.3	621.7	12kHz pinging.
5653	J2-492	2010/03/25 03:00:36	14.60234	144.77244	272.1	528.3	622.0	About 65m away from target.
5654	J2-492	2010/03/25 03:01:56	14.60229	144.77243	272.1	528.3	623.3	There is a target on the Medea sonar but it is probably just Jason.
5655	J2-492	2010/03/25 03:02:26	14.60229	144.77243	293.5	528.3	620.4	Target on Jason sonar.
5656	J2-492	2010/03/25 03:02:47	14.60228	144.77241	287.7	528.3	621.3	Medea is about 40m behind us.
5657	J2-492	2010/03/25 03:02:52	14.60228	144.77241	287.7	528.3	620.2	That is Medea.
5658	J2-492	2010/03/25 03:03:00	14.60228	144.77240	287.7	528.3	620.8	There is a target 50m slant range from Jason.
5659	J2-492	2010/03/25 03:03:34	14.60229	144.77236	287.8	528.4	619.7	There is the target and we are going to head to it.
5660	J2-492	2010/03/25 03:03:50	14.60229	144.77233	288.2	528.8	618.6	Not hearing anything with Medea.
5661	J2-492	2010/03/25 03:04:00	14.60229	144.77232	287.1	528.6	622.5	Range does agree with where the hydrophone should be.
5662	J2-492	2010/03/25 03:04:15	14.60229	144.77230	285.8	528.1	620.6	Jason is all stopped waiting for Medea and ship to settle before going any closer.
5663	J2-492	2010/03/25 03:04:31	14.60229	144.77228	291.8	528.1	623.5	Good target on sonar.
5664	J2-492	2010/03/25 03:04:54	14.60229	144.77227	300.5	528.2	623.6	At end of the tether-waiting.
5665	J2-492	2010/03/25 03:05:27	14.60227	144.77226	301.7	528.3	622.8	It is a solid return.
5666	J2-492	2010/03/25 03:06:16	14.60226	144.77227	303.0	528.3	621.3	We are 100m off the bottom and seeing the target.
5667	J2-492	2010/03/25 03:07:20	14.60227	144.77221	300.6	528.9	625.3	Medea is starting to move west-waiting for more tether.
5668	J2-492	2010/03/25 03:09:57	14.60227	144.77207	328.8	528.3	626.2	Target is under 25m away now but still waiting for Medea.
5669	J2-492	2010/03/25 03:10:08	14.60227	144.77207	329.1	528.4	626.3	Going to move ship a bit more west to get more Medea tether.
5670	J2-492	2010/03/25 03:11:26	14.60226	144.77207	325.7	532.0	626.4	Going to go to the bottom-Matt tired of waiting for ship.
5671	J2-492	2010/03/25 03:12:04	14.60223	144.77209	316.0	539.6	626.2	Going to get a sonar target on the instrument below then come back straight up.
5672	J2-492	2010/03/25 03:12:14	14.60222	144.77210	319.3	544.7	626.1	Going down.
5673	J2-492	2010/03/25 03:12:55	14.60218	144.77212	329.8	559.9	626.0	Going down and starting to loose target.
5674	J2-492	2010/03/25 03:13:42	14.60214	144.77213	330.8	585.8	626.1	Still have sonar target.
5675	J2-492	2010/03/25 03:14:00	14.60215	144.77214	326.6	591.9	626.2	Jason has been back away from target.
5676	J2-492	2010/03/25 03:14:46	14.60217	144.77222	332.6	592.7	625.5	Medea is 40m away from the target.
5677	J2-492	2010/03/25 03:14:52	14.60217	144.77222	332.5	592.2	625.5	NAV: Doppler Reset
5678	J2-492	2010/03/25 03:15:22	14.60224	144.77216	332.4	593.5	626.3	Got some more tether so going to drive to target.
5679	J2-492	2010/03/25 03:16:38	14.60223	144.77216	331.8	604.8	626.7	Still have target at 25m off bottom.
5681	J2-492	2010/03/25 03:17:17	14.60229	144.77214	333.1	624.8	628.6	There is the bottom at 623m and looks like sandy sediment.
5682	J2-492	2010/03/25 03:17:42	14.60236	144.77210	328.2	624.7	630.8	Got cameras looking left and right to maximize view.

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5683	J2-492	2010/03/25 03:17:51	14.60239	144.77209	324.2	624.5	631.4	Still hard target ahead at 20m.
5684	J2-492	2010/03/25 03:18:07	14.60243	144.77206	328.8	624.4	632.2	There's the wire
5685	J2-492	2010/03/25 03:18:08	14.60243	144.77206	328.8	624.4	632.3	TXT:
5686	J2-492	2010/03/25 03:18:15	14.60243	144.77206	329.5	624.1	632.2	10m ahead and got wire in view.
5687	J2-492	2010/03/25 03:18:31	14.60243	144.77207	322.0	624.9	632.1	Going to the bottom to look at the anchor.
5688	J2-492	2010/03/25 03:19:13	14.60242	144.77208	318.6	627.0	632.2	The release is buried in the sediment and can't talk to us.
5690	J2-492	2010/03/25 03:19:24	14.60241	144.77208	318.6	626.9	632.2	There is the hydrophone.
5691	J2-492	2010/03/25 03:19:48	14.60241	144.77207	318.7	626.9	632.2	See chain going into the sediment.
5692	J2-492	2010/03/25 03:20:43	14.60241	144.77206	318.8	627.0	632.2	Maybe the release is actually 10m above the chain. Just the anchor is buried.
5694	J2-492	2010/03/25 03:22:43	14.60243	144.77205	319.3	620.2	632.0	There is the release! Bottom depth here was 632m at the base.
5695	J2-492	2010/03/25 03:23:06	14.60243	144.77205	319.2	620.0	632.0	Release looks fine but still won't talk.
5697	J2-492	2010/03/25 03:24:38	14.60243	144.77204	319.0	620.0	632.0	Hydrophone is not in the slide area it is just not talking.
5702	J2-492	2010/03/25 03:32:23	14.60242	144.77203	318.9	620.0	632.0	Trying to decide what is the best strategy for releasing the hydrophone.
5704	J2-492	2010/03/25 03:33:39	14.60241	144.77204	318.9	620.0	632.0	Going to figure out how to recover this tomorrow and go back to fluid sample today.
5706	J2-492	2010/03/25 03:35:31	14.60239	144.77208	317.5	619.8	631.8	Going to head back over to Phantom vent for fluid sampling (may change that to old Mkr-105 site).
5707	J2-492	2010/03/25 03:35:55	14.60239	144.77208	319.0	620.1	631.7	Leaving the hydrophone site on the west to begin moving back to the east.
5708	J2-492	2010/03/25 03:36:24	14.60239	144.77207	318.9	619.9	631.6	We have 370m to go to the east at 117m.
5709	J2-492	2010/03/25 03:36:54	14.60238	144.77207	319.4	619.8	631.2	Need to bring Jason up to 519m to clear the summit ridge.
5711	J2-492	2010/03/25 03:38:27	14.60219	144.77223	320.1	620.4	625.9	Going to drive midwater back to the east.
5712	J2-492	2010/03/25 03:38:39	14.60219	144.77223	318.6	619.9	626.0	Ship is moving.
5714	J2-492	2010/03/25 03:40:34	14.60240	144.77239	28.1	620.4	626.7	Going to go to Phantom for fluid sampling-at least 30min away.
5716	J2-492	2010/03/25 03:42:34	14.60231	144.77265	117.0	617.0	624.5	Still on bottom as we drive across this slide basin.
5718	J2-492	2010/03/25 03:43:42	14.60219	144.77278	119.6	611.5	616.5	Lots of white and yellow sediments as we head east.
5719	J2-492	2010/03/25 03:45:07	14.60203	144.77298	117.6	597.6	603.2	Big streaks in the sediment and coming up the ridge here.
5721	J2-492	2010/03/25 03:45:30	14.60199	144.77304	112.9	592.2	599.3	We actually were not in the slide basin we were west of it where the hydrophone was located.
5722	J2-492	2010/03/25 03:45:49	14.60196	144.77309	116.7	591.3	598.4	Cresting the wall of the slide basin now.
5723	J2-492	2010/03/25 03:46:01	14.60194	144.77311	117.0	591.2	598.4	Jason watch change now. Jimmy is going to drive.
5724	J2-492	2010/03/25 03:47:15	14.60178	144.77343	117.6	592.2	619.8	Now driving mid-water over to Phantom.
5726	J2-492	2010/03/25 03:58:47	14.60116	144.77490	121.1	575.6	588.9	Ship is just crossing the summit rim. Jason has bottom in sight.
5728	J2-492	2010/03/25 03:59:54	14.60104	144.77509	116.6	566.7	574.4	Jason looking at the west facing wall of the summit.
5729	J2-492	2010/03/25 04:00:01	14.60103	144.77509	135.3	566.5	573.5	We are on the other side of the cone.
5730	J2-492	2010/03/25 04:00:50	14.60092	144.77512	131.6	562.8	567.9	Large lava rocks precariously sitting on the tephra slope.
5731	J2-492	2010/03/25 04:00:59	14.60090	144.77513	134.9	562.2	566.7	Almost at Phantom.
5732	J2-492	2010/03/25 04:01:09	14.60088	144.77514	137.0	559.7	565.3	Tephra bucket on the outer side.

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5734	J2-492	2010/03/25 04:01:30	14.60086	144.77516	137.2	558.4	564.5	Venting here.
5735	J2-492	2010/03/25 04:01:41	14.60086	144.77515	136.0	557.9	564.6	Stop here.
5736	J2-492	2010/03/25 04:01:58	14.60086	144.77514	137.1	558.3	564.5	14deg 36.052 144deg 46.509 saw a tephra bucket on the bottom but couldn't stop.
5737	J2-492	2010/03/25 04:02:19	14.60086	144.77514	138.0	558.2	564.5	Here is a vent and they have done a reset with the doppler I believe.
5738	J2-492	2010/03/25 04:02:55	14.60085	144.77516	136.9	558.2	564.6	TXT:
5739	J2-492	2010/03/25 04:03:07	14.60087	144.77514	136.0	558.1	564.0	Nav was reset when we came at the vent.
5741	J2-492	2010/03/25 04:03:17	14.60089	144.77511	137.1	557.7	565.6	Activity here is diminished at Phantom.
5742	J2-492	2010/03/25 04:03:26	14.60091	144.77510	140.5	557.6	567.6	There is the bucket.
5743	J2-492	2010/03/25 04:03:29	14.60091	144.77512	137.5	557.8	567.2	Bucket is up.
5744	J2-492	2010/03/25 04:04:05	14.60091	144.77514	135.9	558.0	566.9	Tephra A was repositioned here at Phantom.
5746	J2-492	2010/03/25 04:06:23	14.60088	144.77517	107.3	556.7	564.4	Heading over to Sulfur Vent since Phantom is not that active.
5747	J2-492	2010/03/25 04:06:47	14.60086	144.77520	114.5	554.9	562.8	We will leave in 25 minutes to the hydrophone recovery site.
5749	J2-492	2010/03/25 04:08:15	14.60085	144.77523	126.2	557.7	560.3	Going to sample the Sulfur Vent.
5750	J2-492	2010/03/25 04:08:42	14.60085	144.77523	126.9	557.2	560.4	Positioning to sample at Sulfur Vent. 14deg 36.050 144deg 46.513 z=557m
5751	J2-492	2010/03/25 04:08:53	14.60084	144.77524	126.8	557.2	560.4	Fairly steady venting and focused source.
5753	J2-492	2010/03/25 04:10:41	14.60084	144.77525	126.3	557.2	560.5	Took about 28 minutes to transit over from the hydrophone. It is about 400m away.
5754	J2-492	2010/03/25 04:11:08	14.60084	144.77526	127.0	557.2	560.4	Moved the Tephra sampler in the basket to the back of the basket.
5756	J2-492	2010/03/25 04:11:43	14.60084	144.77525	126.6	557.2	560.6	Sample site looks good with yellow smoke and some bubbles.
5757	J2-492	2010/03/25 04:12:00	14.60084	144.77525	126.8	557.2	560.4	Retrieving wand from basket and waiting for laptop to boot.
5758	J2-492	2010/03/25 04:12:05	14.60084	144.77525	126.8	557.2	560.5	Wand is out.
5759	J2-492	2010/03/25 04:12:52	14.60083	144.77524	126.6	557.1	560.6	Looks like more bubbles-preparing for larger eruption.
5760	J2-492	2010/03/25 04:13:13	14.60083	144.77524	126.7	557.1	560.6	Positioning wand in flow-waiting for laptop.
5762	J2-492	2010/03/25 04:13:22	14.60083	144.77524	126.7	557.1	560.6	Lots of bubbles coming out.
5763	J2-492	2010/03/25 04:14:11	14.60083	144.77524	126.7	557.1	560.6	Getting ready to fluid sample.
5765	J2-492	2010/03/25 04:15:55	14.60084	144.77525	126.6	557.2	560.6	SAMPLE: fluid J492-HFS-19 Piston filtered #3. Start at t>160deg.
5766	J2-492	2010/03/25 04:16:41	14.60084	144.77525	126.7	557.1	560.6	J492-HFS-19 in great flow with bubbles and yellow with explosive activity in back of view.
5768	J2-492	2010/03/25 04:17:28	14.60083	144.77525	126.4	557.2	560.6	J492-HFS-19 flow has gone down and so has temperature.
5769	J2-492	2010/03/25 04:18:24	14.60083	144.77525	126.5	557.2	560.6	SAMPLE: fluid J492-HFS-19 Action has moved. Stop
5770	J2-492	2010/03/25 04:18:54	14.60083	144.77525	126.3	557.2	560.5	Tmax=176 Tavg=141.8 vol=292 T2=36.
5772	J2-492	2010/03/25 04:19:18	14.60084	144.77525	126.3	557.2	560.5	SAMPLE: fluid May be clogged-short reverse.
5773	J2-492	2010/03/25 04:20:11	14.60083	144.77525	126.4	557.2	560.6	J492-HFS-20 at Sulfur Vent placing wand in higher flow. Bubbles in front.
5776	J2-492	2010/03/25 04:24:50	14.60082	144.77525	125.9	557.2	560.5	J492-GTHFS-20 Port fired.
5777	J2-492	2010/03/25 04:25:15	14.60082	144.77525	126.1	557.2	560.5	J492-HFS-20 T=53
5779	J2-492	2010/03/25 04:25:22	14.60082	144.77525	126.0	557.2	560.4	J492-HFS-21 Piston #4 started.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5780	J2-492	2010/03/25 04:26:11	14.60082	144.77525	126.1	557.2	560.5	SAMPLE: fluid Unfiltered #4 in process and J492-GTHFS-20 fired just before in same place.
5781	J2-492	2010/03/25 04:26:27	14.60082	144.77525	126.0	557.2	560.5	SAMPLE: fluid Activity increasing during J492-HFS-21.
5783	J2-492	2010/03/25 04:27:16	14.60083	144.77525	126.0	557.2	560.5	Temperature is increasing.
5784	J2-492	2010/03/25 04:27:31	14.60083	144.77525	125.9	557.2	560.4	Bubble mapper shows intense short plume. Have seen bubbles during sampling.
5785	J2-492	2010/03/25 04:27:52	14.60083	144.77524	126.0	557.2	560.5	SAMPLE: fluid J492-HFS-21 stop.
5786	J2-492	2010/03/25 04:28:10	14.60083	144.77524	125.9	557.2	560.4	Tmax=62.9 Tavg=58.1 vol=469 T2=16.
5787	J2-492	2010/03/25 04:28:54	14.60083	144.77524	126.1	557.2	560.5	SAMPLE: fluid J492-HFS-22 #8 Piston unfiltered. Started.
5789	J2-492	2010/03/25 04:29:32	14.60083	144.77524	126.0	557.2	560.4	SAMPLE: fluid J492-HFS-22 at same site with good flow. Not as many bubbles at present.
5791	J2-492	2010/03/25 04:31:16	14.60083	144.77525	126.1	557.2	560.5	SAMPLE: fluid J492-HFS-22 stop.
5792	J2-492	2010/03/25 04:31:32	14.60082	144.77525	126.1	557.2	560.5	Tmax=56.5 Tavg=53.9 vol=388 T2=8.0
5793	J2-492	2010/03/25 04:31:39	14.60082	144.77525	126.2	557.2	560.5	Wiggling wand around for better flow.
5794	J2-492	2010/03/25 04:32:48	14.60082	144.77525	126.4	557.2	560.5	SAMPLE: fluid Reversing flow.
5795	J2-492	2010/03/25 04:33:03	14.60082	144.77525	126.4	557.2	560.5	Need to get going.
5797	J2-492	2010/03/25 04:34:15	14.60083	144.77525	127.0	557.2	560.6	Temp is coming up. Looks like it should be hot.
5798	J2-492	2010/03/25 04:34:39	14.60083	144.77525	127.0	557.2	560.6	SAMPLE: fluid J492-HFS-23 filtered Piston #7
5799	J2-492	2010/03/25 04:34:57	14.60083	144.77524	127.0	557.2	560.6	SAMPLE: fluid Just 26deg. Filtered piston #7.
5801	J2-492	2010/03/25 04:35:28	14.60083	144.77524	127.1	557.2	560.6	Last sample before leaving.
5802	J2-492	2010/03/25 04:37:05	14.60083	144.77524	126.9	557.2	560.6	SAMPLE: fluid J492-HFS-23 stopped.
5804	J2-492	2010/03/25 04:37:26	14.60083	144.77525	126.3	557.2	560.5	Tmax=26.4 Tavg=17.4 vol=285 T2=7.0
5805	J2-492	2010/03/25 04:37:37	14.60083	144.77525	126.0	557.2	560.4	Lots of sulfur but not covering tip.
5806	J2-492	2010/03/25 04:38:05	14.60083	144.77525	126.0	557.2	560.4	Stow and go.
5807	J2-492	2010/03/25 04:38:31	14.60083	144.77525	126.0	557.2	560.4	Stowing the wand here at Sulfur Vent.
5808	J2-492	2010/03/25 04:39:09	14.60083	144.77524	125.7	557.2	560.4	Activity at end was steady but not seeing the bubbles like at the start of sampling on this run.
5810	J2-492	2010/03/25 04:39:57	14.60082	144.77524	126.4	557.3	560.5	Wand is secure.
5811	J2-492	2010/03/25 04:40:12	14.60081	144.77525	127.7	556.5	560.6	HD_CAM: start Leaving Sulfur.
5812	J2-492	2010/03/25 04:40:22	14.60081	144.77525	127.7	556.3	559.9	Stowing basket.
5813	J2-492	2010/03/25 04:40:28	14.60080	144.77525	127.9	556.3	559.9	Moving off.
5814	J2-492	2010/03/25 04:40:42	14.60080	144.77526	125.9	556.3	559.9	Plume is away from Jason.
5815	J2-492	2010/03/25 04:40:48	14.60080	144.77526	131.9	556.4	560.5	Getting HD and DSC.
5816	J2-492	2010/03/25 04:40:50	14.60080	144.77526	133.4	556.3	560.7	TXT:
5817	J2-492	2010/03/25 04:40:53	14.60081	144.77526	132.0	556.2	560.8	Nice views.
5818	J2-492	2010/03/25 04:41:01	14.60082	144.77525	116.6	555.7	562.3	Heading west.
5820	J2-492	2010/03/25 04:41:16	14.60082	144.77522	219.5	554.1	561.2	HD_CAM: stop
5821	J2-492	2010/03/25 04:42:55	14.60102	144.77480	299.8	555.1	582.7	Jason
5822	J2-492	2010/03/25 04:44:53	14.60107	144.77479	297.8	554.5	591.8	Driving midwater and as fast as possible to the mooring.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5823	J2-492	2010/03/25 04:50:09	14.60122	144.77425	298.1	555.0	624.4	Background samples.
5824	J2-492	2010/03/25 04:50:55	14.60129	144.77416	297.7	554.6	629.6	SAMPLE: fluid Filtered bag #21 J492-HFS-24 background.
5825	J2-492	2010/03/25 04:54:25	14.60142	144.77377	297.2	554.6	643.4	SAMPLE: fluid J492-HFS-24 background sample stopped.
5826	J2-492	2010/03/25 04:54:52	14.60145	144.77372	296.7	554.7	643.5	T=6.7 at 554m depth.
5827	J2-492	2010/03/25 04:57:06	14.60172	144.77352	297.9	554.8	639.8	SAMPLE: fluid Piston #9 J492-HFS-25 filtered started.
5829	J2-492	2010/03/25 05:02:55	14.60183	144.77309	298.0	603.2	615.9	SAMPLE: fluid J492-HFS-25 background water sample at 555m depth stopped.
5830	J2-492	2010/03/25 05:03:03	14.60184	144.77307	302.5	602.0	615.6	T=6.7deg.
5831	J2-492	2010/03/25 05:03:14	14.60186	144.77304	297.0	601.6	612.7	NAV: Doppler Reset
5833	J2-492	2010/03/25 05:03:20	14.60186	144.77303	297.7	601.2	612.0	Depth at end of sample was 600m.
5834	J2-492	2010/03/25 05:03:55	14.60185	144.77303	297.5	594.0	610.5	Great view of ridge and slide area.
5835	J2-492	2010/03/25 05:04:08	14.60187	144.77300	299.4	593.6	608.7	Large boulders at base of sandy slope with white bands of sulfur.
5836	J2-492	2010/03/25 05:04:26	14.60191	144.77295	301.3	593.3	600.0	Lots of white sediment on top of ridge.
5838	J2-492	2010/03/25 05:05:56	14.60209	144.77282	300.7	600.6	609.1	Driving high but can see sandy bottom.
5839	J2-492	2010/03/25 05:06:38	14.60215	144.77272	302.1	600.9	613.7	Slope is dropping away from us-going across the ridge leading over to the hydrophone.
5843	J2-492	2010/03/25 05:12:55	14.60236	144.77213	296.0	618.4	630.7	There it is.
5844	J2-492	2010/03/25 05:13:12	14.60239	144.77214	298.4	618.2	630.8	Hydrophone is in front of us at 298deg.
5846	J2-492	2010/03/25 05:13:21	14.60240	144.77211	294.7	618.8	631.2	Now on sci cam.
5847	J2-492	2010/03/25 05:13:26	14.60240	144.77210	293.8	619.1	631.5	There is the hydrophone.
5848	J2-492	2010/03/25 05:13:56	14.60241	144.77207	298.0	619.4	631.8	Approaching the instrument.
5849	J2-492	2010/03/25 05:14:21	14.60242	144.77205	298.9	619.5	632.0	Waiting for ship and Medea to settle out-visual on release.
5850	J2-492	2010/03/25 05:14:50	14.60241	144.77205	297.6	619.6	632.0	Medea is 25m from Jason.
5851	J2-492	2010/03/25 05:15:02	14.60241	144.77206	297.3	619.4	632.0	Medea is off STBD of ship.
5853	J2-492	2010/03/25 05:15:37	14.60242	144.77206	287.8	619.3	631.9	Current is coming from the NE and away from us. Good position of ship and Medea for release.
5854	J2-492	2010/03/25 05:16:20	14.60245	144.77210	227.8	618.6	632.2	Plan is to watch the release when signal is sent and then zoom away from instrument to recover Jason.
5855	J2-492	2010/03/25 05:16:49	14.60248	144.77207	245.7	619.6	632.3	Small boat in water to track the float.
5856	J2-492	2010/03/25 05:17:04	14.60249	144.77203	231.4	619.4	632.3	Getting Jason in better position for viewing up current of the instrument.
5858	J2-492	2010/03/25 05:17:53	14.60246	144.77204	251.3	618.9	632.2	Jason looking 235 at the release.
5859	J2-492	2010/03/25 05:18:31	14.60242	144.77210	220.1	618.6	632.1	Mooring is leaning in the current.
5860	J2-492	2010/03/25 05:18:40	14.60243	144.77208	243.9	619.3	632.0	NAV: Doppler Reset
5861	J2-492	2010/03/25 05:19:00	14.60246	144.77205	252.8	619.0	632.1	Good position here 14deg 36.147 144deg 46.324 after reset. Depth 619m.
5862	J2-492	2010/03/25 05:19:12	14.60247	144.77206	250.4	619.3	632.2	Jason and Medea are in position.
5864	J2-492	2010/03/25 05:20:11	14.60248	144.77206	249.3	619.5	632.2	Jason-Medea and ship all aligned W-E but would like ship to move 20m to east.
5865	J2-492	2010/03/25 05:20:51	14.60247	144.77205	248.4	619.5	632.2	Mooring squared in view.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5866	J2-492	2010/03/25 05:20:59	14.60247	144.77205	249.6	619.5	632.2	Waiting for ship.
5868	J2-492	2010/03/25 05:21:43	14.60247	144.77205	249.5	619.5	632.1	Ship is moving east.
5869	J2-492	2010/03/25 05:22:40	14.60247	144.77205	249.7	619.5	632.2	Taking DSC while waiting for ship movement. Will record HD at release time.
5871	J2-492	2010/03/25 05:23:21	14.60247	144.77205	249.9	619.5	632.1	TXT:
5872	J2-492	2010/03/25 05:24:13	14.60248	144.77206	250.0	619.5	632.1	HD_CAM: start HD on.
5873	J2-492	2010/03/25 05:24:18	14.60248	144.77206	250.1	619.5	632.1	USBL nav is being turned off.
5874	J2-492	2010/03/25 05:24:24	14.60248	144.77206	250.0	619.5	632.1	Preparing to send codes.
5876	J2-492	2010/03/25 05:25:41	14.60248	144.77209	250.2	619.4	632.1	RECOVER: hydrophone Ducer back in water.
5877	J2-492	2010/03/25 05:25:56	14.60249	144.77210	250.5	619.5	632.1	RECOVER: hydrophone Code sent.
5878	J2-492	2010/03/25 05:26:10	14.60249	144.77210	250.0	619.5	632.2	Enable code has been sent.
5880	J2-492	2010/03/25 05:27:51	14.60249	144.77212	250.1	619.4	632.1	RECOVER: hydrophone Not received any signal in reply.
5881	J2-492	2010/03/25 05:28:11	14.60249	144.77212	250.0	619.5	632.1	Sending release command.
5882	J2-492	2010/03/25 05:28:15	14.60249	144.77213	250.2	619.5	632.1	Whew!
5883	J2-492	2010/03/25 05:28:21	14.60249	144.77213	248.9	619.4	632.1	It is released!
5884	J2-492	2010/03/25 05:28:38	14.60247	144.77207	254.9	618.5	632.2	HD_CAM: stop
5886	J2-492	2010/03/25 05:29:59	14.60231	144.77184	251.9	586.0	631.6	Basket maintenance.
5887	J2-492	2010/03/25 05:30:10	14.60230	144.77183	252.0	580.1	631.4	JASON: Jason off bottom

Table 6.5-7 JASON Dive J2-493

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5917	J2-493	2010/03/25 18:43:56	14.601555	144.7785161	287.22	620.63	649.83	SURVEY: Start line calibration line 5 m
5918	J2-493	2010/03/25 18:45:40	14.601619	144.7783438	287.4	621.31	650.51	SURVEY: End line calibration 5m
5921	J2-493	2010/03/25 18:45:55	14.60162	144.7783432	287.29	621.32	650.52	turning 180 degrees
5922	J2-493	2010/03/25 18:48:22	14.601632	144.7783297	105.92	618.43	647.63	coming up to 10m alt
5923	J2-493	2010/03/25 18:49:57	14.601633	144.7783294	106.53	617.2	646.4	SURVEY: Start line 10m alt
5924	J2-493	2010/03/25 18:51:28	14.601563	144.7785215	106.89	617.97	647.17	SURVEY: End line
5925	J2-493	2010/03/25 18:51:49	14.601564	144.7785109	128.66	618.63	647.83	spinning 180 degrees
5926	J2-493	2010/03/25 18:52:11	14.601563	144.7785132	171.3	618.59	647.79	coming up to 20m alt
5927	J2-493	2010/03/25 18:53:59	14.601554	144.7785069	287.65	616.9	646.1	now coming up
5928	J2-493	2010/03/25 18:55:48	14.601555	144.7785068	287.98	610.8	640	SURVEY: Start line 20m alt
5929	J2-493	2010/03/25 18:57:07	14.601629	144.7783267	289.85	608.66	637.86	SURVEY: End line at 20m alt
5930	J2-493	2010/03/25 18:59:04	14.601641	144.7783449	70.68	601.86	631.06	Jason moving over to start of first line
5931	J2-493	2010/03/25 19:05:36	14.601619	144.7788506	287.77	620.61	649.81	heading 288

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5932	J2-493	2010/03/25 19:09:20	14.601629	144.7788476	287.13	620.71	649.91	SURVEY: Start line 1
5933	J2-493	2010/03/25 19:09:32	14.601639	144.7788123	291.61	620.52	649.72	SURVEY: Start survey
5934	J2-493	2010/03/25 19:19:41	14.602005	144.7774697	287.96	606.68	635.88	Ship is struggling to get the right heading so Jason is moving upslope slightly
5935	J2-493	2010/03/25 19:20:06	14.602022	144.7774164	288.95	606.96	636.16	Jason still driving parallel to the trackline but a little upslope
5936	J2-493	2010/03/25 19:20:26	14.602033	144.7773714	289.8	605.82	635.02	Ship is correcting so should be OK again soon
5937	J2-493	2010/03/25 19:28:02	14.602414	144.7761279	290.03	583.64	612.84	Changed SM2000 range from 100m to 75m
5938	J2-493	2010/03/25 19:29:32	14.602502	144.7758127	287.5	569.27	598.47	Jason sped up for a few minutes to catch up to ship - trying lines at 0.5 knots
5939	J2-493	2010/03/25 19:39:08	14.602856	144.7746257	289.76	593.55	622.75	Jason stopped momentarily by mistake - almost at end of line 1
5940	J2-493	2010/03/25 19:39:57	14.602931	144.7744021	289.54	598.93	628.13	Jason has drifted south of the track line and will end up about midway between the line 1 and 2 endpoints
5941	J2-493	2010/03/25 19:40:51	14.603015	144.7741523	289.48	604.66	633.86	SURVEY: End line 1
5942	J2-493	2010/03/25 19:49:08	14.602827	144.7740703	107.86	601	630.2	SURVEY: Start line 2
5943	J2-493	2010/03/25 19:49:38	14.602807	144.7741295	107.07	599.32	628.52	Heading 108
5944	J2-493	2010/03/25 20:01:52	14.602227	144.775631	108.12	518.98	548.18	Lost Doppler
5945	J2-493	2010/03/25 20:04:47	14.602166	144.776022	107.71	548.61	577.81	Drifted off to the south a bit. Our altitude went off to 50m and now it is back at about 40m.
5946	J2-493	2010/03/25 20:06:15	14.602118	144.7762211	110.01	563.54	592.74	They seem to be getting back on line.
5947	J2-493	2010/03/25 20:07:30	14.602062	144.7763563	109.7	574.12	603.32	NAV: Doppler Reset
5948	J2-493	2010/03/25 20:08:03	14.602015	144.7764785	109.06	573.62	602.82	The Doppler position has now been reset to the USBL position.
5949	J2-493	2010/03/25 20:08:51	14.601939	144.7766836	107.88	569.67	598.87	We're moving at 0.5 knot. The plan is to maintain .25m/sec=0.5 knots.
5950	J2-493	2010/03/25 20:09:20	14.601893	144.7767961	110.27	568.63	597.83	NAV: Doppler Reset the doppler again.
5951	J2-493	2010/03/25 20:10:17	14.601797	144.7770417	109.57	568.96	598.16	25m is the altitude we want and they are there now.
5952	J2-493	2010/03/25 20:23:19	14.601175	144.7787591	106.93	605.31	634.51	SURVEY: End line EOL 2. We had one Doppler incident on this line and Jason lost bottom at that time. Didn't last too long. Maybe 5 minutes.
5953	J2-493	2010/03/25 20:25:49	14.601181	144.7787397	289.59	609.63	638.83	NAV: Doppler Reset
5954	J2-493	2010/03/25 20:29:11	14.601129	144.7787346	289.17	610.38	639.58	On the next line we will be going backwards with the ship and over extremely steep terrain. The consensus is that the lack of a bow thruster is not helping the data quality.
5955	J2-493	2010/03/25 20:31:01	14.601014	144.7787032	289.79	606.77	635.97	The line spacing is 35m.
5956	J2-493	2010/03/25 20:35:27	14.601014	144.778705	288.91	606.77	635.97	The ship is on the move.
5957	J2-493	2010/03/25 20:36:06	14.601031	144.7786446	292.39	604.1	633.3	SURVEY: Start line SOL 3. East to west. We will be going over some steep terrain on this one.
5958	J2-493	2010/03/25 20:36:39	14.601055	144.7785696	292.41	599.87	629.07	Talking about restarting this line.
5959	J2-493	2010/03/25 20:36:54	14.601068	144.7785358	290.24	598.4	627.6	We have lost sight of the tether.
5960	J2-493	2010/03/25 20:37:28	14.601091	144.7784616	289.82	594.92	624.12	Looking OK. Won't restart this line after all.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5961	J2-493	2010/03/25 20:40:38	14.601222	144.7780654	290.14	573.99	603.19	Slowing down a bit with Jason. Medea is off a bit too far south.
5962	J2-493	2010/03/25 20:42:52	14.601273	144.7778823	293.36	573.9	603.1	We're moving over the cliff on our port side now.
5963	J2-493	2010/03/25 20:43:09	14.601256	144.7778822	291.22	572.14	601.34	Jason will have to job to the south because Medea is so far south.
5964	J2-493	2010/03/25 20:43:19	14.60125	144.7778775	290.67	571.84	601.04	We're over the cliff on our port side.
5965	J2-493	2010/03/25 20:43:40	14.601261	144.7778504	291.85	571.65	600.85	Just passing over Mkr112 now.
5966	J2-493	2010/03/25 20:44:26	14.60128	144.7777845	295.64	570.11	599.31	Medea is way further south than it should be.
5967	J2-493	2010/03/25 20:45:30	14.601365	144.7775479	296.79	570.86	600.06	Picked up the speed with Jason.
5968	J2-493	2010/03/25 20:47:17	14.601492	144.7771507	292.73	560.93	590.13	Here comes the cliff (the area of the landslide) off to our port side.
5969	J2-493	2010/03/25 20:48:33	14.60155	144.7769695	289.22	556.38	585.58	The SM2K system has over 100 beams per ping.
5970	J2-493	2010/03/25 20:49:51	14.601492	144.7768634	290.15	555.37	584.57	Jason is wandering down the slope a bit. Not looking so great.
5971	J2-493	2010/03/25 20:50:58	14.601554	144.7766614	294.22	550.81	580.01	Jason took a zag to the south there. Coming back to the north now.
5972	J2-493	2010/03/25 20:52:25	14.601645	144.776428	290.06	545.31	574.51	Coming up to the cone now. It will be on our port side.
5973	J2-493	2010/03/25 20:55:44	14.601823	144.7759119	293.58	539.02	568.22	The bottom is in view on the Jason pilot cam. We are 20m over the bottom. Summit to the port side.
5974	J2-493	2010/03/25 20:56:39	14.601867	144.7757434	287.91	539.02	568.22	Losing Doppler.
5975	J2-493	2010/03/25 20:57:56	14.601883	144.7756347	290.89	549.55	578.75	We will be going over the slide area west of the cone any minute now.
5976	J2-493	2010/03/25 20:58:12	14.601893	144.7755972	292.88	550.29	579.49	The slide will be on our port side.
5977	J2-493	2010/03/25 21:04:40	14.602298	144.7745403	294.62	589.13	618.33	Medea is heading south again.
5978	J2-493	2010/03/25 21:08:43	14.602508	144.7740016	295.04	587.5	616.7	SURVEY: End line EOL 3. Western edge of the survey.
5979	J2-493	2010/03/25 21:14:58	14.602243	144.7738776	108.17	591.61	620.81	SURVEY: Start line SOL 4. West to east. Ship will be driving forward this time. Good.
5980	J2-493	2010/03/25 21:29:55	14.601585	144.7757091	110.22	541.33	570.53	Lost doppler
5981	J2-493	2010/03/25 21:30:18	14.601555	144.7758058	109.51	538.01	567.21	We are going up over the summit just going over the top now
5982	J2-493	2010/03/25 21:30:41	14.601525	144.775902	109.15	534.2	563.4	We had fallen behind Medea so will have to speed up a bit
5983	J2-493	2010/03/25 21:31:17	14.601449	144.7760362	109.88	526.83	556.03	Jason was near the seafloor for a bit - now getting back to survey altitude
5984	J2-493	2010/03/25 21:31:32	14.601423	144.7760779	110.21	522.75	551.95	Doppler reset
5985	J2-493	2010/03/25 21:35:10	14.60108	144.7768638	105.74	567.41	596.61	We are in the middle of the landslide scar east of the summit
5986	J2-493	2010/03/25 21:35:35	14.601066	144.7769329	104.52	575.12	604.32	Bottom will start coming up now with steep cliffs ahead
5987	J2-493	2010/03/25 21:37:01	14.601039	144.7772689	111.54	558.38	587.58	Marker 121 in sight
5988	J2-493	2010/03/25 21:37:20	14.601022	144.7773309	109.2	556.11	585.31	Doppler hanging in there
5989	J2-493	2010/03/25 21:38:14	14.600945	144.7774999	110.2	545.27	574.47	Correction: The first marker we saw was 119.
5990	J2-493	2010/03/25 21:39:13	14.600919	144.7775403	102.69	552.29	581.49	The bottom is in sight again.
5991	J2-493	2010/03/25 21:39:49	14.600916	144.7775515	103.91	549.3	578.5	Seeing the steep spine-like ridge in the marker area. No markers in sight.
5992	J2-493	2010/03/25 21:40:48	14.600873	144.7776859	102.17	545.49	574.69	NAV: Lost bottom lock
5993	J2-493	2010/03/25 21:41:53	14.60079	144.7778769	100.79	562.77	591.97	Jason is tracking north of the USBL line.
5994	J2-493	2010/03/25 21:46:41	14.600627	144.7786046	103.59	589.8	619	SURVEY: End line EOL 4.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
5995	J2-493	2010/03/25 21:47:40	14.600633	144.7785902	103.18	589.01	618.21	NAV: Doppler Reset
5996	J2-493	2010/03/25 21:56:53	14.600413	144.7785497	288.77	591	620.2	The ship is trying to line up with the start of the line. Having some difficulty.
5997	J2-493	2010/03/25 21:58:35	14.600429	144.7785167	288.49	591.79	620.99	SURVEY: Start line SOL 5. East to west. Ship is backing up along the line. (We've been waiting for the ship up until now).
5998	J2-493	2010/03/25 22:01:12	14.600557	144.7781763	287.82	579.56	608.76	We're heading along the slope for awhile.
5999	J2-493	2010/03/25 22:04:13	14.600637	144.7778717	289.52	584.72	613.92	The ship is struggling to stay on station. We are waiting for the ship. Pausing the line survey.
6000	J2-493	2010/03/25 22:08:41	14.600641	144.7778849	288.59	584.34	613.54	The ship is moving to the north a little more. Then it will start backing up again.
6001	J2-493	2010/03/25 22:10:19	14.60069	144.7777205	290.16	584.17	613.37	We are moving again. Starting survey again.
6002	J2-493	2010/03/25 22:10:46	14.600688	144.777668	290.3	575.25	604.45	We can see the edge of the ridge.
6003	J2-493	2010/03/25 22:12:43	14.60073	144.7774052	289.05	557.04	586.24	On the north side we will probably have a data gap because of the steep slope.
6004	J2-493	2010/03/25 22:13:08	14.600752	144.7773586	287.94	554.33	583.53	Maybe not.
6005	J2-493	2010/03/25 22:14:57	14.600804	144.7770884	288.66	556.29	585.49	We have no Doppler right now. When the dots are red we have lost the Doppler lock. When the dots are yellow we only have 3 of 4 beams. Green dots are good.
6006	J2-493	2010/03/25 22:16:22	14.600797	144.7768844	288.12	574.15	603.35	We are leaving the eastern ridge and entering the valley before the main summit.
6007	J2-493	2010/03/25 22:16:58	14.600797	144.7767793	288.49	577.94	607.14	NAV: Doppler Reset
6008	J2-493	2010/03/25 22:17:28	14.600791	144.7767033	288.64	575.52	604.72	The Doppler reset pulled us south about 5 meters.
6009	J2-493	2010/03/25 22:17:58	14.600779	144.7766416	289.53	563.44	592.64	We can see the bottom right now.
6010	J2-493	2010/03/25 22:18:46	14.600767	144.7765608	290.21	536.1	565.3	We changed the range from 75 to 150 on the SM2000.
6011	J2-493	2010/03/25 22:19:27	14.600777	144.7764833	286.13	522.98	552.18	We are seeing interference in the data. It may be from the thruster.
6012	J2-493	2010/03/25 22:19:47	14.60079	144.7764395	287.47	519.44	548.64	We can see plume in the Medea cam.
6013	J2-493	2010/03/25 22:20:29	14.600817	144.7763441	286.39	520.79	549.99	Bringing the range on the SM2000 back down to 100m.
6014	J2-493	2010/03/25 22:21:10	14.600816	144.7762413	287.95	517.73	546.93	Medea's depth is 478m.
6015	J2-493	2010/03/25 22:22:12	14.600806	144.7762172	288.12	509.83	539.03	Changed the range on SM2000 to 150m.
6016	J2-493	2010/03/25 22:23:52	14.600883	144.7762571	284.11	503.74	532.94	We have lost the Doppler again on this steep slope.
6017	J2-493	2010/03/25 22:24:09	14.600908	144.7762377	290.08	502.98	532.18	There is a lot of slack in the tether.
6018	J2-493	2010/03/25 22:24:50	14.600956	144.776118	289.49	504.98	534.18	We are going up the cliff to the summit. It is a 100m.
6019	J2-493	2010/03/25 22:25:02	14.600968	144.7760841	287.18	503.72	532.92	Dropped the range on the SM2K to 100m.
6020	J2-493	2010/03/25 22:29:44	14.601201	144.775679	286.74	506.85	536.05	We can see the bottom. We have seen wisps of plume now and then as we cross the summit.
6021	J2-493	2010/03/25 22:31:45	14.601235	144.7755654	294.29	508.66	537.86	The Doppler is back.
6022	J2-493	2010/03/25 22:32:57	14.601274	144.775416	292.52	521.88	551.08	We are getting ready to go down the slope again.
6023	J2-493	2010/03/25 22:33:03	14.601271	144.7754099	291.11	523.65	552.85	NAV: Doppler Reset
6024	J2-493	2010/03/25 22:36:00	14.601316	144.7752181	294.07	559.96	589.16	Bringing range on SM2K to 75m.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6025	J2-493	2010/03/25 22:45:48	14.601883	144.7740097	294.11	617.68	646.88	When the ship is driving backwards Medea will end up further to the south.
6026	J2-493	2010/03/25 22:47:39	14.601992	144.7737805	294.9	611.7	640.9	SURVEY: End line Each line is around 500m and has been taking about half an hour.
6027	J2-493	2010/03/25 22:49:01	14.601909	144.7737571	204.16	608.28	637.48	SURVEY: End line EOL 5.
6028	J2-493	2010/03/25 22:50:16	14.601833	144.7737507	168.6	611.46	640.66	Jason is turning to the south to get to the beginning of the next line.
6029	J2-493	2010/03/25 22:51:09	14.601708	144.7737719	170.33	616.02	645.22	Jason team switched shifts. Matt is now driving and Dara is now navigating.
6030	J2-493	2010/03/25 22:53:10	14.601584	144.7737858	138.36	618.59	647.79	Also Casey is the co-pilot.
6031	J2-493	2010/03/25 22:53:31	14.601582	144.7737864	133.08	619.44	648.64	Waiting for the ship to get in position before starting next line.
6032	J2-493	2010/03/25 22:56:42	14.601595	144.7737964	108.3	619.7	648.9	SURVEY: Start line SOL 6.
6033	J2-493	2010/03/25 23:04:35	14.601246	144.7747429	108.88	587.33	616.53	We can see the bottom as we start to climb to the summit.
6034	J2-493	2010/03/25 23:06:22	14.601151	144.7750188	110.58	567.87	597.07	The Doppler dots are yellow right now.
6035	J2-493	2010/03/25 23:07:02	14.601148	144.7750824	107.77	553.74	582.94	We can see the plume in Medea
6036	J2-493	2010/03/25 23:07:24	14.601143	144.7751241	108.55	553.62	582.82	We can see the plume in Medea's camera.
6037	J2-493	2010/03/25 23:07:58	14.601124	144.775235	108.75	553.44	582.64	The Doppler dots are turning green but we don't actually see the beams.
6038	J2-493	2010/03/25 23:09:04	14.601086	144.7753632	108.75	540.47	569.67	We see the plume in all of the cameras now.
6039	J2-493	2010/03/25 23:12:40	14.600966	144.775846	107.7	527.9	557.1	We are flying over Arrowhead.
6040	J2-493	2010/03/25 23:15:28	14.600801	144.7763367	107.01	516.15	545.35	NAV: Doppler Reset
6041	J2-493	2010/03/25 23:15:44	14.60078	144.7763614	108.47	521.64	550.84	Beginning to drop down off the summit now.
6042	J2-493	2010/03/25 23:21:49	14.600459	144.7770208	110.3	614.59	643.79	We can see the bottom again. Coming back up again.
6043	J2-493	2010/03/25 23:22:59	14.600445	144.7771833	105.5	588.44	610.46	The altimeter is on.
6048	J2-493	2010/03/25 23:30:57	14.600067	144.7784736	122.38	591.34	602.49	SURVEY: End line EOL 6.
6050	J2-493	2010/03/25 23:31:58	14.60002	144.7784551	204.52	594.05	605.2	Jason is turning south to get to the start of the next line. During the next line the ship will be driving backwards.
6052	J2-493	2010/03/25 23:33:41	14.599813	144.7783654	203.54	604.13	615.28	Waiting for the ship and Medea to get into position.
6056	J2-493	2010/03/25 23:39:24	14.59982	144.7783629	288.58	607.24	618.39	SURVEY: Start line SOL 7.
6062	J2-493	2010/03/25 23:50:52	14.600189	144.7769935	286.91	646.52	657.67	NAV: Doppler Reset
6066	J2-493	2010/03/25 23:57:15	14.600351	144.7762009	289.15	590.84	601.99	NAV: Doppler Reset
6068	J2-493	2010/03/25 23:57:57	14.600378	144.7761191	291.17	583.27	594.42	Doppler was 5 m north of USBL
6072	J2-493	2010/03/26 00:03:22	14.600554	144.775824	289.67	559.11	570.26	Going through smoke plume
6073	J2-493	2010/03/26 00:04:56	14.600625	144.7756221	289.34	546.6	557.75	Dave Butterfield is monitoring pH on his laptop
6074	J2-493	2010/03/26 00:05:00	14.600627	144.775614	289.1	546.21	557.36	TXT:
6077	J2-493	2010/03/26 00:08:56	14.600735	144.7751641	287.43	540.84	551.99	Plume is much denser
6078	J2-493	2010/03/26 00:09:12	14.600729	144.7751331	286.92	544.65	555.8	Dave seeing change in pH
6080	J2-493	2010/03/26 00:11:07	14.600773	144.7748554	288.6	557.59	568.74	Doppler has been off from USBL some 5-10 m
6082	J2-493	2010/03/26 00:13:04	14.600837	144.7746734	284.26	572.11	583.26	NAV: Doppler Reset

