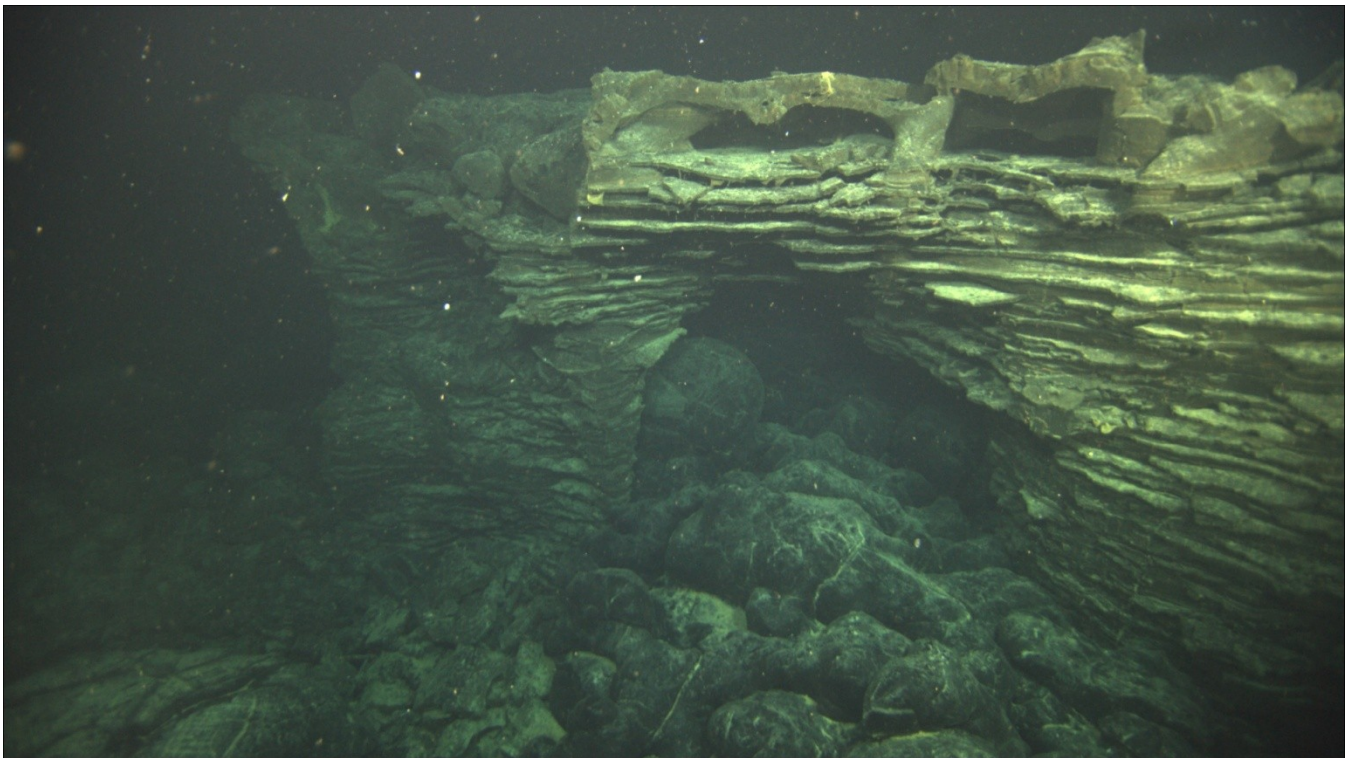


NeMO 2011 Cruise Report

Endeavour segment and Axial Seamount, Juan de Fuca Ridge

R/V Atlantis - AT18-08
July 19 to August 1, 2011
Astoria, Oregon to Astoria, Oregon
Jason dives J2-574 to J2-583

Chief Scientist: Bill Chadwick
R/V Atlantis Captain: Al Lunt
Jason Expedition Leader: Akel Kevis-Stirling
Cruise report prepared by: Susan Merle



The 2011 lava flowed beneath 1998 lava pillars southeast of Marker 33 vent site.

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1.0 EXPEDITION SUMMARY

Bill Chadwick, Chief Scientist

This expedition consisted of five separate projects piggybacked together, funded by NSF and NOAA. The projects had differing goals but were unified by the need for ROV dives at two long-term study areas they had in common: Endeavour segment and Axial Seamount on the Juan de Fuca Ridge. The first half of the cruise was spent at Endeavour where we completed 6 Jason ROV dives at the Main Endeavour and High Rise vent fields. Three dives (J2-574, J2-576, J2-579) were devoted to turning around a temperature and resistivity probe, fluid sampling, and testing a new underwater gas chromatograph (Marv Lilley, PI). Two dives (J2-575 and J2-578) were used to deploy and recover a time-lapse camera and temperature logging arrays (Ray Lee, PI). One additional dive (J2-577) was attempted to recover an instrument deployed in 2006 and tested a new fluid sampling device (Zhou, PI). Endeavour segment is an unparalleled study area for long-term experiments at high-temperature hydrothermal vents. The chimneys at Endeavour (especially High Rise) are truly spectacular.

After a 12-hour transit to Axial Seamount, we completed 3 more Jason ROV dives. The first (J2-580) was focused on fluid and microbial sampling at the ASHES vent field (Butterfield, PI). The second dive (J2-581) lasted over 3 days and was devoted to making pressure measurements at an array of seafloor benchmarks to monitor volcanic inflation (Chadwick and Nooner, PIs). It was during this dive that we discovered that an eruption had occurred since last year that had not been previously recognized because the US Navy's SOSUS system has been recently disabled due to cable breaks. Of 7 monitoring instruments that had been deployed on the seafloor since last year (3 bottom pressure recorders (BPRs), 3 ocean-bottom hydrophones (OBHs), and 1 remote access fluid sampler (RAS)), 4 were successfully recovered and the rest are known or suspected to be buried in new lava. However, the data recorded by the 2 BPRs and 2 OBHs are extraordinary and reveal that the eruption began on April 6, 2011 and probably lasted about a week. In retrospect, the end of dive J2-580 encountered some of the 2011 lava flows as they explored to the east of ASHES at the end of the dive (lava that flowed ~2km west from the eruptive vents and stopped within about 170m of the vent field). Jason dive J2-582 was aborted near the surface due to a hard ground fault on the Kraft manipulator arm. The last dive (J2-583) reinstalled a new RAS sampler at the Marker 33 site, explored some of the new lava flows and snowblower vents, and conducted time-series fluid and microbial sampling at the International District vent field.

The discovery of the April 2011 eruption at Axial was exciting and gratifying as we had successfully forecast this eruption based on the deflation observed during the last eruption in 1998 and the re-inflation measurements since then. The discovery was shared with MBARI research groups already at sea (Dave Clague and Dave Caress) and they were able to resurvey the eruption zone with their mapping AUV and then make an ROV dive on the new lava flows (from separate research vessels) in remarkably quick succession. High-resolution (1-m) bathymetry of the entire caldera at Axial had been collected by the MBARI AUV starting in 2007, and the new data allow difference maps to be made that show the new lava flows in spectacular detail. This was a great example of unselfish cooperation and collaboration in science that will benefit all. For example, another expedition by John Delaney and Deb Kelley (R/V Thompson with ROPOS) later in August was able to take great advantage of the AUV depth difference map and our own bottom observations during their own ROV dive series at Axial. They also resurveyed the entire south rift with the Thompson's EM302 multibeam sonar, conducted CTD casts and tows, collected more lava samples, found more snowblower vents and were able to explore more of the 2011 lava flows. Both Endeavour and Axial continue to be remarkably rewarding sites for long-term research on volcanic and hydrothermal processes.

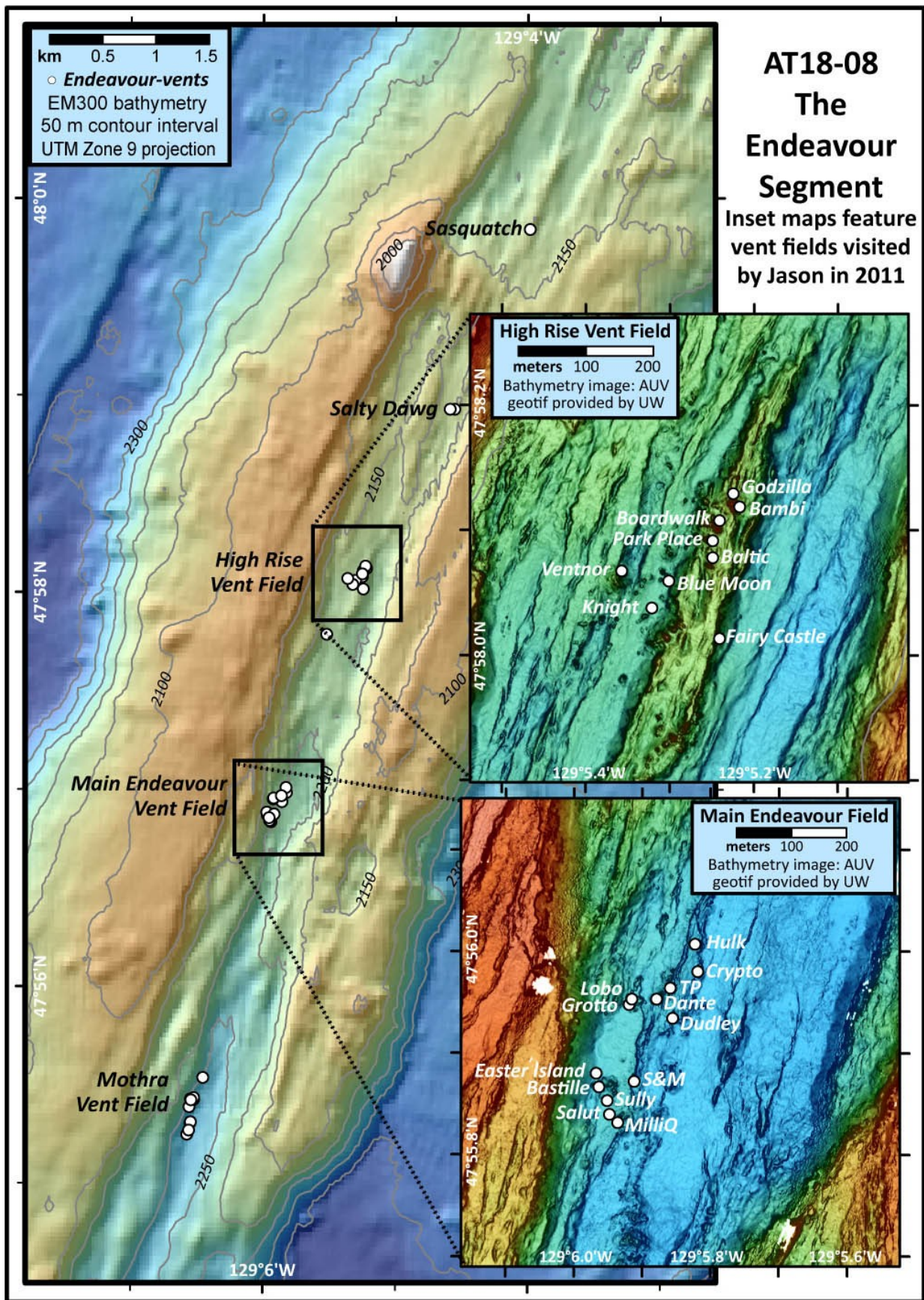


Fig 1. Map of the Endeavour segment, Juan de Fuca Ridge. Vent field visited are shown in insets.

AT18-08 NeMO 2011 Jason Dive Tracks (on seafloor)

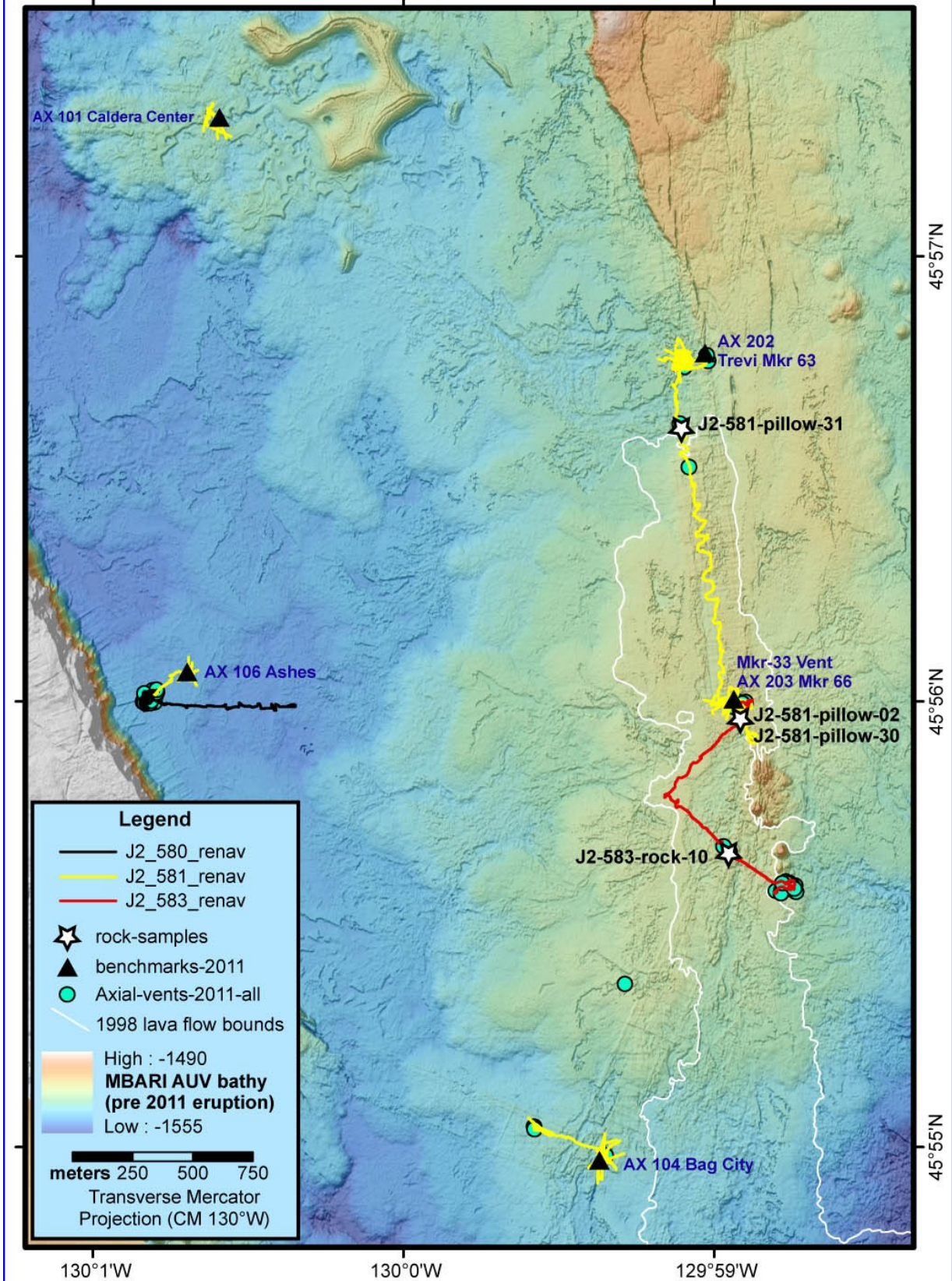


Fig 2. Map of Axial caldera, Juan de Fuca Ridge, featuring 2011 Jason dive tracks (J2-580,581,583) while on the seafloor.



Plate 1. All three high resolution images at Boardwalk vent, High Rise vent field, Endeavour segment, Juan de Fuca Ridge.
A) COL.20110722.1846. Sulfide structure with tubeworm bush in left foreground, black smoker right background. B) COL.20110722.1847. Zooming in on the tubeworm bush and black smoker. C) COL.20110722.1944. Close-up view of healthy tubeworms at Boardwalk.

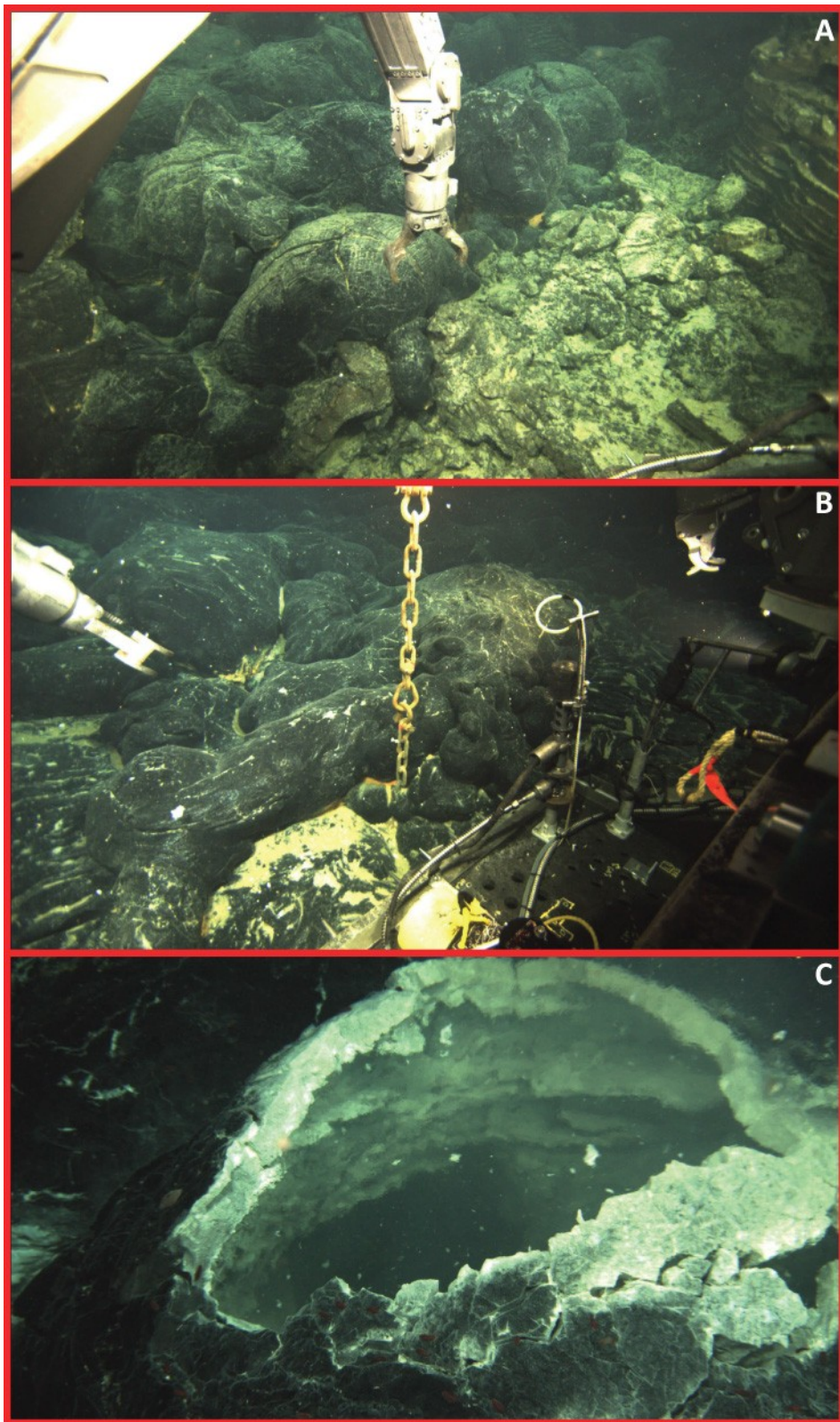


Plate 2. All three high-resolution images at Axial volcano, Juan de Fuca Ridge. A) COL.20110728.1035. 2011 lava contact southeast of Mkr-33 vent site. B) COL.20110728.1501. OBH-South encased in 2011 lava. C) COL.20110731.1015. Boca snowblower vent on 2011 lava northwest of the International District.

2.0 CRUISE PARTICIPANTS

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3.0 AT18-08 Endeavour / Axial 2011 Cruise Operations Log

GMT is 7 hours ahead of local time

Date (local)	Time (local)	GMT Date	GMT Time	Events	Latitude	Longitude
7/19/2011	18:15	7/20/2011	01:15	R/V Atlantis departs Astoria (after 12 hour delay waiting for package to arrive at ship). Transit to Endeavour.	46.188056	-123.830000
7/19/2011	23:36	7/20/2011	06:36	Started logging EM122 multibeam data (noisy).		
7/20/2011	15:48	7/20/2011	22:48	Ship arrives at Endeavour (High Rise vent field). (Thompson and ROPOS already diving NE of MEF). Stopped logging EM122 data.	47.893875	-129.164488
7/20/2011	15:45	7/20/2011	22:45	Start Jason dive J2-574 at High Rise vent field.	47.893875	-129.164488
7/21/2011	00:16	7/21/2011	07:16	End Jason dive J2-574.	47.968959	-129.087969
7/21/2011	08:00	7/21/2011	15:08	Start Jason dive J2-575 at Main Endeavour Field (MEF).	47.948469	-129.098072
7/22/2011	00:13	7/22/2011	07:13	End Jason dive J2-575.	47.948998	-129.097715
7/22/2011	08:30		15:30	Start Jason dive J2-576 at High Rise Field.	47.968619	-129.087025
7/22/2011	22:50	7/23/2011	05:50	End Jason dive J2-576.	47.967621	-129.089486
7/23/2011	07:50	7/23/2011	04:50	Deploy Jason elevator at MEF.	47.948533	-129.098983
7/23/2011	08:00	7/23/2011	15:00	Start Jason dive J2-577 at Main Endeavour Field (MEF).	47.948533	-129.098983
7/24/2011	00:16	7/24/2011	07:16	End Jason dive J2-577.	47.947771	-129.098859
7/24/2011	03:00	7/24/2011	10:00	Between dives: CTD#1 (AT1808001) on axis at Endeavour over Bambi vent. CTD feature noted as "Godzilla Plume".	47.968617	-129.086800
7/24/2011	08:00	7/24/2011	15:00	Start Jason dive J2-578 at Main Endeavour Field (MEF).	47.948891	-129.098100
7/25/2011	00:07	7/25/2011	07:07	End Jason dive J2-578.	47.949308	-129.097780
7/25/2011	08:00	7/25/2011	15:00	Start Jason dive J2-579 at Main Endeavour Field (MEF).	47.950036	-129.096984
7/25/2011	15:30	7/25/2011	23:30	End Jason dive J2-579.	47.949805	-129.096962
7/25/2011	15:45	7/25/2011	23:45	Depart the Endeavour segment of the Juan de Fuca Ridge enroute to Axial Volcano. EM122 multibeam survey during entire transit. Bathymetry data much improved after taking the system out of "dual swath" mode under depth settings.	47.949805	-129.096962
7/25/2011	19:25	7/26/2011	02:25	New SVP applied to EM122 data from Endeavour CTD.		
7/25/2011	20:00	7/26/2011	03:00	CTD#2 (AT1808002) - background. Between Endeavour and Axial.	47.370117	-129.399783
				Multibeam line 37. Don't use. Turn data.		
7/25/2011	22:21	7/26/2011	05:21	Multibeam line 38. Back on course.	47.350000	-129.410000
				Multibeam line 41. Survey for Wilcox Cascadia Station OBS: point J47-1	46.879350	-129.648380
7/26/2011	00:40	7/26/2011	07:40	Survey for Wilcox Cascadia Station OBS: point J47 (46.84583° -129.67033°). Multibeam line 41.	46.897000	-129.639000
7/26/2011	01:13	7/26/2011	08:13	Multibeam line 41 extends beyond Cascadia Station J47.	46.808000	-129.689000
7/26/2011	06:00	7/26/2011	13:00	Arrive at Axial. At OBH-4 (North) mooring.	45.960583	-130.008733
7/26/2011	07:01	7/26/2011	14:01	OBH-4 on deck.		
7/26/2011	07:07	7/26/2011	14:07	Tried to enable Center-BPR but no confirmation.		
7/26/2011	07:50	7/26/2011	14:50	No luck enabling Center-BPR.		
7/26/2011	08:19	7/26/2011	15:19	OBH-3 (East) released.	45.942100	-129.978950
7/26/2011	09:09	7/26/2011	16:09	OBH-3 (East) on deck.		
7/26/2011	09:45	7/26/2011	16:45	BPR-South released.	45.934117	-129.999883

Date (local)	Time (local)	GMT Date	GMT Time	Events	Latitude	Longitude
7/26/2011	10:22	7/26/2011	17:22	BPR-South on deck.		
7/26/2011	11:05	7/26/2011	18:05	Deploying new 2011 OBH; OBH-2 (East); where we recovered 2010 OBH. This position is surveyed in.	45.9413167	-129.977167
7/26/2011	12:30	7/26/2011	18:30	Start Jason dive J2-580 at ASHES vent field. 30 minute delay due to replacing RAM on stbd arm which was leaking oil.	45.933152	-130.013773
7/27/2011	04:00	7/27/2011	11:00	End Jason dive J2-580.	45.933129	-130.006064
7/27/2011	05:10	7/27/2011	12:10	Deployed OBH-3 (west) mooring. This is the surveyed position.	45.9319833	-130.017167
7/27/2011	06:05	7/27/2011	13:10	Deployed OBH-4 (north) mooring. Position is drop location; need to survey this in.	45.960583	-130.008733
7/27/2011	06:20	7/27/2011	13:20	Tried to enable Center-BPR again repeatedly from multiple locations.		
7/27/2011	06:50	7/27/2011	13:50	Sent release code to Center-BPR (no confirmation).		
7/27/2011	07:10	7/27/2011	14:10	Center BPR at surface!		
7/27/2011	07:15	7/27/2011	14:15	Center BPR on deck!		
7/27/2011	12:00	7/27/2011	19:00	Start Jason dive J2-581 Pressure dive at Axial.	45.933641	-130.013246
7/27/2011	12:55	7/27/2011	19:55	Shut Jason winch down due to overheating. Seawater cooling system had been shut off and not restarted. (~40 minute delay). Discovered 2011 eruption while visiting benchmarks.		
7/30/2011	12:50	7/30/2011	19:50	End Jason dive J2-581 (71 hrs 55 min).	45.9344182	-130.0115795
7/30/2011	13:41	7/30/2011	20:41	NeMO2011-center BPR deployed. Position is drop location; need to survey this in.	45.955467	-130.009570
7/30/2011	14:10	7/30/2011	21:10	NeMO2011-south BPR deployed. Position is drop location; need to survey this in.	45.934117	-129.999883
7/30/2011	15:10	7/30/2011	22:10	RAS in the water. Jason positioned the RAS at Mkr-33 vent site on dive J2-583. Jason position listed.	45.933200	-129.982268
7/30/2011	16:30	7/30/2011	23:30	CTD#3 (AT1808003) at Vixen - Coquille vent field.	45.917023	-129.993960
7/30/2011	18:15	7/31/2011	01:15	Tried to talk to the NeMO2009-middle-BPR but could not enable it - stuck in 2011 lava?	45.942650	-129.999733
7/30/2011	18:19	7/31/2011	01:19	Start Jason dive J2-582.	45.9339225	-130.0112463
7/30/2011	20:26	7/31/2011	03:26	Jason-2 Kraft arm ground fault at 350m. Returned to the surface.		
7/30/2011	20:41	7/31/2011	03:41	End Jason dive J2-582 (aborted).	45.9165612	-130.0249203
7/30/2011	21:32	7/31/2011	04:32	Start Jason dive J2-583. Mkr-33 vent site to the International District.	45.9331668	-129.9825472
7/31/2011	13:51	7/31/2011	20:51	End Jason dive J2-583.	45.9261704	-129.9801490
7/31/2011	14:30	7/31/2011	21:30	CTD#4 (AT1808004) at the International District.	45.926433	-129.980350
7/31/2011	16:00	7/31/2011	23:00	Heading to Astoria. Collecting EM122 multibeam data on the transit.		
7/31/2011	16:19	7/31/2011	23:19	Collecting EM122 multibeam data on transit. SOL 49.		
8/1/2011	11:26	8/1/2011	18:26	Stop logging multibeam data. Data fell apart after we got up on the continental shelf.		
8/1/2011	16:00	8/1/2011	23:00	Arrive in Astoria. End of expedition.	46.188056	-123.830000

4.0 POSITIONAL INFORMATION (Vents, Markers, etc.)

Table 4.1 Endeavour Vents and Jason Targets

The positions in the following table are a combination of old positions determined during previous expeditions, and new positions determined during this cruise. We distinguish between them by putting the year after the vent name. The 2011 latitude/longitude positions were generally provided by the Jason navigator, based on USBL fixes while sitting in one place (usually the “cursor” position in the middle of the scatter of fixes). These positions will vary slightly from the final Jason dive track navigation (renav), which merges the USBL and Doppler positions.

Vent / Target	Latitude	Longitude	Depth	Lat Deg	Lat Min	Long Deg	Long Min
Baltic 2011	47.967954	-129.087490	2149	47	58.077261	-129	5.249412
Bambi 2011 25 m hgth	47.968690	-129.087062	2140	47	58.121403	-129	5.223704
Boardwalk 2011	47.968386	-129.087422	2134	47	58.103178	-129	5.245303
camera 7 (base of RAS)	47.949297	-129.098334	2185	47	56.957827	-129	5.900037
camera 8 aprx	47.949306	-129.098355	2187	47	56.958350	-129	5.901287
Covis Mooring	47.949376	-129.097989	0	47	56.962579	-129	5.879366
Crypto 2011	47.949795	-129.096886	2198	47	56.987686	-129	5.813173
Dante 2009	47.949077	-129.097651	2179	47	56.944609	-129	5.859066
Dante Marker 2011	47.949235	-129.097841	2190	47	56.954094	-129	5.870461
Dante smoking mat	47.948968	-129.097668	2192	47	56.938093	-129	5.860056
Dudley 2005	47.948900	-129.097567	0	47	56.933979	-129	5.854011
Fairy Castle 2011	47.966940	-129.088364	2148	47	58.016390	-129	5.301829
Gremlin 2011	47.950002	-129.096907	2200	47	57.000094	-129	5.814436
Grotto 2009	47.949194	-129.098253	2187	47	56.951624	-129	5.895172
Grotto North Tower	47.949298	-129.098543	2176	47	56.957866	-129	5.912578
Hulk 2011	47.950185	-129.096930	2186	47	57.011091	-129	5.815824
Knight	47.967250	-129.088817	0	47	58.034979	-129	5.329036
Lobo	47.949481	-129.098437	2187	47	56.968883	-129	5.906192
Lobo Temp Profile Site	47.949507	-129.098332	2190	47	56.970395	-129	5.899931
Mole Castle	47.967532	-129.089318	2180	47	58.051897	-129	5.359076
MQ 2008	47.947323	-129.098841	2181	47	56.839382	-129	5.930475
Orange Mat	47.949539	-129.098314	2190	47	56.972337	-129	5.898835
Park Place 2011	47.968310	-129.087577	2140	47	58.098622	-129	5.254632
RAS Grotto 2011	47.949287	-129.098315	2182	47	56.957229	-129	5.898927
S&M 2008	47.947935	-129.098507	2181	47	56.876077	-129	5.910416
TP	47.949667	-129.097567	0	47	56.980009	-129	5.854011
Vent Cap Mound	47.948091	-129.098520	2196	47	56.885439	-129	5.911211
Ventor	47.967734	-129.089349	0	47	58.064011	-129	5.360969

Table 4.2 Axial Vents

The latitude/longitude positions of some of these vents and were provided by the ROV navigators (Jason and ROPOS), based on observations of the incoming fixes while sitting in one place (usually the “cursor” position in the middle of the scatter of fixes). These positions will vary slightly from the final Jason dive track navigation (renav), which merges the USBL and Doppler positions. These positions at Axial have been re-navigated with increased accuracy as years go by and navigation improves.

Axial Vent	lat deg min (N)	long deg min (W)	Z (m)	Area	Marker	Dive Found	Nav Info	Latitude	Longitude
9m Chimney	45° 55.5922'	129° 58.7564'	1518	Intl Dist	Mkr153		2010	45.926536	-129.979273
2010 nav from bathy & J523 nav. (Mkr153 deployed 2010)									
Anemone	45° 55.9951'	130° 0.8174'	1543	ASHES	n/a	J2-580	2011	45.933251	-130.013790
Large diffuse venting area at the S end of ASHES field. Less than 10m SW of Phoenix/Ropos sulfide. Anemones and lots of biota present.									
Bag City vent	45° 54.9803'	129° 59.3492'	1536	Pre87 / 2011?	Mkr36	R492	2010	45.916338	-129.989153
Marker and old NeMONet frame not found in 2011.									
Boca	45° 55.6615'	129° 58.9489'	1519	2011 lava flow	Mkr170	J2-583	2011	45.927692	-129.982482
New venting 2011 lava. Diffuse snow blower. Rounded shape. Bowl-like.									
Casper	45° 55.0448'	129° 59.5793'	1538	Coquille	n/a	R627	2010	45.917414	-129.992989
Anhydrite chimney, within 10 m of Vixen.									
Castle	45° 55.5731'	129° 58.7998'	1518	Intl Dist	n/a	R461	2010	45.926218	-129.979996
Active anhydrite vent at base of large dead sulfide chimney.									
Cottonball	45° 55.6733'	129° 58.9694'	1521	2011 lava flow	n/a	J2-583	2011	45.927888	-129.982824
New venting 2011 lava. J2-583 traverse to Int'l Dist. Area with white cotton-like mat and orange sediments. NW of Boca Vent.									
Diva	45° 55.5854'	129° 58.7385'	1524	Intl Dist	Mkr150		2010	45.926424	-129.978975
Anhydrite chimney. 2010 nav from bathy & J523 nav. (Mkr150 deployed 2010)									
El Abuelo	45° 55.5745'	129° 58.7829'	1516	Intl Dist	n/a		2010	45.926241	-129.979715
Extinct sulfide chimney. 2010 nav from bathy & J523 nav.									
El Antiquo	45° 55.5773'	129° 58.7638'	1521	Intl Dist	n/a		2010	45.926288	-129.979396
Extinct sulfide chimney. 2010 nav from bathy & J523 nav.									
El Gordo	45° 55.5716'	129° 58.7363'	1524	Intl Dist	Mkr151		2010	45.926194	-129.978939
Tubeworm bush. 2010 nav from bathy & J523 nav. (Mkr151 deployed 2009-Alvin)									
El Guapo	45° 55.5945'	129° 58.7687'	1507	Intl Dist	n/a		2010	45.926575	-129.979479
Large active sulfide chimney. 2010 nav from bathy & J523 nav.									

Axial Vent	lat deg min (N)	long deg min (W)	Z (m)	Area	Marker	Dive Found	Nav Info	Latitude	Longitude
Escargot	45° 55.5845'	129° 58.7471'	1520	Intl Dist	n/a		2010	45.926409	-129.979119
Active sulfide chimney. 2010 nav from bathy & J523 nav.									
Flattop	45° 55.5692'	129° 58.7841'	1522	Intl Dist	n/a		2010	45.926154	-129.979735
Extinct sulfide chimney near Castle. 2010 nav from bathy & J523 nav. (Mkr N5 not seen 2010)									
Fuzzy Tubeworm Bush	45° 56.0186'	130 0.8195'	1544	ASHES	n/a	J2-580	2011	45.933644	-130.013658
White filamentous bacteria and diverse biota on TW bush. Between Inferno and Mushroom.									
Gollum	45° 56.0128'	130° 00.7966'	1547	ASHES	121, 64, Tripod 21	J2-521	2010	45.933547	-130.013277
Tubeworm bush with diffuse venting. Markers deployed in 2010.									
Hell	45° 55.9990'	130° 00.8378'	1546	ASHES	n/a	PIS 1720	2007	45.933317	-130.013964
Large active sulfide chimney. Marker 68 is 5 m SE. Found on Pisces 1986 dive.									
Hermosa	45° 55.5908'	129° 58.7639'	1519	Intl Dist	Mkr152		2007	45.926514	-129.979398
Large active sulfide chimney. 2010 nav from bathy & J523 nav (Mkr152 deployed in 2010)									
Inferno	45° 56.0137'	130° 00.8204'	1547	ASHES	n/a	PIS 1720	2010	45.933561	-130.013674
Large active sulfide chimney. Found on Pisces 1986 dive.									
Marshmallow	45° 56.0248'	130° 0.8056'	1544	ASHES	none	R471	2011	45.933746	-130.013428
Small anhydrite vent.									
Medusa	45° 55.9968'	130° 00.8336'	1547	ASHES	Mkr68	R469	2010	45.933280	-130.013894
Mkr-68 is at Medusa. Medusa is just a big tubeworm bush ~5m SE of Hell.									
Mkr113 Vent	45° 55.3645'	129° 59.2862'	1526	Pre87 Lava Flow	Mkr62		2010	45.922741	-129.988104
Not visited 2011 post-eruption. Believe it is still there. Marker 62 at site. Vent still very active venting on top and under pillar.									
MkrN3 Vent	45° 56.6230'	129° 59.1098'	1530	2011 lava flow?	n/a	J2-581 visited	2011	45.943716	-129.985163
No previous markers spotted in 2011. Probably covered in 2011 lava. Hard to tell on visit but it looked very different. No blue mat. Still has diffuse flow. No markers.									
Mkr33 Vent	45° 55.9920'	129° 58.9361'	1524	2011 lava flow	Mkr166	J2-581 visited	2011	45.933200	-129.982268
Area overrun with 2011 lobate lavas. All markers; RAS; etc. buried. Still some diffuse venting happening. 2011 RAS deployed here. Also Mkr166 and an MTR deployed.									
Mushroom	45° 56.0149'	130° 00.8149'	1547	ASHES	(Mkrl)	PIS 1720	2010	45.933581	-130.013582
Small sulfide vent with tubeworms. Found on Pisces 1986 dive.									

Axial Vent	lat deg min (N)	long deg min (W)	Z (m)	Area	Marker	Dive Found	Nav Info	Latitude	Longitude
Old Tubeworms	45° 55.9988'	129° 58.9242'	1520	1998 lava kipuka	n/a	J2-581	2011	45.933313	-129.982069
A kipuka of 1998 lava surrounded by 2011 lava. Found heading east from Mkr33.									
Phoenix / ROPOS	45° 55.9979'	130° 0.8209'	1544	ASHES	n/a	1998	2011	45.933299	-130.013682
ROPOS11 Jason target. It is actually the position of the small (~2m) sulfide chimney at the S end of ASHES. It looks a bit like a "Phoenix" bird; was also called "Ropos" sometimes.									
Snow Globe	45° 56.5706'W	129° 59.0935'	1521	2011 lava flow	n/a	J2-581	2011	45.945844	-129.984892
New venting 2011 lava. Large collapse hole (snowblower) in 2011 lava venting lots of floc and diffuse flow.									
Spanish Steps	45° 56.7651'	129° 59.0192'	1520	E of Magnesia site (E of 2011 lava)	Mkr155	J2-525	2010	45.946085	-129.983654
Vent site, tubeworms, and marker still there post-2011 eruption J2-581.									
Subway	45° 56.5260'	129° 59.0796'	1518	2011 lava flow	n/a	J2-581	2011	45.942100	-129.984660
New venting 2011. Skylight. A big white hole with a little bit of "lazy floc" and diffuse flow.									
Styx	45° 56.0010'	130° 0.8125'	1544	ASHES	Mkr21 ~5m SW		2011	45.933350	-130.013541
Diffuse vent area. This position from 2011 better than previous target. Very little activity in 2011.									
Tiny Towers	45° 55.5782'	129° 58.7413'	1524	Intl Dist	n/a		2010	45.926303	-129.979022
Mini chimneys. 2010 nav from bathy & J523 nav.									
Top Gun	45° 55.5906'	129° 58.7791'	1520	Intl Dist	n/a		2010	45.926510	-129.979652
Large inactive sulfide chimney. 2010 nav from bathy & J523 nav.									
Trevi	45° 56.7766'	129° 59.0228'	1520	E of Magnesia site (E of 2011 lava)	Mkr63	J2-291	2010	45.946276	-129.983713
Anhydrite chimney. Still there in 2011 after eruption. Mkr63 at AX202 benchmark. Discovered in 2007.									
Village	45° 55.5708'	129° 58.8342'	1520	W of IntlDist	n/a		2007	45.926180	-129.980570
Not visited in 2010 or 2011. Suspect it is still there post 2011 eruption.									
Virgin	45° 56.0196'	130° 0.7030'	1544	ASHES	n/a	PIS 1720	2011	45.933660	-130.013216
Anhydrite chimney. Found on Pisces 1986 dive.									
Virgin's Daughter	45° 56.0255'	130° 00.7932'	1547	ASHES	n/a		2010	45.933758	-130.013220
Just north of Virgin - in the general vicinity. Small anhydrites. Still very active in 2006. Pos from Delaney 2010 cruise.									
Vixen	45° 55.0396'	129° 59.5768'	1537	Coquille	Mkr57?	R627	2010	45.917327	-129.992946
Anhydrite chimney within 10 m of Casper vent. Marker laying on ground but no one picked it up. Mkr57? Found 2001. 2007 & 2010 pos within 2m.									

4.3 Axial Markers

The latitude/longitude positions of some of these markers and were provided by the ROV navigators (Jason and ROPOS), based on observations of the incoming fixes while sitting in one place (usually the “cursor” position in the middle of the scatter of fixes). These positions will vary slightly from the final Jason dive track navigation (renav), which merges the USBL and Doppler positions.

Table 4.3.1 Axial Markers Observed in 2011

Marker	Lat deg min (N)	Long deg min (W)	Depth (m)	Location	Vent	Depl	Nav Info	Latitude	Longitude	Markers on the Seafloor 2011
Mkr 121	45° 56.0130'	130° 00.7950'	1542	ASHES	Gollum	J2-521	2010	45.933550	-130.013250	Mkr64 & tripod 21 also seen at site in 2010.
Mkr 122	45° 55.0300'	129° 59.5740'	1534	Coquille	Diffuse site	J2-520	2010	45.917167	-129.992900	Deployed by Jason in big tubeworm bush.
Mkr 150	45° 55.5854'	129° 58.7385'	1520	Intl District	Diva	J2-523	2010	45.926424	-129.978975	Deployed by Jason at Diva Vent (J2-523)
Mkr 151	45° 55.5716'	129° 58.7363'	1520	Intl District	El Gordo		2010	45.926194	-129.978939	Deployed by Alvin in 2009
Mkr 153	45° 55.5900'	129° 58.7520'	1517	Intl District	9meter Chimney	J2-523	2010	45.926500	-129.979200	Deployed by Jason in 2010 at 9-meter chimney (J2-523)
Mkr 155	45° 56.7651'	129° 59.0192'	1520	E of Magnesia site (E of 2011 lava)	Spanish Steps	J2-525	2010	45.946085	-129.983654	Spotted on J2-581 post-2011 eruption. Deployed at new vent near Trevi (J2-525)
Mkr 166	45° 55.9896'	129° 58.9371'	1520	Mkr33 Site	Mkr33 Vent	J2-583	2011	45.933164	-129.982282	Deployed on top of a rock next to the MTR and RAS2011.
Mkr 169	45° 55.5908'	129° 58.7639'	1519	Intl District	Hermosa	J2-583	2011	45.926514	-129.979398	Deployed on the seafloor ~1 m away from the anhydrite.
Mkr 170	45° 55.6615'	129° 58.9489'	1519	2011 flow	Boca	J5-583	2011	45.927692	-129.982482	Off to the side of round lava domes with diffuse milky fluid and snowblower floc. On shiny black 2011 lava.
Mkr 21	45° 55.9964'	130° 00.8152'	1547	ASHES	~5m SW of Styx		2007	45.933274	-130.013586	J2-580 (2011) saw the bucket lid laying on the seafloor E of Phoenix/ROPOS. Styx looks nearly dead.
Mkr 47	45° 56.0069'	130° 00.8095'	1542	ASHES	between Gollum-Dave's		2010	45.933448	-130.013491	OK still there 2011. On rusted frame in tubeworm patch.
Mkr 60	45° 57.3071'	130° 00.5936'	1534	Caldera Center	AX101 bmrk	R-623	2007	45.955119	-130.009893	5m N from benchmark caldera center.
Mkr 61	45° 57.3016'	130° 00.5936'	1534	Caldera Center	AX101 bmrk	R-623	2007	45.955027	-130.009893	5m S from benchmark caldera center.
Mkr 62	45° 55.3645'	129° 59.2862'	1526	Pre 87 Flow	Mkr113 vent	J2-289	2010	45.922741	-129.988104	Deployed 2007. Site still active (07) but no signs of old marker 113.
Mkr 63	45° 56.7834'	129° 59.0293'	1521	E of Magnesia site (E of 2011 lava)	AX202 bmrk near Trevi	J2-581	2011	45.946390	-129.983822	This replaced the marker near Magnesia bmrk; now gone. Benchmark moved E to Trevi.
Mkr 64	45° 56.0136'	130° 00.7980'	1545	ASHES	Medusa	J2-293	2011	45.933560	-130.013300	Saw this at Medusa, SE of Hell ~5m on J2-580. Did not see Mkr-121 that was supposed to be here. Swapped out its position for Mkr64 - here.
Mkr 65	45° 54.9700'	129° 59.3700'	1534	Pre 87 Flow	AX104 bmrk near Bag City	R-623	2010	45.916167	-129.989500	Near AX104 cement pressure sensor benchmark. Bag City.

Marker	Lat deg min (N)	Long deg min (W)	Depth (m)	Location	Vent	Depl	Nav Info	Latitude	Longitude	Markers on the Seafloor 2011
Mkr 66	45° 56.0052'	129° 58.9367'	1517	N of Mkr33 site	AX203 bmrk near Mkr33 site	J2-581	2011	45.933420	-129.982278	~24m due N of Mkr33 nav target. Moved with old benchmark from S pillow mound to replace benchmark and marker overrun with 2011 lava. Benchmark re-named AX203.
Mkr 68	45° 55.9960'	130° 00.8340'	1542	ASHES	Medusa-2010	J2-521	2011	45.933550	-130.013250	J2-580 (2011) seen SE of Hell ~5m. Did not see Mkr121 at Medusa (where it plotted) that was listed to be here. Took position of old Mkr121 and used it for Mkr68.
observ. platform	45° 56.0173'	130° 0.8336'	1545	ASHES	W of Inferno	J2-580	2011	45.933622	-130.013894	Test platform and junction box for the observatory.
Smiley	45° 55.9953'	129° 58.9069'	1517	98 Lava Flow	E of Mkr33 Site		2011	45.933255	-129.981781	Smiley face marker on "Roman aqueduct". Drove over J2-525. Dave Butterfield deployed this on an Alvin dive.
Tripod 21	45° 56.0140'	130° 00.7973'	1547	ASHES	Gollum		2010	45.933567	-130.013288	Small tripod Mkr-21. Spotted 2010.

Table 4.3.2 Axial Markers Missing in 2011

These markers could not be found during the 2011 Jason dives. Most missing markers are related to the new 2011 lava flow, either directly in the path or nearby. The missing markers at Ashes were mostly old, small markers that may have lost their buoyancy or disappeared in some other fashion.

Marker	Lat Deg Min (N)	Long Deg Min (W)	Z (m)	Area	Vent	Nav Info	Comments	Latitude	Longitude
Mkr152	45° 55.5930'	129° 58.7620'	1517	Intl District	Hermosa	2010	Gone (J2-583) 2011. Deployed by Alvin in 2009 at El Guapo but moved by Jason in 2010 to Hermosa chimney (J2-523)	45.926550	-129.979367
Mkr156	45° 56.7766'	129° 59.0228'	1520	E of 2011 lava	Trevi	2010	Gone 2011. Line burned (lying down) and marker probably melted in vent. [Deployed at Trevi (J2-525).]	45.946276	-129.983713
Mkr19	45° 56.0092'	130° 00.8200'	1547	ASHES	Inferno	2010	Gone 2011. [1998 unreadable due to bio-coating; marker deployed 1996. Spotted 2010 (bucket lid).]	45.933486	-130.013666
Mkr36	45° 54.9803'	129° 59.3492'	1536	2011 lava?	Bag City	2010	Gone 2011. [Depl 07 J2-289. 2010 pos 15m from 2007.]	45.916338	-129.989153
Mkr52	45° 56.6230'	129° 59.1098'	1530	2011 lava	MrkrN3 vent	2010	Gone 2011. [Mkr N3 not seen for many years. Mkr52 spotted 2010 J2-525 after sampling nearby.]	45.943716	-129.985163
Mkr53	45° 55.9990'	129° 58.9420'	1523	2011 lava	Mkr33 vent	2010	Gone 2011. [Near AX103 benchmark at Mkr33 site.]	45.933317	-129.982367
Mkr54	45° 55.9959'	130° 00.8298'	1547	ASHES	Phoenix / ROPOS	2006	Gone 2011. [Deployed 2007 (J2-293) on west edge of ROPOS vent (white diamond).]	45.933265	-130.013830
Mkr55	45° 55.9920'	129° 58.9361'	1524	2011 lava	Mkr33 vent	2010	Gone 2011. [Marker 55 deployed in 2006. Mkr33 may have gone missing in 02/03.]	45.933200	-129.982268
Mkr57	45° 55.0396'	129° 59.5768'	1537	Coquille	Vixen	2010	Gone 2011. [Deployed 2007. (J2-289) Old mkr57 deployed on R857(04). 2010 moved by ~0.5m.]	45.917327	-129.992946

Marker	Lat Deg Min (N)	Long Deg Min (W)	Z (m)	Area	Vent	Nav Info	Comments	Latitude	Longitude
Mkr67	45° 56.7670'	129° 59.1020'	1524	2011 lava	Magnesia	2010	Gone 2011. [Marker on AX102 benchmark near Magnesia.]	45.946117	-129.985033
Mkr69	45° 55.9979'	129° 58.8965'	1525	2011 lava	Cloud Pit	2007	Gone 2011. [Marker next to hole with MTRs nearby ('07). 2010 J2-525 7m from 2007 pos.]	45.933298	-129.981609

Table 4.4 Seafloor Benchmarks at Axial

Location of remaining cement benchmarks, deployed in 2010, and positions of relocated older benchmarks (which replaced cement benchmarks covered in 2011 lava).

AXIAL CEMENT BENCHMARK NAMES	Marker	Latitude	Longitude	Depth	Lat deg	Lat min	Long deg	Long min
AX-106 Ashes		45.934448	-130.011599	1542	45	56.0669	-130	0.6960
AX-101 Caldera Center	60, 61	45.955202	-130.009874	1532	45	57.3121	-130	0.5924
AX-104 Bag City	65	45.916166	-129.989499	1534	45	54.9700	-129	59.3700
AX-105 Pillow Mound	moved 66 to Mkr33 AX103	45.863170	-130.003755	1718	45	51.7902	-130	0.2253
Metal benchmarks moved in 2011 to be temporary (moved from Caldera Center and Pillow Mound)								
AX-202 Trevi	63	45.946390	-129.983822	1520	45	56.7834	-129	59.0293
AX-203 Marker 33 site	66	45.933420	-129.982278	1516	45	56.0052	-129	58.9367
Old cement benchmarks buried by 2011 lava flow (gone!)								
AX-102 Magnesia	67 gone	45.946116	-129.985033	1524	45	56.7670	-129	59.1020
AX-103 Marker 33 site	53 gone	45.933311	-129.982361	1520	45	55.9987	-129	58.9417

Table 4.5 Snowblower Vents Discovered by MBARI on 2011 Lava Flow

Vents were identified on the MBARI expedition directly following AT18-08 field operations. Positions provided by Dave Clague and Jenny Paduan.

MBARI Vent	Latitude	Longitude	Description
Snowblower	45.943873	-129.984953	MBARI 2011: Snowblower vent.
Snowblower	45.943813	-129.984906	MBARI 2011: Collapsed lobe with snowblower vent.
Snowblower	45.940369	-129.984454	MBARI 2011: Snowblower vent.
Pillars-mat	45.92772	-129.98242	MBARI 2011: Nearby Boca are lava pillars with bacterial mat on top, gently venting fluid.
Snowblower	45.92417	-129.98254	MBARI 2011: Snowblower vent.
Older-diffuse	45.92744	-129.98278	MBARI 2011: An older diffuse venting site with mostly dead tubeworms.

Table 4.6 Deployment and Recovery of MTR and HOBO/MISO Temperature Probes

Vent / Marker	Temp Probe	Dive Deployed	Dive Recovered	Comments
Gollum (Mkr 121)	MTR 4127	J2-521	J2-580	On recovery, clock was 00:16:49 early
Styx	MTR 4001	J2-521	J2-580	On recovery, clock was 00:09:23 early
Hermosa	MTR 3291	J2-523	J2-583	On recovery, clock was 00:12:08 early
Mkr 33	MTR 3292	J2-524	LOST	Deployed near RAS intake in 2010
Mkr 33	MTR 3292	J2-524	LOST	On top of RAS cover
Mkr 33	MTR 3039	J2-524	LOST	On RAS intake line
Mkr 33	MTR ???	???	LOST	MTR in the tubeworm bush visible from the pressure benchmark, not recovered in 2010.
Mkr N3 vent	MTR 3049	J2-525	LOST	Put in same vent as previous MTR and where fluid sample was taken in 2010
Virgin	HOBO 153	J2-521	J2-580	Put in anhydrite chimney vent
Trevi	MISO 101	J2-525	J2-581	Put in anhydrite chimney vent
Vixen	MISO 102	J2-520	J2-581	Put in anhydrite chimney vent
Casper	MISO 104	J2-520	J2-581	Put in anhydrite chimney vent
Diva	MISO 129	J2-523	J2-583	Put in anhydrite chimney vent
Castle	MISO 130	J2-523	J2-583	Put in anhydrite chimney vent
Mkr113 Vent (Mkr 62)	MTR 4128	J2-520		Deployed about 1 m east of Marker 62. MTRs deployed in 2010 will record 2 years
Bag City	MTR 3087	J2-520		Couldn't find in 2011.
Fuzzy tubeworm bush	MTR 3041	J2-580		Between Inferno and Mushroom vents
Marshmallow	MRT 3334	J2-580		ASHES
Anemone vent	MTR 4096	J2-580		ASHES
Mkr 33 site	MTR 4094	J2-581		In 2011 lavas
Mkr N3 vent	MTR 3312	J2-581		In 2011 lavas
Boca	MTR3043	J2-583		In 2011 lavas - snowblower vent
Virgin	MISO 103	J2-580		Put in anhydrite chimney vent
Trevi	MISO 135	J2-581		Put in anhydrite chimney vent
Casper	MISO 141	J2-581		Put in anhydrite chimney vent
Vixen	MISO 147	J2-581		Put in anhydrite chimney vent
Diva	HOBO 153	J2-583		Put in anhydrite chimney vent
Castle	MISO 102	J2-583		Put in anhydrite chimney vent

4.7 Moorings at Axial Seamount

Table 4.7.1 Instrument Mooring Positions

Items suspended above the bottom (as of July 2011 AFTER Axial 2011 cruise)

Instrument	Longitude degree minute	Latitude degree minute	Longitude decimal degree	Latitude decimal degree	Depth of instrument on bottom	Height of mooring (glass ball flotation)	Depth of top of mooring
NeMO2011-center-BPR*	-130° 00.574'	45° 57.328'	-130.009567	45.955467	1550	15	1535
NeMO2009-middle-BPR†	-129° 59.984'	45° 56.559'	-129.999733	45.942650	1543	15	1528
NeMO2011-south-BPR*	-129° 59.993'	45° 56.047'	-129.999883	45.934117	1541	15	1526
RAS @ Mkr33	-129° 58.936'	45° 55.988'	-129.982267	45.9331337	1520	40	1480
OBH-1 (South)**	-129° 58.914'	45° 55.089'	-129.981900	45.918150	1555	30	1525
OBH-3 (West)	-130° 01.030'	45° 55.919'	-130.017167	45.931983	1442	30	1412
OBH-2 (East)	-129° 58.630'	45° 56.479'	-129.977167	45.941317	1535	30	1505
OBH-4 (North)*	-130° 00.524'	45° 57.635'	-130.008733	45.960583	1553	30	1523

* Drop location (not surveyed)

† Couldn't enable in July 2011 – stuck in 2011 lava?

** Confirmed stuck in 2011 lava

Table 4.7.2 Transponder Moorings

All Benthos XT-6000's, a 17-inch glass ball floating at the top of a 200-m long mooring line made of parachute chord. All were deployed in 2003 and used during cruises in 2003 2004, and 2007. They all interrogate at 9.0 kHz, but I imagine the batteries are all dead now. Delaney recovered the 10.0 Lava Net transponder during the expedition following ours, so it is not included in the table below.

Reply Frequency (kHz)	UTM X	UTM Y	Long (decimal degrees)	Lat (decimal degrees)	Depth (top of 200-m high mooring)	Enable Code	Disable Code
Lava Net							
8.5	424349	5086129	-129.975673	45.924567	1320.87	A	B
11.5	422407	5086195	-130.000728	45.924940	1326.71	A	B
7.5	421926	5087976	-130.007223	45.940918	1336.26	A	B
CASM Net							
8.0	421279	5093140	-130.016412	45.987312	1363.79	A	B
10.0	420510	5094426	-130.026552	45.998798	1306.48	A	B
9.5	419661	5093074	-130.037288	45.986528	1277.21	A	B

Table 4.8 CTDs During AT18-08 Expedition

GMT	Name	2011 Endeavour / Axial CTD Information	Latitude	Longitude	Lat Deg	Lat Min	Long Deg	Long Min
7/24 1000	CTD1- AT1808001	Endeavour: on axis over Bambi vent. CTD feature noted as "Godzilla Plume".	47.968617	-129.086800	47	58.1170	-129	5.2080
7/26 0300	CTD2- AT1808002	Background: between Endeavour and Axial.	47.370117	-129.399783	47	22.2070	-129	23.9870
7/30 2330	CTD3- AT1808003	Axial: Vixen - Coquille vent field.	45.917023	-129.993960	45	55.0214	-129	59.6376
7/31 2130	CTD4- AT1808004	Axial: at the International District.	45.926433	-129.980350	45	55.5860	-129	58.8210

5.0 DISCIPLINE SUMMARIES

5.1 GEOLOGY

5.1.1 Observations About the 2011 Eruption

Bill Chadwick

Here's a summary of what we were able to learn about the Axial 2011 eruption during our limited time at Axial (3 Jason dives over 5 days, while completing fluid sampling and pressure measurement tasks). Everyone on this cruise went all out to get as much done as possible in a short amount of time, and I'm proud of our collective accomplishment.

NEW LAVA DISTRIBUTION

The 2011 lava appears to have been erupted along the upper south rift in a similar area to the 1998 eruption, however, its eruptive vents are probably further west than in 1998. We know east of the Marker 33 site (M33) 2011 lava does not overflow the 1998 collapse area, so its eastern margin is within the 1998 flow. The same thing was observed at the latitude of the International District vent field. However west of M33 2011 lava does overflow the 1998 collapse area toward the west and we discovered that 2011 lava had flowed 2 km west with a flow front ~170 m east of the ASHES vent field (!). That flow front is along the edge of a former basin in the MBARI AUV bathymetry, but it now is upslope from the flow front toward the east. Other possible evidence for 2011 lava to the west of the rift is that we could not talk to our "middle BPR" mooring. We did not get to that mooring with Jason to visually inspect it, so there could be another explanation for why it wouldn't talk, but the most likely explanation is that it is stuck in 2011 lava. The "south BPR" mooring did successfully release, even though it is directly between M33 and ASHES. During the cruise it was not obvious that there was 2011 lava in the Magnesia and Marker N3 sites, because the bathymetry at those sites now is almost identical to that before the eruption. However, remapping by the MBARI AUV makes it clear that those areas were overrun by new lava. When we traversed south from Magnesia to M33, it was clear there was 2011 lava in the floor of the 1998 collapse area. 2011 lava ends about 70 SSE of M33, where we found and sampled a clear contact, but we followed a 2011 flow front along a traverse SW of M33 for about 500 m, and then encountered it again inside the 1998 collapse area as we traversed SE back toward the International District, but it stopped a couple 100 m west of there. The only observations we have south of there are that we found the OBH-South mooring stuck in 2011 lava, and 2011 lava invaded the collapse areas (but did not overtop them) around Bag City vent. No new lava in the Vixen/Coquille area.

LAVA MORPHOLOGY & APPEARANCE

The lack of collapse features in the 2011 lava suggests this eruption was longer lived than the one in 1998 (and so does the long flow to the west). The 2011 flow is pillowed at its thin margins and these are the only places where it looks black and young. In most other places it is uncollapsed lobate lava and where it is thick it is covered with a thick orange/tan gelatinous mat. We saw the same thing right after the 1998 eruption. This appearance can be very deceptive and confusing at first until to understand what you're looking at by looking at it closely. The mat-covered 2011 lava looks very "old" at first look, but the mat is probably hydrothermal/biological in origin, not pelagic sediment. It must form as the lava cools.

VENTING & WATER COLUMN

We observed very little hydrothermal venting from the 2011 lavas. The M33 site is still venting. We did find two new slow-blower vents - one just south of Magnesia (off the new lava, an area which also had them in 1998) and another one in the 2011 lava flow west of the International District. However, the water was VERY murky everywhere in the caldera with a lot of floc in the water. For example, most of the time Medea could not see Jason on the seafloor from only 40 m above. So there must have been many more active (snowblower) vents

that we did not encounter (probably along the eruptive vents, which we did not locate). The ASHES vent field appeared unchanged, as did the Trevi area (just north of the 1998 flow). The International District appeared a bit diminished, with lots of new iron staining and less biology on the chimneys, but otherwise more or less the same. Magnesia and Bag City appear to be re-invigorated. We only had time for 2 CTD casts, one at Vixen and the other over the International District (which we also did last year). The Vixen cast is pretty impressive with plumes up to 1360 m (180 m above bottom), with the largest turbidity signals in the lower 40 m (1500-1540). The Int. Dist. cast had smaller peaks.

BIOTA

We observed biological colonization on the new lava flows already at M33 (a few tiny tubeworms, scaleworms, and either pandorae, palm, and/or sulfide worms), including a new species of scaleworm that was observed for the first time after the 1998 eruption, but hasn't been seen since. We saw virtually no crabs or holothurians on the 2011 lava flows.

MOORINGS

Before the eruption, we had 3 Bottom Pressure Recorder (BPR) moorings and 3 Ocean Bottom Hydrophone (OBH) moorings (the latter Bob Dziak's), and one Remote Access Sampler (RAS) mooring (Dave Butterfield's). We got 2 BPRs, 2 OBHs back. Unfortunately, the RAS mooring was lost and 1 OBH is encased in 2011 lava. We could not communicate with the 3rd BPR and did not try to release it blind, in the hopes that the site can be inspected by ROV first. While it is always deeply disappointing to lose gear, the moorings we successfully recovered are going to have valuable records of the dynamics of the 2011 eruption. We turned around and re-deployed the 2 BPRs and the 2 OBHs with a 3rd OBH that we brought with us. We also deployed a new RAS mooring at M33 vent site. The BPR/OBH data clearly show the eruption started April 6, 2011.

MAJOR DEFLATION

Our ROV-based pressure measurements for this year show that the center of the caldera subsided nearly 2.0 meters since last year, no doubt associated with the eruption in April. This is quite impressive, yet less than the 3.2 m of subsidence measured during the 1998 eruption. We will get more information on the dynamics of this subsidence when the BPR data are processed.

TEMPERATURE CHANGES

We had many HOBO/MISO and MTR temperature probes scattered at various vent sites in the caldera. The MISO records at Diva and Casper vents show a temperature decrease coincident with the eruption in April, then a gradual recovery. The record at Trevi is relatively flat with no co-eruption signal. The probes at Virgin, Castle, and Vixen fell out of their respective vents before the eruption, unfortunately. There were also 3 MTR low-temp probes at Gollum, Styx, and Hermosa vents. Both the Gollum and Hermosa records show small (5-10°C) temperature increases at about the time of the eruption onset.

5.1.2 Repeat Pressure Measurements to Monitor Volcanic Inflation and Deflation

Scott Nooner and Bill Chadwick

We have made pressure measurements at Axial Seamount since 2000 in order monitor the re-inflation of the volcano after its eruption in 1998 and to anticipate its next one. These measurements are among the first to measure vertical deformation on a submarine volcano, and this year our work paid off as Axial erupted within our previously published forecast windows (“before 2014” and “before 2020”). We could not be precise in our previous forecasts due to a data gap and large measurement uncertainties in the first few years of the measurements, but anticipate that we can do better next time.

The pressure measurements this year were made on Jason dive J2-581. The 2011 survey was carried out in the same way as last year’s survey (using our new concrete benchmarks). The average transit speed for towing Jason from benchmark to benchmark was about 1 knot. Jason used ultra-short baseline (USBL) navigation and we were able to find most benchmarks quickly and within a few meters of the target. However, there were 2 notable exceptions this year due to the 2011 eruption! After making measurements on benchmarks AX106 (ASHES) and AX101 (Caldera Center) we headed to AX102, but it was nowhere to be found. After searching for about 2 hours we decided to head to the next site AX103 (Marker 33) but, again, it was nowhere to be found and the seafloor looked completely different. After another search and debating whether or not there was a problem with the navigation we found a marker from 2010 - the smiley face marker – and it appeared to be where it was supposed to be (which was very confusing at the time!). We then transited to a large circular mound of pillow lava nearby that the 1998 lava had lapped up against – a distinctive seafloor feature – in order to convince us whether or not the ship and ROV navigation was really correct. The pillow hill and 1998 lava contact was indeed right where it was supposed to be. As we transited back to the AX103 site, we encountered a very clear new/old lava contact. We then realized that there had been an eruption since last year and that the reason we couldn’t find AX102 and AX103 was because they were both buried by the new lava! This changed the goals of the dive, and indeed the rest of the cruise, to include learning as much as we could about the 2011 eruption, while still completing the pressure measurements.

We were able to complete 2 pressure measurements on benchmarks AX101 and AX105, 3 measurements on AX106 and AX04 (the old benchmark at Bag City), and 4 measurements on AX104 (the cement benchmark at Bag City). We made measurements on AX04 again this year because the hollow lava lobe that AX104 had been placed on had collapsed since last year. We also carried the old metal triangular benchmarks from AX63 (caldera center) and from the reference site AX66 (Pillow Mound) and placed them at the sites of the buried benchmarks AX102 and AX103, respectively. We made a single measurement on each of these new sites, which we are calling AX202 and AX203 (AX202 is near Trevi, and AX203 is near the new Marker 33 vent site).

Each measurement was made by placing the MPR (mobile pressure recorder) on top of a benchmark. The pressure sensor has a flat plate on the bottom to make the exact orientation of the sensor repeatable from measurement to measurement. The new concrete benchmarks have a rectangular indentation on the surface that the flat plate fits into. This design worked well and made positioning the MPR easy and repeatable – with one exception: we found in retrospect that during the first measurement at AX101 this year the flat plate was caught on the edge of the indentation. This shows that careful visual inspection is still necessary to make sure the sensor is completely flush in the indentation. The connector on the pressure sensor faced left at all benchmarks (as in previous years). On the old triangular benchmarks, the sensor was aligned with a specific side, again to increase repeatability. 20 minutes of data were recorded at each site on a laptop PC in the Jason control room. Measurements were made on seven benchmarks (AX101 - Caldera Center; AX202 - Magnesia; AX203 - Marker 33; AX04 and AX104 - Bag City; AX105 - Pillow Mound; and AX106 - ASHES). A total of 16 measurements were made including both old and new benchmarks. AX105 is the reference benchmark and is located ~ 10 km south of the caldera center, outside the area of expected deformation. The pressure data were converted to depth then corrected for varying ocean tides using tide data collected on an autonomous tide gauge that recorded at

ASHES during the dive. The uncertainty in the measurements this year, 2.8 cm, is given by the scatter of repeated measurements at each benchmark. This is a larger number than the 0.6 cm uncertainty of the 2010 survey, and is apparently due to larger temperature fluctuations seen by the MPR during the survey (caused by increased hydrothermal activity over the new lava flows).

Comparing the 2011 depths to 2010 shows a difference in elevation of -1.91m (subsidence) at the caldera center. The amount of deflation decreases generally with distance from the caldera center, but the data do not fit a Mogi deflation source at the caldera center. Table 5.1.3 shows the results from each benchmark.

Table 5.1.3 Benchmark Heights Relative to AX105

Benchmark	Location	2010 depth (m)	2011 depth (m)	2011-2010 (m)	Notes
AX004	Bag City	188.1479	187.3312	-0.8167	Old benchmark next to AX104
AX101	Caldera Center	187.3075	185.3982	-1.9093	
AX104	Bag City	188.1961	187.1092	-1.0869	On top of pillow that collapsed
AX105	Pillow Mound	0	0	0	Reference benchmark
AX106	NE of ASHES	176.5995	175.383	-1.2165	
AX202	Trevi area	*194.6998	197.6368	2.937	Repositioned triangular benchmark
AX203	Marker 33 site	*198.7545	202.1552	3.4007	Repositioned triangular benchmark

* Height in 2010 is from concrete benchmarks that were buried in the 2011 flow. The 2011 heights are from repositioned triangular benchmarks, placed near the sites of the buried benchmarks. The difference number for AX203 gives the approximate thickness of the new lava flow at the Mkr 33 site; the difference number for AX202 does not because the repositioned benchmark is near Trevi vent, which is not close to the AX102 site (Magnesia). We moved this measurement site from Magnesia to Trevi to get it out of the collapse area, which was often problematic.

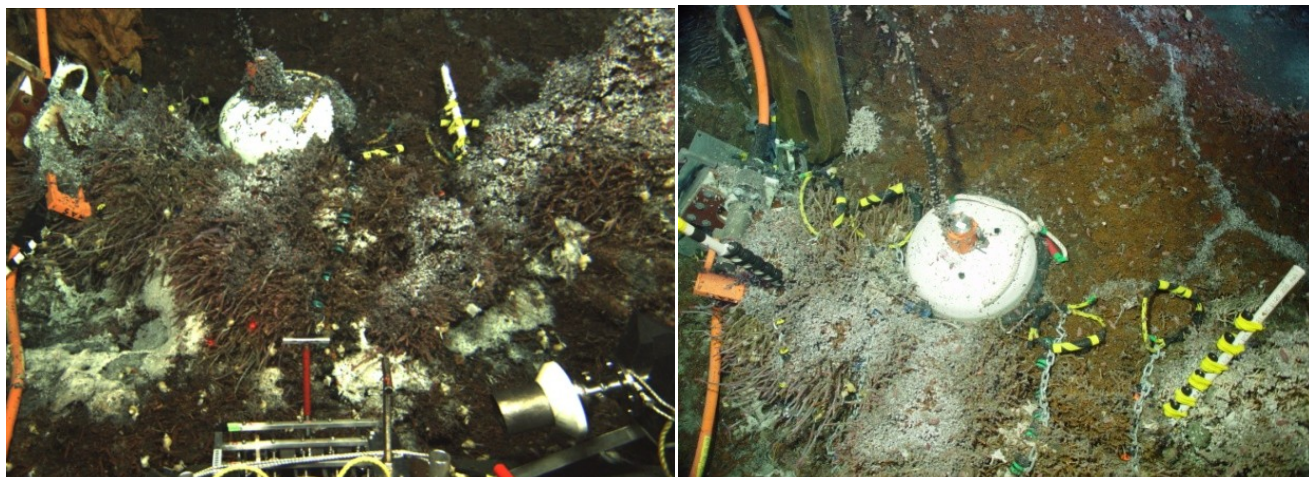
5.2 BIOLOGY

5.2.1 Thermal Biology of Hydrothermal Vent Macrofauna - Lowerings J2-575 and J2-578

Ray Lee

Two dives were used to investigate the thermal environment inhabited by macrofauna communities at the Main Endeavour vent field. The aim of these studies was to assess the degree to which the thermal regime challenges organismal physiological tolerance, governs species distribution, and affects community succession and development. The following tasks were completed on this cruise: (1) Recover a 48 temperature logger array from a diffuse flow environment at Grotto as part of the NEPTUNE Canada Observatory deployed in 2010. (2) Deploy a replacement logger array in the same area at Grotto for recovery in 2012. (3) Time-lapse imaging of animal activities and distributions as a function of temperature using two instruments deployed for 72 hours on small patches of polychaetes/gastropods. (4) Mapping of temperature on sulfide structures using temperature logger grids. (5) Collection of sulfides for microbiological studies by co-PI (Girguis).

Grotto temperature logger arrays – the 2010 array was recovered and replaced during J2-575 from the planned camera site at Grotto vent in the Main Endeavour vent field. Each recovered logger had an hourly temperature record beginning in November 2010.



Temperature logger array at Grotto – Images of site when recovered in 2011 (left; this cruise) and following deployment in 2010 (right). Loggers consist of 2.5 cm diameter titanium cylinders wrapped with colored tape and attached to a steel chain. Arrays were placed in a roughly linear pattern on communities consisting of *Ridgeia* tubeworms, polychaetes, and gastropods. White dome is the RAS fluid intake.

Time-lapse camera temperature array deployments – Two camera instruments were deployed on J2-575 and recovered on J2-578. The cameras consisted of time-lapse digital cameras with 16 temperature loggers arranged in a 12 x 12" grid in the field of view. Images showed movements of limpets, glob snails, scaleworms, and paralvinellid polychaetes before and after clearing the community from the substratum.

Temperature was mapped using a two 30 temperature logger grids that were deployed using the Jason manipulator on J2-575 and J2-578. Surface temperature in animal communities on sulfide structures was determined. Mapping was accomplished by sequentially placing temperature logger grids over 6-36

approximate 12 x 12" areas. On J2-575, two flanges were mapped at Grotto. On J2-578, three sulfide structures were mapped at Lobo, Dante, and Dudley, as well as parts of two spires covered with *Ridgeia* tubeworms.



Mapping of temperature on sulfide structures using logger grids. Top: structure at Dudley; black outlines indicate position of logger grids. Bottom: multiple image overlay showing grid deployments on structure at Lobo.

5.3 CHEMISTRY

5.3.1 2011 Hydrothermal Fluid Chemistry Summary

David Butterfield

The primary goal of our 2011 fluid chemistry program was to collect time-series samples from Axial Seamount as part of a long-term study of the hydrothermal system over an entire eruptive cycle. Our long-term goal was met this year to a large extent with the discovery that a large eruption took place in April of this year. We were able to collect critical samples within 3.5 months of the eruption.

Funding for the fluid chemistry portion of the 2011 cruise (2 days on station and one port day) was provided by NOAA PMEL and the NOAA UNOLS Charter fund. Through cooperation with the other NSF-funded PI projects, we were able to collect samples on every dive except one. The hydrothermal fluid and particle sampler (HFPS) was the primary instrument for vent fluid sampling. Major samplers were used only twice, primarily as a comparison with HFPS for organic and trace metal chemistry. Titanium gas-tight samplers were used both connected to the HFPS manifold and as discrete samplers to capture primarily high-temperature fluids for gas analysis. We collected 102 HFPS samples for fluid chemistry (47 from 3 dives at Axial and 55 from 5 dives at Endeavour) and 33 gas-tight samples during the cruise. The Sample Split Summary Table describes how the samples were processed and divided. The samples represent many of the known high-temperature sites (ASHES, International District, Casper/Vixen, and Trevi) and many of the known diffuse sites. In addition to our primary sampling at Axial, we used HFPS on 5 dives at Endeavour, split between the Main and High-Rise fields. Thanks to Marv Lilley, Ray Lee, Pete Girguis and Bill Chadwick for the ample opportunities to sample fluids on this expedition. We collected a combination of high-T and low-T samples from a number of chimney structures. These samples will extend the long-term time-series for the Endeavour region, support the Neptune Canada monitoring, provide additional high-T/low-T sample pairs to evaluate the effect of microbial activity on fluid chemistry, and provide some chemistry support for the other PI projects. In particular, we provided aliquots of samples from Jason dives 575 and 578 to Kiana Frank from Pete Girguis's laboratory for work on sulfur isotopes and other unspecified analysis.

Because the configuration of HFPS changes slightly with time, we provide some details of how it was set up. Valve positions 1 through 9 were occupied by pistons. Pistons 1-4 were titanium with Teflon end caps. Pistons 5-9 were PVC. The filters used were Millipore http 0.4 micron polycarbonate membrane filters. Positions 10-12 were Sterivex filters used for DNA analysis. Positions 13-16 were flat 0.2 micron filters in housings with a preservative reservoir, filled with RNA-Later preservative that was passively added to the filter in-situ after the sample was taken. Positions 17-24 were collapsible Tedlar bag samples. Initially, we intended to filter all odd-numbered piston and bag samples, and to leave all even-numbered samplers unfiltered. However, we were placing significant emphasis this year on collecting clean samples for dissolved organic chemistry for collaborators Aron Stubbins and Pamela Rossell. It was therefore decided to NOT use filters in titanium pistons 1 and 3 in order to remove one *potential* source of contamination. Experiments to evaluate organic carbon blanks were not completed before this cruise. It is clear, however, that the polycarbonate membrane filters, the polypropylene filter supports/housings, and the Tedlar bags can partially melt when collecting the hottest water. Samplers with all Teflon and titanium parts were preferred for the hottest samples. We collected a number of replicates of hot water samples with different sampler types in order to evaluate sampling equipment artifacts

that cannot be easily determined from laboratory experiments. The number of gas-tight samplers on the ROV varied depending on payload issues, with up to 3 gas-tights connected to the fluid manifold and 3 in the basket for hand-held triggering. A removable titanium cylinder attachment with magnetic coupling was broken on the first dive and was not used for the remainder of the cruise.

Kevin Roe analyzed hydrogen sulfide, dissolved silica and ammonia on board. Dave Butterfield and Aron Stubbins analyzed pH and alkalinity. Eric Olson analyzed methane and hydrogen by GC. Leigh Evans processed gas-tight samplers.

Gastight bottle contents were divided into three sub-samples during seaboard processing, degassed liquids and two sizes of glass ampule. Magnesium concentration will be analyzed in the liquid and gases will be analyzed from the contents of glass ampules. Aluminosilicate ampules of an approximate volume of 3 ml will be dedicated to the stable isotopes of helium (3 and 4) in John Lupton's lab in Newport. Pyrex ampules of an approximate volume of 35 ml will be used to measure hydrogen, methane, carbon dioxide and some atmospheric gases in Marv Lilley's lab in Seattle.

Our shore-based analytical plan is similar to previous years. We will analyze major elements (Na, K, Mg, Ca, Cl, SO₄) by ion chromatography, minor elements (Li, F, B, Sr, Rb) by Atomic Absorption, ICP-OES, and other techniques, a suite of trace metals (Fe, Mn, Cu, Zn, Pb, Mo, Ni, Ag, Cd, Bi, U and others) by ICP-MS, S isotopes on H₂S and SO₄, O and H isotopes of water, and stable C on DIC, Sr and Pb isotopes on selected samples.

The RAS sampler deployed last year at Marker 33 vent was directly in the path of the 2011 lava flow. The site this year was 4 meters shallower than last year, and we presume that the RAS was buried by the lava flow. Venting persisted at the Marker 33 site, and we deployed another RAS at the same site this year to observe how venting at this long-term diffuse site evolves following the eruption. The RAS deployed this year is S/N ML11605-01, stainless steel frame. All sample positions have Tedlar bags with 0.2 micron polycarbonate filters, using a 10-ml deionized water flush between samples. Two MTRs (S/N 4097 @ 20 min rate and 3197 @ 10 min rate) were attached to the intake line (internal volume 10ml). Sampling started on 8/1/2011 at 08:00 UTC, and will sample every week at that time, finishing on June 25, 2012.

5.3.2 Hydrothermal Fluid Sample Split Summary Tables

Butterfield

abbreviations: BF= filtered bag; B= unfiltered bag; PF= filtered piston; P=unfiltered piston

Table 5.3.2.a J2-574 Jason Dive Fluid Sample Split Summary. 21 Jul. Sites sampled: High Rise.

Sample# J2-574	Vent	T max	gas H ₂ O aliquot	H ₂ S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes		best vol. est.
P8	Background 2000m SW	1.8	10	30	35	45	35		350	125	45	15		683
BF23	Bambi	341	10	15	35	43	35		222	240		15		600
PF1	Bambi	340.7	15	13	35	40	35		300	250	45	15		760
P2	Bambi	341	10	15	35	40	35		300	250	45	15		745
BF17	Bambi	25.1	15	30	35	45	35			75	45	15		300
B18	Bambi	24.6	15	30	35	45	35	60		125	45	15		600
P4	Godzilla	350.9	10	15	35	45	35		260	250	45	15		737
PF3	Godzilla	350.4	8	10	35	0	35		0	0	0	0		107
BF19	Godzilla	351	20	15	35	42	35		180	125	45	15		600

Table 5.3.2.b J2-575 Jason Dive Fluid Sample Split Summary. 22-Jul. Sites sampled: MEF (Grotto, Dudley).

Sample# J2-575	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	K. Frank Isotopes	best vol. est.
B22	Grotto flange edge	18.1	15	30	35	45	35	60	110	120	45	15	60	557
BF21	Grotto flange edge	16.8	15	22	35	45	35		60	60			60	367
PF1	Grotto flange pool	215.6	20	20	35	40	35		20	125	45	10	60	410
P2	Grotto flange pool	177.6	10	20	35	45	35		125	60			60	390
B20	Dudley smoker	322.7	10	18	35	40	35		130	200	45	10		562
BF19	Dudley smoker	323.1	10	15	35	45	35			45	10			550
BF17	Background bottom SW	2.2	15	30	35	45	35		110	250	45	15		575
B24	Grotto flange top	4.2	15	30	35	45	35	40	175	125	45	15	60	571
BF23	Grotto flange top	4.1	15	30	35	45	35		150	125	45	15	60	551

Table 5.3.2.c J2-576 Jason Dive Fluid Sample Split Summary. 22/23-Jul. Sites sampled: Hi Rise (Bambi, Boardwalk, Park Place, Baltic, Fairy Castle, Ventor).

Sample# J2-576	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes		best vol. est.
PF1	Bambi smoker	341.7	10	15	35	40	35		150	250	45	15		595
P2	Bambi smoker	341.2	10	10	35	40	35		150	240	45	15		580
B24	Boardwalk smoker	342.8	10	8	35	40	35		90	60	45	15		348
BF23	Boardwalk smoker	340.7	10	7	35	40	35			100	45			303
BF21	Boardwalk diffuse 18?						32							32
B22	Boardwalk diffuse	18?	10	10	35	40	35	60		60				247
PF3	Park Place smoker	344.5	10	6	35	40	35		320	250	45	15		756
P4	Park Place smoker	344.6	10	8	35	40	35		110	240	45	15		538
B20	Park Place diffuse	24.9	10	6			35			60				112
BF19	Park Place diffuse	26.4	10	15	35	30	35		100	60				302
B18	Park Place diffuse	29.1	15	25	35	45	35	60	150	120	45	15		567
P6	Park Place diffuse	42.7	10	25	35	40	35	120	350	125	45	15		778
PF7	Baltic smoker	325.9	10	10	35	45	35		150	220	45	15		547
P8	Baltic smoker	301.3	10	15	35	40	35		150	230	45	15		547
PF9	Fairy Castle top smoker	341.8	10	15	35	40	35		270	240	45	15		705
PF5	Fairy Castle top smoker	341.9	10	10	35	40	35		250	250	45	15		690
BF17	Ventnor top smoker	330.5	10	10	35	40			150	180	45	15		516

Table 5.3.2.d J2-578 Jason Dive Fluid Sample Split Summary. 24/25-Jul. Sites sampled: MEF (Lobo, Dudley, Dante).

Sample# J2-578	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	K. Frank Isotopes	best vol. est.
B20	Dudley diffuse	20.7	15	30	35	45	35	60		200	45	45	60	560
PF9	Dudley diffuse	21.1	15	25	35	45	35			450	45	15	60	700
P6	Dudley dead chimney	2.6	20	30	35	45	35			450	45	15	60	725
BF19	Dante diffuse	15.1	15	30	35	45	35			250	45	15	60	554
PF3	Dante top smoker	336.2	10	15	35	40	35			300	45	15	60	560
B18	Dante top smoker	322	10	15	35	40	35			260	45	15	60	515
PF1	Lobo smoker	309.7	failed											0
P2	Lobo smoker	309.6	10	10	35		30			30				115
B22	Lobo diffuse S end	27.3	15	30	35	45	35	60		200	45	15	60	556
BF21	Lobo diffuse S end	27.1	15	30	35	45	35			250	45	15	60	558
P4	Lobo smoker S end	319.9	10	15	35	45	35			200	45	15	60	460
PF5	Lobo smoker S end	321.1	10	10	35	45	35			500	45	15	60	707

Sample#	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	K. Frank Isotopes	best vol. est.
J2-578	Vent													
BF23	Lobo diffuse central	31	15	30	35	45	35			100	45	15	60	416
B24	Lobo diffuse central	23.8	15	30	35	45	35	60		100	45	15	60	460

Table 5.3.2.e J2-579 Jason Dive Fluid Sample Split Summary. 25-Jul. Sites sampled: MEF (Hulk, Crypto).

Sample#	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	best vol. est.
J2-579	Vent												
PF1	Hulk smoker		10	10	35	40	35		400	100		12	645
P2	Hulk smoker		10	12	35		35		400	120	45	12	662
P6	Hulk smoker		10	12	35		35		440	125			657
BF18	Hulk smoker		10	15	35	45	35		150	120	45		461
PF3	Crypto smoker		10	15	35	40	35		300	125	45	12	623
P4	Crypto smoker		10	10	35		35		306	250			650
P8	Crypto smoker		failed										0
B20	Crypto smoker		10	10	35	45	35				45	10	524

Table 5.3.2.f J2-580 Jason Dive Fluid Sample Split Summary. 26/27-Jul. Sites sampled: ASHES.

Sample#	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	best vol. est.
J2-580	Vent												
P6	diffuse bet Inf and Mushrm	19.8	10	25	35	45	35	180	110	110	45	11	588
BF17	diffuse bet Inf and Mushrm	20.1	10	25	35	50	35		60	130	45	10	540
PF7	Marshmallow	45.6	10	25	35	45	35		300	200	45	10	707
B24	Marshmallow	50	10	30	35	50	35	120	70	120	45	15	521
P1	Virgin	273.2	10	5	35	50	35		150	110	45	15	455
P4	Virgin	272.7	10	10	35	45	35		15	220	45	9	425
P2	Inferno N side lower	282.4	10	10	35	45	35		350	120	45	10	660
P3	Inferno N side lower	283.1	10	15	35		35		305	270			670
B20	Inferno N side lower	283.7	10	10	35		20		150	190			415
B22	Mushroom top smoker	289.4	10	15	35	40	35		170	120	45	10	489
BF21	Mushroom top smoker	291.3	10	15	35	45	35		160	125	45	10	466
BF19	Mushroom top smoker	291.9	10	15	35	45	35		190	125	45	8	488
BF23	Hell	289.7	10	25	35	45	35		145	110	45	10	456
P8	Hell	290.8	10	10	35	45	35		250	220	45	10	670
P9	Hell	291.2	10	10	35	45	35		305	250			690
PF5	diffuse S of ROPOS	19.8	10	25	35	45	35		240	250	45	10	690
B18	diffuse S of ROPOS	20.3	10	25	35	45	35	155	100	100	45	10	560
Red major	Hell	290		10	35	45	35		400	125	45	12	650

Table 5.3.2.g J2-581 Jason Dive Fluid Sample Split Summary. 29-Jul. Sites sampled: Bag City, Vixen, Trevi, N3, Mkr 33.

Sample#	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	best vol. est.
J2-581	Vent												
BF17-PP	Bag City	13.9	10	25	35	47	35			300	45	11	549
B18-PP	Bag City	13.6	15	20	35	40	35	60	105	125		15	477
P1-Ti-Tef	Vixen	344.5	Failed										0
P2-Ti-Tef	Vixen	344.7	Failed										0
PF3-Ti-Tef	Casper	313	8	10	37	38	35		150	200	45	10	543
P4-Ti-Tef	Casper	313.4	10	5	35	35	35		105	125	45	12	417
P6-PVC	Trevi	252.7	10	10	35		35		200	110		10	410
PF7-PVC	Trevi	253.7	10	25	35	40	35			200	90	10	445
B20-Tef/PP	Spanish Steps	169.2	10	25	35		35		200	120		10	440
P5-PVC-PP	Spanish Steps	169.2	10	25	35	45	35			420	45	10	633
B24-PP	Snow Globe near old Magnesia	11.4	10	25	35	45	35	130	150	60	45	10	550

Sample# J2-581	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	best vol. est.
BF23-PP	Snow Globe near old Magnesia	11.5	10	25	35	45	35			240	45	10	494
B22-PP	Mkr N3 area (no marker)	23.2	10	25	35	45	35	60	200	60	45	10	544
BF21- Tef/PP	Mkr N3 area (no marker)	22.5	10	25	35	45	35			270	45	10	542
P8-PVC- PP	Mkr 33 new lava	25.6	10	20	35		35	60	100	35			282
PF9-PVC- PP	Mkr 33 new lava	27.1	10	25	35	45	35			470	45	15	651
BF19-PP	Mkr 33 new lava	27.3	10	25	35	45	35			280	45	10	522

note: a suffix has been added here to indicate the materials used in the samplers

Table 5.3.2.h J2-583 Jason Dive Fluid Sample Split Summary. 31-Jul. Sites sampled: Mkr 33, Snow, International District

Sample# J2-583	Vent	T max	gas H2O aliquot	H2S / Si	pH / alk	Nutrients	Majors	Micro bio Akerman	DOM Stubbins	Trace Metal	Sulfur Isotopes	O/H isotopes	best vol. est.
BF23	Mkr 33 RAS vent	21.7	10	25	35	41	35		150	130	45	15	493
B24	Boca snow blower	16.8	10	25	35	45	35	60	170	125			514
BF21	Boca snow blower	16.9	10	25	35	45	35			240	90	15	505
PF5	Boca snow blower	17	10	25	35	45	35		20	220	45	12	450
P1	Diva anhydrite	271	8	5	35	35	35		20	220	45	12	415
P3	Diva anhydrite	272	8	5	35		30		240	90			411
P8	9 meter	35.2	10	20	35	40	35	120	200	125	45	15	648
BF17	9 meter	32.1	10	20									518
P2	El Guapo top smoker	330.5	8	10	35	30	35			500		10	628
P4	El Guapo top smoker	330.8	8	10	35		35		330	125	45	13	601
B18	Escargot bottom palm worms	10.3	10	25	35	45	35	120		190	45	13	518
B20	Escargot bottom palm worms	9.8	10	20	35	45	35		200	240	45	10	640
P6	Castle anhydrite	266.5	9	7	35		35		70	65	45		266
PF7	Castle anhydrite	266.4	8	7	35		25			75			150
Major	El Guapo top smoker	330		5	35		35		212	400			680

5.3.3 Dissolved Organic Matter Characterization

Aron Stubbins and Pamela Rossel

Synopsis of samples collected: Approximately 70 vent fluid samples were collected using David Butterfield's fluid sampler: aka The Beast. These samples were processed on board to provide samples for dissolved organic matter (DOM) characterization. Aliquots of filtered vent fluids will be analyzed for dissolved organic carbon (DOC) concentration, DOM optical absorbance and fluorescence, and molecular signatures using high resolution Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS).

In addition to the vent fluids, 24 samples were also collected from CTD casts 1 through 4. The larger volumes collected using the CTD Niskins allowed aliquots to be collected for analysis of the dissolved organic carbon and dissolved inorganic natural (^{13}C) and radio (^{14}C) isotopic signatures and DOM Fourier transform infrared spectra in addition to those analyses listed above.

The samples will be analyzed by the end of 2011 at laboratories in the US (Skidaway Institute of Oceanography and Ohio State University) and Germany (Max Planck).

Rationale: Dissolved organic matter (DOM) plays a major role in key biogeochemical processes: providing sustenance at the base of foodwebs; transporting carbon (C), nutrients and trace elements from the land to the oceans; and mediating fluxes of C from vegetation and soils, to rivers, the oceans, and eventually the atmospheric CO₂ pool. The DOM pool in the oceans represents one of the largest global C pools (~700 Pg C), storing approximately the same amount of C as is found in all living organisms on Earth. Due to its great size, even minor changes in the dynamics of the DOM pool or its components can impact the global ecosystem, particularly ocean C-storage and atmospheric CO₂.

In most waters, photosynthesizing organisms, whether trees in a river's catchment or the phytoplankton of the sunlit surface waters fix the carbon that is then cycled through the DOM pool to heterotrophic organisms and along the rest of the food chain. The role of DOM in transferring material from the chemotrophic organisms at the base of hydrothermal vent ecosystems to heterotrophs is currently unknown. The role of hydrothermal vents in the global carbon cycle is so poorly constrained it is not even clear whether these systems act as net sources or sinks of organic carbon. The chemotrophs mentioned above may be a source of organic carbon, producing DOM from inorganic energy supplies, or organic carbon may be directly released from subterranean organic sources. Conversely, excessive heating can combust DOM, converting it back into inorganic carbon dioxide. The samples collected will help address these fundamental issues concerning the role of vent systems in the global biogeochemical cycle.

The DOM pool is of further interest as an information rich set of tracers, diverse in source, reactivity and history. These molecules carry the signatures of their source and subsequent journey through the environment to their point of analysis. The great potential of mining this information led John Hedges (2002) to state that "the future of oceanographic research belongs in large part to those who can learn to read these molecular messages". These signatures will be determined, providing a fingerprint for hydrothermal DOM. Once identified, hydrothermal DOM can then be tracked in the ocean and the study of its role in the global carbon cycle and vent ecosystems can begin in earnest.

Sample list:

Jason II (Butterfield ID)

J2-574B18, J2-574BF17, J2-574BF19, J2-574BF23, J2-574P2, J2-574P4, J2-574P8, J2-574PF1
J2-575B20, J2-575B22, J2-575B24, J2-575BF17, J2-575BF19, J2-575BF21, J2-575BF23, J2-575P2, J2-575PF1
J2-576B18, J2-576B24, J2-576BF17, J2-576BF19, J2-576P2, J2-576P4, J2-576P6, J2-576P8, J2-576PF1, J2-576PF3,
J2-576PF5, J2-576PF7, J2-576PF9
J2-579B18, J2-579B20, J2-579P2, J2-579P4, J2-579P6, J2-579PF1, J2-579PF3
J2-580B18, J2-580B20, J2-580B22, J2-580B24, J2-580BF17, J2-580BF19, J2-580BF21, J2-580BF23, J2-580Major
Red, J2-580P1, J2-580P2, J2-580P3, J2-580P6, J2-580P8, J2-580PF5, J2-580PF7, J2-580PF9
J2-581B18, J2-581B20, J2-581B22, J2-581B24, J2-581P4, J2-581P6, J2-581P8, J2-581PF3
J2-583B20, J2-583B24, J2-583BF23, J2-583Major White, J2-583P3, J2-583P4, J2-583P6, J2-583P8

CTD # and Bottle #

CTD #1: 1, 6, 9, 12, 16, 20

CTD #2: 1, 23

CTD #3: 1, 3, 5, 7, 9, 11, 13

CTD #4: 1, 3, 5, 7, 9, 11, 13, 15, 17, 20

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5.4 MICROBIOLOGY

5.4.1 Deep Sea Vent Micro-organisms as a Source of Medicinally Relevant Small Molecule Natural Products

(McPhail, OSU, Zabriskie, OSU) Submitted by Oliver Vining, OSU

Structurally complex natural products from diverse biological sources continue to be a critical source of lead compounds for drug development and molecular tools to define new cellular targets for rational drug design. Chemical diversity directly correlates with biological diversity, and thus phylogenetically unique organisms from rare or extreme ecosystems are rational sources of novel chemotypes with important biological activities. Therefore, frozen collections of microbial mats and invertebrates hosting microbial symbionts will be chemically extracted (with organic solvents) and the organic extracts crudely fractionated before testing for activity against human cancer cell lines, and eukaryotic (e.g. malarial and trypanosomal parasites) and prokaryotic (e.g. *Mycobacterium tuberculosis*, *Staphylococcus aureus* and *Escherichia coli*) microbial pathogens. Laboratory cultivation of filamentous bacteria from microbial mat samples will also be attempted. Subsequent bioassay-guided HPLC fractionation of active crude fractions from extracts of field-collected and laboratory-cultured microbes will be used to obtain pure active compounds. These fractionations will also be guided by chemical profiling using mass spectrometry (LC-MS) and capillary microflow nuclear magnetic resonance (NMR) spectroscopy. Molecular structure elucidation of new compounds will be carried out by NMR spectroscopy using either a capillary microflow probe or a cryogenic probe on 300, 600 or 700 MHz spectrometers available at OSU. This project is the focus of OSU College of Pharmacy Ph.D. graduate students Christopher Thornburg and Oliver Vining, with assistance from research associate Edward Mitchell.

Biological samples for this project were obtained from ROV dives (J2-574 through J2-581 and J2-583) by suction via syringe sampler (100 mL and 500 mL volume) or swab from sulfidic rock collected via biobox. 5ml of each sample was transferred into a sterile screw cap tube with 1ml of glycerol. The tubes were frozen at -70°C for later processing in the lab. The remainder of the samples were de-watered by vacuum pump collection on to 0.45µm filters. The samples were “wet stamped” and swabbed onto 0.45µm filters placed on five media types. The sediment was then placed in to an oven at 50°C overnight to dry completely. These samples were then plated by “dry stamping” onto the same five media types.

Table 5.4.2 Bacterial Mat / Sediment Sample List

Edward Mitchell

abbreviations: vv= virtual van entry; fg=frame grab ID start

Collection ID	Type	Sampler	Field	Vent / Marker	Lat. (Deg Min N)	Long. (Deg Min W)	Depth (m)	Alt. (m)	Temp. (° C)
J2-574-Misfire	Water	Large Red	Endeavour	Bambi	47 58.124290	129 5.226710	2141.4	15.6	cold
Misfire in water above Jason basket					vv: 280-291	fg: COL.20110721.024736807.0032466			
J2-574-MAT-17	Sediment	Small Blue	Endeavour	Godzilla	47 58.133866	129 5.235158	2137.9	15.0	cold
Dark grey sediment 2/3 up vent from seafloor, at base of tubeworm mat					vv: 551-576	fg: COL.20110721.054320561.0032523			
J2-575-MAT-08	Mat	Large Red	Endeavour	Grotto	47 56.951983	129 5.902179	2190.1	4.1	warm
Bright orange mat covering tubeworms					vv: 1473-1490	fg: COL.20110722.031556228.0032732			
J2-575-MAT-09	Sediment	Small Blue	Endeavour	Grotto	47 56.950982	129 5.900507	2191.7	3.4	cold
Light grey brown sediment/mat at base of dead tubeworm mat					vv: 1494-1518	fg: COL.20110722.033331679.0032733			
J2-575-Rockswab	Sulfide	Swab	Endeavour	Grotto					hot
Swabbed surface of sulfide flange from side of Grotto						fg: COL.20110722.012335691.0032721			

Collection ID	Type	Sampler	Field	Vent / Marker	Lat. (Deg Min N)	Long. (Deg Min W)	Depth (m)	Alt. (m)	Temp. (° C)
J2-576-GEO-26	Sediment	Large Blue	High Rise	Fairy Castle	47 58.017525	129 5.294857	2165.4	0.8	2.9
Dark grey sediment with orange staining on top of dead tubeworms					vv: 2518-2563	fg: COL.20110723.024459534.0032923			
J2-576-MAT-27	Mat	Small Red	High Rise	Knight	47 58.033763	129 5.330960	2174.5	5.1	warm
Bright orange mat on bare rock, top of inactive vent					vv: 2590-2609	fg: COL.20110723.030950659.0032930			
J2-576-MAT-31	Mat	Small Yellow	High Rise	Ventor	47 58.056242	129 5.370085	2172.9	2.0	cold
Orange mat on light brown sediment away at bottom of vent					vv: 2770-2795	fg: COL.20110723.042638753.0032946			
J2-577-SED-10	Sediment	Small Yellow	Endeavour	Needle	47 56.864486 N	129 5.933454	2194.0	1.1	cold
Dark brown sediment w/orange and yellow staining on seafloor					vv: 3795-3812	fg: COL.20110724.051406103.0033278			
J2-577-SED-11	Sediment	Small Red	Endeavour	Needle	47 56.864486	129 5.933454	2194.0	1.1	cold
Same location as above					vv: 3812-3822	fg: COL.20110724.051639996.0033282			
J2-578-SED-12	Sediment	Large Red	Endeavour	Dudley	47 56.933841	129 5.860636	2192.2	9.6	warm
Ledge with diffuse venting, tubeworm mats, and dark grey sediment					vv: 4455-4473	fg: COL.20110725.013242473.0033547			
J2-578-MAT-16	Mat	Small Red	Endeavour	Dudley	47 56.933676	129 5.855915	2190.5	6.1	warm
Orange mat on tubeworm clump at top of older chimney with diffuse venting					vv: 4541-4554	fg: COL.20110725.022332939.0033559			
J2-578-MAT-21	Mat	Small Blue	Endeavour	Dante	47 56.956879	129 5.872351	2182.8	12.0	warmish
Orange mat on rock and tubeworm clump, side of chimney with little diffuse flow					vv: 4751-4765	fg: COL.20110725.043725801.0033581			
J2-578-SED-27	Sediment	Small Yellow	Endeavour	Dante	47 56.959195	129 5.867001	2175.3	18.7	warm
Dark grey sediment next to large tubeworm mat on ledge near top of chimney					vv: 4879-4892	fg: COL.20110725.054955675.0033626			
J2-579-Sulfide-13	Sulfide	Swab	Endeavour	Crypto	47 56.987940	129 5.811828	2197.4	8.8	warm / hot
Light grey/white mat on sulfide chimney, swabbed on ship after recovery					vv: 5254-5301	fg: COL.20110725.204251986.0033740			
J2-580-MAT-05	Mat / Sediment	Small Yellow	South Axial	Ropos	45 55.998144	130 0.821658	1544.6	0.7	warmish
Fine light grey/tan sediment among small tubeworms next to small vent					vv: 5572-5602	fg: COL.20110726.232554428.0033825			
J2-580-MAT-10	Mat / Sediment	Small Blue	South Axial	Mushroom	45 56.025546	130 0.814842	1544.2	0.9	3.5
Fine orange Mat / Sediment covering seafloor. Mainly iron precip					vv: 5707-5739	fg: COL.20110727.014150149.0033859			
J2-580-MAT-11	Mat / Sediment	Small Red	South Axial	Mushroom	45 56.025546	130 0.814842	1544.2	0.9	cold
same as above					vv: 5707-5739	fg: COL.20110727.015438817.0033864			
J2-581-MAT-03	Mat	Large Blue	Axial	Marker 33	45 55.986636	129 58.93228	1516.1	0.9	2.8
Fine light orange/yellow/green mat covering all lava surfaces near new eruption					vv: 7139-7150	fg: COL.20110728.114023698.0034313			
J2-583-MAT-02	Mat	Small Red	North of Intl Dist.	Cotton Ball	45 55.672295	129 58.96706	1519.9	0.0	cold
White cotton-like mat covering new lava, mixed with patches of orange and tan mat					vv: 9546-9577	fg: COL.20110731.092434041.0035211			
J2-583-MAT-03	Mat	Small Blue	North of Intl Dist.	Cotton Ball	45 55.672295	129 58.96706	1519.9	0.0	cold
Orange and tan mat covering new lava, mixed with white cottonlike mat					vv: 9578-9583	fg: COL.20110731.100052319.0035240			
J2-583-MAT-18	Ciliate	Large Red	International Dist.	9 Meter	45 55.589792	129 58.756582	1516.7	3.7	warmish
Blue ciliate mat on side of chimney with light diffuse flow, did not look healthy					vv: 9930-9977	fg: COL.20110731.152040566.0035418			

Collection ID	Type	Sampler	Field	Vent / Marker	Lat. (Deg Min N)	Long. (Deg Min W)	Depth (m)	Alt. (m)	Temp. (° C)
J2-583-MAT-27	Sediment	Small Yellow	International Dist.	Escargot	45 55.583164	129 58.749122	1520.3	2.1	warmish
Light sandy colored sediment midway up chimney near diffuse venting and tubeworms					vv: 10208-10228	fg: COL.20110731.183256205.0035550			

5.4.3 DNA / RNA Culturing of Microbial Communities in the Subseafloor

Nancy Akerman

The Huber Laboratory's research focuses on understanding the functional diversity and activity of microbial communities in the subseafloor at Axial Seamount. The goal of our fieldwork was to collect samples for microbial culturing and to filter diffuse flow fluids for DNA and RNA analysis in the laboratory. Low-temperature diffuse fluids collected on Butterfield's HFPS were used to inoculate growth media and preserve for cell counts. Filters for DNA and RNA analysis were collected in pairs from 9 diffuse flow venting sites at Axial and one site at Endeavour, with one additional RNA filter of background seawater collected at Endeavour. Water from the CTD casts of background seawater and plume water over Vixen and Snow Globe were preserved for cell counts and also filtered for DNA and RNA analysis. We collected vent fluids that represent a continuation of our time series work at Axial, as well as a number of new samples associated with the eruption. The latter are especially exciting targets for examining subseafloor microbial populations.

Growth media were inoculated and incubated at sea for Angus Angermeyer and Julie Meyer in the Huber Laboratory, and the laboratories of Jim Holden and Kesen Ma. Angus Angermeyer is interested in studying biofilm-forming microorganisms, and media containing thermophilic coverslips as substrates showed positive signs of biofilm growth at sea. Julie Meyer's media is targeted at *Lebetimonas* strains, and when checked in the lab, at least five inoculations showed signs of growth. The Holden Laboratory's fieldwork goal was to enrich for representative thermophilic autotrophs from Axial and Endeavour to further their research in bioenergetics modeling. Four types of media aiming for moderately thermophilic, hydrogenotrophic methanogens like *Methanothermococcus*, and hyperthermophilic autotrophic and acetotrophic sulfur reducers like the *Desulfurococcales* were inoculated at sea. The Ma Laboratory is targeting hyperthermophilic heterotrophs, and 8 different types of growth media containing different carbohydrate substrates, such as corn husk, xylan, and filter paper, were inoculated at sea. Growth in these media will be verified in their respective labs.

5.5 BIOGEOCHEMISTRY

5.5.1 Determining the Impact of Vent Communities on Biogeochemical Cycling

Kiana Frank

McCollum and Shock (2001) predict a number of metabolic reactions such as sulfate reduction, sulfide oxidation, methanogenesis and anaerobic oxidation of methane to be the most thermodynamically favorable reactions at hydrothermal vents at different temperatures and chemistries. However it is the kinetics of these reactions that determine the impact of vent communities on biogeochemical cycling. Assessing direct rate measurements under physico-chemical conditions as close to natural as possible will aid in determining the impact of vent communities on biogeochemical cycling.

The optimum rates of metabolism should occur at the temperatures in which targeted metabolisms are most active. The distribution of metabolic activity, e.g. sulfate reduction, will exhibit a modality that reflects the periodicity of geochemical conditions due to features such as tidal pumping, the nature of ecological interactions, and the heterogeneity inherent to mineral precipitates, e.g. sulfides. This pattern of activity may reflect the phylogenetic diversity, in which different microbes (capable of coupling growth to key dissimilatory pathways) dominate at different temperatures, and/or homeokinesis, wherein an organism contains a variety of mechanisms (performing the same metabolic function) that are optimal under different conditions. The effect of temperature and chemistry on rates of sulfate reduction and carbon fixation will be quantified experimentally using sulfide samples by measuring changes in the concentration of the desired species over time.

Intact sulfide samples were collected from the Main Endeavor (Crypto, Lobo, Dudley, Grotto, Dante) and High Rise (Boardwalk, Bambi, Godzilla, Vantor). Samples were transferred to anaerobic seawater until they were further processed. Sulfide Chimneys were subsampled for mineralogy (anhydrite, pyrite, marcosite, etc..) using a sterile chisel and hammer. A subset of these samples were frozen at -80 for DNA analysis to look at community and functional gene compositions with respect to different mineralogy. Rock samples were blended to coarse consistency and about 7.5mL volume (or ½ TBS) were aliquoted into 25mL balch tubes in an anaerobic chamber. 15mL artificial anaerobic vent water media (filtered artificial seawater, 14mM sulfate, pH (4 or 6) and [H₂S] varied from 0-1mM) were added to each tube. Samples were capped with gas tight stoppers under nitrogen gas atmosphere then incubated with their respective substrate for 3 to 7 days at temperatures of 4°C, 25°C, 50°C and 90°C. Each experimental set included a set of negative controls which were sulfides 'killed' by a double round of autoclaving, freezing and microwaving. 28mM molybdate was also added as an inhibitor to sulfate reduction as an added negative control. Samples were run in triplicate.

For sulfate reduction rates, 15μCi of ³⁵SO₄²⁻ in filtered sea water was added to each balch tube. The reaction was quenched by the injection of 10mL 25% Zinc acetate and frozen for further analysis. The samples will be analyzed via chromium distillation (Fossing and Jorgensen, 1989), and the radioactivities of the nonreduced sulfate and the reduced sulfur will be measured via liquid scintillation counter back in the lab. Rates of carbon fixation and methanogenesis were measured concurrently with the addition of 10μCi of ¹⁴C labeled bicarbonate. The reaction was quenched by the addition of 5mL concentrated glacial acetic acid and frozen for later analysis.

Table 5.5.2 Sulfide Sample Summary (Pete Girguis's laboratory)

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2001	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis	Initial Slurry
2002	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis	Initial Slurry
2003	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis	Initial Slurry
2004	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis	Initial Slurry
2005	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis	Initial Slurry
2006	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2007	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS	Initial Slurry
2008	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS	Initial Slurry
2009	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH	Initial Slurry
2010	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	322-4C-7dat
2011	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	335-50C-7day
2012	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	348-90C-7day
2013	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	323-4C-7day
2014	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	323-4C-7day
2015	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	323-4C-7day
2016	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	323-4C-7day
2017	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	336-50C-7day
2018	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	336-50C-7day
2019	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	336-50C-7day
2020	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	336-50C-7day
2021	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	349-90C-7day
2022	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	349-90C-7day
2023	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	349-90C-7day
2024	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	349-90C-7day
2025	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2026	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2027	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2028	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2029	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2030	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2031	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2032	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS, 4C	Initial Slurry
2033	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2034	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	361-4C-7day
2035	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	374-50C-7day
2036	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	387-90C-7day
2037	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	362-4C-7day
2038	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	362-4C-7day

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2039	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	362-4C-7day
2040	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	362-4C-7day
2041	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	375-50C-7day
2042	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	375-50C-7day
2043	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	375-50C-7day
2044	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	375-50C-7day
2045	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	388-90C-7day
2046	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	388-90C-7day
2047	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	388-90C-7day
2048	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	388-90C-7day
2049	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2050	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2051	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2052	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2053	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2054	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2055	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2056	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS, 4C	Initial Slurry
2057	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2058	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	400-4C-7day
2059	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	413-50C-7day
2060	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	426-90C-7day
2061	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	401-4C-7day
2062	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	401-4C-7day
2063	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	401-4C-7day
2064	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	401-4C-7day
2065	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	414-50C-7day
2066	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	414-50C-7day
2067	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	414-50C-7day
2068	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	414-50C-7day
2069	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	427-90C-7day
2070	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	427-90C-7day
2071	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	427-90C-7day
2072	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	427-90C-7day

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2073	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2074	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2075	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2076	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2077	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2078	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2079	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2080	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS, 4C	Initial Slurry
2081	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2082	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	439-4C-7day
2083	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	452-50C-7day
2084	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	465-90C-7day
2085	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	440-4C-7day
2086	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	440-4C-7day
2087	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	440-4C-7day
2088	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	440-4C-7day
2089	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	453-50C-7day
2090	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	453-50C-7day
2091	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	453-50C-7day
2092	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	453-50C-7day
2093	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	466-90C-7day
2094	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	466-90C-7day
2095	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	466-90C-7day
2096	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	466-90C-7day
2097	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2098	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2099	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2100	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2101	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2102	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2103	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2104	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS, 4C	Initial Slurry
2105	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2106	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	478-4C-7day
2107	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	491-50C-7day
2108	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	504-90C-7day

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2109	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	479-4C-7day
2110	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	479-4C-7day
2111	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	479-4C-7day
2112	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	479-4C-7day
2113	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	492-50C-7day
2114	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	492-50C-7day
2115	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	492-50C-7day
2116	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	492-50C-7day
2117	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	504-90C-7day
2118	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	504-90C-7day
2119	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	504-90C-7day
2120	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	504-90C-7day
2121	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2122	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2123	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2124	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2125	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2126	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2127	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2128	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde...in PBS, 4C	Initial Slurry
2129	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2130	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	517-4C-7day
2131	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	530-50C-7day
2132	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	543-90C-7day
2133	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	518-4C-7day
2134	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	518-4C-7day
2135	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	518-4C-7day
2136	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	518-4C-7day
2137	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	531-50C-7day
2138	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	531-50C-7day
2139	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	531-50C-7day
2140	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	531-50C-7day
2141	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	544-90C-7day
2142	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	544-90C-7day

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2143	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	544-90C-7day
2144	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	544-90C-7day
2145	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2146	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2147	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2148	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2149	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2150	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2151	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2152	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS, 4C	Initial Slurry
2153	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2154	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	556-4C-7day
2155	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	569-50C-7day
2156	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	582-90C-7day
2157	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	557-4C-7day
2158	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	557-4C-7day
2159	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	557-4C-7day
2160	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	557-4C-7day
2161	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	570-50C-7day
2162	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	570-50C-7day
2163	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	570-50C-7day
2164	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	570-50C-7day
2165	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	583-90C-7day
2166	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	583-90C-7day
2167	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	583-90C-7day
2168	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	583-90C-7day
2169	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2170	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis,-80	Initial Slurry
2171	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2172	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1mL Cryovials for DNA Analysis, -80	Initial Slurry
2173	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	15mL Cryovials for DNA Analysis, -80	Initial Slurry
2174	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1 scoop for wet weight/dry weight/SA frozen -80	Initial Slurry
2175	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform... in PBS, 4C	Initial Slurry
2176	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde....in PBS, 4C	Initial Slurry
2177	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C	Initial Slurry
2178	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	595-4C-7day

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2179	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	608-50C-7day
2180	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	1:3 RNALater in 50mL falcon tube	621-90C-7day
2181	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	596-4C-7day
2182	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	596-4C-7day
2183	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	596-4C-7day
2184	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	596-4C-7day
2185	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	609-50C-7day
2186	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	609-50C-7day
2187	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	609-50C-7day
2188	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	609-50C-7day
2189	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	622-90C-7day
2190	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	4mL cryovial filtered zinc trap media water for isotopes	622-90C-7day
2191	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	FLUID-FROZEN-ISO	Plastic Scint vial unfiltered zinc trap media water	622-90C-7day
2192	7/23/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-ISO	15mL cryovial for isotopes	622-90C-7day
2193	7/20/2011	GODZILLA (HRF)	J2-574-SULFIDE-016	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	Nice mineralogical layers, pyrite
2194	7/20/2011	GODZILLA (HRF)	J2-574-SULFIDE-016	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	Nice mineralogical layers, pyrite
2195	7/20/2011	GODZILLA (HRF)	J2-574-SULFIDE-016	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2196	7/20/2011	GODZILLA (HRF)	J2-574-SULFIDE-016	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2197	7/20/2011	BAMBI (HRF)	J2-574-SULFIDE-09	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	Friable sulfide, looks like a chimney? Anhydrite layers
2198	7/20/2011	BAMBI (HRF)	J2-574-SULFIDE-09	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	Pulverized and Used to Set up Heathers CFX exp.
2199	7/20/2011	BAMBI (HRF)	J2-574-SULFIDE-09	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2200	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	Really hard sulfide, beautiful mineralogical layers
2201	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2202	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	
2203	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	
2204	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	
2205	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2206	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	
2207	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	
2208	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	LIVE-RATE	1L Mason Jar at 4C for rate experiments	
2209	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	100% EtOH, 4C, 15mL cryovial	
2210	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	RNA Later, 15mL cryovial	
2211	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	GEO-FROZEN-DNA	RNA Later, 15mL cryovial	
2212	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde in PBS, 4C, 15mL cryovial	
2213	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Gluteraldehyde in PBS, 4C, 15mL cryovial	
2214	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform in PBS, 4C, 15mL cryovial	
2215	7/21/2011	GROTTO FLANGE	J2-575-SULFIDE-07	MICROSCOPY-GEO	Paraform in PBS, 4C, 15mL cryovial	
2216	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2217	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2218	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2219	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2220	7/24/2011	DANTE EXTINGT	J2-578-SULFIDE-22	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2221	7/24/2011	DANTE EXTINGT	J2-578-SULFIDE-22	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2222	7/24/2011	DANTE ACTIVE	J2-578-SULFIDE-19	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2223	7/24/2011	CENTRAL LOBO	J2-578-SULFIDE-01	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2224	7/24/2011	CENTRAL LOBO	J2-578-SULFIDE-01	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2225	7/24/2011	CENTRAL LOBO	J2-578-SULFIDE-01	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2226	7/24/2011	SOUTH LOBO	J2-578-SULFIDE-08	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2227	7/24/2011	SOUTH LOBO	J2-578-SULFIDE-08	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2228	7/24/2011	DUDLEY ACTIVE	J2-578-SULFIDE-12	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2229	7/24/2011	DUDLEY EXTINGT	J2-578-SULFIDE-17	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2230	7/24/2011	DUDLEY EXTINGT	J2-578-SULFIDE-17	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2231	7/24/2011	DUDLEY EXTINGT	J2-578-SULFIDE-17	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2232	7/24/2011	DUDLEY EXTINGT	J2-578-SULFIDE-17	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2233	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2234	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Small 1/2 pint Mason Jar at 4C for rate experiments	
2235	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Small 1/2 pint Mason Jar at 4C for rate experiments	

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2236	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Small 1/2 pint Mason Jar at 4C for rate experiments	Pulverized and Used to Set up Heathers CFX exp.
2237	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Small 1/2 pint Mason Jar at 4C for rate experiments	
2238	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Small 1/2 pint Mason Jar at 4C for rate experiments	Pulverized and Used to Set up Heathers CFX exp.
2239	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2240	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2241	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2242	7/24/2011	DANTE EXTINGT	J2-578-SULFIDE-22	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2243	7/24/2011	DANTE ACTIVE	J2-578-SULFIDE-19	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2244	7/24/2011	DUDLEY ACTIVE	J2-578-SULFIDE-12	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2245	7/24/2011	DUDLEY EXTINGT	J2-578-SULFIDE-17	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2246	7/24/2011	DUDLEY EXTINGT	J2-578-SULFIDE-17	LIVE-RATE	Pint Mason Jar at 4C for rate experiments	
2247	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	MICROSCOPY-GEO	Gluteraldehyde in PBS, 4C, 15mL cryovial	
2248	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	MICROSCOPY-GEO	Paraform in PBS, 4C, 15mL cryovial	
2249	7/24/2011	DANTE FLANGE	J2-578-SULFIDE-28	MICROSCOPY-GEO	100% EtOH, 4C, 15mL cryovial	
2250	7/24/2011	CENTRAL LOBO	J2-578-SULFIDE-01	MICROSCOPY-GEO	Gluteraldehyde in PBS, 4C, 15mL cryovial	
2251	7/24/2011	CENTRAL LOBO	J2-578-SULFIDE-01	MICROSCOPY-GEO	Paraform in PBS, 4C, 15mL cryovial	
2252	7/24/2011	DANTE EXTINGT	J2-578-SULFIDE-22	MICROSCOPY-GEO	Gluteraldehyde in PBS, 4C, 5mL cryovial	
2253	7/24/2011	DANTE EXTINGT	J2-578-SULFIDE-22	MICROSCOPY-GEO	Paraform in PBS, 4C, 5mL cryovial	
2254	7/24/2011	SOUTH LOBO	J2-578-SULFIDE-08	MICROSCOPY-GEO	Gluteraldehyde in PBS, 4C, 5mL cryovial	
2255	7/24/2011	SOUTH LOBO	J2-578-SULFIDE-08	MICROSCOPY-GEO	Paraform in PBS, 4C, 5mL cryovial	
2256	7/24/2011	SOUTH LOBO	J2-578-SULFIDE-08	MICROSCOPY-GEO	100% EtOH, 4C, 5mL cryovial	
2257	7/24/2011	CENTRAL LOBO	J2-578-HFS-04	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2258	7/24/2011	CENTRAL LOBO	J2-578-HFS-05	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2259	7/24/2011	SOUTH LOBO	J2-578-HFS-06	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2260	7/24/2011	SOUTH LOBO	J2-578-HFS-07	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2261	7/24/2011	SOUTH LOBO	J2-578-HFS-09	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	High Temperature Flow coordinated with sulfide collection
2262	7/24/2011	SOUTH LOBO	J2-578-HFS-10	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	High Temperature Flow coordinated with sulfide collection

#	DATE	SAMPLE	DIVE #	TYPE	PRESERVATION	DESCRIPTION / HOW STORED
2263	7/24/2011	DUDLEY ACTIVE	J2-578-HFS-14	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2264	7/24/2011	DUDLEY ACTIVE	J2-578-HFS-15	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2265	7/24/2011	DUDLEY EXTINGT	J2-578-HFS-18	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Cold water
2266	7/24/2011	DANTE ACTIVE	J2-578-HFS-20	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow
2267	7/24/2011	DANTE ACTIVE	J2-578-HFS-23	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	High Temperature Flow coordinated with sulfide collection
2268	7/24/2011	DANTE ACTIVE	J2-578-HFS-25	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	High Temperature Flow coordinated with sulfide collection
2269						
2270	7/26/2011	CRYPTO	J2-579-SULFIDE-13	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2271	7/26/2011	CRYPTO	J2-579-SULFIDE-13	GEO-FROZEN-DNA	Frozen whole large chunk for DNA -80C	
2272						
2273	7/21/2011	GROTTO FLANGE	J2-575-HFS-01	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Low temperature reference top of flange
2274	7/21/2011	GROTTO FLANGE	J2-575-HFS-02	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Low temperature reference top of flange
2275	7/21/2011	GROTTO FLANGE	J2-575-HFS-03	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow, Shimmering water right most edge
2276	7/21/2011	GROTTO FLANGE	J2-575-HFS-04	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	Diffuse Flow, Shimmering water right most edge
2277	7/21/2011	GROTTO FLANGE	J2-575-HFS-05	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	High Temperature fluid in pool under flange
2278	7/21/2011	GROTTO FLANGE	J2-575-HFS-06	FLUID-FROZEN-ISO	Filtered 60mL in HDPE frozen at -80 for Dan	High Temperature fluid in pool under flange

5.6 Bathymetric Mapping Operations

Susan Merle

The R/V *Atlantis* recently installed a Simrad EM122 seafloor and water column mapping system. Our expedition was only the second time the marine technicians had attempted to collect data with the new system, so there were a few glitches to iron out. In particular, on the transit from Astoria to the Endeavour segment very little useful data were collected due to an artifact at nadir (beams near nadir were too deep) and noisy beams across the ping. The result was noisy data throughout the swath. The artifact at nadir produced a gouge in the data along track at nadir. Originally it was presumed that the noise was probably due to speed induced cavitation (bubbles) under the ship. The data looked better when the ship was slowed down, but still displayed the nadir artifact. After manipulating several settings it was determined that the “Dual swath mode”, a depth setting, was the largest contributor to the noisy data, especially at nadir. For the remainder of the expedition the dual swath mode option was turned off and the data improved for a while then degraded again. Cycling the power on the system resulted in better bathymetry at times.

A planned survey line from the Endeavour segment to Axial was run to the west of the Vents Program’s existing coverage. That line passed over a waypoint that was surveyed for William Wilcock (UW), who will be working with others on a project to blanket the Juan de Fuca plate and Cascadia margin with OBSs. The transit line from Axial back to Astoria was also submitted to Wilcock for the OBS project. No other mapping operations were performed during the AT18-08 expedition.

EM122 Bathymetric Survey Issues during AT18-08

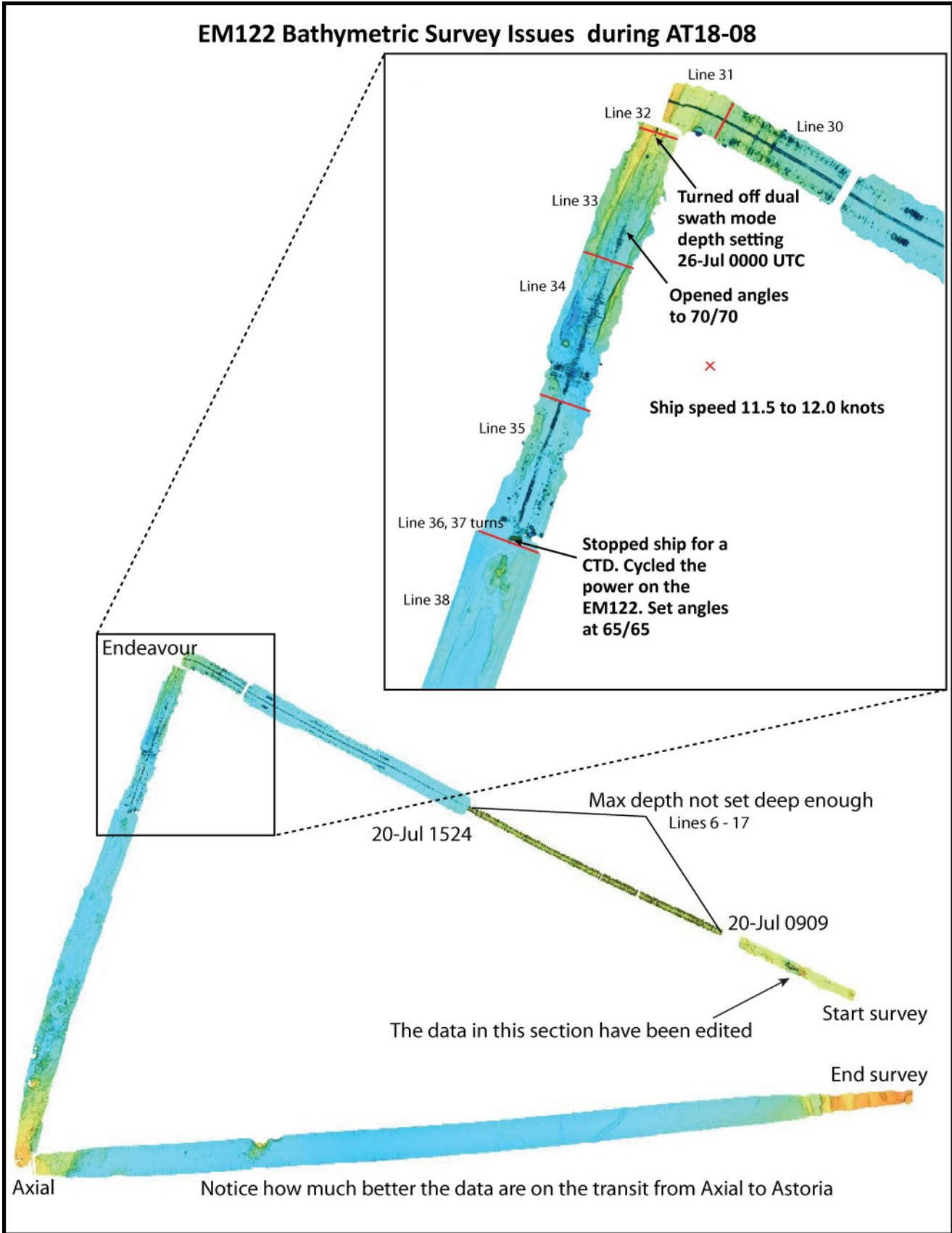


Fig 3. Bathymetric mapping operations and problems encountered with the new EM122 system on the R/V *Atlantis*.

5.7 Mooring Operations NeMO 2011

Matt Fowler

All mooring operations were conducted during daylight hours. Three moorings were lost, one RAS, and one OBH (South) were lost due to the eruption of Axial seamount. ROV Jason observed no RAS at mooring site, and OBH mooring line and floats emerging from freshly emplaced lava flow. BPR (Middle) failed to respond to interrogation and is assumed similarly lost due to eruption.

The acoustic release - an ORE 8242aa - on the BPR Center mooring failed to respond to interrogation from the ORE deckset, however did release when the command was sent. Standard BPR recovery then proceeded.

A total of two OBH, and two BPR moorings were recovered without incident. One RAS, two BPRs and three OBH moorings were deployed at Axial.

Summary of 2011 mooring recoveries

Instrument	Latitude N	Longitude W	Depth (m)	Release S/N	Recovery/Loss Confirmation
RAS	45°55.988'	129°58.936'	1520	Manual	Lost, Jason confirmation
OBH - S	45°55.089'	129°58.914'	1552	33687	Lost, Jason confirmation
BPR - M	45°56.559'	129°59.984	1543	31963	Presumed Lost, no reply
BPR - S	45°56.047'	129°59.993'	1541	31961	Recovered
BPR - C	45°57.328'	130°00.574	1550	34462	Recovered
OBH - N	45°57.635'	130°00.524	1553	33686	Recovered
OBH - E	45°56.526'	129°58.687	1534	33688	Recovered

Summary of 2011 mooring deployments

Instrument	Latitude	Longitude	Depth (m)	Release S/N
RAS	45°55.988' N	129°58.936' W	1520	Manual release
BPR-South	45°56.047' N	129°59.993' W	1541	33686
BPR-Center	45°57.328' N	130°00.574' W	1550	31961
OBH-North	45°57.635' N	130°00.524' W	1553	020290
OBH-East	45°56.479' N	129°58.630' W	1535	34683
OBH-West	45°55.919' N	130°01.030' W	1442	35161

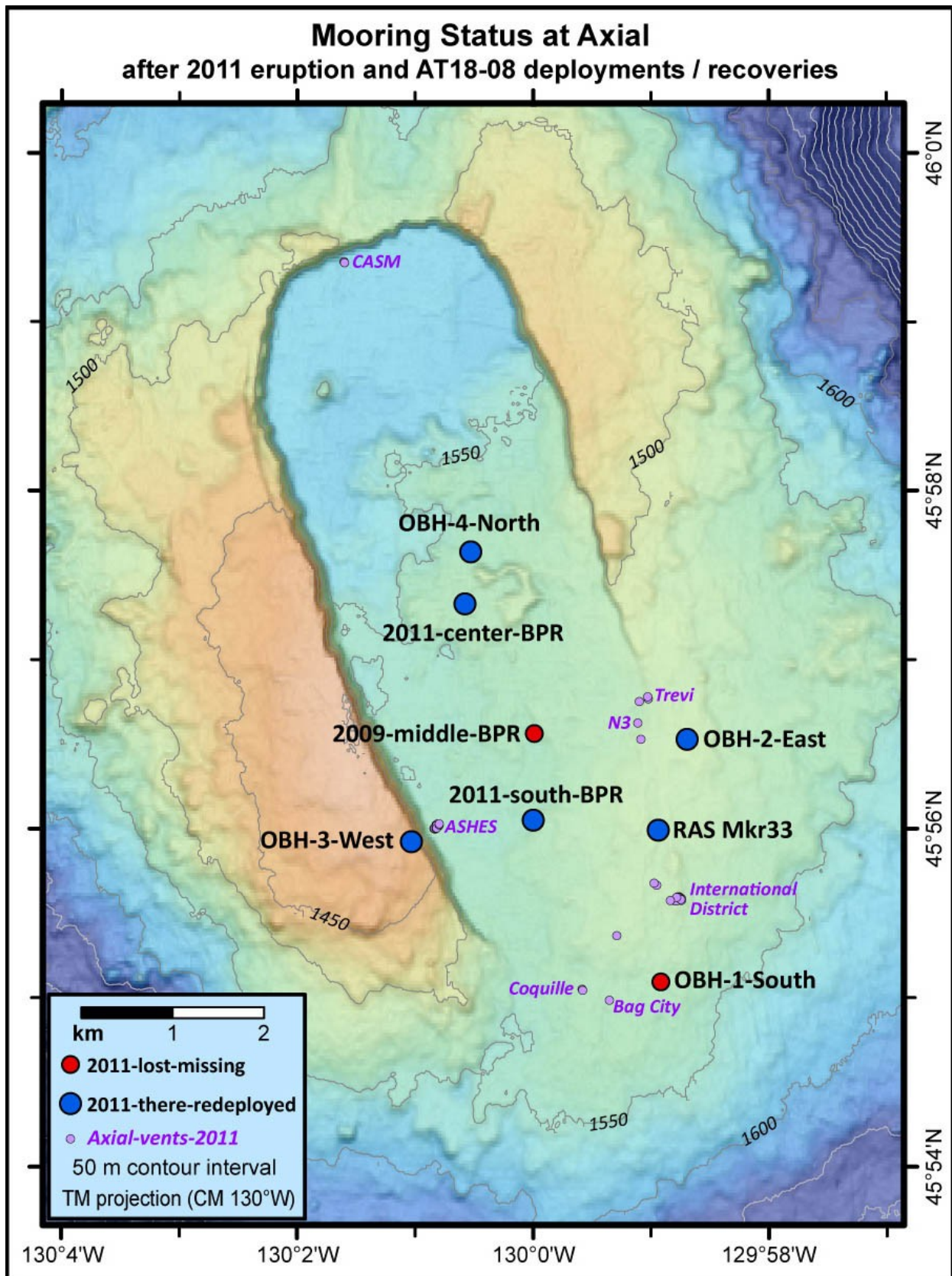


Fig 4. Status of moored instruments at Axial at the end of AT18-08 expedition.

6.0 JASON HIGH-DEFINITION (HD) STILL IMAGERY AND VIDEO

Bill Chadwick

The HD frame grabs from the HD science camera (12 Mb tiffs) were excellent again this year and we generally did not use the old Digital Still Camera (DSC). New this year was the ability to view the last HD still images in the Jason control van during each dive, which was a good improvement.

The HD video science camera was recorded to DVD continuously (in standard definition, SD), and highlights were selectively recorded to hard disk in high-definition (HD). We did not use the DVCAM tape deck this year. We recorded over 11 hours HD video highlights during this cruise. The HD filenames were renamed after each dive based on the start and end times on the hand-written HD camera log from the control van. Note that those times were not always accurate (but they have been corrected in the tables below). The HD camera provided good quality video in general.

Table 6.1 Still Video Statistics

Dive number	Number of HD frame grabs	Total size of HD images (Gb)	Number of HD video clips	Total size of HD video clips (Gb)
J2-574	114	1.4	6	35.2
J2-575	226	2.8	9	48.3
J2-576	197	2.5	6	50.7
J2-577	337	4.2	4	37.5
J2-578	342	4.3	3	24.2
J2-579	149	1.9	1	2.3
J2-580	358	4.5	11	47.1
J2-581	784	9.8	21	181.1
J2-582(aborted)	0	0.0	0	0
J2-583	671	8.4	18	79.3
Cruise Total	3335	41.8	79	505.7

Table 6.2 HD Video Log with Corrected Start/End Times (NeMO 2011 / AT18-08)

Dive #	Start time (TC)	End Time (TC)	Clip duration	Cumulative duration	HD Video Log Notes
J2-574	2011/07/21 00:43:40	2011/07/21 00:52:42	00:09:02	00:09:02	Recording of temp probe in Bambi
J2-574	2011/07/21 00:56:42	2011/07/21 01:04:25	00:07:43	00:16:45	ICL wand grab and data recovery
J2-574	2011/07/21 01:16:10	2011/07/21 01:30:23	00:14:13	00:30:58	Resistivity probe recovery
J2-574	2011/07/21 02:47:28	2011/07/21 02:50:14	00:02:46	00:33:44	Syringe Sampler
J2-574	2011/07/21 03:01:22	2011/07/21 03:02:21	00:00:59	00:34:43	Departing Bambi chimney (maneuvering)
J2-574	2011/07/21 03:08:42	2011/07/21 03:20:40	00:11:58	00:46:41	Sampling sulfide at Bambi (maneuvering to grab a rock)
				00:46:41	
J2-575	2011/07/21 17:54:24	2011/07/21 18:08:19	00:13:55	01:00:36	Checking on chains that Ray Lee deployed in 2010
J2-575	2011/07/21 19:18:39	2011/07/21 19:22:09	00:03:30	01:04:06	Surveying new temperature chains.
J2-575	2011/07/21 20:07:35	2011/07/21 20:21:15	00:13:40	01:17:46	Positioning temp array
J2-575	2011/07/22 01:33:39	2011/07/22 01:39:04	00:05:25	01:23:11	Collecting a sulfide sample from Grotto
J2-575	2011/07/22 01:42:22	2011/07/22 01:51:03	00:08:41	01:31:52	Collecting a sulfide sample from Grotto
J2-575	2011/07/22 02:57:30	2011/07/22 03:02:21	00:04:51	01:36:43	Underside of a sulfide sample from Grotto

Dive #	Start time (TC)	End Time (TC)	Clip duration	Cumulative duration	HD Video Log Notes
J2-575	2011/07/22 03:14:35	2011/07/22 03:16:30	00:01:55	01:38:38	syringe sampler of an orange microbial mat at Grotto
J2-575	2011/07/22 03:21:10	2011/07/22 03:29:48	00:08:38	01:47:16	syringe sampler attempt
J2-575	2011/07/22 03:31:31	2011/07/22 03:33:47	00:02:16	01:49:32	syringe sampler of a grey mat at Grotto
				01:49:32	
J2-576	2011/07/22 17:57:23	2011/07/22 18:13:04	00:15:41	02:05:13	Deploying Marv's 'RES' probe in Bambi
J2-576	2011/07/22 18:23:00	2011/07/22 18:29:01	00:06:01	02:11:14	Scanning the positioning of Marv's deployment of the 'RAS
J2-576	2011/07/22 18:42:39	2011/07/22 18:50:27	00:07:48	02:19:02	surveyed board walk from the bottom up. Looked at high definition of animal life.
J2-576	2011/07/22 23:28:53	2011/07/22 23:41:38	00:12:45	02:31:47	Baltic chimney
J2-576	2011/07/22 23:43:53	2011/07/22 23:51:36	00:07:43	02:39:30	Lower Baltic chimney
J2-576	2011/07/23 02:29:45	2011/07/23 02:48:07	00:18:22	02:57:52	Traversing around Fairy Castle and taking syringe sample
				02:57:52	
J2-577	2011/07/23 17:20:44	2011/07/23 17:36:43	00:15:59	03:13:51	Surveying new growth on the chimney where the Chinese deployed their instrument in 2005/06?
J2-577	2011/07/23 17:41:18	2011/07/23 17:50:35	00:09:17	03:23:08	Close up of chimney extraction.
J2-577	2011/07/23 18:21:52	2011/07/23 18:28:18	00:06:26	03:29:34	Close up of chimney extraction.
J2-577	2011/07/24 00:20:24	2011/07/24 00:38:48	00:18:24	03:47:58	Chimney karate chop
				03:47:58	
J2-578	2011/07/25 00:56:06	2011/07/25 00:58:00	00:01:54	03:49:52	Albino/hairy pycnogonid
J2-578	2011/07/25 04:43:02	2011/07/25 04:45:00	00:01:58	03:51:50	syringe sample of orange mat
J2-578	2011/07/25 05:23:38	2011/07/25 05:52:01	00:28:23	04:20:13	temperature array and syringe sample
				04:20:13	
J2-579	2011/07/25 17:06:47	2011/07/25 17:09:50	00:03:03	04:23:16	HD of the Gc probe in vent opening
				04:23:16	
J2-580	2011/07/26 20:57:57	2011/07/26 21:00:33	00:02:36	04:25:52	HD observation of Hell chimney
J2-580	2011/07/26 21:26:05	2011/07/26 21:27:16	00:01:11	04:27:03	HD of new bee hives on top of hulk
J2-580	2011/07/26 21:36:24	2011/07/26 21:38:37	00:02:13	04:29:16	Ropos or Phoenix, unsure which one
J2-580	2011/07/26 23:27:59	2011/07/26 23:34:13	00:06:14	04:35:30	Large syringe sampling failure
J2-580	2011/07/26 23:38:35	2011/07/26 23:43:06	00:04:31	04:40:01	Small yellow syringe sampling attempt
J2-580	2011/07/26 23:54:50	2011/07/27 00:01:24	00:06:34	04:46:35	Inferno Vent
J2-580	2011/07/27 03:42:39	2011/07/27 03:46:02	00:03:23	04:49:58	Video of Virgin vent
J2-580	2011/07/27 04:35:43	2011/07/27 04:38:14	00:02:31	04:52:29	Video of Inferno formation
J2-580	2011/07/27 05:38:22	2011/07/27 05:46:52	00:08:30	05:00:59	Video of the area at Inferno we just sampled from as a potential location for a cable observatory.
J2-580	2011/07/27 05:50:01	2011/07/27 06:10:06	00:20:05	05:21:04	Video of Mushroom
J2-580	2011/07/27 08:31:03	2011/07/27 08:35:29	00:04:26	05:25:30	Hell from above
				05:25:30	
J2-581	2011/07/27 21:02:49	2011/07/27 21:26:09	00:23:20	05:48:50	HD of Chinese fluid sampler
J2-581	2011/07/28 09:16:40	2011/07/28 09:17:33	00:00:53	05:49:43	HD of Bioluminescent jelly
J2-581	2011/07/28 10:34:53	2011/07/28 10:39:55	00:05:02	05:54:45	Sample from axial to determine age of lava?
J2-581	2011/07/28 11:02:11	2011/07/28 11:07:56	00:05:45	06:00:30	Pillow lava with older pillars
J2-581	2011/07/28 11:12:44	2011/07/28 11:58:53	00:46:09	06:46:39	Hunting for RAS
J2-581	2011/07/28 14:59:34	2011/07/28 15:03:42	00:04:08	06:50:47	Buried OBH
J2-581	2011/07/29 04:36:56	2011/07/29 04:45:51	00:08:55	06:59:42	pillows at bag city
J2-581	2011/07/29 05:01:42	2011/07/29 05:19:11	00:17:29	07:17:11	vixen vent
J2-581	2011/07/29 05:39:32	2011/07/29 05:40:45	00:01:13	07:18:24	placement of hobo at vixen
J2-581	2011/07/29 05:47:21	2011/07/29 06:29:31	00:42:10	08:00:34	sampling and hobo recovery and deployment at Casper
J2-581	2011/07/29 14:41:19	2011/07/29 14:45:31	00:04:12	08:04:46	HOBO into Trevi

Dive #	Start time (TC)	End Time (TC)	Clip duration	Cumulative duration	HD Video Log Notes
J2-581	2011/07/29 15:46:51	2011/07/29 15:48:55	00:02:04	08:06:50	new lava flow SW of Spanish Steps
J2-581	2011/07/29 15:59:54	2011/07/29 16:03:54	00:04:00	08:10:50	snowglobe vent
J2-581	2011/07/29 18:18:59	2011/07/29 18:23:09	00:04:10	08:15:00	red worm crawling on the seafloor at marker N3
J2-581	2011/07/29 19:36:52	2011/07/29 19:41:03	00:04:11	08:19:11	Marker N3 mats
J2-581	2011/07/29 19:52:20	2011/07/29 19:53:33	00:01:13	08:20:24	In the collapse
J2-581	2011/07/29 21:32:39	2011/07/29 21:35:30	00:02:51	08:23:15	Marker 33 HD
J2-581	2011/07/29 21:54:43	2011/07/29 21:57:44	00:03:01	08:26:16	HD of MKR 33
J2-581	2011/07/29 21:58:12	2011/07/29 22:04:51	00:06:39	08:32:55	HD of PC on tube worm recolonization
J2-581	2011/07/29 22:12:33	2011/07/29 22:43:12	00:30:39	09:03:34	Dave's sampler + browsing around
J2-581	2011/07/29 22:51:56	2011/07/29 23:12:07	00:20:11	09:23:45	Dave's fluid sampler
				09:23:45	
J2-583	2011/07/31 07:49:09	2011/07/31 07:54:33	00:05:24	09:29:09	Collapse features at Contact
J2-583	2011/07/31 07:58:28	2011/07/31 08:04:59	00:06:31	09:35:40	Collapse features at Contact
J2-583	2011/07/31 08:06:48	2011/07/31 08:21:14	00:14:26	09:50:06	Pillows and collapse features
J2-583	2011/07/31 08:34:20	2011/07/31 08:37:56	00:03:36	09:53:42	Following 2011 contact
J2-583	2011/07/31 09:14:42	2011/07/31 09:16:41	00:01:59	09:55:41	Pillows
J2-583	2011/07/31 09:16:48	2011/07/31 09:27:50	00:11:02	10:06:43	Pillows
J2-583	2011/07/31 09:30:07	2011/07/31 09:37:13	00:07:06	10:13:49	Bacterial mat, syringe sample
J2-583	2011/07/31 09:41:07	2011/07/31 09:45:57	00:04:50	10:18:39	Bacterial mat, syringe sample
J2-583	2011/07/31 09:56:02	2011/07/31 09:57:38	00:01:36	10:20:15	Bacterial mat, syringe sample
J2-583	2011/07/31 09:58:42	2011/07/31 10:07:10	00:08:28	10:28:43	Bacterial mat, syringe sample
J2-583	2011/07/31 10:12:58	2011/07/31 10:18:11	00:05:13	10:33:56	Boca vent
J2-583	2011/07/31 10:19:27	2011/07/31 10:20:49	00:01:22	10:35:18	Boca vent floc
J2-583	2011/07/31 10:37:44	2011/07/31 10:53:23	00:15:39	10:50:57	Boca vent
J2-583	2011/07/31 15:50:25	2011/07/31 15:56:31	00:06:06	10:57:03	rising up el Guapo
J2-583	2011/07/31 16:03:23	2011/07/31 16:06:27	00:03:04	11:00:07	Jason temp probe of el Guapo
J2-583	2011/07/31 16:33:28	2011/07/31 16:37:00	00:03:32	11:03:39	major sampler at el Guapo
J2-583	2011/07/31 16:47:44	2011/07/31 16:49:19	00:01:35	11:05:14	Hermosa vent
J2-583	2011/07/31 18:37:28	2011/07/31 18:40:19	00:02:51	11:08:05	syringe sample

7.0 JASON DIVES

7.1 Dive Summaries

J2-574 - High Rise Field. Endeavour Segment, JdFR.

