

Axial 2022 Cruise Report

Axial Seamount, Juan de Fuca Ridge

TN404

R/V Thompson

June 19 to July 2, 2022

Newport, OR to Newport, OR

ROV *Jason* Dives J2-1428 – 1433 (n=6)

AUV *Sentry* Dives 648 – 654 (n=7)

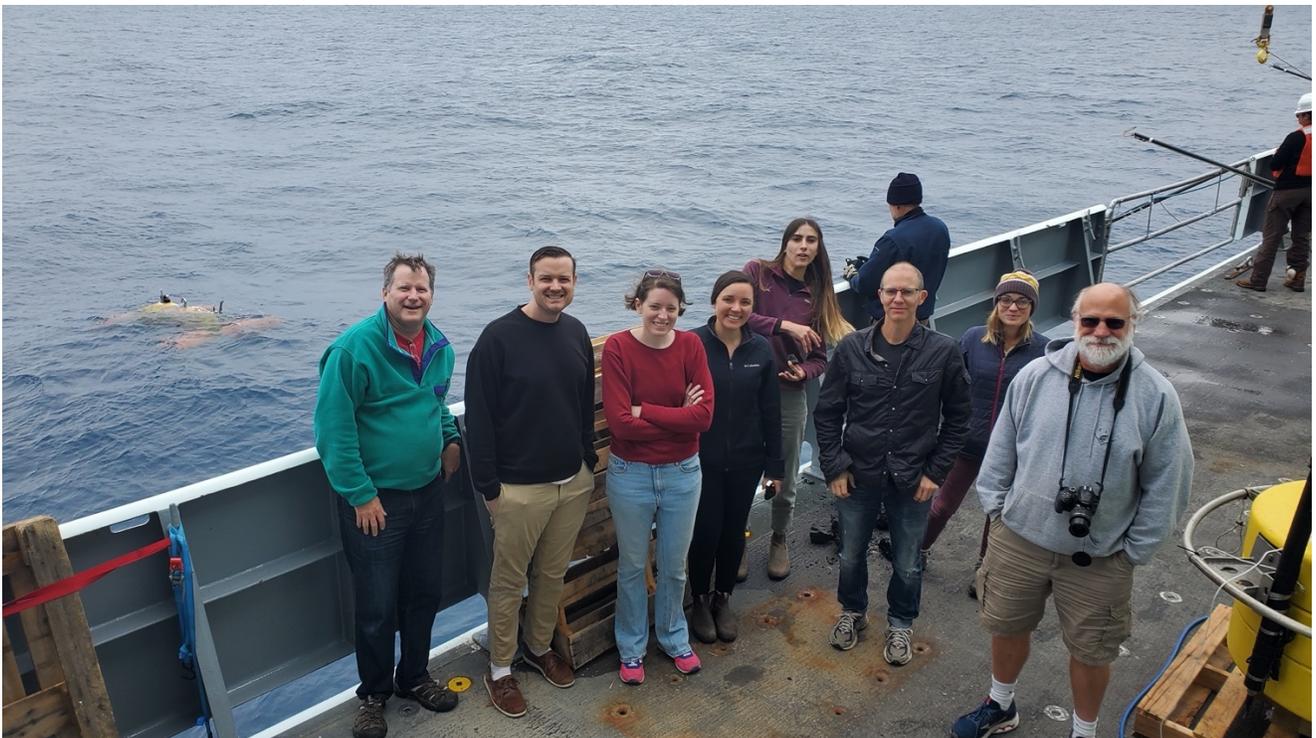
Chief Scientist: Bill Chadwick

R/V Thompson Captain: Bruce Barnaby

ROV *Jason* Expedition Leader: Akel Kevis-Sterling

AUV *Sentry* Expedition Leader: Sean Kelley

Cruise Report prepared by: Bill Chadwick



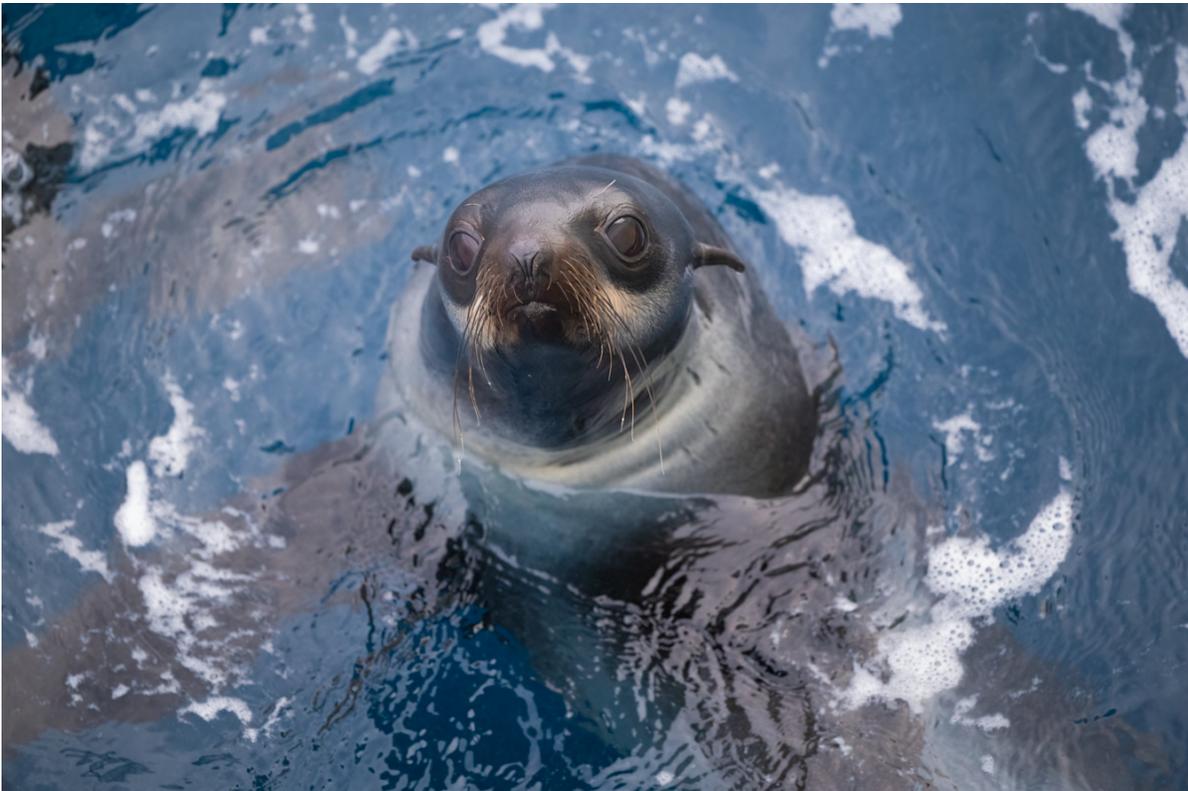


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A pod of Orcas seen after departure from Newport on June 19 (photo by Sandra Slead).



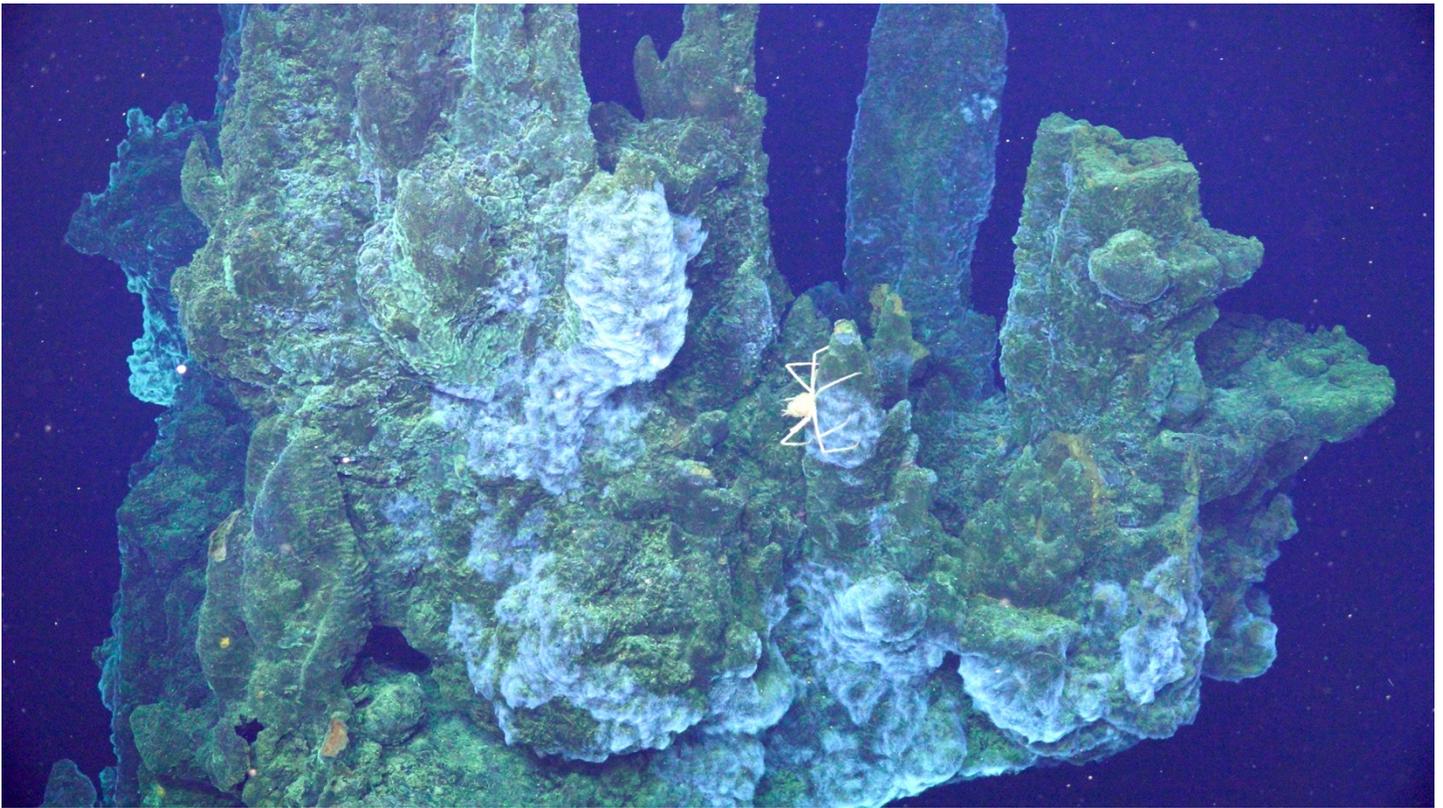
One of several northern fur seals that frolicked around the ship during TN404 (photo by Sandra Slead).



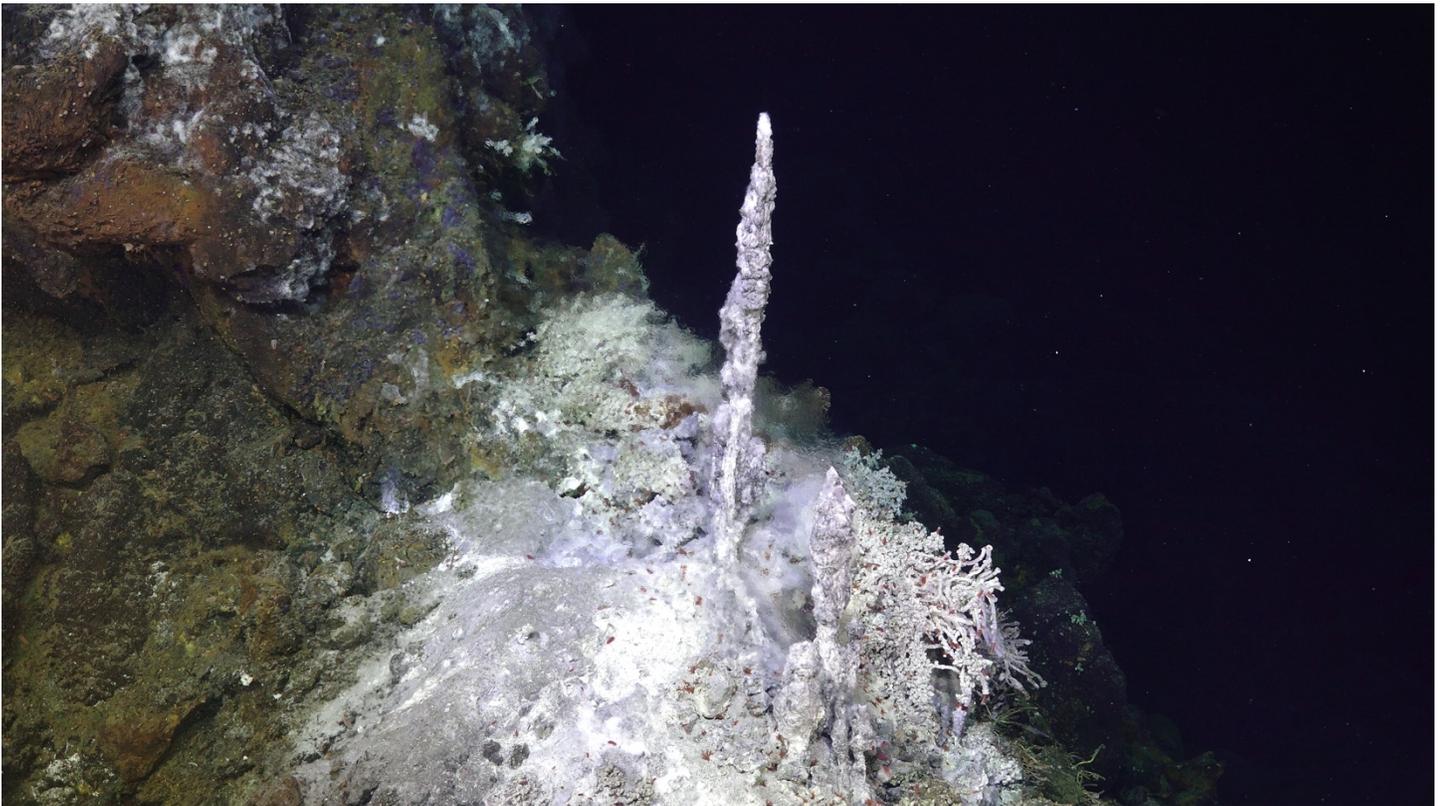
Fin whale encounter just off the bow of R/V Thompson during TN404 (frame grab from video by Kelli Scott).



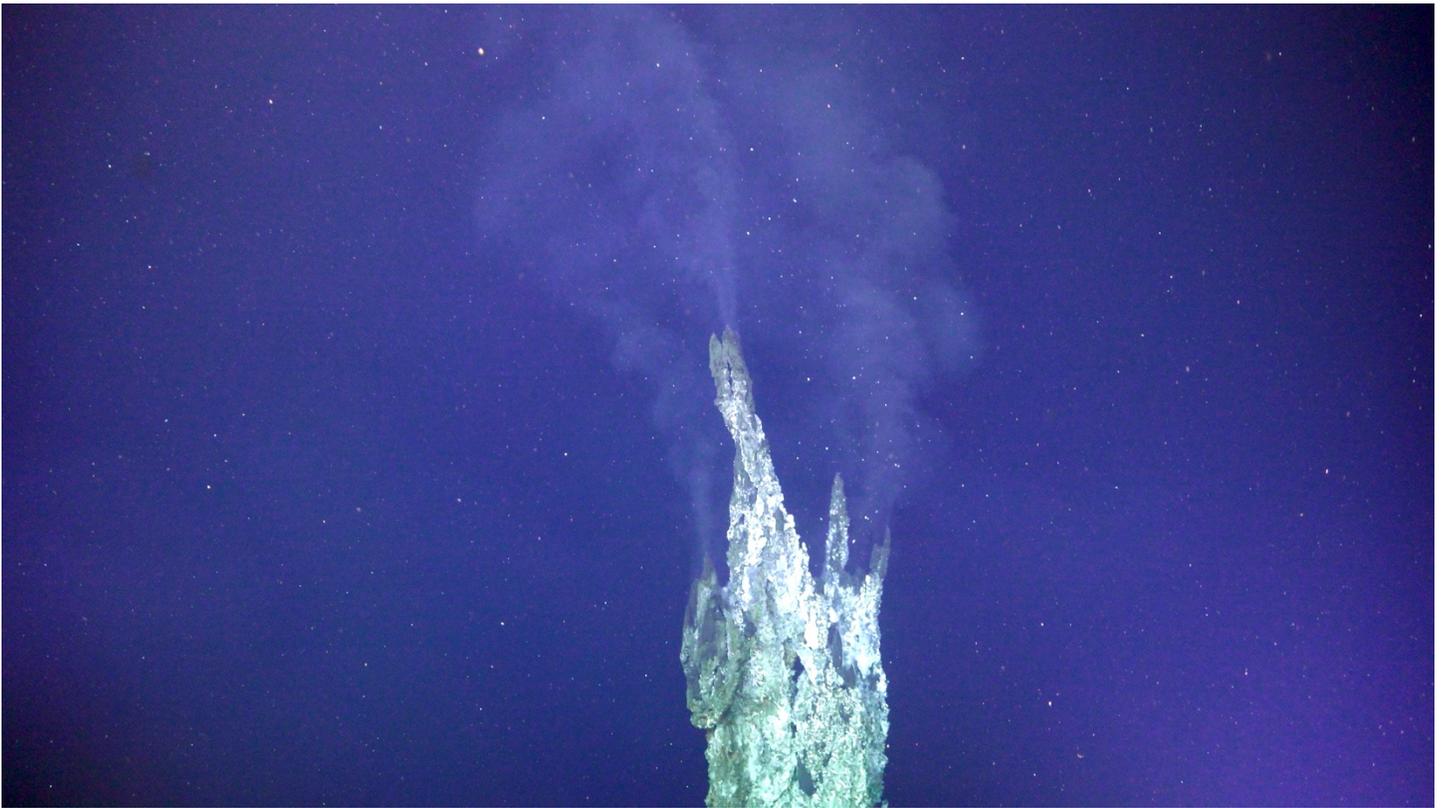
Octopus encounter during ROV *Jason* dive J2-1433.



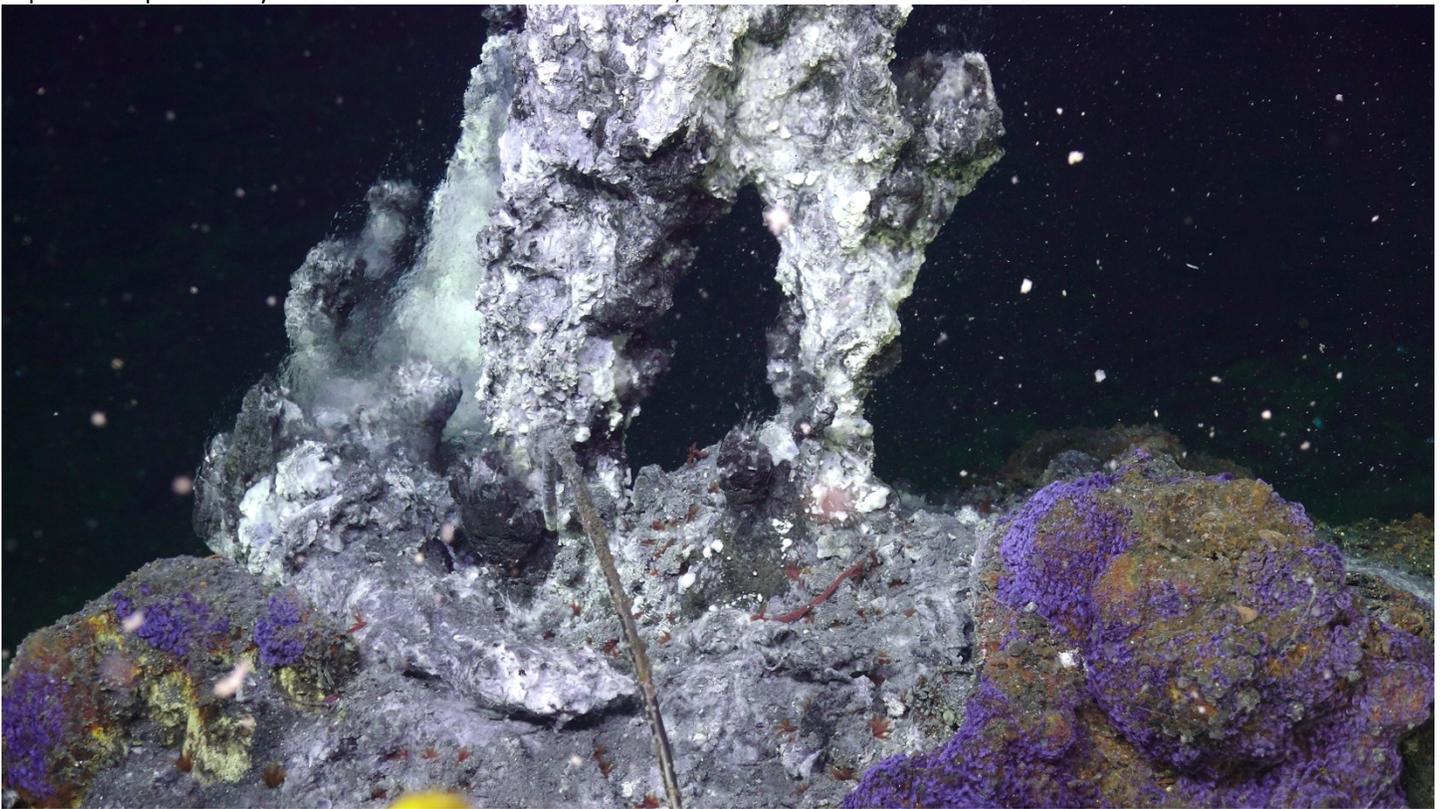
Crab perched on the top of Castle chimney in the International District Vent field during ROV Jason dive J2-1431.



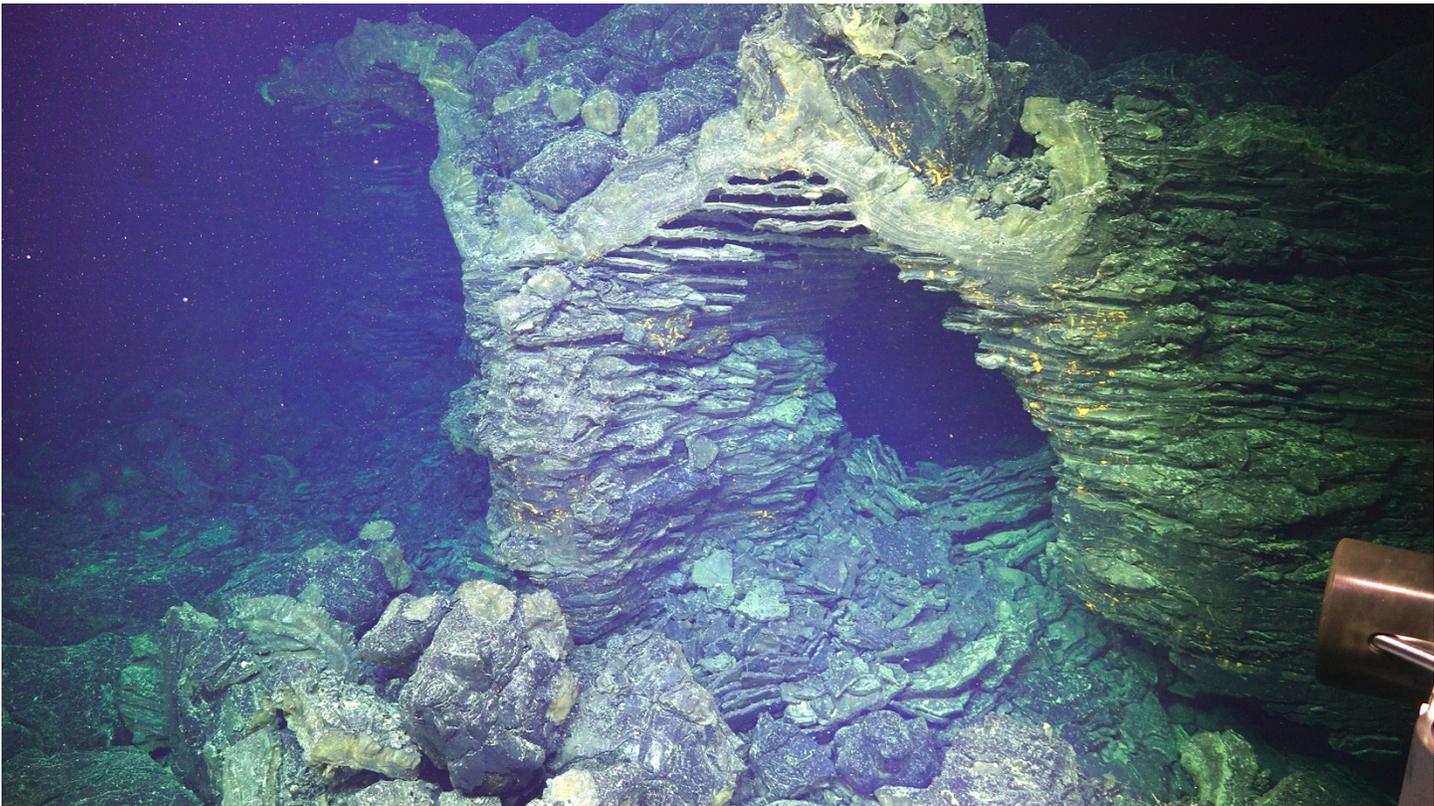
Anhydrite chimney at the base of Castle chimney in the International District vent field, seen on ROV Jason dive J2-1431.



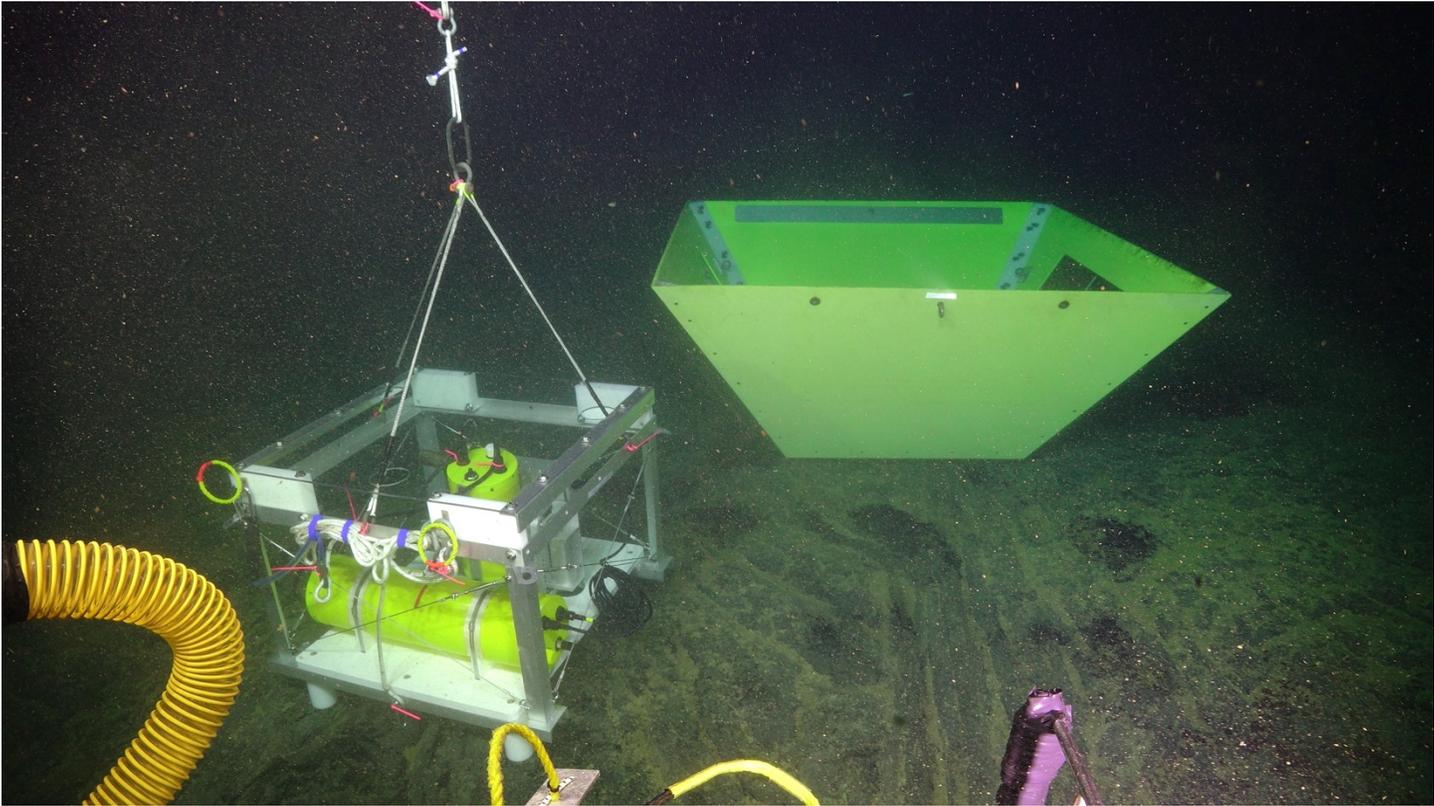
Top of El Guapo chimney in the International District vent field, seen on ROV *Jason* dive J2-1431.



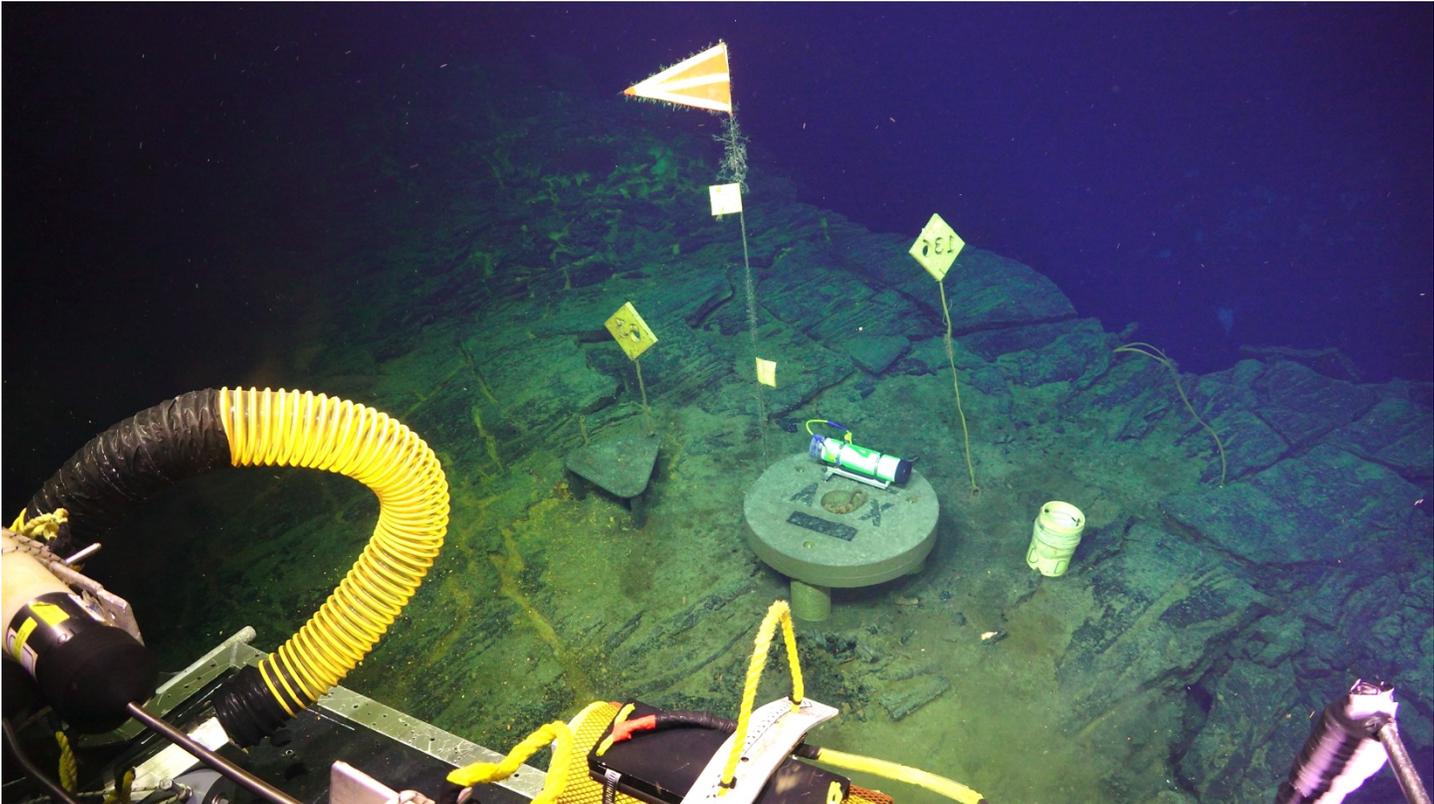
Swapping out HOBO/MISO temperature probe at Diva vent in the International District vent field on ROV *Jason* dive 1431.