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6085	J2-493	2010/03/26 00:16:16	14.601044	144.7744694	286.54	579.45	590.6	Seem to be out of thickest plume don't see swirling turbid clouds anymore but still some turbidity
6089	J2-493	2010/03/26 00:21:41	14.601265	144.7736107	302.2	617.55	628.7	SURVEY: End line
6090	J2-493	2010/03/26 00:21:59	14.601211	144.7735997	180.29	617.81	628.96	Just ended Line 7
6092	J2-493	2010/03/26 00:23:37	14.600964	144.7736198	107.51	628.22	639.37	SURVEY: Start line Start Line 8
6096	J2-493	2010/03/26 00:31:15	14.600586	144.7746924	109.41	585.2	596.35	Getting into thick plume again
6098	J2-493	2010/03/26 00:32:01	14.600571	144.774806	109.3	575.35	586.5	Increase speed from 0.5 to 0.75 knots
6100	J2-493	2010/03/26 00:35:05	14.600376	144.7755063	116.57	559.3	570.45	Plume thinning out
6102	J2-493	2010/03/26 00:35:23	14.600358	144.7755604	104.65	563.82	574.97	Lot of sulfur particles in the water now
6103	J2-493	2010/03/26 00:36:23	14.600297	144.7757477	104.64	570.49	581.64	Sulfur particle and some plume
6105	J2-493	2010/03/26 00:37:26	14.600238	144.7758619	106.7	578.02	589.17	We're south of vents at 572 m seeing sulfur particles and some plume
6107	J2-493	2010/03/26 00:40:30	14.600028	144.7763234	107.49	607.64	618.79	Still seeing apparent plume at 592 m depth
6109	J2-493	2010/03/26 00:41:24	14.599953	144.7765275	107.08	618.48	629.63	Slowing down some
6111	J2-493	2010/03/26 00:43:55	14.599787	144.7770456	100.74	646.21	657.36	Out of obvious plume now but still lot of white particles - marine snow?
6113	J2-493	2010/03/26 00:47:02	14.599452	144.7778718	87.67	652.96	664.11	NAV: Doppler Reset
6115	J2-493	2010/03/26 00:47:28	14.599423	144.7779109	90.87	646.14	657.29	Doppler was about 5 m north of USBL
6116	J2-493	2010/03/26 00:48:45	14.599474	144.7779846	112.46	641.46	652.61	White particles mostly gone now
6118	J2-493	2010/03/26 00:49:37	14.599514	144.778035	120.23	635.13	646.28	Jason just took excursion to north about 15 m
6119	J2-493	2010/03/26 00:51:07	14.599392	144.7782504	167.42	636.12	647.27	SURVEY: End line 8
6122	J2-493	2010/03/26 00:53:36	14.599144	144.778201	286.35	649.88	661.03	NAV: Doppler Reset
6124	J2-493	2010/03/26 00:55:36	14.599191	144.7781477	292.18	648.05	659.2	SURVEY: Start line 9
6125	J2-493	2010/03/26 00:57:07	14.5993	144.7778373	289.91	658.4	669.55	Jason heading is 291 along line
6133	J2-493	2010/03/26 01:09:25	14.599846	144.7763423	289.82	623.02	634.17	Slowing down
6135	J2-493	2010/03/26 01:13:10	14.599909	144.7761488	289.89	610.72	621.87	Seems like there's more white particulates in the water now Jason at 611 m depth 25 m altitude
6140	J2-493	2010/03/26 01:20:05	14.600206	144.775312	289.69	573.38	584.53	Can see fractures at about 250 degrees orientation on Jason sonar
6142	J2-493	2010/03/26 01:21:52	14.600245	144.7750661	288.29	581.65	592.8	Getting back into plume here at 578 m depth 25 m altitude
6146	J2-493	2010/03/26 01:28:53	14.600422	144.7744054	291.02	599.15	610.3	NAV: Doppler Reset
6148	J2-493	2010/03/26 01:29:37	14.600435	144.7743286	288.41	603.58	614.73	Lot of white particles but not clear if from vents or is marine snow
6151	J2-493	2010/03/26 01:35:07	14.600705	144.7735534	224.59	631.41	642.56	SURVEY: End line 9
6158	J2-493	2010/03/26 01:45:37	14.600371	144.7734735	108.2	646.9	658.05	NAV: Doppler Reset Andra logging.
6159	J2-493	2010/03/26 01:46:56	14.600365	144.7734975	106.8	647.65	658.8	Start of line heading 107.
6160	J2-493	2010/03/26 01:47:04	14.600354	144.7735282	109.99	647.22	658.37	Line #10 started.
6163	J2-493	2010/03/26 01:50:11	14.600168	144.7741158	108.45	629.31	640.46	White particles raining down-dispersed white.
6165	J2-493	2010/03/26 01:51:53	14.600073	144.774407	109.12	615.23	626.38	Jason is way ahead of Medea (60m).
6166	J2-493	2010/03/26 01:52:17	14.600071	144.7744153	107.41	615.23	626.38	Jason all stop.
6167	J2-493	2010/03/26 01:53:00	14.600072	144.7744109	108.49	615.56	626.71	Ship is moving and Jason all stop while waiting for Medea to catch

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
								up.
6169	J2-493	2010/03/26 01:53:29	14.60007	144.7744069	108.02	615.74	626.89	When stopped the white particles are just floating about.
6170	J2-493	2010/03/26 01:55:00	14.600068	144.7743941	108.45	615.81	626.96	Medea is catching up.
6185	J2-493	2010/03/26 02:23:14	14.598913	144.7780471	107.75	665.49	676.64	End of line 10.
6187	J2-493	2010/03/26 02:23:24	14.598915	144.7780412	107.34	665.61	676.76	NAV: Doppler Reset
6188	J2-493	2010/03/26 02:23:49	14.598913	144.7780426	125.01	666.07	677.22	Moving south to next line.
6205	J2-493	2010/03/26 02:55:20	14.599756	144.7745452	288.17	632.99	644.14	SURVEY: Start line Start line #11.
6206	J2-493	2010/03/26 02:55:28	14.599762	144.7745269	287.79	632.95	644.1	Missed logging the start of the line.
6211	J2-493	2010/03/26 03:05:03	14.600167	144.7734084	277.49	659.84	670.99	resetting Doppler
6212	J2-493	2010/03/26 03:05:07	14.600167	144.7734088	271.71	659.38	670.53	end of line #11
6214	J2-493	2010/03/26 03:05:29	14.600166	144.7734091	238.76	657.61	668.76	SURVEY: End line end line #11
6218	J2-493	2010/03/26 03:12:27	14.599764	144.7732326	109.09	680.97	692.12	moving south to next line
6220	J2-493	2010/03/26 03:14:38	14.599743	144.7732374	107.43	680.84	691.99	SURVEY: Start line #12
6236	J2-493	2010/03/26 03:44:33	14.598666	144.7762315	108.67	688.27	699.42	TXT:
6237	J2-493	2010/03/26 03:45:08	14.598662	144.7763139	107.5	690.58	701.73	NAV: Doppler Reset
6241	J2-493	2010/03/26 03:51:13	14.598477	144.7771176	107.88	712.3	723.45	NOTE: Did not enter the start of line #12 when it actually started-late. Check navigator's record.
6247	J2-493	2010/03/26 03:59:36	14.598214	144.7779032	109.69	694.2	705.35	SURVEY: End line End line #12.
6250	J2-493	2010/03/26 04:04:28	14.597905	144.7778263	288.27	702.06	713.21	SURVEY: Start line Start line #13.
6271	J2-493	2010/03/26 04:43:35	14.599476	144.7731454	288.03	697.39	708.54	SURVEY: End line End line #13.
6272	J2-493	2010/03/26 04:44:12	14.599491	144.7731012	288	696.35	707.5	Next line will be breaking from line #13 and heading north.
6275	J2-493	2010/03/26 04:47:29	14.599599	144.7728136	1.26	704.56	715.71	NAV: Doppler Reset
6277	J2-493	2010/03/26 04:50:43	14.599585	144.7728275	9.03	708.73	719.88	SURVEY: Start line Start North line #1.
6283	J2-493	2010/03/26 05:00:07	14.600036	144.772914	9.93	677.8	688.95	Ship is having problems with this heading.
6289	J2-493	2010/03/26 05:09:58	14.60119	144.7730875	9.57	625.72	656.5	altimeter turned on for a few seconds
6290	J2-493	2010/03/26 05:14:45	14.601945	144.7732247	12.62	590.32	621.1	seeing bottom
6291	J2-493	2010/03/26 05:16:37	14.602067	144.7732275	8.82	576.99	607.77	heading to target 94
6292	J2-493	2010/03/26 05:17:03	14.602104	144.7732234	10.24	576.28	607.06	some discussion whether we should be going to target 92
6293	J2-493	2010/03/26 05:17:19	14.602128	144.7732339	8.91	575.27	606.05	ph pump went off at 03:21:25
6294	J2-493	2010/03/26 05:17:43	14.602172	144.7732358	11.48	575.87	606.65	ph pump turned back on at 05:17
6295	J2-493	2010/03/26 05:30:32	14.603315	144.7736596	17.84	619.59	650.37	SURVEY: End line north line #1
6296	J2-493	2010/03/26 05:30:47	14.603315	144.7736608	64.25	620.06	650.84	changing to new heading 113
6297	J2-493	2010/03/26 05:36:42	14.603237	144.7739056	111.3	618.54	649.32	moving to next line
6298	J2-493	2010/03/26 05:37:15	14.603214	144.7739632	111	617.66	648.44	Jason is holding
6299	J2-493	2010/03/26 05:37:23	14.603213	144.7739685	110.62	617.18	647.96	reset doppler
6300	J2-493	2010/03/26 05:38:37	14.603181	144.7739488	199.77	616.98	647.76	SURVEY: Start line N #2
6301	J2-493	2010/03/26 05:38:56	14.603152	144.7739377	199.84	616.99	647.77	going south along western edge of survey from target 92 to target 91
6302	J2-493	2010/03/26 06:04:11	14.600909	144.7731062	196.91	633.03	663.81	Jason appears to be drifting somewhat

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6303	J2-493	2010/03/26 06:04:17	14.600897	144.7731039	194.96	633.45	664.23	new heading 191
6304	J2-493	2010/03/26 06:06:57	14.600616	144.7730664	190.53	641.96	672.74	Ship drifting moving back into position
6305	J2-493	2010/03/26 06:15:45	14.599553	144.772887	189.23	701.64	732.42	SURVEY: End line north #2
6306	J2-493	2010/03/26 06:16:03	14.599556	144.7728853	238.25	700.28	731.06	Jason moving to next line 35m
6307	J2-493	2010/03/26 06:16:12	14.599559	144.7728924	281.86	699.69	730.47	heading 287
6308	J2-493	2010/03/26 06:16:42	14.599553	144.7728948	287.11	701.1	731.88	heading to target 99
6309	J2-493	2010/03/26 06:20:34	14.599669	144.7725659	288.36	710.32	741.1	at target 99
6310	J2-493	2010/03/26 06:20:37	14.59967	144.7725655	287.35	710.28	741.06	reset doppler
6311	J2-493	2010/03/26 06:21:11	14.599666	144.7725691	10.92	712.97	743.75	SURVEY: Start line North #3
6312	J2-493	2010/03/26 06:21:49	14.599669	144.7725645	16.58	714.95	745.73	heading north along new line heading 016
6313	J2-493	2010/03/26 06:25:39	14.5997	144.7725659	15.58	714.41	745.19	were waiting on medea
6314	J2-493	2010/03/26 06:25:52	14.599713	144.7725704	15.41	712.75	743.53	SURVEY: Start line now starting #3
6319	J2-493	2010/03/26 06:47:11	14.601962	144.7733381	14.69	587.61	614.11	approaching target 94
6322	J2-493	2010/03/26 06:49:42	14.602192	144.7733748	16.49	577.65	604.15	reset doppler
6323	J2-493	2010/03/26 06:49:57	14.602193	144.7733744	52.66	580.39	606.89	at target 94
6324	J2-493	2010/03/26 06:50:11	14.602196	144.7733751	98.77	580.35	606.85	SURVEY: End line #3
6325	J2-493	2010/03/26 06:50:18	14.602199	144.7733724	106.38	579.04	605.54	heading to do cross line
6326	J2-493	2010/03/26 06:50:59	14.602206	144.7733711	110.75	578.35	604.85	this is not a real line just a transit line
6329	J2-493	2010/03/26 06:53:35	14.602112	144.77361	109.22	592	618.5	heading 110
6336	J2-493	2010/03/26 07:06:16	14.601612	144.7748771	112.2	597.41	623.91	stopping ship
6338	J2-493	2010/03/26 07:08:50	14.601576	144.7749748	117.13	592.28	618.78	We are doing a cross line between lines 4 and 5
6339	J2-493	2010/03/26 07:09:13	14.601573	144.7749732	113.57	592.22	618.72	Dara had put down some targets on the east and west of the summit
6341	J2-493	2010/03/26 07:09:42	14.601573	144.7749726	110.51	591.96	618.46	We just got to the west target so its the start of this mini-line but we should use the whole thing
6344	J2-493	2010/03/26 07:13:37	14.60157	144.7749647	112.77	591.69	618.19	SURVEY: Start line The lines oriented N-S to the west of the other lines (1-13) we are calling 14 and 15
6345	J2-493	2010/03/26 07:15:00	14.601579	144.7749722	113.07	592.35	618.85	So the E-W line we are doing now we are calling line 16 and it started at 0649
6347	J2-493	2010/03/26 07:15:56	14.601581	144.7749743	113.99	591.81	618.31	We are now setting up at the target that Dara put on the nav screen (#89) and will head to target 90
6348	J2-493	2010/03/26 07:16:18	14.601582	144.7749757	112.65	592.07	618.57	The ship is moving so we are holding still while the ship gets set up.
6349	J2-493	2010/03/26 07:16:59	14.601582	144.7749771	112.88	592.09	618.59	We are going to do the target 89-90 line slower and more carefully since it goes over cliffs and we had trouble this morning.
6351	J2-493	2010/03/26 07:17:36	14.601581	144.7749777	112.43	592	618.5	This E-W line should fill gaps between lines 4 and 5 this morning right over the summit and the cliffs to either side
6354	J2-493	2010/03/26 07:21:32	14.601536	144.775052	112.58	587.78	614.28	SURVEY: Start line Ships on the move. This is start of line in the Jason navigators logbook from target 89-90 but we should use the whole line 16.
6361	J2-493	2010/03/26 07:34:28	14.601238	144.775626	111.28	514.98	541.48	can see bottom

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6362	J2-493	2010/03/26 07:34:40	14.601228	144.7756362	111.37	512.89	539.39	just ascended western wall up to summit
6364	J2-493	2010/03/26 07:35:31	14.601147	144.7757366	111.61	510.91	537.41	reset doppler
6365	J2-493	2010/03/26 07:35:59	14.601131	144.7757584	112.98	508.77	535.27	can see plume below
6371	J2-493	2010/03/26 07:46:00	14.601049	144.7760421	113.56	513.81	540.31	plume visible
6375	J2-493	2010/03/26 07:52:25	14.600941	144.7762521	112.09	493.55	520.05	lost bottom lock
6377	J2-493	2010/03/26 07:53:33	14.600858	144.7763206	113.49	507.86	534.36	in plume
6378	J2-493	2010/03/26 07:53:48	14.600834	144.7763498	112.69	507.82	534.32	still not bottom lock
6380	J2-493	2010/03/26 07:56:17	14.600731	144.7765642	112.87	528.94	555.44	reset doppler
6382	J2-493	2010/03/26 07:59:13	14.600714	144.7767715	49.15	563.84	628.86	SURVEY: End survey
6383	J2-493	2010/03/26 07:59:36	14.600775	144.7768085	14.19	566.59	631.61	SURVEY: End survey due to not bottom lock data is meaningless
6384	J2-493	2010/03/26 08:00:04	14.600854	144.776881	31.98	567.33	632.35	moving vehicle under medea
6385	J2-493	2010/03/26 08:00:38	14.600952	144.7769561	43.13	567.25	621.07	stop logging SM2000

Table 6.5-8 JASON Dive J2-494

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6394	J2-494	3/26/2010 17:58	14.59896	144.77987	299.7	-0.1	173.1	Jason in water
6395	J2-494	3/26/2010 18:00	14.59886	144.77999	278.0	1.1	1.9	JASON: Medea in water Dive J2-494.
6396	J2-494	3/26/2010 18:02	14.59872	144.78035	275.1	5.1	201.1	Main goals J2-494: Fluid sampling at Mkr109; Mkr110; eruptive vents; visual observations; explore to either E or W of summit.
6397	J2-494	3/26/2010 18:03	14.59871	144.78049	292.7	20.7	201.6	Tools: Single-chamber suction sampler. Beast with 2 gas-tights.
6398	J2-494	3/26/2010 18:03	14.59869	144.78064	288.2	43.3	197.5	Basket: milk crates; 3 scoop bags and 3 markers; 1 gas-tight with funnel
6399	J2-494	3/26/2010 18:05	14.59868	144.78083	294.0	76.6	226.8	Tasks Mkr109; Mkr110 (Iceberg); Mkr163 (summit): Re-deploy Mkr109
6400	J2-494	3/26/2010 18:06	14.59865	144.78103	274.0	99.8	233.0	Tasks at Mkrs cont: Fluid sampling
6401	J2-494	3/26/2010 18:07	14.59862	144.78131	272.6	99.9	232.5	Tasks at Mkrs cont: At Mkr110 recover shrimp trap and fluid sample. Suction of shrimp at Mkr110 (deploy shrimp trap?). Drive up to summit; exchange hydrophone.
6402	J2-494	3/26/2010 18:08	14.59860	144.78155	270.5	99.9	230.4	Tasks at eruptive vents: Survey all vents then make visual observation at most active one. Fluid sampling at most active eruptive vents.
6403	J2-494	3/26/2010 18:09	14.59860	144.78177	267.2	110.2	245.3	Tasks at eruptive vents: Bubble catcher gas-tight
6404	J2-494	3/26/2010 18:10	14.59862	144.78184	266.7	118.2	256.8	Tasks at eruptive vents: Exchange 1 tephra sampler at Sulfur Crust or Phantom.
6405	J2-494	3/26/2010 18:10	14.59863	144.78193	267.6	128.2	264.8	Tasks cont: Explore slide scar east or west. Search for hydrothermal vents around summit.
6406	J2-494	3/26/2010 18:12	14.59868	144.78225	269.8	163.7	308.7	Tasks revised: Switch the order of tasks at markers. Go to the summit first then to the markers.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6407	J2-494	3/26/2010 18:19	14.59895	144.78298	266.1	281.8	471.3	Lots of worms in the brow cam.
6408	J2-494	3/26/2010 18:32	14.59944	144.78388	23.1	510.1	556.4	Substantial plume at 510m.
6409	J2-494	3/26/2010 18:33	14.59959	144.78385	353.9	510.6	549.0	Total white-out
6410	J2-494	3/26/2010 18:34	14.59968	144.78386	19.6	510.9	547.6	Quite a large billowing plume today.
6411	J2-494	3/26/2010 18:36	14.59965	144.78406	30.3	529.6	547.6	Bill is in the hotseat.
6413	J2-494	3/26/2010 18:37	14.60110	144.77576	42.7	542.3	546.5	JASON: Jason on bottom
6414	J2-494	3/26/2010 18:37	14.60110	144.77576	42.6	539.6	546.5	We're at 542m and will climb up the slope to the summit.
6415	J2-494	3/26/2010 18:38	14.60112	144.77576	63.3	530.3	544.0	S of the summit at the wall about 15m below the summit.
6417	J2-494	3/26/2010 18:39	14.60112	144.77584	63.4	522.3	527.6	The plume is thick today. No visibility as we climb up this wall.
6418	J2-494	3/26/2010 18:40	14.60113	144.77584	18.9	520.1	528.9	The summit is in view to the left in the pilot cam.
6419	J2-494	3/26/2010 18:40	14.60115	144.77584	18.7	519.6	527.3	On the edge of the plume now.
6420	J2-494	3/26/2010 18:41	14.60121	144.77584	78.4	519.3	540.5	The marker and hydrophone are just off to the east. Now straight ahead.
6422	J2-494	3/26/2010 18:41	14.60122	144.77585	110.6	519.1	538.5	Great shot of the massive outcrops here at the summit.
6423	J2-494	3/26/2010 18:42	14.60122	144.77587	132.3	519.1	531.6	We're at the marker and hydrophone now. Straight ahead.
6425	J2-494	3/26/2010 18:43	14.60122	144.77580	134.5	519.2	531.7	There are lots of shrimp on the rocks up here.
6426	J2-494	3/26/2010 18:44	14.60123	144.77573	138.7	518.9	530.7	Zooming in on the summit we see lots of shrimp on the sediments next to the marker.
6427	J2-494	3/26/2010 18:45	14.60123	144.77571	141.0	519.5	529.6	Mkr163 right here.
6429	J2-494	3/26/2010 18:45	14.60123	144.77569	135.6	519.5	530.4	Shrimp are swimming away. They don't like Jason's lights.
6430	J2-494	3/26/2010 18:45	14.60123	144.77569	135.6	519.5	529.8	Quite a current up here.
6431	J2-494	3/26/2010 18:46	14.60123	144.77568	135.2	519.5	530.2	HD_CAM: start 184555.
6432	J2-494	3/26/2010 18:47	14.60120	144.77568	92.6	518.0	521.6	RECOVER: hydrophone from the summit at the base of Mkr163. Stowing it in the port biobox.
6434	J2-494	3/26/2010 18:47	14.60119	144.77568	73.3	517.9	521.7	Getting some footage of the operations up here.
6435	J2-494	3/26/2010 18:48	14.60119	144.77569	39.9	517.8	523.0	HD_CAM: stop
6436	J2-494	3/26/2010 18:48	14.60118	144.77568	24.8	518.0	523.9	Backing away from the marker and summit to stow the hydrophone.
6438	J2-494	3/26/2010 18:51	14.60120	144.77570	338.9	518.6	526.4	Shrimp on the rocks at the summit in the science cam.
6441	J2-494	3/26/2010 18:53	14.60120	144.77569	338.9	518.6	526.4	Jason switched the hydrophone from one claw to the other and it now stowing it in the port biobox (swing arm).
6442	J2-494	3/26/2010 18:54	14.60121	144.77567	340.3	517.3	527.2	Now will deploy another hydrophone to replace the one we just recovered.
6445	J2-494	3/26/2010 18:57	14.60125	144.77568	134.9	519.7	529.7	NAV: Doppler Reset
6447	J2-494	3/26/2010 18:59	14.60124	144.77567	135.3	519.7	529.7	Looking at lots of tiny shrimp crawling on the rocks right in front of us here at the summit.
6449	J2-494	3/26/2010 19:02	14.60125	144.77568	138.5	519.5	530.0	DEPLOY: hydrophone in the same position as the one we just recovered at the summit.
6450	J2-494	3/26/2010 19:02	14.60125	144.77568	138.5	519.6	528.6	Next we are going to take some video here and observe the shrimp.
6452	J2-494	3/26/2010 19:03	14.60125	144.77568	138.6	519.6	528.6	190300. Shrimp observations. Verena wants to zoom right in.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6453	J2-494	3/26/2010 19:04	14.60124	144.77568	138.7	519.6	528.6	BIOLOGY: Opaepele(shrimp) observations at the summit. Mostly small shrimp and all Opaepele.
6455	J2-494	3/26/2010 19:05	14.60124	144.77567	138.9	519.6	528.6	Shrimp are scurrying about here. Verena wants to stick the temp probe in the sediments after more observations.
6456	J2-494	3/26/2010 19:05	14.60124	144.77567	138.9	519.6	528.6	They are tiny shrimp.
6457	J2-494	3/26/2010 19:06	14.60124	144.77566	138.9	519.6	528.6	Up in the top to the left of the chain link Verena sees a shrimp with eggs.
6459	J2-494	3/26/2010 19:07	14.60123	144.77567	139.1	519.6	528.6	BIOLOGY: Opaepele(shrimp) see a couple of the adults of the same species. The majority are very small.
6460	J2-494	3/26/2010 19:08	14.60123	144.77567	139.1	519.6	528.6	HD_CAM: stop
6462	J2-494	3/26/2010 19:09	14.60123	144.77567	135.0	519.3	530.7	The plume is right beneath the summit.
6463	J2-494	3/26/2010 19:11	14.60124	144.77567	133.5	519.5	530.7	Jason is grabbing the temp probe.
6465	J2-494	3/26/2010 19:12	14.60125	144.77568	133.6	519.4	530.9	BIOLOGY: other mid-water fish just swam (floated) by.
6467	J2-494	3/26/2010 19:13	14.60126	144.77569	133.6	519.4	531.0	The temp probe is in the sediments a couple centimeters. It started at 8.6C and has gone up to 9.6C.
6468	J2-494	3/26/2010 19:14	14.60124	144.77569	133.7	519.4	530.9	Temperature went up to 9.8. The heat is percolating through the sediments. It's now up to 10.0.
6470	J2-494	3/26/2010 19:16	14.60123	144.77568	133.7	519.4	531.1	BIOLOGY: Opaepele(shrimp) Small shrimp was in the HD Cam and it did have eggs. Very small shrimp with eggs. The temp in the seds went up to 10.0 an increase of 1.5 degrees.
6471	J2-494	3/26/2010 19:16	14.60124	144.77567	133.9	519.4	530.9	We're going to leave the tephra bucket and MTR here until the last dive.
6473	J2-494	3/26/2010 19:18	14.60124	144.77564	127.1	518.0	534.1	Leaving the summit and will move east and south.
6474	J2-494	3/26/2010 19:18	14.60124	144.77565	91.6	517.5	534.9	We're looking east and will follow the summit ridge for a way. Then will travel south to the markers there.
6476	J2-494	3/26/2010 19:19	14.60125	144.77571	99.7	517.6	527.1	The summit ridge here is knife-edge. It's maybe a meter across in the area of the marker.
6477	J2-494	3/26/2010 19:20	14.60120	144.77580	98.1	520.9	524.6	Large narrow outcrops. The plume is coming up right near the ridge.
6478	J2-494	3/26/2010 19:20	14.60119	144.77584	105.7	521.4	522.4	The plume is wafting up and being sheered out and punched to the south.
6480	J2-494	3/26/2010 19:21	14.60117	144.77593	117.5	525.3	527.0	Lots of sediments here with tiny shrimp all along here.
6481	J2-494	3/26/2010 19:21	14.60117	144.77594	116.9	525.3	527.1	BIOLOGY: Opaepele(shrimp) cluster.
6482	J2-494	3/26/2010 19:22	14.60117	144.77598	109.9	524.7	527.5	HD_CAM: start as we traverse all along the summit from west to east.
6483	J2-494	3/26/2010 19:22	14.60114	144.77608	114.6	524.2	525.3	Some rocky outcrop and perhaps some barnacles.
6484	J2-494	3/26/2010 19:22	14.60113	144.77610	117.0	523.6	525.6	The shrimp are here in masses.
6486	J2-494	3/26/2010 19:23	14.60112	144.77613	213.8	523.8	526.7	BIOLOGY: Opaepele(shrimp) clusters of shrimp along the summit. Now we know where they are.
6487	J2-494	3/26/2010 19:24	14.60107	144.77617	105.3	521.3	525.0	BIOLOGY: Opaepele(shrimp) There is lots of white on the sediments here so the theory is that it is incubating and microbes are coming up through the sediments. The shrimp are feeding on them.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6488	J2-494	3/26/2010 19:25	14.60107	144.77617	47.2	521.4	527.8	At least we think that the shrimp are feeding on them.
6490	J2-494	3/26/2010 19:25	14.60106	144.77616	39.1	521.3	532.5	We are 54m east of the summit marker on the summit ridge.
6491	J2-494	3/26/2010 19:26	14.60111	144.77612	43.2	521.7	531.4	Maneuvering Jason to get a better position for suctioning the shrimp on the summit sediments.
6493	J2-494	3/26/2010 19:27	14.60113	144.77611	40.2	524.5	526.9	Creeping up on the shrimp from the south. Heading 44°. There must be something good to eat right there.
6494	J2-494	3/26/2010 19:28	14.60113	144.77610	40.5	524.5	526.9	BIOLOGY: Opaepele(shrimp) congregation of shrimp here. Will do some observations before suctioning them. They are pretty bright orange.
6495	J2-494	3/26/2010 19:28	14.60113	144.77610	40.5	524.5	526.7	BIOLOGY: limpets Limpets and shrimp here.
6497	J2-494	3/26/2010 19:29	14.60112	144.77610	39.7	524.5	527.0	There are probably little limpet egg cases here too. The limpets are clinging to the tiny little rock here.
6498	J2-494	3/26/2010 19:31	14.60112	144.77610	41.4	524.4	526.6	BIOLOGY: other Bill is looking at the top little rock that is covered with shrimp.
6500	J2-494	3/26/2010 19:32	14.60113	144.77609	40.9	524.5	526.6	Shrimp swarming all over the place climbing all over each other.
6501	J2-494	3/26/2010 19:32	14.60114	144.77609	40.5	524.5	526.8	There is one ghost (white) shrimp on the pile of limpets.
6503	J2-494	3/26/2010 19:33	14.60113	144.77609	40.5	524.6	526.9	Scattered piles of limpets on what little rocks are poking out. "Bathed on the sulfur fumes".
6504	J2-494	3/26/2010 19:34	14.60112	144.77610	41.2	524.6	526.7	HD_CAM: stop
6505	J2-494	3/26/2010 19:34	14.60112	144.77610	41.7	524.5	529.2	Next we will suction the shrimp in these sediments.
6507	J2-494	3/26/2010 19:35	14.60111	144.77610	41.7	524.5	529.2	Lasers on for a moment to get the scale of this.
6508	J2-494	3/26/2010 19:37	14.60112	144.77609	41.3	524.4	529.4	NAV: Location 144°46.5656 14°36.0684. Z=525. Hdg 41°. Summit ridge in sediments east of the marker about 50m.
6511	J2-494	3/26/2010 19:40	14.60110	144.77610	46.1	523.8	530.4	We are E/SE of Mkr163 on the summit ridge. We can't use the slurp sampler here. The valve was installed improperly.
6512	J2-494	3/26/2010 19:40	14.60110	144.77611	39.3	525.0	529.3	We didn't get the sample we wanted here on the ridge. Will have to come back.
6514	J2-494	3/26/2010 19:42	14.60109	144.77611	40.3	523.8	529.6	Masses of shrimp clustering on the summit ridge on top of the sediments. Will take a temperature probe in the sediments.
6515	J2-494	3/26/2010 19:43	14.60110	144.77611	36.2	524.1	526.0	They are congregating on the slight peaks - probably where there is just a little bit of rock poking through the sediments.
6517	J2-494	3/26/2010 19:43	14.60110	144.77610	33.9	524.2	526.4	Limpets are clustered on the small rocks here.
6518	J2-494	3/26/2010 19:44	14.60110	144.77609	34.4	524.2	526.4	Temperature probe in the sediments. T=8.3C to start. The probe is in the middle of the cluster and they hardly moved.
6519	J2-494	3/26/2010 19:45	14.60110	144.77609	34.5	524.2	526.4	Another albino in the cam.
6521	J2-494	3/26/2010 19:45	14.60110	144.77609	34.1	524.2	526.4	The temperature is not increasing.
6522	J2-494	3/26/2010 19:46	14.60110	144.77610	34.6	524.2	526.4	No temperature anomaly in the first spot we probed.
6523	J2-494	3/26/2010 19:46	14.60110	144.77610	34.2	524.2	526.4	Poking another spot a bit higher up . T=8.3 start.
6524	J2-494	3/26/2010 19:47	14.60110	144.77611	34.5	524.2	526.4	Zooming in with the HD Cam.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6526	J2-494	3/26/2010 19:47	14.60110	144.77611	34.2	524.1	526.3	BIOLOGY: limpets clustered on a small rock. The second probe also did not show any anomaly.
6527	J2-494	3/26/2010 19:48	14.60111	144.77611	34.3	524.1	526.3	Third probe in the white sediments just below the shrimp. Temp starts at 8.3C - just like the other two probes.
6529	J2-494	3/26/2010 19:50	14.60111	144.77611	34.5	524.1	526.3	Temp started at 8.3C. It's rising slightly (to 8.4C). Only 0.1 degree C increase in temperature in the sediments.
6531	J2-494	3/26/2010 19:51	14.60111	144.77610	34.7	524.1	526.7	Stowing the temp probe.
6532	J2-494	3/26/2010 19:52	14.60110	144.77612	90.7	523.2	526.4	Moving east along the ridge.
6534	J2-494	3/26/2010 19:53	14.60108	144.77621	90.1	523.3	527.0	Driving east along the summit ridge. Still have plume off to the south. Rocky outcrops now with no room for sediments to build up.
6535	J2-494	3/26/2010 19:54	14.60108	144.77633	94.9	522.1	524.2	We have lost the ridge right here. It drops off at this cliff edge.
6537	J2-494	3/26/2010 19:56	14.60108	144.77633	94.5	522.1	524.2	The next plan if to go straight over to Mkr109. We will move east. Can head there without following the bottom. 128m to the E/SE.
6538	J2-494	3/26/2010 19:57	14.60099	144.77629	204.0	523.2	527.8	We're still seeing the bottom.
6540	J2-494	3/26/2010 19:57	14.60089	144.77626	165.3	524.6	530.6	Driving south along the edge here. The landslide scar is to our left. Driving along the edge of the cloud.
6541	J2-494	3/26/2010 19:57	14.60083	144.77625	173.9	527.8	533.2	The bottom is falling away and we are in the thick of the plume now.
6542	J2-494	3/26/2010 19:58	14.60076	144.77623	174.4	537.1	539.7	NAV: Doppler Reset
6544	J2-494	3/26/2010 19:59	14.60075	144.77619	32.9	537.9	558.3	Ben is now taking over as pilot.
6545	J2-494	3/26/2010 20:01	14.60076	144.77618	32.8	535.4	569.2	We changed plans and are going to Marker 110 since we are right next to it. Bill saw the marker in the butt cam.
6547	J2-494	3/26/2010 20:03	14.60085	144.77627	15.1	531.4	539.6	We are now at Marker 110. We will recover the shrimp trap here and take fluid samples.
6549	J2-494	3/26/2010 20:05	14.60087	144.77626	19.7	533.7	536.7	It looks like there are some shrimp inside this trap.
6552	J2-494	3/26/2010 20:09	14.60086	144.77627	18.8	532.3	537.6	We're at Mkr110 looking at the shrimp trap. There is a shrimp on the bungee cord in the basket.
6553	J2-494	3/26/2010 20:11	14.60087	144.77627	333.2	532.1	537.8	Will first collect the shrimp trap and then will water sample. The shrimp trap is trap#4.
6555	J2-494	3/26/2010 20:12	14.60086	144.77628	332.6	533.5	536.8	Mkr110 (Iceberg). Lots of shrimp here but not as abundant as the clusters we saw that the summit. This is an outcrop with sediments in the slope.
6557	J2-494	3/26/2010 20:13	14.60088	144.77628	334.9	533.4	537.0	NAV: The navigation is putting us really near where we were on previous dives.
6558	J2-494	3/26/2010 20:13	14.60088	144.77628	335.3	533.4	537.1	NAV: Doppler Reset
6559	J2-494	3/26/2010 20:15	14.60089	144.77628	335.6	533.4	536.9	NAV: Location J494 Mkr110 location: 144.46.5764' 14.36.0520'. Z=533.
6562	J2-494	3/26/2010 20:17	14.60085	144.77630	335.1	533.2	537.0	RECOVER: shrimp trap Shrimp trap #4 perched on the rock outcrop. Deployed here on J490. Quite a lots of shrimp in the trap. The honeybear is on this trap. The bear did its job.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6564	J2-494	3/26/2010 20:19	14.60085	144.77630	333.5	533.3	536.7	SAMPLE: bio J494-shrimptrap-1. Trap #4. Mkr110 144°46.5764' 14°36.0520'. Z=533. Quite a few shrimp in the trap. Perching the trap on the basket behind the weights and markers.
6566	J2-494	3/26/2010 20:21	14.60085	144.77630	334.0	533.3	537.1	Going to deploy the new one in the same spot.
6567	J2-494	3/26/2010 20:22	14.60085	144.77631	334.7	533.3	536.9	DEPLOY: shrimp trap Deploying shrimp trap #2 in the same spot as the previous one. There is a package of Spam in the trap.
6569	J2-494	3/26/2010 20:23	14.60084	144.77631	334.1	533.3	536.9	Shrimp trap #2 deployed at Mkr110. Shrimp trap #4 was recovered and is in the basket (honey bear in tow).
6570	J2-494	3/26/2010 20:24	14.60084	144.77628	332.7	533.5	536.7	Our next operation will be to fluid sample. Will look for a spot.
6572	J2-494	3/26/2010 20:25	14.60084	144.77626	0.1	530.7	536.3	Looks like some lobate lavas in the brow cam.
6573	J2-494	3/26/2010 20:25	14.60084	144.77625	0.6	531.1	536.1	Looking around this area for a fluid sampling site.
6574	J2-494	3/26/2010 20:26	14.60084	144.77624	0.6	530.5	537.0	HD_CAM: start 222605. Mkr110 area. We just moved a little west of this knife-edge ridge. Looking for a fluid sampling spot.
6575	J2-494	3/26/2010 20:27	14.60084	144.77625	0.7	530.1	536.9	Looks like some flow under this ledge.
6577	J2-494	3/26/2010 20:27	14.60085	144.77625	13.5	530.3	536.7	Mkr110 is just off to the east of this ridge and below us.
6578	J2-494	3/26/2010 20:28	14.60086	144.77626	12.5	532.6	535.0	Lots of shrimp swimming around as we approach.
6579	J2-494	3/26/2010 20:28	14.60086	144.77626	10.0	531.8	535.5	Mat floating up from somewhere. It seems to be coming out of a hole here.
6580	J2-494	3/26/2010 20:28	14.60087	144.77626	13.6	532.2	534.9	There are quite a few shrimp here.
6582	J2-494	3/26/2010 20:29	14.60087	144.77626	10.9	532.7	534.8	BIOLOGY: Opaepale(shrimp) swarming through the water column around the vehicle.
6584	J2-494	3/26/2010 20:31	14.60085	144.77624	13.1	532.0	535.4	Nice stream of flow coming out at the base of the outcrop. Bacterial floc coming out of the hole with a stream of flow.
6586	J2-494	3/26/2010 20:34	14.60084	144.77623	13.1	532.0	535.4	HD_CAM: stop
6587	J2-494	3/26/2010 20:34	14.60084	144.77623	12.9	532.0	535.4	We are ready to fluids sample now. Kevin will be sitting in the hotseat for this.
6590	J2-494	3/26/2010 20:38	14.60085	144.77622	12.8	532.0	535.4	NAV: Location Fluid sampling sight at Mkr110 area. 144°46.5738 14°36.0517' Z=532. Hdg=12°. Snow-blower with lots of floc coming out. The marker is just on the east side of this knife edge.
6592	J2-494	3/26/2010 20:40	14.60085	144.77623	13.1	532.0	535.4	We're only getting 11.5 degrees in this hole with the floc. Starting to rise now to 13°. Repositioning the probe. Lots of floc coming out of this hole. Temp=16? now.
6593	J2-494	3/26/2010 20:40	14.60084	144.77623	12.8	532.0	535.4	BIOLOGY: Opaepale(shrimp) See one large shrimp and lots of smaller shrimp.
6595	J2-494	3/26/2010 20:43	14.60085	144.77625	14.4	532.0	535.5	Have the probe in a floc flow hole in the rock here. Temp is slowly rising. Repositioned the sand again.
6597	J2-494	3/26/2010 20:43	14.60085	144.77625	14.3	532.0	535.5	Moving the probe did not change the temp at all.
6598	J2-494	3/26/2010 20:43	14.60085	144.77625	14.3	532.0	535.5	TXT:
6599	J2-494	3/26/2010 20:43	14.60085	144.77625	14.3	532.0	535.5	TXT:

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6600	J2-494	3/26/2010 20:43	14.60085	144.77625	14.3	532.0	535.5	TXT:
6601	J2-494	3/26/2010 20:43	14.60085	144.77625	14.3	532.0	535.5	TXT:
6602	J2-494	3/26/2010 20:43	14.60085	144.77625	14.3	532.0	535.5	TXT:
6604	J2-494	3/26/2010 20:46	14.60084	144.77624	13.6	532.1	535.5	SAMPLE: fluid J494-HFS-2. Filtered bag #24. Start 204350. Lots of floc coming out of this hole where we are sampling. 144.776246.5738 14.6008436.0517'.
6605	J2-494	3/26/2010 20:47	14.60083	144.77624	13.6	532.1	535.5	The temp on the sample is lowering.
6607	J2-494	3/26/2010 20:47	14.60083	144.77625	14.2	532.0	535.5	J494-HFS-2 Stop sample. Tmax=17.0 Tavg=14.5 T2=6.8. Vol=400ml.
6609	J2-494	3/26/2010 20:49	14.60084	144.77626	13.8	532.0	535.4	SAMPLE: fluid J494-HFS-3. Unfiltered bag #17. Start 204910. Temp is 17.6 and rising. Same position as previous (Mkr110 area).
6610	J2-494	3/26/2010 20:50	14.60084	144.77626	14.2	532.0	535.4	Lots of floc coming out of this area. Fluid sampling. Some shrimp here also.
6612	J2-494	3/26/2010 20:53	14.60084	144.77625	14.5	532.0	535.4	J494-HFS-3 stop. Tmax=20.0 Tavg=18.0 T2=6.7. Vol=363ml.
6614	J2-494	3/26/2010 20:55	14.60083	144.77625	14.2	532.0	535.5	HD_CAM: start 205445. Fluid sampling in this floc flow SW of Mkr110.
6616	J2-494	3/26/2010 20:55	14.60083	144.77625	14.2	532.0	535.4	Temp is still dropping.
6617	J2-494	3/26/2010 20:55	14.60083	144.77625	13.8	532.0	535.4	Poking the probe around a bit to find some warmer water.
6618	J2-494	3/26/2010 20:56	14.60084	144.77625	13.7	532.0	535.4	That looks like a good spot.
6620	J2-494	3/26/2010 20:57	14.60084	144.77626	14.5	532.0	535.4	Tamp is coming up.
6621	J2-494	3/26/2010 20:58	14.60084	144.77627	14.1	531.9	535.4	HD_CAM: start J494-HFS-4 Sterivex filter #10. Start 205815. Same hole in floc area. Temp still rising.
6623	J2-494	3/26/2010 20:59	14.60084	144.77626	14.1	532.0	535.4	Panning around with the HD cam looking at shrimp on the rocks here. Some white staining apparent and the shrimp are on that as well as the rock without it.
6624	J2-494	3/26/2010 21:00	14.60084	144.77626	14.1	532.0	535.4	The filter is clogging a bit - because of the floc.
6625	J2-494	3/26/2010 21:00	14.60084	144.77626	14.0	532.0	535.4	HD_CAM: stop
6626	J2-494	3/26/2010 21:01	14.60084	144.77625	13.7	531.9	535.5	Lasers on. Our sampling field of view is only about 20cm.
6628	J2-494	3/26/2010 21:01	14.60084	144.77625	13.4	531.9	535.5	Back up to 20' in the sampling hole.
6630	J2-494	3/26/2010 21:04	14.60083	144.77625	12.8	531.9	535.4	Sitting here fluid sampling. This is a sterivex filter sample so will take some time.
6632	J2-494	3/26/2010 21:06	14.60084	144.77624	12.5	531.9	535.4	Experimenting with the DSC. Doesn't look like the DSCs are going. Will be diagnosing the problem.
6634	J2-494	3/26/2010 21:07	14.60084	144.77623	12.5	531.9	535.4	Cycling power to the DSC.
6635	J2-494	3/26/2010 21:07	14.60084	144.77623	12.5	531.9	535.4	Looks like it is not the camera it is the strobe.
6636	J2-494	3/26/2010 21:08	14.60085	144.77622	12.4	531.9	535.4	BIOLOGY: Opaepele(shrimp) zooming in on the HDcam to shrimp on the rocks.
6638	J2-494	3/26/2010 21:10	14.60085	144.77623	12.8	532.0	535.4	Seems that the DSC strobes are not working.
6640	J2-494	3/26/2010 21:11	14.60084	144.77625	12.5	531.9	535.4	Zooming out on HDcam to get some perspective on the site.
6641	J2-494	3/26/2010 21:11	14.60084	144.77625	12.3	532.0	535.5	Little itty bitty shrimp.

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6643	J2-494	3/26/2010 21:13	14.60085	144.77625	12.2	531.9	535.4	The temperature record looks like a period of long waves. Started sampling at 15. Max has been 20.7. The trough of the data are at about 18.
6647	J2-494	3/26/2010 21:19	14.60084	144.77625	12.4	531.9	535.4	J494-HFS-4 cont. Going for 2500ml. 800 to go. Temp is heading back up again.
6648	J2-494	3/26/2010 21:21	14.60084	144.77625	12.4	531.9	535.5	Lots more flock now.
6650	J2-494	3/26/2010 21:21	14.60084	144.77626	12.3	531.9	535.5	Another burst of flock.
6651	J2-494	3/26/2010 21:22	14.60084	144.77625	12.1	532.0	535.5	Less flock now.
6654	J2-494	3/26/2010 21:25	14.60084	144.77626	10.9	531.8	535.4	SAMPLE: fluid More flock again.
6655	J2-494	3/26/2010 21:26	14.60084	144.77627	11.3	531.9	535.4	SAMPLE: fluid J494-HFS-4 stop.
6656	J2-494	3/26/2010 21:26	14.60084	144.77627	11.4	531.9	535.4	Tmax=20.7 Tavg=18.4 vol=2503 T2=6.7
6658	J2-494	3/26/2010 21:27	14.60084	144.77625	11.8	531.9	535.5	Need to reposition wand as temp has fallen.
6659	J2-494	3/26/2010 21:28	14.60084	144.77624	12.0	531.9	535.4	Seems to have gotten cloudy here (smokey).
6661	J2-494	3/26/2010 21:29	14.60085	144.77623	12.1	531.8	535.4	Starting to clear but still see smoke in butt cam.
6662	J2-494	3/26/2010 21:29	14.60085	144.77624	12.0	531.8	535.4	Lots of flock while wiggling the wand.
6663	J2-494	3/26/2010 21:30	14.60085	144.77625	11.6	531.9	535.5	Medea cam shows lots of plume.
6666	J2-494	3/26/2010 21:33	14.60085	144.77624	11.9	531.8	535.5	SAMPLE: fluid J494-HFS-5 start. RNA filter #13.
6667	J2-494	3/26/2010 21:34	14.60085	144.77624	11.2	531.9	535.4	Couldn't see much bubbles in water column EM122 data-ship is fairly far to east.
6668	J2-494	3/26/2010 21:34	14.60085	144.77625	11.2	531.8	535.4	Can see clear flow with flock chunks.
6670	J2-494	3/26/2010 21:37	14.60084	144.77624	11.0	531.9	535.4	Still lots of plume in Medea cam.
6673	J2-494	3/26/2010 21:39	14.60083	144.77623	11.6	531.8	535.4	NAV: Doppler Reset
6674	J2-494	3/26/2010 21:40	14.60084	144.77623	11.0	531.8	535.4	SAMPLE: fluid J494-HFS-5 still pumping.
6676	J2-494	3/26/2010 21:42	14.60084	144.77624	11.3	531.8	535.4	1500 ml about 15min to go.
6678	J2-494	3/26/2010 21:45	14.60084	144.77625	11.0	531.8	535.4	The strobe is working again.
6680	J2-494	3/26/2010 21:45	14.60084	144.77625	11.6	531.8	535.5	Change of watch for the Jason gang.
6681	J2-494	3/26/2010 21:46	14.60084	144.77626	11.5	531.8	535.4	Still pumping. The visibility has cleared a bit since the white-out.
6683	J2-494	3/26/2010 21:47	14.60084	144.77625	11.5	531.8	535.4	Discussion about how we saw a lot more shrimp up top on the summit than we see here at this hydrothermal venting site.
6684	J2-494	3/26/2010 21:48	14.60084	144.77623	11.1	531.9	535.4	Looks like the shrimp in the pilot cam are grazing on the rock. They are mostly little tiny shrimp. A couple of big guys here and there.
6686	J2-494	3/26/2010 21:49	14.60085	144.77623	10.9	531.8	535.4	Lots of plumage in the Medea cam.
6687	J2-494	3/26/2010 21:50	14.60085	144.77622	10.8	531.8	535.4	Seeing the plume waft in here again. Visibility is decreasing.
6688	J2-494	3/26/2010 21:51	14.60085	144.77622	10.6	531.8	535.4	We're about 5m upslope from Mkr110 (Iceberg).
6690	J2-494	3/26/2010 21:52	14.60085	144.77621	11.4	531.8	535.3	From here we are going to go down to the eruptive vents and watch for awhile. We don't want to miss the event at the eruptive vents.
6691	J2-494	3/26/2010 21:52	14.60086	144.77621	11.5	531.8	535.4	Visibility is decreasing.
6693	J2-494	3/26/2010 21:54	14.60086	144.77620	11.6	531.8	535.4	We can't even see the HFS wand. The temperature is at 16. Temp is not going up here. The plume is really thick.

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6695	J2-494	3/26/2010 21:56	14.60087	144.77619	12.2	531.7	535.4	The pump rate has been set at about half of what is usually is so the samples are taking a bit longer.
6697	J2-494	3/26/2010 21:58	14.60085	144.77622	11.9	531.7	535.4	TXT:
6698	J2-494	3/26/2010 21:59	14.60084	144.77625	12.1	531.8	535.4	J494-HFS-5 stopped. Tmax=19.8 Tavg=16.5 Vol=2612ml. T2=7.
6699	J2-494	3/26/2010 21:59	14.60084	144.77625	12.1	531.8	535.4	Temperature is going up.
6701	J2-494	3/26/2010 22:01	14.60084	144.77625	12.3	531.9	535.4	Retrieving the wand. There is white stuff (probably floc) on the tip of the wand.
6703	J2-494	3/26/2010 22:01	14.60084	144.77625	12.3	531.9	535.4	Floc in the water.
6704	J2-494	3/26/2010 22:02	14.60083	144.77625	12.3	531.9	535.4	A bunch of floc came off the tip when Dave reversed the flow.
6706	J2-494	3/26/2010 22:04	14.60085	144.77626	12.5	531.9	535.4	Dave wants to put the probe back in the crack again. Dave wants to check on the pump because the T2 does not seem to be warming up at all.
6708	J2-494	3/26/2010 22:06	14.60086	144.77627	12.5	531.8	535.4	NAV: Doppler Reset
6709	J2-494	3/26/2010 22:06	14.60086	144.77626	12.7	531.8	535.4	We're ready to go. The pumps were probably just bogged down because of the filters. All seems well in HFS-land.
6710	J2-494	3/26/2010 22:06	14.60086	144.77626	12.7	531.8	535.4	Stowing the wand.
6712	J2-494	3/26/2010 22:08	14.60087	144.77625	12.3	531.8	535.4	The wand is stowed.
6713	J2-494	3/26/2010 22:08	14.60086	144.77625	12.4	531.9	535.4	A few shrimp swimming around the vehicle.
6714	J2-494	3/26/2010 22:08	14.60084	144.77625	13.7	530.3	535.3	NAV: Doppler Reset
6716	J2-494	3/26/2010 22:09	14.60078	144.77626	15.3	530.0	545.8	There is no Doppler on the bottom - We will be using USBL to navigate.
6717	J2-494	3/26/2010 22:10	14.60072	144.77628	0.0	535.8	552.2	The Medea cams are showing a very large plume. We are in a white-out.
6718	J2-494	3/26/2010 22:10	14.60069	144.77629	3.0	537.7	602.0	We're seeing tephra in the DSC.
6719	J2-494	3/26/2010 22:12	14.60072	144.77631	347.7	542.3	550.2	Bill is trying to find Sulfur wall. We saw the bottom of it but didn't go up to the top.
6720	J2-494	3/26/2010 22:12	14.60073	144.77631	348.4	542.9	549.2	Here is the wall. We want to look at the white stuff.
6721	J2-494	3/26/2010 22:12	14.60075	144.77632	348.3	542.5	549.1	This looks like pillow lavas and is probably intact and not part of the landslide material.
6722	J2-494	3/26/2010 22:13	14.60076	144.77632	347.2	542.1	549.2	We are seeing shrimp here.
6724	J2-494	3/26/2010 22:13	14.60077	144.77632	348.6	541.1	548.5	See intact pillows with staining.
6725	J2-494	3/26/2010 22:15	14.60078	144.77633	355.1	540.1	547.5	Bill wants to take a close look at a white patch here. This is the old Mkr105 area (Limpet Lair). The depth is the same at 540m. There are shrimp on this rock. Good flow.
6727	J2-494	3/26/2010 22:16	14.60077	144.77633	355.3	540.1	547.5	It looks like a fresh sheer on the cliff face. Now seeing lots of white (sulfur or floc?) probably sulfur. Shrimp moving in the flow. Big and little shrimp but mostly little.
6728	J2-494	3/26/2010 22:16	14.60077	144.77633	355.5	540.1	547.6	Observations here at the wall where Mkr105 used to be.
6729	J2-494	3/26/2010 22:17	14.60077	144.77633	355.2	540.1	547.6	The flow looks like it is coming out of the cavern below.
6731	J2-494	3/26/2010 22:18	14.60078	144.77633	355.7	540.1	547.4	Doppler does not seem to be working.

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6732	J2-494	3/26/2010 22:18	14.60078	144.77632	355.7	540.1	547.5	Z=540 here. Looks like a good spot to sample.
6734	J2-494	3/26/2010 22:19	14.60079	144.77632	1.0	537.5	542.7	Bill is zooming up the ridge. We see a dive weight on the steep slope.
6735	J2-494	3/26/2010 22:20	14.60079	144.77632	1.1	537.8	542.0	Shrimp on the rocks here.
6736	J2-494	3/26/2010 22:21	14.60079	144.77631	0.8	537.4	541.9	Verena just changed the color on the HD Cam. It looks better now (less green).
6738	J2-494	3/26/2010 22:21	14.60080	144.77631	10.0	536.9	540.3	There are intact pillows on the slope so Bill thinks that we are above where the landslide sheered the slope.
6739	J2-494	3/26/2010 22:22	14.60080	144.77630	9.2	537.1	540.3	Staining on the pillow lavas.
6740	J2-494	3/26/2010 22:22	14.60080	144.77629	10.0	537.0	540.4	Seeing some floc in the water. It's coming out of the cracks in the wall where there is lots of fluid flow.
6742	J2-494	3/26/2010 22:23	14.60081	144.77629	10.2	536.9	540.3	According to the nav we are a little bit north of where Mkr105 used to be.
6744	J2-494	3/26/2010 22:25	14.60079	144.77629	26.0	537.1	540.6	NAV: Location Here in the floc flow north of the old Mkr105. 144.46.5780 14.36.0479. Z=537m.
6745	J2-494	3/26/2010 22:26	14.60079	144.77629	26.0	537.1	540.5	BIOLOGY: Austino-graea(crab) Crab and shrimp here.
6746	J2-494	3/26/2010 22:27	14.60079	144.77629	26.0	537.0	540.6	HD_CAM: stop 2226. 4 minutes left on the tape.
6751	J2-494	3/26/2010 22:34	14.60080	144.77629	27.6	537.0	540.5	SAMPLE: fluid J494-HFS-6 start 223340. Filtered bag #23. ~10m N/NW of the old Mrk105 position. Z=537. Good flow here on the edge of this steep cliff face in a crack. Quite a few shrimp here. Getting 38.
6753	J2-494	3/26/2010 22:36	14.60080	144.77630	27.3	537.0	540.5	Shrimp grazing on the rocks here. Some big ones here.
6755	J2-494	3/26/2010 22:37	14.60080	144.77630	27.4	537.0	540.5	J494-HFS-6. Tmax=40.6. Tavg=40.4. Vol=453. T2=16. stopped sample.
6757	J2-494	3/26/2010 22:39	14.60080	144.77629	27.4	537.0	540.7	J494-HFS-7. Unfiltered bag #18. Start 2323755. Same position as previous sample.
6758	J2-494	3/26/2010 22:40	14.60080	144.77629	27.2	537.0	540.5	Shrimp are digging in the sediment here. They seem to be fighting over something that they all want.
6759	J2-494	3/26/2010 22:41	14.60080	144.77629	27.2	537.0	540.7	J494-HFS-7 stop. Tmax=41.3. Tavg=40.7 Vol=457ml. T2=17. Finished sampling here.
6761	J2-494	3/26/2010 22:42	14.60080	144.77630	27.0	537.1	540.4	HD_CAM: start 224145. Shrimp fighting over something they are eating (perhaps a dead shrimp)/
6763	J2-494	3/26/2010 22:43	14.60080	144.77630	28.2	536.2	540.6	HD_CAM: stop
6764	J2-494	3/26/2010 22:43	14.60080	144.77630	28.5	536.6	540.8	The wand is stowed.
6765	J2-494	3/26/2010 22:44	14.60079	144.77631	36.9	537.7	540.9	We are going to deploy a marker here.
6767	J2-494	3/26/2010 22:46	14.60079	144.77631	338.5	538.4	542.6	Going to deploy the marker. We sampled just to the right of this. The sampling spot was just to the left of the dive weight.
6770	J2-494	3/26/2010 22:50	14.60077	144.77633	338.4	539.0	551.3	DEPLOY: marker 117. Heading 338. Just to the left of the sampling sight. 144.46.5779 14.36.0479. Z=539m.
6771	J2-494	3/26/2010 22:50	14.60075	144.77635	337.7	542.0	560.4	Moving out. Going down the slope as we back down.
6772	J2-494	3/26/2010 22:51	14.60074	144.77636	337.9	544.2	562.8	This all looks intact.
6774	J2-494	3/26/2010 22:51	14.60073	144.77637	338.9	546.7	562.7	Great floc-covered spot just south of the makers. Depth is 546.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6775	J2-494	3/26/2010 22:53	14.60070	144.77636	343.8	553.3	570.9	There are lots of shrimp on the white patch here.
6776	J2-494	3/26/2010 22:53	14.60068	144.77635	334.7	551.3	603.7	On the nav screen we are about 5m E of the Mkr-105 position. We are now on the sheer scarp face.
6777	J2-494	3/26/2010 22:53	14.60068	144.77635	331.1	552.2	606.2	Continuing down here for another 30m.
6778	J2-494	3/26/2010 22:54	14.60067	144.77635	337.6	557.9	608.7	We are lateralling down the wall.
6779	J2-494	3/26/2010 22:55	14.60066	144.77637	346.4	560.0	610.1	We are still moving down the wall.
6780	J2-494	3/26/2010 22:55	14.60065	144.77638	356.5	561.9	610.4	We are at 560m and still a lot of white on the wall.
6781	J2-494	3/26/2010 22:56	14.60066	144.77636	28.0	567.0	602.3	Bill is in the hotseat now.
6782	J2-494	3/26/2010 22:57	14.60067	144.77635	27.8	567.0	603.5	We're moving down the wall. All stop waiting on Medea.
6783	J2-494	3/26/2010 22:57	14.60068	144.77633	30.4	567.5	603.3	Lots of shrimp on the wall.
6784	J2-494	3/26/2010 22:58	14.60068	144.77633	23.2	570.4	599.8	This is definitely sheered off by the landslide. Hardly any staining here.
6785	J2-494	3/26/2010 22:58	14.60068	144.77634	23.1	571.6	600.8	We are continuing down the wall.
6786	J2-494	3/26/2010 22:59	14.60067	144.77635	11.7	572.7	606.4	We are seeing sulfur-staining (?)
6787	J2-494	3/26/2010 23:00	14.60066	144.77638	12.1	572.3	607.5	We are probably at the top of the sulfur wall. The bottom is at 581m.
6788	J2-494	3/26/2010 23:01	14.60066	144.77638	12.2	572.4	607.4	Lasers on.
6789	J2-494	3/26/2010 23:01	14.60066	144.77638	12.5	575.6	609.1	The big guy in the HD C am was probably an Alvinocaris.
6790	J2-494	3/26/2010 23:02	14.60066	144.77638	12.4	577.5	608.7	Looking at lots of small (tiny) shrimp on the sulfur wall.
6791	J2-494	3/26/2010 23:02	14.60067	144.77638	12.4	578.0	608.8	HD_CAM: start 230205. At the Sulfur Wall.
6792	J2-494	3/26/2010 23:02	14.60067	144.77638	11.5	580.4	609.4	Large concentration of tiny shrimp. They are covering this sulfur face.
6794	J2-494	3/26/2010 23:03	14.60066	144.77638	12.4	586.0	608.9	Knife-like edge of this cliff in the brow and pilot cam.
6795	J2-494	3/26/2010 23:04	14.60069	144.77638	12.6	586.2	609.1	Our altitude is still 24m and we are at 586m. Sheer cliff face covered in sulfur.
6797	J2-494	3/26/2010 23:05	14.60069	144.77639	12.6	586.2	609.4	Looks like we are at some lineation. Beneath this ledge it looks less sulfurous. We will see as we move down.
6798	J2-494	3/26/2010 23:06	14.60070	144.77639	12.3	586.1	609.6	The area that we are at we see sulfur plates covered with shrimp. Z=586.
6799	J2-494	3/26/2010 23:07	14.60070	144.77639	13.0	586.2	609.5	BIOLOGY: Alvinocaris(shrimp) serrated rostrum. They have beady eyes too says John.
6801	J2-494	3/26/2010 23:07	14.60070	144.77638	12.6	586.2	609.1	They are feeding. some of the sulfur crust looks like it has been grazed.
6802	J2-494	3/26/2010 23:08	14.60069	144.77638	12.5	586.2	609.5	John Sherrin would like a rock to scrape for an idea of what the shrimp are grazing on.
6804	J2-494	3/26/2010 23:11	14.60069	144.77638	12.5	586.2	608.5	BIOLOGY: Opaepele(shrimp) The shrimp are just sitting here. Verena says they are obviously feeding here and not nearly as frenzied.
6810	J2-494	3/26/2010 23:21	14.60071	144.77637	8.1	585.1	609.4	SAMPLE: geo J4494-rock-8. Rock from the sulfur wall to determine what the shrimp are grazing upon. This is for John Sherrin. Z=586m. 144°46.5825' 14°36.0432'.
6812	J2-494	3/26/2010 23:22	14.60070	144.77638	8.1	585.0	609.5	J4494-rock-8 cont. Small piece of sulfur plate from the wall hirer. It's quite a small flat plate of sulfur.
6813	J2-494	3/26/2010 23:23	14.60070	144.77638	8.2	585.1	609.8	HD_CAM: stop 2322.

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6815	J2-494	3/26/2010 23:24	14.60071	144.77639	9.3	585.0	609.1	Stowing the in the port biobox. Very fancy handling.
6817	J2-494	3/26/2010 23:25	14.60071	144.77639	8.1	585.1	609.2	The position is just E of old Mkr105 just along this vertical sulfur wall.
6818	J2-494	3/26/2010 23:26	14.60071	144.77639	8.0	585.5	609.5	NAV: Location Put a target here and are calling it Sulfur Wall. Z=586. Hdg=24. Sample 8 position.
6819	J2-494	3/26/2010 23:26	14.60071	144.77639	8.1	586.3	609.6	Heading down the wall again.
6820	J2-494	3/26/2010 23:26	14.60072	144.77639	7.9	586.4	609.3	Going to the bottom of this wall.
6821	J2-494	3/26/2010 23:27	14.60072	144.77639	8.0	586.6	609.6	Heading down.
6823	J2-494	3/26/2010 23:27	14.60072	144.77639	8.0	587.2	609.3	NAV: Doppler Reset
6824	J2-494	3/26/2010 23:28	14.60071	144.77639	7.9	591.1	609.8	We are right at the corner of the wall looking north. The break is at a right angle.
6825	J2-494	3/26/2010 23:28	14.60071	144.77639	8.1	590.9	609.4	As we get lower on the wall we see less sulfur.
6826	J2-494	3/26/2010 23:28	14.60072	144.77639	7.8	592.0	610.0	Much less sulfur here.
6828	J2-494	3/26/2010 23:29	14.60072	144.77640	8.0	595.5	610.1	There are still lots of shrimp on this bare rock as well. They are really small.
6829	J2-494	3/26/2010 23:29	14.60072	144.77639	8.2	596.4	610.1	They are on the sulfur and bare rocks. Most of the shrimp are very small.
6830	J2-494	3/26/2010 23:29	14.60072	144.77638	7.5	596.8	609.3	We are going to start to lateral left.
6831	J2-494	3/26/2010 23:30	14.60072	144.77637	7.9	598.3	608.8	We have an overhang below us so we will move to the left a bit.
6832	J2-494	3/26/2010 23:30	14.60072	144.77636	7.6	599.7	607.4	Left is west. The shrimp look whiter here.
6834	J2-494	3/26/2010 23:31	14.60073	144.77632	7.6	602.3	605.4	There are lots of shrimp here. LOTS. The depth here is 600. A huge overhang here Looks like a grotto here.
6835	J2-494	3/26/2010 23:31	14.60073	144.77631	16.0	602.9	605.1	We are less than 10m west of the Sulfur Wall target.
6836	J2-494	3/26/2010 23:31	14.60073	144.77631	16.9	602.8	605.0	We are stirring the shrimp up.
6837	J2-494	3/26/2010 23:32	14.60072	144.77632	351.9	602.1	606.6	HD_CAM: start 233200.
6838	J2-494	3/26/2010 23:32	14.60071	144.77634	343.9	603.0	608.2	We are at the bottom of the wall here but the bottom sort of slopes to the east where it gets deeper. Our depth is 603m.
6840	J2-494	3/26/2010 23:33	14.60071	144.77634	343.9	602.9	608.3	We are looking at a small alcove here and it drops off to the east.
6841	J2-494	3/26/2010 23:34	14.60071	144.77634	343.9	603.0	608.1	The base of the wall is leaking. There is fluid flow here. We see some white mat here that is fluttering in the current. Good fluid flow. Z=603m.
6842	J2-494	3/26/2010 23:34	14.60071	144.77634	343.9	602.9	608.2	We are at the bottom now. Z=603m.
6844	J2-494	3/26/2010 23:36	14.60071	144.77635	343.9	602.9	608.3	We are going to deploy a marker here. We're at the base of Sulfur Wall on the west edge of it. It drops off to the east. This area looks like a grotto. A sort of cave beneath this overhang. Lots of fluid flow here.
6849	J2-494	3/26/2010 23:44	14.60066	144.77626	316.5	599.4	603.8	DEPLOY: marker Mkr164 at the base of the western Sulfur Wall. Z=603m. Heading is 344. Placed on top of outcrop to the west of the grotto.
6850	J2-494	3/26/2010 23:44	14.60065	144.77623	322.1	597.3	602.1	We're heading away without getting a position. We are going to lateral to the west along the base of this wall.
6852	J2-494	3/26/2010 23:45	14.60066	144.77615	320.9	592.5	596.2	Mkr164 position: 144.7465468' 14.336.0554'