Bottom time: 7/21 0014 – 0551 UTC (5.6 hours).

MAIN GOALS: Recover Marv Lilley's Resistivity Probe at Bambi Vent.

TASKS ACCOMPLISHED

- 1) Recovered data from resistivity probe.
 - 3) Recovered resistivity probe.
 - 4) Collected fluid samples with beast and gas-tights.
 - 5) Collected sulfide samples.
 - 6) Used syringe sampler to collect bacterial mat at Godzilla.
- 17 SAMPLES: 1 Mat, 9 HFS fluid, 5 gas, 2 geo (sulfides).
Sample locations: Bambi, Godzilla.

J2-575 - Main Endeavour Field. Endeavour Segment, JdFR.

Bottom time: 7/21 1623 – 7/22 0547 UTC (13.4 hours).

MAIN GOALS: Ray Lee temperature surveys, deploy cameras near Grotto Vent.

TASKS ACCOMPLISHED

- 1) Deployed two time-lapse cameras in diffuse flow near Grotto.
 - 2) Frame-grab survey of 4 old temperature chains near RAS @ Grotto.
 - 3) Deployed 4 new temperature chains, frame-grab survey.
 - 4) Recovered 4 old temperature chains, frame-grab survey.
 - 5) Fluid sampling near RAS @ Grotto
 - 6) Temperature array survey of selected areas at Grotto (several hours).
 - 7) Collected sulfide samples at Grotto for Kiana Frank.
 - 8) Used syringe sampler to collect microbial mat and sediments at Grotto.
- 14 SAMPLES: 1 mat, 1 sediment, 10 HFS fluid, 1 gas, 1 sulfide.
Sample locations: Dudley, Grotto.

J2-576 - High Rise Field. Endeavour Segment, JdFR.

Bottom time: 7/22 1647 – 7/23 0434 UTC (11.8 hours).

MAIN GOALS: Deploy Marv Lilley's Resistivity Probe at Bambi Vent. Test gas-chromatograph.

TASKS ACCOMPLISHED

- 1) Deployed resistivity probe.
 - 2) Tested gas-chromatograph (GC) in diffuse flow.
 - 3) Collected fluid and sulfide samples.
 - 4) Used syringe sampler(s) to collect bacterial mat at Knight and Vantor, sediments at Fairy Castle.
- 31 SAMPLES: 2 mat, 1 sediment, 19 HFS fluid, 6 gas, 3 sulfides.
Sample locations: Baltic, Bambi, Boardwalk, Fairy Castle, Knight, Park Place, Vantor.

J2-577 - Main Endeavour Field. Endeavour Segment, JdFR.

Bottom time: 7/23 1636 – 7/24 0521 UTC (12.75 hours).

MAIN GOALS: Recover instrument and sulfide near S&M Vent, test Chinese fluid sampler.

TASKS ACCOMPLISHED

- 1) Deployed elevator.
 - 2) Attempted to excavate sulfide mound but it was solid and not budging.
 - 3) Collected black smoker fluid sample at Vent Cap Mound with Chinese fluid sampler.
 - 4) Collected gastight sample at Vent Cap Mound, plus chimney sulfide sample.
 - 5) Collected sulfide samples at S&M, Needle, Puffer, Sully and MilliQ.
 - 6) Released and recovered elevator loaded with Chinese fluid sampler, gastights, and sulfide samples.
- 13 SAMPLES: 1 with Chinese fluid sampler, 1 gas, 9 sulfides, 2 sediment.
Sample locations: MilliQ, Needle, Puffer, S&M, Sully, Vent Cap Mound.

J2-578 - Main Endeavour Field. Endeavour Segment, JdFR.

Bottom time: 7/24 1628 – 7/25 0556 UTC (13.5 hours).

MAIN GOALS: Ray Lee temperature surveys, recover cameras near Grotto Vent

TASKS ACCOMPLISHED

- 1) Recovered two time-lapse cameras near RAS @ Grotto.
 - 2) Recovered 2 temperature sticks near RAS @ Grotto.
 - 3) Temperature array survey of selected areas (Dudley and Lobo).
 - 4) Selected fluid sampling.
 - 5) Selected sulfide sampling for Kiana Frank.
 - 6) Used syringe samplers to collect microbial mat.
- 27 SAMPLES: 2 mat, 14 HFS fluid, 3 gas, 6 sulfides, 2 sediment.
Sample locations: Dante, Dudley, Lobo.

J2-579 – Endeavour Main Endeavour Field. Endeavour Segment, JdFR.

Bottom time: 7/25 1614 – 7/25 2212 UTC (6.97 hours).

MAIN GOALS: Test Marv Lilley's gas-chromatograph. Fluid, sulfide and gas sampling.

TASKS ACCOMPLISHED

- 1) Tested the gas-chromatograph.
 - 2) Sampled at Hulk vent.
 - 3) Sampled at Crypto vent.
- 15 SAMPLES: 8 HFS fluid, 4 gas, 3 sulfides.
Sample locations: Crypto, Hulk.

J2-580 - Ashes Vent Field. Axial Seamount, JdFR

Bottom time: 7/26 2034 – 7/27 1002 UTC (13.5 hours).

MAIN GOALS: Fluid sampling in ASHES vent field.

TASKS ACCOMPLISHED

- 1) Diffuse fluid sampling between Hell and Phoenix/ROPOS vents (Anemone vent site).
- 2) RECOVERED: MTRs at Gollum and Styx; MISO at Virgin. DEPLOYED: MTRs at Fuzzy tubeworm bush, Marshmallow and Anemone; MISO at Virgin.
- 3) Collected large syringe sample of mat at diffuse vent (base of Phoenix/ROPOS).
- 4) Diffuse fluid sampling within 20m radius north of Inferno and WNW of Mushroom (Fuzzy Tubeworm Bush).

- 5) Fluid sampling at Marshmallow, Virgin, Mushroom, Inferno and Hell.
 - 6) Small syringe samples of sediment/mat north of Inferno in orange sediments.
 - 7) Drove east of Ashes at end of dive and encountered lava flows from the 2011 eruption (in retrospect).
- 35 SAMPLES: 3 mat, 23 HFS fluid, 1 Major fluid, 6 gas, 2 sulfides.

Sample locations: Anemone, Fuzzy Tubeworm Bush, Hell, Inferno, Marshmallow, Mushroom, ROPOS/Phoenix, Virgin.

J2-581 – Pressure measurement transects, 2011 eruption exploration. Axial Seamount, JdFR.

Bottom and transit time: 7/27 2053 – 7/30 1848 UTC (69.92 hours).

MAIN GOALS: Pressure measurements at seafloor benchmark array. After the eruption was discovered, the task expanded to surveying parts of the 2011 lava flow.

TASKS ACCOMPLISHED

- 1) Used Chinese fluid sampler at Virgin vent in ASHES Vent Field.
- 2) Deployed autonomous pressure sensor next to AX106 benchmark.
- 3) Pressure measurements at benchmarks along ~12 km transect. (Found 2 were buried under 2011 lava)
- 4) Examined OBH-South mooring. Found it was stuck in the 2011 lava.
- 5) RECOVERED: MISOS at Vixen, Casper and Trevi. DEPLOYED: MTRs at Marker 33 vent and Marker N3 vent; MISOs at Trevi, Casper and Vixen.
- 6) Fluid sampling at Bag City, Coquille, Magnesia area and new 2011 snowblower vents (Snow Globe).
- 7) Hoped to collect blue mat sample from Marker N3 vent – but there was no blue mat when we arrived. Most likely, covered over by 2011 lava.
- 8) Collected 2011 lava samples.
- 9) Recovered autonomous pressure sensor next to AX106 benchmark.

29 SAMPLES: 1 mat, 1 with Chinese fluid sampler, 23 HFS fluid, 3 gas, 3 geo 2011 lava.

Sample locations: Bag City, Casper, 2011 lava contacts near N3 and Mkr33 sites, Marker 33 Vent site, Marker N3 Vent site, Snow Globe, Spanish Steps, Trevi, Vixen.

J2-582 – Aborted near surface

J2-583 - Marker 33 site, 2011 eruption exploration, sampling at the International District. Axial Seamount, JdFR.

Bottom time: 7/31 0532 –1955 UTC (14.4 hours)/

MAIN GOALS: Fluid sampling on and near new lava flow.

TASKS ACCOMPLISHED

- 1) Installed RAS mooring at Marker 33 vent site.
- 2) Navigated to the International District on the seafloor in a zigzag pattern - to get an idea of the extent of 2011 flow.
- 3) Opportunistic sampling of mat/fluids/sediment/new lava.
- 4) Deployed and recovered MTRs and MISOS. RECOVERED: MTR at Hermosa, MISOS at Diva and Castle. DEPLOYED: RAS at Marker 33, MTR at Boca, Hobo at Diva, MISO at Castle.
- 5) Fluid sampling in International District.

32 SAMPLES: 4 mat, 20 HFS fluid, 1 Major fluid, 6 gas, 1 geo 2011 lava (Boca).

Sample locations: 9m Chimney, Boca, Castle, Cotton Ball, Diva, El Guapo, Escargot, Marker 33 Vent site.

7.2 Dive Maps

Endeavour bathymetry underlay is a geotif (an image, not a grid) provided by UW, created with MBARI AUV data. Contours overlaid on the image are EM300 bathymetry data, which is much coarser resolution than the AUV data. Axial dive map bathymetry is a grid of MBARI AUV data collected before the 2011 eruption. The latitude/longitude positions of most samples were provided by the Jason navigators, based on observations of the incoming fixes while sitting in one place. Sample positions vary slightly from the final Jason dive track navigation (renav), which merges the USBL and Doppler positions. *For more info contact susan.merle@noaa.gov.*

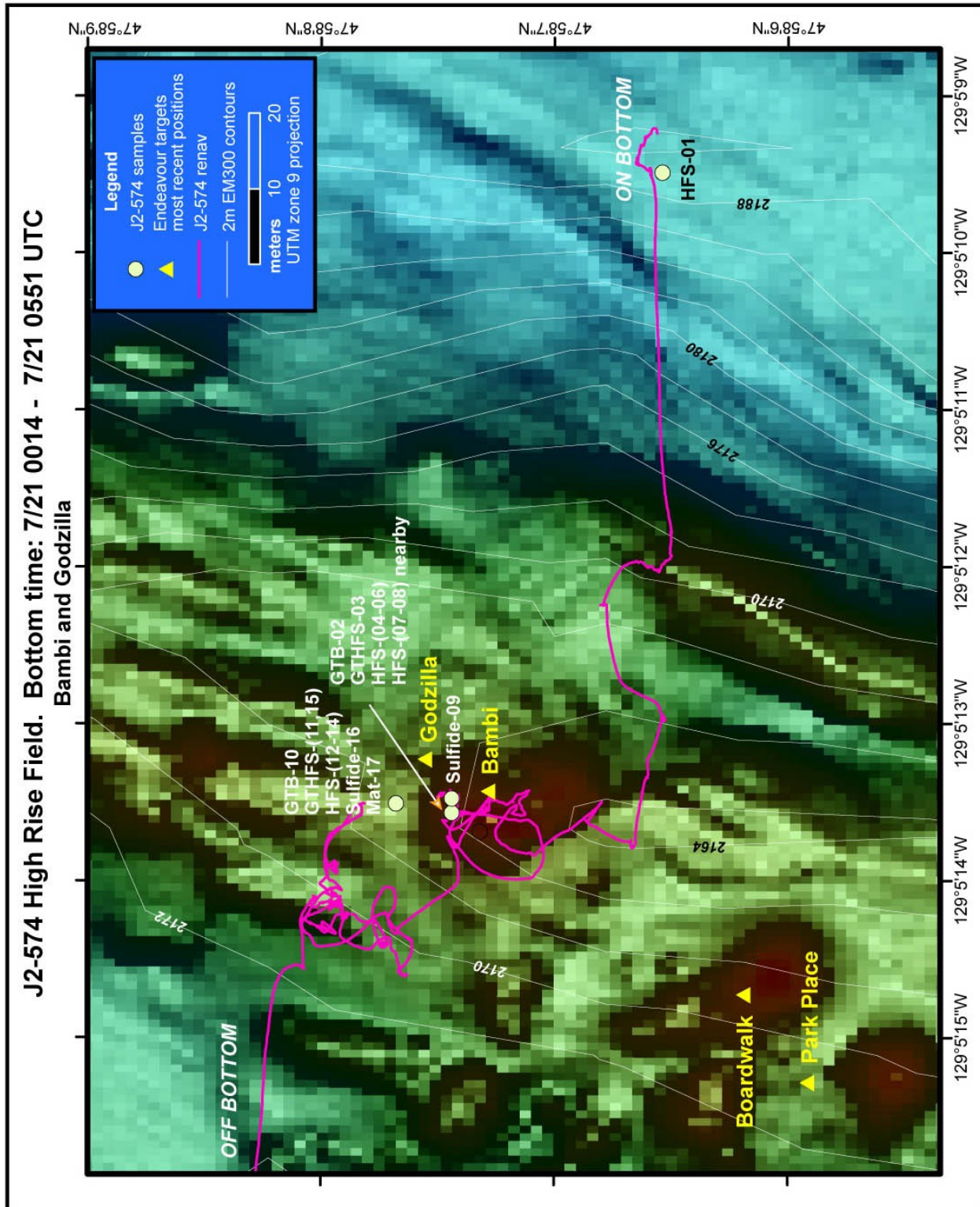


Fig 5. J2-574 dive map. Jason nav and samples at High Rise Field, Endeavour segment JdFR.

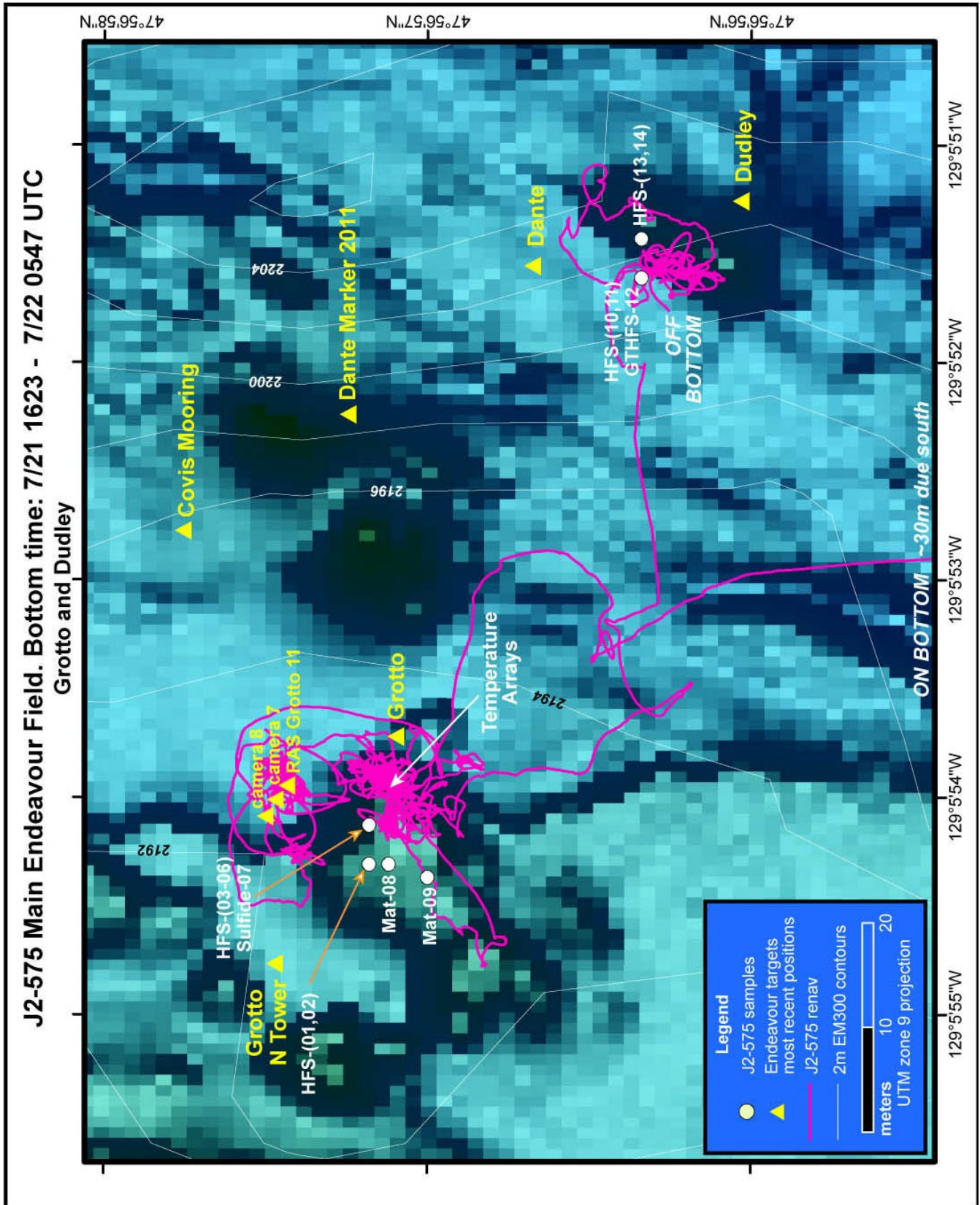


Fig 6. J2-575 dive map. Jason nav and samples at Main Endeavour Field, Endeavour segment JdFR.

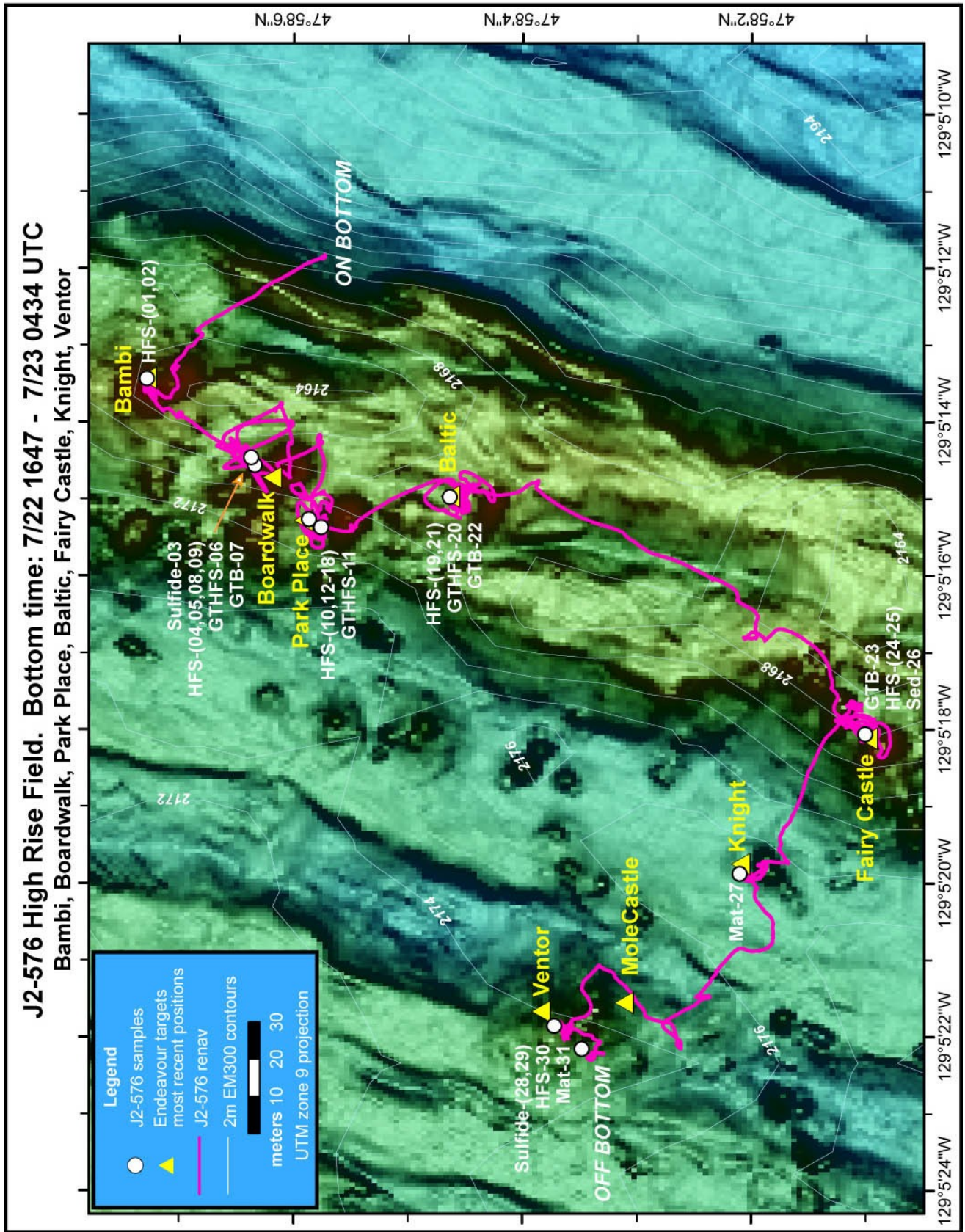


Fig 7. J2-576 dive map. Jason nav and samples at High Rise Field, Endeavour segment JdFR.

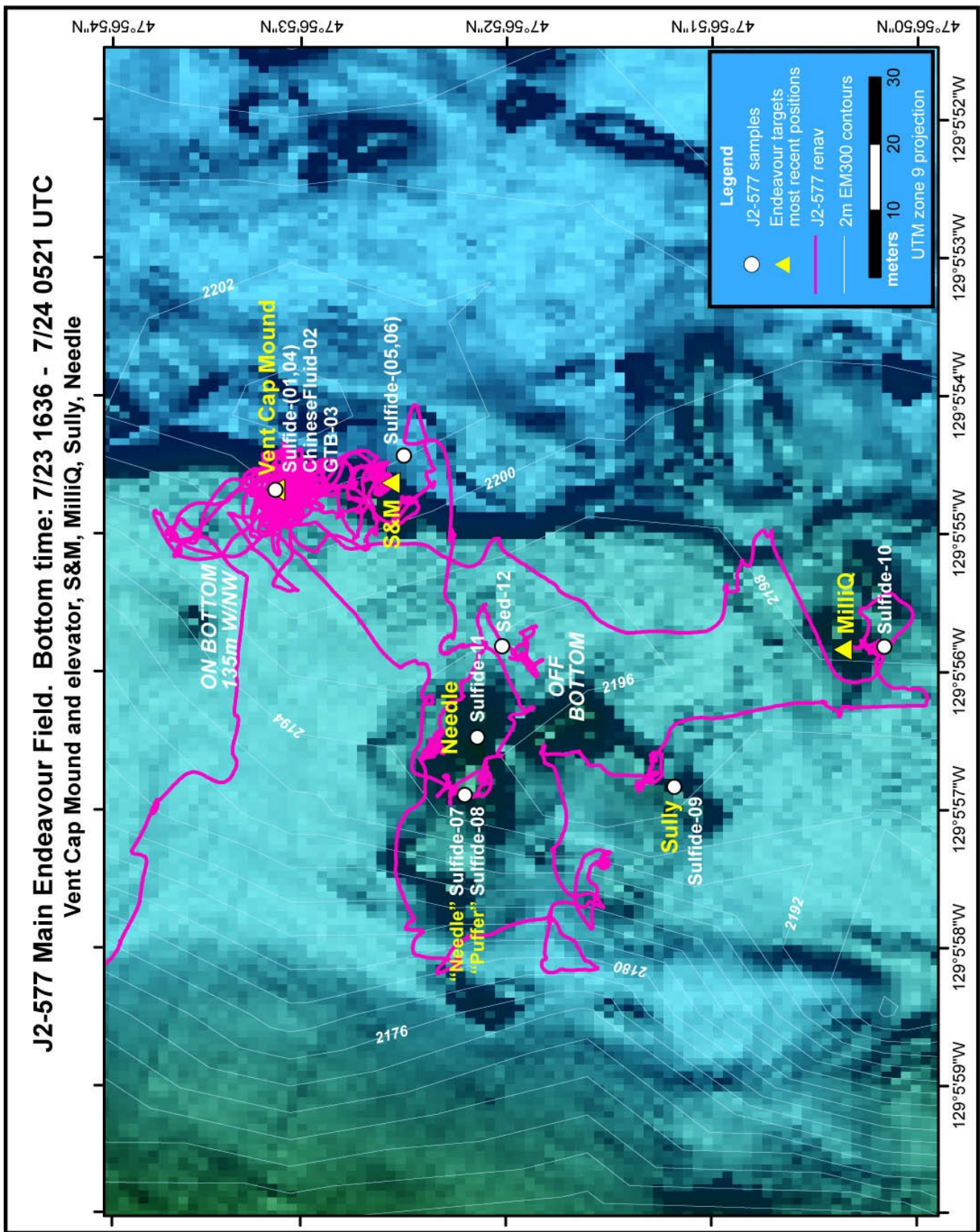


Fig 8. J2-577 dive map. Jason nav and samples at Main Endeavour Field, Endeavour segment JdFR.

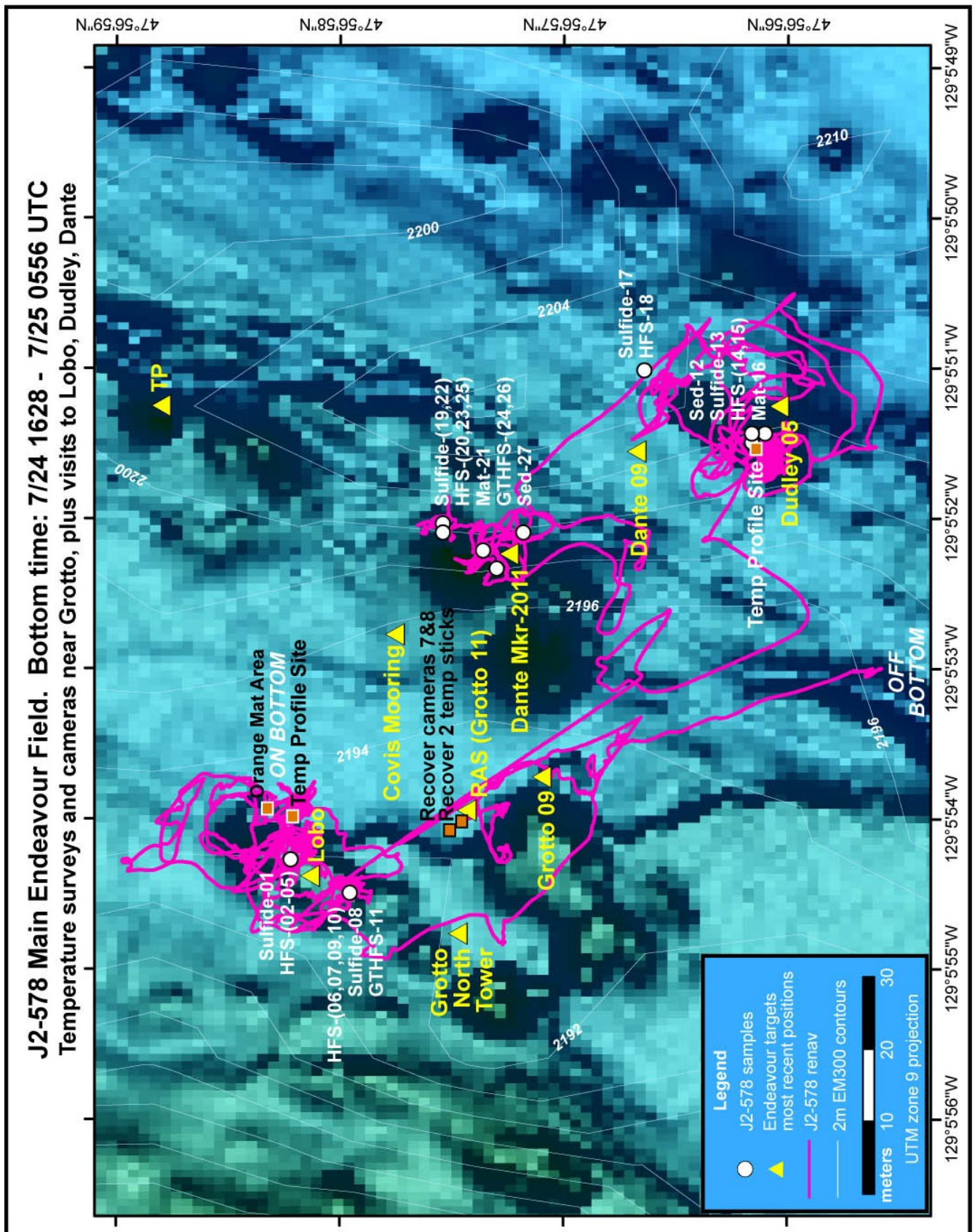


Fig 9. J2-578 dive map. Jason nav and samples at Main Endeavour Field, Endeavour segment JdFR.

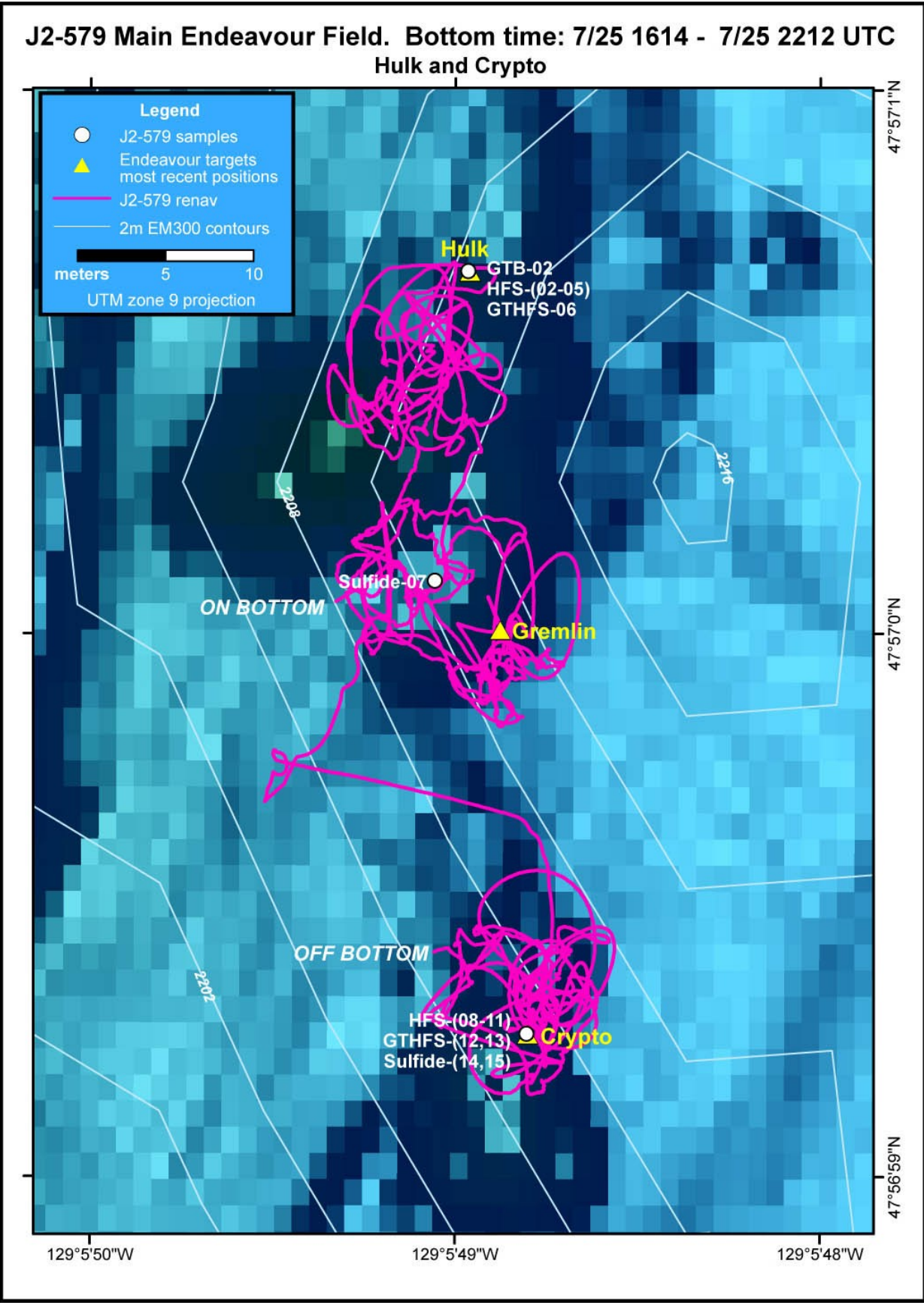


Fig 10. J2-579 dive map. Jason nav and samples at Main Endeavour Field, Endeavour segment JdFR.

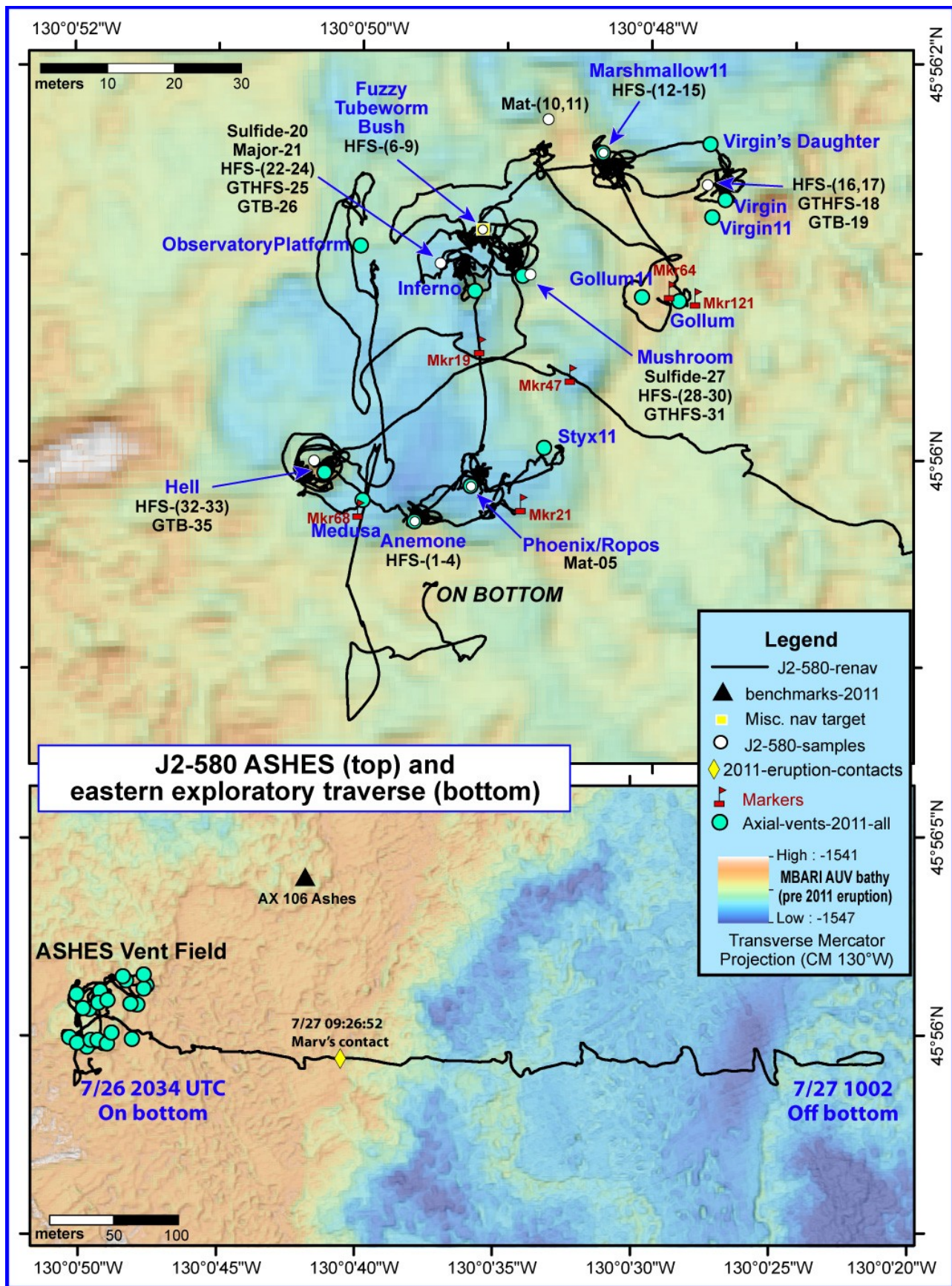


Fig 11. J2-580 dive map. Jason nav and samples at ASHES Vent Field and trek to the east, Axial volcano JdFR.

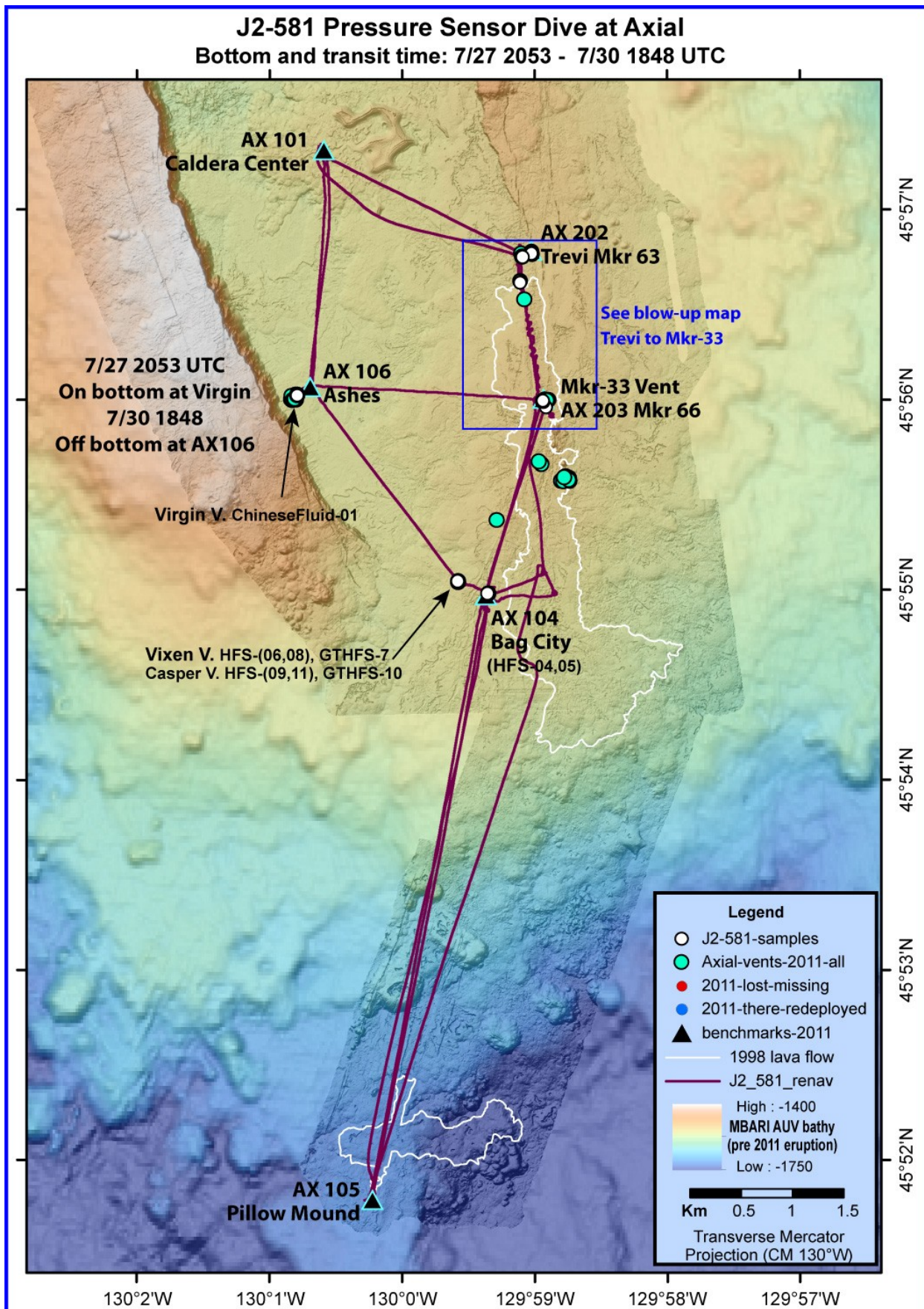


Fig 12. J2-581 dive map. Entire pressure sensor dive at Axial. Jason nav shows both bottom time and transit in the water column.

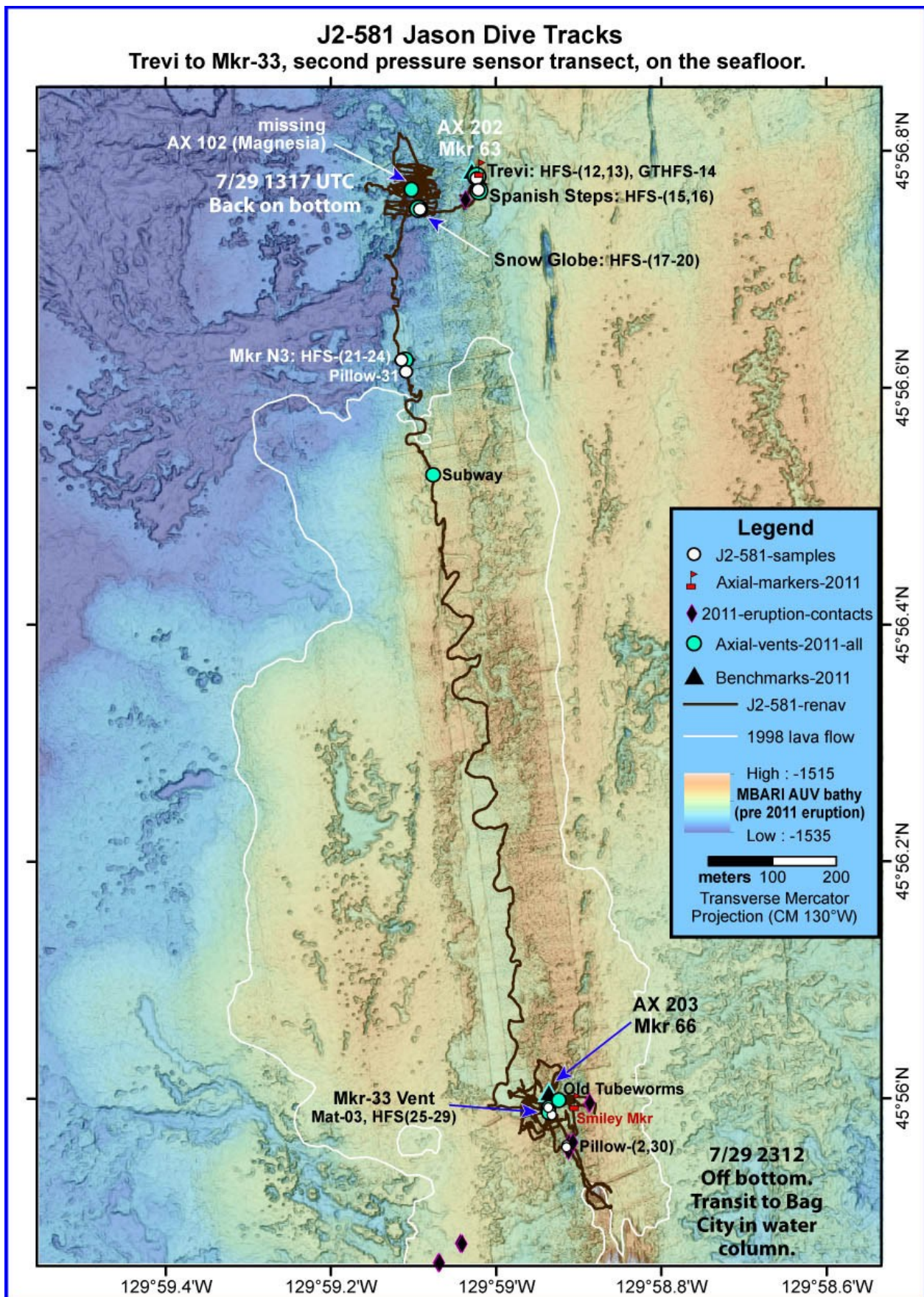


Fig 13. J2-581 Jason nav and samples, surveying the 2011 lava from Magnesia area to S/SE of Marker 33 vent site.

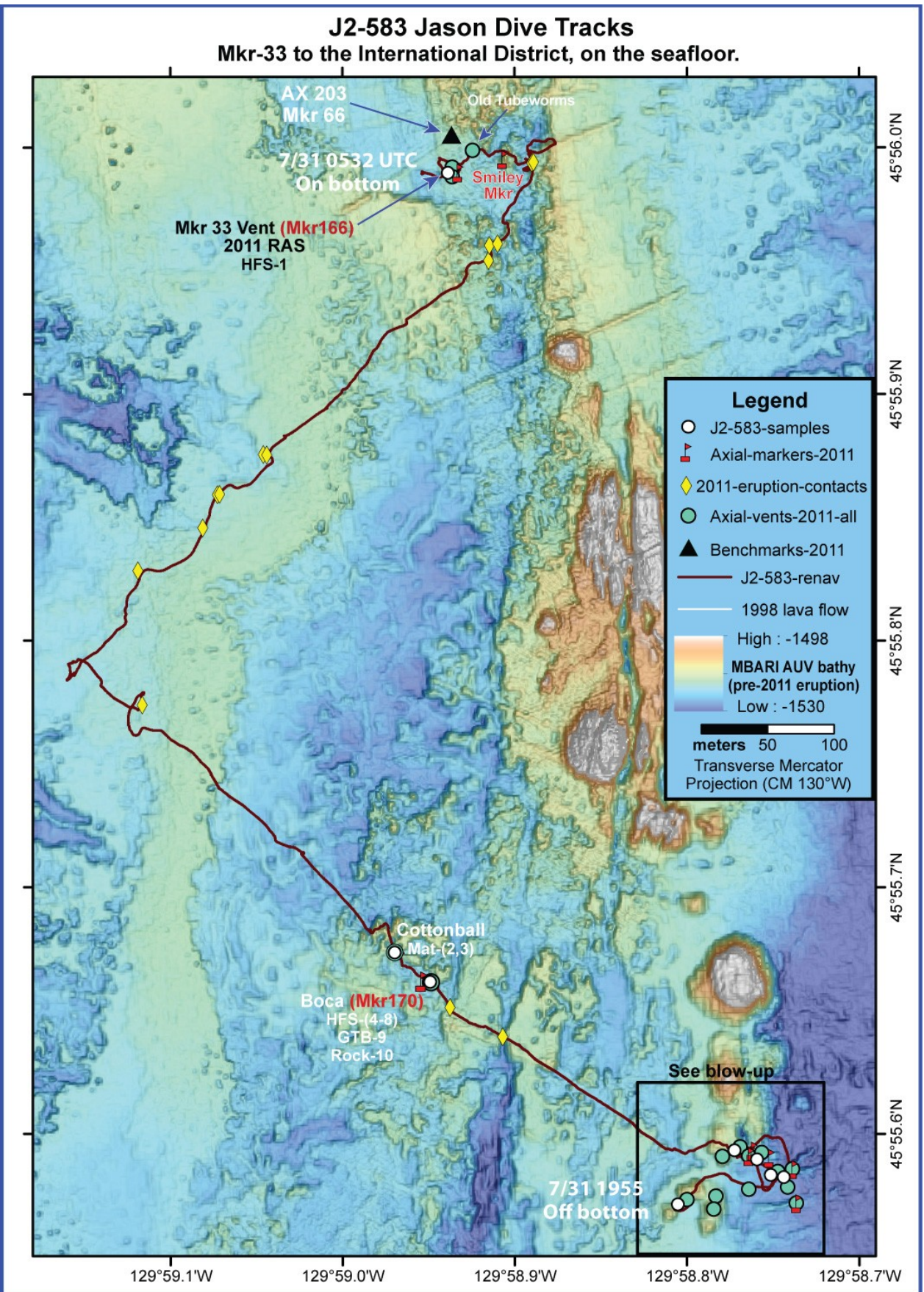
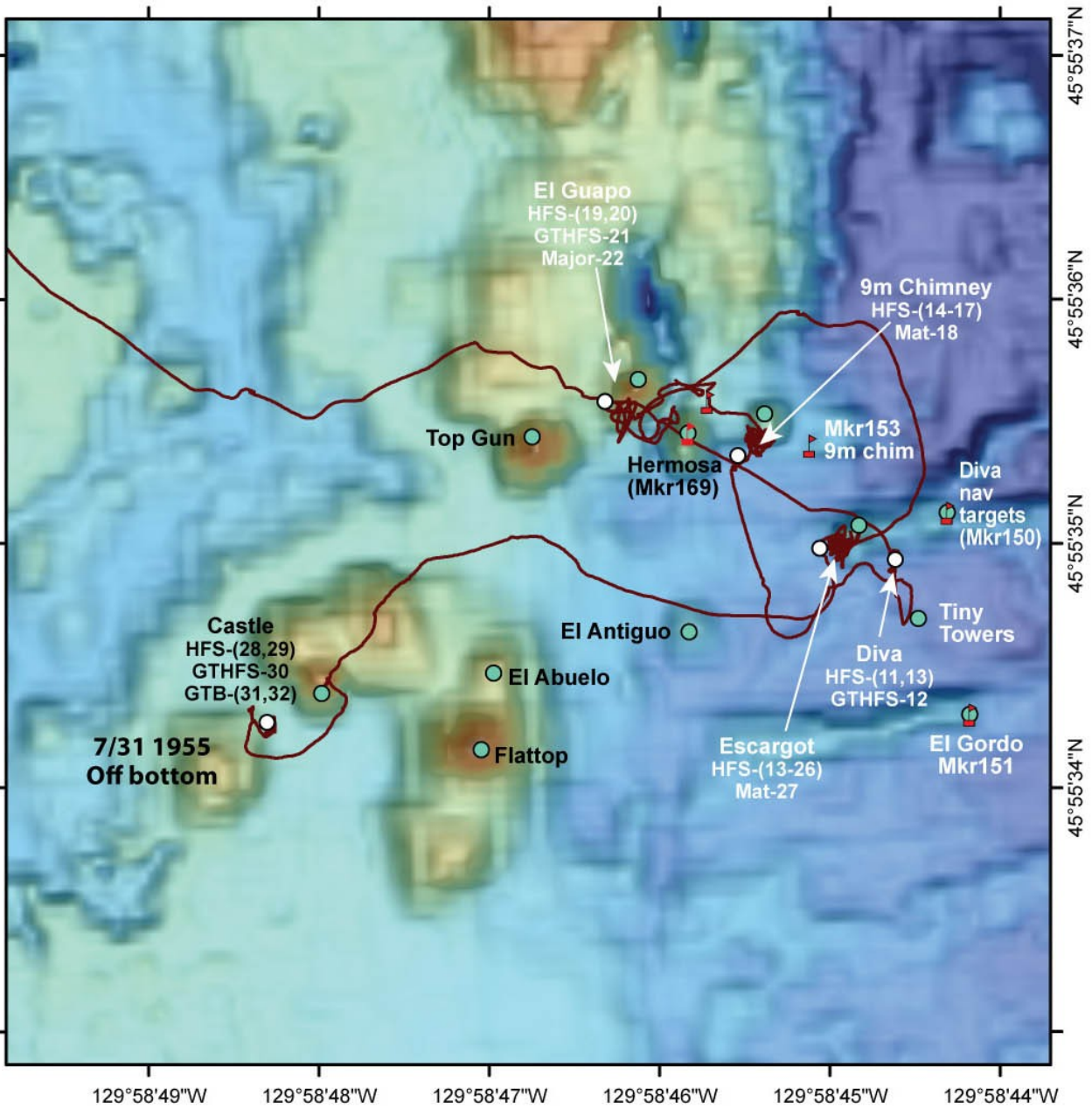


Fig 14. J2-583 Dive Map. Jason nav and samples, surveying the 2011 lava from Marker 33 vent site to the International District.

J2-583 Jason Dive Tracks
End of dive at International District, on the seafloor.



Legend

- J2-583-samples
- J2-583-renav
- ▲ Benchmarks-2011
- ▬ Markers
- Axial-vents-2011-all

High : -1510
 MBARI AUV bathy (pre-2011 eruption)
 Low : -1525

meters 10 20 30

Transverse Mercator Projection (CM 130°W)

Fig 15. J2-583 Jason nav and samples at the International District.

7.3 Jason Samples

The latitude/longitude positions of most of these samples and were provided by the Jason navigators, based on observations of the incoming fixes while sitting in one place (usually the “cursor” position in the middle of the scatter of fixes). These positions will vary slightly from the final Jason dive track navigation (renav), which merges the USBL and Doppler positions. All date and time stamps are UTC, 7 hours ahead of local Pacific time.

Table 7.3.1 J2-574 Jason Samples (High Rise Field, Endeavour Segment, JdFR)

Sample	Type	Site	Site Description	J2-574 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-574-HFS-01	fluid	High Rise field	Background	HFS unfiltered piston #8. Hdg 270. Tmax=1.8. Tavg=1.8. T2=1.8. Vol=600ml. Z=2187.	7/21	00	24	47	58.1090	-129	5.1580	Butterfield	61
J2-574-GTB-02	gas	Bambi	Resistivity probe (ResProbe) hole. Black smoker area.	GTB #7 black-orange. Jason depth 2142m. JasonT=339.6C. Z=2142.	7/21	01	46	47	58.1220	-129	5.2280	Lilley / Evans	185
J2-574-GTHFS-03	gas	Bambi	Resistivity probe (ResProbe) hole. Black smoker area.	GTHFS port gas tight #10 purple. Temp 339C just before firing. Z=2142.	7/21	02	08	47	58.1240	-129	5.2260	Lilley / Evans	222
J2-572-HFS-04	fluid	Bambi	Resistivity probe (ResProbe) hole. Black smoker area.	HFS filtered piston #1 . Tmax=340.7. Tavg =340.3. T2= 105. Vol=600mL. Z=2142m.	7/21	02	10	47	58.1240	-129	5.2260	Butterfield	225
J2-574-HFS-05	fluid	Bambi	Resistivity probe (ResProbe) hole. Black smoker area.	HFS unfiltered piston #2. Tmax=341.0. Tavg=340.7. T2=110C. Vol=600mL. Z=2142m.	7/21	02	15	47	58.1240	-129	5.2260	Butterfield	235
J2-574-HFS-06	fluid	Bambi	Resistivity probe (ResProbe) hole. Black smoker area.	HFS filtered bag #23. Tmax=341.8C. Tavg=341.4C. T2=110C. Vol=550mL. Z=2142m.	7/21	02	20	47	58.1240	-129	5.2260	Butterfield	242
J2-574-HFS-07	fluid	Bambi	Diffuse flow area near ResProbe vent hole.	HFS filtered bag #17. Tmax=25.1 C. Tavg=23.3 C. T2=10.5 C. Vol=408mL. Z=2142m.	7/21	02	33	47	58.1093	-129	5.2142	Butterfield	260
J2-574-HFS-08	fluid	Bambi	Diffuse flow area near ResProbe vent hole.	HFS unfiltered bag #18. Tmax=24.8. Tavg=23.5. T2=12. Vol=600mL. Z=2142m.	7/21	02	38	47	58.1093	-129	5.2142	Butterfield	267
J2-574-Sulfide-09	geo	Bambi	6-8 inches down from top of Bambi.	Scoop bag of sulfide (for endolithic microbes). Z=2141m.	7/21	03	34	47	58.1240	-129	5.2245	Frank	371
J2-574-GTB-10	gas	Godzilla	Top of chimney pillar.	GTB #18 black. Jason Tmax=351.6C. Z=2138m.	7/21	04	37	47	58.1280	-129	5.2250	Lilley / Evans	464
J2-574-GTHFS-11	gas	Godzilla	Top of chimney pillar.	HFS orange #16 center gastight. Tmax=350.1C. Z=2138m.	7/21	05	03	47	58.1280	-129	5.2250	Lilley / Evans	505
J2-574-HFS-12	fluid	Godzilla	Top of chimney pillar.	HFS filtered piston #3. Tmax=350.4. Tavg=350.1C. T2=98C. Vol=600mL. Z=2138m.	7/21	05	06	47	58.1280	-129	5.2250	Butterfield	508
J2-574-HFS-13	fluid	Godzilla	Top of chimney pillar.	HFS unfiltered piston #4. Tmax=350.9. Tavg=350.7. T2=101C. vol=600mL. Z=2138m.	7/21	05	10	47	58.1280	-129	5.2250	Butterfield	514
J2-574-HFS-14	fluid	Godzilla	Top of chimney pillar.	HFS filtered bag #19. Tmax=351. Tavg=350.9. T2=98.7C. Vol=600mL. Z=2138m.	7/21	05	14	47	58.1280	-129	5.2250	Butterfield	521

Sample	Type	Site	Site Description	J2-574 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-574-GTHFS-15	gas	Godzilla	Top of chimney pillar.	GTHFS stbd gastight red #9. Tmax=351. Z=2138m.	7/21	05	19	47	58.1280	-129	5.2250	Lilley / Evans	528
J2-574-Sulfide-16	geo	Godzilla	Near top of chimney pillar.	Grab of chimney piece (for endolithic microbes). Has some FeO and white patches on it. Z=2138m.	7/21	05	29	47	58.1280	-129	5.2250	Frank	546
J2-574-Mat-17	bio	Godzilla	Near top of chimney pillar.	Syringe of black-grey material on rocks. For microbial studies. Z=2138m.	7/21	05	47	47	58.1280	-129	5.2250	Mitchell	574

Table 7.3.2 J2-575 Jason Samples (Main Endeavour Field, Endeavour Segment, JdFR)

Sample	Type	Site	Site Description	J2-575 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-575-HFS-01	fluid	Grotto	Low temp reference. Flange.	HFS unfiltered bag #24. Tmax=4.2 Tavg=4.1 T2=3.0 Vol=500ml. Z=2189m	7/21	23	51	47	56.9530	-129	5.9050	Butterfield / Frank	1112
J2-575-HFS-02	fluid	Grotto	Low temp reference. Flange.	HFS filtered bag #23 Tmax=4.1 Tavg=3.9 T2=2.9 Vol=500ml. Z=2189m	7/21	23	56	47	56.9530	-129	5.9050	Butterfield / Frank	1117
J2-575-HFS-03	fluid	Grotto	In shimmering water on the left flange; right-most edge in palmworms.	HFS unfiltered bag #22. Tmax=18.1 Tavg=16.2 T2=7.6. Vol=500ml Z=2189m.	7/22	00	12	47	56.9530	-129	5.9020	Butterfield / Frank	1135
J2-575-HFS-04	fluid	Grotto	In shimmering water on the left flange; right-most edge in palmworms.	HFS filtered bag #21. Tmax=16.8 Tavg=14.0 T2=6.5 Vol=500mL. Z=2189m.	7/22	00	16	47	56.9530	-129	5.9020	Butterfield / Frank	1141
J2-575-HFS-05	fluid	Grotto	Under flange.	HFS filtered piston #1. Tmax=215.6C Tavg=185.6 T2=70C. Vol=343mL. Z=2192m.	7/22	01	03	47	56.9530	-129	5.9020	Butterfield / Frank	1192
J2-575-HFS-06	fluid	Grotto	Under flange.	HFS unfiltered piston #2. Tmax=177.6 Tavg=164.6 T2=66C. Vol=565mL. Z=2192m	7/22	01	11	47	56.9530	-129	5.9020	Butterfield / Frank	1212
J2-575-Sulfide-07	geo	Grotto	Flange.	Grab several pieces of sulfide flange (for endolithic microbes). Some edges coated in pyrite. Z=2192m.	7/22	01	47	47	56.9530	-129	5.9020	Butterfield / Frank	1272
J2-575-Mat-08	bio	Grotto	On end of rocks and flange - on top of worm clump.	Syringe of orange squishy mat. Z=2190.5m.	7/22	03	15	47	56.9520	-129	5.9050	Mitchell	1481
J2-575-Sed-09	bio/geo	Grotto	Below sample 08.	Syringe of grey and grown-red sediments (for microbes). Z=2190m.	7/22	03	33	47	56.950	-129	5.906	Mitchell	1540
J2-575-HFS-10	fluid	Dudley	Black smoker venting.	HFS unfiltered bag #20. Tmax=322.7 Tavg=322.1 T2=105 C. Vol=500mL. Z=2191m.	7/22	04	26	47	56.9390	-129	5.8600	Butterfield	1622
J2-575-HFS-11	fluid	Dudley	Black smoker venting.	HFS filtered bag #19. Tmax=323.1 Tavg=322.7 T2=106 Vol=504mL. Z=2191m.	7/22	04	30	47	56.9390	-129	5.8600	Butterfield	1629
J2-575-GTHFS-12	gas	Dudley	Black smoker venting.	GTHFS port gastight naked #6. T=322 when fired. Z=2191m.	7/22	04	32	47	56.9390	-129	5.8600	Lilley / Evans	1637

Sample	Type	Site	Site Description	J2-575 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-575-HFS-13	fluid	Dudley	Temperature array mound.	HFS filtered bag #17. Background sample. Tmax=2.2 Tav=1.9 Vol=501mL T2 also ~2. Z=2191	7/22	05	03	47	56.9390	-129	5.8570	Butterfield	1679
J2-575-HFS-14	fluid	Dudley	Temperature array mound.	HFS RNA filter #16. Background sample. Tmax=2.2 Tav=2 T2=2.0 Vol=3001mL. Z=2191	7/22	05	07	47	56.9390	-129	5.8570	Huber / Butterfield	1695

Table 7.3.3 J2-576 Jason Samples (High Rise Field, Endeavour Segment, JdFR)

Sample	Type	Site	Site Description	J2-576 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-576-HFS-01	fluid	Bambi	Near the top of Bambi in black smoker hole under top flange.	HFS filtered piston #1. Tmax=341.7. Tav=341.0. T2=114. Vol=567ml. Z=2141m.	7/22	17	30	47	58.1214	-129	5.2237	Butterfield	1824
J2-576-HFS-02	fluid	Bambi	Near the top of Bambi in black smoker hole under top flange.	HFS unfiltered piston #2. Tmax=341.2 Tav=340.9. T2=113. Vol=562ml. Z=2141m.	7/22	17	34	47	58.1214	-129	5.2237	Butterfield	1831
J2-576-Sulfide-03	geo	Boardwalk	Next to black smoker hole near top.	Grab of fragile young mix of sulfide and anhydrite. Not hardened yet. Small. Dark colored/blackish. Nearly flat. Z=2138m.	7/22	19	23	47	58.1057	-129	5.2425	Frank	1952
J2-576-HFS-04	fluid	Boardwalk	In black smoker hole near top of sulfide.	HFS unfiltered bag #24. Tmax=342.8. Tav=341.7. T2=100. Vol=302ml. Z=2138m.	7/22	19	43	47	58.1057	-129	5.2425	Butterfield	1974
J2-576-HFS-05	fluid	Boardwalk	In black smoker hole near top of sulfide.	HFS filtered bag #23. Tmax=340.7. Tav=336.8. T2=97.0. Vol=276ml. Z=2138m.	7/22	19	45	47	58.1057	-129	5.2425	Butterfield	1979
J2-576-GTHFS-06	gas	Boardwalk	In black smoker hole near top of sulfide.	HFS port gastight. Tmax=340.7. Z=2138m.	7/22	19	48	47	58.1057	-129	5.2425	Butterfield	1982
J2-576-GTB-07	gas	Boardwalk	In black smoker hole near top of sulfide.	GTB forward - white. Tmax=340.7. Z=2138m.	7/22	20	4	47	58.1057	-129	5.2425	Lilley / Evans	1995
J2-576-HFS-08	fluid	Boardwalk	Diffuse flow near skinny field of smaller tubeworms.	HFS filtered bag #21. Tmax=18.8 Tav=n/a T2=9.2 Vol=370ml. Z=2134.5m.	7/22	20	24	47	58.1062	-129	5.2408	Butterfield	2015
J2-576-HFS-09	fluid	Boardwalk	Diffuse flow near skinny field of smaller tubeworms.	HFS unfiltered bag #22. No temperature data. Not updating. Vol=304ml. Z=2134.5m.	7/22	20	24	47	58.1062	-129	5.2408	Butterfield	2018
J2-576-HFS-10	fluid	Park Place	Black smoker at the top of the sulfide chimney.	HFS filtered piston #3. Tmax=344.5 Tav=344.5 T2=107 Vol=675. Z=2142.5m.	7/22	21	33	47	58.0960	-129	5.2560	Butterfield	2094
J2-576-GTHFS-11	gas	Park Place	Black smoker at the top of the sulfide chimney.	HFS center black #5 gastight. Tmax=344. Z=2142.5m.	7/22	21	38	47	58.0960	-129	5.2560	Lilley / Evens	2101
J2-576-HFS-12	fluid	Park Place	Black smoker at the top of the sulfide chimney.	HFS unfiltered piston #4. Tmax=344.6 Tav=344.5 T2=105 Vol=675ml Z=2142.5m.	7/22	21	39	47	58.0960	-129	5.2560	Butterfield	2104

Sample	Type	Site	Site Description	J2-576 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-576-HFS-13	fluid	Park Place	In field of Sulfincola / palmiformas (area where worms are sparse) above and slightly to the left of smoker.	HFS unfiltered bag #20. Tmax=24.9 Tavg=21.6 T2=10 Vol=500ml. Z=2142.	7/22	22	12	47	58.0978	-129	5.2542	Butterfield	2141
J2-576-HFS-14	fluid	Park Place	In field of Sulfincola / palmiformas (area where worms are sparse) above and slightly to the left of smoker.	HFS filtered bag #19. Tmax=26.4 Tavg=23.7 T2=11 Vol=500ml. Z=2142.	7/22	22	17	47	58.0978	-129	5.2542	Butterfield	2148
J2-576-HFS-15	fluid	Park Place	In field of Sulfincola / palmiformas (area where worms are sparse) above and slightly to the left of smoker.	HFS unfiltered bag #18. Tmax=29.1 Tavg=27.4 T2=1 Vol=500ml Z=2142.	7/22	22	21	47	58.0978	-129	5.2542	Butterfield	2154
J2-576-HFS-16	fluid	Park Place	In field of Sulfincola / palmiformas (area where worms are sparse) above and slightly to the left of smoker.	HFS RNA filter #16. Tmax=27.0 Tavg=17.9 T2=8 Vol=2400ml. Z=2142.	7/22	22	25	47	58.0978	-129	5.2542	Huber / Butterfield	2160
J2-576-HFS-17	fluid	Park Place	In field of Sulfincola / palmiformas (area where worms are sparse) above and slightly to the left of smoker.	HFS DNA filter #12. Tmax=40.8 Tavg=37.5 T2=16 Vol=3000ml. Z=2142.	7/22	22	53	47	58.0978	-129	5.2542	Huber / Butterfield	2189
J2-576-HFS-18	fluid	Park Place	In field of Sulfincola / palmiformas (area where worms are sparse) above and slightly to the left of smoker.	HFS unfiltered piston #6. Tmax=42.7 Tavg=40.2 T2=16 Volume=675ml. Z=2142.	7/22	23	15	47	58.0978	-129	5.2542	Butterfield	2208
J2-576-HFS-19	fluid	Baltic	Mid-height on sulfide directly in a skinny black smoker.	HFS filtered piston #7. Tmax=325.9 Tavg=323 T2=25 Vol=600ml. Z=2149.	7/23	00	11	47	58.0773	-129	5.2494	Butterfield	2268
J2-576-GTHFS-20	gas	Baltic	Mid-height on sulfide directly in a skinny black smoker.	HFS stbd gastight blue #12. T=320C. Z=2149.	7/23	00	19	47	58.0773	-129	5.2494	Lilley / Evans	2280
J2-576-HFS-21	fluid	Baltic	Mid-height on sulfide directly in a skinny black smoker.	HFS unfiltered piston #8. Tmax=301.3 Tavg=300 T2=5 Vol=600ml. Z=2149.	7/23	00	25	47	58.0773	-129	5.2494	Butterfield	2290
J2-576-GTB-22	gas	Baltic	Mid-height on sulfide directly in a skinny black smoker.	GTB yellow #11. T=301C. Z=2149.	7/23	00	48	47	58.0773	-129	5.2494	Lilley / Evans	2318
J2-576-GTB-23	gas	Fairy Castle	Near top of sulfide at base of one of the pillars.	GTB black #18. T=341. Z=2148m.	7/23	01	51	47	58.0168	-129	5.3007	Lilley / Evans	2435
J2-576-HFS-24	fluid	Fairy Castle	Near top of sulfide at base of one of the pillars.	HFS filtered piston #9. Tmax=341.8 Tavg=341.3 T2=100 vol=650mL Z=2148m.	7/23	02	02	47	58.0168	-129	5.3007	Butterfield	2464

Sample	Type	Site	Site Description	J2-576 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-576-HFS-25	fluid	Fairy Castle	Near top of sulfide at base of one of the pillars.	HFS piston #5. Tmax= 341.9 Tavg=341.6 T2=95 vol=650mL Z=2148m.	7/23	02	09	47	58.0168	-129	5.3007	Butterfield	2472
J2-576-Sed-26	bio/ geo	Fairy Castle	At base of sulfide on the seafloor.	Syringe sampler (large) extracted dark brown/grey sediment for microbes. Z=2166m.	7/23	02	45	47	57.9770	-129	5.4030	Mitchell	2544
J2-576-Mat-27	bio	Knight	On the edge of rocks / spires.	Syringe sampler (small) collected orange-red slimy mat for microbes. Z=2175m.	7/23	03	11	47	58.0350	-129	5.3310	Mitchell	2604
J2-576-Sulfide-28	geo	Ventor	Midway up column by a diffuse flow area.	Grab of piece of sulfide spire (for endolithic microbes) with attached worms. Temp in the nearby venting area is 266. Z=2164m.	7/23	03	40	47	58.0620	-129	5.3640	Frank	2663
J2-576-Sulfide-29	geo	Ventor	On top of Ventor column next to a smoking vent.	Scoop of sulfide scrapings into bag (?). Smoker Temp~328C. For endolithic microbial studies. Z=2162m.	7/23	04	02	47	58.0620	-129	5.3640	Frank	2716
J2-576-HFS-30	fluid	Ventor	On top of Ventor column next to a smoking vent.	HFS filtered bag #17. Tmax=330.5 Tavg=330 T2=107 Vol=475mL Z=2162m.	7/23	04	15	47	58.0620	-129	5.3640	Butterfield	2757
J2-576-Mat-31	bio	Ventor	On bottom by Ventor column.	Syringe of orange mat and sediment for microbes. Z=2173m	7/23	04	30	47	58.0580	-129	5.3690	Mitchell	2784

Table 7.3.4 J2-577 Jason Samples (Main Endeavour Field, Endeavour Segment, JdFR)

Sample	Type	Site	Site Description	J2-577 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
NOTE: SAMPLE NUMBERS IN VV (Virtual Van) ARE INCORRECT AFTER FIRST SAMPLE. BELOW ARE PROPER SAMPLE NUMBERS													
J2-577-Sulfide-01	geo	Vent Cap Mound	Small sulfide mound in the MEF ~ 15m north of S&M	Sulfide / anhydrite chimney at the center of the mound. Chimney built up over the last 6 years. It was not there when they deployed their instrument. Z=2194m.	7/23	17	49	47	56.8854	-129	5.9112	Fuwu Ji / Hu Wang	2938
J2-577-ChineseFluid-02	fluid	Vent Cap Mound	Small sulfide mound in the MEF ~ 15m north of S&M.	Fluid sample on a small vent on the mound - now the main vent after removing the sulfide chimney. Z=2194m.	7/23	22	00	47	56.8854	-129	5.9112	Fuwu Ji / Hu Wang	3187
J2-577-GTB-03	gas	Vent Cap Mound	Small sulfide mound in the MEF ~ 15m north of S&M.	Gastight bottle red #9 in same orifice as previous fluid sample. Z=2194m.	7/23	22	41	47	56.8854	-129	5.9112	Lilley / Fuwu Ji / Hu Wang	3222
J2-577-Sulfide-04	geo	Vent Cap Mound	Small sulfide mound in the MEF ~ 15m north of S&M.	Grab of very small piece of sulfide next to the mound.	7/23	22	41	47	56.8854	-129	5.9112	Fuwu Ji / Hu Wang	3233
J2-577-Sulfide-05	geo	S&M	Area of sulfide chimneys up to 26m high.	Grab of an inactive less friable sample next to the active chimney. Z=2181m.	7/23	23	36	47	56.8750	-129	5.9070	Fuwu Ji / Hu Wang	3268
J2-577-Sulfide-06	geo	S&M	Area of sulfide chimneys up to 26m high.	Small piece of active chimney - very friable. Z=2181m.	7/24	00	23	47	56.8750	-129	5.9070	Fuwu Ji / Hu Wang	3307
J2-577-Sulfide-07	geo	Needle	Less active chimney but some worm clumps in area and black precipitates on spires.	Scoop collected crumbly pieces of active sulfide chimneys. Z=2185m.	7/24	02	08	47	56.8700	-129	5.9480	Fuwu Ji / Hu Wang	3450

Sample	Type	Site	Site Description	J2-577 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-577-Sulfide-08	geo	Puffer	Limited activity. Center of chimney.	Grab of piece of little spire. Jason T=278C. Z=2194.	7/24	02	51	47	56.8700	-129	5.9480	Fuwu Ji / Hu Wang	3535
J2-577-Sulfide-09	geo	Sully	Still smoking in this area of 3 little chimneys near HOB0 probe that has been here since at least 2008.	Grab of 2 fairly hard small chimneys: 1chimney was at the tip of the Hobo probe. Aside: also picked up Hobo. Jason temps=239C and 207C.	7/24	03	18	47	56.853	-129	5.9470	Fuwu Ji / Hu Wang	3591
J2-577-Sulfide-10	geo	MilliQ	Sulfide structure with lots of lobed spires.	Grab of large chimney spire with mini flanges. Mid-way up MilliQ. Sample ~1m long and 40lbs. Z=2184.	7/24	03	54	47	56.8360	-129	5.9300	Fuwu Ji / Hu Wang	3665
J2-577-Sulfide-11	geo	Needle	Midway up side of Needle.	Chimney spire from active venting area. Z=2182.	7/24	05	02	47	56.8690	-129	5.9410	Fuwu Ji / Hu Wang	3787
J2-577-Sed-12	bio /geo	Needle	Near north side of sulfide structure	Syringe (small yellow) sample of brown-orange sediments with yellow spots from the seafloor. Z=2195m.	7/24	05	16	47	56.8670	-129	5.9300	Mitchell	3811
J2-577-Sed-13	bio /geo	Needle	Near north side of sulfide structure	Syringe (small red) sample of brown-orange sediments with yellow spots from the seafloor. Z=2195m.	7/24	05	19	47	56.8670	-129	5.9300	Mitchell	3816

Table 7.3.5 J2-578 Jason Samples (Main Endeavour Field, Endeavour Segment, JdFR)

Sample	Type	Site	Site Description	J2-578 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-578-Sulfide-01	geo	Lobo	Central Lobo sulfide structure.	Scoop bag of friable sulfide off to the side (left) of the large spire. Black smoke poured out of hole created when removed the sulfide. 294C fluid pouring out of hole. Z=2187.	7/24	20	58	47	56.9703	-129	5.9043	Frank	4163
J2-578-HFS-02	fluid	Lobo	Central Lobo hole created by removing sulfide sample 1. Black smoke pouring out.	HFS filtered piston #1. Tmax=309.7 Tavg=309.0 T2=100 Vol=576ml. Z=2187m.	7/24	21	33	47	56.9703	-129	5.9043	Butterfield	4203
J2-578-HFS-03	fluid	Lobo	Central Lobo hole created by removing sulfide sample 1. Black smoke pouring out.	HFS unfiltered piston #2. Tmax=309,7 Tavg=309.0 T2=100 Vol=576ml. Z=2187m.	7/24	21	33	47	56.9703	-129	5.9043	Butterfield	4209
J2-578-HFS-04	fluid	Lobo	Central Lobo down the chimney spire a bit to get more diffuse flow.	HFS unfiltered bag #24, Stop=2148 Tmax=23.8 Tavg=21.2 T2=12 Vol=402ml. Z=2187m.	7/24	21	45	47	56.9703	-129	5.9043	Butterfield	4218
J2-578-HFS-05	fluid	Lobo	Central Lobo down the chimney spire a bit to get more diffuse flow.	HFS filtered bag #23. Stop=2152 Tmax=31 Tavg=25.7 T2=14 Vol=390ml. Z=2187m.	7/24	21	49	47	56.9703	-129	5.9043	Butterfield	4224
J2-578-HFS-06	fluid	Lobo	South Lobo in diffuse flow on another chimney structure.	HFS Unfiltered bag #22. Stop=2222 Tmax=27.3 Tavg=24.4 T2=12 Vol=500ml. Z=2187m.	7/24	22	19	47	56.9659	-129	5.9080	Butterfield	4251
J2-578-HFS-07	fluid	Lobo	South Lobo in diffuse flow on another chimney structure.	HFS filtered bag #21. STOP=2227 Tmax=27.1 Tavg=24 T2=12 Vol=500ml. Z=2187m.	7/24	22	23	47	56.9659	-129	5.9080	Butterfield	4259

Sample	Type	Site	Site Description	J2-578 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2=578-Sulfide-08	geo	Lobo	South Lobo in field of hot flow	Grab of a smaller spire - covered in tubeworms - with good flow. Z=2187m.	7/24	22	36	47	56.9659	-129	5.9080	Butterfield	4276
J2-578-HFS-09	fluid	Lobo	South Lobo high temp fluid from hole created by sulfide-08 collection.	HFS unfiltered piston #4. Stop=2259 Tmax=319.9 Tavg=318.8 T2=108 Vol=675ml. Z=2191m.	7/24	22	55	47	56.9659	-129	5.9080	Butterfield	4294
J2-578-HFS-10	fluid	Lobo	South Lobo high temp fluid from hole created by sulfide-08 collection.	HFS filtered piston #5. Stop 2305. Tmax=321.1 Tavg=320.6 T2=105 Vol=625ml. Z=2191m.	7/24	23	00	47	56.9659	-129	5.9080	Butterfield	4301
J2-578-GTHFS-11	gas	Lobo	South Lobo high temp fluid from hole created by sulfide-08 collection.	GTHFS purple #10 port gastight. Tmax=321. Z=2191m.	7/24	23	07	47	56.9659	-129	5.9080	Lilley / Evans	4309
J2-578-Sed-12	bio / geo	Dudley	Area of temp array experiment.	Large syringe of dark (hard rock-like) sediment next to diffuse flow. For microbial studies. Z=2193m.	7/25	01	34	47	56.9360	-129	5.8580	Mitchell	4466
J2-578-Sulfide-13	geo	Dudley	Venting smoker area.	Mid-portion of active sulfide chimney. Z=2191m.	7/25	01	56	47	56.9350	-129	5.8570	Frank	4495
J2-578-HFS-14	fluid	Dudley	Diffuse flow area near active sulfides.	Unfiltered bag #20. Stop 0210. Tmax=20.7 Tavg=19.8 T2=9 Vol=500mL. Z=2191m.	7/25	02	08	47	56.9360	-129	5.8570	Butterfield	4525
J2-578-HFS-15	fluid	Dudley	Diffuse flow area near active sulfides.	HFS filtered piston #9. Tmax=21.1 Tavg=18.3 T2=9 Vol=676ml. Z=2191m.	7/25	02	12	47	56.9360	-129	5.8570	Butterfield	4531
J2-578-Mat-16	bio	Dudley	Diffuse flow area near active sulfides.	Small syringe in orange mat on top of tubeworms. Z=2191m.	7/25	02	12	47	56.9360	-129	5.8570	Mitchell	4542
J2-578-Sulfide-17	bio / geo	Dudley	Area with inactive sulfides and dead-looking worms.	Grab quite large inactive sulfide chimney. Some iron oxide coating. Also some purple-blue ciliates; orange mat and snails. Z=2196m.	7/25	02	12	47	56.9440	-129	5.8500	Frank	4560
J2-578-HFS-18	fluid	Dudley	Next to inactive sulfide - where a piece broke off.	HFS unfiltered piston #6. Stop 0255. Tmax=2.6 Tavg=2.3 T2=2.3 Vol=675ml.	7/25	02	50	47	56.9440	-129	5.8500	Butterfield	4596
J2-578-Sulfide-19	geo	Dante	SW side of Dante	Scoop bag of active sulfide chimney - diffuse flow. Z=2183m.	7/25	04	09	47	56.9560	-129	5.8700	Frank	4699
J2-578-HFS-20	fluid	Dante	SW side of Dante. Same spot as sulfide-19	HFS filtered bag #19. Stop 0433. Tmax=15.2 Tavg=13.9 T2=7.1 Vol=502mL. Z=2183m.	7/25	04	29	47	56.9560	-129	5.8700	Butterfield	4741
J2-578-Mat-21	bio	Dante	Low temp diffuse flow by active diffuse flow chimney.	Small blue syringe of orange squishy mat with yellow mat underneath. Z=2184m.	7/25	04	44	47	56.9550	-129	5.8720	Mitchell	4755
J2-578-Sulfide-22	geo	Dante	Next to Marker D in area of dead chimney spires.	Dead sulfide chimney piece. Z=2190m.	7/25	04	50	47	56.9530	-129	5.8680	Frank	4773
J2-578-HFS-23	fluid	Dante	Black smoker pinnacle on top of Dante.	HFS filtered piston #3. Stop 0504. Tmax=336.2 Tavg=333.8 T2=70 Vol=625mL. Z=2176m.	7/25	05	01	47	56.9590	-129	5.8670	Butterfield	4798
J2-578-GTHFS-24	gas	Dante	Black smoker pinnacle on top of Dante.	GTHFS stbd gastight blue #12. Temp dropped to 100C. Z=2176m.	7/25	05	07	47	56.9590	-129	5.8670	Lilley / Evans	4807

Sample	Type	Site	Site Description	J2-578 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-578-HFS-25	fluid	Dante	Black smoker pinnacle on top of Dante.	HFS unfiltered bag #18. Stop 0518. Tmax=322C Tavg=298.7 T2=90 Vol=368ml. Z=2176m.	7/25	05	16	47	56.9590	-129	5.8670	Butterfield	4828
J2-578-GTHFS-26	gas	Dante	Black smoker pinnacle on top of Dante.	HFS gastight center yellow / black #5. T=260C. Z=2176m.	7/25	05	17	47	56.9590	-129	5.8670	Lilley / Evans	4831
J2-578-Sed-27	bio / geo	Dante	Black smoker pinnacle on top of Dante.	Small yellow syringe of dark sediment for microbial studies. Z=2176	7/25	05	51	47	56.9590	-129	5.8680	Mitchell	4879

Table 7.3.6 J2-579 Jason Samples (Main Endeavour Field, Endeavour Segment, JdFR)

Sample	Type	Site	Site Description	J2-579 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-579-GTB-01	gas	Hulk	Black-gray smoker hole near the top of sulfide edifice.	GTB white #17. Z=2187. Tmax was 326.9C with Jason Tprobe. Fired at 1820:10. hdg 11deg. Z=2187m.	7/25	18	20	47	57.0111	-129	5.8159	Lilley / Evans	5094
J2-579-HFS-02	fluid	Hulk	Black-gray smoker hole near the top of sulfide edifice.	HFS filtered piston #1. Tmax=314.5 Tavg=312.5 T2=26. Vol=600ml. Z=2187m.	7/25	18	33	47	57.0111	-129	5.8159	Butterfield	5110
J2-579-HFS-03	fluid	Hulk	Black-gray smoker hole near the top of sulfide edifice.	HFS unfiltered piston #2. Tmax=315.1 Tavg=312.1 T2=28.0 Vol=600ml. Z=2187m.	7/25	18	37	47	57.0111	-129	5.8159	Butterfield	5116
J2-579-HFS-04	fluid	Hulk	Black-gray smoker hole near the top of sulfide edifice.	HFS unfiltered piston #6. Tmax=318.5 Tavg=316.0 T2=28. Vol=600ml. Z=2187m.	7/25	18	42	47	57.0111	-129	5.8159	Butterfield	5121
J2-579-HFS-05	fluid	Hulk	Black-gray smoker hole near the top of sulfide edifice.	HFS unfiltered bag #18. Tmax=320.1 Tavg=318.9 T2=29. Vol=501ml. Z=2187m.	7/25	18	48	47	57.0111	-129	5.8159	Butterfield	5129
J2-579-GTHFS-06	gas	Hulk	Black-gray smoker hole near the top of sulfide edifice.	HFS gastight. Tmax for GTHFS is 320.1.	7/25	18	52	47	57.0111	-129	5.8159	Butterfield	5131
J2-579-Sulfide-07	geo	Hulk	South side of sulfide edifice.	Initial grab of sulfide includes a lot of dust and small chimney shards. Z=2201m. (Note: samp # is corrected - vv # sulfide-06 incorrect).	7/25	19	33	47	57.0016	-129	5.8174	Frank	5173
J2-579-HFS-08	fluid	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	HFS filtered piston #3. Tmax=323.1 Tavg=312.7 T2=70 Vol=550ml. Z=2198m.	7/25	20	17	47	56.9877	-129	5.8132	Butterfield	5219
J2-579-HFS-09	fluid	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	HFS unfiltered piston #4. Tmax=318.7 Tavg=316.7 T2=70 Vol=650ml. Z=2198m.	7/25	20	20	47	56.9877	-129	5.8132	Butterfield	5228
J2-579-HFS-10	fluid	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	HFS unfiltered piston #8. Tmax=323 Tavg=321 T2=70 Vol=600ml. Z=2198m.	7/25	20	25	47	56.9877	-129	5.8132	Butterfield	5234
J2-579-HFS-11	fluid	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	HFS filtered bag #20. Tmax=323 Tavg=322.3 T2=69 Vol=500ml. Z=2198m.	7/25	20	31	47	56.9877	-129	5.8132	Butterfield	5240

Sample	Type	Site	Site Description	J2-579 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-579-GTHFS-12	gas	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	GTHFS middle gastight. Tmax=323C. Z=2198m.	7/25	20	35	47	56.9877	-129	5.8132	Lilley / Evans	5245
J2-579-GTHFS-13	gas	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	Sulfide grab. Pieces from smoker chimney. Z=2198m.	7/25	20	36	47	56.9877	-129	5.8132	Frank	5247
J2-579-Sulfide-14	geo	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	Scoop bag of sulfide pieces from smoker chimney. Z=2198m.	7/25	21	36	47	56.9877	-129	5.8132	Frank	5301
J2-579-Sulfide-15	geo	Crypto	Sulfide spire with 4 or 5 smaller spires at the top like a crown. In black smoker.	Grab of solid chunk of sulfide. Z=2198m.	7/25	22	05	47	56.9877	-129	5.8132	Frank	5323

Table 7.3.7 J2-580 Jason Samples (Ashes Vent Field, Axial Seamount, JdFR)

Sample	Type	Site	Site Description	J2-580 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-580-HFS-01	fluid	Anemone	Large area of diffuse flow with diverse biota and bacterial mat.	HFS filtered piston #5. Tmax=19.4 Tavg=18.4 T2=9. Vol=650ml. Z=1543m.	7/26	21	55	45	55.9951	-130	0.8274	Butterfield	5500
J2-580-HFS-02	fluid	Anemone	Large area of diffuse flow with diverse biota and bacterial mat.	HFS unfiltered bag #18. Tmax=20.3 Tavg=18.6 T2=9 Vol=500ml. Z=1543m.	7/26	22	02	45	55.9951	-130	0.8274	Butterfield	5500
J2-580-HFS-03	fluid	Anemone	Large area of diffuse flow with diverse biota and bacterial mat.	HFS RNA filter #16. Tmax=20.0 Tavg=17.8 T2=9.0 Vol=2508ml. Z=1543m.	7/26	22	06	45	55.9951	-130	0.8274	Huber / Butterfield	5500
J2-580-HFS-04	fluid	Anemone	Large area of diffuse flow with diverse biota and bacterial mat.	HFS Sterivex filter #12. Tmax=17.7 Tavg=15.7 T2=9 Vol=3000ml. Z=1543m.	7/26	22	33	45	55.9951	-130	0.8274	Huber / Butterfield	5528
J2-580-Mat-05	bio	Ropos / Phoenix	In white mat and dense biota at the base of Ropos.	Large blue syringe of white microbial mat. NE side of chimney at base. Z=1545m.	7/26	23	45	45	55.9979	-130	0.8209	Mitchell	5597
J2-580-HFS-06	fluid	Fuzzy Tubeworm Bush	Fuzzy tubeworm bush with white filamentous bacteria and diverse biota. Between Inferno and Mushroom.	HFS unfiltered piston #6. Tmax=19.8 Tavg=18.9 T2=10. Vol=650ml. Z=1545	7/27	00	21	45	56.0186	-130	0.8195	Butterfield	5646
J2-580-HFS-07	fluid	Fuzzy Tubeworm Bush	Fuzzy tubeworm bush with white filamentous bacteria and diverse biota. Between Inferno and Mushroom.	HFS filtered bag #17. Tmax=20.1 Tavg=19.4 T2=9.8 Vol=501ml. Z=1545	7/27	00	30	45	56.0186	-130	0.8195	Butterfield	5653
J2-580-HFS-08	fluid	Fuzzy Tubeworm Bush	Fuzzy tubeworm bush with white filamentous bacteria and diverse biota. Between Inferno and Mushroom.	HFS DNA Sterivex filter #11. Tmax=20.0 Tavg=19.1 Vol=3000ml. Z=1545.	7/27	00	37	45	56.0186	-130	0.8195	Huber / Butterfield	5653

Sample	Type	Site	Site Description	J2-580 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-580-HFS-09	fluid	Fuzzy Tubeworm Bush	Fuzzy tubeworm bush with white filamentous bacteria and diverse biota. Between Inferno and Mushroom.	HFS RNA filter #15. Tmax=19.5 Tavg=17.5 T2=10 Vol=3000ml. Z=1545m.	7/27	01	01	45	56.0186	-130	0.8195	Huber / Butterfield	5653
J2-580-Mat-10	bio / geo	N of Inferno	Area of orange sediments.	Blue syringe sample in orange "liquid" sediment. Probably iron oxide mat. JasonT=3.5C. Z=1544m.	7/27	01	46	45	56.0275	-130	0.8119	Mitchell	5722
J2-580-Mat-11	bio / geo	N of Inferno	Area of orange sediments.	Red syringe sample in orange "liquid" sediment. Probably iron oxide mat. JasonT=3.5C. Z=1544m.	7/27	01	55	45	56.0275	-130	0.8119	Mitchell	5731
J2-580-HFS-12	fluid	Marshmallow	Area of white mat (?) and biota incl. tubeworms.	HFS filtered bag #7. Tmax=45.6 Tavg=44.7 T2=18 Vol=650ml. Z=1544m.	7/27	02	36	45	56.0248	-130	0.8056	Butterfield	5780
J2-580-HFS-13	fluid	Marshmallow	Area of white mat (?) and biota incl. tubeworms.	HFS unfiltered bag #24. Tmax=50.0 Tavg=46.2 T2=18 Vol=480ml. Z=1544m.	7/27	02	47	45	56.0248	-130	0.8056	Butterfield	5787
J2-580-HFS-14	fluid	Marshmallow	Area of white mat (?) and biota incl. tubeworms.	HFS RNA filter #14. Tmax=49.5 Tavg=48.1 T2=19 Vol=3000ml. Z=1544m.	7/27	02	48	45	56.0248	-130	0.8056	Huber / Butterfield	5794
J2-580-HFS-15	fluid	Marshmallow	Area of white mat (?) and biota incl. tubeworms.	HFS Sterivex filter #10. Tmax=51.9 Tavg=49.9 T2=19 Vol=3000ml. Z=1544m.	7/27	02	48	45	56.0248	-130	0.8056	Huber / Butterfield	5816
J2-580-HFS-16	fluid	Virgin	In hole created when anhydrite chimney fell. Steady flow.	HFS unfiltered piston #1. Tmax=273.2 Tavg 272.7 T2=77 Vol=400ml. Z=1544m.	7/27	04	06	45	56.0222	-130	0.7935	Butterfield	5873
J2-580-HFS-17	fluid	Virgin	In hole created when anhydrite chimney fell. Steady flow.	HFS unfiltered piston #4. Tmax=272.7 Tavg=272.5 T2=80.1 Vol=400ml. Z=1544m.	7/27	04	12	45	56.0222	-130	0.7935	Butterfield	5877
J2-580-GTHFS-18	gas	Virgin	In hole created when anhydrite chimney fell. Steady flow.	HFS gastight stbd purple #10. Tmax=272.7C. Z=1544m.	7/27	04	12	45	56.0222	-130	0.7935	Lilley / Evans	5884
J2-580-GTB-19	gas	Virgin	In hole created when anhydrite chimney fell. Steady flow.	Gastight handheld black #18. Tmax=272.7C. Z=1544m.	7/27	04	19	45	56.0222	-130	0.7935	Lilley / Evans	5891
J2-580-Sulfide-20	geo	Inferno	Top of sulfide structure. Small active spire below tallest black spire (beehive).	Grab small smoker spire near top of structure. Z=1542m.	7/27	04	45	45	56.0159	-130	0.8244	Frank	5923
J2-580-Major-21	fluid	Inferno	In grey-black fluid coming out of hole where spire was.	Major #21 fluid sample in hot smoker hole. T=287.4C. Z=1542m.	7/27	05	03	45	56.0159	-130	0.8244	Butterfield	5942
J2-580-HFS-22	fluid	Inferno	In grey-black fluid coming out of hole where spire was.	HFS unfiltered piston #2. Tmax=282.4 Tavg=281.9 T2=75 Vol=620ml. Z=1542m	7/27	05	10	45	56.0159	-130	0.8244	Butterfield	5957
J2-580-HFS-23	fluid	Inferno	In grey-black fluid coming out of hole where spire was.	HFS filtered piston #3. Tmax=283.1 Tavg=282.7 T2=78 Vol=600ml. Z=1542m	7/27	05	10	45	56.0159	-130	0.8244	Butterfield	5964

Sample	Type	Site	Site Description	J2-580 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-580-HFS-24	fluid	Inferno	In grey-black fluid coming out of hole where spire was.	HFS unfiltered bag #20. Tmax=283.7 Tavg=283.4 T2=85 Vol=375ml. Z=1542m	7/27	05	20	45	56.0159	-130	0.8244	Butterfield	5970
J2-580-GTHFS-25	gas	Inferno	In grey-black fluid coming out of hole where spire was.	GTHFS gastight center yellow-black #5. Tmax=283.7C. Z=1542m	7/27	05	24	45	56.0159	-130	0.8244	Lilley / Evans	5977
J2-580-GTB-26	gas	Inferno	In grey-black fluid coming out of hole where spire was.	Handheld gastight bottle orange/black #7. Tmax=283.7C. Z=1542m	7/27	05	34	45	56.0159	-130	0.8244	Lilley / Evans	5989
J2-580-Sulfide-27	geo	Mushroom	Top of sulfide chimney.	Pieces of sulfide at top of structure. Grabbed lower part. Z=1543m.	7/27	06	23	45	56.0150	-130	0.8140	Frank	6066
J2-580-HFS-28	fluid	Mushroom	Top of sulfide chimney.	HFS unfiltered piston #22. Tmax=289.4 Tavg=286.7 T2=28 Vol=476ml. Z=1543m.	7/27	07	07	45	56.0150	-130	0.8140	Butterfield	6154
J2-580-HFS-29	fluid	Mushroom	Top of sulfide chimney.	HFS filtered bag #21. Tmax=291.3 Tavg=291.1 T2=27.6 Vol=477ml. Z=1543m.	7/27	07	12	45	56.0150	-130	0.8140	Butterfield	6159
J2-580-HFS-30	fluid	Mushroom	Top of sulfide chimney.	HFS filtered bag #19. Tmax=291.9 Tavg=291.4 T2=31.2 Vol=477ml. Z=1543m.	7/27	07	17	45	56.0150	-130	0.8140	Butterfield	6166
J2-580-GTHFS-31	gas	Mushroom	Top of sulfide chimney.	GTHFS port gastight blue #12. Tmax=291.9C. Z=1543m.	7/27	07	22	45	56.0150	-130	0.8140	Lilley / Evans	6172
J2-580-HFS-32	fluid	Hell	Top of sulfide chimney in large vent opening.	HFS unfiltered bag #23. Tmax=289.7 Tavg=289.5 T2=76.1 Vol=476ml. Z=1541m.	7/27	08	01	45	56.0000	-130	0.8390	Butterfield	6248
J2-580-HFS-33	fluid	Hell	Top of sulfide chimney in large vent opening.	HFS unfiltered piston #8. Tmax=290.8 Tavg=290.4 T2=86.8 Vol=603ml. Z=1541m.	7/27	08	06	45	56.0000	-130	0.8390	Butterfield	6257
J2-580-HFS-34	fluid	Hell	Top of sulfide chimney in large vent opening.	HFS filtered piston #9. Tmax=291.2 Tavg=291.0 T2=83 vol=??ml. Z=1541m. Sample pump froze so don't know volume.	7/27	08	11	45	56.0000	-130	0.8390	Butterfield	6264
J2-580-GTB-35	gas	Hell	Top of sulfide chimney in large vent opening.	Gastight bottle yellow #7. Tmax=291.2. Z=1541m. The nozzle moved a bit so not sure if got a sample.	7/27	08	27	45	56.0000	-130	0.8390	Lilley / Evans	6279

Table 7.3.8 J2-581 Jason Samples (Axial benchmarks, 2011 eruption exploration, Axial Seamount, JdFR)

Sample	Type	Site	Site Description	J2-581 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-581-ChineseFluid-01	fluid	Virgin	Anhydrite mound	Sample taken in the flow pouring out of anhydrite opening. Z=1544m.	7/26	21	09	45	56.0196	-130	0.7930	Ji / Wang	6500
J2-581-pillow-02	geo	Contact	70 m SE of Mkr-33 nav target. 150deg hdg.	Contact of April 2011 pillow lava on older jumbled flow. Originally called "Fist-sized piece" from lobe on edge of new flow. The sample is actually a large piece of pillow. Z=1521m.	7/28	10	40	45	55.9604	-129	58.9145	Chadwick	7062

Sample	Type	Site	Site Description	J2-581 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-581-pillow-30 / originally pillow-03	geo	Contact	70 m SE of Mkr-33 nav target. 150deg hdg.	Pillow lava from the contact of the 2011 eruption. This piece is really glassy rind. It's large. It's about as wide as the milk crate on the deck. Z=1521m. (Sample number out of order due to mistake in virtual van log.). Z=1520m.	7/28	10	55	45	55.9584	-129	58.9145	Chadwick	7084
J2-581-Mat-03	bio	Mkr-33 area	April 2011 lobate flow	Large syringe of white/orange/yellow mat near shimmering water. Hydrothermal deposit (?) linked to eruption. Z=1515m.	7/28	11	40	45	55.9861	-129	58.9320	Mitchell	7149
J2-581-HFS-04	fluid	Bag City	Area of diffuse flow venting from large hole.	HFS filtered bag #17. Tmax=13.9 Tavg=13.8 T2=8 Vol=500ml. Z=1533m.	7/29	04	21	45	54.9800	-129	59.3580	Butterfield	7537
J2-581-HFS-05	fluid	Bag City	Area of diffuse flow venting from large hole.	HFS unfiltered bag #18. Tmax=13.6 Tavg=13.4 T2=8 Vol=500ml. Z=1533m.	7/29	04	25	45	54.9800	-129	59.3580	Butterfield	7537
J2-581-HFS-06	fluid	Vixen	High temp boiling anhydrite smoker mound.	HFS unfiltered piston #1. T=344.5C. Tmax=? Tavg=? T2=? Vol=? Z=1536m. Sample failed.	7/29	05	16	45	55.0430	-129	59.5810	Butterfield	7638
J2-581-GTHFS-07	gas	Vixen	High temp boiling anhydrite smoker mound.	HFS gastight stbd green #2. T=344.7C. Z=1536m.	7/29	05	20	45	55.0430	-129	59.5810	Lilley / Evans	7646
J2-581-HFS-08	fluid	Vixen	High temp boiling anhydrite smoker mound. T~344C.	HFS unfiltered piston #2. Tmax=344.7 Tavg=344.6 T2=95 Vol=450ml. Z=1536m.	7/29	05	21	45	55.0430	-129	59.5810	Butterfield	7652
J2-581-HFS-09	fluid	Casper	High temp boiling anhydrite smoker mound. T~313C.	HFS filtered piston #3. Tmax=313 Tavg=212 T2=90. Vol=476ml. Z=1536m.	7/29	05	54	45	55.0450	-129	59.5820	Butterfield	7715
J2-581-GTHFS-10	gas	Casper	High temp boiling anhydrite smoker mound. T~313C.	HFS gastight center orange #16. Tmax=313C. Z=1536m.	7/29	05	58	45	55.0450	-129	59.5820	Lilley / Evans	7729
J2-581-HFS-11	fluid	Casper	High temp boiling anhydrite smoker mound. T~313C.	HFS unfiltered piston #4. Tmax=313.4 Tavg=313.1 T2=88 Vol=400ml. Z=1536m.	7/29	05	59	45	55.0450	-129	59.5820	Butterfield	7733
J2-581-HFS-12	fluid	Trevi	High temp high flow anhydrite chimney.	HFS unfiltered piston #6. Tmax=252.7 Tavg=252.3 T2=62 Vol=400ml. Z=1520m.	7/29	14	23	45	56.7767	-129	59.0230	Butterfield	7927
J2-581-HFS-13	fluid	Trevi	High temp high flow anhydrite chimney.	HFS filtered piston #7. Tmax=253.7 Tavg=252.8 T2=66 Vol=400ml. Z=1520m.	7/29	14	26	45	56.7767	-129	59.0230	Butterfield	7931
J2-581-GTHFS-14	gas	Trevi	High temp high flow anhydrite chimney.	HFS gastight port naked #6. Tmax=254C. 20m.	7/29	14	29	45	56.7767	-129	59.0230	Butterfield	7935
J2-581-HFS-15	fluid	Spanish Steps	Small vent opening at base of steps to right of marker. T~165C.	HFS unfiltered bag #20. 169.2 Tavg=164.9 T2=55 Vol=400ml. Z=1519m.	7/29	15	12	45	56.7670	-129	59.0210	Butterfield	7992
J2-581-HFS-16	fluid	Spanish Steps	Small vent opening at base of steps to right of marker. T~165C.	HFS filtered piston #5. Tmax=169.2 Tavg=165.4 T2=55 Vol=600ml. Z=1519m.	7/29	15	17	45	56.7670	-129	59.0210	Butterfield	7997
J2-581-HFS-17	fluid	Snow Globe	Large hole venting lots of white floc. T~10C.	HFS unfiltered bag #24. Tmax=11.4 Tavg=11.0 T2=7 Vol=500. Z=1524m.	7/29	16	13	45	56.7504	-129	59.0921	Butterfield	8109
J2-581-HFS-18	fluid	Snow Globe	Large hole venting lots of white floc. T~10C.	HFS filtered bag #23. Tmax=11.5 Tavg=11.0 T2=7 Vol=475ml. Z=1524m.	7/29	16	18	45	56.7504	-129	59.0921	Butterfield	8116
J2-581-HFS-19	fluid	Snow Globe	Large hole venting lots of white floc. T~10C.	HFS RNA filter #16. Tmax=12.0 Tavg=11.1 T2=7 Vol=3000ml. Z=1524m.	7/29	16	23	45	56.7504	-129	59.0921	Huber / Butterfield	8124
J2-581-HFS-20	fluid	Snow Globe	Large hole venting lots of white floc. T~10C.	HFS DNA filter #12. Tmax=12.0 Tavg=11.4 T2=7C Vol=3001ml. Z=1524m.	7/29	16	48	45	56.7504	-129	59.0921	Huber / Butterfield	8148

Sample	Type	Site	Site Description	J2-581 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-581-HFS-21	fluid	N3 area	In a crack between lobates with white filaments surrounding the opening.	HFS unfiltered bag #22. Tmax=23.2 Tavg=22.0 T2=13 Vol=500ml. Z=1524m.	7/29	18	43	45	56.6230	-129	59.1140	Butterfield	8325
J2-581-HFS-22	fluid	N3 area	In a crack between lobates with white filaments surrounding the opening.	HFS filtered bag #21. Tmax=22.5 Tavg=21.8 T2=12 Vol=500ml. Z=1524m.	7/29	18	48	45	56.6230	-129	59.1140	Butterfield	8332
J2-581-HFS-23	fluid	N3 area	In a crack between lobates with white filaments surrounding the opening.	HFS RNA filter #15. Tmax=23.1 Tavg=21.4 T2=12. Vol=3000ml. Z=1524m.	7/29	18	53	45	56.6230	-129	59.1140	Huber / Butterfield	8337
J2-581-HFS-24	fluid	N3 area	In a crack between lobates with white filaments surrounding the opening.	HFS DNA Sterivex filter #11. Tmax=22.5 Tavg=20.1 T2=12. Vol=3000ml. Z=1524m.	7/29	19	17	45	56.6230	-129	59.1140	Huber / Butterfield	8365
J2-581-pillow-31 sample number out of order	geo	W of N3	West of N3 in collapse area.	Small piece of shiny black lava grabbed in the collapse to the west of N3 at start of transit from N3 to Mkr-33. Black elongate thin piece. In area of eruptive seds covering the lava. Some white mat in the area. Only a small triangular piece remains. Z=1528m. (renav position from virtual van)	7/29	19	50	45	56.6132	-129	59.1086	Chadwick	
J2-581-HFS-25	fluid	Mkr-33	In diffuse flow between the lobates. Lots of mat and even some biota.	HFS unfiltered piston #8. Tmax=25.6 Tavg=25.1 T2=12. Vol=650ml. Z=1518m.	7/29	22	12	45	55.9921	-129	58.9363	Butterfield	8660
J2-581-HFS-26	fluid	Mkr-33	In diffuse flow between the lobates. Lots of mat and even some biota.	HFS RNA filter #13. Tmax=25.9 Tavg=20.4 (not a good number because temp kept fluctuating) T2=10. Z=1518m. Vol=3000ml. Z=1518m.	7/29	22	17	45	55.9921	-129	58.9363	Huber / Butterfield	8666
J2-581-HFS-27	fluid	Mkr-33	In diffuse flow between the lobates. Lots of mat and even some biota.	HFS filtered piston #9. Tmax=27.1 Tavg=26.8 T2=12. Vol=650ml. Z=1518m.	7/29	22	42	45	55.9921	-129	58.9363	Butterfield	8695
J2-581-HFS-28	fluid	Mkr-33	In diffuse flow between the lobates. Lots of mat and even some biota.	HFS filtered bag #28. Tmax=27.3 Tavg=27.2 T2=13. Vol=475ml. Z=1518m.	7/29	22	49	45	55.9921	-129	58.9363	Butterfield	8702
J2-581-HFS-29	fluid	Mkr-33	In diffuse flow between the lobates. Lots of mat and even some biota.	HFS DNA filter #10. Tmax=28.2 Tavg=27.8 T2=12 Vol=3000ml Z=1518m.	7/29	22	52	45	55.9921	-129	58.9363	Huber / Butterfield	8708

Table 7.3.9 J2-583 Jason Samples (Marker 33 site, 2011 eruption sampling, Axial Seamount, JdFR)

Sample	Type	Site	Site Description	J2-583 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-583-HFS-01	fluid	Mkr-33	Area of diffuse flow between pillow lobes with mat and sparse biota. RAS 2011 site.	HFS filtered bag #23. Stop 0704. Tmax=21.7 Tavg=21.0 T2=11 Vol=475ml. Z=1519m. (Same spot as on J2-581)	7/31	07	01	45	55.9896	-129	58.9384	Butterfield	9278
J2-583-Mat-02	bio	Cotton Ball	Area of white fluffy mat on the eruptive (orange/tan) mat.	Small red syringe sample of white cotton-like mat on 2011 eruption lobate. Z=1520m.	7/31	09	45	45	55.6733	-129	58.9694	Mitchell	9563

Sample	Type	Site	Site Description	J2-583 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-583-Mat-03	bio	Cotton Ball	Area of white fluffy mat on the eruptive (orange/tan) mat.	Small blue syringe sample of orange/tan eruptive mat on 2011 eruption lobate. Z=1520m.	7/31	09	50	45	55.6733	-129	58.9694	Mitchell	9582
H2-582-HFS-04	fluid	Boca	In large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	HFS unfiltered bag #4. Tmax=16.8 Tavg=16.6 T2=9.3. Vol=475ml. Z=1519m.	7/31	10	38	45	55.6615	-129	58.9489	Butterfield	9629
H2-582-HFS-05	fluid	Boca	In large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	HFS filtered bag #21. Tmax=16.9 Tavg=16.7 T2=9.5. Vol=475ml. Z=1519m.	7/31	10	42	45	55.6615	-129	58.9489	Butterfield	9635
H2-582-HFS-06	fluid	Boca	In large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	HFS RNA filter #16. Tmax=17.0 Tavg=16.7 T2=9.5 Vol=3000ml. Z=1519m.	7/31	10	46	45	55.6615	-129	58.9489	Huber / Butterfield	9648
H2-582-HFS-07	fluid	Boca	In large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	HFS DNA filter #12. Tmax=17.1 Tavg=16.8 T2=9.4 Vol=3000ml Z=1519m.	7/31	11	11	45	55.6615	-129	58.9489	Huber / Butterfield	9664
H2-582-HFS-08	fluid	Boca	In large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	HFS filtered piston #5. Tmax=17.0 Tavg=16.9 T2=9.4 Vol=650ml. Z=1519m.	7/31	11	33	45	55.6615	-129	58.9489	Butterfield	9680
H2-582-GTB-09	gas	Boca	In large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	GTB red #9. Tmax=17.0. Z=1519m.	7/31	11	46	45	55.6615	-129	58.9489	Lilley / Evans	
J2-583-Rock-10	geo	Boca	Large circular raised holes on shiny black 2011 lava. Diffuse milky fluid and snowblower floc pouring out. Z=1519.	2011 fresh shiny black lava.	7/31	11	59	45	55.6615	-129	58.9489	Chadwick	9702
J2-583-HFS-11	fluid	Diva	High temperature anhydrite chimney.	Unfiltered piston #11. max=271 Tavg 270.6 T2=75 Vol=400ml. Z=1521m.	7/31	13	07	45	55.5822	-129	58.7436	Butterfield	9810
J2-583-GTHFS-12	gas	Diva	High temperature anhydrite chimney.	GTHFS purple port #10. Z=1521m.	7/31	13	10	45	55.5822	-129	58.7436	Lilley / Evans	9815
J2-583-HFS-13	fluid	Diva	High temperature anhydrite chimney.	HFS filtered piston #3. Tmax=272 Tavg=271.6 T2=82 Vol=400 ml. Z=1521m.	7/31	13	11	45	55.5822	-129	58.7436	Butterfield	9817

Sample	Type	Site	Site Description	J2-583 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-583-HFS-14	fluid	9m Chimney	Shimmering flow under a tiny spicket of focused flow in tubeworms.	HFS unfiltered piston #8. Tmax=35.2 Tavg=33.1 T2=15 Vol=650ml. Z=1517m.	7/31	14	20	45	55.5893	-129	58.7590	Butterfield	9885
J2-583-HFS-15	fluid	9m Chimney	Shimmering flow under a tiny spicket of focused flow in tubeworms.	HFS DNA Sterivex filter #10. Tmax=35.7 Tavg=32.7 T2=15 Vol=2000ml. Z=1517m.	7/31	14	27	45	55.5893	-129	58.7590	Huber / Butterfield	9893
J2-583-HFS-16	fluid	9m Chimney	Shimmering flow under a tiny spicket of focused flow in tubeworms.	HFS filtered bag #17. Tmax=32.1 Tavg=31 T2=14 Vol=480ml. Z=1517m.	7/31	14	47	45	55.5893	-129	58.7590	Butterfield	9907
J2-583-HFS-17	fluid	9m Chimney	Shimmering flow under a tiny spicket of focused flow in tubeworms.	HFS RNA filter #15. Tmax=32.0 Tavg=30.6 T2=15 Vol=3000ml. Z=1517m.	7/31	14	52	45	55.5893	-129	58.7590	Huber / Butterfield	9912
J2-583-Mat-18	bio	9m Chimney	Shimmering flow under a tiny spicket of focused flow in tubeworms.	Large red syringe sample of blue mat from the base of mound near the fluid sampling site. Got a little bit of blue mat in the sampler. Z=1517m.	7/31	15	38	45	55.5893	-129	58.7590	Mitchell	9950
J2-583-HFS-19	fluid	El Guapo	One of the two sulfide spires at the top of chimney.	HFS unfiltered piston #22. Tmax=330.5 Tavg=329.7 T2=78 Vol=550ml. Z=1504m.	7/31	16	15	45	55.5930	-129	58.7720	Butterfield	10051
J2-583-HFS-20	fluid	El Guapo	One of the two sulfide spires at the top of chimney.	HFS unfiltered piston #4. Tmax=330.8 Tavg=330.5 T2=84 Vol=551ml. Z=1504m.	7/31	16	19	45	55.5930	-129	58.7720	Butterfield	10056
J2-583-GTHFS-21	gas	El Guapo	One of the two sulfide spires at the top of chimney.	GTHFS center orange / black #7. Tmax=330.8. Z=1504m.	7/31	16	23	45	55.5930	-129	58.7720	Lilley / Evans	10061
J2-583-Major-22	fluid	El Guapo	One of the two sulfide spires at the top of chimney.	Major fluid sampler #22. Tmax=330.8. Z=1504m.	7/31	16	35	45	55.5930	-129	58.7720	Butterfield	10081
J2-583-HFS-23	fluid	Escargot	Diffuse venting from worm patch on side of vent.	HFS unfiltered bag #18. Tmax=10.3 Tavg=9 T2=5.5 vol=603ml. Z=1520m.	7/31	17	22	45	55.5830	-129	58.7510	Butterfield	10138
J2-583-HFS-24	fluid	Escargot	Diffuse venting from worm patch on side of vent.	HFS RNA filter #14. Tmax=10.5 Tavg=9.6 T2=5.7 Vol=3024ml. Z=1520m.	7/31	17	28	45	55.5830	-129	58.7510	Huber / Butterfield	10146
J2-583-HFS-25	fluid	Escargot	Diffuse venting from worm patch on side of vent.	HFS DNA filter #11. Tmax=10.4 Tavg=9.3 T2=5.3 Vol=3001ml. Z=1520m	7/31	17	58	45	55.5830	-129	58.7510	Huber / Butterfield	10179
J2-583-HFS-26	fluid	Escargot	Diffuse venting from worm patch on side of vent.	HFS unfiltered bag #20. Tmax=9.8 Tavg=9.6 T2=5.6 Vol=602ml. Z=1520m.	7/31	18	23	45	55.5830	-129	58.7510	Butterfield	10200
J2-583-Mat-27	bio	Escargot	Diffuse venting from worm patch on side of vent.	Small yellow syringe sample of sediment / mat. Z=1520m.	7/31	18	38	45	55.5830	-129	58.7510	Mitchell	10219
J2-583-HFS-28	fluid	Castle	Small anhydrite chimney near the base of Castle sulfide structure.	HFS unfiltered piston #6. Tmax=266.5 Tavg=266.4 T2=45. Vol=302ml. Z=1519m.	7/31	19	31	45	55.5711	-129	58.8051	Butterfield	10261
J2-583-HFS-29	fluid	Castle	Small anhydrite chimney near the base of Castle sulfide structure.	HFS filtered piston #7. Tmax=266.4 Tavg=266.2 T2=58. Vol=301ml. Z=1519m.	7/31	19	36	45	55.5711	-129	58.8051	Butterfield	10238

Sample	Type	Site	Site Description	J2-583 Sample Descriptions	Date	hr	min	Lat Deg	Lat Min	Long Deg	Long Min	Contact	vv#
J2-583-GTHFS-30	gas	Castle	Small anhydrite chimney near the base of Castle sulfide structure.	GTHFS stbd blue #12. Tmax=266.5. Z=1519m.	7/31	19	34	45	55.5711	-129	58.8051	Lilley / Evans	10281
J2-583-GTB-31	gas	Castle	Small anhydrite chimney near the base of Castle sulfide structure.	Gastight black #8. Tmax=266.5. Z=1519m.	7/31	19	41	45	55.5711	-129	58.8051	Lilley / Evans	10287
J2-583-GTB-32	gas	Castle	Small anhydrite chimney near the base of Castle sulfide structure.	Gastight white #17. Tmax=266.5. Z=1519m.	7/31	19	46	45	55.5711	-129	58.8051	Lilley / Evans	

7.4 Jason Dive Logs

The latitude/longitude positions of most of samples in the log were provided by the Jason navigators, based on observations of the incoming fixes while sitting in one place (usually the “cursor” position in the middle of the scatter of fixes). These positions will vary slightly from the final Jason dive track navigation (renav), which merges the USBL and Doppler positions. Positions in the dive logs are Jason renav. All date and time stamps are UTC, 7 hours ahead of local Pacific time.