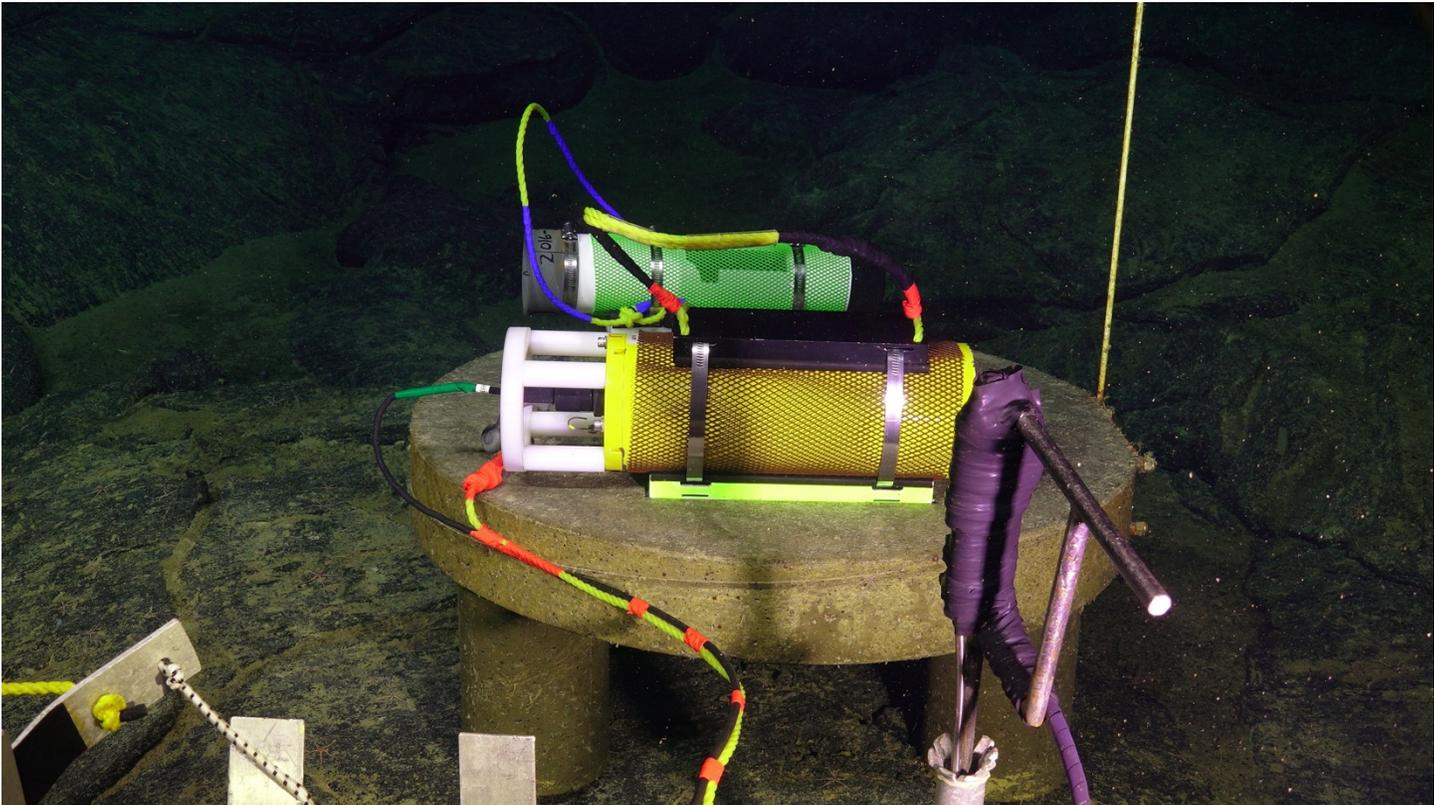
A lava arch in a collapse area seen during ROV *Jason* dive J2-1428.



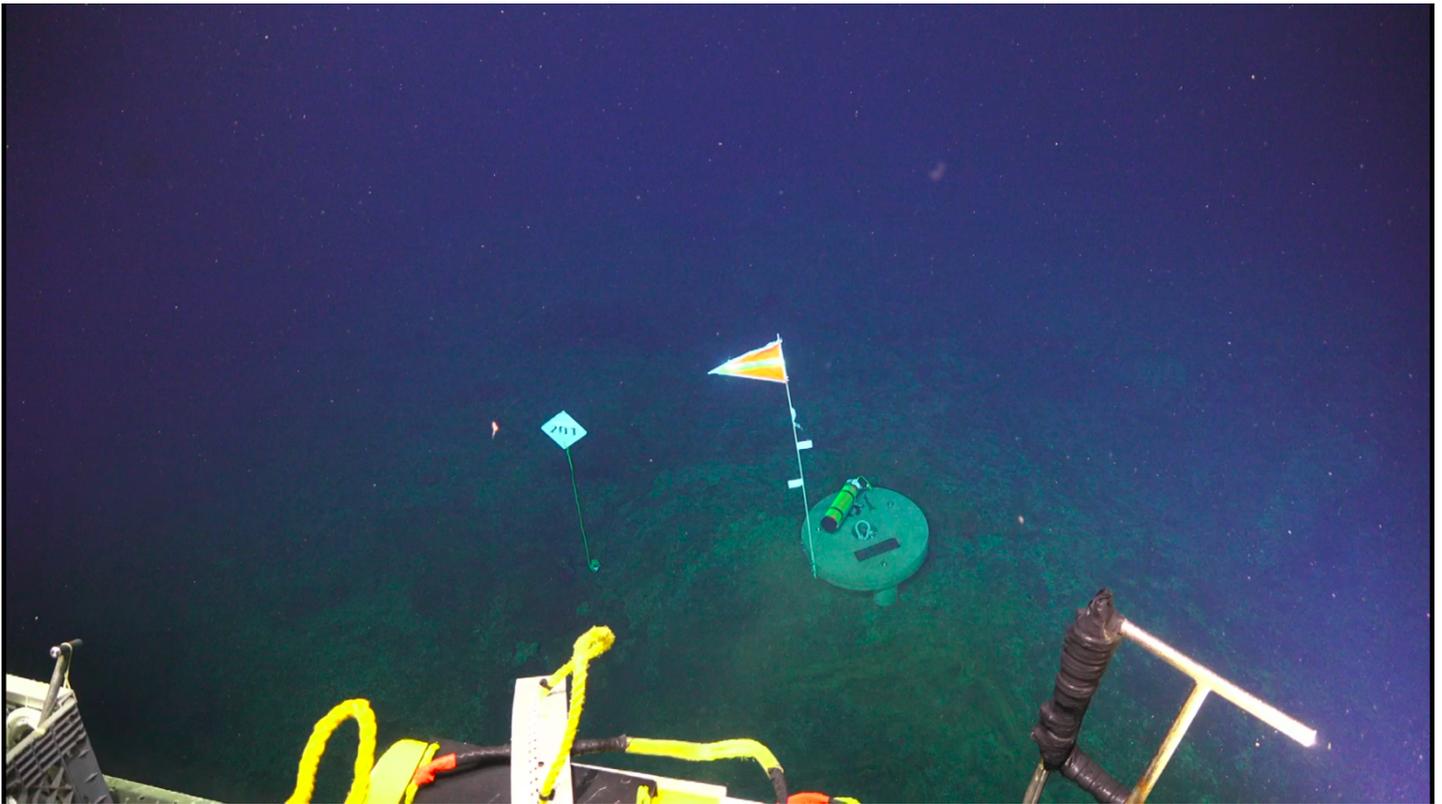
Deploying a crustal compliance instrument with shield (upside-down) for Spahr Webb, during ROV *Jason* dive J2-1428.



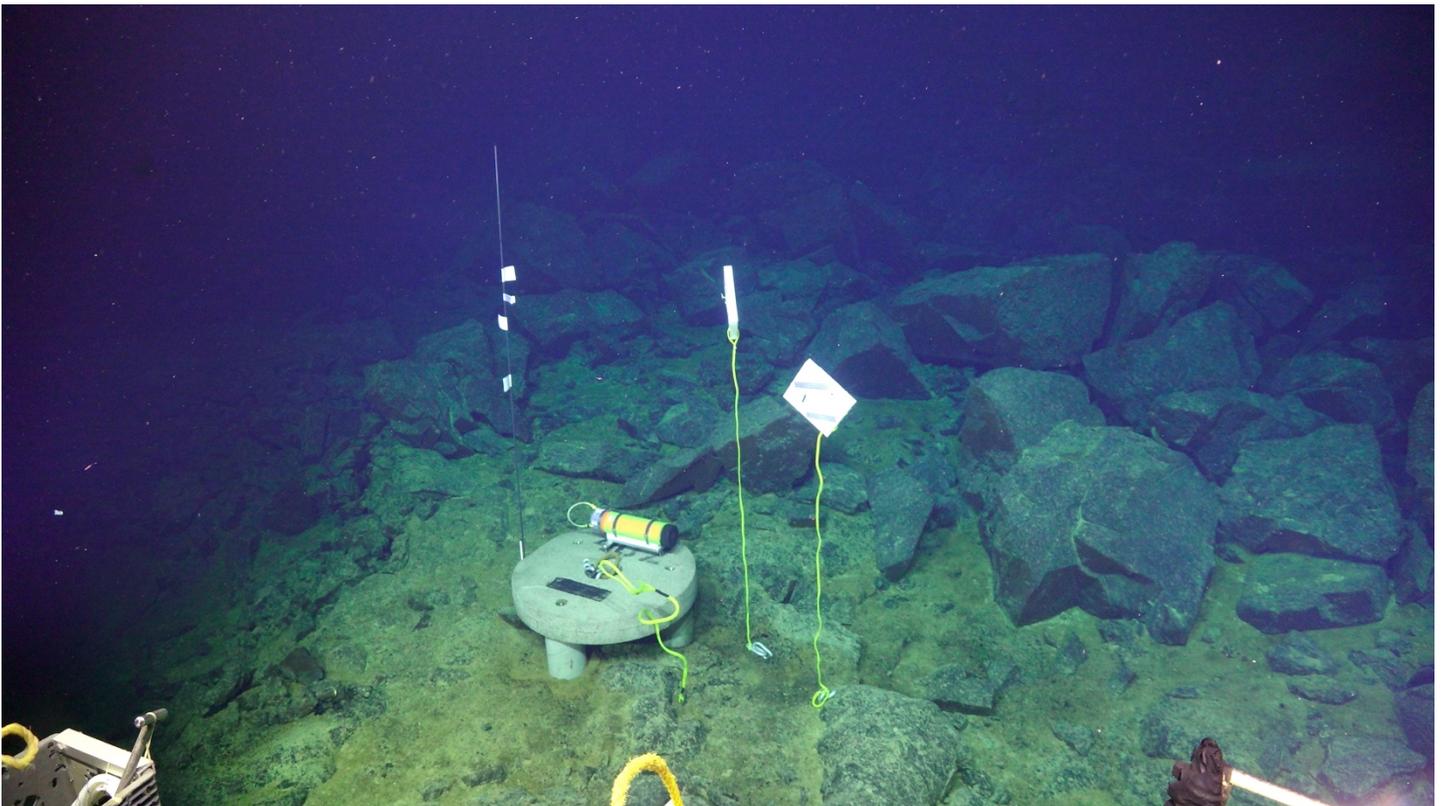
Preparing to make a pressure measurement at benchmark AX-302 near Trevi vent, during ROV *Jason* dive J2-1430.



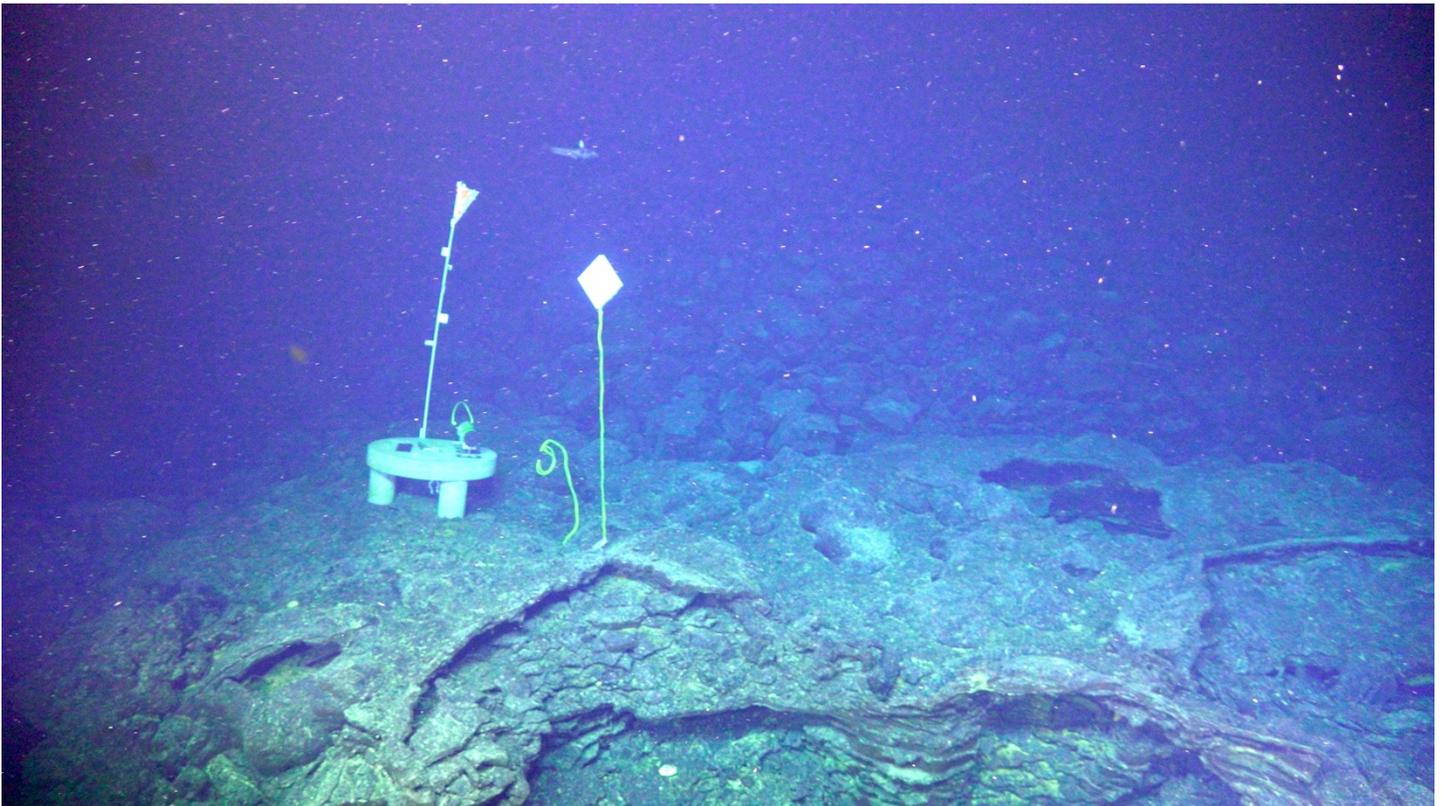
Mobile Pressure Recorder (MPR, foreground) and mini-BPR (background) on benchmark AX-101, during ROV *Jason* dive J2-1431.



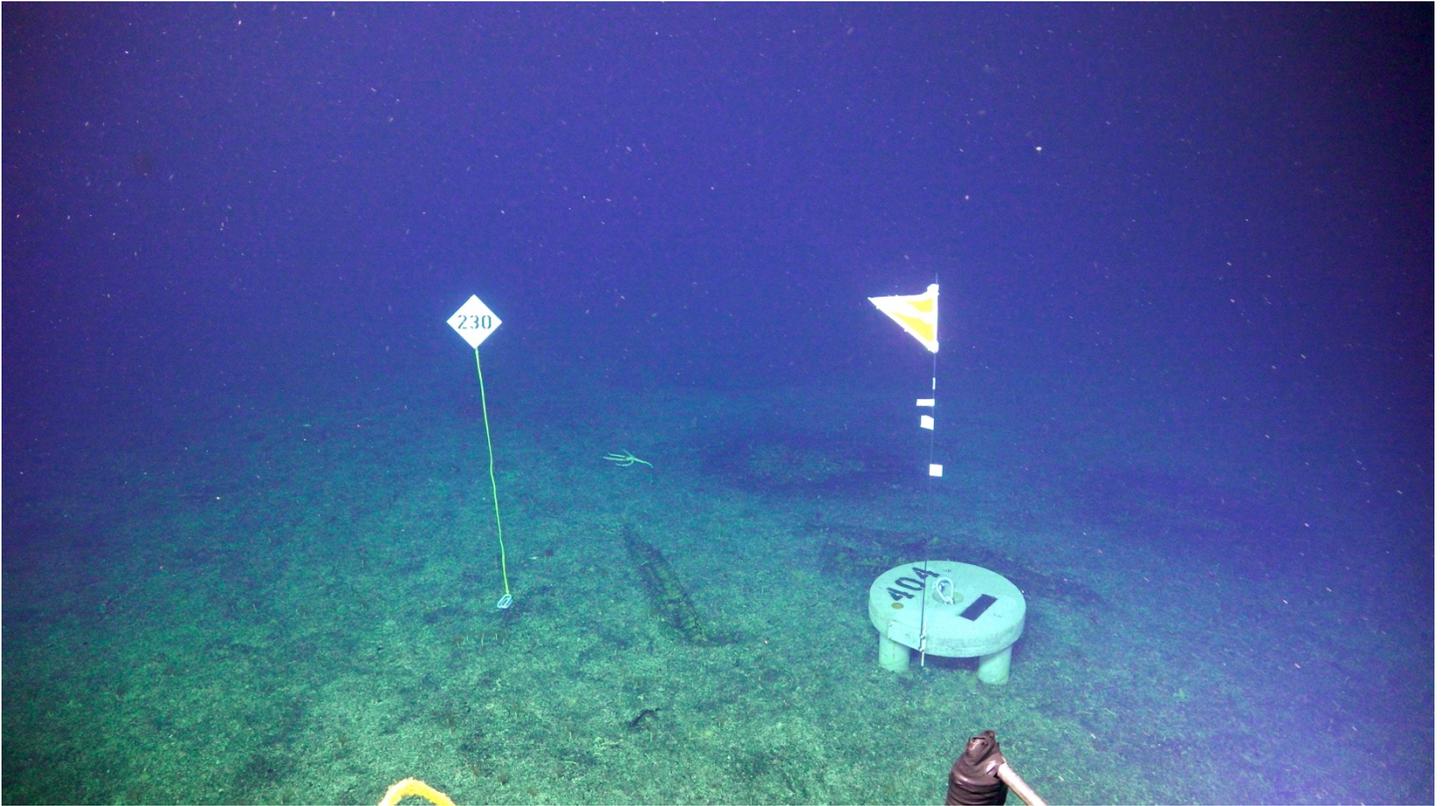
New benchmark AX-401 deployed at the rim of the eastern caldera wall, during ROV *Jason* dive J2-1432.



New benchmark AX-402 deployed at the base of the eastern caldera wall, during ROV *Jason* dive J2-1432.



New benchmark AX-403 deployed at the base of the western caldera wall, during ROV *Jason* dive J2-1432.



New benchmark AX-404 deployed at the top of the western caldera wall, during ROV *Jason* dive J2-1432.

1 - Axial 2022 Cruise Summary

Bill Chadwick, Chief Scientist

This year's cruise (TN404) still had some COVID-19 mitigation measures in place, but far less than in 2020. These included everyone being fully vaccinated and requiring a self-administered COVID test 7 days before the cruise departure. During that week, everyone limited their potential exposure to COVID (avoiding large gatherings, wearing masks when inside public places, no eating in restaurants or going to bars, but outdoor dining or going to work was permitted). Then everyone took a PCR COVID test within 72 hours before boarding the ship (enough time to get a negative result back). And finally, a rapid COVID test was taken on the gangway before getting on the ship. Significantly, for those who had to travel to join the cruise, they could do the testing whenever convenient, as long as they followed the other protocols.

The Axial 2022 cruise had the following main geodesy objectives (similar to our 2020 cruise): conducting MPR pressure measurements with ROV *Jason* at our array of seafloor benchmarks in the caldera, turning around bottom pressure recorder (BPR) moorings and stand-alone mini-BPR instruments deployed on the MPR benchmarks, and collecting repeat bathymetry with AUV *Sentry* over the summit of the volcano. These are all to document the pattern of depth changes in space and time due to volcanic inflation since Axial Seamount's last eruption in April-May 2015. These goals were all accomplished. In addition, temperature probes were turned around at several hydrothermal vent sites to continue long time-series. An important additional goal during the AUV *Sentry* dives was further testing and implementation of Terrain Relative Navigation (TRN) software on AUV *Sentry*, which we started during our 2020 cruise. TRN allows the AUV to self-navigate by comparing incoming sonar data to a pre-existing bathymetric map. This too was accomplished, with the last 2 *Sentry* dives being successfully navigated entirely by TRN, which greatly reduced the navigation mis-match with previous surveys. Using TRN in future years will improve our ability to repeat the AUV bathymetric survey lines with better fidelity, which will reduce errors when looking for depth changes from year to year. All this work was funded by NSF award OCE-1736926 to PI's Nooner, Chadwick, and Caress. This was the last of 3 cruises funded by that grant.

This year, we also deployed 4 new seafloor benchmarks (AX-401 to 404) across the western and eastern caldera walls (one on each rim and one at the base of each wall) in order to better document any vertical movement across the caldera faults. We made MPR pressure measurements at each one and tied them to the pre-existing benchmark AX-101 at the center of the caldera. We also deployed mini-BPRs at each new benchmark. These new benchmarks were added to complement a horizontal acoustic ranging experiment consisting of 2 transponders on the western and eastern caldera rims and 2 on the caldera floor near the caldera center, one of which will be connected to the OOI regional cabled array. This ranging project is funded by NSF grant OCE-2130060 to William Wilcock and Dana Manalang at University of Washington. The Sonardyne Fetch ranging transponders were deployed at Axial during a subsequent *R/V Thompson* cruise in August 2022 (TN407). The coordination of these two experiments will yield vertical and horizontal displacements at the same geodetic sites for the first time.

Similar to our 2020 cruise, a separate project, supported by NSF grant OCE-1924024, with Spahr Webb as PI, was piggybacked on our cruise to deploy and recover 3 crustal compliance instruments in the summit caldera of Axial Seamount using the ship and ROV *Jason*. Two of the compliance instruments were deployed & recovered twice and the third only once, and useful data were successfully recorded.

In total, we made 6 ROV *Jason* dives and 7 AUV *Sentry* dives. In between those, 5 instrument moorings recovered, including 4 moored-BPRs and one 1200-m long hydrophone mooring (for colleague Bob Dziak at NOAA/PMEL). Later 3 of the moored-BPRs were re-deployed (one was sent back to shore for maintenance).

The MPR pressure measurements at our array of seafloor benchmarks were accomplished during two long ROV *Jason* dives (J2-1430 and J2-1431) this year. We found the center of the caldera had risen only 11.1 cm since the last survey in September 2020, reflecting the continuing decrease of the rate of inflation since 2015. As of June 2022, the center of the caldera has reinflated a total of 2.18 m since the end of the 2015 eruption, which means the volcano has recovered 89% of the 2.54 m of co-eruption deflation in 2015. Because of the very slow rate of inflation, it appears that the next eruption is still years away and its exact timing will depend on whether the rate of inflation stays steady, keeps decreasing, or increases again.

The AUV *Sentry* dives were made to resurvey a spider web pattern of previously run multibeam sonar lines to document depth changes between this year and previous years, to complement the pressure measurements that we make on the seafloor. The AUV resurveys have lower resolution for detecting depth change, but we can make them efficiently over a much larger area than is practical to cover with the pressure measurements. This year's AUV surveys included the crisscrossing lines inside the caldera, radial lines extending outside the caldera, and two sets of circumferential ovals at different distances outside the caldera. In addition, for the first time, we repeated the extra lines added in 2020 that extend further to the south and southeast over the secondary magma reservoir located ~10 km SE of the caldera. Processing of the AUV data is on-going and will help us model the subsurface magma storage system at Axial Seamount.

This year our outreach and education efforts focused on bringing a science reporter (Jes Burns) and videographer (Stephani Gordon) to sea with us from Oregon Public Broadcasting (OPB) in Portland, Oregon. They were both a lively and fun addition to the cruise and greatly helped us communicate the science we are conducting at Axial Seamount with the general public and the world at large.

Marine mammal observations during TN404 included: (1) seeing a pod of 5-6 orcas just beyond the Newport jetties soon after departure on June 19 (identified from photos taken by Sandra Sleed by Josh McInnes at University of British Columbia's Institute for the Oceans and Fisheries Marine Mammal Research Unit, with help from Bob Pittman at OSU), (2) two to three northern fur seals that hung around the ship for much of the cruise, and (3) several fin whales that swam around and near the ship on several days.

As always, we are grateful to UNOLS and the National Science Foundation for supporting this research and for helping make this year's research cruise a success. We also appreciate the support from the University of Washington, the captain and crew of *R/V Thompson*, the National Deep Submergence Facility at the Woods Hole Oceanographic Institution, and the ROV *Jason* and AUV *Sentry* teams. All were outstanding.