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6853	J2-494	3/26/2010 23:46	14.60067	144.77613	322.6	590.8	594.3	We see venting here at the base of the wall.
6854	J2-494	3/26/2010 23:46	14.60071	144.77609	318.3	586.5	591.7	14 36.0426; 144 46.5784 CORRECTION to position for Mkr164.
6856	J2-494	3/26/2010 23:48	14.60070	144.77608	318.5	586.1	591.5	We are SE of Styx. We see quite a lot of venting here. Plumage. We are 10m SE of Styx.
6857	J2-494	3/26/2010 23:48	14.60070	144.77608	318.5	586.1	591.5	We are out of markers now.
6859	J2-494	3/26/2010 23:49	14.60070	144.77608	318.3	586.1	591.5	This looks pretty hot.
6860	J2-494	3/26/2010 23:50	14.60071	144.77607	300.2	587.4	590.9	We are about 40m SE of Styx.
6861	J2-494	3/26/2010 23:50	14.60072	144.77607	302.9	587.8	590.5	We are in a bunch of talus. The wall is off in the distance about 10m.
6862	J2-494	3/26/2010 23:51	14.60071	144.77606	303.6	586.3	591.1	This vent is quite active. We see bubbling. and fluid.
6864	J2-494	3/26/2010 23:52	14.60075	144.77600	303.2	579.5	584.5	Lots of plumage here. Medea is right up against the wall so we have to move.
6867	J2-494	3/26/2010 23:55	14.60071	144.77608	327.2	586.4	590.5	NAV: Location Position of area of venting. Looks hot and bubbles. 144 46.5652' 14 36.0437'. Charon is the target. The person that rowed people across the river Styx.
6868	J2-494	3/26/2010 23:56	14.60072	144.77608	313.7	588.2	590.9	Huge talus pile with venting coming out of it.
6869	J2-494	3/26/2010 23:57	14.60072	144.77608	313.6	588.2	590.9	Some tephra covering the talus.
6871	J2-494	3/26/2010 23:57	14.60072	144.77608	313.3	588.2	590.8	NAV: Doppler Reset
6872	J2-494	3/26/2010 23:59	14.60072	144.77608	312.9	588.2	590.8	Position after reset 14deg 36.043 144deg 46.564 z=588 head=312 Charon Vent
6874	J2-494	3/26/2010 23:59	14.60072	144.77608	312.6	588.2	590.8	We are just south of the old marker site of 106
6875	J2-494	3/27/2010 0:00	14.60072	144.77608	313.0	588.2	590.8	The venting is going right up the wall in the talus.
6876	J2-494	3/27/2010 0:00	14.60072	144.77608	312.3	588.2	590.8	There are big blocks of new lava around the vent.
6877	J2-494	3/27/2010 0:00	14.60072	144.77608	312.6	588.2	590.8	New lava blocks being extruded on a talus slope.
6878	J2-494	3/27/2010 0:00	14.60072	144.77608	312.6	588.2	590.8	HD_CAM: start
6880	J2-494	3/27/2010 0:01	14.60072	144.77607	317.6	587.4	590.5	Going to watch the vent before any sampling.
6881	J2-494	3/27/2010 0:01	14.60072	144.77606	324.8	587.1	589.7	Doing a visual survey of the venting zone.
6882	J2-494	3/27/2010 0:01	14.60072	144.77606	331.5	587.1	589.5	Lots of fresh lava.
6883	J2-494	3/27/2010 0:02	14.60072	144.77606	328.0	587.2	589.5	This plume is being pushed up and away from.
6884	J2-494	3/27/2010 0:02	14.60072	144.77606	327.9	587.2	589.5	Don't see Medea plume because Medea is 25m south of us.
6886	J2-494	3/27/2010 0:04	14.60071	144.77605	328.0	587.2	589.5	Not much yellow in this plume.
6887	J2-494	3/27/2010 0:04	14.60071	144.77605	328.0	587.2	589.5	Venting is a few meters up the wall.
6889	J2-494	3/27/2010 0:06	14.60070	144.77605	328.0	587.1	589.5	Observing Charon Vent. No bubbles and little ash.
6890	J2-494	3/27/2010 0:06	14.60070	144.77605	328.0	587.1	589.5	NAV: Doppler Reset
6892	J2-494	3/27/2010 0:07	14.60069	144.77606	327.8	587.1	589.5	Smoke is starting to bend a bit toward Jason.
6894	J2-494	3/27/2010 0:10	14.60068	144.77607	328.1	587.1	589.5	HD_CAM: stop
6896	J2-494	3/27/2010 0:11	14.60069	144.77608	324.1	586.5	590.9	Looking for water sampling spots.
6897	J2-494	3/27/2010 0:11	14.60069	144.77608	318.0	587.3	591.4	Moving off and around to the other side counter-clockwise.
6898	J2-494	3/27/2010 0:11	14.60069	144.77608	313.9	588.3	591.2	Looking head on right now. New lava right in front.
6899	J2-494	3/27/2010 0:12	14.60070	144.77608	317.5	588.5	591.2	Very unstable as basket touches-the rocks and tephra tumble.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6900	J2-494	3/27/2010 0:12	14.60070	144.77608	316.7	588.5	591.2	Want to sample a gradient of fluid here.
6902	J2-494	3/27/2010 0:13	14.60069	144.77609	317.6	587.8	591.3	Start with clear fluid coming out in front of vent through the tephra.
6903	J2-494	3/27/2010 0:14	14.60070	144.77609	317.9	587.6	591.3	Retrieving HFS wand from basket. Using the long wand.
6904	J2-494	3/27/2010 0:14	14.60069	144.77608	317.2	587.6	591.4	Want to sample the out edges and work toward middle.
6905	J2-494	3/27/2010 0:15	14.60069	144.77608	317.4	587.6	591.4	Outer is clear fluid.
6907	J2-494	3/27/2010 0:15	14.60068	144.77608	317.6	587.6	591.5	Bringing up the fluid sampler.
6908	J2-494	3/27/2010 0:16	14.60068	144.77608	317.6	587.6	591.4	This clear patch has turned a little smokey.
6909	J2-494	3/27/2010 0:16	14.60068	144.77608	317.5	587.6	591.4	Temperature is going up.
6911	J2-494	3/27/2010 0:18	14.60069	144.77609	317.7	587.6	591.4	SAMPLE: fluid Temperature got up to 33deg but the vehicle is not stable here.
6912	J2-494	3/27/2010 0:19	14.60069	144.77609	317.6	588.0	591.3	Pulling out and reposition at the same hole.
6914	J2-494	3/27/2010 0:20	14.60068	144.77609	326.6	588.7	591.3	Where we were has started to puff white.
6915	J2-494	3/27/2010 0:20	14.60068	144.77609	326.1	588.7	591.2	Sonar shows that 5m to STBD is a parallel wall-we are in a bit of a box canyon here.
6916	J2-494	3/27/2010 0:20	14.60068	144.77609	326.6	588.6	591.2	That should read 'here'.
6918	J2-494	3/27/2010 0:21	14.60068	144.77609	327.1	588.6	591.2	Looking for clear fluid in the front part of the vent from this heading.
6919	J2-494	3/27/2010 0:21	14.60069	144.77610	327.1	588.6	591.2	HFS pump is on.
6920	J2-494	3/27/2010 0:22	14.60069	144.77610	326.3	588.6	591.2	Temp is going up.
6921	J2-494	3/27/2010 0:22	14.60069	144.77610	325.5	588.6	591.2	Slightly smokey water in a small crack in tephra.
6923	J2-494	3/27/2010 0:23	14.60068	144.77608	326.4	588.6	591.2	SAMPLE: fluid The first spot is to the left of here and it is still white fluid now.
6924	J2-494	3/27/2010 0:24	14.60067	144.77607	326.2	588.6	591.2	SAMPLE: fluid Temp level at 32deg.
6926	J2-494	3/27/2010 0:25	14.60067	144.77607	327.3	588.6	591.2	SAMPLE: fluid J494-HFS-09 Filtered bag #22 Started.
6928	J2-494	3/27/2010 0:28	14.60068	144.77607	327.6	588.6	591.2	SAMPLE: fluid J494-HFS-09 Charon Vent stop.
6929	J2-494	3/27/2010 0:29	14.60068	144.77607	327.3	588.6	591.2	Tmax=30.5 Tavg=29.1 vol=392 T2=7.0 J494-HFS-09 Probably not good flow-clogged a bit.
6931	J2-494	3/27/2010 0:29	14.60068	144.77607	326.9	588.6	591.2	Reverse flushing the sampler to remove clogging.
6932	J2-494	3/27/2010 0:31	14.60068	144.77608	326.7	588.6	591.2	Pumping again and temp is going back up.
6934	J2-494	3/27/2010 0:32	14.60068	144.77608	326.2	588.5	591.1	Temperature is going up and is higher now that it has been flushed.
6935	J2-494	3/27/2010 0:33	14.60069	144.77608	326.1	588.5	591.1	SAMPLE: fluid J494-HFS-10 Unfiltered bag #19 Start at Charon Vent.
6937	J2-494	3/27/2010 0:33	14.60069	144.77608	326.1	588.6	591.1	Same crack as HFS-09.
6938	J2-494	3/27/2010 0:34	14.60069	144.77608	325.8	588.7	591.2	SAMPLE: fluid J494-HFS-10 temp is steadily going up.
6939	J2-494	3/27/2010 0:35	14.60069	144.77608	325.6	588.7	591.2	SAMPLE: fluid Getting gradient in this spot as the fluid is turning more white as sampled.
6941	J2-494	3/27/2010 0:35	14.60069	144.77608	325.6	588.7	591.2	SAMPLE: fluid J494-HFS-10 Charon Vent stopped.
6942	J2-494	3/27/2010 0:35	14.60069	144.77608	325.7	588.7	591.3	J494-HFS-10 Tmax=85.3 Tavg=77.7 vol=379 T2=35.
6943	J2-494	3/27/2010 0:36	14.60069	144.77608	325.6	589.0	591.3	SAMPLE: fluid J494-HFS-11 Filtered Piston #9 started Charon Vent same crack.
6945	J2-494	3/27/2010 0:38	14.60068	144.77607	325.6	589.0	591.3	SAMPLE: fluid J494-HFS-11 Watching site heat up as we are sitting

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
								here.
6947	J2-494	3/27/2010 0:40	14.60069	144.77609	325.5	589.0	591.4	J494-HFS-11 Stopped at Charon Vent.
6948	J2-494	3/27/2010 0:40	14.60069	144.77609	325.4	589.0	591.4	Tmax=126 Tavg=106 vol=423 T2=44. J494-HFS-10.
6949	J2-494	3/27/2010 0:40	14.60069	144.77610	325.5	589.0	591.4	SAMPLE: gas J494-GTHFS-12 Port fired.
6950	J2-494	3/27/2010 0:41	14.60069	144.77610	325.3	589.0	591.4	SAMPLE: gas Temp was 126deg for J494-GTHFS-12.
6952	J2-494	3/27/2010 0:42	14.60068	144.77609	325.1	589.0	591.4	J494-GTHFS-12 same crack as other samples.
6953	J2-494	3/27/2010 0:43	14.60068	144.77608	325.2	589.0	591.4	SAMPLE: fluid Unfiltered Piston #8 J494-HFT-13 at the same crack at Charon Vent started.
6955	J2-494	3/27/2010 0:43	14.60068	144.77608	325.2	589.0	591.4	Still no bubbles and not yellow plume. Fairly steady activity.
6957	J2-494	3/27/2010 0:46	14.60066	144.77608	325.2	589.0	591.4	J494-HFS-13 stopped. Charon Vent.
6958	J2-494	3/27/2010 0:46	14.60066	144.77608	325.3	588.9	591.4	SAMPLE: fluid Tmax=124.7 Tavg=122.8 vol=529 T2=45 J494-HFS-13
6959	J2-494	3/27/2010 0:47	14.60065	144.77608	325.4	588.9	591.4	Enough for that crack. Temp stabilized at about 125deg.
6961	J2-494	3/27/2010 0:47	14.60066	144.77608	323.7	589.1	591.0	Explode.
6962	J2-494	3/27/2010 0:47	14.60066	144.77608	324.1	589.0	591.0	Big plume and ash. Time to move.
6963	J2-494	3/27/2010 0:48	14.60066	144.77608	324.1	589.0	591.0	Lots of flock and ash.
6964	J2-494	3/27/2010 0:48	14.60065	144.77607	324.0	589.0	590.9	It is black and Jason hasn't moved. Dropped in temperature-pump is on.
6966	J2-494	3/27/2010 0:49	14.60065	144.77607	324.1	589.0	590.9	SAMPLE: fluid J494-HFS-14 Filtered piston #7.
6967	J2-494	3/27/2010 0:50	14.60065	144.77607	324.7	589.0	590.9	All black as ash on vehicle but Medea can see that Jason is ok.
6968	J2-494	3/27/2010 0:51	14.60066	144.77607	324.5	589.0	590.9	SAMPLE: fluid J494-HFS-14 still sampling at same spot on Charon Vent during an event.
6970	J2-494	3/27/2010 0:52	14.60066	144.77608	324.5	589.0	591.1	SAMPLE: fluid J494-HFS-14 Medea cam can see ash and yellow.
6972	J2-494	3/27/2010 0:53	14.60066	144.77608	324.4	589.1	591.0	Now recording Medea cam on Sci cam recorder.
6973	J2-494	3/27/2010 0:53	14.60067	144.77609	324.5	589.1	591.0	J494-HFS-14 stopped.
6974	J2-494	3/27/2010 0:54	14.60067	144.77609	324.6	589.1	591.0	Tmax=112.3 Tavg=110.4 vol=431 T2=33. J494-HFS-14 Charon as event clears.
6975	J2-494	3/27/2010 0:54	14.60067	144.77609	324.6	589.1	591.0	Can see ash on vehicle.
6976	J2-494	3/27/2010 0:55	14.60067	144.77608	324.7	589.0	591.0	On the water column EM122 did see plume.
6978	J2-494	3/27/2010 0:56	14.60068	144.77609	325.2	589.0	591.0	Wand is still out recording temperature.
6979	J2-494	3/27/2010 0:56	14.60068	144.77609	325.5	589.0	590.9	Switching camera recording back from Medea to Sci cam.
6980	J2-494	3/27/2010 0:56	14.60068	144.77609	326.4	589.0	590.9	Going to reposition vehicle to sample more intense part of this plume.
6982	J2-494	3/27/2010 0:57	14.60068	144.77607	324.1	588.2	590.5	Lots of ash raining down off the vehicle as we back up.
6983	J2-494	3/27/2010 0:58	14.60067	144.77607	324.5	588.3	590.5	Water column recorder show plume diminished.
6984	J2-494	3/27/2010 0:59	14.60067	144.77606	324.1	588.2	590.4	Tacking DSC of the vent.
6986	J2-494	3/27/2010 1:01	14.60066	144.77606	327.4	587.8	590.6	Going to try to get a bit higher in the plume.
6988	J2-494	3/27/2010 1:01	14.60066	144.77606	339.7	587.1	590.0	Overview of the vent upslope.
6989	J2-494	3/27/2010 1:01	14.60067	144.77605	338.3	586.6	589.7	Big lava blocks up slope.
6990	J2-494	3/27/2010 1:01	14.60067	144.77606	330.9	587.9	589.9	Really fresh and big clocks being pushed out (maybe .5 m).
6991	J2-494	3/27/2010 1:02	14.60067	144.77606	330.5	587.5	590.0	Temp is going up.
6992	J2-494	3/27/2010 1:03	14.60066	144.77605	331.9	587.4	589.9	Pump was off after all.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
6994	J2-494	3/27/2010 1:03	14.60066	144.77605	331.3	587.4	590.0	Some floc-like stuff floating now.
6995	J2-494	3/27/2010 1:03	14.60066	144.77605	332.0	587.4	589.9	Medea is all in smoke-can't see Medea.
6996	J2-494	3/27/2010 1:04	14.60066	144.77605	332.6	587.3	589.7	Ash coming down now-something going on.
6997	J2-494	3/27/2010 1:04	14.60066	144.77605	333.0	587.3	589.7	Wand reverse did remove some sediment.
6998	J2-494	3/27/2010 1:04	14.60066	144.77605	332.5	587.2	589.8	Sulfur pieces going out.
6999	J2-494	3/27/2010 1:04	14.60066	144.77605	332.5	587.2	589.8	Big pieces of lava.
7000	J2-494	3/27/2010 1:04	14.60066	144.77605	331.2	587.2	589.8	Pump looks good.
7002	J2-494	3/27/2010 1:05	14.60066	144.77605	334.1	587.5	589.7	Ash coming down.
7003	J2-494	3/27/2010 1:06	14.60065	144.77605	334.7	587.4	589.7	Trying to keep wand flat in plume so it won't clog with sulfur.
7004	J2-494	3/27/2010 1:06	14.60065	144.77605	334.3	587.4	589.7	Wand in heavy part of the plume.
7005	J2-494	3/27/2010 1:06	14.60066	144.77605	334.2	587.5	589.7	Large piece of sulfur raining down.
7007	J2-494	3/27/2010 1:07	14.60065	144.77605	334.4	587.6	589.8	Filtered piston #1 J494-HFS-15 start.
7008	J2-494	3/27/2010 1:08	14.60065	144.77605	334.3	587.6	589.8	SAMPLE: fluid J494-HFS-15 started at Charon.
7009	J2-494	3/27/2010 1:09	14.60065	144.77605	334.3	587.5	589.8	Maybe 1m up the vent from the last fluid sample area at Charon Vent. J494-HFS-15.
7011	J2-494	3/27/2010 1:11	14.60065	144.77606	334.1	587.5	589.7	SAMPLE: fluid J494-HFS-15 stopped.
7013	J2-494	3/27/2010 1:11	14.60065	144.77605	334.1	587.5	589.7	SAMPLE: fluid J494-HFS-15 Tmax=54.0 Tavg=52.1 vol=480 T2=22.
7014	J2-494	3/27/2010 1:11	14.60065	144.77605	334.2	587.5	589.7	SAMPLE: fluid Unfiltered piston #2 J494-HFS-16 start.
7016	J2-494	3/27/2010 1:14	14.60067	144.77607	334.2	587.5	589.8	SAMPLE: fluid J494-HFS-16 Charon Vent stopped. Can see solid wall in STBD looking pilot cam.
7017	J2-494	3/27/2010 1:15	14.60068	144.77607	334.0	587.6	589.8	SAMPLE: fluid J494-HFS-16 Tmax=48.7 Tavg=46.2 vol=485 T2=20.
7019	J2-494	3/27/2010 1:16	14.60068	144.77608	334.1	587.5	589.7	We're finished sampling here.
7021	J2-494	3/27/2010 1:17	14.60068	144.77607	339.0	586.5	589.1	The plan is to move up the slope a little bit.
7022	J2-494	3/27/2010 1:18	14.60068	144.77606	342.4	586.3	588.8	Looks like some fresh lava blocks around the base of Charon. Temp at a crack near the vent Dave got 125 degrees.
7023	J2-494	3/27/2010 1:18	14.60068	144.77607	342.5	586.5	588.7	We're going to see if there is a hotter spot right here. They got 54 degrees while sampling.
7024	J2-494	3/27/2010 1:19	14.60067	144.77607	342.3	586.5	588.7	Dave is taking the temperature here in the smoke.
7026	J2-494	3/27/2010 1:21	14.60066	144.77605	2.8	586.5	588.0	There are some larger; darker blocks right next to the vent that are blacker in color. Fresh lava blocks? Surrounded by lighter colored talus blocks.
7028	J2-494	3/27/2010 1:21	14.60066	144.77605	2.6	586.5	588.0	Still here at Charon vent.
7029	J2-494	3/27/2010 1:22	14.60067	144.77605	2.5	586.5	588.0	We're taking the temperature here a little farther upslope.
7031	J2-494	3/27/2010 1:24	14.60067	144.77606	3.0	586.5	588.0	They started in a little crack in the clear area and temp went up to 125C; then it dropped down about 5degrees C.
7033	J2-494	3/27/2010 1:26	14.60067	144.77605	2.3	586.5	587.9	Finished sampling at Charon.
7034	J2-494	3/27/2010 1:26	14.60067	144.77604	2.4	586.5	587.9	Seeing very few bubbles.
7035	J2-494	3/27/2010 1:27	14.60067	144.77604	2.3	586.5	588.0	Trying to get the wand in the holder and all buttoned up.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7037	J2-494	3/27/2010 1:28	14.60066	144.77604	2.7	586.5	588.0	We are going toward Styx. 315m 40m from Charon to Styx. There is only a couple meters from left to right where the venting is coming out.
7038	J2-494	3/27/2010 1:29	14.60065	144.77604	3.0	586.5	588.0	We are moving on now.
7040	J2-494	3/27/2010 1:29	14.60065	144.77604	2.7	586.4	588.0	A bit premature but hopeful.
7041	J2-494	3/27/2010 1:30	14.60065	144.77601	350.3	583.2	586.8	Our depth here is 586m.
7042	J2-494	3/27/2010 1:30	14.60064	144.77596	333.2	578.2	584.5	We're waiting for Medea to move.
7044	J2-494	3/27/2010 1:31	14.60067	144.77594	335.4	578.2	581.6	We are looking at what seems to be eruption material.
7045	J2-494	3/27/2010 1:32	14.60067	144.77595	336.0	578.2	581.7	Some erupted material is in front of us.
7046	J2-494	3/27/2010 1:32	14.60069	144.77592	324.3	574.8	579.7	We want to maneuver on to Styx (Mkr116).
7048	J2-494	3/27/2010 1:33	14.60070	144.77591	318.5	574.5	579.1	Big massive block on the left. The massive block on the right looks to have sulfur coating.
7050	J2-494	3/27/2010 1:36	14.60072	144.77591	313.8	567.0	578.4	Moving up. Solid lava block.
7051	J2-494	3/27/2010 1:36	14.60072	144.77592	315.5	567.9	578.8	Same orientation as Styx and Charon this cracking we are observing.
7053	J2-494	3/27/2010 1:37	14.60072	144.77591	297.6	566.0	578.1	Working our way around this headwall north of Charon.
7054	J2-494	3/27/2010 1:37	14.60072	144.77590	323.7	565.5	577.7	Lots of white particulates in the water.
7055	J2-494	3/27/2010 1:37	14.60073	144.77589	324.0	563.9	577.3	Pinnacle-like basalt block. Could be dike.
7056	J2-494	3/27/2010 1:38	14.60074	144.77589	323.7	561.6	569.1	Very knife-like feature below.
7057	J2-494	3/27/2010 1:38	14.60074	144.77587	317.0	559.6	566.8	Venting down in this hole. We are up 14m.
7059	J2-494	3/27/2010 1:39	14.60073	144.77586	306.5	559.8	566.5	Indentation to port on sonar is probably where Styx is.
7060	J2-494	3/27/2010 1:39	14.60073	144.77584	304.8	558.4	564.7	Moving around to other side to port.
7061	J2-494	3/27/2010 1:39	14.60075	144.77583	330.0	557.6	560.3	Los of plume here as we head to Styx.
7062	J2-494	3/27/2010 1:40	14.60075	144.77582	327.5	558.0	559.8	White out but good sonar targets.
7063	J2-494	3/27/2010 1:40	14.60081	144.77578	327.2	557.9	563.5	Notch in wall right now.
7064	J2-494	3/27/2010 1:40	14.60089	144.77578	1.6	557.9	560.9	Plume ahead as we approach Styx.
7066	J2-494	3/27/2010 1:41	14.60090	144.77579	344.7	557.7	561.5	There is Styx. We have plume and bubbles with multiple vent areas.
7067	J2-494	3/27/2010 1:42	14.60089	144.77580	343.6	557.9	561.6	On port side of ship can see black pool of water. Checking EM122 data.
7068	J2-494	3/27/2010 1:42	14.60089	144.77580	343.5	557.9	561.6	Lots of plume and venting here.
7070	J2-494	3/27/2010 1:43	14.60086	144.77577	352.6	559.0	561.4	Big ash plume now. Total white out.
7071	J2-494	3/27/2010 1:44	14.60086	144.77576	359.7	559.9	561.2	Plume moved over vehicle with lots of ash.
7072	J2-494	3/27/2010 1:44	14.60086	144.77575	2.0	559.9	561.1	Can't see anything on Jason or Medea cameras.
7073	J2-494	3/27/2010 1:45	14.60084	144.77575	19.2	558.7	559.4	Can't see so backing up a bit.
7074	J2-494	3/27/2010 1:46	14.60082	144.77577	34.8	559.2	645.7	Backing out to find a clearer view.
7075	J2-494	3/27/2010 1:46	14.60082	144.77578	47.0	559.5	744.7	Can see some wall in the butt cam.
7076	J2-494	3/27/2010 1:47	14.60083	144.77576	339.8	560.5	561.3	Lots of ash plume blowing around.
7077	J2-494	3/27/2010 1:47	14.60083	144.77577	343.1	561.6	563.2	NAV: Doppler Reset
7079	J2-494	3/27/2010 1:47	14.60083	144.77579	350.5	561.6	563.1	Holding here for clearer view.
7080	J2-494	3/27/2010 1:48	14.60085	144.77578	345.9	561.4	563.9	NAV: Doppler Reset
7081	J2-494	3/27/2010 1:48	14.60086	144.77577	346.0	561.2	564.1	Still white-out.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7083	J2-494	3/27/2010 1:50	14.60085	144.77581	339.9	560.7	564.3	Can't see but seems to be a bit more active.
7084	J2-494	3/27/2010 1:51	14.60086	144.77581	346.5	560.1	562.6	Large sulfur particle floating.
7086	J2-494	3/27/2010 1:51	14.60087	144.77580	345.1	559.1	562.0	Bottom check and can see just at the bottom about a meter.
7087	J2-494	3/27/2010 1:51	14.60088	144.77578	345.8	558.4	561.3	All white again.
7088	J2-494	3/27/2010 1:52	14.60089	144.77577	347.2	556.9	559.7	Jason just finished watch change. Jimmy driving.
7089	J2-494	3/27/2010 1:52	14.60089	144.77577	345.1	556.8	559.6	Big burst of bubbles.
7090	J2-494	3/27/2010 1:52	14.60090	144.77577	345.5	556.2	559.1	There it is on HD cam.
7091	J2-494	3/27/2010 1:52	14.60090	144.77577	345.6	556.1	558.8	Big plume.
7092	J2-494	3/27/2010 1:53	14.60089	144.77578	344.7	556.2	560.0	Trying to get to Styx but no vis.
7093	J2-494	3/27/2010 1:53	14.60089	144.77578	342.2	556.0	560.5	NAV: Doppler Reset
7095	J2-494	3/27/2010 1:53	14.60086	144.77581	345.8	556.8	563.7	HD_CAM: start Turning on just in case view clears.
7096	J2-494	3/27/2010 1:54	14.60086	144.77582	346.0	558.4	563.9	Some distinct bubbles.
7097	J2-494	3/27/2010 1:54	14.60086	144.77582	345.3	559.4	563.9	Getting some bottom view on pilot cam.
7098	J2-494	3/27/2010 1:54	14.60087	144.77582	335.1	558.8	563.4	Sci cam has some venting.
7100	J2-494	3/27/2010 1:55	14.60087	144.77581	334.7	557.4	563.0	We are east of the vent where this venting is coming from.
7101	J2-494	3/27/2010 1:55	14.60088	144.77581	335.4	558.0	562.5	Looks like venting is along edge of wall base.
7102	J2-494	3/27/2010 1:56	14.60088	144.77580	334.5	557.4	561.7	Approaching from the north side of wall edge. Styx target is to Port.
7103	J2-494	3/27/2010 1:56	14.60088	144.77580	334.8	558.3	561.8	Butt cam has view of wall on other side.
7104	J2-494	3/27/2010 1:56	14.60088	144.77580	335.2	558.7	561.8	Can see venting again at 335hdg.
7106	J2-494	3/27/2010 1:57	14.60088	144.77580	352.4	558.8	561.6	Bubble burst.
7107	J2-494	3/27/2010 1:58	14.60088	144.77579	316.1	558.5	561.6	Depth is 560 here and before it was 556 so maybe not at the main part of the vent.
7108	J2-494	3/27/2010 1:59	14.60088	144.77579	19.0	558.8	561.1	Looking a bit more port and scanning around.
7110	J2-494	3/27/2010 1:59	14.60088	144.77578	22.7	558.9	561.0	Venting all along here.
7111	J2-494	3/27/2010 1:59	14.60088	144.77579	21.5	559.0	561.7	Looking for most active part of the venting.
7112	J2-494	3/27/2010 2:00	14.60088	144.77581	21.2	557.9	560.6	Sci cam shows very active plume a bit higher up and to stbd.
7113	J2-494	3/27/2010 2:00	14.60088	144.77580	23.5	558.1	562.1	Smoke is yellow there.
7114	J2-494	3/27/2010 2:01	14.60088	144.77580	11.0	559.1	562.7	Lots of tephra and white out again.
7116	J2-494	3/27/2010 2:02	14.60086	144.77578	16.9	561.2	563.9	More bubbles.
7117	J2-494	3/27/2010 2:02	14.60085	144.77582	12.5	562.9	565.8	Lots of tephra and smoke as Jason was still-plume was moving fast.
7118	J2-494	3/27/2010 2:02	14.60086	144.77582	354.8	562.8	566.0	North view shows the wall at z=562.
7119	J2-494	3/27/2010 2:03	14.60086	144.77581	1.7	563.4	565.2	As pan back to port-can't see anything.
7121	J2-494	3/27/2010 2:03	14.60085	144.77581	20.6	563.1	565.0	Can't find any approach to get to the site-too much plume.
7122	J2-494	3/27/2010 2:03	14.60086	144.77580	13.2	562.7	564.7	Moving around to find some clearing.
7123	J2-494	3/27/2010 2:04	14.60085	144.77579	13.9	562.6	563.4	We are deeper than the vent and backing away.
7124	J2-494	3/27/2010 2:04	14.60083	144.77579	16.4	562.5	564.2	Butt cam sees the wall.
7125	J2-494	3/27/2010 2:04	14.60083	144.77579	352.9	562.2	565.1	Over 10m away from vent and below and can't see anything.
7126	J2-494	3/27/2010 2:05	14.60085	144.77578	293.5	562.3	565.6	Ash rain-big time now.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7128	J2-494	3/27/2010 2:05	14.60086	144.77575	282.2	561.7	565.3	We are south and slightly west of Styx.
7129	J2-494	3/27/2010 2:06	14.60086	144.77575	282.5	560.8	565.3	The ash was not from Jason-came from plume.
7130	J2-494	3/27/2010 2:06	14.60086	144.77576	283.8	559.2	565.0	Sort of clear here but seeing a lot of ash raining down.
7131	J2-494	3/27/2010 2:06	14.60086	144.77575	282.4	558.2	564.4	Climbing back up.
7132	J2-494	3/27/2010 2:06	14.60087	144.77571	280.0	557.3	561.0	Lots of ash rocks and sediment between.
7134	J2-494	3/27/2010 2:07	14.60090	144.77573	310.0	558.6	562.0	We are west of area on cone slope to Brimstone. Moving back toward Styx and coming lower.
7135	J2-494	3/27/2010 2:07	14.60090	144.77574	28.4	558.7	559.9	Moving northward along wall.
7136	J2-494	3/27/2010 2:08	14.60090	144.77576	28.3	558.7	560.5	Medea is still in the plume with no visibility just 20m from Jason.
7137	J2-494	3/27/2010 2:08	14.60090	144.77577	31.8	558.6	561.2	Looking NE and seeing the plume.
7138	J2-494	3/27/2010 2:08	14.60089	144.77578	32.0	558.5	561.5	HD_CAM: start HD on.
7139	J2-494	3/27/2010 2:08	14.60089	144.77578	32.2	558.5	561.8	Great view of the venting all along the wall.
7140	J2-494	3/27/2010 2:08	14.60089	144.77578	31.2	560.0	561.4	Want to watch this.
7141	J2-494	3/27/2010 2:09	14.60089	144.77578	30.9	560.2	561.7	Plume is starting to take over again.
7142	J2-494	3/27/2010 2:09	14.60088	144.77578	32.0	560.8	561.9	HD_CAM: stop
7144	J2-494	3/27/2010 2:09	14.60088	144.77578	32.3	560.8	561.8	Much murkier here than before.
7145	J2-494	3/27/2010 2:09	14.60088	144.77579	31.6	559.4	562.0	Can see in sci cam again some.
7146	J2-494	3/27/2010 2:10	14.60088	144.77580	27.8	561.1	562.3	Looked like breakout down slope-looked like Mata type.
7147	J2-494	3/27/2010 2:10	14.60088	144.77580	29.5	560.7	562.2	Big explosion
7148	J2-494	3/27/2010 2:10	14.60087	144.77580	4.9	560.2	563.1	Jason can't hold here.
7149	J2-494	3/27/2010 2:10	14.60086	144.77580	14.0	561.8	563.0	Can't get down here-on bottom.
7151	J2-494	3/27/2010 2:11	14.60085	144.77580	12.1	562.6	564.7	Trying to get good view again.
7152	J2-494	3/27/2010 2:11	14.60085	144.77580	17.9	564.1	564.9	EM122 shows bubbles about half the water depth coming up.
7153	J2-494	3/27/2010 2:13	14.60085	144.77580	11.8	561.8	564.4	Can't get in to do anything here-no visibility.
7155	J2-494	3/27/2010 2:13	14.60086	144.77579	15.6	560.8	563.7	Good news is that it is much more active but bad news is we can't see.
7156	J2-494	3/27/2010 2:14	14.60088	144.77579	17.0	559.9	562.1	Backed away and can see again.
7157	J2-494	3/27/2010 2:14	14.60088	144.77579	31.3	560.0	562.0	Looks like 2 distinct areas.
7158	J2-494	3/27/2010 2:14	14.60088	144.77579	26.4	560.1	562.1	HD_CAM: start
7159	J2-494	3/27/2010 2:14	14.60088	144.77579	19.4	560.2	562.2	Explosions.
7160	J2-494	3/27/2010 2:14	14.60088	144.77580	25.3	560.8	562.1	Pilot cam shows sediment falling.
7161	J2-494	3/27/2010 2:14	14.60088	144.77580	25.3	560.7	562.1	Lots of bubbles.
7163	J2-494	3/27/2010 2:15	14.60088	144.77580	26.0	560.6	562.1	That was a great explosion.
7164	J2-494	3/27/2010 2:15	14.60088	144.77580	26.9	560.5	562.1	Lots of bubbles again on pilot cam.
7165	J2-494	3/27/2010 2:15	14.60089	144.77581	28.6	560.5	562.0	big tephra rain.
7166	J2-494	3/27/2010 2:16	14.60089	144.77581	28.6	560.6	562.0	Lots of tephra.
7167	J2-494	3/27/2010 2:16	14.60089	144.77582	29.7	560.5	562.0	Just observing.
7168	J2-494	3/27/2010 2:17	14.60088	144.77581	28.4	560.6	562.2	Lava tumbling in pilot cam.
7170	J2-494	3/27/2010 2:17	14.60088	144.77579	28.3	560.6	562.2	White out again.

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7171	J2-494	3/27/2010 2:17	14.60088	144.77579	28.3	560.6	562.2	Tephra in air but not so much bubble action.
7172	J2-494	3/27/2010 2:17	14.60088	144.77579	28.3	560.6	562.2	HD_CAM: stop
7173	J2-494	3/27/2010 2:17	14.60088	144.77579	28.3	560.6	562.2	Hoping for it to clear now.
7174	J2-494	3/27/2010 2:18	14.60088	144.77580	28.2	560.6	562.2	Plume is coming at us still.
7175	J2-494	3/27/2010 2:19	14.60088	144.77580	28.5	560.6	562.2	View is clearing.
7176	J2-494	3/27/2010 2:19	14.60087	144.77580	33.1	561.1	562.3	Getting pushed away by falling sediment.
7178	J2-494	3/27/2010 2:19	14.60086	144.77579	30.9	560.2	562.6	Bubbles after.
7179	J2-494	3/27/2010 2:19	14.60086	144.77579	29.0	560.1	562.5	Getting shoved away.
7180	J2-494	3/27/2010 2:19	14.60085	144.77578	24.7	560.8	561.5	View is clearing again.
7181	J2-494	3/27/2010 2:20	14.60084	144.77580	27.0	561.5	564.0	Looks like venting is below us.
7182	J2-494	3/27/2010 2:21	14.60084	144.77580	18.0	562.1	564.6	Going down a bit and see venting coming out of wall.
7184	J2-494	3/27/2010 2:22	14.60080	144.77580	31.6	563.7	565.1	Venting from below we are at 562.
7185	J2-494	3/27/2010 2:22	14.60081	144.77579	14.7	562.1	564.6	A nose with multiple nostrils.-Jimmy
7187	J2-494	3/27/2010 2:24	14.60087	144.77577	328.6	558.4	561.9	We are above the vent.
7189	J2-494	3/27/2010 2:25	14.60087	144.77578	345.0	558.5	561.3	Heading back to Styx target to the north. We are 8m above the original vent.
7190	J2-494	3/27/2010 2:25	14.60088	144.77578	334.1	558.5	561.6	Seeing some lower level of venting in the wall here at 558m.
7191	J2-494	3/27/2010 2:26	14.60088	144.77579	3.5	558.8	561.0	Can see venting on the other side of the ridge. Venting in lots of places around here.
7192	J2-494	3/27/2010 2:26	14.60088	144.77578	358.9	558.9	561.1	More venting as we go north to target.
7193	J2-494	3/27/2010 2:26	14.60088	144.77578	355.9	558.7	561.7	Venting is below us and here comes the plume to us.
7195	J2-494	3/27/2010 2:28	14.60088	144.77576	358.5	559.8	562.1	Can't see here to sample so we will go over to Brimstone-just over the ridge.
7196	J2-494	3/27/2010 2:29	14.60087	144.77575	275.4	558.4	562.3	Heading to Brimstone for awhile.
7198	J2-494	3/27/2010 2:29	14.60088	144.77575	281.1	558.6	562.0	Nice view of plume in Medea cam.
7199	J2-494	3/27/2010 2:29	14.60088	144.77575	282.8	558.6	561.8	NAV: Doppler Reset
7200	J2-494	3/27/2010 2:30	14.60087	144.77573	282.0	557.4	561.0	Heading over the ridge.
7201	J2-494	3/27/2010 2:30	14.60084	144.77572	287.5	556.9	559.8	To Brimstone after close-up of sand which was not leaking any fluid.
7203	J2-494	3/27/2010 2:32	14.60081	144.77563	316.4	551.6	556.6	Top of the ridge is covered in tephra as we head over to Brimstone which is now at 314deg and 13m.
7204	J2-494	3/27/2010 2:33	14.60084	144.77561	321.8	550.9	554.1	Lots of particles in the water.
7206	J2-494	3/27/2010 2:33	14.60084	144.77560	323.5	548.9	552.8	Heading up slope-at Brimstone depth.
7207	J2-494	3/27/2010 2:34	14.60082	144.77557	323.0	548.8	552.4	Medea is still back looking at the plume from Styx.
7208	J2-494	3/27/2010 2:34	14.60084	144.77557	357.6	547.5	550.9	Just a lot of tephra here with some large boulders.
7209	J2-494	3/27/2010 2:34	14.60086	144.77557	355.1	547.2	549.8	Smokey here but not too much.
7211	J2-494	3/27/2010 2:35	14.60088	144.77557	355.5	547.1	549.1	Can see marker in pilot cam.
7212	J2-494	3/27/2010 2:35	14.60088	144.77557	355.9	546.9	549.2	No activity today.
7213	J2-494	3/27/2010 2:36	14.60089	144.77560	320.1	546.3	551.1	Nothing going on here.
7214	J2-494	3/27/2010 2:37	14.60090	144.77560	313.6	547.3	549.1	Shrimp are here.