Table 7.4.1 J2-574 Jason Dive Log (High Rise Field, Endeavour Segment, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	0	13	49									JASON: Jason on bottom
7/21	0	14	30									JASON: Depth 2191.4m; HDG 291.3
7/21	0	14	57									Just settling in waiting for the nav to settle in.
7/21	0	16	6									NAV: Doppler Reset
7/21	0	17	50	47.968513	-129.085943	292	-10	0	7	2187	2194	Location: We are located outside the vent field E/SE of it.
7/21	0	20	30	47.968506	-129.085956	269	-11	0	7	2187	2194	Preparing to sample. J2-574-HFS-01 Background sample.
7/21	0	21	13	47.968498	-129.085962	266	-11	0	7	2187	2194	SAMPLE: fluid J2-574-HFS-01 Background sample. Start 0020. Unfiltered piston #8.
7/21	0	22	0	47.968497	-129.085969	266	-11	0	7	2187	2194	J2-574-HFS-01 cont. Dave is looking at the sampler to make sure all is well.
7/21	0	23	10	47.968497	-129.085969	266	-11	0	7	2187	2194	J2-574-HFS-01 Location: 47 58.109 129 5.158 Z=2187.
7/21	0	24	37	47.968497	-129.085969	266	-11	0	7	2187	2194	Moving now. Still sampling.
7/21	0	24	51	47.968497	-129.085970	266	-11	0	7	2187	2194	J2-574-HFS-01 Stop 0024:45.
7/21	0	26	6	47.968489	-129.086240	266	-15	0	6	2187	2193	J2-574-HFS-01. Unfiltered piston #8. Background sample. Hdg 270. Tmax=1.8. Tavg=1.8. T2=1.8. Vol=600ml. Location: 47 58.109 129 5.158 Z=2187.
7/21	0	26	42	47.968483	-129.086490	265	-12	0	8	2187	2195	Still moving toward Bambi to check out Marv Lilley's resistivity probe.
7/21	0	27	49	47.968472	-129.086601	265	-10	0	5	2186	2192	Still moving toward Bambi rattail in science cam.
7/21	0	29	54	47.968505	-129.086659	294	-10	-1	9	2181	2190	Still moving looking at cool rocks on the seafloor.
7/21	0	30	9	47.968512	-129.086655	295	-10	0	10	2180	2190	Jason is moving up in depth
7/21	0	32	4	47.968555	-129.086732	295	-10	0	8	2160	2168	JASON: HDG 294.6; depth 2160.5
7/21	0	33	39	47.968480	-129.086937	290	-10	-1	11	2157	2168	Moving towards Bambi; HDG 289.4
7/21	0	35	10	47.968503	-129.087044	289	-11	0	8	2159	2167	Jason is still moving towards Bambi to locate resistivity probe; hdg 289.7
7/21	0	36	14	47.968519	-129.087162	289	-11	0	2	2159	2160	Pilots and science discussing the best way to approach the chimney.
7/21	0	36	27	47.968520	-129.087150	319	-10	-2	2	2159	2161	NAV: Doppler Reset
7/21	0	36	58	47.968563	-129.087124	22	-12	0	2	2159	2161	Jason should be coming up to Bambi on the right; HDG 23.0
7/21	0	38	3	47.968557	-129.087085	331	-11	0	2	2159	2160	Sonar showing large structure dead ahead smaller structure on the left. There is discussion of which heading to follow.
7/21	0	38	46	47.968625	-129.087161	335	-11	1	3	2158	2161	Navigation suggests driving on to one structure and seeing what we see.
7/21	0	39	29	47.968681	-129.087140	19	-11	1	6	2154	2160	Still in the process of locating the Bambi vent
7/21	0	41	12	47.968646	-129.087103	37	-12	0	9	2151	2160	We have come upon a vertical structure unsure if this is the correct vent verifying with Marv.
7/21	0	42	0	47.968641	-129.087061	21	-10	1	16	2144	2160	Adjusting depth closer to 2140m to determine if this is the right vent.
7/21	0	42	37	47.968661	-129.087081	20	-11	0	17	2142	2160	Medea is being adjusted.
7/21	0	43	0	47.968670	-129.087084	20	-11	0	17	2142	2159	We have reached Bambi we see the PIG.
7/21	0	43	34	47.968684	-129.087079	31	-10	0	17	2141	2159	Marv is directing photo taking operation before we try to remove it.
7/21	0	43	44	47.968687	-129.087076	30	-11	1	17	2141	2158	Big billowing smoker on the top of Bambi.
7/21	0	43	56	47.968687	-129.087073	30	-11	0	17	2141	2159	Looks very different from previous dives.
7/21	0	44	2	47.968689	-129.087072	30	-11	0	17	2141	2158	HIGHLIGHTS: KiPro hard drive start
7/21	0	45	2	47.968688	-129.087075	30	-11	0	17	2141	2158	Close up photographs of resistivity probe are being taken.
7/21	0	45	51	47.968688	-129.087077	30	-11	0	17	2141	2158	Lots of diffuse fluid surrounding resistivity probe hard to tell where it is.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	0	50	41	47.968689	-129.087095	30	-11	0	16	2141	2158	The flange on the lower right is brand new - not there last year. It's right next to the resistivity probe.
7/21	0	51	5	47.968692	-129.087095	30	-10	0	16	2142	2158	Great view in the port arm camera of a larger flange.
7/21	0	52	20	47.968695	-129.087095	45	-11	0	16	2142	2158	This structure is ~22 meters tall with black smoker beehives pouring out black smoke.
7/21	0	53	0	47.968694	-129.087096	45	-11	0	16	2142	2158	Lots of life here. Looks like sulfide worms covering the top of this structure.
7/21	0	53	14	47.968694	-129.087096	45	-11	0	16	2142	2157	HIGHLIGHTS: KiPro hard drive stop
7/21	0	54	12	47.968696	-129.087099	51	-9	-2	15	2142	2157	The flange has overgrown the black smoker that they put the probe in. The flow has totally changed.
7/21	0	55	0	47.968696	-129.087097	59	-9	-1	14	2142	2156	The tubeworms look close to dead. Ray Lee says it's probably gotten a lot hotter lately.
7/21	0	56	15	47.968696	-129.087098	59	-11	-1	15	2142	2157	Getting set up to put the ICL (little cone) over the resistivity probe to test the ICL wind for data recovery from the resistivity probe.
7/21	0	57	9	47.968696	-129.087099	59	-10	-2	15	2142	2157	The position right here at Bambi is ~10 meters north of the 2010 Jason positions.
7/21	0	57	17	47.968696	-129.087099	59	-10	-2	15	2142	2157	HIGHLIGHTS: KiPro hard drive start
7/21	0	59	23	47.968696	-129.087101	58	-10	-2	15	2142	2157	Moving in to grab the ICL.
7/21	1	0	54	47.968696	-129.087102	58	-10	-3	15	2142	2157	Still working on picking up the ICL
7/21	1	1	4	47.968696	-129.087102	58	-10	-3	15	2142	2157	whoops.... picking up the ICL.
7/21	1	3	35	47.968697	-129.087103	58	-10	-2	15	2142	2157	Listening to the ICL now. The instrument with the cone is hopefully sending a signal to the loop (ICL).
7/21	1	3	55	47.968697	-129.087103	58	-10	-2	15	2142	2157	It's working. 340.9 degrees.
7/21	1	4	25	47.968698	-129.087102	58	-10	-2	15	2142	2157	The ICL is the loop. The instrument with the cone is the resistivity probe.
7/21	1	6	31	47.968699	-129.087103	58	-10	-2	15	2142	2157	Ambient temp is 3.1 C - according to the ICL.
7/21	1	9	9	47.968700	-129.087103	58	-10	-2	15	2142	2157	This instrument has been down for 13 months.
7/21	1	9	42	47.968700	-129.087103	58	-10	-2	15	2142	2157	Last year it was inserted into a small orifice - lots of material has grown around it since.
7/21	1	11	26	47.968701	-129.087103	58	-10	-2	15	2142	2157	HIGHLIGHTS: DVD Deck start HD on.
7/21	1	12	20	47.968701	-129.087103	58	-10	-3	15	2142	2157	Removing Resistivity Probe.
7/21	1	13	40	47.968702	-129.087103	58	-11	-2	15	2142	2157	Discussing strategies for best way to remove probe.
7/21	1	15	15	47.968703	-129.087102	57	-10	-2	15	2142	2157	HIGHLIGHTS: KiPro hard drive stop
7/21	1	15	42	47.968703	-129.087102	58	-11	-2	15	2142	2157	Correction DVD Deck start was for the HD being turned on.
7/21	1	16	17	47.968703	-129.087102	58	-11	-2	15	2142	2157	Going to take the T handle on the ResProbe.
7/21	1	16	46	47.968703	-129.087102	57	-11	-2	15	2142	2157	HIGHLIGHTS: KiPro hard drive start
7/21	1	18	34	47.968704	-129.087101	54	-15	-2	16	2142	2158	May have to excavate down to the probe to get it out.
7/21	1	19	33	47.968705	-129.087101	54	-15	-2	16	2142	2158	Zooming in for a better view on science cam.
7/21	1	21	37	47.968705	-129.087102	55	-15	-2	16	2142	2158	Probe is broken free - going to try turning it.
7/21	1	21	51	47.968705	-129.087102	57	-13	-2	16	2142	2157	Probe is out.
7/21	1	23	5	47.968706	-129.087102	57	-12	-2	15	2142	2157	Waiting for ceramic on Res Probe to cool before lifting more.
7/21	1	24	6	47.968706	-129.087102	57	-12	-2	15	2142	2157	Probe is totally out of orifice.
7/21	1	24	16	47.968706	-129.087102	57	-12	-2	16	2142	2158	Going to bring probe into basket.
7/21	1	25	54	47.968707	-129.087102	57	-12	-2	15	2142	2157	Dropped probe - did not have a good grip on T handle.
7/21	1	27	21	47.968708	-129.087103	57	-11	-3	15	2142	2157	Moving probe into basket.
7/21	1	28	6	47.968708	-129.087102	57	-11	-2	15	2142	2157	Res Probe stowed in basket.
7/21	1	29	40	47.968709	-129.087103	56	-11	-2	15	2142	2157	Correction -- actually stowed sensor wand in basket.
7/21	1	29	58	47.968709	-129.087103	56	-10	-2	15	2142	2157	Now picking up Res Probe.
7/21	1	30	43	47.968709	-129.087102	57	-11	-3	15	2142	2157	Res probe covered in limpets.
7/21	1	30	46	47.968709	-129.087102	57	-11	-3	15	2142	2157	HIGHLIGHTS: KiPro hard drive stop
7/21	1	32	54	47.968710	-129.087102	57	-10	-3	15	2142	2157	Restivity probe stowed in basket now.
7/21	1	33	28	47.968710	-129.087102	57	-10	-3	15	2142	2157	Correction - Resistivity probe.
7/21	1	34	41	47.968711	-129.087101	57	-11	-2	15	2142	2157	Marv and Dave discussing water sampling sites.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	1	36	30	47.968712	-129.087101	57	-11	-3	15	2142	2157	Not going to leave a marker here.
7/21	1	37	54	47.968712	-129.087101	57	-11	-2	15	2142	2157	Picking up gas-tight black-orange #7.
7/21	1	39	10	47.968713	-129.087101	57	-12	-1	15	2142	2157	Gas-tight back in basket.
7/21	1	39	16	47.968713	-129.087101	57	-11	-1	15	2142	2157	Checking out sampling area for best approach.
7/21	1	41	57	47.968714	-129.087101	57	-12	-2	15	2142	2157	Approaching black smoker vent.
7/21	1	44	48	47.968715	-129.087101	56	-12	-2	15	2142	2157	Gastight #7 in Jason arm.
7/21	1	45	11	47.968716	-129.087101	57	-12	-2	15	2142	2157	Trying to get gastight into smoker
7/21	1	45	18	47.968716	-129.087101	57	-12	-2	15	2142	2157	Firing gastight #7.
7/21	1	45	48	47.968716	-129.087101	56	-12	-2	15	2142	2157	SAMPLE: gas J2-574-GTB-02 . Gastight #7 black-orange fired at 01:44:58 into black smoker hole. Location: 47 58.124 129 5.226. Z=2142. ResProbe hole.
7/21	1	49	1	47.968717	-129.087102	56	-10	-2	15	2142	2157	Stowing gastight in Jason basket.
7/21	1	50	18	47.968718	-129.087102	57	-10	-2	15	2142	2157	Putting bungee on probe in basket.
7/21	1	51	3	47.968718	-129.087102	57	-11	-2	15	2142	2157	Gastight sampler secured in basket.
7/21	1	52	4	47.968718	-129.087101	57	-11	-1	15	2142	2157	Getting Jason temp probe.
7/21	1	54	34	47.968720	-129.087101	57	-11	-2	15	2142	2157	TEMPS: Jason temperature Inserting Jason temp probe in ResProbe vent.
7/21	1	55	13	47.968720	-129.087102	57	-12	-2	15	2142	2157	Temperature at 298 and rising
7/21	1	56	19	47.968720	-129.087102	57	-11	-2	15	2142	2157	Temperature at 339.6 C and stable.
7/21	1	56	37	47.968720	-129.087101	57	-11	-2	15	2142	2157	Stowing Jason temp in basket.
7/21	1	59	31	47.968722	-129.087102	57	-10	-2	15	2142	2157	Jason temp probe stowed.
7/21	2	0	51	47.968721	-129.087105	58	-11	-1	15	2142	2157	Flange is in the way of the Jason arm.
7/21	2	0	57	47.968721	-129.087105	58	-11	-1	15	2142	2157	Repositioning Jason arm.
7/21	2	1	36	47.968721	-129.087105	57	-11	-1	15	2142	2157	Getting HFS intake arm out of basket.
7/21	2	3	8	47.968722	-129.087105	57	-12	-1	16	2142	2157	Putting HFS intake into same vent orifice ResProbe was in.
7/21	2	3	20	47.968722	-129.087105	57	-12	-1	15	2142	2157	This vent orifice is the same orifice the gastight #7 was fired in.
7/21	2	3	50	47.968722	-129.087105	57	-12	-2	16	2142	2157	HFS intake wand in.
7/21	2	4	8	47.968722	-129.087105	57	-12	-2	15	2142	2157	Temperature only 4C.
7/21	2	4	22	47.968722	-129.087105	57	-11	-1	15	2142	2157	Going to re-position intake deeper in vent.
7/21	2	5	40	47.968723	-129.087105	57	-12	-2	16	2142	2157	Jason arm may be on rock and preventing intake from being inserted deeper.
7/21	2	6	12	47.968724	-129.087105	58	-12	-2	16	2142	2157	Trying a new angle into the vent for the HFS intake.
7/21	2	6	21	47.968724	-129.087105	58	-12	-2	16	2142	2157	Temp about 149 C.
7/21	2	6	34	47.968724	-129.087105	57	-12	-2	16	2142	2157	Temp 100C and still rising.
7/21	2	6	42	47.968724	-129.087105	57	-12	-2	16	2142	2157	Temp 250C and rising.
7/21	2	6	55	47.968724	-129.087105	58	-12	-2	16	2142	2157	Temp 310 and rising.
7/21	2	7	21	47.968724	-129.087105	57	-12	-2	16	2142	2157	Temp 330C. T2 at 80C.
7/21	2	7	57	47.968725	-129.087105	58	-12	-2	16	2142	2157	Temp T1 holding at 339C.
7/21	2	8	28	47.968725	-129.087105	57	-12	-2	16	2142	2157	SAMPLE: gas J2-574-GTHFS-03 . Taking port gas tight purple #10. Location: 47 58.124 129 5.226. Z=2142. ResProbe hole.
7/21	2	9	7	47.968725	-129.087105	57	-12	-2	16	2142	2157	Temp holding at T1=340.3 and T2=115.5C.
7/21	2	9	58	47.968726	-129.087105	57	-12	-2	16	2142	2157	SAMPLE: fluid. J2-572-HFS-04 . HFS filtered piston #1 starting
7/21	2	10	16	47.968726	-129.087105	57	-12	-2	16	2142	2157	Temp 340.2 C
7/21	2	12	43	47.968727	-129.087105	57	-12	-2	16	2142	2157	400mL and still pumping.
7/21	2	12	50	47.968727	-129.087105	57	-12	-2	16	2142	2157	Flushing at 3L/min.
7/21	2	13	1	47.968727	-129.087105	58	-12	-2	16	2142	2157	T2 = 107C.
7/21	2	14	4	47.968727	-129.087105	57	-12	-2	16	2141	2157	SAMPLE: fluid J2-572-HFS-04 finished.
7/21	2	15	3	47.968728	-129.087105	57	-12	-2	16	2141	2157	J2-574-HFS-04 Tmax=340.7 Tavg =340.3 T2= 105. vol 600mL. Location: 47 58.124 129 5.226. Z=2142. ResProbe hole.
7/21	2	17	3	47.968728	-129.087106	57	-12	-2	16	2141	2157	J2-574-HFS-04 start time was 02:09:58 and end=02:14:04.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	2	17	46	47.968728	-129.087106	57	-12	-2	16	2141	2157	SAMPLE: fluid J2-574-HFS-05 fluid sample is unfiltered piston #2. Location: 47 58.124 129 5.226. Z=2142. ResProbe hole.
7/21	2	18	27	47.968729	-129.087106	57	-12	-2	16	2141	2157	SAMPLE: fluid J2-574-HFS-05 finished
7/21	2	19	32	47.968729	-129.087106	57	-12	-2	16	2141	2157	J2-574-HFS-05 start 02:14:52 end=02:18:06. Tmax=341.0 Tavg=340.7 T2=110C. Vol=600mL.
7/21	2	19	48	47.968729	-129.087106	58	-12	-2	16	2141	2157	SAMPLE: fluid filtered bag #23 starting. J2-574-HFS-06.
7/21	2	22	22	47.968730	-129.087107	58	-12	-2	16	2141	2157	SAMPLE: fluid J2-574-HFS-06 still sampling.
7/21	2	23	3	47.968730	-129.087107	58	-11	-2	16	2141	2157	SAMPLE: fluid. Looking for diffuse flow fluids in this area.
7/21	2	23	8	47.968730	-129.087107	58	-12	-2	16	2141	2157	Can see some on top of the flange.
7/21	2	24	29	47.968731	-129.087107	58	-12	-2	16	2141	2157	SAMPLE: fluid HFS-06 done.
7/21	2	25	33	47.968731	-129.087107	58	-12	-2	15	2141	2157	SAMPLE: fluid J2-574-HFS-06: start 02:19:27. end=02:24:08. Tmax=341.8C. Tavg=341.4C. T2=110C. vol=550mL. Location: 47 58.124 129 5.226. Z=2142. ResProbe hole.
7/21	2	26	25	47.968731	-129.087108	58	-11	-2	15	2142	2157	Moving intake arm of HFS to diffuse flow area.
7/21	2	28	49	47.968732	-129.087108	57	-10	-3	15	2142	2157	Looking at temperature in this diffuse flow next to ResProbe vent hole.
7/21	2	29	52	47.968733	-129.087109	57	-10	-3	15	2142	2157	The temperature is going down.
7/21	2	30	54	47.968733	-129.087110	58	-10	-4	15	2142	2157	Checking the temperature in this diffuse area.
7/21	2	31	49	47.968733	-129.087110	58	-10	-4	15	2142	2156	Temp is hovering around T1=24C.
7/21	2	32	41	47.968734	-129.087110	58	-10	-4	15	2142	2157	SAMPLE: fluid J2-574-HFS-07 Filtered bag #17
7/21	2	34	21	47.968734	-129.087110	58	-10	-4	15	2142	2157	SAMPLE: fluid Still filtering sample.
7/21	2	34	43	47.968734	-129.087111	58	-10	-4	16	2142	2157	SAMPLE: fluid J2-574-HFS-07 slowing down - lots of material here.
7/21	2	36	9	47.968735	-129.087111	59	-10	-4	15	2142	2157	SAMPLE: fluid HFS-07 end
7/21	2	37	8	47.968735	-129.087111	58	-10	-4	15	2142	2156	J2-574-HFS-07: filtered bag #17. start=02:32:20. end=02:35:48. Tmax=25.1 C. Tavg=23.3 C. T2=10.5 C. vol=408mL
7/21	2	37	25	47.968735	-129.087111	58	-10	-4	15	2141	2156	SAMPLE: fluid. J2-HFS-08. unfiltered bag 18 start.
7/21	2	38	33	47.968736	-129.087111	58	-10	-4	15	2141	2157	J2-574-HFS-08 is unfiltered bag #18.
7/21	2	40	39	47.968736	-129.087111	57	-10	-3	15	2141	2157	SAMPLE: fluid J2-574-HFS-08 done.
7/21	2	41	36	47.968737	-129.087111	58	-10	-4	15	2141	2157	SAMPLE: fluid J2-574-HFS-08: Tmax=24.8 Tavg=23.5. T2=12. vol=600mL. start=02:37:03. end=02:40:17. unfiltered bag #18.
7/21	2	41	53	47.968737	-129.087111	58	-10	-3	16	2141	2157	Finished with HFS for now.
7/21	2	42	2	47.968737	-129.087111	58	-11	-3	15	2141	2157	Stowing HFS wand in Jason basket.
7/21	2	43	43	47.968737	-129.087111	58	-12	-1	15	2141	2157	Looking at sampling possibilities for McPhail syringe sampler.
7/21	2	44	56	47.968738	-129.087111	58	-11	-1	15	2141	2157	Stowing HFS wand in Jason basket.
7/21	2	45	31	47.968738	-129.087111	59	-12	-2	16	2141	2157	HFS wand stowed.
7/21	2	45	56	47.968738	-129.087111	59	-11	-1	16	2141	2157	Going to use syringe sampler for McPhail lab.
7/21	2	47	10	47.968738	-129.087113	58	-10	-3	15	2141	2156	Undoing rubber band on syringe.
7/21	2	47	46	47.968739	-129.087113	58	-11	-3	15	2141	2157	HIGHLIGHTS: KiPro hard drive start
7/21	2	48	22	47.968739	-129.087113	59	-10	-3	16	2141	2157	Going to try and sample black dust.
7/21	2	48	49	47.968739	-129.087114	59	-10	-3	16	2141	2157	SAMPLE: bio Triggered syringe. Mistake.....
7/21	2	49	0	47.968739	-129.087114	59	-10	-3	15	2141	2157	Syringe triggered by mistake.
7/21	2	49	19	47.968739	-129.087114	59	-10	-3	15	2141	2157	Rotating the arm triggered the syringe.
7/21	2	49	57	47.968739	-129.087114	59	-10	-3	16	2141	2157	The syringe piston is too sensitive.
7/21	2	50	10	47.968739	-129.087114	59	-10	-3	16	2141	2157	Stowing syringe sampler back in Jason basket.
7/21	2	50	40	47.968740	-129.087114	59	-10	-3	15	2141	2157	HIGHLIGHTS: KiPro hard drive stop
7/21	2	51	55	47.968740	-129.087114	58	-10	-3	15	2141	2157	Going to try and collect sulfide now.
7/21	2	54	4	47.968741	-129.087115	58	-10	-3	15	2141	2157	Tying bungee down over pigpen.
7/21	2	54	57	47.968741	-129.087114	59	-11	-1	16	2141	2157	Bungee cord too short.
7/21	2	55	45	47.968741	-129.087114	59	-11	1	14	2141	2156	Broke flange with Jason arm.
7/21	2	56	23	47.968741	-129.087114	59	-11	1	14	2141	2156	Tying bungee with other arm.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	2	57	35	47.968742	-129.087114	59	-12	0	16	2141	2157	Trying to stretch bungee across pigpen.
7/21	2	58	45	47.968742	-129.087115	58	-11	-1	15	2141	2157	Bungee tied down.
7/21	2	58	55	47.968742	-129.087115	58	-11	-1	15	2141	2157	Going to collect sulfide.
7/21	2	59	56	47.968743	-129.087115	58	-11	-1	15	2141	2157	Discussing best way to collect sulfides.
7/21	3	0	53	47.968744	-129.087113	58	-10	-1	15	2141	2157	May try to grab sulfides but may be better to use scoop.
7/21	3	1	19	47.968742	-129.087117	57	-11	-1	15	2141	2157	Retracting Jason basket.
7/21	3	1	39	47.968729	-129.087128	59	-10	-1	14	2141	2156	HIGHLIGHTS: KiPro hard drive start
7/21	3	2	3	47.968697	-129.087092	57	-9	-1	18	2139	2157	Pulling away from Bambi to approach sulfides from other direction.
7/21	3	2	22	47.968683	-129.087062	59	-10	-2	18	2141	2159	Going to drop weights on starboard side.
7/21	3	2	41	47.968686	-129.087070	60	-12	-2	19	2141	2159	HIGHLIGHTS: KiPro hard drive stop
7/21	3	3	29	47.968686	-129.087069	60	-11	-4	19	2141	2159	Jason away from vent formation. Dropping weights.
7/21	3	4	4	47.968687	-129.087069	60	-11	-4	18	2141	2159	Basket out. Picking weights out of basket.
7/21	3	4	42	47.968687	-129.087069	60	-13	1	19	2141	2159	Dropping weights.
7/21	3	5	7	47.968687	-129.087070	60	-10	-1	18	2141	2159	Retracting basket.
7/21	3	6	20	47.968688	-129.087073	60	-9	-1	20	2139	2159	Driving to other side of Bambi vent formation.
7/21	3	6	35	47.968689	-129.087074	60	-9	-1	20	2138	2159	Checking how much weight is on Jason.
7/21	3	8	4	47.968694	-129.087083	60	-9	-1	21	2138	2159	Doppler says we are 25m from bottom.
7/21	3	8	19	47.968714	-129.087123	60	-9	-1	21	2138	2159	This sulfide formation is ~25m high.
7/21	3	8	43	47.968732	-129.087158	60	-9	-1	20	2138	2158	Jason needs ~60lbs of buoyancy. We are at 60lbs now.
7/21	3	8	48	47.968732	-129.087160	60	-9	-1	20	2138	2158	Can only collect a small rock.
7/21	3	9	6	47.968738	-129.087145	60	-9	-1	18	2139	2157	Using port swing arm box for rock collection.
7/21	3	9	9	47.968738	-129.087143	60	-9	-1	18	2139	2157	HIGHLIGHTS: KiPro hard drive start
7/21	3	9	37	47.968728	-129.087155	59	-9	-1	18	2139	2157	Approaching chimney tops.
7/21	3	11	3	47.968635	-129.087212	60	-10	-1	24	2138	2162	Port swing arm box out.
7/21	3	11	48	47.968642	-129.087113	59	-10	-1	20	2141	2161	Want to move Jason counterclockwise around vents.
7/21	3	12	56	47.968729	-129.087098	17	-9	-1	18	2140	2158	Coming into chimneys.
7/21	3	13	18	47.968734	-129.087091	17	-10	-1	18	2140	2158	Frame Grab:
7/21	3	14	3	47.968734	-129.087060	355	-9	-1	18	2140	2159	Do not want to destroy entire flange so looking for a good spot to sample.
7/21	3	16	12	47.968740	-129.087067	294	-3	-5	12	2141	2154	Chimney venting black plumes and covered in limpets.
7/21	3	16	57	47.968741	-129.087067	295	-4	-1	12	2141	2154	Some red thread-like worms also on chimney.
7/21	3	17	12	47.968741	-129.087067	295	-4	-2	12	2141	2153	Opening port swing arm box lid.
7/21	3	17	41	47.968741	-129.087067	295	-4	-2	13	2141	2154	Lid open.
7/21	3	17	53	47.968741	-129.087067	296	-4	-1	13	2141	2154	Going to collect sulfide chimney 6-8 inches down from top.
7/21	3	19	7	47.968742	-129.087068	296	-5	0	14	2141	2155	SAMPLE: geo Collected GEO-SULFIDE-09
7/21	3	19	26	47.968742	-129.087068	296	-5	0	14	2141	2155	Chimney piece is crumbling.
7/21	3	19	42	47.968742	-129.087068	296	-5	0	14	2141	2155	Chimney piece broke.
7/21	3	19	51	47.968742	-129.087068	296	-5	0	13	2141	2154	Chimney piece disintegrated.
7/21	3	20	13	47.968743	-129.087068	296	-5	0	14	2141	2155	SAMPLE: geo CORRECTION: GEO-SULFIDE-09 NOT COLLECTED.
7/21	3	20	30	47.968743	-129.087069	296	-5	0	14	2141	2155	Using scoop to collect sulfides instead.
7/21	3	21	6	47.968743	-129.087068	296	-3	-1	12	2141	2154	HIGHLIGHTS: KiPro hard drive stop
7/21	3	22	7	47.968743	-129.087069	296	-3	-1	12	2141	2154	Going to use scoop on front of pigpen.
7/21	3	23	37	47.968744	-129.087069	296	-4	-1	12	2141	2154	Scoop bag out in arm.
7/21	3	23	54	47.968744	-129.087069	296	-4	-1	12	2141	2153	Scoop bag next to chimney.
7/21	3	24	18	47.968745	-129.087070	296	-4	0	12	2141	2154	Moving bag down to base of chimney.
7/21	3	24	43	47.968745	-129.087070	296	-4	1	13	2141	2154	Actually moving bag to right of chimney.
7/21	3	25	32	47.968745	-129.087070	296	-4	0	12	2141	2154	Positioning bag so chimney can easily be knocked into it.
7/21	3	25	53	47.968746	-129.087070	296	-4	0	14	2141	2155	Chimney is more solid than it looked - not breaking.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	3	26	54	47.968746	-129.087070	296	-4	0	13	2141	2154	Going to try to push chimney into bag.
7/21	3	27	13	47.968746	-129.087070	296	-4	0	13	2141	2154	Chimney breaking but not falling yet.
7/21	3	27	55	47.968747	-129.087070	296	-4	0	14	2141	2155	Going to try to tweak chimney in with craft arm.
7/21	3	29	25	47.968747	-129.087071	296	-4	-1	13	2141	2154	Right arm approaching chimney.
7/21	3	30	40	47.968748	-129.087071	296	-4	-2	13	2141	2154	Considering best way to collect chimney.
7/21	3	31	13	47.968748	-129.087071	296	-5	-1	12	2141	2153	SAMPLE: geo Chimney piece collected in arm.
7/21	3	31	25	47.968748	-129.087071	296	-4	-1	13	2141	2154	SAMPLE: geo Large piece of chimney fell into bag.
7/21	3	32	14	47.968748	-129.087071	296	-5	-1	13	2141	2154	SAMPLE: geo Sulfide chimney crumbled and fell out of bag.
7/21	3	34	4	47.968749	-129.087071	296	-3	-3	12	2141	2153	SAMPLE: geo J2-574-SULFIDE-09 collected in scoop bag in port arm box. Location: 47 58.124 129 5.2245. Z=2141
7/21	3	34	13	47.968749	-129.087071	296	-3	-2	12	2141	2153	Pieces of chimney fell into bag.
7/21	3	36	10	47.968749	-129.087072	296	-4	-2	12	2141	2153	Putting scoop bag into port swing box.
7/21	3	37	15	47.968750	-129.087072	295	-3	-2	11	2141	2152	Port box top closed.
7/21	3	37	37	47.968750	-129.087072	296	-4	-2	13	2141	2154	Tying box top closed with bungee.
7/21	3	39	31	47.968750	-129.087072	295	-4	-5	11	2141	2152	Retracting port swing arm box.
7/21	3	39	58	47.968741	-129.087064	295	-3	-4	12	2141	2153	Next -- moving Jason to Godzilla.
7/21	3	40	10	47.968736	-129.087068	295	-12	-2	22	2140	2163	Godzilla should be about 15m NE of Bambi.
7/21	3	40	21	47.968727	-129.087067	298	-10	0	22	2140	2162	Going to look for a place at Godzilla to use HFS.
7/21	3	42	17	47.968780	-129.087284	52	-11	0	27	2134	2161	Approaching some chimneys with flanges.
7/21	3	46	11	47.968857	-129.087279	73	-11	-1	21	2137	2158	Still looking for Godzilla.
7/21	3	46	41	47.968889	-129.087307	100	-11	0	22	2136	2159	See some smoke coming out of a vent here.
7/21	3	47	32	47.968871	-129.087313	124	-11	0	25	2136	2161	Repositioning ship to have Medea on other side of Jason.
7/21	3	49	45	47.968874	-129.087234	125	-13	0	21	2139	2160	Moving Medea up away from Jason.
7/21	3	51	24	47.968858	-129.087119	214	-11	-1	17	2139	2156	We are at Godzilla.
7/21	3	51	38	47.968852	-129.087113	234	-11	-1	16	2139	2155	There are lots of venting orifices on the structure.
7/21	3	52	50	47.968839	-129.087084	253	-10	0	24	2136	2160	Lost Science Cam feed.
7/21	3	53	18	47.968838	-129.087083	256	-11	-1	21	2139	2160	Correction -- Science cam feed working but dark.
7/21	3	54	51	47.968839	-129.087083	256	-10	-1	21	2139	2160	Restarting HD cam.
7/21	3	55	4	47.968839	-129.087083	256	-11	-1	21	2139	2160	Camera seems stuck on frame grabs.
7/21	3	58	11	47.968872	-129.087196	218	-11	-1	6	2140	2146	Trying to solve camera problem - don't know what's wrong.
7/21	3	58	48	47.968874	-129.087189	210	-11	0	11	2140	2151	Cycling power to cameras to try and fix problem.
7/21	4	0	23	47.968889	-129.087224	184	-10	0	16	2139	2155	Looking for a fluid sampling site on Godzilla.
7/21	4	1	34	47.968874	-129.087249	183	-10	0	16	2137	2152	Looking at separate chimney structure that's higher up.
7/21	4	2	24	47.968874	-129.087246	184	-12	0	16	2137	2153	Putting Jason basket out.
7/21	4	5	57	47.968870	-129.087247	182	-12	0	16	2136	2153	Still trying to solve camera problems.
7/21	4	6	4	47.968870	-129.087247	182	-13	0	17	2136	2153	Going to sample from Godzilla.
7/21	4	6	23	47.968866	-129.087248	183	-13	0	16	2136	2153	Chimney collapse!
7/21	4	6	33	47.968871	-129.087257	183	-10	0	16	2136	2152	Big structure toppled over.
7/21	4	8	45	47.968826	-129.087286	183	-12	0	14	2138	2152	Starboard swing arm box out.
7/21	4	9	8	47.968812	-129.087276	168	-12	0	10	2140	2151	Moving Medea down.
7/21	4	9	50	47.968780	-129.087326	114	-13	-1	17	2142	2159	Lots of floc in water column.
7/21	4	10	25	47.968784	-129.087323	92	-12	-1	16	2142	2158	Going to try to fix Science Cam again.
7/21	4	14	6	47.968860	-129.087326	110	-13	-1	21	2137	2158	Moving around back of Godzilla.
7/21	4	16	10	47.968864	-129.087263	106	-11	0	19	2138	2157	Looking at venting orifice on side of Godzilla. Lots of orange rust on rocks.
7/21	4	17	9	47.968866	-129.087266	111	-12	-1	20	2138	2158	Frame_Grab:
7/21	4	17	11	47.968866	-129.087263	111	-13	-1	20	2138	2158	Two areas of venting on this side of chimney.
7/21	4	18	26	47.968865	-129.087254	109	-13	0	20	2138	2158	These are black smoker vents on both sides.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	4	18	38	47.968865	-129.087254	109	-13	0	19	2138	2157	Turning power on HD camera.
7/21	4	19	34	47.968865	-129.087254	109	-14	-1	20	2138	2158	Science camera back.
7/21	4	20	37	47.968865	-129.087254	109	-14	-1	20	2138	2157	Will be taking temperature at Godzilla with Jason temp probe.
7/21	4	22	14	47.968866	-129.087255	109	-13	-2	19	2138	2157	TEMPS: Jason temperature Taking temp in Godzilla black smoker vent.
7/21	4	22	21	47.968866	-129.087255	109	-13	-2	19	2138	2157	T is 338 and rising.
7/21	4	22	54	47.968866	-129.087255	109	-13	-2	19	2138	2157	TEMPS: Jason temperature T is 350C and still rising slowly.
7/21	4	23	55	47.968866	-129.087255	109	-13	-2	19	2138	2157	TEMPS: Jason temperature T is 351.5 C in Godzilla.
7/21	4	24	21	47.968866	-129.087255	109	-13	-2	19	2138	2157	TEMPS: Jason temperature Tmax is 351.6 C.
7/21	4	25	2	47.968867	-129.087255	109	-13	-2	19	2138	2157	Removing temp probe.
7/21	4	26	0	47.968867	-129.087255	109	-13	-1	19	2138	2157	This vent is gushing black smoke and has orange rust around the orifice.
7/21	4	26	16	47.968867	-129.087255	109	-13	-1	19	2138	2157	Stowing Jason temp probe in basket.
7/21	4	27	15	47.968867	-129.087256	109	-13	-2	19	2138	2157	Going to take a sample from this vent.
7/21	4	27	59	47.968867	-129.087256	109	-13	-2	19	2138	2157	Going to remove bungee from a gastight bottle in the basket.
7/21	4	29	16	47.968868	-129.087256	109	-13	-3	19	2138	2157	Removed bungee from gastight.
7/21	4	29	35	47.968868	-129.087256	109	-13	-2	19	2138	2157	Releasing bungee cord.
7/21	4	30	1	47.968868	-129.087257	109	-13	-2	20	2138	2158	Tying bungee down.
7/21	4	33	25	47.968869	-129.087257	108	-14	-2	20	2138	2158	Picking up gastight #18 black.
7/21	4	34	48	47.968869	-129.087257	109	-14	-2	20	2138	2158	Maneuvering gastight bottle into position.
7/21	4	36	10	47.968870	-129.087258	108	-13	-2	19	2138	2157	Positioning gastight in vent opening.
7/21	4	37	1	47.968870	-129.087258	109	-13	-2	20	2138	2158	SAMPLE: gas J2-574-GTB-10 collected. Location: Top of Godzilla. Jason Tmax=351.6 C
7/21	4	37	47	47.968870	-129.087258	108	-13	-3	19	2138	2157	J2-574-GTB-10 is black bottle #18.
7/21	4	39	6	47.968871	-129.087258	109	-13	-2	20	2138	2158	Stowing gastight in basket.
7/21	4	39	57	47.968871	-129.087258	108	-13	-2	19	2138	2157	Tying bungee down on gastight.
7/21	4	40	35	47.968871	-129.087258	108	-13	-2	19	2138	2157	Going to do fluid samples with HFS next.
7/21	4	41	29	47.968871	-129.087258	108	-14	-1	20	2138	2158	Getting HFS wand out of the basket.
7/21	4	42	38	47.968876	-129.087260	134	-12	0	16	2138	2154	Repositioning Jason to have more space to get the wand out.
7/21	4	43	44	47.968878	-129.087270	137	-13	-1	19	2138	2157	Now getting HFS wand out of basket.
7/21	4	44	38	47.968878	-129.087270	137	-13	-1	19	2138	2157	HFS sampler wand out of basket.
7/21	4	45	13	47.968878	-129.087270	136	-12	-1	19	2138	2157	Getting software for the Beast started.
7/21	4	46	57	47.968874	-129.087258	121	-13	-1	18	2138	2156	Inserting HFS wand into vent on side of Godzilla.
7/21	4	49	21	47.968874	-129.087258	122	-13	-1	18	2138	2156	We are close to the top of Godzilla.
7/21	4	50	24	47.968875	-129.087258	121	-13	-2	19	2138	2156	Trying to move HFS wand into position.
7/21	4	51	48	47.968877	-129.087256	147	-12	-2	15	2138	2152	Moving Jason for better approach to vent.
7/21	4	53	11	47.968877	-129.087255	149	-14	-2	19	2138	2157	Trying to insert HFS wand into orifice from above.
7/21	4	53	36	47.968877	-129.087256	149	-15	-1	19	2138	2157	HFS inserted.
7/21	4	54	46	47.968877	-129.087256	149	-14	-2	15	2138	2153	TEMPS: HFS temperature T is 346 and rising.
7/21	4	55	48	47.968878	-129.087256	148	-14	-1	15	2138	2153	Temperature is dropping.
7/21	4	56	3	47.968878	-129.087256	148	-14	-1	15	2138	2153	HFS intake may have moved or chimney is broken.
7/21	4	56	48	47.968878	-129.087256	149	-14	-2	15	2138	2153	Going to reinsert HFS wand in chimney again.
7/21	4	58	22	47.968879	-129.087256	149	-14	-3	15	2138	2153	Positioning wand over vent orifice from above.
7/21	5	0	6	47.968879	-129.087256	149	-14	-2	15	2138	2153	Trying to fix Science Cam still.
7/21	5	1	7	47.968879	-129.087257	149	-14	-2	15	2138	2152	Camera seems to work now.
7/21	5	1	30	47.968879	-129.087257	149	-14	-2	15	2138	2153	HFS wand reinserted from perpendicular angle rather than from above.
7/21	5	1	42	47.968879	-129.087257	149	-14	-2	15	2138	2153	TEMPS: HFS temperature T is 280C and rising
7/21	5	2	1	47.968879	-129.087257	149	-14	-2	15	2138	2152	TEMPS: HFS temperature T is 325C and rising.
7/21	5	2	34	47.968880	-129.087257	149	-14	-2	15	2138	2152	TEMPS: HFS temperature T is 347.8C and rising.
7/21	5	3	8	47.968880	-129.087257	149	-14	-2	15	2138	2152	TEMPS: HFS temperature T is 350C.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	5	3	23	47.968880	-129.087257	149	-14	-2	15	2138	2152	SAMPLE: gas Going to take middle gastight
7/21	5	3	57	47.968880	-129.087257	149	-14	-2	15	2138	2152	SAMPLE: gas J2-574-GTHFS-11 . T was 350.1C when orange#16 center gastight on HFS fired.
7/21	5	5	22	47.968880	-129.087257	148	-13	-2	15	2138	2152	SAMPLE: fluid #3 filtered piston start
7/21	5	6	11	47.968881	-129.087258	149	-13	-2	15	2138	2152	SAMPLE: fluid J2-574-HFS-12 is filtered piston #3.
7/21	5	8	28	47.968881	-129.087258	148	-13	-2	15	2138	2152	J2-574-HFS-12 end.
7/21	5	9	15	47.968882	-129.087258	148	-13	-2	15	2138	2152	J2-574-HFS-12 : filtered piston#3. start=05:06:10. Tmax=350.4. Tavg=350.1C. T2=98C. vol=600mL. end=05:08:27.
7/21	5	9	26	47.968882	-129.087258	148	-13	-2	15	2138	2152	SAMPLE: fluid unfiltered piston #4 start
7/21	5	10	36	47.968882	-129.087258	148	-13	-2	15	2138	2152	SAMPLE: fluid J2-574-HFS-13 is unfiltered piston #4.
7/21	5	12	36	47.968883	-129.087258	149	-13	-2	15	2138	2152	SAMPLE: fluid J2-574-HFS-13 end.
7/21	5	13	41	47.968883	-129.087258	148	-13	-2	15	2138	2152	SAMPLE: fluid J2-574-HFS-13 : Tmax=350.9. Tavg=350.7. T2=101C. vol=600mL start=05:09:25 end=05:12:35 unfiltered piston#4.
7/21	5	14	11	47.968883	-129.087258	149	-13	-2	14	2138	2152	SAMPLE: fluid filtered bag #19 start
7/21	5	14	25	47.968883	-129.087258	149	-13	-2	14	2138	2152	SAMPLE: fluid J2-574-HFS-14 is filtered bag #19
7/21	5	16	13	47.968884	-129.087258	148	-13	-2	15	2138	2152	Still filtering sample J2-574-HFS-14.
7/21	5	17	48	47.968885	-129.087258	149	-13	-2	15	2138	2152	SAMPLE: fluid J2-574-HFS-14 end.
7/21	5	18	38	47.968885	-129.087259	148	-13	-2	15	2138	2152	J2-574-HFS-14: Tmax=351 Tavg=350.9 Tmin=98.7C. vol=600mL start=05:14 end=05:17
7/21	5	19	0	47.968885	-129.087259	148	-13	-1	15	2138	2152	SAMPLE: gas J2-574-GTHFS-15 collected.
7/21	5	19	28	47.968885	-129.087259	148	-13	-1	15	2138	2152	SAMPLE: gas J2-574-GTHFS-15 is starboard gastight red#9.
7/21	5	20	54	47.968885	-129.087259	148	-13	-1	15	2138	2152	Retracting HFS arm and stowing in basket.
7/21	5	22	29	47.968886	-129.087260	148	-14	-1	15	2138	2152	Replaced HFS wand in basket.
7/21	5	23	42	47.968886	-129.087260	148	-13	-1	15	2138	2153	Opening starboard swing arm box.
7/21	5	23	54	47.968886	-129.087260	148	-13	-1	15	2138	2152	Going to try to collect more sulfide samples.
7/21	5	24	34	47.968887	-129.087260	148	-13	-3	15	2138	2152	Using arm to grab sulfide chimney from area right next to venting fluids.
7/21	5	24	59	47.968887	-129.087260	148	-13	-3	14	2138	2152	Repositioning cameras for better view.
7/21	5	27	5	47.968887	-129.087259	148	-14	-3	15	2138	2153	Breaking chimney piece with arm.
7/21	5	27	32	47.968887	-129.087259	148	-14	-3	15	2138	2153	Chimney piece broken off near top.
7/21	5	27	48	47.968887	-129.087259	148	-14	-3	15	2138	2153	Some pieces have crumbled off the chimney but piece still intact.
7/21	5	28	5	47.968887	-129.087259	148	-14	-3	18	2138	2156	Piece has some orange rust and white patches on it.
7/21	5	28	50	47.968888	-129.087259	149	-14	-3	15	2138	2153	Moving piece to swing arm box.
7/21	5	29	10	47.968888	-129.087259	149	-15	-1	19	2138	2157	SAMPLE: geo J2-574-SULFIDE-16 collected in box.
7/21	5	30	58	47.968888	-129.087259	149	-15	-2	15	2138	2153	Closing lid of starboard swing arm box.
7/21	5	32	9	47.968889	-129.087260	148	-15	-1	15	2138	2153	Tying bungee cord down on starboard swing arm box.
7/21	5	33	7	47.968889	-129.087260	148	-15	-1	14	2138	2152	Going to collect mat samples in small syringe sampler.
7/21	5	34	15	47.968889	-129.087260	149	-15	-1	15	2138	2153	Discussing how to use small syringe.
7/21	5	36	17	47.968890	-129.087260	149	-15	-2	19	2138	2157	Aim is to collect black-grey dirt with syringe sampler.
7/21	5	37	15	47.968898	-129.087267	151	-12	-2	16	2138	2154	Repositioning Jason for a better angle to sample.
7/21	5	38	23	47.968895	-129.087251	157	-11	-1	13	2138	2151	Could also collect orange rusty mat area.
7/21	5	39	31	47.968896	-129.087251	157	-14	-3	15	2138	2153	Jason in position now - going to pick up syringe sampler.
7/21	5	40	34	47.968896	-129.087251	157	-14	-3	14	2138	2152	Pulling small syringe sampler out of basket.
7/21	5	40	54	47.968896	-129.087251	157	-14	-2	14	2138	2152	Need to use both Jason arms to use syringe.
7/21	5	41	12	47.968896	-129.087251	157	-14	-2	14	2138	2152	There is a strong current pushing Jason to the southwest (to the right) of the vent pillar.
7/21	5	42	18	47.968896	-129.087252	157	-14	-2	15	2138	2153	Changing watches.
7/21	5	42	39	47.968896	-129.087252	157	-14	-2	15	2138	2153	Going to use syringe to suck grey mat on rocks.
7/21	5	44	47	47.968897	-129.087252	157	-14	0	15	2138	2153	Going to grab syringe with other hand.
7/21	5	45	5	47.968897	-129.087252	157	-14	0	15	2138	2153	Holding syringe in place with left hand.
7/21	5	45	30	47.968897	-129.087252	157	-15	0	15	2138	2153	Going to use right hand to pull syringe to collect sample.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-574 Dive Log
7/21	5	45	53	47.968897	-129.087252	157	-15	0	15	2138	2153	Would like to collect loose material away from worms in syringe.
7/21	5	46	22	47.968897	-129.087253	157	-15	0	15	2138	2153	Syringe in place.
7/21	5	47	19	47.968898	-129.087253	157	-15	0	15	2138	2153	SAMPLE: bio J2-574-Mat-17 collected.
7/21	5	48	25	47.968898	-129.087253	157	-14	0	15	2138	2153	Syringe looks full of black-grey material.
7/21	5	51	10	47.968956	-129.087923	290	-15	-1	36	2138	2174	Samples all collected.
7/21	5	51	28	47.968959	-129.087969	290	-13	-1	42	2134	2177	JASON: Jason off bottom

Table 7.4.2 J2-575 Jason Dive Log (Main Endeavour Field, Endeavour Segment, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	16	23	13	47.948501	-129.098001	292	-8	-1	5	2202	2207	JASON: Jason on bottom
7/21	16	24	25	47.948469	-129.098072	292	-11	-1	5	2202	2207	Settling in on the edge of this ledge.
7/21	16	25	5	47.948469	-129.098074	292	-11	-1	6	2201	2207	NAV: Doppler Reset
7/21	16	25	24	47.948471	-129.098066	291	-11	-1	7	2200	2207	We're not getting accurate LBL fixes yet. John thinks we're too far from the ship.
7/21	16	27	48	47.948497	-129.097995	291	-11	-1	8	2199	2207	We're going to test the "color card" now.
7/21	16	35	30	47.948528	-129.098036	291	-11	-3	8	2199	2207	There's a ray in the brow cam.
7/21	16	36	8	47.948533	-129.098061	291	-11	-3	8	2199	2207	He seems unconcerned about the presence of Jason.
7/21	16	37	57	47.948508	-129.098099	291	-12	-2	8	2199	2207	Stowing the color chart.
7/21	16	40	1	47.948495	-129.098049	326	-10	0	8	2199	2207	Still no good LBL nav fixes. We're about 70 meters from the ship.
7/21	16	40	22	47.948503	-129.098043	351	-10	-2	8	2199	2207	Grotto has the RAS mooring on top of it. If we see that we're at Grotto.
7/21	16	40	29	47.948523	-129.098049	351	-11	-1	8	2199	2207	Starting to move.
7/21	16	43	8	47.948906	-129.098053	350	-10	-1	5	2196	2201	We're still up on a pillow lava ledge.
7/21	16	43	52	47.948961	-129.098094	350	-10	-1	3	2197	2199	Vent fish in the Digital still cam
7/21	16	45	33	47.949023	-129.098153	350	-10	-1	4	2196	2200	We're waiting for the navigation to settle out.
7/21	16	45	40	47.949023	-129.098151	350	-10	-1	4	2196	2200	NAV: Doppler Reset
7/21	16	46	47	47.949016	-129.098122	350	-10	-1	4	2196	2200	We're stationary here.
7/21	16	47	46	47.949011	-129.098126	350	-10	-1	4	2196	2200	Turned off the HMI lights.
7/21	16	48	53	47.949007	-129.098152	350	-10	-1	4	2196	2200	We are hoping to take the HMI lights off for the next dive so are experimenting here.
7/21	16	49	23	47.949010	-129.098149	350	-10	-1	4	2196	2200	Bringing up the HMI's again.
7/21	16	50	6	47.949019	-129.098126	350	-10	-1	4	2196	2200	They take a while to fully engage.
7/21	16	52	51	47.949023	-129.098048	312	-10	-1	3	2196	2200	Probably at full intensity now. We'll give it another minute and then turn them off again to see the change.
7/21	16	53	29	47.949048	-129.098019	327	-11	-1	3	2196	2200	Turned the HMI's off again. The video is a little darker.
7/21	16	54	5	47.949098	-129.098025	349	-11	-1	3	2196	2200	Jimmy is preparing to head to Grotto - the RAS site.
7/21	16	54	53	47.949135	-129.098145	307	-11	-2	4	2195	2199	We're going to follow this scarp and hopefully it will lead us to the chimney.
7/21	16	55	49	47.949167	-129.098317	329	-11	0	7	2189	2196	The HD science cam is darker now without the lights.
7/21	16	55	53	47.949170	-129.098325	330	-10	-1	8	2189	2196	We're here.
7/21	16	56	18	47.949164	-129.098341	331	-10	-2	9	2187	2196	Turning the HMI's on again.
7/21	16	56	28	47.949163	-129.098350	331	-10	-2	9	2187	2197	Looking at Grotto vent now.
7/21	16	56	54	47.949164	-129.098361	329	-10	-1	9	2188	2197	We will circle around it and survey the structure. The RAS is in the background.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	16	57	30	47.949166	-129.098365	334	-11	-1	7	2187	2194	Large flanges on this edifice. Ray Lee is looking for a spot to set the cameras. He needs something flat.
7/21	16	58	11	47.949170	-129.098373	349	-11	-1	6	2187	2193	We have to be able to scrub it clean of biology.
7/21	16	59	6	47.949196	-129.098353	4	-10	-1	6	2187	2193	We're looking around. Circling the structure surveying a spot for Ray Lee's cameras.
7/21	17	0	41	47.949192	-129.098375	334	-10	-2	6	2187	2193	We can't circle it completely because of other chimneys in the area.
7/21	17	2	12	47.949163	-129.098471	301	-11	-1	8	2184	2192	We're not moving much.
7/21	17	2	53	47.949137	-129.098505	325	-10	-1	7	2184	2191	Still surveying the site.
7/21	17	3	24	47.949123	-129.098527	338	-11	-2	7	2184	2191	So far don't see any smoke coming out of this sulfide structure: Grotto.
7/21	17	5	26	47.949137	-129.098434	341	-10	-1	7	2183	2190	Diffuse flow is evident in the DSC camera.
7/21	17	6	18	47.949196	-129.098309	331	-10	-1	11	2183	2194	Ray says there should be some bee hives on this structure.
7/21	17	6	31	47.949203	-129.098296	322	-10	-1	13	2184	2197	The RAS is in view.
7/21	17	7	1	47.949222	-129.098285	318	-10	-2	12	2186	2197	RAS is in the science and brow cams.
7/21	17	8	14	47.949240	-129.098281	321	-10	-2	11	2187	2197	Still looking for a flat spot.
7/21	17	9	11	47.949243	-129.098313	321	-10	-1	11	2186	2197	Lots of worms here of all varieties.
7/21	17	9	39	47.949237	-129.098308	321	-13	-1	11	2186	2197	Pretty heavy flow coming out of the top of some of these chimneys. Bee hive in the science cam view.
7/21	17	11	43	47.949212	-129.098268	306	-12	-1	11	2186	2196	Can see some black smoke bee hives in the distant view.
7/21	17	12	38	47.949244	-129.098251	303	-12	-2	10	2186	2196	Grotto11 position: 129 5.8989 47 56.9572. Z=2185.
7/21	17	13	28	47.949287	-129.098274	287	-12	-1	12	2186	2198	We're at the base of the RAS.
7/21	17	14	7	47.949292	-129.098328	269	-13	-1	10	2187	2197	Looking at the base of the RAS for a flat spot. The RAS is staying down for another year.
7/21	17	15	46	47.949275	-129.098352	268	-7	-3	9	2187	2196	Zooming in on a spot near the RAS base.
7/21	17	17	20	47.949237	-129.098324	269	-7	-3	7	2187	2194	The flat areas we've seen don't have a lot of biota. Ray Lee wants to look around some more.
7/21	17	19	4	47.949261	-129.098277	268	-7	-3	8	2187	2196	Ray likes the looks of a spot in diffuse flow.
7/21	17	19	36	47.949271	-129.098270	268	-7	-3	7	2187	2194	The creature he wants are in the Sci cam.
7/21	17	19	42	47.949272	-129.098269	269	-7	-3	7	2187	2194	Turned on the lasers.
7/21	17	21	1	47.949299	-129.098310	212	-12	-1	12	2186	2198	Whelks visible here.
7/21	17	23	17	47.949234	-129.098334	176	-12	-3	3	2186	2189	Lots of biota in the sci cam. See vent fish and tube worms.
7/21	17	24	4	47.949244	-129.098337	174	-9	0	8	2186	2195	Lots of flow coming out here. Scale worms; pycnogonids; vent fish on top of this flat spot.
7/21	17	25	6	47.949266	-129.098340	174	-9	0	8	2186	2195	Ray Lee wants some frame grabs before setting down the camera.
7/21	17	25	58	47.949278	-129.098331	173	-9	0	8	2186	2195	Heading is 173 to get at this site. Came in from the south and went counter clockwise around the RAS to get here.
7/21	17	26	36	47.949282	-129.098319	173	-9	0	8	2186	2195	We're going to deploy Camera 7 on the little mound where Ray Lee took the frame grabs.
7/21	17	27	35	47.949289	-129.098308	173	-8	-3	2	2186	2189	DEPLOY camera 7 on this small mound.
7/21	17	28	51	47.949295	-129.098347	174	-10	-2	3	2186	2189	Limpets and palm worms on dark area. To the left it's probably hotter (it's whiter) probably tube worms and scale worms.
7/21	17	29	43	47.949289	-129.098382	173	-10	-2	2	2186	2189	DEPLOY camera 7 for Ray Lee. It's pretty big. It fits in a milk crate.
7/21	17	30	25	47.949277	-129.098394	173	-9	0	8	2186	2195	Ray Lee's camera package consists of 2 cameras on top and lights. On the base is a grid with 16 temperature loggers (he white little circles).
7/21	17	31	35	47.949263	-129.098373	174	-9	0	8	2186	2195	Lots of diffuse flow in the area of the cameras we just deployed.
7/21	17	32	30	47.949270	-129.098346	174	-9	0	9	2186	2195	Ray Lee sees palm worms on the next mound. Zoomed in on science cam.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	17	33	0	47.949278	-129.098335	174	-8	-1	2	2186	2189	We're backing away to see if there is anyplace else in the area to deploy the second camera package.
7/21	17	33	16	47.949289	-129.098330	175	-11	-2	9	2186	2194	Backing away slowly.
7/21	17	33	32	47.949298	-129.098331	179	-12	-1	9	2186	2194	Camera 7 is right at the base of the RAS.
7/21	17	35	21	47.949308	-129.098303	229	-11	-1	12	2186	2198	NAV. Camera 7 is at the same position as the RAS. 129 5.8989 47 56.9572 Z=2185.
7/21	17	35	50	47.949296	-129.098294	224	-12	-3	10	2187	2197	Zooming in on snails.
7/21	17	36	29	47.949307	-129.098299	248	-12	-2	12	2185	2198	Searching around here for another place to deploy the second camera package.
7/21	17	36	41	47.949305	-129.098309	251	-12	-2	13	2185	2198	Some unknown instrument just passed out of view.
7/21	17	37	6	47.949320	-129.098336	226	-12	-1	13	2185	2198	More snails and stained tubeworms here on this zoom.
7/21	17	37	55	47.949335	-129.098405	186	-12	-1	8	2187	2195	The Neptune cable is in the science cam.
7/21	17	38	39	47.949312	-129.098467	117	-13	-1	8	2187	2195	Covis mooring and the RAS are both hooked up to the Neptune Canada cable.
7/21	17	39	38	47.949269	-129.098458	107	-13	-1	8	2187	2194	Black smoke pouring out of various spots on this sulfide structure.
7/21	17	40	10	47.949267	-129.098438	107	-12	-1	4	2187	2191	Lots of limpets here. Ray Lee says that if we clear them they will come back.
7/21	17	41	12	47.949281	-129.098408	108	-10	-2	3	2187	2190	Ray Lee has chosen another spot.
7/21	17	42	52	47.949290	-129.098398	108	-10	-4	3	2187	2190	Will attempt to deploy another camera here in this area of dense biota.
7/21	17	44	49	47.949267	-129.098392	109	-12	-3	3	2187	2190	Camera package 8 deployment beginning. Hoping to tuck it on a ledge between 2 mounds. Dense biota in the area.
7/21	17	45	36	47.949271	-129.098397	109	-11	-3	3	2187	2190	Repositioning the camera in the same spot.
7/21	17	47	11	47.949282	-129.098415	109	-10	-2	3	2187	2190	The next step will be to scrape the area under the cameras free of biota so it doesn't get in the way of the flow. Want to check if the temp changes. And he wants to know how quickly they recolonize.
7/21	17	48	13	47.949273	-129.098408	109	-10	-2	3	2187	2190	The 2 deployment sites set them within view of each other.
7/21	17	49	37	47.949268	-129.098401	109	-10	-2	3	2187	2190	Ray Lee will also recover 4 chains with 10 temperature sensors on them. They've been out since last year. Ray will recover them and deploy new ones.
7/21	17	50	50	47.949278	-129.098394	109	-10	-2	3	2187	2190	Zoomed in on sci cam. See pycnogonids; palm worms; limpets; dead tube worms. Hairy scaleworm with bacterial mat on its back. Other pink scale worms in view.
7/21	17	51	14	47.949280	-129.098392	109	-12	-2	3	2187	2190	Next we are heading to the chain by the RAS intake.
7/21	17	52	36	47.949328	-129.098283	184	-12	-2	11	2186	2197	The heading was 103 degrees when we were at the last camera (8).
7/21	17	54	42	47.949296	-129.098307	188	-12	-1	12	2185	2198	We're now zoomed in on a temperature chain.
7/21	17	55	10	47.949285	-129.098324	179	-13	-2	9	2186	2195	HIGHLIGHTS: KiPro hard drive start. Zoom on temperature chains.
7/21	17	58	23	47.949290	-129.098314	166	-14	-3	8	2187	2195	Tracking up and down the chain that we see here. The temp sensors on one of the chain appear as turquoise circles in the sci cam.
7/21	17	59	11	47.949289	-129.098316	166	-14	-3	8	2187	2194	We've located the temperature probes from one of the sites. We're looking for the second one.
7/21	18	0	39	47.949276	-129.098320	165	-14	-3	8	2187	2194	Jimmy thinks that they may be buried. He sees a yellow chain of temp probes.
7/21	18	1	40	47.949270	-129.098324	165	-14	-3	8	2187	2194	We're going to pull the yellow chain of temperature recorders first (to the left of the other chain).
7/21	18	2	24	47.949272	-129.098328	165	-14	-3	8	2187	2194	Want to do 5 minutes of highlights with the brow cam.
7/21	18	4	1	47.949292	-129.098338	165	-14	-3	8	2187	2194	HIGHLIGHTS: DVD Deck start Frame grabs of all 4 chains. Recording mini-Zeus highlights of the brow cam on the DVD deck. Looking at the 4 chains.
7/21	18	6	18	47.949291	-129.098317	165	-14	-3	8	2187	2195	We have highlights going on both the DVD deck and the KPro HD.
7/21	18	7	45	47.949283	-129.098300	165	-14	-3	8	2187	2195	The white ball in the sci cam is the intake valve for the RAS.
7/21	18	8	28	47.949285	-129.098304	165	-14	-3	8	2187	2194	Ray also wants to recover the 2 white sticks in the pilot cam - sometime. They have temperature probes in them.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	18	8	33	47.949286	-129.098305	165	-14	-3	8	2187	2194	HIGHLIGHTS: KiPro hard drive stop
7/21	18	10	8	47.949292	-129.098308	165	-14	-3	8	2187	2195	Jimmy is going to pull one of the chains. Ray wants to recover all 4 of the temperature chains.
7/21	18	11	35	47.949279	-129.098303	165	-14	-2	8	2187	2195	Jimmy is starting to yank on the yellow chain. It's moving the stick.
7/21	18	13	25	47.949275	-129.098336	165	-14	-2	8	2187	2195	RECOVER the yellow chain. He's laying it on the basket for now.
7/21	18	15	5	47.949283	-129.098303	165	-14	-2	8	2187	2195	RECOVER green chain now. Laying them on the basket.
7/21	18	16	57	47.949290	-129.098294	165	-14	-2	8	2187	2195	DEPLOYING new green temperature chain in the same area as the recovered chains.
7/21	18	18	0	47.949289	-129.098317	165	-14	-2	8	2187	2195	The 4 chains out here were laying 2 on each side of the RAS intake cone. All 4 will be recovered and 4 new ones deployed.
7/21	18	19	19	47.949281	-129.098327	165	-15	0	8	2187	2195	Grabbing one of the temperature sticks to see how long it is. See it in sci cam.
7/21	18	20	24	47.949274	-129.098323	165	-14	-1	8	2187	2195	Moving the yellow recovered chain to the bottom left compartment of the temp chains box in the basket.
7/21	18	21	23	47.949272	-129.098320	165	-14	-2	8	2187	2195	Attempting to uncover one of the chains that are practically buried with biota here.
7/21	18	21	57	47.949273	-129.098320	165	-14	0	8	2187	2195	RECOVERING the blue temp chain. Laying it on the basket for now.
7/21	18	23	39	47.949279	-129.098326	165	-14	-1	8	2187	2195	DEPLOYING yellow temp chain to the right of the green one we just deployed. The green chain is on the far left.
7/21	18	24	16	47.949280	-129.098331	164	-14	0	8	2187	2195	Putting the blue temperature chain we just recovered.....
7/21	18	25	53	47.949273	-129.098335	165	-13	1	8	2187	2195	Jimmy grabbed a loop with no chain attached. Not sure what it is for. Probably for the chain.
7/21	18	27	36	47.949284	-129.098318	165	-13	1	8	2187	2195	Pulling the new red chain out of the biobox and laying it down temporarily.
7/21	18	28	20	47.949293	-129.098313	165	-13	1	8	2187	2195	Jimmy is stowing the loop in the temp chain box.
7/21	18	29	48	47.949293	-129.098316	165	-13	1	8	2187	2195	RECOVERING the green temp chain and stowing it in the lower right temp chain box. The top part is lying over the lip. Jimmy will get it in there.
7/21	18	31	50	47.949272	-129.098316	165	-13	1	8	2187	2195	Positioning the chain in the temp chain box. Trying to stuff it in there.
7/21	18	33	31	47.949279	-129.098305	165	-13	1	8	2187	2195	DEPLOYING red temp chain now. Placing it to the right of the dome. where the green one was previously.
7/21	18	35	43	47.949279	-129.098319	165	-13	1	8	2187	2195	We have one more chain to recover. It's orange.
7/21	18	37	17	47.949287	-129.098317	165	-13	1	8	2187	2195	Attempting to pick up the orange chain. Got it.
7/21	18	38	38	47.949297	-129.098307	165	-13	1	8	2187	2195	Looks like the orange chain is short. Probably only 4 temp sensors. Will set it on the "deck" for now.
7/21	18	39	12	47.949296	-129.098305	164	-13	2	8	2187	2195	Put what we found of the orange chain in the temp chain box with the green recovered chain. Searching for more pieces (temp sensors).
7/21	18	40	8	47.949285	-129.098312	164	-13	2	8	2187	2195	The rest of the chain is buried.
7/21	18	41	19	47.949282	-129.098312	164	-13	1	8	2187	2195	Lots of stuff in the water now - because he is attempting to find the rest of the chain.
7/21	18	42	8	47.949279	-129.098319	164	-13	1	8	2187	2195	RECOVERED orange chain with 4 temp sensors and placed it in the temp chain box with the green recovered chain.
7/21	18	42	57	47.949283	-129.098323	164	-13	1	8	2187	2195	DEPLOYING white temp chain in the spot where the orange chain was.
7/21	18	43	36	47.949294	-129.098323	156	-12	-1	8	2187	2195	Will move back a bit and straighten them out.
7/21	18	46	8	47.949295	-129.098317	178	-7	2	8	2188	2195	Moving out to get a larger view. Jimmy is zooming in to try to find the rest of the chain.
7/21	18	47	30	47.949289	-129.098305	178	-8	2	7	2187	2195	Moving one of the temperature sticks and getting a look at it.
7/21	18	50	13	47.949282	-129.098294	158	-14	-2	8	2187	2194	Still attempting to find the rest of the orange chain.
7/21	18	52	59	47.949296	-129.098284	160	-13	-1	8	2187	2195	Looking at the temperature stick and placing it off to the side with another one that has been pulled out.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	18	54	13	47.949290	-129.098294	158	-12	-1	8	2187	2195	Repositioning the 4 newly deployed chains.
7/21	18	57	20	47.949312	-129.098288	158	-13	-2	8	2187	2195	Next task is to straighten out the newly deployed chains.
7/21	19	0	34	47.949291	-129.098295	158	-13	-2	8	2187	2195	The recovered temperature chains have been out here for 1 year.
7/21	19	2	32	47.949296	-129.098311	160	-12	-5	8	2187	2195	The yellow chain is straightened out now. If the bottom looks good we'll take some pics here.
7/21	19	3	8	47.949294	-129.098307	161	-11	-2	7	2187	2195	These chains are longer than the ones he had out here last year.
7/21	19	3	39	47.949291	-129.098304	162	-2	-1	7	2188	2195	He's trying to lengthen them but now pull them away from the RAS intake at the top.
7/21	19	6	54	47.949279	-129.098317	174	-3	2	8	2188	2196	When looking at the UW mosaic here it appears this structure is about 20x20 meters. Don't know how tall it is.
7/21	19	10	24	47.949299	-129.098289	175	-5	2	9	2188	2196	All four chains are now in place and will be surveyed using the brow camera.
7/21	19	12	49	47.949299	-129.098311	173	-5	2	7	2188	2195	The yellow chain was slightly crooked and is now being realigned in parallel with the other three chains.
7/21	19	14	54	47.949289	-129.098307	173	-5	2	7	2188	2195	The green chain looks to be shorter than the rest and is being investigated by pulling on the end to see if it is tangled.
7/21	19	20	46	47.949313	-129.098294	172	-5	0	7	2188	2195	HIGHLIGHTS: DVD Deck start. Using both the DVD deck and HD hard drive to view the newly positioned temperature sensors for Ray Lee.
7/21	19	25	51	47.949302	-129.098321	172	-5	0	7	2188	2195	HIGHLIGHTS: KiPro hard drive start. The chains look good here. Now going to look at the cameras. One of them fell over.
7/21	19	29	19	47.949275	-129.098314	161	-11	-2	1	2186	2187	Looking at the camera 7 now. It tipped over.
7/21	19	30	40	47.949295	-129.098327	161	-7	-2	1	2187	2187	Ray wants to get the animals off the mound he will reposition camera 7 upon.
7/21	19	34	26	47.949281	-129.098335	160	-6	-4	1	2187	2187	Ben is using the broom/brush to clear biota from the top of the mound. Won't disturb it too much. Just want the flow to not be obstructed.
7/21	19	36	8	47.949283	-129.098349	161	-8	-3	1	2187	2187	Placing camera 7 on the new partially-cleared mound.
7/21	19	37	32	47.949283	-129.098341	160	-9	-4	1	2187	2188	Actually deployed now.
7/21	19	39	12	47.949289	-129.098315	162	-11	-3	2	2186	2187	Camera 7 in place. Facing it a 160 deg heading. VV#853.
7/21	19	42	46	47.949275	-129.098407	109	-9	-2	3	2188	2190	Moving off toward camera 8 next. Camera 7 is perched higher and nearer to the RAS.
7/21	19	43	24	47.949275	-129.098408	109	-9	-2	3	2188	2190	At camera 8 spot. Will brush this off also so the flow is unobstructed.
7/21	19	45	1	47.949270	-129.098402	109	-10	-3	3	2188	2190	Lots of diffuse flow here. Animals have already started to climb on the camera. Snails and limpets probably.
7/21	19	48	18	47.949278	-129.098400	110	-11	1	3	2188	2190	Ben is sweeping the area where Camera 8 will be deployed for the year.
7/21	19	54	17	47.949299	-129.098365	110	-9	-1	3	2188	2190	Positioned Camera 8 after removing some of the biota under the camera. Moving out to look at it. Heading is 109 degrees.
7/21	19	57	52	47.949159	-129.098265	311	-12	0	11	2187	2197	Moving into view of the big flange to do temperature probes.
7/21	19	58	41	47.949158	-129.098284	313	-11	1	11	2187	2197	Unsure if we can get into a stable position in front of big flange; depends if they can set the X Y; HDG 313.0.
7/21	19	59	58	47.949155	-129.098302	313	-11	2	11	2187	2197	Jason arm is returning brush to basket.
7/21	20	1	30	47.949160	-129.098273	313	-13	-1	11	2187	2198	Port Biobox side arm pulled to the front and Jason arm opening the box.
7/21	20	1	53	47.949164	-129.098262	313	-12	2	11	2187	2197	The plan is to get some temperature array readings from this flange and then collect it.
7/21	20	3	12	47.949179	-129.098240	313	-12	-3	11	2187	2198	Securing a stray piece of rope in the port biobox for safe keeping.
7/21	20	3	50	47.949181	-129.098242	313	-12	-1	11	2187	2198	JASON: Depth: 22187.2m; HDG 313.2; GROTT0
7/21	20	7	6	47.949178	-129.098296	313	-12	-1	9	2188	2197	Inching into position in the flange. Doppler position: 47 56.953'N; 129 5.901'W

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	20	7	43	47.949178	-129.098302	313	-12	-3	9	2188	2197	HIGHLIGHTS: KiPro hard drive start
7/21	20	9	38	47.949198	-129.098325	313	-12	-3	9	2188	2197	Frame_Grab:
7/21	20	11	9	47.949200	-129.098328	313	-11	-2	9	2188	2197	Silver handled temperature array moving into position on flange.
7/21	20	17	31	47.949189	-129.098379	22	-10	-4	4	2188	2192	Temperature array in placed near tubeworm cluster.
7/21	20	19	2	47.949193	-129.098379	22	-10	-3	4	2188	2192	Temperature array placed in zone 1 (see sample diagram) on left hand side of flange near tubeworms.
7/21	20	19	37	47.949202	-129.098374	21	-10	-3	4	2188	2192	START temperature array: 20:19:21.
7/21	20	22	12	47.949192	-129.098374	21	-11	-3	4	2188	2192	Frame_Grab:
7/21	20	26	12	47.949201	-129.098378	21	-11	-3	4	2188	2192	JASON: Depth 2188.3; Hdg 21.3; DOP 47 56.953'N 129 5.905'W
7/21	20	28	46	47.949203	-129.098359	21	-11	-3	4	2188	2192	Still taking first temperature array in zone one (PI LEE).
7/21	20	30	1	47.949197	-129.098341	21	-11	-3	4	2188	2192	Stop temp reading: 20:29.
7/21	20	30	17	47.949196	-129.098341	22	-10	-3	4	2188	2192	Moving temperature array to the next position.
7/21	20	30	56	47.949195	-129.098343	22	-11	-3	4	2188	2192	START: temperature array 20:30
7/21	20	31	44	47.949196	-129.098348	22	-10	-3	4	2188	2192	Temperature array still in tubeworm cluster but lower on the flange; zone 2.
7/21	20	37	54	47.949196	-129.098335	22	-10	-3	4	2188	2192	Zone 2 temperature array still reading; science and Jason crew trying to figure out how to print in van.
7/21	20	40	5	47.949195	-129.098357	22	-11	-3	4	2188	2192	STOP: temperature array 20:39.
7/21	20	40	49	47.949198	-129.098369	22	-11	-3	4	2188	2192	Position temperature array sample #3; on outskirts of tubeworm pile; zone 3.
7/21	20	40	58	47.949198	-129.098371	22	-11	-3	4	2188	2192	START: Temperature array 20:39.
7/21	20	44	25	47.949198	-129.098374	22	-11	-3	4	2188	2192	Continuing taking temperature array data; zone 3.
7/21	20	48	12	47.949193	-129.098363	22	-11	-3	4	2188	2192	Frame_Grab:
7/21	20	50	27	47.949200	-129.098355	21	-11	-2	4	2188	2192	STOP: temperature array 3 20:49.
7/21	20	51	22	47.949202	-129.098360	22	-11	-2	4	2188	2192	START: Temperature Array 20:51.
7/21	20	52	22	47.949203	-129.098358	21	-11	-2	4	2188	2192	Temperature Array #4; out of tubeworms more on rock and microbial mat; zone 4.
7/21	20	56	26	47.949198	-129.098346	21	-11	-2	4	2188	2192	Frame_Grab:
7/21	21	2	35	47.949196	-129.098364	22	-11	-2	4	2188	2192	STOP: Temperature array #4 20:02.
7/21	21	3	15	47.949195	-129.098370	22	-11	-2	4	2188	2192	START: Temperature array #5 zone 5 21:03
7/21	21	4	46	47.949195	-129.098360	22	-11	-1	4	2188	2192	CORRECTION: vv line 934 time stop temperature array #4 21:02.
7/21	21	6	1	47.949197	-129.098362	22	-11	0	4	2188	2192	Port arm grabbing red temperature array; causing temperature array #5 to move a bit.
7/21	21	6	59	47.949191	-129.098375	21	-11	0	4	2188	2192	Temperature array #5 in zone 5; rotated in a different direction (clockwise) from other previous arrays.
7/21	21	8	7	47.949181	-129.098385	21	-12	0	4	2188	2192	Temperature array #6 (red handle) in zone 6.
7/21	21	8	23	47.949181	-129.098385	21	-12	0	4	2188	2192	START: Temperature array #6 21:08.
7/21	21	9	28	47.949192	-129.098378	21	-11	0	4	2188	2192	Temperature array #6 on the upper left edge of tubeworm cluster; zone 6.
7/21	21	10	23	47.949204	-129.098373	22	-11	0	4	2188	2192	Frame_Grab:
7/21	21	14	17	47.949198	-129.098331	21	-12	0	4	2188	2192	Continuing to take temperature array data from array #5 and #6.
7/21	21	14	36	47.949196	-129.098332	21	-12	0	4	2188	2192	Beast powered on for Dave Butterfield to test.
7/21	21	18	37	47.949203	-129.098363	22	-12	0	4	2188	2192	STOP: Temperature array #5 20:18.
7/21	21	18	57	47.949206	-129.098362	22	-12	0	4	2188	2192	STOP: Temperature array #6 (red) 21:18.
7/21	21	19	14	47.949207	-129.098362	22	-11	0	4	2188	2192	CORRECTION: vv line 953 stop array #5 21:18.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	21	20	26	47.949212	-129.098365	22	-11	0	4	2188	2192	START: Temperature array #7 (red) 21:19 zone 7 in tubeworms lower left edge of flange.
7/21	21	21	18	47.949217	-129.098361	21	-11	1	4	2188	2192	START: Temperature array #8 (silver) 21:20 zone 8 partially in tubeworms.
7/21	21	21	19	47.949217	-129.098361	21	-11	1	4	2188	2192	Frame_Grab:
7/21	21	27	49	47.949194	-129.098358	22	-11	1	4	2188	2192	Continuing measuring temperature arrays at Grotto (Lee).
7/21	21	30	1	47.949194	-129.098354	21	-11	2	4	2188	2192	STOP: Temperature array #8 21:29.
7/21	21	30	54	47.949197	-129.098356	21	-12	0	4	2188	2192	STOP: Temperature array #7 (red) 21:30.
7/21	21	31	12	47.949198	-129.098357	21	-10	-1	4	2188	2192	Repositioning Jason to the front of the flange at Grotto.
7/21	21	35	14	47.949191	-129.098295	290	-10	-1	11	2187	2198	JASON: HDG 289.7; Depth 2188.1.
7/21	21	36	17	47.949199	-129.098301	290	-10	-1	12	2186	2198	Frame_Grab:
7/21	21	37	11	47.949201	-129.098294	290	-11	-1	11	2187	2198	Akel is checking ballast; about 60lbs.
7/21	21	38	41	47.949207	-129.098276	290	-10	-1	10	2188	2198	Obvious Beggiatoa mats visible on front face of mat.
7/21	21	39	15	47.949207	-129.098274	290	-10	-1	10	2188	2198	Sorry I meant front face of flange.
7/21	21	40	0	47.949205	-129.098280	290	-10	-1	10	2189	2198	Ray and Akel discussing which side of flange to array. Suggesting concentrating on the lower right side of the flange.
7/21	21	40	22	47.949204	-129.098290	290	-10	-1	9	2189	2198	Frame_Grab:
7/21	21	44	10	47.949186	-129.098326	290	-10	-1	9	2189	2198	Frame_Grab:
7/21	21	45	48	47.949183	-129.098313	290	-11	-1	9	2189	2198	CORRECTION: vv line 883 not Ki PRO hardrive its actually DVD Deck HIGHLIGHTS start.
7/21	21	47	46	47.949204	-129.098304	289	-11	2	9	2189	2198	START: Temperature array #9 (red) zone 9 21:47.
7/21	21	49	27	47.949215	-129.098310	289	-11	1	9	2189	2198	START: Temperature array #10 (silver) zone 10 21:49.
7/21	21	50	35	47.949208	-129.098325	289	-11	1	9	2189	2198	JASON: Depth 2189.3; HDG 289.1; 47 56.954'N 129 5.901'W.
7/21	21	55	22	47.949196	-129.098293	289	-12	0	9	2189	2198	Refer to temperature arrays 1-8 as on FLANGE 1 and temperature arrays 9+ as on FLANGE 2.
7/21	21	56	14	47.949195	-129.098297	290	-12	0	9	2189	2198	FLANGE 1 = Depth 2188.3; Hdg 21.3; DOP 47 56.953'N 129 5.905'W.
7/21	21	56	56	47.949195	-129.098298	290	-12	0	9	2189	2198	FLANGE 2=JASON: Depth 2189.3; HDG 289.1; 47 56.954'N 129 5.901'W.
7/21	22	0	15	47.949204	-129.098294	290	-12	0	9	2189	2198	STOP: Temperature array #10 21:59; move lower on flange.
7/21	22	0	53	47.949206	-129.098300	290	-12	0	10	2189	2198	START: Temperature array #11 22:00 (silver).
7/21	22	1	7	47.949207	-129.098302	290	-12	1	10	2189	2198	STOP: Temperature array #9 (red) 22:00.
7/21	22	3	23	47.949202	-129.098308	290	-11	0	9	2189	2198	Jason accidently inched forward can get array down; need to back up. Lifting up temperature array #11.
7/21	22	3	47	47.949199	-129.098306	290	-11	0	10	2189	2198	MOVE temperature probes: 22:03.
7/21	22	5	31	47.949190	-129.098301	290	-11	1	10	2189	2198	START: Temperature array #12 (red) 22:05 zone 12.
7/21	22	6	12	47.949191	-129.098303	290	-11	1	10	2189	2198	START: (RESTART) Temperature array #11 (silver) 22:06 zone 11.
7/21	22	6	14	47.949191	-129.098303	290	-10	1	10	2189	2198	Frame_Grab:
7/21	22	16	2	47.949198	-129.098301	290	-11	-1	10	2189	2198	STOP: Temperature array #12 (red) 22:15.
7/21	22	16	51	47.949200	-129.098295	290	-11	-2	9	2189	2198	STOP: Temperature array #11 (silver) 22:16.
7/21	22	17	5	47.949200	-129.098293	290	-11	-2	9	2189	2198	Reposition arrays to the left.
7/21	22	18	18	47.949205	-129.098285	290	-11	-2	9	2189	2198	START: Temperature array #13 (silver) 22:17.
7/21	22	18	58	47.949209	-129.098282	289	-11	-2	9	2189	2198	START: Temperature array #14 (red) 22:18.
7/21	22	19	18	47.949210	-129.098281	289	-11	-2	9	2189	2198	Frame_Grab:
7/21	22	21	15	47.949219	-129.098274	289	-11	-2	9	2189	2198	Temperature arrays in zone 13 and 14 are on the lower left most region of flange 2.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	22	28	5	47.949215	-129.098302	290	-11	-2	10	2189	2198	STOP: Temperature array #13 (silver) 22:27.
7/21	22	29	21	47.949210	-129.098297	290	-11	-2	10	2189	2198	START: Temperature array #15 (silver) 22:28; slightly lumpy.
7/21	22	30	8	47.949208	-129.098294	290	-11	-2	10	2189	2198	STOP: temperature array #14 (red) 22:29.
7/21	22	30	36	47.949207	-129.098293	290	-11	-2	10	2189	2198	START Temperature array #16 (red) 22:30; sitting on left most edge on top of a lump.
7/21	22	35	39	47.949191	-129.098326	291	-11	-2	10	2189	2199	Frame_Grab:
7/21	22	40	0	47.949199	-129.098316	291	-11	-2	10	2189	2199	STOP: Temperature array #16 (red) 22:39.
7/21	22	41	16	47.949198	-129.098304	290	-12	-2	10	2189	2199	START: Temperature array #17 (red) 22:40; higher on the slope shimmery water visible.
7/21	22	41	31	47.949198	-129.098302	290	-12	-2	10	2189	2199	STOP: Temperature array #15 (silver) 22:40.
7/21	22	42	33	47.949197	-129.098297	290	-12	-2	10	2189	2199	START: Temperature array #18(silver) 22:41; higher less vertical shimmering water visible.
7/21	22	45	11	47.949198	-129.098322	290	-12	-2	10	2189	2199	Frame_Grab:
7/21	22	52	10	47.949193	-129.098309	290	-13	-1	10	2189	2199	STOP: Temperature array #18 (silver) 22:51.
7/21	22	52	49	47.949200	-129.098307	290	-13	-1	10	2189	2199	START: Temperature array #19 (silver) 22:52.
7/21	22	53	16	47.949204	-129.098306	290	-13	0	10	2189	2199	STOP: Temperature array #17 (red) 22:52.
7/21	22	53	49	47.949210	-129.098305	290	-13	0	10	2189	2199	i-button on temperature array fell off on to flange.
7/21	22	54	7	47.949212	-129.098305	290	-13	0	10	2189	2199	i-button fell off of red temperature array.
7/21	22	54	47	47.949214	-129.098306	290	-13	0	10	2189	2199	START: Temperature array #20 (red) 22:53.
7/21	22	55	17	47.949213	-129.098308	290	-13	0	10	2189	2199	Arrays 19 and 20 are on upper right most region of flange at a slight incline.
7/21	22	55	30	47.949212	-129.098309	290	-13	0	10	2189	2199	Frame_Grab:
7/21	23	6	25	47.949207	-129.098298	290	-13	1	10	2189	2199	STOP: Temperature array #19 (silver) 23:06.
7/21	23	7	17	47.949207	-129.098297	290	-11	0	10	2189	2199	STOP: Temperature array #20 (red) 23:06.
7/21	23	9	6	47.949208	-129.098296	290	-12	0	10	2189	2199	Return red array to basket followed by silver temp array.
7/21	23	16	6	47.949204	-129.098302	290	-10	-4	10	2189	2199	After some clever manipulation by the pilot the arrays are almost placed in basket.
7/21	23	18	13	47.949214	-129.098297	290	-11	-2	10	2189	2199	Jason temperature wand is being removed to do some temperature profile of Flange 2.
7/21	23	21	36	47.949219	-129.098294	290	-12	-2	10	2189	2199	Jason temperature reading on 4 corners of the flange and the middle.
7/21	23	21	52	47.949219	-129.098293	290	-12	-2	10	2189	2199	Temperature reading on the right front corner.
7/21	23	23	29	47.949218	-129.098292	289	-12	-3	10	2189	2199	TEMPS: Jason temperature Right upper corner: 11.8 C.
7/21	23	24	46	47.949215	-129.098293	290	-12	-3	10	2189	2199	Temperature probe on the right side clump.
7/21	23	25	19	47.949212	-129.098294	290	-12	-3	10	2189	2199	TEMPS: Jason temperature Right corner #2 : 8.3 C.
7/21	23	27	5	47.949203	-129.098300	290	-12	-3	10	2189	2199	TEMPS: Jason temperature Lower right corner 8.8 C.
7/21	23	28	51	47.949195	-129.098311	290	-12	-2	10	2189	2199	Readjusting Jason position to take temperature in shimmering water on upper left corner.
7/21	23	32	36	47.949201	-129.098309	290	-12	-3	10	2189	2199	TEMPS: Jason temperature Right upper face in tubeworms 15.4C.
7/21	23	34	25	47.949205	-129.098312	290	-12	-3	10	2189	2199	TEMPS: Jason temperature Second attempt in the right edge in the tubeworms; 18C.
7/21	23	36	51	47.949198	-129.098301	290	-12	-4	10	2189	2199	On the Right edge same in tubeworms looking for hottest spot 33C .
7/21	23	39	27	47.949198	-129.098292	290	-11	-2	10	2189	2199	Jason secures the temperature probe.
7/21	23	41	10	47.949203	-129.098295	290	-12	-2	10	2189	2199	Jason grab the fluid sampling inlet on the BEAST; preparing to take water sample in shimmering water in upper right corner of flange 2.
7/21	23	43	32	47.949209	-129.098304	290	-12	-2	10	2189	2199	SAMPLE: fluid Jason still in the process of grabbing the fluid inlet.
7/21	23	47	36	47.949202	-129.098296	290	-11	-3	10	2189	2199	Positioning the fluid intake on the surface of the flange for a low temperature reading.
7/21	23	48	24	47.949202	-129.098297	290	-10	-3	10	2189	2199	Pushing intake into brown regions of flange.
7/21	23	48	33	47.949202	-129.098297	291	-10	-3	10	2189	2199	Frame_Grab:

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/21	23	49	18	47.949201	-129.098297	290	-10	-3	10	2189	2199	SAMPLE: fluid J2-575-HFS-01: Positioning samples; temp 4.4C
7/21	23	50	24	47.949199	-129.098297	290	-10	-3	10	2189	2199	SAMPLE: fluid J2-575-HFS-01 unfiltered bag temp 4.4C Start: 23:50.
7/21	23	52	11	47.949200	-129.098294	290	-11	-3	10	2189	2199	SAMPLE: fluid CORRECTION; J2-575-HFS-01: unfiltered bag #24; START: 23:51.
7/21	23	53	25	47.949201	-129.098294	290	-10	-3	10	2189	2199	J2-575-HFS-01 unfiltered bag #24 cont. Location: 47 56.953 129 5.905. Z=2189m.
7/21	23	55	4	47.949204	-129.098299	291	-11	-3	10	2189	2199	J2-575-HFS-01 unfiltered bag #24 cont.
7/21	23	55	40	47.949206	-129.098301	290	-11	-3	10	2189	2199	J2-575-HFS-01 unfiltered bag #24 STOP Tmax=4.2 Tavg=4.1 t2=3.0 volume=500 (Frank Butterfield)
7/21	23	56	6	47.949207	-129.098301	290	-11	-3	10	2189	2199	J2-575-HFS-02 filter bag #23 START: 23:55:46
7/21	23	56	19	47.949207	-129.098300	291	-11	-3	10	2189	2199	J2-575-HFS-01 unfiltered bag #24 STOP: 23:55.
7/21	23	58	9	47.949206	-129.098294	290	-11	-3	10	2189	2199	J2-575-HFS-02 filter bag #23 cont. Location: 47 56.953 129 5.905. Z=2189m.
7/21	23	59	57	47.949206	-129.098297	290	-11	-3	10	2189	2199	J2-575-HFS-02 filter bag #23 cont.
7/22	0	0	48	47.949206	-129.098301	290	-11	-3	10	2189	2199	J2-575-HFS-02 filter bag #23 STOP: 23:59 Tmax=4.1 Tavg=3.9 t2=2.9 volume=500ml (Frank/Butterfield)
7/22	0	1	58	47.949199	-129.098312	304	-10	-2	9	2189	2198	SAMPLE: fluid J2-575-HFS-03 Positioning fluid intake into shimmering water on the upper right edge (the dara stream).
7/22	0	5	35	47.949196	-129.098319	306	-11	-3	9	2189	2198	SAMPLE: fluid J2-575-HFS-03 positioning of intake wand on flange to the left in clump of tubeworms because it looks more like diffuse flow.
7/22	0	8	0	47.949193	-129.098314	307	-11	-3	9	2189	2198	SAMPLE: fluid J2-575-HFS-03 Positioning looking for hotter diffuse flow.
7/22	0	9	57	47.949200	-129.098316	306	-11	-3	9	2189	2198	Still positioning and looking for hotter diffuse flow.
7/22	0	11	49	47.949192	-129.098315	306	-11	-3	9	2189	2198	The beast is reading the temperature and we are creeping up in temperature making sure this is a good spot to sample.
7/22	0	12	35	47.949187	-129.098310	306	-11	-3	9	2189	2198	J2-575-HFS-03 unfiltered bag #22. START: 00:12. Location: 47 56.953 129 5.902. Z=2189m.
7/22	0	13	15	47.949185	-129.098306	306	-11	-3	9	2189	2198	J2-575-HFS-03 unfiltered bag #22 cont. Shimmering coming out of the green tube.
7/22	0	14	32	47.949190	-129.098305	306	-11	-3	9	2189	2198	J2-575-HFS-03 unfiltered bag #22 cont.
7/22	0	16	19	47.949201	-129.098317	307	-11	-3	9	2189	2198	J2-575-HFS-03 unfiltered bag #22 STOP: 0:15 Tmax=18.1 Tavg=16.2 T2=7.6 Volume=500 (Frank/Butterfield)
7/22	0	16	48	47.949200	-129.098318	307	-11	-3	9	2189	2198	SAMPLE: fluid J2-575-HFS-04 filtered bag #21 START: 00:16. Location: 47 56.953 129 5.902. Z=2189m.
7/22	0	18	33	47.949196	-129.098315	307	-11	-3	9	2189	2198	SAMPLE: fluid J2-575-HFS-04 filtered bag #21 cont. Duplicate samples
7/22	0	19	30	47.949200	-129.098310	306	-11	-3	9	2189	2198	SAMPLE: fluid J2-575-HFS-04 filtered bag #21 cont.
7/22	0	21	14	47.949206	-129.098299	306	-11	-3	9	2189	2198	SAMPLE: fluid J2-575-HFS-04 filtered bag #21 START=00:12 STOP=00:20 Tmax=16.8 Tavg=14.0 T2=6.5 Volume=500mL (Frank/Butterfield)
7/22	0	22	22	47.949204	-129.098296	307	-10	-2	9	2189	2198	Stowing the fluid intake sampler and so we can pull out the small nozzle.
7/22	0	27	16	47.949198	-129.098304	306	-10	-2	9	2189	2198	Continuing to put fluid sampler back in its place.
7/22	0	28	16	47.949194	-129.098310	307	-10	-1	9	2189	2198	Pulling out small nozzle of water sampler.
7/22	0	29	35	47.949195	-129.098280	307	-11	-2	8	2191	2199	Repositioning below the flange to find the source of the hot fluid and sample.
7/22	0	32	3	47.949226	-129.098253	306	-10	-2	9	2189	2198	Accidental hit of the emergency stop button on the winch currently rectifying situation with the bridge.
7/22	0	35	52	47.949188	-129.098286	307	-10	-2	10	2189	2199	Waiting on the bosun to fix the winch.
7/22	0	37	37	47.949192	-129.098305	318	-10	-2	10	2189	2199	We have regained control of the winch; science can continue.
7/22	0	38	8	47.949189	-129.098310	318	-10	-2	7	2191	2199	Continuing to reposition Jason underneath the flange to take a fluid sample.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	0	40	56	47.949193	-129.098342	318	-11	-2	7	2191	2198	Looking at the shimmering water below the flange trying to determine best place to take fluid sample.
7/22	0	42	1	47.949196	-129.098341	318	-12	-2	7	2191	2198	Moving the basket forward to allow fluid sampler to reach into the fluid pocket.
7/22	0	45	45	47.949190	-129.098312	318	-12	-2	7	2191	2198	Cable length attached to sampler is too short we are attempting to find a the best way to sample.
7/22	0	48	32	47.949204	-129.098311	318	-12	3	7	2191	2198	Still in the processes of adjusting sample inlet.
7/22	0	49	55	47.949199	-129.098299	318	-12	3	7	2191	2198	Creeping on over to below flange trying to get it into a decent position.
7/22	0	51	56	47.949210	-129.098304	290	-12	4	7	2191	2198	Slowly but surely we are making way to where we want to sample.
7/22	0	58	32	47.949173	-129.098316	290	-11	3	7	2191	2198	TEMPS: HFS temperature is ~140C and dropping a little.
7/22	1	0	56	47.949204	-129.098309	290	-11	4	7	2191	2198	Temp is ~65C under flange and increasing.
7/22	1	1	0	47.949205	-129.098308	290	-11	4	7	2191	2198	Temp is 110C.
7/22	1	1	15	47.949209	-129.098304	290	-11	4	7	2191	2198	Temp is now 165C.
7/22	1	1	24	47.949211	-129.098302	290	-11	4	7	2191	2198	TEMPS: HFS temperature is 180C.
7/22	1	1	35	47.949213	-129.098300	290	-11	4	7	2191	2198	TEMPS: HFS temperature is ~200C.
7/22	1	1	51	47.949215	-129.098296	290	-11	4	7	2191	2198	We are going to take a fluid sample under this flange.
7/22	1	1	58	47.949215	-129.098295	290	-11	4	7	2191	2198	Then we will break the flange for sampling.
7/22	1	2	4	47.949215	-129.098294	290	-11	4	7	2191	2198	Temp is now ~207C.
7/22	1	2	24	47.949215	-129.098291	290	-11	4	7	2191	2198	The HFS intake is settled into the sediment a little and is not on the surface.
7/22	1	2	52	47.949214	-129.098291	290	-11	4	7	2191	2198	SAMPLE: fluid sample started
7/22	1	3	27	47.949210	-129.098295	290	-11	4	7	2191	2198	SAMPLE: fluid J2575-HFS-05 sample is filtered piston #1. Location: 47 56.953 129 5.902. Z=2189m.
7/22	1	4	54	47.949202	-129.098302	290	-11	4	7	2191	2198	J2575-HFS-05 end.
7/22	1	6	0	47.949196	-129.098300	290	-10	4	7	2191	2198	SAMPLE: fluid J2575-HFS-05: start=01:02:52 end=01:04:36 Tmax=215.6C Tavg=185.6 Vol=343mL T2=70C.
7/22	1	6	7	47.949195	-129.098300	290	-11	4	7	2191	2198	The HFS lost temperature.
7/22	1	6	23	47.949193	-129.098301	290	-11	4	7	2191	2198	It will restart in a minute.
7/22	1	7	14	47.949189	-129.098309	290	-11	4	7	2191	2198	T is about 150C.
7/22	1	7	32	47.949190	-129.098314	290	-11	4	7	2191	2198	T is about 155C.
7/22	1	7	56	47.949192	-129.098320	290	-11	3	7	2191	2198	Going to try repositioning the intake arm of the HFS a little.
7/22	1	8	3	47.949193	-129.098321	290	-11	3	7	2191	2198	T is now ~100C.
7/22	1	9	1	47.949210	-129.098330	290	-11	3	7	2191	2198	Part of the flange has broken away.
7/22	1	10	8	47.949230	-129.098323	290	-11	4	7	2191	2198	Temp is ~60C and rising.
7/22	1	10	23	47.949232	-129.098320	290	-11	4	7	2191	2198	TEMPS: HFS temperature is ~100C.
7/22	1	10	39	47.949233	-129.098317	290	-11	4	7	2191	2198	TEMPS: HFS temperature is ~130C
7/22	1	10	51	47.949232	-129.098314	290	-11	4	7	2191	2198	TEMPS: HFS temperature is ~152C.
7/22	1	11	16	47.949228	-129.098310	290	-11	4	7	2191	2198	Going to collect a fluid from this site under the flange.
7/22	1	11	24	47.949226	-129.098310	290	-11	4	7	2191	2198	SAMPLE: fluid HFS-06 start.
7/22	1	11	53	47.949218	-129.098307	290	-11	4	7	2191	2198	J2-575-HFS-06 is unfiltered piston #2. Location: 47 56.953 129 5.902. Z=2192m.
7/22	1	13	10	47.949196	-129.098305	290	-11	3	7	2191	2198	TEMPS: HFS temperature Temp is steady at 176C.
7/22	1	15	49	47.949197	-129.098316	290	-11	4	7	2191	2198	SAMPLE: fluid sample ended
7/22	1	16	44	47.949199	-129.098324	290	-11	4	7	2191	2198	J2575-HFS-06: start=01:11 end=01:15 Tmax=177.6 Tavg=164.6 T2=66 C. vol=565mL
7/22	1	16	51	47.949199	-129.098325	290	-11	4	7	2191	2198	We are finished water sampling.
7/22	1	17	54	47.949188	-129.098311	290	-10	4	7	2191	2198	Replacing HFS intake wand in Jason basket.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	1	19	25	47.949186	-129.098313	290	-10	4	8	2191	2199	We pulled back from the flange to maneuver the HFS intake wand into the basket.
7/22	1	19	38	47.949187	-129.098314	290	-12	4	8	2191	2199	The cable for the HFS is a little twisted.
7/22	1	20	4	47.949190	-129.098316	290	-12	3	8	2191	2199	Going to use both arms to try and straighten the cable out and put the wand away.
7/22	1	21	38	47.949202	-129.098313	290	-13	3	8	2191	2199	Holding the HFS intake wand with one arm.
7/22	1	21	53	47.949203	-129.098310	290	-13	2	8	2191	2199	Trying to pick up intake wand handle with other arm.
7/22	1	22	52	47.949203	-129.098294	290	-12	2	8	2191	2199	Wand handle is grasped in craft arm.
7/22	1	23	38	47.949199	-129.098286	290	-14	1	8	2191	2199	Let go of HFS wand with the other arm.
7/22	1	25	27	47.949194	-129.098310	290	-12	-2	8	2191	2199	Trying to place HFS intake into Jason basket.
7/22	1	26	27	47.949196	-129.098329	290	-13	-2	8	2191	2199	HFS intake wand is in Jason basket.
7/22	1	27	7	47.949196	-129.098336	290	-12	-2	8	2191	2199	Making sure the wand is stowed securely.
7/22	1	28	32	47.949192	-129.098327	290	-11	-2	7	2191	2199	Discussing the sample collection strategy for the sulfide flange.
7/22	1	29	23	47.949190	-129.098317	290	-11	-1	7	2191	2199	Port swing arm box is out.
7/22	1	29	31	47.949190	-129.098316	290	-12	-1	8	2191	2199	Opening the port box lid.
7/22	1	30	21	47.949191	-129.098310	290	-11	0	7	2191	2199	Port box lid is open.
7/22	1	31	30	47.949199	-129.098313	289	-11	1	8	2191	2199	Moving Jason over for a better approach to the flange.
7/22	1	32	36	47.949207	-129.098318	290	-11	1	7	2191	2199	Jellyfish floated past flange.
7/22	1	33	15	47.949208	-129.098314	290	-11	2	7	2191	2198	Positioning arm to grab piece of flange.
7/22	1	33	33	47.949209	-129.098312	289	-11	2	7	2191	2199	Piece of flange is coated in tubeworms.
7/22	1	33	56	47.949210	-129.098308	289	-10	3	7	2191	2198	HIGHLIGHTS: KiPro hard drive start
7/22	1	34	36	47.949210	-129.098300	290	-10	2	7	2191	2198	Grabbing piece of flange and pulling.
7/22	1	34	54	47.949209	-129.098298	290	-11	2	7	2191	2198	Small piece of something in Jason arm - could just be worms.
7/22	1	35	5	47.949208	-129.098297	290	-11	2	7	2191	2198	Let the worms go.
7/22	1	35	23	47.949206	-129.098296	290	-11	3	7	2191	2198	Repositioning for another grab.
7/22	1	35	52	47.949203	-129.098295	289	-10	3	7	2191	2198	Floc and sediment is breaking off of flange with every grip of the arm.
7/22	1	36	58	47.949197	-129.098302	290	-11	2	7	2191	2198	Small pieces of worms and floc are coming off.
7/22	1	37	36	47.949195	-129.098307	290	-11	2	7	2191	2198	Making another grab and shaking the worms off the hand.
7/22	1	38	32	47.949197	-129.098311	290	-12	2	7	2191	2199	Got a grip on the flange.
7/22	1	39	1	47.949199	-129.098310	290	-11	2	7	2191	2198	White worms keep breaking off in the hand.
7/22	1	39	18	47.949200	-129.098309	290	-11	2	7	2191	2199	A lot of dust and floc are breaking out of the flange.
7/22	1	39	25	47.949200	-129.098309	290	-11	2	7	2191	2198	HIGHLIGHTS: KiPro hard drive stop
7/22	1	39	43	47.949201	-129.098308	290	-11	2	7	2191	2198	Watch change.
7/22	1	41	43	47.949200	-129.098307	290	-11	2	8	2191	2199	Discussing what samples we're trying to collect.
7/22	1	41	52	47.949201	-129.098308	290	-11	2	8	2191	2199	The flange on the right is the one we're going for.
7/22	1	42	4	47.949202	-129.098306	290	-10	1	7	2191	2198	Repositioning the arm for a flange grab.
7/22	1	42	49	47.949205	-129.098303	290	-10	2	7	2191	2198	HIGHLIGHTS: KiPro hard drive stop
7/22	1	42	57	47.949206	-129.098302	290	-11	2	7	2191	2198	HIGHLIGHTS: KiPro hard drive start
7/22	1	43	15	47.949207	-129.098300	290	-11	2	8	2191	2199	Correction - KiPro hard drive stop should have been Start.
7/22	1	43	34	47.949209	-129.098297	290	-11	1	8	2191	2199	Piece of worm-covered sulfide in Jason hand.
7/22	1	43	46	47.949211	-129.098296	290	-11	-1	7	2191	2199	Piece of flange also may have fallen into port box.
7/22	1	43	58	47.949212	-129.098295	290	-11	-1	7	2191	2199	Placing sulfide flange into port swing arm box.
7/22	1	46	1	47.949210	-129.098312	290	-10	2	7	2191	2198	SAMPLE: geo More flange pieces being collected.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	1	46	28	47.949209	-129.098317	291	-10	4	7	2191	2198	SAMPLE: geo These flange piece samples are J2-575-Sulfide-07
7/22	1	46	43	47.949209	-129.098318	291	-11	3	7	2191	2198	Gripping area of orange and white mats/worms.
7/22	1	47	7	47.949210	-129.098320	293	-12	3	7	2191	2198	Lots of floc coming off of flange.
7/22	1	47	58	47.949213	-129.098308	293	-5	2	7	2191	2198	Trying to get a good grip on the flange.
7/22	1	48	30	47.949216	-129.098310	295	-7	2	7	2191	2198	This piece of flange doesn't want to break.
7/22	1	48	57	47.949217	-129.098303	290	-10	2	8	2191	2199	Repositioning arm at a different piece of the flange.
7/22	1	49	34	47.949216	-129.098300	290	-9	1	7	2191	2198	Trying to dig hand in for a good grip.
7/22	1	49	56	47.949216	-129.098299	291	-11	2	7	2191	2199	Lots of dusty floc in water.
7/22	1	50	12	47.949214	-129.098299	292	-10	2	7	2191	2198	Piece of flange will not break even with shaking.
7/22	1	50	58	47.949212	-129.098300	291	-11	3	7	2191	2198	Really turning and shaking the flange with the Jason arm - still won't break.
7/22	1	51	26	47.949212	-129.098302	291	-10	2	7	2191	2199	HIGHLIGHTS: KiPro hard drive stop
7/22	1	51	46	47.949214	-129.098303	288	-12	3	7	2191	2199	This flange is really solid.
7/22	1	53	32	47.949227	-129.098297	290	-11	1	8	2191	2199	Going to try to grip the left part of the flange.
7/22	1	55	4	47.949217	-129.098302	290	-10	2	7	2191	2199	Taking a break and checking Jason electronics.
7/22	1	56	3	47.949210	-129.098303	292	-10	1	7	2191	2198	Shaking flange again with left arm.
7/22	1	57	5	47.949210	-129.098308	290	-11	2	7	2191	2199	Flange still won't break.
7/22	1	57	39	47.949211	-129.098307	290	-11	2	7	2191	2199	Nice view of mirrored fluids under flange on pilot cam.
7/22	1	59	3	47.949211	-129.098297	290	-9	2	7	2191	2198	Have a grip on the flange and shaking it.
7/22	1	59	26	47.949211	-129.098297	291	-9	1	8	2191	2199	Tube worms breaking off left and right.
7/22	2	0	0	47.949211	-129.098292	289	-11	1	7	2191	2199	Flange just won't break.
7/22	2	0	28	47.949213	-129.098293	290	-12	0	7	2191	2199	Opening lid of port swing arm box.
7/22	2	1	1	47.949217	-129.098300	290	-11	1	8	2191	2199	Going back to flange again.
7/22	2	2	2	47.949222	-129.098315	290	-11	1	7	2191	2198	Grabbed a piece of flange.
7/22	2	2	16	47.949222	-129.098319	290	-11	1	8	2191	2199	Worm colony is just crumbling off of sulfides.
7/22	2	2	53	47.949222	-129.098326	290	-11	2	7	2191	2198	Broke off another clump of worms.
7/22	2	3	51	47.949219	-129.098330	290	-10	1	7	2191	2198	There are no scoop bags available on this dive.
7/22	2	5	11	47.949217	-129.098327	299	-10	1	8	2191	2198	Repositioning Jason.
7/22	2	6	31	47.949221	-129.098321	329	-10	1	8	2190	2198	Putting swing arm box under flange.
7/22	2	6	51	47.949222	-129.098320	329	-10	1	8	2190	2198	Will try to knock pieces of flange into box.
7/22	2	7	35	47.949226	-129.098315	329	-11	0	8	2190	2198	Moving Jason under flange.
7/22	2	7	55	47.949223	-129.098308	329	-11	0	8	2190	2198	The swing arm box lid closed - hit by the flange.
7/22	2	8	15	47.949225	-129.098307	329	-12	-1	8	2190	2198	Going to open up the box lid again.
7/22	2	8	56	47.949228	-129.098301	328	-13	-3	8	2190	2198	Moving port bio box into space under flange.
7/22	2	9	14	47.949230	-129.098298	328	-10	1	8	2190	2198	Gripping piece of flange again.
7/22	2	10	18	47.949233	-129.098291	330	-11	2	8	2190	2198	This strategy doesn't seem to be working either.
7/22	2	10	31	47.949232	-129.098293	334	-12	1	8	2190	2198	Going to try again.
7/22	2	10	45	47.949231	-129.098295	332	-14	0	8	2190	2198	Pulling at piece of flange covered in worms.
7/22	2	11	44	47.949229	-129.098285	302	-12	2	9	2190	2199	Nothing will break off this flange very easily.
7/22	2	12	55	47.949222	-129.098294	307	-12	2	8	2190	2199	Going for a lobe of the flange to the right of the one we tried before.
7/22	2	13	46	47.949220	-129.098294	311	-13	1	8	2191	2198	Shaking the piece of flange up and down and left to right.
7/22	2	13	57	47.949217	-129.098287	305	-11	1	8	2190	2199	Got a piece of the flange to break off!

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	2	14	25	47.949221	-129.098289	305	-11	0	8	2190	2198	SAMPLE: geo This sulfide piece is going in the same port biobox as the other.
7/22	2	14	48	47.949224	-129.098290	305	-12	0	8	2190	2198	SAMPLE: geo This piece is also part of J2575-Sulfide-07 cont.
7/22	2	15	20	47.949228	-129.098290	305	-13	-1	9	2190	2199	Putting piece of sulfide into the box.
7/22	2	15	34	47.949229	-129.098291	305	-12	1	8	2190	2198	Going back for more of the same flange.
7/22	2	16	27	47.949232	-129.098294	305	-14	1	8	2190	2199	Grabbing and shaking a piece of the same flange.
7/22	2	16	42	47.949234	-129.098295	305	-14	0	9	2190	2199	Little bits of worms and floc coming off of flange.
7/22	2	17	10	47.949233	-129.098295	311	-12	0	8	2190	2198	Shaking flange back and forth.
7/22	2	17	45	47.949230	-129.098294	306	-16	-1	9	2190	2199	Huge piece of flange broke off and fell.
7/22	2	18	5	47.949210	-129.098293	305	-12	0	8	2190	2198	Going to have a look at the piece that fell - may collect from seafloor.
7/22	2	18	29	47.949191	-129.098294	305	-12	-1	6	2192	2198	The piece is about 8m below.
7/22	2	19	19	47.949217	-129.098297	278	-11	-1	6	2193	2199	Moving around to look for flange piece.
7/22	2	19	38	47.949217	-129.098301	262	-13	-1	5	2194	2199	Frame_Grab:
7/22	2	19	57	47.949216	-129.098298	264	-12	-1	4	2195	2199	The piece is sitting on the seafloor at an angle.
7/22	2	20	11	47.949215	-129.098298	263	-11	0	4	2195	2199	We've settled down next to it.
7/22	2	20	21	47.949214	-129.098297	263	-11	0	4	2195	2199	It's really large and bigger than the port box.
7/22	2	20	44	47.949212	-129.098297	265	-10	1	4	2195	2199	Trying to pick up the sulfide.
7/22	2	20	51	47.949212	-129.098297	265	-12	1	4	2195	2199	Arm grabbed a bunch of tubeworms.
7/22	2	21	12	47.949209	-129.098295	265	-10	4	4	2195	2199	Released the tubeworms - going back for the sulfide.
7/22	2	21	46	47.949197	-129.098300	265	-3	5	3	2196	2199	Trying to pick up the sulfide piece.
7/22	2	21	58	47.949197	-129.098302	265	-10	3	5	2194	2199	We can't collect the whole piece - it's too big and heavy.
7/22	2	22	54	47.949193	-129.098295	262	-13	-1	4	2194	2199	Looking at the piece and how to pick it up.
7/22	2	23	39	47.949192	-129.098296	263	-14	-1	4	2194	2199	Trying to make room in the basket for the sulfide piece.
7/22	2	23	47	47.949193	-129.098296	262	-14	-1	4	2194	2199	Going to try to move the HFS intake arm over.
7/22	2	25	5	47.949198	-129.098292	263	-14	-2	4	2194	2199	Took the HFS arm out of its holster.
7/22	2	25	14	47.949199	-129.098292	263	-14	-1	4	2194	2199	Replacing it at an angle.
7/22	2	25	50	47.949204	-129.098300	262	-14	-1	4	2194	2199	Studying basket.
7/22	2	26	27	47.949200	-129.098305	263	-14	0	4	2195	2199	Now basket is below ledge where sulfide piece is.
7/22	2	26	43	47.949196	-129.098287	261	-20	0	4	2195	2199	Picking up the sulfide piece with the left arm.
7/22	2	26	52	47.949197	-129.098284	264	-21	1	3	2196	2199	It's sliding down the ledge.
7/22	2	27	22	47.949192	-129.098314	261	-15	0	3	2195	2199	Couldn't catch it with the arm - it slid down the ledge.
7/22	2	27	42	47.949180	-129.098320	263	-15	-1	6	2193	2199	Going back to the flange edge to see what else we can collect instead.
7/22	2	28	21	47.949192	-129.098318	306	-14	0	9	2189	2199	Back at the Grotto flange edge.
7/22	2	29	3	47.949194	-129.098317	295	-13	0	8	2190	2199	Repositioning Jason near the flange again.
7/22	2	29	35	47.949190	-129.098309	293	-13	1	9	2190	2199	Shaking worms off of arm.
7/22	2	29	46	47.949188	-129.098308	293	-14	1	9	2190	2199	Grabbing a piece of flange.
7/22	2	30	29	47.949185	-129.098306	295	-16	1	8	2190	2199	Shaking the flange back and forth.
7/22	2	30	54	47.949185	-129.098299	293	-12	2	8	2190	2199	Small piece has broken off - just worms.
7/22	2	31	3	47.949193	-129.098300	293	-12	1	8	2191	2199	Releasing worms.
7/22	2	31	47	47.949200	-129.098305	274	-14	1	8	2190	2198	Going to grip the flange.
7/22	2	32	8	47.949204	-129.098308	274	-12	3	8	2190	2198	Shaking and pulling on flange - got a piece.
7/22	2	32	33	47.949209	-129.098313	274	-13	2	8	2190	2199	Good-sized piece covered in orange and white worms.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	2	32	56	47.949212	-129.098318	274	-13	2	8	2190	2199	Putting this sample in the starboard swing arm bio box.
7/22	2	33	12	47.949213	-129.098321	274	-14	1	8	2190	2198	Opening the starboard box.
7/22	2	33	46	47.949213	-129.098324	274	-13	2	8	2190	2198	Moving camera to see biobox.
7/22	2	34	3	47.949212	-129.098325	274	-13	2	8	2190	2198	Putting sulfides and tube worm clump inside box.
7/22	2	34	42	47.949208	-129.098325	274	-14	1	8	2190	2198	Using both arms to transfer piece into box.
7/22	2	34	49	47.949207	-129.098324	274	-14	2	8	2190	2198	Got the piece in the box.
7/22	2	35	5	47.949205	-129.098322	274	-12	1	8	2190	2198	Going back for more pieces of flange.
7/22	2	35	38	47.949202	-129.098318	274	-14	1	8	2190	2198	All the pieces of flange will have the same sample number SULFIDE-07.
7/22	2	35	51	47.949202	-129.098316	275	-13	1	8	2190	2198	Shaking a piece of flange again with Jason arm.
7/22	2	36	29	47.949199	-129.098316	274	-16	1	8	2190	2198	This piece is covered in orange-red worms and rust.
7/22	2	36	45	47.949199	-129.098314	275	-16	1	8	2190	2198	This piece is to the left of where the previous flanges were.
7/22	2	38	1	47.949199	-129.098320	274	-13	1	8	2190	2198	Have broken off some more worm clumps.
7/22	2	38	36	47.949200	-129.098323	273	-11	2	8	2190	2198	Trying to grip the flange again.
7/22	2	38	56	47.949200	-129.098322	275	-13	0	8	2190	2198	Crushing more worms with the Jason hand.
7/22	2	40	0	47.949195	-129.098313	278	-13	2	8	2190	2198	This piece won't break off.
7/22	2	40	9	47.949185	-129.098321	279	-15	-1	8	2190	2198	We'll try the flange to the left instead.
7/22	2	41	7	47.949171	-129.098332	309	-13	2	8	2190	2198	Repositioning arm at new flange.
7/22	2	41	21	47.949170	-129.098331	310	-13	1	8	2190	2198	This flange is covered in white worms along the outer edge.
7/22	2	41	46	47.949171	-129.098331	309	-13	1	8	2190	2198	These clumps of worms are breaking off in the Jason arm too.
7/22	2	42	8	47.949168	-129.098332	307	-13	3	8	2190	2198	Shaking the flange up and down.
7/22	2	42	41	47.949153	-129.098312	309	-14	1	8	2190	2198	Big pieces of flange have broken off and fallen.
7/22	2	42	58	47.949152	-129.098312	309	-14	1	8	2190	2198	Huge clumps of worms and floc breaking off.
7/22	2	43	17	47.949154	-129.098313	308	-13	2	7	2191	2198	Shaking the worms off of the sulfide piece.
7/22	2	43	41	47.949154	-129.098314	303	-13	3	8	2190	2198	Going to put the sulfide into the starboard biobox.
7/22	2	44	39	47.949159	-129.098318	304	-14	2	8	2190	2198	Transferring sulfide between hands to put into the box.
7/22	2	45	3	47.949165	-129.098323	303	-14	0	8	2190	2198	Going to try and collect one more piece of sulfide.
7/22	2	46	21	47.949180	-129.098336	310	-14	0	8	2190	2198	Getting one more piece from left-hand piece of flange.
7/22	2	46	36	47.949181	-129.098339	309	-14	0	8	2190	2198	Now sticking into area of red worms.
7/22	2	47	0	47.949178	-129.098339	311	-14	0	8	2190	2198	Red worms were more in center of left-hand flange - white worms on outer edge.
7/22	2	47	15	47.949181	-129.098332	309	-14	-1	8	2190	2198	Shaking piece of flange back and forth.
7/22	2	47	51	47.949185	-129.098330	301	-14	-1	8	2190	2199	Moving to far right lobe of original right-hand flange.
7/22	2	48	12	47.949182	-129.098329	301	-13	0	8	2190	2198	This piece also has some orange worms on it.
7/22	2	48	23	47.949180	-129.098329	304	-13	-1	8	2190	2199	Gripped the flange - shaking it now.
7/22	2	49	49	47.949181	-129.098329	301	-12	1	8	2190	2198	Trying to snap off the flange.
7/22	2	51	7	47.949192	-129.098318	305	-11	-1	8	2190	2198	Small pieces of worms and floc are crumbling off the flange.
7/22	2	51	27	47.949193	-129.098314	300	-12	-2	8	2190	2199	Moving back from flange.
7/22	2	51	47	47.949195	-129.098313	301	-14	0	8	2190	2198	Going to get a new grip on the flange.
7/22	2	51	57	47.949195	-129.098313	303	-14	1	8	2190	2198	Pulling the flange again.
7/22	2	53	20	47.949198	-129.098314	272	-13	0	8	2190	2198	Repositioning for a different angle.
7/22	2	55	11	47.949182	-129.098302	258	-13	1	8	2190	2198	Trying to break the flange on this right side now.
7/22	2	55	18	47.949177	-129.098304	255	-19	1	8	2190	2198	Got it off.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	2	55	41	47.949156	-129.098282	263	-15	0	8	2190	2198	This piece is too big to go into the box though
7/22	2	55	44	47.949150	-129.098284	270	-17	1	7	2191	2198	Frame_Grab:
7/22	2	55	53	47.949139	-129.098285	273	-16	1	8	2192	2199	Frame_Grab:
7/22	2	55	53	47.949139	-129.098285	274	-16	1	7	2192	2199	Frame_Grab:
7/22	2	56	7	47.949120	-129.098284	289	-17	1	5	2194	2199	All the flanges have been broken off now.
7/22	2	56	29	47.949123	-129.098290	290	-17	0	2	2196	2198	This piece is also too heavy -- it's dragging Jason down to the seafloor.
7/22	2	57	5	47.949123	-129.098291	282	-14	0	1	2197	2198	The seafloor is covered in lava rocks and orange sediments.
7/22	2	57	23	47.949123	-129.098291	282	-14	1	1	2197	2198	Trying to break piece of flange apart on seafloor.
7/22	2	57	27	47.949123	-129.098291	282	-15	1	1	2197	2198	Hitting it against other rocks.
7/22	2	57	52	47.949123	-129.098290	282	-14	0	1	2197	2198	HIGHLIGHTS: KiPro hard drive start
7/22	2	58	5	47.949125	-129.098291	282	-14	0	1	2197	2198	The bottom of the flange piece has some interesting sulfides.
7/22	2	58	18	47.949126	-129.098292	282	-15	0	1	2197	2198	They look like a river network of black.
7/22	2	58	42	47.949131	-129.098293	282	-15	0	1	2197	2198	Frame_Grab:
7/22	2	58	54	47.949133	-129.098294	282	-15	0	1	2197	2198	There's also some bits of worms stuck in it.
7/22	2	59	12	47.949136	-129.098294	282	-15	0	1	2197	2198	The edges are coated in pyrite.
7/22	3	0	24	47.949141	-129.098284	282	-16	-1	1	2197	2198	This piece is really beautiful on the bottom where the fluids pooled.
7/22	3	0	45	47.949140	-129.098282	282	-16	-1	1	2197	2198	There were sulfide worms on the bottom too.
7/22	3	1	6	47.949139	-129.098280	282	-16	-1	1	2197	2198	The worms look like Sulfincola.
7/22	3	1	30	47.949135	-129.098279	282	-16	-1	1	2197	2198	Shaking piece of sulfide to break a piece off.
7/22	3	2	43	47.949129	-129.098284	281	-15	-2	1	2197	2198	HIGHLIGHTS: KiPro hard drive stop
7/22	3	3	39	47.949136	-129.098281	280	-18	-1	2	2197	2198	Can't seem to break a piece off of the sulfide.
7/22	3	3	53	47.949140	-129.098275	281	-17	-2	2	2196	2198	It's too heavy to bring the whole thing up.
7/22	3	5	10	47.949139	-129.098277	282	-15	-3	3	2195	2198	Checking out what's in the basket that we can drop.
7/22	3	5	22	47.949136	-129.098280	282	-14	-3	3	2195	2198	Leaving some weights behind - 2 sets.
7/22	3	5	36	47.949132	-129.098285	282	-14	-3	3	2195	2198	Dropped one set of weights.
7/22	3	5	41	47.949131	-129.098287	282	-14	-3	3	2195	2198	Picking up second set.
7/22	3	6	5	47.949125	-129.098292	281	-14	2	3	2195	2198	Dropped second set of weights.
7/22	3	6	17	47.949122	-129.098293	282	-13	1	3	2195	2198	Now we can keep the piece of sulfide.
7/22	3	7	10	47.949120	-129.098293	282	-13	1	4	2194	2198	Lifting Jason off of seafloor.
7/22	3	8	2	47.949127	-129.098288	282	-12	3	5	2193	2198	Placing the sulfide piece into the basket.
7/22	3	9	14	47.949137	-129.098289	282	-12	1	5	2193	2198	Sulfide piece stowed. End of flange sampling - J2-575-Sulfide-07 . Location: 47 56.953' 129 5.902. Z=2192m.
7/22	3	9	25	47.949140	-129.098300	282	-14	1	6	2193	2198	Now going to collect mat samples in syringe sampler.
7/22	3	10	17	47.949184	-129.098323	316	-12	1	10	2188	2198	Looking for mats to sample.
7/22	3	11	42	47.949181	-129.098386	343	-13	0	4	2190	2194	Some bright orange mat is on the edge of the flange/rocks here.
7/22	3	12	35	47.949182	-129.098385	342	-14	-2	4	2190	2194	Positioning arm to poke at the orange mat.
7/22	3	13	27	47.949190	-129.098378	342	-12	-3	4	2190	2194	The orange mat seems squishy - going to collect it.
7/22	3	14	27	47.949199	-129.098370	342	-13	-2	4	2190	2194	SAMPLE: bio Getting syringe sampler out of basket.
7/22	3	14	48	47.949200	-129.098370	342	-13	-1	4	2190	2194	Positioning sipper in the orange mat.
7/22	3	14	58	47.949199	-129.098370	342	-14	-1	4	2190	2194	HIGHLIGHTS: KiPro hard drive start
7/22	3	15	30	47.949197	-129.098373	342	-14	-1	4	2190	2194	Going to fire syringe.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	3	15	47	47.949195	-129.098374	343	-14	-1	4	2190	2194	Sucking orange mat into syringe.
7/22	3	16	12	47.949192	-129.098377	342	-13	-2	4	2190	2194	Canister full of orange and grey mat floc. J2-575-Mat-08 . Location: 47 56.952' 129 5.905. Z=2190.5m.
7/22	3	16	13	47.949192	-129.098377	342	-13	-2	4	2190	2194	Frame_Grab:
7/22	3	16	23	47.949191	-129.098378	342	-13	-2	4	2190	2194	Frame_Grab:
7/22	3	16	39	47.949190	-129.098379	342	-12	-2	4	2190	2194	Putting syringe sampler back in basket.
7/22	3	17	2	47.949190	-129.098379	342	-13	0	4	2190	2194	SAMPLE: bio Syringe sample is J2-575-Mat-08 .
7/22	3	17	5	47.949189	-129.098379	342	-13	0	4	2190	2194	HIGHLIGHTS: KiPro hard drive stop
7/22	3	19	24	47.949195	-129.098367	342	-13	-2	4	2190	2194	Getting little syringe out of basket.
7/22	3	19	44	47.949196	-129.098364	342	-14	-2	4	2190	2194	Going to collect stuff on rocks below orange mat.
7/22	3	20	32	47.949196	-129.098362	342	-13	1	4	2190	2194	HIGHLIGHTS: KiPro hard drive start
7/22	3	22	0	47.949198	-129.098375	340	-13	0	3	2191	2194	Looking at grey-brown sediments with snails (Buccinales?) in it.
7/22	3	23	54	47.949183	-129.098361	315	-10	2	4	2191	2195	Positioning syringe in sediments.
7/22	3	24	22	47.949184	-129.098355	322	-5	5	3	2192	2194	Lots of red thread worms around this area.
7/22	3	24	49	47.949185	-129.098347	318	-7	2	3	2192	2194	Syringe in red-brown sediment.
7/22	3	27	26	47.949177	-129.098349	264	-2	0	3	2192	2195	Moving around to find a better sampling site.
7/22	3	29	54	47.949140	-129.098362	321	-9	2	5	2189	2194	HIGHLIGHTS: KiPro hard drive stop Found a site.
7/22	3	30	2	47.949136	-129.098347	321	-10	1	6	2189	2194	HIGHLIGHTS: KiPro hard drive stop
7/22	3	31	10	47.949167	-129.098355	265	-4	0	3	2192	2195	Looking for orange grey mat to sample.
7/22	3	31	29	47.949168	-129.098353	268	-1	1	3	2192	2195	Checking Jason and Medea electronics.
7/22	3	31	39	47.949169	-129.098353	267	-1	1	3	2192	2195	HIGHLIGHTS: KiPro hard drive start
7/22	3	32	0	47.949172	-129.098350	268	-1	1	3	2192	2195	Syringe positioned in mat.
7/22	3	32	39	47.949179	-129.098347	269	-3	1	3	2192	2195	SAMPLE: bio J2-575-Mat-09 . Pulling syringe
7/22	3	33	6	47.949182	-129.098344	269	-3	2	3	2192	2195	Frame_Grab:
7/22	3	33	21	47.949183	-129.098342	269	-3	2	3	2192	2195	This is sample J2-575-MAT-09 .
7/22	3	33	25	47.949183	-129.098342	269	-3	1	3	2192	2195	Frame_Grab:
7/22	3	33	55	47.949183	-129.098341	268	-3	-1	3	2192	2195	HIGHLIGHTS: KiPro hard drive stop
7/22	3	34	50	47.949149	-129.098350	267	-12	1	6	2189	2196	J2575-MAT-09 is grey-brown sediments
7/22	3	36	24	47.949100	-129.098299	57	-10	-2	6	2188	2194	J2-575-MAT-09 is 47N 56.950' 129W 5.906'
7/22	3	36	35	47.949085	-129.098297	69	-10	-3	5	2189	2194	Now we're moving to Dudley (not Dante- corrected J2-578) for fluid sampling.
7/22	3	40	34	47.948998	-129.098175	98	-11	-1	6	2193	2199	Dudley (not Dante- corrected J2-578) is about 30m away from Grotto.
7/22	3	42	4	47.948980	-129.098090	75	-10	-2	6	2195	2201	After fluid sampling we will continue mapping.
7/22	3	43	39	47.948983	-129.097796	75	-11	-2	2	2197	2199	Still traveling to Dudley (not Dante- corrected J2-578).
7/22	3	47	32	47.948990	-129.097687	106	-10	0	4	2197	2201	We have arrived at the navigation lock.
7/22	3	47	41	47.948990	-129.097690	106	-10	0	4	2197	2201	Looking at a marker -- it may be 11V?
7/22	3	48	25	47.948974	-129.097659	133	-10	0	2	2199	2201	It says Du
7/22	3	48	34	47.948980	-129.097658	136	-9	1	3	2198	2201	The marker says Du.
7/22	3	49	35	47.948984	-129.097662	126	-9	1	9	2192	2201	We are looking around to see if we're in the right spot.
7/22	3	50	6	47.948983	-129.097639	126	-10	-1	8	2193	2201	Looking for venting areas
7/22	3	50	18	47.948980	-129.097635	126	-9	1	7	2193	2200	There are some areas of dead tubeworms.
7/22	3	50	45	47.948976	-129.097642	127	-10	0	9	2192	2200	Dante is big and tall and should have a vent pillar with several smokers.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	3	50	59	47.948970	-129.097654	126	-10	0	9	2192	2201	Frame_Grab:
7/22	3	51	2	47.948969	-129.097654	127	-10	0	9	2192	2201	There are lots of palm worms on this flange here.
7/22	3	51	28	47.948964	-129.097666	126	-10	0	10	2192	2201	Going to look at these smokers around to the right of the flange.
7/22	3	52	26	47.948958	-129.097686	100	-10	0	9	2191	2200	NAV: Doppler Reset
7/22	3	54	9	47.948950	-129.097687	81	-10	0	10	2191	2201	We're at Dante. DOP: 47N 56.939 129W5.860 (Correction - Actually at Dudley. Discovered on dive 578)
7/22	3	54	30	47.948940	-129.097672	58	-9	-1	13	2189	2202	Going to move upwards and look for sampling sites.
7/22	3	56	13	47.948941	-129.097598	306	-10	0	10	2189	2199	There are some interesting clumps of worms on top
7/22	3	56	23	47.948946	-129.097597	286	-9	0	10	2189	2199	There's a black smoker on top too.
7/22	3	56	49	47.948964	-129.097586	291	-10	0	12	2190	2202	We've gone most of the way around Dudley (not Dante - corrected J2-578) now.
7/22	3	57	48	47.948980	-129.097581	297	-10	-1	9	2192	2201	We're going to keep looking at the vent area.
7/22	3	58	16	47.948974	-129.097588	301	-8	1	8	2192	2201	Trying to pick a good area for instruments to get into.
7/22	3	59	19	47.949024	-129.097573	260	-10	-1	8	2191	2200	We've done a full circle of Dudley (not Dante- corrected J2-578) now.
7/22	3	59	34	47.949018	-129.097522	107	-9	-1	5	2191	2196	Going to move back down the pillar.
7/22	4	0	40	47.949046	-129.097603	181	-9	0	9	2192	2201	Stopping to look at an orange mat next to a white mat area.
7/22	4	1	5	47.949051	-129.097612	171	-10	0	8	2192	2201	The orange mat looks like the same squishy mat sampled earlier at Grotto.
7/22	4	1	22	47.949041	-129.097645	151	-10	0	9	2191	2200	Moving on to look at more sampling site possibilities.
7/22	4	1	44	47.949018	-129.097671	145	-10	-1	8	2192	2200	This area is the one we first approached - may be easiest to work at.
7/22	4	2	2	47.949004	-129.097675	140	-10	0	8	2193	2201	The smokers here are not as vigorous as they were in 2009.
7/22	4	2	41	47.948997	-129.097659	93	-9	1	9	2192	2201	Looking for a biologically diverse spot.
7/22	4	3	47	47.948970	-129.097664	93	-10	0	7	2193	2200	This area is biologically interesting but not topographically flat enough for a temperature array.
7/22	4	5	3	47.948942	-129.097670	107	-9	-1	8	2193	2201	Higher up is too far and not biologically diverse.
7/22	4	5	15	47.948941	-129.097682	140	-10	-1	9	2192	2201	Go back to beginning spot.
7/22	4	5	44	47.948922	-129.097665	130	-10	0	9	2191	2200	Looking for the interesting flange again.
7/22	4	5	53	47.948914	-129.097670	118	-10	-1	9	2191	2200	There may be a marker here.
7/22	4	6	12	47.948921	-129.097659	128	-10	0	10	2191	2201	This black smoker looks like a good fluid sampling site.
7/22	4	7	43	47.948940	-129.097661	127	-7	-1	8	2192	2200	Going to get some fluid samples on the HFS.
7/22	4	9	7	47.948954	-129.097662	127	-7	-1	8	2192	2200	Going to try and take some temperatures in this area.
7/22	4	9	28	47.948954	-129.097663	127	-7	-2	8	2192	2200	Going to use Jason temperature probe around black smoker vent.
7/22	4	10	39	47.948944	-129.097667	128	-8	-2	8	2191	2200	Going to insert probe in smoker vent - right orifice.
7/22	4	10	56	47.948941	-129.097669	127	-8	-3	8	2191	2200	TEMPS: Jason temperature is 195 and rising.
7/22	4	11	7	47.948938	-129.097670	127	-9	-2	9	2191	2200	T is 265 C.
7/22	4	11	21	47.948936	-129.097672	126	-9	-2	8	2191	2200	T is 295.9 C.
7/22	4	11	29	47.948935	-129.097673	126	-9	-2	8	2191	2200	T is dropping now to 280 C.
7/22	4	11	55	47.948931	-129.097676	126	-9	-2	8	2191	2200	TEMPS: Jason temperature is 303 and rising.
7/22	4	12	23	47.948930	-129.097678	127	-9	-3	8	2191	2200	TEMPS: Jason temperature: Tmax was 307.9C.
7/22	4	12	40	47.948930	-129.097678	127	-9	-2	8	2191	2200	No - temp is still rising.
7/22	4	12	49	47.948930	-129.097678	127	-9	-2	8	2191	2200	TEMPS: Jason temperature \is up to 318 and still rising slowly.
7/22	4	13	6	47.948931	-129.097677	128	-8	-2	8	2191	2200	Temp is 321.4 and rising slowly.
7/22	4	13	48	47.948933	-129.097673	127	-8	-3	8	2191	2200	T is 323.3 C.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	4	14	22	47.948934	-129.097668	128	-9	-3	9	2191	2200	TEMPS: Jason temperature is holding at 323.5 C.
7/22	4	15	16	47.948932	-129.097663	128	-9	-3	8	2191	2200	Looking at different venting areas - left vent much cooler.
7/22	4	15	43	47.948928	-129.097663	127	-8	-3	8	2191	2200	T is 67C and rising.
7/22	4	16	24	47.948923	-129.097667	127	-8	-2	8	2191	2200	TEMPS: Jason temperature at the diffuse vent is 90C.
7/22	4	17	44	47.948920	-129.097677	126	-9	-2	8	2191	2200	This right diffuse vent is only about 22.7 C.
7/22	4	17	54	47.948921	-129.097678	127	-9	-2	8	2191	2200	The diffuse vent that's 90 C is grey.
7/22	4	18	2	47.948921	-129.097679	126	-10	-2	9	2191	2200	The right diffuse vent that's 22.7 C is clear.
7/22	4	18	27	47.948925	-129.097681	127	-8	-2	8	2191	2200	Going to replace Jason temp probe.
7/22	4	18	55	47.948930	-129.097682	127	-9	-2	8	2191	2200	Jason temp probe cord is twisted.
7/22	4	19	5	47.948932	-129.097682	127	-8	-2	8	2191	2200	Stored Jason temp probe in basket.
7/22	4	19	27	47.948936	-129.097682	126	-8	-2	8	2191	2200	Going to get out HFS intake wand.
7/22	4	19	38	47.948938	-129.097681	126	-8	-2	8	2191	2200	HIGHLIGHTS: DVD Deck start
7/22	4	19	50	47.948939	-129.097681	127	-8	-2	8	2191	2200	HIGHLIGHTS: DVD Deck stop
7/22	4	20	9	47.948941	-129.097680	127	-8	-2	8	2191	2200	Correction - DVD decks changed. Not highlights.
7/22	4	20	29	47.948941	-129.097678	127	-8	-2	8	2191	2200	Picking up HFS intake wand.
7/22	4	20	42	47.948941	-129.097677	127	-9	-2	9	2191	2200	HFS intake wand is out.
7/22	4	21	24	47.948938	-129.097674	127	-9	-2	9	2191	2200	Inserting HFS wand in hottest black smoker vent (on right).
7/22	4	22	10	47.948934	-129.097669	127	-9	-2	9	2191	2200	TEMPS: HFS temperature is 129 C.
7/22	4	22	28	47.948934	-129.097668	126	-9	-2	8	2191	2200	TEMPS: HFS temperature is 180 C and rising.
7/22	4	22	40	47.948933	-129.097667	126	-9	-2	8	2191	2200	TEMPS: HFS temperature is 237 and rising.
7/22	4	23	11	47.948934	-129.097666	126	-8	-2	8	2191	2200	TEMPS: HFS temperature is 304 C and still rising.
7/22	4	23	44	47.948937	-129.097667	127	-9	-2	8	2191	2200	T is 315 C and still going up.
7/22	4	24	58	47.948945	-129.097668	127	-9	-2	8	2191	2200	SAMPLE: fluid T is at 321.2 C and holding.
7/22	4	25	6	47.948946	-129.097667	127	-8	-2	8	2191	2200	SAMPLE: fluid unfiltered bag #20 start
7/22	4	25	37	47.948946	-129.097665	127	-8	-3	8	2191	2200	SAMPLE: fluid Still same lat/long as before.
7/22	4	26	6	47.948945	-129.097661	127	-8	-2	8	2191	2200	SAMPLE: fluid J2-575-HFS-10 is unfiltered bag #20.
7/22	4	28	22	47.948926	-129.097651	127	-8	-2	9	2191	2200	SAMPLE: fluid J2575-HFS-10 is done.
7/22	4	29	0	47.948927	-129.097654	127	-8	-2	8	2191	2200	J2-575-HFS-10: start=04:25 Tmax=322.7 Tavg=322.1 T2=105 C. vol=500mL end 04:28
7/22	4	29	7	47.948928	-129.097655	127	-8	-2	8	2191	2200	SAMPLE: fluid filtered bag #19 start
7/22	4	29	23	47.948930	-129.097656	127	-8	-2	8	2191	2200	SAMPLE: fluid J2-575-HFS-11 is filtered bag #19.
7/22	4	30	55	47.948950	-129.097651	127	-9	-2	8	2191	2200	heading=126.9 and depth=2191.7m
7/22	4	31	54	47.948957	-129.097641	126	-8	-3	8	2191	2200	J2575-HFS-11 still filtering.
7/22	4	32	9	47.948957	-129.097639	126	-8	-3	8	2191	2200	J2575-HFS-11 done.
7/22	4	32	32	47.948955	-129.097636	126	-8	-2	8	2191	2200	J2-575-HFS-11: Tmax=323.1 Tavg=322.7 T2=106 vol=504.
7/22	4	32	49	47.948953	-129.097635	127	-8	-2	8	2191	2200	SAMPLE: J2-575-GTHFS-12. gas port gastight firing.
7/22	4	33	11	47.948950	-129.097635	127	-8	-2	8	2191	2200	SAMPLE: gas Port gastight is naked #6. fired.
7/22	4	33	23	47.948948	-129.097636	127	-8	-2	8	2191	2200	T=322 when fired.
7/22	4	35	27	47.948939	-129.097644	127	-8	-2	8	2191	2200	Stowing HFS intake wand in basket.
7/22	4	37	23	47.948943	-129.097649	127	-8	-2	8	2191	2200	Samples J2575-HFS-10/11/12 all at same location 47N 56.939 129W 5.860 depth 2191.3m
7/22	4	37	36	47.948943	-129.097650	127	-8	-2	8	2191	2200	Now going to do some temperature mapping.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	4	37	51	47.948943	-129.097652	127	-7	-2	8	2191	2200	Retracting Jason basket.
7/22	4	39	55	47.948954	-129.097649	127	-9	-3	9	2191	2200	Going to do temperature mapping on this little rectangular-shaped mound.
7/22	4	40	8	47.948955	-129.097649	127	-10	-3	9	2191	2200	This mound has some brown worms in the middle.
7/22	4	40	23	47.948955	-129.097648	127	-10	-3	9	2191	2200	One of the temperature sensors came off the array.
7/22	4	40	57	47.948956	-129.097643	127	-11	-3	9	2191	2200	It's the second to left in the bottom row where the T-handle is.
7/22	4	43	11	47.948949	-129.097635	127	-12	0	9	2191	2200	Going to place the array down on the mound.
7/22	4	43	22	47.948948	-129.097636	127	-13	2	9	2191	2200	Frame_Grab:
7/22	4	43	29	47.948948	-129.097638	127	-13	-1	9	2191	2200	Frame_Grab:
7/22	4	43	54	47.948947	-129.097642	127	-12	2	9	2191	2200	The array will be held in place for 10 minutes.
7/22	4	44	19	47.948947	-129.097647	126	-12	1	9	2191	2200	It is to the center left of the top (far part from Jason) of the mound.
7/22	4	45	32	47.948954	-129.097658	127	-12	1	9	2191	2200	SAMPLE: fluid First sample - Sample 1
7/22	4	45	34	47.948954	-129.097658	127	-12	1	9	2191	2200	Frame_Grab:
7/22	4	45	54	47.948957	-129.097659	127	-12	1	9	2191	2200	Correction - sample was not fluid sample. It was a temperature array sample.
7/22	4	47	30	47.948963	-129.097647	127	-12	1	9	2191	2200	We're taking the temperature array.
7/22	4	51	31	47.948942	-129.097619	128	-12	1	9	2191	2200	The sensors are sensitive to 0.5 degrees.
7/22	4	51	47	47.948943	-129.097624	128	-12	1	9	2191	2200	It takes about 5 minutes for the sensors to get up to temperature.
7/22	4	54	16	47.948968	-129.097662	128	-12	1	9	2191	2200	temp array done.
7/22	4	54	45	47.948971	-129.097662	128	-12	0	9	2191	2200	Moving right array to right edge of mound.
7/22	4	54	52	47.948971	-129.097661	128	-13	1	9	2191	2200	Moving left array to left edge of mound.
7/22	4	54	53	47.948971	-129.097661	128	-13	1	9	2191	2200	Frame_Grab:
7/22	4	55	6	47.948970	-129.097660	128	-13	1	9	2191	2200	Position #2 04:55
7/22	4	56	12	47.948961	-129.097657	128	-12	1	9	2191	2200	Position #1 was at 04:44:44.
7/22	5	1	33	47.948964	-129.097642	127	-12	1	9	2191	2200	SAMPLE: J2-575-HFS-13 fluid filtered bag #17 start
7/22	5	2	35	47.948956	-129.097638	128	-12	1	9	2191	2200	SAMPLE: fluid J2-575-HFS-13 is filtered bag #17 - Background sample at Dudley (not Dante-corrected J2-578).
7/22	5	4	25	47.948947	-129.097645	127	-12	1	9	2191	2200	1 more minute on temperature array.
7/22	5	4	57	47.948949	-129.097647	128	-12	1	9	2191	2200	J2575-HFS-13 started a little later than logged.
7/22	5	5	6	47.948949	-129.097647	128	-12	1	9	2191	2200	Array position #2 done.
7/22	5	5	40	47.948952	-129.097647	128	-12	1	9	2191	2200	Moving temp array again.
7/22	5	6	15	47.948955	-129.097645	127	-12	1	9	2191	2200	Left arm array moved.
7/22	5	6	27	47.948956	-129.097644	127	-12	2	9	2191	2200	Moving right arm array.
7/22	5	6	36	47.948956	-129.097644	127	-12	1	9	2191	2200	HFS-13 finished.
7/22	5	6	43	47.948957	-129.097643	127	-12	1	9	2191	2200	Frame_Grab:
7/22	5	6	53	47.948957	-129.097642	127	-12	1	9	2191	2200	Position #3 05:07.
7/22	5	7	45	47.948955	-129.097637	127	-12	1	9	2191	2200	SAMPLE: fluid J2575-HFS-13: Tmax=2.2 Tavg=1.9 vol=501mL T2 also ~2.
7/22	5	9	15	47.948946	-129.097637	127	-12	1	9	2191	2200	SAMPLE: fluid J2-575-HFS-14 started 05:07 RNA filter #16.
7/22	5	14	1	47.948974	-129.097643	127	-12	1	9	2191	2200	We're fluid sampling in the background while the temperature array records.
7/22	5	17	3	47.948955	-129.097660	127	-12	1	9	2191	2200	Array position #3 done
7/22	5	17	59	47.948948	-129.097659	127	-12	1	9	2191	2200	Frame_Grab:
7/22	5	18	2	47.948948	-129.097659	127	-12	1	9	2191	2200	Frame_Grab:
7/22	5	18	10	47.948948	-129.097658	127	-12	1	9	2191	2200	Array position #4 05:18

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-575 Dive Log
7/22	5	26	7	47.948966	-129.097652	127	-11	1	9	2191	2200	This mound is at DOP 47N 56.939 129W 5.857
7/22	5	26	19	47.948967	-129.097653	127	-11	1	9	2191	2200	heading 126.9 depth 2191.1 m
7/22	5	26	33	47.948969	-129.097654	127	-11	1	9	2191	2200	Temp array position #4 has a couple more minutes.
7/22	5	28	8	47.948979	-129.097650	127	-11	1	9	2191	2200	Position #4 done.
7/22	5	28	19	47.948980	-129.097648	127	-11	1	9	2191	2200	Moving arrays to new position.
7/22	5	29	4	47.948979	-129.097638	127	-11	1	9	2191	2200	Jason basket has shifted a little.
7/22	5	29	31	47.948978	-129.097633	127	-11	1	9	2191	2200	Frame_Grab:
7/22	5	29	33	47.948977	-129.097632	127	-11	1	9	2191	2200	Position #5 05:29
7/22	5	29	40	47.948977	-129.097631	127	-11	1	9	2191	2200	Frame_Grab:
7/22	5	33	36	47.948961	-129.097637	128	-11	1	9	2191	2200	SAMPLE: fluid HFS-14 done.
7/22	5	35	12	47.948964	-129.097642	127	-11	1	9	2191	2200	J2575-HFS-14: Tmax=2.2 Tavg=2 T2=2.0 vol=3001. start=05:07 end=05:33. RNA filter #16.
7/22	5	38	30	47.948975	-129.097634	128	-11	1	9	2191	2200	Still have another minute for the temperature array.
7/22	5	39	7	47.948972	-129.097631	128	-11	1	9	2191	2200	Position #5 done.
7/22	5	39	55	47.948971	-129.097634	128	-12	0	9	2191	2200	Moving back from the mound.
7/22	5	40	2	47.948970	-129.097633	127	-11	0	9	2191	2200	Putting temperature arrays back in Jason basket.
7/22	5	41	10	47.948970	-129.097637	128	-11	-1	9	2191	2200	Stowing right-hand temperature array in basket.
7/22	5	42	26	47.948965	-129.097636	128	-11	0	9	2191	2200	Picking up dropped sensor and putting it in the box.
7/22	5	42	39	47.948964	-129.097635	128	-11	0	9	2191	2200	Stowing left-hand temperature array in basket.
7/22	5	43	27	47.948959	-129.097632	128	-11	0	9	2191	2200	The sensor likely came from the left-hand (red handle) array.
7/22	5	43	52	47.948958	-129.097631	128	-11	0	9	2191	2200	There is a sensor missing in the left-hand column (looking with handle at the bottom) second row.
7/22	5	44	5	47.948958	-129.097630	127	-11	-1	9	2191	2200	Red-handled sensor array stowed.
7/22	5	45	38	47.948962	-129.097641	128	-12	-4	9	2190	2200	Right-handed sensor array stowed.
7/22	5	46	12	47.948966	-129.097641	323	-13	-2	2	2189	2191	Right-handed array was silver handled.
7/22	5	46	48	47.948962	-129.097705	234	-11	-4	10	2189	2200	Sampling completed.
7/22	5	46	50	47.948998	-129.097715	231	-12	-5	11	2189	2200	JASON: Jason off bottom

Table 7.4.3 J2-576 Jason Dive Log (High Rise Field, Endeavour Segment, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	16	47	49	47.968255	-129.086608	322	-10	0	6	2182	2188	Jason on bottom
7/22	16	48	43	47.968266	-129.086632	322	-10	-1	4	2183	2188	We're on the bottom here on a talus/rubble slope. Setting things up.
7/22	16	48	56	47.968266	-129.086631	322	-12	0	4	2184	2188	Need to drop a weight here.
7/22	16	50	58	47.968265	-129.086627	322	-10	0	6	2181	2187	Looks like small sponges (?) on the rocks here.
7/22	16	51	06	47.968268	-129.086627	322	-9	0	6	2181	2187	Heading up slope.
7/22	16	51	20	47.968276	-129.086633	322	-10	0	6	2180	2187	Lots of floc and smoke in the area.
7/22	16	56	00	47.968564	-129.086895	323	-9	0	10	2160	2170	NAV: the doppler and USBL are 40m apart.
7/22	16	56	19	47.968561	-129.086899	323	-9	0	10	2160	2171	USBL positions are ~40m south of doppler fixes.
7/22	16	57	24	47.968605	-129.086983	324	-10	0	8	2158	2166	Green trail is USBL. The trail (yellow) behind Jason is Doppler. I had it wrong earlier. Doppler was ~40m S of USBL position.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	16	57	37	47.968613	-129.086993	324	-10	1	9	2157	2165	NAV: Doppler Reset about 1 minute ago.
7/22	16	58	29	47.968626	-129.087021	323	-9	0	16	2148	2164	Huge sulfide chimney right in front of us.
7/22	16	59	02	47.968619	-129.087025	322	-7	0	21	2143	2164	This is probably Bambi. It's about 25m high at the top.
7/22	16	59	12	47.968619	-129.087023	324	-10	0	23	2142	2165	Beautiful huge chimney.
7/22	16	59	29	47.968622	-129.087030	324	-10	0	24	2140	2164	This is it. Bambi has grown up.
7/22	17	00	12	47.968617	-129.087073	353	-9	0	20	2139	2159	Black bee hives pouring out smoke at the top of this huge chimney. The altimeter is reading 24m here.
7/22	17	01	25	47.968647	-129.087131	43	-12	0	19	2139	2158	There are a couple peaks on this chimney; both with beehives pouring out black smoke. Big flanges on both peaks.
7/22	17	02	50	47.968671	-129.087112	49	-11	0	16	2140	2156	Zooming in on this massive sulfide with black smoke pouring out of orifices.
7/22	17	04	18	47.968679	-129.087106	48	-7	-2	15	2140	2155	Seeing some shrimp in the area. The pic in the science cam is beautiful. Can see lots of life on top of the flanges and lots of flow.
7/22	17	05	17	47.968684	-129.087107	49	-7	-1	15	2140	2155	We're going to take a water sample.
7/22	17	06	11	47.968687	-129.087108	48	-7	-1	15	2140	2155	NAV: Dropped DVL target New target for Bambi 11 put in now.
7/22	17	07	31	47.968687	-129.087109	48	-7	-2	15	2140	2155	New position for Bambi: 129 5.2231 47 58.1196. Depth here at sampling site is 2141m.
7/22	17	09	11	47.968681	-129.087104	48	-7	-2	15	2140	2155	Preparing to sample with the Beast.
7/22	17	12	25	47.968672	-129.087103	49	-8	0	15	2140	2155	Setting up for J2-576-HFS-01. Sample will be in black smoker hole under the largest flange at the top of Bambi.
7/22	17	13	22	47.968671	-129.087106	49	-8	-1	15	2140	2155	Wand is in the hole. The temperature is rising.
7/22	17	14	03	47.968670	-129.087109	49	-8	-1	15	2140	2155	Heading is 49 degrees. Altitude is 20.5m.
7/22	17	14	20	47.968670	-129.087110	49	-8	-1	15	2140	2155	Just got a Tmax of 45 degrees. It's dropping now.
7/22	17	15	14	47.968670	-129.087113	49	-8	-1	15	2140	2155	We expect a temp here of ~340C.
7/22	17	15	22	47.968670	-129.087113	50	-7	-1	15	2140	2155	It's at 115 now.
7/22	17	15	37	47.968670	-129.087112	49	-8	-1	15	2140	2155	Jimmy is repositioning the wand. The temp is still rising.
7/22	17	15	52	47.968670	-129.087112	49	-8	-1	15	2140	2155	The wand is right in the black smoker hole.
7/22	17	16	18	47.968670	-129.087110	48	-9	-1	15	2140	2156	Repositioning again.
7/22	17	18	22	47.968671	-129.087094	49	-8	-1	15	2140	2155	NAV: Dropped DVL target John got a better doppler fix while we have been sitting here. Bambi11: 129 5.2237' 47 58.1214'
7/22	17	21	35	47.968679	-129.087113	48	-8	-1	15	2140	2155	Still repositioning. Not quite in the correct spot in the hole. It's hard to see.
7/22	17	23	27	47.968675	-129.087140	49	-9	2	15	2140	2156	The temperature dropped again.
7/22	17	26	25	47.968672	-129.087115	49	-8	2	15	2140	2156	This is looking good now. Temp is rising fast. Up to 270 and rising.
7/22	17	29	21	47.968686	-129.087084	49	-9	2	15	2140	2156	SAMPLE: fluid J2-576-HFS-01. Bambi11 new position: 129 5.2237' 47 58.1214' Z=2141 at sampling site. Hdg=49degrees. We're at 333 deg C. Sampling start 1729:17.
7/22	17	30	07	47.968682	-129.087083	49	-9	1	15	2140	2156	J2-576-HFS-01 cont. Filtered piston #1. 340 deg C right now. Hdg. 49 deg.
7/22	17	30	34	47.968679	-129.087083	49	-8	2	15	2140	2156	J2-576-HFS-01 cont. VV# 1824.
7/22	17	32	59	47.968671	-129.087101	49	-9	1	15	2140	2155	J2-576-HFS-01 cont. Stop sample at 17:32:27. Tmax=341.7. Tavg=341.0. T2=114. Vol=567ml.
7/22	17	33	36	47.968674	-129.087107	49	-9	1	15	2140	2155	SAMPLE: fluid J2-HFS-576-02. Unfiltered piston #2. Start 1733:23. same location.
7/22	17	35	50	47.968689	-129.087107	49	-9	2	15	2140	2155	J2-HFS-576-02 cont. Same location; depth; heading as sample 1.
7/22	17	36	46	47.968692	-129.087093	49	-8	2	15	2140	2155	J2-HFS-576-02 cont. stop 1736:18. Tmax=341.2 Tavg=340.9. T2=113. Vol=562ml.
7/22	17	37	49	47.968691	-129.087082	49	-8	-1	15	2141	2156	That's it for fluid sampling here at Bambi - at least for now. Stowing the HFS wand. Next we are moving on to deploy the resistivity probe (ResProbe).