Cruise data availability:

The underway ship data from TN404 (and this cruise report) are available on line at the R2R website:

<https://www.rvdata.us/search/cruise/TN404>

The TN404 cruise was given this DOI: 10.7284/909745

Other science data from the cruise will be archived at the Marine Geoscience Data System website:

<https://www.marine-geo.org/index.php>

2 – Science Participants

Science Party	Affiliation	Expertise
Bill Chadwick	Oregon State U.	Geology
Jeff Beeson	Oregon State U.	Geology
Scott Nooner	UNC Wilmington	Geophysics
Dave Caress	MBARI	AUV mapping
Michael (TR) Tepper-Rasmussen	Oregon State U.	Mooring tech
Pete Liljegren	Lamont	Geophysics
Ted Koczynski	Lamont	Geophysics
Sandra Slead	Univ. of Rhode Island	Geophysics / Watch stander
Haley Cabaniss	Eastern Kentucky Univ.	Geophysics / Watch stander
Kelli Scott	UNCW student	Watch stander
Kelly Chadwick	U. Washington student	Watch stander
Jes Burns	Oregon Public Broadcasting	Science reporter
Stephani Gordon	Oregon Public Broadcasting	Videographer
AUV Sentry Team		
Sean Kelley	AUV Sentry group	Expedition Leader
Justin Fujii	AUV Sentry group	Sentry
Mike Skowronski	AUV Sentry group	Sentry
Tim Joyce	AUV Sentry group	Sentry
Syenna Graham	AUV Sentry group	Sentry
ROV Jason Team		
Akel Kevis-Stirling	ROV Jason group	Expedition Leader
Chris Hadalton	ROV Jason group	Jason
Stephen Murray	ROV Jason group	Jason
Peter Hall	ROV Jason group	Jason
Jeremy Paulus	ROV Jason group	Jason
Ronnie Whims	ROV Jason group	Jason
Tito Collasius	ROV Jason group	Jason
Jessica McLaughlin	ROV Jason group	Jason
Sarah Sergeant	ROV Jason group	Jason
James Pelowski	ROV Jason group	Jason
Megan Bachant	ROV Jason group (intern)	Jason (extra 11 th)
UW Marine Techs / cadet		
Liz Ricci	U. Washington	Marine Tech.
Steve Jalickee	U. Washington	Marine Tech.
Huck Parra	Cal Maritime/UW	Maritime Cadet

3 – Operations Log

date UTC	time UTC	date local	time local	Axial2022 - TN404 Operations Log
6/20/2022	01:00	6/19/2022	18:00	Depart Newport
	22:00	6/20/2022	15:30	Arrive at Axial Seamount at BPR-East mooring site
	22:30		15:45	Sent enable command to BPR-East using hand-held hydrophone with EG&G deck unit.
	22:22		15:50	BPR-East release confirmed
	23:08		16:08	BPR-East on surface
	23:30		16:30	BPR-East on deck
6/21/2022	00:30		17:23	Spent a lot of time trying to send commands to BPR-Southeast. It enabled quickly but then did not confirm other commands despite moving ship and varying output levels. Eventually release command was confirmed on low power @ 18:22. Problem may have been having a hand-held radio too close to the EG&G deck unit during operations. Seemed to perform better after radio was removed.
	02:13		19:13	BPR-Southeast on deck
	02:30		19:30	Transit to deployment site for Sentry dive #648
	03:34		20:34	Sentry launched - BEGIN DIVE 648
	06:16		23:16	Deployed Webb instrument CMP-1 at "Webb-1" site.
	07:00	6/21/2022	00:00	Jason launched - BEGIN DIVE J2-1428 (deploy Webb instruments)
	10:44		03:44	Float pack recovered at "Webb-1" site.
	17:34		10:34	Jason recovered - END DIVE J2-1428 (dive aborted due to jetway power issu)
	19:25		12:25	Deployed Webb instrument CMP-2 at "Webb-2" site.
	20:39		13:39	Jason launched - BEGIN DIVE J2-1429 (continue previous - deploy Webb insts)
	23:02		16:02	Sentry recovered - END DIVE 648
6/22/2022	00:44		17:44	Float pack recovered at "Webb-2" site.
	06:35		23:35	Deployed Webb instrument CMP-3 at "Webb-6" site.
	08:03	6/22/2022	01:03	Float pack recovered at "Webb-6" site.
	13:24		06:24	Sentry launched - BEGIN DIVE 649
6/23/2022	04:58		21:58	Sentry recovered - END DIVE 649
	05:06		22:06	USBL pole raised for mooring operations.
	06:49		23:49	BPR-East deployed (at same site it was recovered from).
	09:10	6/23/2022	02:10	BPR-Southeast deployed (at same site it was recovered from).
	11:00		04:00	USBL pole lowered for dive operations.
	11:16		04:16	Jason launched - BEGIN DIVE J2-1430 (Pressure dive - Part 1)
	20:11		13:11	Float pack launched at "Webb-1" site for recovery of Webb inst. CMP-1.
	20:25		13:25	Sentry launched - BEGIN DIVE 650

	23:39		16:39	Recovered Webb instrument CMP-1 from "Webb-1" site.
6/24/2022	16:29	6/24/2022	09:29	Deployed Webb instrument CMP-1 at "Webb-4" site.
	17:30		10:30	Sentry recovered - END DIVE 650
	19:53		12:53	Float pack recovered at "Webb-4" site
6/25/2022	06:00		23:00	Float pack deployed at "Webb 2" site
	06:18		23:18	Sentry launched - BEGIN DIVE 651
	10:24	6/25/2022	03:24	Recovered Webb instrument CMP-2 from "Webb-2" site. Shield broke off at surface
	17:54		10:54	Jason recovered - END DIVE J2-1430 (aborted due to thruster and MPR disruption)
	21:12		14:12	Jason launched - BEGIN DIVE J2-1431 (Pressure dive - Part 2)
6/26/2022	04:10		21:10	Sentry recovered - END DIVE 651
	08:30	6/26/2022	01:30	Deployed Webb instrument CMP-2 at "Webb-6" site (without shield).
	11:03		04:03	Float pack recovered - single disk
	11:36		04:36	Float pack launched - triple disk
	14:26		07:26	Recovered Webb instrument CMP-3 from "Webb-6" site. Shield broke off at depth
	19:58		12:58	Sentry launched - BEGIN DIVE 652
6/27/2022	17:00	6/27/2022	10:00	Sentry recovered - END DIVE 652
6/28/2022	11:00	6/28/2022	04:00	Jason recovered - END DIVE J2-1431
				(somewhat higher winds on 6/28 prevented Jason & Sentry from diving)
	12:27		05:27	BPR-West mooring released
	12:44		05:44	BPR-West mooring on surface
	13:05		06:05	BPR-West mooring on deck
	13:42		06:42	BPR-North mooring released
	14:00		07:00	BPR-North mooring on surface
	14:22		07:22	BPR-North mooring on deck
	15:20		08:20	Acoustic release on BPR-East disabled (had not been disabled when deployed)
	16:15		09:15	BPR-Southeast released (deployed earlier, but found to be not working properly)
	16:33		09:33	BPR-Southeast on surface
	16:59		09:59	BPR-Southeast on deck
				Transit to 1200-m-long hydrophone mooring location
	19:17		12:17	Hydrophone mooring released
	19:25		12:25	Hydrophone float on surface
	20:58		13:58	Hydrophone recovery complete, transit to benchmark deployment sites
	23:13		16:13	Benchmark AX-401 deployed
	23:58		16:58	Benchmark AX-402 deployed
6/29/2022	01:11		18:11	Benchmark AX-403 deployed
	01:49		18:49	Benchmark AX-404 deployed

	02:45		19:45	Multibeam sonar survey on NW caldera rim @ 4.5 kt (repeating Langseth lines)
	12:20	6/29/2022	05:20	End multibeam survey, transit to Sentry launch site
	13:25		06:25	Sentry launched - BEGIN DIVE 653
	15:05		08:05	Jason launched - BEGIN DIVE J2-1432 (Pressure dive for new benchmarks)
	19:22		12:22	Glass balls released from AX-403
	19:45		12:45	Glass balls on the surface
	20:00		13:00	Glass balls on deck
	22:28		15:28	Glass balls released from AX-404
	23:06		16:06	Glass balls on deck
6/30/2022	06:03		23:03	Glass balls released from AX-401
	07:52	6/30/2022	00:52	Glass balls on deck
	14:54		07:54	Sentry recovered - END DIVE 653
	16:00		09:00	Glass balls released from AX-402
	16:40		09:40	Glass balls on deck
7/1/2022	02:30		19:30	Jason recovered - END DIVE J2-1432
	03:00		20:00	Sentry launched - BEGIN DIVE 654
	04:30		21:30	BPR-North mooring deployed
	04:45		21:45	BPR-West mooring deployed
	05:50		22:50	On station for CTD
	06:00		23:00	CTD cast at El Guapo vent (for following TN405 Julie Huber cruise)
	08:19	7/1/2022	01:19	CTD back on deck, transit to "Webb-6" site
	10:56		03:56	Float pack deployed at "Webb-6" site for recovery of CMP-2 instrument
	11:11		04:11	Jason launched - BEGIN DIVE J2-1433
	12:50		05:50	Float pack & instrument connected and released by Jason
	13:52		06:52	Float pack & instrument on surface
	14:02		07:02	Float pack & instrument on deck
	15:51		08:51	Float pack deployed at "Webb-4" site for recovery of CMP-1 instrument
	18:34		11:34	Float pack & instrument connected and released by Jason
	19:54		12:54	Float pack & instrument on deck
	20:22		13:22	Jason recovered - END DIVE J2-1433
	20:58		13:58	Sentry recovered - END DIVE 654
	21:08		14:08	transit to BPR-North for acoustic survey
	21:34		14:34	Start survey of BPR-North and BPR-West moorings (deployed in same location)
	23:55		16:55	Depart Axial Seamount for transit to Newport
7/2/2022	23:40	7/2/2022	16:40	Arrive Newport

4 – Discipline Summaries

4.1 - Pressure Measurements to Monitor Volcanic Deformation at Axial Seamount

Bill Chadwick, Scott Nooner, and Jeff Beeson

We have made ROV-based campaign-style pressure measurements with a “mobile pressure recorder” (MPR) on seafloor benchmarks at Axial Seamount since 2000 to monitor vertical movements of the seafloor due to volcanic inflation and deflation caused by magma movements beneath the volcano. This is our main method for eliminating the problem of long-term drift with the pressure sensors, because our MPR surveys precisely measure the *relative* depths of our benchmarks over a short period of time (several days), *relative* to a reference site. Since 2013, we have had 10 seafloor benchmarks in the MPR array, but we added 4 more this year located across the western and eastern caldera walls (one on the rim and one on the floor on both sides). In addition, we have deployed various kinds of continuously-recording bottom pressure recorders (BPRs) throughout the caldera. We are using 3 kinds of BPRs: (1) Moored BPRs that are battery-powered and record internally for 1-3 years at a time (3 of these were turned around in 2022, 1 was returned to Seattle for maintenance). (2) Four others are BPR/Tilt instruments (BOTPT) that are connected to the OOI Regional Cabled Array and transmit data to shore in real-time. Each of these are near one of our MPR benchmarks. (3) In addition, we use “Mini-BPRs” (aka TG11’s built by Scripps) that are deployed and recovered by ROV on many of the MPR benchmarks (we recovered 8 of these and deployed 10 new ones in 2022). The overall aim is to have both campaign-style and continuous pressure measurements at all of our pressure monitoring sites (the array of 14 seafloor benchmarks). Where the MPR measurements are co-located with a BPR, then the MPR data can be used to drift-correct the BPR data. This section summarizes this year’s MPR & BPR operations and results.

MPR measurements

The MPR measurements provide a precise depth for each benchmark *relative* to a reference site. In the past we have used the southern-most benchmark, AX-105, as the reference site, but this year we transitioned to using the OOI-BPR-MJ03F at the caldera center, near MPR benchmark AX-101, as the reference. This is because our MPR measurements have shown that the OOI-BPR-MJ03F has nearly zero drift, so it can be used as a reference instead (because we know how much AX-101 is moving vertically from the OOI-BPR-MJ03F data). The caldera center is also where the Scripps SCPR instrument (self-calibrating pressure recorder) has been tested and deployed since July 2018, and it provides an independent reference and confirms that the OOI-BPR-MJ03F has nearly zero drift (the SCPR is currently funded to stay deployed on the OOI-RCA until the summer of 2024, but it may be extended to 2028). Not having to visit benchmark AX-105 will save us a lot of time in future MPR surveys, especially when ROV *Jason* is in single-body mode when the one-way transit time between benchmarks AX-104 and AX-105 is 7 hours each way! This increased time-efficiency will allow us to expand the network of benchmarks within the caldera in future years.

This year, MPR pressure measurements on our pre-existing benchmarks were made during *Jason* dives J2-1430 and J2-1431 (June 23-28, 2022). Dive J2-1430 started at benchmark AX-105 and was our only visit to that benchmark. Unfortunately, because it was the first pressure measurement of the dive, the MPR instrument did not have enough time to fully thermally equilibrate, and that measurement had more error than the rest of the survey. We estimate that the measurement at AX-105 was too shallow by 2.1 cm, by comparing the MPR data at AX-101 (using AX-105 as a reference) with single-station data from the OOI-BPR-MJ03F, and differential-BPR data from MJ03E-F (which we can multiply by 1.67 to compare with single-station data). Both of the latter suggest that AX-101 uplifted by 11.7 cm between September 2020 and June 2022, which we can use as our reference site for this year. This is equivalent to subtracting 2.1 cm from the MPR results that would be computed holding AX-105 as the reference site instead, as shown in Table 4.1.2, below.

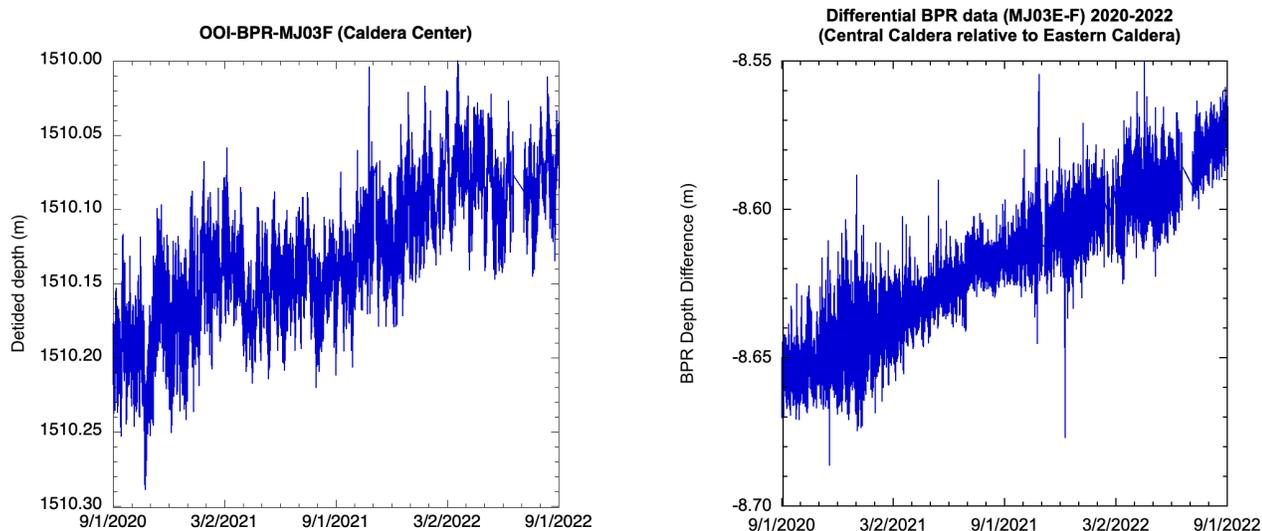


Figure 4.1.1 – (Left) Single-station OOI-BPR data from MJ03F (Central Caldera) from Sept 1 2020 to Sept 1 2022. Part of the apparent rate variability is due to seasonal oceanographic changes that make single station uplift rates appear higher in the fall and winter each year. (Right) Differential OOI-BPR data (MJ03E-F or Central Caldera relative to Eastern Caldera). This differencing takes out the common noise from tidal residuals and non-tidal oceanographic signals, and shows a more linear rate of uplift with less noise. This data is uncorrected (it is relative), but we have found empirically that it can be directly compared with the MJ03F single-station data by multiplying by a correction factor of 1.67. The uncorrected differential uplift measured from Sept 2020 to June 2022 is 7 cm, which translates to a corrected uplift of 11.7 cm at the Caldera Center. This is the value we use as a reference for the MPR survey, representing real uplift at benchmark AX-101 at the Caldera Center from Sept 2020 to June 2022.

Table 4.1.1 - Cement MPR Benchmark Locations, including the 4 new benchmarks added this year.

AXIAL CEMENT BENCHMARK NAMES	LAT	LON	Depth	LAT DEG	LAT MIN	LON DEG	LON MIN
AX-101 Caldera Center	45.95520	-130.00987	1532	45	57.312	-130	0.592
AX-104 Bag City	45.91617	-129.98950	1534	45	54.970	-129	59.370
AX-105 Pillow Mound	45.86317	-130.00376	1718	45	51.790	-130	0.225
AX-106 Ashes	45.93445	-130.01160	1542	45	56.067	-130	0.696
AX-302 Trevi	45.94642	-129.98378	1522	45	56.785	-129	59.027
AX-303 Marker 33 site	45.93346	-129.98225	1516	45	56.008	-129	58.935
AX-307 Magnesia West	45.94535	-130.00906	1544	45	56.721	-130	0.544
AX-308 BPR-South1	45.93160	-129.99880	1533	45	55.896	-129	59.928
AX-309 RSN-PN	45.93835	-129.97208	1527	45	56.301	-129	58.325
AX-310 Intern. District	45.92580	-129.97787	1531	45	55.548	-129	58.672
AX-401 East Rim	45.96271	-129.99111	1475	45	57.763	-129	59.466
AX-402 East Floor	45.96263	-129.99159	1522	45	57.758	-129	59.495
AX-403 West Floor	45.94783	-130.02570	1556	45	56.869	-130	01.542
AX-404 West Rim	45.94709	-130.02677	1399	45	56.825	-130	01.606

Table 4.1.2 - Depth changes from September 2020-June 2022 at MPR benchmarks. Uncertainty is ± 0.41 cm.

BENCHMARK NAME	Preferred depth change (cm) using OOI-BPR-MJ03F as a reference for AX-101 (based on MJ03E-F corrected differential data)	Value subtracted to get AX-101 (relative to AX-105) to match the corrected differential OOI-MJ03E-F data (cm)	Depth change (cm) using AX-105 as a reference (less accurate due to temperature-related error on 1 st measurement)
AX-101 Caldera Center	11.7	-2.1	13.8
AX-104 Bag City	5.5	-2.1	7.6
AX-105 Pillow Mound	n/a	n/a	0.0*
AX-106 Ashes	9.0	-2.1	11.1
AX-302 Trevi	5.4	-2.1	7.5
AX-303 Marker 33 site	6.4	-2.1	8.5
AX-307 Magnesia West	11.9	-2.1	14.0
AX-308 South1	9.0	-2.1	11.1
AX-309 RSN-PN	4.4	-2.1	6.5
AX-310 Intern. District	6.0	-2.1	8.3

* probably not accurate since it was the 1st MPR measurement on dive J2-1430 and the MPR had not fully thermally equilibrated, and there was only one MPR measurement at benchmark AX-105.

This year ROV *Jason* was operating in single-body mode (without *Medea*) on *R/V Thompson*, so *Jason* could only transit between sites at a speed of 0.5 knot. On dive J2-1430, we started at benchmark AX-105 and made one circuit of all the other MPR benchmarks, and then made repeat measurements at benchmarks AX-104, AX-310, AX-303, and AX-309. While at AX-309, the MPR got rotated inside the hose clamps that hold the handle and base on the MPR (due to getting caught on the MPR holster during deployment and the mesh sleeve on the MPR being too loose). This rotation would have compromised the subsequent pressure measurements, so the dive was aborted to remedy this situation. The MPR survey was continued on dive J2-1431, more or less where we left off. The dive started at benchmark AX-303 and proceeded in a clockwise direction around the benchmarks in the caldera (omitting benchmark AX-105). The combined survey had 3 repeat measurements at each benchmark over the 2 dives, with the exception of AX-105, which only had one measurement. Deployments and recoveries of the Webb crustal compliance instruments and HOBO temperature probe deployments/recoveries were interspersed during the MPR survey dives. One circuit of the benchmarks (without AX-105 and omitting Webb instrument time) took about 24 hours.

We also made a separate MPR survey during *Jason* dive J2-1432 (June 29-July 1, 2022) at the new benchmarks that we deployed this year on the western and eastern caldera walls (AX-401 to 404). These measurements we tied to benchmark AX-101 at the center of the caldera, which is convenient since it is located mid-way between the benchmarks. The dive started and ended at AX-101. One circuit starting and ending at AX-101 and visiting all 4 new benchmarks took about 12 hours. The new benchmarks were positioned by *Jason* and then the MPR measurements were made later on the same dive. Mini-BPRs were placed on each new benchmark. The goal of adding these 4 new benchmarks is to document any vertical offset across the caldera faults related to seismicity, and the benchmarks will be co-located with and complementary to a horizontal ranging experiment across the caldera using Sonardyne Fetch transponders funded by a separate NSF award to William Wilcock and Dana Manalang at University of Washington (NSF grant OCE-2130060).

As in previous years, each measurement was made by placing the MPR on top of a benchmark and recording for 20 minutes. Data were recorded on a laptop PC in the *Jason* control room. The two Paros pressure gauges that we have used in the past (s/n 43535 and 62201) were again used in the MPR this year. The MPR pressure data were converted to depth then corrected for ocean tides using data recorded by the OOI-BPR-MJ03D instrument (note that OOI-BPR-MJ03F

was off-line during TN404, but was on-line both before and after our cruise). Instrument drift was calculated during the MPR survey and was removed. The uncertainty in the pressure measurements was determined by the scatter of repeated measurements at each benchmark and was ± 0.41 cm this year. The 2020-2022 MPR results show uplift (inflation) at all pre-existing stations, but at a markedly decreased rate from previous years (see Table 4.1.2 above).

OOI Regional Cabled Array BPR drift

The results from the MPR surveys allow us to constrain the drift rates of the OOI Regional Cabled Array bottom pressure/tilt instruments (BOTPTs), which all have MPR benchmarks located nearby. This is the fourth time we have been able to do this since the original three BOTPT instruments were powered up in September 2014 (although only the third time for the fourth BOTPT instrument, MJ03B, that was deployed at ASHES in August 2017). Using the seven-year record from 2015-2022, in particular, provides the best signal-to-noise yet with which to constrain these drift rates. The calculated drift rates are all less than ± 0.3 cm/yr for the 2015-2022 time period (far right column in the table below). Thus, we consider the drift for these BPRs “essentially zero”, considering the errors. The drift calculations over shorter time periods (2015-2017, 2017-2018, 2018-2020) are less precise, because there is more error in picking a single depth from the BPR data at the beginning and end of each time interval, which are overprinted with non-tidal oceanographic effects. For example, in the table below, the calculated drift rates from 2017-2018 are the highest, because that is also the shortest time interval (just 1 year), with the highest error and worst signal to noise. The bottom line is that we conclude again that no drift corrections need to be made to the OOI NANO-BPR data from the BOTPT instruments on the cabled observatory inside the summit caldera, because their drift rates are very low, and essentially zero.

Table 4.1.3 – Apparent Drift Rates of OOI BOTPT NANO-BPRs Determined by Comparing with MPR Surveys: 2015-2022

BOTPT Name & Location & Nearest MPR benchmark	Drift rate 2015-2017 (cm/yr)	Drift rate 2017-2018 (cm/yr)	Drift rate 2018-2020 (cm/yr)	Drift rate 2020-2022 (cm/yr)	Drift rate 2015-2022 (cm/yr)
BOTPT-A301-MJ03F Central Caldera (AX-101)	-0.682	+3.376	-1.635	+0.167	+0.190
BOTPT-A302-MJ03E Eastern Caldera (AX-309)	-0.839	+6.023	-1.372	-0.224	+0.263
BOTPT-A303-MJ03D International District (AX-310)	-0.892	+3.011	-1.538	-0.559	-0.234
BOTPT-A304-MJ03B ASHES (AX-106)	n/a	+2.099	-2.521	-0.559	-0.264*

* The drift rate for the OOI NANO-BPR at ASHES in the right-most column is calculated from August 2017-June 2022

Autonomous BPR moorings

In June 2022, we recovered the four autonomous BPR moorings that were deployed in September 2020 (North, West, East, and Southeast) and 3 of the 4 recorded data successfully, but BPR-Southeast did not. The data recorded by **BPR-Southeast** (paros S/N 125320, formerly “BPR-South2”) had obvious problems (there appeared to be a tidal signal, but the depth values did not make sense), so it was decided to return this instrument to PMEL in Seattle for evaluation. Post-cruise assessment of the instrument determined that it was actually OK, but the problem was that it had shallower depth-limit than we thought (~1640 m or 2400 psi dynamic range) and it had been deployed just beyond that limit in 2020 (~1690 m). This was the cause of the strange depth values recorded during its 2020-2022 deployment. The instrument itself is fine and can be used in future years (it is currently in Seattle), if deployed shallower than 1600 m. The other moored BPR instruments have depth limits of ~6800m or 10,000 psi, so depth is not a limiting factor for them at Axial. All the moored BPRs were built by NOAA/PMEL and record pressure every 15 seconds in psi, which is converted to depth by multiplying by 0.670 m/psi. Below, is a first-look summary of the data from each autonomous BPR mooring that recorded successfully (red), compared with the OOI-BPR-MJ03F record (blue). In general, we have shifted our

strategy for using these moored instruments to being deployed outside the caldera to extend the footprint of our pressure measurements, and our mini-BPR instruments are now used for continuously recording data on all the MPR benchmarks inside the caldera instead. As such, none of the moored BPR instruments were deployed near MPR benchmarks, so their drift cannot be constrained. However, if an eruption occurred they could provide valuable and accurate short-term geodetic data over the duration of co-eruption deflation.

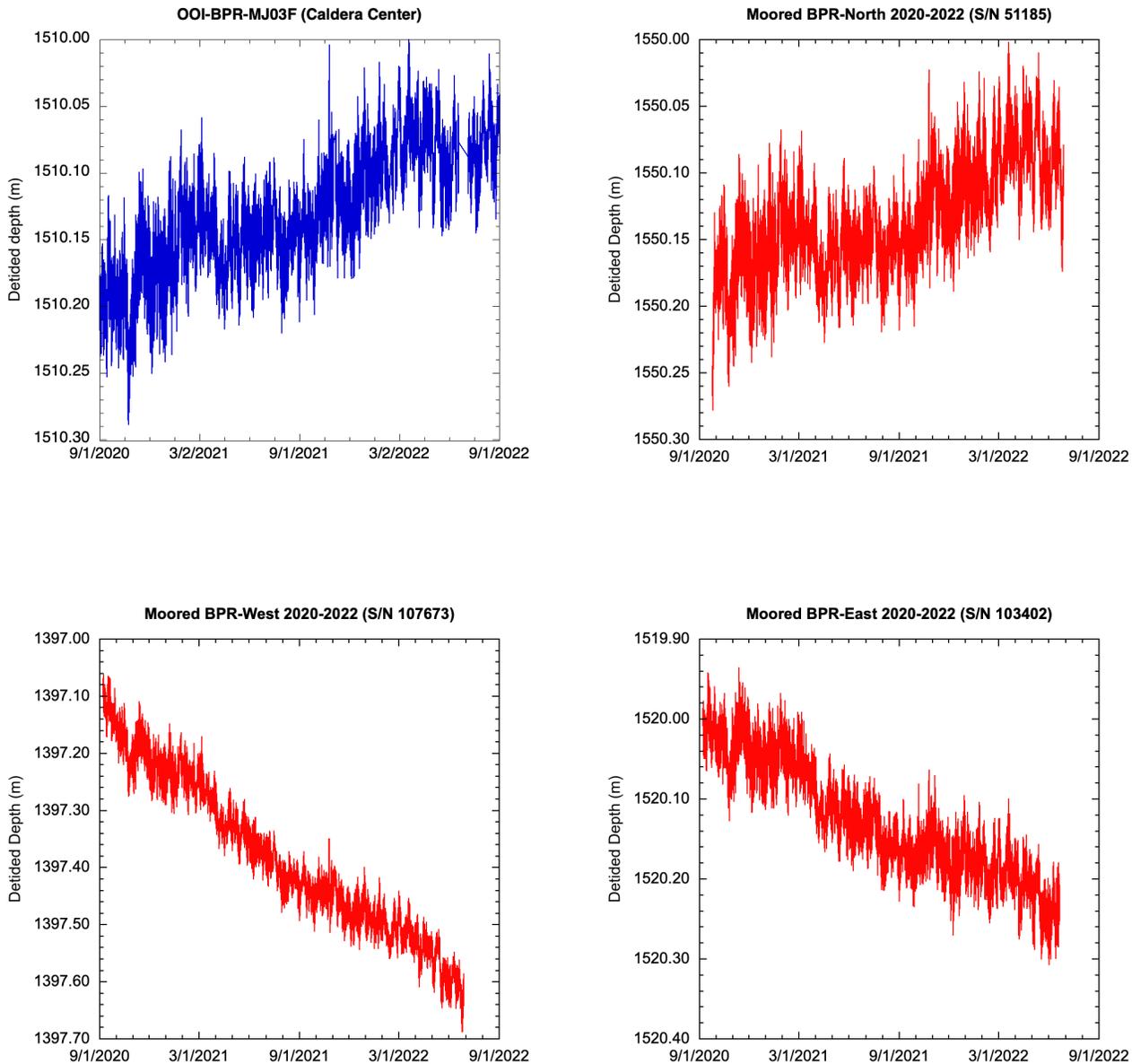


Figure 4.1.2 – Plots of Moored BPR data (in red) compared to the OOI cabled BPR at the Caldera Center (MJ03F, in blue) that is known to have nearly zero drift and showing ~11 cm of uplift at the Caldera Center. All plots form Sept 1 2020 to Sept 1 2022.

BPR-North (paros S/N 51185) was located about 2 km NNW of OOI-BPR-MJ03F at the Caldera Center and shows a similar pattern to that location, and as such was the “best behaved” of the 3 moored BPRs. It shows an apparent uplift of ~8 cm (with unconstrained drift), but this makes sense compared with the uplift of ~11.7 cm observed at MJ03F (which we know has nearly zero drift), although this sensor has had higher drift than the others in previous years.

BPR-West (paros S/N 107673) was located again up on the heavily sedimented western caldera rim, and it once again showed a strong deflationary or subsidence signal, which it has done every year since it was first deployed there in 2017. Between September 2020 and June 2022 the apparent subsidence amounts to ~55 cm! Either the instrument slowly sunk into the thick sediment during its 2-year deployment, or it has a very high positive drift rate (which would be unusual). To try to determine which of these is the case, we re-deployed it this summer near the BPR-North instrument (inside the caldera on bare rock), so that we will be able to directly compare their records when they are next recovered. It will be important to find out whether these moored BPR instruments are unstable when deployed in heavy sediment.

BPR-East (paros S/N 103402, formerly “BPR-Center”) was located several km to the east of the caldera for the first time. However, it too measured strong apparent deflation or subsidence, amounting to ~22 cm, between 2020-2022. The fact that this particular sensor had never before shown a positive drift rate (apparent subsidence), and the fact that only the BPRs that have been deployed in sediment are showing such rates (like BPR-West), seems to support the conclusion that deploying our moored BPR instruments in areas of heavy sediment is problematic. We deployed the same instrument in the same location east of the caldera in June 2022 to give it a second try, and we will make an assessment after the instrument is recovered again.

The Latitude/Longitude locations of the BPR Moorings recovered and deployed in June 2022 are presented in the Mooring Operations summary. They are shown in map view in the figure below.

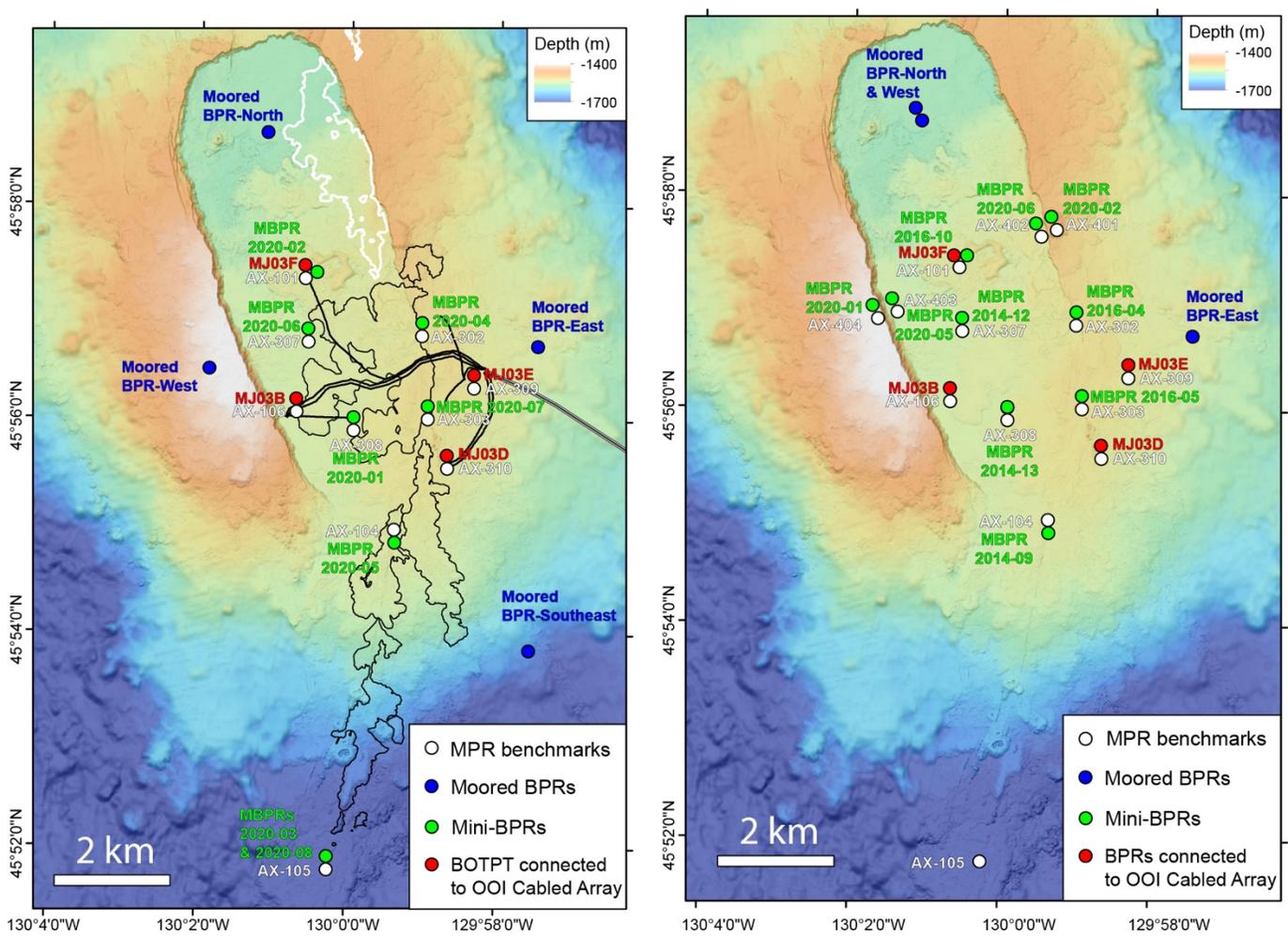


Figure 4.1.3 - Maps showing MPR benchmarks (white dots) and various types of BPRs (after the 2020 cruise on the left and after the 2022 cruise on the right). Note there are no Mini-BPRs at benchmark AX-105 after the 2022 cruise.