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7216	J2-494	3/27/2010 2:37	14.60089	144.77561	307.3	546.7	551.0	Heading over to Sulfur Vent. 33m at 257deg.
7217	J2-494	3/27/2010 2:38	14.60081	144.77562	287.8	550.7	555.8	Moving Jason-Medea-Ship west to reach Sulfur Vent.
7219	J2-494	3/27/2010 2:39	14.60076	144.77560	305.9	553.5	560.5	Much smokier as we head in this direction.
7220	J2-494	3/27/2010 2:39	14.60073	144.77558	306.5	554.8	560.0	Sulfur area could be active.
7221	J2-494	3/27/2010 2:39	14.60071	144.77557	313.7	555.4	560.5	Moving down slope of old Brimstone cone.
7223	J2-494	3/27/2010 2:41	14.60069	144.77533	347.8	554.3	562.0	Lots of plume in water here.
7224	J2-494	3/27/2010 2:41	14.60069	144.77527	4.1	553.4	565.9	Can see some sulfur crust.
7225	J2-494	3/27/2010 2:42	14.60067	144.77526	4.3	559.1	567.2	Wisp of weird smoke here.
7226	J2-494	3/27/2010 2:43	14.60069	144.77525	4.8	557.6	566.0	Rain of sulfur coming down.
7227	J2-494	3/27/2010 2:43	14.60071	144.77525	2.8	556.6	564.8	HD_CAM: start
7229	J2-494	3/27/2010 2:43	14.60073	144.77521	4.6	556.1	565.0	Plume is coming at us from here-going to approach from SW.
7230	J2-494	3/27/2010 2:44	14.60074	144.77518	35.9	556.1	567.3	Marker is probably in the plume.
7231	J2-494	3/27/2010 2:44	14.60076	144.77519	49.0	555.4	567.4	Plume is coming from port.
7232	J2-494	3/27/2010 2:44	14.60078	144.77520	49.3	556.2	563.3	Phantom is coming from left and see Sulfur ahead.
7234	J2-494	3/27/2010 2:45	14.60080	144.77520	71.0	556.3	564.4	Sulfur is active ahead.
7235	J2-494	3/27/2010 2:45	14.60081	144.77519	71.0	556.8	563.4	Sulfur is really yellow plume and the Phantom plume is white.
7236	J2-494	3/27/2010 2:45	14.60081	144.77519	79.0	557.1	562.8	Very active today.
7237	J2-494	3/27/2010 2:45	14.60082	144.77519	91.9	557.2	563.0	Current is blowing to one side.
7238	J2-494	3/27/2010 2:46	14.60083	144.77519	90.7	557.3	563.5	Whole area is venting.
7239	J2-494	3/27/2010 2:46	14.60085	144.77519	124.1	557.2	563.9	Great views-not Phantom-just lower venting all over this area.
7240	J2-494	3/27/2010 2:46	14.60086	144.77522	125.6	557.9	562.2	Lots of venting from below the crust material.
7242	J2-494	3/27/2010 2:47	14.60086	144.77520	119.7	558.7	562.6	Observing before sampling. Would like a bubble sample.
7243	J2-494	3/27/2010 2:49	14.60086	144.77520	119.0	558.6	562.7	Retrieving GT bubble catcher from the basket.
7245	J2-494	3/27/2010 2:50	14.60086	144.77522	119.1	558.7	562.8	We are looking east and the plume is blowing south.
7247	J2-494	3/27/2010 2:52	14.60085	144.77523	119.4	558.7	562.8	Sci cam is flickering a bit-just noticed a few minutes ago.
7248	J2-494	3/27/2010 2:52	14.60085	144.77523	119.4	558.6	562.7	Changing iris does not affect it.
7249	J2-494	3/27/2010 2:53	14.60085	144.77523	119.7	558.7	562.6	HD_CAM: stop
7251	J2-494	3/27/2010 2:53	14.60085	144.77522	118.3	558.7	562.6	Checking wiring in van.
7252	J2-494	3/27/2010 2:54	14.60085	144.77523	118.9	558.7	562.6	Stopped flickering when moved cable in the engineering seat.-Scott
7253	J2-494	3/27/2010 2:54	14.60086	144.77523	119.0	558.7	562.7	Steady stream of venting.
7255	J2-494	3/27/2010 2:56	14.60086	144.77523	120.1	558.6	562.5	Still observing Sulfur Vent.
7257	J2-494	3/27/2010 2:57	14.60085	144.77522	118.9	558.7	562.6	There is a hole in the crust with no smoke but bubbles coming out.
7258	J2-494	3/27/2010 2:58	14.60085	144.77522	118.8	558.6	562.6	Want a bubble sample there.
7259	J2-494	3/27/2010 2:58	14.60085	144.77523	118.7	558.7	562.5	Pulling in basket for sampling.
7261	J2-494	3/27/2010 2:59	14.60084	144.77523	119.0	558.2	562.0	Moving Jason for sampling.
7262	J2-494	3/27/2010 2:59	14.60084	144.77524	105.8	558.7	561.6	Starting to get more plume and ash.
7263	J2-494	3/27/2010 3:00	14.60084	144.77524	109.0	558.7	561.7	Can still see the bubbles coming out of the hole.
7264	J2-494	3/27/2010 3:00	14.60084	144.77524	109.1	558.7	561.7	Clear bubbles.

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7265	J2-494	3/27/2010 3:00	14.60085	144.77524	109.1	558.7	561.7	Putting sampler in fire position.
7267	J2-494	3/27/2010 3:02	14.60084	144.77524	109.1	558.8	561.7	SAMPLE: gas Red funnel GT sampler.
7268	J2-494	3/27/2010 3:02	14.60084	144.77524	109.1	558.7	561.6	Tipped funnel and didn't get any bubbles coming out.
7270	J2-494	3/27/2010 3:04	14.60085	144.77523	109.2	558.8	561.6	Need more-not enough here.
7271	J2-494	3/27/2010 3:04	14.60085	144.77523	109.2	558.7	561.6	There was some but not a full load.
7273	J2-494	3/27/2010 3:05	14.60085	144.77524	109.2	558.7	561.6	TXT:
7274	J2-494	3/27/2010 3:06	14.60086	144.77524	109.1	558.8	561.7	Pulling sampler out of the plume.
7275	J2-494	3/27/2010 3:06	14.60086	144.77524	109.2	558.7	561.7	Lasers off.
7276	J2-494	3/27/2010 3:07	14.60086	144.77524	109.2	558.8	561.7	Observing again -need more bubbles.
7278	J2-494	3/27/2010 3:08	14.60085	144.77524	109.2	558.8	561.7	Intense plume on the EM122 recorder.
7280	J2-494	3/27/2010 3:09	14.60085	144.77524	109.1	558.8	561.7	Taking some HD pan views of Sulfur Vent area.
7281	J2-494	3/27/2010 3:10	14.60085	144.77524	109.1	558.8	561.7	HD_CAM: stop
7282	J2-494	3/27/2010 3:11	14.60086	144.77523	109.1	558.8	561.7	Lots of plume in Medea cam.
7284	J2-494	3/27/2010 3:11	14.60086	144.77523	110.9	558.8	561.7	Looking around for sampling site again.
7285	J2-494	3/27/2010 3:12	14.60088	144.77522	113.2	557.1	562.6	Panning around for bubbles.
7286	J2-494	3/27/2010 3:12	14.60088	144.77524	113.3	557.3	562.0	Moving clockwise around vent. Plume is streaming away from vehicle.
7288	J2-494	3/27/2010 3:13	14.60087	144.77522	113.4	557.8	562.6	Bubbles have stopped.
7290	J2-494	3/27/2010 3:16	14.60085	144.77519	112.9	556.0	562.2	Activity has diminished here while observing-bubbles have stopped.
7291	J2-494	3/27/2010 3:16	14.60085	144.77519	113.6	556.0	562.4	Plume is steady.
7292	J2-494	3/27/2010 3:16	14.60083	144.77518	104.2	556.0	562.6	Going over to Phantom while holding the bubble sampler over the basket.
7293	J2-494	3/27/2010 3:17	14.60083	144.77518	104.1	556.1	562.6	TXT:
7294	J2-494	3/27/2010 3:17	14.60083	144.77518	104.1	556.1	562.6	TXT:
7296	J2-494	3/27/2010 3:17	14.60083	144.77518	104.8	556.1	562.4	Lots of yellow in the brow cam from Sulfur vent.
7297	J2-494	3/27/2010 3:17	14.60083	144.77518	104.5	556.1	562.0	TXT:
7298	J2-494	3/27/2010 3:17	14.60083	144.77518	93.4	556.2	563.1	10m at 304deg to Phantom.
7299	J2-494	3/27/2010 3:17	14.60083	144.77518	93.8	556.2	563.0	TXT:
7300	J2-494	3/27/2010 3:17	14.60083	144.77517	55.4	556.2	562.5	Moving to Phantom.
7301	J2-494	3/27/2010 3:18	14.60085	144.77515	24.2	556.3	563.3	Not seeing any plume from Phantom here.
7302	J2-494	3/27/2010 3:18	14.60085	144.77511	281.1	556.3	561.9	Bucket is still at Sulfur.
7303	J2-494	3/27/2010 3:18	14.60084	144.77511	243.3	556.1	562.1	NAV: Doppler Reset
7304	J2-494	3/27/2010 3:18	14.60084	144.77513	120.5	555.5	563.6	That bucket was at Phantom in brow cam-not Sulfur.
7306	J2-494	3/27/2010 3:19	14.60088	144.77508	61.9	557.1	568.1	Tephra sampler in sci cam at Phantom.
7307	J2-494	3/27/2010 3:20	14.60088	144.77507	60.4	557.3	569.0	That is Tephra Sampler A in the view at Phantom.
7308	J2-494	3/27/2010 3:20	14.60090	144.77506	111.0	557.4	569.4	Phantom is on the side of Sulfur.
7311	J2-494	3/27/2010 3:24	14.60091	144.77512	112.6	560.8	566.8	Going to recover the Tephra Sampler here at Phantom.
7313	J2-494	3/27/2010 3:27	14.60089	144.77518	108.3	563.0	565.7	Tephra Sampler-A at Phantom has been there since J490 and repositioned on J492.
7315	J2-494	3/27/2010 3:27	14.60089	144.77519	108.2	563.0	565.7	Putting the GTB funnel sampler back in the basket.

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7316	J2-494	3/27/2010 3:27	14.60089	144.77519	108.2	563.0	565.7	Lots of plume in the Medea cam still.
7319	J2-494	3/27/2010 3:32	14.60089	144.77520	108.5	562.9	565.7	RECOVER: tephra bucket Tephra Sampler-A at Phantom.
7320	J2-494	3/27/2010 3:32	14.60089	144.77520	108.5	562.9	565.7	SAMPLE: geo J494-tephra-17 Tephra Sampler A recovered at Phantom.
7321	J2-494	3/27/2010 3:33	14.60089	144.77520	108.4	563.0	565.6	Didn't look in bucket.
7323	J2-494	3/27/2010 3:33	14.60089	144.77520	108.4	563.0	565.6	Sampler in basket next to shrimp trap.
7324	J2-494	3/27/2010 3:33	14.60090	144.77520	108.4	563.0	565.6	Done at Phantom.
7325	J2-494	3/27/2010 3:33	14.60090	144.77520	108.4	563.0	565.6	Going back to Sulfur Vent to look for bubbles or more intense venting.
7327	J2-494	3/27/2010 3:36	14.60088	144.77519	108.7	562.9	565.7	Dropping weights.
7329	J2-494	3/27/2010 3:37	14.60088	144.77519	113.7	562.4	565.5	Basket housekeeping.
7330	J2-494	3/27/2010 3:38	14.60089	144.77519	112.9	561.8	565.6	Heading back to Sulfur at 119deg and 13m away.
7332	J2-494	3/27/2010 3:40	14.60083	144.77520	114.8	556.3	562.2	Looking at the Sulfur complex. Plume away from Jason's heading of 113deg.
7333	J2-494	3/27/2010 3:40	14.60083	144.77520	115.6	556.0	562.5	Yellow smoke in center.
7334	J2-494	3/27/2010 3:40	14.60083	144.77520	115.4	555.5	562.1	Looks about the same before we went over to Phantom.
7335	J2-494	3/27/2010 3:41	14.60082	144.77519	122.1	556.7	562.0	Heading to Sulfur crust to pickup instruments.
7337	J2-494	3/27/2010 3:41	14.60080	144.77518	114.3	557.3	563.4	Is there sulfur flowing down the hill? Nothing active now.
7338	J2-494	3/27/2010 3:42	14.60078	144.77517	82.8	558.6	562.8	TXT:
7339	J2-494	3/27/2010 3:42	14.60074	144.77519	70.9	554.7	567.0	The bucket and marker in view.
7340	J2-494	3/27/2010 3:43	14.60074	144.77520	49.3	554.3	563.4	Looks like bucket is in a good sampling spot.
7342	J2-494	3/27/2010 3:43	14.60073	144.77522	25.8	555.1	560.4	TXT:
7343	J2-494	3/27/2010 3:43	14.60073	144.77522	10.9	555.1	561.5	Good view of marker and bucket.
7344	J2-494	3/27/2010 3:43	14.60074	144.77524	356.1	555.5	559.5	Looks like some more broke off.
7345	J2-494	3/27/2010 3:44	14.60074	144.77524	328.8	556.8	558.7	Positioning for recovery.
7346	J2-494	3/27/2010 3:44	14.60074	144.77524	328.8	556.8	558.7	More shrimp here again. Last time we only saw one shrimp.
7347	J2-494	3/27/2010 3:44	14.60074	144.77524	328.8	556.8	558.6	Pilot change-Scott driving now.
7349	J2-494	3/27/2010 3:46	14.60073	144.77527	314.8	555.9	558.1	Going to look into Port biobox to see if hydrophone is inside.
7350	J2-494	3/27/2010 3:47	14.60073	144.77527	314.8	555.9	557.2	Hydrophone is in the box.
7352	J2-494	3/27/2010 3:48	14.60073	144.77526	315.4	555.8	557.2	Took hydrophone out but decided to leave it in the biobox.
7353	J2-494	3/27/2010 3:48	14.60073	144.77526	311.5	556.6	558.1	Basket maintenance.
7356	J2-494	3/27/2010 3:52	14.60074	144.77528	320.0	556.8	558.7	Hydrophone is out of the biobox again and being placed in the basket.
7358	J2-494	3/27/2010 3:53	14.60074	144.77527	319.5	556.8	558.6	RECOVER: mat cage Looks like this trap is squished. Fell out of hand.
7359	J2-494	3/27/2010 3:54	14.60074	144.77527	319.5	556.8	558.8	Going to get the second one before reclaiming the first one that fell.
7361	J2-494	3/27/2010 3:55	14.60074	144.77527	319.6	556.8	558.7	RECOVER: mat cage Got the mat cage with the marker on it trap-1.
7362	J2-494	3/27/2010 3:56	14.60075	144.77529	320.8	556.8	558.9	SAMPLE: bio J494-matcage-18 at Mkr-120 recovered. Been down since J488.
7363	J2-494	3/27/2010 3:57	14.60075	144.77529	320.0	556.8	558.7	RECOVER: MTR Picking up MTR-6 at Mkr-120.
7365	J2-494	3/27/2010 3:57	14.60075	144.77530	320.0	556.8	558.7	Put MTR-6 in port biobox.
7366	J2-494	3/27/2010 3:58	14.60076	144.77530	320.1	556.8	558.8	RECOVER: mat cage Both mat cages are in biobox.

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7367	J2-494	3/27/2010 3:58	14.60076	144.77530	320.1	556.8	558.8	SAMPLE: bio J494-matcage-19 also at Mkr-10.
7369	J2-494	3/27/2010 4:00	14.60075	144.77530	311.3	556.7	558.0	Going to swap Tephra samplers at this same spot.
7372	J2-494	3/27/2010 4:03	14.60076	144.77528	335.7	555.9	558.7	Tephra Sampler D at same location that we are going to recover Tephra H at Mkr-120
7373	J2-494	3/27/2010 4:04	14.60076	144.77528	328.6	555.4	557.4	DEPLOY: tephra bucket Tephra ring around the bucket to be picked up.
7374	J2-494	3/27/2010 4:04	14.60076	144.77528	328.6	555.3	557.4	DEPLOY: tephra bucket Tephra Sampler D at same location that we are going to recover Tephra H at Mkr-120. On the ledge.
7375	J2-494	3/27/2010 4:05	14.60076	144.77528	328.5	555.3	557.2	Picking up Tephra H.
7377	J2-494	3/27/2010 4:06	14.60077	144.77529	328.8	555.7	557.4	RECOVER: tephra bucket Picked up Tephra-H at Mkr-120 and will put it in the STBD biobox.
7379	J2-494	3/27/2010 4:07	14.60077	144.77530	328.5	555.4	557.1	SAMPLE: geo Tephra-H J494-tephra-20 at Mkr-120. Been here since J492.
7380	J2-494	3/27/2010 4:08	14.60076	144.77529	327.0	555.5	557.1	Biobox closed.
7381	J2-494	3/27/2010 4:08	14.60074	144.77529	327.6	555.3	559.4	Lots of plume smoke wafting over Mkr-120.
7382	J2-494	3/27/2010 4:09	14.60074	144.77528	328.8	556.2	559.6	Next going to Styx to check on the activity.
7384	J2-494	3/27/2010 4:10	14.60073	144.77528	328.1	555.8	560.0	NAV: Doppler Reset
7385	J2-494	3/27/2010 4:10	14.60072	144.77531	344.6	552.3	560.4	Styx is 067deg at 56m away.
7387	J2-494	3/27/2010 4:12	14.60073	144.77552	49.3	554.0	556.5	Lots of plume in water. Medea has no view.
7389	J2-494	3/27/2010 4:15	14.60071	144.77568	47.5	559.3	563.5	Moving ship to get over to Styx.
7391	J2-494	3/27/2010 4:15	14.60071	144.77569	49.4	560.3	564.1	Tilted yellow lava blocks.
7392	J2-494	3/27/2010 4:15	14.60071	144.77568	49.7	560.3	563.9	Sulfur or oxidized iron?
7393	J2-494	3/27/2010 4:15	14.60071	144.77568	49.3	560.1	563.9	White is sulfur and red/orange is iron.
7394	J2-494	3/27/2010 4:16	14.60069	144.77569	49.6	560.1	565.1	Downslope from Styx doesn't look like eruptive debris.
7395	J2-494	3/27/2010 4:17	14.60068	144.77569	50.0	560.0	565.4	Looks like an old outcrop.
7397	J2-494	3/27/2010 4:18	14.60069	144.77571	14.6	554.2	567.9	Styx is at 558 and we are at 554.
7398	J2-494	3/27/2010 4:18	14.60069	144.77570	5.0	553.2	567.5	Water is clear here.
7399	J2-494	3/27/2010 4:18	14.60069	144.77571	6.8	552.6	567.8	27m at 019 to get to Styx.
7400	J2-494	3/27/2010 4:18	14.60071	144.77573	4.9	553.8	568.4	Butt cam has plume smoke in it.
7401	J2-494	3/27/2010 4:19	14.60071	144.77574	349.1	553.6	569.0	Very angular edges to the outcrop
7403	J2-494	3/27/2010 4:19	14.60074	144.77576	330.3	552.7	558.1	We are due south of Styx.
7404	J2-494	3/27/2010 4:20	14.60077	144.77580	32.7	555.1	561.6	Jason is looking at Styx but turning away.
7405	J2-494	3/27/2010 4:20	14.60081	144.77581	33.0	557.8	564.5	Driving up to headwall that faces south.
7406	J2-494	3/27/2010 4:20	14.60084	144.77579	21.7	558.9	561.3	Now moving along west facing the headwall.
7407	J2-494	3/27/2010 4:20	14.60084	144.77579	21.7	559.4	561.5	NAV: Doppler Reset
7408	J2-494	3/27/2010 4:21	14.60085	144.77580	21.4	559.8	562.3	Looking at Styx dead ahead to north.
7409	J2-494	3/27/2010 4:21	14.60085	144.77580	21.0	559.3	562.8	Up over this ledge as we approach.
7411	J2-494	3/27/2010 4:21	14.60086	144.77581	16.8	559.4	563.2	Line of venting with ash coming out.
7412	J2-494	3/27/2010 4:21	14.60086	144.77581	16.5	559.6	563.2	HD_CAM: start
7413	J2-494	3/27/2010 4:21	14.60086	144.77581	16.8	559.9	563.1	Sliding in front of us on this ridge-rim.

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7414	J2-494	3/27/2010 4:21	14.60086	144.77581	6.1	559.1	563.2	Watching explosions and falling slope.
7415	J2-494	3/27/2010 4:21	14.60086	144.77580	6.2	559.1	563.2	Huge explosions.
7416	J2-494	3/27/2010 4:22	14.60086	144.77580	6.2	558.9	563.3	Holding camera steady.
7417	J2-494	3/27/2010 4:22	14.60086	144.77580	6.1	559.0	563.3	Big tephra (or rocks) bubbling in the center.
7418	J2-494	3/27/2010 4:22	14.60086	144.77580	2.8	559.0	563.3	Pan a little left to center.
7419	J2-494	3/27/2010 4:22	14.60086	144.77580	0.9	559.2	563.4	Lots of tephra in center.
7420	J2-494	3/27/2010 4:22	14.60086	144.77580	1.2	559.3	563.4	Huge explosions.
7421	J2-494	3/27/2010 4:22	14.60086	144.77580	1.1	559.4	563.4	WOW.
7422	J2-494	3/27/2010 4:22	14.60086	144.77580	1.5	559.3	563.4	Watching the venting.
7423	J2-494	3/27/2010 4:23	14.60086	144.77580	1.1	559.1	563.4	Large pieces of rock and ground swelling.
7424	J2-494	3/27/2010 4:23	14.60086	144.77580	1.1	559.2	563.4	Its about time!
7426	J2-494	3/27/2010 4:23	14.60086	144.77580	1.2	559.3	563.4	Lots of black tephra downslope of venting on slope.
7427	J2-494	3/27/2010 4:24	14.60086	144.77580	1.2	558.8	563.2	We have 40 minutes left in the dive.
7428	J2-494	3/27/2010 4:24	14.60086	144.77580	1.0	558.3	563.3	Sulfur raining down in the pilot cam.
7430	J2-494	3/27/2010 4:25	14.60086	144.77581	1.0	558.4	563.3	Observing the vent.
7431	J2-494	3/27/2010 4:26	14.60086	144.77581	1.2	558.3	563.2	Bringing basket back in to observe.
7432	J2-494	3/27/2010 4:26	14.60086	144.77581	1.1	558.4	562.9	EM122 was not showing any impressive plume.
7433	J2-494	3/27/2010 4:26	14.60086	144.77581	1.2	558.3	562.9	Big explosion.
7434	J2-494	3/27/2010 4:26	14.60085	144.77581	1.3	558.3	563.0	Good view here.
7436	J2-494	3/27/2010 4:28	14.60086	144.77580	1.3	558.5	562.9	Dueling vents at this volcano. Seems like each time we visit the seafloor a different vent is erupting.
7437	J2-494	3/27/2010 4:29	14.60086	144.77580	1.6	557.9	563.0	Tephra and bubbles erupting from Styx.
7439	J2-494	3/27/2010 4:29	14.60086	144.77580	1.1	557.8	562.9	This is amazing.
7440	J2-494	3/27/2010 4:30	14.60086	144.77580	1.3	558.1	563.0	This is a powerful eruption.
7442	J2-494	3/27/2010 4:31	14.60086	144.77580	1.1	558.1	562.9	This looks like it is a couple meters across. We are almost at the red flash level if not for all the smoke.
7443	J2-494	3/27/2010 4:32	14.60086	144.77580	1.1	558.2	562.9	This vent is amazing. Lots of gas bubbles right now.
7444	J2-494	3/27/2010 4:32	14.60086	144.77580	1.2	558.3	562.9	Tephra explosions here.
7446	J2-494	3/27/2010 4:33	14.60086	144.77580	1.1	558.3	562.9	The smoke seems to be coming out of a bigger area than is erupting.
7447	J2-494	3/27/2010 4:33	14.60086	144.77580	3.4	558.3	563.0	Depth here is 558m.
7448	J2-494	3/27/2010 4:34	14.60085	144.77579	18.6	558.8	563.4	Here comes another eruption and a fresh wave of bubbles.
7449	J2-494	3/27/2010 4:34	14.60084	144.77579	18.6	558.8	563.6	We are in the smoke now.
7450	J2-494	3/27/2010 4:34	14.60084	144.77579	18.8	558.7	563.7	lasers off now.
7452	J2-494	3/27/2010 4:36	14.60082	144.77576	18.8	559.5	561.1	The level of activity has decreased all of a sudden.
7453	J2-494	3/27/2010 4:36	14.60084	144.77576	17.2	560.0	561.9	We can go on in for a scoop now.
7454	J2-494	3/27/2010 4:37	14.60084	144.77577	17.4	560.4	561.9	HD_CAM: stop
7458	J2-494	3/27/2010 4:42	14.60082	144.77578	2.2	562.5	563.5	We were attempting to take a scoop but the field of view has been overwhelmed by tephra and smoke.

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7459	J2-494	3/27/2010 4:43	14.60082	144.77578	15.1	561.3	562.3	NAV: Location Styx Vent on dive J494. Z=560m. 144.77578 14.60082. We are south about 10m from the old position.
7461	J2-494	3/27/2010 4:44	14.60086	144.77581	19.0	559.4	562.4	There is the vent in front and can scoop below that.
7462	J2-494	3/27/2010 4:45	14.60085	144.77581	27.5	561.0	562.2	Looks like a good sample site.
7464	J2-494	3/27/2010 4:45	14.60085	144.77581	20.7	557.7	563.1	Saw big rock roll down the hill.
7465	J2-494	3/27/2010 4:47	14.60083	144.77576	309.2	550.3	563.9	SAMPLE: geo We are up above the vent to the left.
7467	J2-494	3/27/2010 4:47	14.60078	144.77581	318.8	555.9	564.4	Going down to sample.
7468	J2-494	3/27/2010 4:48	14.60079	144.77580	321.1	560.6	566.6	Alcove visible in the sonar.
7469	J2-494	3/27/2010 4:48	14.60081	144.77579	325.1	559.8	565.7	We are a couple meters deeper than original depth of vent.
7470	J2-494	3/27/2010 4:49	14.60085	144.77578	328.6	560.3	563.1	Just below the vent here-good place to scoop.
7472	J2-494	3/27/2010 4:49	14.60085	144.77578	327.9	560.8	562.9	SAMPLE: geo J494-tephra-21. Scoop of tephra from the base of Styx Vent. Z=560m. 144.77578 14.60085. We are south about 10m from the Styx position.
7473	J2-494	3/27/2010 4:50	14.60085	144.77578	328.8	559.2	563.2	Depth was 561 for J494-tephra-21.
7474	J2-494	3/27/2010 4:50	14.60086	144.77578	329.2	558.6	563.0	Scoop stowed in basket center.
7475	J2-494	3/27/2010 4:51	14.60086	144.77578	338.2	558.4	562.6	Going to try to approach vent for fluid sampling.
7477	J2-494	3/27/2010 4:51	14.60088	144.77578	347.6	558.8	561.1	There it is.
7478	J2-494	3/27/2010 4:51	14.60088	144.77579	350.4	558.3	561.6	Saw red flash in one of the pilot cams.
7479	J2-494	3/27/2010 4:51	14.60087	144.77579	8.8	557.9	561.2	Getting a blackout again.
7480	J2-494	3/27/2010 4:51	14.60087	144.77580	25.4	557.6	561.1	Huge explosion
7481	J2-494	3/27/2010 4:51	14.60087	144.77580	45.6	557.3	560.9	Bubbles
7482	J2-494	3/27/2010 4:52	14.60087	144.77579	70.4	555.8	559.9	Thick smoke-black.
7483	J2-494	3/27/2010 4:52	14.60086	144.77578	60.1	554.0	560.0	Coming up and backing out.
7484	J2-494	3/27/2010 4:52	14.60085	144.77579	31.5	552.5	561.0	Not sure if there was red flashing in the pilot cam.
7485	J2-494	3/27/2010 4:52	14.60083	144.77579	28.8	552.8	560.2	Came up to 10m altitude (maybe up 5m).
7487	J2-494	3/27/2010 4:53	14.60081	144.77580	33.3	560.8	682.0	Lots of tephra coming down now.
7488	J2-494	3/27/2010 4:53	14.60081	144.77580	39.2	560.7	703.3	Tephra is on the basket.
7490	J2-494	3/27/2010 4:55	14.60085	144.77580	31.4	560.3	562.4	Looking at the lava wall again SW of the venting.
7491	J2-494	3/27/2010 4:56	14.60085	144.77581	29.5	560.4	562.3	Big explosions here.
7492	J2-494	3/27/2010 4:56	14.60085	144.77581	29.8	560.3	562.3	HD_CAM: start
7493	J2-494	3/27/2010 4:56	14.60085	144.77581	30.0	560.1	561.9	Pulsing explosions and swelling cone.
7494	J2-494	3/27/2010 4:56	14.60085	144.77581	32.6	560.7	561.9	Huge and violent.
7495	J2-494	3/27/2010 4:56	14.60085	144.77581	32.0	560.6	561.9	Shaking and swelling and deflating.
7496	J2-494	3/27/2010 4:57	14.60085	144.77581	31.7	560.5	561.9	Large tephra being thrown in air.
7498	J2-494	3/27/2010 4:57	14.60085	144.77580	32.2	560.6	561.9	Very intense. Moved the big rock.
7499	J2-494	3/27/2010 4:57	14.60085	144.77580	31.7	560.6	561.9	There it goes again.
7500	J2-494	3/27/2010 4:58	14.60085	144.77580	31.9	560.6	561.9	Here it comes at us.
7501	J2-494	3/27/2010 4:58	14.60085	144.77580	32.0	560.7	561.9	Big plume.
7502	J2-494	3/27/2010 4:58	14.60085	144.77580	32.4	560.7	561.9	Sonar shows the plume cloud.

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7503	J2-494	3/27/2010 4:59	14.60085	144.77580	32.3	560.6	561.8	Smoke coming at us again.
7505	J2-494	3/27/2010 4:59	14.60085	144.77580	33.0	560.7	561.8	Spots of sulfur on the brow cam.
7506	J2-494	3/27/2010 5:00	14.60085	144.77580	45.6	560.4	561.4	HD_CAM: stop
7507	J2-494	3/27/2010 5:01	14.60084	144.77580	65.3	560.4	701.4	Smoke is clearing up again.
7508	J2-494	3/27/2010 5:01	14.60084	144.77580	66.2	560.4	641.3	Tumbling rock again in pilot cam.
7509	J2-494	3/27/2010 5:02	14.60084	144.77580	64.7	560.4	686.0	Pilot cam is best view.
7510	J2-494	3/27/2010 5:02	14.60085	144.77580	64.0	560.4	718.4	HD_CAM: start
7511	J2-494	3/27/2010 5:02	14.60085	144.77580	63.3	560.5	718.4	Big boulder came out.
7512	J2-494	3/27/2010 5:02	14.60085	144.77581	59.2	560.6	698.2	Sonar is clear now and view is clearing.
7513	J2-494	3/27/2010 5:03	14.60085	144.77580	59.2	560.6	687.5	Jason has been sitting on the bottom all this time.
7514	J2-494	3/27/2010 5:04	14.60085	144.77580	59.3	560.7	689.8	We are 2m below the vent depth and can see it above us on the sci cam.
7515	J2-494	3/27/2010 5:05	14.60085	144.77579	59.2	560.6	692.6	Plume is swinging away again.
7516	J2-494	3/27/2010 5:06	14.60086	144.77580	34.0	559.4	561.8	Moving in to plume area.
7517	J2-494	3/27/2010 5:06	14.60087	144.77581	20.4	559.6	562.1	Bubbles and good plume.
7518	J2-494	3/27/2010 5:06	14.60087	144.77581	14.2	560.2	562.3	Yellow again.
7519	J2-494	3/27/2010 5:06	14.60087	144.77581	21.8	560.4	562.1	Getting wand.
7520	J2-494	3/27/2010 5:07	14.60087	144.77581	25.2	560.2	561.9	Big tephra explosion very close by.
7522	J2-494	3/27/2010 5:07	14.60087	144.77581	25.4	560.1	561.9	Sonar has big tephra and watching huge tephra explosions.
7523	J2-494	3/27/2010 5:07	14.60087	144.77581	24.9	560.1	561.9	Here comes the white out.
7524	J2-494	3/27/2010 5:07	14.60087	144.77581	24.2	560.0	561.9	Whoa.
7525	J2-494	3/27/2010 5:07	14.60087	144.77581	23.8	559.9	562.1	TXT:
7526	J2-494	3/27/2010 5:07	14.60087	144.77581	24.2	559.4	562.2	TXT:
7527	J2-494	3/27/2010 5:07	14.60087	144.77581	24.6	558.7	562.0	Too many rocks in the basket.
7528	J2-494	3/27/2010 5:07	14.60085	144.77579	21.6	555.9	561.4	Sonar shows lots of tephra in the water.
7529	J2-494	3/27/2010 5:08	14.60083	144.77579	20.6	555.4	560.3	HD_CAM: stop
7530	J2-494	3/27/2010 5:08	14.60081	144.77578	24.6	559.5	560.8	Basket is shaking.
7531	J2-494	3/27/2010 5:08	14.60081	144.77578	19.1	559.4	560.2	Tephra is all over the fluid sampler.
7532	J2-494	3/27/2010 5:09	14.60082	144.77579	17.9	560.0	720.7	Rock on top of wand-fresh from the oven.
7533	J2-494	3/27/2010 5:10	14.60081	144.77579	16.7	560.0	727.4	SAMPLE: geo Getting rock from wand and putting it in the weight basket. J494-rock-22 at Styx.
7534	J2-494	3/27/2010 5:10	14.60081	144.77579	18.1	560.0	727.4	J494-rock-22 came into the basket during the last explosion.
7535	J2-494	3/27/2010 5:11	14.60081	144.77579	22.1	559.9	717.7	Not going to try fluid sampling here.
7536	J2-494	3/27/2010 5:11	14.60081	144.77579	22.8	559.9	687.2	Watching event tumbling down the slope.
7537	J2-494	3/27/2010 5:11	14.60081	144.77579	22.2	559.9	687.2	HD_CAM: start
7538	J2-494	3/27/2010 5:12	14.60081	144.77579	21.2	560.0	707.3	Seeing bursts of activity down erupting downslope.
7539	J2-494	3/27/2010 5:12	14.60082	144.77578	22.1	559.9	710.6	Small bench at the most intense venting but not much-so steep on the slope.
7540	J2-494	3/27/2010 5:13	14.60082	144.77578	21.8	560.0	704.8	Getting out the GTB funnel sampler in case we can capture some gas.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7541	J2-494	3/27/2010 5:13	14.60082	144.77580	16.8	559.6	563.8	Looks like a pit on the platform with big explosions as we view from above.
7542	J2-494	3/27/2010 5:14	14.60083	144.77580	17.3	560.5	564.6	Lasers on.
7543	J2-494	3/27/2010 5:14	14.60084	144.77580	16.8	561.4	563.8	Great explosions or tephra and rock tumbling downslope.
7544	J2-494	3/27/2010 5:14	14.60084	144.77580	18.1	561.3	563.6	good view of slide in sci cam and pilot cam.
7545	J2-494	3/27/2010 5:14	14.60084	144.77580	18.3	561.2	563.6	More slides.
7546	J2-494	3/27/2010 5:14	14.60084	144.77580	18.0	560.7	564.0	Butt cam shows rocks piling at bottom.
7547	J2-494	3/27/2010 5:14	14.60084	144.77580	18.6	560.5	564.3	Rocks sliding downslope in pilot cam.
7548	J2-494	3/27/2010 5:15	14.60083	144.77579	18.7	560.3	564.0	big explosion in sci cam.
7550	J2-494	3/27/2010 5:15	14.60083	144.77580	18.0	560.3	564.3	Medea has no view-all plume.
7551	J2-494	3/27/2010 5:16	14.60082	144.77580	18.2	559.1	563.2	That's it-out of time.
7552	J2-494	3/27/2010 5:16	14.60082	144.77580	18.1	558.7	563.2	HD_CAM: stop
7553	J2-494	3/27/2010 5:16	14.60081	144.77579	18.1	558.1	562.0	About to come up.
7554	J2-494	3/27/2010 5:16	14.60081	144.77579	18.1	557.2	561.6	TXT:
7556	J2-494	3/27/2010 5:18	14.60069	144.77588	18.2	549.7	559.1	Looks like a tephra-rock just aft of the tephra bucket-another rock from these explosions perhaps.
7557	J2-494	3/27/2010 5:18	14.60068	144.77588	18.5	549.3	559.0	Dropping weight.
7558	J2-494	3/27/2010 5:18	14.60074	144.77589	14.6	546.1	563.6	Basket retracting.
7559	J2-494	3/27/2010 5:18	14.60078	144.77590	14.3	546.2	562.9	JASON: Jason off bottom
7560	J2-494	3/27/2010 5:19	14.60082	144.77590	17.5	545.8	559.9	Going through the plume with Jason
7562	J2-494	3/27/2010 5:20	14.60088	144.77592	14.7	526.9	539.7	All black.
7563	J2-494	3/27/2010 5:20	14.60088	144.77592	14.7	526.9	539.7	Lost power to ROV
7564	J2-494	3/27/2010 5:20	14.60088	144.77592	14.7	526.9	539.7	Bringing it up.
7565	J2-494	3/27/2010 5:20	14.60088	144.77592	14.7	526.9	539.7	Vehicle is out of power.
7566	J2-494	3/27/2010 5:21	14.60088	144.77592	14.7	526.9	539.7	Moving ship to deep water-no power.
7568	J2-494	3/27/2010 5:22	14.60088	144.77592	14.7	526.9	539.7	Winch cam shows that Medea is being pulled up.
7569	J2-494	3/27/2010 5:23	14.60088	144.77592	14.7	526.9	539.7	Jason is light in weight.
7572	J2-494	3/27/2010 5:26	14.60088	144.77592	14.7	526.9	539.7	Still no power-Jason
7573	J2-494	3/27/2010 5:26	14.60088	144.77592	14.7	526.9	539.7	All dead-no battery.
7574	J2-494	3/27/2010 5:27	14.60088	144.77592	14.7	526.9	539.7	350m on the wire.
7577	J2-494	3/27/2010 5:30	14.60088	144.77592	14.7	526.9	539.7	Medea is coming up at 20m/min.
7578	J2-494	3/27/2010 5:30	14.60088	144.77592	14.7	526.9	539.7	Ground fault somewhere.
7581	J2-494	3/27/2010 5:34	14.60088	144.77592	14.7	526.9	539.7	Passing 150m out.
7583	J2-494	3/27/2010 5:35	14.60088	144.77592	14.7	526.9	539.7	Passing 130m.
7584	J2-494	3/27/2010 5:36	14.60088	144.77592	14.7	526.9	539.7	Ship is at .5. Wire up at 20m/min.
7589	J2-494	3/27/2010 5:45	14.60088	144.77592	14.7	526.9	539.7	Tether in sight.
7592	J2-494	3/27/2010 5:47	14.60088	144.77592	14.7	526.9	539.7	Jason on surface.
7595	J2-494	3/27/2010 5:52	14.60088	144.77592	14.7	526.9	539.7	Medea is already on deck.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7597	J2-494	3/27/2010 5:53	14.60088	144.77592	14.7	526.9	539.7	JASON: Jason out of water
7598	J2-494	3/27/2010 5:54	14.60088	144.77592	14.7	526.9	539.7	JASON: Jason on deck
7599	J2-494	3/27/2010 5:54	14.60088	144.77592	14.7	526.9	539.7	End dive J2-494.