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	17	38	37	47.968691	-129.087076	49	-7	-1	15	2141	2156	This whole place is hotter than it was last year according to Marv Lilley.
7/22	17	39	07	47.968691	-129.087077	49	-7	-1	15	2141	2156	Unwinding the hose and attempting to stow the Beast wand.
7/22	17	42	44	47.968676	-129.087121	49	-8	1	15	2141	2156	Looking for a spot to deploy the ResProbe. When the wand was removed from the hole a bit of the chimney crumbled in the area they wanted to put the ResProbe. Examining things.
7/22	17	43	37	47.968671	-129.087121	49	-8	0	15	2141	2156	The rock they were going to set the probe on is really loose. It looks like a precarious spot. Marv and Eric are discussing it.
7/22	17	46	52	47.968674	-129.087100	49	-8	-2	15	2141	2156	TEMP: Jason temperature 3.9. They really want it to be cool where they put the instrument.
7/22	17	48	41	47.968676	-129.087102	49	-7	-2	15	2141	2156	The sensors that go into the black smoker hole will be reading temperature; conductivity and redox.
7/22	17	50	44	47.968673	-129.087101	49	-13	-1	16	2140	2156	The sensors go into the black smoker hole and then send their information to the ResProbe where the data is stored. The ICL wand can read those data without recovering the ResProbe.
7/22	17	51	25	47.968674	-129.087100	49	-6	-2	14	2141	2155	Looking around here for a spot to put the ResProbe. The place it was before is a bit precarious now after sampling.
7/22	17	52	40	47.968678	-129.087098	49	-7	-2	15	2141	2156	They are going to put it in the 7 degree spot below the smoker and to the left a bit.
7/22	17	54	53	47.968686	-129.087105	49	-7	-1	15	2141	2155	Jason is pulling the bungee off the "piggy" (ResProbe).
7/22	17	55	38	47.968687	-129.087107	49	-9	-2	15	2141	2156	Here comes the instrument. Hoisting it up to the spot where they want to deploy it.
7/22	17	57	12	47.968687	-129.087108	48	-7	0	14	2141	2155	DEPLOY ResProbe "piggy" on small ledge just down from the black smoker hole. Z=2141. Hdg=20deg. Same position as samples 1 and 2. (47 58.1214 129 5.2237).
7/22	17	57	44	47.968687	-129.087105	49	-8	-1	15	2141	2156	HIGHLIGHTS: KiPro hard drive start video while positioning the ResProbe.
7/22	18	01	19	47.968679	-129.087103	49	-9	-1	15	2141	2156	The ResProbe seems to be in a stable place. Marv wants to hang the ICL loop while it goes into the hole. They will get readings every 3 minutes to see if they have it in the heat.
7/22	18	02	43	47.968686	-129.087111	49	-9	-1	15	2141	2156	Placing the ICL loop over the cone on the ResProbe. They will get a reading in 3 minutes. Next will stick the sensors in the hole.
7/22	18	04	37	47.968698	-129.087108	49	-8	-1	15	2141	2156	Jimmy is grabbing the sensor package and preparing to put it in the black smoker hole.
7/22	18	05	09	47.968698	-129.087104	49	-8	-1	15	2141	2156	The cable is sort of twisted so Jimmy is trying to straighten it out.
7/22	18	07	59	47.968689	-129.087086	50	-9	-1	15	2141	2156	Manipulating the sensor wand. Looks like the cable connecting the sensors to the Res Probe is a bit twisted.
7/22	18	08	48	47.968688	-129.087087	49	-9	0	15	2141	2156	Quite the delicate operation going on there.....
7/22	18	09	57	47.968689	-129.087094	50	-9	0	15	2141	2156	Looks like it's in there. Going to read the sensor. Marv thinks it's only half way in there. He wants to see a reading before they try to push the sensor wand in the hole further.
7/22	18	10	55	47.968689	-129.087097	49	-9	0	15	2141	2156	The ICL is still on the pig. They have 344 deg C reading now. Will collect a few more readings.
7/22	18	13	08	47.968691	-129.087089	50	-8	1	15	2141	2156	HIGHLIGHTS: KiPro hard drive stop
7/22	18	13	47	47.968693	-129.087085	50	-8	1	15	2141	2156	Second reading 344C. The other readings are believable as well.
7/22	18	16	20	47.968697	-129.087097	49	-8	1	15	2141	2156	Sitting here getting more readings from the ICL.
7/22	18	16	51	47.968695	-129.087103	49	-8	1	15	2141	2156	If they have it all the way in and the pig goes tumbling the wand may hold it.
7/22	18	17	29	47.968692	-129.087108	50	-8	1	15	2141	2155	The rocks around the hole are chalcopyrite and really hard according to Marv. 343.7C reading now.
7/22	18	20	00	47.968686	-129.087088	50	-8	1	15	2141	2156	The ResProbe went to zero. There could be a crack in the ceramic where the sensors are.
7/22	18	20	49	47.968688	-129.087074	48	-7	-1	15	2141	2156	They will still get temperature and eH values..... but not the other 2 sensors.
7/22	18	22	08	47.968691	-129.087063	50	-6	2	14	2141	2155	Jimmy is going to try to tuck the ICL loop back in the basket. That's it for the ResProbe deployment here at Bambi.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	18	23	22	47.968691	-129.087073	49	-7	-1	15	2141	2156	HIGHLIGHTS: KiPro hard drive start Getting one more view of the ResProbe at Bambi before moving on to the next task.
7/22	18	26	46	47.968677	-129.087136	48	-9	0	16	2140	2157	Looking at the ResProbe on Bambi. Backing out slowly so that Marv can get some HDvideo of the whole thing.
7/22	18	28	31	47.968668	-129.087154	49	-9	0	14	2142	2156	These sulfide structure are huge. Covered with biota; black smokers; diffuse flow; amazing.
7/22	18	29	03	47.968651	-129.087181	47	-8	-1	15	2144	2159	HIGHLIGHTS: KiPro hard drive stop
7/22	18	30	09	47.968648	-129.087174	49	-9	0	12	2147	2159	Jimmy is doing tether management.
7/22	18	30	57	47.968644	-129.087173	49	-9	0	12	2147	2159	Gas chromatograph is dead for the day. Ground fault was related to the gas chromatograph so that deployment won't be happening.
7/22	18	32	00	47.968641	-129.087173	49	-9	0	12	2147	2159	Moving down to boardwalk. Remaining tasks are the water sampling.
7/22	18	36	30	47.968549	-129.087259	218	-9	0	14	2148	2162	
7/22	18	36	43	47.968530	-129.087279	219	-8	-1	13	2149	2162	Still transiting.
7/22	18	37	00	47.968486	-129.087314	218	-10	-1	9	2151	2160	Coming up on a sulfide structure.
7/22	18	37	42	47.968491	-129.087305	218	-10	0	12	2148	2160	Examining sulfide to see if it is Boardwalk. Looking for markers etc.
7/22	18	39	03	47.968479	-129.087327	219	-9	0	22	2137	2159	Fairly large sulfide structure with multiple flanges. Jason has gone up about 10m on it so far.
7/22	18	39	10	47.968478	-129.087327	219	-9	0	22	2137	2159	Getting near the top of the structure.
7/22	18	39	27	47.968479	-129.087328	219	-9	0	22	2137	2159	nice clump of white Ridgeia.
7/22	18	39	49	47.968480	-129.087333	213	-9	0	24	2136	2159	More white Ridgeiea on the top of a flange.
7/22	18	40	38	47.968481	-129.087340	208	-9	-1	27	2133	2159	Can see smokers now.
7/22	18	40	53	47.968478	-129.087336	206	-8	0	27	2131	2158	We are near the top of the structure.
7/22	18	42	40	47.968480	-129.087345	208	-9	0	28	2131	2159	Can view Boardwalk chimney. There is a spire (about 2 m) with a smoker at the base and a clump of healthy Ridgeia. Will sample the most robust venting.
7/22	18	42	50	47.968480	-129.087344	208	-9	0	28	2131	2159	Turning on the HD to get better video.
7/22	18	43	52	47.968461	-129.087350	210	-9	0	26	2132	2158	Nice view of black smoking next to the spire. Heavily colonized with Ridgeia on the spire and on a mound to the right of the smoker.
7/22	18	46	28	47.968429	-129.087339	230	-8	1	18	2133	2152	We're looking at a beautiful sulfide chimney. There are amazing palm worms in among the Ridgeia.
7/22	18	47	53	47.968429	-129.087345	232	-10	-1	21	2133	2154	Sulfide worms are probably mixed in there. Palm worms are more colonial - in groups. Sulfide worms are more solitary. Ray Lee says that it's hard to tell the difference even when he has them in his hand.
7/22	18	48	57	47.968432	-129.087354	226	-9	2	25	2133	2158	Lots of gray/black smoke coming out of Boardwalk. The altitude here is 26 meters.
7/22	18	49	23	47.968433	-129.087356	227	-10	0	25	2133	2158	The white structure in view now is probably an anhydrite chimney.
7/22	18	50	34	47.968439	-129.087356	226	-9	1	21	2133	2154	HIGHLIGHTS: KiPro hard drive stop.
7/22	18	51	30	47.968444	-129.087354	226	-9	1	21	2133	2154	We're waiting for the navigation to settle out before we can get a good lat/long for this chimney.
7/22	18	53	50	47.968451	-129.087353	226	-8	0	21	2133	2154	Boardwalk has a spire going up a couple more meters - so it's probably about 28 meters high. We're at 26 meters here.
7/22	18	55	35	47.968447	-129.087357	226	-9	-1	24	2133	2158	Grabbing the wand for fluid sampling.
7/22	18	58	50	47.968437	-129.087358	225	-9	0	21	2133	2154	TEMPS: Jason temperature in black smoker hole near top of Boardwalk. Surrounded by dense biota. Temp was 337.5C.
7/22	19	01	16	47.968443	-129.087352	225	-10	1	21	2133	2154	Grabbing the Beast wand and preparing to sample vent fluids.
7/22	19	03	57	47.968441	-129.087347	226	-10	0	25	2133	2158	NAV: Dropped DVL target Boardwalk11: 129 5.2425 47 58.1057. New target here.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	19	13	29	47.968430	-129.087350	226	-9	0	21	2133	2154	Attempt at fluid sample at Boardwalk in black smoker hole near top of sulfide hard to see. Will now break off a piece of sulfide that is in the way.... at least that was the plan. Let's see.
7/22	19	13	41	47.968430	-129.087351	226	-9	1	21	2133	2154	Stowing the Beast wand.
7/22	19	18	24	47.968439	-129.087341	227	-9	-1	21	2133	2154	Setting up to grab this piece of sulfide (?) to clear up the black smoker hole for fluid sampling.
7/22	19	22	06	47.968444	-129.087350	227	-9	1	25	2133	2158	SAMPLE: geo J2-576-sulfide-03 . Location: Boardwalk 129 5.2425 47 58.1057. Z=2138. Hdg=227. It's pretty fragile young mix of sulfide and anhydrite. Not hardened yet. Small flat black.
7/22	19	23	49	47.968450	-129.087355	227	-9	0	21	2133	2154	That is going into the stbd swing box.
7/22	19	26	06	47.968450	-129.087351	226	-9	0	21	2133	2154	J2-576-sulfide-03 was a small piece of quite fragile sulfide. Dark colored/blackish. Pretty flat.
7/22	19	27	23	47.968445	-129.087345	226	-9	1	25	2133	2158	The HFS wand is getting a bit sticky. Having a bit of a problem pulling it out of the holder.
7/22	19	30	20	47.968442	-129.087344	226	-8	-1	20	2133	2154	The wand is out of the holder. Now need to un-twirl it and prepare for sampling.
7/22	19	32	36	47.968445	-129.087347	226	-8	-2	20	2133	2154	Now trying to grab the wand which was set in the basket.
7/22	19	35	21	47.968444	-129.087334	226	-9	-1	21	2133	2154	Now the black smoker hole is totally exposed. Should make for easier water sampling.
7/22	19	38	43	47.968455	-129.087327	226	-9	-1	24	2133	2157	Getting ready to sample here in this black smoker hole on Boardwalk.
7/22	19	42	15	47.968447	-129.087309	226	-9	-1	21	2133	2154	SAMPLE: fluid J2-576-HFS-04 at Boardwalk in black smoker hole near top of sulfide. Location: 129 5.2425 47 58.1057. Z=2138. Hdg=226. Steady at 340degC. Start 1942:10.
7/22	19	42	42	47.968445	-129.087315	226	-9	-1	24	2133	2157	J2-576-HFS-04 cont. Unfiltered bag #24.
7/22	19	43	31	47.968443	-129.087330	226	-9	-1	21	2133	2154	J2-576-HFS-04 cont. We're 26 meters up this sulfide chimney. Nearly at the top.
7/22	19	44	51	47.968445	-129.087355	226	-10	-1	24	2133	2157	J2-576-HFS-04 cont. Stop 1944:00. Tmax=342.8. Tavg=341.7. T2=100. Vol=302ml.
7/22	19	45	33	47.968448	-129.087362	226	-9	-1	21	2133	2154	SAMPLE: fluid J2-576-HFS-05 . Filtered bag #23. Start 1945:15. Same location.
7/22	19	47	31	47.968456	-129.087355	226	-9	-1	21	2133	2155	J2-576-HFS-05 cont. Stop 1446:56. Tmax=340.7. Tavg=336.8. T2=97.0. Vol=276ml.
7/22	19	49	20	47.968448	-129.087352	225	-9	-1	21	2133	2154	SAMPLE: fluid J2-576-GTHFS-06 . Port GTHFS. Fired 1948:20. Same location. Tmax=340.7.
7/22	19	50	49	47.968435	-129.087367	225	-8	-2	20	2133	2154	Going to look around Boardwalk for some diffuse flow. Lots of shimmer coming up through the tubeworms. Going to check out the temp in the tubeworms to the left of the black smoker hole.
7/22	19	51	41	47.968428	-129.087373	226	-8	-1	20	2134	2154	Still flushing out the hot water.
7/22	19	55	53	47.968442	-129.087319	225	-8	-1	20	2134	2154	Stowing the wand in the basket - not the holder because it was sticking there.
7/22	20	04	19	47.968480	-129.087386	226	-9	-1	24	2133	2158	SAMPLE: gas J2-576-GTB-07 . Forward GTB - white tape. Fired in same black smoker hole as previous samples here at Boardwalk. Tmax here previously was 340.7C. Fired at 2004:15.
7/22	20	11	17	47.968346	-129.087217	245	-8	-1	23	2134	2158	We are looking straight ahead at Boardwalk at a nice area for diffuse flow sampling with the Beast water sampler.
7/22	20	13	00	47.968410	-129.087218	244	-8	-1	23	2134	2158	Debating whether to use naked probe or in the cup housing; decided on using naked sample inlet to prevent clogging and it getting stuck for future samples.
7/22	20	15	17	47.968470	-129.087252	244	-8	-1	20	2134	2154	Positioning at vent for fluid sample. Cursor position of best fix from Nav: 129 5.2408'W 47 58.1062'N; Depth: 2134.5; Hdg 244.2
7/22	20	15	58	47.968472	-129.087277	244	-9	-1	23	2134	2158	Jason struggling to release naked fluid sampler from magnetic cup front piece.
7/22	20	18	05	47.968432	-129.087407	245	-7	3	16	2134	2150	In attempts to use two arms to free the sampling inlet; the cup part snapped off at the first fitting; this loosened the hold between the sampler and the magnetic fitting.
7/22	20	18	48	47.968414	-129.087446	244	-8	-1	23	2134	2158	Positioning in diffuse flow; temperatures recorded around 8C; we are aiming for a fluid temperature around 20-30.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	20	19	56	47.968401	-129.087473	243	-7	-3	16	2134	2150	Moving around the inlet valve and monitoring temperature on the Beast
7/22	20	22	23	47.968438	-129.087376	243	-7	-3	16	2134	2150	Fluid intake at the lower corner; near skinny field of smaller tubeworms.
7/22	20	26	20	47.968477	-129.087312	243	-7	-3	16	2134	2150	SAMPLE: fluid J2-576-HFS-08 Filter bag #21 Start=2024. Boardwalk location=129 5.2408'W 47 58.1062'N Depth=2134.5
7/22	20	27	29	47.968457	-129.087347	243	-8	-3	19	2134	2154	SAMPLE: fluid J2-576-HFS-08 cont. Stop: 2026 Tmax=18.8 Tavg=na T2=9.2 Volume=370 (Butterfield)
7/22	20	28	29	47.968443	-129.087359	243	-7	-3	19	2134	2154	SAMPLE: fluid J2-576-HFS-09 Unfiltered Bag #22 Start=2028. Not showing temperature. Same Location
7/22	20	29	11	47.968437	-129.087358	243	-7	-3	16	2134	2150	J2-576-HFS-09 cont. Flow seen in beast out of green tubing.
7/22	20	30	36	47.968424	-129.087354	243	-7	-3	16	2134	2150	SAMPLE: fluid J2-576-HFS-09 STOP=2029.58 No temperature data not updating. Volume=304. (Butterfield)
7/22	20	31	22	47.968413	-129.087361	243	-7	-3	19	2134	2154	J2-576-HFS-09 sample taken in rough position on boardwalk beneath the smokers and around to the left. smokers are still in view.
7/22	20	32	34	47.968392	-129.087386	243	-7	-2	19	2134	2154	Sampling done at Boardwalk; Jason is pulling out temperature wand; investigating issues on the wand due to no temperature readings.
7/22	20	33	07	47.968386	-129.087397	243	-7	-2	16	2134	2150	Kevin is rebooting the beast to see if that will turn back on the temperature readings.
7/22	20	33	36	47.968383	-129.087405	243	-7	-2	16	2134	2150	After rebooting temperature measurements returned.
7/22	20	34	13	47.968385	-129.087411	243	-7	-2	16	2134	2150	Jason is going to hold the fluid intake probe in its starboard arm while we transit to Park Place.
7/22	20	36	53	47.968466	-129.087360	203	-8	-2	23	2134	2158	Moving southeast in the field to Park Place.
7/22	20	38	45	47.968442	-129.087221	145	-8	-4	11	2143	2154	Transiting to Park Place.
7/22	20	40	19	47.968365	-129.087160	238	-8	-2	15	2144	2160	Still locating Park Place vent.
7/22	20	41	59	47.968345	-129.087245	238	-8	-2	16	2144	2161	Continuing to look for Park Place vent.
7/22	20	42	47	47.968346	-129.087299	238	-9	-2	16	2145	2160	We see a chimney off in the distance and we are moving towards it.
7/22	20	43	46	47.968348	-129.087329	238	-8	-2	16	2144	2160	Changing Medea heading.
7/22	20	46	03	47.968372	-129.087370	240	-8	-3	12	2145	2157	Moving towards chimney structure its relatively straight upright with a flange near the top and a flange some meters below.
7/22	20	48	41	47.968270	-129.087268	238	-8	-2	16	2145	2161	Chimney faded from view; redetermining bearings and which direction to move in towards Park Place while working with Medea to make sure tether doesn't get caught on a chimney.
7/22	20	50	14	47.968276	-129.087280	238	-8	-2	16	2145	2161	Still locating vent.
7/22	20	51	57	47.968295	-129.087496	280	-8	-2	16	2145	2161	Chimney came into view - one we saw earlier with flanges towards the top and lower down there is active black smoker venting along flanges.
7/22	20	53	08	47.968311	-129.087498	258	-8	-2	16	2146	2161	Circling around the Park Place chimney to determine the best place to sample fluids.
7/22	20	57	30	47.968332	-129.087474	258	-10	-2	16	2145	2161	Hanging out on the front of Park Place reballasting the weight.
7/22	21	01	03	47.968314	-129.087456	258	-11	-1	17	2145	2162	Confirming with science the plan; we want to take a high temp water sample; grab a sulfide and take a low temp diffuse flow water sample.
7/22	21	02	23	47.968305	-129.087483	258	-10	3	17	2145	2162	Moving the fluid sampler inlet to the port arm; don't want to stick the inlet back in the holster for fear of it getting stuck.
7/22	21	04	58	47.968290	-129.087497	258	-11	2	18	2144	2162	Moving towards a nice black smoker on field to take water sample and gas tight.
7/22	21	06	39	47.968248	-129.087541	326	-10	1	20	2141	2161	At the top of the Park Place structure; very flange-like at the top. Right at the very tip there is a thin concentrated black smoker billowing "smoke".

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	21	07	17	47.968251	-129.087517	329	-10	1	20	2141	2161	I think we will sample this smoker right at the tip top of Park Place.
7/22	21	07	55	47.968258	-129.087510	329	-10	0	20	2141	2161	Not as many tubeworms observed on this chimney as we did on the last.
7/22	21	08	49	47.968266	-129.087509	329	-10	0	20	2141	2161	First thing we are going to do is take a Jason temperature probe reading.
7/22	21	11	38	47.968282	-129.087606	332	-9	1	7	2142	2148	Repositioning Jason around smoker for the best alignment to reach the smoker.
7/22	21	14	18	47.968285	-129.087555	3	-7	1	9	2142	2151	Still positioning in front of vent to take temperature sample.
7/22	21	16	03	47.968274	-129.087592	2	-13	0	11	2142	2153	Positioning temperature probe in the black smoker.
7/22	21	18	19	47.968288	-129.087598	2	-13	0	11	2142	2153	Temperature probe in place within smoker and temperature is rising above 100C; moving probe into position to get around 300C fluids.
7/22	21	19	32	47.968286	-129.087590	1	-13	0	10	2142	2152	Moving wand to get best temperature reading.
7/22	21	21	35	47.968260	-129.087562	2	-12	-1	11	2142	2153	Temperature wand repositioning cont.
7/22	21	21	48	47.968258	-129.087559	2	-12	-1	11	2142	2153	Highest temperature observed so far is 245C
7/22	21	22	53	47.968267	-129.087568	1	-12	-1	10	2142	2152	TEMPs: Jason temperature Highest temperature recorded 319.2C
7/22	21	23	44	47.968282	-129.087604	2	-12	0	10	2142	2152	Black smoker really blowing.
7/22	21	25	44	47.968272	-129.087674	2	-13	0	10	2142	2152	Positioning of Jason at Park Place. Sampling the tip top smoker chimney. Depth=2142.5 HDG=1.6 Cursor position from Nav (129 5.2550'W 47 58.0958'N)
7/22	21	26	41	47.968263	-129.087659	2	-12	1	9	2142	2152	Dara says that DOP is also a good fix recording for good measure: 47 58.096'N 129 5.256'W
7/22	21	27	23	47.968268	-129.087614	1	-12	1	10	2142	2152	Repositioning the fluid sampler inlet into the starboard arm to take a high temperature piston sample.
7/22	21	29	29	47.968290	-129.087519	2	-13	-1	11	2142	2153	Still working on positioning the sampler into position.
7/22	21	31	21	47.968282	-129.087574	2	-13	-2	10	2142	2152	SAMPLE: fluid J2-576-HFS-10: Putting wand directly into smoker on the top of Park Place vent wiggling inlet around to get highest temp reading.
7/22	21	31	42	47.968278	-129.087583	2	-13	-2	11	2142	2153	J2-576-HFS-10 Note line below was not the start of sampling.
7/22	21	32	28	47.968270	-129.087599	2	-13	-2	11	2142	2153	J2-576-HFS-10 Reading temperatures around 340C with the Beast.
7/22	21	33	25	47.968262	-129.087616	2	-13	-2	10	2142	2152	SAMPLE: fluid J2-576-HFS-10 Filtered Piston #3 Start=2132.58 location same as described previously.
7/22	21	34	17	47.968258	-129.087630	2	-13	-2	11	2142	2153	J2-576-HFS-10 cont.
7/22	21	35	06	47.968261	-129.087641	2	-13	-2	11	2142	2153	J2-576-HFS-10 cont. sampling of high temp black smoker on Park Place cont.
7/22	21	36	14	47.968274	-129.087644	2	-13	-2	10	2142	2152	J2-576-HFS-10 cont. sampling high temp fluid.
7/22	21	37	53	47.968289	-129.087609	2	-13	-2	11	2142	2153	J2-576-HFS-10 STOP=2137.15 Tmax=344.5 Tavg=344.5 T2=107 Volume=675 (Butterfield)
7/22	21	38	42	47.968285	-129.087589	2	-13	-2	11	2142	2153	SAMPLE: fluid J2-576-GTHFS-11 Firing middle gastight 2138. Center black #5 gastight.
7/22	21	39	19	47.968277	-129.087577	2	-13	-2	21	2142	2163	J2-576-GTHFS-11 Tmax=344
7/22	21	40	42	47.968257	-129.087569	2	-13	-2	10	2142	2152	SAMPLE: fluid J2-576-HFS-12 Unfiltered Piston #4 Start=2139. same position.
7/22	21	41	51	47.968257	-129.087573	2	-13	-2	11	2142	2153	Additional info about J2-576-GTHFS-11 Akel saw firing of center gastight connected to HFS in the same position.
7/22	21	42	17	47.968262	-129.087576	2	-13	-2	21	2142	2163	J2-576-HFS-12 cont. sampling of high temperature fluid at Park Place.
7/22	21	43	21	47.968282	-129.087580	2	-13	-2	10	2142	2152	J2-576-HFS-12 cont. of sampling of high temp fluid at Park Place smoker.
7/22	21	45	19	47.968303	-129.087589	2	-13	-2	10	2142	2152	SAMPLE: fluid J2-576-HFS-12 Stop=2144.25 Tmax=344.6 Tavg=344.5 T2=105 Volume=675ml (Butterfield)
7/22	21	45	58	47.968300	-129.087591	2	-13	-2	11	2142	2153	Witness sulfide fall from right above the smoker. We did not even move sub just fell on its own.
7/22	21	46	35	47.968297	-129.087589	2	-13	-2	10	2142	2152	We plan on collecting as much of the opportunistic sulfide that fell on its own as we can.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	21	49	32	47.968324	-129.087519	2	-14	1	10	2142	2152	Sulfide collected looked like a spire of sorts right above the smoker. Intended for the port biobox. Very friable having a hard time.
7/22	21	51	33	47.968313	-129.087602	2	-13	-1	11	2142	2153	Marv suggests that we may leave the sulfide here at the vent and get a sample from somewhere else. We only have one more opportunity for collecting a sulfide in a biobox.
7/22	21	52	30	47.968298	-129.087631	2	-13	-1	11	2142	2153	We are going to stay in the same position and poke the sample inlet in a cluster of worms to the left looking for good diffuse fluids.
7/22	21	54	10	47.968274	-129.087628	2	-13	-2	11	2142	2153	Positioning sample inlet looking for diffuse flow.
7/22	21	55	00	47.968270	-129.087606	2	-12	-2	10	2142	2152	Sample inlet just to the right of the smoker peak of temperature around 9C.
7/22	21	56	37	47.968277	-129.087569	2	-12	-2	11	2142	2153	Wiggling inlet around looking for fluid around 20-30 or warmest we can find in this area.
7/22	21	58	43	47.968286	-129.087570	2	-13	-2	11	2142	2153	Moving up above the smoker to look for warmer fluids using biology as an indication.
7/22	21	59	48	47.968284	-129.087577	23	-9	-2	9	2142	2152	Area we are going to reposition and try next has a bunch of palm worms so temperature may be promising.
7/22	22	01	13	47.968288	-129.087572	41	-9	-2	12	2142	2153	Repositioning Jason to sample diffuse flow fluids.
7/22	22	03	02	47.968283	-129.087572	41	-9	-2	16	2142	2158	Jason repositioned with a hdg=40.7 depth 2142.1.
7/22	22	03	35	47.968281	-129.087580	40	-9	-2	16	2142	2157	Moving the temperature probe into positions.
7/22	22	05	06	47.968285	-129.087602	40	-9	-2	12	2142	2154	Looking for best position to take fluid. Wiggling around inlet and watching temperature.
7/22	22	06	47	47.968299	-129.087605	41	-9	-3	12	2142	2154	So far the highest temperature we have seen is 9.7C in the shimmering water.
7/22	22	09	37	47.968289	-129.087576	41	-9	-3	4	2142	2146	Continuing to move around the wand in search of best fluid sample.
7/22	22	12	32	47.968296	-129.087576	40	-9	-3	12	2142	2154	SAMPLE: fluid J2-576-HFS-13 Unfiltered bag #20 Start=2212.20. In field of Sulfincola / palmiformas (area where no worms are) above and slightly to the left of smoker
7/22	22	13	25	47.968294	-129.087580	40	-8	-3	4	2142	2146	J2-576-HFS-13 cont. confirmed shimmering out of green tube.
7/22	22	14	22	47.968291	-129.087583	40	-8	-3	4	2142	2146	J2-576-HFS-13 cont..
7/22	22	15	35	47.968291	-129.087582	40	-9	-3	4	2142	2146	J2-576-HFS-13 cont. location cursor position 129 5.2542'W 47 58.0978'N.
7/22	22	16	12	47.968292	-129.087580	41	-9	-3	4	2142	2146	SAMPLE: fluid J2-576-HFS-13 STOP=221514 Tmax=24.9 Tavg=21.6 T2=10 Volume=500 (Butterfield).
7/22	22	16	41	47.968294	-129.087578	41	-8	-3	4	2142	2146	SAMPLE: fluid J2-576-HFS-14 Filtered Bag #19 Start=2216.31.
7/22	22	17	30	47.968296	-129.087577	41	-8	-3	4	2142	2146	J2-576-HFS-14 cont. filtering diffuse flow in same position.
7/22	22	19	03	47.968292	-129.087576	41	-8	-3	12	2142	2154	J2-576-HFS-14 cont.
7/22	22	20	27	47.968282	-129.087574	41	-8	-3	12	2142	2154	SAMPLE: fluid J2-576-HFS-14 STOP=2219 Tmax=26.4 Tavg=23.7 T2=11 Vol=500 (Butterfield).
7/22	22	21	13	47.968279	-129.087575	41	-9	-3	4	2142	2146	J2-576-HFS-15 Unfiltered bag #18 Start=2220.49. same location duplicate because we didn't trust the first sample.
7/22	22	21	36	47.968278	-129.087576	41	-9	-3	4	2142	2146	SAMPLE: fluid J2-576-HFS-15 Unfiltered bag #18 Start=2220.49.
7/22	22	22	26	47.968281	-129.087578	41	-9	-3	4	2142	2146	J2-576-HFS-15 cont.
7/22	22	24	44	47.968287	-129.087588	41	-9	-3	12	2142	2154	SAMPLE: fluid J2-576-HFS-15 STOP=2223.55 Tmax=29.1 Tavg=27.4 T2=1 Volume=500 (Butterfield)
7/22	22	25	23	47.968285	-129.087592	41	-9	-3	4	2142	2146	SAMPLE: fluid J2-576-HFS-16 RNA Filter #16 Start=2225.15. same location.
7/22	22	25	57	47.968282	-129.087596	41	-8	-3	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16.
7/22	22	27	30	47.968275	-129.087595	39	-9	-3	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16.
7/22	22	34	23	47.968264	-129.087590	39	-8	-2	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16.
7/22	22	35	48	47.968284	-129.087587	39	-8	-2	12	2142	2154	J2-576-HFS-16 cont. RNA filter #16.
7/22	22	38	53	47.968301	-129.087597	38	-8	-2	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	22	40	51	47.968290	-129.087586	39	-8	-2	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16.
7/22	22	42	45	47.968287	-129.087590	38	-8	-2	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16. inlet looks good nothing's changed.
7/22	22	43	54	47.968286	-129.087595	39	-8	-3	4	2142	2146	J2-576-HFS-16 cont. RNA filter #16.
7/22	22	45	34	47.968280	-129.087589	39	-8	-3	4	2142	2146	J2-576-HFS-16 cont. moving inlet around because the temperature reading has dropped a bit; moving the inlet a bit to the left.
7/22	22	46	47	47.968280	-129.087587	38	-7	-3	4	2142	2146	J2-576-HFS-16 cont. Inlet moved to the left temperature around 25C.
7/22	22	48	47	47.968287	-129.087604	38	-8	-2	4	2142	2146	SAMPLE: fluid J2-576-HFS-16 STOP=2248.07 Tmax=27.0 Tavg=17.9 T2=8 Volume 2400 (Butterfield).
7/22	22	49	20	47.968287	-129.087609	38	-8	-2	4	2142	2146	Moving around inlet around cm at a time to get a temperature of around 20C.
7/22	22	52	14	47.968289	-129.087572	38	-7	-2	4	2142	2146	Continuing to move temp wand around in areas of Sulfincola field where worms are sparse. temp around 30C
7/22	22	54	01	47.968301	-129.087536	38	-7	-2	4	2142	2146	SAMPLE: fluid J2-576-HFS-17 Sterivex DNA filter #12 Start=2253.
7/22	22	55	36	47.968296	-129.087545	38	-7	-2	4	2142	2146	J2-576-HFS-17 cont. DNA filter #12.
7/22	23	01	33	47.968316	-129.087579	38	-7	-2	4	2142	2146	J2-576-HFS-17 cont. DNA filter #12.
7/22	23	04	28	47.968303	-129.087590	38	-8	-2	4	2142	2146	J2-576-HFS-17 cont. DNA filter #12.
7/22	23	06	22	47.968296	-129.087616	38	-7	-2	4	2142	2146	J2-576-HFS-17 cont. DNA filter #12.
7/22	23	10	00	47.968296	-129.087582	38	-8	-2	4	2142	2146	J2-576-HFS-17 cont. DNA filter #12.
7/22	23	11	06	47.968288	-129.087577	38	-7	-2	4	2142	2146	J2-576-HFS-17 cont. DNA filter #12.
7/22	23	14	20	47.968272	-129.087630	38	-7	-2	4	2142	2146	SAMPLE: fluid J2-576-HFS-17 Stop=2313.44 Tmax=40.8 Tavg=37.5 T2=16 Volume=3000 (Butterfield).
7/22	23	15	41	47.968285	-129.087604	38	-7	-2	4	2142	2146	SAMPLE: fluid J2-576-HFS-18 Unfiltered piston #6. Start=2315.
7/22	23	17	19	47.968299	-129.087579	38	-7	-2	4	2142	2146	J2-576-HFS-18 cont. Same position in Park Place in higher temperature diffuse flow within Sulfincola field above smokers.
7/22	23	18	59	47.968295	-129.087592	39	-7	-2	4	2142	2146	J2-576-HFS-18 cont.
7/22	23	20	18	47.968293	-129.087600	39	-8	-2	4	2142	2146	SAMPLE: fluid J2-576-HFS-18 Stop=2319 Tmax=42.7 Tavg=40.2 T2=16 Volume=675 (Butterfield).
7/22	23	21	31	47.968295	-129.087594	38	-7	-1	4	2142	2146	Securing fluid sample inlet in basket via the starboard arm.
7/22	23	22	10	47.968288	-129.087589	40	-9	-1	17	2141	2158	Next target is the Baltic vent. Once everything is secure on Jason we will begin transit.
7/22	23	24	52	47.968181	-129.087582	148	-7	-1	22	2144	2166	Transiting to Baltic vent.
7/22	23	26	11	47.967974	-129.087433	205	-9	-1	9	2152	2161	Continuing to transit to Baltic vent.
7/22	23	28	34	47.967902	-129.087453	253	-9	-1	11	2149	2160	Chimney in view is skinny with two flanges in the middle perpendicular to each other. The top spire very vertical. Large gusting smokers on the top and one on the left at the base of the vertical spire.
7/22	23	28	59	47.967901	-129.087461	261	-9	-1	12	2147	2160	HIGHLIGHTS: KiPro hard drive start
7/22	23	29	57	47.967921	-129.087460	261	-9	-1	10	2149	2159	Smaller skinny smoker at the same depth 2149.7 as big smoker; just at the bottom of the big vertical spire.
7/22	23	32	07	47.967986	-129.087446	222	-9	-1	18	2143	2161	Sweeping up and down the chimney to get some nice HD images.
7/22	23	35	13	47.967942	-129.087476	256	-9	-1	16	2143	2158	This Baltic sulfide looks beautiful and smoky.
7/22	23	36	53	47.967888	-129.087421	278	-9	-1	19	2140	2159	Still panning around vent to record some nice images. Waiting on Medea to reposition so we can visualize the south face.
7/22	23	40	10	47.967920	-129.087454	313	-9	-1	13	2147	2160	Still circling for HD camera.
7/22	23	41	42	47.967907	-129.087460	311	-9	-1	15	2145	2160	HIGHLIGHTS: KiPro hard drive stop
7/22	23	43	56	47.967909	-129.087474	310	-9	-1	11	2148	2159	Going in tight.
7/22	23	43	58	47.967910	-129.087473	311	-10	-1	11	2148	2159	HIGHLIGHTS: KiPro hard drive start

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/22	23	46	32	47.967915	-129.087507	323	-9	-2	10	2149	2159	Looking at the medium size smoker off the big spire at a depth of 2149. It's crazy. Looks like it's coming out in a line.
7/22	23	46	57	47.967909	-129.087536	19	-9	-2	12	2149	2161	Attempting to position Jason in the best way to take fluid samples.
7/22	23	49	09	47.967934	-129.087505	39	-13	-1	13	2149	2162	Currently positioning in front of Baltic. It just looks so beautiful.
7/22	23	49	59	47.967935	-129.087511	39	-13	-1	13	2149	2162	Pulling out sample wand and placing it directly into smoker flow. Medium size smoker off to the side.
7/22	23	51	54	47.967927	-129.087546	39	-13	-1	13	2149	2162	HIGHLIGHTS: KiPro hard drive stop
7/22	23	54	14	47.967929	-129.087533	39	-13	-1	13	2149	2161	HFS intake wand in smoker highest temperature recorded was around 245C but we think that the temperature is much hotter so we are moving the wand around.
7/22	23	55	04	47.967931	-129.087521	39	-13	-2	13	2149	2161	Submerged entire inlet right into the chimney.
7/22	23	56	26	47.967932	-129.087512	39	-13	-2	12	2149	2161	Highest temperature recorded so far is 316C.
7/23	0	00	44	47.967937	-129.087510	40	-13	-3	13	2149	2162	Flow seems to have slowed down in our attempts to find a sweet spot. Most likely we knocked a hole into the rocks creating a flow with less resistance. Smoke is now observed from below.
7/23	0	01	53	47.967936	-129.087508	39	-12	-3	13	2149	2162	Inlet wand positioned completely into one of the skinnier smokers. Temperature is going up.
7/23	0	03	33	47.967940	-129.087514	39	-12	-3	12	2149	2161	We are pushing the inlet in further to try to get even higher temperature. It's like threading a needle - a sulfide needle.
7/23	0	06	46	47.967937	-129.087538	39	-12	-3	13	2149	2162	Highest temperature observed around 313 C. Observing change in flow surging.
7/23	0	07	05	47.967934	-129.087539	39	-12	-3	13	2149	2162	Accidentally broke off beehive. Stuck the inlet down into the solid hole.
7/23	0	10	05	47.967919	-129.087516	39	-12	-3	13	2149	2162	Location: Baltic Vent Cursor Pos. 129 5.2494'W 47 58.0773'N Depth=2149.4 Hdg=39.3.
7/23	0	10	44	47.967923	-129.087509	39	-12	-3	13	2149	2162	TEMPS: HFS temperature reading in hole 323 C
7/23	0	11	05	47.967926	-129.087507	39	-12	-3	13	2149	2162	J2-576-HFS-19 Filtered Piston #7 Start=0010.56. Inlet location is directly in a skinny black smoker shoved down in there.
7/23	0	11	34	47.967930	-129.087506	39	-12	-3	12	2149	2161	J2-576-HFS-19 cont. Definitely getting shimmering water coming out.
7/23	0	12	59	47.967940	-129.087513	39	-12	-3	13	2149	2162	J2-576-HFS-19 cont.
7/23	0	13	55	47.967939	-129.087517	39	-12	-3	13	2149	2162	J2-576-HFS-19 cont.
7/23	0	15	26	47.967930	-129.087511	39	-12	-3	13	2149	2162	J2-576-HFS-19 cont.
7/23	0	17	40	47.967925	-129.087508	40	-12	-3	13	2149	2162	J2-576-HFS-19 cont.
7/23	0	18	35	47.967929	-129.087514	39	-12	-3	13	2149	2162	J2-576-HFS-19 Stop=0018.10
7/23	0	19	03	47.967931	-129.087517	39	-13	-3	13	2149	2162	SAMPLE: fluid J2-576-GTHFS-20 Fired the starboard blue #12. Gastight and the temperature was 320.
7/23	0	19	49	47.967935	-129.087518	39	-13	-3	13	2149	2162	SAMPLE: fluid J2-576-HFS-19 Stop=0018.10 Tmax=325.9 Tavg=323 T2=25 Volume=600 (Butterfield).
7/23	0	20	32	47.967939	-129.087515	39	-13	-3	13	2149	2162	Inlet is starting to build up a mineral precipitate we are going to clean it by taking out of flow and jiggling it.
7/23	0	20	57	47.967940	-129.087513	39	-13	-3	13	2149	2162	Sticking the inlet back in the same location.
7/23	0	21	21	47.967941	-129.087511	39	-13	-3	13	2149	2162	Note SAMPLE: J2-576-GTHFS-20 was fired in the same position.
7/23	0	22	24	47.967941	-129.087509	39	-12	-4	13	2149	2162	Sticking temperature probe into the rock dislodged some chunks of sulfide; widening the hole to stick the inlet mineral ring around inlet. Looks white probably anhydrite.
7/23	0	24	24	47.967942	-129.087516	39	-13	-4	13	2149	2162	Measuring temperature within inlet about 300 on the front but not much water is running through the system so it's moving slowly.
7/23	0	25	16	47.967943	-129.087518	39	-13	-4	13	2149	2162	SAMPLE: fluid J2-576-HFS-21 Unfiltered Piston #8 Start=0025.05.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	0	26	10	47.967944	-129.087518	39	-12	-3	13	2149	2162	J2-576-HFS-21 cont. Inlet location the same in the vent. Location details are all the same.
7/23	0	27	13	47.967942	-129.087519	38	-12	-3	13	2149	2162	J2-576-HFS-21 cont.
7/23	0	28	14	47.967937	-129.087521	39	-12	-3	13	2149	2162	J2-576-HFS-21 cont.
7/23	0	29	20	47.967928	-129.087520	39	-12	-3	13	2149	2162	J2-576-HFS-21 cont.
7/23	0	30	51	47.967922	-129.087514	38	-12	-3	13	2149	2161	SAMPLE: fluid J2-576-HFS-21 Stop=0030.09 Tmax=301.3 Tavg=300 T2=5 Volume=600 (Butterfield).
7/23	0	33	28	47.967927	-129.087513	39	-13	-2	13	2149	2162	Securing inlet wand in port arm to allow for starboard arm manipulation of hand held gas tights.
7/23	0	35	03	47.967924	-129.087513	39	-13	-1	13	2149	2162	Reaching for center hand held gas tight black #18.
7/23	0	36	50	47.967929	-129.087495	39	-12	-2	13	2149	2162	Still reaching for hand held gas tight.
7/23	0	38	16	47.967941	-129.087497	39	-12	-2	13	2149	2162	In process of grabbing hand held gas tight.
7/23	0	42	03	47.967931	-129.087522	39	-13	-2	13	2149	2162	Still in process of securing gas tight in manipulator arm.
7/23	0	43	03	47.967928	-129.087513	39	-13	-2	13	2149	2162	Gas tight secured in arm the back Gastight Yellow #11
7/23	0	44	08	47.967932	-129.087511	39	-13	-2	13	2149	2162	Repositioning angle on gas tight in manipulator.
7/23	0	44	56	47.967935	-129.087516	39	-13	-2	13	2149	2162	Secured in arm moving to position in vent.
7/23	0	45	51	47.967934	-129.087527	39	-13	-2	13	2149	2162	J2-576-GTB-22 Gastight yellow #11 positioning in vent.
7/23	0	47	53	47.967917	-129.087546	40	-14	-2	13	2149	2162	SAMPLE: fluid Positioning gas tight for firing right outside the hole same spot as fluid sampling.
7/23	0	49	21	47.967917	-129.087537	39	-13	-2	13	2149	2162	SAMPLE: fluid J2-576-GT-22 Fire Gastight yellow #11 at 0048 same position as fluid sampling.
7/23	0	51	06	47.967926	-129.087505	39	-13	-2	13	2149	2162	We're finished fluid sampling here.
7/23	0	52	14	47.967928	-129.087487	39	-13	-2	13	2149	2162	Going to do some temperature measurements now.
7/23	0	54	37	47.967930	-129.087507	38	-13	-2	13	2149	2162	Trying to bungee the gastight bottle down in the basket.
7/23	0	54	56	47.967931	-129.087512	38	-13	-2	13	2149	2162	SAMPLE: gas The GT-22 was a gastight bottle.
7/23	0	55	45	47.967932	-129.087520	38	-14	-1	13	2149	2162	Gastight bottle is secured in the basket.
7/23	0	56	19	47.967933	-129.087520	38	-14	-1	13	2149	2162	Now going to pick up the Jason temp probe.
7/23	0	58	28	47.967930	-129.087489	38	-13	-2	13	2149	2162	TEMPS: Jason temperature is 333.4 and rising
7/23	0	59	04	47.967929	-129.087484	38	-13	-2	13	2149	2162	TEMPS: Jason temperature is 336 C and leveling off
7/23	0	59	47	47.967930	-129.087483	38	-13	-2	13	2149	2162	T is 336.4 C in this vent opening.
7/23	1	00	02	47.967931	-129.087484	38	-13	-2	13	2149	2162	We'll try the temperature in the next opening.
7/23	1	00	20	47.967932	-129.087487	38	-13	-2	13	2149	2162	Checking the temperature to the left.
7/23	1	00	52	47.967933	-129.087492	38	-13	-2	13	2149	2162	Knocked off a little bit of the chimney on the left.
7/23	1	01	20	47.967933	-129.087498	38	-13	-2	13	2149	2162	Repositioning the arm for a better angle to sample the temp.
7/23	1	02	28	47.967930	-129.087510	38	-13	-2	13	2149	2162	Putting the probe into the left smoker.
7/23	1	03	21	47.967926	-129.087509	38	-13	-3	13	2149	2162	TEMPS: Jason temperature here is 304.8 and rising slowly.
7/23	1	03	40	47.967925	-129.087506	38	-14	-2	13	2149	2162	Temp is now 310.9.
7/23	1	03	48	47.967924	-129.087505	38	-14	-2	13	2149	2162	Took probe out of vent.
7/23	1	04	26	47.967922	-129.087496	39	-14	-2	13	2149	2162	The vent is at a hard angle to access easily.
7/23	1	04	43	47.967922	-129.087492	39	-14	-3	13	2149	2162	Trying to reinsert the probe at a different angle to check the temperature.
7/23	1	05	23	47.967922	-129.087482	37	-14	-5	13	2149	2162	Now the temp is 312 and rising.
7/23	1	05	35	47.967922	-129.087479	37	-14	-5	13	2149	2162	TEMPS: Jason temperature is 320 and still rising.
7/23	1	06	31	47.967923	-129.087471	37	-14	-5	13	2149	2162	TEMPS: Jason temperature is holding steady at 323.5C.
7/23	1	06	56	47.967922	-129.087470	37	-14	-5	13	2149	2162	This looks like a good spot.
7/23	1	07	06	47.967922	-129.087470	37	-14	-3	13	2149	2162	Going to take the probe out.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	1	07	26	47.967921	-129.087470	38	-14	-2	13	2149	2162	Now we're going to head to Fairy Castle.
7/23	1	07	35	47.967920	-129.087470	38	-14	-2	13	2149	2162	Stowing the Jason temp probe back in the basket.
7/23	1	08	52	47.967913	-129.087470	37	-14	-2	13	2149	2162	Probe is stored in holder.
7/23	1	10	51	47.967874	-129.087468	34	-9	1	13	2148	2162	We're going to head to Fairy Castle now.
7/23	1	11	00	47.967866	-129.087473	358	-9	0	14	2148	2162	Discussing the direction to take.
7/23	1	11	52	47.967762	-129.087445	190	-9	0	10	2150	2159	We're heading in a straight line from Park Place to Baltic to Fairy Castle.
7/23	1	12	01	47.967743	-129.087438	206	-8	0	9	2151	2160	There should be tubeworms along the way if we go on the bottom.
7/23	1	12	08	47.967740	-129.087433	201	-8	1	8	2152	2160	Jason heading back down.
7/23	1	12	55	47.967745	-129.087450	202	-9	1	3	2157	2160	The bottom is in sight now.
7/23	1	14	59	47.967502	-129.087658	189	-9	0	4	2164	2167	There are some clumps of tubeworms on the bottom.
7/23	1	15	40	47.967390	-129.087730	154	-10	1	5	2165	2170	These worms are situated among loose rocks on the seafloor.
7/23	1	16	41	47.967324	-129.087779	154	-9	1	3	2165	2168	There are some sparse white clumps of worms - they may be dead.
7/23	1	16	56	47.967324	-129.087780	154	-9	0	3	2165	2168	They're likely Ridgeia tubeworms.
7/23	1	18	03	47.967259	-129.087839	151	-8	4	2	2165	2168	Still traveling along bottom and looking for biology.
7/23	1	19	02	47.967234	-129.087886	209	-9	1	6	2161	2166	There aren't any more tubeworms here.
7/23	1	19	43	47.967212	-129.087977	209	-11	0	3	2159	2162	Actually there is another clump of white worms coming into view.
7/23	1	20	00	47.967212	-129.087999	213	-9	0	4	2157	2161	They may not be only worms.
7/23	1	20	27	47.967214	-129.087999	213	-9	0	4	2158	2161	These structures could be good for syringe sampling.
7/23	1	20	49	47.967222	-129.088001	213	-9	1	3	2158	2161	There are some clumps of brown worms.
7/23	1	21	03	47.967230	-129.088000	213	-9	1	3	2158	2161	There may also be some microbial mat covering the rocks.
7/23	1	21	12	47.967236	-129.087999	213	-9	1	4	2158	2161	There is also some diffuse flow at the base of the structure.
7/23	1	21	58	47.967210	-129.087982	214	-9	0	5	2157	2162	This location kind of looks like a Fairy Castle.
7/23	1	23	02	47.967154	-129.087968	233	-10	-1	7	2155	2161	However it's very dead-looking so maybe it's not the actual Fairy Castle site.
7/23	1	23	55	47.967035	-129.088107	280	-10	1	1	2159	2159	We're moving on to where we think Fairy Castle should really be.
7/23	1	24	33	47.967029	-129.088181	315	-9	0	5	2157	2162	There are some tube worm clumps in this area.
7/23	1	25	11	47.967019	-129.088270	317	-9	1	11	2156	2166	We're passing a tall pillar with some dead-looking tubeworms on it.
7/23	1	25	22	47.966998	-129.088292	303	-9	1	11	2155	2166	There should be 3 tall pillar structures in the region.
7/23	1	26	00	47.966930	-129.088296	297	-9	1	13	2152	2165	Coming up from the bottom.
7/23	1	26	10	47.966926	-129.088295	296	-9	1	14	2150	2165	Going to take a look around higher up.
7/23	1	26	53	47.966937	-129.088311	296	-9	1	18	2147	2165	There are some vents on top of this pillar.
7/23	1	27	25	47.966961	-129.088314	277	-9	1	19	2147	2166	There are two black smokers on top of some white sulfide arm structures.
7/23	1	27	44	47.966986	-129.088298	268	-9	1	21	2145	2166	We've arrived at Fairy Castle.
7/23	1	29	13	47.966920	-129.088321	314	-9	1	18	2146	2163	We're going around the structure to get a good look at it.
7/23	1	29	39	47.966919	-129.088365	340	-9	1	17	2147	2164	These pillars are 17m high.
7/23	1	30	20	47.966901	-129.088429	354	-9	0	18	2145	2164	The tall smokers on top look like a good sampling site.
7/23	1	30	55	47.966894	-129.088323	331	-8	0	17	2145	2162	Repositioning Jason to be at a good site for sampling.
7/23	1	31	38	47.966950	-129.088321	258	-9	0	20	2145	2165	The top of the vent is billowing lots of smoke.
7/23	1	32	12	47.966941	-129.088334	259	-9	1	19	2146	2165	Coming down next to the two white pillars of Fairy Castle.
7/23	1	32	27	47.966942	-129.088331	259	-9	0	18	2146	2165	Both pillars are smoking grey-ish black smoke.
7/23	1	34	04	47.966954	-129.088332	259	-3	0	16	2148	2164	NAV: Doppler Reset
7/23	1	35	13	47.966965	-129.088336	260	-4	0	16	2148	2164	We're at DOP: 47N 58.017' 129W 5.301'

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	1	35	31	47.966967	-129.088336	260	-4	0	16	2148	2164	There may be some microbial mats on these structures
7/23	1	36	30	47.966966	-129.088336	259	-5	-1	16	2148	2164	The Jason temp probe is out.
7/23	1	36	41	47.966965	-129.088335	260	-3	0	16	2148	2164	Looking for somewhere to get a high temperature sample.
7/23	1	37	11	47.966960	-129.088333	259	-4	-1	16	2148	2164	Depth=2148.1 m hdg 259.3
7/23	1	38	05	47.966947	-129.088324	259	-4	0	16	2148	2164	Inserting Jason temp probe into the black smoker.
7/23	1	39	16	47.966930	-129.088314	259	-4	0	16	2148	2164	Temp is 332.5 and rising.
7/23	1	39	41	47.966926	-129.088312	259	-4	0	16	2148	2164	TEMPS: Jason temperature is 338.5 and still rising.
7/23	1	40	12	47.966923	-129.088313	259	-4	0	16	2148	2164	Fairy Castle is located next to a site called Bin Laden.
7/23	1	41	58	47.966926	-129.088330	259	-5	0	16	2148	2164	Temperature appears to have peaked at 341.2
7/23	1	43	08	47.966930	-129.088340	260	-5	-1	16	2148	2164	Looking for the next smoke from which to take a temperature measurement.
7/23	1	44	24	47.966932	-129.088342	260	-4	0	16	2148	2164	Moving the arm to the next smoker for a temperature reading.
7/23	1	45	48	47.966936	-129.088340	260	-4	-1	16	2148	2164	Preparing to take a gas tight sample from the smoker we just measured.
7/23	1	47	39	47.966946	-129.088348	260	-3	-1	16	2148	2164	Picking up a gastight bottle - black #18.
7/23	1	48	21	47.966949	-129.088352	260	-5	-1	16	2148	2164	SAMPLE: gas Going to position the gastight in the smoker vent.
7/23	1	50	23	47.966942	-129.088351	260	-5	0	16	2148	2164	Not sure if we went past the smoker vent opening or not.
7/23	1	51	30	47.966936	-129.088345	260	-5	0	16	2148	2164	SAMPLE: gas J2-576-GTB-23 . Gastight bottle fired.
7/23	1	52	19	47.966934	-129.088341	260	-3	0	16	2148	2164	Stowing gastight bottle back in basket.
7/23	1	52	54	47.966934	-129.088341	261	-2	-1	16	2148	2164	Tying bungee down on gastight bottle.
7/23	1	53	27	47.966936	-129.088342	261	-3	0	16	2148	2164	SAMPLE: gas Gastight bottle #18 black was J2-576-GTB-23 .
7/23	1	53	48	47.966937	-129.088343	260	-3	-1	16	2148	2164	Next going to do some fluid sampling.
7/23	1	54	26	47.966940	-129.088344	261	-5	2	16	2148	2164	Taking HFS intake arm out of basket and unwinding the cord.
7/23	1	55	09	47.966942	-129.088343	261	-4	2	16	2148	2164	Changing hands for the HFS intake wand.
7/23	1	56	19	47.966943	-129.088335	261	-5	2	16	2148	2164	Intake arm in vent smoker area.
7/23	1	56	58	47.966943	-129.088328	261	-5	2	16	2148	2164	There's a camera on the left arm that the pilot is using to see the sampling area up close.
7/23	1	57	13	47.966942	-129.088325	261	-5	2	16	2148	2164	TEMPS: HFS temperature. The intake is measuring 200C
7/23	1	57	23	47.966942	-129.088323	261	-5	2	16	2148	2164	Temp is 260 and still rising.
7/23	1	57	49	47.966942	-129.088318	262	-6	2	16	2148	2164	They're looking for the hottest temperature area.
7/23	1	58	21	47.966942	-129.088314	261	-5	2	16	2148	2164	It was headed up past 260C but the arm moved a little and now it is dropping.
7/23	1	58	30	47.966943	-129.088313	261	-6	2	16	2148	2164	The temp is about 175C.
7/23	1	58	59	47.966943	-129.088311	261	-5	1	16	2148	2164	The temp is going up slowly -- 135C.
7/23	1	59	31	47.966945	-129.088312	261	-6	2	16	2148	2164	The temp is going up past 160C again.
7/23	2	00	55	47.966952	-129.088322	261	-6	2	16	2148	2164	Trying to position the intake wand for the maximum temperature spot.
7/23	2	01	01	47.966952	-129.088323	261	-6	2	16	2148	2164	The T is going up again past 171C.
7/23	2	01	13	47.966953	-129.088325	261	-6	2	16	2148	2164	Now we're at 250C.
7/23	2	01	36	47.966955	-129.088329	261	-6	2	16	2148	2164	Temp is 312C.
7/23	2	01	44	47.966956	-129.088330	261	-6	2	16	2148	2164	Going to take a sample.
7/23	2	02	46	47.966959	-129.088337	261	-6	2	16	2148	2164	SAMPLE: fluid Filtered piston #9 start. Sample is J2-576-HFS-24 .
7/23	2	07	19	47.966955	-129.088330	260	-6	2	16	2148	2164	SAMPLE: fluid J2-576-HFS-24 done.
7/23	2	08	31	47.966965	-129.088331	260	-6	2	16	2148	2164	J2-576-HFS-24 : Start 02:02. End 02:07. Tmax=341.8 Tavg=341.3 T2=100 vol=650mL
7/23	2	09	40	47.966972	-129.088337	259	-5	2	16	2148	2164	SAMPLE: fluid Piston #5 start. Sample is J2576-HFS-25 .

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	2	14	22	47.966944	-129.088350	260	-5	2	16	2148	2164	Piston #5 done.
7/23	2	15	03	47.966945	-129.088353	260	-5	2	16	2148	2164	J2576-HFS-25: Start 02:09 End 02:14 Tmax= 341.9 Tavg=341.6 T2=95 vol=650mL
7/23	2	15	12	47.966945	-129.088353	260	-5	2	16	2148	2164	Finished fluid sampling at this location.
7/23	2	15	24	47.966946	-129.088354	260	-5	2	16	2148	2164	Going to store the HFS intake wand.
7/23	2	16	21	47.966947	-129.088351	259	-4	3	16	2148	2164	Untwisting the HFS intake wand cable.
7/23	2	17	10	47.966949	-129.088339	259	-8	1	18	2147	2165	First going to look for a sulfide sample to take.
7/23	2	17	23	47.966950	-129.088330	258	-9	0	19	2147	2166	Next going to look for a place to sample microbial mat in the syringe.
7/23	2	18	15	47.966960	-129.088342	216	-8	1	17	2148	2165	There's a piece of sulfide chimney behind the smoker we were sampling that looks good.
7/23	2	18	20	47.966962	-129.088343	207	-9	-1	17	2148	2165	Port swing arm box out.
7/23	2	19	56	47.966954	-129.088333	160	-9	0	16	2146	2162	Looking for the best approach to sample at.
7/23	2	20	22	47.966958	-129.088327	115	-8	4	1	2147	2148	This sample is mostly white sulfide.
7/23	2	21	03	47.966955	-129.088337	203	-8	1	20	2145	2165	Backing off for a better Jason fix.
7/23	2	21	56	47.966918	-129.088340	318	-8	0	17	2147	2164	Circling around the left side of Fairy Castle
7/23	2	22	53	47.966948	-129.088354	49	-9	0	5	2147	2152	The extinct chimney to the right (now left) of the smoker chimney has 3 summits.
7/23	2	23	03	47.966952	-129.088351	54	-8	0	5	2147	2152	We're going to look at the middle summit piece.
7/23	2	24	34	47.966967	-129.088340	69	-8	1	3	2148	2151	The port swing arm box is next to the chimney.
7/23	2	24	38	47.966967	-129.088340	69	-8	2	4	2148	2152	Opening the lid of the box.
7/23	2	25	00	47.966968	-129.088342	69	-8	2	3	2148	2151	There's a clump of worms below the summit we'll avoid.
7/23	2	25	12	47.966968	-129.088344	69	-8	2	3	2148	2151	Trying to grasp the top of the chimney.
7/23	2	25	42	47.966965	-129.088350	69	-8	2	3	2148	2151	The whole sulfide pillar crumbled and fell!
7/23	2	26	16	47.966957	-129.088366	64	-7	1	7	2146	2153	Leaving the area.
7/23	2	26	48	47.966937	-129.088374	36	-9	0	18	2145	2162	Closing up the port arm bio box.
7/23	2	27	38	47.966926	-129.088379	36	-8	1	17	2145	2162	Now we're going to head down to the seafloor and look around.
7/23	2	28	00	47.966920	-129.088372	24	-8	0	17	2146	2163	We'll look for the sulfide chimney that fell while we're down there.
7/23	2	28	32	47.966928	-129.088318	313	-9	0	18	2147	2165	Heading downwards around Fairy Castle.
7/23	2	28	58	47.966966	-129.088303	240	-9	0	17	2149	2166	Some beautiful clumps of tubeworms on the edge of Fairy Castle.
7/23	2	29	47	47.966977	-129.088314	222	-8	1	16	2149	2165	HIGHLIGHTS: KiPro hard drive start
7/23	2	30	11	47.966972	-129.088314	221	-7	1	16	2149	2165	This clump of tubeworms has some white worms on top and red on the bottom.
7/23	2	30	23	47.966971	-129.088315	220	-8	1	16	2150	2165	There are some palm worms in the middle.
7/23	2	31	31	47.966968	-129.088321	218	-8	1	16	2149	2165	There is a small vent coming out of the center top of the worm mound!
7/23	2	33	09	47.966983	-129.088309	236	-7	2	13	2152	2165	There are some brown worms below the red clump. They might be dead.
7/23	2	35	01	47.967014	-129.088297	235	-7	1	6	2159	2165	Heading down and looking for a possible mat to sample.
7/23	2	35	23	47.967014	-129.088294	236	-7	0	5	2160	2166	Nice clump of worms behind Jason.
7/23	2	35	41	47.966997	-129.088280	237	-7	1	5	2161	2166	There may be some mats around here - 5m from bottom.
7/23	2	36	51	47.966984	-129.088232	240	-7	1	3	2164	2167	Some snails and a fish here.
7/23	2	37	43	47.966983	-129.088245	243	-8	0	2	2164	2166	Looking at orange area in the tubeworms.
7/23	2	37	52	47.966983	-129.088248	243	-8	1	2	2165	2166	Could just be oxidized sulfides.
7/23	2	38	07	47.966980	-129.088249	242	-7	0	1	2165	2166	It's not microbial mat - it's just rust.
7/23	2	38	17	47.966978	-129.088247	243	-3	0	1	2165	2166	There's sediment here that could be sampled in the syringe.
7/23	2	38	44	47.966969	-129.088245	242	-3	0	1	2165	2166	Also lots of snails in the area.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	2	39	28	47.966971	-129.088247	242	-4	0	1	2165	2166	Going to get a syringe sample of sediment here.
7/23	2	40	06	47.966972	-129.088254	242	-4	-1	1	2165	2166	Moving HFS intake arm out of the way.
7/23	2	41	07	47.966969	-129.088252	242	-4	-3	1	2165	2166	Put HFS wand away.
7/23	2	41	16	47.966969	-129.088250	242	-3	-3	1	2165	2166	Going to pick up the big syringe now.
7/23	2	41	59	47.966975	-129.088241	242	-5	-2	1	2165	2166	Picked up a big piece of rock.
7/23	2	42	07	47.966977	-129.088240	242	-5	-2	1	2165	2166	Not sulfide - going to leave it.
7/23	2	42	51	47.966976	-129.088236	242	-4	-1	1	2165	2166	Rammed area with basket- it's soft sediment.
7/23	2	42	59	47.966975	-129.088237	242	-3	-1	1	2166	2166	Going to get a syringe sample.
7/23	2	43	10	47.966974	-129.088239	242	-3	-1	1	2166	2166	Picking up the syringe from the basket.
7/23	2	43	31	47.966970	-129.088242	242	-3	-1	1	2166	2166	Untying the syringe sampler.
7/23	2	44	18	47.966959	-129.088247	242	-4	-1	1	2165	2166	Syringe sampler is out of the basket.
7/23	2	44	39	47.966959	-129.088248	242	-4	-1	1	2165	2166	Putting syringe into the sediment.
7/23	2	45	19	47.966958	-129.088244	242	-4	-1	1	2165	2166	SAMPLE: geo Sediment sample is J2-576-Sed-26 (was originally called J2-576-Geo-26)
7/23	2	45	53	47.966958	-129.088239	242	-4	-1	1	2165	2166	SAMPLE: bio Sediment looks dark brown/grey.
7/23	2	46	01	47.966959	-129.088238	242	-3	-1	1	2165	2166	Stowing syringe in basket.
7/23	2	48	06	47.966970	-129.088250	242	-4	-1	1	2165	2166	SAMPLE: geo Sample Sed-26 is at DOP: 47N 57.977' 129W 5.403'
7/23	2	48	10	47.966970	-129.088250	242	-4	-1	1	2165	2166	HIGHLIGHTS: KiPro hard drive stop
7/23	2	48	41	47.966976	-129.088244	242	-3	-1	1	2165	2166	Depth 2165.6 m and Hdg 241.7
7/23	2	48	48	47.966973	-129.088245	242	-3	-1	1	2165	2166	Stowing syringe sampler in basket.
7/23	2	48	55	47.966972	-129.088246	242	-4	-1	1	2165	2166	Taking Jason temp probe measurement.
7/23	2	50	29	47.966967	-129.088243	242	-4	0	1	2165	2166	TEMPS: Jason temperature is a little higher than ambient at 2.6C (ambient is 2.1 C)
7/23	2	50	43	47.966969	-129.088244	242	-4	0	1	2165	2166	Tying bungee down on large syringe sampler.
7/23	2	51	09	47.966969	-129.088249	242	-4	0	1	2165	2166	TEMPS: Jason temperature is still creeping up slowly -- 2.7C now.
7/23	2	52	10	47.966967	-129.088259	242	-4	-1	1	2165	2166	TEMPS: Jason temperature stable at 2.7C.
7/23	2	52	18	47.966958	-129.088263	242	-3	-1	1	2165	2166	Going to stow the Jason temperature wand now.
7/23	2	52	27	47.966956	-129.088263	242	-3	-1	1	2165	2166	Syringe sampler is also bungeed down now.
7/23	2	53	09	47.966965	-129.088259	242	-3	-1	1	2165	2166	The Jason temp wand is stowed.
7/23	2	53	35	47.966967	-129.088258	242	-3	-1	1	2165	2166	Now we're going to head to Knight.
7/23	2	53	53	47.966965	-129.088259	242	-9	-1	2	2164	2166	NAV: Doppler Reset
7/23	2	54	27	47.966970	-129.088271	260	-10	0	7	2160	2166	Retracting Jason basket.
7/23	2	55	16	47.967010	-129.088305	299	-8	0	12	2154	2165	Now we're heading towards Knight.
7/23	2	55	23	47.967012	-129.088312	300	-8	-1	13	2153	2165	We're 10m off the bottom.
7/23	2	56	34	47.967081	-129.088475	301	-10	-1	20	2149	2170	We're still headed to Knight.
7/23	2	57	38	47.967127	-129.088656	301	-8	0	23	2155	2177	Remaining objectives for this dive are to collect sulfide pieces.
7/23	2	58	34	47.967152	-129.088740	301	-6	-1	19	2162	2181	We're within about 10m of Knight now.
7/23	2	59	24	47.967138	-129.088804	312	-8	-1	7	2175	2182	We're stirring up a lot of stuff from the bottom.
7/23	2	59	28	47.967134	-129.088808	338	-9	-1	7	2175	2182	Big fish is swimming by.
7/23	3	00	04	47.967188	-129.088808	5	-8	-1	7	2174	2181	We seem to have arrived at Knight.
7/23	3	00	48	47.967205	-129.088843	43	-9	-2	5	2174	2178	There are some pillar formations but no active vents in sight yet.
7/23	3	01	40	47.967188	-129.088837	1	-9	0	8	2173	2181	There are two large pillars here -- one with a couple horned structures on the end.
7/23	3	01	44	47.967185	-129.088825	1	-9	0	8	2173	2181	The other is flat.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	3	02	03	47.967205	-129.088818	360	-9	0	8	2172	2180	The two horns - or spires - don't seem to be venting.
7/23	3	02	16	47.967207	-129.088822	0	-9	0	8	2172	2180	There is a fish swimming vertically upwards past the pillars.
7/23	3	03	29	47.967222	-129.088867	79	-8	0	7	2173	2180	This area seems pretty dead.
7/23	3	03	50	47.967250	-129.088872	83	-8	0	7	2174	2180	There is some orange mat here.
7/23	3	04	17	47.967223	-129.088879	89	-10	0	7	2174	2181	The spires actually have some diffuse venting coming from them.
7/23	3	05	11	47.967231	-129.088866	91	-9	0	6	2174	2180	We'll collect some orange mat in one of the small syringes.
7/23	3	05	14	47.967231	-129.088865	90	-10	1	6	2174	2180	Jason basket is out.
7/23	3	05	55	47.967232	-129.088860	89	-2	2	5	2175	2180	This area has some good orange slimy looking mat.
7/23	3	06	53	47.967233	-129.088858	87	-3	0	5	2175	2180	Getting the small syringe out of the basket.
7/23	3	07	12	47.967233	-129.088859	87	-2	0	5	2175	2180	Going to use the small red syringe.
7/23	3	08	04	47.967236	-129.088863	87	-2	-1	5	2175	2180	The small red syringe slipped into the basket.
7/23	3	08	26	47.967238	-129.088864	87	-3	0	5	2175	2180	Retrieving small red syringe.
7/23	3	09	18	47.967238	-129.088860	88	-3	2	5	2175	2180	Going to hold the syringe in the left hand.
7/23	3	10	09	47.967234	-129.088853	89	-4	3	5	2175	2180	Positioning the syringe in the orange-red mat.
7/23	3	10	50	47.967229	-129.088849	88	-5	3	5	2175	2180	SAMPLE: bio Collecting the sample in the syringe now.
7/23	3	11	40	47.967226	-129.088850	88	-4	4	5	2175	2180	Sample is J2-576-MAT-27 .
7/23	3	13	24	47.967221	-129.088869	87	-3	1	5	2175	2180	Stowing syringe in sample basket with nozzle up.
7/23	3	14	06	47.967211	-129.088947	344	-9	-1	6	2173	2179	MAT-27: Collected at Knight. DOP: 47N 58.035' and 129W 5.331'
7/23	3	14	26	47.967180	-129.089002	343	-8	-1	7	2173	2180	Heading to Vantor next - last stop on this dive!
7/23	3	14	33	47.967171	-129.089025	337	-9	-1	8	2173	2181	Jason off the bottom.
7/23	3	15	05	47.967184	-129.089119	306	-9	1	8	2172	2180	Vantor is bigger than Knight.
7/23	3	15	16	47.967202	-129.089129	307	-8	-1	9	2172	2181	There are some smokers at Vantor.
7/23	3	16	46	47.967305	-129.089204	319	-8	-1	5	2174	2179	Still traveling to Vantor.
7/23	3	17	39	47.967308	-129.089212	321	-8	-1	5	2174	2179	We'll probably finish this dive in the next 30-45 minutes.
7/23	3	17	51	47.967310	-129.089217	320	-10	-1	5	2174	2179	We'll come up earlier than the scheduled midnight on deck.
7/23	3	19	13	47.967330	-129.089293	321	-9	-1	5	2175	2180	Heading down to seafloor now.
7/23	3	20	26	47.967381	-129.089342	320	-9	-1	3	2175	2178	Checking out the seafloor - lots of large rocks and some sediment.
7/23	3	21	12	47.967419	-129.089429	310	-8	-2	2	2176	2178	There are also some clumps of white worms on the seafloor.
7/23	3	21	27	47.967395	-129.089459	347	-9	-2	4	2177	2181	A couple small pillar structures on the seafloor too.
7/23	3	22	08	47.967408	-129.089423	8	-9	-1	4	2175	2179	Still looking around the area.
7/23	3	22	30	47.967441	-129.089386	4	-8	-1	5	2174	2179	There's a small broken-off pillar ahead of us.
7/23	3	22	38	47.967458	-129.089380	7	-9	-1	4	2174	2179	It looks like a tiny sand castle.
7/23	3	23	04	47.967480	-129.089365	6	-8	-1	1	2176	2177	It has some venting coming out of its center mound.
7/23	3	23	14	47.967483	-129.089347	7	-9	0	3	2176	2178	The center mound is covered in brown worms.
7/23	3	23	44	47.967508	-129.089296	6	-8	-1	4	2175	2179	We're going to put a target on the small vent.
7/23	3	24	14	47.967545	-129.089239	2	-9	-1	5	2176	2181	We're naming it Mole Castle.
7/23	3	25	45	47.967633	-129.089271	331	-9	-2	9	2168	2177	Going past some rocks - looks like we're on a fault scarp.
7/23	3	25	50	47.967626	-129.089287	331	-9	-2	10	2167	2177	Some fish in this area.
7/23	3	26	28	47.967644	-129.089375	351	-8	-1	7	2164	2171	We seem to have arrived at the base of Vantor.
7/23	3	26	35	47.967650	-129.089378	350	-9	-1	6	2165	2171	There's a flange covered in some worms.
7/23	3	26	53	47.967656	-129.089380	352	-8	-1	6	2164	2170	There's also some white worms in a clump on the side.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	3	27	41	47.967661	-129.089394	3	-9	0	5	2165	2170	There's some diffuse venting in front of this pillar.
7/23	3	28	08	47.967660	-129.089396	3	-10	1	5	2165	2170	Some beautiful mirrored venting underneath the flange.
7/23	3	28	24	47.967659	-129.089397	3	-10	1	5	2165	2170	There's also some tubeworms (Sulfincola?) underneath the flange.
7/23	3	28	39	47.967658	-129.089397	3	-10	1	5	2165	2170	HIGHLIGHTS: KiPro hard drive start. This is highlights from the left arm cam.
7/23	3	29	58	47.967659	-129.089396	3	-11	1	5	2165	2170	We're looking around under the flange.
7/23	3	30	18	47.967661	-129.089397	3	-11	-1	5	2165	2170	The minerals are likely chalcopyrite.
7/23	3	31	25	47.967667	-129.089402	3	-9	-2	5	2165	2170	We'll try collecting a little piece of sulfide from the left.
7/23	3	31	34	47.967666	-129.089407	9	-8	-3	5	2165	2169	HIGHLIGHTS: KiPro hard drive stop. Arm cam highlights off.
7/23	3	32	41	47.967672	-129.089429	66	-9	-2	5	2165	2170	Port swing arm box is out.
7/23	3	32	52	47.967667	-129.089433	66	-9	-2	6	2165	2170	Positioning Jason next to the pillar.
7/23	3	33	07	47.967667	-129.089431	66	-10	-1	6	2165	2170	Now we're going to open the lid of the biobox.
7/23	3	33	22	47.967665	-129.089430	66	-9	-2	6	2165	2170	Port box top is open.
7/23	3	34	37	47.967669	-129.089418	66	-9	-2	5	2165	2169	This will be sample J2-576-SULFIDE-28 .
7/23	3	35	25	47.967672	-129.089414	62	-7	0	4	2165	2169	Swing arm box is crashing into pillar.
7/23	3	35	43	47.967673	-129.089417	66	-8	-2	5	2165	2169	There is some diffuse fluid coming off the back near the spire.
7/23	3	36	19	47.967670	-129.089443	70	-10	-2	7	2164	2171	Backing away from the pillar complex.
7/23	3	36	38	47.967674	-129.089438	80	-11	-2	6	2165	2171	Going to move in for another try.
7/23	3	37	34	47.967682	-129.089414	71	-9	-1	4	2165	2169	Doesn't seem like it's going to work.
7/23	3	37	41	47.967682	-129.089413	70	-10	0	4	2165	2169	Moving the arm in for a grab.
7/23	3	38	18	47.967682	-129.089413	70	-10	0	4	2165	2169	There's lots of palm worms and tubeworms on this spire.
7/23	3	38	58	47.967681	-129.089415	70	-10	0	4	2165	2169	Arm caught a piece of the spire.
7/23	3	39	20	47.967680	-129.089416	71	-10	0	4	2165	2169	Looks kind of like the shape of an ice cream cone.
7/23	3	39	33	47.967680	-129.089416	70	-11	0	4	2165	2169	This piece is going in the bio box.
7/23	3	40	16	47.967677	-129.089415	70	-11	-1	4	2165	2169	Going to try and get more of the chimney.
7/23	3	40	22	47.967676	-129.089414	70	-11	0	4	2165	2169	This bit crumbled a lot more than the top.
7/23	3	40	29	47.967676	-129.089414	71	-10	0	4	2165	2169	Some tubeworms are on this piece.
7/23	3	40	42	47.967675	-129.089412	70	-11	1	5	2165	2169	This piece is also going in the port bio box and is part of the same sample number.
7/23	3	40	55	47.967674	-129.089410	70	-11	1	4	2165	2169	This is sample J2-576-SULFIDE-28 .
7/23	3	41	18	47.967671	-129.089406	70	-11	0	5	2165	2169	Position is DOP: 47N 58.062' 129W 5.364'
7/23	3	41	43	47.967669	-129.089402	70	-11	0	4	2165	2169	Closing the lid of the bio box.
7/23	3	41	56	47.967668	-129.089400	70	-9	0	4	2165	2169	Now we'll take the temperature of the area we collected the sulfide from.
7/23	3	42	34	47.967664	-129.089396	70	-10	-1	4	2165	2169	Getting the Jason temp probe out of its holster.
7/23	3	42	58	47.967662	-129.089397	70	-9	0	4	2165	2169	Unwinding the cord of the Jason temp probe.
7/23	3	43	21	47.967662	-129.089398	70	-9	-2	4	2165	2169	Going to measure the temperature of the vent area.
7/23	3	43	58	47.967664	-129.089402	70	-10	-2	4	2165	2169	TEMPS: Jason temperature of the diffuse flow is 227 and rising.
7/23	3	44	34	47.967669	-129.089408	70	-10	-2	4	2165	2169	TEMPS: Jason temperature Temp is 265 and slowly rising.
7/23	3	44	42	47.967670	-129.089409	70	-10	-2	4	2165	2169	Moving temp probe to the left a little.
7/23	3	45	14	47.967676	-129.089413	71	-10	-3	4	2165	2169	Now the temp is about 141 but falling.
7/23	3	45	26	47.967678	-129.089415	71	-10	-3	4	2165	2169	Temperature max was 266 in first spot.
7/23	3	45	40	47.967680	-129.089416	71	-10	-3	4	2165	2169	Removing the Jason temp probe.
7/23	3	46	21	47.967681	-129.089429	76	-9	-2	5	2165	2170	Going to look around the top of the pillar for some fluid sampling sites.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	3	46	28	47.967678	-129.089443	76	-11	-2	7	2164	2171	Keeping a hold on the Jason temp probe.
7/23	3	46	42	47.967677	-129.089451	75	-10	-2	9	2162	2171	Going up past the two flanges to the top where there is a smoker vent.
7/23	3	46	55	47.967678	-129.089441	58	-10	-1	9	2162	2171	Going to take the temperature of the smoker.
7/23	3	48	44	47.967681	-129.089415	19	-9	-2	7	2162	2169	Going to insert the temperature probe down the center of the smoker.
7/23	3	49	35	47.967682	-129.089413	19	-10	-2	7	2162	2169	Lots of rock/sulfide chunks floating around.
7/23	3	49	48	47.967682	-129.089412	19	-10	-2	7	2162	2169	TEMPS: Jason temperature probe is reading 324 and rising.
7/23	3	49	56	47.967682	-129.089412	19	-10	-2	7	2162	2169	There may be two different openings in this area.
7/23	3	50	09	47.967682	-129.089412	19	-9	-2	7	2162	2169	Seems like there might be pyrite around the edges of the smoker opening.
7/23	3	51	14	47.967679	-129.089413	19	-9	-2	7	2162	2169	Temp is stabilizing around 326 C.
7/23	3	51	35	47.967678	-129.089414	19	-9	-2	7	2162	2169	TEMPS: Jason temperature is 328.4 C.
7/23	3	52	02	47.967677	-129.089415	19	-9	-2	7	2162	2169	TEMPS: Jason temperature is about 327.7 C.
7/23	3	52	30	47.967676	-129.089415	18	-9	-2	7	2162	2169	Putting the Jason temperature probe back.
7/23	3	52	52	47.967675	-129.089415	18	-8	-2	7	2162	2169	Some pieces of sulfides are falling into the basket.
7/23	3	53	20	47.967674	-129.089414	18	-9	-2	7	2162	2169	The Jason temp probe is stored now.
7/23	3	53	43	47.967673	-129.089413	18	-9	-2	7	2162	2169	Getting HFS intake wand out.
7/23	3	54	34	47.967672	-129.089411	19	-9	-2	7	2162	2169	The HFS intake wand is tangled up.
7/23	3	54	50	47.967671	-129.089410	19	-10	-1	7	2162	2169	The intake wand fell off the basket.
7/23	3	55	05	47.967670	-129.089408	19	-10	1	7	2162	2169	It's sitting in front of the basket on the chimney structure though.
7/23	3	55	15	47.967670	-129.089408	20	-10	2	7	2162	2169	Going to use left arm to pick up the HFS arm.
7/23	3	55	59	47.967668	-129.089406	20	-10	2	7	2162	2169	Holding the wand in place with the left arm.
7/23	3	57	12	47.967664	-129.089404	20	-8	1	7	2162	2169	Going to get the scoop bag with the right arm.
7/23	3	58	18	47.967665	-129.089405	20	-10	2	7	2162	2169	Picked up the scoop bag to the left of the syringe box.
7/23	3	58	44	47.967667	-129.089405	19	-10	2	7	2162	2169	The bag is open in the right hand.
7/23	3	59	25	47.967672	-129.089404	19	-11	1	7	2162	2169	Putting the bag down on the slope to the right of the smoker vent.
7/23	4	00	03	47.967676	-129.089403	18	-10	2	7	2162	2169	Lifting the HFS intake wand into the basket again.
7/23	4	02	00	47.967687	-129.089392	19	-11	1	7	2162	2169	Using the left arm to put the HFS intake back.
7/23	4	02	15	47.967688	-129.089390	19	-10	1	7	2162	2169	Not sure of the best approach for using the scoop bag to collect samples.
7/23	4	02	19	47.967688	-129.089389	19	-10	1	7	2162	2169	Trying to shake and scrape the bag back and forth.
7/23	4	02	27	47.967688	-129.089388	18	-11	2	7	2162	2169	Some sulfides may have gone into the bag.
7/23	4	03	13	47.967688	-129.089386	18	-10	1	7	2162	2169	After this we'll just collect one water sample with the Beast.
7/23	4	03	33	47.967688	-129.089387	18	-11	1	7	2162	2169	We'll probably be done with the dive in about 30 minutes.
7/23	4	03	59	47.967686	-129.089388	18	-11	1	7	2162	2169	Moving the scoop bag around the smoker.
7/23	4	04	14	47.967685	-129.089389	18	-10	2	7	2162	2169	Seems like we're finished.
7/23	4	04	32	47.967684	-129.089391	18	-11	2	7	2162	2169	Going to put the scoop bag in the port swing arm box.
7/23	4	04	58	47.967683	-129.089395	18	-11	-1	7	2162	2169	This is sample J2-576-SULFIDE-29 .
7/23	4	07	09	47.967683	-129.089413	17	-10	-1	7	2162	2168	Putting the scoop bag into the port swing arm box.
7/23	4	07	38	47.967683	-129.089416	17	-10	-1	7	2162	2169	The position is the same as the previous sample but the depth is 2162.3m instead of 2164.4m
7/23	4	07	49	47.967683	-129.089416	17	-10	-1	7	2162	2169	The scoop bag is in the port box.
7/23	4	08	00	47.967682	-129.089417	17	-10	-1	7	2162	2168	The lid on the bio box is closed now.
7/23	4	08	37	47.967681	-129.089417	17	-11	-1	7	2162	2169	Tying the bungee down on the port box.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	4	09	42	47.967679	-129.089413	17	-9	0	7	2162	2168	Port bio box is stored.
7/23	4	09	55	47.967679	-129.089411	17	-9	0	7	2162	2169	Next we'll take a fluid sample with the HFS.
7/23	4	11	17	47.967683	-129.089405	17	-9	2	7	2162	2169	Going to pick up the intake wand with the right arm and hold it in the left.
7/23	4	12	15	47.967685	-129.089402	18	-7	3	7	2162	2169	Pulled the nozzle off of the wand's front - makes sampler easier to insert in small places.
7/23	4	12	46	47.967684	-129.089403	18	-10	3	7	2162	2169	Stowing the nozzle piece in the right hand box with the gastight bottles.
7/23	4	13	08	47.967683	-129.089403	17	-10	1	7	2162	2169	Going to sample the smoker vent.
7/23	4	14	18	47.967678	-129.089412	17	-10	0	7	2162	2169	Inserting the wand into the vent.
7/23	4	14	30	47.967678	-129.089414	17	-10	0	7	2162	2169	TEMPS: HFS temperature is 293 and rising.
7/23	4	15	25	47.967678	-129.089423	17	-10	0	7	2162	2169	The temp is now 328 C.
7/23	4	15	54	47.967679	-129.089426	17	-9	0	7	2162	2168	Starting to sample filtered bag #17
7/23	4	16	49	47.967681	-129.089423	17	-9	0	7	2162	2168	J2-576-HFS-30 is filtered bag #17. Start at 04:15.
7/23	4	18	36	47.967666	-129.089414	17	-9	0	7	2162	2169	J2576-HFS-30 done.
7/23	4	19	12	47.967660	-129.089416	17	-10	0	7	2162	2169	J2576-HFS-30: Tmax=330.5 Tavg=330 T2=107 vol=475mL. End at 04:18
7/23	4	19	32	47.967658	-129.089416	18	-10	1	7	2162	2169	Location is same as SULFIDE-29.
7/23	4	19	54	47.967658	-129.089416	18	-10	2	7	2162	2169	We're done with fluid sampling.
7/23	4	20	11	47.967659	-129.089414	18	-10	2	7	2162	2169	We're going to take a quick look at the bottom of the Vantor pillar for sediment or mat to sample.
7/23	4	20	35	47.967663	-129.089409	17	-9	-1	7	2162	2169	We need to stow the HFS intake arm in the basket.
7/23	4	20	53	47.967651	-129.089414	17	-10	0	9	2161	2170	There is nowhere good to hold it in the basket without the nozzle on.
7/23	4	21	11	47.967628	-129.089433	15	-11	0	10	2162	2173	We're going down the column now.
7/23	4	22	30	47.967600	-129.089477	23	-10	-1	2	2172	2174	There's some brown sediment here under the tubeworms.
7/23	4	22	38	47.967601	-129.089485	23	-10	0	3	2172	2175	There's also some orange mat next to the tubeworms.
7/23	4	23	07	47.967601	-129.089495	22	-10	-1	3	2172	2175	Going to try to collect the orange mat in the last syringe.
7/23	4	23	20	47.967602	-129.089502	23	-11	-1	3	2172	2175	The HFS intake is being wound on its cord.
7/23	4	24	00	47.967606	-129.089521	23	-10	-1	2	2172	2175	Going to try and stick the HFS nozzle into one of the holes on the Jason basket bottom.
7/23	4	24	17	47.967609	-129.089524	23	-10	-2	2	2172	2175	Picking up the yellow small syringe now.
7/23	4	25	54	47.967621	-129.089517	23	-10	-1	2	2172	2175	Using the right hand to get the syringe.
7/23	4	26	37	47.967619	-129.089517	23	-10	-1	3	2172	2175	Pulled syringe out of the basket.
7/23	4	26	55	47.967618	-129.089515	23	-10	-1	3	2172	2175	Yellow syringe in right hand.
7/23	4	27	20	47.967615	-129.089512	23	-11	0	2	2172	2175	Gripping syringe barrel in left hand.
7/23	4	27	56	47.967608	-129.089506	22	-11	0	2	2172	2174	Positioning Jason to pick up orange mat.
7/23	4	29	29	47.967604	-129.089501	50	-6	-3	2	2173	2175	Positioning the syringe in place over the orange mat.
7/23	4	30	19	47.967597	-129.089499	50	-7	-3	2	2173	2175	Pulling the syringe sample now.
7/23	4	30	46	47.967595	-129.089498	50	-7	-3	2	2173	2175	Actually - checking to make sure it's in the mat.
7/23	4	30	51	47.967595	-129.089498	50	-7	-3	2	2173	2175	Pulling the sampler now. J2-576-MAT-31 .
7/23	4	31	36	47.967592	-129.089502	50	-6	-3	2	2173	2175	Sediment from below the mat was sucked up into the syringe.
7/23	4	31	46	47.967591	-129.089501	50	-6	-3	2	2173	2175	The orange mat mostly stayed in place on the surface though.
7/23	4	31	58	47.967591	-129.089503	49	-5	-2	2	2173	2175	This is sample J2-576-MAT-31 .
7/23	4	32	25	47.967591	-129.089501	49	-4	-2	2	2173	2175	Location was DOP: 47N 58.058 and 129W 5.369'
7/23	4	32	42	47.967590	-129.089502	50	-3	-4	2	2173	2175	Depth was 2173.1 (2.6m off bottom)
7/23	4	32	48	47.967590	-129.089501	49	-10	0	2	2173	2175	heading 49

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-576 Dive Log
7/23	4	33	50	47.967581	-129.089502	49	-8	0	10	2165	2175	We're done sampling.
7/23	4	33	57	47.967581	-129.089502	50	-8	0	10	2165	2175	The syringe was stored in the basket.
7/23	4	34	00	47.967621	-129.089486	50	-8	0	10	2165	2175	JASON: Jason off bottom

Table 7.4.4 J2-577 Jason Dive Log (Main Endeavour Field, Endeavour Segment, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	16	36	27	47.948367	-129.100440	343	-16	1	7	2123	2129	NAV: Doppler Reset
7/23	16	37	00	47.948371	-129.100437	344	-16	0	6	2123	2129	The elevator has a "Homer" on it that is saying the elevator is 44m away.
7/23	16	38	41	47.948364	-129.100417	344	-16	0	8	2121	2129	The instrument has been on the seafloor since 2005 and it buried under hydrothermal (?) deposits.
7/23	16	41	04	47.948607	-129.100546	337	-18	0	7	2122	2129	Jimmy sees the elevator on the mini-Zeus camera. It's also visible on the sonar.
7/23	16	41	16	47.948628	-129.100567	339	-17	0	5	2124	2129	It looks all safe and sound and happy.
7/23	16	42	39	47.948733	-129.100691	86	-16	0	6	2125	2131	Jason is hovering above the elevator.
7/23	16	43	45	47.948749	-129.100644	110	-15	1	4	2127	2132	Nice frame grabs of the elevator.
7/23	16	45	47	47.948750	-129.100631	110	-18	3	4	2128	2132	Taking some HD frame grabs of the elevator before Jason moves it.
7/23	16	46	49	47.948742	-129.100624	109	-26	2	6	2126	2132	Jason has the elevator with its Schilling arm (the left one).
7/23	16	47	31	47.948740	-129.100625	110	-20	4	9	2123	2132	Up off the bottom with the elevator. Want to bring it up a bit to get it over the little ridge it is sitting behind.
7/23	16	48	27	47.948731	-129.100626	113	-20	4	14	2118	2132	Coming up from 2121 to 2100 m with Jason.
7/23	16	50	54	47.948602	-129.100450	106	-20	5	18	2111	2130	The elevator is up on a ridge to the NW of S and M.
7/23	16	52	57	47.948553	-129.100374	109	-19	4	17	2113	2130	Ship and Jason are moving toward S and M vent. The "mound" is slightly N of the vent on the west side of a fissure (on the up block).
7/23	16	58	26	47.948529	-129.100277	110	-19	4	17	2113	2130	Slowly moving - elevator in tow - toward the mound with the "cap" and sulfide.
7/23	17	08	50	47.948272	-129.099331	104	-21	3	14	2182	2195	Still moving at 20m/min. Hdg 102deg.
7/23	17	16	35	47.948220	-129.098626	101	-22	2	6	2188	2194	Jason is putting the elevator on the seafloor and will now go out and search for the Chinese instrument.
7/23	17	17	05	47.948221	-129.098636	102	-17	4	4	2190	2194	Elevator is free.
7/23	17	18	50	47.948122	-129.098596	127	-15	1	4	2190	2195	We're moving away from the elevator in search of the mound.
7/23	17	19	18	47.948105	-129.098566	123	-15	0	5	2190	2195	My goodness. There it is! That took all of 1 minute.
7/23	17	19	44	47.948084	-129.098567	129	-14	-1	3	2192	2195	The HD science cam is pretty dark.
7/23	17	20	42	47.948063	-129.098532	163	-15	1	3	2192	2195	The little chimney on the top of the mound has grown since last year. There is a lot of new growth.
7/23	17	20	59	47.948066	-129.098528	164	-17	0	3	2193	2195	HIGHLIGHTS: KiPro hard drive start
7/23	17	22	02	47.948089	-129.098499	164	-16	0	3	2192	2195	The 117 marker is Chuck Fisher's.
7/23	17	23	01	47.948107	-129.098488	164	-15	0	3	2193	2195	When this was deployed there was black smoke coming directly out of the seafloor. It's still smoking.
7/23	17	23	20	47.948107	-129.098490	164	-15	0	3	2193	2195	Adam Schultz had an instrument down here. He threw it away.
7/23	17	23	50	47.948105	-129.098495	164	-15	0	3	2193	2195	Nice image in the mini-Zeus cam too.
7/23	17	24	00	47.948103	-129.098497	164	-15	0	3	2193	2195	What is all this stuff around the vent?

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	17	24	42	47.948097	-129.098505	164	-15	0	3	2193	2195	A milk crate with something sticking out the top. Don't know what it is.
7/23	17	25	41	47.948094	-129.098509	164	-16	0	3	2193	2195	The composition of the little chimney is probably sulfite and anhydrite.
7/23	17	26	30	47.948094	-129.098499	164	-16	0	3	2193	2195	ZHOU marker. This belongs to the Chinese (06-2 is that it says).
7/23	17	27	43	47.948080	-129.098500	145	-16	-1	3	2193	2195	That chimney is probably close to 2 feet tall.
7/23	17	28	07	47.948067	-129.098509	118	-16	-1	2	2193	2195	We're taking some shots of the mound before bringing the elevator over here to excavate it.
7/23	17	28	26	47.948052	-129.098518	96	-16	0	2	2193	2195	There's not as much material there as appeared in the photo we saw.
7/23	17	28	40	47.948047	-129.098521	77	-15	0	2	2193	2195	There is an apron around the chimney.
7/23	17	28	58	47.948037	-129.098523	72	-16	0	2	2192	2195	There is a lot of basalt on the edges.
7/23	17	29	14	47.948030	-129.098527	55	-16	0	2	2193	2195	Circling the mound.
7/23	17	31	19	47.948024	-129.098506	4	-15	0	2	2193	2195	The S and M chimney is in the butt cam. It's big. About 7 meters behind us.
7/23	17	32	16	47.948050	-129.098480	358	-15	0	2	2193	2195	S and M has been there at least 30 years. The target is accurate.
7/23	17	33	15	47.948041	-129.098469	342	-15	-1	2	2192	2194	We are seeing an array of soap dishes possibly? They seem to have fallen out of the milk crate onto the mound.
7/23	17	34	00	47.948030	-129.098470	304	-15	0	17	2192	2210	Looks like lots of snails around the mound.
7/23	17	34	17	47.948027	-129.098471	304	-15	0	17	2193	2210	There is venting coming out of a couple spots on the mound.
7/23	17	34	49	47.948038	-129.098472	274	-15	0	18	2192	2210	Bill can see shimmer coming out of the beehive at the top of this small chimney.
7/23	17	36	37	47.948088	-129.098533	180	-16	-1	3	2192	2195	Backing away from the chimney a bit for more frame grabs and HD. We have circled the mound.
7/23	17	36	48	47.948098	-129.098530	189	-16	0	4	2191	2195	HIGHLIGHTS: KiPro hard drive stop
7/23	17	37	43	47.948111	-129.098482	160	-16	0	6	2190	2195	Jason will move the elevator closer to the mound.
7/23	17	40	52	47.948048	-129.098479	62	-15	0	1	2194	2195	What a pretty little chimney. Want to knock all of it in a scoop bag.
7/23	17	41	51	47.948070	-129.098532	62	-15	0	1	2194	2195	It's (the chimney) is about 1.5 meters tall.
7/23	17	41	56	47.948069	-129.098537	62	-15	0	1	2194	2195	HIGHLIGHTS: KiPro hard drive start
7/23	17	42	20	47.948064	-129.098556	62	-15	-1	1	2194	2194	Nice flow coming out of the chimney. Not really black smoke.
7/23	17	42	39	47.948059	-129.098565	63	-15	-1	1	2194	2194	The lasers are 10cm apart.
7/23	17	43	36	47.948059	-129.098549	62	-15	-1	1	2194	2195	The base appears to be at least 25cm apart. The white stuff is anhydrite and the darker stuff is sulfide minerals.
7/23	17	44	08	47.948064	-129.098530	62	-15	-1	1	2194	2194	There's a baby flange on the chimney.
7/23	17	44	57	47.948074	-129.098519	62	-15	-1	1	2194	2194	Don't really see any black smoke but there is definitely active with lots of flow visible.
7/23	17	45	03	47.948074	-129.098519	62	-15	-1	1	2194	2194	Lasers off.
7/23	17	46	23	47.948062	-129.098507	62	-15	-1	1	2194	2195	It's bigger than it seems. The scoop bag looks pretty small next to the chimney.
7/23	17	48	22	47.948035	-129.098512	63	-16	-1	1	2194	2194	Preparing to sample. The left arm is coming in to assist.
7/23	17	48	49	47.948044	-129.098513	63	-15	-1	1	2194	2194	Jimmy is delicately trying to break off the top.
7/23	17	50	13	47.948053	-129.098518	63	-15	-1	2	2194	2195	SAMPLE: geo J2-577-Sulfide-01 . Begin sampling at 1749. Looks like the top of the chimney did not go into the bag.
7/23	17	50	37	47.948048	-129.098511	63	-15	-1	1	2194	2195	HIGHLIGHTS: KiPro hard drive stop
7/23	17	53	34	47.948069	-129.098523	63	-15	-2	1	2194	2195	Contemplating how to collect the rest of the chimney.
7/23	17	54	06	47.948073	-129.098526	63	-15	-2	1	2194	2194	Marv thinks he sees the top of the chimney (beehive) on the seafloor.
7/23	17	57	57	47.948056	-129.098528	62	-16	-1	1	2194	2194	J2-577-Sulfide-01 cont. Looks like the chimney and parts are hopefully going to go into the port biobox.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	17	58	34	47.948052	-129.098526	62	-17	-1	1	2194	2194	J2-577-Sulfide-01 cont. Location: -129 5.9112' 47 56.8854. Z=2194.
7/23	18	01	27	47.948057	-129.098495	62	-15	-2	1	2194	2194	J2-577-Sulfide-01 cont. Out comes the little mesh scoop to try to collect some of the chimney. Nice nudge. It's in the mesh scoop. Hopefully will stay in there as it is transported to the biobox.
7/23	18	02	46	47.948078	-129.098520	62	-15	-2	1	2194	2195	We're thinking about what to do with the chimney... coffin of biobox?
7/23	18	04	35	47.948050	-129.098494	63	-15	-2	2	2194	2195	Going to pull the divider out of the swing arm biobox so that the chimney does not break up.
7/23	18	05	38	47.948053	-129.098525	63	-15	-2	1	2194	2194	J2-577-Sulfide-01 cont. The chimney is not as friable as Marv thought earlier. This second piece is intact.
7/23	18	06	30	47.948070	-129.098535	63	-15	-3	2	2194	2195	Jimmy took the divider out of the port biobox with the left arm; holding the mesh scoop and chimney with the right.
7/23	18	07	41	47.948071	-129.098517	63	-15	-3	1	2194	2194	J2-577-Sulfide-01 cont. Dumping most of that chimney piece into the biobox.
7/23	18	09	08	47.948063	-129.098533	62	-16	-2	2	2194	2195	Pulling the deck (basket) in and out of the way of the biobox so he can collect the pieces that didn't make it in there.
7/23	18	14	17	47.948067	-129.098498	62	-16	-2	1	2194	2195	We will be sampling this mound for a long time. Picking up pieces that have dropped outside the biobox. It's too friable to use the claw.
7/23	18	15	02	47.948055	-129.098517	63	-15	1	1	2194	2194	There's quite a large part of the chimney left intact on the seafloor. Going for more.
7/23	18	18	38	47.948068	-129.098465	63	-15	-1	2	2194	2195	Moving in with the left claw too. Looks like it is all going to come down as one piece now. More solid near the base.
7/23	18	20	23	47.948072	-129.098501	63	-15	0	2	2194	2195	Going to get the swing box out of the way and perhaps put the whole thing into the coffin.
7/23	18	21	58	47.948057	-129.098534	62	-16	-1	1	2194	2195	HIGHLIGHTS: KiPro hard drive start
7/23	18	22	37	47.948043	-129.098519	63	-16	-1	1	2194	2194	Hoping to put the remaining chimney into the coffin biobox.
7/23	18	24	20	47.948029	-129.098520	63	-16	-1	1	2194	2194	There's a small; narrow orifice still on the seafloor pouring out hot water.
7/23	18	26	06	47.947998	-129.098459	63	-19	1	1	2193	2194	The flow coming out of the remaining orifice has a gray color to it. Lots of flow coming out.
7/23	18	27	17	47.947981	-129.098505	106	-19	1	3	2191	2194	The "cap" they are wanting to retrieve is under the flow.
7/23	18	27	26	47.947983	-129.098514	87	-17	1	4	2190	2194	Under the visible flow.
7/23	18	28	04	47.948050	-129.098553	347	-20	0	4	2190	2194	Going to the elevator to get the shovel.
7/23	18	28	24	47.948089	-129.098598	353	-18	1	4	2190	2195	HIGHLIGHTS: KiPro hard drive stop
7/23	18	30	02	47.948230	-129.098607	100	-19	2	1	2193	2194	The consensus is that the elevator will stay where it is. If it's any closer to the mound it will be in the way according to Jimmy.
7/23	18	33	57	47.948221	-129.098625	99	-15	-3	1	2194	2194	Lifting the "shovel" out of the milk crate on the elevator.
7/23	18	36	47	47.948116	-129.098520	124	-20	1	3	2192	2195	Shovel in tow. Heading back to the mound. Travelling over lobate pillows. Back at the mound now.
7/23	18	39	21	47.948025	-129.098525	46	-18	0	1	2193	2194	The flow coming out of the small orifice is vigorous.
7/23	18	40	35	47.948050	-129.098522	45	-18	-1	1	2193	2194	The Chinese want to call this: Vent Cap Mound. The navigation shows it is ~15m north of S & M.
7/23	18	41	36	47.948053	-129.098527	45	-19	-1	1	2193	2194	They don't want the chimney broken.
7/23	18	42	17	47.948038	-129.098532	46	-19	0	1	2193	2194	The shovel is moving into place under the remaining chimney part.
7/23	18	46	48	47.948053	-129.098531	69	-19	2	1	2193	2194	SAMPLE: geo J2-577-Sulfide-01 cont. Shovel under the remaining chimney. It will go in the big coffin biobox. Assistance with the left arm here.
7/23	18	49	23	47.948069	-129.098506	69	-19	2	1	2193	2194	J2-577-Sulfide-01 cont. Location: Vent Cap Mound. 47 56.8854' -129 5.9112'. Z=2194m. Still working on scooping up the remaining sulfide chimney piece.
7/23	18	52	45	47.948047	-129.098543	70	-18	-1	1	2193	2194	It seems more fragile than anticipated earlier.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	18	54	24	47.948059	-129.098517	69	-19	-3	1	2193	2194	Discussing how to pick up the remaining chimney chunk. Changing the approach....
7/23	18	55	12	47.948066	-129.098492	131	-20	-4	1	2193	2195	The suggestion is to re-orient the vehicle so that he can come at it with the shovel from downhill - scooping it that way.
7/23	18	55	21	47.948069	-129.098486	152	-19	-1	2	2193	2195	Want the ROV facing south.
7/23	18	56	21	47.948074	-129.098492	147	-16	1	1	2194	2195	Moving Jason so that it is now heading 147 degrees. Facing south. Now we have gravity on our side says Marv.
7/23	18	57	12	47.948073	-129.098516	150	-15	-1	1	2194	2195	The shovel is working better this way. This might be it?
7/23	18	58	17	47.948064	-129.098490	150	-16	1	1	2194	2195	Left arm pushing chimney piece onto shovel.
7/23	18	59	08	47.948055	-129.098458	150	-15	0	1	2194	2195	Opened lid of coffin biobox again.
7/23	19	01	18	47.948023	-129.098515	149	-17	1	1	2194	2195	Tried to lift with the shovel but the chimney kept rolling off.
7/23	19	01	37	47.948027	-129.098518	148	-17	1	1	2194	2195	Going to try to just pick it up with the manipulator claw.
7/23	19	01	47	47.948031	-129.098518	148	-16	1	1	2194	2195	Stowing shovel.
7/23	19	02	57	47.948054	-129.098494	148	-16	1	1	2194	2195	Picking up chimney with right manipulator.
7/23	19	03	57	47.948063	-129.098490	148	-16	1	1	2194	2195	Got it!
7/23	19	04	21	47.948065	-129.098492	148	-15	0	1	2194	2195	Lifting it up and into coffin biobox. Wow! It just fits.
7/23	19	04	52	47.948066	-129.098491	148	-16	0	1	2194	2195	End of Sample.
7/23	19	06	03	47.948062	-129.098494	148	-17	0	1	2194	2195	Going to see if there is more of the chimney on the mound.
7/23	19	09	54	47.948078	-129.098514	121	-21	1	2	2192	2194	Moving Jason to look around.
7/23	19	11	21	47.948083	-129.098478	184	-13	1	1	2194	2195	Found the beehive top of the chimney that had fallen off earlier. Going to try to pick it up.
7/23	19	11	58	47.948089	-129.098469	184	-13	1	1	2194	2195	Closing coffin biobox.
7/23	19	14	57	47.948074	-129.098470	184	-15	0	1	2194	2195	Using the triangular net to capture the top of the beehive that was knocked over in the initial attempt to recover the chimney.
7/23	19	17	15	47.948037	-129.098519	183	-14	0	1	2194	2195	We're looking at the top of the chimney on the seafloor - scoop perched ready to retrieve it.
7/23	19	20	25	47.948107	-129.098472	183	-13	0	1	2194	2195	Opened the port biobox. Will place more of the chimney remains in there.
7/23	19	22	02	47.948102	-129.098485	183	-14	2	1	2194	2195	Ben is attempting to scoop up this small piece of the chimney top. It's the top of the beehive.
7/23	19	23	57	47.948061	-129.098474	182	-13	-1	1	2194	2195	Ben has it in the scoop. It is super fragile. Almost like dust.
7/23	19	26	17	47.948066	-129.098520	182	-13	-1	1	2194	2195	J2-577-Sulfide-01 cont. The beehive top is going into the port biobox. Some solid pieces but mostly super-fine-grained particles.
7/23	19	28	59	47.948058	-129.098469	183	-13	2	1	2194	2195	Going to put the biobox away and survey the area so that they can move the elevator closer.
7/23	19	29	16	47.948059	-129.098468	184	-13	2	1	2194	2195	Closing up the port biobox and stowing it.
7/23	19	31	46	47.948086	-129.098520	184	-19	1	2	2193	2195	J2-577-Sulfide-01 end. Finished collecting what we could of the chimney. It is stored in the port biobox and the coffin. Ending this sampling cycle at 1930.
7/23	19	33	51	47.948071	-129.098446	228	-17	1	2	2193	2195	The rest of the mound will be sample 2. It will go in one of the bioboxes on the elevator and probably the stbd biobox. The instrument is probably too big for the biobox so will probably have to be held down by the arm.
7/23	19	35	27	47.948108	-129.098474	301	-17	1	3	2192	2195	There are at least 3 vents on the mound. Will want to fluid sample the one under the cap.
7/23	19	36	15	47.948184	-129.098548	269	-16	3	5	2190	2195	NAV: Doppler Reset
7/23	19	40	50	47.948195	-129.098607	190	-17	3	4	2191	2195	The tasks have changed a bit. Because there is more venting than last year at Vent Cap Mound the gastights will be taken there and at "S and M". We'll probably not visit Dudley.
7/23	19	42	28	47.948203	-129.098617	141	-22	3	7	2188	2195	Carrying the elevator closer to the vent.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	19	48	39	47.948084	-129.098532	174	-15	0	1	2194	2195	Settling in near the mound - off to the west.
7/23	19	49	18	47.948089	-129.098529	172	-17	-1	2	2194	2195	Jason is probably 5-10 feet from the mound.
7/23	19	49	57	47.948077	-129.098529	192	-14	2	1	2194	2195	NAV: Doppler Reset
7/23	19	53	30	47.948072	-129.098542	184	-21	4	5	2190	2195	Moving the elevator 1m to the east to make it easier to get the material into the bioboxes.
7/23	19	55	19	47.948083	-129.098539	182	-17	1	4	2191	2195	Still maneuvering the elevator.
7/23	19	58	55	47.948069	-129.098495	222	-10	-6	1	2194	2195	The elevator is in a good spot. Getting out the scoop to collect from the sulfide mound.
7/23	20	00	09	47.948062	-129.098504	224	-11	-5	1	2194	2195	One more small elevator adjustment.
7/23	20	03	40	47.948065	-129.098479	198	-19	-2	2	2194	2195	Positioning Jason to begin excavating the sulfide mound.
7/23	20	07	03	47.948083	-129.098489	202	-10	3	1	2194	2195	Opening one of the elevator bioboxes.
7/23	20	08	42	47.948079	-129.098501	198	-11	-2	1	2194	2195	Picking up the scoop.
7/23	20	10	21	47.948072	-129.098515	200	-12	0	2	2194	2195	Scoop is grabbed and ready to dig.
7/23	20	13	37	47.948075	-129.098487	197	-13	-1	2	2194	2195	Attempting to scoop up the top of the mound. The mound has a hard cap on top.
7/23	20	17	42	47.948072	-129.098517	203	-11	2	2	2194	2195	Deciding what approach to take in collecting from the sulfide mound.
7/23	20	19	47	47.948068	-129.098450	203	-13	1	2	2194	2195	Grabbing the top of the sulfide mound. It is pretty well cemented on.
7/23	20	22	52	47.948065	-129.098472	202	-12	-1	1	2194	2195	Pause the action for shift change.
7/23	20	26	08	47.948061	-129.098493	230	-21	2	3	2193	2196	Moving Jason to get a better angle for prying off the top of the mound.
7/23	20	28	09	47.948052	-129.098477	229	-16	2	1	2194	2195	Trying to pull off the top of the mound again.
7/23	20	33	11	47.948046	-129.098502	349	-19	0	1	2193	2194	Moving Jason to the southwest side of the mound to try again. The mound is really cemented together.
7/23	20	38	38	47.948054	-129.098524	349	-17	3	1	2194	2195	The entire mound is cemented with just a light coating of dust.
7/23	20	40	39	47.948057	-129.098491	243	-21	0	19	2192	2211	Moving back to the northeast side of the mound to try breaking off a little of the mound.
7/23	20	42	46	47.948074	-129.098492	226	-17	1	1	2194	2195	The plan is to try pushing the mound with the spikes on the front of the science basket of Jason.
7/23	20	45	17	47.948080	-129.098486	225	-17	-1	1	2194	2195	Moving an old milk crate off of the mound to make room.
7/23	20	46	46	47.948043	-129.098495	243	-10	-1	1	2194	2195	Nudging is not working either.
7/23	20	48	19	47.948049	-129.098492	244	-14	3	2	2194	2196	Regrouping.
7/23	20	51	13	47.948059	-129.098492	242	-11	2	1	2194	2195	Trying a bit more with the arm but this mound is tough.
7/23	20	51	42	47.948063	-129.098488	243	-13	6	2	2194	2196	Moving to a small chimney on the side of the mound to try to collect that.
7/23	20	59	47	47.948052	-129.098498	234	-17	4	1	2194	2195	Trying to break off the small chimney of the east side of the mound.
7/23	21	01	45	47.948064	-129.098510	234	-16	4	2	2194	2195	That did not work either. Giving up on the efforts to collect samples of the mound.
7/23	21	04	29	47.948072	-129.098523	236	-17	5	2	2194	2196	Putting the Chinese basket into the elevator biobox.
7/23	21	06	44	47.948073	-129.098517	235	-16	5	2	2194	2196	The Chinese basket that is being retrieved is an older experiment. The basket was already down here.
7/23	21	07	08	47.948073	-129.098513	235	-16	5	2	2194	2196	Got it in.
7/23	21	10	53	47.948059	-129.098562	3	-13	2	1	2194	2195	Getting the Chinese fluid sampler.
7/23	21	11	47	47.948066	-129.098558	2	-15	4	1	2194	2194	Frame grabber has stopped grabbing frame. It looks stuck.
7/23	21	12	59	47.948060	-129.098546	2	-13	3	1	2194	2195	Frame grabber is working again.
7/23	21	14	55	47.948057	-129.098564	2	-16	1	1	2194	2194	Stowing the scoop.
7/23	21	16	52	47.948059	-129.098553	2	-17	2	1	2194	2194	Closing the elevator biobox.
7/23	21	18	17	47.948059	-129.098557	2	-15	1	1	2194	2194	Closing the coffin biobox.
7/23	21	23	24	47.948090	-129.098539	118	-13	-1	1	2194	2195	Getting the Chinese fluid sampler.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	21	30	14	47.948056	-129.098571	116	-10	-2	1	2194	2195	Looking closely to see if the t-handle is in the jaws.
7/23	21	31	16	47.948070	-129.098560	118	-12	0	1	2194	2195	Slowly picking up the fluid sampler.
7/23	21	31	29	47.948074	-129.098554	118	-11	0	1	2194	2195	Got it out of the box.
7/23	21	33	46	47.948111	-129.098525	178	-17	2	1	2194	2195	This fluid sampler is heavy.
7/23	21	36	49	47.948090	-129.098482	235	-21	5	18	2193	2211	Moving Jason over to a chimney at Vent Cap Mound.
7/23	21	39	15	47.948045	-129.098513	223	-20	6	2	2194	2196	Choosing the vent to sample.
7/23	21	41	39	47.948090	-129.098474	225	-17	1	1	2194	2196	The Chinese fluid sampler is being positioned at a vent. The front of the sampler caught on the mound and bent a little bit.
7/23	21	42	44	47.948061	-129.098502	225	-18	0	1	2194	2196	The problem is that the ROV is tilted because of the weight of the sampler.
7/23	21	43	41	47.948045	-129.098518	226	-19	1	3	2193	2195	Lifted the entire ROV to dislodge the stuck sampler nozzle.
7/23	21	43	51	47.948049	-129.098515	225	-21	1	2	2193	2196	Try again.
7/23	21	49	07	47.948064	-129.098472	205	-16	0	1	2195	2195	Jason in position and trying to place the tip of the sampler in the chimney.
7/23	21	50	40	47.948064	-129.098481	205	-15	0	1	2195	2195	Nozzle is in the chimney orifice.
7/23	21	51	43	47.948061	-129.098479	205	-16	0	1	2195	2195	Repositioning the sampler for a straighter shot into the chimney. It is in.
7/23	21	52	28	47.948061	-129.098475	205	-16	0	1	2195	2195	Preparing to sample.
7/23	21	54	02	47.948078	-129.098501	205	-16	0	1	2195	2195	SAMPLE: fluid J2-522-Chinesefluid-02 attempted to sample but the ram tilted the nozzle out of the hole.
7/23	21	54	33	47.948081	-129.098502	205	-16	0	1	2195	2195	Retracted ram and repositioning sampler nozzle.
7/23	21	57	35	47.948079	-129.098513	205	-16	0	1	2195	2195	Nozzle is back in the vent. The Schilling arm will be used to hold the sampler to keep it from swinging.
7/23	21	59	28	47.948070	-129.098503	205	-16	0	1	2195	2195	Both arms are in place.
7/23	22	00	04	47.948072	-129.098498	205	-17	0	1	2195	2195	SAMPLE: fluid J2-577-Chinesefluid-02 Started sample.
7/23	22	02	17	47.948065	-129.098491	205	-17	0	1	2195	2195	It is unclear whether the nozzle is still in the chimney. It probably is based on the cameras but the sampler did move a bit when the ram was pushed to start the sample.
7/23	22	06	07	47.948078	-129.098498	205	-16	0	1	2195	2196	Ending sample. Releasing ram.
7/23	22	08	59	47.948071	-129.098490	205	-17	0	1	2195	2195	Taking sampler out of the chimney.
7/23	22	10	59	47.948094	-129.098479	189	-21	-2	2	2194	2196	Headed to the elevator to stow the sampler.
7/23	22	15	22	47.948093	-129.098557	93	-16	-1	1	2194	2195	Putting the Chinese fluid sampler back into the milk crate holder on the elevator.
7/23	22	21	49	47.948094	-129.098584	93	-10	-2	1	2194	2195	Sampler is stowed.
7/23	22	24	01	47.948073	-129.098499	221	-16	0	1	2194	2196	Heading back to the same chimney to get a gastight sample and temperature reading.
7/23	22	26	17	47.948079	-129.098501	221	-18	-1	2	2194	2196	Picking up temperature probe.
7/23	22	28	23	47.948053	-129.098518	221	-18	-2	2	2194	2196	Temperature probe is in the chimney.
7/23	22	30	19	47.948058	-129.098504	224	-20	-1	2	2194	2196	TEMPS: Jason temperature is 259.3 degrees C.
7/23	22	30	36	47.948058	-129.098503	221	-18	-2	1	2194	2196	Next up is a gastight sample.
7/23	22	36	04	47.948059	-129.098506	221	-18	-3	1	2194	2196	Basket management time. Moving around the various digging devices to improve access to gastights.
7/23	22	38	25	47.948051	-129.098497	221	-18	-3	1	2194	2196	Picking up gastight red number 9.
7/23	22	40	14	47.948065	-129.098493	221	-18	-3	1	2194	2196	Placing the nozzle into the chimney.
7/23	22	41	09	47.948070	-129.098493	221	-18	-3	1	2194	2196	SAMPLE: gas J2-577-GTB-03 Starting sample.
7/23	22	41	47	47.948070	-129.098494	221	-18	-3	1	2194	2196	Done with the sample.
7/23	22	43	40	47.948065	-129.098501	221	-17	-3	1	2194	2196	Gastight is stowed.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/23	22	47	04	47.948072	-129.098504	221	-18	-3	1	2194	2196	Now the plan is to head south to S&M and collect a chimney sample. First we will open the other elevator biobox and dump the digging tools.
7/23	22	54	42	47.948073	-129.098496	221	-18	1	1	2194	2196	SAMPLE: geo J2-577-Sulfide-04. Grabbing a little piece of sulfide from Vent cap. Very small piece.
7/23	22	56	55	47.948077	-129.098505	221	-17	1	2	2194	2196	Holding the sulfide sample to take to the elevator.
7/23	23	00	49	47.948094	-129.098559	253	-15	-1	1	2195	2196	Opening black painted biobox on the elevator to put in the sample.
7/23	23	05	10	47.948063	-129.098568	253	-15	-1	1	2195	2196	The sample J2-577-Sulfide-04 was dropped into the back half of the black elevator biobox.
7/23	23	10	32	47.948122	-129.098518	283	-16	-3	2	2194	2196	Trying to maneuver into position to open biobox B on the elevator.
7/23	23	15	24	47.948080	-129.098535	280	-15	1	1	2195	2196	Biobox B is open.
7/23	23	16	35	47.948096	-129.098506	199	-17	-1	2	2193	2196	Now headed to S&M vent to collect some samples.
7/23	23	18	27	47.948003	-129.098571	150	-17	-1	10	2185	2195	Looking up high for a chimney to collect.
7/23	23	21	05	47.947959	-129.098496	260	-16	-1	26	2182	2208	Chimneys on the east side of S&M.
7/23	23	21	44	47.947955	-129.098504	259	-19	-1	26	2181	2208	Chimneys are at about 26 m of altitude.
7/23	23	26	58	47.947956	-129.098486	257	-22	-2	27	2181	2208	Deciding what to sample.
7/23	23	29	29	47.947959	-129.098494	257	-23	1	26	2181	2208	Grabbing an inactive less friable sample next to the active chimney.
7/23	23	32	19	47.947946	-129.098496	258	-23	2	26	2181	2208	Shovel fell off of the basket.
7/23	23	33	54	47.947944	-129.098488	256	-21	-2	27	2181	2208	Stowing some of the other digging tools.
7/23	23	36	38	47.947950	-129.098480	256	-23	-2	27	2181	2208	SAMPLE: geo J2-577-Sulfide-05. Got a piece from S&M. Location: 47 56.875 129 5.907 Z=2181m.
7/23	23	39	17	47.947946	-129.098485	256	-23	-2	27	2181	2208	Headed to the elevator to stow the sample.
7/23	23	50	09	47.948078	-129.098568	282	-12	1	1	2195	2196	At elevator and deciding where to put sample.
7/23	23	53	52	47.948087	-129.098455	281	-11	1	1	2195	2196	Sample J-577-Sulfide-05 placed in the black elevator biobox where sample Sulfide-04 was placed.
7/23	23	55	14	47.948123	-129.098571	246	-14	-1	2	2195	2196	Shovel with green netting was dropped onto the seafloor. Picking it back up.
7/24	0	02	28	47.948025	-129.098483	180	-17	-1	8	2188	2196	Going back to S&M to collect the active chimney.
7/24	0	05	33	47.947954	-129.098486	272	-18	0	27	2181	2207	Now planning to push the active chimney into the starboard swing arm biobox.
7/24	0	05	58	47.947953	-129.098491	272	-18	3	27	2181	2207	Back at S&M and the swing arm is out.
7/24	0	07	19	47.947948	-129.098506	272	-16	4	26	2181	2207	Opening the swing arm biobox.
7/24	0	09	21	47.947940	-129.098508	272	-17	4	26	2181	2207	Removing the biobox divider.
7/24	0	11	40	47.947950	-129.098480	271	-22	3	24	2182	2206	Stowing the divider.
7/24	0	14	34	47.947942	-129.098519	272	-19	0	26	2181	2207	Moving into position to try the push and catch sample technique for the active chimney.
7/24	0	17	26	47.947935	-129.098499	273	-19	0	26	2181	2208	ROV is in position.
7/24	0	20	07	47.947945	-129.098488	273	-20	0	26	2181	2208	Putting the shovel with green netting in front of the biobox as a barricade.
7/24	0	20	15	47.947946	-129.098488	273	-20	2	26	2181	2207	Ready to push.
7/24	0	20	29	47.947948	-129.098489	273	-20	3	26	2181	2207	HIGHLIGHTS: KiPro hard drive start
7/24	0	23	15	47.947971	-129.098502	273	-21	4	26	2181	2207	SAMPLE: geo J2-577-Sulfide-06 Attempt to push.
7/24	0	23	30	47.947972	-129.098503	273	-20	4	26	2181	2207	Only a little made it into the box.
7/24	0	23	50	47.947972	-129.098502	273	-20	4	26	2181	2207	Going for another piece.
7/24	0	30	13	47.947955	-129.098480	273	-20	0	26	2181	2208	Moving Jason a bit for better access to the chimney.
7/24	0	32	09	47.947952	-129.098497	273	-20	-1	26	2181	2208	Okay. Going to try to grab another piece of the chimney.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	0	35	47	47.947935	-129.098512	272	-20	-1	26	2181	2208	SC-A DVD recorder is not working.
7/24	0	36	35	47.947935	-129.098511	272	-20	-1	26	2181	2208	Very difficult to pick up anything.
7/24	0	38	03	47.947936	-129.098509	272	-20	-1	26	2181	2208	DVD recorder is working again.
7/24	0	38	55	47.947936	-129.098508	272	-20	-1	26	2181	2208	HIGHLIGHTS: KiPro hard drive stop
7/24	0	39	42	47.947936	-129.098508	272	-20	-1	26	2181	2208	Try again with the green net shovel.
7/24	0	47	26	47.947943	-129.098512	272	-20	0	27	2181	2208	The net burned. It is a goner.
7/24	0	49	14	47.947944	-129.098513	272	-19	-2	27	2181	2208	Try again with the smaller triangular scoop. The mesh on this one is metal.
7/24	0	55	59	47.947954	-129.098521	289	-22	-1	26	2181	2207	Still trying to scoop a couple pieces of sulfide with the metal triangular scoop.
7/24	0	57	42	47.947940	-129.098508	289	-22	0	26	2181	2207	Going to try and shovel some pieces into the scoop with the left arm.
7/24	0	57	49	47.947940	-129.098508	289	-23	2	26	2181	2207	Doesn't seem like it's going to happen.
7/24	0	58	00	47.947940	-129.098508	290	-21	1	26	2181	2207	We'll stop collecting this particular chimney.
7/24	0	58	38	47.947938	-129.098505	289	-22	1	26	2181	2207	Actually - got a small piece in the hand - putting it in the scoop.
7/24	1	02	03	47.947950	-129.098530	291	-22	5	26	2182	2207	Putting small piece in starboard biobox. J2-577-Sulfide-06 cont.
7/24	1	02	44	47.947943	-129.098524	289	-22	3	26	2181	2207	Tried to put a second piece in but it fell before getting into the box.
7/24	1	03	51	47.947937	-129.098517	289	-22	3	26	2181	2207	Going to move on to a new spot to collect sulfides.
7/24	1	06	24	47.947944	-129.098510	290	-18	2	25	2181	2207	Retracting the starboard biobox.
7/24	1	07	27	47.947951	-129.098505	235	-19	1	29	2179	2209	Looking around the area for other sulfides to collect.
7/24	1	07	49	47.947961	-129.098544	181	-19	2	16	2179	2196	We could collect an inactive chimney if we see any that looks good.
7/24	1	08	32	47.947926	-129.098591	103	-19	2	15	2180	2195	Coming around to the right and looking at flanges.
7/24	1	10	57	47.947920	-129.098536	15	-21	1	17	2179	2196	We're on top of S&M.
7/24	1	11	11	47.947920	-129.098535	15	-21	1	17	2179	2196	Active chimneys will go into the starboard biobox.
7/24	1	11	20	47.947920	-129.098535	15	-21	2	17	2179	2196	Inactive chimneys will go into milk crates.
7/24	1	11	27	47.947919	-129.098535	15	-21	1	17	2179	2196	Starboard biobox is out.
7/24	1	13	03	47.947919	-129.098539	15	-21	-1	17	2179	2196	Putting the triangular scoop back into the toolbox.
7/24	1	14	02	47.947923	-129.098552	14	-22	0	17	2179	2196	Opening the starboard biobox lid.
7/24	1	15	41	47.947933	-129.098586	14	-22	0	17	2179	2196	Some diffuse flow in this area.
7/24	1	16	47	47.947937	-129.098599	15	-22	0	17	2179	2196	Trying to get some pieces of the active white chimney.
7/24	1	16	56	47.947937	-129.098599	15	-22	0	17	2179	2196	It's very crumbly.
7/24	1	17	09	47.947936	-129.098600	15	-22	1	17	2179	2196	Have a piece - going to put it in the starboard biobox.
7/24	1	18	33	47.947930	-129.098588	15	-22	0	17	2179	2196	Piece is in the box.
7/24	1	18	37	47.947929	-129.098586	15	-21	0	17	2179	2196	Going back for another one.
7/24	1	19	07	47.947924	-129.098577	15	-22	0	17	2179	2196	Discussing the possibility of doing another run with the fluid sampler.
7/24	1	19	22	47.947922	-129.098572	15	-21	0	17	2179	2196	We'd have to release the elevator and wait for it to come up.
7/24	1	19	34	47.947920	-129.098567	15	-22	0	17	2179	2196	Then they need an hour to turn the fluid sampler around.
7/24	1	19	55	47.947916	-129.098560	15	-22	0	17	2179	2196	Then they'd have to put the elevator down again (~1hr).
7/24	1	20	03	47.947915	-129.098558	15	-22	0	17	2179	2196	Then Jason would have to find the elevator and move it to a chimney.
7/24	1	20	32	47.947911	-129.098550	14	-21	-1	17	2179	2196	It would be tight because of the timing of this dive - we only have ~4.5 hrs left.
7/24	1	21	19	47.947903	-129.098542	15	-20	-1	17	2179	2196	Jason trying to shake a piece of sulfide off the chimney.
7/24	1	23	45	47.947904	-129.098540	331	-22	1	27	2179	2205	Looking around at chimneys to sample.
7/24	1	24	17	47.947905	-129.098544	332	-23	0	27	2179	2205	This piece to the left of the center looks like an active chimney.
7/24	1	24	20	47.947905	-129.098545	332	-23	0	27	2179	2205	Going to try to grab it.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	1	25	21	47.947908	-129.098547	332	-23	0	27	2179	2205	Positioning hand around chimney -- seems very soft.
7/24	1	25	23	47.947908	-129.098547	331	-23	0	27	2179	2205	Could be mostly worms.
7/24	1	25	37	47.947909	-129.098547	332	-23	0	27	2179	2205	All seems to be worms.
7/24	1	26	20	47.947912	-129.098544	332	-23	1	27	2179	2205	Going to put the worms back where they came from.
7/24	1	29	13	47.947877	-129.098506	326	-21	1	25	2179	2204	Stowing the boxes and discussing where to go next.
7/24	1	29	45	47.947877	-129.098512	327	-20	1	25	2179	2204	We may head to Bastille or Terra.
7/24	1	32	33	47.947881	-129.098465	286	-20	1	26	2179	2205	Still thinking about where to go.
7/24	1	33	12	47.947889	-129.098404	269	-16	1	27	2179	2206	Basket retracted.
7/24	1	33	56	47.947899	-129.098352	268	-15	1	26	2181	2206	Correction - Terra should be Tara.
7/24	1	35	19	47.947861	-129.098448	269	-17	1	23	2182	2205	Moving to southern part of Main Endeavour Field.
7/24	1	37	04	47.947849	-129.098612	269	-16	1	6	2190	2196	Ship is almost done moving.
7/24	1	37	30	47.947858	-129.098685	269	-18	1	6	2190	2196	We'll have to look around because there aren't many nav labels here.
7/24	1	41	44	47.947850	-129.098841	268	-16	1	5	2190	2195	Jason watch change -- explaining what the goals are to the new watch.
7/24	1	41	52	47.947847	-129.098840	268	-16	1	5	2190	2195	Still moving to the right area.
7/24	1	43	13	47.947807	-129.098836	267	-16	0	2	2192	2194	Seem to have arrived in the southern half.
7/24	1	43	40	47.947806	-129.098836	266	-16	0	4	2190	2194	We're looking at a RAS anchor where we had a time series.
7/24	1	44	07	47.947807	-129.098833	267	-15	1	7	2187	2194	RAS anchor at virtual van #3410.
7/24	1	44	40	47.947816	-129.098851	269	-16	0	10	2184	2194	We are at Needle.
7/24	1	45	07	47.947821	-129.098878	266	-17	1	12	2182	2194	CORRECTION - we were always in the southern half of the MEF - just moving to the southwest of S&M.
7/24	1	45	41	47.947834	-129.098903	263	-16	1	7	2181	2188	There are some flanges that we could break off here.
7/24	1	47	14	47.947838	-129.098934	263	-15	0	10	2177	2188	Traveling up the column.
7/24	1	47	40	47.947845	-129.098944	230	-17	-1	18	2176	2193	There's a marker on the top of this pillar - N.
7/24	1	47	49	47.947855	-129.098948	235	-16	-1	17	2177	2193	We're at Needle. Needle is dead.
7/24	1	47	56	47.947861	-129.098962	223	-14	1	15	2177	2192	There's no venting on top.
7/24	1	48	16	47.947868	-129.098993	200	-16	-1	13	2180	2193	There's some shimmering water around here.
7/24	1	48	53	47.947864	-129.099005	194	-17	0	9	2184	2193	There's some flanges here next to some venting.
7/24	1	49	50	47.947875	-129.099013	188	-17	0	8	2185	2194	There's lots of snails on these formations.
7/24	1	50	08	47.947883	-129.099036	198	-16	0	8	2185	2193	There's a small piece of chimney growing on a flange here.
7/24	1	51	06	47.947877	-129.099057	193	-14	1	6	2186	2192	Actually it looks like there's 2 spires.
7/24	1	51	16	47.947878	-129.099057	193	-16	0	6	2186	2192	There's some diffuse venting next to the flange.
7/24	1	51	30	47.947880	-129.099057	192	-16	0	6	2186	2192	The spires have venting from their tops.
7/24	1	51	46	47.947881	-129.099056	192	-16	0	6	2186	2192	Frame_Grab:
7/24	1	52	28	47.947882	-129.099054	192	-16	0	6	2186	2192	Going to try knocking the chimneys with one arm into a scoop being held in the other arm.
7/24	1	52	57	47.947883	-129.099051	193	-20	0	7	2186	2193	There are some clumps of worms next to these chimneys.
7/24	1	53	07	47.947884	-129.099051	192	-20	0	7	2186	2193	There's black precipitates on the spires.
7/24	1	54	54	47.947886	-129.099051	193	-20	-2	7	2186	2193	Going to get the metal scoop.
7/24	1	55	55	47.947883	-129.099047	192	-20	-2	7	2186	2193	Picked up triangular metal scoop.
7/24	1	56	44	47.947877	-129.099037	192	-20	-1	7	2186	2193	Opened starboard biobox.
7/24	1	57	09	47.947874	-129.099032	192	-20	-1	7	2186	2193	Positioning metal scoop next to chimney spires.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	1	57	48	47.947871	-129.099022	180	-20	2	8	2185	2193	Repositioning Jason for a better approach.
7/24	1	58	34	47.947867	-129.099014	179	-21	3	9	2185	2194	Using left arm to grab chimneys.
7/24	1	59	57	47.947868	-129.099028	179	-20	2	7	2185	2193	Repositioning Jason again.
7/24	2	01	26	47.947872	-129.099044	177	-21	3	7	2185	2193	Approaching sulfides.
7/24	2	04	15	47.947890	-129.099063	177	-19	1	6	2186	2193	Getting close and moving down for a better approach.
7/24	2	05	35	47.947893	-129.099063	176	-18	1	8	2185	2193	Moved back up and to the right a little.
7/24	2	05	58	47.947891	-129.099062	177	-19	1	8	2185	2193	Reaching out for the spires now.
7/24	2	07	02	47.947885	-129.099057	177	-19	1	7	2185	2193	Going to grab/push them in the left hand.
7/24	2	07	12	47.947886	-129.099057	177	-19	1	8	2185	2193	Moving scoop into position to catch them.
7/24	2	07	56	47.947887	-129.099054	177	-20	1	8	2185	2193	Pushed them but they're crumbly.
7/24	2	08	08	47.947886	-129.099053	177	-18	2	8	2185	2193	Got a little bit into the scoop -- putting it in the biobox.
7/24	2	08	44	47.947888	-129.099053	177	-19	2	8	2185	2193	This is sample SULFIDE-05 (actually J2-577-Sulfide-07) There was a sampling mix-up earlier. Location: 47 56.870 129 5.948.
7/24	2	09	45	47.947891	-129.099056	177	-20	1	8	2185	2193	Grabbing the chimney spire with the left arm again.
7/24	2	10	01	47.947891	-129.099056	177	-18	3	8	2185	2193	Pushed it right into the scoop.
7/24	2	10	11	47.947890	-129.099055	177	-19	3	8	2185	2193	Putting the spire into the starboard swing arm box.
7/24	2	10	36	47.947889	-129.099055	177	-19	2	8	2185	2193	Lost the pieces out of the scoop!
7/24	2	11	14	47.947886	-129.099053	176	-20	1	8	2185	2193	These sulfides are too crumbly to collect.
7/24	2	12	37	47.947880	-129.099048	177	-19	1	8	2185	2193	Location of SULFIDE-07 is 47N 56.870' and 129W 5.948'
7/24	2	12	56	47.947880	-129.099047	177	-19	2	7	2185	2193	Going to move to a different area perhaps.
7/24	2	13	27	47.947878	-129.099049	177	-19	2	7	2185	2192	Moving in for another attempt at scooping.
7/24	2	13	39	47.947877	-129.099050	176	-19	3	8	2185	2193	Got some sulfides into the scoop -- putting them into the starboard box.
7/24	2	14	24	47.947875	-129.099051	176	-18	5	8	2185	2193	Dropped sulfides into the box - some fell out but some pieces are in.
7/24	2	16	31	47.947880	-129.099027	176	-20	1	8	2185	2193	Going to shovel some pieces of chimney into scoop.
7/24	2	16	53	47.947880	-129.099024	177	-18	2	7	2185	2192	Have a large piece in the scoop but it's hooked on the ledge.
7/24	2	18	46	47.947866	-129.099048	175	-19	2	6	2186	2192	Trying to move down from above for spire collection.
7/24	2	19	24	47.947863	-129.099050	179	-14	3	5	2186	2192	Hot fluid billowing out from below flange on the left.
7/24	2	20	04	47.947862	-129.099044	178	-14	3	5	2186	2192	Shifting pieces into scoop with left hand.
7/24	2	21	02	47.947867	-129.099035	181	-13	4	5	2186	2192	Trying to level scoop out and not let the pieces fall out.
7/24	2	21	14	47.947867	-129.099035	177	-14	4	6	2186	2192	Pieces dropped out of scoop.
7/24	2	21	20	47.947868	-129.099035	177	-13	4	5	2186	2192	We're going to give up on this area.
7/24	2	22	39	47.947875	-129.099047	175	-17	-1	6	2186	2192	Discussing where to move to next.
7/24	2	22	44	47.947881	-129.099046	175	-17	0	7	2186	2193	Putting swing arm box away.
7/24	2	23	37	47.947887	-129.099103	201	-17	0	9	2184	2193	The goal is to try and collect an active chimney but everything is very friable in this area.
7/24	2	25	53	47.947913	-129.099401	248	-18	0	5	2192	2197	We're heading to the west now to look for chimneys that we can break off in one piece.
7/24	2	26	47	47.947888	-129.099461	218	-18	-1	9	2189	2198	There are some pillars over here that are very tall.
7/24	2	27	07	47.947852	-129.099470	212	-17	-1	6	2187	2193	We're about 10m off the seafloor and they are still going up.
7/24	2	27	33	47.947841	-129.099472	199	-17	0	8	2185	2193	This pillar is flat on top - a large flange.
7/24	2	28	01	47.947844	-129.099464	187	-17	0	9	2187	2196	We're at Peanut.
7/24	2	28	13	47.947845	-129.099467	186	-17	0	9	2187	2196	Peanut doesn't seem to be active anymore either.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	2	28	23	47.947843	-129.099477	181	-17	0	9	2187	2196	It's grown a lot since it was first discovered.
7/24	2	29	06	47.947869	-129.099482	184	-17	-1	12	2184	2197	Nothing looks good to sample here.
7/24	2	29	11	47.947862	-129.099472	185	-17	0	13	2184	2197	We're going to move south a little.
7/24	2	30	45	47.947725	-129.099382	182	-16	0	2	2197	2200	There is lots of sediment here and some worm clumps on the ground.
7/24	2	30	53	47.947721	-129.099380	182	-16	0	3	2197	2200	Also some orange mat staining the rocks.
7/24	2	31	42	47.947673	-129.099463	219	-16	1	5	2196	2201	We've come upon a pillar.
7/24	2	31	53	47.947663	-129.099472	216	-17	0	6	2195	2201	This is Cannaport.
7/24	2	32	34	47.947674	-129.099485	180	-16	-1	8	2192	2200	Cannaport also does not seem active on top anymore.
7/24	2	34	38	47.947719	-129.099375	105	-16	0	7	2193	2200	Discussing Jason and Medea engineering.
7/24	2	35	45	47.947649	-129.099354	105	-17	0	6	2193	2199	We're at Puffer - just passed marker P.
7/24	2	36	06	47.947657	-129.099316	112	-17	0	6	2192	2198	There are some small spires on top next to the marker that look like they're venting.
7/24	2	36	56	47.947641	-129.099270	272	-17	0	4	2192	2196	We're only 4m off the seafloor here.
7/24	2	37	40	47.947639	-129.099271	275	-13	-1	2	2193	2195	There is a big black onion-shaped dome on this pillar.
7/24	2	37	45	47.947639	-129.099270	274	-11	-2	2	2193	2195	It's venting off the top.
7/24	2	38	16	47.947640	-129.099270	275	-13	-2	2	2193	2195	DOP: 47N 56.857' 129W 5.961'
7/24	2	39	48	47.947643	-129.099269	275	-13	-2	2	2193	2195	Getting the scoop out to try and sample.
7/24	2	40	10	47.947643	-129.099268	275	-14	-2	2	2193	2195	The starboard box is out.
7/24	2	40	23	47.947643	-129.099267	275	-14	-2	2	2193	2195	Opened the lid of the starboard box.
7/24	2	40	44	47.947643	-129.099266	275	-14	-2	2	2193	2195	Going to position the scoop next to the black cone on top of Puffer.
7/24	2	43	40	47.947646	-129.099268	274	-15	0	2	2193	2195	Putting left arm down to push cone.
7/24	2	43	51	47.947648	-129.099268	274	-15	0	2	2193	2195	Cone fell onto the metal scoop.
7/24	2	44	18	47.947651	-129.099269	274	-15	0	2	2193	2195	Cone fell out of the scoop!!
7/24	2	45	59	47.947654	-129.099273	274	-15	1	2	2193	2195	Trying to grab the bit of the chimney that was below the cone.
7/24	2	46	39	47.947651	-129.099277	274	-15	-2	2	2193	2195	Putting whatever they can collect into the scoop.
7/24	2	47	17	47.947650	-129.099280	272	-13	-2	3	2193	2196	Trying to scrape the sulfide mound with the scoop.
7/24	2	47	35	47.947648	-129.099281	273	-13	-1	3	2193	2196	Lots of sulfide bits in the scoop - going to try and tip into the box.
7/24	2	49	23	47.947649	-129.099274	279	-13	-3	1	2193	2195	Have the right arm gripping a little spire now.
7/24	2	49	56	47.947650	-129.099273	279	-13	-3	1	2193	2195	Scraping away some sulfide to get at the center chimney lower down.
7/24	2	50	09	47.947650	-129.099273	279	-13	-3	2	2193	2195	Now gripping closer to the base.
7/24	2	50	32	47.947649	-129.099274	279	-13	-3	1	2193	2195	Holding this piece of chimney and moving it to the biobox.
7/24	2	51	00	47.947646	-129.099277	279	-13	-3	1	2193	2195	Put the sulfide into the biobox
7/24	2	51	24	47.947643	-129.099278	279	-13	-3	1	2193	2195	SAMPLE: geo Sample is J2-577-Sulfide-08. Chimney piece from Puffer.
7/24	2	52	25	47.947640	-129.099277	279	-13	-3	1	2193	2195	We're going to take the temperature here.
7/24	2	53	26	47.947641	-129.099270	279	-13	-2	1	2193	2195	TEMPS: Jason temperature The temp is 266.5C.
7/24	2	54	03	47.947640	-129.099266	279	-13	-2	1	2193	2195	The temp is about 277.4C.
7/24	2	54	32	47.947640	-129.099263	279	-13	-2	1	2193	2195	The whole southern half of the Main Endeavour Field has been losing active venting since 1999.
7/24	2	54	40	47.947640	-129.099263	279	-13	-2	1	2193	2195	There was an earthquake in 1999.
7/24	2	54	47	47.947640	-129.099263	279	-13	-2	1	2193	2195	TEMPS: Jason temperature The temp was 278C.
7/24	2	55	11	47.947642	-129.099262	279	-13	-2	1	2193	2195	There was a series of earthquakes in 1999.
7/24	2	55	21	47.947643	-129.099262	279	-13	-2	1	2193	2195	There may also have been a dike that didn't reach the seafloor.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	2	55	28	47.947644	-129.099263	279	-13	-2	1	2193	2195	Everything has cooled off in this area since then.
7/24	2	55	38	47.947645	-129.099263	279	-13	-2	1	2193	2195	Stowing the Jason temperature wand.
7/24	2	56	15	47.947648	-129.099264	279	-13	-2	1	2193	2195	We may head to MilliQ vent next.
7/24	2	57	41	47.947644	-129.099253	278	-16	0	4	2192	2196	Heading to MilliQ now.
7/24	2	58	36	47.947657	-129.099245	273	-16	1	5	2192	2197	We'll stop and look at Sully on the way.
7/24	2	59	09	47.947683	-129.099352	263	-15	0	3	2194	2197	Sully is about the same height as Puffer.
7/24	3	01	07	47.947703	-129.099216	79	-16	-1	4	2193	2197	There's lots of snails and worms in this area.
7/24	3	03	32	47.947682	-129.099048	134	-15	1	10	2186	2195	Looking around and trying to determine where we are.
7/24	3	04	28	47.947621	-129.099094	157	-16	0	6	2188	2195	We're at Sully.
7/24	3	04	31	47.947617	-129.099093	157	-16	0	6	2188	2195	There's a marker here.
7/24	3	04	48	47.947601	-129.099095	152	-16	-1	4	2190	2193	There's no activity here.
7/24	3	05	35	47.947583	-129.099096	82	-15	0	4	2190	2194	There's something on top of Sully trapped in the tubeworms.
7/24	3	05	55	47.947581	-129.099099	83	-16	1	4	2190	2194	Looks like a temp HOBO.
7/24	3	06	37	47.947587	-129.099095	83	-16	-1	5	2189	2194	There's a little bit of venting coming off the tip.
7/24	3	07	17	47.947584	-129.099095	83	-18	0	4	2190	2194	It's very crusted over.
7/24	3	07	25	47.947584	-129.099097	83	-10	-2	3	2190	2194	We may pick it up and bring it back.
7/24	3	07	58	47.947581	-129.099096	83	-14	2	4	2190	2194	RECOVER: HOBO temp probe Recovering the old HOBO.
7/24	3	09	15	47.947573	-129.099090	83	-14	2	4	2190	2194	Using the hand to scrub the filaments off the handle of the HOBO.
7/24	3	11	03	47.947584	-129.099092	83	-14	1	4	2190	2194	CORRECTION - NOT going to recover the HOBO.
7/24	3	11	15	47.947586	-129.099094	83	-13	-1	4	2190	2194	The label says D SCORE.
7/24	3	11	41	47.947591	-129.099098	83	-17	0	4	2190	2194	SCORE was an exhibition to show off new instruments.
7/24	3	13	13	47.947599	-129.099108	80	-20	1	4	2190	2194	D SCORE is a label for where the metal is scored and the HOBO will break if you grab it there.
7/24	3	13	19	47.947600	-129.099110	81	-19	-1	5	2189	2194	This HOBO was there in 2008.
7/24	3	13	26	47.947600	-129.099107	80	-18	-1	4	2189	2194	Going to try and collect the chimney first.
7/24	3	13	34	47.947600	-129.099110	79	-8	-1	3	2190	2194	Then may collect the HOBO.
7/24	3	14	10	47.947602	-129.099113	80	-12	0	4	2190	2194	We'll release the elevator in ~2hrs.
7/24	3	14	34	47.947602	-129.099114	80	-13	-1	4	2190	2194	Opening the starboard biobox again.
7/24	3	15	34	47.947602	-129.099116	79	-13	0	4	2190	2194	There are 3 little chimneys here we'll try to collect.
7/24	3	15	46	47.947602	-129.099117	80	-13	0	4	2190	2194	We'll store them in the coffin so we can tell them apart from the previous sample.
7/24	3	17	46	47.947591	-129.099107	79	-13	-2	4	2190	2194	Going to break the small chimney at the tip of the HOBO.
7/24	3	18	29	47.947588	-129.099102	79	-13	-2	4	2190	2194	This chimney is much harder.
7/24	3	18	34	47.947588	-129.099102	79	-13	-2	4	2190	2194	It broke off nicely. J2-577-Sulfide-09 . Location: 47 56.853 129 5.947
7/24	3	18	42	47.947587	-129.099102	78	-12	-4	4	2190	2194	There's still smoke coming from this site.
7/24	3	18	51	47.947587	-129.099101	78	-13	-3	4	2190	2194	Put it in the coffin.
7/24	3	19	01	47.947587	-129.099101	78	-13	-3	4	2190	2194	Now going to grab the HOBO.
7/24	3	19	26	47.947588	-129.099102	79	-11	-4	4	2190	2194	RECOVER: old HOBO temp probe.
7/24	3	19	42	47.947588	-129.099103	78	-13	-3	4	2190	2194	Putting HOBO in basket.
7/24	3	20	21	47.947591	-129.099107	79	-12	-2	4	2190	2194	Going to take the temperature from the chimney we just collected.
7/24	3	20	40	47.947592	-129.099108	79	-12	-2	4	2190	2194	SAMPLE: geo These 3 chimneys will be Sample SULFIDE-09.
7/24	3	21	50	47.947596	-129.099108	79	-13	-2	4	2190	2194	SULFIDE-09 is at Sully.
7/24	3	22	02	47.947596	-129.099108	79	-13	-2	4	2190	2194	Jason temp probe is 234 and rising slowly.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	3	22	46	47.947594	-129.099106	79	-13	-2	4	2190	2194	TEMPS: Jason temperature Temp is 238.6C.
7/24	3	23	07	47.947592	-129.099106	79	-13	-1	4	2190	2194	Putting Jason temp probe away.
7/24	3	24	12	47.947568	-129.099052	313	-21	0	7	2189	2195	Moving around to the right to try and collect the other chimneys.
7/24	3	25	37	47.947577	-129.099065	270	-15	-1	4	2190	2193	Going to grab the second chimney now.
7/24	3	26	19	47.947575	-129.099063	270	-15	-1	4	2190	2193	This one is venting too.
7/24	3	26	24	47.947575	-129.099063	270	-15	-1	4	2190	2193	It's mostly white.
7/24	3	26	29	47.947575	-129.099063	270	-15	-1	4	2190	2193	Inside has some black sulfides.
7/24	3	26	37	47.947576	-129.099062	270	-14	-1	4	2190	2194	Actually the white are all worms.
7/24	3	26	53	47.947576	-129.099061	269	-15	-1	4	2190	2193	This second piece is going in the coffin too.
7/24	3	27	18	47.947577	-129.099059	270	-15	-2	4	2190	2193	Going for the third piece of chimney now.
7/24	3	28	18	47.947577	-129.099057	270	-15	-2	4	2190	2193	This last piece is crumbly.
7/24	3	28	22	47.947577	-129.099057	270	-15	-2	4	2190	2193	It has mostly broken.
7/24	3	28	26	47.947577	-129.099057	270	-15	-2	4	2190	2193	We're going to leave it.
7/24	3	29	24	47.947579	-129.099064	270	-15	-2	4	2190	2193	SAMPLE: geo CORRECTION: SULFIDE-09 is actually TWO chimney pieces.
7/24	3	29	30	47.947579	-129.099065	270	-15	-2	4	2190	2193	Now we'll take the temperature.
7/24	3	30	24	47.947583	-129.099078	270	-15	-2	4	2190	2193	Jason temperature probe out.
7/24	3	31	05	47.947585	-129.099085	270	-15	-2	4	2190	2193	Sticking temp probe into vent.
7/24	3	31	58	47.947584	-129.099086	270	-15	-2	4	2190	2193	Reinserting the probe at a better angle.
7/24	3	32	41	47.947582	-129.099082	270	-15	-2	4	2190	2194	Temp is 203 and rising.
7/24	3	33	25	47.947581	-129.099076	270	-15	-2	4	2190	2193	TEMPS: Jason temperature Temp is 206.9C.
7/24	3	33	43	47.947580	-129.099075	270	-15	-2	4	2190	2193	Putting Jason temp probe back in basket.
7/24	3	34	41	47.947580	-129.099071	270	-15	-1	4	2190	2193	Some blue ciliates in this area.
7/24	3	34	46	47.947580	-129.099070	270	-14	-1	4	2190	2193	May try to sample them.
7/24	3	36	29	47.947506	-129.098979	170	-16	0	3	2192	2195	Ciliates apparently don't pick up in the syringe -- need to just pick up the rock they're on.
7/24	3	36	36	47.947491	-129.098978	170	-17	-1	3	2193	2195	Not going to get them - patch is very small.
7/24	3	36	54	47.947449	-129.098965	167	-18	0	4	2192	2196	Moving past some very old vent structures.
7/24	3	37	07	47.947416	-129.098956	170	-16	0	3	2193	2196	Continuing on to MilliQ vent now.
7/24	3	38	28	47.947351	-129.098946	170	-20	-2	5	2191	2196	Dropping some weights now.
7/24	3	39	00	47.947349	-129.098949	168	-19	-1	5	2191	2196	Looks like there's some old junk on the seafloor here.
7/24	3	39	28	47.947328	-129.098975	170	-15	-1	3	2193	2196	Some large hexagonal nuts here.
7/24	3	40	18	47.947311	-129.098960	172	-9	1	110	2195	2305	Also some large lava rocks.
7/24	3	40	25	47.947311	-129.098960	172	-10	0	149	2195	2344	The hexagonal nut is very lightweight.
7/24	3	40	52	47.947311	-129.098961	172	-9	1	166	2195	2361	Frame_Grab:
7/24	3	41	04	47.947314	-129.098958	172	-18	0	1	2194	2195	A big worm swimming by now.
7/24	3	41	09	47.947307	-129.098958	173	-18	0	2	2194	2195	May have lived on the nut.
7/24	3	41	45	47.947216	-129.098953	173	-15	-1	6	2190	2195	Moving on to MilliQ.
7/24	3	41	50	47.947211	-129.098952	173	-14	-1	6	2190	2195	We seem to have passed it.
7/24	3	41	54	47.947210	-129.098945	151	-15	-1	6	2190	2195	It's to the north of us now.
7/24	3	42	13	47.947235	-129.098920	50	-16	-2	7	2189	2196	Turning back around to MilliQ.
7/24	3	42	33	47.947270	-129.098901	55	-17	0	8	2188	2196	Here's a pillar.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	3	43	52	47.947287	-129.098842	56	-16	-2	15	2180	2195	This seems to be MilliQ.
7/24	3	44	36	47.947313	-129.098834	83	-15	0	14	2180	2195	Lots of lobed spires here.
7/24	3	47	30	47.947240	-129.098799	36	-16	-1	10	2184	2194	Going back down to the bottom now.
7/24	3	48	30	47.947282	-129.098842	40	-18	0	14	2181	2195	Going to try and grab the chimney in the middle of this column.
7/24	3	49	38	47.947298	-129.098826	69	-19	0	12	2183	2195	We'll try grabbing it at the base.
7/24	3	49	57	47.947298	-129.098825	66	-9	-5	9	2184	2193	The pillar to its left is covered in clumps of worms.
7/24	3	51	00	47.947298	-129.098826	68	-13	-5	10	2184	2194	Grabbing the chimney base now.
7/24	3	51	30	47.947298	-129.098827	68	-15	-5	10	2184	2194	It seems pretty solid and too wide.
7/24	3	51	40	47.947298	-129.098827	68	-15	-4	10	2184	2194	Going to grab closer to the orange part on top.
7/24	3	52	00	47.947298	-129.098828	68	-15	-5	10	2184	2194	Whole chimney has broken near the first grab point.
7/24	3	52	46	47.947296	-129.098829	68	-15	-4	10	2184	2194	Moving left arm over to help hold the chimney.
7/24	3	53	51	47.947280	-129.098828	69	-28	0	14	2182	2196	Have whole piece of chimney held in both hands.
7/24	3	53	57	47.947275	-129.098823	69	-28	0	15	2181	2196	Frame_Grab:
7/24	3	54	16	47.947269	-129.098856	66	-26	-1	16	2180	2196	SAMPLE: geo Chimney is J2-577-Sulfide-10 .
7/24	3	56	39	47.947419	-129.098607	53	-27	0	7	2187	2195	Now traveling back to the elevator to stow the chimney.
7/24	3	57	03	47.947423	-129.098611	53	-27	0	7	2187	2195	SULFIDE-08 is ~1m long and 40lbs.
7/24	3	57	27	47.947430	-129.098601	54	-28	0	7	2188	2195	SAMPLE: geo SULFIDE-08 has some miniature flanges on it.
7/24	3	59	57	47.947481	-129.098731	19	-27	-1	8	2187	2195	Still traveling to the elevator.
7/24	4	04	18	47.947808	-129.098653	20	-27	-1	8	2187	2195	Continuing to the elevator.
7/24	4	05	56	47.947988	-129.098639	18	-28	-1	7	2188	2195	Lots of floc in the water here - could be from S&M
7/24	4	06	51	47.948049	-129.098589	56	-27	-2	4	2191	2195	We've arrived at the elevator.
7/24	4	08	04	47.948065	-129.098582	64	-28	1	6	2190	2196	Circling around the elevator to the bioboxes.
7/24	4	09	30	47.948087	-129.098502	226	-27	0	5	2191	2196	There are still dividers in the bioboxes.
7/24	4	09	39	47.948086	-129.098497	226	-27	0	6	2191	2197	We'll put the chimney in the milk crate instead.
7/24	4	10	37	47.948081	-129.098515	191	-27	0	4	2193	2196	We'll put the chimney into the large black milk crate.
7/24	4	11	35	47.948081	-129.098506	187	-28	0	3	2193	2196	Stowing the chimney into the yellow milk crate.
7/24	4	11	44	47.948085	-129.098505	187	-9	-1	1	2195	2196	The top fell off and fell into the black crate.
7/24	4	12	12	47.948089	-129.098510	187	-10	-1	1	2195	2196	Trying to put it in the yellow box but it seems very heavy.
7/24	4	13	10	47.948090	-129.098519	189	-10	0	1	2195	2196	Going to try to tie it in with a bungee.
7/24	4	13	29	47.948090	-129.098520	189	-11	3	1	2195	2196	Pieces of the chimney are flaking off.
7/24	4	13	42	47.948088	-129.098520	188	-10	1	1	2195	2196	It's quite tall compared to the height of the milk crate.
7/24	4	16	28	47.948069	-129.098557	195	-18	-3	1	2194	2196	Not sure bungees are available.
7/24	4	16	40	47.948069	-129.098559	194	-17	-3	1	2194	2196	Trying to break it in half instead and take it up in two boxes.
7/24	4	16	49	47.948069	-129.098560	194	-17	-3	1	2194	2196	But it doesn't want to break.
7/24	4	17	22	47.948068	-129.098560	192	-16	-3	1	2194	2196	May instead try to lay it on its side on the elevator wedged between boxes.
7/24	4	17	53	47.948069	-129.098558	191	-16	-2	1	2194	2196	The chimney is more than 40lbs.
7/24	4	19	24	47.948076	-129.098548	188	-16	-3	1	2195	2196	Taking the chimney out of the yellow milk crate.
7/24	4	19	35	47.948078	-129.098547	189	-13	2	1	2195	2196	Trying to put it in the black box.
7/24	4	19	49	47.948080	-129.098548	186	-15	-2	1	2195	2196	It's too large for the black box too.
7/24	4	20	19	47.948084	-129.098550	186	-14	-2	1	2195	2196	It's leaning on its side towards the center of the elevator.
7/24	4	20	44	47.948088	-129.098552	186	-14	-2	1	2195	2196	Going to put the bungee over the chimney.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	4	20	57	47.948090	-129.098554	186	-14	-2	1	2195	2196	Tied the chimney piece in!
7/24	4	21	08	47.948092	-129.098554	186	-15	-2	1	2195	2196	Not sure it will make it up to the surface though.
7/24	4	21	47	47.948093	-129.098580	108	-20	-2	3	2193	2196	Moving around to get another look at the chimney.
7/24	4	22	16	47.948086	-129.098587	97	-20	0	1	2194	2195	Snapping some high-def photos of the other side of the chimney.
7/24	4	23	55	47.948102	-129.098522	203	-20	-3	3	2193	2196	We'll release the elevator in about 35mins.
7/24	4	24	03	47.948094	-129.098513	208	-19	1	4	2193	2196	We'll go have another look at S&M.
7/24	4	24	16	47.948093	-129.098510	210	-20	0	4	2193	2196	We can get some sulfides there.
7/24	4	24	25	47.948091	-129.098511	210	-20	0	4	2193	2196	We can also fire off the small syringes to get some samples.
7/24	4	24	45	47.948090	-129.098510	210	-20	0	4	2193	2196	It should take about 2 hrs for the elevator to come up.
7/24	4	25	59	47.948102	-129.098530	205	-20	-1	7	2189	2196	Discussing whether we want to release the elevator sooner or later.
7/24	4	27	54	47.948087	-129.098559	217	-22	-6	5	2191	2196	Grasping the handle on top of the elevator.
7/24	4	29	26	47.948079	-129.098560	216	-29	-11	6	2190	2196	Picking the elevator up.
7/24	4	29	36	47.948066	-129.098564	206	-33	-18	6	2190	2196	It's very heavy.
7/24	4	30	13	47.948081	-129.098559	203	-19	-2	6	2190	2196	Dropped the elevator.
7/24	4	30	28	47.948068	-129.098521	209	-18	-4	5	2191	2196	We'll release the elevator at 05:00.
7/24	4	30	52	47.948061	-129.098515	283	-20	-2	4	2192	2196	Going to close the lids of the bioboxes on the elevator.
7/24	4	34	02	47.948051	-129.098519	296	-10	-3	1	2195	2195	Closed both lids on the bioboxes.
7/24	4	34	16	47.948046	-129.098516	296	-12	-4	1	2194	2195	Now we'll head to the west side of S&M.
7/24	4	35	27	47.947999	-129.098512	268	-16	-1	19	2190	2209	Going towards S&M.
7/24	4	35	32	47.947996	-129.098512	263	-17	-3	21	2190	2210	Ran into some worms.
7/24	4	37	16	47.947976	-129.098557	118	-15	-1	7	2188	2195	Lots of floc and worms floating here.
7/24	4	37	45	47.947969	-129.098543	123	-15	0	11	2184	2195	We're on the west side of S&M.
7/24	4	38	12	47.947991	-129.098539	140	-15	1	10	2185	2195	There might be some venting from a chimney on the bottom here.
7/24	4	38	17	47.947992	-129.098536	138	-16	0	10	2185	2195	No - it's a flange.
7/24	4	39	03	47.947980	-129.098542	144	-16	0	14	2181	2195	Lots of worms on top of these flanges.
7/24	4	40	35	47.947964	-129.098473	234	-16	1	27	2182	2209	There's some venting coming out of the side of this pillar.
7/24	4	40	54	47.947962	-129.098472	234	-17	1	27	2181	2208	The fluid is brown-ish grey.
7/24	4	42	57	47.947954	-129.098580	109	-19	-1	15	2179	2195	NAV: Doppler Reset CORRECTION The Doppler was Reset at 03:00
7/24	4	43	28	47.947956	-129.098609	109	-20	-1	16	2180	2195	SAMPLE: geo J2-577-Sulfide-10 was collected at 47N 56.836' 129W 5.930'
7/24	4	45	11	47.948021	-129.098615	116	-18	0	9	2186	2195	Discussing when to release the elevator.
7/24	4	46	04	47.948070	-129.098600	84	-20	-1	4	2191	2195	It's heavy but don't know how much it weighs.
7/24	4	46	08	47.948073	-129.098590	84	-19	0	4	2192	2195	Jason couldn't pick it up.
7/24	4	46	32	47.948093	-129.098565	133	-19	-1	3	2192	2196	It will probably only come up at 20m/min.
7/24	4	47	24	47.948082	-129.098552	134	-17	-2	2	2193	2195	Going to release the elevator.
7/24	4	49	17	47.948072	-129.098538	186	-17	-4	2	2194	2196	Reaching in to grab the mooring release.
7/24	4	49	32	47.948080	-129.098542	188	-14	-3	2	2194	2196	Pulling the release line.
7/24	4	49	50	47.948117	-129.098553	194	-16	0	3	2193	2196	The elevator is on its way up.
7/24	4	52	27	47.947882	-129.098893	216	-16	0	12	2183	2195	Going back to Tara.
7/24	4	52	45	47.947892	-129.098932	218	-16	0	13	2182	2194	There are some snails on the rocks here.
7/24	4	52	49	47.947890	-129.098941	218	-17	0	12	2181	2193	Also some tubeworm clumps.
7/24	4	53	01	47.947883	-129.098951	223	-14	-1	14	2178	2193	This may be Needle actually.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-577 Dive Log
7/24	4	53	26	47.947883	-129.098936	220	-16	0	17	2176	2193	This is Needle.
7/24	4	55	21	47.947807	-129.099101	28	-14	1	10	2182	2193	Looking around for potential chimney samples.
7/24	4	55	33	47.947804	-129.099096	3	-17	0	11	2182	2193	There are some nice flange structures here.
7/24	4	55	47	47.947806	-129.099093	0	-16	0	9	2183	2192	There's a smoker on the side of this pillar.
7/24	4	55	56	47.947805	-129.099093	0	-16	-1	9	2183	2192	Also some shimmering flow lower down.
7/24	4	56	32	47.947813	-129.099106	309	-16	3	10	2181	2191	Going to try to collect a little chimney piece.
7/24	4	57	44	47.947861	-129.099095	172	-16	0	10	2182	2192	There's lots of worms on top of this pillar.
7/24	4	59	16	47.947854	-129.099134	100	-16	-1	10	2182	2192	Looking for a chimney to grab.
7/24	5	01	00	47.947808	-129.099075	279	-15	-1	6	2182	2188	There's a small mound here with lots of tubeworms on top of a flange.
7/24	5	01	57	47.947806	-129.099080	280	-12	0	6	2183	2188	Going to grab the small chimney spire.
7/24	5	02	56	47.947804	-129.099079	279	-12	-2	5	2183	2188	SAMPLE: geo J2-577-Sulfide-11 is a small black spire.
7/24	5	03	27	47.947800	-129.099058	294	-17	-2	7	2182	2190	From an area of active venting on the side of Needle.
7/24	5	03	46	47.947786	-129.099054	285	-18	-2	9	2182	2190	Location: 47N 56.869' 129W 5.941'
7/24	5	06	13	47.947744	-129.098959	302	-20	-1	9	2184	2192	Going to try and collect some syringe samples.
7/24	5	06	50	47.947760	-129.098952	327	-16	-1	15	2172	2187	Will try to look for some sediments from the base of the pillars.
7/24	5	07	36	47.947810	-129.098824	316	-15	-1	27	2168	2194	Probably don't have time to do any syringe samples actually.
7/24	5	09	53	47.947737	-129.098869	225	-16	-2	8	2186	2195	Will try to do some syringe samples.
7/24	5	10	37	47.947750	-129.098835	233	-16	0	4	2191	2195	Going down to the seafloor.
7/24	5	12	45	47.947759	-129.098860	200	-14	-7	1	2194	2195	Can try to get some darker red sediments or some of the lighter yellow sediments by the rocks.
7/24	5	14	02	47.947752	-129.098855	198	-17	-3	1	2194	2195	Going to use the small yellow syringe.
7/24	5	14	26	47.947755	-129.098853	198	-17	-2	1	2194	2195	Going to hold the syringe with the left hand.
7/24	5	14	34	47.947756	-129.098853	198	-17	-2	1	2194	2195	Positioning syringe in the sediment.
7/24	5	15	26	47.947751	-129.098873	207	-14	1	1	2194	2195	Looking for a softer spot to sample.
7/24	5	15	47	47.947745	-129.098884	204	-18	1	1	2194	2195	Put syringe into sediment.
7/24	5	16	02	47.947741	-129.098891	204	-18	0	1	2194	2195	SAMPLE: geo Pulling syringe sample.
7/24	5	16	47	47.947737	-129.098891	204	-18	1	1	2194	2195	This is sample J2-577-Sed-12 .
7/24	5	17	12	47.947740	-129.098878	202	-17	2	1	2194	2195	Location: 47N 56.867 129W 5.930 around the North side of Needle.
7/24	5	17	59	47.947752	-129.098853	201	-17	0	1	2194	2195	Stowing syringe.
7/24	5	18	23	47.947757	-129.098848	201	-17	-1	1	2194	2195	Getting out other syringe - this one is small red syringe.
7/24	5	19	14	47.947758	-129.098856	201	-18	1	1	2194	2195	Going to take another sample from the same area.
7/24	5	19	33	47.947759	-129.098859	201	-18	1	1	2194	2195	SAMPLE: geo This is J2-577-Sed-13 . Same location.
7/24	5	19	53	47.947760	-129.098861	201	-18	2	1	2194	2195	The sediment here is brown-orange with yellow spots.
7/24	5	20	26	47.947761	-129.098862	201	-18	2	1	2194	2195	Sample collected.
7/24	5	20	48	47.947762	-129.098862	201	-18	2	1	2194	2195	Stowing syringe back in basket.
7/24	5	21	16	47.947762	-129.098861	201	-16	-1	1	2194	2195	We're done sampling for this dive.
7/24	5	21	38	47.947771	-129.098859	207	-14	-1	3	2192	2195	There are also some dead worms on the seafloor here.
7/24	5	21	42	47.947795	-129.098836	208	-14	-1	3	2191	2195	JASON: Jason off bottom