Mini-BPRs (TG11s)

During *Jason* dives J2-1428, J2-1429, and J2-1431, we recovered 8 Mini-BPRs (aka TG11s, built at Scripps) that were deployed on MPR benchmarks in 2020 (see table below). They were deployed with small tripods on their undersides to make them stable and they weigh ~5 pounds in water. All the 8 Mini-BPRs deployed in 2020 were new. The table below lists the dates & times that the individual Mini-BPRs were placed on and recovered from the MPR benchmarks. The 4th column is the clock drift during the deployment, and the 5th column is the apparent Paros sensor drift (cm/yr) which was calculated by comparing the Mini-BPR data with the MPR survey results. Mini-BPR 2020-08 was recovered with a dead battery and it only recorded for less than a day after it was turned on – apparently due to an electrical short.

Table 4.1.6 - MINI-BPRs RECOVERED in 2022 (date/times are when instrument was on the benchmark)

Inst. ID Paros s/n	Benchmark	Deploy date/time/JD	Recover date/time/JD	Clock drift during depl. (seconds) and clock drift rate (sec/day)	Apparent Paros inst. drift (cm/yr)
2020-01 140958	AX-308	09/10/2020 23:24 (JD=254)	06/22/2022 10:30 (JD=173)	-374 -0.566666667	-1.659
2020-02 140959	AX-101	09/11/2020 06:27 (JD=255)	06/22/2022 21:03 (JD=173)	-132 -0.2	-4.811
2020-03 140960	AX-105	09/12/2020 03:01 (JD=256)	06/23/2022 12:40 (JD=174)	-275 -0.416036309	-6.626
2020-04 140961	AX-302	09/11/2020 10:03 (JD=255)	06/24/2022 09:25 (JD=175)	-435 -0.657099698	-1.875
2020-05 140962	AX-104	09/11/2020 19:50 (JD=255)	06/21/2022 15:21 (JD=172)	-466 -0.707132018	-5.262
2020-06 140963	AX-307	09/13/2020 02:47 (JD=257)	06/22/2022 16:02 (JD=173)	-136 -0.206060606	-2.157
2020-07 140964	AX-303	09/12/2020 15:47 (JD=256)	06/24/2022 05:09 (JD=175)	-419 -0.632930514	-2.977
2020-08 140965	AX-105	09/12/2020 03:01 (JD=256)	06/23/2022 12:40 (JD=174)	n/a	n/a

The Mini-BPRs report pressures in kPa every 100 seconds (1 min 40 sec). The pressure was converted from kPa to psi using $1\text{ kPa} = 0.14503773800722\text{ psi}$ and then to depth in meters using $1\text{ psi} = 0.670\text{ meters}$. During data processing, clock drift measured when the instruments were recovered was used to correct the dates/times in the recorded data. Then all the Mini-BPR data were de-tided by subtracting predicted tides provided by Rick Thomson at the Institute of Ocean Sciences in Sydney, BC, based on the first year of OOI BPR data from instrument BOTPT-A301-MJ03F on the OOI Cabled Array (located at 45.954850° - 130.008753° , at the Central Caldera). Plots of the data are shown on the following pages.

Overall Results of the Pressure Measurements

The data from the 2022 show that by June 2022 Axial Seamount had re-inflated ~ 89% of the total amount of deflation that occurred during the 2015 eruption (2.18 m of post-eruption re-inflation compared to 2.54 m of co-eruption deflation). However, the rate of re-inflation since the 2015 eruption has been gradually decreasing with time, suggesting that the magma supply rate to Axial is also decreasing substantially. For example, the amount of uplift at the caldera center was 48 cm between 2018-2020, but only 12 cm between 2020-2022. Because of this, our eruption forecasting efforts, based on extrapolating the average rate of inflation forward in time, has gotten more difficult with such low inflation rates (https://www.pmel.noaa.gov/eoi/axial_blog.html). For now, the next eruption still appears to be years away, consistent with the very low rate of seismicity.

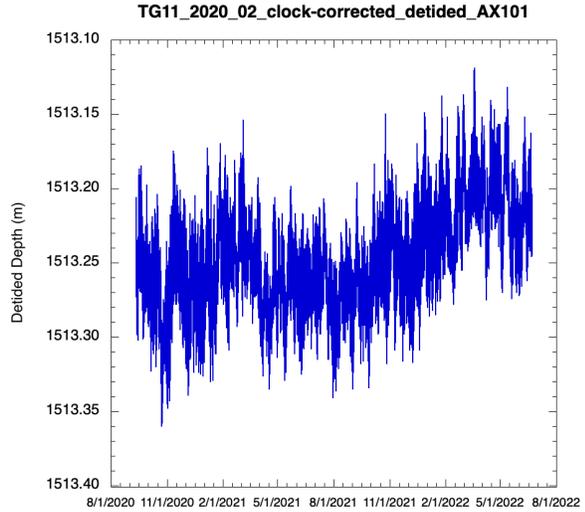
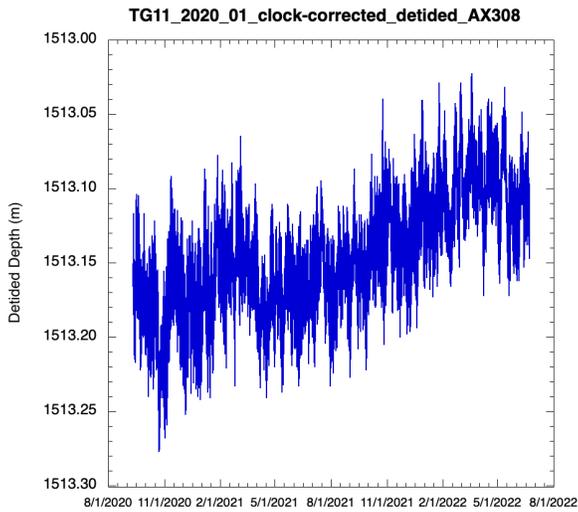


Figure 4.1.4 – Clock-corrected and detided Mini-BPR data from instruments 2020-01 at benchmark AX-308 (left) and 2020-02 at benchmark AX-101 (right).

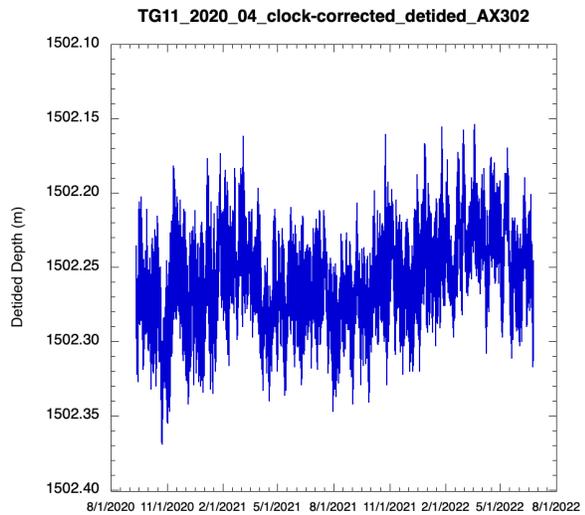
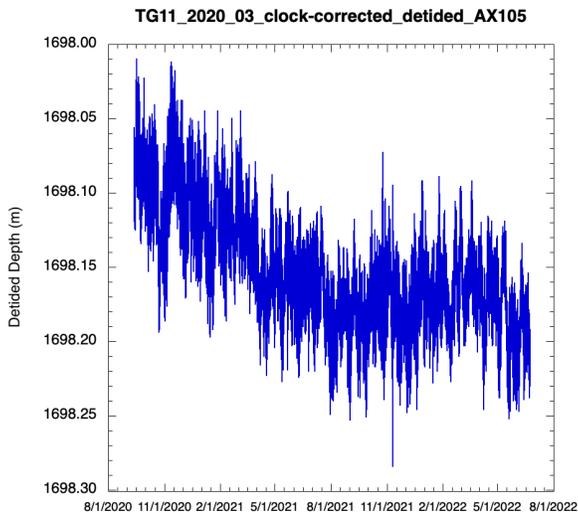


Figure 4.1.5 – Clock-corrected and detided Mini-BPR data from instruments 2020-03 at benchmark AX-105 (left) and 2020-04 at benchmark AX-302 (right).

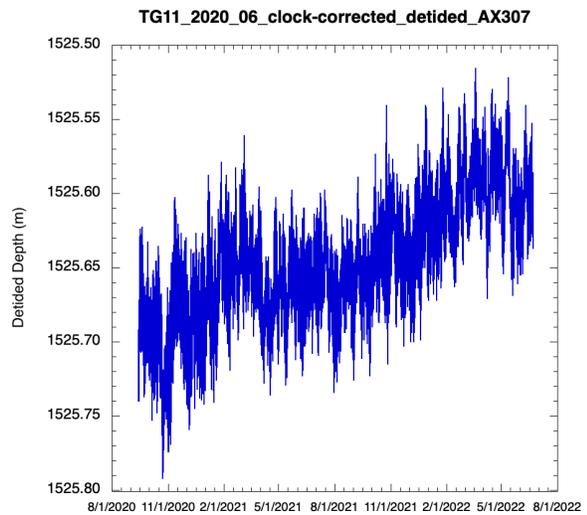
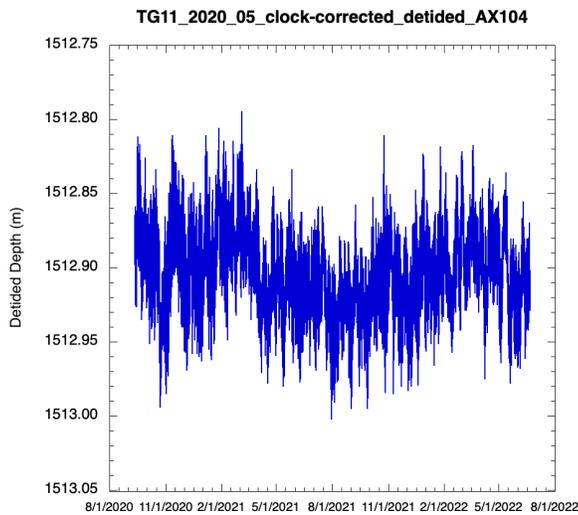


Figure 4.1.6 – Clock-corrected and detided Mini-BPR data from instruments 2020-05 at benchmark AX-104 (left) and 2020-06 at benchmark AX-307 (right).

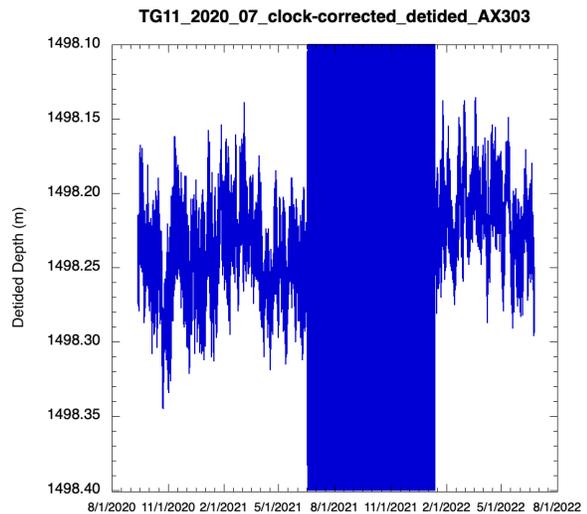
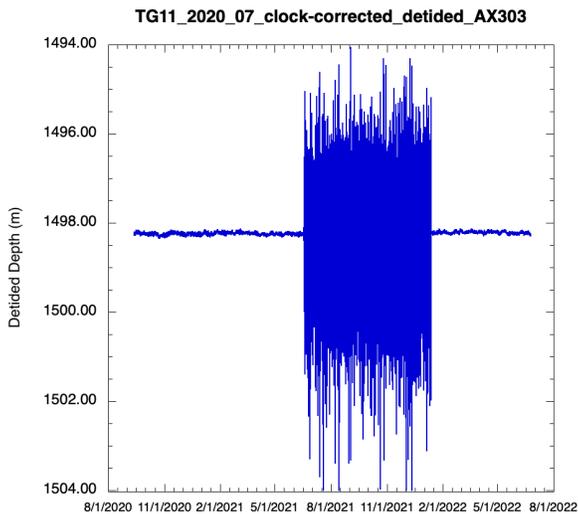


Figure 4.1.7 – Clock-corrected and detided Mini-BPR data from instrument 2020-07 at benchmark AX-303 (left) and rescaled for more detail (right). It is unknown why there is an interval with high noise from 06/18/2021 to 01/12/2022 in this record, but the instrument seems to be behaving normally beforehand and afterward.

The table below shows where Mini-BPRs were deployed in 2022 during *Jason* dives J2-1428-1433. We decided to deploy Mini-BPRs at 10 benchmarks, including on our 4 new benchmarks along the caldera walls. Our old reference site AX-105 does not currently have a Mini-BPR on it. Three other benchmarks that do not have Mini-BPRs are located near OOI cabled BPRs instead (AX-310, AX-309, AX-106). Benchmark AX-101 (our new reference site) is located near an OOI-BPR at the caldera center, and also has a Mini-BPRs for redundancy. We currently own 16 Mini-BPRs.

Table 4.1.7 - MINI-BPRs (TG11's) DEPLOYED in 2022
(date/times are when instrument was placed on the benchmark)

Inst. ID	Paros S/N	Benchmark	Depth (m)	Deploy date	Deploy	
					time	Julian day
2014-09	127331	AX-104	1534	06/21/2022	15:25	172
2014-13	132674	AX-308	1533	06/22/2022	10:33	173
2014-12	132673	AX-307	1544	06/22/2022	16:13	173
2016-10	137990	AX-101	1532	06/22/2022	21:06	173
2016-04	137988	AX-302	1522	06/24/2022	09:33	175
2016-05	137989	AX-303	1516	06/24/2022	05:14	175
2020-05	140962	AX-403	1549	06/29/2022	21:08	180
2020-01	140958	AX-404	1399	06/30/2022	00:11	181
2020-02	140959	AX-401	1470	06/30/2022	06:05	181
2020-06	140963	AX-402	1517	06/30/2022	08:47	181

Below is a list of all the Mini-BPRs we own (between OSU and UNCW) and where they are located currently.

Table 4.1.8 - Mini-BPR (TG11) ID List for instruments used at Axial Seamount

Unit ID	Paros s/n	Paros Model #	PSI range	Owned by	DL5 ID	Current location
2020-01	140958	43K-302	0-3000	OSU	58	Axial – AX404
2020-02	140959	43K-302	0-3000	OSU	59	Axial – AX401
2020-03	140960	43K-302	0-3000	OSU	60	Newport
2020-04	140961	43K-302	0-3000	OSU	61	Newport
2020-05	140962	43K-302	0-3000	OSU	62	Axial – AX403
2020-06	140963	43K-302	0-3000	OSU	63	Axial – AX402
2020-07	140964	43K-302	0-3000	OSU	64	Newport
2020-08	140965	43K-302	0-3000	OSU	65	Scripps*
2016-02	137987	43K-101	0-3000	OSU		Scripps**
2016-04	137988	43K-101	0-3000	OSU		Axial – AX302
2016-05	137989	43K-101	0-3000	OSU		Axial – AX303
2016-10	137990	43K-101	0-3000	OSU	41	Axial – AX101
2014-08	127329	43K-101	0-3000	UNCW	2	Scripps***
2014-09	127331	43K-101	0-3000	UNCW	7	Axial – AX104
2014-12	132673	46K-101	0-6000	UNCW	10	Axial – AX307
2014-13	132674	46K-101	0-6000	UNCW	3	Axial – AX308

* Sent to Scripps for evaluation after recovered with dead battery in June 2022

** Sent to Scripps for evaluation after found note on it in June 2022 to check the peak tubing

*** Sent to Scripps for evaluation after recovered with dead battery in September 2020 (2nd time)

4.2 - Crustal Compliance Instrument Deployments and Recoveries

Bill Chadwick & Spahr Webb

This was an NSF-funded project (Spahr Webb, PI) piggybacked on the Axial 2022 cruise with the aim of testing three instruments to measure crustal compliance at Axial Seamount. Similar operations were piggybacked on the Axial 2020 cruise. The goal this time was to deploy the three instruments and let them each record for several days on the seafloor, then recover them, and hopefully get 2 deployments of each instrument before the end of the cruise. Each instrument had a separate cover to shield it from bottom currents while it was deployed on the seafloor. In 2020, the instruments and the shields were deployed from & recovered by the ship separately, but in 2022 they were re-configured so that they could be deployed and recovered together, which saved considerable time.

The deployments in 2022 were accomplished as follows:

- Before the cruise, specific deployment sites for the instruments were picked in the summit caldera where very flat areas of lineated sheet flow existed, based on high-resolution AUV bathymetry, to ensure maximum instrument stability on the seafloor (see Table 4.2.1, below).
- Each instrument was strapped inside its inverted shield with 4 ratchet straps. Weights were attached to the underside of the shield (no separate descent weights were used, as in 2020). A 1-disk float pack (syntactic foam, provided by the *Jason* group) was attached to the instrument/shield package and this was deployed over the side of the ship and free-falled to the bottom. A USBL beacon was attached to the float pack.
- Once the instrument, shield, & float were on the bottom, ROV *Jason* located them and moved the package to the chosen deployment site. Next, *Jason* cut the 4 ratchet straps holding the instrument in the inverted shield, and lifted it (with float pack) out of the shield and onto the seafloor nearby. After the instrument was deemed to be optimally sited, the float pack was released from the instrument and was recovered at the surface by the ship. *Jason* came off the bottom while the ship was recovering the float pack.
- Once *Jason* was back on the bottom at the instrument site, the shield was turned over and the weights were removed (placed on the seafloor or in the *Jason* basket) and a guide line with markings was extended from the instrument. Next the shield was placed over the instrument (aided by windows and handles on the shield, and the guide line to get the shield properly positioned). Finally, the 3 weights were placed on top of the shield to cover holes in the top and to hold it down securely.

The recoveries were more-or-less the opposite, except with more flotation:

- A 3-disk float pack with a USBL beacon attached and with a descent weight was free-fall deployed from the ship near one of the Webb instruments to be recovered.
- ROV *Jason* then located the float pack on the bottom and moved it to the Webb instrument that was to be recovered.
- *Jason* then carefully removed the weights from the shield, and removed the shield from the instrument, setting it down nearby. Next recovery lines were connected from the instrument to the shield and from the float pack to a bridle on the instrument.
- Finally, *Jason* released the float + instrument + cover assembly from the anchor with a pull-pin, and the entire package floated to the surface and was recovered by the ship.

The deployment and recovery of the Webb instruments was accomplished mixed-in with other operations during the cruise. The time it took to deploy each instrument ranged from 2.0 hours (without a shield) to between 4 to 6.5 hours (with a shield), including deploying and recovering float packs at the surface. Recovering the instruments took between 3 to 4.5 hours, including deploying and recovering float packs at the surface. Once a shield was lost when the line to it parted during recovery (when the shield was temporarily caught under the side of the ship), and another time a shield did not arrive at the surface after release.

Table 4.2.1 - Targets and actual deployment sites for the Webb instruments

Targets for Webb insts	LAT	LON	Depth
WEBB-1 (SE of caldera)	45.90904	-129.98064	1545
WEBB-2 (SW of AX-310)	45.92408	-129.98240	1523
WEBB-4 (NE of AX-307)	45.94870	-130.00338	1532
WEBB-6 (N of AX-308)	45.93633	-129.99795	1539
Actual deployment sites for Webb instruments on the seafloor			
WEBB-1	45.90899	-129.98076	1546
WEBB-2	45.92191	-129.98218	1524
WEBB-4	45.94855	-130.00332	1532
WEBB-6	45.93670	-129.99782	1538
Deployment times (GMT) from end of deployment to start of recovery			
Instrument & location	Deploy Dive#/ Date/Time	Recover Dive#/ Date/Time	Duration on bottom
CMP1 @ WEBB-1 (1st)	J2-1428 06/21/2022 13:45	J2-1430 06/23/2022 21:25	2 days, 8 hrs
CMP2 @ WEBB-2 (1st)	J2-1429 06/22/2022 02:55	J2-1430 06/25/2022 05:58	3 days, 3 hrs
CMP3 @ WEBB-6 (1st)	J2-1429 06/22/2022 09:30	J2-1431 06/26/2022 11:37	4 days, 2 hrs
CMP1 @ WEBB-4 (2nd)	J2-1430 06/24/2022 20:39	J2-1433 07/01/2022 15:51	6 days, 19 hrs
CMP2 @ WEBB-6 (2nd) (without a shield)	J2-1431 06/26/2022 11:03	J2-1433 07/01/2022 11:08	5 days, 0 hrs

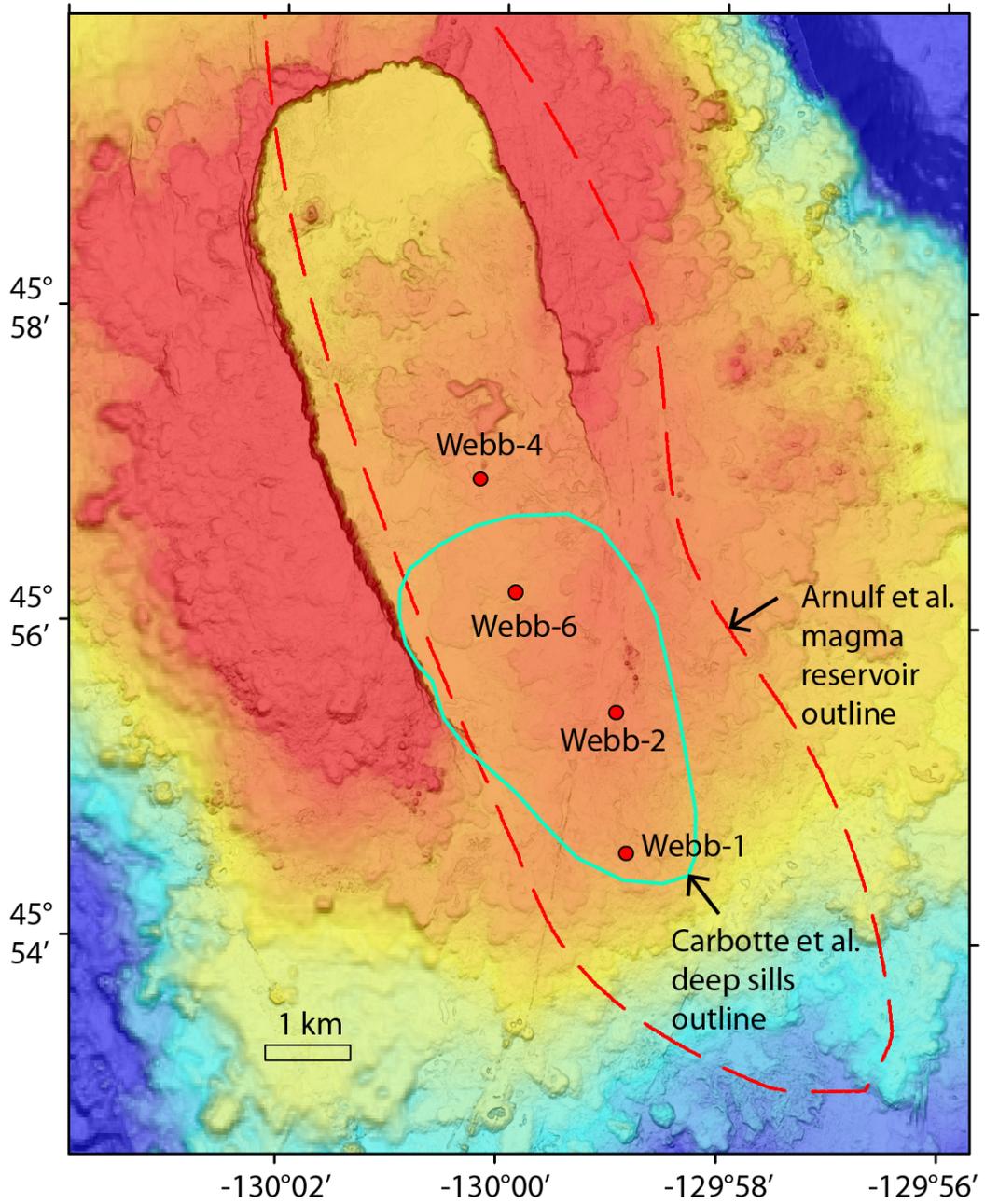


Figure 4.2.1 - Map showing Webb Crustal Compliance instrument deployment locations.

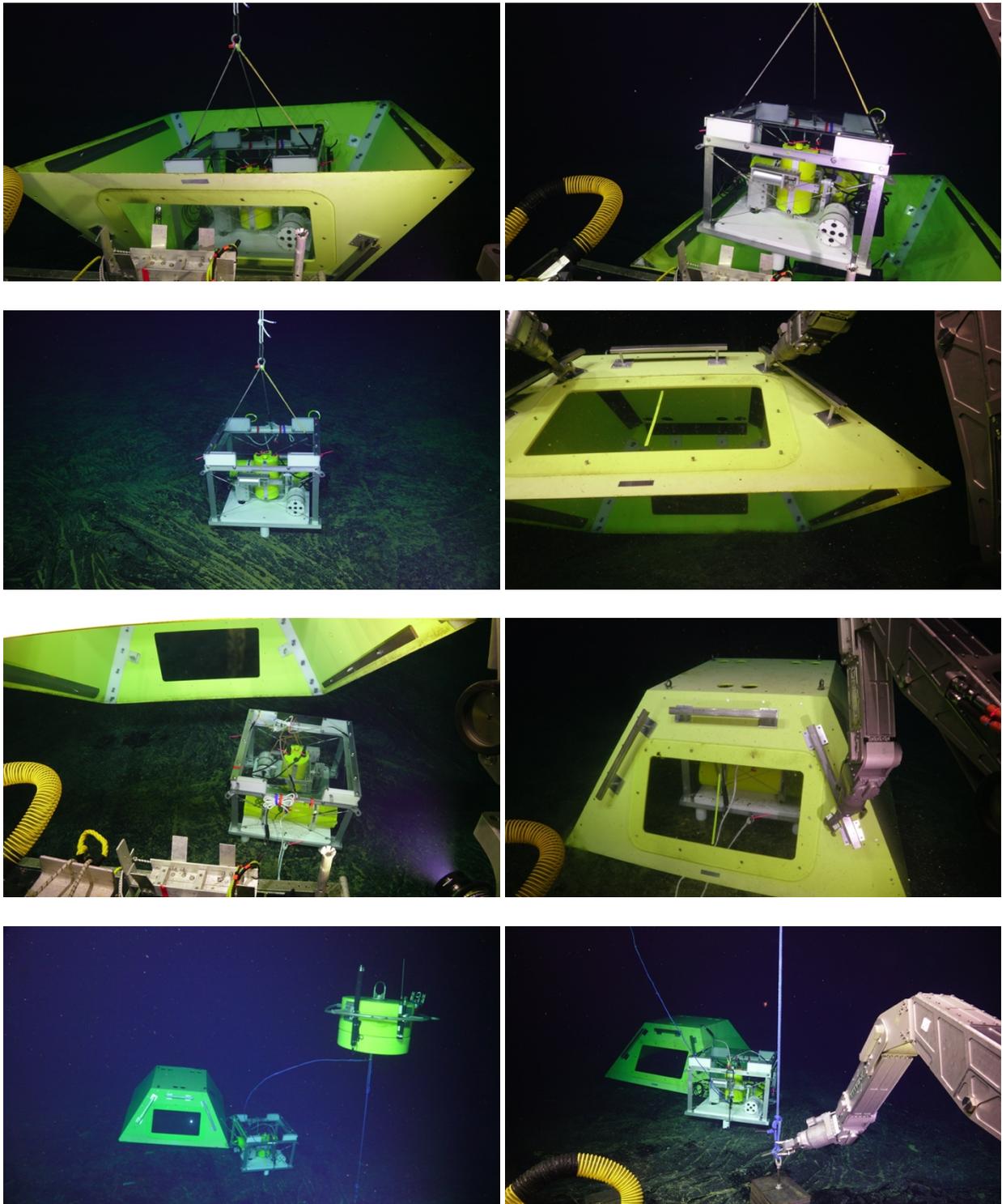


Figure 4.2.2 - ROV *Jason* images of the Webb Crustal Compliance instruments being deployed and recovered.

4.3 Hydrothermal Vent Temperature Recorders

Bill Chadwick

During this year’s ROV *Jason* dives, we recovered 3 HOBO-style (aka MISO) high-temperature probes which had been deployed since September 2020 at Castle, Diva, and Vixen hydrothermal vents (all anhydrite chimneys). We deployed new HOBOs at Diva, Vixen, and Casper (instead of Castle) during TN404. We had hoped to turn around other temperature probes and deploy some brand new ones in other locations, but we ran out of time. First, we asked the following cruise if they could do this for us (Julie Huber was Chief Scientist on TN405), since it was compatible with their cruise plans, but their cruise got cut short prematurely because of a COVID outbreak on board *R/V Thompson*. Next we asked the UW OOI O&M cruise (TN407) if they could deploy and recover additional temperature probes for us, and fortunately they were able and willing to fit this into their other operations at Axial. They turned around probes that we had deployed at Trevi and Virgin vents in 2020, and they deployed 4 additional probes at El Guapo, Castle, Inferno, and Hell vents (see Table 4.3.1 below). We did not deploy or recover any low-temperature MTR recorders this year.

The following temperature probes were deployed in 2020 and recovered in 2022:

Table 4.3.1 – HOBO temperature probes recovered in 2022 on TN404 and TN407.

Vent/Marker	Probe ID	Dive deployed	Dive recovered	Comments
Vixen / Mkr218	MISO 103	J2-1295	J2-1431	In Vixen vent
Diva / Mkr232	HOBO 153	J2-1296	J2-1431	New Marker 232 deployed (Marker 150 was there in 2018, but was missing in 2020)
Castle / Mkr278	MISO 101	J2-1296	J2-1431	At base of Castle chimney.
Trevi / Mkr156	MISO 104	J2-1293	R-2244	Recovered by UW-OOI on 30-Aug-22 by ROV ROPOS
Virgin	MISO 141	J2-1293	R-2249	Inside donut of geothermal structure. Recovered by UW-OOI on 1-Sep-2022 by ROV ROPOS.