Table 6.5-9 JASON Dive J2-495

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7678	J2-495	3/28/2010 17:56	14.54998	144.73336	126.9	-0.1	1.0	Dive J2-495 at NWRota-1. This is the last of our dives here on the expedition.
7679	J2-495	3/28/2010 17:57	14.54997	144.73334	161.2	-0.1	1.0	Main goals: Observations at eruptive vents suctions recover everything. Tools: Multi-chamber suction sampler.
7680	J2-495	3/28/2010 17:57	14.54997	144.73334	164.6	-0.1	1.0	Basket: milk crates; 2 scoop bags * 2 markers; 1 gas-tight with funnel and 1 regular gas-tight. 2 major samplers; bucket for big mat cage. 1 small tephra bucket.
7681	J2-495	3/28/2010 17:59	14.54997	144.73334	168.3	-0.2	0.9	Tasks: Start dive ~100m S of Phantom. Drive upslope then survey all eruptive vents. Watch Phantom/ Sulfur Vent; Brimstone; Styx; Charon for 1 hour each.
7683	J2-495	3/28/2010 18:00	14.55001	144.73330	288.1	-0.2	156.4	JASON: Jason in water
7684	J2-495	3/28/2010 18:03	14.54995	144.73350	258.1	1.1	2.1	JASON: Medea in water
7685	J2-495	3/28/2010 18:04	14.55001	144.73382	264.7	8.0	185.8	Tasks cont: Recover tephra bucket @Sulfur Crust and collect sulfur rocks. Collect lava rocks @Styx; lava from Phantom.
7686	J2-495	3/28/2010 18:04	14.55002	144.73391	263.3	14.2	182.8	Tasks cont: Opportunistic Major
7687	J2-495	3/28/2010 18:05	14.55002	144.73402	257.9	23.3	204.3	Tasks cont: Drive SE to Mkr164 for suction sample of shrimp. Go to Mkr110; recover shrimp trap
7688	J2-495	3/28/2010 18:06	14.55008	144.73420	250.3	45.6	200.5	Tasks cont: Explore eastern slide scar. Transit to Mkr109; recover shrimp trap; MTR and mat cage. Transit to summit; recover hydrophone; MTR and tephra sampler. Scoop tephra N or summit.
7689	J2-495	3/28/2010 18:48	14.59867	144.77513	43.4	696.7	717.7	JASON: Jason on bottom
7690	J2-495	3/28/2010 18:48	14.59872	144.77516	43.5	696.3	711.2	The seafloor is in sight.
7692	J2-495	3/28/2010 18:50	14.59878	144.77519	43.3	694.1	708.3	We're south of the cone peak driving up the western ridge-like feature. The seafloor here is covered with volcanoclastic sediments and very steep.
7694	J2-495	3/28/2010 18:52	14.59878	144.77519	43.0	694.1	706.2	Performing checks on Jason.
7696	J2-495	3/28/2010 18:53	14.59877	144.77518	43.1	694.1	706.5	We're going to head upslope (to the north).
7697	J2-495	3/28/2010 18:53	14.59878	144.77517	2.1	694.0	706.4	NAV: Doppler Reset
7699	J2-495	3/28/2010 18:54	14.59873	144.77515	356.8	694.8	710.8	We're moving the ship 100m to the north.
7700	J2-495	3/28/2010 18:56	14.59905	144.77513	356.2	675.8	688.7	Seeing lighter patches on this ridge. Looks like rubble to the left and to the right it's a lava flow. Doesn't look like pillows.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7702	J2-495	3/28/2010 18:56	14.59907	144.77518	357.6	670.8	686.2	Dike-like looking ridge.
7703	J2-495	3/28/2010 18:58	14.59908	144.77533	18.7	671.8	683.0	In the brow cam it looks like there may be some lobates here. In front of us on the pilot cam it looks eroded.
7705	J2-495	3/28/2010 18:58	14.59906	144.77541	20.3	671.6	682.5	Bill thinks it is not young from the last eruption. It's really massive and eroded. Perhaps sheet flows on a really steep slope.
7706	J2-495	3/28/2010 18:59	14.59906	144.77541	23.6	671.8	683.2	The HD cam is pretty dark.
7707	J2-495	3/28/2010 18:59	14.59910	144.77543	18.7	672.1	681.1	Driving forward to see more in the science cam.
7708	J2-495	3/28/2010 19:00	14.59916	144.77541	18.0	671.7	675.8	White something on the lavas ahead of us. Sulfur?
7710	J2-495	3/28/2010 19:00	14.59916	144.77542	18.5	671.7	675.9	The white on the rocks is probably sulfur.
7711	J2-495	3/28/2010 19:02	14.59918	144.77545	17.7	671.7	673.8	Seeing iron oxide on the sediments. Also seeing a shrimp. Probably the pelagic shrimp. Lots of those worms in the water column.
7713	J2-495	3/28/2010 19:03	14.59919	144.77544	17.2	671.7	673.8	BIOLOGY: other pelagic worms all over the place in the view.
7715	J2-495	3/28/2010 19:04	14.59919	144.77542	16.9	670.8	674.5	SAMPLE: geo J495-rock-1. Small rock from the cone. Probably not in place. Looks slightly altered. 144-46.5255 14-35.9521. Z=672.
7716	J2-495	3/28/2010 19:06	14.59916	144.77536	5.1	670.7	674.9	Lateralling to the left. Passing over bulbous flow with elongate ridge.
7718	J2-495	3/28/2010 19:07	14.59914	144.77528	2.7	670.4	678.9	Moving to the left (west) of this ridge.
7719	J2-495	3/28/2010 19:07	14.59915	144.77524	14.6	670.4	678.6	We're looking at outcrop ridges.
7720	J2-495	3/28/2010 19:08	14.59917	144.77521	15.8	669.2	676.8	Iron oxide staining and sulfur staining on this ridge.
7721	J2-495	3/28/2010 19:08	14.59919	144.77518	14.8	665.7	677.1	Continuing to lateral west now.
7723	J2-495	3/28/2010 19:09	14.59923	144.77513	19.2	666.0	674.1	Now we are over rubble heading upslope.
7724	J2-495	3/28/2010 19:10	14.59935	144.77508	17.9	661.6	667.0	Volcanic rock piled up on this talus slope. Looks like pillow breccia. None of it is intact. It's all boulders. Probably came downslope from the vents above.
7725	J2-495	3/28/2010 19:10	14.59935	144.77511	18.9	660.3	666.4	Lateralling back to the right and moving upslope.
7727	J2-495	3/28/2010 19:12	14.59928	144.77536	15.3	658.4	665.5	We're looking at part of this ridge that looks like an old lava flow that has been eroded on either side. Lots of iron oxide (?) on the ridge and white seds interspersed.
7728	J2-495	3/28/2010 19:12	14.59928	144.77539	19.8	658.3	665.9	Heading upslope more.
7730	J2-495	3/28/2010 19:12	14.59935	144.77542	23.9	651.6	661.0	Very steep slope.
7731	J2-495	3/28/2010 19:14	14.59946	144.77529	22.3	646.2	654.5	These lavas still look like they are older. Massive flow.
7733	J2-495	3/28/2010 19:14	14.59953	144.77523	39.5	644.3	652.1	This looks like cliffs and almost vertical.
7734	J2-495	3/28/2010 19:14	14.59954	144.77522	37.2	643.6	651.7	We just lost the HD.
7735	J2-495	3/28/2010 19:15	14.59958	144.77518	40.8	643.8	649.1	HD Cam went black. Restarting the camera.
7736	J2-495	3/28/2010 19:16	14.59968	144.77523	43.1	630.6	641.7	Continuing upslope. Volcanic talus on this steep slope. Most likely came down from the eruptive vents above.
7737	J2-495	3/28/2010 19:16	14.59969	144.77524	43.3	628.2	640.7	HD Cam back in business.
7739	J2-495	3/28/2010 19:17	14.59985	144.77538	359.9	609.1	623.8	All intact parts of the volcano on this cone. They aren't a part of the recent eruptive events. It's all really massive. Looks like it has been eroded by slides.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7740	J2-495	3/28/2010 19:17	14.59993	144.77536	358.2	606.8	620.0	We are approaching the top of this wishbone where the 2 ridges come together.
7741	J2-495	3/28/2010 19:18	14.60005	144.77534	358.6	603.1	611.7	Looked like thick flows that have come downslope. There were hints of layering parallel to the slope.
7742	J2-495	3/28/2010 19:18	14.60008	144.77536	1.8	602.2	608.9	Zooming in on the white stuff for a moment.
7744	J2-495	3/28/2010 19:18	14.60009	144.77538	355.4	600.3	607.1	That is most like sulfur particles that have rained down from above.
7745	J2-495	3/28/2010 19:20	14.60016	144.77541	359.1	596.4	601.8	Incredibly steep.
7747	J2-495	3/28/2010 19:20	14.60021	144.77542	357.7	592.5	599.6	The stuff that has hydrothermal venting through it gets weak and unstable. Perhaps that is why the eastern part of the volcano near the summit gave way.
7748	J2-495	3/28/2010 19:21	14.60024	144.77542	359.2	591.1	597.7	Our first target will be Styx.
7749	J2-495	3/28/2010 19:21	14.60028	144.77544	359.5	587.5	595.6	Looks like big rocks coated in sulfur.
7751	J2-495	3/28/2010 19:22	14.60035	144.77545	358.2	582.4	590.1	This stuff in front of us looks more like stuff that would be coming out of an eruptive vent. More blocky lava.
7753	J2-495	3/28/2010 19:25	14.60047	144.77547	358.8	571.4	581.2	Still moving up this steep slope.
7754	J2-495	3/28/2010 19:26	14.60053	144.77550	358.6	568.2	575.2	The slope here is nearly vertical.
7755	J2-495	3/28/2010 19:26	14.60053	144.77550	359.5	566.2	574.7	Seeing a plume in Medea's camera.
7757	J2-495	3/28/2010 19:27	14.60072	144.77549	4.1	556.0	563.0	Impressive plume on the Medea cam.
7758	J2-495	3/28/2010 19:27	14.60076	144.77555	36.2	552.8	557.7	Styx vent is at 048- 40m away to Styx.
7759	J2-495	3/28/2010 19:28	14.60084	144.77560	33.3	550.0	556.2	Lots of sulfur falling through the water. We're seeing the plume here at 550m.
7761	J2-495	3/28/2010 19:29	14.60091	144.77573	352.0	547.5	559.2	Styx vent just off to the right of us.
7762	J2-495	3/28/2010 19:29	14.60092	144.77574	353.6	547.6	559.1	We're there and it is flowing.
7763	J2-495	3/28/2010 19:29	14.60090	144.77575	358.3	550.3	561.7	The vent is very active.
7764	J2-495	3/28/2010 19:29	14.60087	144.77577	357.0	551.4	561.1	Lots of plumage. We are losing visibility.
7765	J2-495	3/28/2010 19:30	14.60087	144.77579	358.4	553.0	565.2	We're in a white-out right now.
7767	J2-495	3/28/2010 19:30	14.60087	144.77579	0.8	555.0	564.9	Looks like tephra falling out of the plume.
7768	J2-495	3/28/2010 19:30	14.60086	144.77580	357.4	555.0	566.0	Our depth is 555m.
7769	J2-495	3/28/2010 19:31	14.60086	144.77580	357.6	553.1	566.3	The ship went a bit too far north. Want them to head 25m south.
7770	J2-495	3/28/2010 19:31	14.60087	144.77580	357.6	552.3	565.3	Waiting on the ship. The tether is too tight to come downslope right now. Will wait it out.
7772	J2-495	3/28/2010 19:32	14.60082	144.77583	357.8	549.2	561.3	Seeing lots of tephra in the plume. Maybe some sulfur spherules also.
7773	J2-495	3/28/2010 19:34	14.60079	144.77585	357.7	548.6	558.8	Very impressive plume in Medea cam.
7774	J2-495	3/28/2010 19:34	14.60080	144.77585	357.6	548.5	558.8	We're near the top of this plume. Jason depth is 549m.
7776	J2-495	3/28/2010 19:35	14.60080	144.77586	357.6	548.5	559.1	Bill would like to record the Medea cam on the DVCam for awhile.
7777	J2-495	3/28/2010 19:36	14.60081	144.77587	359.4	548.5	564.9	Right now we are switching Medea cam in the HDCam.
7778	J2-495	3/28/2010 19:36	14.60081	144.77587	358.6	548.4	560.7	Lots of bubbles visible in the Medea view.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
7780	J2-495	3/28/2010 19:36	14.60082	144.77588	359.8	546.4	566.1	Perfect timing for swapping out the video feed from the HDCam to Medea cam.
7781	J2-495	3/28/2010 19:37	14.60082	144.77592	17.0	545.6	563.7	Medea's altitude is 48m.
7782	J2-495	3/28/2010 19:37	14.60084	144.77589	17.8	543.7	560.7	Switching video recording on the DVCam back to HDCam.
7783	J2-495	3/28/2010 19:38	14.60093	144.77574	11.0	543.1	558.9	We're 16m off the bottom still waiting for Medea and the ship.
7785	J2-495	3/28/2010 19:38	14.60089	144.77574	358.6	543.6	559.3	Will is backing downslope a bit.
7787	J2-495	3/28/2010 19:40	14.60082	144.77578	330.0	559.0	561.5	NAV: Doppler Reset
7789	J2-495	3/28/2010 19:42	14.60095	144.77571	330.1	550.6	558.9	We briefly saw a wall under the plume.
7790	J2-495	3/28/2010 19:44	14.60088	144.77582	332.0	546.5	567.6	The vent is pumping out plumage and tephra. See bubbles in the brow cam. We are pretty much in a white-out right now.
7792	J2-495	3/28/2010 19:44	14.60089	144.77581	344.1	552.7	566.0	Maneuvering around trying to find a position where we can observe the vent.
7793	J2-495	3/28/2010 19:45	14.60090	144.77581	343.7	553.1	566.0	The wall is right in front of us.
7794	J2-495	3/28/2010 19:45	14.60090	144.77577	353.5	554.8	562.9	The vent is to the left of us and down below. It seems to be deeper than the last time we were here.
7795	J2-495	3/28/2010 19:45	14.60091	144.77578	351.5	557.3	563.5	HD_CAM: start Styx vent.
7796	J2-495	3/28/2010 19:46	14.60091	144.77576	344.2	559.2	562.8	The vent is 10 meters deeper than it was on our last visit.
7798	J2-495	3/28/2010 19:47	14.60092	144.77577	347.6	558.5	562.6	We had the incorrect depth previously. It is actually at the same depth as on the previous dive: 558m.
7799	J2-495	3/28/2010 19:47	14.60093	144.77577	347.7	559.1	562.5	The vent is throwing out plumage; tephra; looks like a bit of sulfur in the plume.
7800	J2-495	3/28/2010 19:48	14.60092	144.77576	347.6	558.6	563.1	Falling rocks in the HDcam. The whole base of the vent is undulating. It is extremely active.
7801	J2-495	3/28/2010 19:48	14.60092	144.77576	347.7	558.5	563.1	Throwing out some lava rocks.
7803	J2-495	3/28/2010 19:49	14.60092	144.77576	347.9	558.5	563.1	The wall is pretty much right in front of us. We are 3 meters from the wall.
7804	J2-495	3/28/2010 19:49	14.60092	144.77577	347.9	558.5	563.1	The cone is about a meter across Bill estimates.
7805	J2-495	3/28/2010 19:50	14.60092	144.77577	347.9	558.5	563.1	lasers on. The base of the vent is about a meter across.
7806	J2-495	3/28/2010 19:50	14.60092	144.77577	348.7	558.4	563.1	Lasers off.
7807	J2-495	3/28/2010 19:50	14.60092	144.77577	347.8	558.5	563.2	We're just hanging back from the vent a bit observing.
7809	J2-495	3/28/2010 19:51	14.60091	144.77578	347.8	558.4	563.1	We are sort of in a lull here.
7810	J2-495	3/28/2010 19:52	14.60092	144.77578	347.9	558.5	563.1	Revving up here again. The plume is getting a bit more vigorous.
7811	J2-495	3/28/2010 19:52	14.60092	144.77578	347.8	558.5	563.2	Starting to see some bursts now.
7813	J2-495	3/28/2010 19:52	14.60092	144.77577	347.8	558.5	563.2	Occasional shrimp swimming by. also see a scaleworm in the view.
7814	J2-495	3/28/2010 19:52	14.60092	144.77577	347.7	558.5	563.2	Bill wants to stay zoomed out most of the time.
7815	J2-495	3/28/2010 19:53	14.60093	144.77577	347.7	558.5	563.3	Nick is going to try to use the video to calculate the velocities of stuff coming out of the vent.
7816	J2-495	3/28/2010 19:53	14.60093	144.77577	347.8	558.5	563.3	We are into a curst now.

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7817	J2-495	3/28/2010 19:54	14.60093	144.77577	347.7	558.6	563.2	The plume is getting into the lights. Lots of tephra falling out of the plume now.
7818	J2-495	3/28/2010 19:54	14.60093	144.77577	347.7	558.5	563.4	Wow. The action has really increased.
7819	J2-495	3/28/2010 19:54	14.60093	144.77577	348.2	559.2	563.3	Our view is totally plume now.
7821	J2-495	3/28/2010 19:54	14.60093	144.77577	347.6	558.4	563.2	The plume is coming at us and has enveloped the vehicle.
7822	J2-495	3/28/2010 19:54	14.60092	144.77578	346.1	558.3	564.3	Jason is backing up now. We have no visibility.
7823	J2-495	3/28/2010 19:55	14.60088	144.77581	352.0	561.0	567.3	We see the wall ahead of us again.
7824	J2-495	3/28/2010 19:55	14.60088	144.77578	339.3	561.1	567.5	We have moved to the east a bit.
7825	J2-495	3/28/2010 19:56	14.60087	144.77582	279.3	563.8	569.9	The vent has walls on either side.
7826	J2-495	3/28/2010 19:56	14.60087	144.77583	282.6	564.3	570.5	We are now looking at the vent from the east.
7828	J2-495	3/28/2010 19:57	14.60085	144.77584	327.5	566.6	570.3	We see the wall in front of us. Now the vent is off to our east.
7829	J2-495	3/28/2010 19:57	14.60084	144.77584	320.6	566.0	570.7	Now straight ahead of us.
7830	J2-495	3/28/2010 19:57	14.60083	144.77584	345.3	565.6	567.7	See big outcrop in the butt cam.
7831	J2-495	3/28/2010 19:57	14.60086	144.77582	12.5	562.7	567.6	We're trying to locate the vent again.
7832	J2-495	3/28/2010 19:58	14.60089	144.77578	16.6	556.2	564.9	The plume is in front of us - and so is the wall.
7834	J2-495	3/28/2010 19:58	14.60091	144.77576	348.5	558.4	564.5	We see the alcove the vent sits in on the sonar.
7835	J2-495	3/28/2010 19:59	14.60092	144.77575	347.5	555.9	563.2	The eruptive process waxes and wanes.
7836	J2-495	3/28/2010 19:59	14.60092	144.77576	350.6	556.7	563.6	Right now we are seeing lots of action from the vent.
7837	J2-495	3/28/2010 19:59	14.60093	144.77576	350.1	558.1	562.8	The occasional shrimp swims by.
7838	J2-495	3/28/2010 20:00	14.60094	144.77576	350.3	557.2	562.9	The vent is throwing out tephra rocks. The base is unstable and occasionally we see it move.
7840	J2-495	3/28/2010 20:01	14.60093	144.77576	346.4	555.6	565.2	Jason wants to make sure the tether is OK. He wants to back up and take a look.
7842	J2-495	3/28/2010 20:02	14.60085	144.77580	347.8	555.8	559.7	Will is concerned that Medea is too close to the wall.
7843	J2-495	3/28/2010 20:03	14.60089	144.77578	348.1	555.8	563.3	The tether is fine. Jason is coming back down to the vent base.
7844	J2-495	3/28/2010 20:03	14.60091	144.77578	350.3	557.8	566.1	Very impressive plume in the Medea cam.
7845	J2-495	3/28/2010 20:03	14.60094	144.77576	350.8	556.4	564.1	The seafloor is in sight. Big jagged pinnacles behind.
7846	J2-495	3/28/2010 20:04	14.60095	144.77576	351.2	556.7	563.1	Styx vent back in view.
7848	J2-495	3/28/2010 20:04	14.60097	144.77576	10.1	557.4	561.2	Looks like some real action. Lots of tephra in the view.
7849	J2-495	3/28/2010 20:05	14.60097	144.77576	9.0	556.7	561.2	The pinnacles are in the back of us (sort of E/SE of Styx).
7850	J2-495	3/28/2010 20:05	14.60097	144.77576	1.8	557.5	561.6	More action from the vent.
7851	J2-495	3/28/2010 20:05	14.60098	144.77577	349.2	556.2	562.8	Eruptive bursts of tephra.
7852	J2-495	3/28/2010 20:06	14.60097	144.77577	348.9	558.1	562.9	Amazing activity.
7853	J2-495	3/28/2010 20:06	14.60096	144.77578	348.4	557.8	563.4	There are some pretty large tephra chunks falling out of the plume.
7855	J2-495	3/28/2010 20:06	14.60094	144.77577	352.3	559.3	565.0	See rocks falling downslope in the pilot cam.
7856	J2-495	3/28/2010 20:07	14.60098	144.77572	23.5	557.8	560.8	Rocks to the right and left. The vent is stuck back in an alcove in the wall.
7857	J2-495	3/28/2010 20:07	14.60099	144.77572	28.4	557.4	559.9	The seafloor is shaking. We are seeing rocks move.
7858	J2-495	3/28/2010 20:08	14.60098	144.77573	27.4	556.1	559.9	That big boulder in front of us looks like it is teetering.

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7859	J2-495	3/28/2010 20:08	14.60095	144.77575	13.0	555.2	560.6	Akel commented on shock waves that are bounding Jason around.
7861	J2-495	3/28/2010 20:08	14.60095	144.77575	12.8	556.7	561.3	Correcting "bouncing Jason around".
7862	J2-495	3/28/2010 20:09	14.60098	144.77574	345.8	557.2	562.2	It's hard to find a good place to observe this vent because it is perched right near the wall.
7863	J2-495	3/28/2010 20:10	14.60098	144.77574	346.7	558.3	562.4	Verena says there is something happening behind the vent also. She says there are 2 explosion spots.
7865	J2-495	3/28/2010 20:11	14.60098	144.77575	346.5	558.0	562.6	This view shows that there is also activity behind the main vent orifice.
7866	J2-495	3/28/2010 20:11	14.60098	144.77574	346.2	558.1	562.4	Akel says that the position that we have in the nav is a good one for Styx.
7867	J2-495	3/28/2010 20:11	14.60098	144.77574	346.3	558.1	562.5	Clearer from this angle west of the vent.
7868	J2-495	3/28/2010 20:12	14.60098	144.77574	346.5	558.2	562.6	The vent is very narrow.
7869	J2-495	3/28/2010 20:12	14.60098	144.77574	346.6	558.1	562.5	Ash is falling out of the vent and it appears that there are bubbles too.
7871	J2-495	3/28/2010 20:13	14.60099	144.77575	346.1	558.7	562.1	Preparing to take a scoop sample of the rocks/rubble/tephra. The dark stuff right in front of the vent. Looks like it is very fresh.
7872	J2-495	3/28/2010 20:13	14.60099	144.77575	346.9	558.8	562.2	Big burst coming from the vent now.
7874	J2-495	3/28/2010 20:15	14.60097	144.77576	353.1	559.2	561.4	SAMPLE: geo J495-tephra-2. Scoop of tephra at the base of Styx vent (just to the W of the vent). Z=559m. Lat/long same as on previous dive.
7875	J2-495	3/28/2010 20:16	14.60097	144.77576	355.0	559.2	561.4	HDCam ran out - putting in a new one.
7877	J2-495	3/28/2010 20:16	14.60095	144.77576	348.2	559.5	563.4	J495-tephra-2 cont. Trying to go for more of the small stuff. Looks pretty good now.
7878	J2-495	3/28/2010 20:17	14.60085	144.77574	355.3	551.2	559.0	Visibility has gone to nil. We are in the plume from the eruptive activity.
7880	J2-495	3/28/2010 20:19	14.60072	144.77571	352.9	551.7	574.6	We can see the arm again.
7881	J2-495	3/28/2010 20:20	14.60067	144.77570	353.1	557.3	575.4	Jason will stow the scoop bag in the same milk crate (left) that the previous rock went in.
7883	J2-495	3/28/2010 20:21	14.60059	144.77565	351.9	567.3	576.3	No much visibility. Next to none. We can see the arm holding the scoop bag and that is about all.
7884	J2-495	3/28/2010 20:21	14.60059	144.77562	0.2	568.0	577.7	We see the wall again in the pilot cam.
7885	J2-495	3/28/2010 20:21	14.60061	144.77561	356.3	567.6	576.1	Will is not happy with Medea's position again.
7886	J2-495	3/28/2010 20:22	14.60060	144.77560	355.3	566.6	577.5	We are 30m SW of Styx. We backed up to get out of the plume and now we are quite a ways away from the vent.
7887	J2-495	3/28/2010 20:22	14.60060	144.77560	355.8	566.8	577.3	Moving the ship a bit.
7889	J2-495	3/28/2010 20:22	14.60060	144.77560	356.8	566.7	577.4	The scoop bag looks like it has a healthy sample inside.
7890	J2-495	3/28/2010 20:23	14.60060	144.77560	357.0	566.8	577.3	HD_CAM: stop Visibility is poor.
7892	J2-495	3/28/2010 20:24	14.60059	144.77561	357.4	566.9	577.1	Still stowing the scoop bag.
7893	J2-495	3/28/2010 20:24	14.60059	144.77561	356.9	566.7	577.1	The bag is in the milk crate.
7894	J2-495	3/28/2010 20:26	14.60058	144.77562	27.0	567.2	574.9	Jason is driving back toward Styx.
7896	J2-495	3/28/2010 20:26	14.60066	144.77564	30.6	564.4	568.3	The bottom is in sight but it is very murky. The plume is falling downslope (as well as rising as one can see in the Medea cam).
7897	J2-495	3/28/2010 20:27	14.60072	144.77566	30.4	564.1	566.3	Band of finer-grained material that came downslope.

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7898	J2-495	3/28/2010 20:27	14.60073	144.77566	32.6	562.0	566.0	The wall is in front of us now.
7899	J2-495	3/28/2010 20:28	14.60071	144.77570	30.6	561.3	568.3	Bill wants to stay here a little bit longer while the vent is active and then we will proceed to other vents.
7901	J2-495	3/28/2010 20:28	14.60069	144.77575	27.4	559.3	571.8	Wall and pinnacles in front of us.
7902	J2-495	3/28/2010 20:29	14.60068	144.77573	25.9	564.3	572.2	After moving around the western edge of the vent alcove we are back in the plume and visibility is down to nothing.
7903	J2-495	3/28/2010 20:29	14.60067	144.77574	20.4	569.8	573.5	The bottom is in sight again.
7905	J2-495	3/28/2010 20:31	14.60070	144.77579	12.4	566.6	574.1	This vent is set back in an alcove. We are still below the vent by about 10m.
7906	J2-495	3/28/2010 20:32	14.60073	144.77577	14.5	557.6	571.7	These outcrops are beautiful. Extremely steep.
7907	J2-495	3/28/2010 20:32	14.60074	144.77575	12.3	555.3	571.3	The pinnacles are apparent on the SM2K bathymetry.
7909	J2-495	3/28/2010 20:32	14.60077	144.77575	10.3	553.0	556.0	The nav is not looking correct.
7910	J2-495	3/28/2010 20:33	14.60083	144.77574	11.3	554.5	560.6	We must have come east about 10m. We also need to drive north.
7911	J2-495	3/28/2010 20:33	14.60085	144.77575	10.9	554.2	560.5	Just saw something on the bottom.
7912	J2-495	3/28/2010 20:34	14.60085	144.77575	14.0	559.8	562.5	We see the plume in the science cam.
7913	J2-495	3/28/2010 20:34	14.60085	144.77575	13.3	559.2	562.2	We're at the correct depth (560m).
7915	J2-495	3/28/2010 20:34	14.60088	144.77575	12.5	560.0	560.7	Medea shows lots of plumage here.
7916	J2-495	3/28/2010 20:34	14.60088	144.77577	10.8	560.0	564.1	This vent is in a hard spot for observation. Difficult terrain here and lots of smoke.
7917	J2-495	3/28/2010 20:35	14.60088	144.77579	9.7	561.8	564.6	The vent is near.
7918	J2-495	3/28/2010 20:36	14.60087	144.77581	355.1	562.1	565.3	We seem to be in the right spot. We will wait for the plume to clear.
7920	J2-495	3/28/2010 20:37	14.60088	144.77579	341.6	562.6	564.7	Swim swimming by.
7921	J2-495	3/28/2010 20:38	14.60088	144.77579	341.7	562.6	564.7	This is difficult terrain to We are seeing ash falling down on the pilot cam.
7923	J2-495	3/28/2010 20:38	14.60088	144.77580	341.7	562.6	564.7	This spot is tight. One has to go up and over and around.
7924	J2-495	3/28/2010 20:39	14.60092	144.77578	344.7	559.6	562.5	We are going up a few meters.
7925	J2-495	3/28/2010 20:39	14.60092	144.77578	344.6	559.0	562.4	The vent is right ahead of us now.
7926	J2-495	3/28/2010 20:40	14.60092	144.77578	344.6	559.7	562.0	It is extremely active.
7928	J2-495	3/28/2010 20:40	14.60091	144.77578	345.0	559.7	562.9	HD_CAM: start We have a bit of clearing in the video temporarily.
7929	J2-495	3/28/2010 20:40	14.60091	144.77578	343.3	558.9	562.8	The seafloor is shaking. The base of this vent is vibrating.
7930	J2-495	3/28/2010 20:41	14.60089	144.77580	340.4	559.0	564.1	The base of the vent is pulsing. Tephra is falling out of the plume.
7931	J2-495	3/28/2010 20:41	14.60090	144.77577	338.2	559.5	562.6	Nice view on the HDCam right now.
7932	J2-495	3/28/2010 20:41	14.60090	144.77577	338.8	560.1	562.5	Clear view right now.
7934	J2-495	3/28/2010 20:42	14.60090	144.77578	338.4	560.1	562.5	Looks like we are in a bit of a pause now.
7935	J2-495	3/28/2010 20:43	14.60091	144.77578	338.5	560.1	562.5	NAV: Doppler Reset
7937	J2-495	3/28/2010 20:45	14.60091	144.77578	338.8	560.1	562.5	The alcove is ~7 meters wide.
7938	J2-495	3/28/2010 20:45	14.60091	144.77578	338.8	560.1	562.5	The vent is revving up again.
7939	J2-495	3/28/2010 20:45	14.60092	144.77578	338.8	560.1	562.5	The plume is upon us.
7940	J2-495	3/28/2010 20:46	14.60092	144.77578	339.2	560.1	562.6	Ash is falling.

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7941	J2-495	3/28/2010 20:46	14.60091	144.77578	340.5	561.2	563.0	Going to back off a bit.
7943	J2-495	3/28/2010 20:46	14.60091	144.77578	340.3	560.8	563.1	Looks a little better??
7944	J2-495	3/28/2010 20:46	14.60091	144.77578	342.3	561.0	563.1	We can barely see the bottom in the sci cam.
7947	J2-495	3/28/2010 20:51	14.60091	144.77578	325.8	560.1	563.2	Great visibility right now.
7948	J2-495	3/28/2010 20:51	14.60090	144.77578	325.7	560.1	563.2	See lots of tephra falling out of the vent.
7949	J2-495	3/28/2010 20:51	14.60090	144.77577	342.7	559.8	562.7	Coming up a bit
7950	J2-495	3/28/2010 20:51	14.60090	144.77577	343.0	559.9	562.2	Vigorous eruption going on now with tephra falling out of the plume.
7951	J2-495	3/28/2010 20:51	14.60090	144.77577	342.9	560.0	562.2	Here comes the plume.
7953	J2-495	3/28/2010 20:53	14.60089	144.77578	344.6	560.1	562.2	Seems like very few minutes it sends out a burst then it pauses and clears up.
7955	J2-495	3/28/2010 20:54	14.60088	144.77578	344.9	560.2	562.3	We're here looking 345-. It's slowly clearing up.
7956	J2-495	3/28/2010 20:54	14.60088	144.77578	345.0	560.2	562.3	The activity is starting up again.
7957	J2-495	3/28/2010 20:55	14.60088	144.77578	345.2	560.2	562.3	Tephra coming out of the vent.
7958	J2-495	3/28/2010 20:55	14.60087	144.77578	345.2	560.2	562.3	Nice shot in the HD cam.
7959	J2-495	3/28/2010 20:55	14.60087	144.77578	345.2	560.2	562.3	The vent is on the steep slope.
7961	J2-495	3/28/2010 20:57	14.60087	144.77578	345.2	560.2	562.3	Here comes the plume.
7963	J2-495	3/28/2010 20:58	14.60088	144.77578	341.6	559.5	562.2	Cleared up again.
7964	J2-495	3/28/2010 20:59	14.60088	144.77579	338.7	559.8	562.4	A shrimp.
7965	J2-495	3/28/2010 20:59	14.60088	144.77579	339.6	559.6	562.3	Lasers on.
7966	J2-495	3/28/2010 21:00	14.60089	144.77579	340.1	559.6	562.2	Using the lasers for scale. White rock is 5cm across.
7968	J2-495	3/28/2010 21:00	14.60090	144.77578	340.1	559.6	562.2	A bit of the vent base fell away.
7969	J2-495	3/28/2010 21:01	14.60090	144.77578	340.0	559.6	562.2	See a billowing plume and tephra falling out.
7970	J2-495	3/28/2010 21:01	14.60090	144.77578	338.4	559.2	562.5	The activity is increasing.
7971	J2-495	3/28/2010 21:01	14.60090	144.77579	341.1	558.9	562.5	It's vibrating all over the place.
7972	J2-495	3/28/2010 21:02	14.60089	144.77579	345.0	560.8	563.0	White-out again.
7974	J2-495	3/28/2010 21:04	14.60090	144.77579	344.0	560.9	563.1	We can see the seafloor again.
7975	J2-495	3/28/2010 21:04	14.60091	144.77579	344.7	559.2	563.2	The activity is starting up again.
7977	J2-495	3/28/2010 21:04	14.60091	144.77579	345.3	558.5	563.2	A big rock came falling downslope.
7978	J2-495	3/28/2010 21:04	14.60090	144.77579	344.7	558.2	563.9	That's a nice shot of the tephra raining down out of the plume.
7979	J2-495	3/28/2010 21:05	14.60089	144.77579	342.2	558.8	564.1	Great view in the science cam.
7980	J2-495	3/28/2010 21:05	14.60089	144.77580	342.9	559.3	565.1	Shrimp just swam by.
7981	J2-495	3/28/2010 21:06	14.60089	144.77579	342.3	562.0	564.5	In the plume again.
7983	J2-495	3/28/2010 21:07	14.60091	144.77578	352.7	559.3	562.7	The seafloor here around the vent has been undulating on and off during this eruptive phase.
7985	J2-495	3/28/2010 21:08	14.60090	144.77578	351.7	560.4	562.8	The visibility is good and we are able to see the vent throwing tephra around.
7986	J2-495	3/28/2010 21:08	14.60090	144.77579	353.5	560.1	563.0	The plume is billowing and tephra is raining down.
7987	J2-495	3/28/2010 21:09	14.60091	144.77579	352.5	560.6	563.1	Tephra is raining down and very visible in the brow cam.

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7988	J2-495	3/28/2010 21:10	14.60091	144.77580	352.9	560.7	563.1	Perking up again. Quite visible in the pilot cam.
7989	J2-495	3/28/2010 21:10	14.60090	144.77581	352.5	560.7	563.1	Here it comes. We are enveloped by the plume.
7991	J2-495	3/28/2010 21:10	14.60090	144.77582	352.5	560.8	563.1	The plume is whirling around the sub.
7992	J2-495	3/28/2010 21:11	14.60090	144.77580	353.0	558.6	563.3	The image in the pilot cam was pretty incredible.
7993	J2-495	3/28/2010 21:11	14.60092	144.77578	355.3	551.9	561.5	This eruption is impressive.
7994	J2-495	3/28/2010 21:11	14.60092	144.77578	356.8	545.5	561.1	Next to no visibility except the plume whirling by.
7995	J2-495	3/28/2010 21:11	14.60091	144.77578	358.0	545.2	561.5	Backing up with the sub.
7997	J2-495	3/28/2010 21:13	14.60080	144.77576	353.0	547.3	557.3	The plume is impressive in both the pilot and sci cams.
7998	J2-495	3/28/2010 21:14	14.60079	144.77576	353.1	547.4	557.4	We're now about 10 meters S/SW of the vent.
8001	J2-495	3/28/2010 21:17	14.60085	144.77576	355.8	550.1	559.4	Approaching the vent again.
8002	J2-495	3/28/2010 21:17	14.60090	144.77575	352.6	556.9	560.0	Bob is coming in and relieving Bill.
8004	J2-495	3/28/2010 21:19	14.60091	144.77581	347.9	559.7	562.3	There's the vent in front of us again.
8005	J2-495	3/28/2010 21:19	14.60091	144.77580	347.8	559.7	562.3	The vent is throwing off rocks and tephra.
8006	J2-495	3/28/2010 21:19	14.60091	144.77580	347.7	559.7	562.3	The base of the vent if undulating.
8007	J2-495	3/28/2010 21:20	14.60091	144.77580	347.6	559.6	562.3	Lots of plumage and it's coming right for us.
8009	J2-495	3/28/2010 21:20	14.60091	144.77580	347.6	559.7	562.3	Explosive activity going on.
8010	J2-495	3/28/2010 21:20	14.60091	144.77579	349.2	558.7	562.5	Black out from the plume.
8012	J2-495	3/28/2010 21:22	14.60091	144.77579	349.6	559.5	562.5	It cleared up for us. Better get a good look now.
8013	J2-495	3/28/2010 21:23	14.60092	144.77578	349.2	559.2	561.9	Impressive billowing plume coming straight up from the vent.
8015	J2-495	3/28/2010 21:26	14.60090	144.77578	351.0	559.8	562.0	View is clearing up again.
8016	J2-495	3/28/2010 21:26	14.60090	144.77578	350.9	559.8	562.0	Lasers on.
8018	J2-495	3/28/2010 21:28	14.60091	144.77578	350.9	559.8	562.0	Starting to get some more activity.
8020	J2-495	3/28/2010 21:28	14.60091	144.77578	350.8	559.8	562.0	Getting really clear.
8021	J2-495	3/28/2010 21:28	14.60092	144.77578	350.9	559.8	562.0	HD is still on.
8022	J2-495	3/28/2010 21:29	14.60092	144.77578	350.8	559.8	562.0	Plume is starting to bend around toward us.
8023	J2-495	3/28/2010 21:29	14.60092	144.77578	350.8	559.8	562.0	Diminished activity.
8025	J2-495	3/28/2010 21:30	14.60092	144.77578	350.8	559.8	562.1	Clear view still.
8026	J2-495	3/28/2010 21:30	14.60092	144.77578	350.8	559.8	562.1	Blowing away from Jason.
8027	J2-495	3/28/2010 21:32	14.60091	144.77577	350.8	559.8	562.1	Can see light staining on rocks on cliff behind view.
8029	J2-495	3/28/2010 21:33	14.60090	144.77578	349.9	559.8	562.0	Seems pretty steady state at the moment.
8031	J2-495	3/28/2010 21:35	14.60091	144.77578	349.8	559.7	562.1	HD_CAM: stop
8032	J2-495	3/28/2010 21:36	14.60091	144.77578	349.7	559.7	562.0	Very diminished activity.
8034	J2-495	3/28/2010 21:38	14.60090	144.77579	349.9	559.8	562.0	Good plume view on Medea cam with such good visibility.
8036	J2-495	3/28/2010 21:39	14.60090	144.77578	350.2	559.7	562.2	Still very low activity.
8039	J2-495	3/28/2010 21:43	14.60091	144.77579	350.4	559.8	562.0	Nice plume in Medea cam.
8040	J2-495	3/28/2010 21:43	14.60092	144.77579	350.4	559.8	562.0	Still just steady state activity with no bursts.
8042	J2-495	3/28/2010 21:46	14.60092	144.77578	350.5	559.7	562.0	Visibility is decreasing with same level of activity.
8044	J2-495	3/28/2010 21:46	14.60093	144.77577	350.5	559.7	562.0	Going to go over to the other vents while this has low activity.