Table 7.4.5 J2-578 Jason Dive Log (Main Endeavour Field, Endeavour Segment, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	16	27	46	47.948891	-129.098100	341	-12	-3	5	2195	2200	Jason on the bottom at 1621. At 1627 We are moving toward Grotto now.
7/24	16	28	57	47.949037	-129.098170	342	-11	-3	4	2194	2198	Traveling over lobate flow.
7/24	16	30	03	47.949100	-129.098177	342	-10	-3	4	2194	2198	Sulfide chimney straight ahead.
7/24	16	32	33	47.949148	-129.098284	342	-10	-3	9	2188	2197	This is an amazing structure. It is Grotto after all. There's the RAS.
7/24	16	34	29	47.949202	-129.098227	285	-12	-3	11	2186	2197	John; the navigator; says that every time we are here the position changes by ~12 meters. This is about 10m SE of our position on the last dive.
7/24	16	35	30	47.949251	-129.098261	238	-12	-2	13	2186	2199	Nice pic on the brow cam.
7/24	16	36	29	47.949253	-129.098308	185	-12	-3	9	2186	2195	The mini-Zeus cam has a terrific view of this structure.
7/24	16	38	17	47.949241	-129.098317	171	-10	-2	2	2187	2189	The RAS position (17 RAS Grotto 11 20m height) is about 4m to the NE of our position on this dive. That's good enough.
7/24	16	38	51	47.949244	-129.098321	171	-10	-2	2	2187	2189	Those are little limpets and snails on Camera 7.
7/24	16	39	28	47.949238	-129.098310	171	-10	-3	2	2187	2189	The animals are clumped on the connector at the highest spot.
7/24	16	41	10	47.949244	-129.098323	171	-10	-3	2	2187	2189	RECOVER Camera 7 from this little mound on the vent.
7/24	16	42	24	47.949248	-129.098312	171	-10	-3	2	2187	2189	The limpets seem to want to go higher. Ray says he thinks they try to get to the highest spot (anti-gravity).
7/24	16	42	47	47.949247	-129.098311	171	-10	-3	2	2187	2189	Our heading now is 171deg and we are at 173deg now.
7/24	16	43	35	47.949241	-129.098310	171	-12	-3	2	2187	2189	There are lots of scaleworms under the camera. Ray says they were there when we deployed it.
7/24	16	44	43	47.949238	-129.098309	171	-10	-4	2	2187	2189	Camera 7 placed on the basket. Right side.
7/24	16	45	39	47.949243	-129.098324	172	-11	-4	2	2187	2189	Still tucking the camera into a safe spot on the basket (deck - as Jimmy calls it).
7/24	16	47	00	47.949245	-129.098320	175	-12	-2	3	2187	2189	Looking good. Lots of diffuse flow here.
7/24	16	48	10	47.949241	-129.098398	95	-13	-3	7	2187	2194	Lots of experiments going on here.
7/24	16	48	24	47.949240	-129.098386	94	-12	-2	3	2188	2191	Approaching the other Ray Lee camera.
7/24	16	49	56	47.949246	-129.098384	101	-12	-2	3	2188	2191	The heading for this camera (8) was 103 degrees. We're trying to approach it from that same heading.
7/24	16	51	26	47.949238	-129.098384	101	-11	-3	3	2188	2191	This camera doesn't have as much biota here. Limpets move in herds; says Ray.
7/24	16	51	43	47.949237	-129.098385	101	-11	-3	3	2188	2191	Picking up camera 8.
7/24	16	52	11	47.949236	-129.098384	101	-11	-3	3	2188	2191	Limpets are grazers; like cows Ray says; so can say that limpets travel in "herds".
7/24	16	54	26	47.949238	-129.098382	101	-10	-2	3	2188	2191	Maneuvering the cameras. Camera 8 is relatively clear.
7/24	16	56	08	47.949232	-129.098398	100	-11	-2	3	2188	2191	Calculate a rate in which these things repopulate. Maybe if it's too hot.... they don't like that as much.
7/24	16	56	18	47.949233	-129.098399	100	-10	-2	3	2188	2191	Next task "pick-up sticks".
7/24	16	58	27	47.949256	-129.098273	168	-4	-3	9	2188	2197	Looking at the RAS anchor.
7/24	16	59	30	47.949264	-129.098269	166	-7	-2	9	2188	2197	Zoomed in on the RAS intake and the 2 temperature sticks lying at its base.
7/24	17	00	34	47.949261	-129.098269	165	-6	-3	9	2188	2197	Ray is hoping the sticks have an ID marking on them. Neptune Canada put these temperature sticks out 1 year ago.
7/24	17	01	09	47.949257	-129.098268	165	-7	-2	9	2188	2197	These are Kim Juniper's sticks - one of his students is working on it.
7/24	17	01	44	47.949253	-129.098265	165	-7	-2	9	2188	2197	Jimmy has both of the sticks in the claw.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	17	02	33	47.949246	-129.098259	164	-5	-3	9	2188	2197	Recovered the 2 temperature sticks at Grotto. They will go under the bungee near the cameras.
7/24	17	04	53	47.949246	-129.098259	232	-11	-3	11	2187	2198	Ray is wondering how far N Lobo is. There is an instrument (Covis mooring) that we want to avoid.
7/24	17	06	11	47.949102	-129.098168	316	-11	-2	12	2186	2199	We're heading to Lobo next. Lobo is a mound. Marv says they are all big chimneys.
7/24	17	07	40	47.949129	-129.098228	327	-11	-3	12	2186	2198	Lobo is about 45m north of here.
7/24	17	08	29	47.949137	-129.098369	322	-12	-1	8	2186	2194	Heading from Grotto to Lobo.
7/24	17	08	47	47.949164	-129.098407	320	-13	-3	7	2185	2192	Hopping over Grotto now.
7/24	17	09	11	47.949199	-129.098474	322	-11	-2	3	2185	2189	Heading at 320.
7/24	17	10	37	47.949260	-129.098524	309	-10	-2	12	2182	2194	This is probably North Tower on Grotto. It's taller than the area where we have the RAS. This is a huge edifice. Black smoke coming out of several orifices.
7/24	17	11	13	47.949367	-129.098568	324	-10	-2	12	2183	2195	Lobo should be just on the north side of the Grotto sulfide complex.
7/24	17	11	50	47.949413	-129.098584	4	-11	-2	11	2183	2193	Lobo is probably shorter than Grotto Marv says; but the data are old and these chimneys grow fast.
7/24	17	13	41	47.949435	-129.098481	35	-10	-2	9	2185	2194	Coming upon another chimney. This is probably it.
7/24	17	14	47	47.949451	-129.098448	35	-10	-2	6	2189	2194	Ray is looking for a nice " meadow" for temperature mapping.
7/24	17	15	43	47.949473	-129.098479	50	-10	-1	7	2188	2195	This is a pretty big sulfide structure as well.
7/24	17	16	54	47.949494	-129.098474	92	-10	-3	6	2189	2195	Ray is "shopping around" for a spot for temperature mapping.
7/24	17	17	19	47.949514	-129.098466	117	-10	-2	7	2189	2195	The mini-Zeus has a lot of light and a beautiful image.
7/24	17	18	38	47.949504	-129.098397	116	-11	-2	8	2187	2195	Want to zoom in on the big spire. It's covered in biota.
7/24	17	20	26	47.949510	-129.098502	93	-10	-2	8	2186	2194	We've moved about 3/4 way around. Jimmy is going to come back around the other way. to look at the rest of the sulfide.
7/24	17	21	07	47.949429	-129.098446	42	-10	-1	8	2187	2195	Little marker "L" on this structure.
7/24	17	21	29	47.949381	-129.098434	12	-11	-3	6	2187	2194	Marv says this used to be pretty flat on top. Not anymore. Lots of topography and a huge spire now.
7/24	17	22	31	47.949413	-129.098384	332	-11	-2	6	2189	2196	What's the white thing ahead?
7/24	17	23	30	47.949448	-129.098353	305	-10	-3	7	2189	2196	NAV: Dropped DVL target Lobo position: 129 5.9062 47 56.9689. Z=2190 here.
7/24	17	23	53	47.949457	-129.098317	314	-10	-2	11	2189	2200	Huge structure here. The white bright spot was tubeworms.
7/24	17	24	31	47.949491	-129.098309	297	-9	-2	10	2189	2199	This spot looks a bit flat-ish.
7/24	17	25	13	47.949518	-129.098271	296	-11	-3	10	2189	2199	Ray wants to map from the dark (deadish) to the white (happy worm) area.
7/24	17	26	38	47.949488	-129.098288	303	-12	-2	10	2189	2199	This is a pretty good angle for Jason.
7/24	17	27	39	47.949495	-129.098312	307	-8	-3	8	2190	2198	This whole table is a BIG flange. The hot water under there is the source of what's feeding the critters up on top.
7/24	17	28	59	47.949492	-129.098307	306	-7	-3	8	2190	2198	Frame_Grab:
7/24	17	29	19	47.949491	-129.098305	307	-7	-3	8	2190	2198	Wants a grab from mini-Zeus.
7/24	17	30	33	47.949489	-129.098298	306	-8	-6	8	2190	2198	Ray wants to use the mini-Zeus for frame grabs.
7/24	17	30	38	47.949489	-129.098298	306	-7	-6	8	2190	2198	NAV: Doppler Reset
7/24	17	32	56	47.949493	-129.098299	306	-9	-4	8	2190	2198	Placing the temperature array on the big flange. Making sure Jason can reach everything here.
7/24	17	37	38	47.949488	-129.098313	307	-9	-2	8	2190	2198	We will do 7 minutes at each position.
7/24	17	38	22	47.949491	-129.098315	307	-9	-4	8	2190	2198	Determining how far Jason can reach.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	17	39	17	47.949494	-129.098318	306	-9	-3	8	2190	2198	Placing the 2 temp arrays side by side on this flange.
7/24	17	51	39	47.949496	-129.098320	306	-9	-3	8	2190	2198	We're starting the first temperature map at Lobo. We're at the top with red and silver.
7/24	17	52	11	47.949494	-129.098321	306	-9	-3	8	2190	2198	Moving them over now. They stay in place for 7 minutes.
7/24	17	53	28	47.949493	-129.098321	307	-9	-3	8	2190	2198	There are temperature sensors in the cylinders at the end of this.
7/24	17	54	04	47.949493	-129.098322	307	-9	-3	8	2190	2198	Frame_Grab:
7/24	17	54	20	47.949494	-129.098323	307	-9	-3	8	2190	2198	Second position Started at 1753. The first position started at 1743.
7/24	17	59	54	47.949496	-129.098292	307	-9	-3	8	2190	2198	Finished with 2nd position. Moving on to position 3.
7/24	18	01	25	47.949477	-129.098265	307	-9	-3	8	2190	2198	Start position 3 at 1801.
7/24	18	01	42	47.949476	-129.098263	307	-9	-3	8	2190	2198	Frame_Grab:
7/24	18	03	56	47.949483	-129.098291	307	-9	-3	8	2190	2198	Frame_Grab:
7/24	18	05	19	47.949490	-129.098324	306	-8	-3	8	2190	2198	The silver temp tray moved slightly. Jimmy is moving it back to the original spot.
7/24	18	07	07	47.949513	-129.098338	306	-8	-3	8	2190	2198	The previous temperature survey data shows that it's higher temp in the white part (healthier worms) peaks around 30. The brown area is really low (dead worms) at about 2-3 degrees.
7/24	18	08	03	47.949519	-129.098331	306	-9	-4	8	2190	2198	Whelk and bacterial mat in the science cam.
7/24	18	09	27	47.949513	-129.098328	305	-7	-3	8	2190	2198	Frame_Grab:
7/24	18	10	03	47.949509	-129.098331	305	-8	-2	8	2190	2198	Position 4 at 1809
7/24	18	10	06	47.949509	-129.098331	305	-8	-2	8	2190	2198	Frame_Grab:
7/24	18	16	31	47.949501	-129.098305	305	-8	-3	8	2190	2198	Moving down. Getting into position 5.
7/24	18	18	18	47.949504	-129.098291	306	-8	-2	8	2190	2198	In position 5 now.
7/24	18	21	05	47.949537	-129.098333	306	-7	-3	8	2190	2198	We're getting the temp at position 5 now.
7/24	18	23	25	47.949492	-129.098306	306	-7	-2	8	2190	2198	Frame_Grab:
7/24	18	24	29	47.949477	-129.098284	306	-7	-3	8	2190	2198	Jimmy has the Schilling cam on now.
7/24	18	24	36	47.949476	-129.098282	306	-7	-3	8	2190	2198	End of pos 5 array.
7/24	18	26	36	47.949485	-129.098282	306	-8	-3	8	2190	2198	Frame_Grab:
7/24	18	26	52	47.949486	-129.098285	306	-8	-3	8	2190	2198	Start pos 6 at 1826.
7/24	18	28	05	47.949484	-129.098302	306	-8	-2	8	2190	2198	There is space under red 6 but Ray is OK with that so that he can get ambient.
7/24	18	30	21	47.949483	-129.098317	306	-8	-2	8	2190	2198	Still on array 6
7/24	18	35	41	47.949495	-129.098308	306	-9	-3	8	2190	2198	It's time to move
7/24	18	35	45	47.949494	-129.098308	306	-9	-2	8	2190	2198	Frame_Grab:
7/24	18	36	00	47.949495	-129.098309	306	-9	-3	8	2190	2198	Start pos 7 at 1835.
7/24	18	36	07	47.949495	-129.098310	306	-9	-2	8	2190	2198	Frame_Grab:
7/24	18	36	54	47.949496	-129.098314	307	-9	-3	8	2190	2198	The red 7 is mostly in the air.
7/24	18	40	23	47.949493	-129.098311	306	-8	-3	8	2190	2198	Marv is sitting in for Ray Lee.
7/24	18	43	03	47.949501	-129.098315	307	-9	-3	8	2190	2198	Finished with 7.
7/24	18	45	23	47.949500	-129.098313	307	-9	-3	8	2190	2198	Start pos 8 at 1845.
7/24	18	46	13	47.949499	-129.098315	307	-9	-3	8	2190	2198	This is in the last position.
7/24	18	58	22	47.949489	-129.098308	306	-9	-3	8	2190	2198	Repositioned the starboard (silver) array slightly - rotated it slightly CCW.
7/24	18	59	33	47.949489	-129.098313	306	-9	-3	8	2190	2198	The arm had been rotating slowly for some reason.
7/24	19	01	37	47.949496	-129.098325	306	-9	-4	8	2190	2198	Finished with 9. Position 9 started at 1855.
7/24	19	02	58	47.949503	-129.098324	306	-8	-4	8	2190	2198	Stowing temperature arrays. Still at Lobo vent.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	19	04	35	47.949502	-129.098316	306	-8	-4	8	2190	2198	Starboard array is stowed. Now stowing port array.
7/24	19	06	34	47.949494	-129.098310	307	-7	-2	8	2190	2198	One of the temp probes on the red array just fell off.
7/24	19	07	23	47.949493	-129.098310	307	-6	-2	8	2190	2198	Another one just fell off. It's on the front lip of the basket.
7/24	19	09	06	47.949490	-129.098315	307	-7	-2	8	2190	2198	Temp arrays in basket. Now for the bungee.
7/24	19	14	38	47.949495	-129.098321	307	-8	-2	8	2190	2198	Stowing the temp arrays.
7/24	19	19	17	47.949494	-129.098327	306	-8	-3	8	2190	2198	The temperature arrays are all bungeed down.
7/24	19	19	58	47.949481	-129.098312	304	-11	-2	10	2189	2199	Ray wants to circle around to the right now and check out the base of Lobo.
7/24	19	21	04	47.949535	-129.098306	272	-11	-2	9	2189	2198	Pretty amazing structure with lots of small spires and a couple really big spires. Black smoker orifices here and there.
7/24	19	21	36	47.949525	-129.098292	274	-11	-2	9	2190	2199	Moving down the structure. Zooming in on some orange mat.
7/24	19	22	01	47.949529	-129.098291	270	-11	-1	9	2190	2199	These tubeworms here don't look so hot (literally). Orange mat covering some of them.
7/24	19	25	58	47.949558	-129.098256	244	-11	-2	7	2188	2196	Doing a video survey around the structure.
7/24	19	26	07	47.949555	-129.098262	256	-11	-2	7	2188	2196	Lots of shimmering water.
7/24	19	26	29	47.949552	-129.098265	286	-11	-2	8	2189	2196	Frame_Grab:
7/24	19	26	44	47.949544	-129.098275	291	-10	-2	9	2189	2198	Beautiful images in the Zeus camera.
7/24	19	27	50	47.949541	-129.098328	335	-10	-2	1	2189	2190	Looking for a place to collect sulfides.
7/24	19	28	55	47.949555	-129.098347	347	-11	-2	2	2187	2190	Actually; not sure what we're doing here.
7/24	19	31	01	47.949597	-129.098303	219	-11	-2	6	2188	2194	Ray is checking out the scene for more temperature surveys. This is a huge structure with numerous spires; diffuse and black smoker flow.
7/24	19	31	23	47.949610	-129.098333	180	-10	-2	7	2188	2195	We're still at Lobo.
7/24	19	31	40	47.949609	-129.098372	145	-11	-2	8	2188	2196	Still circling.
7/24	19	34	26	47.949524	-129.098388	201	-12	-2	2	2189	2192	Pretty black smoke coming out of a smallish spire with lots of lush tubeworms on the spire.
7/24	19	37	29	47.949511	-129.098363	178	-5	0	3	2190	2193	Beautiful tubeworms here on this small spire.
7/24	19	38	06	47.949504	-129.098367	178	-5	-2	4	2190	2194	We're going to put 1 array on this small spire to see if we can get a temperature here.
7/24	19	40	21	47.949510	-129.098350	177	-5	-3	4	2190	2194	Pulling the temperature array out of the basket.
7/24	19	41	48	47.949533	-129.098367	177	-4	-3	4	2190	2194	DEPLOYING temperature array gently on this small spire. Black smoke rising out of the top. Array on tubeworms.
7/24	19	41	53	47.949532	-129.098367	177	-4	-3	4	2190	2194	Frame_Grab:
7/24	19	41	58	47.949531	-129.098367	177	-4	-3	4	2190	2194	Frame_Grab:
7/24	19	46	39	47.949514	-129.098350	177	-4	-3	4	2190	2194	Moving the array down to the base of this little sulfide spire with black smoke coming out of the top.
7/24	19	47	01	47.949506	-129.098361	177	-4	-3	4	2190	2194	Just put the array in a second position on the seafloor at the base of the little spire.
7/24	19	49	42	47.949520	-129.098362	176	-4	-2	4	2190	2194	Stop with that array. Finished.
7/24	19	52	17	47.949496	-129.098539	82	-11	-1	6	2189	2195	Going to hold the array in the claw and move on a bit. Checking out other possible temperature array deployment sites.
7/24	19	54	06	47.949453	-129.098499	79	-12	-2	4	2190	2194	This is not the central spire.
7/24	19	55	50	47.949509	-129.098413	344	-11	-2	7	2188	2194	This is the big central spire. Black smoke coming out of several orifices. Covered in biota. A really beautiful sulfide spire.
7/24	19	58	10	47.949559	-129.098432	133	-12	-1	7	2187	2194	Lots of hot water shimmering up from the base of this spire.
7/24	19	59	28	47.949550	-129.098403	131	-9	1	6	2188	2194	Vent fish in front of this feature.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	20	00	12	47.949539	-129.098394	131	-11	0	6	2188	2194	The temperature array is in Jason's stbd arm.
7/24	20	01	39	47.949518	-129.098409	131	-10	0	6	2188	2194	Placing the array in the red tubeworm plumes.
7/24	20	04	05	47.949494	-129.098405	132	-14	0	7	2187	2194	Frame_Grab:
7/24	20	04	20	47.949493	-129.098403	126	-12	-1	6	2187	2193	Frame_Grab:
7/24	20	06	23	47.949513	-129.098420	128	-13	-2	7	2187	2194	2006 start temp array at top of largest spire here at Lobo.
7/24	20	06	25	47.949513	-129.098421	128	-13	-2	7	2187	2194	Frame_Grab:
7/24	20	10	49	47.949519	-129.098373	128	-13	-2	6	2187	2193	Continuing to measure temperature array.
7/24	20	11	38	47.949507	-129.098366	128	-13	-3	6	2187	2193	STOP temp array=2011.11.
7/24	20	11	39	47.949506	-129.098366	128	-13	-3	6	2187	2193	Move temperature array down.
7/24	20	12	45	47.949494	-129.098376	128	-14	-3	6	2187	2193	START=2012 temperature array on the largest spire of Lobo in clump of tubeworms.
7/24	20	13	06	47.949493	-129.098382	128	-14	-3	6	2187	2193	Array is oriented the same as the array before with the T handle on the bottom.
7/24	20	13	47	47.949497	-129.098393	128	-14	-3	6	2187	2193	Frame_Grab:
7/24	20	16	51	47.949511	-129.098395	128	-13	-3	6	2187	2193	Continuing to measure temperature array at Lobo second position.
7/24	20	18	20	47.949522	-129.098387	128	-13	-3	6	2187	2193	STOP temperature array= 2017.56
7/24	20	19	40	47.949521	-129.098384	128	-13	-3	6	2187	2193	START temperature array= 2018 in lowest position on the biggest spire of Lobo.
7/24	20	19	41	47.949521	-129.098384	128	-13	-3	6	2187	2193	Frame_Grab:
7/24	20	20	46	47.949512	-129.098371	128	-13	-3	6	2187	2193	Note orientation of the temperature array has been rotated 180 degrees. T handle is now at the top.
7/24	20	21	54	47.949507	-129.098367	128	-13	-3	6	2187	2193	Little shrimp floating in front of camera entertaining us while we wait for the temperature array.
7/24	20	23	17	47.949496	-129.098379	128	-13	-3	6	2187	2193	Location (cursor) 129 5.9066'W 47 56.9629'N Depth=2187.5 HDG=127.7 ALT=6.3.
7/24	20	24	19	47.949491	-129.098369	128	-14	-3	6	2187	2193	STOP temperature array=2023.47.
7/24	20	25	38	47.949496	-129.098363	128	-14	-3	6	2187	2193	Positioning temperature array back into basket.
7/24	20	25	52	47.949498	-129.098367	128	-14	-3	6	2187	2193	iButton just fell off of temperature array.
7/24	20	27	13	47.949513	-129.098415	128	-13	-3	6	2187	2193	Jason is still stowing the array.
7/24	20	29	06	47.949536	-129.098468	129	-14	0	7	2187	2194	Completed stowing the array.
7/24	20	31	55	47.949506	-129.098443	129	-14	0	7	2187	2194	Debating the best way to collect the friable looking sulfide spire in the background.
7/24	20	34	42	47.949504	-129.098426	129	-13	1	7	2187	2194	Trying to figure out which bag scoop for sulfides is the cloth bag.
7/24	20	37	13	47.949506	-129.098437	129	-14	1	7	2187	2194	Net secured in arm of Jason.
7/24	20	38	42	47.949501	-129.098448	129	-13	-1	6	2187	2193	Passing net to the starboard arm.
7/24	20	42	25	47.949510	-129.098421	128	-14	-4	6	2187	2193	Net secured in starboard arm.
7/24	20	42	47	47.949512	-129.098425	128	-14	-3	6	2187	2193	Looking around in best way to get to spire.
7/24	20	44	15	47.949488	-129.098407	129	-13	-1	6	2187	2193	Moving bag to port arm.
7/24	20	46	10	47.949485	-129.098394	129	-13	-1	6	2187	2193	It's a switching off game with the bag moving from arm to arm to get the best positioning of the bag.
7/24	20	46	35	47.949495	-129.098401	129	-13	-1	6	2187	2193	I think Akel is happy with it in the port arm. It is currently doing a nice little bag dance for us.
7/24	20	49	58	47.949499	-129.098368	206	-12	-3	4	2187	2191	Moving Jason now to get a better position on the chimney.
7/24	20	50	10	47.949496	-129.098375	213	-12	-2	4	2187	2191	Frame_Grab:
7/24	20	53	09	47.949474	-129.098417	231	-15	0	3	2187	2189	HD-frame grab of friable sulfide to the left of the spire. Attempting to make sulfide collection.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	20	54	14	47.949495	-129.098388	230	-15	0	3	2187	2189	Location 129 5.9066'W 47 56.9629'N HDG=230.5 Depth 2187 Alt 3.88.
7/24	20	54	57	47.949493	-129.098372	231	-15	0	3	2187	2189	Large amount of shimmering flow coming out of side.
7/24	20	55	05	47.949491	-129.098370	230	-15	0	3	2187	2189	Base of the chimney is solid.
7/24	20	56	11	47.949475	-129.098380	231	-15	-1	3	2187	2190	Rammed into top and tried to collect what fell into scoop arm.
7/24	20	56	30	47.949471	-129.098378	231	-15	-1	3	2187	2190	Attempting to grab more solid foundation with the starboard arm.
7/24	20	57	47	47.949470	-129.098360	230	-15	-2	3	2187	2190	SAMPLE: geo J2-578-Sulfide-01 Lobo. Friable sulfide to the left of the large spire.
7/24	20	59	23	47.949472	-129.098366	230	-15	1	3	2187	2190	Sample caught on bag but Akel's' ninja superpowers tipped it perfectly into the scoop bag.
7/24	21	01	16	47.949486	-129.098337	230	-11	1	3	2186	2190	Observation of chimney-lots of channels for fluid flow. White anhydrite apparent around channels.
7/24	21	01	41	47.949485	-129.098337	230	-11	1	4	2186	2190	Moving the bag in the starboard biobox.
7/24	21	05	08	47.949510	-129.098417	230	-11	2	5	2186	2192	J2-578-Sulfide-01 from Lobo in scoop bag in starboard biobox
7/24	21	07	37	47.949530	-129.098442	230	-11	-4	6	2186	2192	Manipulating the bag to fit in biobox closing the box.
7/24	21	09	08	47.949564	-129.098464	230	-11	-1	8	2186	2195	Different lat long for sample 1. Dara not sure if earlier was correct. 47 56.9703 129 5.9043.
7/24	21	10	21	47.949525	-129.098372	229	-10	-1	5	2186	2191	Moving back into position to take water sample.
7/24	21	11	20	47.949508	-129.098349	229	-12	-1	4	2186	2190	We are going to take a Jason temperature probe and then do some fluid sampling in the same spot as sulfide collection.
7/24	21	12	05	47.949493	-129.098373	243	-11	-2	3	2187	2190	With the collection of the sulfide the hole created has now become a black smoker.
7/24	21	12	16	47.949492	-129.098383	244	-12	-1	3	2187	2190	Frame_Grab:
7/24	21	13	48	47.949487	-129.098378	243	-15	-3	3	2187	2189	Depth 2187.4 HDG 243.3
7/24	21	15	59	47.949486	-129.098353	243	-15	-2	3	2187	2189	Jason temperature probe being collected from basket and maneuvered into position.
7/24	21	17	55	47.949481	-129.098356	243	-15	-4	3	2187	2189	Frame_Grab:
7/24	21	18	40	47.949493	-129.098362	243	-15	-4	3	2187	2189	Positioning temperature probe into the hole created by sulfide collection
7/24	21	20	07	47.949500	-129.098385	243	-15	-3	3	2187	2189	TEMPS: Jason temperature =294.3C at the hole on lobo on the left side created by sulfide collection.
7/24	21	20	20	47.949498	-129.098387	243	-15	-2	3	2187	2189	Stowing temperature wand.
7/24	21	22	12	47.949479	-129.098373	243	-15	-3	3	2187	2189	Temperature wand stowed.
7/24	21	24	29	47.949498	-129.098384	243	-15	-4	3	2187	2189	Jason arm grabbing HFS fluid inlet.
7/24	21	25	25	47.949492	-129.098390	243	-15	-4	3	2187	2189	Positioning inlet into the whole for high temp fluid sampling.
7/24	21	27	00	47.949485	-129.098362	243	-14	-4	3	2187	2189	SAMPLE: fluid J2-578-HFS-02 positioning the wand in flow for highest temperature.
7/24	21	28	01	47.949487	-129.098345	243	-15	-4	3	2187	2190	Note line before this was not the start of sampling just positioning.
7/24	21	33	31	47.949478	-129.098370	243	-15	-4	3	2187	2190	SAMPLE: fluid J2-578-HFS-02 Filtered Piston #1 START=2133. Temperature still rising 300+C
7/24	21	34	12	47.949479	-129.098371	243	-15	-4	3	2187	2190	J2-578-HFS-02 cont.
7/24	21	35	45	47.949472	-129.098364	242	-15	-4	3	2187	2190	J2-578-HFS-02 temperature really steady at 309.5.
7/24	21	36	39	47.949477	-129.098372	242	-15	-4	3	2187	2190	J2-578-HFS-02 Stop=2136 Tmax=309.7 Tavg=309.0 T2=100 Vol=576 (Butterfield).
7/24	21	37	23	47.949486	-129.098381	243	-15	-4	3	2187	2190	SAMPLE: fluid J2-578-HFS-03 Unfiltered Piston #2 Start 2136.
7/24	21	40	58	47.949481	-129.098379	243	-15	-4	3	2187	2189	SAMPLE: fluid J2-578-HFS-03 Stop=2140 Tmax=309.6 Tavg=309.3 T2=95 Vol=592 (Butterfield).
7/24	21	42	57	47.949500	-129.098422	243	-15	-4	3	2187	2190	Moving downward to get a more diffuse fluid sample allowing the Beast to flush out to get temperature reading.
7/24	21	45	52	47.949510	-129.098417	243	-15	-3	3	2187	2190	SAMPLE: fluid J2-578-HFS-04 Unfiltered Bag #24 START=2145.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	21	46	44	47.949510	-129.098420	243	-15	-3	3	2187	2190	J2-578-HFS-04 cont.
7/24	21	48	38	47.949505	-129.098414	242	-15	-3	3	2187	2190	J2-578-HFS-04 Stop=2148 Tmax=23.8 Tavg=21.2 T2=12 Vol=402 (Butterfield).
7/24	21	49	48	47.949510	-129.098416	242	-14	-3	3	2187	2190	SAMPLE: fluid J2-578-HFS-05 Filtered Bag #23 Start=2149.
7/24	21	51	13	47.949507	-129.098406	242	-14	-3	3	2187	2190	J2-578-HFS-05 cont.
7/24	21	53	03	47.949500	-129.098387	241	-13	-3	3	2187	2190	SAMPLE: fluid J2-578-HFS-05 Stop=2152 Tmax=31 Tavg=25.7 T2=14 Vol=390 (Butterfield).
7/24	21	54	14	47.949553	-129.098388	266	-12	-3	3	2187	2190	Transiting to another portion of the chimney.
7/24	22	01	30	47.949642	-129.098312	195	-12	-3	10	2187	2197	Circling around another section of LOBO looking for sulfide collection.
7/24	22	05	21	47.949632	-129.098305	205	-12	-4	7	2190	2197	Still roaming around the Lobo vent looking for chimney.
7/24	22	10	26	47.949432	-129.098489	91	-13	-3	4	2190	2194	Still Roaming around.
7/24	22	11	42	47.949438	-129.098472	79	-12	-4	4	2190	2194	HD frame grab.
7/24	22	15	44	47.949430	-129.098456	98	-15	-5	5	2190	2195	Planning to take some diffuse flow fluid sample wand moving into position.
7/24	22	16	22	47.949431	-129.098460	98	-15	-5	5	2190	2195	We are now currently at another chimney near or in Lobo.
7/24	22	17	54	47.949422	-129.098459	98	-14	-5	5	2190	2195	JASON position 129 5.9080'W 47 56.9659'N Depth 2190.0 HDG=98.1.
7/24	22	18	27	47.949420	-129.098457	99	-14	-5	5	2190	2195	J2-578-HFS-06 sample in diffuse flow on new chimney structure on LOBO temperatures in the 30 degrees.
7/24	22	19	21	47.949421	-129.098454	98	-14	-5	5	2190	2195	SAMPLE: fluid J2-578-HFS-06 Unfiltered bag #22 START=2219.
7/24	22	20	37	47.949431	-129.098450	98	-14	-5	5	2190	2195	J2-578-HFS-06 cont. Confirming fluid flow for the exhaust of the Beast.
7/24	22	21	58	47.949438	-129.098454	97	-14	-5	5	2190	2195	J2-578-HFS-06 cont.
7/24	22	23	07	47.949441	-129.098459	97	-14	-5	5	2190	2195	J2-578-HFS-06 Stop=2222 Tmax=27.3 Tavg=24.4 T2=12 Vol=500 (Butterfield).
7/24	22	23	46	47.949442	-129.098460	97	-14	-5	5	2190	2195	J2-578-HFS-07 Filtered bag #21 START=2223.
7/24	22	24	24	47.949442	-129.098460	98	-14	-5	5	2190	2195	SAMPLE: fluid J2-578-HFS-07 Filtered bag #21 START=2223.
7/24	22	25	30	47.949434	-129.098453	98	-14	-5	5	2190	2195	J2-578-HFS-07 cont.
7/24	22	28	16	47.949427	-129.098440	99	-14	-5	5	2190	2195	SAMPLE: fluid J2-578-HFS-07 STOP=2227 Tmax=27.1 Tavg=24 T2=12 Vol=500 (Butterfield).
7/24	22	29	03	47.949431	-129.098443	99	-15	-4	5	2190	2195	Going to collect sulfide in this field in hot flow.
7/24	22	29	13	47.949431	-129.098444	98	-15	-3	5	2190	2195	Securing fluid inlet on basket.
7/24	22	32	20	47.949435	-129.098460	99	-15	-3	5	2190	2195	Opening starboard biobox for south lobo collection.
7/24	22	33	08	47.949434	-129.098454	98	-15	-2	5	2190	2195	Note: Samples J2-578-01 thru J2-578-05 are from Central LOBO.
7/24	22	33	47	47.949434	-129.098449	98	-14	-4	5	2190	2195	Samples J2-578-06 thru J2-578-010 are from South LOBO.
7/24	22	34	19	47.949434	-129.098446	99	-14	-4	5	2190	2195	Arm in the processes of attempting to collect sulfide.
7/24	22	35	22	47.949436	-129.098446	98	-14	-4	5	2190	2195	A smaller tubeworm covered spire with good flow attempting to be collected.
7/24	22	36	54	47.949436	-129.098459	98	-15	-2	5	2190	2195	SAMPLE: geo J2-578-Sulfide-08 small tubeworm covered spire from South lobo into starboard biobox.
7/24	22	40	12	47.949422	-129.098452	99	-15	-3	5	2190	2195	Securing the starboard biobox with a bungee.
7/24	22	42	49	47.949424	-129.098452	98	-15	-3	5	2190	2195	Having difficulties securing the biobox
7/24	22	46	34	47.949437	-129.098457	99	-14	-4	5	2190	2195	Positioning the fluid sampler in the hole created from the sulfide collection.
7/24	22	49	39	47.949446	-129.098459	98	-14	-4	5	2191	2195	J2-578-HFS-09 positioning the inlet in to the hot flow.
7/24	22	51	16	47.949440	-129.098461	99	-14	-4	5	2191	2195	We are watching sulfide worms in our field of view while we wait on fluid sampling.
7/24	22	52	38	47.949423	-129.098451	99	-14	-4	5	2191	2195	Jiggling around inlet to get higher temperature.
7/24	22	52	47	47.949421	-129.098451	99	-14	-4	5	2191	2195	Slight pump problem but Dave is on it.
7/24	22	54	17	47.949418	-129.098452	99	-13	-4	5	2191	2195	Pushed the inlet in more into the same spot we collected a sulfide from.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	22	55	48	47.949426	-129.098447	99	-13	-4	5	2191	2195	SAMPLE: fluid J2-578-HFS-09 Unfiltered Piston #4 Start=2255. 315C.
7/24	22	56	43	47.949420	-129.098440	99	-14	-4	5	2191	2195	J2-578-HFS-09 cont. Confirmed flow in green tubing.
7/24	22	57	42	47.949418	-129.098438	99	-14	-4	5	2191	2195	J2-578-HFS-09 cont.
7/24	22	58	31	47.949423	-129.098443	99	-14	-4	5	2191	2195	Depth=2191.1 Hdg=98.9.
7/24	22	59	54	47.949431	-129.098448	98	-14	-4	5	2191	2195	SAMPLE: fluid J2-578-HFS-09 Stop=2259 Tmax=319.9 Tavg=318.8 T2=108 Vol=675 (Butterfield).
7/24	23	00	17	47.949432	-129.098446	99	-14	-4	5	2191	2195	SAMPLE: fluid J2-578-HFS-10 Filtered Piston #5 Start=2300.
7/24	23	02	00	47.949441	-129.098439	99	-14	-4	5	2191	2195	J2-578-HFS-10 cont. Confirmed flow through tubing.
7/24	23	05	59	47.949435	-129.098455	98	-14	-4	5	2191	2195	SAMPLE: fluid J2-578-HFS-10 Stop=2305.
7/24	23	06	25	47.949429	-129.098460	98	-14	-4	5	2191	2195	SAMPLE: fluid J2-578-GTHFS-11 Firing Port Gas tight 2306.
7/24	23	07	12	47.949419	-129.098463	98	-14	-4	5	2191	2195	J2-578-GTHFS-11 Purple #10 port gas tight fired.
7/24	23	07	53	47.949409	-129.098466	98	-14	-4	5	2191	2195	SAMPLE: fluid J2-578-HFS-10 Tmax=321.1 Tavg=320.6 T2=105 Vol=625 (Butterfield).
7/24	23	08	43	47.949406	-129.098464	98	-14	-3	5	2191	2195	Securing the inlet in the basket.
7/24	23	09	42	47.949410	-129.098479	99	-12	-2	5	2190	2196	Plan is to go to another sulfide. Most likely at Dante. Do some temperature arrays. Collect live and extinct sulfides and take water samples.
7/24	23	10	49	47.949421	-129.098472	99	-14	-1	18	2175	2194	Transiting to Dante.
7/24	23	15	11	47.949450	-129.098458	148	-12	-2	52	2138	2191	Still transiting to Dante. Checking ballasting.
7/24	23	18	09	47.949348	-129.098357	147	-10	-2	53	2138	2191	Transit.
7/24	23	18	42	47.949371	-129.098377	148	-10	-2	52	2138	2190	Our method for transit was going up and over most of the chimneys to prevent any damage or entanglement to the vehicle.
7/24	23	23	07	47.949065	-129.098014	148	-12	-2	61	2137	2198	Still in transit.
7/24	23	26	34	47.949124	-129.098072	93	-10	-2	19	2180	2199	Transit.
7/24	23	31	59	47.948928	-129.097691	80	-11	-2	11	2191	2202	Chimney in view looking around for good place to do temperature arrange.
7/24	23	33	01	47.948918	-129.097643	39	-10	-2	11	2191	2203	This area of the chimney looks really nice. Quite a bit of flanges and flat surfaces with chimney spires towards the top.
7/24	23	34	28	47.948928	-129.097647	56	-10	-2	11	2191	2202	Looks there is a flange with lots of dead pieces.
7/24	23	35	11	47.948935	-129.097661	94	-10	-2	10	2191	2201	NOTE: THE CHIMNEY THAT SCIENCE THOUGHT WAS DANTE WAS ACTUALLY DUDLEY. S. MERLE IS CHANGING ALL PERTINENT "DANTE" ENTRIES TO "DUDLEY" ENTRIES THROUGHOUT THIS DIVE LOG. THE VIRTUAL VAN CAN NOT BE CORRECTED BUT THERE ARE NOTES IN CAPITAL LETTERS INDICATING WHEN THE MISTAKE WAS DISCOVERED.
7/24	23	36	53	47.948911	-129.097654	92	-9	-3	9	2192	2201	We've established an area that ranges from what we are assuming is cold (covered in iron oxides and dead worms) to hot with a black smoker off to the left.
7/24	23	37	53	47.948910	-129.097652	93	-11	-2	10	2192	2201	Currently picking up temperature array to give us an idea of scale and positioning.
7/24	23	38	16	47.948911	-129.097652	93	-11	-2	10	2192	2201	iButton fell off of red temperature array.
7/24	23	41	46	47.948925	-129.097656	92	-9	-2	9	2192	2201	Frame_Grab:
7/24	23	44	09	47.948912	-129.097664	92	-11	0	9	2192	2201	We found the sweet spot. We are now grabbing the silver temperature array with the port arm to do two at a time sampling.
7/24	23	46	35	47.948921	-129.097642	92	-10	0	9	2192	2201	Frame_Grab:
7/24	23	47	53	47.948923	-129.097644	92	-9	-2	9	2192	2201	Positioning Zeus camera for a nice initial no-temperature-array sight.
7/24	23	57	12	47.948915	-129.097636	93	-9	1	9	2192	2201	Temperature arrays 1st position start 2349. T handles oriented on the bottom.
7/24	23	57	25	47.948918	-129.097637	93	-10	1	9	2192	2201	Temperature arrays 1st position stop 2356.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/24	23	57	38	47.948921	-129.097637	93	-10	1	9	2192	2201	Rearranging temperature array.
7/24	23	57	55	47.948924	-129.097638	93	-10	1	9	2192	2201	Red temperature array in starboard arm silver in port arm.
7/24	23	58	05	47.948925	-129.097638	93	-9	1	9	2192	2201	Sampling arrays started in center and moved out.
7/24	23	58	28	47.948928	-129.097638	93	-10	1	9	2192	2201	Temperature array 2 start 2358.
7/24	23	58	30	47.948929	-129.097638	93	-10	1	9	2192	2201	Frame_Grab:
7/25	00	04	56	47.948930	-129.097649	93	-9	0	9	2192	2201	Temperature array 2 stop 2403.
7/25	00	05	23	47.948931	-129.097645	93	-10	0	9	2192	2201	Frame_Grab:
7/25	00	06	37	47.948926	-129.097638	92	-10	1	9	2192	2201	Temp array 3 start 0005.
7/25	00	10	39	47.948917	-129.097629	93	-10	0	9	2192	2201	Temp probe stop 0010.
7/25	00	11	43	47.948920	-129.097627	93	-11	0	9	2192	2201	Temp array position 4 start 0011.
7/25	00	11	51	47.948920	-129.097627	93	-11	0	10	2192	2201	Frame_Grab:
7/25	00	15	26	47.948921	-129.097658	93	-10	0	9	2192	2201	Reminder these temperature arrays are being measured on a flattish flange on Dudley.
7/25	00	15	58	47.948921	-129.097658	93	-10	0	9	2192	2201	Temp array position 4 stop 0016.
7/25	00	18	28	47.948922	-129.097646	93	-10	1	9	2192	2201	Temp array position 5 start 0018.
7/25	00	18	50	47.948923	-129.097652	93	-10	0	9	2192	2201	Frame_Grab:
7/25	00	23	19	47.948925	-129.097665	93	-10	0	9	2192	2201	Temp array position 5 stop 0023.
7/25	00	25	21	47.948907	-129.097624	93	-10	1	9	2192	2201	Temp array position 6 (center second row from the bottom) Start=0025.
7/25	00	26	07	47.948906	-129.097628	93	-10	0	9	2192	2201	CORRECTION: temp array position 6 start=0026.
7/25	00	26	36	47.948909	-129.097636	93	-9	1	9	2192	2201	Frame_Grab:
7/25	00	31	25	47.948955	-129.097619	93	-10	1	9	2192	2201	Temp array position 6 stop 0031.
7/25	00	33	36	47.948913	-129.097683	93	-11	1	9	2192	2201	Temp array position 7 start 0033.
7/25	00	33	46	47.948912	-129.097683	93	-11	1	9	2192	2201	Frame_Grab:
7/25	00	35	40	47.948921	-129.097645	93	-11	1	10	2192	2202	Slight turning repositioning 0035.
7/25	00	39	49	47.948927	-129.097641	93	-11	0	10	2192	2202	Temp array position 8 start 0039.
7/25	00	39	57	47.948926	-129.097639	93	-11	0	10	2192	2202	Frame_Grab:
7/25	00	43	51	47.948906	-129.097677	93	-11	0	10	2192	2202	Frame_Grab:
7/25	00	44	03	47.948907	-129.097680	93	-11	0	10	2192	2202	Temp array 8 stop 0043.
7/25	00	46	05	47.948913	-129.097670	93	-11	0	10	2192	2202	Temp array 9 start 0045 in outer most position third row from the bottom.
7/25	00	46	21	47.948914	-129.097667	93	-11	0	10	2192	2202	Frame_Grab:
7/25	00	50	37	47.948911	-129.097631	92	-11	1	10	2192	2202	Temp array 9 stop 0050.
7/25	00	53	24	47.948921	-129.097701	93	-12	0	10	2192	2202	Temp array 10 start 00:53
7/25	00	53	39	47.948921	-129.097704	93	-12	0	10	2192	2202	Frame_Grab:
7/25	00	56	11	47.948901	-129.097673	93	-12	0	10	2192	2202	BIOLOGY: Other Big white vent spider near array.
7/25	00	56	13	47.948901	-129.097672	92	-12	0	10	2192	2202	HIGHLIGHTS: KiPro hard drive start
7/25	00	57	10	47.948905	-129.097661	93	-12	0	10	2192	2202	It looks like a sea spider - never seen a hairy one before.
7/25	00	57	52	47.948912	-129.097660	93	-12	0	10	2192	2202	The sea spider could be a species of Pycnogonid.
7/25	00	58	09	47.948915	-129.097661	92	-12	0	10	2192	2202	Temp array 10 stop 00:58
7/25	00	58	17	47.948917	-129.097661	93	-12	0	10	2192	2202	HIGHLIGHTS: KiPro hard drive stop
7/25	01	00	56	47.948910	-129.097678	92	-12	1	10	2192	2202	Temp array 11 start 01:00:10

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	01	01	25	47.948907	-129.097680	92	-12	1	10	2192	2202	Frame_Grab:
7/25	01	03	33	47.948918	-129.097692	92	-12	1	10	2192	2202	Correction - temp array 11 start 01:01.
7/25	01	06	54	47.948904	-129.097659	93	-12	1	10	2192	2202	Temp array 11 stop 01:06
7/25	01	08	27	47.948912	-129.097673	92	-12	1	10	2192	2202	Temp array 12 start 01:08
7/25	01	09	33	47.948910	-129.097686	92	-12	1	10	2192	2202	Frame_Grab:
7/25	01	13	10	47.948904	-129.097692	92	-12	1	10	2192	2202	Temp array 12 stop 01:13
7/25	01	13	20	47.948903	-129.097692	92	-12	1	10	2192	2202	Going to stow the temperature arrays now.
7/25	01	15	19	47.948887	-129.097662	92	-11	1	10	2192	2202	Left hand array is stowed in the basket.
7/25	01	16	32	47.948900	-129.097653	92	-10	-3	9	2192	2202	Going to stow the right-hand array now.
7/25	01	17	50	47.948918	-129.097668	92	-9	-3	9	2192	2202	Right-hand array (red handle) stowed now.
7/25	01	19	24	47.948915	-129.097688	92	-9	-3	9	2192	2202	Rearranging array in basket.
7/25	01	21	04	47.948897	-129.097685	92	-9	-3	9	2192	2202	Stowed the temperature array in the basket.
7/25	01	21	27	47.948895	-129.097683	92	-9	-2	9	2192	2202	Discussing whether we should collect the hairy Pycnogonid or not.
7/25	01	23	21	47.948893	-129.097691	92	-10	1	10	2192	2202	Going to bungee the array down.
7/25	01	24	22	47.948896	-129.097688	93	-11	1	10	2192	2202	There are two hairy white Pycnogonids sitting near this peanut.
7/25	01	27	08	47.948900	-129.097654	91	-9	-3	10	2192	2202	Trying to find the original white hairy Pycnogonid.
7/25	01	27	20	47.948901	-129.097654	91	-9	-3	10	2192	2202	It's in the middle of the Science cam.
7/25	01	27	22	47.948901	-129.097655	91	-9	-3	10	2192	2202	Frame_Grab:
7/25	01	27	28	47.948902	-129.097655	91	-9	-3	10	2192	2202	Frame_Grab:
7/25	01	28	08	47.948909	-129.097663	91	-9	-3	10	2192	2202	Going to get the syringe sampler out of the basket.
7/25	01	28	42	47.948917	-129.097672	91	-9	-3	10	2192	2202	There are some Alvinellid worms in the sediment here.
7/25	01	28	50	47.948918	-129.097673	91	-9	-3	10	2192	2202	This suggests the temperature is warmer here.
7/25	01	30	04	47.948928	-129.097678	92	-9	-3	10	2192	2202	Picking up the big syringe sampler.
7/25	01	30	57	47.948923	-129.097669	91	-11	-2	10	2192	2202	Going to try to collect the dark sediment to the right of the diffuse flow.
7/25	01	32	03	47.948911	-129.097668	92	-11	-3	10	2192	2202	May also suck the sea spider up.
7/25	01	32	42	47.948904	-129.097673	92	-11	-3	10	2192	2202	It's actually very solid - more rock-like than sediments.
7/25	01	33	38	47.948899	-129.097679	92	-11	-2	10	2192	2202	Going to collect some sediment here.
7/25	01	34	05	47.948897	-129.097677	92	-11	-2	10	2192	2202	SAMPLE: geo This is sample J2-578-Sed-12 . Location 47 56.936 129 5.858 Z=2193m.
7/25	01	35	22	47.948899	-129.097655	91	-10	-3	10	2192	2202	Stowing syringe in basket.
7/25	01	35	55	47.948903	-129.097642	91	-10	-3	10	2192	2202	Syringe is in the basket.
7/25	01	37	26	47.948918	-129.097640	91	-10	-3	10	2192	2202	Tying the bungee down on the large syringe.
7/25	01	38	40	47.948917	-129.097655	91	-10	-3	10	2192	2202	Syringe tied down.
7/25	01	40	56	47.948908	-129.097643	91	-10	-2	10	2192	2202	Plan is to find a friable spire to collect.
7/25	01	41	01	47.948909	-129.097643	91	-10	-2	10	2192	2202	Then we'll take a diffuse flow fluid sample.
7/25	01	41	16	47.948910	-129.097642	91	-10	-2	10	2192	2202	Then we'll drive around and look for an extinct chimney from Dudley.
7/25	01	41	31	47.948911	-129.097642	91	-10	-2	10	2192	2202	The extinct chimneys have lots of iron oxides on them.
7/25	01	42	06	47.948923	-129.097675	94	-12	-3	11	2191	2202	Moving away from this area.
7/25	01	42	54	47.948906	-129.097652	81	-10	-3	12	2190	2203	Traveling past some venting smokers.
7/25	01	44	05	47.948900	-129.097662	77	-12	-2	13	2189	2203	Going to try and collect an active chimney here.
7/25	01	44	35	47.948892	-129.097665	77	-12	-2	13	2190	2203	Port bio box is out.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	01	45	55	47.948884	-129.097640	78	-13	-3	12	2190	2202	This area has some diffuse flow venting - although in the very center it's focused venting.
7/25	01	47	29	47.948876	-129.097634	71	-14	-1	13	2190	2203	Opening the lid of the bio box.
7/25	01	48	27	47.948873	-129.097632	70	-14	-1	13	2190	2203	Going to try and grab the chimney now.
7/25	01	51	42	47.948890	-129.097624	75	-13	0	12	2191	2203	Repositioning Jason so the biobox is closer.
7/25	01	53	05	47.948893	-129.097609	48	-13	0	12	2191	2203	Moving so Jason is higher up.
7/25	01	53	38	47.948891	-129.097608	47	-15	0	12	2191	2203	Going to try and grab this nice cone sulfide.
7/25	01	54	29	47.948887	-129.097610	46	-16	-2	13	2191	2203	It crumbled.
7/25	01	54	37	47.948887	-129.097611	46	-14	-1	12	2191	2203	The top half didn't fall in the box.
7/25	01	54	55	47.948885	-129.097613	46	-14	-1	12	2191	2203	The middle portion was in the hand - put it in the port swing arm biobox.
7/25	01	55	50	47.948884	-129.097624	46	-14	-3	12	2191	2203	Port box closed.
7/25	01	56	13	47.948884	-129.097630	46	-15	-3	12	2191	2203	SAMPLE: geo This chimney piece in the port biobox is J2-578-Sulfide-13 .
7/25	01	58	14	47.948901	-129.097668	59	-13	-4	12	2191	2203	Going to look for a place to sample near this diffuse flow.
7/25	01	59	43	47.948920	-129.097688	118	-13	-4	10	2191	2201	Moving downwards on column.
7/25	02	00	12	47.948921	-129.097689	121	-10	-2	10	2191	2201	Nice clumps of worms on this rock formation.
7/25	02	01	18	47.948921	-129.097682	123	-8	-3	2	2191	2193	There's lots of floc in the water here from the vents.
7/25	02	02	19	47.948918	-129.097677	121	-11	-4	3	2191	2194	TEMPS: Jason temperature The temperature probe is measuring 17.4C.
7/25	02	02	32	47.948916	-129.097675	121	-12	-2	3	2191	2194	We're looking for diffuse flow near the sulfides.
7/25	02	02	40	47.948915	-129.097675	120	-11	-2	3	2191	2194	Putting the Jason temperature probe back.
7/25	02	03	23	47.948911	-129.097669	120	-12	-3	3	2191	2194	Picking up the HFS intake wand.
7/25	02	03	46	47.948909	-129.097666	120	-13	-4	3	2191	2194	Inserting the HFS intake into the diffuse flow area.
7/25	02	03	58	47.948908	-129.097665	119	-12	-4	10	2191	2201	Wand is inserted.
7/25	02	04	06	47.948907	-129.097664	119	-12	-4	3	2191	2194	Starting the Beast up.
7/25	02	04	31	47.948906	-129.097661	121	-12	-4	3	2191	2193	TEMPS: HFS temperature 12C and rising.
7/25	02	04	41	47.948905	-129.097660	121	-12	-4	3	2191	2193	TEMPS: HFS temperature 18C.
7/25	02	04	55	47.948905	-129.097659	122	-12	-4	3	2191	2194	TEMPS: HFS temperature 20C.
7/25	02	05	23	47.948903	-129.097656	122	-12	-4	3	2191	2194	This is a good sampling site.
7/25	02	05	34	47.948902	-129.097655	122	-12	-4	2	2191	2193	Temperature is fluctuating between 18-19-20C.
7/25	02	06	52	47.948895	-129.097649	121	-12	-4	3	2191	2194	Waiting for temp to stabilize before sampling.
7/25	02	07	02	47.948894	-129.097649	121	-12	-4	10	2191	2201	SAMPLE: fluid Unfiltered bag #20 start
7/25	02	08	58	47.948893	-129.097649	121	-12	-4	3	2191	2194	SAMPLE: fluid This is sample J2-578-HFS-14 . Location: 47N 56.936 129W 5.857
7/25	02	10	10	47.948904	-129.097651	122	-12	-4	3	2191	2194	SAMPLE: fluid HFS-14 stop.
7/25	02	11	10	47.948915	-129.097649	122	-12	-4	10	2191	2201	J2-578-HFS-14 : Tmax=20.7 Tavg=19.8 T2=9 vol=500mL. start 02:07:02 end 02:10:10.
7/25	02	11	57	47.948922	-129.097648	121	-12	-4	3	2191	2194	SAMPLE: fluid J2-578-HFS-15 is filtered piston #9 start.
7/25	02	12	21	47.948924	-129.097649	121	-12	-4	3	2191	2194	This is in the same location.
7/25	02	18	03	47.948901	-129.097646	119	-12	-4	11	2191	2202	HFS-15 finished.
7/25	02	18	59	47.948902	-129.097648	120	-11	-3	2	2191	2193	J2578-HFS-15 : Tmax=21.1 Tavg=18.3 T2=9 vol=676. start 02:11:57 end 02:18:04.
7/25	02	19	09	47.948903	-129.097648	121	-10	-4	2	2191	2194	Stowing the HFS intake wand in the basket.
7/25	02	19	35	47.948905	-129.097647	121	-11	-4	3	2191	2194	Depth 2191.5m heading 121.2
7/25	02	19	56	47.948908	-129.097646	121	-11	-4	3	2191	2194	Red small syringe out for sampling now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	02	21	27	47.948896	-129.097615	82	-8	1	6	2191	2197	Going to grab some orange mat from on top of tubeworm clump.
7/25	02	22	07	47.948894	-129.097608	82	-8	1	6	2191	2197	Wriggling syringe to straighten it out.
7/25	02	22	51	47.948891	-129.097601	82	-9	1	6	2190	2197	Grasping syringe in left hand.
7/25	02	23	41	47.948891	-129.097597	82	-10	1	6	2190	2197	Positioning syringe in orange mat.
7/25	02	23	55	47.948891	-129.097597	82	-10	1	6	2190	2197	Want nozzle of syringe tip on top of the mat.
7/25	02	24	29	47.948894	-129.097598	83	-10	2	6	2190	2197	Pulling syringe chain. J2-578-Mat-16.
7/25	02	24	43	47.948895	-129.097599	83	-10	2	6	2190	2197	There's some stuff in the syringe.
7/25	02	24	49	47.948895	-129.097599	83	-9	2	6	2190	2197	Going to store syringe now.
7/25	02	25	35	47.948896	-129.097602	83	-8	0	6	2191	2197	Syringe stowed in basket.
7/25	02	27	47	47.948988	-129.097633	123	-12	-3	9	2192	2201	Now we'll look around for some inactive sulfide chimneys to sample.
7/25	02	28	37	47.949054	-129.097560	156	-13	-2	8	2193	2201	Moving to the north.
7/25	02	29	03	47.949033	-129.097508	189	-13	-4	8	2193	2202	There are some old pillars here with clumps of white worms.
7/25	02	30	29	47.949050	-129.097513	186	-12	-4	6	2196	2202	This pillar looks inactive.
7/25	02	30	53	47.949044	-129.097504	197	-12	-3	7	2195	2202	It's protruding at an angle from this area of dead-looking worms and white sulfide.
7/25	02	31	14	47.949040	-129.097510	205	-12	-4	6	2196	2202	There are some blue-purple mats on this rock.
7/25	02	31	24	47.949037	-129.097507	208	-12	-2	6	2196	2202	They could be ciliates.
7/25	02	32	43	47.949032	-129.097523	219	-13	-3	6	2196	2202	This chimney has a lot of iron oxides on top.
7/25	02	32	57	47.949031	-129.097525	196	-12	-3	6	2196	2202	We'll try to collect it.
7/25	02	34	16	47.949012	-129.097514	155	-12	-3	6	2196	2202	The port bio box is out.
7/25	02	34	24	47.949010	-129.097510	154	-13	-3	6	2195	2202	Moving up close to the chimney.
7/25	02	36	17	47.949013	-129.097517	172	-16	0	7	2195	2202	Opened the port biobox lid.
7/25	02	37	12	47.949015	-129.097521	133	-6	-7	6	2196	2202	There are some snails and possibly orange mat on top of the iron oxide.
7/25	02	37	36	47.949017	-129.097522	132	-6	-1	6	2195	2202	Grabbing the chimney top.
7/25	02	38	02	47.949022	-129.097523	132	-8	-4	6	2195	2202	It's quite large.
7/25	02	38	33	47.949027	-129.097524	134	-7	-4	6	2195	2202	Could try to shake the chimney.
7/25	02	39	26	47.949033	-129.097528	134	-6	-3	6	2196	2202	There are also some limpets on the chimney.
7/25	02	39	53	47.949034	-129.097529	134	-7	-4	6	2195	2202	Broke off some small pieces of chimney.
7/25	02	40	09	47.949033	-129.097529	136	-7	-5	6	2195	2202	This is J2-578-Sulfide-17 . Location: 47 56.944 129 5.850 Z=2196m.
7/25	02	40	21	47.949032	-129.097529	136	-7	-5	6	2195	2202	Put the chimney pieces in the port box.
7/25	02	40	31	47.949032	-129.097529	138	-7	-8	6	2195	2202	Going back for more sulfide.
7/25	02	41	24	47.949028	-129.097537	133	-7	-7	6	2195	2202	Snapped a big piece off - putting it in the port box.
7/25	02	41	45	47.949028	-129.097541	134	-8	-5	6	2195	2202	This is all part of the same sample - SULFIDE-17.
7/25	02	42	26	47.949031	-129.097550	133	-7	-8	6	2196	2202	The port biobox is closed.
7/25	02	45	56	47.949044	-129.097580	132	-7	-9	6	2195	2202	Next we'll take a fluid sample.
7/25	02	46	02	47.949043	-129.097581	132	-7	-9	6	2196	2202	We're waiting for someone who can run the Beast.
7/25	02	48	18	47.949051	-129.097605	132	-7	-9	6	2195	2202	The HFS intake is positioned next to the dead chimney.
7/25	02	48	35	47.949057	-129.097610	132	-7	-9	6	2195	2202	We'll get one sample here for isotope analysis.
7/25	02	50	30	47.949080	-129.097626	132	-7	-9	6	2195	2202	Getting the Beast ready for sampling.
7/25	02	50	45	47.949076	-129.097622	132	-7	-9	6	2195	2202	SAMPLE: fluid unfiltered piston #6 start.
7/25	02	52	28	47.949043	-129.097553	132	-7	-9	6	2196	2202	SAMPLE: fluid Unfiltered piston #6 is J2-578-HFS-18 .

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	02	55	05	47.949072	-129.097580	132	-7	-9	6	2195	2202	HFS-18 stop.
7/25	02	55	51	47.949064	-129.097605	133	-7	-8	6	2195	2202	J2-578-HFS-18: Tmax=2.6 Tavg=2.3 T2=2.3 vol=675. start 02:50:45 end 02:55:05.
7/25	02	56	02	47.949062	-129.097608	133	-7	-8	6	2195	2202	Putting the HFS intake wand back in the basket.
7/25	02	56	18	47.949058	-129.097609	133	-7	-8	6	2195	2202	Going to next poke the dead chimney with the Jason temp probe.
7/25	02	56	35	47.949055	-129.097606	133	-7	-8	6	2195	2202	Getting the Jason temp probe out.
7/25	02	57	12	47.949048	-129.097587	132	-7	-10	6	2195	2202	Trying to stick the temp probe into the orange gash.
7/25	02	57	32	47.949045	-129.097572	132	-7	-9	6	2195	2202	Breaking away the bottom part to try to put the probe inside more.
7/25	02	58	09	47.949040	-129.097544	135	-6	-8	6	2196	2202	Position was too hard to put in the orange gash.
7/25	02	58	20	47.949039	-129.097538	133	-7	-9	6	2195	2202	Trying to poke probe into little hole.
7/25	02	58	22	47.949038	-129.097536	132	-7	-9	6	2195	2202	It's not warm.
7/25	02	58	36	47.949037	-129.097529	133	-7	-8	6	2195	2202	The chimney seems totally dead.
7/25	02	58	56	47.949034	-129.097524	133	-7	-5	6	2195	2202	TEMPS: Jason temperature It was about 2.7C - ambient.
7/25	02	58	57	47.949034	-129.097523	133	-8	-4	6	2195	2202	Stowing the Jason temp probe.
7/25	02	59	07	47.949032	-129.097522	136	-12	-2	7	2195	2202	Next we're heading to Dudley.
7/25	03	00	05	47.949037	-129.097493	156	-11	-3	9	2193	2202	Traveling to Dudley.
7/25	03	05	50	47.948925	-129.097463	250	-10	-2	8	2193	2201	We're arriving at Dudley.
7/25	03	08	44	47.948862	-129.097536	286	-11	-1	14	2191	2206	Looking around the area for an exact location of Dudley.
7/25	03	10	12	47.948947	-129.097577	253	-10	-2	6	2190	2196	There's a black smoker here.
7/25	03	11	49	47.948996	-129.097687	227	-10	-2	7	2195	2201	Not sure where we are - checking.
7/25	03	13	59	47.948969	-129.097653	134	-11	-2	9	2192	2201	HIGHLIGHTS: KiPro hard drive start Recording Medea cam of Jason.
7/25	03	14	36	47.948961	-129.097635	128	-11	-2	10	2192	2201	Looking around this area - lots of pillars with pinnacles.
7/25	03	14	39	47.948960	-129.097635	124	-10	-3	10	2191	2201	Some clumps of worms.
7/25	03	15	11	47.948932	-129.097621	126	-10	-2	13	2189	2202	Some black smokers.
7/25	03	15	43	47.948905	-129.097646	169	-11	-2	11	2190	2201	A lot of floc in this area.
7/25	03	16	30	47.948968	-129.097725	191	-10	-3	8	2193	2201	Still trying to locate Dudley.
7/25	03	17	32	47.949006	-129.097691	142	-11	-2	8	2193	2201	Waiting for the Doppler.
7/25	03	18	55	47.948863	-129.097647	171	-10	-1	13	2187	2201	HIGHLIGHTS: KiPro hard drive stop Stopping recording of Jason from Medea.
7/25	03	23	16	47.948878	-129.097422	282	-11	-2	12	2192	2204	We're looking at the chimneys again.
7/25	03	26	01	47.948783	-129.097642	246	-10	-1	6	2199	2205	We're going to look around for a marker.
7/25	03	26	35	47.948828	-129.097654	332	-10	-2	5	2199	2204	There's a marker here.
7/25	03	27	11	47.948837	-129.097657	328	-10	-2	5	2199	2204	It's not a marker that we recognize - could be someone's experiment.
7/25	03	29	45	47.948970	-129.097457	259	-10	-1	8	2194	2202	THIS IS WHEN THE SCIENCE PARTY REALIZED THERE WAS A PROBLEM....WHAT WAS THOUGHT TO BE DANTE WAS DUDLEY: We HAVE been circling around Dudley for a while.
7/25	03	30	22	47.948986	-129.097493	261	-10	-2	5	2196	2201	There's a marker here - can't see what it says.
7/25	03	30	35	47.948989	-129.097493	262	-10	-1	5	2196	2201	It says B9?
7/25	03	30	41	47.948988	-129.097495	260	-10	-2	5	2196	2201	NAV: Doppler Reset
7/25	03	31	00	47.948996	-129.097497	261	-11	-3	5	2196	2201	Going to grab the marker
7/25	03	31	08	47.948999	-129.097499	260	-12	-4	5	2196	2201	to see what it says.
7/25	03	31	13	47.949001	-129.097499	261	-11	-3	6	2195	2201	It looks like B9.
7/25	03	32	12	47.948917	-129.097467	258	-8	-1	10	2192	2203	Discussing which location we were actually just at.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	03	33	08	47.948847	-129.097519	299	-10	-2	14	2194	2208	Actually the marker may have been 89.
7/25	03	34	53	47.948974	-129.097663	111	-11	-3	10	2191	2201	WE'VE BEEN SAMPLING AT DUDLEY SINCE ~01:33:38.
7/25	03	36	25	47.948938	-129.097548	204	-11	-3	9	2188	2197	ON DIVE J2-575 WE ALSO SAMPLED AT DUDLEY NOT DANTE. THE VIRTUAL VAN ENTRIES WILL HAVE THE INCORRECT NAME. THE DIVE LOGS HAVE BEEN CORRECTED IN THIS LOG FOR THE CRUISE REPORT. SAMPLE LOGS HAVE BEEN CORRECTED AS WELL. CAN'T CHANGE THE ENTRIES IN THE VIRTUAL VAN. (S. Merle susan.merle@noaa.gov)
7/25	03	43	44	47.949029	-129.097474	311	-10	-1	8	2195	2203	Now we're heading to Dante.
7/25	03	47	33	47.949143	-129.097777	290	-10	-1	7	2193	2201	We're going to look for the marker here.
7/25	03	48	10	47.949062	-129.097798	289	-9	-1	7	2196	2204	The marker should be on the southwest side of Dante.
7/25	03	48	13	47.949062	-129.097806	299	-11	-2	6	2196	2202	It is marker D.
7/25	03	52	30	47.949216	-129.097866	260	-7	0	6	2189	2194	We saw marker D in the rear view.
7/25	03	52	34	47.949215	-129.097854	259	-9	-1	6	2188	2194	We're at Dante.
7/25	03	53	28	47.949215	-129.097764	262	-11	-2	7	2190	2197	We'll look around the top of Dante.
7/25	03	53	42	47.949209	-129.097767	269	-10	-2	8	2190	2198	Depth here is 2190m.
7/25	03	54	31	47.949221	-129.097801	326	-10	-1	13	2186	2198	We're right next to Grotto.
7/25	03	54	39	47.949229	-129.097807	325	-9	-1	12	2185	2198	We'll try to make sure we don't go to Grotto.
7/25	03	54	47	47.949236	-129.097809	321	-10	-1	13	2185	2197	Dante has a very steep west side.
7/25	03	55	22	47.949270	-129.097787	299	-9	-1	13	2183	2196	There's some white sulfides here.
7/25	03	55	30	47.949274	-129.097785	299	-10	-1	14	2182	2196	Also some trailing bushes of tubeworms.
7/25	03	55	54	47.949270	-129.097789	310	-10	-2	16	2180	2196	Continuing upwards - some flanges with chimneys and spires on it.
7/25	03	56	45	47.949273	-129.097829	337	-10	-1	11	2181	2191	There's a little bit of diffuse flow in this structure.
7/25	03	58	57	47.949273	-129.097840	338	-11	-2	10	2184	2193	Going to try to collect some sulfides here in the scoop bag.
7/25	03	59	05	47.949272	-129.097838	319	-12	-1	14	2183	2197	Basket out.
7/25	04	01	31	47.949271	-129.097784	314	-12	-5	14	2182	2196	Using the scoop bag from the dive weight box.
7/25	04	02	19	47.949269	-129.097794	317	-12	-5	14	2182	2196	Bag is in the right hand.
7/25	04	04	19	47.949268	-129.097842	343	-14	-3	8	2183	2191	Going to collect an active chimney with the scoop bag.
7/25	04	06	25	47.949257	-129.097836	343	-15	-1	8	2183	2191	Turning bag upside down over chimneys.
7/25	04	07	22	47.949259	-129.097827	343	-15	0	8	2183	2191	Trying to bag the front right chimney.
7/25	04	07	31	47.949260	-129.097825	343	-15	0	8	2183	2191	Giving the chimney a shake.
7/25	04	08	15	47.949266	-129.097821	340	-16	-2	8	2183	2191	Going to crush the chimney with the left hand.
7/25	04	08	22	47.949267	-129.097821	340	-16	-2	8	2183	2191	It's in the bag.
7/25	04	09	00	47.949250	-129.097808	344	-14	-1	11	2183	2194	SAMPLE: geo This is J2-578-Sulfide-19
7/25	04	11	39	47.949226	-129.097800	339	-16	-4	16	2184	2200	Putting the scoop bag into the port biobox.
7/25	04	12	23	47.949225	-129.097798	339	-15	-4	15	2184	2199	We've backed away from Dante.
7/25	04	13	32	47.949225	-129.097789	339	-15	-5	15	2184	2199	Bag stowed in port biobox.
7/25	04	13	46	47.949224	-129.097785	339	-15	-4	15	2184	2199	Closing lid of port box.
7/25	04	14	21	47.949226	-129.097777	339	-15	-2	16	2184	2199	Tied the bungee down on the port box.
7/25	04	14	56	47.949227	-129.097769	339	-13	-4	15	2184	2199	Now we'll take a diffuse flow fluid sample.
7/25	04	15	16	47.949228	-129.097764	339	-13	-3	15	2184	2199	We'd like to take it where the active sulfide was just collected.
7/25	04	16	18	47.949263	-129.097837	354	-13	-4	8	2182	2190	Going back to the sampling area.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	04	18	17	47.949267	-129.097830	18	-14	-4	10	2183	2193	Getting the HFS intake wand out to fluid sample.
7/25	04	19	17	47.949224	-129.097888	24	-12	-4	15	2177	2192	Backing away - engineering problem.
7/25	04	20	54	47.949231	-129.097827	12	-14	-4	14	2182	2195	Seems to be fixed now.
7/25	04	21	08	47.949256	-129.097824	10	-13	-3	12	2182	2194	Going back to sample site.
7/25	04	22	18	47.949276	-129.097832	6	-13	-4	8	2183	2191	We're at 47N 56.956 and 129W 5.870'
7/25	04	22	36	47.949276	-129.097833	7	-13	-4	8	2183	2191	This is the same location for J2578-Sulfide-19.
7/25	04	22	53	47.949275	-129.097834	6	-12	-4	8	2183	2191	TEMPS: HFS temperature T is 15C and rising.
7/25	04	24	07	47.949276	-129.097844	7	-12	-4	8	2183	2191	There are some scale worms and limpets on this chimney.
7/25	04	24	41	47.949278	-129.097849	5	-12	-4	8	2183	2191	Trying to shake worms off the HFS intake wand.
7/25	04	26	24	47.949290	-129.097854	6	-12	-4	8	2183	2191	SAMPLE: fluid This site is getting temperature variations from 8 - 15C.
7/25	04	26	34	47.949292	-129.097854	6	-12	-4	8	2183	2191	Could be because worms are clogging the intake.
7/25	04	26	39	47.949292	-129.097854	6	-12	-4	8	2183	2191	Trying to clear a spot to sample.
7/25	04	26	47	47.949293	-129.097854	6	-12	-4	8	2183	2191	TEMPS: HFS temperature Temp is ~11C.
7/25	04	27	33	47.949299	-129.097851	6	-13	-4	8	2183	2191	Temp is ~14C.
7/25	04	29	03	47.949301	-129.097850	6	-12	-4	8	2183	2191	SAMPLE: fluid This is J2-578-HFS-20 filtered bag #19.
7/25	04	31	09	47.949287	-129.097860	6	-12	-4	8	2183	2191	Still filtering J2578-HFS-20.
7/25	04	32	53	47.949273	-129.097850	6	-12	-4	8	2183	2191	J2578-HFS-20 finished.
7/25	04	35	18	47.949270	-129.097836	6	-12	-4	8	2183	2191	J2-578-HFS-20: Tmax=15.2 Tavg=13.9 T2=7.1 vol=502mL. start 04:29:03 end 04:32:54.
7/25	04	35	33	47.949271	-129.097836	6	-12	-4	8	2183	2191	We've finished fluid sampling at this site.
7/25	04	35	40	47.949271	-129.097836	6	-12	-4	8	2183	2191	Going to store the HFS intake wand.
7/25	04	36	57	47.949252	-129.097891	21	-13	-2	12	2183	2194	Backing away to see where to collect syringe samples.
7/25	04	37	19	47.949264	-129.097890	22	-13	-2	11	2183	2194	Going to collect this orange mat in the syringe sampler.
7/25	04	38	30	47.949259	-129.097877	20	-12	-5	12	2183	2195	Getting a small syringe from the basket.
7/25	04	39	19	47.949257	-129.097869	20	-12	-5	13	2183	2195	This is small blue syringe.
7/25	04	41	16	47.949279	-129.097862	7	-13	-3	11	2183	2194	This is going to be sample J2-578-Mat-21 .
7/25	04	43	04	47.949284	-129.097871	17	-14	-2	12	2183	2194	Positioning syringe in orange mat.
7/25	04	43	08	47.949284	-129.097871	17	-14	-2	12	2183	2194	HIGHLIGHTS: KiPro hard drive start
7/25	04	44	15	47.949282	-129.097872	17	-15	-2	12	2183	2195	Orange mat is squishy.
7/25	04	44	29	47.949281	-129.097873	18	-15	-2	12	2183	2195	Pulling syringe sample now.
7/25	04	44	51	47.949282	-129.097873	18	-14	-2	12	2183	2195	There's some yellow mat underneath where the orange mat was.
7/25	04	45	02	47.949282	-129.097874	17	-14	-2	12	2183	2194	Going to put syringe back in basket now.
7/25	04	45	38	47.949285	-129.097875	17	-13	-4	12	2183	2195	Next we'll go to collect some dead chimneys.
7/25	04	46	17	47.949278	-129.097871	15	-14	-2	13	2183	2195	SAMPLE: bio J2-578-Mat-21 was collected at 47N 56.955 and 129W 5.872
7/25	04	46	50	47.949252	-129.097792	358	-13	-3	12	2185	2197	We're going down to the bottom of this pillar now.
7/25	04	47	00	47.949242	-129.097776	312	-13	-1	14	2185	2199	Next to the marker D there were some dead spires.
7/25	04	48	02	47.949234	-129.097792	302	-13	-2	8	2190	2199	We're at marker D.
7/25	04	48	20	47.949238	-129.097798	301	-13	-2	8	2190	2199	We may break one of these dead chimneys off.
7/25	04	49	05	47.949233	-129.097805	302	-16	-4	9	2190	2199	Grabbing the top of the right-hand chimney.
7/25	04	49	47	47.949229	-129.097815	302	-16	-4	9	2190	2199	The whole chimney broke - it's too big.
7/25	04	49	59	47.949229	-129.097819	301	-16	-2	9	2190	2199	We'll just collect the little piece from the side of the spire.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	04	50	56	47.949230	-129.097834	302	-16	-1	9	2190	2199	Going to store this little piece of sulfide chimney in the weight box.
7/25	04	51	21	47.949229	-129.097832	302	-12	-3	8	2190	2199	SAMPLE: geo This was sample J2-578-Sulfide-22 .
7/25	04	52	08	47.949213	-129.097799	305	-13	-2	10	2189	2199	J2-578-Sulfide-22 was collected at 47N 56.953' and 129W 5.868' depth 2190m
7/25	04	53	23	47.949284	-129.097803	315	-14	-1	14	2182	2196	Traveling up to the top of Dante.
7/25	04	54	15	47.949305	-129.097792	313	-13	-1	17	2178	2196	Looking for a flat area to do a temperature array.
7/25	04	54	48	47.949306	-129.097806	319	-13	-1	17	2178	2196	There's a black smoker on the left of this area.
7/25	04	55	06	47.949306	-129.097813	320	-13	0	16	2179	2195	There's a big clump of worms living on the cliff above the smoker.
7/25	04	55	16	47.949306	-129.097809	314	-13	-1	17	2179	2195	We'll rotate around the Dante structure now.
7/25	04	56	27	47.949345	-129.097786	304	-13	-2	20	2175	2195	There's a nice black smoker here with lots of tubeworms living underneath.
7/25	04	58	07	47.949343	-129.097802	339	-9	1	13	2176	2188	We'll sample in this location.
7/25	04	58	26	47.949342	-129.097803	339	-11	-1	16	2175	2192	Taking the HFS intake wand out.
7/25	04	59	23	47.949340	-129.097804	338	-11	-1	14	2175	2190	TEMPS: HFS temperature 200C and rising.
7/25	04	59	35	47.949339	-129.097804	339	-11	-1	14	2175	2190	TEMPS: HFS temperature 250C and still rising.
7/25	04	59	50	47.949339	-129.097803	338	-11	-1	14	2175	2190	302C and still going up.
7/25	05	01	06	47.949337	-129.097800	339	-10	-1	16	2175	2192	J2-578-HFS-23 Filtered piston #3 start
7/25	05	03	13	47.949340	-129.097793	338	-10	-1	14	2175	2190	SAMPLE: fluid The worms on this mound are Ridgeia. There's also Paralvinella worms below the smoker.
7/25	05	04	38	47.949340	-129.097792	339	-10	-1	14	2175	2190	SAMPLE: fluid J2578-HFS-23 finished.
7/25	05	05	18	47.949339	-129.097793	339	-11	-1	16	2175	2192	J2-578-HFS-23 : Tmax=336.2 Tavg=333.8 T2=70 vol=625 mL.
7/25	05	06	23	47.949335	-129.097792	340	-10	-1	16	2175	2192	SAMPLE: fluid J2-578-HFS-23 start 05:01:06 end 05:05:18
7/25	05	07	38	47.949330	-129.097790	339	-11	-1	16	2175	2192	J2-578-GTHFS-24 : fired starboard gastight.
7/25	05	08	14	47.949327	-129.097789	339	-11	-1	16	2175	2192	The temperature has dropped a lot - it's only at 100C.
7/25	05	08	28	47.949326	-129.097789	339	-11	-1	16	2175	2191	Taking the HFS out and re-inserting into vent.
7/25	05	09	02	47.949324	-129.097789	340	-11	-1	14	2175	2190	SAMPLE: gas J2-578-GTHFS-24 was starboard gastight blue #12.
7/25	05	09	42	47.949323	-129.097789	340	-11	-1	14	2175	2190	Shaking out the HFS intake wand.
7/25	05	10	14	47.949322	-129.097790	340	-10	-1	14	2175	2189	Re-inserting the HFS intake again.
7/25	05	10	36	47.949322	-129.097791	340	-10	-1	14	2175	2190	Now the temp is going up -- 100C and rising.
7/25	05	11	12	47.949322	-129.097792	341	-10	-1	14	2175	2189	Going to fire another gastight on the HFS when it gets hot again.
7/25	05	11	31	47.949322	-129.097793	341	-10	-1	14	2175	2189	The T is 132 C and dropping a little.
7/25	05	12	03	47.949321	-129.097794	341	-10	-1	14	2175	2189	now we're at 140 but dropping.
7/25	05	12	18	47.949321	-129.097794	341	-10	-1	14	2175	2189	Moving the intake wand again.
7/25	05	12	43	47.949320	-129.097793	341	-10	-1	14	2175	2189	The temp is dropping a lot -- 70C and falling.
7/25	05	13	21	47.949319	-129.097791	341	-10	-1	14	2175	2189	The T is rising again -- 180C and going up.
7/25	05	13	35	47.949318	-129.097790	341	-9	-1	14	2175	2189	The T is now at 215.
7/25	05	14	57	47.949315	-129.097782	341	-10	-1	14	2175	2189	Nudged the HFS intake - now temp is rising.
7/25	05	15	07	47.949315	-129.097781	341	-10	-1	14	2175	2189	The T is now 288C.
7/25	05	15	17	47.949314	-129.097780	341	-10	-1	14	2175	2189	The T is above 300C.
7/25	05	15	49	47.949314	-129.097777	341	-10	-1	13	2175	2188	SAMPLE: fluid J2-578-HFS-25 Unfiltered bag #18 start
7/25	05	17	12	47.949317	-129.097772	341	-10	-1	14	2175	2189	SAMPLE: gas J2-578-GTHFS-26 fired
7/25	05	17	39	47.949318	-129.097771	341	-9	-1	13	2175	2188	J2578-GTHFS-26 was middle gastight T=260C.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	05	18	38	47.949323	-129.097772	342	-10	-1	14	2175	2189	J2-578-HFS-25: end 05:17:40. Tmax=322C Tavg=298.7 T2=90 vol=368
7/25	05	19	27	47.949323	-129.097784	318	-7	-6	18	2175	2193	Now we're rotating to the left to do some temperature mapping.
7/25	05	20	20	47.949324	-129.097786	319	-5	-5	17	2176	2193	Untying the temperature arrays from the basket.
7/25	05	22	04	47.949325	-129.097789	320	-6	-5	17	2176	2193	Picking up the red handled array in right hand.
7/25	05	22	13	47.949324	-129.097790	320	-6	-5	17	2176	2193	Using the left hand to get the silver handled array.
7/25	05	22	27	47.949324	-129.097789	320	-6	-5	17	2176	2193	There are quite a few temperature sensors knocked off the red array.
7/25	05	23	00	47.949323	-129.097790	320	-6	-5	17	2176	2193	The bottom row right-hand 3 columns are missing sensors.
7/25	05	23	31	47.949323	-129.097790	319	-7	-4	17	2176	2193	Going to try to do an array of 4 across - 2 rows.
7/25	05	23	39	47.949323	-129.097791	320	-7	-4	17	2176	2193	HIGHLIGHTS: KiPro hard drive start
7/25	05	24	44	47.949321	-129.097793	320	-6	-4	17	2176	2193	Frame_Grab:
7/25	05	24	55	47.949321	-129.097794	320	-6	-4	17	2176	2193	Array position 1 - 05:24 start
7/25	05	24	59	47.949321	-129.097794	320	-6	-4	17	2176	2192	Frame_Grab:
7/25	05	25	12	47.949320	-129.097795	320	-6	-4	17	2176	2193	Frame_Grab:
7/25	05	26	48	47.949314	-129.097798	320	-6	-4	17	2176	2192	This will be held in position for 5 minutes.
7/25	05	28	22	47.949306	-129.097792	320	-6	-4	17	2176	2193	Array position 1 stop 05:28.
7/25	05	28	48	47.949304	-129.097789	320	-5	-4	17	2176	2193	Moving to position 2.
7/25	05	29	02	47.949303	-129.097787	319	-5	-3	17	2176	2193	Frame_Grab:
7/25	05	29	12	47.949303	-129.097786	319	-5	-3	17	2176	2192	Array position 2 start 05:29.
7/25	05	29	15	47.949302	-129.097786	319	-5	-3	17	2176	2193	Frame_Grab:
7/25	05	33	14	47.949310	-129.097779	319	-5	-3	16	2176	2192	Array pos 2 stop 05:33
7/25	05	34	25	47.949313	-129.097780	320	-5	-3	17	2176	2192	Array position 3 start 05:34
7/25	05	34	33	47.949313	-129.097780	320	-5	-3	17	2176	2193	Frame_Grab:
7/25	05	38	17	47.949321	-129.097786	320	-6	-3	13	2176	2189	Array position 3 stop 05:38
7/25	05	38	41	47.949321	-129.097787	320	-5	-3	17	2176	2192	Going to replace the sensor arrays in the basket.
7/25	05	40	52	47.949317	-129.097779	320	-6	-4	17	2176	2192	One sensor fell off the right-hand array- going to try to pick it up.
7/25	05	41	32	47.949315	-129.097775	320	-5	-4	16	2176	2192	Another one fell off --going to stow the array.
7/25	05	41	54	47.949314	-129.097773	320	-5	-4	17	2176	2193	Stowing silver left-hand array.
7/25	05	42	49	47.949314	-129.097770	320	-6	-4	17	2175	2192	Silver array is stowed.
7/25	05	43	05	47.949314	-129.097770	320	-5	-4	17	2176	2193	Putting red right-hand array in the basket.
7/25	05	43	42	47.949315	-129.097772	320	-6	-4	17	2175	2193	Red array stowed.
7/25	05	43	50	47.949315	-129.097772	320	-6	-4	17	2176	2193	Going for dropped temperature sensors.
7/25	05	44	39	47.949318	-129.097775	319	-6	-4	17	2175	2193	Picked up one sensor - it fell on the basket.
7/25	05	45	08	47.949320	-129.097778	319	-5	-4	17	2176	2193	Going to bungee the arrays down.
7/25	05	45	50	47.949323	-129.097781	320	-5	-3	17	2176	2193	Picked up the last small syringe - yellow.
7/25	05	47	09	47.949326	-129.097789	324	-3	-3	13	2176	2188	Going to get some sediment in this syringe.
7/25	05	47	46	47.949328	-129.097778	323	-12	-1	20	2174	2194	SAMPLE: geo This will be sample J2-578-Sed-27 - small yellow syringe.
7/25	05	49	34	47.949328	-129.097777	324	-14	-1	19	2175	2194	Going to try to let the floc clear.
7/25	05	50	31	47.949324	-129.097781	325	-13	-3	19	2175	2194	Getting a syringe sample from this dark sediment.
7/25	05	50	45	47.949323	-129.097781	325	-13	-3	19	2175	2194	SAMPLE: geo J2-578-Sed-27 collection.
7/25	05	51	37	47.949320	-129.097783	326	-14	-3	19	2175	2194	Nothing in first try - depressing plunger.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-578 Dive Log
7/25	05	51	49	47.949319	-129.097784	326	-13	-3	19	2175	2194	Going to collect again.
7/25	05	52	03	47.949318	-129.097784	326	-13	-3	19	2175	2194	This time there's sediment in the syringe.
7/25	05	52	18	47.949317	-129.097784	326	-11	-1	18	2175	2194	HIGHLIGHTS: KiPro hard drive stop
7/25	05	52	28	47.949317	-129.097784	326	-12	-1	18	2175	2194	Stowing syringe in basket.
7/25	05	53	24	47.949315	-129.097785	326	-12	0	18	2175	2194	Dropped a set of weights.
7/25	05	54	12	47.949314	-129.097786	325	-13	-3	19	2175	2194	Dropping second set of weights.
7/25	05	54	40	47.949314	-129.097785	326	-13	1	18	2175	2194	Tying bungee down over temperature sensor arrays.
7/25	05	55	32	47.949310	-129.097782	323	-12	1	19	2174	2193	Backing away from Dante.
7/25	05	55	43	47.949308	-129.097780	323	-12	1	22	2172	2194	Sample collection and temperature mapping done.
7/25	05	56	03	47.949315	-129.097750	29	-9	0	12	2167	2180	JASON: Jason off bottom

Table 7.4.6 J2-579 Jason Dive Log (Main Endeavour Field, Endeavour Segment, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	16	14	00									Jason on bottom
7/25	16	15										Evidence of venting on this raised structure directly beneath us. White spot probably tubeworms.
7/25	16	16										Ballasting Jason.
7/25	16	18	30	47.950036	-129.096984	22	-9	-2	10	2192	2202	Marv says that only the southern end of MEF has been cooling. Marker ahead. Beautiful structure here.
7/25	16	19	59	47.949999	-129.096984	39	-8	-1	6	2196	2202	We're on the south side of what Marv thinks is Hulk. Gremlin is to the south of Hulk.
7/25	16	20	59	47.949987	-129.096897	358	-12	-1	5	2200	2205	See lots of worms here. Some small sulfide spires. Don't see any black smoke yet.
7/25	16	21	40	47.949989	-129.096874	340	-9	0	5	2201	2206	Lots of flow and some semi-black smoke coming out of some of these small spires with beehives on the top.
7/25	16	22	13	47.949988	-129.096871	331	-11	0	6	2200	2207	Marv confirms that we are at Gremlin vent.
7/25	16	23	05	47.949984	-129.096874	332	-11	0	6	2200	2206	Gremlin is an "appendage" of Hulk. This little chimney sprung up in 2005.
7/25	16	23	32	47.949984	-129.096875	331	-7	-2	5	2201	2206	At some point will probably take the top off this little structure and see if we can sample it.
7/25	16	23	53	47.949983	-129.096878	332	-10	-1	6	2201	2206	Lots of shimmering water here and dense biota.
7/25	16	24	51	47.949982	-129.096879	332	-8	-1	5	2201	2206	Some healthy looking tubeworms here but also lots of not-so-happy brown worms.
7/25	16	25	23	47.949982	-129.096879	332	-9	-1	5	2201	2206	Looks like palm worms amid the tubeworms.
7/25	16	25	59	47.949984	-129.096879	332	-9	-2	5	2201	2206	There's a little chimney opening with lots of flow.
7/25	16	26	09	47.949985	-129.096880	332	-8	-2	5	2201	2206	Getting out the Jason temp probe.
7/25	16	26	55	47.949988	-129.096882	332	-8	-2	5	2201	2206	Beautiful image in the brow cam of this smaller venting area with Hulk in the background.
7/25	16	27	17	47.949990	-129.096884	332	-8	-2	5	2201	2206	Marv says Hulk is probably 20+ meters.
7/25	16	28	45	47.949994	-129.096894	332	-8	0	5	2201	2206	NAV: Dropped DVL target Gremlin-11 target. -129 5.8144 47 57.0001. Z=2201. Jason temp=27C. Hdg 7deg.
7/25	16	29	04	47.949994	-129.096896	332	-8	-1	5	2201	2206	Stowing the Jason temp probe.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	16	29	45	47.949995	-129.096899	332	-8	-2	5	2201	2206	Bird pump is on - there is a .1 ground on the gas chromatograph (GC).
7/25	16	30	58	47.949999	-129.096902	332	-10	-1	5	2201	2206	Eventually Marv would like the GC on the cable network at Endeavour and Axial. He's testing it out now. Nowhere near ready to deploy permanently.
7/25	16	31	56	47.950005	-129.096901	332	-9	-1	5	2201	2206	GC wand in the orifice that we just measured. Maneuvering the wand to get the correct temp. Want to be in the warmer water - but not too hot.
7/25	16	32	13	47.950007	-129.096900	332	-9	-1	5	2201	2206	This will be a 15 or 20 minute process.
7/25	16	33	25	47.950009	-129.096894	332	-9	-2	5	2201	2206	The GC hopes to measure hydrogen; methane and CO2.
7/25	16	34	46	47.949999	-129.096886	332	-9	-1	5	2201	2206	Marv is taking FGs at variable iris levels.
7/25	16	36	07	47.950016	-129.096882	332	-9	-1	5	2201	2206	The probe moved a lot. It must have rotated. It's in the cold water now.
7/25	16	36	57	47.950042	-129.096885	332	-9	-2	5	2201	2206	Repositioning the wand. When they are measuring this they are pumping water through the GC. Temp now is back to warmer again.
7/25	16	37	46	47.950050	-129.096896	332	-9	-2	5	2201	2206	Scaleworms; tubeworms; palm worms; the typical community is here.
7/25	16	38	37	47.950022	-129.096909	332	-9	-2	5	2201	2206	The Jason arm has a mind of its own. It is rotating very slowly on its own... Have it under control now.
7/25	16	39	51	47.949966	-129.096911	332	-9	-2	5	2201	2206	The Gremlin11 position is ~5m S/SE of the Hulk09 target - just as it should be. The nav is looking fine.
7/25	16	43	14	47.950005	-129.096939	333	-10	-2	5	2201	2206	Eric suggests that Jason search for some hotter water now.
7/25	16	44	52	47.950001	-129.096908	333	-10	-1	5	2201	2206	Jason has pulled the GC probe out and will now collect the top of this small chimney so check the temp.
7/25	16	45	08	47.950001	-129.096903	333	-9	-1	5	2201	2206	There is some gray smoke coming out and lots of flow.
7/25	16	46	18	47.950005	-129.096895	333	-9	-2	5	2201	2206	We're going to poke around with the GC a bit before we take the beehive off the top.
7/25	16	47	39	47.950003	-129.096898	334	-10	-2	5	2201	2206	The wand is in the flow. The temp is climbing slowly. 10-15deg above ambient. Ambient here is 2C.
7/25	16	49	11	47.949990	-129.096904	333	-10	-3	5	2201	2206	Jimmy has to holster the wand before grabbing the little chimney top.
7/25	16	55	10	47.949978	-129.096870	334	-11	-1	5	2201	2206	The Schilling is approaching the beehive.
7/25	16	56	10	47.949986	-129.096894	334	-10	-3	5	2201	2206	It fell to the seafloor. Lots of flow coming out of the opening now. The chimney parts fell to the seafloor. We're going to try to pick them up.
7/25	16	57	15	47.950010	-129.096912	334	-8	-4	5	2201	2206	Marv says the flow doesn't look too hot. It has a slight gray color. Vigorous flow coming out of the newly-excavated chimney. Still about half of it remains upright.
7/25	16	58	12	47.950019	-129.096917	334	-9	-3	5	2201	2206	Stowing the sieve and grabbing the GC arm.
7/25	16	59	11	47.950007	-129.096909	334	-8	-3	5	2201	2206	Marv says it's not very hot. Maybe about 200C?
7/25	17	00	01	47.949991	-129.096897	334	-8	-3	5	2201	2206	Will try to pick up the parts of the chimney on the seafloor after we measure this.
7/25	17	00	12	47.949989	-129.096894	334	-8	-3	5	2201	2206	Zooming in on the brow cam.
7/25	17	00	39	47.949985	-129.096889	333	-8	-3	5	2201	2206	The temp is climbing (measured by the GC wand). Eric says it's not very hot.
7/25	17	01	28	47.949987	-129.096888	333	-8	-3	5	2201	2206	Marv says poke it down in there. Eric says it's not very hot.
7/25	17	01	49	47.949989	-129.096890	333	-8	-3	5	2201	2206	Re-positioning the GC wand.
7/25	17	02	13	47.949993	-129.096894	333	-8	-3	5	2201	2206	Eric says that it is nowhere near 100deg.
7/25	17	02	24	47.949994	-129.096896	333	-7	-3	5	2201	2206	There there....Now it's falling....
7/25	17	02	37	47.949995	-129.096899	334	-7	-3	5	2201	2206	The temperature is falling that is.
7/25	17	02	58	47.949996	-129.096904	334	-7	-3	5	2201	2206	Perhaps we should try another spot suggests Marv.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	17	03	11	47.949996	-129.096907	334	-8	-3	5	2201	2206	Jimmy wants to give it another try.
7/25	17	03	42	47.949994	-129.096912	334	-7	-4	5	2201	2206	Looks like it's right in there.
7/25	17	03	53	47.949992	-129.096914	334	-8	-4	5	2201	2206	Eric says the temp is climbing.
7/25	17	04	33	47.949987	-129.096919	335	-8	-4	5	2201	2206	The GC pumps water that is flowing across the surface of a membrane in the GC. The temp is still climbing.
7/25	17	04	49	47.949985	-129.096921	335	-8	-4	5	2201	2206	The temp probe is within an inch or two of the end of the GC wand.
7/25	17	05	48	47.949981	-129.096926	334	-8	-4	5	2201	2206	Eric says the temp is about 130 degrees now.
7/25	17	07	13	47.949983	-129.096936	334	-8	-4	5	2201	2206	HIGHLIGHTS: KiPro hard drive start The GC probe in the small chimney.
7/25	17	08	33	47.949976	-129.096944	334	-8	-4	5	2201	2206	GC probe in the flow that was opened up when the top of the chimney was broken off.
7/25	17	09	10	47.949970	-129.096939	334	-8	-4	5	2201	2206	Zooming in on the sulfide worms. Marv says they like to be at about 50C.
7/25	17	09	38	47.949966	-129.096930	334	-8	-4	5	2201	2206	The white patches are probably mat of some type.
7/25	17	09	51	47.949966	-129.096925	334	-8	-4	5	2201	2206	HIGHLIGHTS: KiPro hard drive stop
7/25	17	11	44	47.949983	-129.096898	334	-8	-4	5	2201	2206	This is the second run with the GC. They made 1 dive with Alvin last year. It is still in the developmental stage.
7/25	17	12	03	47.949985	-129.096899	334	-8	-4	5	2201	2206	A few more minutes. We're at 200C now.
7/25	17	14	49	47.949980	-129.096898	334	-8	-4	5	2201	2206	GC "shot" - or an injection.... Eric will look at the numbers. Eric tells it when to pull an aliquot of gas into the analyzer.
7/25	17	15	12	47.949980	-129.096898	333	-8	-4	5	2201	2206	Can stow the wand now and move to some other task.
7/25	17	20	27	47.949975	-129.096909	342	-9	-1	5	2201	2206	Pulling back from the little chimney to see if we can pick up the little chimney top - if it's not just "dust".
7/25	17	20	47	47.949976	-129.096913	342	-9	-1	5	2201	2206	Out comes the port biobox.
7/25	17	21	25	47.949978	-129.096922	342	-4	-3	4	2201	2205	Hoping to retrieve the chimney bits.
7/25	17	22	40	47.949964	-129.096920	342	-9	-2	4	2201	2205	Iron staining on the rocks on the seafloor - which is actually just the base of this huge sulfide structure.
7/25	17	22	54	47.949968	-129.096914	342	-9	-1	4	2201	2205	Grab hidden in the darkness - on the sci cam.
7/25	17	24	21	47.949977	-129.096888	344	-11	0	4	2201	2205	Stopping here. Can't go any further. We can see the beehive and top of chimney but don't know if we can get at it.
7/25	17	24	37	47.949979	-129.096889	344	-11	0	4	2201	2205	Opening the port biobox.
7/25	17	26	31	47.949985	-129.096918	344	-12	-1	4	2201	2205	Going in for a grab with the claw. Most of it is super friable. Could be a bit there that can be retrieved.
7/25	17	28	11	47.949962	-129.096900	345	-11	0	4	2201	2205	Stirred up a bunch of crud Don't know what is it and what's not so we're going to bag it.
7/25	17	29	07	47.949953	-129.096905	342	-8	0	5	2201	2205	We are leaving Gremlin and will move to Hulk next.
7/25	17	30	20	47.950018	-129.096964	342	-9	-1	7	2196	2202	Heading to the north to Hulk.
7/25	17	32	31	47.950049	-129.097013	34	-9	-1	11	2188	2199	This is Hulk. Our altitude is 16m and we're still climbing up this huge structure. Hulk is probably the tallest structure here. Black smoker chimneys on this edifice.
7/25	17	32	58	47.950052	-129.097008	31	-10	0	12	2188	2199	Lots of biota. Vigorous black smoker in front of Jason.
7/25	17	33	42	47.950076	-129.096980	29	-8	2	4	2185	2189	We're looking around here. Pretty impressive. Very impressive.
7/25	17	34	17	47.950084	-129.096972	32	-9	0	5	2186	2191	Black smoke pouring out of many orifices. Really beautiful and lush.
7/25	17	36	12	47.950102	-129.096963	57	-10	0	5	2186	2191	Contemplating which beehive to try to collect.
7/25	17	37	46	47.950143	-129.096938	51	-15	0	5	2186	2191	Still maneuvering.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	17	39	24	47.950172	-129.096943	51	-14	-2	5	2186	2191	Opening up the BIG biobox for sulfides on the "deck". This box has been added for this dive specifically to collect sulfides.
7/25	17	40	53	47.950168	-129.096973	51	-15	-2	5	2186	2191	Jason is grabbing the scoop bag and approaching the beehive. The big biobox is open.
7/25	17	42	11	47.950154	-129.096980	51	-14	-2	5	2186	2191	The water coming out of this beehive structure is grayish. Jimmy is deciding how to sample.
7/25	17	43	26	47.950147	-129.096959	51	-14	-2	5	2186	2191	Nudging the beehive structure. It crumbled.
7/25	17	43	35	47.950144	-129.096962	51	-14	-2	5	2186	2191	NAV: Doppler Reset
7/25	17	44	56	47.950136	-129.096971	51	-15	-2	5	2186	2191	Not sure anything made it into the bag. The beehive is off now and the smoke looks to be blacker than previously.
7/25	17	46	17	47.950104	-129.096987	51	-15	-2	5	2186	2191	Trying to make the hole bigger so that we can stick the wand in it. Using the claw to try to expand the hole. One more try.
7/25	17	47	59	47.950112	-129.097001	50	-14	-2	5	2186	2191	Continuing the excavation work trying to open up the venting hole a bit more.
7/25	17	48	53	47.950121	-129.097018	50	-14	-1	5	2186	2191	NAV: Dropped DVL target Hulk 11: 129 5.8159' 47 57.0111' Z=2187m. Hdg here is 50deg.
7/25	17	49	32	47.950118	-129.097022	50	-15	-1	5	2186	2191	Going to try to put the GC wand in the newly-excavated little hole. It's pretty small so not sure that will work.
7/25	17	50	14	47.950110	-129.097019	50	-14	-2	5	2186	2191	The big biobox is in the way of the Sci cam.
7/25	17	50	29	47.950108	-129.097018	50	-14	-2	5	2186	2191	The temp is climbing on the GC. Good spot.
7/25	17	51	17	47.950103	-129.097009	50	-14	-2	5	2186	2191	Turning the "bird" pump on and off. The bird pump is on the GC.
7/25	17	52	34	47.950109	-129.097009	50	-14	-2	5	2186	2191	Pretty bad video with all the junk in the way - big biobox in the way of sci cam. The entire deck is in the way of the mini-Zeus.
7/25	17	54	23	47.950136	-129.097036	51	-14	-1	5	2186	2191	Eric thinks there is probably a broken connection inside the case? We're "talking" to it but something in the case is not good..... Probably done with the GC for the day.
7/25	17	55	16	47.950120	-129.097038	51	-14	-1	5	2186	2191	Stowing the GC wand.
7/25	17	58	16	47.950159	-129.096993	51	-14	-2	5	2186	2191	Bungee cord over the GC wand. Tucking it into place.
7/25	17	58	33	47.950164	-129.097001	51	-14	-2	5	2186	2191	The plan is to look around after securing all the GC parts.
7/25	18	01	53	47.950098	-129.096981	6	-11	0	15	2186	2201	ROV is leaving chimney where the second GC samples were taken.
7/25	18	05	04	47.950144	-129.096995	74	-11	-1	13	2185	2198	Actually we are not leaving the chimney - just that area of Hulk.
7/25	18	05	23	47.950166	-129.096991	131	-10	-1	15	2185	2200	We're circling around Hulk looking it over.
7/25	18	06	03	47.950176	-129.096937	184	-10	0	16	2184	2200	We're pretty close to the top and the altitude was 20m. Could be higher than that because the base of this structure is probably a few meters off the seafloor.
7/25	18	07	42	47.950121	-129.097017	43	-11	0	9	2186	2195	Marv is calling this "wimpy" - that it's a mere shadow of its former self. Could have fooled me (sm).
7/25	18	09	16	47.950111	-129.096987	11	-11	-2	2	2186	2188	NAV: Location The Hulk11 position looks perfect for this tallest spire on the chimney. Location: 129 5.8159' 47 57.0111' Z=2185.
7/25	18	09	30	47.950105	-129.096982	12	-6	1	1	2187	2188	Marv says there used to be a lot more black smoke coming out of the top.
7/25	18	11	41	47.950145	-129.096948	11	-8	-2	1	2187	2188	Putting the Jason temp probe in this black-gray smoker orifice. Doing a bit of excavating first - with the temp probe.
7/25	18	13	00	47.950171	-129.096974	11	-10	-3	1	2187	2188	TEMPS: Jason temperature 321 and rising in this small little chimlet on the seafloor. Lots of black smoke coming out.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	18	14	30	47.950129	-129.096948	12	-8	-3	1	2187	2188	Jimmy is trying to break off this little piece of chalcopyrite that is a bit in the way of the temp probe.
7/25	18	15	33	47.950131	-129.096985	11	-9	-3	1	2187	2188	The temp here is 326. The smoke looks like it is getting blacker. Tmax with Jason probe is 326.9C.
7/25	18	20	47	47.950166	-129.096945	11	-9	-3	1	2187	2188	SAMPLE: gas J2-579-GTB-01 white #17. Fired in small black smoker hole near the top of Hulk. Z=2187. Tmax was 326.9C with Jason Tprobe. Fired at 1820:10. Location: 129 5.8159' 47 57.0111'. PI Lilley / Evans. Hdg 11.2deg.
7/25	18	23	24	47.950164	-129.096977	11	-9	-3	1	2187	2188	We're waiting for Dave. He's on the way. Will be doing some HFS sampling here.
7/25	18	23	30	47.950165	-129.096974	11	-9	-3	1	2187	2188	Here's Dave.
7/25	18	26	04	47.950137	-129.096953	11	-8	-3	1	2187	2188	The HFS wand is in the same black smoker hole.
7/25	18	28	58	47.950176	-129.096944	11	-8	-3	1	2187	2188	Dave is checking out the fluid sampler. There doesn't seem to be any smoke coming out the back of the sampler.
7/25	18	29	58	47.950139	-129.096949	11	-8	-3	1	2187	2188	Jim will lift it up and put it back in the hole? The exhaust tube could be pinched a bit that would slow it down. We don't see any shimmering coming out the exhaust at all.
7/25	18	31	30	47.950117	-129.096961	11	-8	-2	1	2187	2188	We probably have a restriction in the system. Dave thinks it is slowing it down but not blocking it. Dave knows the pump is running.
7/25	18	31	52	47.950111	-129.096972	11	-8	-3	1	2187	2188	Dave just turned the HFS off. It did change.
7/25	18	32	16	47.950108	-129.096986	11	-8	-3	1	2187	2188	He just turned it back on. The temp drops so it is drawing water.
7/25	18	33	31	47.950126	-129.096999	11	-7	-3	1	2187	2188	SAMPLE: fluid J2-579-HFS-02 . In black smoker orifice near the top of Hulk - maybe 2-3m from the top. Location: 129 5.8159' 47 57.0111' Z=2187m. Hdg 11deg. Filtered piston #1. Start 1833:20.
7/25	18	34	00	47.950129	-129.096991	11	-7	-3	1	2187	2188	Dave thinks the pumps are working but that something is restricting the flow.
7/25	18	35	04	47.950117	-129.096974	11	-7	-3	1	2187	2188	J2-579-HFS-02 cont. Could be a tight bend in the exhaust tube that is making it hard for water to go thru that part.
7/25	18	37	20	47.950140	-129.096910	11	-7	-3	1	2187	2188	J2-579-HFS-02 cont. Stop 1836. Tmax=314.5 Tavg=312.5 T2=26. Vol=600ml.
7/25	18	38	28	47.950132	-129.096922	11	-8	-3	1	2187	2188	SAMPLE: fluid J2-579-HFS-03 Unfiltered piston #2. Start 1837:30.
7/25	18	41	24	47.950129	-129.096921	11	-8	-3	1	2187	2188	J2-579-HFS-03 cont. Same location and orifice as HFS-02. Stop 184051. Tmax=315.1 Tavg=312.1 T2=28.0 Vol=600ml.
7/25	18	43	17	47.950111	-129.096911	11	-7	-3	1	2187	2188	SAMPLE: fluid J2-579-HFS-04 . Unfiltered piston #6. Start 184225.
7/25	18	44	01	47.950107	-129.096924	11	-8	-2	1	2187	2188	All the above samples are in the same orifice. Nothing has moved.
7/25	18	46	31	47.950092	-129.096948	11	-7	-3	1	2187	2188	J2-579-HFS-04 cont. Stop 184608. Tmax=318.5 Tavg=316.0 T2=28. Vol=600ml.
7/25	18	48	45	47.950100	-129.096948	11	-7	-3	1	2187	2188	SAMPLE: fluid J2-579-HFS-05 . Unfiltered bag #18. Start 184816.
7/25	18	52	11	47.950136	-129.096949	11	-8	-3	1	2187	2188	J2-579-HFS-05 cont. stop 185132. Tmax=320.1 Tavg=318.9 T2=29. Vol=501ml.
7/25	18	53	38	47.950143	-129.096939	11	-8	-3	1	2187	2188	SAMPLE: gas J2-579-GTHFS-06 . Fired at 1852:30. Samples 1 - 5 are all at the same location. Tmax for GTHFS is 320.1.
7/25	18	55	35	47.950133	-129.096969	11	-9	-3	1	2187	2188	Marv wants to go back to Crypto to take water and sulfide samples.
7/25	18	56	43	47.950121	-129.096986	11	-9	-3	1	2187	2188	Says he doesn't see any decent sulfide to grab here.
7/25	18	56	46	47.950121	-129.096986	11	-9	-3	1	2187	2188	Frame_Grab:
7/25	18	57	10	47.950115	-129.096988	11	-9	-3	1	2187	2188	Another look at this orifice where the first 5 samples of this dive were collected.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	18	58	00	47.950113	-129.096982	11	-9	-3	1	2187	2188	Stowing the beast wand.
7/25	19	02	23	47.950093	-129.096922	43	-11	1	6	2184	2190	Going to look back at Gremlin to see if we can sample a sulfide.
7/25	19	08	51	47.950065	-129.096973	24	2	-2	2	2201	2203	We are at Gremlin.
7/25	19	09	14	47.950063	-129.096969	21	-13	-1	4	2199	2203	Going to sample a sulfide that is currently inactive.
7/25	19	09	22	47.950061	-129.096967	21	-12	0	4	2200	2203	Jason repositioning.
7/25	19	11	44	47.950052	-129.096889	23	-10	-1	4	2199	2204	SAMPLE: geo Opening starboard biobox.
7/25	19	14	10	47.950024	-129.096953	38	-8	-2	4	2199	2203	Going to look around for something else (no sample taken).
7/25	19	15	21	47.949957	-129.096892	17	-9	-1	5	2200	2205	We were not really at Gremlin before but probably the lower part of Hulk.
7/25	19	15	46	47.949968	-129.096916	356	-9	-1	6	2198	2205	Changed our mind we are going back to the previous site at the base of Hulk.
7/25	19	16	14	47.949982	-129.096947	349	-8	0	2	2199	2201	It's actually on top of a flange sticking out from Hulk. Looking for sulfide targets.
7/25	19	17	03	47.949989	-129.096967	10	-11	-3	1	2201	2202	Picked a different chimney. This one (and the ones before) are partly active and partly inactive.
7/25	19	18	42	47.949993	-129.097008	31	-9	-3	2	2199	2202	Jason repositioning.
7/25	19	19	24	47.950004	-129.096981	108	-3	-1	1	2201	2202	Marker N11 is behind us now. It's not on Marv's list of markers.
7/25	19	23	39	47.950040	-129.097005	105	-6	-2	1	2201	2202	At the base of Hulk on the south side.
7/25	19	23	47	47.950041	-129.097007	105	-6	-2	1	2201	2202	NAV: Doppler Reset
7/25	19	24	17	47.950030	-129.097013	105	-7	-1	1	2201	2202	We're about 5 meters from Gremlin.
7/25	19	25	03	47.950002	-129.097002	105	-6	-1	1	2201	2202	SAMPLE: geo Not sure what they are going to grab here.
7/25	19	33	21	47.950019	-129.097011	105	-6	0	1	2201	2202	SAMPLE: geo J2-579-Sulfide-07 (corrected - vv # sulfide-06 incorrect) . Have a piece of the top of the chimney. A small friable pieces going into the stbd biobox. Initial grab lots of dust and small shards. Location: 129 5.8174' 47 57.0016. Z=2201.
7/25	19	37	43	47.950067	-129.096975	106	-7	-1	1	2201	2202	J2--597-Sulfide-07 cont. Getting the Schilling arm out to try to grab a larger chunk of sulfide here. Still same sample number.
7/25	19	38	36	47.950057	-129.096983	105	-7	-1	1	2201	2202	Frame_Grab:
7/25	19	38	41	47.950051	-129.096985	106	-7	-1	1	2201	2202	J2-597-Sulfide-07 cont. Looks like he has total dust. Attempting another grab.
7/25	19	38	57	47.950043	-129.096994	106	-7	1	1	2201	2202	Beautiful image in the mini-Zeus - just before the grab.
7/25	19	40	39	47.950006	-129.097011	106	-5	0	1	2201	2202	We're heading to Crypto now. That was the end of the sampling here. Not getting anything else. These sulfides are too friable.
7/25	19	43	46	47.949926	-129.097014	92	-10	-1	4	2197	2201	I guess we're still heading for Crypto....a little in the dark at the logging station here.
7/25	19	44	29	47.949877	-129.096870	166	-10	-1	8	2197	2205	We're heading to Crypto - confirmed by the navigator.
7/25	19	46	21	47.949811	-129.096842	193	-7	1	10	2196	2206	Some nice black smoke pouring out of the summit here - directly in the center of the highest part.
7/25	19	46	41	47.949817	-129.096842	194	-9	-1	9	2197	2206	Still looking around. Marv says this one could be a little smaller than the other.
7/25	19	47	08	47.949817	-129.096844	203	-13	-1	8	2198	2206	Lots of black smoke coming out of Crypto.
7/25	19	47	20	47.949816	-129.096845	214	-12	-2	8	2198	2206	NAV: Doppler Reset
7/25	19	48	13	47.949810	-129.096861	183	-8	-1	9	2197	2206	This black smoker area has lots of worms farther down on the chimney.
7/25	19	48	38	47.949804	-129.096871	169	-2	1	6	2198	2204	Jason is trying to get into a better location.
7/25	19	54	16	47.949818	-129.096893	170	-5	0	7	2198	2204	Going to try to collect a sulfide chimney; again. This time at Crypto.
7/25	19	55	21	47.949819	-129.096894	171	-5	1	7	2198	2205	Beautiful sulfide spire with 4 or 5 smaller spires at the top like a crown.
7/25	19	56	01	47.949816	-129.096890	171	-5	1	7	2198	2205	Sieve and Schilling in play here.
7/25	19	57	38	47.949826	-129.096879	172	-4	3	7	2198	2205	Well; that didn't work. The tops of these are way too friable to grab.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	19	57	57	47.949830	-129.096875	172	-5	3	7	2198	2205	Going in with the schilling to try to just grab a piece of it.
7/25	19	59	29	47.949838	-129.096858	173	-5	3	9	2198	2206	Still no success but Ben is continuing to forge on and try to collect this sulfide.
7/25	20	02	07	47.949849	-129.096861	171	-3	-1	6	2198	2204	Decided to measure the temperature of the water coming out of the black smoker.
7/25	20	04	59	47.949843	-129.096824	171	-3	1	6	2198	2204	Temperature is 324.5 degrees C at Crypto.
7/25	20	05	11	47.949843	-129.096825	171	-3	0	6	2198	2204	Stowing the temperature probe.
7/25	20	06	20	47.949846	-129.096840	170	-2	0	6	2198	2204	Taking out the fluid sampler.
7/25	20	09	36	47.949813	-129.096882	171	-4	-1	6	2198	2204	Waiting for temperature reading on the fluid sampler.
7/25	20	13	17	47.949823	-129.096874	171	-3	-1	6	2198	2204	SAMPLE: fluid J2-579-HFS-08 (corrected - vv # HFS-07 incorrect) Start sample in filtered piston #3. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	20	15	31	47.949831	-129.096872	172	-3	-1	6	2198	2204	Arm moved out of the best flow. Moving it back.
7/25	20	16	01	47.949837	-129.096873	171	-3	-1	6	2198	2204	Getting the sampler nozzle back into the warmer water.
7/25	20	17	10	47.949839	-129.096888	171	-4	-1	6	2198	2204	Temperature is good at 314 degrees C.
7/25	20	17	29	47.949834	-129.096893	171	-3	-1	6	2198	2204	Restarting the sampling.
7/25	20	19	34	47.949790	-129.096878	171	-3	-1	6	2198	2204	Stopping first sample. Tmax=323.1 Tavg=312.7 T2=70 Volume=550.
7/25	20	20	01	47.949788	-129.096861	171	-3	-1	6	2198	2204	J2-579-HFS-08 Start sample unfiltered piston number 4.
7/25	20	20	28	47.949789	-129.096846	171	-3	-1	6	2198	2204	SAMPLE: fluid J2-579-HFS-09 (corrected - vv # HFS-08 incorrect) Unfiltered piston #4. Start sample.
7/25	20	24	39	47.949824	-129.096875	172	-3	-1	6	2198	2204	Stopping the sample. Tmax=318.7 Tavg=316.7 T2=70 Volume=650. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	20	25	27	47.949805	-129.096872	172	-4	-1	6	2198	2204	SAMPLE: fluid J2-579-HFS-10 (corrected - vv # HFS-09 incorrect) Unfiltered piston #8. Start Sample.
7/25	20	29	30	47.949846	-129.096851	172	-4	-1	6	2198	2204	Stopping sample. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	20	30	11	47.949839	-129.096869	172	-4	-1	6	2198	2204	Tmax=323 Tavg=321 T2=70 Volume=600.
7/25	20	31	05	47.949833	-129.096886	172	-4	-1	6	2198	2204	SAMPLE: fluid J2-579-HFS-11 (corrected - vv # HFS-10 incorrect) Start sample filtered bag #20.
7/25	20	34	57	47.949852	-129.096836	172	-4	-1	6	2198	2204	Stopping sample. Tmax=323 Tavg=322.3 T2=69 Volume=500. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	20	35	33	47.949873	-129.096853	172	-4	-1	6	2198	2204	SAMPLE: gas J2-579-GHFS-12 (corrected - vv # GHFS-11 incorrect). Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	20	35	46	47.949876	-129.096863	172	-4	-1	6	2198	2204	Gas temp 323.
7/25	20	36	21	47.949878	-129.096891	172	-4	-1	6	2198	2204	That was middle one
7/25	20	36	44	47.949873	-129.096907	172	-4	-1	6	2198	2204	SAMPLE: gas J2-579-GTHFS-13 (corrected - vv # GTHFS-12 incorrect) Starboard gastight. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	20	36	54	47.949870	-129.096912	172	-4	-1	6	2198	2204	Temp was still 323.
7/25	20	36	59	47.949868	-129.096915	172	-4	-1	6	2198	2204	Stowing the probe.
7/25	20	40	47	47.949822	-129.096854	176	-9	0	10	2197	2206	Backing away from the smoker.
7/25	20	41	43	47.949816	-129.096833	186	-8	1	9	2197	2206	Looking for some sulfide to collect.
7/25	20	43	01	47.949787	-129.096855	189	-10	0	9	2197	2206	Settling in at another little vent on Crypto to try to collect the sulfide.
7/25	20	52	39	47.949781	-129.096865	212	-13	0	10	2197	2207	Just pulled the mesh triangle out of the box.
7/25	20	52	55	47.949781	-129.096860	212	-13	0	10	2197	2207	Now to attempt the sulfide collection.
7/25	20	54	25	47.949780	-129.096885	211	-12	0	10	2197	2207	Sulfides collapsed.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-579 Dive Log
7/25	20	56	02	47.949774	-129.096912	212	-12	0	10	2197	2207	There is a little left standing so we will try to get that.
7/25	20	57	22	47.949778	-129.096887	211	-14	1	11	2197	2208	Bringing out the port arm to try to knock sulfide into the triangle.
7/25	21	02	12	47.949800	-129.096862	212	-13	2	11	2197	2208	Slowly positioning the claw.
7/25	21	03	08	47.949803	-129.096847	211	-13	2	11	2197	2208	Trying the grab.
7/25	21	03	23	47.949807	-129.096844	212	-13	3	11	2197	2208	Nope.
7/25	21	04	44	47.949829	-129.096842	212	-13	3	11	2197	2208	Looks like there is a piece lying next to the triangle. Try to get it.
7/25	21	06	20	47.949813	-129.096859	211	-12	-1	10	2197	2207	How about the scoop?
7/25	21	08	22	47.949765	-129.096901	212	-11	-1	9	2197	2206	Adjusting ROV position to attempt the scoop.
7/25	21	16	59	47.949850	-129.096910	157	-3	-2	6	2197	2204	In position. We will try to grab the fallen sulfides again.
7/25	21	19	01	47.949825	-129.096869	171	-11	0	9	2197	2206	Position not good enough. Repositioning again.
7/25	21	19	46	47.949818	-129.096869	168	-9	0	9	2198	2206	Okay...try yet again.
7/25	21	21	15	47.949812	-129.096864	169	-8	2	9	2198	2206	Almost had a piece.
7/25	21	22	43	47.949810	-129.096870	170	-7	2	9	2198	2206	Shilling is not working. How about a bag.
7/25	21	25	31	47.949814	-129.096884	171	-8	2	9	2198	2206	Attempting to scoop with the bag.
7/25	21	30	50	47.949797	-129.096900	171	-11	2	9	2197	2206	Well that did not work yet either. This stuff is hard to get.
7/25	21	36	03	47.949810	-129.096884	171	-9	-1	9	2197	2206	SAMPLE: geo J2-579-Sulfide-14 (corrected - vv # Sulfide-13 incorrect) Looks like we got some sulfide in the bag. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	21	37	11	47.949809	-129.096870	171	-9	0	9	2197	2206	Trying to get a few more pieces.
7/25	21	38	58	47.949791	-129.096871	171	-8	-1	9	2198	2206	Stowing the bag in the biobox.
7/25	21	41	57	47.949802	-129.096877	171	-8	-1	9	2198	2206	Pulling the divider out of the biobox.
7/25	21	43	27	47.949794	-129.096878	170	-8	-3	9	2198	2206	Sample is in the biobox.
7/25	21	43	46	47.949796	-129.096883	171	-8	-2	9	2198	2206	Now the goal is to look around a bit for another sample.
7/25	21	48	58	47.949803	-129.096951	161	-11	0	5	2199	2203	We will try to scoop the chimney directly into the right swing arm biobox.
7/25	21	53	07	47.949848	-129.096906	154	-11	0	5	2199	2204	Here goes the digging. Will it work at all?
7/25	21	55	08	47.949833	-129.096922	154	-10	-2	5	2199	2203	Did not work although there is a piece that landed on the arm next to the biobox.
7/25	21	57	01	47.949828	-129.096930	154	-11	-2	4	2199	2203	Trying to grab that piece on the side arm platform.
7/25	22	00	02	47.949810	-129.096892	154	-10	-2	4	2199	2203	J2-579-Sulfide-15 (corrected - vv # Sulfide-14 incorrect) Got a small sample in the right swing arm biobox. Location: 47 56.9877 129 5.8132 Z=2198m.
7/25	22	01	36	47.949818	-129.096885	154	-11	0	5	2199	2203	Try for one more piece before ending the dive.
7/25	22	05	41	47.949805	-129.096962	154	-10	-1	4	2199	2202	SAMPLE: geo J2-579-Sulfide-15 cont. Got a solid chunk of sulfide and stowed it in the starboard arm biobox. Collected from the same place as last one (corrected - appending this to the previous sample-15. Not a separate sample.)
7/25	22	06	22	47.949812	-129.096949	154	-11	-2	4	2199	2203	Closing and securing biobox.
7/25	22	08	00	47.949821	-129.096928	154	-12	0	4	2199	2203	Securing main basket biobox.