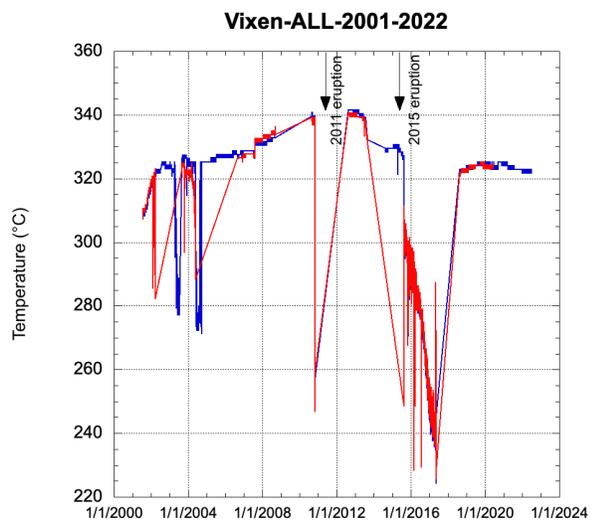
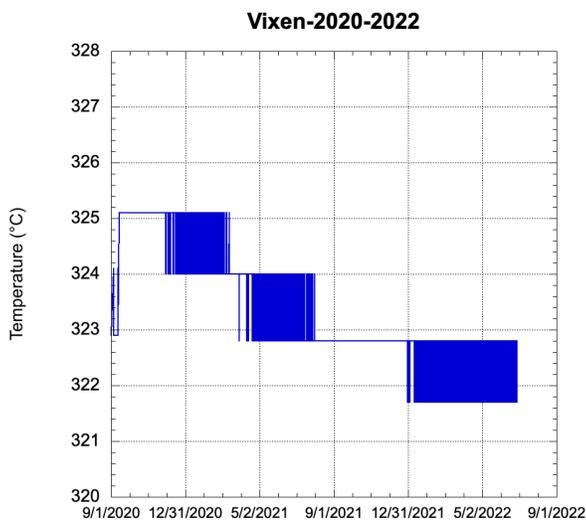
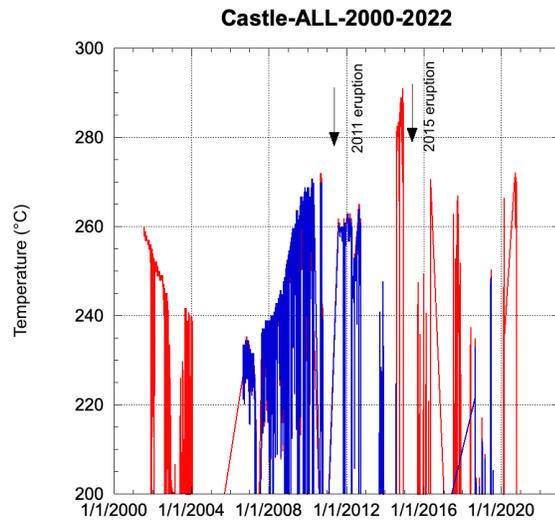
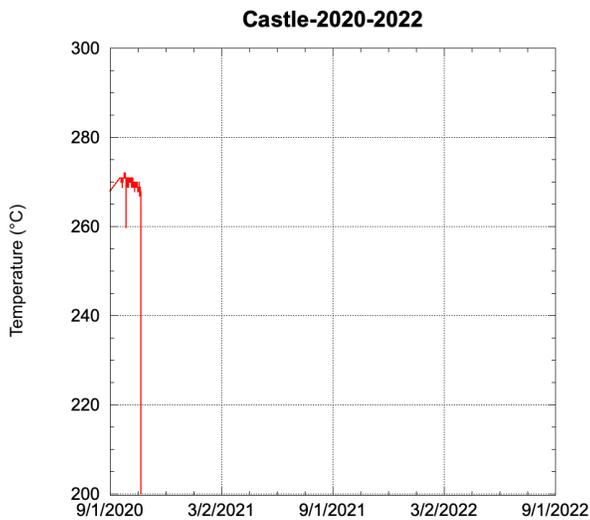
From these new data we have updated long-term plots from the high-temperature vents. In each plot, the excursions to lower temperature should be ignored, because they are largely due to the probes falling out of the vents. The two colors in parts of the plots are from probes with two independent temperature sensors.

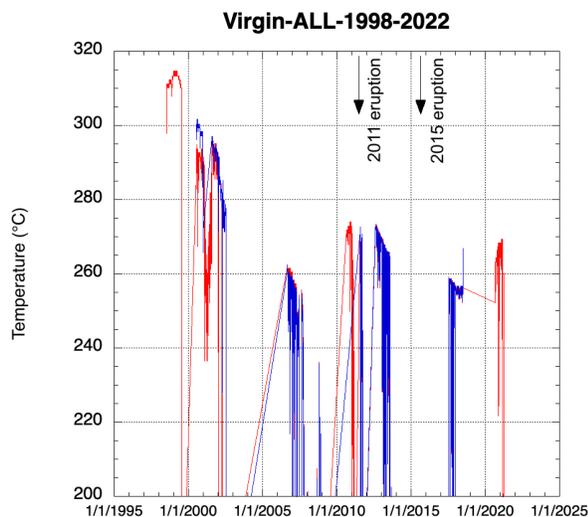
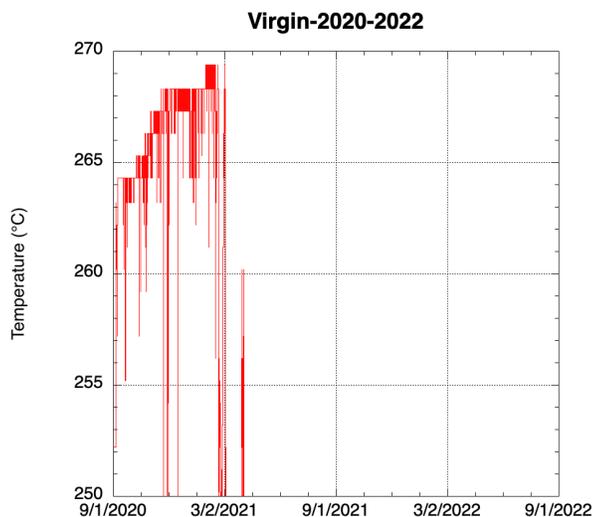
Observations:

- The Castle and Vixen records are the longest (2001-2022). Both showed rising temperature leading up to the 2011 eruption, but generally decreasing temperatures leading up to the 2015 eruption. The Castle record is very noisy and incomplete, because it is difficult to keep a probe in the vent there. The Vixen record showed a co-eruption temperature decrease at the time of the 2015 eruption. The apparent steep decline at Vixen from 2015-2017 was probably due to the probe being on the edge of the fluid flow, because the record since 2018 has been very steady at 322-325°C. The record at Virgin is unfortunately noisy and incomplete.
- The Diva and Trevi records extend from 2010-2022. Diva was one of two probes showing a sudden temperature decrease during the 2011 eruption (the other was Casper). The temperature at Diva rose before both the 2011 and 2015 eruptions and was lower afterward, although the record has many gaps. The 2017-

2018 record at Diva was relatively noisy, probably due to the probe being on the edge of the fluid flow. The 2018-2019 record was much cleaner and showed a steadily rising temperature from 300-322°C. The 2020-2022 record is relatively steady at 334-336°C (near the boiling point at that depth, 1524 m). At Trevi, the temperature increased after the 2011 eruption and then has apparently been decreasing since 2013. The record has been quite noisy since 2014 (including the 2020-2022 record), again probably due to the probe not being well situated in the vent or the fluid flow.

Figure 4.3.1 - The plots below show the temperature records from the last deployment (2020-2022) on the left, and the long-term records on the right for Vixen, Diva, Virgin, Trevi, and Castle vents. We also have long-term records at Casper vent, but have not collected data there since 2015 (see Figure 4.3.2, below).





The following table shows the temperature probes that were deployed in 2022:

Table 4.3.2 – HOBO temperature probe deployments in 2022.

Vent/Marker	Probe ID	Dive deployed	Comments
Diva / Mkr 232	HOBO 130	J2-1431	Repositioned several times to make sure probe tip was in the flow
Vixen / Mkr218	MISO 102	J2-1431	In Vixen vent
Casper	MISO 129	J2-1431	Deployed "as securely as possible"
Trevi / Mkr156	MISO 101	R-2244	Deployed by UW-OOI on 31-Aug-2022 with ROPOS
El Guapo / Mkr 295	MISO 2017-006	R-2246	Deployed by UW-OOI on 31-Aug-2022 with ROPOS. New-style logger borrowed from Dan Fornari.
Castle / Mkr 278	MISO 103	R-2246	Deployed by UW-OOI on 31-Aug-2022 with ROPOS
Hell (ASHES)	MISO 2017-019	R-2249	Deployed by UW-OOI on 1-Sep-2022 with ROPOS. New-style logger borrowed from Dan Fornari.
Inferno (ASHES)	MISO 2017-002	R-2249	Deployed by UW-OOI on 1-Sep-2022 with ROPOS. New-style logger borrowed from Guangyu Xu.
Virgin (ASHES)	HOBO 153	R-2249	Deployed by UW-OOI on 1-Sep-2022 with ROPOS

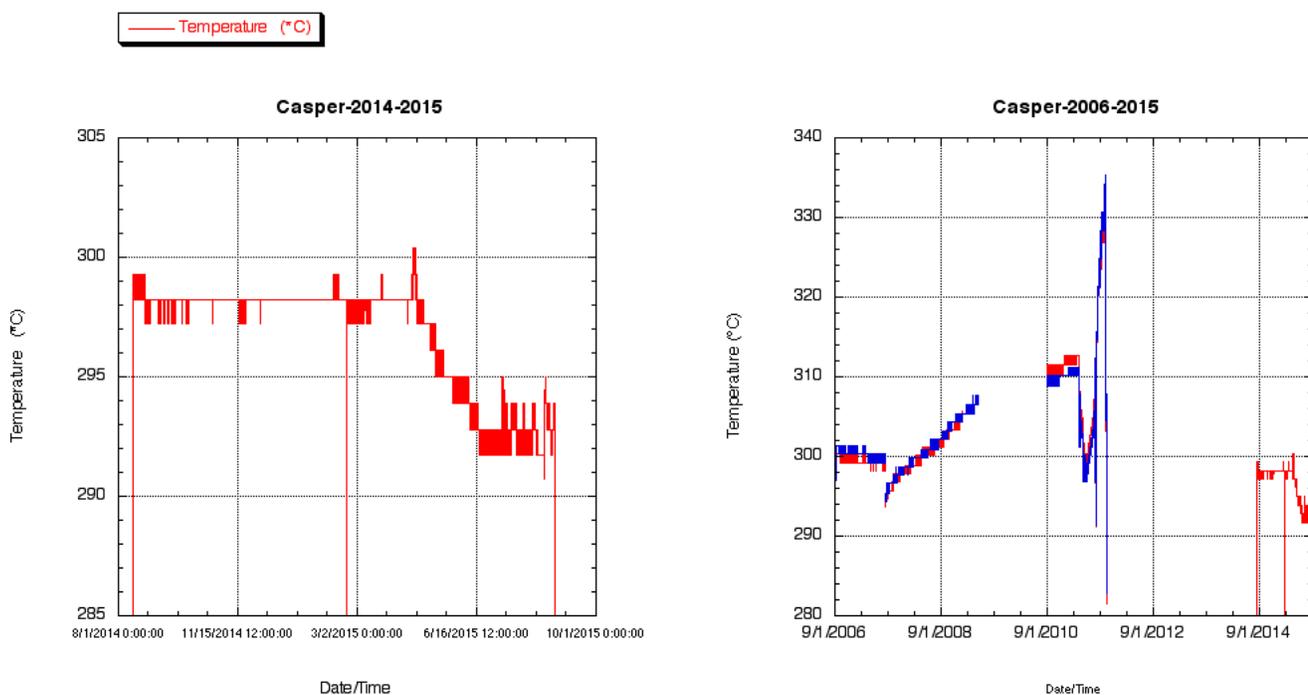
SUMMARY:

- There are 9 temperature probes currently deployed at Axial. Two are ancient (1-chip, "HOBO" in the table above), 4 are just old (2-chip, "MISO" in the table), and 3 are brand new ("MISO YYYY-NNN" in the table). The new probes were borrowed from Dan Fornari (WHOI) and Guangyu Xu (UW-APL).

- Inferno & Hell vents (in ASHES) and El Guapo vent (in International District) have new-style HOBO temperature probes in them. Guangyu Xu is going to try to recover these new probes in summer 2023 on the UW OOI O&M cruise.
- The first 3 probes in the list above were deployed by us on TN404; the next 6 were deployed by the UW-OOI team on TN407 with the *ROPOS* ROV.

One practical note about the “just-old” vintage of MISO temperature probes that we own: The model of 3.6V lithium replacement battery that had been used in previous years on the Onset circuit boards (Tadiran battery model TL-5186) has been discontinued by the manufacturer. The only alternative is a similar model with a slightly different form factor. Therefore, the replacement batteries we purchased in 2020 and used this year were Tadiran model TL-2450 (from DigiKey) which are slightly larger in diameter and slightly thicker. Because of this, only one battery can be placed on the two back-to-back (redundant) circuit boards inside our MISO probes and still fit inside the small pressure cases. Therefore, in the MISO probes we deployed in 2020 and 2022, only one of the two circuit boards have a battery installed (instead of two, as in previous years, with the smaller batteries). In fact, we have removed the 2nd circuit board in some of them to make it easier to get them in and out of the pressure cases. This does not affect the older HOBO temperature probes, because they only had one circuit board, and they still fit with the new batteries.

Figure 4.3.2 - The plots below are the long-term records from Casper vent. No temperature data has been collected there since 2015, but a probe was deployed there in 2022.



4.4 – AUV *Sentry* Operations

Bill Chadwick, Dave Caress, Scott Nooner, and Jeff Beeson



Figure 4.4.1 – (left) AUV *Sentry* (right) Dave Caress with the AUV *Sentry* team during TN-404.

Purpose:

The primary goal of the AUV *Sentry* surveys (Figure 4.4.1) was to collect multibeam sonar data along tracklines inside and outside the caldera that will be compared to past and future surveys to document depth changes due to volcanic deformation. These repeat bathymetric surveys are used to augment and expand the deformation monitoring at Axial Seamount conducted by the seafloor pressure measurements. The pressure data have a higher vertical resolution (± 1 cm) and are continuous in time, but are spatially sparse, only being made at 10-20 measurement points. In comparison, the depth changes between AUV bathymetric resurveys have lower vertical resolution (± 20 cm) and are campaign-style (once a year at the most), but are spatially continuous along tracklines and can extend over a much larger area to places where no pressure data exist. Thus, these two methods form a powerful and complementary combination. A secondary goal for this expedition was to test, and if possible, use a realtime navigation correction algorithm called Terrain Relative Navigation (TRN) to more closely repeat the survey tracklines from prior years.

Prior AUV Surveys:

AUV-based surveys yielding 1-meter scale multibeam bathymetry were begun at Axial Seamount in 2006 using MBARI Mapping AUVs, with additional MBARI surveys adding coverage in 2007, 2008, and 2009. These initial missions covered the summit caldera and part of the upper south rift. Following the 2011 eruption, MBARI surveys in 2011 and 2014 combined new coverage with repeated coverage in the areas of new lava flows; differencing repeated surveys resolved the thickness and extent of most of the 2011 lava flows. A subset of the 2014 missions repeated survey lines within the caldera from 2011; differencing these demonstrated that repeat AUV mapping could resolve the uplift within the caldera that followed the 2011 eruption. Following the April 2015 eruption, we began to conduct a pattern of repeated surveys extending across and well outside the summit caldera to monitor the vertical deformation of the entire summit region. The first long baseline surveys were conducted in August 2015, four months following the eruption, and this expedition's surveys are the sixth repeat of those lines. AUV *Sentry* has been used during expeditions in 2015, 2017, 2020, and now 2022. MBARI Mapping AUVs have been used during 2016, 2018, and 2019. No repeat surveys occurred during 2021. The original repeat survey pattern was extended with additional lines southeast of the caldera starting in 2020. In most years additional surveys have been collected that augmented the overall coverage of Axial Seamount. Including this 2022 expedition, the overall coverage of Axial Seamount includes 82 Mapping AUV and AUV *Sentry* survey missions covering the summit and extending along both the north and south rifts for a total north-south distance of 80 km. The repeat pattern centered on the caldera is about 25 km NNW-SSE and 10 km WSW-ENE, with an additional extension about 6 km to the southeast.

Utility of Terrain Relative Navigation for Repeat AUV Surveys:

TRN is a method for using realtime bathymetry data to determine a vehicle's position relative to an existing topographic map. The TRN algorithm ported to *Sentry* has been developed over several years by Steve Rock of Stanford, his students, and Rob McEwen and Rich Henthorn of MBARI. Prior uses have been to allow AUVs without high grade inertial navigation to use simple echosounder or DVL soundings to navigate relative to a 1-meter scale map generated by a multibeam-equipped AUV. For this project, the goal is to enable a survey AUV to closely follow previous survey lines by using realtime multibeam data to locate the AUV relative to a pre-existing map. The problem being addressed is that INS navigational drift during long survey lines can grow to as much as 100 m (or more when things go badly). When two repeat surveys follow exactly the same track, differencing the bathymetry compares center beam data with center beam data and is relatively insensitive to errors in the multibeam roll bias. If navigational drift causes the repeat surveys to only partially overlap, then outer beam data from both swaths are compared, a calculation that is biased by any roll bias errors for either or both surveys. Thus, failure of a repeat survey to follow the prior survey lines within 30 m or so degrades the precision of the change observed by bathymetric differencing. If we can use TRN to ensure that AUVs precisely follow the previous tracklines being repeated, we eliminate the possibility of failing to achieve any overlap and improve the quality of our measurements of the vertical change between surveys.

TN404 AUV *Sentry* Operations:

The 2022 AUV *Sentry* repeat mapping dives were conducted such that: (1) the survey altitude was 65-70 meters for 1.5 meter lateral resolution on the seafloor, (2) the survey speed was ~1.8-2.0 knots (~1 m/s), (3) dive durations were between 15-25 hours, (4) and AUV *Sentry* came back into acoustic communication range of the ship for navigation updates periodically. In addition to the multibeam sonar, AUV *Sentry* was equipped with a battery powered and internally recording PMEL MAPR instrument and a WHOI magnetometer. The MAPR data collection on *Sentry* are discussed in the following section of this report. The magnetometer data have been provided to Masako Tominaga and Maurice Tivey at WHOI for processing and analysis. No sidescan or subbottom profiler data were collected during these surveys.

We made seven successful AUV *Sentry* dives during this cruise (dives 648-654), shown below in Figures 4.4.2 through 4.4.9. Each of the dive missions was designed as a series of waypoints in consultation with *Sentry* Expedition Leader Sean Kelley. Each dive track was designed to coordinate with the planned movements of the ship and ROV *Jason*. Vehicle configurations, sensor performance, vehicle statistics, and post-dive summaries are detailed in the *Sentry* operations report “Axial2022-Sentry-cruise-report.pdf” provided by the *Sentry* team. The multibeam sonar on the vehicle is a 200-400 kHz Kongsberg EM2040, operated at 400 kHz. USBL updates were given periodically throughout each mission when the AUV was within range of the ship and these were incorporated into the AUV navigation in post-processing. AUV *Sentry* performed quite well overall, and all mapping mission objectives were achieved.

Both the *Sentry* team and the MBARI seafloor mapping group use MB-System (<https://www.mbari.org/products/research-software/mb-system/>) for processing the AUV multibeam data. Following each survey mission, the *Sentry* operations team first processed the AUV navigation data with WHOI/NDSF software, and then ran an MB-System-based automated workflow that includes merging this updated navigation model into the processed multibeam and generating initial data products (e.g. grids and maps). Dave Caress then continued with processing, including interactive bathymetry editing, backscatter correction, and navigation adjustment with the MB-System tool *mbnavadjust*. At sea all of the new 2022 surveys were processed and co-registered together with the most recent prior surveys from 2020. The work to co-register all 82 1-meter-scale AUV surveys together for an updated comprehensive topography model of Axial Seamount continues post-expedition.

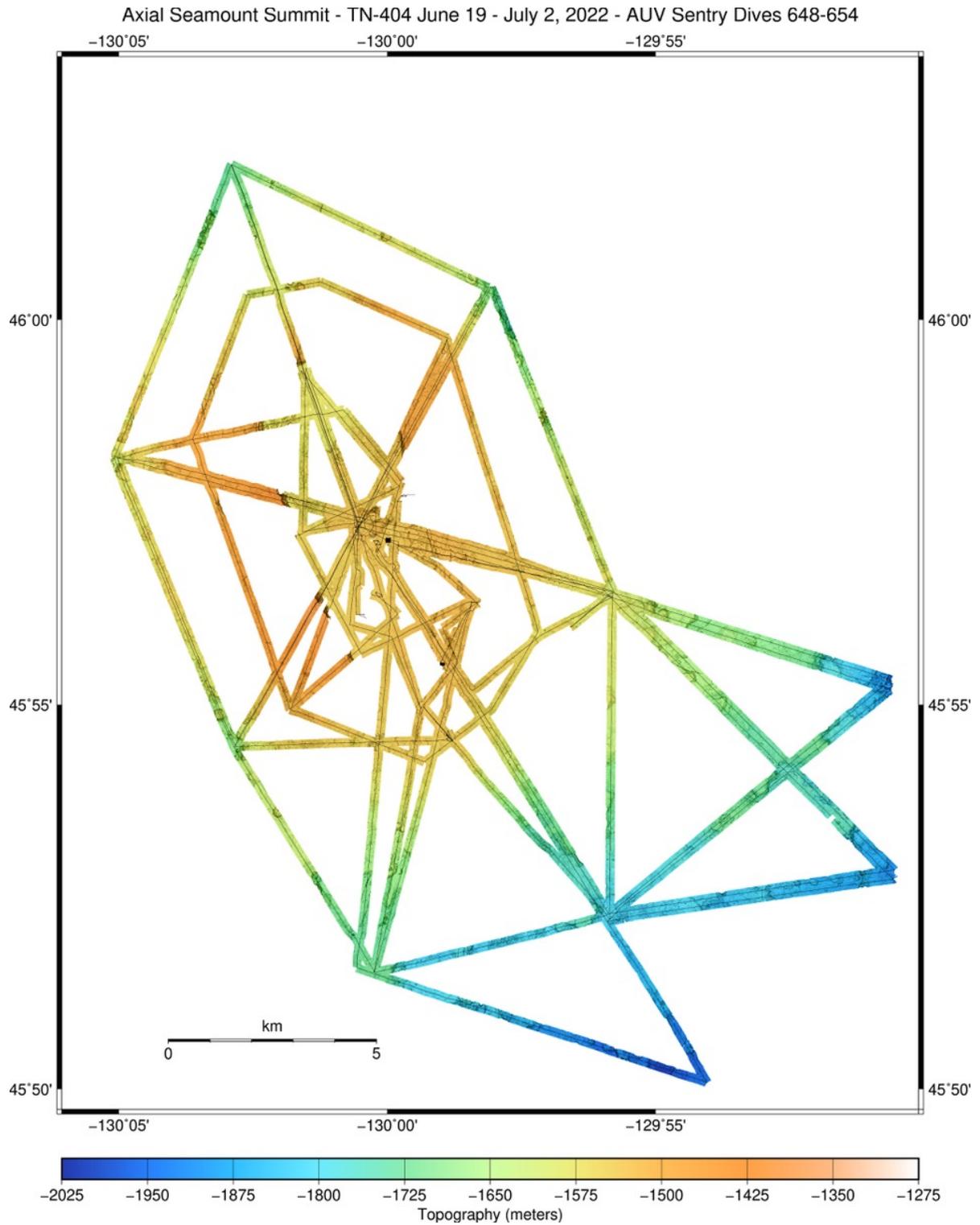


Figure 4.4.2 – The 2022 repeat AUV survey 1-meter-scale multibeam bathymetry coverage.

The *Sentry* dive summaries on the following pages are from the *Sentry* Team’s cruise report.

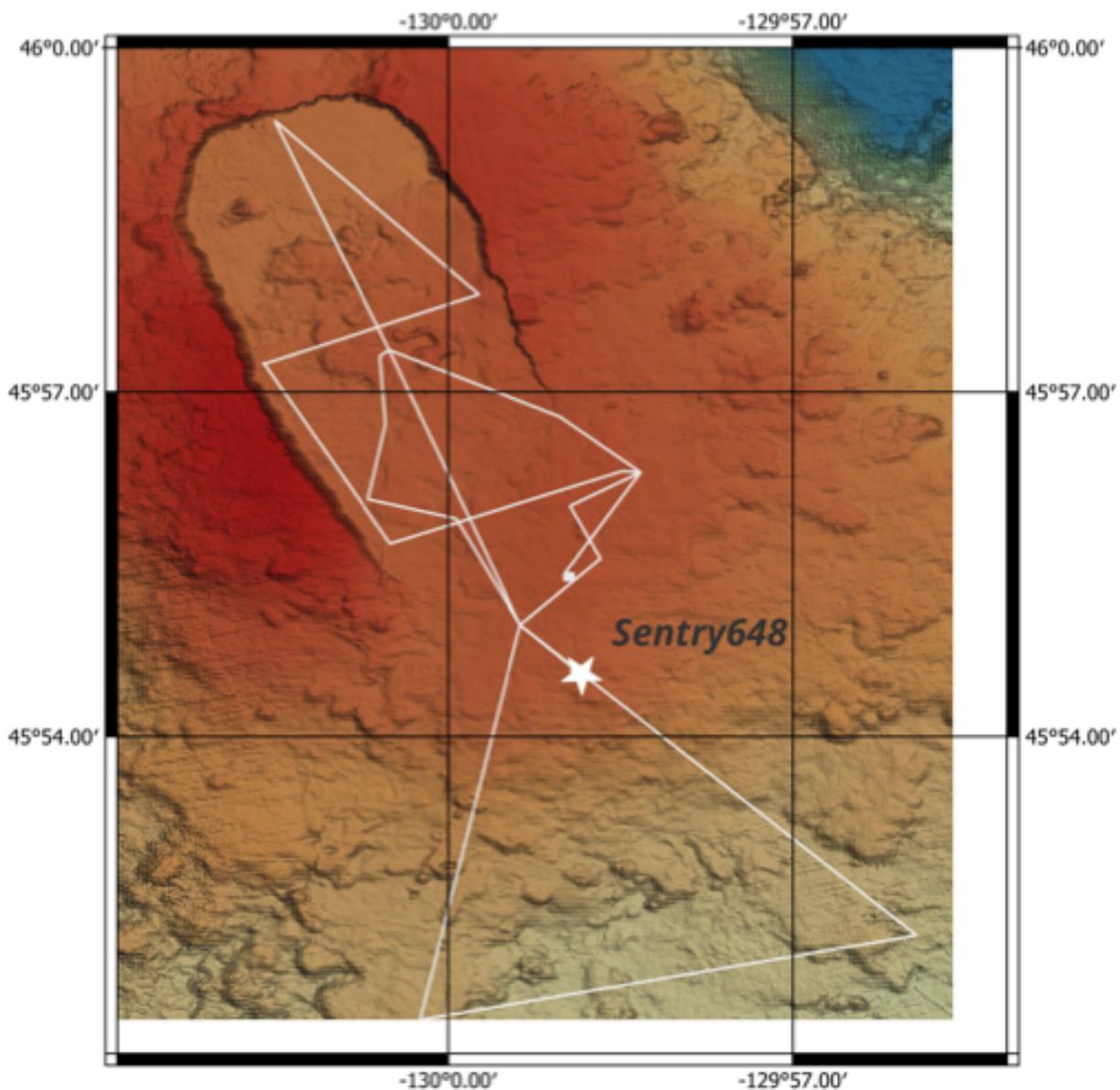


Figure 4.4.3 – **Sentry 648** was the first dive of the cruise, running the spider web pattern inside the caldera floor. Overall the dive went well, running for 50km and collecting multibeam for the duration of the dive. Launch and recovery went smoothly. The TRN datapod was running in passive mode for this dive, and collected data throughout the dive. Convergence was good for the majority of the dive as seen in post processing. ROV Jason was deployed after our launch, then recovered and then redeployed.

Sentry 648

Sentry in water: 2022/06/21 03:33:30
 Sentry on deck: 2022/06/21 22:58:43
 survey time: 18.2 hours
 deck-to-deck time: 19.4 hours
 distance travelled: 58.9 km

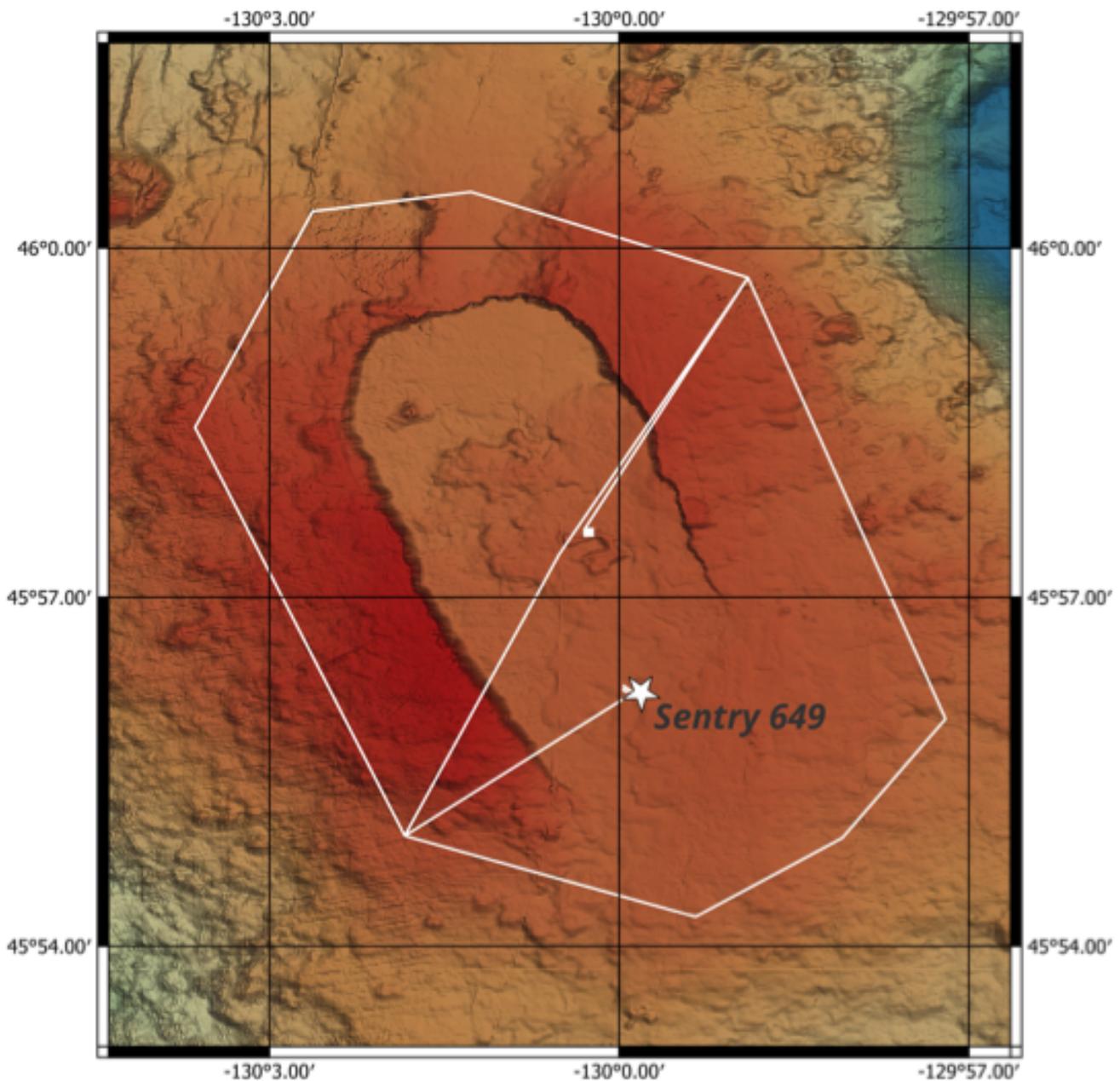


Figure 4.4.4 - **Sentry 649** was additional spider web survey around the caldera, working our way around the outside of the caldera. Sentry ran for 46km in total over 15 hours in the water. TRN was tested towards the end of the dive, but acoustic cue from the vehicle did not indicate it was working. Further investigation showed this was due to the UDP connection on the vehicle between mbtrnpp and the ROS node.