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8045	J2-495	3/28/2010 21:47	14.60093	144.77577	350.5	559.8	562.0	Moving ship to west 50-60m.
8046	J2-495	3/28/2010 21:47	14.60093	144.77575	304.4	556.2	562.5	Heading over to Brimstone and then the other vents.
8048	J2-495	3/28/2010 21:50	14.60086	144.77563	275.7	552.6	554.9	We see the bottom with the plume wafting around us.
8050	J2-495	3/28/2010 21:52	14.60086	144.77556	8.3	549.0	551.9	Brimstone depth is 548m.
8052	J2-495	3/28/2010 21:52	14.60087	144.77556	7.9	548.7	551.8	We are traveling along the wall heading west - although right now we seem to be stationary.
8053	J2-495	3/28/2010 21:53	14.60087	144.77556	109.0	549.0	550.6	We're right in the Brimstone area.
8054	J2-495	3/28/2010 21:53	14.60086	144.77556	107.8	549.2	550.4	The vent must be upslope a bit.
8055	J2-495	3/28/2010 21:54	14.60087	144.77558	9.6	547.9	551.3	Rocks ahead (and all around of course). A bit of a shelf in view.
8057	J2-495	3/28/2010 21:54	14.60086	144.77558	324.1	547.5	552.3	Searching for Brimstone.
8058	J2-495	3/28/2010 21:55	14.60088	144.77557	337.5	548.7	550.8	We see a shrimp in the sci cam.
8059	J2-495	3/28/2010 21:55	14.60088	144.77557	337.5	548.7	550.8	Not much going on here from the looks of it.
8060	J2-495	3/28/2010 21:56	14.60088	144.77557	337.4	548.7	550.8	The marker was just a little upslope from the vent to the NW.
8061	J2-495	3/28/2010 21:56	14.60091	144.77554	340.4	547.6	550.5	Sulfur balls falling through the water column.
8063	J2-495	3/28/2010 21:56	14.60093	144.77552	340.8	547.2	549.7	The marker is straight ahead. Mkr161 right in front of us.
8064	J2-495	3/28/2010 21:57	14.60091	144.77552	339.0	547.2	550.6	The anchor on the marker seems to be buried.
8065	J2-495	3/28/2010 21:57	14.60088	144.77556	21.9	547.3	551.0	Spinning around looking for Brimstone.
8066	J2-495	3/28/2010 21:58	14.60091	144.77556	33.7	546.3	550.1	Brimstone is not active.
8067	J2-495	3/28/2010 21:58	14.60090	144.77556	69.5	546.0	549.6	Brimstone is right in front of us. The smoke in the camera is probably coming from Styx.
8069	J2-495	3/28/2010 22:00	14.60089	144.77558	50.9	545.8	549.5	Brimstone is not doing anything.
8070	J2-495	3/28/2010 22:00	14.60088	144.77558	50.5	545.9	549.7	Off to Sulfur Crust next.
8071	J2-495	3/28/2010 22:00	14.60087	144.77555	50.5	545.9	550.6	Sulfur Vent and Sulfur Crust are right next to each other.
8073	J2-495	3/28/2010 22:01	14.60081	144.77539	286.2	547.3	551.4	Sulfur crust is at 556m depth. Sulfur vent is at 557.
8074	J2-495	3/28/2010 22:02	14.60080	144.77539	286.8	550.0	552.6	Sulfur vent is quite active. Pretty incredible plume here.
8075	J2-495	3/28/2010 22:02	14.60080	144.77537	311.9	550.9	555.6	Our heading is 290. Lots of plume here.
8077	J2-495	3/28/2010 22:03	14.60084	144.77537	286.6	550.5	552.0	The area slopes to the SW.
8078	J2-495	3/28/2010 22:03	14.60086	144.77537	285.7	550.4	552.4	Bill wants to come around to the south of the vent.
8079	J2-495	3/28/2010 22:04	14.60083	144.77538	280.3	551.6	552.3	We're looking at the top of Sulfur vent at 550m.
8081	J2-495	3/28/2010 22:05	14.60077	144.77528	340.0	554.4	562.0	Se see the plume wafting in the distance.
8082	J2-495	3/28/2010 22:05	14.60078	144.77526	339.9	552.9	562.1	We see the marker at Sulfur Crust right ahead and the vent active in the background.
8083	J2-495	3/28/2010 22:06	14.60078	144.77526	0.1	552.9	561.5	HD_CAM: start 2206. Sulfur Crust in the foreground and Sulfur Vent in the background billowing.
8085	J2-495	3/28/2010 22:06	14.60078	144.77527	43.8	552.1	557.9	We would like to settle down in front of the vent and observe it for a while.
8086	J2-495	3/28/2010 22:07	14.60080	144.77529	73.2	552.9	558.4	High level of activity.
8087	J2-495	3/28/2010 22:07	14.60079	144.77530	73.5	554.1	557.9	All that sulfur that was here before is not visible. It must be covered in tephra.

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8088	J2-495	3/28/2010 22:07	14.60078	144.77530	74.1	555.7	557.9	The venting seems more focused. Nice view of the venting.
8089	J2-495	3/28/2010 22:08	14.60077	144.77531	67.6	556.2	558.4	This place is really dynamic.
8090	J2-495	3/28/2010 22:08	14.60077	144.77531	67.4	556.3	558.2	Looks like more venting behind our view.
8091	J2-495	3/28/2010 22:08	14.60076	144.77531	67.4	556.3	558.4	bubbles are rising from the seafloor.
8093	J2-495	3/28/2010 22:08	14.60076	144.77531	67.5	556.3	558.3	Verena is zooming in to get some video of the bubbles.
8094	J2-495	3/28/2010 22:09	14.60076	144.77531	67.5	556.3	558.2	The smoke has a yellow sheen to it.
8095	J2-495	3/28/2010 22:09	14.60076	144.77531	67.5	556.3	558.4	This one is really producing sulfur.
8096	J2-495	3/28/2010 22:09	14.60077	144.77531	67.6	556.2	558.3	
8097	J2-495	3/28/2010 22:10	14.60077	144.77531	67.5	556.2	558.1	The plan is to observe the vent for a time.
8099	J2-495	3/28/2010 22:10	14.60078	144.77531	67.7	556.2	558.1	This is quite a large are of venting here.
8100	J2-495	3/28/2010 22:10	14.60078	144.77530	67.7	556.2	558.2	There is a bit of a tephra/sulfur ball cone around the venting area.
8101	J2-495	3/28/2010 22:11	14.60078	144.77530	67.8	556.2	558.2	Lasers on for scale.
8102	J2-495	3/28/2010 22:11	14.60079	144.77529	68.1	556.2	558.0	The little cone it is building is probably 2 meters or a bit less.
8103	J2-495	3/28/2010 22:12	14.60080	144.77528	68.2	556.2	558.1	Zooming down with the HD cam and focusing on the yellow in the plume.
8105	J2-495	3/28/2010 22:12	14.60082	144.77529	68.3	556.2	558.1	The plume here is has a lot of yellow in it. Vigorous venting.
8106	J2-495	3/28/2010 22:13	14.60083	144.77531	68.6	556.2	558.1	Not really throwing out any tephra. A few little rocks but mostly gas. Lots of bubbling here.
8107	J2-495	3/28/2010 22:14	14.60084	144.77532	68.9	555.8	558.0	We will do some sampling here.
8109	J2-495	3/28/2010 22:14	14.60084	144.77533	60.8	555.9	557.5	Large area of billowing smoke here and some big bubbles.
8110	J2-495	3/28/2010 22:15	14.60085	144.77532	58.8	555.9	557.6	Lots of sulfur coming out of this vent. Vigorous billowing plume
8112	J2-495	3/28/2010 22:16	14.60085	144.77532	59.2	555.9	557.6	This vent is 54 meters to the west of Styx yet they are very different. Styx is throwing out black tephra and this one is very sulfur-laden with lots of bubbles.
8113	J2-495	3/28/2010 22:17	14.60085	144.77532	58.9	555.9	557.6	Grabbing the Jason temp probes
8114	J2-495	3/28/2010 22:17	14.60085	144.77532	58.8	555.9	557.6	Temp rising rapidly.
8115	J2-495	3/28/2010 22:17	14.60085	144.77532	59.4	555.9	557.6	A little slide coming down the little cone.
8116	J2-495	3/28/2010 22:18	14.60084	144.77532	59.4	555.9	557.7	Bubbles are really pouring out of the vent.
8117	J2-495	3/28/2010 22:18	14.60083	144.77532	60.2	555.9	557.7	The temp is really coming up.
8119	J2-495	3/28/2010 22:19	14.60081	144.77531	59.9	556.0	557.7	The temperature got up to 115-C. Put it back in the vent.
8121	J2-495	3/28/2010 22:20	14.60081	144.77530	60.6	556.0	557.5	The temp is rising again. He moved the probe in a bit. It was up to 184-.
8122	J2-495	3/28/2010 22:21	14.60083	144.77530	61.0	556.0	557.5	Moving the probe around in the vent orifice. Matt is going for the highest temperature on the cruise.
8124	J2-495	3/28/2010 22:23	14.60084	144.77531	60.5	556.0	557.6	The temperature got up to 195-C. Stowing the temp probe now.
8126	J2-495	3/28/2010 22:24	14.60085	144.77529	60.5	556.0	557.5	This vent seems to be continuously erupting. Pretty steady state.
8127	J2-495	3/28/2010 22:25	14.60087	144.77530	59.9	555.9	557.6	There is a bunch of sulfur on the vehicle. Black coating on the vehicle.
8128	J2-495	3/28/2010 22:25	14.60089	144.77530	59.8	555.9	557.7	The sulfur was on the temperature probe handle.
8130	J2-495	3/28/2010 22:26	14.60090	144.77531	58.6	555.9	557.6	Zooming into the deposits right next to the vent.

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8131	J2-495	3/28/2010 22:27	14.60089	144.77531	58.4	555.9	557.7	The deposits looks like lava coated with sulfur rock.
8132	J2-495	3/28/2010 22:27	14.60087	144.77530	57.2	555.9	557.6	It looks like pea gravel and river rock. Of course it is not.
8133	J2-495	3/28/2010 22:28	14.60083	144.77529	61.0	556.1	557.7	This vent is exhibiting vigorous; continual venting.
8135	J2-495	3/28/2010 22:30	14.60082	144.77529	31.0	555.8	557.4	That's quite a plume with lots of bubbles. We also see some plumage wafting in from the west.
8137	J2-495	3/28/2010 22:31	14.60082	144.77529	29.2	556.0	557.4	This vent totally changed its look in 2 days. No more sulfur ledge with pancake sheets of sulfur. Now that is all covered up with these deposits of lava coated with sulfur rock.
8138	J2-495	3/28/2010 22:31	14.60082	144.77529	29.4	555.9	557.4	Checking out the starboard arm.
8140	J2-495	3/28/2010 22:33	14.60081	144.77529	29.7	555.9	557.3	The depth of this vent is about 1 meter shallower than on our last visit.
8142	J2-495	3/28/2010 22:34	14.60080	144.77529	28.4	555.9	557.3	Vigorous swirling plumage coming out of the vent and bubbles apparent.
8143	J2-495	3/28/2010 22:35	14.60080	144.77529	28.3	555.9	557.4	That's a nice image in the HDcam.
8144	J2-495	3/28/2010 22:36	14.60080	144.77530	28.3	555.9	557.3	This vent is radically different every time we come. The first time it was not here at all. Then the visit with the pancake sheets of sulfur. Now that is all covered up and a small cone has formed around the vent.
8146	J2-495	3/28/2010 22:36	14.60080	144.77531	30.1	556.0	557.3	Jason is having problems with the starboard arm.
8147	J2-495	3/28/2010 22:37	14.60081	144.77531	30.6	556.2	557.3	They are changing out the controller for the stbd arm.
8150	J2-495	3/28/2010 22:41	14.60083	144.77530	30.6	556.0	557.3	We're just sitting here in front of the vent while messing with the stbd manipulator.
8152	J2-495	3/28/2010 22:43	14.60085	144.77530	30.4	556.1	557.3	The rock around the vent is lava coated or altered with sulfur.
8153	J2-495	3/28/2010 22:43	14.60085	144.77530	30.8	556.0	557.3	The lights are on. Oh my.
8154	J2-495	3/28/2010 22:44	14.60086	144.77530	30.8	556.1	557.3	HD_CAM: stop 2243. Jason crew is trying to get the stbd arm up and running.
8158	J2-495	3/28/2010 22:49	14.60092	144.77530	30.1	556.1	557.3	Still working on the stbd arm - here in the van.
8160	J2-495	3/28/2010 22:52	14.60092	144.77532	30.4	556.1	557.3	Much talk going on between the Jason gang about the stbd arm issue.
8163	J2-495	3/28/2010 22:54	14.60087	144.77532	29.8	556.0	557.2	Bill observed a few rocks being thrown out of the vent.
8164	J2-495	3/28/2010 22:55	14.60086	144.77532	30.1	556.0	557.2	We see plumage in the background also.
8165	J2-495	3/28/2010 22:56	14.60086	144.77533	30.0	556.1	557.2	Still sitting here in exactly the same spot while the Jason guys work on the stbd arm.
8167	J2-495	3/28/2010 22:57	14.60085	144.77532	29.8	556.1	557.3	The current is changing slightly. The current is coming toward us. The plume is affecting the USBL Dara says.
8168	J2-495	3/28/2010 22:58	14.60084	144.77532	29.8	556.1	557.3	The arm is moving again.
8170	J2-495	3/28/2010 22:58	14.60083	144.77532	30.0	556.1	557.3	They tried using a spare master controller. That didn't work. The shoulder of the arm is not working very well.
8171	J2-495	3/28/2010 23:00	14.60083	144.77532	30.4	556.1	557.3	Our plan is to go for a funnel gas-tight next.
8172	J2-495	3/28/2010 23:00	14.60083	144.77532	30.1	556.1	557.3	HD_CAM: start 2300. Here at Sulfur Vent.
8174	J2-495	3/28/2010 23:00	14.60083	144.77531	30.2	556.1	557.3	Going to take a funnel gastight. This is the red funnel.
8176	J2-495	3/28/2010 23:03	14.60082	144.77529	28.6	556.0	557.3	Have to get a better grip on the gastight.

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8178	J2-495	3/28/2010 23:05	14.60083	144.77529	29.7	555.7	557.4	Hand-off of the GTB from the stbd to the port arm.
8179	J2-495	3/28/2010 23:06	14.60083	144.77530	29.1	555.8	557.3	The activity here at this vent is continuous - no waxing and waning here.
8183	J2-495	3/28/2010 23:11	14.60085	144.77530	70.3	555.7	557.4	SAMPLE: gas J495-GTB-3. Red funnel. 144-46.5176 14-36.0493 Z=556. Lots of bubbles. The funnel is in the plume bubble stream.
8185	J2-495	3/28/2010 23:13	14.60083	144.77530	70.2	555.7	557.4	J495-GTB-3 cont. The temperature in the sediments here were 115; 184 and 195 a while back. Triggered at 231245. Burped the funnel and gas with sulfur smoke came out.
8187	J2-495	3/28/2010 23:16	14.60083	144.77530	71.4	554.5	557.9	Stowing the funnel.
8189	J2-495	3/28/2010 23:16	14.60083	144.77530	71.6	554.5	558.0	Next we will sample fluids with the Major with white tape on the handle.
8191	J2-495	3/28/2010 23:20	14.60082	144.77529	30.6	555.7	557.4	SAMPLE: fluid J495-major-4. This is the major with the white tape. Sample in the middle of the plume. Sulfur Vent. Same location as sample 3.
8193	J2-495	3/28/2010 23:21	14.60083	144.77529	18.7	555.4	557.4	Repositioning the major to the right.
8194	J2-495	3/28/2010 23:21	14.60084	144.77530	17.7	555.7	557.4	Dave wants the "less than pH 1".
8195	J2-495	3/28/2010 23:22	14.60083	144.77530	16.7	555.7	557.3	Gas is coming out from the base of the bent.
8197	J2-495	3/28/2010 23:22	14.60083	144.77530	15.1	555.6	557.2	The activity seems to have increased a bit.
8198	J2-495	3/28/2010 23:23	14.60083	144.77529	15.6	555.7	557.2	J495-major-4 fired at 232325. In the plume at Sulfur Vent. Z=556.
8200	J2-495	3/28/2010 23:25	14.60083	144.77529	15.3	555.7	557.2	Holding the major in the plume.
8201	J2-495	3/28/2010 23:25	14.60083	144.77529	15.3	555.7	557.1	HD tape just stopped.\
8202	J2-495	3/28/2010 23:26	14.60083	144.77529	15.4	555.6	557.1	Will swap out the HD tape now.
8204	J2-495	3/28/2010 23:27	14.60083	144.77529	15.6	555.7	557.1	HD_CAM: start new tape #8.
8206	J2-495	3/28/2010 23:29	14.60083	144.77530	15.5	555.7	557.1	Dave is worried that the major did not trigger.
8207	J2-495	3/28/2010 23:30	14.60083	144.77531	15.4	555.6	557.1	Putting it back in the vent to see if it was triggered .
8209	J2-495	3/28/2010 23:32	14.60084	144.77529	16.1	555.7	557.2	J495-major-4 cont. Putting the major back into the plume at 2330 to get a decent sample. Sulfur Vent right in the vent here.
8211	J2-495	3/28/2010 23:34	14.60083	144.77529	14.9	555.8	557.1	Lots of sulfur on the major handle.
8213	J2-495	3/28/2010 23:36	14.60082	144.77530	12.4	554.9	557.6	Jason is pulling away from the vent a bit to do some housekeeping.
8215	J2-495	3/28/2010 23:38	14.60082	144.77530	12.8	554.8	557.6	The major holder came loose from the basket.
8217	J2-495	3/28/2010 23:39	14.60082	144.77530	12.9	554.9	557.6	Going to do another major and another gastight here.
8219	J2-495	3/28/2010 23:40	14.60081	144.77530	12.6	554.8	557.5	Here comes the plume.
8220	J2-495	3/28/2010 23:41	14.60081	144.77530	12.4	554.8	557.5	This major will be the blue-taped one.
8222	J2-495	3/28/2010 23:42	14.60082	144.77530	12.3	554.7	557.5	SAMPLE: fluid Preparing for the major sample (the second in this place).
8223	J2-495	3/28/2010 23:44	14.60082	144.77530	13.3	553.6	557.8	Grabbing the major holster before it floats away.
8225	J2-495	3/28/2010 23:45	14.60083	144.77530	12.8	553.8	557.6	The major holster is now stowed.
8228	J2-495	3/28/2010 23:49	14.60084	144.77530	40.8	555.8	557.5	SAMPLE: fluid J495-major-5. Right in the venting at Sulfur Vent. Z=554. Blue major. Triggered at 234845. Temps got up to 195- in the sediments here earlier.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
8230	J2-495	3/28/2010 23:51	14.60083	144.77531	39.3	555.8	557.5	Shaking bottle again and re-extended.
8231	J2-495	3/28/2010 23:51	14.60083	144.77531	38.7	555.8	557.5	Bottle did not trigger.
8233	J2-495	3/28/2010 23:53	14.60085	144.77530	38.9	555.8	557.5	Lots of bubbles.
8234	J2-495	3/28/2010 23:53	14.60085	144.77530	38.6	555.8	557.5	May have seen a budge in the bottle but did probably did not trigger.
8236	J2-495	3/28/2010 23:54	14.60083	144.77530	40.2	554.2	557.2	Stowing the major.
8237	J2-495	3/28/2010 23:55	14.60083	144.77530	40.7	554.5	557.4	Sulfur coating instruments in front of basket.
8238	J2-495	3/28/2010 23:55	14.60083	144.77530	40.8	554.6	557.4	Going to try to the last gastight.
8241	J2-495	3/28/2010 23:59	14.60083	144.77530	40.8	554.5	557.4	Putting major back in basket and getting the non-funnel GTB.
8242	J2-495	3/29/2010 0:00	14.60083	144.77530	40.5	554.6	557.4	This is the black
8244	J2-495	3/29/2010 0:01	14.60081	144.77529	40.8	554.6	557.4	Transferring GTB from Port to Stbd arms.
8246	J2-495	3/29/2010 0:03	14.60081	144.77529	40.6	554.5	557.3	Activity is about at the same level.
8247	J2-495	3/29/2010 0:04	14.60082	144.77529	41.7	554.3	557.3	GTB in alignment with arm for sampling.
8248	J2-495	3/29/2010 0:04	14.60082	144.77529	41.5	553.9	557.3	Want to position in the intense yellow part of the plume.
8250	J2-495	3/29/2010 0:04	14.60083	144.77529	43.4	553.6	557.3	HD is on.
8251	J2-495	3/29/2010 0:05	14.60085	144.77527	55.1	554.3	557.5	Just started HD tape 8.
8253	J2-495	3/29/2010 0:05	14.60085	144.77528	60.2	555.6	557.3	Moving into position.
8257	J2-495	3/29/2010 0:07	14.60086	144.77529	59.3	555.7	557.3	Good image of arm in plume.
8258	J2-495	3/29/2010 0:08	14.60084	144.77528	58.8	555.7	557.3	SAMPLE: gas J495-GTB-6 fired at Sulfur Vent with tip in yellow. Fired.
8260	J2-495	3/29/2010 0:09	14.60083	144.77528	58.7	555.7	557.3	SAMPLE: gas Bottle did fire. J495-GTB-6 at Sulfur.
8261	J2-495	3/29/2010 0:09	14.60081	144.77526	58.8	553.7	557.7	J495-GTB-6 was the orange-black taped bottle.
8262	J2-495	3/29/2010 0:10	14.60081	144.77526	59.8	552.6	557.7	Stowing the bottle in the basket.
8265	J2-495	3/29/2010 0:13	14.60085	144.77528	37.8	554.0	557.2	Lasers on.
8267	J2-495	3/29/2010 0:15	14.60088	144.77529	37.5	554.0	557.5	GTB in basket where it came from.
8269	J2-495	3/29/2010 0:17	14.60088	144.77528	37.9	554.0	557.3	Looking at the STBD arm a bit (it was cranky earlier).
8271	J2-495	3/29/2010 0:19	14.60086	144.77527	38.9	554.1	557.4	Major explosion from underneath.
8272	J2-495	3/29/2010 0:19	14.60084	144.77527	49.2	554.8	558.4	Ground swelled and moved toward us.
8273	J2-495	3/29/2010 0:19	14.60082	144.77528	46.2	554.8	561.8	Large plume.
8274	J2-495	3/29/2010 0:20	14.60082	144.77529	39.2	554.3	559.7	Backed up to Sulfur Crust and saw the MTR-6.
8275	J2-495	3/29/2010 0:20	14.60081	144.77531	39.9	554.4	559.5	Going to go back into the vent.
8277	J2-495	3/29/2010 0:21	14.60081	144.77530	26.0	556.2	563.9	Waiting for plume to clear before approach (also waiting for nav to boot back up).
8278	J2-495	3/29/2010 0:21	14.60081	144.77530	25.3	556.9	565.6	Rebooted nav because it wasn't working correctly.
8279	J2-495	3/29/2010 0:22	14.60081	144.77530	26.4	558.8	564.5	Sound was not recording during that explosive event.
8282	J2-495	3/29/2010 0:25	14.60058	144.77537	312.9	568.9	576.2	Nav is back up and we are south of Mkr-120.
8283	J2-495	3/29/2010 0:25	14.60059	144.77533	313.3	569.6	577.3	HD_CAM: stop
8284	J2-495	3/29/2010 0:25	14.60059	144.77531	320.9	570.2	577.2	HD_CAM: start Heading back up to Sulfur Crust.
8286	J2-495	3/29/2010 0:26	14.60062	144.77523	312.8	570.8	577.9	Thought we saw another MTR at Sulfur Crust but it could not be MTR-6 which was recovered on J494.

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8287	J2-495	3/29/2010 0:27	14.60062	144.77524	5.1	570.5	581.1	Lots of plume on the approach-steep slope up to the site.
8288	J2-495	3/29/2010 0:28	14.60071	144.77524	6.6	563.4	572.4	Smokey on the approach only 5m away.
8290	J2-495	3/29/2010 0:28	14.60071	144.77524	7.5	562.9	571.7	Large blocks.
8291	J2-495	3/29/2010 0:29	14.60072	144.77525	7.2	561.5	567.6	NAV: Doppler Reset
8292	J2-495	3/29/2010 0:29	14.60073	144.77524	5.2	558.0	566.4	There is the crust.
8294	J2-495	3/29/2010 0:31	14.60073	144.77530	7.3	554.6	563.8	We are seeing a different section of crust here.
8296	J2-495	3/29/2010 0:33	14.60079	144.77521	87.1	557.2	564.9	Part of the crust has been broken. Bucket fell down the hill.
8298	J2-495	3/29/2010 0:34	14.60078	144.77522	90.4	559.7	563.4	Bucket is upside down with some material in it.
8300	J2-495	3/29/2010 0:36	14.60077	144.77522	89.5	559.7	563.2	RECOVER: tephra bucket Got the bucket. Tephra-D J495-tephra-7
8301	J2-495	3/29/2010 0:37	14.60075	144.77522	95.8	557.9	562.6	J495-tephra-7 Tephra-D recovered at Sulfur Crust but it fell downhill of the crust it had been on.
8302	J2-495	3/29/2010 0:37	14.60075	144.77521	96.5	558.0	562.5	That crust has broken and there has been a slide.
8303	J2-495	3/29/2010 0:37	14.60075	144.77522	95.8	558.5	563.0	Placing J495-tephra-7 in PORT-aft of basket.
8305	J2-495	3/29/2010 0:39	14.60075	144.77522	97.0	558.5	562.4	Mkr-120 has been buried a bit and is no longer on top of the crust.
8306	J2-495	3/29/2010 0:40	14.60077	144.77522	108.3	557.3	561.6	View of new marker location Mkr-120.
8308	J2-495	3/29/2010 0:40	14.60078	144.77525	100.5	556.3	560.7	Mkr-120 is now below the big piece of crust. Going to try to take a sample of this crust.
8309	J2-495	3/29/2010 0:41	14.60079	144.77525	99.5	556.4	560.7	Little eddy on the crust is 'bubbling' the sulfur-ash gravel.
8310	J2-495	3/29/2010 0:41	14.60078	144.77525	99.7	556.4	560.7	Preparing to sample the crust.
8312	J2-495	3/29/2010 0:43	14.60078	144.77525	99.6	556.4	561.1	SAMPLE: geo J495-rock-8 at Sulfur Crust (remaining piece of broken crust).
8314	J2-495	3/29/2010 0:44	14.60079	144.77526	98.0	555.4	560.7	Put in crate with gastights. J95-rock-8.
8315	J2-495	3/29/2010 0:44	14.60079	144.77526	98.2	555.4	560.6	Basket put back and now headed to Phantom.
8316	J2-495	3/29/2010 0:45	14.60079	144.77527	98.1	555.4	560.3	Phantom is 321deg at 16m.
8317	J2-495	3/29/2010 0:45	14.60080	144.77522	321.2	555.6	557.7	Turning to leave Sulfur Crust and now headed to Phantom.
8319	J2-495	3/29/2010 0:46	14.60091	144.77508	21.3	565.1	569.8	We just flow over Phantom and did not see any activity.
8320	J2-495	3/29/2010 0:47	14.60091	144.77510	33.8	564.7	569.2	Here is Phantom at this rock outcrop and not seeing any plume.
8321	J2-495	3/29/2010 0:47	14.60091	144.77511	38.8	563.8	569.2	No activity at Phantom.
8323	J2-495	3/29/2010 0:48	14.60093	144.77508	133.2	564.4	570.7	Looking around to verify that there is no venting here.
8325	J2-495	3/29/2010 0:50	14.60086	144.77521	135.3	559.3	563.0	At the top around here and the depth is now 559m--check depths for this site.
8326	J2-495	3/29/2010 0:51	14.60086	144.77521	135.8	559.0	563.6	There is a bit of venting.
8327	J2-495	3/29/2010 0:51	14.60086	144.77520	135.8	559.0	563.6	Depth at venting is 558.9 but low level.
8328	J2-495	3/29/2010 0:52	14.60086	144.77520	136.0	558.9	563.6	Not going to sample here.
8329	J2-495	3/29/2010 0:52	14.60087	144.77519	136.0	558.9	563.6	Phantom is venting at low level and depth is 558.9 with heading of 136deg.
8331	J2-495	3/29/2010 0:53	14.60087	144.77518	103.5	559.0	563.9	Looks like activity is increasing while we are here-looks steamy.
8333	J2-495	3/29/2010 0:54	14.60087	144.77521	105.6	555.7	559.5	Going to go to Charon Vent next.
8334	J2-495	3/29/2010 0:55	14.60089	144.77519	108.6	554.8	559.6	Now looking at part of Sulfur Vent with lots of activity.

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8335	J2-495	3/29/2010 0:55	14.60089	144.77519	108.1	555.0	559.7	Nav screen down.
8336	J2-495	3/29/2010 0:55	14.60085	144.77524	106.2	555.2	559.3	Watching Sulfur Vent again.
8338	J2-495	3/29/2010 0:57	14.60082	144.77540	110.6	547.3	550.5	Going over sulfur encrusted rocks on our way east.
8339	J2-495	3/29/2010 0:57	14.60079	144.77544	110.6	547.3	552.3	We are headed to Charon for a quick look.
8340	J2-495	3/29/2010 0:58	14.60078	144.77544	74.5	546.3	550.8	We passed by north of the sulfur vent and sulfur crust sites.
8343	J2-495	3/29/2010 1:01	14.60068	144.77579	96.2	570.1	572.3	Poor visibility. We are about half way to Charon driving downslope. Very cloudy.
8344	J2-495	3/29/2010 1:01	14.60067	144.77581	86.8	570.5	573.6	Probably the plume from Styx.
8346	J2-495	3/29/2010 1:04	14.60060	144.77600	2.4	552.0	587.2	We are about 20 m SW of Charon looking north still in a white out.
8347	J2-495	3/29/2010 1:06	14.60066	144.77610	321.5	582.6	594.2	lost iris control on science camera
8348	J2-495	3/29/2010 1:06	14.60064	144.77612	322.9	584.6	595.0	science camera back on
8350	J2-495	3/29/2010 1:07	14.60064	144.77612	330.9	586.8	595.1	Had to close the camera control program and then restart it. That the second time that's happened on this dive.
8351	J2-495	3/29/2010 1:08	14.60067	144.77609	350.2	587.0	590.9	We are right at the Charon target but we are up against a sulfur coated wall.
8353	J2-495	3/29/2010 1:08	14.60064	144.77607	330.8	583.8	592.3	There is white smoke and venting here. We are at the right depth for Charon. Nav says we are there.
8354	J2-495	3/29/2010 1:09	14.60065	144.77605	330.6	571.9	592.0	Jason has to come up off the bottom because Medea is too close to the wall.
8355	J2-495	3/29/2010 1:09	14.60065	144.77604	329.5	565.9	590.6	Turning HD off.
8357	J2-495	3/29/2010 1:10	14.60064	144.77601	329.9	566.8	589.8	Having to move the ship and Medea to the south away from the wall.
8358	J2-495	3/29/2010 1:12	14.60061	144.77607	77.4	555.3	585.8	Jason driving east toward Sulfur Wall in the water column.
8360	J2-495	3/29/2010 1:13	14.60062	144.77623	337.4	561.4	602.0	Bottom check has stirred up some shrimp.
8361	J2-495	3/29/2010 1:13	14.60062	144.77626	12.5	561.0	599.3	Not much visibility here.
8362	J2-495	3/29/2010 1:15	14.60063	144.77631	24.6	565.7	602.2	Wall dead ahead of us-still need to go further north for the Sulfur Wall site.
8363	J2-495	3/29/2010 1:15	14.60060	144.77628	24.3	573.6	601.9	Outcrops between us and wall on the new SM2K map.
8364	J2-495	3/29/2010 1:16	14.60057	144.77624	24.3	576.7	601.2	We are high up.
8365	J2-495	3/29/2010 1:16	14.60059	144.77621	24.3	579.4	599.6	Backing Jason away and will go around these outcrops.
8367	J2-495	3/29/2010 1:17	14.60063	144.77620	19.7	586.4	599.0	Base of Sulfur Wall was at 593.
8368	J2-495	3/29/2010 1:17	14.60062	144.77620	13.3	590.7	599.7	Jason moving a bit west and deeper.
8369	J2-495	3/29/2010 1:18	14.60060	144.77622	12.5	594.4	601.3	There is sulfur on this wall just not 100% coverage.
8370	J2-495	3/29/2010 1:18	14.60060	144.77623	24.4	595.2	601.2	NAV: Doppler Reset
8372	J2-495	3/29/2010 1:18	14.60063	144.77624	24.4	594.0	599.3	Want suction of 100% sulfur coverage site and then some with less coverage.
8373	J2-495	3/29/2010 1:18	14.60068	144.77625	24.4	593.4	600.7	Lots of shrimp and sulfur at 594m.
8374	J2-495	3/29/2010 1:19	14.60068	144.77626	24.9	593.7	600.8	Blocky area with Shrimp everywhere.
8376	J2-495	3/29/2010 1:21	14.60070	144.77626	24.7	593.7	600.7	Doing some basket management to tidy up the GTBs and major.
8377	J2-495	3/29/2010 1:22	14.60070	144.77626	24.7	593.6	600.7	Getting the slurp sampler from the basket.