Table 7.4.7 J2-580 Jason Dive Log (Ashes Vent Field, Axial Seamount, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/26	20	27	21			145	-8	0	88	1455	1544	Beautiful jelly in view.
7/26	20	34	13			12	-7	2	4	1540	1544	JASON: Jason on bottom
7/26	20	35	3			11	-9	0	3	1541	1544	We're looking around the southern end of the vent field first.
7/26	20	36	17			13	-8	1	3	1541	1544	NAV: Doppler Reset
7/26	20	37	22			13	-8	0	1	1542	1543	Trying to figure out where we are. Zooming in on this diffuse venting area.
7/26	20	38	45	45.933168	-130.013765	14	-9	0	1	1543	1544	Diffuse venting going on here. Lots of bacterial mat on this small rocky mound. Some not so happy worms.
7/26	20	40	09	45.933169	-130.013748	14	-9	0	1	1543	1544	Diffuse site with lots of filamentous bacterial mat with little tubeworms and palmworms.
7/26	20	40	27	45.933162	-130.013763	320	-8	0	2	1542	1543	Going to turn around a head to the south to see if there is more diffuse flow behind us.
7/26	20	41	27	45.933088	-130.013719	158	-7	0	2	1542	1544	Jason is close to the end of its leash so can't go too far south without moving ship.
7/26	20	42	04	45.933068	-130.013704	157	-8	0	2	1542	1544	We're seeing some iron oxides now and more white bacterial mat and floc. Some iron oxide deposits here.
7/26	20	42	54	45.933067	-130.013686	205	-8	0	4	1540	1544	We're heading to Medusa area. Mkr-54 should be there.
7/26	20	43	52	45.933078	-130.013774	178	-9	0	9	1535	1544	Going to take out a loop in the tether.
7/26	20	44	02	45.933069	-130.013796	177	-8	1	11	1533	1544	Scott is piloting today.
7/26	20	50	02	45.933301	-130.013878	10	-10	0	17	1527	1545	NOTE: not sure if the gastight was triggered or not. Dave says we will use them as a pair.
7/26	20	50	38	45.933348	-130.013862	10	-6	0	17	1528	1545	Still managing the tether.
7/26	20	52	11	45.933354	-130.013868	10	-8	0	10	1535	1545	Still have a kink in the tether.
7/26	20	52	17	45.933355	-130.013867	10	-8	0	10	1535	1545	Scott got it.
7/26	20	53	41	45.933264	-130.013927	330	-8	0	2	1542	1544	Casey thinks we are now north of Hell. Then we will reset the doppler.
7/26	20	53	55	45.933275	-130.013958	336	-10	0	3	1542	1544	Marker right in front of us.
7/26	20	54	43	45.933286	-130.014006	2	-8	0	2	1542	1544	It's Marker 68 .
7/26	20	54	54	45.933294	-130.014003	10	-8	0	3	1541	1544	Reset doppler.
7/26	20	54	58	45.933298	-130.014001	13	-9	0	4	1541	1544	NAV: Doppler Reset
7/26	20	55	11	45.933311	-130.014014	33	-7	0	5	1539	1544	Looks like Hell right here.
7/26	20	56	00	45.933348	-130.013956	182	-9	0	3	1542	1545	Marker 68 was visible. This is Hell.
7/26	20	57	06	45.933304	-130.014006	60	-8	-1	3	1541	1544	This has got to be Hell.
7/26	20	57	45	45.933313	-130.013998	39	-8	-2	3	1541	1544	There are active black smoker beehives at the top.
7/26	20	58	19	45.933308	-130.013968	344	-8	-1	4	1540	1545	HIGHLIGHTS: KiPro hard drive start
7/26	20	59	20	45.933303	-130.013959	321	-7	-1	4	1541	1545	Marker 68 was at Medusa. That makes this structure Hell. Medusa is just SE of Hell.
7/26	20	59	34	45.933297	-130.013969	328	-8	-1	4	1540	1545	The highlights video going right now is shooting Hell.
7/26	21	00	33	45.933295	-130.013968	342	-9	-1	4	1540	1545	The Hell 2009 Navigation target seems to be right on. The Medusa Mkr68 was within 5m of the Jason navigation.
7/26	21	00	38	45.933296	-130.013967	341	-9	-2	4	1540	1545	HIGHLIGHTS: KiPro hard drive stop
7/26	21	01	58	45.933299	-130.013980	34	-9	-3	4	1540	1544	Dave is setting up to sample diffuse flow on the top of Hell chimney.
7/26	21	03	27	45.933311	-130.013991	63	-7	-1	4	1541	1544	Going to do some long samples here filters for DNA / RNA.
7/26	21	03	57	45.933309	-130.013993	63	-7	-1	4	1541	1544	Dave is zooming on in. Looking for an area of diffuse flow.
7/26	21	04	54	45.933309	-130.014004	55	-9	-2	4	1540	1544	Lots of shimmering water here. Looks like palm worms and tubeworms here.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/26	21	05	15	45.933311	-130.014000	50	-8	0	4	1540	1544	There are a couple pretty nice beehives here on top of Hell.
7/26	21	06	19	45.933317	-130.013990	46	-9	0	4	1541	1544	Looking around for a spot to sample diffuse flow here.
7/26	21	08	15	45.933321	-130.013991	44	-10	-2	4	1541	1544	NAV NOTE: The beast wand is in some diffuse flow here on the SW side of the structure. Heading is 44 degrees. The nav underlay makes it look like we're on the SE side.
7/26	21	08	39	45.933321	-130.013993	44	-9	-3	4	1541	1544	Temp got up to 15C there. Still positioning the wand.
7/26	21	09	00	45.933321	-130.013994	44	-9	-3	4	1541	1544	Ambient temp here is 2.2C.
7/26	21	09	38	45.933320	-130.013996	44	-9	-3	4	1541	1544	Nice black-gray smoke coming out of the beehives at the top of Hell.
7/26	21	09	53	45.933320	-130.013997	44	-9	-3	4	1541	1544	Nice image in the mini-Zeus cam of the top of Hell.
7/26	21	09	57	45.933320	-130.013997	43	-9	-3	4	1541	1544	Frame_Grab:
7/26	21	11	32	45.933325	-130.013997	45	-9	-3	4	1541	1544	The HFS wand is in a pile of tubeworms and palm worms. Blue ciliates on here as well.
7/26	21	12	18	45.933326	-130.013998	45	-9	-3	4	1541	1544	Poking around trying to find a spot with nice flow.
7/26	21	13	58	45.933322	-130.014001	44	-9	-3	4	1541	1544	The back side seemed to be the warmest. Some of these worms don't look too happy - sort of brown.
7/26	21	14	37	45.933321	-130.013998	44	-9	-2	4	1541	1544	There's quite a lot of shimmer here.
7/26	21	15	13	45.933320	-130.013994	44	-9	-2	4	1541	1544	Temp is going up now. They moved the probe to the right a bit.
7/26	21	15	30	45.933320	-130.013993	45	-9	-2	4	1541	1544	Pelagic pump associated with the GC turned on.
7/26	21	16	13	45.933319	-130.013990	44	-9	-2	4	1541	1544	Not quite the temperature Dave is looking for. He's going to pass on this spot.
7/26	21	17	10	45.933317	-130.013992	44	-10	-2	4	1540	1544	Going to look around this structure a bit for another spot to sample diffuse fluids.
7/26	21	17	15	45.933317	-130.013992	44	-9	-2	4	1540	1544	Pelagic pump off.
7/26	21	18	10	45.933317	-130.013997	44	-10	-2	4	1540	1544	The flush pump is streaming out bacterial mat; etc.
7/26	21	18	41	45.933317	-130.014000	44	-10	-1	4	1540	1544	0.1 ground fault on the wet GC.
7/26	21	19	52	45.933315	-130.013997	44	-9	-2	4	1541	1544	Securing the wet GC. The pelagic pump seems to have caused the problem
7/26	21	21	08	45.933329	-130.014008	80	-9	-1	3	1541	1544	We're going to circle around a bit and look things over.
7/26	21	23	25	45.933308	-130.013956	324	-9	-2	4	1541	1545	Circling around Hell from another angle. Dave is snapping some HD frame grabs of Hell.
7/26	21	23	35	45.933311	-130.013956	324	-10	-2	5	1540	1545	Another angle.
7/26	21	23	46	45.933318	-130.013949	310	-10	-1	4	1540	1545	Frame_Grab:
7/26	21	23	56	45.933326	-130.013949	279	-10	-1	5	1540	1545	Going to zoom in on the smokers at the top.
7/26	21	24	43	45.933325	-130.013954	244	-9	-1	5	1540	1545	We're 5 meters up so that's about the height of Hell.
7/26	21	25	53	45.933323	-130.013947	243	-6	1	4	1541	1545	We don't want to disturb the beehives on Hell.
7/26	21	26	03	45.933322	-130.013946	243	-6	1	4	1541	1545	Zooming in on the beehives.
7/26	21	26	14	45.933322	-130.013946	243	-6	1	4	1541	1545	HIGHLIGHTS: KiPro hard drive start The top of Hell.
7/26	21	26	44	45.933322	-130.013946	243	-6	1	4	1541	1545	Looking at the 3 beehive smokers on the top of Hell.
7/26	21	27	13	45.933321	-130.013948	243	-6	1	4	1541	1545	Lots of flow coming out at the top here. Mostly clear water. Not much color to it.
7/26	21	27	28	45.933320	-130.013948	243	-6	1	4	1541	1545	HIGHLIGHTS: KiPro hard drive stop highlights at the top of Hell.
7/26	21	28	42	45.933286	-130.013886	217	-7	0	4	1542	1545	Leaving Hell and heading toward Styx for diffuse fluid sampling.
7/26	21	30	24	45.933271	-130.013821	135	-7	-1	3	1542	1545	Dave is headed for the big white patch to the E/SE of Hell in the area of Styx.
7/26	21	31	30	45.933254	-130.013811	103	-8	-2	1	1543	1544	This looks like the area where we landed. The mini-Zeus shows this as a large patch of diffuse flow.
7/26	21	32	14	45.933255	-130.013809	108	-4	-2	1	1543	1544	We see anemones in this patch. Limpets covering this - as well as tubeworms. Some palmworms also visible.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/26	21	32	25	45.933256	-130.013807	108	-4	-2	1	1543	1544	Frame_Grab:
7/26	21	32	53	45.933257	-130.013801	108	-4	-2	1	1543	1544	Anemones and limpets. Some palmworms. Lots of life here.
7/26	21	34	34	45.933279	-130.013778	106	-7	-2	2	1542	1545	We're about 10m to the S/SE of Hell. We're going to continue toward the east.
7/26	21	36	37	45.933297	-130.013702	123	-8	0	2	1543	1545	We're right at the ROPOS target. Not sure if ROPOS and Phoenix or if they're both the same thing.
7/26	21	37	26	45.933302	-130.013673	175	-7	-1	2	1543	1545	HIGHLIGHTS: KiPro hard drive start We're not sure if this is ROPOS or Phoenix.
7/26	21	38	38	45.933281	-130.013663	232	-7	-2	2	1543	1545	There is a little orifice on this sulfide that is trying to be a smoker.
7/26	21	39	10	45.933259	-130.013644	202	-7	-1	2	1543	1545	The last structure was probably Phoenix.
7/26	21	39	29	45.933261	-130.013645	203	-7	-1	1	1544	1545	Just went by a little square marker to the south of where we were.
7/26	21	41	05	45.933271	-130.013638	146	-8	-1	3	1542	1545	We're going to look for the marker at Styx.
7/26	21	41	25	45.933259	-130.013658	188	-6	-1	3	1542	1545	Bill suggests that we find the marker at Styx.
7/26	21	44	04	45.933299	-130.013654	235	-7	0	2	1543	1545	We just passed Phoenix/Ropos. At the base of this structure is a bucket lid. It says "21". It's sitting at the base of this smaller sulfide structure.
7/26	21	44	28	45.933318	-130.013680	255	-7	-1	1	1544	1545	What was it marking? It's not Styx - we don't think.
7/26	21	46	14	45.933266	-130.013766	152	-6	-1	1	1543	1544	Dave wants to go back to the anemone site for diffuse fluid sampling.
7/26	21	47	27	45.933254	-130.013740	152	-7	-3	1	1543	1544	Lots of shimmering water here and diverse biota.
7/26	21	48	15	45.933250	-130.013766	152	-7	-3	1	1543	1544	"It's always a little warmer behind the next tubeworm" says Dave.
7/26	21	48	33	45.933252	-130.013777	152	-7	-3	1	1543	1544	Have the HFS wand in diffuse flow.
7/26	21	49	31	45.933264	-130.013790	152	-7	-3	1	1543	1544	The pump is going. We're setting up to sample some diffuse fluid.
7/26	21	50	25	45.933266	-130.013789	152	-7	-3	1	1543	1544	This must be the big white patch we are seeing on the photo mosaic. ROPOS/Phoenix chimney looks to be to the east of this in the mosaic. We may have it figured out?
7/26	21	51	21	45.933255	-130.013787	152	-7	-2	2	1543	1544	Temperature is rising slowly. Repositioning the nozzle slights more toward the center of this area.
7/26	21	52	07	45.933249	-130.013768	152	-7	-2	1	1543	1544	Frame_Grab:
7/26	21	52	18	45.933249	-130.013763	152	-7	-2	1	1543	1544	This will work.
7/26	21	53	26	45.933255	-130.013739	152	-7	-3	1	1543	1544	We're going to call this Anemone Vent. Z=1543.3m. Heading 152m.
7/26	21	55	32	45.933265	-130.013795	152	-7	-3	1	1543	1544	SAMPLE: fluid J2-580-HFS-01 Filtered piston #5. Start 2155.12.
7/26	21	57	06	45.933269	-130.013801	152	-7	-3	1	1543	1544	J2-580-HFS-01 cont. Location: 130 0.8274' 45 55.9951' Z=1543m. Anemone Vent.
7/26	22	00	02	45.933260	-130.013797	152	-7	-3	1	1543	1544	J2-580-HFS-01 cont. Heading 152 deg. We're just 6m S/SW of the ROPOS target.
7/26	22	00	56	45.933258	-130.013787	152	-7	-3	1	1543	1544	J2-580-HFS-01 stop 2200. Tmax=19.4 Tavg=18.4 T2=9. Vol=650ml. Butterfield.
7/26	22	03	56	45.933255	-130.013793	152	-7	-3	1	1543	1544	SAMPLE: fluid J2-580-HFS-02 Unfiltered bag #18. Start 2201.52. Anemone vent. Exact same location as sample one. Perched in an area of diffuse flow with limpets; anemones; palmworms small tubeworms and who know what else.
7/26	22	04	18	45.933259	-130.013791	152	-7	-3	1	1543	1544	J2-580-HFS-02 cont. Location: 130 0.8274' 45 55.9951' Z=1543m. Anemone Vent.
7/26	22	05	19	45.933266	-130.013787	152	-7	-3	1	1543	1544	J2-580-HFS-02 cont. Stop 2204.50. Tmax=20.3 Tavg=18.6 T2=9 Vol=500ml. Butterfield.
7/26	22	07	08	45.933269	-130.013794	152	-7	-3	1	1543	1544	SAMPLE: fluid J2-580-HFS-03. RNA filter #16. Start 2206.05. Pull about 3 liters of fluid on this sample. Location: 130 0.8274' 45 55.9951' Z=1543m. Anemone Vent.
7/26	22	32	02	45.933246	-130.013802	152	-7	-3	1	1543	1544	J2-580-HFS-03 cont. Still pumping. Stop 2231.15. Tmax=20.0 Tavg=17.8 T2=9.0 Vol=2508ml. Butterfield / Huber.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/26	22	33	25	45.933251	-130.013772	152	-7	-3	1	1543	1544	SAMPLE: fluid J2-580-HFS-04 Sterivex filter #12. Start 2232.38. Exact same location as previous samples at Anemone vent.
7/26	22	55	11	45.933257	-130.013776	152	-7	-3	1	1543	1544	Lasers on and zoomed out so that we can deploy an MTR after this sample.
7/26	22	56	13	45.933255	-130.013780	152	-6	-2	1	1543	1544	J2-580-HFS-04 cont. Stop 2255.30. Tmax=17.7 Tavg=15.7 T2=9 Vol=3000ml. Butterfield / Huber.
7/26	22	59	06	45.933258	-130.013790	152	-6	-3	2	1543	1545	Stowing the wand. Trying to knock off the tubeworms.
7/26	23	00	23	45.933256	-130.013783	151	-7	-3	2	1543	1544	DEPLOY: MTR temp probe 4096. At Anemone Vent. Z=1543. Location: 130 0.8274 45 55.9951. Deployed in the HFS diffuse sampling site here.
7/26	23	02	12	45.933272	-130.013788	95	-8	-2	2	1543	1544	The MTR is deployed at Anemone. The marker is actually a quarter of a normal PMEL marker.
7/26	23	02	45	45.933264	-130.013766	83	-7	-1	2	1542	1544	Heading toward Styx.
7/26	23	04	21	45.933269	-130.013645	2	-8	-1	2	1542	1544	Passing ROPOS/Phoenix to the north of us. Styx
7/26	23	05	04	45.933313	-130.013609	12	-7	-1	2	1542	1544	We're at the bucket lid again. Now heading north?? huh?
7/26	23	07	14	45.933339	-130.013545	10	0	-4	1	1544	1545	We're investigating this site. See a few things down here.
7/26	23	07	33	45.933339	-130.013545	9	-3	-4	1	1544	1545	Bill thinks this is the MTR. Lots of microbial mat here.
7/26	23	07	54	45.933339	-130.013544	10	-3	-4	1	1544	1545	NAV: Doppler Reset
7/26	23	09	22	45.933337	-130.013544	10	-3	-4	1	1544	1545	RECOVER: MTR temp probe at Styx? There are lots of limpets on the rope. We're looking at the number. This is MTR 4001. Recovering it here at Styx.
7/26	23	11	23	45.933329	-130.013531	11	-8	-1	2	1543	1545	Styx location 2011. Where we recovered the MTR (4001 deployed last year). 130 0.8125' 45 56.0010' Z=1544m. Styx11
7/26	23	11	45	45.933337	-130.013505	6	-8	-1	1	1544	1545	Styx11 is listed as MTR4001 Recovery. Re-named Styx11.
7/26	23	12	57	45.933345	-130.013506	5	-6	-5	1	1544	1545	Zooming in on something else here. There's polypro line here that Jason is going to pull up. There is nothing on the end of the rope.
7/26	23	14	30	45.933353	-130.013515	5	-6	-5	1	1544	1545	We're going to look a bit and make sure there is nothing at the end of this rope.
7/26	23	14	56	45.933352	-130.013519	5	-6	-4	1	1544	1545	Debating whether there is a shackle down there too.
7/26	23	15	23	45.933352	-130.013517	6	-5	-4	1	1544	1545	Going to put it in the stbd biobox to pick up the littler.
7/26	23	15	46	45.933351	-130.013514	6	-5	-3	1	1544	1545	Closing the lid of the stbd biobox.
7/26	23	16	28	45.933347	-130.013509	7	-7	-2	1	1544	1545	Next we're going to look for some mat to sample in the vicinity.
7/26	23	17	43	45.933322	-130.013529	263	-7	-1	1	1544	1545	Deciding where to get the suction sample for Oliver.
7/26	23	18	46	45.933296	-130.013650	261	-7	-2	1	1544	1545	Just at the bucket lid at the base of ROPOS chimney.
7/26	23	19	32	45.933317	-130.013661	232	-7	-1	2	1543	1545	The base of ROPOS chimney. Will collect some met for Oliver and Ed (OSU).
7/26	23	22	09	45.933320	-130.013663	202	-4	-3	1	1545	1545	We're calling this place "Ropos" - although the consensus is that Ropos / Phoenix are the same place.
7/26	23	25	29	45.933317	-130.013663	203	-7	-1	1	1545	1545	SAMPLE: bio J2-580-mat-05 . Large blue syringe sample of white microbial mat here at the base of the chimney. We're on the north side of the chimney at the base in microbial mat; sulfide worms.
7/26	23	28	15	45.933305	-130.013666	219	-8	-2	1	1545	1545	J2-580-mat-05 cont. ROPOS11 target 130 0.8209' 45 55.9979' Z=1544m. Repositioning on the NE side of the chimney. Trigger at 2228. This attempt did not work. Will try another syringe...
7/26	23	28	19	45.933305	-130.013666	219	-7	-2	1	1545	1545	HIGHLIGHTS: KiPro hard drive start
7/26	23	32	14	45.933315	-130.013676	219	-8	-2	1	1545	1546	J2-580-mat-05 cont. Trying again. Not having any luck with this. Maybe it's plugged. That was unsuccessful. We're going to try the smaller syringe sampler instead.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/26	23	34	15	45.933303	-130.013674	219	-6	-3	1	1545	1545	The pin has already been fired so that means the blue syringe seized.
7/26	23	34	19	45.933303	-130.013673	219	-6	-3	1	1545	1545	HIGHLIGHTS: KiPro hard drive stop
7/26	23	36	50	45.933322	-130.013677	219	-6	-3	1	1545	1545	We're going to use the small syringe sampler. Pulling out.
7/26	23	36	56	45.933322	-130.013677	219	-7	-3	1	1545	1545	NAV: Doppler Reset
7/26	23	38	04	45.933316	-130.013676	219	-7	-3	1	1545	1545	Still shuffling the syringes. Not sure which sampler we will use.
7/26	23	41	22	45.933312	-130.013672	220	-9	0	1	1545	1545	SAMPLE: bio J2-580-mat-05 second attempt with new small yellow syringe. Sampling in area of dense biota; bacterial mat at the base of ROPOS/Phoenix sulfide structure. Z=1545m.
7/26	23	45	40	45.933342	-130.013689	219	-7	-2	1	1545	1545	J2-580-mat-05 cont. Pulled the syringe and think they have a sample. Going to put this in the stbd biobox.130 0.8209' 45 55.9979 Z=1545m. Contact: Mitchell.
7/26	23	47	22	45.933313	-130.013690	219	-8	2	1	1544	1545	Storing the small yellow syringe in the stbd biobox.
7/26	23	47	57	45.933312	-130.013673	219	-7	-1	1	1544	1545	HD highlights off a while ago.
7/26	23	49	45	45.933324	-130.013661	9	-7	-1	2	1543	1545	Setting up; circling around; we're heading up to the north side of Inferno.
7/26	23	51	08	45.933343	-130.013676	3	-7	-1	1	1544	1545	Still circling around for tether management.
7/26	23	52	17	45.933354	-130.013659	2	-7	-1	1	1544	1545	We see a biobox on the seafloor. We're going to look at what's inside.
7/26	23	53	31	45.933349	-130.013665	3	-10	-1	1	1544	1545	We're just north of ROPOS/Phoenix. This shows up on the photo mosaic. Nothing in the box. except "dust".
7/26	23	54	29	45.933521	-130.013673	1	-9	-1	3	1542	1545	Bucket lid Mkr 19 just passed. Laying on the seafloor. It was supposed to be at Styx. If so Styx is pretty dead.
7/26	23	54	59	45.933566	-130.013674	338	-7	-1	3	1541	1545	HIGHLIGHTS: KiPro hard drive start Inferno.
7/26	23	55	22	45.933569	-130.013689	337	-7	-1	3	1542	1545	We're looking at Inferno sulfide chimney. Doing some highlights.
7/26	23	56	43	45.933559	-130.013667	337	-7	-1	3	1542	1545	Zooming in on some diffuse flow with limpets and palm worms. Some small healthy looking palmworms here near this active little vent. Lots of flow coming out of it. Last year it was 290C.
7/26	23	57	24	45.933589	-130.013646	239	-8	0	3	1542	1545	Circling around the structure and taking a good look.
7/26	23	58	30	45.933593	-130.013659	219	-7	-1	4	1541	1545	Inferno is about 4.5m high. Z=1541m. Hot fluid venting out of small beehives.
7/26	23	59	39	45.933610	-130.013696	154	-8	-1	4	1541	1545	We're going to swing around and do more highlights.
7/27	00	00	17	45.933587	-130.013740	100	-7	-1	4	1541	1545	We're facing S/SE right now.
7/27	00	01	23	45.933575	-130.013778	53	-8	-2	2	1543	1545	We're now looking at the west side. Facing due east. This structure is about 5m high. Looks like it's hardly changed since last year. In fact it hasn't changed much in 15-20 years according to Dave.
7/27	00	01	26	45.933577	-130.013778	60	-8	-1	2	1543	1545	HIGHLIGHTS: KiPro hard drive stop
7/27	00	02	35	45.933641	-130.013733	60	-7	-1	1	1544	1545	That's a test node for RSF in the butt cam.
7/27	00	03	01	45.933636	-130.013724	59	-7	-1	1	1544	1545	Correction: RSN (Regional Scaled Node).
7/27	00	04	12	45.933637	-130.013698	59	-8	-1	1	1544	1545	We're slowly moving around the base of Inferno looking for diffuse venting.
7/27	00	05	09	45.933631	-130.013685	52	-5	-1	1	1545	1545	Inferno10 target was right on according to John. That position is 130 0.8205' 45 56.0136'.
7/27	00	06	09	45.933627	-130.013683	51	-5	-1	1	1545	1545	That's a pretty little tubeworm bush.
7/27	00	07	34	45.933628	-130.013671	51	-5	-1	1	1545	1545	There's a little crab in this tubeworm bush. Lots of white filamentous mat; palmworms; limpets.
7/27	00	08	23	45.933629	-130.013676	52	-6	-3	1	1545	1545	We're between Inferno and Mushroom.
7/27	00	09	48	45.933633	-130.013687	51	-7	-3	1	1545	1545	Getting ready to do some HFS sampling here between Inferno and Mushroom in a pretty tubeworm bush.
7/27	00	12	21	45.933634	-130.013705	51	-7	-3	1	1545	1545	The wand is in the tubeworm bush here.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	00	15	11	45.933632	-130.013685	51	-7	-2	1	1545	1545	We're between Inferno and Mushroom. Wand in a tubeworm bush. There is white mat in the cracks in the lava.
7/27	00	18	04	45.933621	-130.013659	51	-7	-2	1	1545	1545	NAV: Dropped DVL target Fuzzy Tubeworm Bush Sample target. Water sampling target on J2-580. Z=1545m. Location 130 0.8195 45 56.0186. Hdg 51 deg.
7/27	00	21	36	45.933641	-130.013669	51	-7	-2	1	1545	1545	SAMPLE: fluid J2-580-HFS-06 Unfiltered piston #6. Start 0020.55.
7/27	00	24	50	45.933629	-130.013658	51	-7	-2	1	1545	1545	J2-580-HFS-06 cont. Sampling in this tubeworm bush with white filamentous bacteria covering some of the tubeworms. Lots of biota in this area of diffuse flow. Hdg=51deg. Z=1545m.
7/27	00	28	18	45.933632	-130.013678	51	-7	-2	1	1545	1545	J2-580-HFS-06 cont. At Fuzzy Tubeworm Bush target. Tmax=19.8 Tavg=18.9 T2=10. Vol=650ml. Butterfield
7/27	00	30	17	45.933645	-130.013674	51	-7	-2	1	1545	1545	SAMPLE: fluid J2-580-HFS-07 . Location: Fuzzy Tubeworm Bush. Filtered bag #17. Start 0030.04.
7/27	00	32	04	45.933627	-130.013672	51	-7	-2	1	1545	1545	NAV: Doppler Reset
7/27	00	34	17	45.933629	-130.013670	51	-7	-2	1	1545	1545	J2-580-HFS-07 cont. Stop 0033.13. Tmax=20.1 Tavg=19.4 T2=9.8 Vol=501ml.
7/27	00	37	49	45.933635	-130.013680	51	-7	-2	1	1545	1545	SAMPLE: fluid J2-580-HFS-08 . DNA Sterivex filter #11. 0037.30
7/27	00	50	13	45.933633	-130.013691	51	-7	-2	1	1545	1545	J2-580-HFS-08 cont. Still filtering water.
7/27	00	56	19	45.933633	-130.013691	51	-7	-2	1	1545	1546	J2-580-HFS-08 cont. Still Filtering water.
7/27	00	59	53	45.933632	-130.013671	51	-7	-2	1	1545	1546	Preview of coming attractions: finish sample do another filter; put in MTR at the place
7/27	01	00	39	45.933635	-130.013663	51	-7	-2	1	1545	1546	SAMPLE: fluid J2-580-HFS-08 Stop=0100 Tmax=20.0 Tavg=19.1 Vol=3000ml (Huber)
7/27	01	02	43	45.933629	-130.013668	51	-7	-2	1	1545	1546	SAMPLE: fluid J2-580-HFS-09 RNA filter #15 Start=0101 Location=Fuzzy Tubeworm Brush.
7/27	01	06	23	45.933639	-130.013683	51	-7	-2	1	1545	1546	fluid J2-580-HFS-09 cont.
7/27	01	10	47	45.933638	-130.013699	51	-7	-2	1	1545	1546	fluid J2-580-HFS-09 cont.
7/27	01	15	04	45.933628	-130.013681	51	-7	-2	1	1545	1546	fluid J2-580-HFS-09 cont.
7/27	01	20	48	45.933631	-130.013692	51	-7	-2	1	1545	1546	We see a shark in the foreground.
7/27	01	23	49	45.933630	-130.013701	51	-7	-2	1	1545	1546	fluid J2-580-HFS-09 cont.
7/27	01	26	04	45.933634	-130.013691	51	-6	-2	1	1545	1546	fluid J2-580-HFS-09 Stop=0125 Tmax=19.5 Tavg=17.5 T2=10 Vol=3000 (Huber).
7/27	01	28	08	45.933642	-130.013706	52	-7	-2	1	1545	1546	Opening Biobox to deploy an MTR in the tubeworm bush where water samples were taken.
7/27	01	30	25	45.933639	-130.013699	51	-6	-2	1	1545	1546	Deployed MTR 3041 in the fuzzy tubeworm bush between Inferno and Mushroom.
7/27	01	30	56	45.933637	-130.013695	51	-6	-2	1	1545	1546	Lat/Long positioning: 130 0.8216'W 45 56.0185'N.
7/27	01	31	35	45.933655	-130.013702	52	-7	-1	2	1543	1545	Next thing to do is take pictures of test frame for the observatory.
7/27	01	33	16	45.933630	-130.013823	221	-8	-1	2	1543	1545	We see Junction box in frame and we are taking HD stills.
7/27	01	35	31	45.933671	-130.013818	221	-8	-1	3	1542	1545	Next plan is to move to the north where there is orange sediment to take some syringe samples.
7/27	01	37	22	45.933703	-130.013659	87	-8	-2	2	1543	1545	Transiting to the north to look for orange mat.
7/27	01	38	54	45.933739	-130.013580	8	-8	-1	2	1543	1545	We see a patch on the brow cam.
7/27	01	39	03	45.933744	-130.013568	13	-8	-1	2	1543	1545	Zooming in to take mat sample.
7/27	01	40	14	45.933757	-130.013551	61	0	1	1	1544	1545	Orienting the ROV appropriately to collect the perfect mat sample.
7/27	01	43	05	45.933753	-130.013554	60	-4	-1	1	1544	1545	Position 130 0.8119'N 45 56.0275'N
7/27	01	43	36	45.933752	-130.013555	60	-5	-1	1	1544	1545	Blue syringe sampler being repositioned in arm for sampling.
7/27	01	45	45	45.933757	-130.013531	60	-5	0	1	1544	1545	Positioning blue syringe sampler in mat
7/27	01	46	17	45.933755	-130.013535	60	-7	1	1	1544	1545	Pushing tube in. Using starboard arm to pull trigger.
7/27	01	47	39	45.933749	-130.013538	60	-5	1	1	1544	1545	SAMPLE: bio J2-580-mat-10 Syringe pulled at 0146 filled with orange liquid.
7/27	01	48	58	45.933745	-130.013539	62	-9	-1	2	1543	1545	We would like to get another syringe sample while we are here.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	01	49	14	45.933751	-130.013539	65	-9	-2	2	1543	1545	Blue syringe sample to be placed in Port biobox.
7/27	01	54	27	45.933742	-130.013543	65	-5	0	1	1544	1545	Positioning red syringe in starboard arm for sampling.
7/27	01	55	14	45.933748	-130.013536	66	-7	2	1	1544	1545	Pushing sample into mat
7/27	01	55	55	45.933755	-130.013541	65	-6	-1	1	1544	1545	SAMPLE: bio J2-580-mat-11 Pulling sample 0155 with red syringe in orange mat put into port biobox.
7/27	01	56	29	45.933754	-130.013545	64	-5	-2	1	1544	1545	These kinds of precipitates and sediments are very common at the outskirts of vents.
7/27	01	57	11	45.933746	-130.013539	65	-5	0	1	1544	1545	This is what you get when you have slightly acidic water interacting with the rock and slowly diffusing up it pulls out a bunch of iron.
7/27	01	57	46	45.933743	-130.013528	65	-6	0	1	1544	1545	Pulling out Jason temperature probe to get a reading of this area.
7/27	02	00	00	45.933727	-130.013553	65	-5	-1	1	1544	1545	TEMPS: Jason temperature probe is in orange mat precipitates.
7/27	02	01	27	45.933715	-130.013543	65	-5	-1	1	1544	1545	TEMPS: Jason temperature 3.5C in orange mat north of Inferno.
7/27	02	03	56	45.933699	-130.013517	131	-7	-1	2	1543	1545	Now we are transiting to Gollum.
7/27	02	05	49	45.933616	-130.013323	134	-7	0	1	1543	1544	We see a marker ahead we are moving closer to look at it.
7/27	02	07	34	45.933575	-130.013363	128	-8	0	2	1543	1545	Marker 121 confirms that we are at Gollum.
7/27	02	07	51	45.933564	-130.013387	93	-8	1	1	1544	1545	We see Marker 64 also confirming we are at Gollum.
7/27	02	08	59	45.933538	-130.013379	57	-8	-1	1	1544	1544	The vents are very tiny here at ASHES Gollum is just a little patch. Gollum is a low temperature vent.
7/27	02	09	33	45.933531	-130.013364	57	-8	-1	1	1544	1544	NAV: Doppler Reset.
7/27	02	10	29	45.933541	-130.013298	304	-8	-2	2	1543	1545	Circling around Gollum to find the best place to take a fluid sample.
7/27	02	11	45	45.933550	-130.013322	324	-6	3	1	1544	1545	We see a cool looking Jellyfish in the pilot cam.
7/27	02	13	15	45.933558	-130.013272	272	-9	0	1	1544	1545	Nothing looks interesting here at Gollum.
7/27	02	13	49	45.933555	-130.013260	278	-7	0	1	1544	1545	Lets recover that MTR.
7/27	02	15	20	45.933544	-130.013266	343	-5	1	1	1544	1545	Opening starboard biobox for RECOVERY of MTR 4127 from Gollum.
7/27	02	16	19	45.933557	-130.013275	344	-5	2	1	1544	1545	Zooming in to verify correct number on MTR. It is MTR 4127 and it is stowed in the starboard biobox.
7/27	02	17	27	45.933570	-130.013294	344	-8	1	2	1543	1545	Transiting to Marshmallow.
7/27	02	23	07	45.933734	-130.013428	354	-5	-5	1	1544	1545	At Marshmallow vent found a good tubeworm bush to test temperature.
7/27	02	25	39	45.933743	-130.013433	354	-5	-5	1	1544	1545	TEMPS: Jason temperature Marshmallow 47.0.
7/27	02	25	59	45.933744	-130.013433	354	-5	-5	1	1544	1545	Move around temperature probe to see if its hotter.
7/27	02	28	27	45.933731	-130.013389	353	-5	-5	1	1544	1545	Still probing around vent to find hottest temperature.
7/27	02	28	42	45.933734	-130.013378	354	-5	-4	1	1544	1545	TEMPS: Jason temperature 30C and rising in different spot.
7/27	02	29	49	45.933749	-130.013379	354	-5	-5	1	1544	1545	Securing the temperature probe in the Jason basket.
7/27	02	31	10	45.933727	-130.013421	354	-5	-5	1	1544	1545	Positioning Fluid sampler inlet in diffuse flow bush.
7/27	02	33	08	45.933732	-130.013442	354	-6	-4	1	1544	1545	TEMPS: HFS temperature Inlet positioned in vent 37C and slowly rising.
7/27	02	33	32	45.933737	-130.013449	354	-6	-4	1	1544	1545	Turning pump down to see if that will increase temperature.
7/27	02	34	25	45.933736	-130.013444	354	-6	-4	1	1544	1545	We are going to take a fluid sample here in this position since temp is slowly going up.
7/27	02	36	41	45.933722	-130.013418	354	-6	-4	1	1544	1545	SAMPLE: fluid J2-580-HFS-12 Filtered bag #7 Start=0236.
7/27	02	38	02	45.933727	-130.013413	354	-6	-4	1	1544	1545	J2-580-HFS-12 cont.
7/27	02	41	55	45.933738	-130.013408	354	-6	-5	1	1544	1545	SAMPLE: fluid J2-580-HFS-12 Stop=0241 Tmax=45.6 Tavg=44.7 T2=18 Vol=650 (Butterfield).
7/27	02	43	12	45.933718	-130.013403	354	-6	-4	1	1544	1545	J2-580-HFS-13 Unfiltered bag #24 Start=0243.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	02	44	27	45.933733	-130.013412	354	-6	-4	1	1544	1545	Position Marshmallow 130 0.8056' W 45 56.0248.
7/27	02	44	35	45.933736	-130.013415	354	-5	-5	1	1544	1545	Note we did not see marker I.
7/27	02	46	57	45.933742	-130.013418	354	-6	-4	1	1544	1545	Sampler in white mat some tubeworms
7/27	02	47	34	45.933734	-130.013414	354	-6	-5	1	1544	1545	J2-580-HFS-13 Stop=0247.02 Tmax=50.0 Tavg=46.2 T2=18 Vol=480 (Butterfield)
7/27	02	48	25	45.933729	-130.013414	354	-6	-5	1	1544	1545	SAMPLE: fluid J2-580-HFS-14 RNA filter #14 Start=0248.
7/27	02	49	52	45.933738	-130.013403	354	-6	-4	1	1544	1545	Depth=1544.3 Hdg=353.9.
7/27	02	52	35	45.933718	-130.013391	354	-6	-4	1	1544	1545	J2-580-HFS-14 cont.
7/27	02	53	35	45.933734	-130.013389	354	-6	-4	1	1544	1545	CORRECTION: VV line number 5793 is J2-580-HFS-13 Stop=0247.02 Tmax=50.0 Tavg=46.2 T2=18 Vol=480 (Butterfield)
7/27	02	54	24	45.933729	-130.013390	354	-6	-4	1	1544	1545	CORRECTION!! VV line 5794 is sample J2-580-14 RNA filter #14 Start=0248.
7/27	03	00	14	45.933746	-130.013398	354	-6	-4	1	1544	1545	J2-580-HFS-14 RNA filter cont.
7/27	03	02	32	45.933731	-130.013418	354	-6	-5	1	1544	1545	When we eventually finish the filters we will deploy an MTR head over to Virgin vent recover a HOBO and deploy one.
7/27	03	02	47	45.933731	-130.013408	354	-6	-4	1	1544	1545	J2-580-HFS-14 cont.
7/27	03	06	18	45.933701	-130.013403	354	-6	-5	1	1544	1545	J2-580-HFS-14 cont.
7/27	03	10	39	45.933717	-130.013424	354	-6	-4	1	1544	1545	SAMPLE: fluid J2-580-HFS-14 Stop=0310 Tmax=49.5 Tavg=48.1 T2=19 Vol=3000 (Huber).
7/27	03	11	20	45.933724	-130.013419	354	-5	-5	1	1544	1545	SAMPLE: fluid J2-580-HFS-15 Sterivex filter #10 Start=0311.
7/27	03	16	22	45.933701	-130.013401	354	-6	-4	1	1544	1545	J2-580-HFS-15 cont.
7/27	03	24	52	45.933715	-130.013400	354	-6	-4	1	1544	1545	J2-580-HFS-14 cont.
7/27	03	27	06	45.933715	-130.013390	354	-6	-4	1	1544	1545	J2-580-HFS-14 cont.
7/27	03	29	12	45.933727	-130.013392	354	-6	-4	1	1544	1545	SAMPLE: fluid CORRECTION 5825 and 5827 are J2-580-HFS-15
7/27	03	29	56	45.933725	-130.013389	354	-6	-4	1	1544	1545	SAMPLE: fluid J2-580-HFS-15 Stop=0239 Tmax=51.9 Tavg=49.9 T2=19 Vol=3000 (Huber).
7/27	03	30	20	45.933722	-130.013396	354	-6	-5	1	1544	1545	Stowing the fluid inlet valve on the basket.
7/27	03	34	04	45.933736	-130.013434	354	-6	-5	1	1544	1545	Deploy MTR 3334 (corrected in this log - vv incorrect) at Marshmallow Position 130 0.8052'W 45 56.0232'N
7/27	03	35	15	45.933735	-130.013431	354	-6	-5	1	1544	1545	MTR 3341 deployed in white mat tubeworm looking area in diffuse flow where sampling was taken.
7/27	03	36	52	45.933734	-130.013438	354	-6	-4	1	1544	1545	Positioning probe.
7/27	03	38	11	45.933732	-130.013443	354	-5	-3	1	1544	1545	Depth =1544.5 HDG=353.9
7/27	03	40	44	45.933689	-130.013297	89	-8	-1	2	1543	1545	Transiting to Virgin Vent
7/27	03	40	57	45.933693	-130.013276	89	-8	0	1	1543	1544	Big frame to the right of the Virgin Vent.
7/27	03	41	33	45.933705	-130.013244	98	-8	0	1	1543	1545	Virgin vent is just an anhydrite spire. Constantly building and falling.
7/27	03	41	59	45.933713	-130.013239	114	-8	0	1	1543	1545	Recovering Hobo probe first we can see it in view.
7/27	03	42	42	45.933724	-130.013179	175	-8	-1	2	1543	1545	HIGHLIGHTS: KiPro hard drive start
7/27	03	44	35	45.933711	-130.013174	175	-8	0	1	1544	1545	Virgin is a low salinity vapor-dominated vent that has a very low metal concentration. Anhydrite forms basically just due to the temperature.
7/27	03	46	24	45.933739	-130.013204	175	-8	-1	1	1544	1545	HIGHLIGHTS: KiPro hard drive stop
7/27	03	48	11	45.933720	-130.013192	174	-4	0	1	1544	1546	Repositioning sub to RECOVER HOBO 153 from Virgin vent.
7/27	03	49	27	45.933701	-130.013198	174	-5	-1	1	1544	1545	Hobo probe in starboard arm confirming that it says 153 and placing in back of basket.
7/27	03	52	01	45.933689	-130.013198	174	-6	-1	1	1544	1545	Placed Hobo probe in back of basket.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	03	53	23	45.933704	-130.013200	174	-6	-1	1	1544	1546	Put Jason temperature probe in the base of Virgin Vent hoping that it doesn't knock over.
7/27	03	56	20	45.933696	-130.013183	174	-6	-1	1	1544	1545	Temperature probe accidentally knocked over the chimney.
7/27	03	58	00	45.933690	-130.013185	174	-6	-1	1	1544	1545	TEMPS: Jason temperature Temp probe in hole of Virgin vent T=273.5C
7/27	03	59	26	45.933682	-130.013173	175	-6	-1	1	1544	1546	Venting hole has a bit of smoke coming out of it.
7/27	04	00	02	45.933693	-130.013185	175	-6	-1	1	1544	1546	TEMPS: Jason temperature 274.2C
7/27	04	01	03	45.933700	-130.013190	174	-5	-1	1	1544	1546	Stowing the temperature probe to get fluid inlet to begin water sampling.
7/27	04	02	42	45.933695	-130.013189	174	-6	-1	1	1544	1545	Inserting HFS wand into hole.
7/27	04	03	18	45.933697	-130.013193	175	-5	-1	1	1544	1546	Fluid inlet shoved pretty hard into hole. Lots of flow.
7/27	04	06	14	45.933722	-130.013208	174	-5	-1	1	1544	1545	SAMPLE: fluid J2-580-HFS-16 Unfiltered piston #1 Start=0406.
7/27	04	07	37	45.933709	-130.013209	174	-5	-1	1	1544	1545	J2-580-HFS-16 cont.
7/27	04	08	53	45.933684	-130.013182	174	-5	-1	1	1544	1545	J2-580-HFS-16 Stop= Tmax=273.2 Tavg 272.7 T2=77 Vol=400 (Butterfield).
7/27	04	09	29	45.933681	-130.013178	174	-6	-1	1	1544	1545	SAMPLE: fluid J2-580-HFS-17 Unfiltered Piston #4 Start=0409.
7/27	04	09	45	45.933682	-130.013179	174	-6	-1	1	1544	1545	SAMPLE: fluid J2-580-HFS-16 Stop= Tmax=0408 273.2 Tavg 272.7 T2=77 Vol=400 (Butterfield).
7/27	04	10	07	45.933686	-130.013186	174	-6	-1	1	1544	1545	J2-580-HFS-17 cont.
7/27	04	10	55	45.933698	-130.013205	174	-6	-1	1	1544	1545	Position 130 0.7935'W 45 56.0222 Depth=1544.5 HDG=173.6.
7/27	04	12	10	45.933706	-130.013204	174	-5	-1	1	1544	1545	SAMPLE: fluid J2-580-HFS-17 Stop= Tmax=272.7 Tavg=272.5 T2=80.1 Vol=400 (Butterfield).
7/27	04	12	57	45.933707	-130.013189	174	-5	-1	1	1544	1545	SAMPLE: fluid J2-580-GTHFS-18 Starboard Purple #10 Fired at 0412.
7/27	04	13	26	45.933710	-130.013182	174	-6	-1	1	1544	1545	SAMPLE: fluid J2-580-HFS-17 Stop=0410.
7/27	04	13	43	45.933711	-130.013179	174	-5	-1	1	1544	1545	SAMPLE: fluid J2-580-GTHFS-18 T=272.4.
7/27	04	14	34	45.933707	-130.013181	174	-5	-1	1	1544	1545	Going to fire handheld gas tight.
7/27	04	18	59	45.933690	-130.013218	175	-6	-1	1	1544	1545	SAMPLE: fluid J2-580-GTB-19 Handheld black #18 gas tight fired at 0418.55.
7/27	04	20	05	45.933705	-130.013187	175	-5	-1	1	1544	1545	Zoom in on gas tight shimmering and giving off heat.
7/27	04	20	50	45.933720	-130.013157	175	-5	-1	1	1544	1545	Getting ready to DEPLOY HOBO probe #103.
7/27	04	27	08	45.933679	-130.013189	175	-5	-1	1	1544	1545	There is not enough bend in the HOBO probe trying to bend it by pushing on the ground.
7/27	04	27	59	45.933680	-130.013190	175	-5	-1	1	1544	1545	Swiveling HOBO around in arm to find the best position for deployment.
7/27	04	28	39	45.933678	-130.013194	174	-6	-1	1	1544	1545	Let go of HOBO and it stayed.
7/27	04	30	00	45.933680	-130.013192	174	-4	0	1	1544	1545	Floating in hole not lying on ground we are going to call it deployed.
7/27	04	30	55	45.933682	-130.013186	174	-4	0	1	1544	1546	We are done at Virgin vent and are off to Inferno.
7/27	04	34	59	45.933649	-130.013671	208	-10	0	3	1543	1546	Passing by mushroom we were going to look at it but decided not. Don't want to slow us down.
7/27	04	35	24	45.933623	-130.013680	181	-8	0	2	1544	1546	Inferno is in view. Biggest chimney we've seen thus far.
7/27	04	35	48	45.933615	-130.013683	174	-7	0	3	1543	1546	HIGHLIGHTS: KiPro hard drive start
7/27	04	36	55	45.933599	-130.013734	102	-8	0	4	1542	1546	Circling around Inferno to take HD images.
7/27	04	38	16	45.933603	-130.013739	122	-8	-1	5	1540	1546	HIGHLIGHTS: KiPro hard drive stop
7/27	04	39	05	45.933608	-130.013702	197	-8	0	5	1541	1546	Circling around to north face of Inferno to sample little smoker below top black spire.
7/27	04	42	57	45.933605	-130.013701	223	-13	1	4	1542	1546	Opening port biobox to sample small sulfide chimney of smoker.
7/27	04	45	30	45.933592	-130.013706	223	-12	-1	4	1542	1546	SAMPLE: geo J2-580-Sulfide-20 from Inferno small smoker same place where hot fluid sampling will take place. Skinny spire.
7/27	04	47	07	45.933597	-130.013696	223	-13	1	4	1542	1546	Position: 130 0.8224'W 45 56.0159'N Depth=1542.3 HDG=222.4.
7/27	04	49	36	45.933593	-130.013697	222	-11	-2	4	1542	1546	Jason temp probe being put into hole created by sulfide collection.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	04	53	35	45.933595	-130.013687	222	-11	-3	4	1542	1546	TEMPS: Jason temperature Jason temp is 282 and leveling off.
7/27	04	57	19	45.933595	-130.013700	222	-12	-4	4	1542	1546	TEMPS: Jason temperature Temp probe is now 287.4C and steady.
7/27	04	57	23	45.933595	-130.013701	223	-12	-4	4	1542	1546	Stowing the temp probe now.
7/27	04	57	48	45.933597	-130.013702	223	-12	-2	4	1542	1546	There's chalcopyrite around the opening of the vent where the probe is inserted.
7/27	04	59	33	45.933595	-130.013702	223	-12	-2	4	1542	1546	Going to trigger the major here.
7/27	05	00	16	45.933593	-130.013705	223	-11	-3	4	1542	1546	Getting the major out of the basket.
7/27	05	01	10	45.933593	-130.013706	223	-12	-3	4	1542	1546	Going to insert the major into the same vent the temp probe was in.
7/27	05	01	26	45.933594	-130.013705	223	-12	-3	4	1542	1546	There's a lot of grey-black smoke coming out of the vent.
7/27	05	02	47	45.933593	-130.013697	222	-12	-3	4	1542	1546	SAMPLE: fluid Major is triggered.
7/27	05	03	48	45.933587	-130.013699	223	-12	-3	4	1542	1546	Let the major sit for about a minute.
7/27	05	04	00	45.933586	-130.013700	222	-12	-3	4	1542	1546	Now going to take the major out of the vent.
7/27	05	04	20	45.933585	-130.013701	223	-12	-3	4	1542	1546	SAMPLE: fluid The sample is J2-580-Major-21 .
7/27	05	05	03	45.933584	-130.013701	223	-11	-3	4	1542	1546	Putting the major back into the holster.
7/27	05	05	10	45.933585	-130.013701	223	-11	-3	4	1542	1546	Major is stowed.
7/27	05	05	17	45.933585	-130.013701	223	-11	-3	4	1542	1546	Next we'll do sampling with the Beast.
7/27	05	05	26	45.933586	-130.013700	223	-12	-2	4	1542	1546	Getting the HFS intake wand out of the basket.
7/27	05	06	40	45.933592	-130.013694	223	-12	-3	4	1542	1546	Untangling the HFS wand cable from the basket.
7/27	05	08	57	45.933591	-130.013690	222	-11	-3	4	1542	1546	Put the HFS intake wand into the vent hole.
7/27	05	09	44	45.933589	-130.013689	222	-11	-3	4	1542	1546	TEMPS: Jason temperature Temp is 275C.
7/27	05	10	18	45.933590	-130.013689	222	-11	-3	4	1542	1546	SAMPLE: fluid Temp is 281C.
7/27	05	10	44	45.933590	-130.013691	222	-11	-3	4	1542	1546	J2-580-HFS-22 unfiltered piston #2 start.
7/27	05	14	12	45.933595	-130.013696	222	-11	-3	4	1542	1546	J2-580-HFS-22 stop.
7/27	05	14	36	45.933593	-130.013697	222	-11	-3	4	1542	1546	J2-580-HFS-22 Tmax=282.4 Tavg=281.9 T2=75 Vol=620ml>
7/27	05	15	06	45.933591	-130.013699	222	-11	-3	4	1542	1546	J2-580-HFS-23 unfiltered piston #3 start
7/27	05	18	29	45.933596	-130.013696	222	-11	-3	4	1542	1546	SAMPLE: fluid CORRECTION J2580-HFS-23 is filtered piston #3.
7/27	05	18	32	45.933596	-130.013696	222	-11	-3	4	1542	1546	J2-580-HFS-23 stop.
7/27	05	18	59	45.933596	-130.013697	222	-11	-3	4	1542	1546	J2-580-HFS-23 : Tmax=283.1 Tavg=282.7 T2=78 vol=600.
7/27	05	20	12	45.933598	-130.013699	222	-11	-3	4	1542	1546	SAMPLE: fluid J2-580-HFS-24 is unfiltered bag 20. Start.
7/27	05	22	50	45.933595	-130.013713	222	-12	-3	4	1542	1546	SAMPLE: fluid J2-580-HFS-24 stop.
7/27	05	23	31	45.933585	-130.013711	222	-11	-3	4	1542	1546	J2-580-HFS-24 : Tmax=283.7 Tavg=283.4 t2=85 vol=375.
7/27	05	23	41	45.933583	-130.013710	222	-12	-3	4	1542	1546	Going to trigger center gastight.
7/27	05	23	53	45.933581	-130.013708	222	-11	-3	4	1542	1546	SAMPLE: gas GTHFS-25 fired
7/27	05	24	13	45.933580	-130.013705	222	-11	-3	4	1542	1546	J2-580-GTHFS-25 is fired now.
7/27	05	24	41	45.933580	-130.013700	222	-12	-3	4	1542	1546	SAMPLE: gas J2-580-GTHFS-25 is center yellow-black #5.
7/27	05	25	29	45.933585	-130.013694	222	-12	-3	4	1542	1546	Going to take the sampler HFS intake now.
7/27	05	25	41	45.933586	-130.013694	222	-12	-3	4	1542	1546	Going to take a handheld gastight next.
7/27	05	26	17	45.933589	-130.013695	222	-11	-3	4	1542	1546	Stowing the HFS intake wand.
7/27	05	29	09	45.933591	-130.013695	222	-11	-3	4	1542	1546	Picking up gastight bottle orange/black #7.
7/27	05	29	35	45.933590	-130.013695	222	-12	-2	4	1542	1546	Untying bungee cord.
7/27	05	31	07	45.933579	-130.013700	222	-11	-3	4	1542	1546	Getting the gastight out of the basket.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	05	32	22	45.933578	-130.013703	222	-12	-3	4	1542	1546	Putting gastight into position.
7/27	05	33	25	45.933583	-130.013705	222	-12	-3	4	1542	1546	SAMPLE: gas This will be sample J2580-GTB-26.
7/27	05	34	44	45.933587	-130.013704	222	-12	-3	4	1542	1546	SAMPLE: gas J2-580-GTB-26 fired now.
7/27	05	34	56	45.933588	-130.013704	222	-12	-3	4	1542	1546	Taking gastight out of vent.
7/27	05	35	19	45.933589	-130.013703	222	-12	-3	4	1542	1546	Putting gastight bottle back in basket.
7/27	05	37	11	45.933586	-130.013707	222	-11	-2	4	1542	1546	Tying bungee down on gastights.
7/27	05	38	09	45.933582	-130.013713	222	-11	-2	4	1542	1546	Gastights stowed.
7/27	05	38	18	45.933581	-130.013714	222	-11	-1	4	1542	1546	Next we'll go to Mushroom.
7/27	05	38	25	45.933581	-130.013714	222	-11	-1	4	1542	1546	HIGHLIGHTS: KiPro hard drive start
7/27	05	40	17	45.933572	-130.013692	243	-7	-2	3	1542	1546	Taping the area we just sampled as a potential sampling site for Marv Lilley.
7/27	05	42	05	45.933586	-130.013682	242	-8	-2	3	1543	1546	Correction -- actually looking at Inferno for a site on the cabled observatory (OOI).
7/27	05	42	17	45.933591	-130.013686	206	-7	-2	3	1543	1546	The area to the left of the vent is relatively flat.
7/27	05	43	40	45.933594	-130.013675	263	-7	-2	3	1543	1546	Frame_Grab:
7/27	05	44	08	45.933599	-130.013687	239	-8	-1	3	1543	1546	The knob has some tubeworm clumps stuck to it.
7/27	05	45	14	45.933599	-130.013702	233	-7	-2	1	1545	1546	Looking further down the column.
7/27	05	45	33	45.933597	-130.013705	243	-7	-1	1	1545	1546	There's some orange mat on the side of the pillar.
7/27	05	45	37	45.933595	-130.013702	256	-7	-2	1	1545	1546	Also lots of worm clumps.
7/27	05	45	48	45.933586	-130.013689	280	-7	-1	1	1545	1546	Circling around the pillar now.
7/27	05	46	13	45.933585	-130.013675	295	-7	-2	1	1545	1546	There's a slope at the bottom of the pillar.
7/27	05	46	47	45.933582	-130.013659	295	-7	-2	1	1544	1545	Done looking around at Inferno.
7/27	05	46	52	45.933582	-130.013658	295	-7	-2	1	1544	1545	HIGHLIGHTS: KiPro hard drive stop
7/27	05	47	39	45.933586	-130.013654	295	-7	-2	1	1544	1545	It's relatively flat at the bottom actually.
7/27	05	47	46	45.933587	-130.013652	298	-7	-2	1	1544	1545	Could be good sites for instruments in the OOI.
7/27	05	47	53	45.933590	-130.013650	305	-7	-2	1	1544	1545	Now we're on to Mushroom.
7/27	05	49	13	45.933670	-130.013623	128	-8	-2	3	1543	1546	We're arriving at Mushroom now.
7/27	05	49	56	45.933647	-130.013614	162	-7	-2	2	1544	1545	It's a fat white pillar with some worms and sulfides hanging off of it.
7/27	05	50	02	45.933646	-130.013615	162	-7	-2	1	1544	1545	HIGHLIGHTS: KiPro hard drive start
7/27	05	50	27	45.933642	-130.013619	140	-7	-2	1	1544	1546	We'll circle around Mushroom and get a look on the HD video.
7/27	05	52	13	45.933592	-130.013639	29	-7	-2	1	1544	1545	Some black tubeworms on the side here.
7/27	05	52	44	45.933583	-130.013606	349	-7	-1	1	1544	1545	Some grey and dark brown sediment on the bottom.
7/27	05	53	35	45.933635	-130.013578	242	-7	-2	1	1544	1546	The protruding bit on the top side has lots of white sulfides on it.
7/27	05	54	30	45.933642	-130.013654	98	-7	-2	2	1544	1546	We'll get a little bit closer.
7/27	05	55	50	45.933649	-130.013618	146	-8	-2	2	1544	1546	The seafloor lava is spider-webbed in cracks filled with white sulfides.
7/27	05	57	47	45.933619	-130.013610	351	-8	-2	1	1544	1545	The venting is only up one side of this pillar.
7/27	05	58	33	45.933638	-130.013649	67	-7	-2	2	1544	1546	We've circled all the way around Mushroom at least once.
7/27	05	59	12	45.933633	-130.013631	46	-7	-2	2	1544	1546	There's some diffuse flow coming up the side of the pillar.
7/27	06	00	39	45.933628	-130.013632	46	-6	-1	1	1545	1546	There's some black worms next to the diffuse flow at the bottom.
7/27	06	00	44	45.933628	-130.013633	46	-6	-2	1	1545	1546	Frame_Grab:
7/27	06	00	56	45.933627	-130.013636	46	-6	-1	1	1545	1546	Or they could be sulfides.
7/27	06	01	15	45.933623	-130.013640	45	-9	-2	1	1545	1546	Going to look at the top of Mushroom now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	06	02	43	45.933599	-130.013602	325	-7	-2	2	1543	1545	The top has a small pinnacle with a smoker that has black sulfides around it.
7/27	06	03	38	45.933599	-130.013603	297	-7	-2	3	1543	1545	There's also some Ridgeia at the top of the mound.
7/27	06	06	57	45.933617	-130.013608	296	-7	-2	2	1543	1545	And possibly some palm worms.
7/27	06	07	08	45.933616	-130.013613	297	-8	-2	2	1543	1546	We'll try taking a sample at the top vent of Mushroom.
7/27	06	07	19	45.933614	-130.013618	297	-8	-2	2	1543	1545	Afterwards we'll try to collect some sulfides.
7/27	06	07	33	45.933611	-130.013622	296	-8	-2	2	1543	1545	The starboard bio box is out.
7/27	06	07	56	45.933607	-130.013625	296	-8	-2	2	1543	1545	Going to open the box lid.
7/27	06	09	17	45.933607	-130.013603	296	-9	-1	2	1543	1545	Biobox is open.
7/27	06	10	07	45.933608	-130.013601	294	-7	-2	2	1543	1545	HIGHLIGHTS: KiPro hard drive stop
7/27	06	12	02	45.933617	-130.013626	321	-9	-1	3	1542	1545	Positioning Jason next to vent.
7/27	06	12	11	45.933619	-130.013625	321	-9	-1	2	1543	1545	Bumped into vent but it's still in one piece.
7/27	06	12	42	45.933620	-130.013621	323	-10	-1	2	1543	1545	Positioning Jason.
7/27	06	14	20	45.933613	-130.013605	322	-10	-2	3	1543	1545	Reaching out with the Kraft arm.
7/27	06	14	36	45.933610	-130.013606	322	-10	-2	3	1543	1545	Going to try to grab the black cone sulfide on top of Mushroom.
7/27	06	15	44	45.933593	-130.013609	322	-10	-2	3	1543	1545	Using speed 3 for opening/closing.
7/27	06	16	19	45.933588	-130.013603	322	-10	-2	3	1543	1545	It's crumbling already.
7/27	06	16	35	45.933588	-130.013598	322	-10	-2	3	1543	1545	We'll try collecting it down closer to its base.
7/27	06	18	14	45.933607	-130.013587	322	-10	-2	3	1543	1545	It's crumbling in the grip of the arm.
7/27	06	19	09	45.933613	-130.013597	321	-10	-2	3	1543	1545	Oh no - it fell out of the hand!
7/27	06	19	38	45.933614	-130.013603	321	-10	-2	3	1543	1545	Going to try to grab a lower part of the chimney.
7/27	06	20	34	45.933617	-130.013608	321	-10	-1	3	1543	1545	Got some sulfides.
7/27	06	20	40	45.933618	-130.013608	321	-10	-1	3	1543	1545	Putting it in the starboard biobox.
7/27	06	23	19	45.933612	-130.013599	321	-10	-3	2	1543	1545	SAMPLE: geo This sample is J2-580-Sulfide-27 .
7/27	06	24	48	45.933611	-130.013607	321	-10	-3	2	1543	1545	Grabbing another piece of this chimney.
7/27	06	25	23	45.933612	-130.013608	321	-10	-1	2	1543	1545	SAMPLE: geo All these pieces will be part of J2-580-Sulfide-27.
7/27	06	25	32	45.933613	-130.013608	321	-10	-1	2	1543	1545	Another part was placed in the starboard biobox.
7/27	06	25	37	45.933613	-130.013607	321	-10	-1	2	1543	1545	Going to close the biobox.
7/27	06	25	48	45.933613	-130.013607	321	-10	-1	2	1543	1545	Then we'll do some temperature sampling.
7/27	06	26	31	45.933612	-130.013599	321	-10	-3	2	1543	1545	Actually going to try and pick up the cone that was dropped at the start of the chimney sampling.
7/27	06	28	09	45.933612	-130.013584	320	-10	-3	2	1543	1545	The piece totally crumbled.
7/27	06	28	14	45.933612	-130.013583	321	-10	-2	2	1543	1545	Giving up on collecting the cone piece.
7/27	06	28	29	45.933613	-130.013583	321	-9	-1	2	1543	1545	Closing the biobox lid now.
7/27	06	29	49	45.933617	-130.013589	321	-10	-1	2	1543	1545	Tying the bungee closed on the biobox.
7/27	06	32	05	45.933608	-130.013583	320	-9	-2	2	1543	1545	Bungee tied and starboard box stowed.
7/27	06	32	12	45.933608	-130.013582	321	-9	-2	2	1543	1545	Getting the Jason temp probe out of the basket.
7/27	06	33	35	45.933607	-130.013589	320	-9	-2	2	1543	1545	Uncoiling the cord for the temperature probe.
7/27	06	35	27	45.933591	-130.013613	315	4	-6	1	1544	1545	Temp probe is out.
7/27	06	35	41	45.933594	-130.013613	314	4	-5	1	1544	1545	There are some long worms twisting in the vent fluid.
7/27	06	36	04	45.933601	-130.013609	311	4	-6	1	1544	1545	Inserting the temp probe into the smoker vent on top of Mushroom.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	06	36	22	45.933608	-130.013603	308	2	-5	1	1544	1545	Location: DOP 45N 56.015' 130W 0.814'
7/27	06	36	40	45.933614	-130.013596	309	3	-5	1	1544	1545	Looking for a good spot to insert the temp probe.
7/27	06	37	02	45.933623	-130.013584	307	3	-5	1	1544	1545	Found a spot with yellow minerals - pyrite/chalcopyrite.
7/27	06	37	10	45.933626	-130.013581	306	2	-5	2	1544	1545	Inserting probe next to chalcopyrite.
7/27	06	37	21	45.933629	-130.013576	306	2	-4	2	1544	1545	TEMPS: Jason temperature Temp is 200C and rising.
7/27	06	37	49	45.933633	-130.013571	308	3	-5	1	1544	1545	Temp is 245.7C.
7/27	06	38	05	45.933635	-130.013569	308	3	-5	1	1544	1545	There are lots of worms living right next to this vent.
7/27	06	38	21	45.933635	-130.013571	307	3	-5	2	1544	1545	Temp is falling a little to 246C.
7/27	06	38	33	45.933633	-130.013573	307	2	-5	2	1544	1545	It was higher before.
7/27	06	38	43	45.933632	-130.013575	306	2	-5	2	1544	1545	Now it's jumped up to 253.6C.
7/27	06	39	27	45.933622	-130.013586	306	3	-5	1	1544	1545	Going to try placing the probe more to one side.
7/27	06	39	38	45.933619	-130.013588	305	2	-5	2	1544	1545	TEMPS: Jason temperature The temp is 230C and rising.
7/27	06	40	47	45.933602	-130.013591	308	2	-5	2	1544	1545	Took probe out.
7/27	06	40	56	45.933601	-130.013591	308	2	-5	1	1544	1545	Going to try putting it in again at a different angle.
7/27	06	41	32	45.933601	-130.013587	305	2	-5	1	1544	1545	The T is now 165 and rising.
7/27	06	42	10	45.933603	-130.013586	309	3	-5	1	1544	1545	We'll do fluid sampling here - vent is tricky to sample though.
7/27	06	43	21	45.933603	-130.013586	310	4	-5	1	1544	1545	Pieces of sulfide being blown out of the vent opening.
7/27	06	43	43	45.933602	-130.013587	309	3	-5	1	1544	1545	Put Jason temp probe back in holster.
7/27	06	43	44	45.933601	-130.013587	309	3	-5	1	1544	1545	Getting the HFS intake wand out of the basket.
7/27	06	44	32	45.933599	-130.013592	311	4	-5	1	1544	1545	Changing watches.
7/27	06	48	38	45.933600	-130.013601	310	3	-5	1	1544	1545	HFS fluid sampler intake is in Mushroom.
7/27	06	49	19	45.933596	-130.013596	308	3	-5	1	1544	1545	TEMPS: HFS temperature Temp is 196 and rising.
7/27	06	50	47	45.933594	-130.013573	310	4	-5	1	1544	1545	SAMPLE: fluid J2-580-HFS-28 is unfiltered piston 22. Start.
7/27	06	52	02	45.933612	-130.013555	309	3	-5	1	1544	1545	HFS-28 has not started sampling yet.
7/27	06	52	05	45.933613	-130.013554	309	3	-5	1	1544	1545	Moving Jason.
7/27	06	58	01	45.933597	-130.013594	324	-5	-3	2	1543	1545	Discussing fluid sampling for rest of dive - watch leader change.
7/27	06	59	54	45.933612	-130.013608	324	-5	-3	2	1543	1545	Temp is going up to ~204C.
7/27	07	00	17	45.933614	-130.013610	324	-5	-3	2	1543	1545	TEMPS: HFS temperature Temp is climbing again to 240C.
7/27	07	00	23	45.933614	-130.013611	324	-5	-3	2	1543	1545	Was 284C before.
7/27	07	00	37	45.933614	-130.013611	323	-5	-3	2	1543	1545	Waiting till it gets up to temperature.
7/27	07	01	34	45.933616	-130.013609	323	-5	-3	2	1543	1545	Temp is now 260C and still rising.
7/27	07	02	10	45.933620	-130.013614	323	-5	-3	2	1543	1545	Temp is 270C and still rising.
7/27	07	07	23	45.933603	-130.013611	324	-5	-3	2	1543	1545	J2-580-HFS-298 start.
7/27	07	07	47	45.933603	-130.013606	324	-5	-3	2	1543	1545	SAMPLE: fluid CORRECTION: J2580-HFS-28 started.
7/27	07	08	04	45.933604	-130.013603	323	-5	-3	2	1543	1545	SAMPLE: fluid J2580-HFS-28 is unfiltered piston #22.
7/27	07	10	45	45.933613	-130.013593	323	-5	-3	2	1543	1545	SAMPLE: fluid J2580-HFS-28 stop.
7/27	07	11	13	45.933616	-130.013595	323	-5	-3	2	1543	1545	J2-580-HFS-28: Tmax=289.4 Tavg=286.7 T2=28 Vol=476.
7/27	07	12	14	45.933620	-130.013599	323	-5	-3	2	1543	1545	J2-580-HFS-29 is filtered bag #21. Start.
7/27	07	16	00	45.933616	-130.013609	323	-5	-3	2	1543	1545	SAMPLE: fluid J2-580-HFS-30 stop.
7/27	07	16	27	45.933617	-130.013604	323	-5	-3	2	1543	1545	J2-580-HFS-29: Tmax=291.3 Tavg=291.1 Vol=477 T2=27.6

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	07	17	46	45.933608	-130.013593	323	-5	-3	2	1543	1545	SAMPLE: fluid J2-580-HFS-30 is filtered bag #19 start.
7/27	07	19	26	45.933600	-130.013604	323	-5	-3	2	1543	1545	SAMPLE: fluid These samples HFS-27/28/29/30 are all in the same location.
7/27	07	21	24	45.933608	-130.013598	323	-5	-3	2	1543	1545	SAMPLE: fluid J2-580-HFS-30 is done.
7/27	07	21	54	45.933612	-130.013599	323	-5	-3	2	1543	1545	SAMPLE: fluid J2-580-HFS-30: Tmax=291.9 Tavg=291.4 T2=31.2 Vol=477.
7/27	07	22	02	45.933614	-130.013600	323	-5	-3	2	1543	1545	SAMPLE: gas Port gastight on HFS fired.
7/27	07	22	49	45.933623	-130.013608	323	-5	-3	2	1543	1545	SAMPLE: gas J2-580-GTHFS-31 is port gastight blue #12.
7/27	07	23	16	45.933625	-130.013606	324	-9	-1	4	1541	1545	We're going to Hell.
7/27	07	25	00	45.933585	-130.013603	256	-8	-2	2	1543	1545	Saw some Erlenmeyer flasks on the seafloor.
7/27	07	25	19	45.933572	-130.013598	229	-7	-1	2	1542	1545	There's also a sea star here.
7/27	07	26	03	45.933525	-130.013593	217	-7	-2	2	1543	1545	Traveling past some cracked seafloor lava.
7/27	07	26	15	45.933515	-130.013596	216	-8	-2	2	1543	1545	There's lots of white filaments spider-webbed across the seafloor.
7/27	07	26	22	45.933505	-130.013588	195	-8	-2	2	1543	1545	Also lots of floc in the water.
7/27	07	26	34	45.933500	-130.013577	190	-7	-2	2	1544	1545	Big rusting piece of metal here.
7/27	07	26	45	45.933494	-130.013579	199	-7	-2	1	1544	1545	Lots of shrimp flying past the cameras.
7/27	07	27	51	45.933460	-130.013681	227	-8	-2	2	1543	1545	There are also some clumps of tubeworms on the seafloor.
7/27	07	29	21	45.933400	-130.013796	229	-7	-2	2	1543	1545	Hell is dead ahead.
7/27	07	29	28	45.933397	-130.013802	227	-7	-2	2	1543	1545	We'll be there in 15 meters.
7/27	07	30	17	45.933353	-130.013890	227	-8	-2	3	1543	1545	Hell is coming up.
7/27	07	30	20	45.933352	-130.013895	227	-7	-2	3	1543	1546	There's a marker here.
7/27	07	31	20	45.933343	-130.013947	229	-7	-2	4	1541	1545	We'll look around this vent area at the top.
7/27	07	31	52	45.933317	-130.013936	301	-8	-2	5	1540	1545	There's a smoker vent on top.
7/27	07	31	59	45.933312	-130.013945	316	-7	-2	5	1540	1545	Also some clumps of worms on the rocks.
7/27	07	32	10	45.933306	-130.013960	347	-8	-2	5	1540	1545	It's a 3-lobed structure on top.
7/27	07	32	46	45.933333	-130.014013	90	-8	-2	4	1541	1544	There's actually 2 smokers on the top here - they're next to each other.
7/27	07	33	38	45.933354	-130.013943	207	-8	-2	5	1540	1545	We'll try and take samples from the smokers on top.
7/27	07	34	48	45.933335	-130.013954	225	-12	-2	4	1541	1545	This area on top has the 2 smokers to the right and 3 pinnacles to the left covered in worms.
7/27	07	38	31	45.933330	-130.013979	225	-12	-3	4	1541	1545	Putting HFS intake wand back in basket.
7/27	07	38	38	45.933330	-130.013977	225	-12	-3	4	1541	1545	We'll try sampling the sulfide chimneys.
7/27	07	39	43	45.933330	-130.013964	225	-13	-2	4	1541	1545	Going to make a grab at the foremost sulfide chimney.
7/27	07	39	53	45.933329	-130.013963	226	-12	-2	4	1541	1545	It floated up!
7/27	07	39	58	45.933329	-130.013962	226	-12	-2	4	1541	1545	Then it crumbled downwards.
7/27	07	40	15	45.933328	-130.013960	225	-12	-4	4	1541	1545	We'll try picking it up again.
7/27	07	40	25	45.933327	-130.013960	225	-13	-2	4	1541	1545	Seems to be crushing into small pieces.
7/27	07	40	36	45.933326	-130.013959	225	-13	-2	4	1541	1545	Never mind.
7/27	07	40	44	45.933325	-130.013959	225	-12	-3	4	1541	1545	TEMPS: Jason temperature We'll do the Jason temp probe here.
7/27	07	41	26	45.933321	-130.013960	225	-12	-3	4	1541	1545	Getting the Jason temp probe out.
7/27	07	41	43	45.933320	-130.013961	225	-13	-3	4	1541	1545	Sticking the probe into where the sulfide chimney was.
7/27	07	42	33	45.933319	-130.013963	225	-12	-3	4	1541	1545	This is a very narrow opening.
7/27	07	42	43	45.933319	-130.013963	225	-12	-4	4	1541	1545	It seems to have chalcopyrite around the edges of the opening.
7/27	07	42	59	45.933320	-130.013963	226	-12	-3	4	1541	1545	We're putting the Jason temp probe in.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	07	43	11	45.933321	-130.013963	226	-12	-3	4	1541	1545	TEMPS: Jason temperature is 260 and rising.
7/27	07	43	46	45.933324	-130.013962	226	-12	-3	4	1541	1545	TEMPS: Jason temperature Temp is 273 and still rising.
7/27	07	45	29	45.933326	-130.013957	226	-12	-3	4	1541	1545	This vent mound is covered in little palm worms.
7/27	07	45	41	45.933325	-130.013956	226	-12	-3	4	1541	1545	TEMPS: Jason temperature. The temp is 281 and holding steady.
7/27	07	45	54	45.933325	-130.013955	226	-12	-3	4	1541	1545	The max temp was 281.3C.
7/27	07	46	02	45.933324	-130.013955	226	-12	-2	4	1541	1545	Stowing the Jason temp probe.
7/27	07	46	10	45.933323	-130.013954	226	-12	-2	4	1541	1545	Going to fluid sample here with the Beast.
7/27	07	47	09	45.933322	-130.013951	225	-12	-2	4	1541	1545	Have the HFS wand out.
7/27	07	47	22	45.933322	-130.013950	226	-12	-3	4	1541	1545	Trying to break a larger entry into the area where we just took the temperature.
7/27	07	48	24	45.933328	-130.013954	226	-12	-3	4	1541	1545	The temp is ~50C.
7/27	07	48	35	45.933329	-130.013956	226	-12	-3	4	1541	1545	We'll use the Jason hand to break a larger hole.
7/27	07	50	06	45.933332	-130.013968	225	-12	-3	4	1541	1545	A lot of worms are being knocked off the rocks to the left of the vent.
7/27	07	51	09	45.933329	-130.013970	226	-12	-4	4	1541	1545	Trying to lodge the tip of the HFS wand inside the chalcopyrite hole again.
7/27	07	54	15	45.933326	-130.013965	225	-13	-2	4	1541	1545	This vent seems too difficult to fluid sample from.
7/27	07	54	20	45.933325	-130.013965	225	-12	-2	4	1541	1545	We'll have a look at the other vent.
7/27	07	54	44	45.933323	-130.013966	226	-12	-3	4	1541	1545	Removing HFS wand and putting in larger vent opening.
7/27	07	55	02	45.933322	-130.013966	226	-12	-3	4	1541	1545	The temp is much higher already.
7/27	07	55	13	45.933321	-130.013967	226	-12	-3	4	1541	1545	TEMPS: HFS temperature is 234C and rising.
7/27	07	55	39	45.933320	-130.013968	226	-12	-3	4	1541	1545	Temp is 255 and rising.
7/27	07	56	44	45.933323	-130.013968	226	-12	-3	4	1541	1545	We'll take the Hell samples from here.
7/27	08	00	47	45.933327	-130.013963	226	-12	-3	4	1541	1545	SAMPLE: fluid Unfiltered bag #23 start.
7/27	08	01	17	45.933330	-130.013963	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-32 is unfiltered bag #23.
7/27	08	04	33	45.933321	-130.013965	226	-12	-3	4	1541	1545	HFS-32 done.
7/27	08	05	05	45.933320	-130.013966	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-32: Tmax=289.7 Tavg=289.5 Vol=476. T2=76.1
7/27	08	05	49	45.933322	-130.013963	226	-12	-3	4	1541	1545	DOP: 45N 56.000' 130W 0.839'
7/27	08	05	59	45.933322	-130.013963	226	-12	-3	4	1541	1545	depth 1541.2m heading 226.3
7/27	08	06	17	45.933323	-130.013962	226	-12	-3	4	1541	1545	unfiltered piston #8 start.
7/27	08	06	40	45.933324	-130.013961	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-33 is unfiltered piston #8.
7/27	08	10	18	45.933337	-130.013958	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-33 done.
7/27	08	10	42	45.933339	-130.013952	226	-12	-3	4	1541	1545	J2-580-HFS-33: Tmax=290.8 Tavg=290.4 T2=86.8 Vol=603.
7/27	08	11	11	45.933338	-130.013945	226	-12	-3	4	1541	1545	J2-580-HFS-34 is filtered piston #9 start.
7/27	08	11	24	45.933338	-130.013943	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-34 is filtered piston #9.
7/27	08	15	32	45.933324	-130.013958	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-34 is same location as HFS-32/33.
7/27	08	17	50	45.933318	-130.013975	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-34 -- sample pump froze.
7/27	08	21	03	45.933325	-130.013963	226	-12	-3	4	1541	1545	Pumped 448mLs then shut off.
7/27	08	21	19	45.933327	-130.013963	226	-12	-3	4	1541	1545	Restarted the Beast sample pump again - not sure how much volume was actually pumped.
7/27	08	21	30	45.933328	-130.013963	226	-12	-3	4	1541	1545	SAMPLE: fluid J2-580-HFS-34 finished.
7/27	08	22	02	45.933328	-130.013963	226	-12	-3	4	1541	1545	J2-580-HFS-34: Tmax=291.2 Tavg=291.0 T2=83 vol=??
7/27	08	22	34	45.933329	-130.013964	225	-12	-3	4	1541	1545	Stowing the HFS wand intake.
7/27	08	23	13	45.933330	-130.013965	225	-13	-3	4	1541	1545	Going to get out the last gastight bottle.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	08	23	35	45.933332	-130.013964	225	-12	-2	4	1541	1545	This is gastight yellow #7.
7/27	08	24	48	45.933336	-130.013958	225	-12	-4	4	1541	1545	Picking up the gastight.
7/27	08	25	41	45.933334	-130.013951	225	-13	-3	4	1541	1545	Positioning the gastight in the vent.
7/27	08	27	58	45.933324	-130.013961	225	-13	-3	4	1541	1545	SAMPLE: gas Gastight bottle yellow #7 fired.
7/27	08	28	24	45.933323	-130.013966	225	-13	-3	4	1541	1545	The nozzle moved a little - probably didn't get a sample.
7/27	08	28	52	45.933323	-130.013970	225	-12	-4	4	1541	1545	SAMPLE: gas Yellow gastight bottle #7 is J2-580-GTB-35.
7/27	08	29	07	45.933323	-130.013971	225	-12	-3	4	1541	1545	Stowing the last gastight bottle.
7/27	08	29	20	45.933323	-130.013972	225	-12	-3	4	1541	1545	Tying the bungee cord down on the gastights.
7/27	08	30	39	45.933326	-130.013968	225	-13	-3	4	1541	1545	Gastights are stowed.
7/27	08	31	05	45.933327	-130.013968	225	-12	-2	4	1541	1545	HIGHLIGHTS: KiPro hard drive start
7/27	08	31	23	45.933333	-130.013958	227	-9	-1	4	1541	1545	Going to circle around Hell for some HD highlights.
7/27	08	34	00	45.933328	-130.014042	71	-7	-1	3	1541	1544	Frame_Grab:
7/27	08	34	07	45.933337	-130.014045	87	-7	-1	3	1541	1544	Frame_Grab:
7/27	08	35	26	45.933349	-130.013949	233	-7	-1	4	1541	1545	HIGHLIGHTS: KiPro hard drive stop
7/27	08	37	50	45.933334	-130.013844	0	-7	-1	1	1544	1545	We have time for some exploring now.
7/27	08	37	56	45.933334	-130.013844	360	-7	-1	1	1544	1545	We'll go north to Hairdo.
7/27	08	39	25	45.933441	-130.013868	358	-7	-1	2	1543	1545	Coasting over old lava flow here.
7/27	08	39	50	45.933490	-130.013875	360	-7	-1	1	1543	1545	There's lots of yellow sediment here.
7/27	08	41	40	45.933597	-130.013874	24	-7	-1	2	1543	1545	Back at the platform box with the half-dome inside.
7/27	08	41	47	45.933600	-130.013871	25	-7	-2	3	1542	1545	Going to go over it.
7/27	08	43	48	45.933601	-130.013910	22	-8	-1	3	1541	1545	Still not sure where Hairdo is - we may have passed it.
7/27	08	44	16	45.933657	-130.013918	35	-7	-1	2	1542	1544	Going to west of the observatory platform (put a note in a navigation target).
7/27	08	44	51	45.933698	-130.013907	15	-6	-1	2	1542	1544	There's nothing much here.
7/27	08	45	08	45.933688	-130.013900	15	-7	-1	3	1542	1544	There's a starfish here.
7/27	08	46	18	45.933678	-130.013916	34	-8	-1	1	1543	1544	Lots of lava flow and yellow sediment.
7/27	08	47	08	45.933661	-130.013885	9	-7	0	3	1542	1545	We're almost at the same latitude as Virgin now.
7/27	08	48	10	45.933693	-130.013880	11	-7	-1	1	1543	1544	We've probably passed Hairdo.
7/27	08	48	14	45.933695	-130.013878	24	-7	-1	1	1543	1544	We'll go to Crack next.
7/27	08	49	17	45.933720	-130.013890	27	-7	-1	2	1543	1544	Turning the ship to head for Crack.
7/27	08	51	17	45.933550	-130.013964	177	-8	-1	2	1543	1545	Traveling towards Crack now.
7/27	08	51	30	45.933529	-130.013934	170	-8	-1	1	1543	1545	There's a lot of floc in the water here.
7/27	08	51	57	45.933490	-130.013897	177	-7	-1	1	1544	1545	Passing over a metal plate on the seafloor here.
7/27	08	52	22	45.933450	-130.013907	177	-7	-1	1	1543	1545	There's some orange rust. Or orange sediments.
7/27	08	54	47	45.933503	-130.013711	167	-7	0	2	1543	1545	Passing an old marker flag here.
7/27	08	55	31	45.933498	-130.013705	158	-7	-1	2	1543	1545	The marker is 19 - it's upside down.
7/27	08	55	37	45.933494	-130.013712	159	-7	-1	2	1543	1545	Inferno is right here behind us.
7/27	08	56	45	45.933456	-130.013562	150	-7	0	1	1543	1544	Passing a lava contact here.
7/27	08	57	31	45.933462	-130.013533	125	-8	-2	1	1543	1544	There's someone's old experiment here - a line and some plastic caging.
7/27	08	58	06	45.933437	-130.013471	125	-8	-1	3	1542	1545	A lot of orange sediment between the lava here.
7/27	08	58	44	45.933378	-130.013377	146	-8	-1	2	1542	1544	Crack is ~5m ahead of us.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	08	59	07	45.933365	-130.013334	145	-7	-1	1	1542	1544	Here's another experiment or piece of junk.
7/27	08	59	11	45.933365	-130.013326	148	-7	-1	1	1543	1544	We seem to be at Crack.
7/27	08	59	30	45.933364	-130.013303	150	-7	-1	1	1543	1544	It looks like a record turntable with a piece of line on it.
7/27	09	00	21	45.933369	-130.013276	174	-2	0	1	1544	1544	The line is actually a hose.
7/27	09	00	32	45.933368	-130.013276	174	-2	0	1	1544	1544	It must be sitting where Crack is.
7/27	09	01	48	45.933350	-130.013199	126	-8	-1	1	1543	1544	We'll continue heading southeast and see what's beyond the edge of our mapped area.
7/27	09	02	34	45.933348	-130.013148	93	-7	-1	1	1543	1544	There's lots of old sediment and craggy lava flow.
7/27	09	02	39	45.933348	-130.013146	91	-6	-1	1	1543	1544	There's a red anemone here.
7/27	09	03	04	45.933347	-130.013155	91	-3	0	1	1544	1544	There's also a sea star in the background.
7/27	09	05	00	45.933308	-130.013114	120	-8	-1	2	1542	1544	Thought we might collect some sediment but all the syringes have been used.
7/27	09	05	07	45.933299	-130.013094	120	-8	-1	2	1542	1544	We'll continue onwards.
7/27	09	05	35	45.933257	-130.012996	122	-7	-1	2	1542	1544	Continuing to travel to the southeast.
7/27	09	05	59	45.933249	-130.012928	114	-8	-2	1	1542	1543	Some more orange sediments.
7/27	09	06	49	45.933224	-130.012856	81	-7	-1	1	1543	1544	Passing a big chain with some yellow tape on it.
7/27	09	07	05	45.933218	-130.012851	57	-7	-1	1	1543	1544	It looks like it may have been an anchor chain.
7/27	09	08	17	45.933214	-130.012758	119	-7	-1	1	1543	1544	There's a lot of craggy lava rocks here with orange mats on top.
7/27	09	10	33	45.933251	-130.012631	91	-7	-1	3	1541	1544	We're driving to the International District now.
7/27	09	11	51	45.933249	-130.012607	92	-7	-1	2	1542	1544	Passing over some sheet flow lava.
7/27	09	13	13	45.933247	-130.012530	89	-7	-1	1	1543	1544	Waiting for the ship to turn.
7/27	09	19	38	45.933221	-130.012061	91	-9	-2	1	1543	1544	Driving forward and looking for anything new.
7/27	09	23	51	45.933126	-130.011603	90	-7	0	1	1542	1543	Different people trying out driving Jason.
7/27	09	24	53	45.933179	-130.011585	88	-8	0	1	1542	1544	Big anemone went under us.
7/27	09	25	27	45.933169	-130.011467	84	-9	-1	2	1542	1544	Giant fish floated by us!
7/27	09	25	38	45.933177	-130.011431	85	-8	0	2	1542	1544	Lots more sheet flow lava here.
7/27	09	26	19	45.933176	-130.011324	86	-9	-1	2	1542	1544	Even more chains here on the seafloor.
7/27	09	26	53	45.933168	-130.011241	85	-8	-1	2	1542	1544	Here there's pillow lava.
7/27	09	27	38	45.933174	-130.011131	87	-9	-1	2	1539	1542	This area is probably all part of the 1998 lava flow.???????
7/27	09	30	13	45.933128	-130.010628	86	-6	-2	4	1536	1539	Still going by some pillow basalts.
7/27	09	31	21	45.933176	-130.010511	88	-9	-1	2	1538	1539	There's a lot of sediment in between the basalts here.
7/27	09	33	03	45.933157	-130.010221	87	-7	-1	2	1536	1539	We're still traveling eastwards.
7/27	09	36	06	45.933143	-130.009618	89	-6	-2	1	1536	1537	Frame_Grab:
7/27	09	36	08	45.933143	-130.009614	88	-7	1	1	1537	1537	There's a large fish on the bottom here.
7/27	09	36	19	45.933148	-130.009603	88	-9	-1	1	1536	1537	Frame_Grab:
7/27	09	37	00	45.933213	-130.009572	40	-8	-1	1	1536	1537	Turning Jason northwards now.
7/27	09	37	23	45.933172	-130.009529	120	-8	0	1	1536	1537	There's some round pillow basalts here.
7/27	09	38	01	45.933056	-130.009455	86	-9	0	1	1536	1537	Frame_Grab:
7/27	09	38	37	45.933081	-130.009397	78	-8	-1	1	1536	1537	Frame_Grab:
7/27	09	38	48	45.933096	-130.009373	77	-10	-2	2	1535	1537	Some interesting fissures in the lava here.
7/27	09	39	02	45.933094	-130.009349	134	-8	1	1	1536	1537	This area is very craggy.
7/27	09	39	12	45.933077	-130.009334	134	-8	-2	1	1536	1537	A lot of the fissures are filled with orange sediment

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-580 Dive Log
7/27	09	39	14	45.933074	-130.009331	133	-6	-1	1	1536	1537	Frame_Grab:
7/27	09	39	18	45.933072	-130.009332	131	-6	-1	1	1536	1537	Frame_Grab:
7/27	09	39	19	45.933071	-130.009332	131	-6	-2	1	1536	1537	Two fish here.
7/27	09	39	53	45.933099	-130.009234	94	-9	-1	1	1536	1537	This area has older basalts than the area to the west of here that we passed before.
7/27	09	41	39	45.933143	-130.008862	88	-7	-1	1	1536	1537	There are some ridges here of old ropey rocks covered in sediment.
7/27	09	43	25	45.933243	-130.008750	122	-7	-1	1	1536	1537	Frame_Grab:
7/27	09	43	48	45.933193	-130.008660	128	-6	-1	1	1536	1537	Passed another fish.
7/27	09	44	24	45.933158	-130.008523	90	-6	-1	2	1535	1537	There are also lots of shrimp here.
7/27	09	44	50	45.933163	-130.008512	89	-7	-1	1	1536	1537	There's some white sulfides (?) on the seafloor here.
7/27	09	44	59	45.933164	-130.008498	90	-8	0	1	1536	1537	As well as orange sediment and black-grey sulfides.
7/27	09	46	17	45.933130	-130.008156	130	-10	0	1	1536	1537	Frame_Grab:
7/27	09	47	43	45.933220	-130.007809	67	-6	-1	1	1536	1537	There are some white filaments in the fissures here - could be sulfides in a vent area????
7/27	09	47	58	45.933248	-130.007798	68	-6	-2	1	1536	1537	Most of the white patches are among very jagged rocks.
7/27	09	49	14	45.933092	-130.007652	153	-10	1	2	1535	1537	A couple rattail fish here.
7/27	09	52	23	45.933191	-130.007030	149	-7	-3	2	1535	1537	Frame_Grab:
7/27	09	53	31	45.933030	-130.006871	43	-9	-2	1	1535	1536	Frame_Grab:
7/27	09	54	04	45.933123	-130.006868	20	-9	-1	1	1536	1536	Driving north here.
7/27	09	54	45	45.933228	-130.006868	59	-8	1	2	1535	1537	It continues to be old basalts with some sheet lava all covered in the yellow sediments and mats.
7/27	09	56	39	45.933141	-130.006474	79	-7	1	2	1535	1537	Now we're traveling eastward again.
7/27	09	56	52	45.933142	-130.006423	86	-9	0	2	1536	1538	Same types of lava basalts and sediments/mats.
7/27	09	58	21	45.933129	-130.006150	84	-9	0	1	1536	1538	Getting into an area of more pillow basalts.
7/27	09	59	09	45.933130	-130.006066	83	-4	1	1	1537	1538	Frame_Grab:
7/27	09	59	22	45.933129	-130.006064	83	-9	-1	1	1537	1538	This lobate flow has some orange mat on it.
7/27	10	01	12	45.933207	-130.005837	356	-9	-2	2	1535	1537	We seem to have arrived. Where???
7/27	10	02	30	45.933116	-130.006297	280	-8	-1	6	1531	1537	JASON: Jason off bottom

Table 7.4.8 J2-581 Jason Dive Log (Axial benchmarks, 2011 eruption exploration, Axial Seamount, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/27	19	55	50									We were close to a catastrophic failure the winch drum was so hot. Luckily it shut itself off before that happened.
7/27	19	56	48									Yesterday the saltwater cooling system was leaking and when it was fixed the valve was left shut.
7/27	20	49	57									The winch issue is resolved. They by-passed the thermal contact and it is being cooled.
7/27	20	50	55	45.933282	-130.014172	185	-4	-1	47	1496	1544	Heading down.
7/27	20	53	25	45.933600	-130.013320	65	-7	1	3	1541	1544	JASON: Jason on bottom
7/27	20	53	34	45.933598	-130.013312	65	-8	1	3	1541	1544	NAV: Doppler Reset

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/27	20	55	07	45.933652	-130.013265	9	-8	1	2	1542	1545	Virgin vent right ahead. The old RAS frame is in front of us.
7/27	20	55	56	45.933649	-130.013224	355	-11	0	4	1541	1545	Virgin is pretty small.
7/27	20	56	26	45.933649	-130.013221	354	-11	0	4	1541	1545	There is a HOBO in the vent and Jason can take it out for the Chinese fluid sampling. As long as they put it back in.
7/27	20	57	54	45.933650	-130.013224	354	-13	2	4	1541	1545	Sampling with the Chinese fluid sampler is about a 5-10 minutes. They really need to hold on to it with both hands.
7/27	21	00	29	45.933650	-130.013226	354	-13	2	4	1541	1545	Frame_Grab:
7/27	21	01	05	45.933651	-130.013229	354	-13	2	4	1541	1545	Grabbing the Chinese fluid sampler with Jason's stbd claw. Have the Schilling out and ready to help.
7/27	21	02	44	45.933657	-130.013253	354	-15	2	4	1541	1545	Continuing on.
7/27	21	04	46	45.933674	-130.013233	294	-14	4	1	1543	1544	Got a grip on the sampler and approaching Virgin.
7/27	21	06	29	45.933668	-130.013235	289	-9	0	1	1543	1544	Virgin was 278C yesterday.
7/27	21	06	46	45.933668	-130.013231	289	-9	0	1	1543	1544	HIGHLIGHTS: KiPro hard drive start 2102. Virgin Vent Chinese fluid sampling.
7/27	21	08	16	45.933670	-130.013203	289	-9	0	1	1543	1544	NAV: Dropped DVL target Virgin 11 target: 130 0.7930 45 56.0196' Z=1544.
7/27	21	09	48	45.933674	-130.013227	292	-13	6	1	1543	1544	SAMPLE: fluid J2-581-ChineseFluid-01. Virgin Vent. Sampling flow in the orifice of Virgin Vent. Lots of flow coming out here. Starting at 2109. Hdg291deg.
7/27	21	10	21	45.933651	-130.013215	292	-14	2	3	1541	1544	J2-581-ChineseFluid-01 cont. The sampler came out of the hole.
7/27	21	11	26	45.933672	-130.013227	291	-14	2	1	1543	1544	We just put a fish through the thrusters. Lots of fish pieces floating around.
7/27	21	12	23	45.933664	-130.013234	290	-10	-2	1	1543	1544	J2-581-ChineseFluid-01 cont. While we were sampling a fish got into the thruster and actually made Jason move due to lack of thrust.
7/27	21	13	18	45.933668	-130.013231	290	-9	-1	1	1543	1544	J2-581-ChineseFluid-01 cont. Back in the hole with the sampler.
7/27	21	14	27	45.933668	-130.013223	290	-9	-1	1	1543	1544	Dave mentioned that we haven't seen any crabs down here this year. Not any of the big guys we saw in previous years.
7/27	21	14	53	45.933672	-130.013222	290	-9	-1	1	1543	1544	J2-581-ChineseFluid-01 cont. This sample needs to go on for 10 minutes.
7/27	21	18	05	45.933679	-130.013237	290	-9	-1	1	1543	1544	J2-581-ChineseFluid-01. Starting actual sampling at 2115.
7/27	21	20	15	45.933673	-130.013217	290	-9	-1	1	1543	1544	J2-581-ChineseFluid-01 cont. Fluid sampler nozzle down the hole - the small anhydrite chimney was knocked over yesterday. Lots grew back in 1 day.
7/27	21	21	16	45.933670	-130.013220	290	-9	-1	1	1543	1544	J2-581-ChineseFluid-01 cont. The fluid has a little bit of gray color to it; but mainly clear. Very little metal in this flow. Virgin is an anhydrite chimney.
7/27	21	22	04	45.933667	-130.013220	290	-9	-1	1	1543	1544	Looks like sulfide worms on the periphery of this flow hanging out on the anhydrite mound.
7/27	21	23	57	45.933666	-130.013217	290	-9	-1	1	1543	1544	Bill is getting some framegrabs for the Chinese with the HD cam.
7/27	21	26	17	45.933673	-130.013218	290	-9	-1	1	1543	1544	J2-581-ChineseFluid-01 cont. Stop at 2125. Pulling the wand out of the hole and preparing to stow it.
7/27	21	26	24	45.933674	-130.013215	291	-12	0	1	1543	1544	HIGHLIGHTS: KiPro hard drive stop
7/27	21	27	53	45.933672	-130.013210	291	-13	1	2	1542	1544	Storing the ChineseFluid sampler on the stbd side where the biobox usually site.
7/27	21	28	58	45.933665	-130.013216	291	-12	0	2	1542	1544	Putting a bungee over the sampler.
7/27	21	30	25	45.933691	-130.013207	357	-9	2	2	1542	1544	Finished with that process. The Chinese seem happy with it.
7/27	21	31	02	45.933744	-130.013163	43	-8	1	2	1542	1544	Next we are off to the benchmark 150m east of ASHES.
7/27	21	31	26	45.933776	-130.013112	45	-10	1	3	1541	1544	That benchmark is AX106.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/27	21	32	45	45.933837	-130.013030	62	-8	1	3	1542	1545	The pressure sensor needs to be set on the benchmark in a certain direction. There are only 2 possibilities.
7/27	21	34	19	45.933916	-130.012868	59	-8	1	4	1541	1544	There are new concrete benchmarks out here that are circular with a rectangular indentation on one side that is painted black. That's where the instrument goes.
7/27	21	34	36	45.933916	-130.012862	59	-8	1	4	1541	1544	These benchmarks are a lot heavier than the old ones.
7/27	21	36	21	45.933916	-130.012862	60	-8	1	3	1541	1544	The other yellow objects on the Jason deck are pressure sensors too. They are tide gauges and will be placed at AX106 as a backup method to take the tides out. The BPRs are the best method of removing the tides.
7/27	21	38	01	45.933927	-130.012866	59	-8	1	3	1541	1544	We're moving the ship.
7/27	21	39	55	45.933980	-130.012735	59	-11	1	3	1541	1544	Jason is moving again at a whopping 22m/min.
7/27	21	42	24	45.934109	-130.012479	59	-8	1	3	1541	1544	Ropey lavas here with sediments in the cracks.
7/27	21	44	43	45.934297	-130.012475	275	-9	2	4	1541	1545	The benchmarks are a cement table with 3 legs 1m wide and 1/2m high. Has a bicycle flag on it.
7/27	21	45	16	45.934303	-130.012534	264	-9	1	8	1536	1544	This is a desolate place. No signs of life.
7/27	21	45	53	45.934292	-130.012484	62	-12	1	18	1526	1544	Passed over lineated sheet flow.
7/27	21	48	15	45.934436	-130.011974	89	-9	1	3	1542	1545	Passing over large pillows and small lobate flow. Lineations on the lobates. Lots of sediment between the pillows.
7/27	21	48	29	45.934438	-130.011869	80	-13	3	3	1542	1545	Looks like we just passed over a contact.
7/27	21	48	43	45.934429	-130.011768	83	-6	3	3	1543	1545	There's a crab.
7/27	21	49	01	45.934415	-130.011645	86	-8	0	2	1543	1545	Detritus raining down through the water column.
7/27	21	49	13	45.934432	-130.011609	86	-7	1	2	1543	1545	There it is right in front of us.
7/27	21	49	24	45.934445	-130.011594	84	-8	1	2	1543	1545	AX106 benchmark here.
7/27	21	50	34	45.934435	-130.011561	74	-3	2	1	1544	1545	Want to take the autonomous pressure gauges out and put them on the seafloor off to the side so they are not in the way. They will just sit there and we'll pick them up at the end of the dive. They are the tidal gauge backups.
7/27	21	51	23	45.934439	-130.011573	74	-1	1	1	1544	1545	The new benchmark design is much nicer. These benchmarks went out last summer.
7/27	21	52	17	45.934436	-130.011571	74	-3	2	1	1544	1545	AX106 is a new site last year. We weren't measuring here before then. Now there are 6 benchmarks. Up until 2010 there were only 5.
7/27	21	53	31	45.934431	-130.011572	74	-3	2	1	1544	1545	Autonomous pressure gauges directly on the seafloor next to AX106 benchmark. They will act as back-up tidal gauges if necessary.
7/27	21	57	34	45.934448	-130.011574	78	0	1	1	1544	1545	DEPLOY: pressure sensor AX106 ~150m NE of ASHES. The pressure sensor fits in the little slit in the benchmark. All are deployed with the cable facing left.
7/27	21	58	06	45.934449	-130.011570	78	0	2	1	1544	1545	Pressure sensor being maneuvered on down into the proper spot.
7/27	21	58	15	45.934449	-130.011570	78	0	2	1	1544	1545	It looks great.
7/27	21	58	58	45.934450	-130.011569	78	0	2	1	1544	1545	Getting the computer up and running to make the measurements.
7/27	22	00	25	45.934451	-130.011595	78	0	1	1	1544	1545	Start 2159:00. 20 minute measurements at each benchmark.
7/27	22	09	24	45.934456	-130.011589	78	0	2	1	1544	1545	Scott forgot to set the time on the computer. He's doing it now.
7/27	22	10	53	45.934458	-130.011586	78	0	2	1	1544	1545	The filename 2011july272209:30. The other file was 1501 local.
7/27	22	12	35	45.934460	-130.011583	78	0	1	1	1544	1545	It started a new file when Scott changed the computer time from local to UTC. The new file started at 2210 UTC so we will stay here until 2230.
7/27	22	12	45	45.934460	-130.011582	78	0	2	1	1544	1545	Rattail in the background.
7/27	22	24	53	45.934468	-130.011561	78	0	2	1	1544	1545	Weird little translucent fish just swam by.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/27	22	29	36	45.934450	-130.011579	78	0	2	1	1544	1545	The precision of the measurements is sub-centimeter.
7/27	22	31	08	45.934452	-130.011580	78	0	2	1	1544	1545	Finished with measurement at 2229 UTC at AX106.
7/27	22	31	16	45.934452	-130.011581	78	0	2	1	1544	1545	That went well.
7/27	22	31	44	45.934449	-130.011580	77	0	1	1	1544	1545	Stowing the pressure sensor on the Jason deck.
7/27	22	34	06	45.934393	-130.011578	159	-6	-1	21	1524	1544	Bungee'ing the pressure sensor in for its trip to the next benchmark. AX101 at the caldera center. About a 2 hour transit to the next site.
7/27	22	35	49	45.934120	-130.011476	160	-10	-1	41	1503	1544	Jason will be traveling at 1 - 1.2 knots through the water column. Screaming.... 1 measurement down and 20 to go.
7/28	00	27	21	45.955072	-130.009835	349	-9	0	1	1531	1531	We can see the bottom
7/28	00	28	08	45.955065	-130.009834	342	-10	0	2	1531	1532	We are close to where we are heading AX 101 Caldera Center benchmark.
7/28	00	28	37	45.955138	-130.009840	334	-8	1	3	1531	1534	We see a marker to the left. (Note: Look at yellow hydrothermal seds - possibly new lava? Sm)
7/28	00	30	53	45.955215	-130.009936	239	-3	-1	1	1534	1535	We see the circular pressure sensor benchmark AX101 with triangular tripod to the left 63.
7/28	00	32	51	45.955225	-130.009933	237	-4	-1	1	1534	1535	Current position 130 0.5968'W 45 57.3114'N HDG 237.5 Depth 1534.2.
7/28	00	33	45	45.955214	-130.009937	238	-5	-1	1	1534	1535	Pressure sensor being positioned on the benchmark with wire to the left.
7/28	00	34	40	45.955168	-130.009952	237	-5	-1	1	1534	1535	Orientation of the pressure case is really important for the reading.
7/28	00	37	29	45.955217	-130.009914	237	-5	-1	1	1534	1535	Start at 0035 making measurements. 20 minute measurement.
7/28	00	55	50	45.955246	-130.009906	238	-5	-1	1	1534	1535	End measurement at 0055.
7/28	00	56	22	45.955249	-130.009903	238	-4	-1	1	1534	1535	Stowing pressure sensor on Jason basket.
7/28	00	59	48	45.955249	-130.009974	238	-4	-1	1	1534	1535	Still trying to secure the pressure sensor on the basket.
7/28	01	00	24	45.955256	-130.009972	238	-4	-2	1	1534	1535	Works best in holster with cord to the back of the basket.
7/28	01	03	09	45.955245	-130.009890	238	-8	0	4	1531	1535	Transiting away from the benchmark.
7/28	01	04	48	45.955353	-130.010268	293	-8	2	3	1531	1534	Transiting from Center to Magnesia.
7/28	01	08	41	45.955497	-130.010475	298	-8	-1	33	1500	1533	An hour and a half transit.
7/28	03	01	01	45.946034	-129.985131	130	-6	0	3	1522	1524	On the bottom.
7/28	03	02	05	45.946055	-129.985166	130	-9	0	3	1521	1524	NAV: Doppler Reset
7/28	03	03	06	45.946077	-129.985119	52	-7	0	3	1522	1525	We've arrived at the AX-102 benchmark site.
7/28	03	05	01	45.946154	-129.985105	156	-10	0	3	1521	1524	AX102 is also the Magnesia area.
7/28	03	05	12	45.946116	-129.985094	152	-10	0	3	1521	1524	We're looking for the benchmark.
7/28	03	05	58	45.946026	-129.985025	118	-8	0	2	1522	1524	We'll try looking further to the east.
7/28	03	06	35	45.945995	-129.984950	113	-8	0	1	1523	1524	There's lots of orange-red sediment/mat in this area.
7/28	03	08	10	45.946103	-129.985013	340	-7	0	2	1523	1524	The water here is full of floc - it's hard to see the benchmark.
7/28	03	09	27	45.946172	-129.984986	355	-8	0	1	1523	1524	A fish came by.
7/28	03	09	38	45.946211	-129.984991	353	-9	-2	5	1523	1527	Looks like there's some ledges in the basalts here.
7/28	03	10	13	45.946288	-129.985006	355	-10	0	4	1522	1526	We're in a collapse zone area. Lots of pillars and overhangs.
7/28	03	12	37	45.946089	-129.984792	149	-9	0	6	1523	1529	Still searching for the benchmark.
7/28	03	14	00	45.945942	-129.984703	150	-8	0	4	1524	1528	Passing a nice arch.
7/28	03	15	02	45.945832	-129.984875	234	-8	0	3	1522	1526	Looks like a white smoking vent here.
7/28	03	16	41	45.945961	-129.985158	337	-7	1	7	1524	1530	NAV: Location We've put a navigation target down for the white smoking vent - Snow Globe.
7/28	03	17	02	45.946023	-129.985179	351	-8	0	6	1523	1529	We're back to an orange sediment area - the benchmark wasn't in orange sediment.
7/28	03	17	18	45.946047	-129.985180	2	-7	0	2	1523	1525	We're going to go east for 10m then north for 10m then back west.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	03	19	20	45.946116	-129.985106	42	-8	0	2	1523	1525	Looking in a large hole - don't see the benchmark down there!
7/28	03	19	35	45.946129	-129.985094	41	-9	0	1	1523	1524	We're heading straight for the navigation target.
7/28	03	20	19	45.946186	-129.985069	345	-7	0	2	1523	1524	We're back in a collapse zone of arches and pillars.
7/28	03	20	48	45.946205	-129.985070	88	-7	0	1	1523	1524	The benchmark is actually on a ~5m diameter pillar top surrounded by an area of collapse.
7/28	03	21	48	45.946168	-129.984944	98	-10	0	1	1523	1524	We still haven't found the benchmark.
7/28	03	22	38	45.946151	-129.984794	10	-9	1	6	1523	1529	Traveling to the northwest now.
7/28	03	23	19	45.946265	-129.984861	298	-7	0	2	1522	1524	This sediment with long fissures in lava flow looks more like the area the benchmark was placed.
7/28	03	24	05	45.946269	-129.984982	263	-8	0	5	1523	1527	Now we're heading to the west.
7/28	03	24	16	45.946263	-129.985017	262	-8	0	4	1522	1526	There seems to be more sediment stuff in this area.
7/28	03	25	57	45.946201	-129.985286	261	-7	0	2	1522	1524	Traveling west still - lots of yellow sediment here.
7/28	03	26	03	45.946196	-129.985306	258	-8	0	2	1522	1524	We're going to turn south soon.
7/28	03	26	54	45.946166	-129.985424	119	-9	0	3	1522	1525	Turning to start to the south.
7/28	03	27	12	45.946144	-129.985410	113	-7	0	2	1522	1525	Here's another area of collapse.
7/28	03	27	55	45.946094	-129.985358	104	-7	0	2	1523	1525	Maybe all the floc we're seeing in the water is from the Snow Globe site.
7/28	03	29	01	45.946134	-129.985230	65	-9	0	2	1523	1525	We're looping back into the east again.
7/28	03	29	05	45.946138	-129.985223	65	-8	0	2	1523	1525	There's lots of orange sediment here.
7/28	03	29	20	45.946158	-129.985191	65	-9	1	2	1523	1524	It's probably not here -- too much orange sediment and not enough collapse.
7/28	03	31	01	45.946088	-129.985088	148	-8	0	2	1522	1524	Coming up to a large hole in the ground here.
7/28	03	32	06	45.946098	-129.985082	105	-7	0	1	1523	1525	The area northeast of the navigation target looks more like the type of sediment and fresher basalt that they remember the benchmark being placed in.
7/28	03	32	43	45.946092	-129.985034	91	-8	0	1	1523	1525	We'll head to the northeast.
7/28	03	33	00	45.946090	-129.984994	90	-8	0	1	1523	1524	Going over a large collapsed ledge now.
7/28	03	34	01	45.946119	-129.984855	44	-8	-1	5	1523	1528	There's a white edge on this ledge in front of us.
7/28	03	34	09	45.946122	-129.984843	48	-9	0	4	1523	1527	It might be minerals of some kind.
7/28	03	35	13	45.946093	-129.984804	155	-7	0	6	1523	1529	We've been in this area before.
7/28	03	35	19	45.946086	-129.984810	155	-8	-1	6	1523	1528	There's more collapse zone to the right.
7/28	03	37	05	45.946019	-129.984916	218	-8	0	1	1523	1525	There's a lot of fissures filled with orange-yellow sediment here.
7/28	03	37	17	45.945999	-129.984940	216	-8	0	1	1523	1524	This area looks like it's in the right neighborhood.
7/28	03	38	57	45.946012	-129.984887	75	-9	0	1	1523	1524	We'll follow this ridge to the northeast where there's more collapse zone.
7/28	03	42	31	45.946057	-129.984630	73	-8	1	2	1523	1525	NAV: Doppler Reset
7/28	03	58	28	45.946371	-129.984928	42	-7	-1	2	1523	1525	We've been comparing last year's photos to the area we're looking at.
7/28	03	58	40	45.946386	-129.984917	44	-6	0	2	1523	1525	We can't find the right spot.
7/28	03	58	53	45.946380	-129.984922	42	-7	0	2	1523	1525	We're going to make a bigger search grid and look for the benchmark methodically.
7/28	04	04	20	45.946472	-129.985301	180	-8	0	2	1522	1524	We're going to start here - northwest of the navigation target and then go east.
7/28	04	04	46	45.946456	-129.985299	179	-8	0	3	1522	1525	We'll head east-west from north to south.
7/28	04	04	48	45.946456	-129.985298	179	-8	0	3	1522	1524	Lateral search.
7/28	04	09	44	45.946472	-129.984897	183	-8	0	3	1522	1525	We're traveling east over area we already searched to begin the search grid.
7/28	04	11	04	45.946422	-129.984681	180	-9	1	3	1522	1525	Passing the point where we have already searched - this is all new area.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	04	13	53	45.946382	-129.984689	180	-8	0	3	1522	1525	We're heading back to the right (east) again now.
7/28	04	14	41	45.946402	-129.984810	181	-8	0	2	1522	1524	We'll have to head into the floc now.
7/28	04	19	12	45.946448	-129.985328	182	-7	0	3	1521	1524	At the west end of the transect line.
7/28	04	19	17	45.946441	-129.985328	181	-8	0	3	1521	1524	Heading south now.
7/28	04	20	46	45.946379	-129.985332	179	-7	0	3	1521	1524	Resetting navigation DVL.
7/28	04	21	00	45.946390	-129.985341	180	-8	0	3	1521	1524	correction - Restarting navigation DVL.
7/28	04	22	33	45.946380	-129.985251	181	-8	0	2	1522	1524	Navigation re-started.
7/28	04	22	41	45.946378	-129.985231	180	-7	0	2	1522	1524	Traveling east with Jason facing south.
7/28	04	25	37	45.946359	-129.984795	180	-8	0	4	1522	1525	NAV: Doppler Reset doppler reset 4min ago.
7/28	04	26	47	45.946375	-129.984643	179	-8	0	2	1522	1525	Reached the end of this east transect.
7/28	04	27	32	45.946327	-129.984642	178	-6	0	3	1522	1525	Heading south ~5m.
7/28	04	27	44	45.946335	-129.984650	176	-8	0	3	1522	1525	Heading back to the right (west) for ~50m.
7/28	04	30	46	45.946310	-129.985064	183	-8	0	5	1522	1528	We're at 1522m depth - we should be able to see the two benchmarks. The concrete benchmark has a reflective flag bolted to it.
7/28	04	32	59	45.946311	-129.985379	184	-9	-1	2	1522	1524	At the west side of our grid.
7/28	04	33	01	45.946305	-129.985377	183	-9	-1	2	1522	1524	Moving south again.
7/28	04	33	25	45.946261	-129.985372	183	-8	0	2	1522	1525	We're actually making ~60m east-west transects.
7/28	04	33	46	45.946252	-129.985360	184	-7	-1	2	1522	1524	Now we're going back to the east.
7/28	04	35	17	45.946275	-129.985124	181	-8	0	3	1522	1525	This area has lots of piles of rocks coated in orange sediment.
7/28	04	35	56	45.946285	-129.985027	181	-7	0	5	1522	1527	There are some collapse pits here.
7/28	04	38	48	45.946239	-129.984596	185	-9	0	2	1522	1525	As far east as we're going.
7/28	04	38	53	45.946225	-129.984597	185	-9	0	2	1523	1525	Now we're moving forwards ~5m.
7/28	04	45	28	45.946185	-129.985460	185	-6	0	3	1522	1525	We're moving westward over the collapse.
7/28	04	45	48	45.946184	-129.985459	183	-8	0	3	1522	1525	This pass's terrain looked the most similar to what we see in last year's virtual van log.
7/28	04	46	26	45.946186	-129.985461	183	-8	0	3	1522	1525	NAV: Doppler Reset We're going to head south now.
7/28	04	48	13	45.946170	-129.985417	183	-7	-1	3	1522	1525	We're forward 5m from where we were before.
7/28	04	48	16	45.946172	-129.985406	183	-8	-1	3	1522	1525	Heading east again.
7/28	04	53	53	45.946136	-129.984550	178	-7	0	3	1522	1525	Heading south.
7/28	04	54	07	45.946142	-129.984605	186	-8	1	7	1522	1529	Moving back to the west again.
7/28	04	54	20	45.946144	-129.984656	182	-8	0	7	1522	1529	The area around our navigation target seems like the right kind of landscape.
7/28	04	56	52	45.946164	-129.985473	176	-9	1	3	1522	1525	Haven't seen anything that could be our benchmark.
7/28	04	57	05	45.946131	-129.985502	174	-10	-3	3	1522	1525	Heading south again.
7/28	04	57	49	45.946069	-129.985439	178	-7	-1	3	1522	1525	If we don't find the benchmark after this grid search - we'll just head to the next location.
7/28	04	58	06	45.946072	-129.985372	181	-8	-1	3	1522	1525	Heading back to the east.
7/28	04	59	37	45.946083	-129.984951	180	-7	0	3	1522	1525	Lots of sediment in this area - doesn't look quite right.
7/28	05	02	06	45.946106	-129.984494	180	-7	0	3	1522	1525	We're at the end of this transect.
7/28	05	02	48	45.946012	-129.984488	176	-7	1	3	1522	1525	Heading south again.
7/28	05	03	04	45.946005	-129.984552	177	-8	1	3	1522	1525	Going to travel ~5m.
7/28	05	03	13	45.946004	-129.984580	175	-7	0	5	1522	1527	Headed south ~5m.
7/28	05	03	16	45.946005	-129.984591	175	-7	1	3	1522	1526	Now we're going west again.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	05	06	22	45.945891	-129.985551	181	-8	0	3	1522	1526	Reached the west end again - now traveling south.
7/28	05	07	15	45.945896	-129.985396	179	-8	-1	4	1522	1526	There's more sediment in this area.
7/28	05	07	40	45.945900	-129.985292	179	-7	0	7	1522	1530	We've been traveling east for about 20m.
7/28	05	08	25	45.945908	-129.985111	176	-8	0	4	1522	1526	Here's the Snow Globe again.
7/28	05	08	39	45.945905	-129.985070	186	-7	1	3	1522	1526	It's blowing a lot of white floc into the water.
7/28	05	09	10	45.945908	-129.984983	181	-7	0	2	1523	1525	There's a large collapse overhang here.
7/28	05	09	26	45.945911	-129.984936	178	-7	0	3	1522	1525	The overhanging rocks are covered d in orange mats.
7/28	05	11	29	45.945886	-129.984540	175	-9	0	3	1522	1525	Heading southwards again.
7/28	05	12	02	45.945865	-129.984651	176	-7	1	7	1522	1530	Now we're going back to the west.
7/28	05	12	59	45.945810	-129.984967	177	-8	1	2	1522	1524	In the snow cloud again.
7/28	05	14	16	45.945860	-129.985473	175	-8	0	4	1522	1526	The water was much clearer last year based on the photos in the virtual van.
7/28	05	14	23	45.945868	-129.985520	176	-8	0	4	1522	1526	Almost at the west end of the transect.
7/28	05	14	41	45.945819	-129.985577	179	-11	-1	3	1523	1526	Heading south for one more past.
7/28	05	15	16	45.945775	-129.985568	180	-7	-2	4	1522	1526	Now we're going back to the east again.
7/28	05	19	03	45.945751	-129.984803	180	-8	-1	5	1522	1528	Perhaps the benchmark has collapsed into the pits.
7/28	05	20	12	45.945764	-129.984598	178	-7	1	8	1522	1530	At the east end of our last transect.
7/28	05	21	21	45.945882	-129.984763	330	-9	0	7	1522	1529	We'll go have one last look over by the original navigation target.
7/28	05	23	27	45.946067	-129.984816	328	-8	-3	1	1525	1526	Dropping to the bottom to have a look through the pits.
7/28	05	25	44	45.946132	-129.984834	33	-6	1	5	1523	1529	Passing an arch.
7/28	05	26	13	45.946172	-129.984859	35	-6	0	5	1523	1528	We were at this ledge earlier.
7/28	05	28	01	45.946059	-129.984919	285	-8	1	4	1525	1529	In the canyon now.
7/28	05	28	28	45.946016	-129.984943	253	-7	-2	2	1523	1525	Lots of sheets of eruption lava here. (note: Scott says the black area is a pit)
7/28	05	30	33	45.946217	-129.984962	71	-8	1	1	1526	1527	Frame_Grab:
7/28	05	31	52	45.946284	-129.984954	350	-8	0	1	1525	1527	We really don't see any signs of the marker anywhere.
7/28	05	32	24	45.946286	-129.984957	318	-8	-1	2	1525	1527	In addition to the concrete AX-102 benchmark there should also be a steel benchmark.
7/28	05	32	44	45.946293	-129.984951	10	-7	0	4	1523	1527	We see no signs of it.
7/28	05	35	28	45.946128	-129.984773	127	-7	0	4	1525	1529	The area we're in right now is definitely the right kind of terrain.
7/28	05	35	33	45.946116	-129.984758	127	-7	0	4	1526	1530	We're also at the right depth.
7/28	05	35	53	45.946115	-129.984728	109	-6	0	3	1527	1530	Great stacks of lava here.
7/28	05	43	21	45.946236	-129.984988	185	-7	1	3	1525	1528	Still haven't seen any signs of the benchmarks.
7/28	05	44	30	45.946297	-129.985004	214	-8	-1	3	1523	1526	We'll look around this area some more. We're on the bottom here.
7/28	05	48	17	45.946122	-129.985003	67	-9	0	2	1523	1525	This large pinnacle of rock looks like it's kind of the right shape.
7/28	05	48	28	45.946100	-129.984990	66	-7	0	2	1523	1525	But there aren't any benchmarks on it.
7/28	05	54	26	45.946177	-129.984804	61	-8	0	3	1522	1525	We can't find AX-102.
7/28	05	54	32	45.946162	-129.984798	61	-7	0	3	1522	1525	We're going to move on to AX-103.
7/28	05	55	05	45.946137	-129.984721	74	-12	1	8	1523	1530	We'll come back to AX-102 later - maybe when the tide changes the visibility will improve.
7/28	05	56	47	45.946222	-129.984746	348	-10	0	2	1523	1525	We're going to move to Marker AX013.
7/28	05	57	28	45.946474	-129.984903	349	-9	-1	5	1519	1525	The navigation may be off - seems strange we couldn't see any traces of the AX102 benchmark.
7/28	05	57	48	45.946578	-129.984974	352	-9	-2	10	1515	1525	Correction: we're going to move to AX103 not AX013.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	05	59	39	45.946840	-129.985198	352	-6	-1	55	1470	1525	AX103 is about 1500m from where we are now -- transit will take at least 90minutes.
7/28	07	14	13	45.933608	-129.982849	329	-4	2	101	1416	1517	Heading to AX103 near Mkr-33 Vent.
7/28	07	18	23	45.933354	-129.982681	167	-9	2	2	1516	1518	Jason on the bottom.
7/28	07	19	12	45.933343	-129.982668	129	-8	2	3	1515	1518	Lots of floc in the water here too.
7/28	07	21	59	45.933376	-129.982377	123	-11	2	2	1516	1518	We're supposedly 3 meters away from the benchmark - according to the nav.
7/28	07	25	05	45.933277	-129.982415	74	-8	1	3	1516	1518	We're moving along the seafloor here nearing the seafloor.
7/28	07	26	05	45.933215	-129.982344	67	-9	1	2	1517	1519	Crawling along the seafloor. Looking around. So far nothing.
7/28	07	27	14	45.933241	-129.982341	175	-9	1	2	1516	1518	Settling in here and getting our bearings.
7/28	07	28	54	45.933141	-129.982314	109	-8	2	2	1517	1519	This is not new lava and the benchmark is on new lava.
7/28	07	34	36	45.933126	-129.982432	185	-9	0	3	1516	1518	There's tons of floc in the water. The seafloor is covered with lots of "floc"(?)
7/28	07	35	13	45.933136	-129.982549	188	-10	0	3	1515	1518	What the heck? This looks very strange. Something is going on.
7/28	07	38	37	45.933078	-129.982101	137	-7	-1	3	1516	1519	Wow. This is starting to get suspicious says Scott.
7/28	07	39	38	45.933015	-129.982079	134	-9	0	2	1517	1519	Casey reset the doppler at 0718. Missed logging that.
7/28	07	49	11	45.932900	-129.982378	166	-8	-1	3	1516	1519	We suspect that there is a problem with the navigation. This should be an easy benchmark to find. Plus the RAS is there so should be showing up in the sonar. What's going on?
7/28	07	52	04	45.932905	-129.982367	165	-8	-1	3	1516	1519	Now we're talking about conspiracy theories and GPS scrambling shift.
7/28	07	54	51	45.932990	-129.982271	108	-11	-2	2	1516	1518	We're going to head to the east and see if we can find the lava flow boundary.
7/28	07	55	45	45.933023	-129.982033	97	-8	-1	2	1517	1519	Something is not right here. There's tons of floc (detritus; sediment?) on these lava.
7/28	07	59	02	45.933030	-129.981869	89	-9	0	3	1516	1519	This is really odd. Lots of the stuff we see in the water is zooplankton (or little shrimp maybe)?
7/28	08	00	30	45.932938	-129.981797	155	-10	-1	2	1518	1519	We're looking at lobate flow here that is covered with something. Looks white-ish.
7/28	08	03	37	45.933198	-129.981852	6	-8	-1	1	1518	1519	Casey says the underlay matches the topography we're travelling over.
7/28	08	03	47	45.933199	-129.981843	5	-9	0	2	1518	1520	That lava looks fresh-ish.
7/28	08	04	11	45.933267	-129.981843	7	-9	-1	1	1517	1519	There's the marker here.
7/28	08	04	53	45.933292	-129.981838	15	-8	0	3	1517	1520	Frame_Grab:
7/28	08	05	19	45.933275	-129.981842	10	-9	-1	3	1517	1520	What the heck is that? It's a marker with a smiley face on it.
7/28	08	05	53	45.933284	-129.981835	10	-8	-1	2	1518	1519	NAV: Dropped DVL target Smiley face marker.
7/28	08	06	08	45.933284	-129.981834	10	-8	-1	2	1518	1519	Smiley face marker.
7/28	08	06	42	45.933287	-129.981823	6	-8	0	1	1518	1519	Frame_Grab:
7/28	08	06	58	45.933287	-129.981820	6	-8	0	3	1518	1520	What the heck? A smiley face marker.
7/28	08	09	33	45.933232	-129.981510	59	-8	0	4	1517	1521	This is the new flow We're in the pillars and collapse area.
7/28	08	09	36	45.933243	-129.981517	37	-8	0	4	1517	1521	Frame_Grab:
7/28	08	09	48	45.933246	-129.981558	265	-8	-1	2	1519	1521	Frame_Grab:
7/28	08	10	50	45.933275	-129.981790	269	-7	-1	2	1518	1520	Wow. We must be on the 98 flow but it sure doesn't look new.
7/28	08	10	59	45.933271	-129.981827	271	-12	-1	3	1517	1520	Frame_Grab:
7/28	08	11	14	45.933266	-129.981862	274	-8	-1	3	1517	1520	Bacterial mat in the crevices on top of a lava arch.
7/28	08	11	28	45.933256	-129.981858	270	-8	-1	3	1517	1520	What is going on here?
7/28	08	14	34	45.933338	-129.981962	295	-8	-1	2	1517	1519	The underlay agrees with what Jason is driving.
7/28	08	15	19	45.933351	-129.981995	295	-8	-1	1	1518	1519	Straight ahead is a long tube that looks younger than the surrounding lava. It does have tubeworms and bacterial mat on it so it not that new.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	08	15	54	45.933331	-129.982028	292	-8	0	2	1517	1519	Seeing tubeworms and bacterial mat here.
7/28	08	16	03	45.933322	-129.982036	278	-8	-1	1	1517	1519	Lots of patches of mat here.
7/28	08	17	15	45.933340	-129.982157	286	-8	-1	1	1518	1519	What is the coating on all the lavas? I suspect it is a phytoplankton bloom that has fallen through the water column to the seafloor. We were fooled by a similar looking seafloor in 1998.
7/28	08	19	18	45.933370	-129.982237	283	-10	-1	2	1516	1518	Where's the sheet flow? What's with all the pillows?
7/28	08	20	51	45.933353	-129.982384	357	-8	0	1	1517	1518	The smiley face target was in the same place last year. So that means this years nav agrees with last years nav.
7/28	08	22	33	45.933313	-129.982326	237	-7	0	3	1515	1518	We're directly over the target now. Sitting on it Scott says.
7/28	08	23	34	45.933292	-129.982266	260	-8	-2	2	1516	1518	NAV: Doppler Reset
7/28	08	25	28	45.933298	-129.982634	265	-7	-1	1	1516	1517	Scott decided that we should keep going to the west.
7/28	08	26	13	45.933262	-129.982700	244	-7	0	2	1515	1518	Thought we saw a bit of sheet flow; but no.
7/28	08	29	29	45.933060	-129.982589	216	-7	0	4	1514	1518	We are going to head south here.
7/28	08	30	37	45.933087	-129.982734	215	-9	0	3	1515	1518	We've done that now. Still don't see anything. Awakening the Boss!
7/28	08	35	10	45.932889	-129.982794	201	-8	-1	1	1517	1519	These lavas look a little bit different.
7/28	08	35	58	45.932843	-129.982860	346	-8	-1	3	1515	1518	Bill wants us to go back to where it is supposed to be.
7/28	08	37	39	45.933233	-129.982789	51	-7	-1	1	1516	1517	The underlay does not match this.
7/28	08	38	11	45.933222	-129.982797	90	-8	0	2	1516	1517	There is something wrong here.
7/28	08	39	35	45.933176	-129.982780	98	-9	0	2	1515	1518	All of a sudden there is a ton of floc; shrimp; plankton??
7/28	08	41	48	45.933133	-129.982737	85	-4	1	1	1517	1518	We're all puzzled here. Bill is discussing the nav with Casey.
7/28	08	42	12	45.933133	-129.982745	85	-4	1	1	1517	1518	The bridge; by 2 different sources; has verified the GPS nav.
7/28	08	43	29	45.933139	-129.982753	85	-4	1	1	1517	1518	We're stopped here for a pow wow.
7/28	08	50	40	45.933293	-129.982715	358	-8	0	2	1515	1517	Scott looking around. We're hoping to get into some sheet flow.
7/28	08	52	26	45.933216	-129.982804	349	-8	0	3	1515	1517	The bottom is really distinctive here and this should be really easy. Something is wrong.
7/28	08	53	00	45.933257	-129.982816	345	-7	0	2	1515	1517	Casey is shutting down the program and starting over..... more or less.
7/28	08	53	32	45.933302	-129.982783	348	-7	0	3	1514	1517	There's something wrong.
7/28	08	53	43	45.933306	-129.982768	347	-8	-2	3	1514	1517	NAV: Doppler Reset We're starting over.
7/28	08	57	50	45.933542	-129.982465	4	-8	1	4	1513	1517	We're discussing pinging on the RAS.
7/28	08	58	45	45.933468	-129.982638	317	-8	0	3	1514	1517	We want to head to the west a bit. We're in search for lineated sheet flow.
7/28	09	03	40	45.933380	-129.983003	309	-8	1	2	1514	1517	We're in the area on the map where we should be on lineated sheet flows but not.
7/28	09	04	21	45.933342	-129.983044	276	-7	0	3	1513	1516	We're looking at a collapse feature here.
7/28	09	04	28	45.933350	-129.983052	274	-7	1	3	1513	1517	NAV: Doppler Reset
7/28	09	06	25	45.933355	-129.982816	92	-9	0	2	1515	1517	We're heading back toward that Smiley face marker.
7/28	09	07	31	45.933316	-129.982671	95	-8	1	3	1514	1517	This is a real mystery. Even covered in crud the morphology of the seafloor shouldn't change. What's going on?
7/28	09	13	03	45.933365	-129.982586	132	-8	0	2	1515	1517	Everyone is racking their brain to try to unravel this mystery. There is a BPR mooring between us and ASHES.
7/28	09	13	54	45.933234	-129.982379	98	-10	0	2	1516	1517	There is a BPR mooring between here and ASHES (BPR-south). Discussing what to do.
7/28	09	16	33	45.933257	-129.982129	88	-8	0	2	1516	1518	We're now heading toward the smiley face.
7/28	09	16	46	45.933253	-129.982130	89	-8	1	2	1515	1518	Frame_Grab:
7/28	09	17	09	45.933248	-129.982130	88	-7	1	3	1515	1518	Is this a jelly fish?