Sentry 649:

Sentry in water: 2022/06/22 13:23:42
 Sentry on deck: 2022/06/23 04:55:32
 survey time: 14.3 hours
 deck-to-deck time: 15.5 hours
 distance travelled: 46.0 km

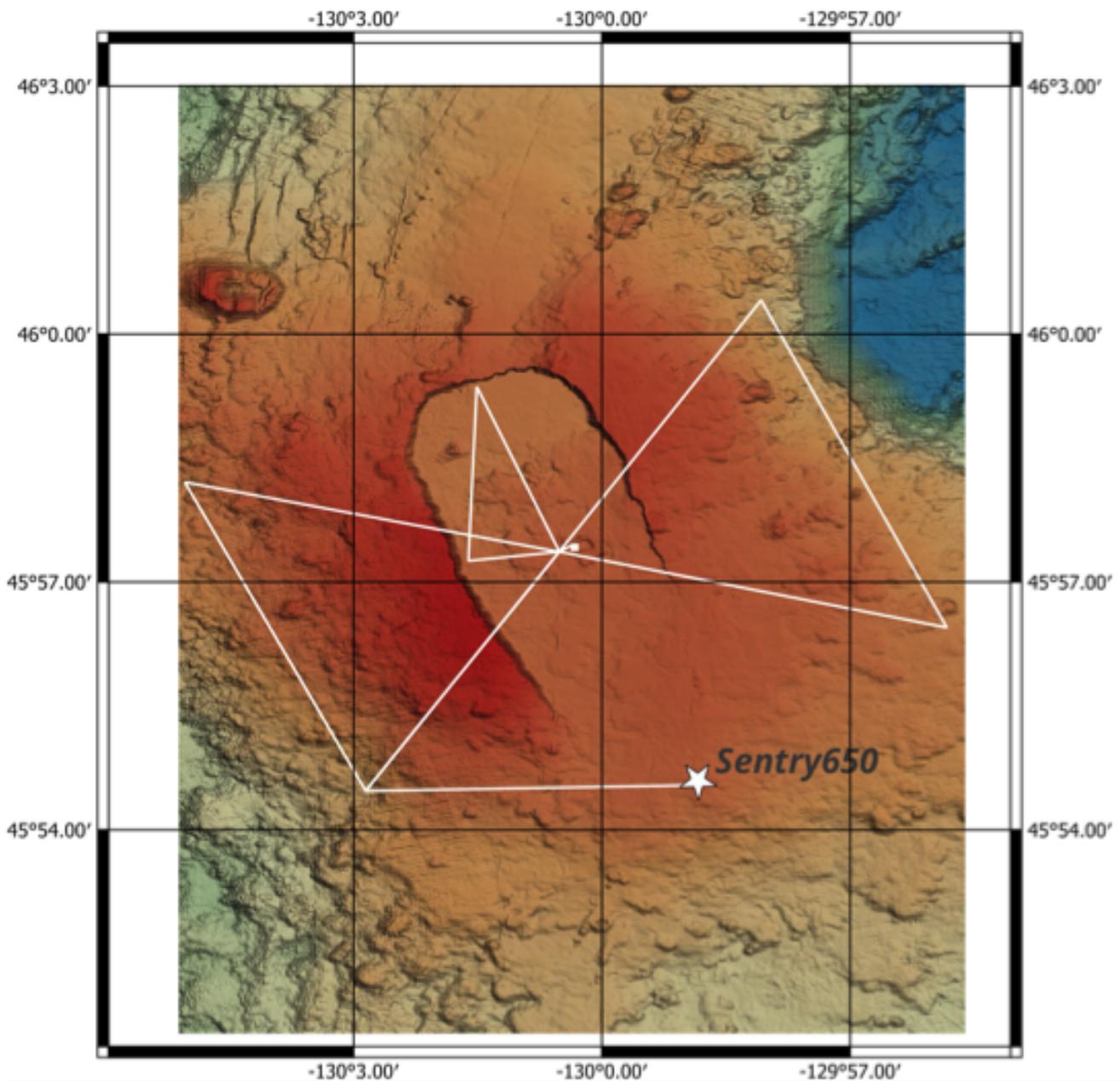


Figure 4.4.5 - **Sentry 650** was a continuation of the spider web, working in a bow tie pattern around the east and west flanks of the caldera. Sentry in total covered 63km during the 21 hour mission. TRN development was tested at the end of the dive. Enabling TRNs ability to shift and testing the acoustic cue, which continued to show stale values and did not update with the shift values supplied to the vehicle. While the TRN software did run for the duration of the dive we continued to have issues with the messaging between mbtrnpp software and Sentry. Commands from topside to the trn software DO work, but commands back to the vehicle don't work.

Sentry 650:

Sentry in water: 2022/06/23 20:27:39
 Sentry on deck: 2022/06/24 17:30:14
 survey time: 19.7 hours
 deck-to-deck time: 21.0 hours
 distance travelled: 63.5 km

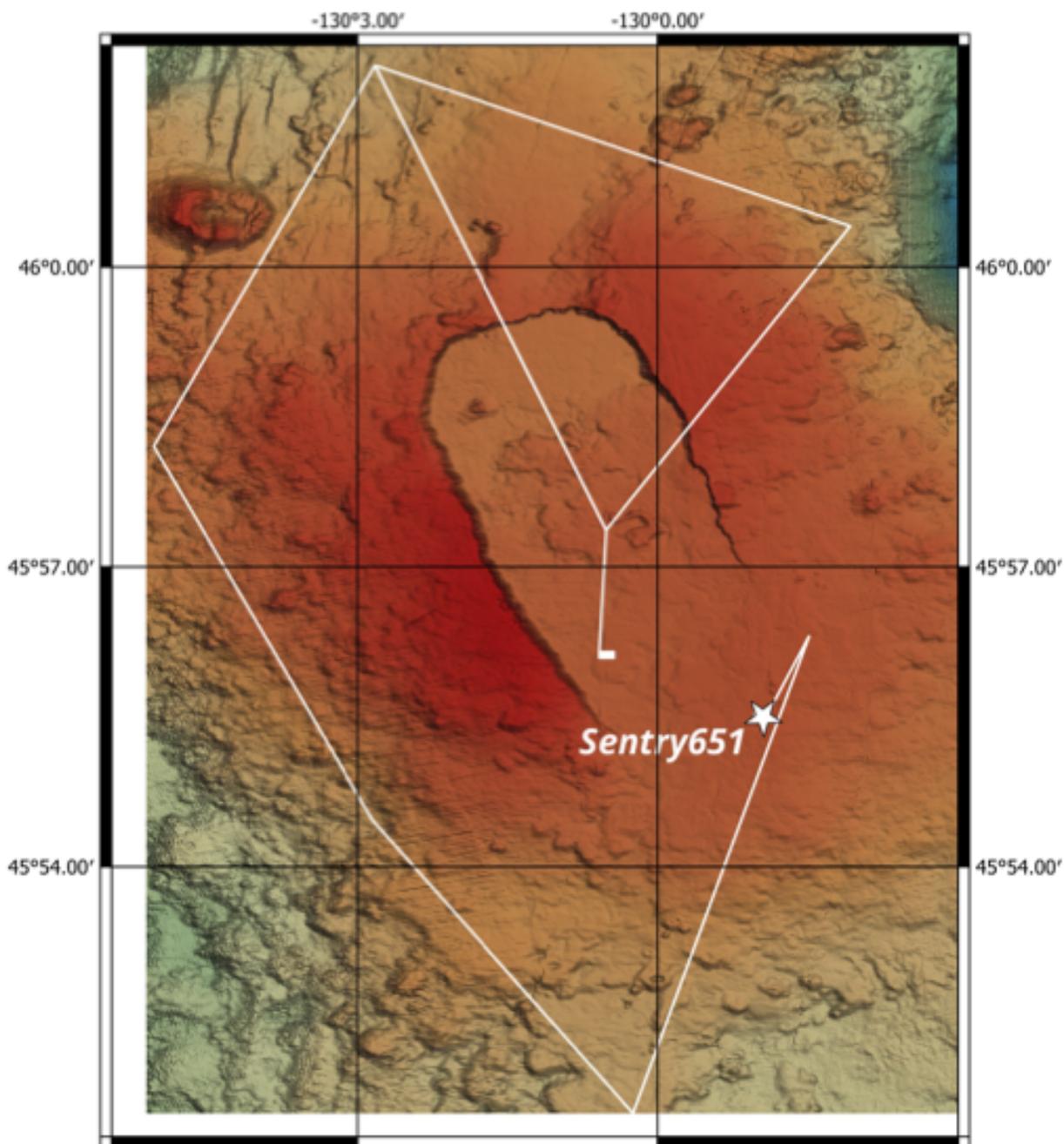


Figure 4.4.6 – **Sentry 651** was a continuation of the spider web, working in diamond shape to cover the outer extents of the pattern. Sentry started in the center of the caldera and transited to the southwestern point to start a northward line. Once at the very top of the map, Sentry came back into the caldera and back out to cover the north eastern line. TRN was turned on at the end of the dive for the first time, to test active tracking. Sentry was shifted roughly 100m to the east before turning on the TRN active shift. Once off the survey line and TRN was active, the next way point we observed the vehicle shifting back, and validating TRNs ability to recognize the shift and bring the vehicle back to the trackline.

Sentry 651:

Sentry in water: 2022/06/25 06:34:00
 Sentry on deck: 2022/06/26 04:07:06
 survey time: 20.6 hours
 deck-to-deck time: 21.6 hours
 distance travelled: 67.7 km

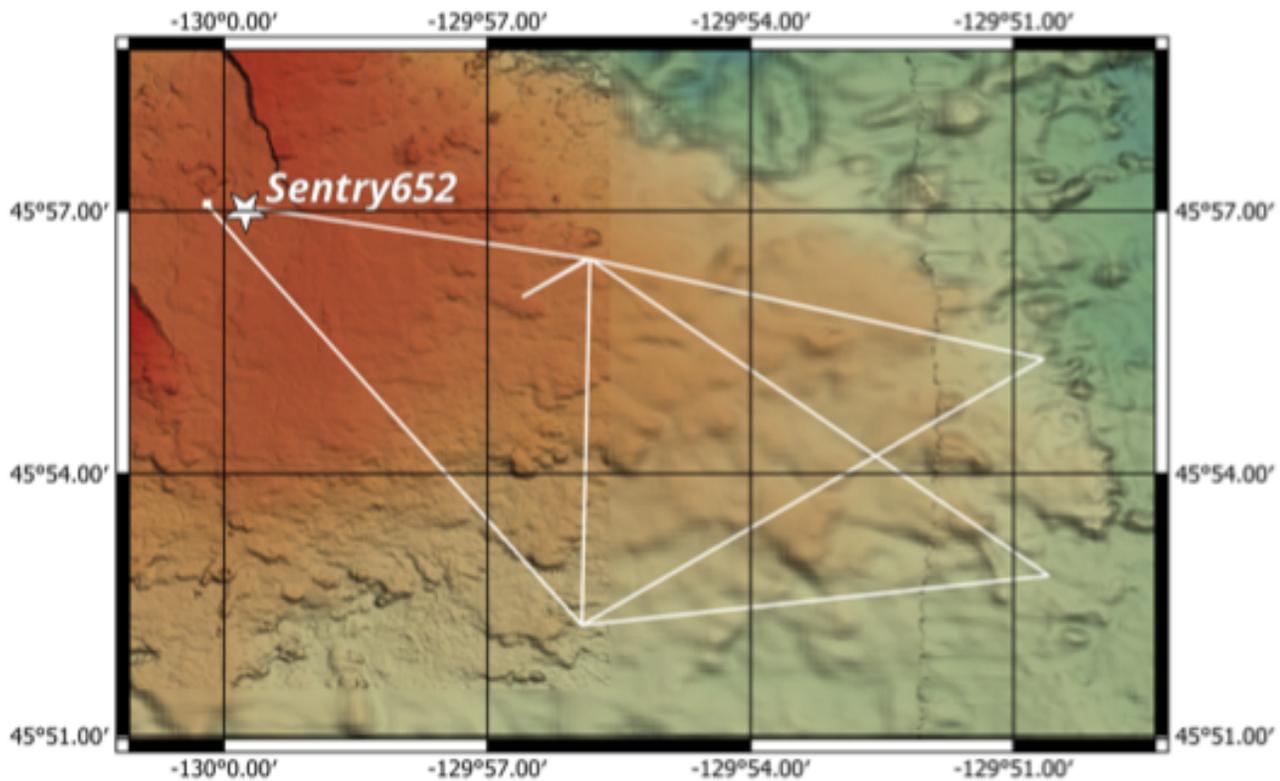


Figure 4.4.7 – **Sentry 652** was a continuation of the spider web, working in the south eastern area of the pattern. Sentry completed 60km of trackline over 19 hours on the bottom. Overall the dive went well, Sentry was out of USBL for almost the entire dive, but mostly within LBL tracking. At the very end of the dive, we enabled TRN, and shifted Sentry OFF of the trackline. TRN quickly brought Sentry back to the trackline and remained ON for the rest of the dive to the final survey block. We also tested a new feature that allowed a reset with shift constraints. This was successfully tested and worked well. Post processing of the dive showed Sentry to be outside of the 2020 multibeam trackline, with not enough overlap.

Sentry 652:

Sentry in water: 2022/06/26 19:59:05
 Sentry on deck: 2022/06/27 16:56:18
 survey time: 19.8 hours
 deck-to-deck time: 21.0 hours
 distance travelled: 60.5 km

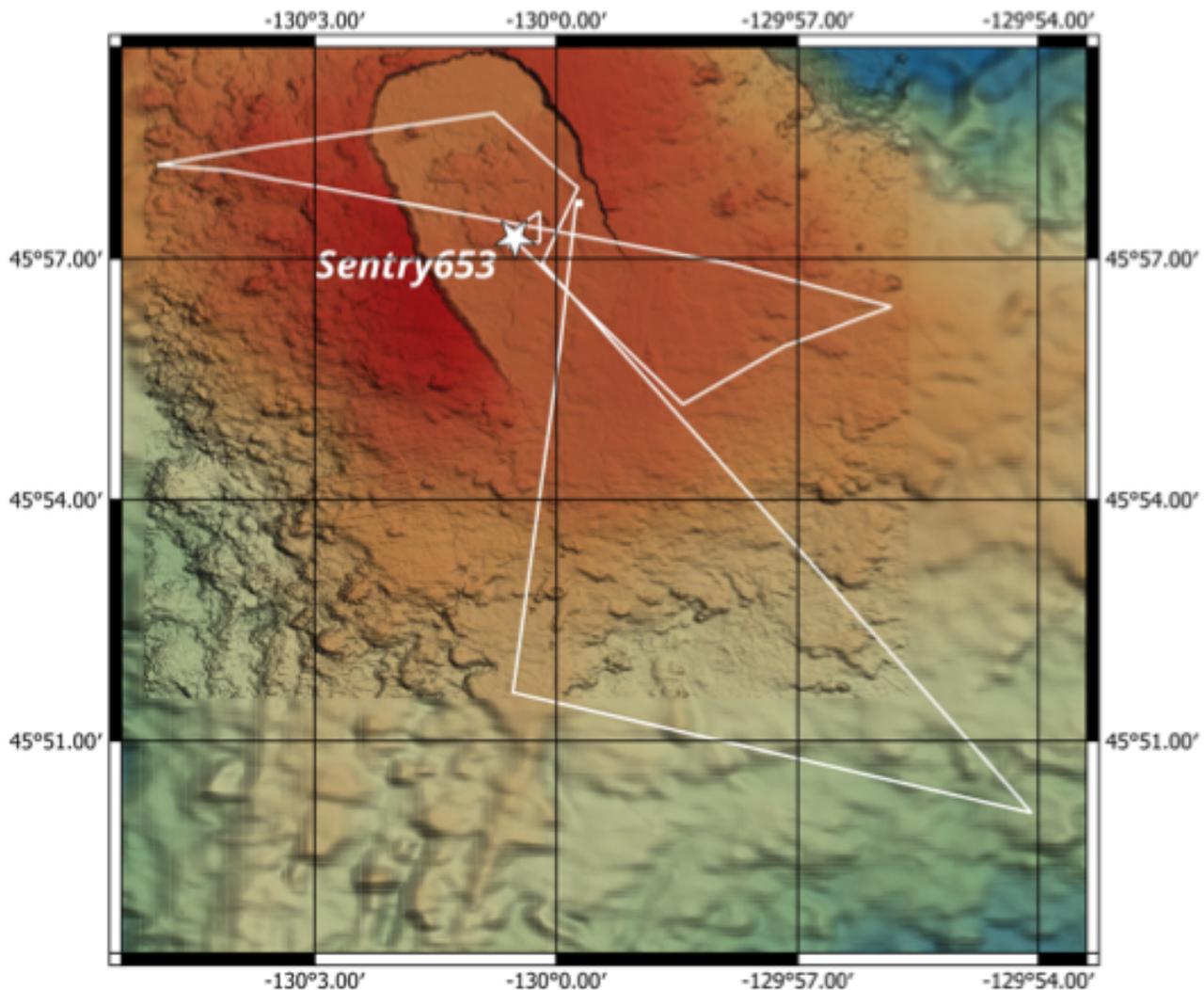


Figure 4.4.8 – **Sentry 653** was planned to cover an area of missing trackline to the very south and recover areas around the caldera. The dive started inside the caldera, launching while Jason was in the water. Once on bottom a short back and forth pattern was completed by the vehicle and used to enable TRN. TRN was enabled for the duration of the dive, checked to make sure it was shifting appropriately and then went on the initial survey around the caldera. Overall this survey went well, with a small mission error that doubled back for 100 meters on part of the line near the west wall. Sentry completed a pass by of the ship, and went to the southern line that needed to be captured. Once Sentry returned for the journey south, TRN was noticed to be OFF, this was due to a timer we set for enabling TRN, which was not set long enough. This was in part due to the vehicle speed needing to be slowed slightly to ensure it would make the journey south and back. Overall the dive went very well, TRN ran for 21 hours straight with no observed issues.

Sentry 653:

Sentry in water: 2022/06/29 13:25:36

Sentry on deck: 2022/06/30 14:51:55

survey time: 24.2 hours

deck-to-deck time: 25.4 hours

distance travelled: 72.3 km

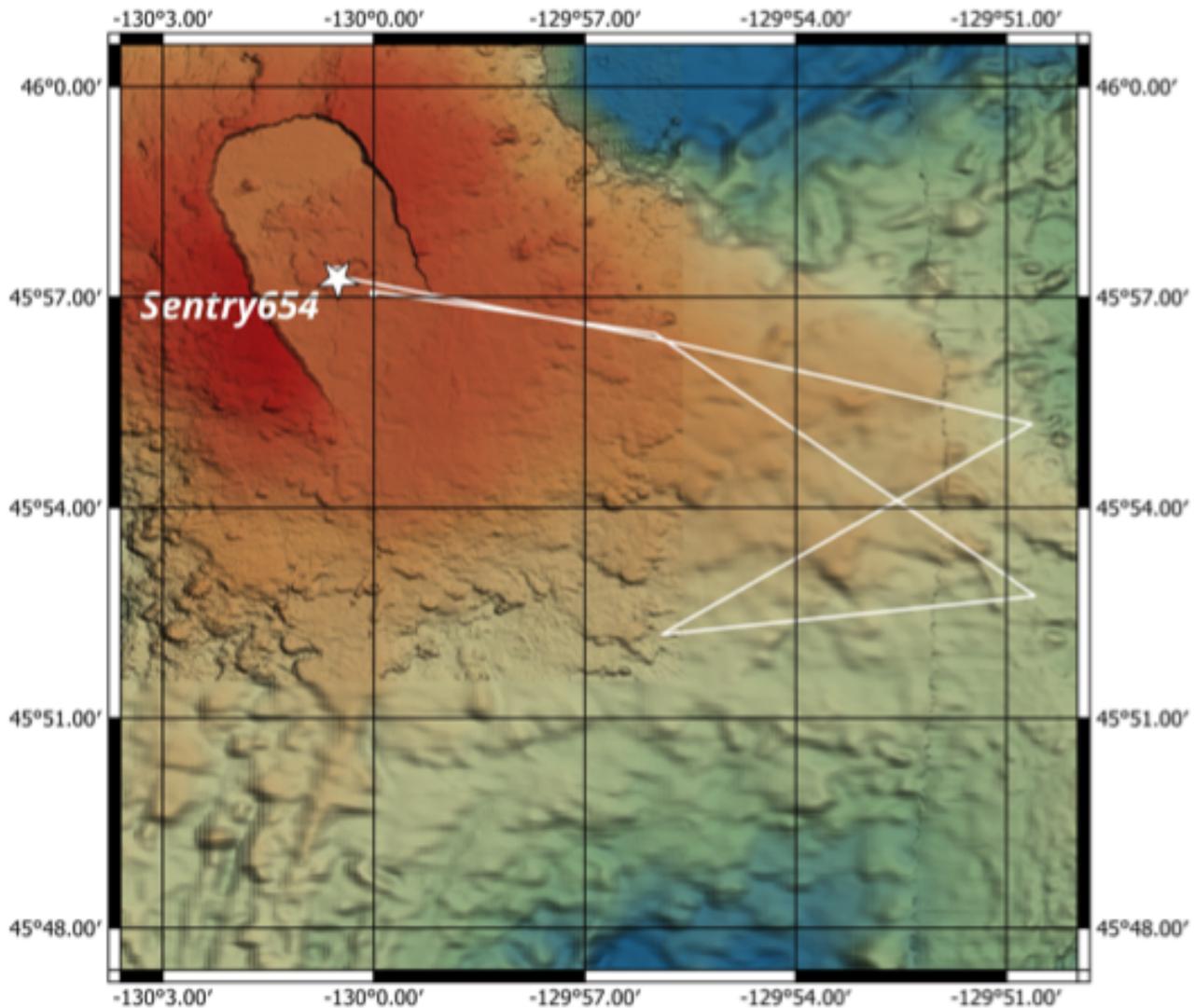


Figure 4.4.9 – **Sentry 654** was a 16 hour mission, deployed at WEBB6 and then continuing onto the south eastern survey lines. These lines had previously been covered, but coverage between 2022 and 2020 was minimal and could use another pass. TRN was enabled at the beginning of the dive and ran for the entire dive. In total, Sentry covered 53km and the mission went very well.

Sentry 654:

Sentry in water: 2022/07/01 03:00:00
 Sentry on deck: 2022/07/01 20:56:22
 survey time: 16.8 hours
 deck-to-deck time: 17.9 hours
 distance travelled: 53.8 km

Implementation of Terrain Relative Navigation (TRN) software on AUV *Sentry*

The *Rock et al.* TRN algorithm is a particle filter that evaluates how a subset of soundings from each multibeam ping matches with the reference map by calculating misfit for a large number of randomly distributed hypotheses for the sensor location - these hypotheses comprise the "particles". As subsequent pings are evaluated, poorly matching hypotheses are discarded and replaced. Over time, the surviving hypotheses tend to converge to a small region around the actual location. When the distribution of particles is sufficiently compact, the location of the sensor relative to the reference map is said to be converged or localized, and the standard deviation of the distribution provides a measure of the uncertainty in the relative position estimate.

TRN has been integrated into the MB-System software package by Kent Headley, Dave Caress, Rich Henthorn, and Rob McEwen of MBARI. In an AUV context, the MB-System TRN tool `mbtrnpp` runs on a computer in the AUV, reading the realtime multibeam data from the sonar and sending results to the AUV control computer over network sockets. `Mbtrnpp` calculates a navigation offset estimate following each multibeam ping; this offset is the difference between the realtime vehicle navigation and the localized position on the reference map. This offset is communicated to the AUV control software, along with the standard deviation and a flag indicating whether `mbtrnpp` regards this offset estimate as reliable. The reliability flag reflects both the magnitude of the standard deviation (must be less than a threshold value to be converged) and the stability of the estimate (must have been converged for at least a minimum number of consecutive pings). On the AUV side, if use of the TRN navigation offset estimate is enabled, then the control software will drive the vehicle using navigation values that are the sum of the realtime navigation and the most recent converged and reliable TRN navigation offset. If the survey waypoints have been defined using the reference map, then the application of this offset will enable the AUV to precisely fly the desired survey lines, regardless of inertial navigation drift. At the mission's start, before TRN arrives at a stable convergence, the most recent offset estimate for the AUV will be zero. If stable convergence is achieved but then lost, then the AUV control software will continue to use the most recent good estimate until it is superseded by a new stably converged estimate.

During TN404 an MB-System distribution including `mbtrnpp` was installed in *Sentry* on a Debian Linux "datapod" computer. Running throughout all seven *Sentry* missions, `mbtrnpp` read the realtime multibeam data, decimated and filtered outliers from the soundings of each ping, passed the filtered soundings to the TRN algorithm that calculated navigation offset estimates, and then communicated those estimates to the AUV control software. The datapod was booted and `mbtrnpp` started by Dave Caress as part of the *Sentry* team's pre-dive checkouts.

TRN was tested passively during the first five *Sentry* surveys (Figure 4.4.10), and then actively used by the AUV control software during the final two surveys (dives 653 & 654). The last mission repeated several lines that had been poorly followed earlier in the cruise. The result was a considerable improvement in how closely the 2020 lines were followed (<50 m displacement instead of >150 m) (Figure 4.4.11). The willingness of the *Sentry* team to allow us to control their AUV with our software while it operated > 10 km from the immobile ship (due to ROV *Jason* ops) for 15 hours, twice, reflected the robustness and reliability of the TRN implementation. The TRN + MB-System software ran without crashing throughout all of the missions and converged to reliable offset estimates everywhere that the seafloor topography was neither extremely steep or smooth. Following the successful testing and use during our 2022 expedition, we expect to continue using TRN for repeat surveys on Axial Seamount with both AUV *Sentry* and the MBARI Mapping AUVs.

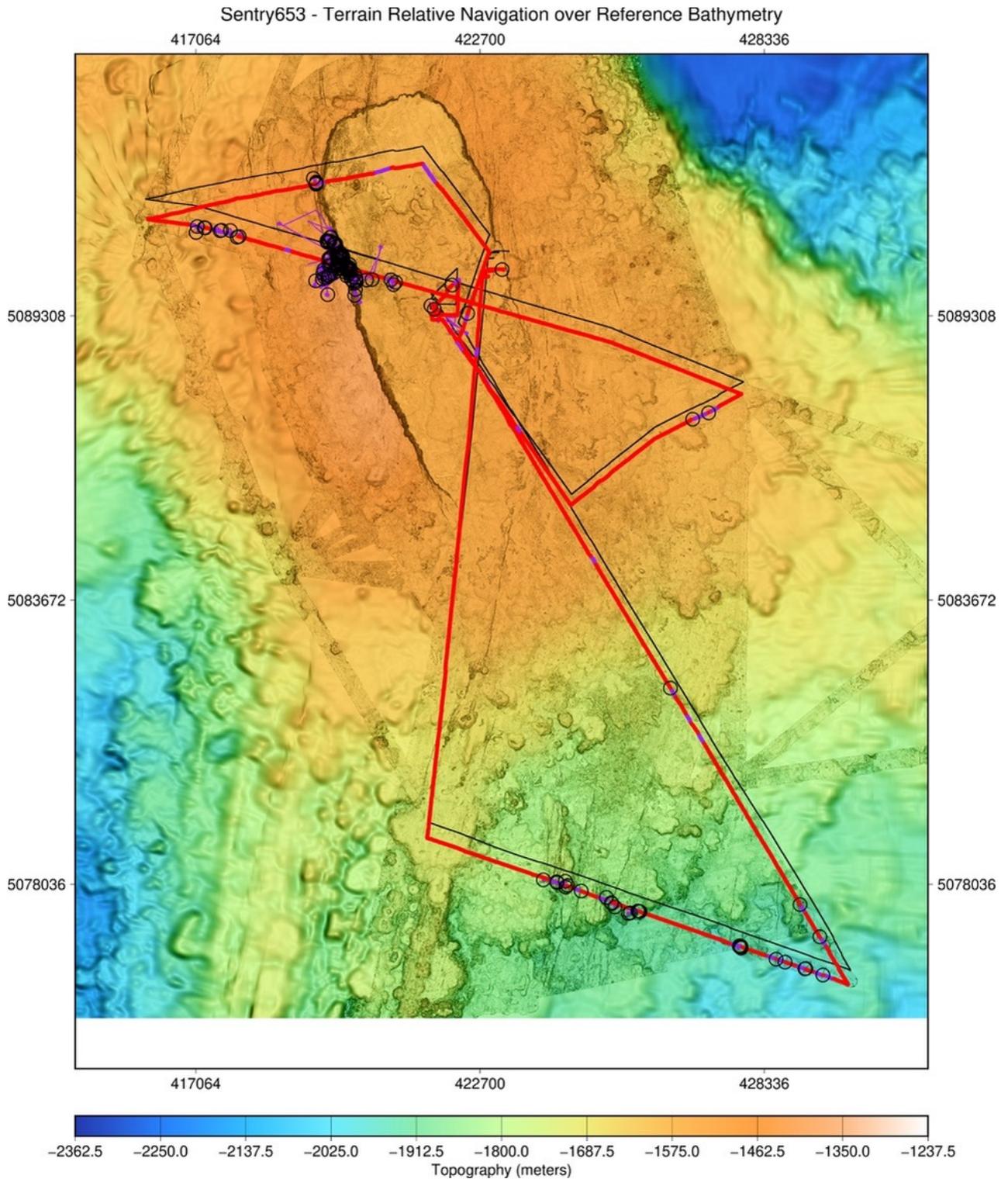


Figure 4.4.10 – TRN performance during *Sentry* dive 653. The black line shows the realtime *Sentry* navigation, and the other lines show the realtime TRN position estimates from localizing the multibeam data to the reference map. The red lines show the TRN estimates that are stably converged with low covariance - only these estimates are flagged to be used to control the AUV. The circles show places where the TRN algorithm was reinitialized due to lack of convergence - these occur either where the topography is extremely steep or very flat and featureless.