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8378	J2-495	3/29/2010 1:22	14.60070	144.77626	24.7	593.7	600.7	HD_CAM: start
8379	J2-495	3/29/2010 1:22	14.60070	144.77626	24.6	593.6	600.7	24 minutes left on this HD tape.
8381	J2-495	3/29/2010 1:22	14.60070	144.77626	24.7	593.6	600.6	Can slurp into anything but green chamber here.
8382	J2-495	3/29/2010 1:24	14.60069	144.77625	24.3	593.6	600.7	A bit west of sulfur wall.
8384	J2-495	3/29/2010 1:25	14.60069	144.77625	24.3	593.5	600.7	SAMPLE: bio Blue chamber suction J495-shrimp-09 from Sulfur Wall area (probably W of marker) Depth 594 and Head=24.
8385	J2-495	3/29/2010 1:25	14.60069	144.77625	24.1	593.5	600.6	Can see shrimp in blue chamber but not many.
8386	J2-495	3/29/2010 1:26	14.60069	144.77625	24.6	593.5	600.7	SAMPLE: bio J495-shrimp-09 W. Sulfur Wall in blue chamber suction. Continuing to suction.
8388	J2-495	3/29/2010 1:28	14.60072	144.77626	24.3	593.5	600.7	SAMPLE: bio J495-shrimp-09 blue suction continues-not to much suction.
8390	J2-495	3/29/2010 1:29	14.60072	144.77627	24.5	593.5	600.7	Big suction.
8393	J2-495	3/29/2010 1:34	14.60068	144.77637	22.5	576.1	606.2	SAMPLE: bio Seeing sulfur on the wall now. Just a little bit to the east of the last sample and up the wall about 20 meters.
8394	J2-495	3/29/2010 1:36	14.60069	144.77638	21.5	573.3	606.5	The shrimp here are really tiny.
8395	J2-495	3/29/2010 1:39	14.60071	144.77642	21.6	573.6	609.0	J495-shrimp-10 suction into red chamber. Up the wall at a sulfur-encrusted area. Z=573m. This position is 20m up the wall from the last sample. (use same lat long as sample 9)
8396	J2-495	3/29/2010 1:41	14.60071	144.77642	8.2	573.6	610.1	Sample 9 was on an area of the wall with no sulfur cover. Sample 10 is 20m up the wall in an area of sulfur cover.
8397	J2-495	3/29/2010 1:41	14.60071	144.77643	9.0	573.6	610.0	Shrimp are swimming about and covering the wall.
8398	J2-495	3/29/2010 1:43	14.60067	144.77642	8.4	574.9	610.8	Moving down the wall a bit to find more shrimp.
8399	J2-495	3/29/2010 1:44	14.60066	144.77641	8.8	574.8	610.5	Jason shift change.
8400	J2-495	3/29/2010 1:48	14.60063	144.77642	7.6	574.8	611.5	Jimmy is not in the pilot seat and going in for the tiny shrimp suction.
8401	J2-495	3/29/2010 1:48	14.60063	144.77641	8.5	574.9	611.3	BIOLOGY: Opaepele(shrimp) juveniles. Suctioning them up on the sulfur-encrusted wall.
8402	J2-495	3/29/2010 1:49	14.60063	144.77640	8.4	574.9	610.0	A big shrimp just swam by.
8403	J2-495	3/29/2010 1:50	14.60065	144.77640	8.8	574.7	610.1	Continuing to suction shrimp off the sulfur-coated section of Sulfur Wall. Continuing to go into the red chamber.
8404	J2-495	3/29/2010 1:52	14.60063	144.77639	8.6	574.8	611.1	Done with the red chamber suction. J495-shrimp-10 at Sulfur Wall.
8405	J2-495	3/29/2010 1:53	14.60058	144.77636	8.5	574.7	611.2	HD_CAM: stop HD tape had run out-putting in new tape. Not sure about the time it ran out.
8406	J2-495	3/29/2010 1:53	14.60054	144.77634	8.5	574.8	612.8	Putting suction back into the basket.
8407	J2-495	3/29/2010 1:55	14.60037	144.77623	8.4	574.7	618.3	Suction left in flush chamber.
8408	J2-495	3/29/2010 1:55	14.60038	144.77622	8.4	574.8	618.5	Stowing basket.
8409	J2-495	3/29/2010 1:56	14.60043	144.77620	7.6	574.8	611.6	No nav right now.
8410	J2-495	3/29/2010 1:58	14.60064	144.77634	8.9	574.8	607.4	Want to go to base of wall and find the marker.
8411	J2-495	3/29/2010 1:58	14.60065	144.77634	8.8	576.3	607.2	Great view of wall at 578m.
8413	J2-495	3/29/2010 1:58	14.60066	144.77634	6.6	584.1	607.7	Descending to base of wall.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
8414	J2-495	3/29/2010 1:59	14.60066	144.77634	317.6	596.0	610.2	HD_CAM: start
8415	J2-495	3/29/2010 1:59	14.60067	144.77632	317.2	595.8	608.0	HD started as descend the wall.
8416	J2-495	3/29/2010 2:00	14.60070	144.77622	316.6	594.1	601.7	Large sulfur outcrop with smaller rocks surrounded a bit deeper than the original marker.
8417	J2-495	3/29/2010 2:00	14.60070	144.77622	332.7	593.9	600.9	NAV: Doppler Reset
8419	J2-495	3/29/2010 2:00	14.60072	144.77622	328.1	592.3	598.4	Moving along STBD on wall.
8420	J2-495	3/29/2010 2:00	14.60071	144.77622	327.4	591.2	598.0	Lots of white here.
8421	J2-495	3/29/2010 2:01	14.60068	144.77625	327.1	590.3	599.8	Lots of shrimp on the 100% white wall.
8422	J2-495	3/29/2010 2:02	14.60066	144.77626	0.9	591.8	598.6	Looking for fluid and shrimp.
8423	J2-495	3/29/2010 2:02	14.60066	144.77625	352.1	593.0	598.9	Whole wall is shimmering with fluid.
8425	J2-495	3/29/2010 2:03	14.60065	144.77624	336.6	596.5	599.7	Nav has us just west of marker.
8426	J2-495	3/29/2010 2:03	14.60064	144.77624	337.0	596.3	600.0	Floc is coming out around here.
8428	J2-495	3/29/2010 2:04	14.60062	144.77623	335.8	596.6	599.9	Floc is coming from the talus at the base.
8429	J2-495	3/29/2010 2:05	14.60060	144.77625	336.7	596.0	601.6	Going to go around this to the right while looking at the base.
8430	J2-495	3/29/2010 2:05	14.60060	144.77625	336.8	595.7	601.6	Gauge check.
8433	J2-495	3/29/2010 2:06	14.60060	144.77623	330.8	599.0	601.3	One piece of sulfur crust in the talus.
8435	J2-495	3/29/2010 2:07	14.60063	144.77621	333.1	595.0	599.0	Moving up the wall.
8437	J2-495	3/29/2010 2:09	14.60063	144.77611	332.6	583.7	592.6	We are at Charon now.
8438	J2-495	3/29/2010 2:09	14.60062	144.77611	332.8	582.9	592.5	We went to far west.
8439	J2-495	3/29/2010 2:09	14.60064	144.77607	333.5	580.3	590.7	Looking down at Charon Vent at contact between talus and white wall.
8440	J2-495	3/29/2010 2:10	14.60067	144.77605	332.6	579.8	587.7	Going to go look for mat up by the Iceberg09 area.
8442	J2-495	3/29/2010 2:10	14.60068	144.77605	333.1	579.4	587.8	Yesterday the venting was not up against the wall.
8443	J2-495	3/29/2010 2:11	14.60067	144.77607	332.8	579.4	590.2	Up to Iceberg09 Mkr-110 looking for mat.
8444	J2-495	3/29/2010 2:12	14.60063	144.77610	34.5	579.1	591.3	We are 30m away but much higher.
8445	J2-495	3/29/2010 2:12	14.60064	144.77609	39.6	579.1	590.5	Looking at the Sulfur Wall.
8447	J2-495	3/29/2010 2:13	14.60070	144.77614	38.4	573.3	589.6	Less staining now.
8448	J2-495	3/29/2010 2:13	14.60071	144.77614	39.3	572.0	588.3	Climbing the wall.
8449	J2-495	3/29/2010 2:13	14.60073	144.77614	39.2	564.1	588.0	Sulfur in a crack.
8450	J2-495	3/29/2010 2:14	14.60077	144.77617	38.0	552.6	569.2	Cloudy water and climbing.
8453	J2-495	3/29/2010 2:14	14.60078	144.77618	39.7	549.7	568.6	Shrimp here.
8455	J2-495	3/29/2010 2:14	14.60078	144.77619	39.6	546.4	569.4	This wall is really tall.
8456	J2-495	3/29/2010 2:15	14.60078	144.77620	39.7	541.7	558.2	Ship is moving.
8457	J2-495	3/29/2010 2:15	14.60078	144.77621	39.0	541.9	567.7	Holding here waiting for Medea
8458	J2-495	3/29/2010 2:20	14.60057	144.77624	24.8	541.0	592.7	Still waiting for Medea and ship.
8459	J2-495	3/29/2010 2:20	14.60057	144.77624	23.5	541.2	592.5	Lots of plume up here now.
8460	J2-495	3/29/2010 2:21	14.60062	144.77625	24.1	538.7	546.7	Moving the ship now-ay.
8461	J2-495	3/29/2010 2:22	14.60066	144.77624	24.8	537.4	543.8	Shrimp on pillows so we think we're above the landslide scars.
8462	J2-495	3/29/2010 2:22	14.60067	144.77624	24.3	537.0	543.5	Looking for venting and mat.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
8464	J2-495	3/29/2010 2:23	14.60070	144.77624	25.0	535.3	543.5	Slabs of white sliding down.
8465	J2-495	3/29/2010 2:23	14.60071	144.77624	24.5	535.5	544.4	There is Mkr-117. 535m depth.
8466	J2-495	3/29/2010 2:23	14.60072	144.77624	25.2	535.3	544.0	We did fluid sampling here.
8467	J2-495	3/29/2010 2:24	14.60073	144.77624	24.5	532.9	536.6	Still heading to Iceberg09 Mkr-110.
8468	J2-495	3/29/2010 2:24	14.60073	144.77625	24.6	531.3	535.2	The nav is not good still-waiting for fixes.
8470	J2-495	3/29/2010 2:24	14.60073	144.77626	24.3	531.0	536.1	We are at the marker depth for Mkr-110.
8471	J2-495	3/29/2010 2:25	14.60075	144.77626	3.1	531.5	539.9	There is Mkr-110 Iceberg09 at 531.5m.
8472	J2-495	3/29/2010 2:25	14.60075	144.77626	351.8	531.3	541.2	Looking at 355deg.
8473	J2-495	3/29/2010 2:25	14.60075	144.77626	356.7	531.2	540.9	Lots of plume here.
8474	J2-495	3/29/2010 2:25	14.60075	144.77627	356.0	531.2	540.5	Going to collect instruments first.
8475	J2-495	3/29/2010 2:25	14.60077	144.77626	311.0	531.1	535.9	There is a shrimp trap and mat cage here.
8477	J2-495	3/29/2010 2:26	14.60076	144.77629	52.9	530.8	535.0	Preparing heading for retrieving trap and cage.
8478	J2-495	3/29/2010 2:27	14.60078	144.77628	37.0	530.6	536.5	Everything is sitting on older basalts.
8479	J2-495	3/29/2010 2:28	14.60079	144.77627	38.1	531.5	535.9	Lots of shrimp in the trap and on the outside of the trap
8480	J2-495	3/29/2010 2:28	14.60079	144.77627	38.1	531.4	536.0	Shrimp Trap-2 has some shrimp in it.
8482	J2-495	3/29/2010 2:28	14.60079	144.77628	38.5	531.5	535.9	Opening PORT biobox for mat cage recovery.
8483	J2-495	3/29/2010 2:30	14.60079	144.77629	39.1	531.4	536.0	RECOVER: mat cage J495-mat-11 Mat Cage has been here since J490 recovered at Mkr-100 at Iceberg09.
8485	J2-495	3/29/2010 2:30	14.60078	144.77629	38.2	531.4	536.0	SAMPLE: bio J495-mat-11 recovered mat cage at Mkr-110 at Iceberg09.
8486	J2-495	3/29/2010 2:32	14.60077	144.77628	37.2	531.4	535.9	Two crabs waiting for easy pickings.
8487	J2-495	3/29/2010 2:32	14.60077	144.77628	37.2	531.4	535.9	Getting the trap now.
8489	J2-495	3/29/2010 2:32	14.60076	144.77628	37.1	531.4	535.9	RECOVER: shrimp trap J495-shrimp-12 at Iceberg09 Mkr-110 been down since J494.
8490	J2-495	3/29/2010 2:33	14.60076	144.77628	37.1	531.5	535.9	Placing trap temporarily on top of the swing arm.
8491	J2-495	3/29/2010 2:34	14.60077	144.77627	36.4	531.6	535.9	SAMPLE: bio J495-shrimp-12 placed on top of tephra bucket not biobox for now. Iceberg09 Mkr-110.
8493	J2-495	3/29/2010 2:36	14.60083	144.77629	37.2	531.5	535.9	Trap is in the bucket that is supposed to be for the mat cage later.
8495	J2-495	3/29/2010 2:37	14.60086	144.77629	37.1	531.6	535.9	Retrieving the suction.
8496	J2-495	3/29/2010 2:38	14.60087	144.77628	36.6	531.6	535.9	Running the flush before sampling.
8498	J2-495	3/29/2010 2:39	14.60087	144.77628	35.5	531.6	535.9	Precision rotation on the sampler.
8499	J2-495	3/29/2010 2:39	14.60087	144.77627	36.2	531.6	535.9	SAMPLE: bio Mkr-110 suction of shrimp into the black chamber J495-shrimp-13 Iceberg09.
8501	J2-495	3/29/2010 2:40	14.60088	144.77627	36.0	531.5	535.9	Still sucking shrimp into chamber.
8502	J2-495	3/29/2010 2:41	14.60088	144.77627	35.6	531.5	535.9	SAMPLE: bio J495-shrimp-13 got some sediment with the shrimp.
8504	J2-495	3/29/2010 2:43	14.60087	144.77628	34.6	531.6	536.0	Just one more suck.
8507	J2-495	3/29/2010 2:46	14.60088	144.77627	36.8	531.8	535.9	SAMPLE: bio J495-shrimp-13 last suction-repositioning at same site. Iceberg09 Mkr-110.
8508	J2-495	3/29/2010 2:47	14.60087	144.77627	36.5	531.8	535.9	Good sample.

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8509	J2-495	3/29/2010 2:48	14.60087	144.77628	36.1	531.8	536.0	Done with shrimp suction and now going to mat suction.
8510	J2-495	3/29/2010 2:48	14.60087	144.77628	35.5	531.9	536.0	Mat suction needs to go into the green chamber.
8512	J2-495	3/29/2010 2:48	14.60087	144.77628	35.3	531.9	536.0	Flushed the sampler.
8513	J2-495	3/29/2010 2:49	14.60088	144.77623	2.1	529.8	536.4	SAMPLE: bio Looking just left of the shrimp slurp for the mat in the rocks.
8514	J2-495	3/29/2010 2:50	14.60089	144.77623	76.5	530.1	542.2	floc was coming out of this vent when fluid sampling on an earlier dive.
8516	J2-495	3/29/2010 2:52	14.60088	144.77623	6.1	530.9	536.0	Hazy here.
8518	J2-495	3/29/2010 2:53	14.60087	144.77626	52.0	529.3	535.8	Good view of top of ridge at 529m.
8520	J2-495	3/29/2010 2:55	14.60085	144.77618	69.3	535.2	546.3	Moving back down the wall looking for mat.
8522	J2-495	3/29/2010 2:56	14.60083	144.77623	353.5	532.1	536.9	Looking for the marker again for a good spot.
8523	J2-495	3/29/2010 2:57	14.60083	144.77626	15.4	532.5	538.8	At Mkr-110 again.
8524	J2-495	3/29/2010 2:57	14.60084	144.77627	320.4	533.0	537.1	Going to look for mat just on the downslope side of the anchor.
8525	J2-495	3/29/2010 2:58	14.60084	144.77629	316.4	532.2	536.7	Basket out.
8527	J2-495	3/29/2010 2:59	14.60084	144.77629	321.0	532.1	544.8	Sample area is bright white rock with vertical crack just above the marker.
8528	J2-495	3/29/2010 3:00	14.60086	144.77629	343.1	533.2	537.4	Rock forming the crack is a long pillow tube stretching down.
8529	J2-495	3/29/2010 3:00	14.60086	144.77629	343.6	533.2	537.5	Shrimp on the tube.
8530	J2-495	3/29/2010 3:00	14.60086	144.77630	343.4	533.2	537.7	Looking for fluffy mat at the top of the crack.
8532	J2-495	3/29/2010 3:00	14.60086	144.77629	323.3	532.4	537.0	Butt cam has edge of plume from something venting.
8533	J2-495	3/29/2010 3:01	14.60087	144.77629	315.9	532.0	536.6	Positioning basket to reach sample area.
8534	J2-495	3/29/2010 3:02	14.60088	144.77629	317.0	532.0	536.4	SAMPLE: bio J495-mat-14 Suction into green chamber at Mkr-110 Iceberg09.
8536	J2-495	3/29/2010 3:02	14.60088	144.77630	316.5	532.0	536.4	See material going into chamber but mainly shrimp.
8538	J2-495	3/29/2010 3:04	14.60090	144.77629	316.8	532.0	536.4	J495-mat-14 suction at Iceberg09 Mkr-110 done.
8539	J2-495	3/29/2010 3:04	14.60090	144.77629	316.8	532.1	536.3	Stowing the suction sampler.
8540	J2-495	3/29/2010 3:06	14.60090	144.77629	316.9	532.0	536.4	There are some shrimp in the flush chamber.
8541	J2-495	3/29/2010 3:06	14.60090	144.77629	316.8	532.0	536.4	Because chamber is contaminated with shrimp here-going to take another shrimp suction here.
8543	J2-495	3/29/2010 3:06	14.60091	144.77629	316.9	532.0	536.5	Need to switch arms for suction.
8544	J2-495	3/29/2010 3:08	14.60093	144.77630	314.9	531.5	536.3	Flush chamber does not have a cover for recovery so the shrimp can climb out the hose.
8545	J2-495	3/29/2010 3:08	14.60093	144.77630	317.4	531.9	536.0	Still going to suction more shrimp here into the chamber and hope some remain.
8547	J2-495	3/29/2010 3:10	14.60087	144.77630	318.1	531.4	536.3	2 hours and 15 min. remaining in dive.
8549	J2-495	3/29/2010 3:10	14.60086	144.77630	318.2	531.4	536.3	SAMPLE: bio J495-shrimp-15 suction at Mkr-110 Iceberg09 into orange flush chamber.
8550	J2-495	3/29/2010 3:10	14.60086	144.77630	318.1	531.5	536.3	Going into chamber.
8551	J2-495	3/29/2010 3:12	14.60086	144.77631	318.1	531.5	536.4	J495-shrimp-15 suction done at Mkr-110. Done.
8553	J2-495	3/29/2010 3:12	14.60087	144.77631	317.9	531.6	536.3	Stowing the wand and then need to head over east to Mkr-109.

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8554	J2-495	3/29/2010 3:12	14.60087	144.77631	318.0	531.5	536.4	Mkr-109 has 3 instruments to retrieve.
8555	J2-495	3/29/2010 3:14	14.60086	144.77631	315.4	531.0	536.7	Going to do ballast check first.
8557	J2-495	3/29/2010 3:14	14.60085	144.77630	331.7	530.6	545.6	Good-bye Iceberg09.
8558	J2-495	3/29/2010 3:15	14.60080	144.77633	88.4	530.7	542.4	Need to move ship and Medea.
8561	J2-495	3/29/2010 3:17	14.60076	144.77634	88.5	531.9	546.2	Ship is moving.
8562	J2-495	3/29/2010 3:17	14.60076	144.77634	88.3	531.1	541.8	Need to fly midwater to Mkr-109 area.
8564	J2-495	3/29/2010 3:19	14.60081	144.77638	86.7	530.5	535.3	HD_CAM: stop
8565	J2-495	3/29/2010 3:19	14.60081	144.77640	87.0	530.3	535.7	45 minute left on HD tape.
8566	J2-495	3/29/2010 3:20	14.60082	144.77645	89.4	530.0	539.3	NAV: Doppler Reset
8568	J2-495	3/29/2010 3:21	14.60079	144.77648	89.3	530.4	540.2	Flying over to Mkr-109 area with ship and Medea moving east.
8570	J2-495	3/29/2010 3:25	14.60081	144.77711	89.2	540.8	612.8	Almost there-ship is above the site.
8571	J2-495	3/29/2010 3:28	14.60083	144.77741	38.8	541.8	585.9	We are high at the site-going to come down.
8572	J2-495	3/29/2010 3:29	14.60082	144.77747	42.5	562.2	583.8	NAV: Doppler Reset
8573	J2-495	3/29/2010 3:30	14.60082	144.77750	37.4	562.7	583.0	Looking for Mkr-112 and the Mkr-109 site.
8575	J2-495	3/29/2010 3:30	14.60086	144.77750	14.6	561.7	570.8	Medea has the view of the trap
8576	J2-495	3/29/2010 3:31	14.60088	144.77750	11.8	562.1	569.9	There is the Mkr-112 in the background at this heading of 013.
8577	J2-495	3/29/2010 3:31	14.60089	144.77751	33.8	562.3	567.3	See the MTR and the trap to pickup.
8578	J2-495	3/29/2010 3:32	14.60089	144.77751	68.5	562.7	566.5	Positioning for recovery of instruments.
8580	J2-495	3/29/2010 3:32	14.60090	144.77751	67.5	562.8	566.5	Instruments here are numbered 2-3-4.
8581	J2-495	3/29/2010 3:33	14.60091	144.77751	67.4	562.9	566.5	Not-#2 is in the basket-almost a straight.
8582	J2-495	3/29/2010 3:34	14.60090	144.77751	67.8	562.9	567.1	Moved trap FWD-Port of basket.
8583	J2-495	3/29/2010 3:34	14.60090	144.77751	69.1	562.9	567.3	RECOVER: shrimp trap Picking up shrimp trap at Mkr-109. J495-shrimp-16.
8585	J2-495	3/29/2010 3:35	14.60089	144.77750	68.7	562.9	567.2	SAMPLE: bio J495-shrimp-16 been down since J489 at old Mkr-109 site with Mkr-112 in background along ridge.
8586	J2-495	3/29/2010 3:36	14.60089	144.77750	68.3	562.8	567.1	Placed shrimp trap-3 next to shrimp trap-2 in fwd port side of basket.
8589	J2-495	3/29/2010 3:39	14.60088	144.77749	68.5	562.9	567.2	Bucket is now free for mat cage recovery.
8590	J2-495	3/29/2010 3:40	14.60089	144.77749	67.1	562.9	566.6	Port biobox ready for MTR.
8591	J2-495	3/29/2010 3:40	14.60090	144.77750	67.3	562.9	566.6	RECOVER: MTR -4 Mkr-109 site recovered-been down since J489.
8593	J2-495	3/29/2010 3:41	14.60091	144.77750	67.3	562.9	566.6	MTR-4 placed in PORT biobox.
8594	J2-495	3/29/2010 3:41	14.60091	144.77750	67.7	562.9	566.6	Biobox closed and swing arm retracted.
8596	J2-495	3/29/2010 3:44	14.60093	144.77753	112.7	562.0	566.9	There is the mat cage on top of the ridge with Mkr-112 in background.
8598	J2-495	3/29/2010 3:44	14.60093	144.77754	113.9	562.7	565.7	This mat cage was halfway between Mkr-109 site and Mkr-112.
8599	J2-495	3/29/2010 3:44	14.60093	144.77754	114.6	562.3	565.9	Very close to Mkr-112.
8600	J2-495	3/29/2010 3:46	14.60094	144.77753	115.0	562.5	565.9	RECOVER: mat cage J495-mat-17 between Mkr-109 site and Mkr-112 been down since J489 and moved on J490.
8602	J2-495	3/29/2010 3:47	14.60095	144.77752	114.8	562.5	566.0	SAMPLE: bio J495-mat-17 between Mkr-109 site and Mkr-112 (has shrimp in it-oops) been down since J489 and moved on J490.
8604	J2-495	3/29/2010 3:48	14.60096	144.77751	115.1	562.5	565.9	After securing all this we need to go to Summit to retrieve instruments.

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8605	J2-495	3/29/2010 3:48	14.60096	144.77751	115.2	562.5	565.9	1 hour and 30 minutes left.
8606	J2-495	3/29/2010 3:49	14.60095	144.77751	115.4	562.4	565.9	200m away to summit at 279deg.
8607	J2-495	3/29/2010 3:50	14.60095	144.77751	115.1	562.5	565.9	Putting bungee over trap.
8609	J2-495	3/29/2010 3:52	14.60094	144.77752	116.5	562.6	565.5	Basket in.
8611	J2-495	3/29/2010 3:53	14.60093	144.77753	116.4	562.7	565.5	Placing arm on top of shrimp trap in front.
8612	J2-495	3/29/2010 3:53	14.60092	144.77752	112.4	561.7	566.9	Heading for Mkr-163 at Summit at 200m and bearing 280
8613	J2-495	3/29/2010 3:53	14.60089	144.77747	112.5	560.0	568.2	Did not redeploy Mkr-109 at this site. This is now the Mkr-112 site.
8617	J2-495	3/29/2010 3:57	14.60083	144.77717	32.4	578.0	588.4	Outcrop here.
8618	J2-495	3/29/2010 3:58	14.60086	144.77716	26.8	577.9	587.6	Waiting for ship and Medea.
8619	J2-495	3/29/2010 3:58	14.60087	144.77717	35.6	578.6	591.0	Looks like pillows with not much sediment.
8621	J2-495	3/29/2010 3:59	14.60090	144.77693	284.8	580.3	609.7	Driving midwater to Mkr-163 at summit.
8622	J2-495	3/29/2010 4:01	14.60078	144.77668	286.7	579.8	632.0	Everything heading west.
8623	J2-495	3/29/2010 4:04	14.60064	144.77641	300.9	574.0	619.5	Wall in front of us. Black on one side and completely white on the 90deg face.
8624	J2-495	3/29/2010 4:05	14.60064	144.77640	329.2	572.7	614.3	This is the Sulfur Wall with Charon down below and a bit west.
8625	J2-495	3/29/2010 4:05	14.60064	144.77639	325.8	571.5	617.7	Fresh fracture.
8626	J2-495	3/29/2010 4:06	14.60065	144.77640	328.4	566.0	615.6	We are 45m up from bottom with vertical jointed wall in front of us at 568m J-depth.
8627	J2-495	3/29/2010 4:06	14.60066	144.77641	323.5	560.2	616.4	Going up wall while we wait for ship and Medea.
8628	J2-495	3/29/2010 4:06	14.60066	144.77641	323.0	559.2	616.4	Very tall wall.
8629	J2-495	3/29/2010 4:07	14.60069	144.77642	325.9	554.4	617.8	60m vertical scarp.
8630	J2-495	3/29/2010 4:07	14.60072	144.77640	329.7	545.3	614.5	70m wall now and climbing.
8631	J2-495	3/29/2010 4:08	14.60075	144.77637	327.3	541.2	560.7	Solid rock with more staining now at top.
8632	J2-495	3/29/2010 4:08	14.60077	144.77635	327.5	537.3	561.3	How tall is Half Dome in Yosemite.
8634	J2-495	3/29/2010 4:08	14.60078	144.77632	324.7	534.5	558.0	Overhanging basalt on top.
8635	J2-495	3/29/2010 4:09	14.60083	144.77627	325.4	534.2	542.4	Top is 535. There is Mkr-117 at 536.
8636	J2-495	3/29/2010 4:10	14.60084	144.77627	332.2	529.8	536.3	Need to restart sci cam program-lost of iris control.
8637	J2-495	3/29/2010 4:10	14.60086	144.77626	325.0	526.7	534.3	Restarting the program.
8638	J2-495	3/29/2010 4:10	14.60093	144.77621	325.6	524.2	535.9	Strong current here as we try to get to the summit.
8640	J2-495	3/29/2010 4:10	14.60102	144.77615	327.7	525.0	534.2	Problem with sci cam.
8641	J2-495	3/29/2010 4:11	14.60107	144.77613	325.7	526.0	534.1	Plume here and more ridges.
8642	J2-495	3/29/2010 4:11	14.60108	144.77612	325.3	524.9	532.8	Ridge top has sediment and outcrops.
8643	J2-495	3/29/2010 4:11	14.60109	144.77612	315.0	523.8	529.4	Restarting sci cam again.
8644	J2-495	3/29/2010 4:11	14.60109	144.77611	315.1	523.4	529.2	Maybe smoke from Styx here.
8645	J2-495	3/29/2010 4:11	14.60110	144.77610	313.6	523.9	529.3	Still no sci cam.
8646	J2-495	3/29/2010 4:12	14.60112	144.77605	315.3	524.3	530.3	Ship still moving west.
8647	J2-495	3/29/2010 4:12	14.60114	144.77603	315.2	524.2	532.1	Ridge in front of us.
8649	J2-495	3/29/2010 4:12	14.60114	144.77602	315.1	524.0	532.3	Gauge check.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
8650	J2-495	3/29/2010 4:13	14.60119	144.77594	311.5	523.3	526.4	Bright white sediment line on top of summit rim.
8651	J2-495	3/29/2010 4:13	14.60119	144.77592	314.3	523.0	526.2	Driving along summit to Mkr-163.
8652	J2-495	3/29/2010 4:13	14.60120	144.77591	297.3	522.3	526.0	Block of breccia/outcrop.
8653	J2-495	3/29/2010 4:13	14.60120	144.77591	281.8	522.4	526.4	26m away at 276deg.
8654	J2-495	3/29/2010 4:13	14.60122	144.77591	265.9	521.8	528.4	NAV: Doppler Reset
8655	J2-495	3/29/2010 4:14	14.60120	144.77590	277.2	519.5	526.5	Lost power to sci cam monitor.
8657	J2-495	3/29/2010 4:15	14.60117	144.77587	273.8	517.9	525.5	Waiting for Medea with only 17m to go.
8658	J2-495	3/29/2010 4:15	14.60109	144.77579	291.2	519.5	534.9	Lots of smoke from this approach.
8660	J2-495	3/29/2010 4:17	14.60099	144.77562	8.8	512.0	547.5	Whiteout here.
8661	J2-495	3/29/2010 4:17	14.60097	144.77560	9.2	509.4	547.6	Sci cam back online.
8662	J2-495	3/29/2010 4:19	14.60096	144.77554	11.4	517.0	552.6	Good plume view in Medea.
8663	J2-495	3/29/2010 4:19	14.60099	144.77554	11.7	520.2	547.9	There's the summit in the sonar.
8664	J2-495	3/29/2010 4:20	14.60105	144.77554	9.5	520.3	544.3	Smokey up here today.
8666	J2-495	3/29/2010 4:21	14.60109	144.77560	10.7	519.9	530.6	Plume is billowing up at Jason.
8667	J2-495	3/29/2010 4:21	14.60116	144.77558	16.9	520.4	528.8	There is the rim out of the smoke.
8668	J2-495	3/29/2010 4:22	14.60117	144.77559	46.8	520.2	534.6	Great look down the summit wall.
8669	J2-495	3/29/2010 4:22	14.60117	144.77559	48.0	520.1	534.1	Pillar on the summit.
8671	J2-495	3/29/2010 4:23	14.60116	144.77565	14.9	519.4	527.6	There it is-bucket and Mkr-163.
8673	J2-495	3/29/2010 4:24	14.60119	144.77571	7.3	518.8	527.3	Can see all the instruments here on the approach to summit Mkr-163.
8674	J2-495	3/29/2010 4:24	14.60120	144.77571	8.4	518.7	525.7	STBD biobox is open and so is the PORT box.
8675	J2-495	3/29/2010 4:25	14.60121	144.77570	8.4	519.0	524.0	Lots of shrimp still here.
8677	J2-495	3/29/2010 4:26	14.60122	144.77571	334.1	519.0	523.8	Opening PORT biobox.
8678	J2-495	3/29/2010 4:26	14.60122	144.77571	336.0	518.9	523.8	Shrimp flying around.
8679	J2-495	3/29/2010 4:27	14.60122	144.77572	335.9	518.9	523.8	RECOVER: hydrophone Mkr-163 Summit hydrophone in the PORT biobox been down since J494..
8680	J2-495	3/29/2010 4:28	14.60122	144.77573	235.7	517.9	522.6	Spinning around ridge top for next recovery position.
8682	J2-495	3/29/2010 4:29	14.60121	144.77573	281.8	517.6	519.6	RECOVER: MTR -5 Summit Mkr-163 recovered. Been down since J487.
8683	J2-495	3/29/2010 4:30	14.60118	144.77572	323.8	517.7	526.6	PORT biobox in-out-in.
8684	J2-495	3/29/2010 4:30	14.60118	144.77572	337.6	517.8	527.2	STBD biobox swung out.
8686	J2-495	3/29/2010 4:32	14.60120	144.77571	9.4	519.1	523.3	RECOVER: tephra bucket Tephra Sampler C J495-tephra-18 recovered at Summit Mkr-163 and put in STBD biobox.
8688	J2-495	3/29/2010 4:32	14.60120	144.77571	10.2	519.2	523.2	SAMPLE: geo Tephra-C J495-tephra-18 recovered at summit with a few shrimp inside. In STBD biobox.
8689	J2-495	3/29/2010 4:34	14.60120	144.77569	8.3	517.8	523.8	Tephra-C has been here since J487.
8691	J2-495	3/29/2010 4:34	14.60119	144.77573	20.0	518.4	527.3	Want to get tephra scoop sample here just to the other side of Mkr-163 (NE of marker).
8692	J2-495	3/29/2010 4:35	14.60120	144.77576	14.7	518.5	527.1	Following ridge to the east. Need to go 10-20m.
8693	J2-495	3/29/2010 4:35	14.60120	144.77578	352.8	519.2	526.8	Plume in butt cam.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
8694	J2-495	3/29/2010 4:35	14.60122	144.77583	90.7	520.6	525.3	Turning 90deg to the east.
8695	J2-495	3/29/2010 4:36	14.60123	144.77583	108.9	521.1	527.4	NAV: Doppler Reset
8696	J2-495	3/29/2010 4:36	14.60123	144.77591	93.8	524.5	528.0	Looking for pre-slide slope.
8698	J2-495	3/29/2010 4:36	14.60120	144.77593	174.7	524.6	531.7	Going to ridge line of sandy slope.
8699	J2-495	3/29/2010 4:36	14.60118	144.77593	178.9	524.8	530.0	Positioning for a scoop here.
8700	J2-495	3/29/2010 4:37	14.60118	144.77593	178.1	525.6	529.1	We are about 10m east of Mkr-163 and facing due south on the slope.
8701	J2-495	3/29/2010 4:38	14.60118	144.77592	180.0	525.8	529.2	SAMPLE: geo 20m east and maybe a meter south of Mkr-163 facing south on a sandy ridge top.
8704	J2-495	3/29/2010 4:41	14.60119	144.77594	179.8	525.7	529.2	J495-tephra-19 20m East of Mkr-163 on ridge top.
8706	J2-495	3/29/2010 4:43	14.60119	144.77594	179.9	525.7	529.1	Started a small slide. Sample looks black.
8707	J2-495	3/29/2010 4:43	14.60119	144.77594	179.6	525.7	529.1	Sample is in the weight box.
8708	J2-495	3/29/2010 4:43	14.60119	144.77594	177.6	525.5	529.1	Want to go to Styx but only 30-40 minutes left.
8709	J2-495	3/29/2010 4:43	14.60120	144.77594	180.6	523.2	529.7	Heading off and closing the basket.
8710	J2-495	3/29/2010 4:44	14.60117	144.77591	206.3	521.4	527.0	Sucking slurp to keep the shrimp in.
8711	J2-495	3/29/2010 4:44	14.60115	144.77590	209.9	521.0	525.4	Moving ship and Medea with hopes of one last view of Styx.
8713	J2-495	3/29/2010 4:45	14.60108	144.77577	195.6	524.1	529.6	Only 16m to go.
8714	J2-495	3/29/2010 4:45	14.60107	144.77576	194.6	524.4	529.8	Lots of plume in the water.
8715	J2-495	3/29/2010 4:46	14.60099	144.77573	75.7	521.7	536.8	Ship is moving over Styx as well-good place to look at water column data from EM122.
8717	J2-495	3/29/2010 4:47	14.60096	144.77569	4.6	516.4	548.0	Moving everything due south.
8718	J2-495	3/29/2010 4:47	14.60095	144.77569	5.8	516.6	551.3	No visibility here.
8719	J2-495	3/29/2010 4:47	14.60092	144.77569	6.0	516.5	553.6	We are high above Styx in the plume.
8720	J2-495	3/29/2010 4:48	14.60090	144.77569	3.3	516.3	555.6	Waiting for Medea and Ship.
8721	J2-495	3/29/2010 4:48	14.60088	144.77570	6.6	516.5	557.7	Ship is in good position.
8722	J2-495	3/29/2010 4:48	14.60087	144.77570	6.0	516.4	555.7	Just waiting for Medea.
8723	J2-495	3/29/2010 4:49	14.60086	144.77571	5.6	516.4	560.0	Jason is just west of the vent and high.
8724	J2-495	3/29/2010 4:51	14.60081	144.77571	5.6	540.3	562.9	Descending to Styx.
8725	J2-495	3/29/2010 4:51	14.60082	144.77569	5.8	545.3	561.2	No visibility.
8726	J2-495	3/29/2010 4:51	14.60084	144.77567	6.3	551.5	557.6	Seeing bottom at 552m.
8727	J2-495	3/29/2010 4:52	14.60088	144.77569	7.9	549.8	554.0	Going around the wall to the vent.
8728	J2-495	3/29/2010 4:52	14.60091	144.77572	0.0	548.6	556.0	NAV: Doppler Reset
8730	J2-495	3/29/2010 4:52	14.60091	144.77576	356.6	549.8	558.3	Need to get deeper.
8731	J2-495	3/29/2010 4:53	14.60091	144.77577	349.1	554.9	559.8	There it is.
8732	J2-495	3/29/2010 4:53	14.60092	144.77579	322.5	554.6	562.0	Very diminished.
8733	J2-495	3/29/2010 4:53	14.60092	144.77579	328.9	554.5	561.9	HD_CAM: start
8734	J2-495	3/29/2010 4:54	14.60095	144.77578	354.3	553.1	559.2	Just watching but not much-that is not it.
8735	J2-495	3/29/2010 4:54	14.60094	144.77574	1.5	553.1	557.6	There it is below us.
8737	J2-495	3/29/2010 4:54	14.60092	144.77574	359.5	555.3	558.2	Park and wait but looks diminished activity-but fairly clear view.

Virtual Van Record	Dive	Date Time	Latitude	Longitude	Gyro	Jason Depth	Total Depth	Log Comment
8738	J2-495	3/29/2010 4:55	14.60091	144.77574	356.7	555.8	558.3	Venting is along upslope.
8739	J2-495	3/29/2010 4:55	14.60091	144.77574	357.8	555.5	558.3	Topography has changed-we are shallower at 555 instead of 558.
8740	J2-495	3/29/2010 4:55	14.60091	144.77574	357.8	555.5	558.3	Lasers are on.
8742	J2-495	3/29/2010 4:57	14.60093	144.77574	356.8	555.6	558.3	It has died down here.
8743	J2-495	3/29/2010 4:58	14.60093	144.77576	353.9	555.4	558.8	Losing position here-moving slightly.
8744	J2-495	3/29/2010 4:58	14.60094	144.77577	310.9	554.3	560.1	View of venting even higher on the wall.
8746	J2-495	3/29/2010 4:58	14.60094	144.77577	300.6	554.4	560.1	More intense higher up.
8747	J2-495	3/29/2010 4:59	14.60094	144.77577	302.8	554.3	560.4	Venting out of the wall.
8748	J2-495	3/29/2010 4:59	14.60094	144.77576	302.7	554.4	560.3	Lots of sulfur.
8749	J2-495	3/29/2010 4:59	14.60094	144.77576	301.3	554.4	560.1	A bit of a sulfur crust at the venting.
8750	J2-495	3/29/2010 4:59	14.60093	144.77576	304.9	555.0	560.3	Doppler not holding here-moving closer.
8751	J2-495	3/29/2010 5:00	14.60094	144.77574	308.9	555.6	559.0	Coming in close.
8753	J2-495	3/29/2010 5:00	14.60093	144.77574	307.7	556.2	559.1	Small slide of sediment.
8754	J2-495	3/29/2010 5:02	14.60094	144.77573	309.6	556.2	559.1	Hardly any activity and seems to be decreasing.
8755	J2-495	3/29/2010 5:02	14.60094	144.77573	309.6	556.2	559.1	Upper smoke is wafting back over vehicle.
8757	J2-495	3/29/2010 5:03	14.60094	144.77572	309.5	556.2	559.1	Small sand slide.
8760	J2-495	3/29/2010 5:05	14.60094	144.77573	309.4	556.2	559.1	Even less venting.
8762	J2-495	3/29/2010 5:07	14.60095	144.77574	309.2	556.3	559.1	Lasers off.
8764	J2-495	3/29/2010 5:09	14.60095	144.77575	306.7	555.2	559.3	Moving over a bit to the right for some more activity.
8765	J2-495	3/29/2010 5:09	14.60096	144.77574	306.3	555.1	558.7	Venting is more vigorous here.
8766	J2-495	3/29/2010 5:09	14.60096	144.77574	304.4	555.4	558.8	Lots of sulfur at the base.
8768	J2-495	3/29/2010 5:10	14.60095	144.77574	303.5	555.3	558.7	Fresh black sand and bright yellow at vent source.
8769	J2-495	3/29/2010 5:12	14.60094	144.77574	303.5	555.3	558.7	Very yellow.
8770	J2-495	3/29/2010 5:12	14.60094	144.77574	303.3	555.3	558.7	The last hurrah for this series of expeditions.
8772	J2-495	3/29/2010 5:12	14.60094	144.77574	303.5	555.3	558.7	Little tephra coming out.
8773	J2-495	3/29/2010 5:12	14.60094	144.77574	303.3	555.3	558.7	Getting a bit more active.
8774	J2-495	3/29/2010 5:13	14.60094	144.77574	303.6	555.3	558.7	Starting to get tephra explosions now.
8775	J2-495	3/29/2010 5:13	14.60094	144.77574	304.0	555.2	558.7	The grand finale.
8776	J2-495	3/29/2010 5:13	14.60094	144.77574	303.7	555.3	558.7	Seeing more tephra in the venting.
8777	J2-495	3/29/2010 5:14	14.60094	144.77573	303.7	555.2	558.7	More tephra entrained in the plume.
8779	J2-495	3/29/2010 5:15	14.60094	144.77573	303.7	555.2	558.7	Looks like cheese curds of sulfur on the rock.
8780	J2-495	3/29/2010 5:16	14.60094	144.77574	303.9	555.2	558.8	Very close to the end...would like one last big explosion....
8782	J2-495	3/29/2010 5:17	14.60094	144.77574	303.2	555.2	558.8	Getting decrease in visibility coming from the left.
8783	J2-495	3/29/2010 5:17	14.60091	144.77576	310.4	555.8	560.1	Looks like more plume.
8785	J2-495	3/29/2010 5:18	14.60092	144.77575	310.8	554.4	559.3	Not much activity.
8786	J2-495	3/29/2010 5:18	14.60093	144.77574	310.8	554.1	558.9	Soaring above the upper vent.
8787	J2-495	3/29/2010 5:19	14.60092	144.77574	309.0	555.6	558.8	5 minutes until go up. Need to close up the forward tephra sampler.
8789	J2-495	3/29/2010 5:22	14.60085	144.77578	308.0	542.4	562.3	Closing the Tephra bucket.

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8791	J2-495	3/29/2010 5:23	14.60085	144.77578	308.2	542.8	565.1	SAMPLE: geo J495-tephra-20 Tephra Sampler closed-been collecting tephra all dive (probably from first Styx visit).
8792	J2-495	3/29/2010 5:23	14.60085	144.77578	308.3	542.9	565.1	Basket maintenance to secure for ascent.
8793	J2-495	3/29/2010 5:24	14.60085	144.77578	308.6	542.8	565.1	bye-bye Rota...not sure when we'll be back.
8795	J2-495	3/29/2010 5:25	14.60087	144.77567	279.0	531.8	557.4	JASON: Jason off bottom
8797	J2-495	3/29/2010 5:35	14.60048	144.77605	265.0	258.2	454.6	Shrimp are still in the flush chamber of the suction sampler. Cycling the suction periodically.
8798	J2-495	3/29/2010 5:40	14.60039	144.77701	272.7	100.1	286.4	Holding at 100m.
8799	J2-495	3/29/2010 5:47	14.60038	144.77815	256.5	0.8	196.4	Medea at surface.
8800	J2-495	3/29/2010 5:48	14.60041	144.77836	257.0	0.7	120.8	Jason at surface.
8801	J2-495	3/29/2010 5:48	14.60041	144.77842	259.5	0.8	1.7	Medea on deck.
8802	J2-495	3/29/2010 5:55	14.60091	144.77988	264.1	-0.3	189.3	JASON: Jason out of water
8803	J2-495	3/29/2010 5:55	14.60090	144.77992	172.1	-0.3	196.9	JASON: Jason on deck
8804	J2-495	3/29/2010 5:56	14.60090	144.77992	180.2	-0.2	0.9	End J2-495-end NW Rota-1 expeditions 2003-2010 NSF/NOAA