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	09	19	04	45.933307	-129.981900	89	-8	1	2	1516	1518	Here comes the smiley face marker.
7/28	09	19	32	45.933305	-129.981839	84	-8	-1	1	1517	1518	The log from 2010 says that this marker was at Cloud vent.
7/28	09	19	45	45.933314	-129.981834	90	-7	0	2	1517	1519	NAV: Doppler Reset
7/28	09	35	00	45.933208	-129.982233	246	-8	1	2	1515	1518	We're all confused now. We went back to the 2010 log and noted that when we passed the smiley face marker (at Cloud?) 4 minutes later we were at Mkr 33 and the RAS.
7/28	09	35	32	45.933199	-129.982238	246	-8	1	2	1516	1518	This is all pillow flow here.
7/28	09	36	32	45.933211	-129.982257	246	-7	1	2	1515	1518	We're at Mkr-33 according to the navigation.
7/28	09	37	21	45.933211	-129.982252	246	-8	1	2	1515	1518	This should have been easy. It doesn't look anything like it should..
7/28	09	37	42	45.933215	-129.982250	150	-7	1	3	1515	1518	Snapping an HD frame grab of what should be Mkr33.
7/28	09	40	18	45.933130	-129.982178	154	-8	0	2	1516	1518	We're going to go to the SE and check out a topographic high. If that's in the right place it will give us more pause for thought.
7/28	09	43	33	45.932916	-129.981993	153	-8	0	2	1516	1518	The topography is very strange. Everything is covered with either floc; phytoplankton or mat.
7/28	09	44	24	45.932848	-129.981946	153	-8	1	2	1516	1519	Suggest that we scrape the lava clean of this covering and see if it is shiny. The fact that we aren't seeing any biology on these pillows makes one suspect.
7/28	09	46	04	45.932745	-129.981834	154	-7	-1	3	1517	1520	There is a pillar straight ahead.
7/28	09	46	31	45.932684	-129.981804	157	-8	0	4	1518	1522	We're seeing a few pillars here.
7/28	09	48	21	45.932488	-129.981645	155	-9	0	1	1520	1521	We're heading for that topographic high that the lava flowed around during the 1998 eruption. Want to check the navigation.
7/28	09	49	28	45.932391	-129.981621	155	-6	1	2	1518	1520	Heading south.
7/28	09	50	10	45.932302	-129.981585	158	-7	0	4	1517	1522	More pillars ahead. Jumbled flow at the bottom of them.
7/28	09	50	31	45.932258	-129.981566	127	-8	0	4	1518	1522	We should be up and out of it here Bill thinks.
7/28	09	51	12	45.932183	-129.981503	149	-10	-2	4	1517	1521	More pillars.
7/28	09	51	28	45.932122	-129.981457	148	-7	0	6	1515	1521	This looks more like what we were expecting here.
7/28	09	51	48	45.932090	-129.981405	174	-7	2	4	1516	1520	Now We're out of the collapse. Here's the pillows.
7/28	09	52	05	45.932104	-129.981365	165	-8	0	2	1516	1518	This topographic high is where it should be.
7/28	09	53	36	45.932017	-129.981015	201	-6	2	3	1516	1519	This topographic high is where it was supposed to be.
7/28	09	55	11	45.932095	-129.981375	212	-9	1	3	1515	1518	We're looking at the contact from the 1998 flow.
7/28	09	56	40	45.931891	-129.981489	115	-9	0	7	1515	1522	The higher topography matches with the navigation.
7/28	09	59	23	45.931818	-129.981010	73	-6	0	4	1515	1519	Still moving around this topographic high.
7/28	09	59	37	45.931794	-129.981030	212	-8	1	7	1513	1519	Bill wants to go back to Marker 33 again.
7/28	10	02	13	45.932042	-129.981446	327	-11	0	4	1513	1517	Heading back to where Marker 33 should be.
7/28	10	02	30	45.932063	-129.981473	327	-7	0	4	1515	1518	Debating what went on here.
7/28	10	05	26	45.932270	-129.981604	348	-7	0	4	1518	1522	This looks like it matches the map. It also looks pretty familiar - similar to past years.
7/28	10	10	36	45.932574	-129.981854	330	-8	1	3	1520	1523	Heading back toward Mkr-33 - or what we think may be Mkr-33? Or what was Mkr-33.
7/28	10	10	51	45.932554	-129.981863	329	-8	1	2	1521	1523	Here are pillows on jumbled flow.
7/28	10	10	59	45.932545	-129.981865	328	-8	-1	2	1521	1523	That is a contact.
7/28	10	11	10	45.932557	-129.981875	325	-8	0	2	1521	1523	Contact of pillows on jumbled flow.
7/28	10	12	44	45.932594	-129.981854	262	-7	1	1	1521	1522	It looks pretty fresh. We're going to grab a piece.
7/28	10	29	28	45.932644	-129.981919	334	-12	2	3	1519	1521	Poking around here to try to find a spot to sample.
7/28	10	30	10	45.932667	-129.981901	30	-9	4	2	1519	1521	The original contact spot was: 129 58.9143' 45 55.9584 Z=1521 m CONTACT.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	10	33	14	45.932664	-129.981892	32	-9	2	2	1519	1521	Bill wants to get a little lobe of this lava right on the edge of the flow. Have to maneuver the vehicle a bit because he can't reach it.
7/28	10	35	10	45.932662	-129.981885	339	-14	4	2	1520	1522	HIGHLIGHTS: KiPro hard drive start Lava contact.
7/28	10	35	48	45.932671	-129.981885	339	-15	3	2	1520	1522	Taking a few HD pics of the contact.
7/28	10	36	29	45.932677	-129.981885	339	-15	3	2	1520	1522	Zooming in on this pillow contact.
7/28	10	38	10	45.932669	-129.981892	343	-9	0	1	1520	1521	Scott loosened the small lobe at the contact and it fell down.
7/28	10	40	20	45.932662	-129.981872	347	-10	4	3	1519	1522	SAMPLE: geo J2-581-pillow-02 . Z=1520. Using the claw to grab a piece of pillow here at this contact where pillows are covering jumbled flow. Z=1520m. 129 58.9145' 45 55.9604 Z=1521m. Contact target entered in nav.
7/28	10	42	21	45.932682	-129.981881	6	-9	0	2	1519	1522	J2-581-pillow-02 cont. Fist-size lobe of pillow at contact. We think this is possibly (probably) new lava.
7/28	10	50	24	45.932668	-129.981882	356	-9	5	2	1520	1522	This contact is SE of the Mkr-33 position is 70m 150degrees.
7/28	10	55	46	45.932641	-129.981887	0	-9	3	2	1520	1522	SAMPLE: geo J2-581-pillow-30 (originally pillow-03 in virtual van) . Z=1520m. 129 58.9143' 45 55.9584 Z=1521m This piece is really glassy rind. It's "huge". It's about as wide as the milk crate.
7/28	11	00	52	45.932580	-129.981877	310	-9	0	3	1519	1522	We're going to head back toward Mkr-33 after some video of it.
7/28	11	02	27	45.932589	-129.981844	286	-8	1	1	1520	1521	HIGHLIGHTS: KiPro hard drive start Following the young pillows.
7/28	11	03	06	45.932595	-129.981872	286	-8	1	2	1521	1522	High def moving over the young pillows.
7/28	11	05	20	45.932627	-129.982068	294	-8	1	2	1518	1519	Following the flow of young pillows we are looking at the 1998 lava arches.
7/28	11	07	11	45.932743	-129.982152	333	-9	1	1	1517	1518	WE are seeing older pillars surrounded by younger pillows.
7/28	11	07	22	45.932756	-129.982150	331	-8	1	2	1517	1519	Just the tops of the pillars are sticking out.
7/28	11	07	36	45.932777	-129.982152	331	-8	1	2	1517	1518	We are more and more convinced that this may be a new eruption but it's hard to believe.
7/28	11	07	45	45.932793	-129.982156	332	-8	1	2	1517	1518	It is a mystery of the deep.
7/28	11	07	59	45.932803	-129.982162	332	-8	1	2	1517	1519	HIGHLIGHTS: KiPro hard drive stop
7/28	11	09	45	45.932802	-129.982167	332	-8	1	2	1517	1519	The pillows of lava and the sea floor is covered in a white flock.
7/28	11	10	12	45.932803	-129.982166	332	-8	1	2	1517	1519	We are currently stopped at the bottom waiting for the ship and Medea to move.
7/28	11	11	02	45.932804	-129.982167	332	-8	1	2	1517	1518	There is flock of some sort in the water we are unsure of what it is.
7/28	11	11	57	45.932811	-129.982164	332	-8	1	2	1517	1518	This certainly is puzzling and not what we expected at all.
7/28	11	12	49	45.932812	-129.982156	332	-8	1	2	1517	1518	HIGHLIGHTS: KiPro hard drive start
7/28	11	13	19	45.932829	-129.982162	332	-9	1	2	1517	1518	Resuming our exploring eye.
7/28	11	13	51	45.932843	-129.982173	332	-8	1	1	1516	1518	Driving over the pillow lava taking HD highlights.
7/28	11	14	40	45.932870	-129.982194	332	-9	1	2	1516	1518	Pillows covered in layers of white stuff probably all the white flock that we observe in the overlying water column.
7/28	11	16	02	45.932935	-129.982231	332	-8	1	1	1516	1517	We are observing a changing from pillow flow to lobate flow.
7/28	11	16	26	45.932951	-129.982242	332	-9	1	1	1516	1517	There is a yellowish color and evenly distributed over everything.
7/28	11	17	10	45.932954	-129.982254	332	-8	1	1	1516	1517	This suggests that the particles are of hydrothermal origin.
7/28	11	20	07	45.933061	-129.982326	332	-8	1	1	1516	1517	The white yellowish covering is getting thicker and thicker.
7/28	11	20	55	45.933097	-129.982314	38	-8	1	1	1516	1517	We are moving to the Mkr33 target to look around in all directions.
7/28	11	21	14	45.933078	-129.982323	37	-8	1	1	1516	1517	We just saw something that might have manmade color we are backing up the sub to investigate
7/28	11	22	10	45.933078	-129.982311	36	-7	1	1	1516	1517	The basalt is so shiny under the settled particles.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	11	23	44	45.933076	-129.982322	36	-7	1	1	1516	1517	Maybe one of the reason we have been seeing so much flock or smoking in the Ashes vent areas could be due to this site.
7/28	11	24	49	45.933116	-129.982307	22	-8	1	1	1516	1517	The color we saw based on closer inspection looks most likely biological in origin.
7/28	11	25	18	45.933113	-129.982293	22	-7	1	1	1516	1517	Setting down to investigate more thoroughly.
7/28	11	25	23	45.933110	-129.982290	25	-7	1	1	1516	1517	Moving 10m East.
7/28	11	26	11	45.933104	-129.982235	90	-8	1	2	1515	1517	Depth=1515.8 The seafloor is 4m higher than observed last year.
7/28	11	27	03	45.933097	-129.982211	82	-5	1	1	1516	1517	The area that we are looking at looks like remnants of a former vent.
7/28	11	27	18	45.933098	-129.982212	82	-5	1	1	1516	1517	There is a tiny bit of shimmering in this area.
7/28	11	28	01	45.933094	-129.982206	83	-8	2	1	1516	1517	We see scale worms.
7/28	11	28	26	45.933095	-129.982193	82	-7	1	1	1516	1517	Shimmering was observer 129 58.9308'W 45 55.9867' N
7/28	11	29	10	45.933095	-129.982190	82	-6	1	1	1516	1517	We definitely see white microbial filamentous mat covered in orange-ish particle covering.
7/28	11	29	40	45.933096	-129.982191	82	-7	1	1	1516	1517	We are taking a temperature probe in this hole to see if its warmer.
7/28	11	29	44	45.933096	-129.982191	82	-7	1	1	1516	1517	NAV: Doppler Reset
7/28	11	30	28	45.933097	-129.982202	81	-7	0	1	1516	1517	Ambient temperature 2.8
7/28	11	33	08	45.933110	-129.982244	81	-8	1	1	1516	1517	TEMPS: Jason temperature in basalt lobate flows with thick hydrothermal sediment=10.2C
7/28	11	33	36	45.933110	-129.982239	82	-7	2	1	1516	1517	Stowing the temperature probe in basket.
7/28	11	35	31	45.933100	-129.982241	57	-9	0	1	1516	1517	Discussing if we can take syringe sample.
7/28	11	38	13	45.933102	-129.982177	54	-7	-1	1	1516	1517	Decided to sample with the large syringe sampler targeting white and orange mat for microbial diversity questions.
7/28	11	40	16	45.933111	-129.982205	54	-8	1	1	1516	1517	SAMPLE: bio J2-581-Mat-03 : Large syringe sampler
7/28	11	40	52	45.933124	-129.982196	53	-9	-1	1	1516	1517	Syringe sampler fired 1139 hurrahs were exclaimed throughout the van.
7/28	11	41	40	45.933134	-129.982184	53	-6	-1	1	1516	1517	Recollecting on how they were so confused surveying back in 1998 and how different everything looked.
7/28	11	43	37	45.933100	-129.982194	54	-8	2	1	1516	1517	Not seeing the same type of venting and heating as observed in the 1998 eruption.
7/28	11	44	35	45.933107	-129.982193	324	-8	1	2	1515	1517	This suggests that this was either a smaller event a fast event or a shallow event - or we are only on the very outskirts of this eruption.
7/28	11	45	28	45.933154	-129.982219	331	-8	1	2	1515	1517	Looking for benchmark at marker 33.
7/28	11	46	09	45.933164	-129.982255	330	-8	0	1	1516	1517	We see shimmering water going in for a closer look and temperature.
7/28	11	47	07	45.933154	-129.982323	331	-6	0	1	1516	1517	Lots of white filamentous mat most likely Beggiatoa.
7/28	11	47	33	45.933147	-129.982335	331	-7	-1	1	1516	1517	There are a few scale worms.
7/28	11	47	44	45.933147	-129.982336	331	-7	-1	1	1516	1517	Probing with Jason temperature probe.
7/28	11	49	57	45.933166	-129.982294	331	-7	-1	1	1516	1517	TEMPS: Jason temperature in shimmering hole is about 20.4C.
7/28	11	50	33	45.933165	-129.982297	331	-7	0	1	1516	1517	Stowing the temperature probe.
7/28	11	51	48	45.933186	-129.982299	331	-10	1	1	1516	1517	We see bag creatures (gelatinous microbial byproduct) in view.
7/28	11	53	09	45.933201	-129.982338	331	-8	1	2	1515	1517	Continuing to explore about.
7/28	11	55	16	45.933311	-129.982344	338	-8	1	1	1515	1516	Spinning around.
7/28	11	55	37	45.933306	-129.982339	262	-8	1	1	1515	1516	We've seen no collapse in this at all.
7/28	11	56	14	45.933319	-129.982341	133	-8	1	2	1515	1516	Bill exclaimed that "this is amazing".
7/28	11	58	59	45.933470	-129.982218	15	-10	1	3	1514	1516	HIGHLIGHTS: KiPro hard drive stop
7/28	11	59	11	45.933518	-129.982206	15	-10	0	2	1514	1516	Transit to Bag City.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	12	03	28	45.933604	-129.982074	29	-6	0	81	1426	1507	Time to remap the AUV bathymetry.
7/28	13	26	55	45.916156	-129.989489	119	-8	1	3	1530	1533	We see the sea floor.
7/28	13	27	20	45.916109	-129.989391	138	-9	2	3	1529	1532	We are close to Bag City.
7/28	13	29	20	45.916172	-129.989432	330	-9	1	1	1530	1532	We see the marker and the benchmark AX 104.
7/28	13	29	38	45.916171	-129.989439	338	-5	2	1	1531	1532	Looks like it is very close to a collapse
7/28	13	30	33	45.916151	-129.989432	336	-3	0	1	1531	1532	The bench mark is scummy and covered in goo - most likely microbial mat. Wishing we had brought brushes.
7/28	13	33	48	45.916184	-129.989451	335	-4	-1	1	1531	1532	Grabbing MPR (Mobile Pressure Recorder) out of basket.
7/28	13	35	40	45.916188	-129.989437	335	-4	-1	1	1531	1532	Starting pressure measurements 13:35.
7/28	13	36	06	45.916184	-129.989429	335	-4	-1	1	1531	1532	Orientation of the MPR is with the cable on the left.
7/28	13	36	21	45.916180	-129.989431	335	-4	-1	1	1531	1532	Noticed cable under the left side so we are going to fix that.
7/28	13	37	11	45.916161	-129.989451	335	-4	-1	1	1531	1532	Repositioned cable without touching the benchmark.
7/28	13	39	52	45.916176	-129.989417	335	-4	-1	1	1531	1532	Still making measurement.
7/28	13	53	55	45.916170	-129.989446	335	-4	-1	1	1531	1532	Looking at a frame grab of this position from last year to see about the collapse.
7/28	13	55	28	45.916168	-129.989437	335	-4	-1	1	1531	1532	Measurement complete at time 13:55.
7/28	13	56	32	45.916170	-129.989445	335	-4	-2	1	1531	1532	Stowing the MPR on the basket.
7/28	13	58	38	45.916168	-129.989451	335	-4	-2	1	1531	1532	We are planning to head over to the OBH1 mooring that didn't release yesterday check it out and see if a tap will allow it to release.
7/28	14	00	30	45.916109	-129.989515	257	-10	1	3	1530	1532	Begin transit.
7/28	14	24	14	45.916995	-129.985884	249	-5	1	94	1435	1529	Looking at framegrabs from last years dive show that there were other collapses in the area.
7/28	14	25	06	45.917036	-129.985656	250	-5	2	81	1448	1529	Thus we should measure the older benchmark in the Bag City area on the next go around.
7/28	14	40	13	45.917919	-129.982582	68	-7	-1	3	1528	1531	Bottom in sight.
7/28	14	41	18	45.917935	-129.982474	68	-9	0	2	1528	1531	About 48m away from deployment target of mooring.
7/28	14	41	44	45.917936	-129.982449	69	-8	0	2	1528	1531	We are turning on Medea's sonar to get better imaging of where the mooring might be.
7/28	14	49	05	45.918133	-129.981983	59	-8	0	2	1529	1531	We see the line for the mooring.
7/28	14	50	19	45.918153	-129.981921	58	-8	1	2	1529	1531	There is new lava on the mooring.
7/28	14	50	28	45.918149	-129.981916	59	-8	0	2	1529	1531	That is unreal it is under the lava.
7/28	14	50	50	45.918148	-129.981911	59	-8	0	2	1529	1531	"That is UNBELIEVABLE"-Bill.
7/28	14	51	03	45.918149	-129.981913	59	-8	0	2	1529	1531	The OBH is encased in lava and its still responding.
7/28	14	52	00	45.918172	-129.981952	59	-8	1	2	1529	1531	Depth=1529.4 the chain is real short.
7/28	14	53	45	45.918167	-129.981930	59	-8	1	2	1529	1531	According to BPR data we are pretty sure this lava flow happened at April 5th (correction April 6th) at 8am UTC.
7/28	14	54	27	45.918145	-129.981926	59	-8	0	2	1529	1531	Discussing whether we are going to release the floats.
7/28	14	56	07	45.918143	-129.981964	59	-8	0	2	1529	1531	There is a nylon wire about 10 m and wouldn't be too hard to cut but we have no knife on this dive.
7/28	14	56	17	45.918143	-129.981969	59	-8	1	2	1529	1531	Bill is real sad we won't get the data from the OBH.
7/28	14	56	43	45.918143	-129.981983	59	-8	0	2	1529	1531	In retrospect they should have put out a 4th OBH.
7/28	14	57	36	45.918141	-129.981998	59	-8	0	2	1529	1531	The line looks like it's about half a meter buried based on the chain length.
7/28	14	57	59	45.918140	-129.981996	59	-8	0	2	1529	1531	Recover the floats on next cruise. But we want to say we tried so we will give it a tug.
7/28	14	58	16	45.918145	-129.981988	59	-8	0	2	1529	1531	It's like getting Excalibur out of the stone is Akel up to the challenge?

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	14	59	40	45.918148	-129.981983	59	-7	1	1	1530	1531	HIGHLIGHTS: KiPro hard drive start
7/28	15	03	26	45.918178	-129.981909	62	-7	1	1	1530	1531	We tried grabbing the chain but it's pretty solidly in there.
7/28	15	03	44	45.918173	-129.981914	62	-7	1	1	1530	1531	HIGHLIGHTS: KiPro hard drive stop
7/28	15	04	25	45.918166	-129.981921	62	-7	1	1	1530	1531	This OBH is not coming out anytime soon.
7/28	15	05	50	45.918186	-129.981962	62	-7	1	1	1530	1531	The OBH transducer is still talking - even though it's in a rubber casing.
7/28	15	06	06	45.918184	-129.981964	62	-7	1	1	1530	1531	Marker 33 is completely paved over with ~4m of lava flow.
7/28	15	06	56	45.918134	-129.981996	60	-7	1	5	1526	1531	There's no sign of the RAS at Marker 33 either - it's been buried.
7/28	15	07	08	45.918123	-129.982023	92	-6	-2	7	1524	1531	All the new lava is covered with bacterial mat/sediment.
7/28	15	07	42	45.918187	-129.982149	100	-9	0	9	1521	1530	There's a few vent openings with white halos around them in the new lava flow.
7/28	15	08	12	45.918124	-129.982230	101	-9	0	9	1522	1531	The event may have happened around April 2011.
7/28	15	08	35	45.918118	-129.982271	102	-9	0	15	1516	1531	It actually happened April 6 0720 UTC. Majority of it was 6 days. By the 15th day it had died back to nothing.
7/28	15	09	12	45.918109	-129.982320	102	-9	1	33	1498	1532	We're off the bottom.
7/28	15	10	53	45.918093	-129.982489	97	-9	0	88	1443	1530	The center of the caldera seems to have gone down - not up.
7/28	15	14	21	45.918622	-129.982360	3	-9	1	126	1402	1528	We're headed to AX105 Pillow Mound.
7/28	15	16	58	45.918792	-129.982512	346	-7	0	139	1379	1518	This new eruption area looks very similar to what happened in the 1998 eruption.
7/28	15	17	16	45.918797	-129.982525	346	-7	0	132	1379	1511	There were small vents with white halos and some orange mats.
7/28	15	19	33	45.918801	-129.982634	342	-7	0	147	1379	1526	Discussing deploying an OBH anchor as a temporary benchmark for pressure measurements.
7/28	15	20	43	45.918801	-129.982693	343	-7	0	145	1379	1525	We still have a RAS to deploy - need to figure out a good place to put it.
7/28	15	20	57	45.918801	-129.982704	343	-8	0	146	1379	1526	It's still a goal to get good data from the benchmarks.
7/28	15	21	30	45.918801	-129.982727	343	-7	0	146	1379	1526	We are probably going to continue transiting around the benchmark circuit.
7/28	15	21	43	45.918801	-129.982736	343	-7	0	147	1379	1526	We'll look for new venting sites to take fluid samples since the Beast is on.
7/28	15	22	13	45.918802	-129.982757	342	-7	0	146	1379	1526	There is still venting where Marker 33 used to be - would be an interesting sample.
7/28	15	23	27	45.918805	-129.982816	343	-7	0	142	1379	1521	All that floc up at AX102 by that Snow Globe vent could be due to sulfide oxidizers.
7/28	15	24	59	45.918787	-129.982894	344	-7	0	139	1379	1518	Previously when the RAS was located over a vent it created a cavity where oxygenated water got mixed in with the sulfides and sulfide oxidizers were able to grow and produced a lot of floc.
7/28	15	25	18	45.918778	-129.982906	344	-7	0	136	1379	1516	Because the AX102 area has so many collapse zone cavities something similar has likely happened in the large cavities where Snow Globe was seen.
7/28	15	26	42	45.918708	-129.982945	345	-7	0	137	1379	1516	The temperatures at ASHES weren't much higher than last year. There didn't seem to be any new diffuse venting areas.
7/28	15	27	20	45.918666	-129.982957	346	-7	0	138	1379	1517	It will be interesting to see what has happened at the International District.
7/28	15	27	43	45.918639	-129.982964	347	-7	1	136	1379	1515	There's a low ridge of pillow mounds that are on the western edge of the International District.
7/28	15	28	06	45.918608	-129.982971	348	-7	0	146	1379	1525	In 1998 the lava lapped up against the mounds and missed the International District.
7/28	15	40	40	45.916668	-129.983507	8	-7	1	37	1365	1402	Transit began around 15:06 - we'll be 3.5 to 4 hours.
7/28	20	12	00	45.864918	-130.003374	3	-7	2	71	1376	1447	Looks like the ship is close to the southern benchmark
7/28	20	12	39	45.864797	-130.003406	3	-8	2	70	1387	1457	We're here looking for AX105 at Pillow Mound. Not on the seafloor yet.
7/28	20	13	32	45.864592	-130.003470	3	-10	2	34	1400	1434	The benchmark should be at 1718m.
7/28	20	25	25	45.863197	-130.003872	106	-3	2	34	1611	1645	Lots of stuff in the water here too - certainly not as much as up north.
7/28	20	28	45	45.863284	-130.003856	128	-7	1	14	1707	1720	NAV: Doppler Reset
7/28	20	29	10	45.863288	-130.003837	129	-7	1	5	1715	1721	JASON: Jason on bottom

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/28	20	29	30	45.863235	-130.003820	159	-8	1	4	1716	1720	Bill has spotted the marker. It's right in front of us.
7/28	20	30	17	45.863170	-130.003843	40	-8	2	4	1717	1720	AX105 benchmark right in front of us.
7/28	20	31	15	45.863187	-130.003817	354	-9	-1	3	1718	1720	Marker 66 is on the old benchmark.
7/28	20	32	10	45.863191	-130.003816	356	-4	1	1	1720	1721	Got some HD framegrabs.
7/28	20	33	26	45.863179	-130.003817	357	-6	0	1	1720	1720	Jason is grabbing the pressure sensor with its stbd claw.
7/28	20	34	18	45.863180	-130.003818	358	-7	0	1	1720	1720	Trying to take the twirl out of the polypro and connective cable.
7/28	20	35	14	45.863172	-130.003817	357	-5	1	1	1720	1721	It's in there.
7/28	20	35	53	45.863174	-130.003815	357	-3	1	1	1720	1721	DEPLOY: pressure sensor AX105 pressure reading. Pillow mound.
7/28	20	37	55	45.863208	-130.003809	357	-3	1	1	1720	1721	This measurement will be finished at 2055.
7/28	20	38	19	45.863204	-130.003816	357	-3	1	1	1720	1721	No new lava here from the looks of it.
7/28	20	39	05	45.863199	-130.003830	357	-3	1	1	1720	1721	This is good. We have a reference outside the caldera.
7/28	20	47	10	45.863179	-130.003809	357	-3	1	1	1720	1721	Sitting here.
7/28	20	51	16	45.863213	-130.003827	358	-3	1	1	1720	1721	The reference has moved up by ~1 cm whereas at the caldera center it has inflated 2.5 meters. (initial estimates)
7/28	20	51	41	45.863209	-130.003830	358	-3	1	1	1720	1721	The BPRs in the caldera will help because they are an absolute reference.
7/28	20	56	33	45.863196	-130.003814	358	-3	1	1	1720	1721	RECOVER: pressure sensor at AX105. Stowing the sensor on the Jason "deck".
7/28	20	58	06	45.863161	-130.003915	296	-11	0	3	1717	1720	Frame_Grab:
7/28	20	58	10	45.863159	-130.003941	295	-9	0	3	1717	1720	We're outta here.
7/28	20	58	19	45.863158	-130.003999	293	-11	1	3	1717	1720	Beautiful sheet flow here. Flat as can be.
7/29	00	24	17	45.910944	-129.991226	203	-6	2	98	1313	1411	Still transiting probably another 30 minutes.
7/29	00	57	38	45.915674	-129.989484	3	-9	1	4	1530	1534	JASON: Jason on bottom
7/29	00	58	06	45.915704	-129.989490	356	-10	1	4	1530	1534	Heading north for AX104 at Bag City.
7/29	01	04	59	45.915288	-129.989533	355	-8	1	5	1530	1534	We see bottom.
7/29	01	05	42	45.915297	-129.989507	351	-8	2	4	1530	1534	There is another issue with the bow thruster.
7/29	01	15	22	45.914796	-129.989164	22	-8	1	6	1529	1535	Bow thruster issue sorted out.
7/29	01	17	41	45.914871	-129.989283	347	-8	2	4	1531	1535	We are 153m away from our target.
7/29	01	18	59	45.915049	-129.989319	14	-9	2	3	1532	1534	We are seeing lots of smoke from something.
7/29	01	21	57	45.915050	-129.989472	351	-9	1	9	1530	1539	Jason is coming up in the water column and centering under Medea.
7/29	01	44	21	45.916186	-129.989445	337	-2	2	1	1532	1533	At benchmark AX104 Bag City.
7/29	02	02	46	45.916187	-129.989429	336	-6	-2	1	1532	1533	At 01:57 UT Started the Measurement on AX104.
7/29	02	04	02	45.916193	-129.989429	336	-6	-2	1	1532	1533	DEPLOY: pressure sensor At AX104 started measuring at 01:57
7/29	02	18	34	45.916182	-129.989453	335	-11	-1	1	1532	1533	RECOVER: pressure sensor Stop pressure measurement at AX 02:17.
7/29	02	18	42	45.916185	-129.989443	333	-10	-1	2	1531	1533	Stowing sensor in basket.
7/29	02	19	42	45.916197	-129.989437	341	-2	-2	1	1532	1533	Moving the MPR to the old triangular tripod benchmark at Bag City.
7/29	02	20	59	45.916202	-129.989434	340	-3	-3	1	1532	1533	Re-measuring the old benchmark to see if the new benchmark has changed and to compare to the old.
7/29	02	21	11	45.916203	-129.989433	340	-3	-3	1	1532	1533	Positioning the MPR on the old benchmark Ax04.
7/29	02	30	52	45.916168	-129.989402	324	-4	-2	1	1532	1533	DEPLOY: pressure sensor Measurement starting at 02:30 UTC on old benchmark AX04
7/29	02	36	35	45.916216	-129.989430	324	-4	-2	1	1532	1533	We are zoomed in on the marker and it is covered in gunk creatures galore and huge anemone.
7/29	02	50	44	45.916199	-129.989439	323	-4	-2	1	1532	1533	Stop measurement of MPR at AX04 at 02:50 UTC

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	02	51	07	45.916200	-129.989439	323	-4	-2	1	1532	1533	RECOVER: pressure sensor stowing the pressure sensor in the basket.
7/29	02	52	13	45.916199	-129.989442	322	-5	-1	1	1532	1533	Next we'll drive northeast to Bag City vent. - not far away.
7/29	02	53	26	45.916198	-129.989431	325	-8	-2	2	1531	1533	There should be an MTR there.
7/29	02	53	58	45.916198	-129.989428	325	-8	-1	2	1531	1533	Stowing the MPR in the basket.
7/29	02	55	15	45.916201	-129.989416	325	-8	-2	2	1531	1533	Bungee is tied down on the MPR.
7/29	02	58	02	45.916171	-129.989315	176	-8	1	2	1531	1533	We're not sure if the navigation underlay is correct - we'll go to the southeast to look for Bag City vent.
7/29	02	58	41	45.916161	-129.989246	166	-8	1	3	1531	1534	Lots of floc in the water here and lots of white filaments in the lava flow cracks.
7/29	02	58	51	45.916141	-129.989236	165	-9	0	2	1531	1534	We'll be looking for a big tubeworm bush with an MTR in it.
7/29	03	00	21	45.916049	-129.989166	165	-8	0	1	1532	1533	We're going to the correct depth - 1536m.
7/29	03	07	56	45.916359	-129.989137	320	-9	0	2	1531	1533	We're checking the navigation from last year for MTR 3087's exact location.
7/29	03	09	44	45.916345	-129.989178	257	-9	1	2	1531	1533	It was in a large tubeworm bush.
7/29	03	09	50	45.916346	-129.989189	258	-7	0	2	1531	1533	We're looking for tubeworms in this region.
7/29	03	10	03	45.916352	-129.989209	269	-9	0	2	1531	1533	There's not very many tubeworms to be seen here.
7/29	03	10	57	45.916332	-129.989232	220	-9	0	2	1531	1533	We've come up on an area with more tubeworms.
7/29	03	11	20	45.916324	-129.989237	159	-8	1	2	1531	1533	Looking around for the MTR.
7/29	03	11	51	45.916306	-129.989261	236	-8	0	2	1531	1533	The visibility is so low that it's hard to see any markers.
7/29	03	19	11	45.916198	-129.989171	320	-8	1	3	1532	1534	Going to try driving to the north of the benchmark to look for the MTR site.
7/29	03	19	39	45.916175	-129.989229	320	-8	1	2	1531	1534	Marker 36 should be there but it's old and crusty and is probably hard to see especially in this floc.
7/29	03	20	26	45.916204	-129.989311	323	-8	1	2	1532	1534	This area has more tubeworms - like we expect there to be.
7/29	03	24	59	45.916368	-129.989169	107	-8	0	1	1532	1533	NAV: Doppler Reset
7/29	03	25	15	45.916371	-129.989167	167	-8	0	1	1532	1533	We're turning south to look for the Bag City MTR 3087.
7/29	03	29	11	45.916288	-129.989214	169	-8	1	1	1532	1533	The tubeworm area seems similar to in previous years.
7/29	03	29	23	45.916293	-129.989233	169	-8	0	2	1532	1533	There's more diffuse flow around the edges of this site though.
7/29	03	29	57	45.916319	-129.989274	169	-9	0	2	1532	1533	It seems like the MTR should be right in this area.
7/29	03	30	26	45.916294	-129.989284	169	-9	1	1	1532	1533	There's also a steel frame benchmark (from an old NeMO camera experiment) right near the marker.
7/29	03	32	10	45.916236	-129.989230	169	-8	0	2	1532	1533	We're getting to the edge of the tubeworm area.
7/29	03	32	20	45.916229	-129.989239	169	-8	1	2	1532	1534	There's an area of collapse directly ahead to the south.
7/29	03	34	35	45.916165	-129.989283	172	-8	1	1	1532	1534	This floc is a nightmare for visibility.
7/29	03	36	00	45.916203	-129.989194	173	-8	0	1	1532	1533	Now we're coming up to a collapse zone again.
7/29	03	36	19	45.916207	-129.989184	172	-8	0	2	1531	1533	The marker was up high so we might be able to look for it on the sonar.
7/29	03	37	07	45.916210	-129.989193	208	-8	1	3	1530	1533	We're going to go back to the benchmark and start searching from there.
7/29	03	38	18	45.916286	-129.989323	247	-8	0	2	1531	1533	We have 2 descriptions: 17m south and 16m west of marker 36 to the benchmark. Or 20 m at heading 222 towards the benchmark from marker 36.
7/29	03	39	14	45.916216	-129.989377	225	-9	1	2	1532	1534	We'll go to the benchmark and drive in the opposite direction - heading 42 - to look for the vent site.
7/29	03	42	16	45.916321	-129.989282	43	-8	1	1	1533	1533	Driving past an area with diffuse flow and floc venting from the seafloor.
7/29	03	42	20	45.916325	-129.989279	43	-8	0	1	1533	1533	Frame_Grab:
7/29	03	42	48	45.916361	-129.989245	43	-8	1	1	1532	1533	The MTR and marker 36 should be here but we don't see them.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	03	42	56	45.916379	-129.989229	43	-9	0	2	1531	1533	There are no large tubeworm bushes here either.
7/29	03	43	09	45.916412	-129.989200	43	-9	0	2	1531	1533	There's some collapse zone ahead.
7/29	03	43	19	45.916438	-129.989170	51	-9	-1	2	1531	1533	We'll turn around and swoop back again.
7/29	03	46	41	45.916297	-129.989231	225	-8	0	1	1532	1533	That tubeworm bush where the marker 36 is was so large - but we don't see anything resembling it.
7/29	03	47	01	45.916283	-129.989234	225	-8	1	1	1532	1533	We would certainly expect to see the marker or the camera frame.
7/29	03	49	30	45.916241	-129.989337	226	-9	1	2	1531	1533	We've come back to the benchmark again.
7/29	03	49	54	45.916201	-129.989352	182	-9	1	1	1532	1533	We're going to turn back around and do one more search line parallel to the ones we've already done - further east.
7/29	03	52	45	45.916301	-129.989167	42	-8	1	1	1532	1533	Frame_Grab:
7/29	03	52	53	45.916311	-129.989156	41	-9	0	1	1532	1533	Passing the shimmering diffuse flow again.
7/29	03	53	49	45.916393	-129.989054	106	-8	1	3	1531	1535	It's possible that the area the marker was on has collapsed - we'll look in this hole.
7/29	03	54	23	45.916429	-129.989058	242	-8	0	3	1530	1533	Doesn't seem to be anything in it.
7/29	03	55	36	45.916374	-129.989099	204	-8	0	1	1532	1533	It seems crazy that there's no trace of anything - maybe it was all buried in some lava flow as well.
7/29	03	57	11	45.916348	-129.989156	203	-8	1	1	1532	1533	Everything here has dropped 2 or 3 meters.
7/29	03	57	32	45.916348	-129.989161	204	-8	1	1	1532	1533	This area of rocks and white filaments is right where the benchmark should be.
7/29	04	00	44	45.916282	-129.989204	203	-8	1	1	1532	1533	We half expect to find the MTR or the marker sticking out of some rock!
7/29	04	01	30	45.916266	-129.989242	202	-8	1	1	1532	1534	We'll just look at the diffuse flow we saw instead and do some fluid sampling.
7/29	04	04	16	45.916328	-129.989293	154	-7	0	1	1533	1533	The frame was about a meter long and 30cm wide. It may have fallen into a collapse hole.
7/29	04	04	23	45.916328	-129.989293	154	-6	1	1	1533	1534	Frame_Grab:
7/29	04	04	24	45.916328	-129.989293	155	-7	0	1	1533	1534	There's some diffuse flow in this area.
7/29	04	04	29	45.916331	-129.989293	146	-8	1	1	1533	1534	We'll try sampling this area.
7/29	04	06	07	45.916324	-129.989306	93	-9	1	1	1533	1534	There seems to be venting coming out of this hole in the ground - in the right of the picture.
7/29	04	06	40	45.916325	-129.989308	93	-9	-1	1	1533	1534	The black basalt (2011 eruption?) showing in the left of the photo where Jason bumped the rocks here at Bag City.
7/29	04	06	57	45.916325	-129.989309	93	-9	-1	1	1533	1534	We'll collect some fluid from this site.
7/29	04	07	04	45.916325	-129.989309	93	-9	0	1	1533	1534	Getting the HFS intake wand out.
7/29	04	07	20	45.916326	-129.989309	93	-9	-1	1	1533	1534	We'll probably only collect water samples because it will take too long to filter here.
7/29	04	08	21	45.916324	-129.989308	93	-9	0	1	1533	1534	If we filter we'll be even more behind schedule for getting to Vixen since we have spent ~1hr searching for the Marker 36 site.
7/29	04	09	10	45.916327	-129.989316	93	-9	-1	1	1533	1534	We'll move the HFS intake wand around the left edge of this hole to find where the flow is really coming from.
7/29	04	10	17	45.916329	-129.989319	93	-10	-1	1	1533	1534	TEMPS: HFS temperature is C and rising.
7/29	04	10	24	45.916328	-129.989318	93	-10	-1	1	1533	1534	Last year this area was about 10C.
7/29	04	10	47	45.916323	-129.989313	93	-10	-1	1	1533	1533	TEMPS: HFS temperature The temp is 7.2C
7/29	04	13	37	45.916309	-129.989277	93	-9	-1	1	1533	1534	Going to move HFS intake to bottom half of hole and angle in to the left under the ledge lip.
7/29	04	14	53	45.916311	-129.989284	93	-9	-1	1	1533	1534	HFS intake wand is completely under the lip of this hole - not even visible anymore!
7/29	04	15	04	45.916312	-129.989286	93	-9	-1	1	1533	1533	Temp is 5.6C now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	04	15	23	45.916313	-129.989289	93	-10	-1	1	1533	1534	Diffuse flow seems to be coming up and over the left edge of this lip.
7/29	04	15	38	45.916314	-129.989290	93	-10	-1	1	1533	1534	The right edge of the hole has collapsed!
7/29	04	16	03	45.916314	-129.989292	93	-10	0	1	1533	1534	We'll put the HFS tip right along the edge of the ledge for maximum temperature flow collection.
7/29	04	16	47	45.916312	-129.989297	93	-10	-1	1	1533	1534	There is a lot of floc floating around now because of the right edge collapse.
7/29	04	16	56	45.916311	-129.989299	93	-10	0	1	1533	1534	TEMPS: HFS temperature We're at 5C and getting warmer.
7/29	04	17	01	45.916311	-129.989300	93	-10	-1	1	1533	1534	TEMPS: HFS temperature Now 7C.
7/29	04	17	13	45.916310	-129.989303	93	-10	0	1	1533	1534	7.9C and still rising.
7/29	04	17	24	45.916310	-129.989306	93	-10	0	1	1533	1534	We're over 8C and still rising.
7/29	04	17	31	45.916310	-129.989308	93	-10	0	1	1533	1534	Now we're at 10C.
7/29	04	17	48	45.916311	-129.989312	93	-10	0	1	1533	1534	The temp is dropping a little.
7/29	04	18	13	45.916315	-129.989319	93	-10	0	1	1533	1534	Now it's at 8.4C.
7/29	04	18	35	45.916320	-129.989322	93	-10	0	1	1533	1534	Fluctuating up again - back to 10C.
7/29	04	19	55	45.916332	-129.989309	93	-10	0	1	1533	1534	Repositioned the wand a little.
7/29	04	20	06	45.916332	-129.989306	93	-10	0	1	1533	1534	This is a good spot - the temp is 12.8C and going up.
7/29	04	20	20	45.916333	-129.989303	93	-10	0	1	1533	1534	We'll do a sample here.
7/29	04	20	38	45.916333	-129.989302	93	-10	0	1	1533	1534	TEMPS: HFS temperature Now the temp is 13.5 C.
7/29	04	20	43	45.916334	-129.989301	93	-10	0	1	1533	1534	Last year we had a temp of 13C.
7/29	04	20	58	45.916334	-129.989302	93	-10	0	1	1533	1534	But last year there was not so much floc and there were tubeworms and we were 2m shallower.
7/29	04	21	17	45.916336	-129.989305	93	-10	0	1	1533	1534	SAMPLE: fluid J2-581-HFS-04 filtered bag #17 collection start.
7/29	04	22	53	45.916325	-129.989306	93	-10	0	1	1533	1534	SAMPLE: fluid The temp is stable at 13.8 C.
7/29	04	24	32	45.916322	-129.989318	93	-10	0	1	1533	1534	J2-581-HFS-04 finished.
7/29	04	24	53	45.916325	-129.989317	93	-10	0	1	1533	1534	J2-581-HFS-04: Tmax=13.9 Tavg=13.8 T2=8 Vol=500.
7/29	04	25	08	45.916326	-129.989315	93	-10	0	1	1533	1534	SAMPLE: fluid J2-581-HFS-05: Unfiltered bag #18 start.
7/29	04	27	55	45.916317	-129.989291	93	-10	0	1	1533	1534	SAMPLE: fluid J2-581-HFS-05 finished.
7/29	04	28	23	45.916314	-129.989286	93	-10	0	1	1533	1534	J2-581-HFS-05: Tmax=13.6 Tavg=13.4 T2=8 Vol=500.
7/29	04	28	35	45.916314	-129.989286	93	-9	0	1	1533	1534	We're going to stow the HFS intake wand and head to Vixen next.
7/29	04	29	49	45.916311	-129.989300	93	-9	-1	1	1533	1534	We'll look in all the holes as we go by to see if we see any traces of the MTR or marker or benchmark.
7/29	04	30	03	45.916309	-129.989300	93	-10	-1	1	1533	1534	NAV: Doppler Reset
7/29	04	32	39	45.916305	-129.989344	25	-8	1	1	1532	1534	We're going by a large collapse zone pit here - looks big enough to have swallowed all the instruments.
7/29	04	33	22	45.916327	-129.989350	349	-7	2	2	1532	1533	This area is filled with pillows.
7/29	04	33	38	45.916336	-129.989348	329	-7	1	2	1532	1534	This could all be recent pillow flow - 2011eruption??
7/29	04	33	57	45.916323	-129.989353	293	-8	0	2	1531	1534	The data on MTR 3087 would be really interesting to look at.
7/29	04	35	38	45.916283	-129.989354	295	-8	1	1	1533	1534	These pillows are covered in yellow sediment/mat staining.
7/29	04	35	49	45.916289	-129.989357	295	-8	1	1	1533	1534	It does look like the new lava flow we've seen in other areas.
7/29	04	36	55	45.916308	-129.989381	296	-9	0	1	1533	1534	We'll try taking a quick temp measurement with the Jason temp probe in any of these crevices.
7/29	04	37	03	45.916303	-129.989387	311	-9	0	2	1533	1535	HIGHLIGHTS: KiPro hard drive start
7/29	04	38	01	45.916287	-129.989391	312	-7	-1	1	1534	1535	Getting the Jason temp probe out of the basket.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	04	40	19	45.916337	-129.989393	311	-9	0	1	1534	1535	TEMPS: Jason temperature The probe is out - it's at 2.8C - cold!
7/29	04	40	39	45.916331	-129.989389	311	-11	0	1	1534	1535	Going to stow the temperature probe.
7/29	04	41	11	45.916291	-129.989446	280	-11	1	2	1533	1535	It's all glassy black basalt beneath the sediment - Jason wiped some sediment off where it was sitting.
7/29	04	42	04	45.916493	-129.989566	356	-14	0	3	1531	1534	Seems like this basalt is all new.
7/29	04	42	17	45.916566	-129.989599	334	-13	-1	3	1531	1534	The lava flow from this eruption covered a large area.
7/29	04	43	20	45.916653	-129.989946	285	-9	1	3	1531	1534	We passed over a crab very briefly.
7/29	04	43	40	45.916670	-129.990059	284	-13	-1	3	1530	1533	We're driving northwest away from Bag City to Vixen.
7/29	04	44	14	45.916710	-129.990263	283	-11	-1	3	1530	1533	It's gotten very cloudy all of a sudden - even poorer visibility than before.
7/29	04	44	47	45.916745	-129.990417	284	-10	0	2	1531	1532	Going over the edge of a collapse area here.
7/29	04	44	57	45.916743	-129.990421	287	-9	0	2	1531	1532	There's a large drop here.
7/29	04	45	43	45.916729	-129.990426	284	-8	1	2	1531	1532	Put the Jason temp probe back in the basket now.
7/29	04	45	52	45.916732	-129.990434	285	-10	1	2	1531	1532	HIGHLIGHTS: KiPro hard drive stop
7/29	04	46	14	45.916786	-129.990535	284	-8	2	5	1531	1536	There's a large ledge here.
7/29	04	46	18	45.916792	-129.990551	283	-10	0	6	1531	1536	Flying up over it.
7/29	04	46	56	45.916832	-129.990699	284	-8	1	2	1531	1533	Lots of orange sediment here on top of the rocks.
7/29	04	50	15	45.917008	-129.991296	284	-9	1	3	1531	1534	We're still transiting to Vixen.
7/29	04	56	34	45.917216	-129.992310	286	-8	1	2	1534	1536	A rattail fish floating by.
7/29	04	56	35	45.917217	-129.992313	286	-8	1	2	1534	1536	Frame_Grab:
7/29	04	57	37	45.917260	-129.992507	286	-8	1	3	1534	1537	Vixen was 1537m deep last year.
7/29	04	58	29	45.917286	-129.992702	285	-9	1	3	1534	1536	We're coming up on the Vixen area - lots of clams.
7/29	04	58	36	45.917289	-129.992731	285	-9	1	3	1534	1536	A rattail swimming by here.
7/29	04	58	39	45.917287	-129.992743	285	-8	1	3	1534	1536	Frame_Grab:
7/29	04	59	01	45.917267	-129.992839	286	-8	1	3	1534	1536	Lots of clams and some sparse tubeworm clumps.
7/29	04	59	32	45.917290	-129.992956	286	-7	0	2	1534	1537	There's a marker here and two tall anhydrite chimneys - there should be HOBOS sticking out of the chimneys.
7/29	05	00	06	45.917330	-129.993008	297	-7	0	2	1534	1536	There's a smoker here.
7/29	05	00	21	45.917338	-129.993010	297	-8	1	2	1534	1537	There is a marker here+N1854 but it seems to have fallen down.
7/29	05	00	47	45.917337	-129.992998	296	-8	1	2	1535	1537	We think we're at Casper actually - to the northwest of Vixen.
7/29	05	01	24	45.917346	-129.992974	292	-2	2	1	1536	1537	The HOBO looks like it fell out of the smoker.
7/29	05	01	43	45.917349	-129.992967	292	-5	2	1	1536	1537	HIGHLIGHTS: KiPro hard drive start
7/29	05	02	52	45.917352	-129.993002	292	-6	1	1	1536	1536	We'll put the HOBO in the basket.
7/29	05	03	07	45.917345	-129.993008	292	-6	0	1	1536	1536	We'll deploy a HOBO here too.
7/29	05	03	26	45.917337	-129.993007	292	-6	0	1	1536	1536	This smoker looks like it might be boiling.
7/29	05	03	45	45.917337	-129.992998	292	-6	0	1	1536	1536	Getting a HOBO out of the basket.
7/29	05	03	54	45.917338	-129.992991	292	-6	0	1	1536	1536	Frame_Grab:
7/29	05	04	05	45.917339	-129.992980	292	-6	0	1	1536	1536	This vent is boiling - temp is likely to be 346-348C.
7/29	05	04	59	45.917352	-129.992928	292	-6	0	1	1536	1536	There's some orange rust staining right next to the vent opening along with some tubeworms.
7/29	05	05	32	45.917356	-129.992928	292	-6	0	1	1536	1536	Picking HOBO 147 out of the basket.
7/29	05	06	42	45.917365	-129.992996	292	-6	-1	1	1536	1536	We'll put the HOBO down on the basket for now while we do some fluid sampling.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	05	08	21	45.917364	-129.992997	292	-6	-1	1	1536	1537	Last year Casper and Vixen were 286 and 326 C (not sure which was which temp).
7/29	05	08	31	45.917363	-129.992994	292	-6	-1	1	1536	1536	They seem to have gone up in temperature this year by possibly 20C.
7/29	05	10	30	45.917363	-129.992998	292	-7	0	1	1536	1537	Putting the HOBO 147 on the ground by the vent now.
7/29	05	10	40	45.917364	-129.992998	292	-7	0	1	1536	1537	Getting the HFS intake wand out.
7/29	05	12	49	45.917366	-129.992966	292	-7	0	1	1536	1536	Putting the HFS intake into the vent opening.
7/29	05	13	31	45.917365	-129.992975	292	-6	0	1	1536	1536	TEMPS: HFS temperature The temp is 70C and rising.
7/29	05	13	47	45.917363	-129.992981	292	-6	0	1	1536	1536	Now it's 200C and slowing down.
7/29	05	13	55	45.917364	-129.992985	292	-7	0	1	1536	1536	TEMPS: HFS temperature is 212C.
7/29	05	14	09	45.917363	-129.992989	292	-7	0	1	1536	1536	Moved the intake wand a little and now it's going up again.
7/29	05	14	19	45.917362	-129.992992	292	-7	0	1	1536	1537	TEMPS: HFS temperature 260C and rising.
7/29	05	14	42	45.917360	-129.992994	292	-7	0	1	1536	1536	TEMPS: HFS temperature 325C and still going up.
7/29	05	15	33	45.917359	-129.992982	292	-7	0	1	1536	1536	This vent area had never been at the boiling point before.
7/29	05	15	55	45.917358	-129.992973	292	-7	0	1	1536	1536	344C and steady.
7/29	05	16	10	45.917359	-129.992968	292	-7	0	1	1536	1536	SAMPLE: fluid J2-581-HFS-06 unfiltered piston #1 start.
7/29	05	17	28	45.917348	-129.992977	292	-7	0	1	1536	1536	NAV: Doppler Reset Doppler reset 7min 19sec ago
7/29	05	17	52	45.917351	-129.992990	292	-7	0	1	1536	1536	The little sulfide chimney on the left spits out a rock or a big floc piece every now and then.
7/29	05	17	58	45.917352	-129.992993	292	-7	0	1	1536	1536	TEMPS: HFS temperature 344.5C
7/29	05	19	09	45.917359	-129.993001	292	-7	0	1	1536	1536	J2-581-HFS-06 done.
7/29	05	19	38	45.917358	-129.992992	292	-7	0	1	1536	1537	SAMPLE: gas Firing starboard gastight .
7/29	05	20	22	45.917358	-129.992980	292	-7	0	1	1536	1536	trying to retract starboard gastight.
7/29	05	20	32	45.917358	-129.992978	292	-7	0	1	1536	1536	SAMPLE: gas Firing starboard gastight again.
7/29	05	20	36	45.917357	-129.992977	292	-7	0	1	1536	1536	Going to retract one more time.
7/29	05	20	46	45.917358	-129.992977	292	-7	0	1	1536	1536	Firing gastight again.
7/29	05	21	19	45.917361	-129.992977	292	-7	0	1	1536	1536	SAMPLE: fluid starting piston #2.
7/29	05	21	43	45.917363	-129.992978	292	-7	0	1	1536	1536	SAMPLE: gas J2-581-GTHFS-07 is starboard gastight green #2.
7/29	05	22	04	45.917364	-129.992979	292	-7	0	1	1536	1536	SAMPLE: fluid J2-581-HFS-08 is unfiltered piston #2.
7/29	05	22	57	45.917355	-129.992977	292	-7	0	1	1536	1536	HIGHLIGHTS: KiPro hard drive stop at 05:19.
7/29	05	23	39	45.917350	-129.992983	292	-7	0	1	1536	1536	sample done.
7/29	05	24	08	45.917352	-129.992989	292	-7	0	1	1536	1536	J2-581-HFS-08: Tmax=344.7 Tavg=344.6 t2=95 Vol=450.
7/29	05	24	16	45.917355	-129.992991	292	-7	0	1	1536	1536	Stowing the HFS wand now.
7/29	05	24	57	45.917355	-129.992988	292	-7	0	1	1536	1536	Getting the Jason temp probe out now.
7/29	05	28	06	45.917360	-129.992995	292	-6	0	1	1536	1537	Putting the temp probe into the vent.
7/29	05	28	12	45.917360	-129.992995	291	-7	0	1	1536	1537	It's 308 and still going up.
7/29	05	28	39	45.917354	-129.992989	291	-7	0	1	1536	1537	TEMPS: Jason temperature It's 340.3C
7/29	05	29	24	45.917351	-129.992978	291	-7	0	1	1536	1537	TEMPS: Jason temperature It's 344.6 and leveling off.
7/29	05	30	25	45.917345	-129.992969	291	-7	0	1	1536	1537	TEMPS: Jason temperature It's 344.9 c.
7/29	05	31	19	45.917352	-129.992976	291	-7	0	1	1536	1537	Now we'll recover and deploy the HOBOS.
7/29	05	31	28	45.917351	-129.992977	291	-7	0	1	1536	1537	Frame_Grab:
7/29	05	31	47	45.917350	-129.992978	291	-6	0	1	1536	1537	Stowed the Jason temp probe.
7/29	05	32	42	45.917340	-129.992977	291	-7	0	1	1536	1537	Picking up the old HOBO - it's covered in corrosion.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	05	34	47	45.917338	-129.992971	291	-6	0	1	1536	1537	RECOVER: HOBO temp probe recovered HOBO 102 - we're at Vixen vent.
7/29	05	35	04	45.917337	-129.992971	291	-6	0	1	1536	1537	Putting the HOBO 102 in the back of the basket for now.
7/29	05	35	23	45.917337	-129.992970	291	-6	0	1	1536	1537	The HOBO was lying on its side next to the vent.
7/29	05	35	30	45.917337	-129.992970	291	-6	0	1	1536	1537	It fell out at some point.
7/29	05	36	36	45.917343	-129.992957	291	-7	0	1	1536	1537	Picking up HOBO 147 to deploy in Vixen vent.
7/29	05	37	28	45.917361	-129.992955	291	-7	0	1	1536	1537	Going to stick HOBO 147 into the vent opening.
7/29	05	37	39	45.917366	-129.992958	291	-7	0	1	1536	1537	DEPLOY: HOBO temp probe HOBO 147 deploying in Vixen vent.
7/29	05	38	44	45.917382	-129.992979	291	-7	0	1	1536	1537	DEPLOY: HOBO temp probe HOBO 147 in Vixen.
7/29	05	38	47	45.917382	-129.992980	291	-7	0	1	1536	1537	Frame_Grab:
7/29	05	38	56	45.917380	-129.992980	291	-7	0	1	1536	1537	Frame_Grab:
7/29	05	39	34	45.917370	-129.992978	291	-6	0	1	1536	1537	HIGHLIGHTS: KiPro hard drive start
7/29	05	40	14	45.917348	-129.992961	292	-10	1	2	1535	1537	Pulling away from vent.
7/29	05	40	45	45.917433	-129.992950	291	-10	1	3	1533	1536	HIGHLIGHTS: KiPro hard drive stop
7/29	05	41	03	45.917456	-129.992972	292	-9	-1	2	1535	1537	Driving through large clouds of orange floc.
7/29	05	41	11	45.917461	-129.992978	292	-9	0	2	1535	1537	Casper should be right around here.
7/29	05	41	24	45.917462	-129.992979	288	-6	0	3	1534	1536	There's some tubeworms and possibly clams on the seafloor here.
7/29	05	41	37	45.917453	-129.992932	292	-6	0	4	1532	1536	Driving backwards to get a larger angle view of the site.
7/29	05	44	14	45.917410	-129.993006	256	-11	0	2	1535	1536	We're back at Vixen - going straight west from here.
7/29	05	44	29	45.917428	-129.993008	258	-9	0	2	1534	1537	We see the HOBO.
7/29	05	44	40	45.917435	-129.992992	257	-9	0	2	1534	1536	Backing up to the vent.
7/29	05	46	19	45.917436	-129.993031	130	-8	0	1	1535	1537	We're at Casper- can see the HOBO. It looks like it's still in the vent.
7/29	05	47	00	45.917445	-129.993022	131	-4	-1	1	1536	1537	Frame_Grab:
7/29	05	47	07	45.917444	-129.993020	130	-5	-2	1	1536	1537	We'll water sample first.
7/29	05	47	11	45.917444	-129.993020	131	-5	-2	1	1536	1537	Getting the HFS intake wand out.
7/29	05	47	22	45.917447	-129.993019	131	-5	-2	1	1536	1537	HIGHLIGHTS: KiPro hard drive start
7/29	05	47	43	45.917450	-129.993017	131	-5	-2	1	1536	1537	The HOBO wire has filaments growing on it.
7/29	05	49	36	45.917462	-129.993022	130	-6	-2	1	1536	1537	NAV: Doppler Reset Doppler reset 14min 52sec ago
7/29	05	50	17	45.917460	-129.993022	130	-6	-2	1	1536	1537	TEMPS: HFS temperature Temp is 100C and rising.
7/29	05	50	24	45.917459	-129.993025	130	-6	-2	1	1536	1537	Readjusting the intake wand in the vent.
7/29	05	51	00	45.917460	-129.993037	130	-6	-2	1	1536	1537	TEMPS: HFS temperature is 150C
7/29	05	51	08	45.917461	-129.993040	130	-6	-2	1	1536	1537	TEMPS: HFS temperature It stopped at 150C.
7/29	05	52	23	45.917466	-129.993049	130	-5	-2	1	1536	1537	Knocking the chimney walls down for a better insertion point.
7/29	05	53	14	45.917462	-129.993036	130	-5	-2	1	1536	1537	TEMPS: HFS temperature The temp is 220C and going up.
7/29	05	53	36	45.917456	-129.993031	130	-5	-2	1	1536	1537	TEMPS: HFS temperature T is 290 and rising.
7/29	05	53	46	45.917454	-129.993028	130	-5	-2	1	1536	1537	Over 300 C.
7/29	05	54	17	45.917452	-129.993028	130	-5	-2	1	1536	1537	310C now.
7/29	05	54	49	45.917453	-129.993033	130	-5	-2	1	1536	1537	J2-581-HFS-09 is filtered piston #3. Start.
7/29	05	55	44	45.917459	-129.993038	130	-5	-2	1	1536	1537	There's some palm worms on the edge of the vent opening.
7/29	05	55	54	45.917459	-129.993040	130	-5	-2	1	1536	1537	Temp is 312C.
7/29	05	57	43	45.917450	-129.993038	130	-5	-2	1	1536	1537	We're still filtering.
7/29	05	57	57	45.917445	-129.993039	130	-5	-2	1	1536	1537	SAMPLE: fluid J2-581-HFS-09 finished.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	05	58	07	45.917444	-129.993039	130	-5	-2	1	1536	1537	SAMPLE: gas Triggering center gastight.
7/29	05	58	35	45.917445	-129.993031	130	-5	-2	1	1536	1537	SAMPLE: gas J2-581-GTHFS-10 is Orange #16
7/29	05	58	46	45.917446	-129.993030	130	-5	-2	1	1536	1537	TXT:
7/29	05	59	03	45.917447	-129.993030	130	-5	-2	1	1536	1537	Tmax=313 Tavg=212 T2=90.
7/29	05	59	13	45.917445	-129.993031	130	-5	-2	1	1536	1537	SAMPLE: fluid unfiltered piston #4 start.
7/29	05	59	27	45.917441	-129.993024	130	-5	-2	1	1536	1537	unfiltered piston #4 is J2-581-HFS-11 .
7/29	06	00	56	45.917437	-129.993014	130	-5	-2	1	1536	1537	SAMPLE: fluid J2-581-HFS-09 was Tmax=313 Tavg=212 T2=90.
7/29	06	01	24	45.917436	-129.993015	130	-5	-2	1	1536	1537	SAMPLE: fluid J2-581-HFS-11 is finished.
7/29	06	01	39	45.917437	-129.993013	130	-5	-2	1	1536	1537	J2-581-HFS-11: Tmax=313.4 Tavg=313.1 t2=88 Vol=400.
7/29	06	01	43	45.917437	-129.993012	130	-5	-2	1	1536	1537	Stowing the Beast probe.
7/29	06	02	06	45.917438	-129.993016	130	-5	-2	1	1536	1537	Next we'll deploy a new HOBO and remove the old HOBO from Casper vent.
7/29	06	03	33	45.917440	-129.993018	130	-5	-2	1	1536	1537	The Beast intake is stowed.
7/29	06	03	49	45.917434	-129.993017	130	-5	-2	1	1536	1537	We'll get the temperature using the Jason temp probe now actually.
7/29	06	05	51	45.917443	-129.993022	130	-5	-2	1	1536	1537	Jason temp probe is in the vent - 316.7 C.
7/29	06	06	15	45.917449	-129.993016	130	-5	-2	1	1536	1537	TEMPS: Jason temperature is 317.6 and holding steady.
7/29	06	06	25	45.917451	-129.993015	130	-5	-2	1	1536	1537	Taking temp probe out.
7/29	06	06	41	45.917456	-129.993015	130	-5	-1	1	1536	1537	Stowing Jason temp probe.
7/29	06	07	40	45.917463	-129.993022	130	-7	-1	1	1536	1537	Now we'll recover and deploy the HOBOS.
7/29	06	09	28	45.917460	-129.993041	130	-6	-1	1	1536	1537	HOBO 104 recovered.
7/29	06	11	25	45.917450	-129.993020	130	-4	-2	1	1536	1537	The HOBO was kind of stuck - but it pulled out.
7/29	06	11	49	45.917457	-129.993020	130	-3	-2	1	1536	1537	RECOVER: HOBO temp probe The recovered HOBO was indeed 104.
7/29	06	12	43	45.917464	-129.993021	130	-3	-2	1	1536	1537	Put HOBO 104 in the basket.
7/29	06	15	45	45.917452	-129.993031	130	-3	-2	1	1536	1537	Picking up HOBO 141 from the basket.
7/29	06	16	26	45.917452	-129.993033	130	-4	-1	1	1536	1537	DEPLOY: HOBO temp probe Deploying HOBO 141 in Casper vent.
7/29	06	17	23	45.917455	-129.993031	130	-4	-1	1	1536	1537	The HOBO is going straight into the chimney.
7/29	06	18	15	45.917456	-129.993027	130	-4	-1	1	1536	1537	The HOBO is at a downward angle from the top of the vent.
7/29	06	18	47	45.917455	-129.993019	130	-4	-1	1	1536	1537	Going to try to get the HOBO to stand upright.
7/29	06	19	17	45.917450	-129.993015	130	-4	-1	1	1536	1537	The HOBO has been pulled out.
7/29	06	21	52	45.917445	-129.993028	130	-4	-1	1	1536	1537	Trying to reinsert the HOBO so it stays more upright and the recorder box is off the ground.
7/29	06	23	23	45.917452	-129.993013	130	-4	-1	1	1536	1537	Pulled it out again for another go - the wire seems bent at the end.
7/29	06	24	34	45.917443	-129.993020	131	-4	-1	1	1536	1537	There are two openings on Casper - one to the back left and one to the front right.
7/29	06	24	49	45.917439	-129.993022	131	-4	-1	1	1536	1537	The probe was in the back left opening before - going to try the front left opening now.
7/29	06	25	12	45.917434	-129.993025	131	-4	-1	1	1536	1537	We're at heading 131 and depth 1536
7/29	06	25	52	45.917431	-129.993022	131	-4	-1	1	1536	1537	DOP: 45N 55.044' 129W 59.581'
7/29	06	27	39	45.917431	-129.993025	130	-4	-1	1	1536	1537	There's some chalcopyrite on the front left of the Casper mound.
7/29	06	28	04	45.917431	-129.993025	130	-4	-1	1	1536	1537	We'll try putting the recorder box part down on the ground and see if the tip stays in the vent.
7/29	06	28	12	45.917430	-129.993024	130	-4	-1	1	1536	1537	It seems to have lodged well.
7/29	06	28	27	45.917431	-129.993020	130	-4	-2	1	1536	1537	We'll be heading to ASHES next.
7/29	06	29	37	45.917435	-129.993009	130	-3	-2	1	1536	1537	HIGHLIGHTS: KiPro hard drive stop
7/29	06	30	34	45.917435	-129.993026	130	-4	-2	1	1536	1537	Tying the bungees down around the HOBO 135 that's still to be deployed.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	06	30	58	45.917429	-129.993034	130	-3	-1	1	1536	1537	The other two recovered HOBOS are in the basket for now.
7/29	06	32	23	45.917447	-129.993003	130	-9	0	3	1534	1537	Transiting to ASHES now.
7/29	06	33	05	45.917334	-129.992769	128	-12	-1	3	1534	1537	Transit takes ~2hrs.
7/29	06	38	05	45.917107	-129.992014	117	-3	-1	104	1431	1535	Jason climbing up to depth 1275m to avoid danger of transponder collision.
7/29	08	23	56	45.934276	-130.011508	338	-7	1	29	1516	1545	NAV: Doppler Reset
7/29	08	25	24	45.934325	-130.011557	338	-12	-1	2	1543	1545	JASON: Jason on bottom
7/29	08	26	13	45.934448	-130.011575	46	-8	0	3	1542	1545	The benchmark is right here. That was easy.
7/29	08	28	13	45.934447	-130.011564	69	0	2	1	1545	1546	Worms (?) floating around. Don't see nearly as much floc in the water over on this side of the caldera.
7/29	08	28	34	45.934447	-130.011564	69	-1	2	1	1545	1546	Jason is positioning to pick up the pressure sensor.
7/29	08	30	16	45.934455	-130.011592	70	-2	2	1	1545	1546	DEPLOY: pressure sensor at benchmark AX106 northeast of ASHES.
7/29	08	32	23	45.934444	-130.011601	70	-2	2	1	1545	1546	Starting pressure reading at 0832.
7/29	08	55	43	45.934438	-130.011568	70	-1	2	1	1545	1545	RECOVER: pressure sensor Finished with this measurement at AX106 NE of ASHES.
7/29	08	57	24	45.934436	-130.011580	69	-9	1	2	1544	1545	Stowing the pressure sensor and heading out of here.
7/29	08	57	32	45.934434	-130.011600	69	-9	1	2	1543	1545	JASON: Jason off bottom
7/29	08	58	18	45.934424	-130.011761	229	-10	0	6	1539	1545	Next stop is the caldera center for pressure measurements at AX101.
7/29	10	56	02	45.954892	-130.009861	3	-8	1	4	1527	1531	NAV: Doppler Reset
7/29	10	56	16	45.954897	-130.009865	2	-7	1	3	1528	1531	We see the bottom.
7/29	10	57	19	45.955013	-130.009906	0	-9	0	2	1528	1530	We are heading towards AX101 to take pressure reading and pick up the old bench mark.
7/29	10	57	25	45.955027	-130.009906	1	-8	0	1	1528	1530	There is flock in the water even here.
7/29	10	58	11	45.955104	-130.009905	359	-9	0	3	1531	1534	We see a marker.
7/29	10	59	10	45.955185	-130.009895	303	-7	1	2	1532	1534	We see the benchmark.
7/29	10	59	46	45.955209	-130.009924	244	-9	-1	2	1532	1534	Positioning the sub in front of the bench mark to put pressure sensor on.
7/29	11	03	00	45.955206	-130.009935	245	-7	0	1	1533	1534	DEPLOY: pressure sensor in place on AX101 Center.
7/29	11	03	27	45.955206	-130.009936	245	-8	0	1	1533	1534	Pressure measurement starting 11:03 at AX101.
7/29	11	20	29	45.955222	-130.009919	246	-8	0	1	1533	1534	We see a nice little shrimp in the view.
7/29	11	23	24	45.955236	-130.009905	245	-10	2	1	1533	1534	Stopping measurement at 11:23.
7/29	11	25	23	45.955231	-130.009940	245	-4	-2	1	1533	1534	RECOVER: pressure sensor and stowing on basket.
7/29	11	27	11	45.955237	-130.009923	245	-5	-1	1	1533	1534	Now we are going to go pick up the old one and carry it with us.
7/29	11	30	45	45.955226	-130.009897	245	-9	-2	1	1532	1534	We just recovered the old triangular pyramid and it's on the basket.
7/29	11	31	11	45.955216	-130.009898	245	-9	-2	1	1532	1534	We are going to transit towards Magnesia and land at Trevi to put the old benchmark there.
7/29	11	32	25	45.955240	-130.010118	298	-11	-2	3	1530	1534	Begin transit.
7/29	13	15	38	45.946179	-129.983802	28	-5	-2	49	1470	1519	NAV: Doppler Reset
7/29	13	16	03	45.946177	-129.983794	30	-5	-1	34	1485	1519	Getting close.
7/29	13	17	00	45.946129	-129.983751	28	-3	-2	1	1519	1520	We see the bottom.
7/29	13	17	11	45.946129	-129.983746	29	-8	-4	1	1519	1520	Helicopter style landing.
7/29	13	18	34	45.946269	-129.983708	347	-9	-1	2	1518	1520	We see some sort of shimmer covered in tubeworms but it is not Trevi.
7/29	13	19	37	45.946267	-129.983742	347	-8	-2	1	1519	1520	The marker is gone. I predict an octopus stole it but Jimmy thinks it got burned off.
7/29	13	23	28	45.946350	-129.983687	195	-6	2	1	1520	1521	DEPLOY: Benchmark AX202-with marker 63 near Trevi about 5 meters away at position 129 59.0249'W 45 56.7789'N Depth=1520.0 Hdg=194.7.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	13	24	08	45.946329	-129.983686	195	-11	-1	2	1518	1520	LIES!!! we decided this was not a good placed because we are perched on a vertical.
7/29	13	28	37	45.946397	-129.983744	234	-5	-1	1	1520	1521	DEPLOY: (GOOD LOCATION) Benchmark AX202-with marker 63 near Trevi position: 129 59.0246'W 45 56.7817'N Depth 1520.3. (LATER REPOSITIONED)
7/29	13	29	21	45.946381	-129.983740	234	-5	-1	1	1520	1521	Looking at benchmark Hdg=234.1 Depth 1520.3.
7/29	13	30	02	45.946383	-129.983744	234	-5	-1	1	1520	1521	Going to deploy pressure sensor with orientation towards the opposite side as the marker with cable to the left.
7/29	13	30	18	45.946390	-129.983747	234	-5	-1	1	1520	1521	We are about 12 m away from Trevi.
7/29	13	30	49	45.946403	-129.983748	234	-6	-1	1	1520	1521	We are going to move the bench mark a little bit up to make room for future people.
7/29	13	35	06	45.946417	-129.983757	236	-6	1	1	1520	1521	REDEPLOY: Final time benchmark AX202- 129 59.0293'W 45 56.7834'N depth 1520.2 Hdg=236.0
7/29	13	36	26	45.946431	-129.983753	236	-7	1	1	1520	1521	Bringing out the pressure sensor to make measurement.
7/29	13	37	08	45.946414	-129.983763	236	-7	2	1	1520	1521	DEPLOY: pressure sensor We are 15.19m from Trevi at a bearing of 326.
7/29	13	39	19	45.946405	-129.983778	236	-6	2	1	1520	1521	Starting the pressure measurement 13:39.
7/29	13	59	11	45.946390	-129.983773	236	-6	2	1	1520	1521	Stop measurement 13:59.
7/29	13	59	24	45.946391	-129.983773	236	-6	1	1	1520	1521	RECOVER: pressure sensor Stowing on the basket.
7/29	13	59	48	45.946391	-129.983772	236	-6	1	1	1520	1521	Next on the list is to go pick up the HOBO probe at Trevi vents.
7/29	14	04	16	45.946419	-129.983766	234	-9	1	2	1519	1521	We are going to turn around slowly to get some good stills to have a photo documentation of where this benchmark is in relation to the vent Trevi.
7/29	14	05	04	45.946407	-129.983747	170	-9	1	2	1519	1521	There is sort of a ridge here or a pile of jumbled up stuff Trevi must be on the other side.
7/29	14	07	42	45.946304	-129.983758	98	-7	1	1	1520	1521	We see the Trevi vent - getting into position to recover and deploy HOBO.
7/29	14	11	18	45.946296	-129.983750	96	-9	1	1	1519	1521	RECOVER: HOBO temp probe Hobo probe 101 from Trevi.
7/29	14	11	31	45.946296	-129.983752	96	-8	1	1	1519	1521	The anhydrite Trevi chimney knocked over completely.
7/29	14	15	41	45.946277	-129.983767	96	-7	0	1	1519	1521	HOBO temp probe Still stowing the recovered HOBO probe which is covered in a nice coating of bacterial mat.
7/29	14	18	26	45.946276	-129.983742	96	-8	1	1	1519	1521	Bringing out fluid inlet to take a water sample from the Beast.
7/29	14	19	10	45.946304	-129.983742	96	-8	1	1	1519	1521	Current position 129 59.0230'W 45 56.7767'N Depth=1519.6 Hdg=95.9.
7/29	14	19	16	45.946308	-129.983744	96	-8	1	1	1519	1521	Watching temperature with fluid inlet.
7/29	14	20	09	45.946327	-129.983768	96	-8	1	1	1519	1521	Hottest temperature recorded so far around 200C
7/29	14	20	28	45.946322	-129.983774	96	-9	1	1	1519	1521	Jiggling probe to find optimal temperature.
7/29	14	22	14	45.946286	-129.983757	96	-9	1	1	1519	1521	Last year the temperature was 258 and so far temp is 250 and still going up.
7/29	14	23	40	45.946314	-129.983746	96	-9	1	1	1519	1521	SAMPLE: fluid J2-581-HFS-12 Unfiltered Piston #6 Start=1423 located in the Trevi vent flow after anhydrite chimney knocked down.
7/29	14	25	02	45.946280	-129.983782	96	-9	1	1	1519	1521	J2-581-HFS-12 cont.
7/29	14	25	55	45.946268	-129.983784	96	-9	1	1	1519	1521	SAMPLE: fluid J2-581-HFS-12 Stop=1425 Tmax=252.7 Tavg=252.3 T2=62 Volume=(400) (Butterfield).
7/29	14	26	24	45.946269	-129.983772	96	-9	1	1	1519	1521	SAMPLE: fluid J2-581-HFS-13 Filtered Piston #7 Start=1426 same spot.
7/29	14	29	10	45.946276	-129.983741	96	-8	1	1	1519	1521	J2-581-HFS-13 Stop=1428 Tmax=253.7 Tavg=252.8 T2=66 Volume=400 (Butterfield).
7/29	14	29	32	45.946271	-129.983746	96	-8	1	1	1519	1521	SAMPLE: fluid J2-581-GTHFS-14 : Fire Port gas tight
7/29	14	31	25	45.946296	-129.983776	96	-8	1	1	1519	1521	Stowing the fluid inlet.
7/29	14	32	02	45.946305	-129.983783	96	-8	1	1	1519	1521	Bringing out Jason temperature probe to get a replicate temperature probe.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	14	37	25	45.946308	-129.983769	96	-8	0	1	1519	1521	TEMPS: Jason temperature Trevi vent Tmax recorded 257.6C.
7/29	14	37	35	45.946310	-129.983772	96	-7	1	1	1519	1521	This is almost exactly the same as last year.
7/29	14	37	46	45.946311	-129.983774	96	-8	1	1	1519	1521	Stowing the temperature wand.
7/29	14	38	29	45.946300	-129.983774	96	-8	1	1	1519	1521	Plan to deploy the HOBO and move to Spanish Steps and take some fluid samples then go to Snow Globe.
7/29	14	41	22	45.946287	-129.983755	96	-8	0	1	1519	1521	DEPLOY: HOBO temp probe in Trevi at same location as water sampling MISO 135 .
7/29	14	41	26	45.946287	-129.983755	96	-8	0	1	1519	1521	HIGHLIGHTS: KiPro hard drive start
7/29	14	45	30	45.946283	-129.983754	97	-9	1	1	1519	1521	Released HOBO probe and preparing to head down to Spanish Steps.
7/29	14	45	33	45.946283	-129.983754	97	-9	1	1	1519	1521	HIGHLIGHTS: KiPro hard drive stop
7/29	14	49	16	45.946117	-129.983727	164	-8	1	1	1519	1520	Traveling to Spanish Steps we see clamshells and tubeworms.
7/29	14	49	46	45.946113	-129.983699	134	-8	1	3	1517	1520	We see Spanish Steps Mkr 155
7/29	14	51	12	45.946118	-129.983691	134	-9	1	2	1518	1520	We are positioning Jason to take some measurements at Spanish steps.
7/29	14	53	28	45.946087	-129.983661	322	-8	1	3	1518	1520	Slowly circling the vent to scope out potential territory for an MTR deployment and fluid sampling.
7/29	14	54	00	45.946099	-129.983701	35	-9	1	3	1518	1520	There looks like there is a lot of biology in the area.
7/29	14	55	29	45.946094	-129.983700	46	-9	1	2	1518	1520	We are going to do a Jason temperature probe of the shimmering water area.
7/29	14	57	56	45.946077	-129.983661	49	-9	0	2	1518	1520	We're getting the Jason temp probe out of the basket.
7/29	15	00	41	45.946080	-129.983686	49	-10	-1	2	1518	1520	Putting temp probe in the small vent hole at the bottom of Spanish Steps.
7/29	15	01	38	45.946090	-129.983686	50	-10	-1	2	1518	1520	TEMPS: Jason temperature Temp is 184 and rising.
7/29	15	01	54	45.946091	-129.983686	50	-10	-1	2	1518	1520	The probe is not in the hole very well.
7/29	15	02	23	45.946093	-129.983691	50	-10	0	2	1518	1520	Repositioning Jason to get closer to Spanish Steps.
7/29	15	03	52	45.946086	-129.983694	48	-10	1	2	1518	1520	Reinserting the probe into the vent.
7/29	15	05	19	45.946095	-129.983679	48	-9	0	2	1518	1520	TEMPS: Jason temperature T is 79 and rising.
7/29	15	05	28	45.946097	-129.983679	48	-9	0	2	1518	1520	This is 20m south of Trevi.
7/29	15	05	55	45.946101	-129.983681	48	-9	0	2	1518	1520	TEMPS: Jason temperature Temp is 155 and rising still
7/29	15	06	41	45.946100	-129.983684	48	-9	0	2	1518	1520	TEMPS: Jason temperature Now the T is 165.4 C
7/29	15	07	04	45.946097	-129.983684	48	-9	0	2	1518	1520	We'll try with the HFS intake next.
7/29	15	07	12	45.946096	-129.983683	48	-9	1	2	1518	1520	Stowing the Jason temp probe
7/29	15	08	32	45.946090	-129.983671	48	-9	0	2	1518	1520	Picking up the HFS intake wand.
7/29	15	10	03	45.946089	-129.983664	48	-9	0	2	1518	1520	TEMPS: HFS temperature is 100C and rising.
7/29	15	10	43	45.946090	-129.983671	48	-9	0	2	1518	1520	TEMPS: HFS temperature is 155C and still rising.
7/29	15	11	43	45.946089	-129.983688	48	-9	0	2	1518	1520	We'll take two fluid samples here.
7/29	15	12	28	45.946088	-129.983705	48	-10	0	2	1518	1520	SAMPLE: fluid J2-581-HFS-15 unfiltered bag #20 start.
7/29	15	14	53	45.946093	-129.983672	48	-9	0	2	1518	1520	J2-581-hFS-15 finished.
7/29	15	15	07	45.946093	-129.983669	48	-9	0	2	1518	1520	Tmax=169.2 Tavg=164.9 T2=55 Vol=400.
7/29	15	16	54	45.946086	-129.983691	48	-9	0	2	1518	1520	SAMPLE: fluid J2-581-HFS-16 is filtered piston #5. Start.
7/29	15	18	41	45.946093	-129.983665	48	-9	0	2	1518	1520	Still filtering HFS-16.
7/29	15	21	21	45.946091	-129.983693	48	-10	0	2	1518	1520	finished.
7/29	15	21	44	45.946090	-129.983691	48	-9	0	2	1518	1520	J2-581-HFS-16: Tmax=169.2 Tavg=165.4 T2=55 Vol=600.
7/29	15	22	09	45.946088	-129.983690	48	-9	0	2	1518	1520	SAMPLE: fluid J2-581-HFS-16: finished at 15:21:21 started at 15:16:54.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	15	22	33	45.946088	-129.983690	48	-9	0	2	1518	1520	Stowing the HFS intake wand.
7/29	15	23	55	45.946087	-129.983698	49	-9	2	4	1517	1520	Wand is stowed.
7/29	15	24	06	45.946087	-129.983698	49	-9	2	4	1516	1520	We're pulling away from Spanish Steps and heading for Snow Globe.
7/29	15	25	40	45.946085	-129.983791	328	-8	2	2	1519	1520	Oh actually heading back to Spanish Steps - forgot to deploy an MTR.
7/29	15	27	57	45.946089	-129.983674	46	-8	2	2	1519	1520	We're back at Spanish Steps.
7/29	15	28	28	45.946090	-129.983676	46	-9	2	2	1519	1521	Port swing arm box is out.
7/29	15	28	34	45.946090	-129.983676	47	-9	3	2	1519	1521	Opening the lid of the swing arm box.
7/29	15	28	59	45.946090	-129.983676	46	-9	2	2	1519	1521	Picking up MTR 3312 from the box.
7/29	15	30	56	45.946098	-129.983677	46	-8	3	2	1519	1521	Moving the MTR from the vent where we sampled earlier -- it's too hot there for the MTR.
7/29	15	32	36	45.946095	-129.983673	47	-8	3	2	1519	1521	The MTR can only take temps up to about 60C.
7/29	15	33	01	45.946095	-129.983670	47	-8	3	2	1519	1521	We'll move around to the other side of Spanish Steps.
7/29	15	35	08	45.946098	-129.983638	328	-9	4	3	1518	1521	Trying a position on top of Spanish Steps by some palm worms for the MTR.
7/29	15	35	51	45.946099	-129.983642	328	-9	4	3	1518	1521	This spot is very squishy.
7/29	15	36	02	45.946099	-129.983642	328	-9	4	3	1518	1521	We'll move it over to the left by the clump of white tubeworms.
7/29	15	36	48	45.946100	-129.983641	328	-9	3	3	1518	1521	Actually we're not going to deploy the MTR here at all.
7/29	15	37	07	45.946100	-129.983640	328	-10	3	3	1518	1521	It will be more interesting to place it in the new flow area that's more likely to change.
7/29	15	37	18	45.946099	-129.983640	329	-10	3	3	1518	1521	Stowing the MTR back in the port swingarm box.
7/29	15	37	38	45.946099	-129.983638	328	-10	2	3	1518	1521	Opening the box lid.
7/29	15	37	54	45.946099	-129.983637	328	-10	1	3	1518	1521	Dropping the MTR back into the swingarm box.
7/29	15	38	58	45.946099	-129.983636	327	-9	1	3	1518	1521	MTR is stowed and the box lid is closed.
7/29	15	39	07	45.946100	-129.983635	328	-9	1	3	1518	1521	Retracting the swing arm box.
7/29	15	40	49	45.946092	-129.983632	328	-10	2	3	1518	1521	Actually trying to get the MTR loop off the Schilling arm.
7/29	15	41	04	45.946091	-129.983631	328	-11	2	3	1518	1521	It's off - now closing the box lid.
7/29	15	41	36	45.946094	-129.983629	328	-10	2	3	1518	1521	Now trying to stuff the MTR marker label into the box.
7/29	15	43	02	45.946095	-129.983673	264	-10	1	3	1518	1521	Everything's stowed.
7/29	15	43	08	45.946087	-129.983692	249	-8	1	2	1519	1520	We're heading to Snow Globe now.
7/29	15	44	11	45.946030	-129.983728	250	-8	1	2	1519	1521	Snow Globe is ~40m southwest of Spanish Steps.
7/29	15	44	52	45.945950	-129.983803	251	-8	0	1	1520	1521	We're stepping off the caldera rim.
7/29	15	44	59	45.945939	-129.983813	250	-7	0	1	1520	1522	There's a fissure we're going over now.
7/29	15	45	25	45.945907	-129.983860	252	-8	0	3	1521	1524	This area is all covered in yellow vent sediments.
7/29	15	45	42	45.945890	-129.983891	251	-8	0	1	1521	1522	This looks like new lava flow.
7/29	15	45	52	45.945888	-129.983896	249	-7	1	2	1521	1522	Putting a Contact navigation target.
7/29	15	46	21	45.945888	-129.983920	251	-9	0	1	1521	1522	We're going to drop down and look at the new lava flow.
7/29	15	46	57	45.945856	-129.983959	251	-8	0	1	1523	1523	HIGHLIGHTS: KiPro hard drive start
7/29	15	47	23	45.945850	-129.983968	252	-6	-1	1	1523	1524	We're sitting on the bottom now.
7/29	15	47	59	45.945856	-129.983978	251	-6	0	1	1523	1524	This new lava has some yellow vent sediments on it.
7/29	15	48	31	45.945875	-129.983985	251	-6	0	1	1523	1524	There's some orange blobs inside the yellow sediment too.
7/29	15	48	57	45.945892	-129.983996	251	-6	0	1	1523	1524	HIGHLIGHTS: KiPro hard drive stop
7/29	15	49	05	45.945896	-129.984000	251	-7	0	1	1523	1524	Continuing on to Snow Globe now.
7/29	15	50	56	45.945856	-129.984160	275	-7	1	1	1522	1523	Traveling over new flow to Snow Globe.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	15	52	11	45.945818	-129.984260	275	-8	0	1	1522	1524	It's all lumpy mounds with yellow sediment in cracks on the rocks.
7/29	15	53	24	45.945814	-129.984400	275	-8	0	1	1522	1523	The lava is a little more jagged here. It looks like a busted pillow.
7/29	15	53	51	45.945810	-129.984450	275	-9	1	2	1522	1523	Not sure if this is 1998 lava or new flow.
7/29	15	54	11	45.945808	-129.984495	276	-8	1	1	1522	1523	Heading into the collapse zone now.
7/29	15	54	38	45.945810	-129.984552	276	-9	0	5	1522	1526	Flying over some pillars ~5m tall.
7/29	15	55	36	45.945781	-129.984569	279	-8	1	3	1524	1526	Going down to the bottom to see what's there next to these pillars.
7/29	15	55	59	45.945791	-129.984592	270	-11	0	3	1524	1527	It looks like old broken-up lava.
7/29	15	56	04	45.945797	-129.984598	270	-7	1	1	1524	1524	We're going to go up again.
7/29	15	58	15	45.945892	-129.984880	320	-9	1	3	1522	1525	We're at Snow Globe now.
7/29	15	58	25	45.945897	-129.984876	288	-9	0	3	1522	1525	Going to find the source and do some fluid sampling and filtering.
7/29	15	59	19	45.945840	-129.984841	265	-8	1	1	1523	1524	There's a lot of orange staining on the rocks here.
7/29	15	59	30	45.945829	-129.984838	265	-8	0	1	1523	1524	Then there's an area of black and white precipitates/filaments on the rocks.
7/29	15	59	49	45.945822	-129.984840	265	-8	0	1	1523	1524	It's a very large area that is venting.
7/29	15	59	54	45.945821	-129.984841	265	-8	0	1	1523	1524	HIGHLIGHTS: KiPro hard drive start
7/29	16	01	40	45.945854	-129.984831	265	-8	0	1	1523	1524	We'll go up and look at the other side.
7/29	16	02	25	45.945886	-129.984848	225	-9	0	3	1522	1525	It looks like it's solid on top.
7/29	16	02	32	45.945887	-129.984852	219	-8	0	3	1522	1525	It's a huge hole that's venting.
7/29	16	03	10	45.945851	-129.984857	251	-8	0	2	1523	1525	There's a lot of white floc coming out of this hole - it's probably very well mixed with seawater and cold.
7/29	16	03	54	45.945826	-129.984855	288	-8	0	3	1523	1525	Backing out of the hole and going to wait for some of the floc we kick up to clear.
7/29	16	03	56	45.945826	-129.984855	288	-8	0	3	1523	1525	HIGHLIGHTS: KiPro hard drive stop
7/29	16	05	37	45.945864	-129.984830	284	-9	0	2	1523	1525	It looked like there was some shimmer from the right side.
7/29	16	07	09	45.945835	-129.984840	283	-8	-1	1	1524	1525	We're parked on the bottom -- we'll try and take a sample from the right side of the hole wall.
7/29	16	07	37	45.945830	-129.984845	283	-8	-1	1	1524	1525	Basket is out - getting the HFS intake wand.
7/29	16	09	00	45.945842	-129.984878	283	-8	-2	1	1524	1525	TEMPS: Jason temperature Temp is 5.7 - the Jason temp probe is still in the basket.
7/29	16	09	10	45.945844	-129.984878	283	-8	-2	1	1524	1525	TEMPS: HFS temperature The HFS wand says 8C.
7/29	16	09	29	45.945845	-129.984878	283	-8	-3	1	1524	1525	We'll just push the HFS wand out ahead as far as we can reach.
7/29	16	09	39	45.945843	-129.984880	282	-9	-2	1	1524	1525	TEMPS: HFS temperature The temp is 8.4C and rising a little.
7/29	16	10	27	45.945835	-129.984883	282	-9	-3	1	1524	1525	The Doppler position is waggling because of all the hot water.
7/29	16	10	32	45.945835	-129.984881	282	-9	-3	1	1524	1525	We'll take the cursor position.
7/29	16	10	54	45.945835	-129.984872	282	-9	-3	1	1524	1525	Cursor: 45N 56.7504' and 129W 59.021'
7/29	16	11	14	45.945836	-129.984860	282	-9	-3	1	1524	1525	We're reaching down into the hole to see what temp we'll get.
7/29	16	11	22	45.945837	-129.984854	282	-9	-3	1	1524	1525	It's about 10 C.
7/29	16	11	28	45.945836	-129.984850	282	-9	-3	1	1524	1525	The Jason temp is reading 7.7 C.
7/29	16	11	33	45.945837	-129.984847	282	-9	-3	1	1524	1525	It's about 10C from the HFS.
7/29	16	11	49	45.945838	-129.984837	282	-9	-3	1	1524	1525	The Jason thrusters are impacting all the floc flying up around us.
7/29	16	12	26	45.945841	-129.984824	282	-9	-3	1	1524	1525	We'll sample fluids from here.
7/29	16	13	53	45.945848	-129.984835	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-17 is unfiltered bag #24. Start.
7/29	16	16	45	45.945841	-129.984875	282	-9	-3	1	1524	1525	J2-581-HFS-17 finished.
7/29	16	16	50	45.945841	-129.984873	282	-9	-3	1	1524	1525	NOT FINISHED.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	16	16	52	45.945841	-129.984872	282	-9	-3	1	1524	1525	Ok done now.
7/29	16	17	25	45.945839	-129.984865	282	-9	-3	1	1524	1525	J2-581-HFS-17: Tmax=11.4 Tavg=11.0 T2=7 Vol=500. Stop: 16:16:52.
7/29	16	18	35	45.945843	-129.984868	282	-9	-3	1	1524	1525	J2-581-HFS-18: filtered bag #23 starting.
7/29	16	21	32	45.945780	-129.984831	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-18 finished.
7/29	16	22	07	45.945797	-129.984837	282	-9	-3	1	1524	1525	CORRECTION J2-581-HFS-18 NOT FINISHED. Still filtering.
7/29	16	22	13	45.945801	-129.984840	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-18 finished.
7/29	16	22	41	45.945821	-129.984854	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-18: Tmax=11.5 Tavg=11.0 T2=7 Vol=475. Stop: 16:22:13.
7/29	16	23	11	45.945833	-129.984868	282	-9	-3	1	1524	1525	SAMPLE: fluid starting RNA filter #16.
7/29	16	23	30	45.945835	-129.984873	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-19 is RNA filter #16.
7/29	16	27	23	45.945873	-129.984899	282	-9	-3	1	1524	1525	Snow Globe is approximately 100m west of Trevi at heading 060
7/29	16	30	27	45.945831	-129.984908	282	-9	-3	1	1524	1525	This hole is pretty deep - can't see the bottom.
7/29	16	30	42	45.945833	-129.984920	282	-9	-3	1	1524	1525	The Jason temp probe is reading 9C in its holster in the basket.
7/29	16	33	50	45.945828	-129.984858	282	-9	-3	1	1524	1525	SAMPLE: fluid Still filtering J2-581-HFS-19.
7/29	16	44	29	45.945834	-129.984896	282	-9	-3	1	1524	1525	SAMPLE: fluid Still filtering J2-581-HFS-19.
7/29	16	47	48	45.945847	-129.984876	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-19 almost finished.
7/29	16	48	03	45.945846	-129.984877	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-19 finished.
7/29	16	48	23	45.945844	-129.984878	282	-9	-3	1	1524	1525	J2-581-HFS-19: Tmax=12.0 Tavg=11.1 T2=7 Vol=3000.
7/29	16	48	40	45.945842	-129.984881	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-20 is DNA sterivex #12.
7/29	16	48	57	45.945841	-129.984883	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-20 is starting.
7/29	16	58	46	45.945837	-129.984875	282	-9	-3	1	1524	1525	J2-581-HFS-20 still filtering - ~1600 mL to go.
7/29	17	05	22	45.945820	-129.984887	282	-9	-3	1	1524	1525	J2-581-HFS-20 still filtering - ~750mL to go.
7/29	17	11	26	45.945828	-129.984907	282	-9	-3	1	1524	1525	J2-581-HFS-20 finished.
7/29	17	12	08	45.945843	-129.984898	282	-9	-3	1	1524	1525	SAMPLE: fluid J2-581-HFS-20: Tmax=12.0 Tavg=11.4 Vol=3001 T2=7C.
7/29	17	12	41	45.945853	-129.984884	282	-9	-3	1	1524	1525	Stowing the Beast.
7/29	17	15	15	45.945826	-129.984863	284	-9	-1	4	1521	1525	We're going to explore next all the way down to Marker 33.
7/29	17	16	58	45.945808	-129.984867	284	-8	-1	6	1521	1526	We'll explore this area first where the AX102 benchmark has been buried.
7/29	17	17	19	45.945819	-129.984878	320	-8	-1	5	1521	1526	We're heading northeast ~35-40 m.
7/29	17	18	56	45.945835	-129.984907	236	-7	-1	4	1521	1525	Discussing the possibility of mooring the RAS in a hole around here.
7/29	17	20	57	45.945788	-129.984864	342	-8	0	3	1522	1525	It might work - the RAS would be floating.
7/29	17	21	17	45.945831	-129.984860	352	-10	0	4	1522	1526	We'll continue traveling north to the marker.
7/29	17	22	23	45.945982	-129.984907	351	-9	-1	1	1522	1524	This lava is very jagged and covered in orange and yellow sediment mat.
7/29	17	22	27	45.945990	-129.984911	351	-9	-1	1	1522	1523	Frame_Grab:
7/29	17	23	03	45.946062	-129.984946	351	-8	-1	2	1522	1524	It's not clear if this is new flow or pre-existing flow.
7/29	17	24	27	45.946173	-129.984989	351	-8	0	1	1522	1524	We'll take a quick look in the collapse pit for any signs of the AX102 concrete benchmark.
7/29	17	24	59	45.946215	-129.984948	338	-8	-1	4	1523	1527	It's quite dark at the bottom.
7/29	17	25	19	45.946231	-129.984949	329	-9	-1	3	1524	1527	We'll try setting down on the bottom for a couple seconds.
7/29	17	25	27	45.946236	-129.984951	330	-8	0	2	1524	1527	This looks like old lava that has tumbled over.
7/29	17	26	07	45.946235	-129.984956	320	-8	-1	2	1525	1527	Lots of orange sediment/rust flaking off the rocks.
7/29	17	26	25	45.946222	-129.984942	34	-7	0	4	1522	1526	We'll go up out of the collapse pit and head 30m southwest.
7/29	17	27	54	45.946100	-129.985013	234	-8	-2	1	1522	1524	We're coming up to the edge of a hole here.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	17	28	36	45.946096	-129.985015	247	-4	-1	1	1523	1524	We're going to snap off a piece of the hole edge if we can- it's covered in biological orange/yellow mats/sediment.
7/29	17	28	46	45.946093	-129.985017	247	-5	-1	1	1523	1524	This hole has warm water coming out - can see the shimmer.
7/29	17	29	23	45.946087	-129.985033	248	-4	-1	1	1523	1524	The pieces are just flaking orange/yellow mat into the water.
7/29	17	29	41	45.946079	-129.985041	246	-4	-2	1	1523	1524	It's very brittle and doesn't grip easily.
7/29	17	30	50	45.946076	-129.985052	247	-4	-2	1	1523	1524	It's hard to break - it looks glassy black underneath the orange/yellow mat.
7/29	17	31	42	45.946078	-129.985047	248	-6	-1	1	1523	1524	Trying to snap a piece off of the other side of this hole.
7/29	17	31	50	45.946079	-129.985048	248	-5	-1	1	1523	1524	It doesn't seem like it's going to work.
7/29	17	32	47	45.946086	-129.985047	247	-5	-2	1	1523	1524	We'll give up on this and keep driving forward.
7/29	17	33	52	45.946049	-129.985113	247	-8	-1	1	1522	1524	This area was 1524m last year - now it's 1522-1523 m.
7/29	17	35	09	45.945963	-129.985217	236	-8	-1	3	1522	1525	We're going to start heading south now.
7/29	17	35	27	45.945925	-129.985231	195	-8	-1	5	1522	1527	We'll head for marker N3.
7/29	17	36	19	45.945869	-129.985256	238	-9	0	5	1525	1530	Looking at a nice lava arch.
7/29	17	36	24	45.945869	-129.985255	252	-9	0	5	1525	1530	Frame_Grab:
7/29	17	38	57	45.945931	-129.985168	142	-10	-1	4	1526	1530	These pillars are covered in orange sediment at the top.
7/29	17	39	33	45.945815	-129.985138	202	-9	0	4	1523	1527	By the hole - the fluid sampler measured 5.5C just sitting in its holster in the basket.
7/29	17	40	23	45.945672	-129.985208	208	-10	-1	7	1523	1530	There were only vents off the flow to the south from Magnesia before this eruption.
7/29	17	41	02	45.945526	-129.985245	194	-9	-1	7	1523	1530	As you go from 12C to 5C you get iron floc (orange) instead of the sulfur floc (white).
7/29	17	43	39	45.945242	-129.985369	301	-8	0	5	1524	1530	There's lots of dome cavities here covered in orange yellow sediment.
7/29	17	43	57	45.945194	-129.985407	327	-8	-1	6	1524	1529	The topography in this area matches the AUV bathymetry pretty well.
7/29	17	44	32	45.945196	-129.985527	346	-8	-1	4	1525	1529	This may not be the latest flow - it's hard to tell. At any rate it's young lava.
7/29	17	46	10	45.945135	-129.985475	153	-8	0	3	1526	1529	We've gone over the top and down - there's some pillows on the bottom.
7/29	17	46	20	45.945102	-129.985452	149	-10	-1	2	1526	1528	These pillows are all covered with yellow sediments.
7/29	17	47	49	45.944919	-129.985334	181	-8	-1	2	1526	1528	Lots of orange staining on the rocks too.
7/29	17	48	04	45.944901	-129.985338	181	-8	-1	2	1526	1528	The sediments here are very thick.
7/29	17	48	59	45.944868	-129.985409	182	-8	-1	3	1527	1530	There could be some very low temperature water leaking out here - about 5C or less.
7/29	17	50	12	45.944771	-129.985405	181	-8	-1	1	1527	1528	The water will leach iron out of the rocks if there's enough acidity and then the iron will precipitate out.
7/29	17	50	31	45.944767	-129.985384	181	-8	-1	1	1527	1528	The iron can precipitate out both abiotically and biotically.
7/29	17	51	52	45.944650	-129.985424	182	-8	0	2	1528	1529	Frame_Grab:
7/29	17	51	53	45.944648	-129.985425	182	-8	-1	1	1528	1529	Large fish here.
7/29	17	54	41	45.944483	-129.985401	180	-8	-1	2	1526	1527	There's some overhanging ledges here.
7/29	17	54	43	45.944480	-129.985405	182	-8	-1	2	1525	1527	Frame_Grab:
7/29	17	55	56	45.944334	-129.985326	181	-8	0	2	1524	1525	There's tons of yellow and orange sediment staining the rocks here.
7/29	17	56	12	45.944312	-129.985321	181	-9	0	1	1524	1525	Passing over a small crater here.
7/29	17	56	55	45.944222	-129.985314	181	-9	0	2	1523	1525	Around N3 there used to not be very much sediment - we'll see what it looks like this year.
7/29	17	58	18	45.944041	-129.985387	181	-8	-1	2	1523	1525	Mostly yellow sediment here and not as much orange.
7/29	17	58	34	45.944008	-129.985388	181	-8	-1	2	1522	1525	Some small collapse craters seen here.
7/29	17	58	53	45.943990	-129.985357	181	-8	0	2	1523	1524	Coming up is some white sediments.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	17	59	12	45.943969	-129.985348	181	-8	-1	1	1523	1524	We did pass over a little warm area before.
7/29	17	59	38	45.943937	-129.985319	181	-8	0	2	1523	1524	Now it's all white filaments and some orange sediments rather than yellow.
7/29	18	01	02	45.943798	-129.985275	180	-9	0	1	1523	1524	We'll sit on the bottom here and try to take a quick temperature measurement out of one of these white holes.
7/29	18	01	11	45.943797	-129.985273	180	-4	0	1	1524	1525	We're about 20m from N3.
7/29	18	01	59	45.943799	-129.985267	179	-5	0	1	1524	1525	Actually we'll just continue on to the marker N3.
7/29	18	03	05	45.943753	-129.985168	124	-9	-1	2	1522	1524	There's usually a lot of blue mat around N3- is it still there?
7/29	18	04	34	45.943656	-129.985147	94	-9	0	2	1523	1524	We're at 1523.1m depth. It was 1530m.
7/29	18	05	10	45.943697	-129.985107	25	-9	-1	1	1523	1524	There should be marker 53 at N3 and it should be 1530m deep.
7/29	18	05	34	45.943731	-129.985066	47	-9	0	1	1523	1524	All the sediment here is orange with white pockets thrown in.
7/29	18	06	54	45.943725	-129.984998	219	-9	0	3	1521	1524	We don't want to go down into the deep area - we'll just keep along the edge of this pit.
7/29	18	07	37	45.943717	-129.985074	268	-7	0	4	1522	1526	We'll set down here and take a look at this area.
7/29	18	08	22	45.943718	-129.985104	269	-7	-1	1	1523	1524	The 1530m depth recorded last year was wrong - it was actually 1524m.
7/29	18	08	28	45.943719	-129.985105	269	-7	-1	1	1523	1524	We're at the right depth.
7/29	18	08	43	45.943720	-129.985113	268	-8	0	1	1523	1524	We're going to look around for the marker 53 and the MTR.
7/29	18	10	30	45.943699	-129.985077	153	-7	0	1	1522	1524	We don't see any blue mat -- it used to be blue and white mats here.
7/29	18	10	36	45.943711	-129.985076	154	-8	0	1	1522	1524	Now it's all orange and white mat.
7/29	18	10	48	45.943737	-129.985072	155	-8	0	2	1522	1524	There used to be some tubeworms too.
7/29	18	10	54	45.943750	-129.985072	156	-8	0	2	1522	1524	We don't see any tubeworms here this year.
7/29	18	12	12	45.943669	-129.985161	234	-8	0	1	1523	1524	We'll look around for the MTR - don't know where it could have gone!
7/29	18	14	20	45.943745	-129.985346	22	-8	0	2	1523	1525	We'll turn around and go check out the area south of the navigation target.
7/29	18	16	00	45.943729	-129.985219	108	-9	1	1	1523	1524	There's a lot of white sediment/filaments here.
7/29	18	17	40	45.943729	-129.985129	91	-3	2	1	1523	1524	We'll settle down and look at this sediment that's yellow/brown.
7/29	18	17	53	45.943729	-129.985130	91	-4	2	1	1523	1524	Frame_Grab:
7/29	18	18	31	45.943724	-129.985121	91	-4	2	1	1523	1524	There's two large worms - we saw some after the 1998 eruption that wasn't seen afterwards.
7/29	18	18	40	45.943722	-129.985117	91	-4	2	1	1523	1524	They're orange-brown with large legs.
7/29	18	18	46	45.943721	-129.985115	91	-5	2	1	1523	1524	Lots of legs.
7/29	18	19	02	45.943717	-129.985109	91	-5	2	1	1523	1524	HIGHLIGHTS: KiPro hard drive start They
7/29	18	19	31	45.943715	-129.985101	91	-4	2	1	1523	1524	The worm creatures have lots of legs. They're kind of red-brown colored.
7/29	18	22	41	45.943715	-129.985080	91	-5	2	1	1523	1524	These worms are a type of scale worm - they're named Embleyii.
7/29	18	23	03	45.943717	-129.985082	91	-9	0	1	1523	1524	They have large antennae on their front ends.
7/29	18	23	10	45.943718	-129.985083	90	-7	0	1	1523	1524	HIGHLIGHTS: KiPro hard drive stop
7/29	18	24	34	45.943656	-129.985088	159	-9	0	4	1521	1525	Going by the AUV overlay there's different topography now - we're over a collapsed area that's not marked.
7/29	18	25	58	45.943656	-129.985090	104	-8	0	2	1523	1525	We'll turn around and find somewhere to sample.
7/29	18	26	05	45.943661	-129.985085	54	-8	0	1	1523	1524	We'll fluid sample.
7/29	18	26	56	45.943685	-129.985119	332	-8	0	2	1523	1525	This edge matches up with the overlay.
7/29	18	27	20	45.943709	-129.985173	318	-8	0	3	1522	1525	We'll get further away from the edge and go back to where there were large patches of white sediment/filaments.
7/29	18	28	16	45.943721	-129.985238	323	-7	0	1	1523	1524	This area looks totally different - it could be that there is a thin new flow covering everything.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	18	28	31	45.943710	-129.985233	332	-8	0	1	1523	1524	Or - perhaps something happened to wipe out all the tubeworms and blue mat.
7/29	18	28	40	45.943707	-129.985230	337	-7	1	1	1523	1524	But how do you remove all the tubeworms?
7/29	18	29	08	45.943701	-129.985216	343	-4	1	1	1524	1524	There's some diffuse flow here.
7/29	18	29	24	45.943703	-129.985206	343	-5	1	1	1524	1524	It's got white floc behind it and some orange mat in the area around it.
7/29	18	29	36	45.943704	-129.985201	343	-6	1	1	1524	1524	Jason basket out.
7/29	18	31	08	45.943709	-129.985191	343	-6	-1	1	1523	1524	We're going to take the temperature with the Jason temp probe.
7/29	18	32	08	45.943700	-129.985192	342	-6	-1	1	1523	1524	TEMPS: Jason temperature There's a 5.4C temp reading.
7/29	18	33	08	45.943700	-129.985192	342	-5	-1	1	1524	1524	TEMPS: Jason temperature Now it's only at 3.7C.
7/29	18	33	39	45.943703	-129.985191	341	-5	-1	1	1524	1524	It's going up again - tweaking the probe position.
7/29	18	33	49	45.943704	-129.985192	342	-6	-1	1	1523	1524	It's 10.4C.
7/29	18	35	12	45.943712	-129.985201	343	-5	-1	1	1524	1524	TEMPS: Jason temperature Now it's 21.8C and rising still.
7/29	18	36	00	45.943691	-129.985205	343	-5	-1	1	1524	1524	Last year we had 23C at N3.
7/29	18	36	13	45.943687	-129.985206	343	-5	-1	1	1524	1524	Here it's 22.2 C with the Jason temp probe.
7/29	18	37	12	45.943690	-129.985203	343	-6	-1	1	1524	1524	Removing the Jason temp probe from the fissure.
7/29	18	37	37	45.943691	-129.985203	343	-6	0	1	1524	1524	Basket out.
7/29	18	37	46	45.943692	-129.985203	343	-6	0	1	1524	1524	Replacing the Jason temp probe in the basket.
7/29	18	38	53	45.943696	-129.985202	343	-7	0	1	1524	1524	These little white vents look like what was here previously - little white vents in the lobate flow.
7/29	18	39	02	45.943696	-129.985202	343	-6	0	1	1524	1524	Retracting the basket.
7/29	18	39	43	45.943694	-129.985203	343	-6	0	1	1524	1524	The HFS wand is out.
7/29	18	40	52	45.943703	-129.985202	343	-6	-1	1	1524	1524	It's in the fissure.
7/29	18	41	18	45.943717	-129.985201	343	-6	-1	1	1524	1524	TEMPS: HFS temperature The temperature is going up - 15C and rising.
7/29	18	42	02	45.943732	-129.985199	342	-6	-1	1	1524	1524	TEMPS: HFS temperature Now it's 21C.
7/29	18	43	30	45.943704	-129.985193	342	-6	-1	1	1524	1524	SAMPLE: fluid Unfiltered bag #22 start.
7/29	18	43	45	45.943699	-129.985192	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-21 is unfiltered bag #22.
7/29	18	46	37	45.943680	-129.985208	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-21 done.
7/29	18	46	57	45.943681	-129.985211	342	-6	-1	1	1524	1524	J2-581-HFS-21: Tmax=23.2 Tavg=22.0 T2=13 Vol=500.
7/29	18	50	02	45.943733	-129.985190	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-22 Filtered bag #21 started at 18:48.
7/29	18	52	03	45.943713	-129.985210	342	-6	-1	1	1524	1524	HFS-22 finished.
7/29	18	52	25	45.943700	-129.985214	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-22: Tmax=22.5 Tavg=21.8 T2=12 Vol=500.
7/29	18	53	27	45.943687	-129.985213	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-23 is RNA filter #15.
7/29	18	53	44	45.943686	-129.985213	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-23 started at 18:53:25.
7/29	18	58	04	45.943691	-129.985204	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-23 cont. this is one of those long filters.
7/29	19	14	11	45.943693	-129.985200	342	-6	-1	1	1524	1524	Took a bunch of frame grabs of this area.
7/29	19	15	12	45.943693	-129.985217	342	-6	-1	1	1524	1524	We're almost done here.
7/29	19	16	19	45.943695	-129.985220	342	-6	-1	1	1524	1524	J2-581-HFS-23 stop 1916. Tmax=23.1 Tavg=21.4 T2=12. Vol=3000ml.
7/29	19	17	09	45.943693	-129.985222	342	-6	-1	1	1524	1524	SAMPLE: fluid J2-581-HFS-24 DNA Sterivex #11. start1917.
7/29	19	25	41	45.943696	-129.985198	342	-6	-1	1	1524	1524	Still sampling in the same diffuse flow between large lobates with lots of bacterial mat. Down in the crack between lobes. Some orange mat (?) nearby.
7/29	19	30	33	45.943710	-129.985228	342	-6	-1	1	1524	1524	This area doesn't really look like the other new lavas we have seen. The mat is white and does not cover all the surfaces; mainly in the cracks - probably wherever there is diffuse flow.
7/29	19	30	53	45.943711	-129.985223	342	-6	-1	1	1524	1524	Where we see the white mat is diffuse flow.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	19	31	20	45.943712	-129.985216	342	-6	-1	1	1524	1524	The temperature and depth here are the same as in previous years. 23C and Z=1524.
7/29	19	32	01	45.943708	-129.985202	342	-6	-1	1	1524	1524	Where is all the blue mat and tubeworms? Were they grazed away.
7/29	19	33	06	45.943698	-129.985178	342	-6	-1	1	1524	1524	If this got really hot and was covered in water with sulfide - it could have killed the blue mat. The tubeworms don't mind sulfide. Where did they go?
7/29	19	34	14	45.943695	-129.985189	342	-6	-1	1	1524	1524	There were limpets all over the place here before as well. Want to look at the little white chips on the rocks to figure out what they are. Remnants of days gone by?
7/29	19	35	54	45.943696	-129.985213	342	-6	-1	1	1524	1524	Zoomed in on what could possibly be the remains of the blue mat. Dead blue mat now surrounded in orange slime.
7/29	19	37	54	45.943703	-129.985260	342	-6	-1	1	1524	1525	HIGHLIGHTS: KiPro hard drive start Zooming in at Mkr'N3.
7/29	19	38	37	45.943708	-129.985245	343	-6	-1	1	1524	1524	Dave is talking on the microphone describing Mkr-N3 area.
7/29	19	39	51	45.943700	-129.985182	342	-6	-1	1	1524	1525	Orange hydrothermal sediments.
7/29	19	41	31	45.943698	-129.985200	343	-5	0	1	1524	1525	J2-581-HFS-24 finished. Tmax=22.5 Tavg=20.1 T2=12. Vol=3000ml.
7/29	19	45	06	45.943695	-129.985219	344	-6	0	1	1524	1525	DEPLOY: MTR temp probe #3312. in the crack where we were previously sampling.
7/29	19	45	14	45.943693	-129.985217	343	-5	1	1	1524	1525	MTR in place. Looking good.
7/29	19	46	10	45.943691	-129.985211	342	-8	1	1	1523	1524	The course is 169 degrees. We're headed to Mkr-33 area next at 0.4 knots.
7/29	19	46	48	45.943651	-129.985215	189	-8	1	2	1523	1524	Want to look down into the collapse area to the west to see if there is any new lava here.
7/29	19	47	46	45.943604	-129.985142	93	-9	1	4	1523	1528	We're on the edges of the collapse now.
7/29	19	47	58	45.943571	-129.985129	99	-8	1	4	1524	1527	Going to go down into the collapse to see what's shaking.
7/29	19	48	07	45.943552	-129.985122	100	-7	0	4	1524	1528	Shaking - not literally.
7/29	19	49	33	45.943563	-129.985127	98	-3	-1	1	1528	1528	The lavas here are covered in hydrothermal sediments. Dave wants to break it to see what is underneath the yellow fuzzy mat.
7/29	19	50	10	45.943564	-129.985138	98	-2	-1	1	1528	1528	Frame grab of the sediments down in the collapse below N3.
7/29	19	50	21	45.943564	-129.985141	98	-2	-1	1	1528	1528	Can we keep that?
7/29	19	52	08	45.943553	-129.985143	99	-2	0	1	1528	1528	J2-581-lava-31. That shattered. It is a very shiny piece of lava.
7/29	19	53	32	45.943427	-129.985101	156	-11	0	3	1522	1525	HIGHLIGHTS: KiPro hard drive start N3 is not necessarily indicative of new lava. Especially because this is the same depth. Susan is not so sure.
7/29	19	53	46	45.943391	-129.985091	162	-7	0	2	1522	1524	The sediments here are hydrothermal.
7/29	19	54	42	45.943342	-129.985070	151	-8	1	2	1522	1524	It's not obvious that the topography has changed here.
7/29	19	55	25	45.943300	-129.985074	125	-9	-1	3	1522	1526	We're looking at the lavas in this crevice.
7/29	19	55	56	45.943362	-129.985036	144	-10	0	3	1521	1524	Debating what is happening here. There was a lot of hydrothermal sediment here after the 1998 flow.
7/29	19	56	09	45.943356	-129.985018	143	-9	0	3	1521	1523	There have been a lot of dives through here in 1998.
7/29	19	57	07	45.943293	-129.985049	149	-8	0	3	1522	1524	Highlights turned off a few minutes ago.
7/29	19	57	44	45.943239	-129.985006	175	-8	-1	2	1523	1525	The ship is moving from here to Mkr-33.
7/29	19	58	55	45.943215	-129.984917	154	-8	0	2	1521	1523	That should take us down the axis of the flow. Bill wants Jason back up on top of the ledge out of the collapse area.
7/29	19	59	20	45.943290	-129.984861	99	-10	-1	3	1520	1523	We want to cover as much ground as we can.
7/29	19	59	37	45.943219	-129.984845	186	-10	0	2	1521	1523	We're now up on top again heading south.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	20	00	28	45.943162	-129.985025	214	-9	-1	2	1522	1524	Here comes another collapse. Pillar-like structure. Everything is covered in the hydrothermal (?) sediments.
7/29	20	01	12	45.943145	-129.985115	213	-11	0	4	1522	1526	Jumbled lavas in this collapse area.
7/29	20	01	59	45.943023	-129.985133	202	-10	0	2	1521	1523	Coming upon a bit of bacterial mat and possibly tubeworms in the distance? Probably just bacterial mat.
7/29	20	02	14	45.942985	-129.985088	170	-10	-1	1	1522	1523	Everything here is covered in the orange-ish sediments.
7/29	20	03	36	45.942861	-129.984783	164	-9	-1	2	1519	1521	Lots of orange staining on all the lavas here. Hard to tell what's going on.
7/29	20	04	23	45.942706	-129.984813	219	-8	1	1	1518	1519	It's a little sky light.
7/29	20	04	41	45.942699	-129.984878	219	-7	1	1	1518	1519	Doesn't seem to be any warm water coming out here.
7/29	20	06	25	45.942542	-129.985048	123	-7	-1	2	1518	1520	The hydrothermal sediments here are really thick. The orangish/yellowish sediments are really thick here.
7/29	20	06	42	45.942544	-129.984987	124	-8	0	2	1517	1519	We're in the area of the 1998 flow here.
7/29	20	06	58	45.942514	-129.984925	125	-10	0	2	1516	1519	There were a lot of these sediments up here before.
7/29	20	07	25	45.942442	-129.984857	125	-8	0	2	1518	1520	Going over the edge into a collapse.
7/29	20	07	39	45.942448	-129.984885	234	-9	1	1	1519	1520	Lavas pillars ahead. Milky water here.
7/29	20	07	56	45.942442	-129.984889	189	-9	-2	2	1518	1520	Beautiful lava pillars with some diffuse venting on the top.
7/29	20	08	22	45.942437	-129.984876	241	-9	0	2	1520	1522	The water is cloudy down here.
7/29	20	08	39	45.942422	-129.984845	204	-9	-1	1	1519	1520	What a beautiful shot of lava pillars in this collapse area.
7/29	20	09	00	45.942439	-129.984817	184	-9	0	2	1518	1520	Heading on. Bumped into a pillar roof.
7/29	20	09	42	45.942323	-129.984754	162	-11	-1	4	1515	1519	Thick orange-ish sediments.
7/29	20	10	26	45.942232	-129.984684	165	-8	0	2	1516	1518	Continuing on to an area of white mat where there is undoubtedly diffuse flow.
7/29	20	10	53	45.942205	-129.984675	167	-9	0	2	1515	1517	Lots of white mat.
7/29	20	11	32	45.942187	-129.984672	158	-10	0	2	1516	1517	Sky light here. A big white hole. A little bit of "lazy floc" coming out. Bill is calling it the entryway into the deep biosphere.
7/29	20	11	44	45.942145	-129.984665	159	-10	-1	2	1515	1517	Another black (white) hole.
7/29	20	11	52	45.942124	-129.984655	159	-9	-1	2	1515	1517	Lots of small collapses in the crust.
7/29	20	12	12	45.942111	-129.984627	171	-9	0	1	1516	1517	Boy all of a sudden we're in a snow blower. This is a big hole.
7/29	20	12	40	45.942112	-129.984630	170	-9	0	1	1516	1517	Going to hover here for a minute. The temperature is going up here. It has gone up by a degree here.
7/29	20	14	38	45.941971	-129.984611	167	-9	1	2	1515	1517	NAV: Dropped DVL target Subway target at this large arch to floc; etc. The temp is still rising. 5.0 here compared to 2.3 which is background. Location: Z=1515. 129 59.0796 45 56.5260.
7/29	20	14	57	45.941910	-129.984618	166	-8	0	3	1514	1517	Gradually less yellow sediments as we move on and the floc has cleared up.
7/29	20	16	22	45.941711	-129.984545	171	-10	1	2	1514	1517	More lava arches with sediments which are not as thick as the previously.
7/29	20	16	49	45.941695	-129.984553	164	-11	-1	2	1514	1516	Rattail fish.
7/29	20	17	11	45.941599	-129.984550	173	-11	0	6	1514	1519	We are seeing so few animals. We've only seen one crab and very few fish.
7/29	20	18	12	45.941406	-129.984498	173	-9	-1	3	1513	1516	Moving on. Here are more patches of white bacterial mat on and thicker hydrothermal sediments again.
7/29	20	18	32	45.941451	-129.984428	143	-8	-1	2	1514	1516	Lava roofs and drain out features.
7/29	20	19	01	45.941442	-129.984369	167	-11	0	5	1515	1520	Want to head to the big fissure in this area. Looks like it's still here. This is part of the eruptive fissure from 1998. It's right at the center of the 1998 flow.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	20	19	12	45.941388	-129.984360	183	-9	0	2	1517	1519	The fissure is still here.
7/29	20	19	30	45.941332	-129.984384	202	-11	1	4	1515	1520	Rattail fish here.
7/29	20	20	04	45.941242	-129.984393	199	-9	0	3	1517	1520	See some bacterial mat. We're down in the fissure here. Our altitude is 5 meters. We're at the top of the pillars.
7/29	20	20	09	45.941241	-129.984390	202	-6	1	4	1516	1520	Rattail ahead.
7/29	20	20	44	45.941151	-129.984399	183	-9	-1	4	1514	1518	This is really beautiful. Lava arches on both sides of this fissure.
7/29	20	20	55	45.941101	-129.984413	187	-12	0	3	1514	1517	Pretty narrow fissure opening.
7/29	20	22	07	45.941011	-129.984424	185	-11	-1	9	1515	1524	Still skating along at the top of this fissure opening.
7/29	20	23	07	45.940833	-129.984386	166	-11	0	4	1516	1520	Can't see the bottom here. The water is pretty murky.
7/29	20	23	42	45.940817	-129.984414	191	-9	-2	7	1516	1523	Beautiful pillar to the port side with bathtub rings.
7/29	20	24	12	45.940750	-129.984365	172	-7	-1	2	1513	1516	Bill wants to speed up. We're pretty behind schedule.
7/29	20	25	25	45.940740	-129.984169	128	-10	-1	1	1514	1516	Lobate flow here. No evidence of any biology on the flow.
7/29	20	25	36	45.940739	-129.984122	127	-12	0	1	1514	1516	Maybe biology?
7/29	20	25	48	45.940706	-129.984086	173	-10	0	2	1514	1516	Yellow sediments in the cracks between the pillars.
7/29	20	25	54	45.940679	-129.984093	200	-12	0	2	1514	1516	Rattail fish again.
7/29	20	26	25	45.940558	-129.984206	214	-12	0	2	1514	1516	It's pretty difficult to tell what's happening here.
7/29	20	26	50	45.940452	-129.984318	214	-10	-1	2	1514	1516	We're zigzagging a bit here. Heading to the SW now.
7/29	20	27	07	45.940387	-129.984381	215	-10	0	4	1514	1517	We're seeing a few rattail fish here.
7/29	20	28	02	45.940320	-129.984429	157	-7	0	6	1514	1520	The venting we've seen up here is so spotty. For the most part we're not seeing much venting.
7/29	20	28	14	45.940326	-129.984429	158	-10	0	6	1513	1520	The frame grabber stopped working.
7/29	20	28	26	45.940297	-129.984395	144	-13	-1	6	1513	1519	Casey fixed it.
7/29	20	30	24	45.940120	-129.983875	151	-11	0	2	1514	1516	Moving along heading SE now.
7/29	20	31	12	45.939981	-129.983855	197	-8	0	2	1514	1516	Another sky light.
7/29	20	31	29	45.939922	-129.983914	204	-12	-1	2	1514	1516	Rattail.
7/29	20	32	24	45.939719	-129.984142	215	-10	-1	2	1514	1516	Now we're zigzagging to the SW. Were' still in this area of pillars and collapse. Out of the big fissure area.
7/29	20	33	16	45.939602	-129.984308	188	-10	0	5	1514	1519	Rattail fish here. We have moved quite a distance here and not seen any hydrothermal activity.
7/29	20	33	34	45.939552	-129.984305	166	-10	0	1	1514	1516	There's a lots of floc ("snow") in the water here.
7/29	20	34	11	45.939525	-129.984195	154	-9	-1	3	1515	1518	There's something happening around here. Still plenty of stuff in the water.
7/29	20	34	38	45.939549	-129.984076	149	-10	-1	2	1514	1516	Snowblowers are really dependent on the subsurface plumbing. If you add sulfide in a little cavity with sea water it all make floc.
7/29	20	35	12	45.939510	-129.983941	146	-10	-1	3	1513	1516	There may be something particular about the plumbing up by Magnesia.
7/29	20	36	19	45.939561	-129.983663	127	-8	-2	6	1514	1519	Magnesia area seems to be the snowblower area of choice. Maybe it's because the SRZ ends there.
7/29	20	37	13	45.939414	-129.983816	258	-8	2	5	1516	1520	The long-term stuff persists in the same places throughout eruptions. (Mkr-33). There's a short-term circulation that cools off the extruded lavas. That may be what produces all the floc.
7/29	20	37	55	45.939280	-129.983972	201	-9	1	2	1514	1516	Whether it's just the increased circulation with all the extra heat in there. The chemistry of the water will give you an idea of iron to heat and sulfide to heat ratios. How the water is interacting with the rock.
7/29	20	38	56	45.939180	-129.984199	189	-12	0	2	1514	1516	This all looks like preexisting lavas. It's matching the old bathymetry quite close.
7/29	20	39	21	45.939045	-129.984203	167	-14	-1	2	1514	1516	There are big changes though. Mkr-N3 had no biology.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	20	39	50	45.938964	-129.984085	151	-10	-1	2	1514	1516	The area between the caldera rim and the benchmark looked like it could possibly have been new lavas.
7/29	20	40	15	45.938960	-129.983967	127	-11	0	2	1515	1516	Bill wants to head as far east as we can go.
7/29	20	40	31	45.938953	-129.983891	129	-11	-1	2	1515	1516	Looks like a jumbled mess. We're in the collapse area.
7/29	20	40	52	45.938929	-129.983823	127	-13	-1	2	1514	1516	Lots of red shrimp in the area since we got here.
7/29	20	41	03	45.938916	-129.983772	127	-12	-1	3	1514	1518	There were lots of holothurians up here last year.
7/29	20	41	27	45.938906	-129.983646	131	-10	1	4	1515	1518	All the slow moving fauna have not returned. Holothurians; tubeworms; etc. are not here.
7/29	20	42	31	45.938714	-129.983520	180	-12	0	3	1514	1517	There must have been incredible currents related to the eruption. Density and temperature differences create currents. Could make a big vortex.
7/29	20	43	02	45.938575	-129.983510	191	-8	0	3	1515	1518	More rattails.
7/29	20	43	24	45.938478	-129.983499	175	-13	1	2	1515	1516	We don't really know what the eruptions are look like when they are happening.
7/29	20	43	56	45.938352	-129.983471	167	-10	0	2	1515	1516	The effects here are pretty staggering and suggest that it must be pretty dramatic - violent. It seems like everything was swept clean.
7/29	20	46	15	45.938045	-129.983898	194	-11	-2	1	1516	1517	Maybe the difference in time between our visit this year explains the difference in biology. This time we're here 3 months after the eruption. In 1998 it was 6 months after.
7/29	20	46	25	45.938023	-129.983908	194	-10	0	2	1515	1517	Another rattail.
7/29	20	46	47	45.937945	-129.983943	195	-9	1	2	1515	1517	NAV: Doppler Reset
7/29	20	47	03	45.937913	-129.983906	164	-8	-2	2	1515	1517	We've moved off the edge of the bathymetry overlay.
7/29	20	47	33	45.937857	-129.983770	141	-11	-1	1	1515	1517	Lots of holes in the "roof".
7/29	20	48	20	45.937843	-129.983539	137	-12	-1	3	1517	1519	A solitary pillar.
7/29	20	49	34	45.937647	-129.983326	145	-10	1	4	1515	1519	This is pretty. We had to come up several meters to get to the top of these pillars all of a sudden.
7/29	20	50	03	45.937547	-129.983389	190	-11	0	4	1515	1519	We were pretty steady for quite some time and now the top of the pillars is 1515m.
7/29	20	50	11	45.937519	-129.983418	190	-10	0	4	1516	1519	Continuing south.
7/29	20	52	01	45.937262	-129.983793	167	-14	-1	2	1514	1516	Still in an area of lobates with occasional collapse features.
7/29	20	52	16	45.937199	-129.983749	165	-12	-2	2	1515	1517	An arch on the stbd side.
7/29	20	52	24	45.937180	-129.983715	163	-14	-3	2	1515	1517	Collapse.
7/29	20	52	49	45.937135	-129.983608	132	-11	0	1	1515	1516	We're already about 4 hours behind.
7/29	20	53	26	45.937145	-129.983414	120	-10	1	3	1517	1519	Collapse below with solitary pillars.
7/29	20	53	48	45.937133	-129.983344	115	-10	-2	3	1516	1519	We're still heading E/SE.
7/29	20	54	07	45.937154	-129.983273	113	-11	-1	1	1515	1516	Beautiful area of pillars.
7/29	20	54	42	45.937193	-129.983135	101	-11	-1	3	1516	1519	Solitary pillars and jumbled flow. Some orange staining.
7/29	20	55	08	45.937106	-129.983137	185	-12	1	5	1515	1520	This might be the northern end of that big flat collapse area north of Mkr-33.
7/29	20	56	44	45.936820	-129.983276	196	-12	0	3	1516	1518	We're on sheet flow highway here. Lava pillars interspersed.
7/29	20	57	01	45.936786	-129.983300	187	-11	-1	4	1515	1519	Whoops. Ran into a pillar.
7/29	20	58	21	45.936560	-129.983267	182	-11	0	4	1514	1518	Continuing south in this area of pillars; rubble; etc.
7/29	20	59	12	45.936371	-129.983376	183	-12	0	2	1514	1516	Can't really tell what's happening here.
7/29	20	59	40	45.936263	-129.983301	156	-9	0	1	1515	1516	Bill says no sign of change.
7/29	21	00	14	45.936278	-129.983140	136	-10	-1	1	1515	1517	Striated lavas and collapse.
7/29	21	01	12	45.936131	-129.982989	155	-8	0	3	1517	1520	Can't say anything definitive.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	21	01	33	45.936074	-129.983028	232	-10	0	1	1519	1520	The bottom is getting flatter so the sediments appear deeper.
7/29	21	01	40	45.936070	-129.983045	238	-10	0	1	1519	1520	We are seeing the lava highway.
7/29	21	02	41	45.935884	-129.983065	180	-11	0	3	1517	1520	We're hoping to see a lava contact here.
7/29	21	03	41	45.935692	-129.983116	194	-11	-1	4	1515	1519	We are way behind schedule.
7/29	21	04	01	45.935621	-129.983090	165	-11	-2	4	1515	1519	Almost on the bathymetry underlay again.
7/29	21	05	16	45.935381	-129.982988	203	-13	-1	3	1518	1520	Rattail on these thick orange/yellowish sediments on striated sheet flow.
7/29	21	05	54	45.935257	-129.983000	158	-10	-1	2	1519	1520	Striated flat lavas with lobates and pillows.
7/29	21	06	08	45.935274	-129.982930	112	-12	-2	1	1519	1521	Lava swirl.
7/29	21	06	18	45.935271	-129.982878	119	-9	0	2	1519	1521	Great striations on this sheet flow.
7/29	21	10	35	45.934642	-129.982883	175	-11	-1	1	1515	1517	We're back on the nav underlay.
7/29	21	10	56	45.934561	-129.982838	172	-11	0	3	1515	1519	We're moving along here.
7/29	21	11	22	45.934453	-129.982803	175	-10	-2	3	1515	1518	Bill did not see a contact but the topography looks different than the AUV bathymetry.
7/29	21	11	33	45.934426	-129.982794	178	-9	0	2	1515	1517	Bill would like to go to the SW.
7/29	21	12	06	45.934414	-129.982920	221	-10	0	2	1515	1517	He wants to be out on the flat sheet flow (at least it was flat sheet flow previously).
7/29	21	12	52	45.934369	-129.983074	206	-11	-1	1	1516	1517	This is not flat lineated sheet flow here.
7/29	21	13	16	45.934355	-129.983077	211	-4	-3	1	1516	1517	Bill wants to stop and get the depth here. Z=1516.5.
7/29	21	13	52	45.934218	-129.983033	175	-13	-1	2	1515	1517	This was super flat lineated flow after the 1998 eruption.
7/29	21	14	17	45.934166	-129.982975	159	-11	-1	2	1515	1517	It seems to be filled with lobates yet. There's a small circular collapse feature.
7/29	21	14	54	45.934036	-129.982915	165	-9	0	1	1516	1517	Nothing really looks new - they are covered with some sediments.
7/29	21	15	24	45.933955	-129.982952	167	-11	0	1	1516	1517	There should be pillars and the edge of a collapse. We're not seeing that at all.
7/29	21	16	04	45.933851	-129.983038	179	-10	0	2	1516	1517	There should not be lobates where we are.
7/29	21	16	38	45.933738	-129.983113	180	-10	0	1	1515	1517	We're going to move to the west on what should be lineated sheet flows. Right in the middle of it.
7/29	21	17	01	45.933740	-129.983119	179	-6	0	1	1517	1518	We're going to stop a minute and zoom in on it.
7/29	21	17	57	45.933755	-129.983117	179	-5	-2	1	1517	1518	Bill is zooming in on these lobate lavas. Little pieces of white floc.
7/29	21	18	19	45.933759	-129.983117	179	-6	0	1	1517	1518	Jason is poking the end of this lobe. It looks pretty dark and shiny.
7/29	21	19	11	45.933604	-129.983099	180	-11	1	1	1516	1517	Super-new lava: the glass is really thick and fragile. Over time it sort of "sloughs off".
7/29	21	19	38	45.933536	-129.983158	203	-9	0	2	1515	1517	We're pretty far out in the middle of what should have been sheet flow. This all has to be new.
7/29	21	20	20	45.933527	-129.983303	207	-6	0	1	1516	1517	We saw a bit of lineated flow earlier. Somewhere in the northern part of this collapse is where a contact should be.
7/29	21	21	05	45.933341	-129.983381	175	-14	0	2	1515	1517	Bill is convinced that this area is all new lava. It's all lobate.
7/29	21	21	29	45.933243	-129.983354	229	-10	2	1	1516	1517	Wondering where the venting is?
7/29	21	21	52	45.933240	-129.983420	228	-7	0	1	1516	1517	We're going to head to the western edge of the 1998 lava flow. Want to see if the edge of the collapse is here.
7/29	21	22	13	45.933237	-129.983491	228	-7	0	1	1517	1518	There is no wall here. This is thick enough to have overflowed the wall of the old collapse feature.
7/29	21	23	06	45.933211	-129.983297	107	-9	0	1	1517	1518	Marv says this is what the little blob at ASHES looked like too. He could actually see a small contact there.
7/29	21	23	55	45.933204	-129.983040	100	-8	2	2	1515	1518	More hydrothermal sediments here.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	21	24	44	45.933213	-129.982756	103	-8	1	2	1516	1518	This flow is 4-5 meters thick at Mkr-33 site. Depth differences from last year.
7/29	21	25	18	45.933228	-129.982603	104	-7	1	2	1516	1518	Super thick hydrothermal sediments here.
7/29	21	25	39	45.933192	-129.982519	101	-10	0	1	1516	1518	The western collapse wall was at least 2 meters high.
7/29	21	25	57	45.933181	-129.982475	102	-8	0	2	1516	1518	This looks like fallout from a snow blower.
7/29	21	26	13	45.933180	-129.982442	101	-7	1	2	1516	1518	The fuzz is getting thicker and thicker as we get closer to marker 33.
7/29	21	26	50	45.933176	-129.982338	102	-12	1	3	1515	1518	We're looking for shimmer here.
7/29	21	27	29	45.933199	-129.982322	101	-9	0	2	1517	1519	This is probably it. This is Marker-33 vent here. We're right on last years nav target for Mkr-33.
7/29	21	28	44	45.933207	-129.982314	100	-2	1	1	1518	1519	We're looking at this fuzzy stuff that looks like it grew on the lava. It's almost gelatinous. It looks similar to what we saw up by Mkr-N3 when Dave zoomed in. Only much more so.
7/29	21	29	14	45.933207	-129.982316	100	-2	1	1	1518	1519	This is quite the change. Looking for signs of venting.
7/29	21	29	41	45.933205	-129.982325	100	-2	1	1	1518	1519	Scaleworm?
7/29	21	29	49	45.933205	-129.982329	101	-4	2	1	1518	1519	Looking for venting here.
7/29	21	31	00	45.933164	-129.982340	53	-2	5	1	1518	1519	Mkr-33 is covered over with "junk" on the lava. See some white floc blobs.
7/29	21	31	30	45.933171	-129.982346	53	-2	4	1	1518	1519	There's a little bit of flow.
7/29	21	31	48	45.933174	-129.982345	53	-2	4	1	1518	1519	Bag creatures in the video.
7/29	21	32	14	45.933176	-129.982336	53	-2	4	1	1518	1519	Bury all those animals and cook them and out comes methane and gelatin (Bag Creature explanation by Dave).
7/29	21	32	54	45.933170	-129.982310	53	-2	5	1	1518	1519	HIGHLIGHTS: KiPro hard drive start Marker 33 highlights.
7/29	21	34	58	45.933165	-129.982279	53	-2	5	1	1518	1519	Cool looking black lava and scaleworms.
7/29	21	35	22	45.933165	-129.982279	53	-2	5	1	1518	1519	Looking at the flow here.
7/29	21	35	37	45.933165	-129.982282	53	-2	5	1	1518	1519	We're at Marker 33. It's hard to believe it's this changed.
7/29	21	36	51	45.933174	-129.982320	53	-3	2	1	1518	1519	SAMPLE: fluid Dave plans to fill up the fluid sampler here so that we will be "done with him for this dive".
7/29	21	39	03	45.933139	-129.982291	52	-3	2	1	1518	1519	SAMPLE: fluid Setting up to fluid sample here. The heading is 53 degrees right now. Facing NE. The current site got up to 14.9. Dave wants it hotter.
7/29	21	40	27	45.933170	-129.982308	52	-3	3	164	1518	1682	Floc is coming out there we just poked the wand.
7/29	21	40	43	45.933171	-129.982312	52	-3	3	179	1518	1697	The scaleworm in the upper right is an "old school" scaleworm.
7/29	21	43	33	45.933172	-129.982279	52	-3	3	165	1518	1683	HIGHLIGHTS: DVD Deck start Mini-arm cam may be on? Not sure. Want to record the mini-triton starting at 21:43. Going now. Fluid sampling at Marker-33.
7/29	21	44	20	45.933172	-129.982297	52	-3	3	1	1518	1519	HIGHLIGHTS: KiPro hard drive stop The temp in that spot was 13.3C. Not warm enough.
7/29	21	45	27	45.933173	-129.982309	53	-3	3	1	1518	1519	Still trying to get a decent temperature for fluid sampling here.
7/29	21	46	02	45.933174	-129.982308	53	-3	3	1	1518	1519	Where's the hot water?
7/29	21	47	19	45.933174	-129.982306	53	-3	2	1	1518	1519	Where the temperature probe has been and removed the coating - the lavas are really black and shiny.
7/29	21	50	33	45.933173	-129.982300	36	-2	1	1	1518	1519	Bill zoomed in on palm worms (?) and scaleworms. Bill guesses they are Pandora worms. They are usually hidden among the tubeworms. They look like teeny palm worms.
7/29	21	51	37	45.933172	-129.982294	35	-2	1	1	1518	1519	Have the wand in this crevice hoping to get some higher temperatures.
7/29	21	52	29	45.933173	-129.982304	35	-2	1	1	1518	1519	The temperature is fluctuating a bit. It's at 13C now.
7/29	21	53	53	45.933178	-129.982326	35	-2	1	1	1518	1519	We got 28 degrees when we were here last time.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	21	54	56	45.933178	-129.982328	38	-2	3	1	1518	1519	HIGHLIGHTS: KiPro hard drive start Moving the arms out of the way for HD highlights.
7/29	21	56	19	45.933182	-129.982331	36	0	1	1	1518	1519	Zooming in on this area with the worms. These little worms are about the only thing we've seen - except scaleworms.
7/29	21	56	53	45.933181	-129.982328	36	0	1	1	1518	1519	This place is covered in orangish/yellow gelatinous goo.
7/29	21	57	27	45.933181	-129.982326	36	0	1	1	1518	1519	Little teeny tubeworms poking out the side of this rock.
7/29	21	57	47	45.933181	-129.982325	36	0	1	1	1518	1519	Itty bitty tubeworms.
7/29	21	58	24	45.933181	-129.982328	36	0	1	1	1518	1519	HIGHLIGHTS: KiPro hard drive stop filming Pandora worms and will switch the HD to record the HD pilot cam and little tiny tubeworms.
7/29	22	00	13	45.933184	-129.982295	38	-2	3	1	1518	1519	The pilot cam has a clear shot at several tiny tube worms in shimmering water clinging to the side of fresh basalt. Remarkably fast colonization.
7/29	22	02	46	45.933185	-129.982309	36	1	0	1	1518	1519	The Pandora worm's tentacles are skinnier. The tubeworms are not supposed to be the colonizers.
7/29	22	04	34	45.933187	-129.982305	351	-7	0	2	1517	1518	Pandora worms come first; according to Jean's succession theory. Pandora worms have a skinnier plumes.
7/29	22	04	40	45.933188	-129.982294	330	-7	1	2	1517	1518	Off.
7/29	22	06	06	45.933208	-129.982289	179	-7	-3	1	1518	1519	The recolonization can vary but gastropods are supposed to be later.
7/29	22	07	33	45.933158	-129.982254	179	-6	-4	1	1518	1518	Dave wants to find a new spot to water sample.
7/29	22	08	10	45.933180	-129.982276	179	-6	-4	1	1518	1518	Moved the wand and continue to try to get warmer water.
7/29	22	08	19	45.933180	-129.982277	179	-6	-4	1	1518	1518	Here we go says Dave.
7/29	22	10	26	45.933190	-129.982252	179	-6	-4	1	1518	1518	Setting up to sample here. It's climbing. 19 degrees.
7/29	22	11	39	45.933200	-129.982270	179	-6	-4	1	1518	1518	Zoomed in on pilot's cam. Ray thinks they are on the skinny side - but probably palm worms or sulfide worms.
7/29	22	12	56	45.933199	-129.982286	179	-6	-4	1	1518	1518	SAMPLE: fluid J2-581-HFS-25. Unfiltered piston #8. Start 2212.30.
7/29	22	15	03	45.933209	-129.982258	179	-6	-4	1	1518	1518	HIGHLIGHTS: KiPro hard drive start HGS sampling at Mkr-33 on at 2212.
7/29	22	15	51	45.933204	-129.982254	179	-6	-4	1	1518	1518	Bag creatures bear the sampling wand.
7/29	22	16	49	45.933200	-129.982274	179	-6	-4	1	1518	1518	J2-581-HFS-25 stop. Tmax=25.6 Tavg=25.1 T2=12. Vol=650ml.
7/29	22	17	31	45.933192	-129.982280	179	-6	-4	1	1518	1518	SAMPLE: fluid J2-581-HFS-26. RNA filter #13. Start now
7/29	22	21	34	45.933201	-129.982284	179	-6	-4	1	1518	1518	A scaleworm "riding" a bag creature in the HD camera. Hanging on for dear life.
7/29	22	23	06	45.933192	-129.982272	179	-6	-4	1	1517	1518	This site on the new eruptive feature that we have found any biology other than scaleworms.
7/29	22	24	35	45.933185	-129.982266	179	-6	-4	1	1517	1518	The scaleworms have to be grazing on the mat here.
7/29	22	27	05	45.933203	-129.982282	179	-6	-4	1	1517	1518	Scott is zoomed in on the orange mat/slime plus clear gelatinous substance.
7/29	22	27	25	45.933197	-129.982283	179	-6	-4	1	1517	1518	Moving around the place with the HD frame grabber.
7/29	22	28	53	45.933164	-129.982270	179	-6	-4	1	1517	1518	J2-581-HFS-26 cont. The temperature has dropped a little bit - a couple degrees.
7/29	22	29	49	45.933172	-129.982273	179	-6	-4	1	1517	1518	Now the temperature is rally dropping.
7/29	22	30	29	45.933173	-129.982267	179	-5	-5	1	1517	1518	J2-581-HFS-26 paused to wiggle the wand a bit trying to get the temperature back up.
7/29	22	30	57	45.933178	-129.982268	179	-5	-5	1	1517	1518	J2-581-HFS-26 paused waiting for the temperature to come back up.
7/29	22	33	42	45.933219	-129.982311	179	-5	-5	1	1517	1518	J2-581-HFS-26 back on a couple minutes ago. Wiggling the HFS wand to try to get warmer temperatures. Temps are coming up.
7/29	22	37	16	45.933186	-129.982279	179	-6	-4	1	1517	1518	J2-581-HFS-26 cont. (A "emblemii" just swam by)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/29	22	37	49	45.933197	-129.982271	179	-6	-4	1	1517	1518	J2-581-HFS-26 stop. Tmax=25.9 Tavg=20.4 (not a good number) T2=10. Vol=3000ml.
7/29	22	38	35	45.933193	-129.982269	178	-5	-5	1	1517	1518	Want to move the sampling wand around again to try to get some hotter water.
7/29	22	39	26	45.933192	-129.982291	179	-8	0	1	1517	1518	Temperature is still low - 13C.
7/29	22	40	36	45.933193	-129.982302	179	-8	0	1	1517	1518	Location for samples at Mkr-33 Vent: 45 55.9921' -129 58.9363' Z=1517.8. In crack with diffuse flow.
7/29	22	41	51	45.933174	-129.982289	179	-8	0	1	1517	1518	Marker 33 is nothing like it used to be. No long crack with venting fluids. Just a little raised mound (barely raised) covered in the orange/white/yellow hydrothermal coating with a little biota and lots of "bag creatures".
7/29	22	42	45	45.933179	-129.982265	179	-8	0	1	1517	1518	SAMPLE: fluid J2-582-HFS-27. Filtered piston #9. Start 2242. Same venting crack as previous samples. Just moved the wand a touch.
7/29	22	47	09	45.933179	-129.982283	179	-8	0	1	1517	1518	J2-582-HFS-27 cont. Temperature is going up.
7/29	22	47	39	45.933187	-129.982280	179	-8	0	1	1517	1518	J2-582-HFS-27 stop 2247. Tmax=27.1 Tavg=26.8 T2=12. Vol=650ml.
7/29	22	50	12	45.933215	-129.982277	179	-8	0	1	1517	1518	SAMPLE: fluid J2-581-HFS-28 filtered bag #28. Start 2248:45.
7/29	22	51	26	45.933203	-129.982308	179	-8	0	1	1517	1518	The "vampire embleyii" worm in the distance.
7/29	22	52	00	45.933189	-129.982302	179	-8	0	1	1517	1518	J2-582-HFS-27 stop. 2251.30. Tmax=27.3 Tavg=27.2 T2=13. Vol=475ml.
7/29	22	52	11	45.933186	-129.982299	179	-8	0	1	1517	1518	HIGHLIGHTS: KiPro hard drive start biology
7/29	22	52	58	45.933181	-129.982281	179	-8	0	1	1517	1518	SAMPLE: fluid J2-HFS-581-29. DNA filter #10. Start 2252.30
7/29	22	59	27	45.933183	-129.982281	179	-8	0	1	1517	1518	J2-582-HFS-29 cont.
7/29	23	10	02	45.933194	-129.982284	179	-8	0	1	1517	1518	once we are finished sampling we want to deploy an MTR.
7/29	23	12	47	45.933192	-129.982287	179	-8	0	1	1517	1518	SAMPLE: fluid J2-582-HFS-29 Stop=11:53 Tmax=28.2 Tavg=27.8 T2=12 Volume=3000 (Huber).
7/29	23	12	57	45.933194	-129.982285	179	-8	0	1	1517	1518	Stowing the fluid inlet on the basket.
7/29	23	13	15	45.933195	-129.982283	179	-8	0	1	1517	1518	HIGHLIGHTS: DVD Deck stop
7/29	23	13	24	45.933196	-129.982282	179	-8	0	1	1517	1518	HIGHLIGHTS: KiPro hard drive stop
7/29	23	17	00	45.933194	-129.982280	179	-9	1	1	1517	1518	NAV: Doppler Reset
7/29	23	17	22	45.933191	-129.982280	179	-9	1	1	1517	1518	Opening port biobox to deploy MTR.
7/29	23	18	54	45.933182	-129.982291	179	-6	-2	1	1517	1518	DEPLOY: MTR 4095 temp probe Position 129 58.9374'W 4 55.9902'N Depth=1517.5 Hdg=179.1.
7/29	23	21	15	45.933171	-129.982308	317	-8	0	2	1516	1518	Transit to Bag City.
7/29	23	24	14	45.933706	-129.982040	22	-10	0	18	1500	1517	Probably an hour and a half.
7/30	01	23	17	45.916026	-129.987001	52	-6	1	73	1459	1532	We are still transiting to Bag City.
7/30	01	46	28	45.916598	-129.989524	288	-9	1	3	1529	1533	We just got to the bottom.
7/30	01	48	36	45.916389	-129.989598	183	-10	0	3	1530	1533	Looking at a large skate.
7/30	01	48	44	45.916364	-129.989593	183	-9	1	3	1530	1533	Still going one knot east.
7/30	01	49	50	45.916392	-129.989569	87	-8	1	3	1529	1533	We are having lots of ship control issues.
7/30	01	50	24	45.916393	-129.989369	87	-9	1	4	1529	1533	We are seeing the bottom again.
7/30	01	51	35	45.916206	-129.989236	87	-10	0	2	1530	1533	Looking for the MTR because we can't actually work yet and we are sort of in the neighborhood.
7/30	01	58	08	45.916085	-129.989101	268	-8	1	2	1530	1533	NAV: Doppler Reset
7/30	01	58	18	45.916081	-129.989112	267	-8	1	2	1530	1533	Site should be pretty much dead ahead.
7/30	02	00	35	45.916174	-129.989371	294	-7	0	2	1530	1533	We see the benchmark.
7/30	02	01	26	45.916162	-129.989440	337	-8	2	1	1532	1533	Aligning the basket to make a pressure reading on the new AX104 benchmark.
7/30	02	04	35	45.916173	-129.989445	337	-6	1	1	1532	1533	DEPLOY: pressure sensor at Bag City new benchmark AX104 .