Axial Seamount Summit - 2020 and 2022 AUV Sentry Multibeam Bathymetry

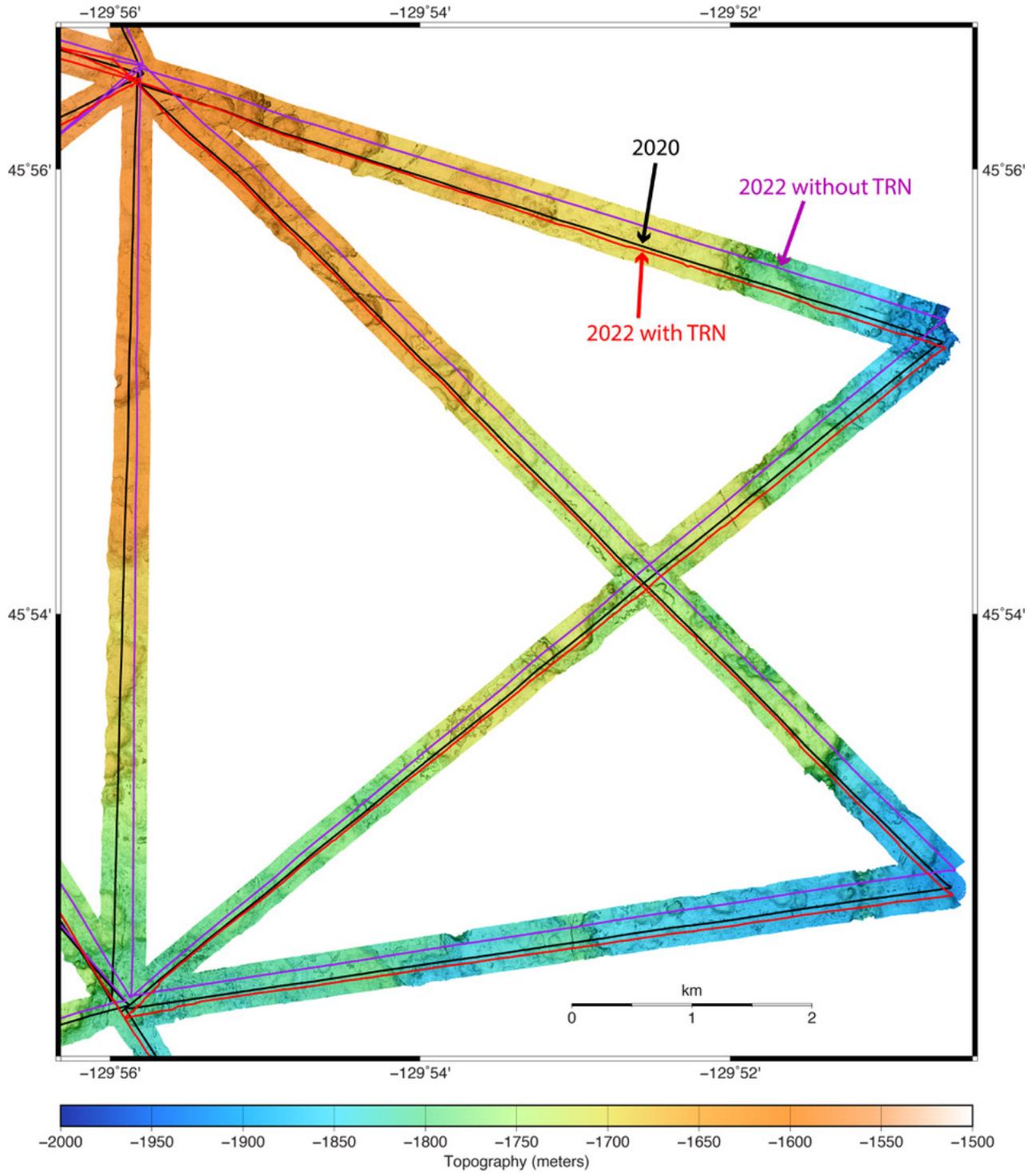


Figure 4.4.11 – Combination of 2020 and 2022 surveys showing the AUV *Sentry* tracklines (black = 2020, purple = 2022 without TRN, red = 2022 with TRN). Utilizing TRN enabled much a closer repeat of the 2020 surveys.

4.5 - CTD and Miniature Autonomous Plume Recorder (MAPR) deployments:

Sharon Walker and Bill Chadwick

CTD summary

Only one CTD casts was completed during the 2022 Axial expedition (TN404). The purpose of this cast was to obtain water in advance of the next leg (TN405) at the request of Julie Huber for microbial/virus studies. The CTD cast was conducted using the ship's Seabird *9plus* CTD enhanced with one optical backscatter sensor (Seapoint high-sensitivity turbidity meter) and one PMEL oxidation-reduction potential (ORP) sensor, which were both supplied, along with the required cables, by PMEL (Sharon Walker). The ship's CTD set-up also included two SBE43 oxygen sensors, one WET Labs C-Star transmissometer, one WET Labs ECO-AFL/FL fluorometer, and one altimeter. All 24 Niskin bottles were tripped to a depth of 1447 m (74 m above bottom). This depth was within the particle plume at the El Guapo vent, however, the ORP voltage began decreasing slightly deeper during the downcast, and was recovering from the near-bottom signal at that time/depth during the upcast when the bottles were tripped. The maximum ORP anomaly was $\Delta E = -122$ mV, all within ~ 20 m of the seafloor.

Table 4.5.1 - Summary of CTD cast locations.

Cast#	Station Name	Lat (°N)	Lat (min)	Lon (°W)	Lon (min)	Site
1	V22B-01	45	55.578	129	58.759	El Guapo

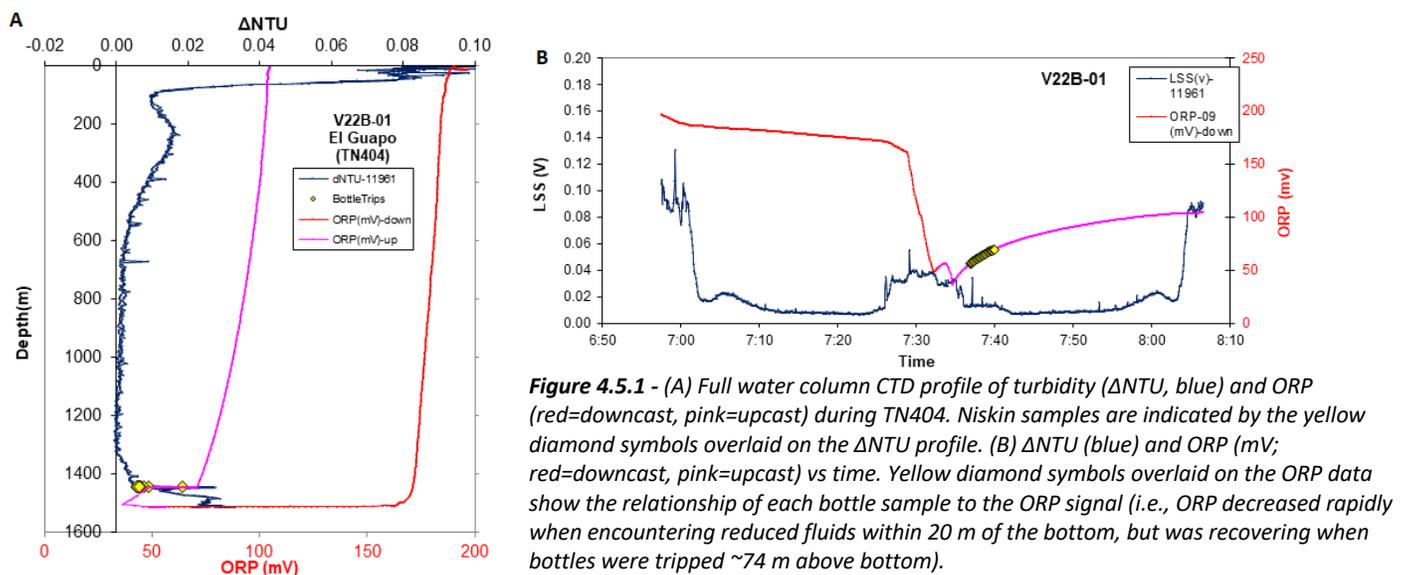


Figure 4.5.1 - (A) Full water column CTD profile of turbidity (Δ NTU, blue) and ORP (red=downcast, pink=upcast) during TN404. Niskin samples are indicated by the yellow diamond symbols overlaid on the Δ NTU profile. (B) Δ NTU (blue) and ORP (mV; red=downcast, pink=upcast) vs time. Yellow diamond symbols overlaid on the ORP data show the relationship of each bottle sample to the ORP signal (i.e., ORP decreased rapidly when encountering reduced fluids within 20 m of the bottom, but was recovering when bottles were tripped ~ 74 m above bottom).

Hydrothermal plumes are commonly defined by the plume tracers of turbidity and ORP, which indicate the presence of hydrothermal particles and reduced chemical species, respectively. Data from these tracers are displayed in real-time to aid sampling through the plume and in the water column above and below the plume. Optical backscatter data is presented as Δ NTU, the anomaly of dimensionless Nephelometric Turbidity Units (NTU) above a non-plume mid-water minimum value (blue line in Fig. CTD-1). The ORP sensor responds to dissolved reduced hydrothermal chemicals (i.e., Fe^{2+} , H_2S , and H_2) with rapidly decreasing voltage (reported in millivolts (mV)). The hysteresis seen in ORP profiles is typical and due to slow “recovery” of values after encountering a plume (red and pink in the profiles above are from the down and up portion of the cast, respectively).

Miniature Autonomous Plume Recorder (MAPR) deployments:

Miniature Autonomous Plume Recorder (MAPR) instruments were provided by PMEL (Sharon Walker) to mount on AUV *Sentry* and ROV *Jason* during dives. MAPRs measure temperature, pressure, optical backscatter (Δ NTU), and oxidation-reduction potential (ORP, mV). MAPR optical backscatter and ORP sensors are identical to those used on the CTD, and provide full water column profiles of these plume tracers during every descent and ascent of the vehicles (except where batteries died before the end of the dive or sensor(s) were fouled). Additionally, MAPRs provide regional plume distributions along dive tracklines. AUV *Sentry* surveys are typically conducted at an altitude of 60-70 m above bottom, while ROV *Jason* dives generally maintain an altitude of <5 m above bottom, except while transiting between positions at altitudes of 20-70 m above bottom. The distribution of particle plumes and ORP anomalies can be mapped from these data.

Table 4.5.2 - Locations of full water column MAPR profiles from ROV-Jason and AUV-Sentry deployments.

Dive#	Profile direction	Lat (°N)	Lat (min)	Lon (°W)	Lon (min)	Comments
J2-1428	descent	45	54.5017	129	58.8164	
	ascent	45	55.5169	129	58.9329	
J2-1429	descent	45	55.2890	129	58.8883	No ascent data (batteries died)
J2-1430	descent	45	51.7737	130	0.2400	No ascent data (batteries died)
J2-1431	descent	45	55.9661	129	58.9634	No ascent data (batteries died)
J2-1432	descent	45	57.2461	130	0.5093	
	ascent	45	57.3016	130	0.4651	
J2-1433	descent	45	56.1740	129	59.8414	
	ascent	45	56.9843	130	0.2608	
Sentry-648	descent	45	54.5077	129	58.9000	MAPR started sampling @ 1040 m
	ascent	45	55.5001	129	58.9460	LSS fouled during ascent (~20:22)
Sentry-649	descent	45	56.4560	130	0.2856	
	ascent	45	59.5662	129	58.9856	LSS fouled near end of dive (~04:22)
Sentry-650	descent	45	54.5491	129	58.8591	
	ascent	45	57.2050	130	0.2045	
Sentry-651	descent	45	55.5047	129	58.9607	
	ascent	45	56.1117	130	0.3856	
Sentry-652	descent	45	56.9415	129	59.7965	
	ascent	45	57.1267	130	0.1715	
Sentry-653	descent	45	57.1135	130	0.5145	
	ascent	45	57.7187	129	59.4659	
Sentry-654	descent	45	57.1629	130	0.5530	
	ascent	45	56.9972	130	0.0215	LSS fouled during ascent (~14:35)

Figure 4.5.2 - Turbidity (Δ NTU, navy blue=descent, light blue=ascent) and ORP (red=descent, pink=ascent) profiles from each AUV Sentry dive during TN404.

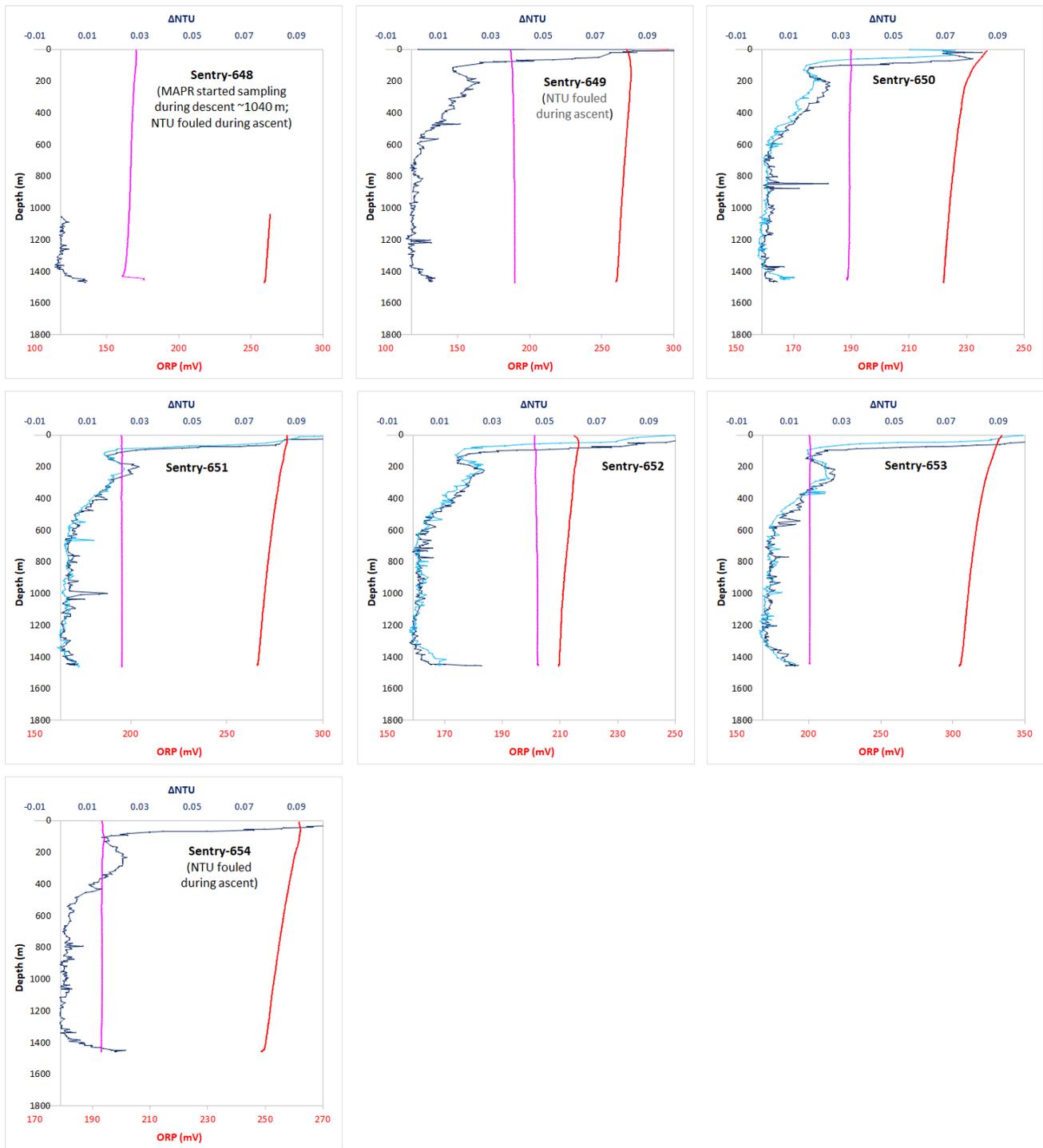
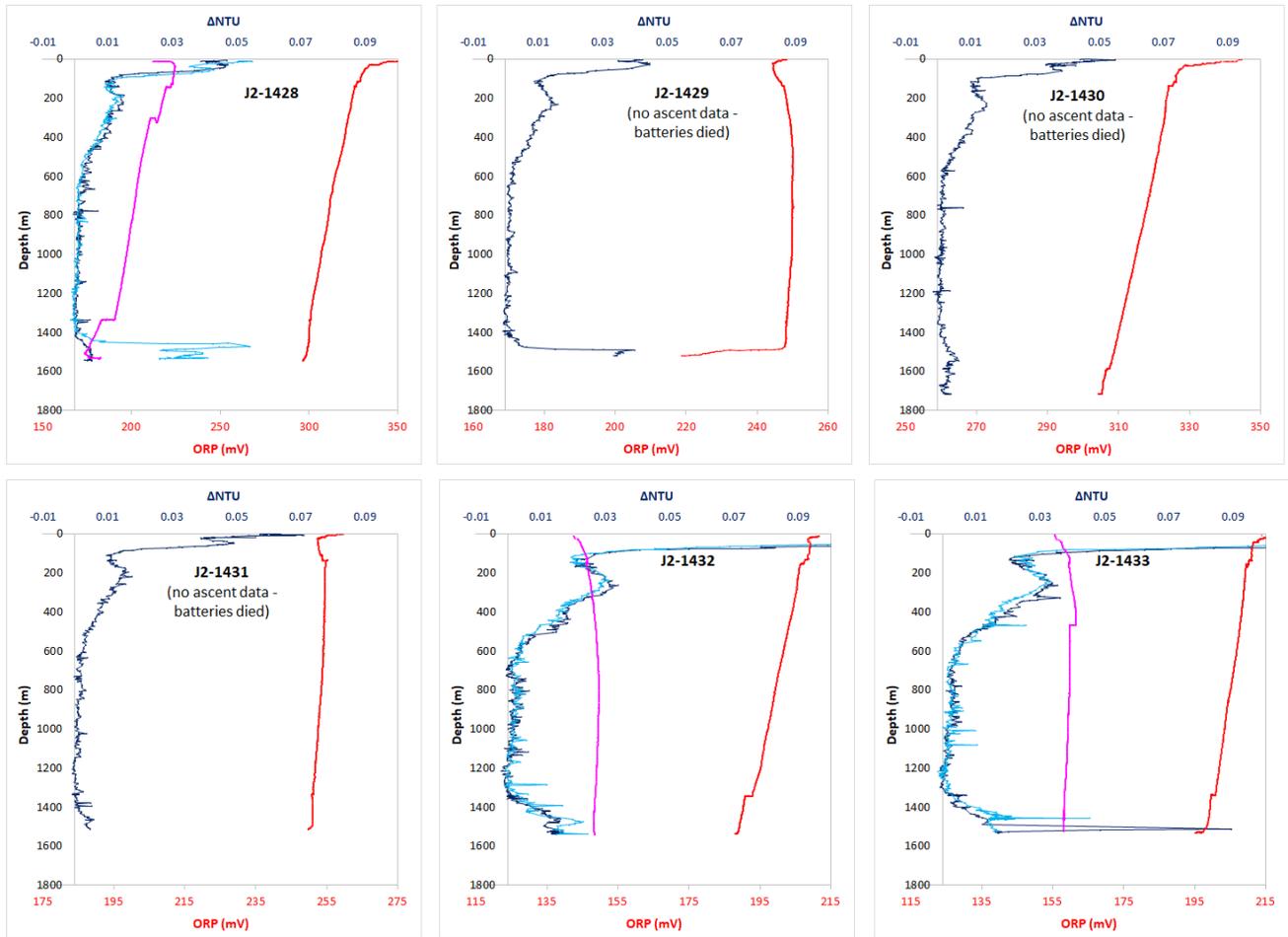


Figure 4.5.3 - Turbidity (ΔNTU , navy blue=descent, light blue=ascent) and ORP (red=descent, pink=ascent) profiles from each ROV Jason dive during TN404.



4.6 - Mooring Operations

Michael "TR" Tepper-Rasmussen and Bill Chadwick

Mooring Recoveries

BPR-East (paros s/n 103402, has name "BPR-Center" on pressure case)

We arrived on site at 2000 UTC on 06/20/22. Combined seas were 3 feet at ten seconds with 15 knots N wind. There was some initial miscommunication regarding the ships position. After the ship set up directly over the mooring, they changed position and ended up .25 NM downwind from the mooring location, holding station using dynamic positioning. After that was sorted out, the enable code was sent using the deck box and the over the side transducer. The over the side transducer was used as no three to five pin Amphenol adapter was available to connect the deck box with the ship's transducer. Care should be taken in future years to verify the type of 5 pin arrangement on the deck units as there are two different types of 5 pin connectors that Edgetech has used (see photo at end of document). A response was heard from the enable code on the second try indicating that the release was upright and unreleased. The power level used was 5 and the initial range was 1500 meters. Release code sent and release indicated that the release had triggered. A few more range signals were sent to ensure that the range was closing, and the mooring was on its way to the surface. After releasing it took about 20 minutes for the glass balls to be sighted at the surface.

BPR East was recovered using the ships starboard crane. A 15m pendant of 3/8" Amsteel was attached to a snap hook rated to 1500lbs and fixed to the end of a 20' pole. Two grappling hooks were also at the ready as the ship brought the glass balls down the starboard side. BPR East was recovered by bringing the package along the starboard side 10 meters forward of *Sentry*. An attempt was made to hook onto the chain between the glass balls, but the hook was inadvertently clipped onto the 3-meter Yalex portion of the mooring that was wrapped around the chain and balls. This pendant became a tagline, and another pendant and hook were used to hook into an appropriate portion of chain. The other end of the pendant was attached to the crane and lifted until the swivel was at the height of the bulwarks. Once up the crane brought the line near the rail and a stopper line was attached just below the swivel. The package was lowered, and the top swivel shackle was broken, the glass balls were then brought on board. Once the glass balls were out of the way the crane was hooked back into the package at the swivel using a 4' round sling and lifted on board. The mooring was broken down and moved out of the way.

BPR Southeast (paros S/N 125320, has name "South-2" on the pressure case)

After the main deck work area was cleared by moving the glass balls to the 02 deck and moving the tables and BPRs forward and secured by the main lab doors, we began a similar process for recovering BPR Southeast around 00:00 UTC on 06/21/22. Once again, the ship was positioned .25 NM downwind of the mooring location and the over the side transducer and deck box were used. After an initial response from the enable code no more responses were heard. The initial response gave a signal that the release was upright and unreleased. All codes were checked, powers changed on the deck box, and ships position was changed twice, once to .1 NM away from the mooring and once to directly over the position. At 01:22 UTC communication with the release was established at power level 2 while directly over the mooring. Release codes were sent, and range confirmed that the mooring was on its way to the surface. I suspect the problems with communication were caused by RF interference from hand-held radios with the deck unit. Moving on from this point all radios were kept well away from the deck unit. Visibility was around .25 NM and visual siting could not initially be established. The transducer was used to continually range, and instructions were given to the bridge to make small maneuvers to close the range. At 370 meters, the glass balls were sighted, and an approach was enacted. BPR Southeast was recovered with the same deck arrangement as for the previous BPR East.

BPR West (paros S/N 107673)

BPR West was recovered using the same technique as for the other BPR moorings. Release code was sent at 11:25 UTC on 6/28/22. The mooring was on deck at 12:06. This mooring had the OSU acoustic release on it (s/n 52409) with OSU tag # 328429. It is now in Seattle for maintenance.

BPR North (paros S/N 51195)

Next BPR North was recovered. Release code was sent at 13:42 UTC on 6/28/22 and the mooring was on deck at 14:30.

BPR Southeast (paros S/N 125320) – 2nd recovery after it was re-deployed

We re-deployed BPR Southeast, but later discovered the data it recorded between 2020-2022 had problems, so after consultation with Scott Stalin at PMEL, we decided to recover it and bring it back to Seattle for an assessment. The release code for the second recovery of BPR Southeast was sent at 16:20 UTC on 6/28/22, and the mooring was on deck at 17:10. The BPR Southeast instrument (paros S/N 125320) was brought back to PMEL in Seattle for evaluation after the cruise. It was determined that the instrument was actually OK, but that it had mistakenly been deployed just beyond its depth rating of 1640 m (2400 psi) in 2020 (at a depth of ~1690 m), and that was the reason that the 2020-2022 recorded data was no good.

1200-m long hydrophone Mooring

The 1200-m long hydrophone mooring consisted of a 40-inch orange syntactic foam float and loop of poly line at the top of the mooring followed by 0.5 meters of chain, 50m of nylon, the hydrophone, 1012m of Vectran, 200m of Yalex, 18m of nylon, 1m of chain, swivel, and the acoustic release. A TSE winch was used to aid in the recovery (installed on the back deck of *R/V Thompson* by special request before the cruise). The ship provided a 600 ft. length of 3/8th inch Amsteel as a working line for the winch. The line was lead through the two-meter block on the A-Frame and along the starboard rail forward of AUV *Sentry*. A flying boathook was shackled to the end of the line and was hooked into the floating Polyolfin loop at the top of the float with a 20 foot boat pole. The ship was instructed to make a half a knot through the water to keep the gear streaming away from the boat. The TSE winch paid in line as the float travelled back until it settled out about 30 meters behind the A-frame. The A-Frame was set out prior to the recovery evolution beginning. The TSE winch continued to pay in until the float was out of the water and above the deck, the A-frame was brought in until the float rested in its special pallet waiting on the back deck. Stoppers were made off to deck cleats on the port and starboard side and the float was disconnected and pallet jacked out of the way. The line was then removed from the two-meter block at the top of the A-frame and rove through a floating trawl block that was hung from the same two-meter block and made off to a bit just aft and to port of the TSE winch. The floating block was provided by OOI (the *Thompson* also had an appropriate block). Two guy lines were utilized to help stabilize the floating block. They both passed through small turning blocks on the sides of the A-frame and to small single deck bolt cross bits. After this connection was made, the TSE winch again began to pay in and the A-Frame went back out. Some adjustments were needed for the height of the floating block. The hydrophone came on deck. A-frame came in to bring the instrument into range to work safely around and again stoppers were made off port and starboard after the instrument, the instrument was then broken out of the line and the line was reattached just above the stopper point. The TSE took a strain and the stoppers were slipped. The TSE paid in until the acoustic release was just below the waterline at the end of the mooring and the last bit was hauled in by hand to ensure the release didn't swing and bounce on the back of the ship. The next day the line was unspooled from the TSE and onto a spool with a spool stand. In the future if there is room on the deck, an electric spooler would have been useful to accomplish this task. By hand spooling it took 4 people 2 hours.

Benchmark Moorings

Two-glass-ball float packs were attached to benchmarks for counter-flotation, and were deployed to allow ROV *Jason* to re-position them on the seafloor. After positioning the benchmarks, ROV *Jason* released the two-glass-ball float packs with a USBL attached provided by the *Jason* team hose clamped between the glass balls. The *Jason* team fabricated 4 sets of holders to keep the USBL's secured. The two glass ball packs were recovered by the ship's crew with little or no help from the mooring technician. All were done using the starboard crane and a boat hook with the same 15-meter pendant as the BPR mooring recoveries. Two flying boat hook tag lines were used to keep the light package stable as it came out of the water and on deck.

Mooring Refurbishment and Re-Deployments

BPR-East (paros s/n 103402, has name "BPR-Center" on pressure case)

BPR East's acoustic release was replaced with SN 60417. The BPR appeared to have recorded reasonable data for the entire previous deployment. The time before reformatting was UTC +26 seconds. During refurbishment it received new desiccant, o-rings, band clamps, and battery. Recovered battery voltage was 14.46V and 14.01V under 150 ohm load. New battery voltage was 17.66V unloaded and 17.3V under 150 ohm load and all series circuits measured >16.5V. After the card was reformatted it did not start recording at the correct sector (2010) so the card was replaced. 2 more used cards reformatted and tested and all three had a different sector number upon proof of life testing. Later we discovered that after the reformat command is given a "fclear" command is also needed to get the correct sector number on the card (but this was not mentioned in the BPR manual documentation). All proof of life tests were passed and the data appeared to be stable. This mooring was deployed with a "new" (shore provided) set of glass balls and flag. The non glass ball sections of 0.5m chain, shackles, line, and wire rope were all new. All shackles were greased with Aquashield, hand tightened and cotter pinned, shackles near line sections were taped with electrical tape. The mooring and cotter pins were double checked against the mooring diagram before deployment. In addition all release codes were confirmed to be correct before leaving the dock and the release was operational. All the release hardware (3/8"-16 x 2.75" 316SS) was new including the delrin isolation washers. The 3/8"-16 316SS u-bolts holding the BPR were in ok condition as this table arrangement was provided from shore. The leg hardware was galvanized, obviously used and very corroded. This hardware was all replaced with new SS hardware provided from shore at the request of Chris Holm. In following cruises it would be useful to bring replacement SS hardware for two sets of legs for the tables. The mooring was deployed using the ship's A-Frame. The flag section was pushed off the deck on a slip line followed by the rest of the glass balls on a second slip line. The lines were cleared as soon as the balls hit the water without issue. A Brailer style release provided by OSU OOI was used to lift and release the anchor once it reached the water. The anchor was deployed at 6:46 UTC on 6/23/22. This mooring was upright on the seafloor after the survey. No notes were made as to the disabled/enabled status of the release after the survey was completed. Later, it was decided that we should return to the site to determine its enable/disable status. Upon returning to the site on 6/28/22 at 15:30 UTC the release was disabled.

BPR Southeast (paros S/N 125320, has name "South-2" on the pressure case)

BPR Southeast's acoustic release was replaced with SN 60420. At first, the BPR appeared to have recorded data for the entire previous deployment, so we went ahead and re-deployed it. But later on closer examination Bill Chadwick noted that the data had some apparent problems. The depth values were way off, reading in the positive and negative near zero range when it should be reading in the 1500 meter range. The time scale of the readings also appeared to be way off, as if more time has passed between each sample than the other instruments. The time before reformatting was UTC +25 seconds. Serial number of BPR was checked against the cal file and correct pressure frequency divider, temperature frequency divider, and temperature heterodyned frequency divider from the cal file were all checked. During refurbishment it received new desiccant, desiccant card, o-rings, band clamps, and battery. The memory card was changed out and once again without the "fclear" command, the sector numbers were not reading 2010. Once "fclear" command was given, the sector number reading was 2010. All proof of life tests were passed and the data appeared to be stable. The recovered battery measured 14.46V and 14.01V under 150 ohm load. The new battery voltage was 17.74V and 17.02 under 150 ohm load. All parallel cells in series measured greater than 16.5V under 150 ohm load. All release codes were confirmed and the release was tested before leaving the dock. This mooring was deployed with a set of "new" glass balls provided from shore. The BPR table was a newer style but the 1/2"-13 x 3.75" galvanized steel leg bolts were replaced with 1/2"-13 x 4.00" 316SS hardware. This table came from PMEL, it might be worth noting to them that galvanized hardware if installed should be new and that SS hardware is preferred. The 316 SS BPR U-bolts appeared to be in reasonable condition and were used. The release hardware 3/8"-16 x 2.75" 316SS was all new and was installed upon arrival. The shackles, line, wire rope, and intermediate chain sections were all new from PMEL. All shackles were greased with Aquashield, hand tightened and cotter pinned, shackles near line sections were taped with electrical tape. The mooring and cotter pins were double checked against the mooring diagram before deployment. As with the other mooring the glass balls were slipped off the deck on a slip line, this time only one slip line was used after the last glass ball, and a Brailer release provided by OOI OSU and secured to the pear link immediately above the acoustic release was

used to overboard the anchor and instrument platform through the A-Frame. The anchor was released at 09:00 UTC on 6/23/22. This mooring is upright and the release was disabled after surveying the position. However, after an email exchange between Bill Chadwick and Scott Stalin (PMEL-Seattle) it was decided that we should recover the BPR-Southeast instrument again and return it to PMEL for examination to make sure it was functioning properly. That post-cruise assessment determined that this BPR-Southeast (paros S/N 125320) is only rated to 2400 psi (= ~1640 m depth), and that the problem of the weird data during the 2020-2022 deployment was due the instrument being deployed just beyond its depth rating limit (~1690 m). Otherwise it appeared to be fine and should be OK for future deployments at depths less than ~1600 m.