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/30	02	05	17	45.916178	-129.989443	336	-5	1	1	1532	1533	Start pressure measurement at 02:05.
7/30	02	25	24	45.916192	-129.989433	336	-5	1	1	1532	1533	RECOVER: pressure sensor measurement stop 02:24.
7/30	02	26	23	45.916206	-129.989417	315	6	-2	1	1532	1533	Realigning the basket to make a pressure measurement at old triangular benchmark AX04.
7/30	02	29	49	45.916205	-129.989404	319	-2	-1	1	1532	1533	DEPLOY: pressure sensor aligned on the old triangular benchmark AX04 at Bag City start measurement 02:29.
7/30	02	34	32	45.916189	-129.989404	319	-2	-1	1	1532	1533	You can tell the sleep depravity is getting to everyone in the van they are now playing with the sound of lowering their chairs.
7/30	02	51	53	45.916202	-129.989421	319	-2	-2	1	1532	1533	Stop measurement at 02:51.
7/30	02	52	01	45.916200	-129.989420	318	-2	-2	1	1532	1533	RECOVER: pressure sensor and stowing on ship.
7/30	02	52	06	45.916200	-129.989420	318	-2	-3	1	1532	1533	NAV: Doppler Reset
7/30	02	54	28	45.916204	-129.989399	320	-9	-2	2	1531	1533	Stowing the pressure sensor in the basket.
7/30	02	59	45	45.916204	-129.989396	320	-9	-2	2	1531	1533	Making sure the pressure sensor is in tight and then going to transit to pillow mound.
7/30	03	00	01	45.916203	-129.989399	320	-9	-2	2	1531	1533	Approx 4 hour transit.
7/30	03	01	26	45.916193	-129.989406	320	-9	-2	2	1531	1533	Re-stowing the MPR in the basket.
7/30	03	01	56	45.916198	-129.989401	320	-9	-2	2	1531	1533	Tying the bungee down.
7/30	03	03	05	45.916211	-129.989392	320	-9	0	2	1531	1533	The pressure sensor is secured in the basket.
7/30	03	03	27	45.916191	-129.989387	319	-9	1	3	1530	1533	Coming off the bottom.
7/30	03	04	50	45.916394	-129.989402	354	-12	1	4	1529	1534	Beginning the transit to South Pillow Mound - have to go north a little first to turn around and go south.
7/30	06	54	00	45.863607	-130.003483	340	-7	2	9	1713	1722	NAV: Doppler Reset
7/30	06	55	10	45.863543	-130.003482	144	-9	2	4	1718	1722	JASON: Jason on bottom
7/30	06	55	31	45.863557	-130.003537	220	-8	1	3	1719	1722	There's a lot of flock in the water down here too.
7/30	06	56	25	45.863550	-130.003610	214	-8	0	2	1720	1722	Rattail on the bottom.
7/30	06	57	27	45.863328	-130.003730	197	-11	1	3	1719	1722	Moving along over the bottom in the direction of the benchmark.
7/30	06	57	35	45.863282	-130.003737	192	-11	2	3	1719	1722	The benchmark is dead ahead.
7/30	06	58	12	45.863207	-130.003823	108	-8	2	3	1718	1721	We're here at AX105.
7/30	06	58	29	45.863165	-130.003829	79	-8	1	3	1718	1721	The eruptive fissure is eight behind the benchmark.
7/30	06	58	51	45.863140	-130.003821	13	-9	2	3	1718	1721	That's the 1998 eruptive fissure; not this years. We haven't found that yet.
7/30	06	59	37	45.863147	-130.003820	2	-9	1	1	1720	1721	Looking at the striated sheet flow.
7/30	07	01	25	45.863148	-130.003770	3	-3	2	1	1721	1722	Picking up the pressure sensor and preparing to set it on the benchmark.
7/30	07	02	06	45.863152	-130.003789	3	-3	2	1	1721	1722	DEPLOY: pressure sensor at AX105 .
7/30	07	02	14	45.863153	-130.003795	3	-3	2	1	1721	1722	Great view from Medea.
7/30	07	02	39	45.863155	-130.003815	3	-3	2	1	1721	1722	Great placement on the benchmark.
7/30	07	04	48	45.863158	-130.003819	3	-3	2	1	1721	1722	After this reading we will pick up the old benchmark and bring it with us to the Smiley Face marker perched up high and east of Mkr-33.
7/30	07	07	42	45.863161	-130.003797	3	-3	2	1	1721	1722	This is the same pressure sensor that has been in use since 1999. And it's still going strong.
7/30	07	23	35	45.863138	-130.003807	4	-3	2	1	1721	1722	RECOVER: pressure sensor Finished with the pressure measurement reading here at AX105.
7/30	07	25	37	45.863140	-130.003783	0	-10	2	2	1719	1721	The old benchmark we are going to pick up it was called AX66. We're going to re-locate it and "call it a different number". The newer scheme. It will be called AX203.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/30	07	27	14	45.863125	-130.003782	360	-11	2	1	1720	1721	This old marker is looking a little worse for the wear. It is Marker 66. Memories.....
7/30	07	27	23	45.863118	-130.003782	358	-9	2	2	1719	1721	JASON: Jason off bottom
7/30	07	28	02	45.863127	-130.003753	354	-10	3	3	1719	1721	The bottom is still in sight.
7/30	07	28	20	45.863144	-130.003759	355	-10	2	8	1714	1721	We're passing over the eruptive fissure from 1998.
7/30	07	28	26	45.863150	-130.003764	355	-10	3	9	1712	1721	Bottom out of sight now.
7/30	11	40	07	45.915881	-129.989567	2	-10	0	65	1467	1533	We are getting close about 35m away.
7/30	11	43	45	45.915954	-129.989479	358	-9	0	1	1532	1533	We see the bottom.
7/30	11	46	37	45.916146	-129.989457	345	-9	0	1	1531	1532	We see the marker in the distance.
7/30	11	47	29	45.916154	-129.989446	332	-8	0	1	1531	1532	Aligning yourself in front of the AX104 benchmark.
7/30	11	48	43	45.916155	-129.989447	332	-10	2	1	1531	1532	Looks like the partial collapse here at Bag City new benchmark has become completely collapsed.
7/30	11	50	09	45.916173	-129.989456	332	-6	2	1	1531	1532	Next year put a scrubber on the basket to clean off benchmark.
7/30	11	51	58	45.916181	-129.989461	331	-6	1	1	1531	1532	Positioning the pressure sensor with the right orientation on the benchmark.
7/30	11	56	19	45.916174	-129.989453	331	-6	2	1	1531	1532	DEPLOY: pressure sensor at Bag City new benchmark AX104.
7/30	11	56	36	45.916174	-129.989453	331	-6	1	1	1531	1532	Start pressure measurement 11:56UTC.
7/30	12	17	06	45.916172	-129.989446	332	-6	1	1	1531	1532	Stop pressure measurement 12:17.
7/30	12	17	56	45.916171	-129.989445	332	-6	0	1	1531	1532	RECOVER: pressure sensor
7/30	12	18	20	45.916171	-129.989441	332	-10	0	1	1531	1532	Moving the basket to align right in front of old triangle Bag City benchmark AX04.
7/30	12	21	05	45.916183	-129.989439	308	-5	-1	1	1531	1532	Orienting the MPR on the old benchmark.
7/30	12	21	37	45.916182	-129.989442	308	-5	-1	1	1531	1532	DEPLOY: pressure sensor at Bag City old benchmark AX04.
7/30	12	21	44	45.916182	-129.989443	308	-5	-1	1	1531	1532	Start measurement 12:21.
7/30	12	22	59	45.916187	-129.989459	308	-5	-1	1	1531	1532	Stop 12:22.
7/30	12	23	16	45.916188	-129.989460	308	-5	-1	1	1531	1532	Restart measurement 12:23 because of outliers.
7/30	12	43	07	45.916199	-129.989432	308	-5	-1	1	1531	1532	Stop measurement 12:43.
7/30	12	43	36	45.916197	-129.989428	308	-8	-1	1	1530	1532	RECOVER: pressure sensor and stowing on the basket.
7/30	12	46	44	45.916185	-129.989422	307	-10	0	2	1530	1532	Pressure sensor stowed on basket.
7/30	12	47	35	45.916174	-129.989423	308	-8	0	2	1530	1532	We are going to start transit from Bag City to M33 to deploy and old benchmark and make a measurement at the Smiley face marker.
7/30	12	50	50	45.915556	-129.989351	177	-8	0	21	1512	1532	Begin transit.
7/30	12	57	03	45.915719	-129.989548	193	-7	1	138	1375	1513	Should be about an hour in a half transit.
7/30	14	36	58	45.933029	-129.982245	224	-9	-1	3	1514	1516	Bottom in sight.
7/30	14	37	07	45.933026	-129.982246	262	-10	2	3	1514	1517	End transit.
7/30	14	37	15	45.933027	-129.982244	306	-9	-1	2	1514	1516	Water is very murky.
7/30	14	38	45	45.933292	-129.982363	344	-7	-1	2	1514	1516	Sea floor looks lumpy..
7/30	14	39	30	45.933343	-129.982360	344	-6	0	3	1513	1516	Putting the benchmark in the neighborhood of AX103.
7/30	14	40	09	45.933376	-129.982299	344	-8	0	2	1514	1516	We are looking for a level area to deploy the benchmark.
7/30	14	41	43	45.933431	-129.982255	346	-4	5	1	1516	1517	We found a site that might work we are going to try and see what happens.
7/30	14	47	40	45.933437	-129.982258	346	-4	5	1	1516	1517	We are still trying out this location but we are not sure and still moving it around for best location.
7/30	14	56	17	45.933440	-129.982266	344	-6	1	1	1515	1516	NAV: Doppler Reset

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/30	15	00	08	45.933405	-129.982282	345	-7	3	1	1516	1516	They're discussing the placement of the benchmark.
7/30	15	01	57	45.933408	-129.982287	345	-8	2	1	1516	1516	This benchmark is being called AX-203 and it has marker 66 attached to it.
7/30	15	02	29	45.933407	-129.982285	345	-6	4	1	1516	1516	Trying to use the Jason claw to push some dirt off the surface of AX203.
7/30	15	02	52	45.933406	-129.982278	338	-9	1	1	1515	1516	We're ~25m due north of Marker 33.
7/30	15	04	25	45.933416	-129.982285	332	-7	3	1	1516	1517	Correction - We're ~24m due north of Marker 33.
7/30	15	04	43	45.933416	-129.982282	332	-7	3	1	1516	1517	And we're ~14m due north of old AX-103 benchmark.
7/30	15	05	15	45.933414	-129.982276	333	-7	2	1	1516	1516	Getting MPR out of Jason bask.et
7/30	15	06	50	45.933416	-129.982272	333	-6	4	1	1516	1517	Untying the bungee from the MPR.
7/30	15	09	31	45.933436	-129.982264	333	-7	3	1	1516	1517	Putting the MPR down on the benchmark - the wired connection is coming off to the left.
7/30	15	10	57	45.933411	-129.982269	333	-6	4	1	1516	1517	Jason needs to move over a little to the left.
7/30	15	11	16	45.933409	-129.982272	336	-9	-2	1	1515	1516	Or need to transfer the MPR to the left arm to put down on the benchmark.
7/30	15	13	09	45.933408	-129.982270	332	-3	3	1	1516	1517	Jason moved over a little.
7/30	15	13	22	45.933408	-129.982270	332	-3	5	1	1516	1517	Put the benchmark down on the edge of the benchmark with the flag behind.
7/30	15	13	28	45.933408	-129.982270	333	-3	5	1	1516	1517	Starting the p-measurement.
7/30	15	16	10	45.933410	-129.982277	333	-3	5	1	1516	1517	We're at 1516.0m depth heading 332.6
7/30	15	16	46	45.933411	-129.982280	333	-3	5	1	1516	1517	DOP: 45N 56.008' 129W 58.932'
7/30	15	19	02	45.933413	-129.982284	333	-3	5	1	1516	1517	The Doppler is drifting since we're on the bottom.
7/30	15	23	42	45.933398	-129.982253	333	-3	5	1	1516	1517	We're still doing the p-measurement.
7/30	15	26	14	45.933420	-129.982272	333	-3	5	1	1516	1517	Crinoids from South Pillow Mound have made a move to the Marker 33 area on the marker 66 line.
7/30	15	27	01	45.933420	-129.982266	333	-3	5	1	1516	1517	The Cursor is where we're at: 45N 56.0052' and 129W 58.9367'
7/30	15	27	26	45.933419	-129.982263	333	-3	5	1	1516	1517	Six minutes left on the p-measurement.
7/30	15	33	12	45.933404	-129.982263	333	-3	4	1	1516	1517	P-measurement finished.
7/30	15	34	01	45.933405	-129.982258	333	-3	4	1	1516	1517	At the end of dive J2-580 drove east from ASHES and the new lava flow begins about 170m east of ASHES.
7/30	15	34	13	45.933405	-129.982259	333	-3	4	1	1516	1517	Picking up the MPR from the benchmark.
7/30	15	34	52	45.933405	-129.982267	333	-3	3	1	1516	1517	Putting the MPR back into the basket.
7/30	15	36	07	45.933406	-129.982267	333	-3	3	1	1516	1517	The MPR is in its holster in the basket.
7/30	15	36	30	45.933406	-129.982261	333	-3	3	1	1516	1517	Tying the bungee down on the MPR.
7/30	15	37	10	45.933407	-129.982251	333	-3	3	1	1516	1517	We're heading to ASHES and benchmark AX106 next.
7/30	15	38	12	45.933406	-129.982252	333	-3	4	1	1516	1517	The bungee is tied down.
7/30	15	38	37	45.933399	-129.982256	331	-7	2	1	1515	1516	Pulling away from the benchmark.
7/30	15	38	56	45.933404	-129.982262	332	-8	2	1	1515	1516	Now we're heading for ASHES.
7/30	15	39	05	45.933403	-129.982262	327	-8	2	2	1515	1517	Transit is ~2hrs.
7/30	17	38	46	45.934412	-130.011413	268	-8	0	2	1542	1544	Getting to the bottom at AX106 NE of ASHES.
7/30	17	39	12	45.934477	-130.011502	240	-7	1	2	1542	1544	Here's the benchmark.
7/30	17	41	02	45.934445	-130.011597	57	-8	-2	3	1542	1544	Untying the MPR from the basket.
7/30	17	41	30	45.934448	-130.011594	57	-9	-2	2	1542	1544	Picking the pressure sensor up.
7/30	17	41	48	45.934449	-130.011590	57	-9	-2	3	1542	1544	Retracting the basket.
7/30	17	43	43	45.934416	-130.011547	66	-5	-1	1	1544	1544	Jason is sitting on the bottom now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/30	17	44	07	45.934397	-130.011545	66	-5	-1	1	1544	1544	NAV: Doppler Reset 6min 15sec
7/30	17	44	24	45.934390	-130.011543	67	-6	-1	1	1544	1544	The doppler was reset 6min 32 sec ago
7/30	17	44	55	45.934389	-130.011529	66	-6	-1	1	1544	1544	Putting the MPR down on the AX106 benchmark with the cable to the left.
7/30	17	47	22	45.934471	-130.011558	66	-6	0	1	1544	1544	Accidentally knocked the MPR on its side on the benchmark.
7/30	17	47	35	45.934465	-130.011576	66	-6	0	1	1544	1544	Picking it up again to put it in the right spot.
7/30	17	49	39	45.934397	-130.011490	66	-6	0	1	1544	1544	Trying to put the MPR into the slot on the benchmark again.
7/30	17	50	40	45.934459	-130.011532	66	-6	-1	1	1544	1544	Going to try to set it down and then pick it up from the handle again.
7/30	17	51	22	45.934474	-130.011573	66	-6	-1	1	1544	1544	Now it's on the benchmark - going to try to move it into position in the slot.
7/30	17	52	13	45.934449	-130.011574	66	-6	-1	1	1544	1544	Going to have to move Jason closer - the cable is too short.
7/30	17	52	59	45.934436	-130.011572	66	0	0	1	1544	1545	Bringing Jason closer to the benchmark.
7/30	17	53	37	45.934444	-130.011594	66	-1	0	1	1544	1545	Going to try to put the MPR in the slot again.
7/30	17	54	38	45.934408	-130.011539	66	-1	0	1	1544	1545	It's close - going to try again.
7/30	17	55	36	45.934337	-130.011395	66	-1	0	1	1544	1545	Almost in - letting go of the handle and then going to push it from the bottom into the slot.
7/30	17	57	05	45.934446	-130.011435	66	-1	0	1	1544	1545	Trying to nudge the left side in first.
7/30	17	58	40	45.934427	-130.011568	66	-1	0	1	1544	1545	Trying to push from the right side now.
7/30	17	59	31	45.934410	-130.011490	66	-1	0	1	1544	1545	It's not quite level inside the slot - it's sitting at an angle into the slot.
7/30	18	00	36	45.934440	-130.011449	66	-1	0	1	1544	1545	Trying to poke the left side into the slot.
7/30	18	01	39	45.934437	-130.011541	66	-1	0	1	1544	1545	Extended the basket out.
7/30	18	02	04	45.934425	-130.011540	66	-1	0	1	1544	1545	Now the arm is running into the HFS intake wand in the basket.
7/30	18	02	18	45.934419	-130.011527	66	-1	0	1	1544	1545	Okay got the arm free of the HFS.
7/30	18	02	23	45.934417	-130.011521	66	-1	0	1	1544	1545	Basket retracted a little.
7/30	18	02	36	45.934412	-130.011505	66	-1	0	1	1544	1545	Going to push from the center of the MPR.
7/30	18	02	58	45.934412	-130.011481	66	-1	0	1	1544	1545	Actually pushing the left side.
7/30	18	04	42	45.934435	-130.011586	66	-1	0	1	1544	1545	Going to try to put the fingers right at the base and then push.
7/30	18	04	57	45.934436	-130.011601	66	-2	0	1	1544	1545	Pushed too far - it's fallen over now.
7/30	18	05	19	45.934440	-130.011608	66	-1	0	1	1544	1545	Getting a good look at the slot - the back left corner was a little sticky.
7/30	18	07	42	45.934428	-130.011594	66	-2	0	1	1544	1545	Picked it up again and going to try to settle it down correctly in the slot so it doesn't need pushing.
7/30	18	08	42	45.934373	-130.011473	66	-2	0	1	1544	1545	It's in the slot but needs to go to the left a little to sit flush in the slot.
7/30	18	09	14	45.934383	-130.011407	66	-1	0	1	1544	1545	It's settled now.
7/30	18	09	58	45.934427	-130.011407	66	-1	0	1	1544	1545	P-measurement started.
7/30	18	21	12	45.934447	-130.011499	66	-1	0	1	1544	1545	Continuing the pressure measurement.
7/30	18	22	42	45.934441	-130.011535	66	-1	0	1	1544	1545	When the pressure measurement is finished we'll stow the MPR and pick up the tide gauge.
7/30	18	24	10	45.934462	-130.011545	66	-1	0	1	1544	1545	The tide gauge doesn't have a bungee so it will just have to be held on the basket.
7/30	18	29	03	45.934393	-130.011515	66	0	0	1	1544	1545	P-measurement is finished.
7/30	18	29	26	45.934385	-130.011467	66	0	0	1	1544	1545	Picking up the MPR now.
7/30	18	31	14	45.934407	-130.011492	66	-11	-2	1	1543	1545	The balance spot for the MPR to be horizontal is to pick up the handle just to the right of the tape.
7/30	18	31	24	45.934401	-130.011519	66	-8	-2	3	1542	1545	Putting the MPR back in the basket.
7/30	18	32	10	45.934381	-130.011570	66	-9	-2	3	1542	1545	Rotating the MPR to fit in its cradle.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-581 Dive Log
7/30	18	34	01	45.934418	-130.011514	66	-8	-2	3	1542	1545	Setting the MPR down in the basket.
7/30	18	35	23	45.934451	-130.011578	66	-9	-2	3	1542	1545	The MPR isn't sitting right - going to try again.
7/30	18	36	22	45.934444	-130.011598	66	-8	-2	3	1542	1545	Pushing the pucks so it will sit upright in the holster.
7/30	18	36	52	45.934442	-130.011594	66	-8	-2	3	1542	1545	Actually going to try to grab the pucks now and turn the MPR upright.
7/30	18	37	46	45.934441	-130.011597	66	-8	-2	3	1542	1545	MPR is upright now.
7/30	18	37	51	45.934441	-130.011598	66	-9	-2	3	1542	1545	Going to bungee it down.
7/30	18	40	13	45.934440	-130.011562	66	-9	-1	3	1542	1545	The bungee is tied down.
7/30	18	40	24	45.934438	-130.011552	66	-9	-1	3	1542	1545	Going to pick up the tide gauge next.
7/30	18	40	41	45.934415	-130.011536	69	-9	0	3	1542	1545	Moving Jason to the right.
7/30	18	41	57	45.934412	-130.011525	73	-6	2	1	1544	1545	Picking up the tide gauge now.
7/30	18	42	58	45.934406	-130.011519	73	-6	1	1	1544	1545	Have the tide gauge in hand - putting it in the basket.
7/30	18	45	33	45.934431	-130.011576	73	-5	1	1	1544	1545	The tide gauge is in the basket.
7/30	18	47	26	45.934418	-130.011579	73	-5	1	1	1544	1545	Going to settle the tide gauge in the basket better.
7/30	18	47	28	45.934418	-130.011579	73	-4	1	1	1544	1545	Now it's set.
7/30	18	47	37	45.934418	-130.011579	72	-4	1	1	1544	1545	Jason will still have to hold onto it on the way up.
7/30	18	47	42	45.934418	-130.011580	73	-6	0	1	1544	1545	We're done with the dive.

Table 7.4.9 J2-583 Jason Dive Logs (Marker 33 site, 2011 eruption sampling, Axial Seamount, JdFR)

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	5	22	17			124	-8	0	3	1515	1518	JASON: Jason on bottom
7/31	5	23	16			125	-9	-3	3	1514	1518	Doing a ballast check.
7/31	5	23	53			125	-9	-1	2	1516	1518	Jason is heavier than we thought it'd be on this dive.
7/31	5	25	4			125	-10	-1	2	1515	1518	CORRECTION to Tools: There's actually 2 large syringe samplers on not one.
7/31	5	25	44			125	-10	-1	2	1515	1518	Putting the basket out.
7/31	5	26	21			124	-11	-3	2	1515	1518	Going to drop some weights.
7/31	5	27	14			124	-10	-3	3	1515	1518	Dropped one set of weights.
7/31	5	27	29			124	-10	-3	3	1515	1518	Going to drop another weight.
7/31	5	28	28			124	-11	0	3	1515	1518	Dropped the second weight.
7/31	5	28	58			124	-9	0	3	1515	1518	NAV: Doppler Reset
7/31	05	29	39	45.933167	-129.982547	107	-13	0	3	1515	1518	Going to drive straight east to get the RAS.
7/31	05	30	18	45.933150	-129.982320	83	-7	0	1	1517	1518	There was a patch of black fresh basalt that we just passed.
7/31	05	30	26	45.933161	-129.982298	81	-9	0	2	1517	1519	The RAS is straight ahead of us.
7/31	05	31	11	45.933179	-129.982226	83	-8	0	2	1516	1519	The RAS has a really large anchor on it.
7/31	05	31	55	45.933181	-129.982203	92	-8	0	2	1517	1519	Need to release a pull pin on the bottom of the chain the RAS is floating from.
7/31	05	33	05	45.933188	-129.982194	92	-8	-1	2	1517	1519	Going to hold the RAS with the Schilling arm.
7/31	05	34	24	45.933189	-129.982205	92	-10	1	2	1517	1519	Grasped the RAS in the Schilling.
7/31	05	35	11	45.933185	-129.982209	92	-10	0	2	1517	1519	Pulling the pull pin from the cylinder attached to the corner of the RAS actually - not the chain.
7/31	05	36	05	45.933182	-129.982207	92	-11	1	2	1517	1519	Now going to pull the line from the top of the cylinder - it's the beacon.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	05	36	31	45.933182	-129.982206	93	-10	0	2	1516	1519	Let go of the RAS with the left hand.
7/31	05	38	30	45.933187	-129.982207	92	-9	-3	3	1516	1519	Pulling the USBL beacon out of the cylinder with the line.
7/31	05	38	38	45.933187	-129.982214	92	-9	-3	3	1516	1519	Pulling away from the RAS.
7/31	05	39	49	45.933187	-129.982311	92	-9	-3	3	1516	1518	Putting the tracking beacon down on the basket.
7/31	05	41	12	45.933188	-129.982312	92	-10	-3	3	1516	1518	The beacon's in the basket - tying the bungee down over it.
7/31	05	42	15	45.933190	-129.982316	92	-9	-3	3	1516	1518	Now the beacon is tied down.
7/31	05	42	59	45.933190	-129.982318	92	-9	-1	3	1516	1518	Retracting the basket.
7/31	05	43	11	45.933191	-129.982314	92	-10	-2	3	1516	1519	Next we'll go to get the RAS and release the anchor.
7/31	05	44	15	45.933211	-129.982206	129	-8	-2	1	1517	1518	The RAS anchor looks like it's kicked up a lot of the orange hydrothermal sediment and is showing the black basalt underneath.
7/31	05	45	58	45.933203	-129.982206	131	-8	-1	1	1517	1518	Looking at the lines and the pull pins on the anchor.
7/31	05	49	22	45.933171	-129.982216	40	-7	-2	1	1518	1519	Going to pull the blue line.
7/31	05	49	56	45.933173	-129.982223	40	-7	-2	1	1518	1519	Pulling the pin attached to the blue line.
7/31	05	51	20	45.933180	-129.982220	35	-9	1	1	1518	1519	Going to try driving backwards.
7/31	05	51	52	45.933176	-129.982241	31	-9	0	1	1518	1519	The pin won't quite release - driving backwards and pulling it.
7/31	05	52	06	45.933176	-129.982242	31	-9	1	2	1518	1519	Lots of orange sediments being kicked up in the water.
7/31	05	52	48	45.933172	-129.982231	38	-9	-2	1	1518	1519	Dropped the line - going to try with the Schilling arm.
7/31	05	53	40	45.933169	-129.982227	52	-8	0	1	1518	1519	Waiting for some of the floc to clear to see better.
7/31	05	53	54	45.933172	-129.982223	57	-10	1	1	1518	1519	Going back in for another try at the pull pin.
7/31	05	55	29	45.933172	-129.982233	54	-5	-4	1	1518	1519	Grasped the blue line again with the right arm.
7/31	05	55	41	45.933173	-129.982234	54	-5	-4	1	1518	1519	Giving the line a shake to untangle the chain.
7/31	05	56	09	45.933173	-129.982231	54	-6	-1	1	1518	1519	Reaching in with the Schilling to give it a pull.
7/31	05	57	28	45.933180	-129.982221	55	-4	0	1	1518	1519	There's a rubber band holding the pull pin in - trying to pull and snap the rubber band to release the line.
7/31	05	58	28	45.933188	-129.982210	54	-4	1	1	1518	1519	The pull pin is out.
7/31	05	58	56	45.933192	-129.982207	54	-4	1	1	1518	1519	Leaving the pull pin - we can get an extra rock!
7/31	05	59	16	45.933197	-129.982202	54	-4	1	1	1518	1519	Going to pull on the red line now - it connects the two anchors.
7/31	05	59	26	45.933198	-129.982201	54	-4	1	1	1518	1519	The red anchor line is off too.
7/31	06	00	36	45.933185	-129.982207	54	-5	-2	1	1518	1519	Holding the RAS near the anchor is generally a good idea.
7/31	06	00	47	45.933180	-129.982215	55	-6	1	2	1518	1519	Can also hold the RAS from the line above the RAS.
7/31	06	01	05	45.933185	-129.982247	42	-8	0	2	1517	1519	Backing away from the RAS to look at the vent marker 33 where we can deploy the RAS.
7/31	06	01	33	45.933232	-129.982276	42	-6	0	1	1517	1518	Looking for Marker 33 now.
7/31	06	02	58	45.933240	-129.982397	106	-8	1	2	1516	1518	There's lots of orange sediments here with white filaments on this lava flow.
7/31	06	03	58	45.933192	-129.982338	91	-8	-1	1	1517	1519	Here's a marker.
7/31	06	04	26	45.933190	-129.982337	91	-8	-1	1	1517	1519	This area has some orange sediment and black lava with white sulfur filaments present.
7/31	06	04	57	45.933191	-129.982335	91	-8	0	2	1517	1519	There's some shimmering water in front of the marker.
7/31	06	05	21	45.933193	-129.982333	91	-8	0	1	1517	1519	This crack was measured earlier - it's 27 C.
7/31	06	05	33	45.933194	-129.982333	91	-8	0	2	1517	1519	We can take the MTR out and then put the RAS intake in to this site.
7/31	06	06	40	45.933176	-129.982317	91	-8	0	2	1517	1519	The RAS has an ~18ft hose coming off it that has 2 MTRs on it. It's the intake so it can stretch pretty far.
7/31	06	07	28	45.933176	-129.982277	91	-9	-1	2	1516	1519	Going back to the RAS now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	06	08	12	45.933173	-129.982228	91	-7	-1	1	1518	1519	We're at the RAS now - going to pick it up from as far down the chain as possible.
7/31	06	09	55	45.933180	-129.982218	93	-9	0	1	1518	1519	Using the Schilling arm to pick up the RAS chain.
7/31	06	10	38	45.933186	-129.982224	89	-17	-1	3	1516	1519	Picked the RAS up.
7/31	06	10	52	45.933189	-129.982260	88	-18	-1	4	1515	1519	Driving back to the Marker 33 site.
7/31	06	15	33	45.933154	-129.982334	86	-5	0	1	1518	1519	Putting the RAS down next to the vent.
7/31	06	17	11	45.933157	-129.982312	7	-8	-1	2	1517	1519	Releasing the intake line for the RAS which is wrapped on a corner of the frame.
7/31	06	17	56	45.933159	-129.982314	7	-9	0	2	1517	1519	This is a 2-handed job.
7/31	06	18	49	45.933155	-129.982317	7	-10	1	2	1517	1519	Trying to position Jason in the right place.
7/31	06	19	55	45.933151	-129.982312	7	-9	3	2	1517	1519	Grasped the intake line with the Schilling.
7/31	06	20	03	45.933151	-129.982311	7	-9	3	2	1517	1519	Going to pull the pin with the other arm.
7/31	06	21	12	45.933154	-129.982310	8	-8	0	2	1517	1519	Pulled the line off the frame - the intake is halfway free.
7/31	06	21	23	45.933156	-129.982311	7	-8	0	2	1517	1519	Putting the yellow rope pull in the basket.
7/31	06	22	50	45.933157	-129.982313	8	-9	2	2	1517	1519	Pulling away from the RAS and unwinding the intake cord as we go.
7/31	06	23	33	45.933157	-129.982322	23	-9	2	2	1517	1519	Only one more rubber band is holding the intake cord to the frame.
7/31	06	24	07	45.933158	-129.982326	37	-9	3	2	1517	1519	Going to try and see where the rubber band is.
7/31	06	24	18	45.933159	-129.982331	53	-9	2	2	1517	1519	The intake might reach the vent without even needing to snap the rubber band.
7/31	06	27	08	45.933191	-129.982304	142	-9	2	2	1517	1519	We'll try to put the intake in the vent as is without unwinding the whole cord.
7/31	06	30	14	45.933157	-129.982294	142	-10	1	1	1517	1519	It looks like it's too short - the rubber band needs to be broken.
7/31	06	30	31	45.933161	-129.982291	142	-9	2	1	1517	1519	Putting the intake down and going to go snap the rubber band.
7/31	06	31	26	45.933187	-129.982307	143	-8	-1	1	1517	1519	Pulling away from the RAS.
7/31	06	32	18	45.933192	-129.982281	225	-9	-2	3	1516	1519	Circling around the RAS to the rubber band corner.
7/31	06	33	32	45.933169	-129.982290	265	-8	-1	2	1517	1519	Looking at the intake hose and the rubber band tying it to the frame.
7/31	06	34	35	45.933168	-129.982278	265	-10	2	3	1517	1519	Gripping the RAS frame with the Schilling.
7/31	06	35	47	45.933166	-129.982288	265	-9	0	2	1517	1519	Going to try to break the rubber band - or pull the hose to snap the rubber band.
7/31	06	37	22	45.933151	-129.982308	265	-9	0	2	1517	1519	Pulling at the rubber band with a finger - it snapped.
7/31	06	37	27	45.933151	-129.982308	265	-9	0	2	1517	1519	The intake hose is free.
7/31	06	37	51	45.933153	-129.982307	265	-9	2	2	1517	1519	Now there's plenty of slack for the intake to be positioned in the vent.
7/31	06	38	43	45.933165	-129.982304	265	-8	-1	3	1517	1519	Let go of the RAS - moving Jason back around to the vent.
7/31	06	40	23	45.933176	-129.982310	213	-8	-2	2	1517	1519	The RAS is actually programmed to take a sample at 08:00.
7/31	06	40	42	45.933171	-129.982313	213	-7	-1	1	1518	1519	The RAS is positioned right next to the marker.
7/31	06	42	36	45.933190	-129.982291	213	-10	-2	1	1518	1519	Untying the HFS intake wand from the basket.
7/31	06	42	48	45.933193	-129.982287	213	-10	-1	1	1518	1519	Actually first have to move the MTRs.
7/31	06	45	51	45.933196	-129.982279	213	-10	-1	2	1517	1519	Changing Jason watch.
7/31	06	46	58	45.933203	-129.982291	200	-10	-1	1	1517	1519	We'll set up to measure the temperature just to check it's still the same as last time.
7/31	06	47	12	45.933207	-129.982299	189	-9	-2	1	1518	1519	Then we need to move the MTR so we can put the RAS intake there.
7/31	06	47	24	45.933209	-129.982299	190	-10	-1	1	1518	1519	We'll leave the MTR to one side.
7/31	06	47	36	45.933209	-129.982300	195	-9	-2	1	1518	1519	Then we need to put the RAS intake into the hole.
7/31	06	49	42	45.933215	-129.982230	189	-6	-3	1	1518	1519	Picking up the MTR.
7/31	06	50	28	45.933194	-129.982265	189	-5	-4	1	1518	1519	Moving MTR 4094 to the side - it's now to the right of where it was before - 4'o clock from the RAS anchor.
7/31	06	51	16	45.933187	-129.982287	189	-6	-4	1	1518	1519	Picking up the HFS intake and holding it over the crack.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	06	52	22	45.933182	-129.982281	189	-7	-2	1	1518	1519	TEMPS: HFS temperature It's about 5.9 C.
7/31	06	52	47	45.933183	-129.982288	188	-7	-3	1	1518	1519	Moving the HFS intake around to find a good temperature spot.
7/31	06	54	31	45.933193	-129.982296	189	-7	-3	1	1518	1519	Going to pick up the RAS intake line.
7/31	06	55	00	45.933194	-129.982287	188	-7	-3	1	1518	1519	Moving the RAS intake away from the diffuse venting crack so the HFS intake can measure the temperature.
7/31	06	56	12	45.933196	-129.982291	188	-7	-3	1	1518	1519	TEMPS: HFS temperature The temperature's up to 15 C now.
7/31	06	56	48	45.933195	-129.982294	188	-7	-3	1	1518	1519	TEMPS: HFS temperature It's 16.1 C and rising.
7/31	06	57	40	45.933197	-129.982298	188	-7	-3	1	1518	1519	It's 17.5 C - we'll move it to another corner and see what the temp is like there.
7/31	06	58	35	45.933190	-129.982299	188	-7	-3	1	1518	1519	Now it's 18.4 and rising quickly.
7/31	06	59	35	45.933178	-129.982283	188	-7	-4	1	1518	1519	TEMPS: HFS temperature It's 21 C.
7/31	06	59	49	45.933176	-129.982281	188	-7	-3	1	1518	1519	Take a filtered sample here.
7/31	07	01	03	45.933182	-129.982281	188	-7	-3	1	1518	1519	SAMPLE: fluid J2-583-HFS-01: filtered bag #23. Start.
7/31	07	05	47	45.933173	-129.982294	188	-7	-4	1	1518	1519	J2-583-HFS-01 cont. stop 0704. Tmax=21.7 Tavg=21.0 T2=11 Vol=475ml. Z=1519m. In the hole where the RAS sampler will go. This is the same place as we sampled on J2-581.
7/31	07	08	54	45.933165	-129.982266	221	-4	1	1	1519	1520	Better position for RAS sampler here at Mkr-33. 129 58.9384' 45 55.9896'. Z=1518. This should be the position for HFS-01 also.
7/31	07	09	18	45.933165	-129.982270	221	-4	1	1	1519	1520	Checking another little vent opening to see if it's as warm as the last sight. Right next to the last hole.
7/31	07	12	35	45.933171	-129.982276	221	-4	1	1	1519	1520	Back to the original site.
7/31	07	14	50	45.933170	-129.982290	218	-4	2	1	1519	1519	Picking up the RAS intake and preparing to deploy it in the crack between pillows in diffuse flow.
7/31	07	25	14	45.933179	-129.982280	185	-7	-3	1	1518	1519	Still positioning the RAS wand in the crack. Want it standing up just right.
7/31	07	28	16	45.933180	-129.982297	184	-7	-2	1	1518	1520	We will put a marker here before we go. We want to see if the marker-eating monster is still around next year says Bill.
7/31	07	30	25	45.933176	-129.982286	184	-7	-2	1	1518	1519	RAS intake is good.
7/31	07	31	06	45.933172	-129.982285	184	-7	-2	1	1518	1519	REDEPLOY the MTR here in another little crack with diffuse flow.
7/31	07	32	32	45.933170	-129.982284	184	-8	-3	1	1518	1519	Moved MTR 4094 to ~20cm away from the RAS intake.
7/31	07	34	00	45.933180	-129.982264	185	-8	0	1	1518	1519	DEPLOY: marker Mkr-166 will be deployed a little a little way from the diffuse flow here to keep it from getting all gummed up.
7/31	07	36	34	45.933161	-129.982311	126	-3	2	1	1519	1519	Mkr166 deployed on top of a rock next to the MTR and RAS at Mkr-33. Nav target added: Mkr166. -129 58.9371 45 55.9896 Z=1518.6m.
7/31	07	39	01	45.933208	-129.982294	92	-8	0	2	1517	1519	Going to move toward the Smiley Face marker to see the extent of the new lava on the east side.
7/31	07	39	29	45.933219	-129.982222	93	-8	0	2	1517	1519	Heading 90 deg to check out the eastern extent of the 2011 lava.
7/31	07	41	57	45.933310	-129.982093	75	-7	1	1	1519	1520	Tubeworms here and an anemone. This must be a little pocket of older lava in the new lava.
7/31	07	42	29	45.933315	-129.982092	75	-7	1	1	1519	1520	NAV: Dropped DVL target Tubeworm Survivors. Anemone here as well.
7/31	07	42	35	45.933318	-129.982092	75	-7	1	1	1519	1520	NAV: Doppler Reset
7/31	07	43	07	45.933315	-129.982046	80	-9	0	2	1518	1520	Kipuka is an island of older lava surrounded by new lava.
7/31	07	43	32	45.933305	-129.981957	125	-9	1	2	1518	1520	Continuing on here and now there is no biology again.
7/31	07	43	58	45.933285	-129.981895	100	-8	-1	2	1518	1520	Floc everywhere in the water column.
7/31	07	44	22	45.933309	-129.981842	121	-7	0	2	1518	1520	Here we are at Smiley Face marker. It's a little ridge of jumbled lavas. We're facing east.
7/31	07	44	54	45.933311	-129.981767	99	-9	1	2	1519	1521	There is new lava on the other side of Smiley face.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	07	45	36	45.933278	-129.981687	98	-8	0	2	1519	1521	Big pillows on the east side of Smiley instead of lobates. We're downhill - getting deeper as we go east.
7/31	07	45	50	45.933270	-129.981661	98	-10	1	2	1519	1521	Moving downslope. Still in it.
7/31	07	46	08	45.933247	-129.981652	97	-8	0	2	1519	1521	Yellow hydrothermal seds still covering the pillows here.
7/31	07	46	58	45.933220	-129.981634	96	-8	0	1	1520	1521	Smiley face is probably on the elongate (N/S) hill seen on the nav underlay.
7/31	07	47	22	45.933221	-129.981618	90	-8	0	1	1520	1521	Big pillows with lots of fuzzy yellow stuff on them.
7/31	07	48	25	45.933241	-129.981540	90	-8	-1	1	1520	1521	Pillows are surrounding this older pillar feature.
7/31	07	48	39	45.933239	-129.981533	89	-8	1	2	1520	1522	There's a black patch with no sediments on one side.
7/31	07	49	11	45.933240	-129.981510	90	-8	0	1	1520	1521	We're right near where Cloud used to be. It's constrained by the edge of the collapse.
7/31	07	49	40	45.933240	-129.981532	139	-8	1	1	1520	1521	HIGHLIGHTS: KiPro hard drive start The edge of the new flow constrained by the pillars.
7/31	07	50	05	45.933258	-129.981559	139	-8	0	2	1519	1521	The flow seems to end right here. It's lying on top of the jumbled flow.
7/31	07	50	27	45.933251	-129.981532	139	-8	0	1	1520	1521	We want to see this better.
7/31	07	50	59	45.933260	-129.981512	98	-7	-3	1	1520	1521	NAV: Dropped DVL target CONTACT right here in this grotto.
7/31	07	51	39	45.933290	-129.981519	63	-8	0	2	1520	1521	Se want to get some good images. High def video on here.
7/31	07	52	05	45.933312	-129.981510	58	-8	0	1	1520	1521	This is just beautiful. Coming up on another "garage" here.
7/31	07	52	22	45.933310	-129.981520	43	-8	0	1	1520	1521	The pillows on the edge are blacker with less sediments.
7/31	07	53	32	45.933355	-129.981511	107	-9	1	2	1520	1521	We see a line here. What is it? It looks kind of old.
7/31	07	54	21	45.933378	-129.981420	109	-9	0	4	1517	1521	We want to see what's on the end of the line.
7/31	07	54	31	45.933374	-129.981381	107	-11	0	4	1517	1522	We're on the 1998 flow here.
7/31	07	54	40	45.933382	-129.981355	115	-9	0	2	1518	1520	HIGHLIGHTS: KiPro hard drive stop
7/31	07	55	02	45.933391	-129.981303	158	-9	0	1	1518	1520	Turning around and heading to the south now.
7/31	07	55	37	45.933358	-129.981277	258	-9	1	1	1519	1520	Bill is putting on the microphone and running the show.
7/31	07	56	01	45.933326	-129.981351	236	-9	0	1	1518	1520	We're heading south now to follow this eastern edge of the flow.
7/31	07	56	47	45.933298	-129.981436	236	-8	0	2	1518	1520	We're going to drop off the 1998 flow ledge back down to the 2011 pillow/lobate area.
7/31	07	57	57	45.933279	-129.981520	177	-6	1	2	1519	1521	We are a bit east of Cloud vent. We're back down on the 2011 lava. Pillows covered with hydrothermal/biological orangey gelatinous goo.
7/31	07	58	17	45.933255	-129.981485	177	-9	0	2	1519	1522	Pillars of 1998 lava sticking out with 2011 pillows around it.
7/31	07	58	33	45.933236	-129.981485	149	-9	0	2	1520	1522	This is a contact here - probably the one we saw earlier.
7/31	07	58	41	45.933233	-129.981482	148	-9	1	2	1520	1522	HIGHLIGHTS: KiPro hard drive start Moving south now.
7/31	07	59	03	45.933214	-129.981495	144	-10	0	1	1519	1521	Where are those pillows coming from?
7/31	07	59	29	45.933188	-129.981511	175	-9	0	4	1518	1522	This is all 1998 collapse below us.
7/31	08	00	10	45.933179	-129.981553	163	-8	0	3	1519	1522	There's more new lava pillows ahead. They seem to terminate on at the pillars.
7/31	08	00	52	45.933194	-129.981566	165	-8	0	2	1520	1522	We're looking south now. New pillows butted up against 1998 pillars.
7/31	08	01	45	45.933218	-129.981495	106	-8	0	1	1521	1522	Pillow lobes right up against the pillars.
7/31	08	02	25	45.933222	-129.981484	106	-4	-3	1	1521	1522	Beautiful shot here of young pillows under the lava arch.
7/31	08	03	16	45.933228	-129.981489	78	-1	4	1	1521	1522	Zooming in to look at the red animal on the pillar. It's a shrimp alright.
7/31	08	04	05	45.933230	-129.981492	78	-8	1	2	1520	1522	Looking at the little shrimp on the pillar.
7/31	08	04	38	45.933227	-129.981490	78	-8	0	2	1520	1522	What is he doing here? We don't remember ever seeing shrimp here. What the heck?
7/31	08	04	47	45.933226	-129.981488	78	-8	1	2	1520	1522	Let's head southwest?
7/31	08	05	14	45.933204	-129.981494	163	-9	1	5	1516	1521	Moving over the top of the lava arch.
7/31	08	05	35	45.933147	-129.981497	176	-8	1	2	1517	1519	Heading southwest now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	08	06	00	45.933076	-129.981560	224	-9	2	2	1518	1520	Turning south; now SW.
7/31	08	06	18	45.933046	-129.981610	230	-9	1	3	1519	1521	New pillows butted up against an old pillar.
7/31	08	06	33	45.933006	-129.981641	227	-9	0	2	1519	1521	We're now west of the edge of the 1998 collapse. White staining off to the right.
7/31	08	06	41	45.932988	-129.981655	228	-8	1	2	1519	1521	Eruption mat covering the pillows.
7/31	08	06	53	45.932967	-129.981665	228	-9	0	1	1519	1520	HIGHLIGHTS: KiPro hard drive start Heading to the west.
7/31	08	07	22	45.932919	-129.981729	227	-9	0	3	1518	1521	Floc is thick here. Where's the darn floc coming from?
7/31	08	07	43	45.932880	-129.981766	227	-8	1	3	1519	1521	We just passed up over some really big pillows. Here's another pile of them.
7/31	08	08	30	45.932824	-129.981768	191	-8	0	2	1519	1521	Bill has coined the term "eruption mat". That sounds good.
7/31	08	08	40	45.932824	-129.981745	191	-8	0	2	1519	1522	More pillows up against 1998 pillars.
7/31	08	09	27	45.932728	-129.981754	218	-8	1	3	1520	1523	We're close to where we sampled the pillows on the last dive in the channel south of Mkr-33.
7/31	08	11	00	45.932695	-129.981860	219	-7	1	1	1522	1523	Now we're out of the 2011 lava. Here's another CONTACT here That's an amazing contact. Long pillow lobe.
7/31	08	11	15	45.932689	-129.981882	217	-8	-1	2	1521	1523	Z=1522 here.
7/31	08	11	30	45.932668	-129.981899	218	-9	0	2	1521	1523	The flow is 1 pillow thick here. so we're right at the edge.
7/31	08	11	38	45.932653	-129.981901	219	-7	0	2	1521	1522	We're following it to the SW here.
7/31	08	12	05	45.932591	-129.981897	212	-8	1	2	1522	1524	Pillar fragments sticking up. Still see nice black (?) 2011 pillows.
7/31	08	12	19	45.932575	-129.981909	212	-9	1	4	1521	1524	NAV: Dropped DVL target Contact here.
7/31	08	12	57	45.932556	-129.982038	254	-9	1	4	1518	1522	Still heading SW (hdg 225).
7/31	08	13	03	45.932556	-129.982053	279	-8	0	4	1519	1522	We're on 1998 collapse here.
7/31	08	13	51	45.932478	-129.982130	217	-9	0	4	1519	1523	Now we're in the 1998 collapse.
7/31	08	14	24	45.932406	-129.982192	215	-10	0	3	1519	1522	We're deeper than Mkr-33 site - but it didn't get down here.
7/31	08	15	42	45.932330	-129.982395	229	-8	0	4	1517	1522	Moving over the 1998 pillars and collapse area.
7/31	08	16	55	45.932216	-129.982621	228	-8	1	1	1519	1520	We're just coming out of the 1998 collapse area. This is un-collapsed 1998 flow.
7/31	08	17	10	45.932196	-129.982661	229	-8	1	2	1518	1520	There is not as thick of hydrothermal mat on here.
7/31	08	18	44	45.932096	-129.982865	222	-8	1	1	1519	1520	This is pelagic sediment on the 1998 flow - but it looks like the eruptive sediment - but it doesn't cover it in the same way.
7/31	08	18	56	45.932079	-129.982905	223	-8	0	3	1519	1522	We're now getting into more of a Swiss cheese area with lots of collapses.
7/31	08	19	07	45.932059	-129.982929	223	-9	0	1	1519	1520	No sign of the 2011 lava out here.
7/31	08	19	19	45.932030	-129.982961	221	-9	0	3	1519	1521	The 1998 flow is pretty dramatic looking.
7/31	08	19	54	45.931971	-129.983014	223	-8	0	3	1518	1521	Little starfish on the side of that 1998 flow.
7/31	08	20	39	45.931877	-129.983094	223	-7	0	1	1519	1520	Haven't seen any holothurians or crabs. A year ago we would have seen holothurians everywhere. They were cruising around eating the sediment.
7/31	08	20	47	45.931866	-129.983105	223	-7	0	2	1519	1521	Ratfish in his own dog house.
7/31	08	21	31	45.931798	-129.983194	222	-9	0	2	1519	1522	HIGHLIGHTS: KiPro hard drive stop
7/31	08	21	53	45.931751	-129.983245	223	-10	0	3	1519	1522	We're heading to the International District. This is information about where the 2011 lava isn't.
7/31	08	22	17	45.931704	-129.983301	223	-8	1	2	1518	1520	Hole in the collapse.
7/31	08	22	53	45.931670	-129.983352	231	-8	1	1	1519	1520	There's a holothurian. It's the first one we've seen since we've been here. He didn't get fried or swept away.
7/31	08	23	35	45.931626	-129.983421	229	-9	0	1	1518	1520	Coming out of "bad Swiss cheese" to more lobate. 1998 lavas here.
7/31	08	24	08	45.931570	-129.983484	230	-8	1	1	1519	1520	Another holothurian here.
7/31	08	25	25	45.931553	-129.983529	232	-9	0	2	1518	1520	Another holothurian.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	08	25	57	45.931483	-129.983669	231	-10	0	2	1518	1520	This is uncollapsed 1998 lava.
7/31	08	27	08	45.931384	-129.983881	230	-8	0	2	1519	1520	Fish dead ahead.
7/31	08	28	29	45.931314	-129.984000	230	-11	0	2	1519	1521	Steady as she goes.
7/31	08	29	32	45.931258	-129.984068	231	-8	0	1	1520	1521	Contact right here.
7/31	08	29	54	45.931270	-129.984084	243	-8	0	1	1520	1521	Bill thinks the eruptive fissure(s) are further west than they were in 1998.
7/31	08	30	30	45.931261	-129.984074	248	-8	0	1	1520	1521	We want to stay here until we can put a target here.
7/31	08	31	01	45.931235	-129.984016	220	-8	0	1	1520	1521	This is 2011 lava over 1998. We're on another eastern edge of the 2011 lava.
7/31	08	31	30	45.931198	-129.984024	219	-8	0	1	1520	1521	The eruptive fissure for this flow must be further west than the 1998 fissure.
7/31	08	31	54	45.931186	-129.984051	217	-6	-2	1	1520	1521	This is a beautiful contact here.
7/31	08	32	59	45.931186	-129.984052	218	-3	-2	1	1520	1521	Really black lavas here. There are brittle stars on this new lava contact.
7/31	08	33	17	45.931168	-129.984081	219	-10	0	1	1520	1521	NAV: Dropped DVL target Contact.
7/31	08	33	59	45.931052	-129.984256	231	-9	1	1	1520	1521	Dark fresh pillows just barely covering the 1998 lava. Along the contact.
7/31	08	34	07	45.931047	-129.984293	231	-9	1	1	1520	1521	Same heading 225 degrees.
7/31	08	34	31	45.931036	-129.984369	277	-8	1	1	1519	1521	HIGHLIGHTS: KiPro hard drive start
7/31	08	34	50	45.931052	-129.984420	320	-8	0	1	1519	1521	The contact is right ahead here.
7/31	08	35	27	45.930991	-129.984523	266	-8	0	1	1519	1521	Jason is facing NW now. 2011 lava on top of 1998 lava. It's very thin here. Just one pillow thick.
7/31	08	36	16	45.930855	-129.984619	208	-9	0	1	1519	1521	2011 lava to SW and 1998 lava to SE.
7/31	08	36	36	45.930784	-129.984656	208	-10	-1	2	1519	1521	Still traveling along this contact.
7/31	08	37	06	45.930674	-129.984727	210	-8	0	2	1519	1521	Now we're in the 2011 lavas but still seeing the 1998 flow.
7/31	08	37	15	45.930635	-129.984755	208	-10	0	2	1519	1520	We couldn't have picked a better heading.
7/31	08	37	25	45.930591	-129.984790	208	-9	1	2	1519	1521	Now we're on 1998 lava.
7/31	08	37	58	45.930508	-129.984980	215	-10	0	2	1519	1521	Still on 1998 lava.
7/31	08	38	04	45.930497	-129.985007	219	-8	0	1	1520	1521	HIGHLIGHTS: KiPro hard drive stop
7/31	08	39	22	45.930384	-129.985319	230	-7	0	2	1519	1521	We're looking NW to another contact. Can still see through to the 1998 surface.
7/31	08	39	26	45.930373	-129.985326	222	-10	0	2	1519	1521	We're facing SW.
7/31	08	39	40	45.930331	-129.985377	224	-11	0	1	1519	1520	We're on 1998 lava??
7/31	08	40	07	45.930249	-129.985424	220	-9	0	1	1519	1520	This looks like the older stuff now.
7/31	08	41	24	45.930130	-129.985429	221	-9	0	1	1519	1520	This is the 1998 lava. Another orange shrimp on here.
7/31	08	41	49	45.930106	-129.985445	222	-9	0	1	1519	1520	It seems like the source of the 2011 lava we were seeing is to the north of us.
7/31	08	42	31	45.930061	-129.985529	221	-10	1	1	1519	1520	HIGHLIGHTS: KiPro hard drive stop
7/31	08	43	03	45.930001	-129.985605	223	-10	1	1	1519	1520	Rattail ahead.
7/31	08	43	21	45.929984	-129.985635	223	-8	0	1	1519	1520	1998 lavas.
7/31	08	44	16	45.929914	-129.985741	223	-8	0	3	1517	1520	We're heading to the SW (225 degrees).
7/31	08	44	52	45.929881	-129.985811	223	-7	0	2	1518	1520	We haven't had a nav underlay for quite some time so it's hard to tell where we are. Casey has been multitasking.
7/31	08	45	48	45.929797	-129.985906	221	-12	0	2	1518	1520	Lava swirl right beneath us.
7/31	08	46	10	45.929767	-129.985929	222	-7	0	2	1518	1520	Still on 1998 lava.
7/31	08	46	25	45.929780	-129.985927	223	-8	0	1	1518	1520	We're close to the western edge of the 1998 lava flow.
7/31	08	47	04	45.929762	-129.985957	223	-8	1	1	1519	1520	Nav hold up.
7/31	08	47	26	45.929745	-129.985975	224	-8	0	2	1519	1520	Bill is deciding what to do next.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	08	50	03	45.929859	-129.985934	128	-8	0	1	1519	1520	Reset doppler
7/31	08	51	16	45.929846	-129.985802	132	-8	0	2	1518	1520	Drove SW from Marker 33. Now turning SE and heading for the International District.
7/31	08	52	04	45.929784	-129.985731	133	-8	0	2	1518	1520	saw no venting 2011 flow was very thin.
7/31	08	54	14	45.929636	-129.985584	132	-9	0	2	1518	1520	Flying over 98 lava. Bill doesn't expect to see more 2011 lava in this direction.
7/31	08	56	26	45.929544	-129.985341	126	-8	0	1	1519	1521	Still over 98 flow.
7/31	08	57	08	45.929534	-129.985313	170	-8	0	1	1520	1520	Looking at contact.
7/31	08	57	33	45.929566	-129.985271	100	-8	0	1	1519	1521	Hdg 160 looking at a contact.
7/31	08	59	28	45.929471	-129.985407	177	-11	0	2	1518	1520	Heading SE and on 98 flow.
7/31	09	00	42	45.929392	-129.985288	79	-9	-1	1	1520	1521	Drove S about 40 m turning SE.
7/31	09	01	22	45.929393	-129.985135	120	-9	-1	2	1519	1521	Hdg 120
7/31	09	02	00	45.929343	-129.985013	127	-7	0	2	1519	1521	All 98 flow.
7/31	09	02	52	45.929286	-129.984882	125	-10	0	2	1519	1520	160 meters to the International District.
7/31	09	03	56	45.929252	-129.984803	127	-10	0	1	1519	1520	All 98 flow on this transect - except for one questionable site.
7/31	09	08	15	45.929001	-129.984528	129	-8	0	2	1520	1522	We've been in uncollapsed 1998 lavas but now we're in jumbled.
7/31	09	09	30	45.928925	-129.984379	126	-9	0	2	1520	1522	We've turned to the SE toward the International District.
7/31	09	09	56	45.928901	-129.984329	128	-7	0	2	1521	1522	No new lavas on this SE traverse since we turned.
7/31	09	13	24	45.928657	-129.983983	128	-8	1	3	1520	1523	Heading to the SE over 1998 jumbled flow.
7/31	09	14	02	45.928618	-129.983892	125	-9	1	2	1520	1523	We're getting into pillows to the right - jumbled to the left.
7/31	09	14	07	45.928613	-129.983872	126	-7	2	3	1520	1523	NAV: Doppler Reset
7/31	09	14	32	45.928602	-129.983803	127	-8	0	2	1520	1522	Bill doesn't think there were pillows in there before in the collapse of the 1998 flow.
7/31	09	14	47	45.928584	-129.983758	126	-8	0	2	1520	1521	HIGHLIGHTS: KiPro hard drive start
7/31	09	15	06	45.928561	-129.983716	126	-7	1	1	1521	1522	Can we look at this a bit closer?
7/31	09	15	35	45.928567	-129.983708	108	-5	2	1	1521	1522	Bill doesn't think there were pillows in this area in 1998.
7/31	09	15	47	45.928568	-129.983711	109	-5	1	1	1521	1522	Jason is going to give it a poke.
7/31	09	16	00	45.928569	-129.983712	108	-4	3	1	1521	1522	The mat seems fuzzy.
7/31	09	16	30	45.928570	-129.983719	108	-4	3	1	1521	1522	Looks pretty shiny where Jason gave this a poke.
7/31	09	16	53	45.928568	-129.983725	108	-4	3	1	1521	1522	It could be new lava but not 100 percent sure.
7/31	09	17	20	45.928546	-129.983720	132	-9	0	2	1520	1522	In the 1998 collapse and we are seeing pillows here.
7/31	09	17	33	45.928523	-129.983687	132	-10	0	2	1520	1521	Bill thinks the floor of this was all jumbled before.
7/31	09	17	53	45.928488	-129.983646	133	-8	0	2	1520	1522	The one thing that raises questions for Bill is that the contact was not all dark.
7/31	09	19	00	45.928333	-129.983424	133	-9	-1	1	1520	1521	Looks like the sedimentation is getting thicker and uniformly covering everything.
7/31	09	19	12	45.928312	-129.983396	132	-9	0	2	1520	1521	The lobes are getting broader and flatter.
7/31	09	19	27	45.928284	-129.983365	134	-11	0	3	1519	1521	No biota on these lavas.
7/31	09	20	03	45.928196	-129.983250	132	-10	0	2	1519	1521	Maybe it knocked over the pillars or buried them.
7/31	09	20	42	45.928098	-129.983139	133	-9	1	2	1519	1521	Bill thinks it's new. It was not in here before. It has eruption mat all over it. We should be in pillars and they are not here. The 2011 lava is totally filling the 1998 collapse area here.
7/31	09	20	51	45.928078	-129.983123	133	-9	0	2	1519	1521	Here's part of the old collapse.
7/31	09	21	34	45.928040	-129.983061	112	-8	0	1	1519	1521	2011 lobate flow inundating the 1998 flow. The pillows are almost up to the top of the lava arch.
7/31	09	22	14	45.928046	-129.983022	130	-9	-1	2	1519	1521	We're facing SE and we don't see the pillows to the SW.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	09	22	50	45.928067	-129.982959	164	-8	0	1	1520	1521	New lava on the bottom bleeding this collapse area.
7/31	09	22	58	45.928069	-129.982945	161	-8	0	1	1520	1521	Looks like a yellow snow storm.
7/31	09	23	38	45.928055	-129.982889	142	-10	0	3	1518	1521	The most sediment-laden lavas are the youngest...Marv says it's counterintuitive.
7/31	09	23	51	45.928013	-129.982882	146	-10	0	1	1519	1520	More 2011 lava.
7/31	09	24	19	45.927931	-129.982845	146	-8	0	1	1519	1521	The 2011 lava is butting up against these lava arches.
7/31	09	25	23	45.927894	-129.982789	190	-8	0	1	1520	1521	Biota on the 1998 lava? Just white bacterial mat and scaleworms. More orange-colored mat here.
7/31	09	26	31	45.927892	-129.982785	187	-9	-1	1	1519	1520	We want to look on the other side of this to see where the 2011 lava is?
7/31	09	26	56	45.927896	-129.982837	186	-8	0	1	1519	1520	We're going to look around first to figure out the age of the lavas here.
7/31	09	27	15	45.927898	-129.982871	158	-9	0	1	1519	1520	2011 lava is almost overflowing the collapse.
7/31	09	27	49	45.927896	-129.982824	161	-12	-4	2	1519	1521	Bill says these pillars are 4 - 5 meters high so that lava is pretty deep.
7/31	09	28	00	45.927893	-129.982816	160	-9	-2	1	1519	1520	HIGHLIGHTS: KiPro hard drive stop while setting up to sample.
7/31	09	29	06	45.927894	-129.982817	160	-9	-3	1	1519	1520	Going to take a syringe sample of this white filamentous mat here.
7/31	09	29	27	45.927892	-129.982812	161	-9	-2	1	1519	1520	2011 lavas here filling the collapse area almost to the top.
7/31	09	30	53	45.927844	-129.982839	52	-9	-3	1	1519	1520	HIGHLIGHTS: KiPro hard drive start A bit of HD before we sample it (the white bacterial mat here). Small patch of white microbial mat on the 2011 lava that is filling up this collapse area. Will take a syringe sample of it.
7/31	09	32	29	45.927870	-129.982833	52	-12	-1	1	1520	1521	You can see the black shiny lava rind under the orange eruptive mat and the white bacterial mat.
7/31	09	32	49	45.927872	-129.982831	52	-14	0	1	1520	1521	Zooming in. What are the red things?
7/31	09	33	00	45.927873	-129.982829	52	-14	0	1	1520	1521	No animals or shimmering water either.
7/31	09	33	05	45.927873	-129.982828	52	-14	0	1	1520	1521	Looking around at the mat.
7/31	09	34	04	45.927878	-129.982822	52	-13	0	1	1520	1521	White fluffy mat - like cotton balls.
7/31	09	35	54	45.927875	-129.982820	52	-13	0	1	1520	1521	SAMPLE: bio J2-582-Mat-02. Syringe (white large) sample of white fluffy mat on the eruptive mat. Naming this Cotton Ball. Z=1520m. Hdg 52deg.
7/31	09	38	40	45.927872	-129.982820	52	-13	-1	1	1520	1521	J2-582-Mat-02 cont. -129 58.9694' 45 55.6733'. Looks like it triggered but it didn't depress. It didn't work. Will try another syringe...and give it the same sample number.
7/31	09	43	07	45.927877	-129.982797	119	-6	4	1	1520	1521	J2-582-Mat-02 cont. Small red syringe sampler this time. This is on 2011 lobate flow with eruptive mat - very orange here covered in darker mat..
7/31	09	45	02	45.927875	-129.982798	118	-6	3	98	1520	1618	J2-582-Mat-02 cont. Zooming in on the sample. The sample looks good. This is for Oliver.
7/31	09	49	12	45.927877	-129.982798	118	-7	1	186	1520	1706	J2-582-Mat-02 storage issues.
7/31	09	50	36	45.927875	-129.982802	118	-7	1	112	1520	1632	Going to take 2 MTRs out of the port biobox and put them in the rock box. They'll be deployed at International district later.
7/31	09	52	37	45.927885	-129.982798	118	-7	1	1	1520	1521	We've not seen hardly any venting. We've seen no collapse on the 2011 lava.
7/31	09	52	52	45.927887	-129.982798	118	-7	2	98	1520	1618	Where's the venting and where's the eruptive fissures?
7/31	09	57	02	45.927887	-129.982807	118	-6	4	1	1520	1521	SAMPLE: bio There is a ground fault in something.
7/31	09	57	27	45.927888	-129.982803	118	-6	4	1	1520	1521	The Jason guys are discussing things.
7/31	09	58	14	45.927882	-129.982798	118	-6	4	1	1520	1521	Seems OK??
7/31	10	00	17	45.927872	-129.982784	118	-7	3	179	1520	1699	SAMPLE: bio J2-582-Mat-03 . Small blue syringe sample of the orange and gray/tan mat (the last sample was the white mat). Same position here at Cotton Ball.
7/31	10	00	38	45.927874	-129.982784	118	-7	3	179	1520	1699	Hard ground on the GC (gas chromatograph).

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	10	06	36	45.927865	-129.982850	118	-7	3	1	1520	1521	J2-582-Mat-03 cont. Going to try to suck some more in there. Right on the boundary of orange and tan mat. One last try.
7/31	10	08	03	45.927892	-129.982782	118	-7	2	1	1520	1521	That's better. The Blue syringe sample is going into the port biobox.
7/31	10	08	25	45.927889	-129.982757	118	-7	3	1	1520	1521	Stowing the samples and then we are going to head toward the International District.
7/31	10	09	40	45.927888	-129.982767	116	-9	1	1	1520	1520	Continue SE toward the International district.
7/31	10	09	53	45.927878	-129.982769	117	-8	0	1	1519	1521	NAV: Doppler Reset
7/31	10	10	16	45.927846	-129.982766	131	-9	1	1	1519	1520	The 2011 lava is up level with the 1998 lava.
7/31	10	10	32	45.927822	-129.982759	129	-8	0	2	1519	1521	We're about 300m from the International District.
7/31	10	11	09	45.927792	-129.982707	130	-9	-1	1	1519	1520	2011 lava is even with the 1998 flow.
7/31	10	11	17	45.927791	-129.982688	129	-9	0	1	1519	1520	Mat on the lava here.
7/31	10	12	06	45.927724	-129.982566	136	-9	0	1	1519	1520	More white mat ahead.
7/31	10	13	01	45.927693	-129.982507	137	-8	0	1	1519	1520	All of a sudden we're seeing more white mat. The lavas are dark all of a sudden. The eruption mat just stopped.
7/31	10	13	09	45.927690	-129.982496	136	-9	0	1	1519	1520	HIGHLIGHTS: KiPro hard drive start
7/31	10	13	54	45.927685	-129.982480	137	-9	0	1	1519	1520	Whooh. There is a hole in the lava that is coated in white microbes. Lots of diffuse flow coming out of this hole.
7/31	10	15	12	45.927681	-129.982480	134	2	-1	1	1519	1520	Lots of scaleworms. Finally - some venting. It looks like a big mouth with lots of diffuse venting.
7/31	10	17	05	45.927675	-129.982482	135	0	2	1	1519	1520	DEPLOY: marker Diffuse venting pouring out of this hole. There are scaleworms around the edge of this hole that seems to be pushed up out of the lavas. It's slightly raised.
7/31	10	17	40	45.927680	-129.982486	136	1	1	1	1519	1520	It looks like there is a pillar down in the hole?? The lavas here are really black and shiny.
7/31	10	18	32	45.927682	-129.982487	135	1	1	1	1519	1520	The flow is really pouring out of the little raised hole - with another one right behind it. The fluid coming out has a milky look to it.
7/31	10	19	24	45.927680	-129.982480	135	1	1	1	1519	1520	DEPLOY: marker Deploying marker 170 off to the side of these hole that are pouring out diffuse fluids and floc. (Boca vent)
7/31	10	21	02	45.927684	-129.982493	134	1	1	1	1519	1520	HIGHLIGHTS: KiPro hard drive start Boca venting site. Several holes with fluid and floc coming out. This is the first venting we've seen. Floc coming out of these holes with milky fluid.
7/31	10	23	00	45.927685	-129.982492	134	1	1	1	1519	1520	Marker 170 position and Boca vents position: Z=1519m. 129 58.9489' 45 55.6615'. We're 300m from International district. We're in the middle of the 1998 collapse area (old Mkr-108 area).
7/31	10	23	07	45.927683	-129.982491	135	1	1	1	1519	1520	HIGHLIGHTS: KiPro hard drive stop
7/31	10	24	38	45.927677	-129.982475	165	-2	-1	1	1519	1520	Taking the temperature of these vents. Little one first.
7/31	10	26	16	45.927678	-129.982481	164	-2	-2	1	1519	1520	All of a sudden when we came upon this area of venting the eruptive mat disappeared and the lavas are glassy and black.
7/31	10	26	34	45.927679	-129.982481	164	-2	-2	1	1519	1520	Lots of gunk coming out of the vent.
7/31	10	28	01	45.927676	-129.982484	164	-4	-2	1	1519	1520	HIGHLIGHTS: DVD Deck start Schilling arm cam in the hole.
7/31	10	29	29	45.927675	-129.982484	164	-3	-2	1	1519	1520	Working to switch out the hard disks. Stopped working right before 10:22.
7/31	10	30	02	45.927677	-129.982482	164	-4	-2	1	1519	1520	Temperature rising. Only got up to 15.4.
7/31	10	31	26	45.927678	-129.982477	164	-2	-2	1	1519	1520	The smaller hole was venting - temps up to 16C.
7/31	10	32	14	45.927677	-129.982476	164	-2	-2	1	1519	1520	The bigger hole temp is going up. There's a lot of flow coming out.
7/31	10	32	38	45.927678	-129.982476	164	-2	-2	1	1519	1520	That's quite a gaping hole. Kind of like Cloud vent was.
7/31	10	35	02	45.927680	-129.982463	153	0	-5	1	1519	1520	This is a pretty lava swirl mound with these circular (ball-like) holes with milky fluids extruding.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	10	38	08	45.927688	-129.982469	154	-1	-3	1	1519	1520	SAMPLE: fluid H2-582-HFS-04. Unfiltered bag #24. Start 1038. Boca vent.
7/31	10	38	38	45.927687	-129.982467	154	-1	-3	1	1519	1520	HIGHLIGHTS: KiPro hard drive start Back on after switching out hard drives.
7/31	10	40	48	45.927689	-129.982466	154	-1	-3	1	1519	1520	Fluid sampling in this big hole (that looks like a gaping mouth) called Boca Vent. Mkr-170 off to the side.
7/31	10	41	20	45.927689	-129.982460	154	-1	-3	1	1519	1520	H2-582-HFS-04. Stop 104045. Tmax=16.8 Tavg=16.6 T2=9.3. Vol=475ml. Boca Vent.
7/31	10	42	11	45.927686	-129.982452	154	-1	-3	1	1519	1520	SAMPLE: fluid J2-582-HFS-05 Filtered bag #21. Start 1042.07.
7/31	10	45	34	45.927673	-129.982481	154	-1	-3	1	1519	1520	H2-582-HFS-05 cont. Same orifice as previous sample. Tmax=16.9 Tavg=16.7 T2=9.5. Vo=475ml.
7/31	10	46	51	45.927670	-129.982489	154	-1	-3	1	1519	1520	SAMPLE: fluid J2-582-HFS-06. RNA Filter #16.104620. Same exact spot as previous samples here.
7/31	10	48	11	45.927665	-129.982495	154	-1	-3	1	1519	1520	NAV: Doppler Reset
7/31	10	49	33	45.927664	-129.982492	154	-1	-3	1	1519	1520	This place looks like it should be really hot according to Jimmy -
7/31	10	50	26	45.927669	-129.982484	154	-1	-3	1	1519	1520	These scaleworms look different than others. They're shinier and deeper red color. They don't look like the emblyejii.
7/31	10	51	13	45.927668	-129.982485	154	-1	-3	1	1519	1520	The highlights are still on.
7/31	10	53	27	45.927667	-129.982486	154	-1	-3	1	1519	1520	HIGHLIGHTS: KiPro hard drive stop
7/31	10	56	17	45.927686	-129.982461	154	-1	-3	1	1519	1520	Bird pump on for the GC.
7/31	11	00	24	45.927682	-129.982458	154	-1	-3	1	1519	1520	Boca is a few circular (skylight?) vents on the new 2011 eruption lavas. Lava is shiny and black. As we approached the venting the eruptive mat (yellow/orange) disappeared and the lavas were black and glassy.
7/31	11	04	41	45.927682	-129.982476	154	-1	-3	1	1519	1520	H2-582-HFS-06 cont.
7/31	11	10	56	45.927680	-129.982464	154	-1	-3	1	1519	1519	H2-582-HFS-06 Stop=1110 Tmax=17.0 Tavg=16.7 T2=9.5 Vol=3000ml (Huber).
7/31	11	11	32	45.927681	-129.982469	154	-1	-3	1	1519	1519	SAMPLE: fluid J2-582-HFS-07 DNA filter #12 Start=1111.
7/31	11	20	34	45.927683	-129.982459	154	-1	-3	1	1519	1519	CORRECTION!! Last sample label(vv 9664) is J2-583-HFS-07
7/31	11	22	03	45.927679	-129.982470	154	-1	-3	1	1519	1519	CORRECTION!! (vv# 9663-9659) Sample number should be J2-583-HFS-06 RNA filter #16.
7/31	11	26	52	45.927689	-129.982471	154	-1	-3	1	1519	1519	J2-583-HFS-07 cont.
7/31	11	32	40	45.927679	-129.982469	154	-1	-3	1	1519	1519	J2-583-HFS-07 Stop=1132 Tmax=17.1 Tavg=16.8 T2=9.4 Vol=3000 (Huber).
7/31	11	33	38	45.927680	-129.982473	154	-1	-3	1	1519	1519	SAMPLE: fluid J2-583-HFS-08 Filtered Piston #5 Start=1133.
7/31	11	35	15	45.927684	-129.982470	154	-1	-3	1	1518	1519	J2-583-HFS-08 cont.
7/31	11	38	35	45.927689	-129.982458	154	-1	-3	1	1518	1519	SAMPLE: fluid J2-583-HFS-08 Stop=1137 Tmax=17.0 Tavg=16.9 T2=9.4 Vol=650 (Butterfield).
7/31	11	38	48	45.927692	-129.982457	154	-1	-3	1	1518	1519	Stowing the beast preparing to fire a hand held gas tight.
7/31	11	41	01	45.927696	-129.982455	154	0	-5	1	1518	1519	Some pieces of the rim broke off and now the flock is flying.
7/31	11	47	31	45.927686	-129.982462	154	0	-5	1	1518	1519	SAMPLE: fluid J2-583-GTB-09 Red gas tight #9 fired at 1146.
7/31	11	49	17	45.927683	-129.982460	154	1	-6	1	1518	1519	We want to deploy a MTR into the vent and take a rock sample.
7/31	11	49	31	45.927683	-129.982461	154	1	-6	1	1518	1519	This hole looks like a good way to loose and MTR.
7/31	11	49	43	45.927684	-129.982463	154	1	-6	1	1518	1519	Marv wants to use this picture for Christmas cards because of all the snow.
7/31	11	56	17	45.927684	-129.982469	154	-1	-4	1	1518	1519	Attempting to grab a piece of rock with scale worms on it.
7/31	11	57	53	45.927691	-129.982469	154	-1	-4	1	1518	1519	SAMPLE: geo J2-583-Rock-10 from Boca Vent same position as fluid sampling stowing in port biobox.
7/31	11	58	40	45.927689	-129.982473	155	-1	-4	1	1518	1519	Another attempt is being made to collect a piece of the rock.
7/31	11	59	48	45.927683	-129.982475	155	-1	-4	1	1518	1519	Second piece of rock with same sample name J2-583-rock-10 stowed in the port biobox.
7/31	11	59	56	45.927683	-129.982473	155	-1	-4	1	1518	1519	Stowing the biobox.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	12	01	00	45.927687	-129.982467	156	-1	-3	1	1518	1519	Want to deploy MTR in Boca vent to the right.
7/31	12	05	43	45.927684	-129.982478	156	0	-4	1	1518	1519	DEPLOY: MTR 3043 temp probe at Boca snowblower vent. MTR 3043 off the right in a crack.
7/31	12	06	22	45.927686	-129.982476	156	-1	-4	1	1518	1519	Frame_Grab:
7/31	12	06	59	45.927689	-129.982475	156	0	-5	1	1518	1519	Worried that if we put it in any farther it will fall into the never ending hole.
7/31	12	08	22	45.927685	-129.982475	158	-8	0	1	1517	1519	Move the boat at 0.2 knots towards the International District to explore and meander about the new flow.
7/31	12	08	29	45.927685	-129.982476	158	-7	0	2	1517	1519	We have zigged now we are zagging.
7/31	12	09	30	45.927665	-129.982423	121	-7	1	2	1517	1519	Heading southeast our heading is 121.
7/31	12	10	09	45.927643	-129.982409	121	-8	0	2	1517	1519	Almost immediately we are seeing the eruption mat as soon as we get out of the venting area on 2011 lava.
7/31	12	11	29	45.927538	-129.982303	121	-8	0	3	1516	1519	It's a Contact the orangish stuff is 2011 and its banked up against the 1998 eruption lava.
7/31	12	12	11	45.927522	-129.982294	121	-8	0	4	1516	1520	Target set and called Contact .
7/31	12	12	23	45.927522	-129.982293	121	-8	0	3	1516	1520	Waiting for Medea to get going.
7/31	12	14	05	45.927508	-129.982298	121	-6	-2	1	1519	1520	Zooming in on rocks and taking pictures.
7/31	12	14	12	45.927507	-129.982299	120	-9	0	1	1519	1520	Frame_Grab:
7/31	12	14	42	45.927507	-129.982300	122	-8	-1	1	1519	1520	Foreground in 1998 jumbled up stuff and the background is 2011 lava.
7/31	12	14	49	45.927507	-129.982300	122	-8	-1	1	1519	1520	They don't look very different.
7/31	12	15	27	45.927507	-129.982300	122	-8	-1	1	1519	1520	We left Boca and got out of the venting very quickly.
7/31	12	15	38	45.927507	-129.982299	122	-8	-1	1	1519	1520	Interesting that there wasn't this type of mat around the vent.
7/31	12	19	46	45.927431	-129.982131	121	-8	0	3	1517	1520	Continuing our transit. We see all these black spots... stuff flocked off?
7/31	12	20	39	45.927407	-129.982070	121	-8	0	2	1517	1519	We should be passing the deepest part of the collapse.
7/31	12	21	23	45.927390	-129.981993	121	-8	0	2	1517	1519	Temperature has been at a flat background for the past 5 minutes or so.
7/31	12	22	06	45.927376	-129.981915	121	-8	0	2	1517	1519	Flying over 1998 lava that has these collapsed parts perhaps there is some 2011 lobate in there but it's hard to tell.
7/31	12	22	19	45.927366	-129.981890	121	-8	0	2	1517	1519	Looks like there is a lower level infill from 2011.
7/31	12	22	30	45.927359	-129.981875	122	-8	0	2	1517	1519	Coming out of 1998 remnant and probably this is 2011.
7/31	12	23	01	45.927333	-129.981807	120	-8	0	2	1517	1520	The 2011 has filled in the collapse. We should be going over a canyon but lava must have filled in this channel.
7/31	12	23	28	45.927315	-129.981758	121	-8	0	2	1517	1519	That was a narrow little band of 2011 now we are on the other side of the canyon looking at 1998.
7/31	12	23	49	45.927299	-129.981715	121	-8	0	2	1517	1519	Both flows are covered in yellow mat differentiating flow mainly based on topography.
7/31	12	24	43	45.927270	-129.981628	120	-9	0	2	1517	1519	We saw Holothurian those are sea cucumbers
7/31	12	25	38	45.927238	-129.981583	121	-8	0	2	1517	1519	Going over mostly intact roof of 1998 lava.
7/31	12	25	49	45.927232	-129.981566	120	-9	0	2	1517	1519	We should be coming up to another collapsed part in another 25m.
7/31	12	26	00	45.927222	-129.981546	120	-8	0	2	1517	1519	We are about 150m from the International District.
7/31	12	26	29	45.927218	-129.981539	121	-8	0	2	1517	1519	We can bump up the speed of travel slightly because we are not seeing any venting.
7/31	12	26	35	45.927214	-129.981533	121	-8	0	1	1517	1519	Boat moving 0.3knots.
7/31	12	27	56	45.927172	-129.981473	121	-8	0	2	1517	1519	We see an odd colored patch in a square. Stopping to investigate.
7/31	12	28	58	45.927137	-129.981394	121	-8	0	4	1517	1521	Here is the edge of the preexisting collapse area.
7/31	12	29	56	45.927093	-129.981286	121	-8	0	3	1518	1521	We are going down into the collapse to have a look.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	12	30	07	45.927081	-129.981260	120	-9	0	3	1519	1522	Its old lava - looks like 1998.
7/31	12	30	53	45.927030	-129.981156	121	-8	0	4	1518	1522	Jason is rising to avoid pillars.
7/31	12	31	36	45.927026	-129.981146	121	-8	0	5	1517	1522	Looking at the top of the pillar. It has limpets and slight flow.
7/31	12	35	38	45.926880	-129.980834	121	-7	0	4	1516	1520	Speeding up to get to International District because nothing looks too interesting.
7/31	12	40	02	45.926664	-129.980412	121	-8	0	2	1516	1519	1998 Flow doesn't seem to be covered in orange mat over here which seems consistent with the idea that the flow started to the west.
7/31	12	40	47	45.926641	-129.980356	120	-8	0	2	1516	1519	Going past the last eastern part of the collapse before we leave it.
7/31	12	44	11	45.926551	-129.979957	111	-9	0	2	1517	1519	Getting to the edge of the 1998 flow this is the edge of the collapse on the east side.
7/31	12	44	44	45.926581	-129.979852	111	-9	-1	5	1514	1519	Straight ahead is the inactive sulfide chimney Top Gun.
7/31	12	46	10	45.926576	-129.979606	110	-8	1	5	1512	1517	Something looming in the murky waters.
7/31	12	46	20	45.926567	-129.979597	112	-7	-1	8	1509	1517	It is El Guapo.
7/31	12	46	50	45.926554	-129.979540	137	-8	0	11	1504	1515	It feels like we are doing science in a blizzard.
7/31	12	47	18	45.926550	-129.979513	157	-8	-1	13	1504	1517	El Guapo has two chimney spires smoking.
7/31	12	49	12	45.926408	-129.979096	111	-9	0	4	1518	1522	We see Diva straight ahead.
7/31	12	49	22	45.926394	-129.979078	110	-8	1	3	1519	1522	There is a Hobo in it and a marker next to it.
7/31	12	49	50	45.926376	-129.979070	47	-8	0	3	1520	1523	Our plan is to do some fluid sampling and trade out the Hobos.
7/31	12	51	46	45.926371	-129.979068	43	-5	1	1	1521	1522	We are going to pull the hobo out and put in the Jason temp probe.
7/31	12	52	37	45.926373	-129.979069	44	-8	3	2	1521	1522	NAV: Doppler Reset
7/31	12	53	53	45.926377	-129.979067	43	-6	2	2	1521	1522	RECOVER: temp probe MISO 129 from Diva with port arm. Knocked over the anhydrite chimney in the process.
7/31	12	57	36	45.926380	-129.979060	43	-8	1	2	1521	1522	Taking Jason temperature readings.
7/31	12	57	58	45.926379	-129.979060	43	-8	1	2	1521	1522	TEMPS: Jason temperature so far 273C.
7/31	12	59	27	45.926371	-129.979062	43	-8	1	2	1521	1522	Position 129 58.7436'W 45 55.5822'N.
7/31	12	59	49	45.926370	-129.979063	43	-7	0	2	1521	1522	Depth=1520.8 Hdg=42.8.
7/31	13	00	12	45.926368	-129.979064	43	-7	1	2	1521	1522	Jiggling temperature probe around to get hottest reading.
7/31	13	00	34	45.926368	-129.979065	43	-8	1	2	1521	1522	TEMPS: Jason temperature Highest temperature recorded 276C.
7/31	13	02	29	45.926374	-129.979070	43	-8	1	2	1521	1522	Bringing out fluid sampler for sampling.
7/31	13	03	41	45.926374	-129.979066	43	-8	1	2	1521	1522	Starting to see hot water coming out the exhaust.
7/31	13	05	33	45.926378	-129.979057	43	-8	1	2	1520	1522	SAMPLE: fluid J2-583-HFS-11 Unfiltered Piston #11 Start=1305.
7/31	13	05	48	45.926379	-129.979056	43	-8	1	2	1520	1522	GC membrane tear when pumping hot water.
7/31	13	06	43	45.926380	-129.979057	43	-8	1	2	1520	1522	J2-583-HFS-11 pump didn't start.
7/31	13	07	09	45.926378	-129.979059	43	-8	1	2	1521	1522	We are at DIVA vent in a hole where the anhydrite used to be.
7/31	13	07	19	45.926377	-129.979060	43	-8	1	2	1520	1522	SAMPLE: fluid J2-583-HFS-11 Restart=1307.
7/31	13	08	55	45.926377	-129.979066	43	-7	1	2	1521	1522	J2-583-HFS-11 cont.
7/31	13	10	08	45.926381	-129.979063	43	-7	1	2	1520	1522	SAMPLE: fluid J2-583-HFS-11 Stop=1309 Tmax=271 Tavg 270.6 T2=75 Vol=400 (Butterfield).
7/31	13	11	04	45.926378	-129.979058	43	-7	1	2	1520	1522	SAMPLE: fluid J2-583-GTHFS-12 : Firing purple #10 port gastight 1310 (Butterfield).
7/31	13	11	19	45.926377	-129.979056	43	-7	1	2	1520	1522	J2-583-HFS-13 Filtered Piston #3 Start 1311.
7/31	13	11	47	45.926374	-129.979055	43	-7	1	2	1520	1522	SAMPLE: fluid J2-583-HFS-13 Filtered Piston #3 Start 1311.
7/31	13	14	00	45.926373	-129.979061	43	-7	1	2	1520	1522	Tying to decide where to take handheld gas tights.
7/31	13	14	40	45.926374	-129.979059	43	-8	1	2	1520	1522	J2-583-HFS-13 Stop=1314 Tmax=272 Tavg=271.6 T2=82 Vol=400 (Butterfield).

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	13	15	03	45.926374	-129.979057	43	-7	1	2	1520	1522	SAMPLE: fluid J2-583-HFS-13 Stop=1314 Tmax=272 Tavg=271.6 T2=82 Vol=400 (Butterfield).
7/31	13	15	14	45.926374	-129.979057	43	-7	1	2	1520	1522	Stowing the inlet to do a major sampler.
7/31	13	16	49	45.926372	-129.979055	43	-7	1	2	1520	1522	Sure is nothing living around this vent anymore.
7/31	13	18	46	45.926361	-129.979066	44	-12	-2	4	1519	1522	Bringing round the starboard swing arm to take a major sampler.
7/31	13	19	37	45.926366	-129.979063	42	-10	1	2	1520	1522	Marker 150 at this vent we call Diva.
7/31	13	21	06	45.926370	-129.979058	42	-8	1	2	1520	1522	Actually lets not take a major sampler here because of the high gas concentration.
7/31	13	21	26	45.926372	-129.979057	42	-7	1	2	1520	1522	Instead lets deploy and recover the Hobo.
7/31	13	23	55	45.926376	-129.979062	42	-7	1	2	1520	1522	Going to deploy Hobo 153 here at Diva vent.
7/31	13	28	50	45.926371	-129.979068	42	-8	1	2	1520	1522	DEPLOY: MISO temp probe 153 at Diva vent.
7/31	13	33	02	45.926370	-129.979062	42	-7	1	2	1520	1522	Positioning the Hobo in the vent just trying to get the tubing in a deep as we can.
7/31	13	41	13	45.926377	-129.979067	42	-6	-1	2	1520	1522	HOBO 153 is installed in Diva vent. Stowing the HOBO we recovered.
7/31	13	42	05	45.926377	-129.979065	42	-5	-1	2	1521	1522	RECOVER: temp probe MISO 129 from Diva site stowing on the basket.
7/31	13	44	01	45.926377	-129.979062	42	-5	1	2	1521	1522	We are moving to Escargot.
7/31	13	44	33	45.926365	-129.979061	46	-9	0	3	1519	1522	We are checking our ballasting.
7/31	13	47	15	45.926366	-129.979108	345	-9	-1	3	1519	1522	We decided to head to 9meter Chimney
7/31	13	50	07	45.926427	-129.979314	344	-11	-1	1	1521	1522	The water is murky.
7/31	13	51	24	45.926475	-129.979324	344	-8	-1	6	1515	1521	We are at 9 meter chimney and we are going to sample diffuse flow fluids.
7/31	13	53	11	45.926507	-129.979302	232	-9	0	4	1516	1520	Investigating where the best place to take a sample would be.
7/31	13	53	30	45.926497	-129.979297	245	-10	-1	3	1517	1520	We see some blue mat.
7/31	13	54	01	45.926494	-129.979297	246	-10	0	4	1517	1520	Marker 153 site to the right of the chimney.
7/31	13	54	54	45.926493	-129.979293	247	-8	-1	4	1517	1520	We are parking in front of a tubeworm and sulfide worm bush with lots of limpets.
7/31	13	56	10	45.926494	-129.979286	247	0	-2	3	1517	1520	We are planning on sampling in this bush biology area at 9 meter chimney.
7/31	13	57	10	45.926492	-129.979283	247	4	-1	3	1517	1521	Position is 129 58.7590'W 45 55.5893'N Depth=1517.3 Hdg=247.1.
7/31	13	57	55	45.926490	-129.979281	248	3	-1	3	1517	1521	Inlet in shimmering water moving it around to find best temperature.
7/31	14	03	52	45.926505	-129.979296	233	-9	-1	3	1517	1520	Changing position to find better flow going closer to marker Hdg=232.7
7/31	14	05	52	45.926508	-129.979302	232	-11	-1	3	1517	1520	Found a more fresh tubeworms section putting tip in small empty shimmering area surrounded by worms.
7/31	14	05	59	45.926508	-129.979302	232	-10	-1	3	1517	1520	Inlet checking temperature.
7/31	14	08	29	45.926513	-129.979301	232	-11	-1	3	1517	1520	Maximum temperature up in the 60's.
7/31	14	08	37	45.926514	-129.979301	232	-11	-1	3	1517	1520	Moving around probe to get something cooler.
7/31	14	16	13	45.926503	-129.979291	231	-11	-1	3	1517	1520	Still juggling about inlet looking for best temperature.
7/31	14	18	52	45.926512	-129.979290	232	-10	-1	3	1517	1520	We finally found the spot underneath a tiny spicket of focused flow in a bush of tubeworms.
7/31	14	20	08	45.926505	-129.979291	232	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-14 Unfiltered piston #8 Start=1420.
7/31	14	22	26	45.926522	-129.979301	232	-10	-1	3	1517	1520	TEMPS: HFS temperature 32C.
7/31	14	25	34	45.926502	-129.979291	231	-10	-1	3	1517	1520	J2-583-HFS-14 cont.
7/31	14	26	18	45.926506	-129.979289	231	-10	-1	3	1517	1520	J2-583-HFS-14 Stop=1425 Tmax=35.2 Tavg=33.1 T2=15 Vol=650 (Butterfield).
7/31	14	27	09	45.926515	-129.979292	231	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-15 DNA Sterivex Filter #10 Start=1427.
7/31	14	47	13	45.926513	-129.979292	232	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-15 Stop=11:46 Tmax=35.7 Tavg=32.7 T2=15 Vol=2000 (Huber). At 9meter Chimney in tubeworm bush. Location: 45 55.5893 129 58.7590. Z=1517m.
7/31	14	48	02	45.926512	-129.979293	231	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-16 Filtered bag #17 Start=1447.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	14	51	55	45.926512	-129.979281	232	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-16 Stop=1451 Tmax=32.1 Tavg=31 T2=14 Vol=480 (Butterfield).
7/31	14	52	22	45.926511	-129.979280	231	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-17 RNA Filter #15 Start=1452.
7/31	15	14	01	45.926515	-129.979285	231	-10	-1	3	1517	1520	SAMPLE: fluid J2-583-HFS-17 finished.
7/31	15	14	37	45.926514	-129.979284	231	-10	-1	3	1517	1520	J2-583-HFS-17: Tmax=32.0 Tavg=30.6 T2=15 Vol=3000.
7/31	15	15	19	45.926513	-129.979281	231	-10	-2	3	1517	1520	We're done water sampling here.
7/31	15	15	33	45.926513	-129.979279	232	-10	-2	3	1517	1520	Moving around to the side to look at the blue mat.
7/31	15	15	47	45.926514	-129.979278	231	-10	-2	3	1517	1520	Actually going to stow the HFS intake first.
7/31	15	17	36	45.926518	-129.979272	231	-10	-1	3	1517	1520	HFS intake is stowed.
7/31	15	17	59	45.926518	-129.979273	231	-10	-1	3	1517	1520	Now we'll go laterally to the left.
7/31	15	19	45	45.926505	-129.979261	269	-10	-1	3	1517	1520	May try to just grab some of this mat off the rocks here.
7/31	15	20	22	45.926503	-129.979270	266	-10	-1	4	1517	1520	It's not particularly blue but it's the same sort of stuff as is usually blue - it could just be covered with white mat.
7/31	15	20	59	45.926504	-129.979272	266	-11	-1	4	1517	1520	There are several patches here so we can try sampling different patches if we don't get the first one.
7/31	15	21	11	45.926504	-129.979273	266	-11	-1	4	1517	1520	It looks like it's growing on top of the limpets.
7/31	15	21	13	45.926504	-129.979273	266	-11	-1	4	1517	1520	Frame_Grab:
7/31	15	21	56	45.926507	-129.979272	266	-11	-1	4	1517	1520	Going to try to grab this piece and put it in the port biobox.
7/31	15	22	18	45.926507	-129.979272	266	-12	-2	4	1517	1520	Reaching with the Kraft arm.
7/31	15	23	30	45.926506	-129.979272	265	-11	-2	4	1517	1520	The mat seems very solid here.
7/31	15	24	39	45.926504	-129.979277	265	-11	-3	4	1517	1520	The ram slid around on the Kraft arm - the arm might have some problems?
7/31	15	24	50	45.926504	-129.979278	265	-12	-2	4	1517	1520	Trying to scrape the blue mat down so we can suck some up.
7/31	15	25	23	45.926504	-129.979279	265	-12	-2	4	1517	1520	Some mat has blown away after scraping.
7/31	15	25	51	45.926504	-129.979279	265	-11	-3	4	1517	1520	We'll just try to suck it up in the syringe here - it doesn't seem nearly as attached as it usually does to basalts.
7/31	15	27	59	45.926512	-129.979277	266	-11	1	4	1517	1520	Trying to fix the ram which has rotated around 180 degrees with the Schilling arm.
7/31	15	30	18	45.926514	-129.979273	265	-11	0	4	1517	1520	Still fixing the ram.
7/31	15	30	28	45.926513	-129.979274	265	-11	-1	4	1517	1520	Now it's aligned - it's not tight but it's in the right position.
7/31	15	30	56	45.926512	-129.979276	265	-11	-1	4	1517	1520	Going to test it.
7/31	15	31	09	45.926512	-129.979278	265	-11	-1	4	1517	1520	Extended the ram - it looks good.
7/31	15	31	56	45.926510	-129.979281	265	-11	-3	4	1517	1520	Now going to pick up the red large syringe.
7/31	15	33	24	45.926508	-129.979279	265	-10	-3	4	1517	1520	Pulling the bungee cord off the syringe.
7/31	15	34	03	45.926507	-129.979277	265	-10	-3	4	1517	1520	Picking up the syringe sampler now.
7/31	15	35	15	45.926503	-129.979271	265	-11	-3	4	1517	1520	Getting the syringe out of the basket.
7/31	15	35	57	45.926501	-129.979268	265	-11	-3	4	1517	1520	Testing the ram again.
7/31	15	36	50	45.926500	-129.979269	265	-12	-3	4	1517	1520	Rotating syringe around so ram is in position for firing it.
7/31	15	37	51	45.926501	-129.979273	265	-11	-3	4	1517	1520	This syringe should suck up a little bit slower than usual - may try moving the nozzle back and forth a little as it pulls for a couple seconds.
7/31	15	38	20	45.926502	-129.979275	265	-11	-3	4	1517	1520	The lower clump of mat looks like it's easier to collect - it's even less attached.
7/31	15	38	52	45.926503	-129.979277	265	-11	-3	4	1517	1520	J2-583-Mat-18. Going to fire the syringe now.
7/31	15	39	09	45.926504	-129.979278	265	-11	-3	4	1517	1520	Got a little bit of blue mat in the syringe.
7/31	15	39	39	45.926505	-129.979279	265	-12	-3	4	1517	1520	Storing the syringe in the basket now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	15	42	47	45.926497	-129.979278	265	-10	-3	4	1517	1520	Syringe is in the basket.
7/31	15	43	17	45.926497	-129.979276	265	-11	-3	4	1517	1520	SAMPLE: bio This blue mat was sample J2-583-Mat-18.
7/31	15	45	28	45.926537	-129.979308	229	-9	0	5	1516	1521	Now backing away from 9m to go to El Guapo.
7/31	15	45	58	45.926552	-129.979364	230	-8	0	3	1516	1519	El Guapo will be on the right - it's to the northwest of 9m.
7/31	15	47	21	45.926570	-129.979422	259	-9	-1	3	1516	1519	Here we are at El Guapo.
7/31	15	47	34	45.926567	-129.979434	253	-8	-1	2	1516	1519	It's kind of hard to sample from.
7/31	15	48	17	45.926555	-129.979440	250	-8	0	4	1514	1519	We're rising up El Guapo now.
7/31	15	49	12	45.926540	-129.979464	250	-8	0	6	1512	1518	Lots of dead tube worms clinging to the sides.
7/31	15	49	16	45.926540	-129.979465	250	-9	-1	6	1512	1518	Some white sulfide patches.
7/31	15	50	26	45.926535	-129.979480	250	-8	-1	10	1508	1518	Lots of orange stained worms higher up with some white patches.
7/31	15	50	38	45.926533	-129.979480	250	-8	0	11	1508	1518	HIGHLIGHTS: KiPro hard drive start El Guapo
7/31	15	51	30	45.926538	-129.979493	249	-8	0	14	1505	1518	The top pinnacle has some palm worms all over it.
7/31	15	51	47	45.926538	-129.979492	250	-8	0	13	1505	1518	There's a little bit of venting coming out the top of a sulfide cone.
7/31	15	52	55	45.926550	-129.979495	250	-8	0	14	1505	1518	We're at 1505m depth
7/31	15	53	19	45.926551	-129.979495	250	-8	0	14	1505	1518	There used to be lots of tubeworms on the top - now there's none.
7/31	15	53	36	45.926552	-129.979494	250	-8	-1	14	1505	1518	There's lots of palmworms and some scale worms crawling among them.
7/31	15	54	40	45.926553	-129.979495	250	-10	0	14	1505	1518	We'll get the Jason temp probe out.
7/31	15	54	42	45.926553	-129.979495	250	-10	0	14	1505	1518	Basket out.
7/31	15	55	40	45.926550	-129.979502	250	-10	0	14	1504	1518	The "orange stained worms" are all palm worms.
7/31	15	55	56	45.926549	-129.979504	250	-10	0	14	1504	1519	There's actually two smokers on top - one behind the other.
7/31	15	56	03	45.926549	-129.979505	250	-11	0	14	1504	1518	They're both coming out of little sulfide cones.
7/31	15	56	32	45.926549	-129.979506	250	-11	-1	14	1504	1518	HIGHLIGHTS: KiPro hard drive stop
7/31	15	58	09	45.926546	-129.979510	250	-11	-1	15	1504	1519	Getting the Jason temp probe out.
7/31	15	59	24	45.926543	-129.979509	250	-11	-2	15	1504	1519	Going to put the temp probe down the chimney.
7/31	15	59	59	45.926542	-129.979507	250	-11	-2	15	1504	1519	TEMPS: Jason temperature It's 112.9 and rising.
7/31	16	00	20	45.926541	-129.979505	250	-11	-2	15	1504	1519	Gently placing the temp probe in gives 303 C.
7/31	16	00	46	45.926538	-129.979504	250	-11	-2	15	1504	1519	This is inserted in the chimney at the right/back.
7/31	16	00	55	45.926538	-129.979503	250	-11	-2	15	1504	1519	TEMPS: Jason temperature The max is 317.9 C.
7/31	16	01	49	45.926530	-129.979502	250	-11	-2	15	1504	1519	Going to try inserting the probe in the front/left chimney.
7/31	16	02	01	45.926529	-129.979502	250	-11	-2	15	1504	1519	Knocked a little bit of the sulfide down.
7/31	16	02	14	45.926526	-129.979503	250	-11	-2	15	1504	1519	The front/left smoker looks like it's boiling.
7/31	16	02	26	45.926524	-129.979503	250	-11	-2	15	1504	1519	The chimney sulfide fell over.
7/31	16	02	31	45.926523	-129.979503	250	-11	-2	15	1504	1519	Now there's a great opening for the probe.
7/31	16	03	15	45.926515	-129.979507	250	-11	-2	15	1504	1519	Can see chalcopyrite on the rim of the vent orifice.
7/31	16	03	29	45.926512	-129.979509	250	-11	-2	15	1504	1519	HIGHLIGHTS: KiPro hard drive start El Guapo sampling.
7/31	16	03	42	45.926510	-129.979510	250	-11	-2	15	1504	1519	The probe is inserted.
7/31	16	03	52	45.926509	-129.979511	250	-11	-2	15	1504	1519	TEMPS: Jason temperature The probe is not really deeply inserted.
7/31	16	03	58	45.926508	-129.979511	250	-11	-2	15	1504	1519	The temp is 310.8 C and rising.
7/31	16	04	11	45.926506	-129.979512	250	-11	-2	15	1504	1519	Going to try putting the probe further into the vent.
7/31	16	04	51	45.926504	-129.979513	250	-11	-2	15	1504	1519	Reinserted the probe.
7/31	16	04	56	45.926504	-129.979513	250	-11	-2	15	1504	1519	Now it's 314 and rising.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	16	05	19	45.926506	-129.979511	250	-11	-2	15	1504	1519	TEMPS: Jason temperature 330 C and rising still.
7/31	16	05	55	45.926512	-129.979506	250	-11	-2	15	1504	1519	TEMPS: Jason temperature is 333 and still slowly climbing.
7/31	16	06	17	45.926517	-129.979502	250	-11	-2	15	1504	1519	TEMPS: Jason temperature Tmax is 333.4 C.
7/31	16	06	29	45.926520	-129.979500	250	-11	-2	15	1504	1519	Stowing the Jason temp probe.
7/31	16	06	32	45.926521	-129.979499	250	-11	-2	15	1504	1519	HIGHLIGHTS: KiPro hard drive stop
7/31	16	07	49	45.926541	-129.979486	250	-11	-1	15	1504	1519	Untangling the temp probe cord.
7/31	16	08	48	45.926549	-129.979484	250	-11	-2	15	1504	1519	The temp probe is stored.
7/31	16	08	53	45.926550	-129.979485	250	-11	-2	15	1504	1519	Now picking up the HFS intake wand.
7/31	16	09	35	45.926549	-129.979489	250	-11	-2	15	1504	1519	The HFS cord has run into the palm worm clump on top of El Guapo!
7/31	16	10	02	45.926547	-129.979493	250	-11	-2	15	1504	1519	Now the HFS cord is rotated so it won't knock all the worms off.
7/31	16	11	25	45.926539	-129.979504	250	-11	-2	15	1504	1519	HFS intake is inserted into the front/left chimney.
7/31	16	11	59	45.926538	-129.979505	250	-11	-2	15	1504	1519	We're at DOP: 45N 55.593' and 129W 58.772' heading 250 and depth 1504.5
7/31	16	12	08	45.926538	-129.979504	250	-11	-2	15	1504	1519	TEMPS: HFS temperature The HFS temp is stuck at 200 C.
7/31	16	12	31	45.926538	-129.979503	250	-11	-2	15	1504	1519	Trying to move the intake around to stick into the vent from a different side.
7/31	16	13	38	45.926539	-129.979498	249	-11	-3	15	1504	1519	TEMPS: HFS temperature Now the temp is 298 and rising.
7/31	16	13	57	45.926539	-129.979497	249	-11	-2	15	1504	1519	TEMPS: HFS temperature It's 320 C.
7/31	16	14	55	45.926537	-129.979494	249	-11	-3	14	1504	1519	TEMPS: HFS temperature It's 328 C now.
7/31	16	15	33	45.926533	-129.979495	249	-11	-3	15	1504	1519	SAMPLE: fluid J2-583-HFS-19: Unfiltered piston #2 starting.
7/31	16	18	38	45.926516	-129.979511	249	-11	-3	15	1504	1519	SAMPLE: fluid J2-583-HFS-19 finished.
7/31	16	19	07	45.926518	-129.979513	249	-11	-3	15	1504	1519	J2-583-HFS-19: Tmax=330.5 Tav=329.7 T2=78 Vol=550.
7/31	16	19	39	45.926521	-129.979514	249	-11	-3	15	1504	1519	SAMPLE: fluid J2-583-HFS-20: Unfiltered piston #4 starting.
7/31	16	22	41	45.926542	-129.979509	249	-11	-3	15	1504	1519	J2-583-HFS-20 finished.
7/31	16	23	07	45.926543	-129.979509	249	-11	-3	15	1504	1519	SAMPLE: fluid J2-583-HFS-20: Tmax=330.8 Tav=330.5 T2=84 Vol=551.
7/31	16	23	16	45.926543	-129.979509	249	-11	-3	15	1504	1519	SAMPLE: gas middle gastight firing
7/31	16	23	37	45.926543	-129.979509	249	-11	-3	15	1504	1519	SAMPLE: gas J2-583-GTHFS-21 center orange-black #7 fired.
7/31	16	24	26	45.926543	-129.979511	249	-10	-2	14	1504	1519	Also going to fire the major here.
7/31	16	24	31	45.926542	-129.979511	249	-11	-2	14	1504	1519	Stowing the HFS intake wand.
7/31	16	25	32	45.926540	-129.979517	249	-11	-1	15	1504	1519	We're actually lodged against El Guapo - not hovering as in previous years.
7/31	16	26	18	45.926539	-129.979523	249	-11	-2	15	1504	1519	HFS intake wand is stowed.
7/31	16	26	57	45.926541	-129.979528	249	-13	0	15	1504	1519	Starboard swingarm box is out.
7/31	16	28	42	45.926546	-129.979535	249	-13	0	15	1504	1519	Pulling the bungee off the Major in the right biobox.
7/31	16	29	32	45.926548	-129.979532	249	-12	-1	15	1504	1519	Grabbing the major now.
7/31	16	30	25	45.926549	-129.979527	249	-13	0	15	1504	1519	Pulling the major out of the biobox
7/31	16	31	26	45.926542	-129.979515	249	-12	-1	15	1504	1519	We pulled away from the chimney - moving back in now.
7/31	16	32	24	45.926540	-129.979509	250	-12	-2	15	1504	1519	Maneuvering the major into position.
7/31	16	33	13	45.926539	-129.979504	250	-12	-2	15	1504	1519	Placing the major in the vent.
7/31	16	33	32	45.926539	-129.979502	250	-12	-2	15	1504	1519	HIGHLIGHTS: KiPro hard drive start.
7/31	16	34	42	45.926540	-129.979500	250	-12	-3	15	1504	1519	SAMPLE: fluid Starting major sampler now J2-583-Major-22.
7/31	16	37	05	45.926539	-129.979509	249	-12	-3	15	1504	1519	HIGHLIGHTS: KiPro hard drive stop.
7/31	16	37	45	45.926538	-129.979515	250	-12	-1	15	1504	1519	SAMPLE: fluid J2-583-Major-22 is done.
7/31	16	39	15	45.926535	-129.979523	250	-13	0	15	1504	1519	Stowing the major in the starboard swingarm box.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	16	40	13	45.926532	-129.979523	250	-13	1	15	1504	1519	Next we'll get the MTR from Hermosa.
7/31	16	40	22	45.926532	-129.979523	250	-13	0	15	1504	1519	Then we'll do fluid sampling at Escargot.
7/31	16	40	37	45.926531	-129.979522	250	-13	0	15	1504	1519	After that we'll go to Castle and recover/deploy the HOBOS.
7/31	16	49	41	45.926530	-129.979438	220	-6	1	2	1518	1520	HIGHLIGHTS: KiPro hard drive stop
7/31	16	49	54	45.926530	-129.979442	220	-6	2	2	1518	1520	KiPro hard drive started 16:47
7/31	16	50	12	45.926526	-129.979446	221	-7	3	2	1518	1520	Recovering the MTR at Hermosa.
7/31	16	51	29	45.926508	-129.979464	220	-6	1	2	1518	1520	There's a rope with a chain attached to the end here - probably an old marker.
7/31	16	51	58	45.926513	-129.979472	220	-6	0	2	1518	1520	The MTR is actually behind the vent
7/31	16	52	30	45.926528	-129.979476	220	-7	-1	2	1518	1520	Grabbing the MTR rope.
7/31	16	52	57	45.926543	-129.979468	221	-8	-1	2	1518	1520	Stowing the MTR in the left biobox
7/31	16	55	08	45.926561	-129.979374	220	-6	0	2	1518	1520	We are going to deploy Marker 169 here at Hermosa.
7/31	16	56	16	45.926558	-129.979380	220	-8	-1	2	1518	1520	Stowing the biobox and heading to Escargot now.
7/31	16	58	13	45.926601	-129.979324	220	-8	0	4	1516	1520	It's about 30 meters to the southeast.
7/31	17	04	26	45.926403	-129.979078	240	-8	0	2	1520	1522	Diva is on the left.
7/31	17	04	32	45.926398	-129.979095	241	-9	-1	2	1520	1521	We're at Escargot now.
7/31	17	05	01	45.926388	-129.979143	241	-8	-1	2	1520	1522	Near the bottom.
7/31	17	06	45	45.926386	-129.979166	242	-8	-1	4	1517	1521	There's a small vent here on the side.
7/31	17	08	16	45.926384	-129.979156	242	-8	-1	2	1519	1522	Moving down towards the bottom to find some low temperature venting that vent on the side was high temp.
7/31	17	08	37	45.926384	-129.979147	242	-8	0	2	1520	1522	There's a patch of worms with some diffuse venting here.
7/31	17	08	42	45.926384	-129.979145	242	-8	0	2	1520	1522	Frame_Grab:
7/31	17	10	51	45.926385	-129.979162	243	-12	-2	3	1519	1521	Grabbing the HFS intake wand.
7/31	17	12	33	45.926380	-129.979151	243	-12	-2	3	1519	1521	Frame_Grab:
7/31	17	13	35	45.926378	-129.979153	243	-12	-2	3	1519	1521	The temp at that spot was only 4C or so adjusting to find a warmer spot.
7/31	17	15	30	45.926391	-129.979181	243	-11	-2	3	1519	1521	Still looking for a warmer spot.
7/31	17	17	15	45.926396	-129.979164	244	-10	-2	2	1520	1522	Maybe found a spot by these palm worms.
7/31	17	18	59	45.926392	-129.979155	243	-11	-2	2	1520	1522	Still looking for a good spot with diffuse flow.
7/31	17	19	14	45.926394	-129.979153	243	-11	-2	2	1520	1522	Moving the HFS intake wand in to see if this is a good spot to sample.
7/31	17	20	06	45.926399	-129.979148	243	-11	-2	2	1520	1522	Temp is 7C and rising.
7/31	17	20	32	45.926398	-129.979147	243	-11	-2	2	1520	1522	9C and rising still.
7/31	17	21	48	45.926383	-129.979156	243	-11	-2	2	1520	1522	10C.
7/31	17	22	34	45.926377	-129.979164	242	-11	-2	2	1520	1522	SAMPLE: fluid starting sample J2-583-HFS-23 is unfiltered bag #18
7/31	17	25	36	45.926396	-129.979149	243	-11	-2	2	1520	1522	SAMPLE: fluid still sampling
7/31	17	26	06	45.926394	-129.979147	243	-11	-2	2	1520	1522	J2-583-HFS-23 is finished.
7/31	17	27	24	45.926391	-129.979140	242	-11	-2	2	1520	1522	SAMPLE: fluid HFS-23 Tmax=10.3 Tavg=9 T2=5.5 vol=603ml
7/31	17	27	48	45.926391	-129.979140	242	-11	-2	2	1520	1522	SAMPLE: fluid CORRECTION: volume was 603ml
7/31	17	27	57	45.926392	-129.979140	242	-11	-2	2	1520	1522	SAMPLE: fluid starting J2-583-HFS-24 RNA filter #14
7/31	17	31	19	45.926390	-129.979130	242	-11	-2	2	1520	1522	Still filtering.
7/31	17	36	15	45.926384	-129.979152	242	-11	-2	2	1520	1522	2000ML to go
7/31	17	37	15	45.926390	-129.979153	242	-11	-2	2	1520	1522	The temp is dropping the tube may be clogged with worms they are going to pull it out and wiggle it around to try and get it unclogged.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	17	37	47	45.926392	-129.979153	242	-11	-2	2	1520	1522	Planning on staying down an extra 2 hours so that we can get all the necessary sampling done and we are going to skip the 2nd CTD.
7/31	17	38	08	45.926391	-129.979154	242	-11	-2	2	1520	1522	Temperature is still dropping down to 5.6C now.
7/31	17	38	44	45.926389	-129.979158	242	-12	-2	2	1520	1522	Adjusting the wand and moving it to a new spot.
7/31	17	39	12	45.926389	-129.979161	242	-11	-2	2	1520	1522	Temp is rising again up to 6.3C.
7/31	17	40	57	45.926407	-129.979148	242	-11	-2	2	1520	1522	Resuming sampling.
7/31	17	42	04	45.926406	-129.979143	242	-11	-2	2	1520	1522	We filtered 1132ml and then had to reposition and started filtering again.
7/31	17	42	19	45.926403	-129.979143	242	-12	-2	2	1520	1522	Temp is up to 9.5C.
7/31	17	44	20	45.926390	-129.979138	242	-12	-2	2	1520	1522	About halfway done now.
7/31	17	45	15	45.926391	-129.979134	242	-12	-2	2	1520	1522	Temp is up to 9.8C.
7/31	17	47	36	45.926386	-129.979144	242	-11	-2	2	1520	1522	2000ml filtered so far.
7/31	17	48	34	45.926382	-129.979145	242	-11	-2	2	1520	1522	Max temp so far is 10.5C.
7/31	17	53	37	45.926394	-129.979123	242	-11	-2	2	1520	1522	300ml to go.
7/31	17	56	22	45.926386	-129.979139	242	-11	-2	2	1520	1522	SAMPLE: fluid J2-583-HFS-24 is finished.
7/31	17	56	52	45.926384	-129.979146	242	-11	-2	2	1520	1522	Tmax=10.5 Tavg=9.6 T2=5.7 Vol=3024ml.
7/31	17	58	20	45.926388	-129.979150	242	-11	-2	2	1520	1522	Starting J2-583-HFS-25 DNA filter #11.
7/31	18	10	38	45.926377	-129.979151	243	-11	-2	2	1520	1522	Halfway done now.
7/31	18	13	13	45.926386	-129.979145	242	-11	-2	2	1520	1522	1000ml to go now.
7/31	18	21	09	45.926376	-129.979150	242	-12	-2	2	1520	1522	J2-583-HFS-25 is finished.
7/31	18	21	30	45.926377	-129.979147	242	-12	-2	2	1520	1522	Tmax=10.4 Tavg=9.3 T2=5.3 Vol=3001ml.
7/31	18	22	54	45.926381	-129.979140	242	-11	-2	2	1520	1522	SAMPLE: fluid start J2-583-HFS-26 is unfiltered bag #20
7/31	18	24	04	45.926383	-129.979143	242	-11	-2	2	1520	1522	CORRECTION: starting now
7/31	18	27	19	45.926385	-129.979158	243	-11	-2	2	1520	1522	J2-583-HFS-25 is finished.
7/31	18	27	36	45.926386	-129.979157	242	-11	-2	2	1520	1522	Tmax=9.8 Tavg=9.6 T2=5.6 Vol=602ml.
7/31	18	29	10	45.926388	-129.979150	242	-12	-2	2	1520	1522	Stowing the HFS wand.
7/31	18	30	32	45.926386	-129.979156	242	-11	-3	2	1520	1522	Next we will be taking a sediment sample with the small yellow syringe.
7/31	18	31	01	45.926387	-129.979161	242	-11	-3	2	1520	1522	Moving to grab the syringe.
7/31	18	32	50	45.926391	-129.979162	242	-11	-3	2	1520	1522	Grasping the syringe.
7/31	18	37	38	45.926384	-129.979151	242	-13	0	2	1520	1522	HIGHLIGHTS: KiPro hard drive start
7/31	18	37	50	45.926384	-129.979151	242	-13	0	2	1520	1522	Syringe is in position.
7/31	18	38	12	45.926384	-129.979151	242	-14	0	2	1520	1522	Frame_Grab:
7/31	18	38	52	45.926386	-129.979152	242	-13	-1	2	1520	1522	SAMPLE: bio Taking sample J2-583-Mat-27
7/31	18	40	13	45.926388	-129.979153	241	-13	-1	2	1520	1522	Stowing the syringe in the port biobox.
7/31	18	41	04	45.926389	-129.979152	242	-10	0	2	1520	1523	HIGHLIGHTS: KiPro hard drive stop
7/31	18	41	31	45.926396	-129.979148	244	-9	-1	4	1519	1523	Backing away from Escargot.
7/31	18	41	55	45.926397	-129.979148	244	-9	0	4	1519	1523	Once we stow the syringe we will be heading to our final destination Castle.
7/31	18	44	16	45.926399	-129.979158	243	-9	1	4	1519	1523	Transferring the syringe to the schilling arm.
7/31	18	45	42	45.926393	-129.979151	244	-10	1	4	1519	1523	Putting it in the biobox now.
7/31	18	48	32	45.926389	-129.979163	243	-8	-1	3	1519	1523	We're going up to the top of the chimney to get a look at the supposedly snail-shaped structure that the vent is named for.
7/31	18	51	00	45.926368	-129.979172	245	-8	-2	6	1515	1522	We are backing away from the vent now.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	18	51	10	45.926353	-129.979164	244	-8	-2	7	1515	1522	Heading to Castle.
7/31	18	57	10	45.926345	-129.979865	161	-8	-1	2	1518	1520	We are now north of Castle heading south.
7/31	18	59	42	45.926233	-129.979986	147	-8	-1	2	1515	1517	Preparing to sample here. Sort of in limbo at the moment.
7/31	19	01	10	45.926203	-129.979960	161	-7	-1	2	1516	1518	That must be Castle in the butt cam.
7/31	19	03	00	45.926193	-129.980110	80	-8	-1	4	1516	1520	Last stop Castle. We have an hour before we recover.
7/31	19	04	01	45.926187	-129.980105	75	-7	-2	4	1516	1520	Castle looks the same as ever.
7/31	19	04	15	45.926179	-129.980099	73	-8	-1	3	1517	1520	Little anhydrite chimney near the base.
7/31	19	06	47	45.926177	-129.980080	58	-4	-3	2	1518	1520	Bill is zoomed in on the Hobo. Looks like the end is in the anhydrite chimney.
7/31	19	07	01	45.926177	-129.980078	58	-4	-3	2	1518	1520	It did look like it has fallen out of the orifice.
7/31	19	07	35	45.926176	-129.980075	58	-4	-4	2	1518	1520	RECOVER: HOBO temp probe at Castle. HOBO #130 being placed on the Jason deck.
7/31	19	08	39	45.926177	-129.980072	58	-5	-2	2	1518	1520	Nancy and Bill are running the show. The lone survivors..Susan logging and John on video.
7/31	19	10	37	45.926191	-129.980076	59	-6	-2	2	1518	1520	We'll deploy MISO 102 in the little anhydrite near the base of Castle. The same spot where we had the last one? There are a few little anhydrite spires here.
7/31	19	13	39	45.926172	-129.980082	59	-5	-2	2	1518	1520	Deploying MISO 102 in little chimney at near base of Castle. There are a few orifices where water is gushing out in this spot.
7/31	19	14	08	45.926173	-129.980079	59	-6	-1	2	1518	1520	Poking the MISO probe down into the hole that is deepest (closest to the base).
7/31	19	16	38	45.926175	-129.980103	59	-6	-2	2	1518	1520	MISO102 deployed: 129 58.8051' 45 55.5711' Z=1518m.....The hobo is not in. We'll fluid sample first. Then we'll try to deploy the Hobo again.
7/31	19	20	54	45.926175	-129.980103	59	-5	-2	2	1518	1520	SAMPLE: fluid J2-583-HFS-28. Setting up to sample here in the hold where a small anhydrite chimney previously stood. It's no 105C. Last year it was 250C.
7/31	19	23	01	45.926179	-129.980102	59	-5	-1	2	1518	1520	Temp is 100C and rising. Decided to try the bigger chimney about 6 inches up from this orifice.
7/31	19	24	31	45.926182	-129.980105	58	-6	-2	2	1518	1520	Knocked the anhydrite chimney over and will try to get a higher temp in the orifice.
7/31	19	24	49	45.926182	-129.980105	58	-6	-2	2	1518	1520	Trying the hold in the middle just downslope from where the larger chimney stood.
7/31	19	25	08	45.926182	-129.980106	58	-6	-2	2	1518	1520	Temp is 110 and rising.
7/31	19	27	00	45.926182	-129.980107	59	-6	-2	2	1518	1520	Temp is rising. It's up to 170C now and going up.
7/31	19	27	48	45.926180	-129.980106	59	-6	-2	2	1518	1520	We're at 257C now. Setting up to sample.
7/31	19	30	59	45.926183	-129.980106	58	-6	-2	2	1518	1520	SAMPLE: fluid J2-583-HFS-28 . Unfiltered piston #6. Start 1931:10.
7/31	19	31	44	45.926183	-129.980106	58	-6	-2	2	1518	1520	J2-583-HFS-28 cont. 129 58.8051' 45 55.5711' Z=1518.5m.
7/31	19	32	23	45.926183	-129.980106	58	-6	-2	2	1518	1520	J2-583-HFS-28 cont. stop 1932. Tmax=266.5 Tavg=266.4 T2=45. Vol=302ml.
7/31	19	34	50	45.926188	-129.980105	59	-5	-2	2	1518	1520	SAMPLE: fluid J2-583-GTHFS-29 . Stbd gastight blue #12. Fired at 1934. Tmax ~266.5.
7/31	19	36	17	45.926188	-129.980106	59	-6	-2	2	1518	1520	J2-583-HFS-30 . Filtered piston #7. 129 58.8051' 45 55.5711' Z=1518.5m.
7/31	19	37	25	45.926187	-129.980105	59	-7	-1	2	1518	1520	J2-583-HFS-30. Stop 193655. Tmax=266.4 Tavg=266.2 T2=58. Vol=301ml.
7/31	19	41	41	45.926191	-129.980103	58	-6	-1	2	1518	1520	J2-583-GTB-31 black #18. Same orifice as samples 29 - 31 at Castle anhydrite. Fired 1941.30.
7/31	19	46	15	45.926191	-129.980102	59	-7	0	2	1518	1520	J2-583-GTB-32 white #17. Samples 28 - 32 are all in the same location. Tmax was 266C. Fired 1946:05.
7/31	19	48	16	45.926176	-129.980093	20	-10	3	3	1519	1521	We'll deploy the MISO next - in the hole where we have been fluid sampling.
7/31	19	48	32	45.926178	-129.980092	17	-13	2	3	1518	1521	Jason had to maneuver around so we could see what it's doing.
7/31	19	48	42	45.926178	-129.980091	17	-12	2	3	1518	1521	Picking up the MISO.
7/31	19	50	05	45.926187	-129.980097	34	-3	1	2	1519	1521	Moving on in for the deployment.

date	hr	min	sec	latitude	longitude	hdg	pitch	roll	alt	Z	totalZ	J2-583 Dive Log
7/31	19	52	49	45.926183	-129.980102	41	-10	0	3	1518	1521	DEPLOY: HOBO temp probe Jason is poking around trying to find the orifice for the MISO. MISO 102 deployed in the anhydrite flow at Castle. 45 55.5711 -129 58.5051.
7/31	19	53	06	45.926183	-129.980102	41	-10	0	3	1518	1521	We're running out of time. Finito here.
7/31	19	53	57	45.926183	-129.980102	41	-10	-2	3	1518	1521	Jason is doing a little housekeeping and will be coming up now.
7/31	19	55	33	45.926170	-129.980137	141	-9	-1	7	1514	1520	Our heading for is 45 degrees. It agrees pretty well with the nav. Underlay here could be moved a few meters to the SW... But - overall it's pretty good.
7/31	19	55	39	45.926170	-129.980149	164	-9	0	8	1512	1520	JASON: Jason off bottom