BPR North (paros S/N 51195)

The acoustic release for BPR North was replaced with SN 60416 which was tested on deck dockside. The BPR appears to have recorded reasonable data for the entire previous deployment. The time before reformatting was UTC +45 seconds. During refurbishment it received new desiccant, desiccant card, o-rings, band clamps, and battery. The memory card was replaced and reformatted. All proof of life tests were passed and the data appeared to be stable. The old battery voltage was 14.79V and 14.26V under 150 ohm load. The new battery voltage was 17.71V and 16.98 under 150ohm load. All cells measured greater than 16.5V under 150 ohm load. This mooring received the same glass ball package from the recently re-recovered BPR Southeast. As this section of the mooring was only in the water for a few days, all hardware was checked and re-used. The BPR platform was also a newer style with ½"-13 x 4.00" SS bolts for the legs. The 3/8"-16 U-Bolts are grade 2 Titanium and in excellent condition. I did not notice any galling of the threads on the U-bolts as mentioned in the 2020 report but I will reiterate that having some extra titanium nuts and washers would be helpful as titanium and SS should not be used together. The extra Titanium 3/8th hardware we still have is in the yellow BPR turnover case. All of the 3/8"-16 x 2.75" 316SS bolts, hardware, and isolation bushings fastening the release were checked and reused. All shackles were greased with Aquashield, hand tightened and cotter pinned, shackles near line sections were taped with electrical tape. The mooring and cotter pins were double checked against the mooring diagram before deployment. ¼"-20 x 1.75 Titanium socket cap screws were used to replace the SS hardware securing the BPR handle. This mooring was deployed the same as the previous two and the anchor was released at 07/01/2022 04:46 UTC. No survey was done immediately following deployment to note the upright status of the mooring or its location on the seafloor. Immediately following the anchor release the ship was asked to hold position while the deck team reset to deploy BPR West (in the same location). Once the BPR West mooring was in place the ship came ahead at 1 knot and BPR West was deployed in close proximity to BPR North. Returning to the site later on 7/01/22 for a survey, the BPR North mooring returned 7 pings at 2 second intervals, indicating that the release is tilted at an angle of more than 45 degrees. A survey was completed and the release was disabled.

BPR West (paros S/N 107673)

BPR West's acoustic release was replaced with SN 60420 which was tested and disabled on deck dockside. The BPR appears to have recorded reasonable data for the entire previous deployment. The time recorded before reformatting was UTC + 2:48:05 (NOTE: unusually large clock drift, perhaps wrong?). During refurbishment it received new desiccant, o-rings, band clamps, and battery. The memory card was replaced and reformatted. All proof of life tests were passed and the data appeared to be stable. Recovered battery voltage was 14.76V and 14.31V under 150ohm load. New battery voltage is 17.70V and 17.00V under 150ohm load. All cells measured greater than 16.5V under 150ohm load. This mooring was deployed with a re-used set of glass balls, mixing the top 6 from one recovered set with the bottom 2 from another recovered set to provide a complete set with the best looking chain and hardware on the hardhats. The 0.5m sections of chain, shackles, line, and wire rope were replaced. All shackles were greased with Aquashield, hand tightened and cotter pinned, shackles near line sections were taped with electrical tape. The mooring and cotter pins were double checked against the mooring diagram before deployment. This mooring has the newer style table with all 316SS hardware, this was the same table used in the initial BPR Southeast deployment. ¼"-20 x 1.75 Titanium socket cap screws were used to replace the SS hardware securing the BPR handle. This mooring was deployed exactly like the previous 3, directly after the deployment of BPR North at 05:05 UTC on 07/01/22. The deployments were done close to one another to be able to check data against each other. No survey was done at the time of deployment to check upright status or triangulate position. This was done later in the cruise. Upon returning to the site, the mooring was upright and its position was triangulated. The mooring was disabled after survey was completed.

New Benchmark Moorings

All four benchmark moorings were deployed on 6/28/22 using the starboard crane at the break in the bulwarks forward of AUV *Sentry*. Before deployment, the moorings were built on pallets along the starboard inboard main deck side so they could be easily moved into position. The *Jason* team provided USBL's and made brackets for them to be secured between the two glass floats. This arrangement worked well. The only change made to the mooring diagram was to chain the anchor links together to minimize overall length of the mooring. The mooring consists of two engineered pull pins secured with rubber bands and a 350 lbs. (in air) benchmark in the middle of the mooring string. This arrangement makes for a difficult deployment for such a small mooring. Several tag line arrangements were tried. The final mooring was deployed with three tag lines on the anchor only. This was the best arrangement found to control the load while staying out of the way of the delicate pull pins. The package is moderately unstable, the benchmark can swing quite a bit until the anchor comes off the deck. With some more thought, I believe a safer deployment technique can be created. A shorter overall length of the mooring would make this a much easier and safer package to deploy.

Table 4.6.1: Mooring Recoveries in 2022

Recoveries in 2022								
Instrument	Date (UTC) ¹	Time (UTC) ¹	Date (UTC) ²	Time (UTC) ²	Depth (m) ¹	Latitude ¹	Longitude ¹	Paros S/N
BPR-East	6/20/22	22:47	6/20/22	23:30	1536	45.9431	-129.9538	103402
BPR-Southeast	6/21/22	1:22	6/21/22	2:13	1689	45.8969	-129.9568	125320
BPR-West	6/28/22	11:25	6/28/22	12:06	1396	45.9413	-130.0298	107673
BPR-North	6/28/22	13:42	6/28/22	14:30	1577	45.9776	-130.0184	51185
BPR-Southeast 2nd recovery	6/28/22	16:20	6/28/22	17:10	1679	45.8964	-129.9583	125320
Hydrophone mooring	6/28/22	19:20	6/28/22	21:10	2149	46.1303	-129.8429	
				1) Time/Location of Release	2) Time on Deck			

Table 4.6.2: Mooring Deployments in 2022

Deployments in 2022								
Instrument	Date (UTC)	Time (UTC) ¹	Depth (m)	Latitude ²	Longitude ²	Latitude ³	Longitude ³	Paros S/N
BPR-East	6/23/22	6:46	1538	45.9457	-129.959	45.94523	-129.95877	103402
BPR-North	7/1/22	4:46	1555	45.9775	-130.01842	45.97694	-130.01819	51185
BPR-West (deployed at same location as BPR-North as a test)	7/1/22	5:05	1554	45.97885	-130.01873	n/a	n/a	107673
		1) Time of Anchor release		2) Drop position from ship's log		3) Surveyed Location		

Table 4.6.3: Acoustic Release Codes for instruments deployed in 2022

Release Codes					
Instrument	Release S/N	Enable	Disable	Release	Comments
BPR-West	60420	560447	560464	545504	Taken off of BPR-Southeast when it was recovered and used for BPR-West
BPR-East	60417	560303	560320	542665	
BPR-North	60416	560251	560272	542646	Note release indicated tilted at > 45° on seafloor
(recovered - sent back to Seattle)	60415	560217	560234	542623	Returned to PMEL after failed deck test
(unused - sent back to Seattle)	57586	406776	407003	426027	

This is the pin layout of the Edgetech deck boxes sent this year. In years past it was potentially another type of Edgetech fitting. Thompson did not have a connector to match this.



4.7 - Multibeam mapping from R/V Thompson

Jeff Beeson and Bill Chadwick

Seafloor bathymetry, backscatter, and water-column backscatter mapping with R/V Thompson's EM302 multibeam sonar system was collected during the duration of TN404. A total of 1,076 line kilometers resulting in 3,678 square kilometres of multibeam data was collected. A targeted, short survey, was done on Axial Seamount's NW caldera rim, repeating some lines previously run by R/V Langseth with its EM122 system in 2019 for a frequency response comparison. We also collected multibeam sonar data during the transit out and back from Axial Seamount.

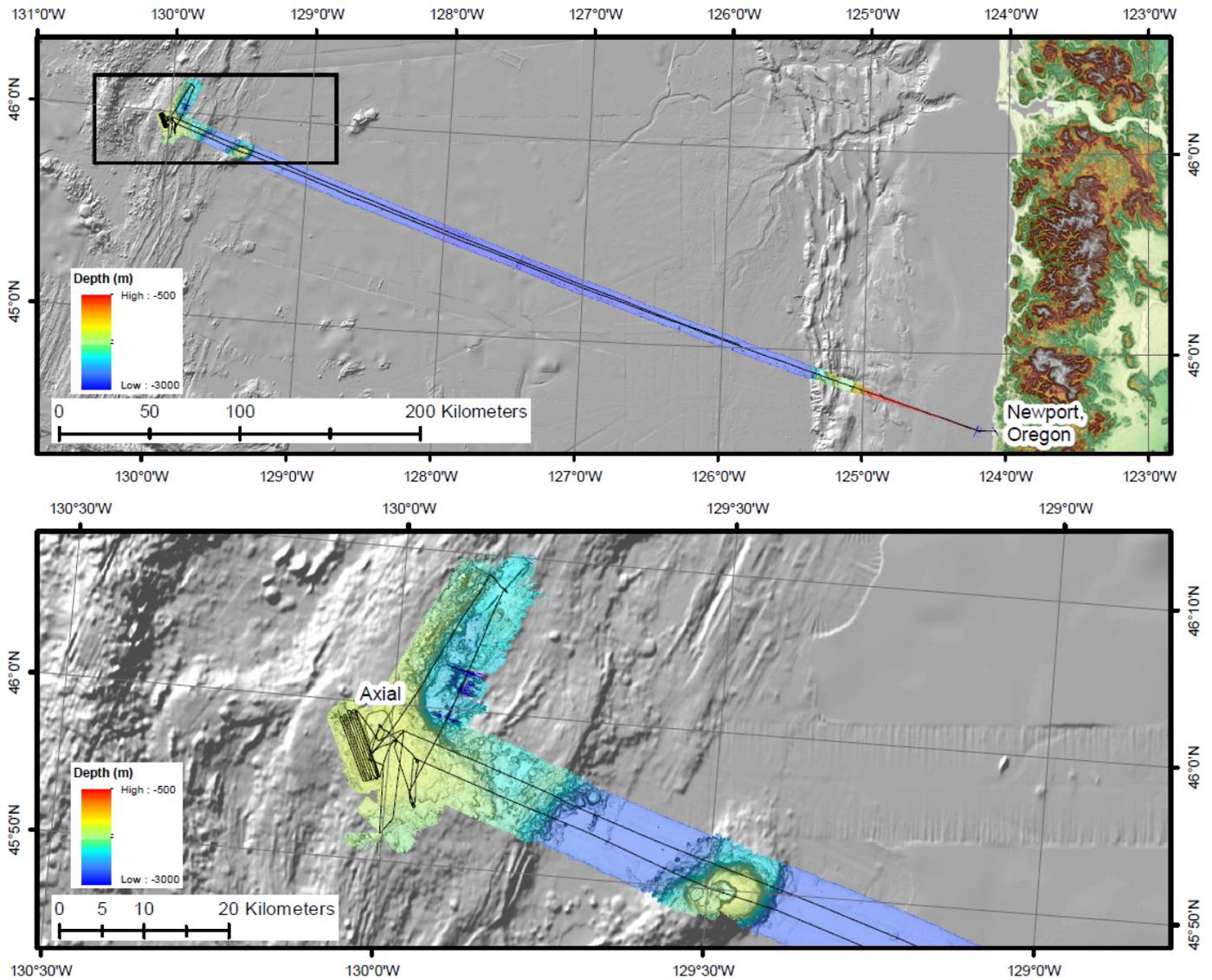


Figure 4.7.1 – Maps showing coverage of multibeam sonar mapping during TN404.

4.8 - Outreach

Bill Chadwick

Jes Burns (science reporter) and Stephani Gordon (videographer) from Oregon Public Broadcasting (OPB) joined the expedition to help us communicate our science to the general public and the world at large. They filmed the wide variety of operations on the ship during the cruise and conducted interviews with members of the science party. A big THANK YOU to them for going to sea with us, being up at all hours to capture what we were doing, and for helping us to communicate our science!

The first reporting from the expedition was a 5-minute radio piece that was broadcast on OPB radio and appeared with an accompanying story on the OPB website on June 30, 2023 (during the cruise):

<https://www.opb.org/article/2022/06/30/axial-seamount-volcano-research-oregon-coast-crab-battle/>

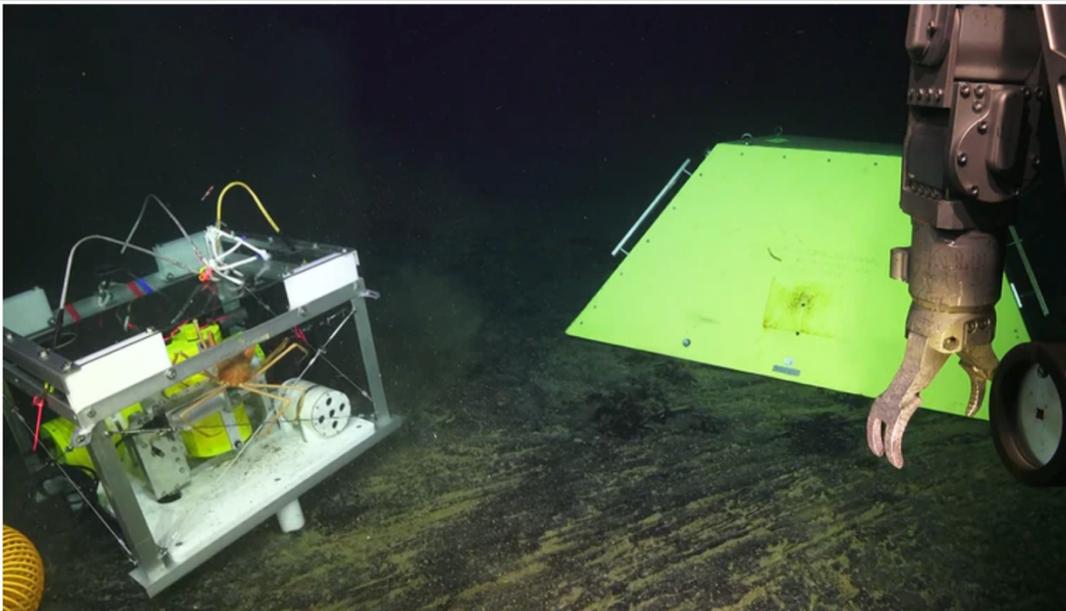
MAY 17, 2023

In The News | Apartment fire | Senate walkout | Multnomah County Commission | Capital gains tax | Jacob Stokes

Battling crabs 250 miles off the Oregon Coast, while studying an underwater volcano

 **By Jes Burns** (OPB)
June 30, 2022 5 a.m. Updated: June 30, 2022 1:24 p.m.



A spider crab decides that seismometer deployed by scientists on board the research vessel Thompson is the place to be on the ocean floor.

ROV Jason, Woods Hole Oceanographic Institution

That story was picked up by CBC Radio in Canada, who interviewed Bill Chadwick about the story in the July 7 episode of "As it Happens" from 17:56-25:27 elapsed time in the episode:

<https://www.cbc.ca/listen/live-radio/1-2-as-it-happens/clip/15923725-tipping-point>

After the cruise, Jes Burns talked about her experience at sea during a 17-minute interview on OPB's radio show "Think Out Loud":

<https://www.opb.org/article/2022/07/12/volcano-off-oregon-coast-may-provide-clues-to-predict-eruptions/>

On March 16, 2023, a 10-minute "All Science, No Fiction" video episode appeared on the OPB website with an accompanying written story with text and photos:

<https://www.opb.org/article/2023/03/16/oregon-coast-deep-sea-volcano-axial-seamount-research-eruption-forecasting/>

OPB MAY 17, 2023

In The News Apartment fire Senate walkout Multnomah County Commission Capital gains tax Jacob Stokes

SCIENCE & ENVIRONMENT

Deep-sea volcano off the Oregon Coast helps scientists forecast eruptions

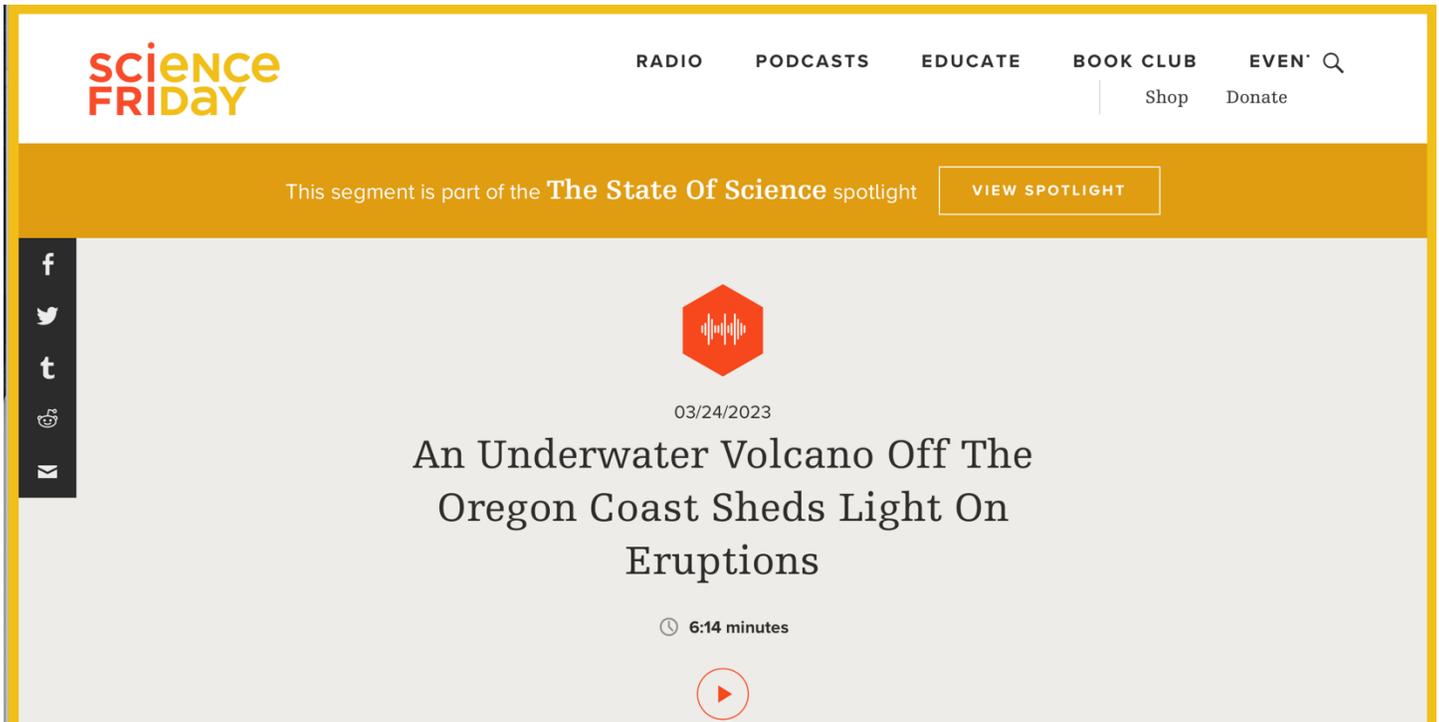
✉️ 📘 🐦

By **Jes Burns** (OPB)
March 16, 2023 6 a.m.

Instruments placed on the Axial Seamount measure volcanic activity and provide helpful clues

This story was picked up by NPR's Science Friday show on March 24, 2023, who interviewed Jes Burns about the cruise:

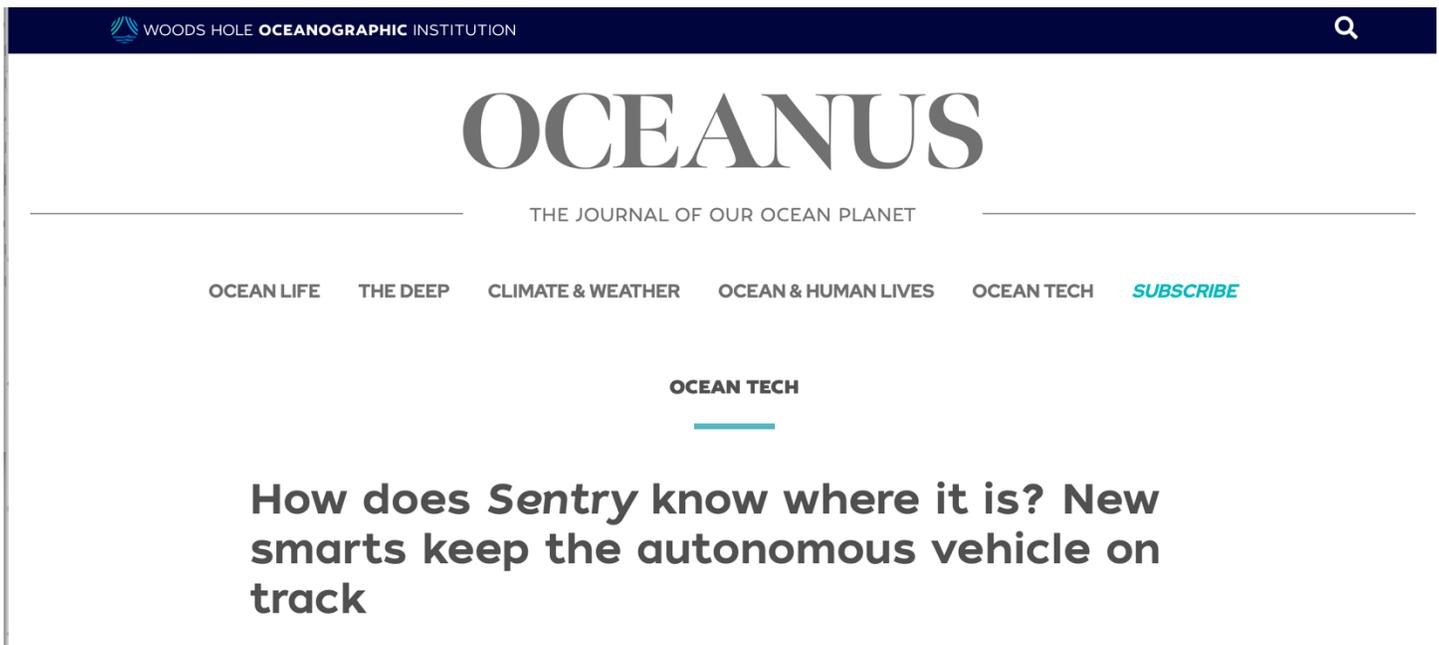
<https://www.sciencefriday.com/segments/oregon-deep-sea-volcano-eruptions/>



The screenshot shows the Science Friday website interface. At the top left is the Science Friday logo. Navigation links include RADIO, PODCASTS, EDUCATE, BOOK CLUB, and EVEN' with sub-links for Shop and Donate. A banner indicates the segment is part of 'The State Of Science' spotlight with a 'VIEW SPOTLIGHT' button. The main content area features a red audio icon, the date 03/24/2023, the title 'An Underwater Volcano Off The Oregon Coast Sheds Light On Eruptions', and a duration of 6:14 minutes. A play button is visible at the bottom of the player area. A vertical sidebar on the left contains social media icons for Facebook, Twitter, Tumblr, and Email.

Finally, a story came out in Oceanus Magazine (by WHOI) on January 25, 2023, about our AUV *Sentry* operations using TRN at Axial:

<https://www.whoi.edu/oceanus/feature/sentry-trn/>



The screenshot shows the Oceanus Magazine website. The header includes the Woods Hole Oceanographic Institution logo and a search icon. The main title 'OCEANUS' is prominently displayed, with the subtitle 'THE JOURNAL OF OUR OCEAN PLANET'. Navigation links include OCEAN LIFE, THE DEEP, CLIMATE & WEATHER, OCEAN & HUMAN LIVES, OCEAN TECH, and a blue 'SUBSCRIBE' button. The 'OCEAN TECH' section is highlighted with a blue underline. The article title 'How does Sentry know where it is? New smarts keep the autonomous vehicle on track' is displayed in a large, bold font.

5.0 - ROV *Jason* Overview and Notes About Imagery and Data Logging

Bill Chadwick

ROV *Jason* Overview

In general, ROV *Jason* and all its standard equipment worked well. The few problems we had with *Jason* equipment included the following:

- On *Jason* dive J2-1428 the dive had to be aborted due to a problem with the *Jason* jetway power supply.
- The starboard-aft thruster on *Jason* had hard ground faults on 4 of our 6 dives (J2-1430, J2-1431, J2-1432, J2-1433) and had to be secured (not used) during the rest of those dives. Multiple attempts were made to fix the problem between those dives, to no avail (it kept happening on each subsequent dive, apparently indicating that the underlying problem was not really fixed each time). Fortunately, we found that we were still able to accomplish our goals on each dive, despite not being able to use that thruster. For example, we found that *Jason* could use the lateral thrusters instead of the aft thrusters during long transits above the seafloor between benchmark sites, and could travel at about the same speed. However, the lack of the aft thruster made it more challenging for the pilots to carefully maneuver *Jason* when approaching benchmarks on the bottom, but it was workable.

ROV *Jason* Imagery and Data Logging

Issues we encountered with *Jason* imagery and data logging this year included:

- There was some confusion at the beginning of the cruise about which settings were needed on the science camera. This resulted in non-optimal imagery on the first dive.
- In general, I was disappointed (again) that the logging software Sealog & Virtual Van is still "kludgy" and much as it was two years ago when we last sailed with *Jason*. It seems that little progress has been made to complete and finalize the *Jason* data logging system. Extensive editing of the Virtual Van entries was necessary after the cruise to produce the dive logs in this report. WHOI is supposedly working on it.

H264 Continuous HD Video Recordings

Three 1080i camera streams (SciCam, BrowCam, PilotCam) were recorded to hard drive-based video files. Raw videos are MPEG Transport Stream (.ts) files compressed using the H.264 codec. The data rate for these H.264 files was higher this year than in previous years, so the file sizes are also larger. Image resolution is 1920x1080 pixels. These are playable using open source video players such as VLC. Filenames include camera name and start timestamp. Automated clip duration was set at 15 minutes (files are ~3 Gb each). In addition to the video files, metadata broadcast in real-time on the *Jason* network was captured to subtitle files (.srt format), which can produce a line of text overlain on the video (time, lat, long, heading, depth). These components were merged into a Matroska container file (.mkv). Only the merged .mkv files were provided on the *Jason* data disk this year. The following is a listing of the number of H264 files and the total file sizes:

<u>Dive</u>	<u>Number of H264 .mkv files</u>	<u>Total file size</u>
J2-1428	123	437.9 Gb
J2-1429	357	1.3 Tb
J2-1430	219	676.4 Gb (pressure dive - part 1)
J2-1431	754	2.77 Tb (pressure dive – part 2)

J2-1432	430	1.58 Tb (pressure dive – part 3 – new benchmarks)
J2-1433	111	398 Gb
Total	1994	7.162 Tb

Sulis 4K High-Definition video highlights

Highlight video from the SciCam was manually recorded to hard disk (on demand) at a higher quality format than the H264 recordings. These “UHD” highlight recordings were recorded in 4K (3840 x 2160 pixels) using the Apple ProRes422 family of codecs (.mov) at a data rate of 590 Mbit/s. The video files are renamed after each dive so that they indicate lowering ID, start time, and stop time. Some of the highlight videos are provided in both regular HD format (1920x1080 and 143 Mbit/s) and 4K (UHD) format. A summary listing of the highlight video clips are included in the table below. The recordings include time code.

Dive	# of HD files	HD format file size	# of UHD files	UHD format file size
J2-1428	4	23.2 Gb	11	79.8 Gb
J2-1429	10	71.4 Gb	24	219.2 Gb
J2-1430	10	54.1 Gb	11	126.3 Gb
J2-1431	3	14.5 Gb	32	363.1 Gb
J2-1432	10	34.0 Gb	13	104.7 Gb
J2-1433	10	84.3 Gb	10	142.6 Gb
Total	47	281.5 Gb	101	1.035 Tb

4K video frame grabs

Frame grabs from *Jason* video can be captured in 3 different ways and at 3 different resolutions. The highest resolution are 4K frame grabs from the Sulis science camera, which are manually captured using a button on the control box at the Watch Leader station in the *Jason* control van. Each image takes some time to process, so there is a limit to how many images you can capture in a short amount of time. The images are saved as *sulis*.jpg* files (5968 x 3352 pixels) with date and time in the file name. The files are 3-10 Mb in size. The 4K images are beautifully crisp.

HD video frame grabs (TIFF)

The two other ways to capture frame grabs are lower resolution. One way is to manually capture TIF images at the Video Logger station (3840 x 2160 pixels from the Sulis SciCam, and are 24.9 Mb in size, which is about double the size and resolution compared to previous years). The other way is with Data Logger entries into the Virtual Van (1920x1080 pixels, from all 3 cameras on *Jason* simultaneously, and saved in compressed jpg format). While Virtual Van frame grabs are the lowest resolution, they are also the most frequent, since they are captured automatically every log entry and every 30 sec otherwise. File names include date and time.

Dive	# of 4K frame grabs	Total file size	# of TIFF frame grabs	Total file size
J2-1428	49	238 Mb	15	324 Mb
J2-1429	253	1.26 Gb	26	647 Mb
J2-1430	202	989 Mb	55	1.33 Gb
J2-1431	186	922 Mb	48	1.18 Gb
J2-1432	111	617 Mb	8	150 Mb
J2-1433	46	231 Mb	0	0 Mb
Total	847	4.257 Tb	152	3.63 Gb

6.0 – ROV JASON Dives

6.1 - ROV Jason Dive Statistics

Dive No.	Dates	Max Depth	Hours Descending	Hours Ascending	Hours on Bottom	Hours in water	Time On Deck	Time on Deck not available to science
J2-1428	2022/06/21	1546	01:15	01:04	8:05	10:24	NA	NA
J2-1429	2022/06/21 – 2022/06/23	1550	01:02	01:02	27:09	29:13	2:45	02:45
J2-1430	2022/06/23 – 2022/06/25	1716	01:13	01:15	52:09	54:37	9:26	04:00
J2-1431	2022/06/25 – 2022/06/28	1542	01:08	01:07	59:28	61:43	3:19	03:19
J2-1432	2022/06/29 – 2022/07/01	1551	01:09	01:05	33:12	35:26	04:10	04:10
J2-1433	2022/07/01	1538	01:15	01:36	06:17	09:08	08:38	08:38

6.2 - ROV Jason Dive Goals and Summaries

J2-1428 - Goal was to deploy 3 Webb instruments (CMP-1, CMP-2, CMP-3) at sites Webb-1, Webb-2, and Webb-6, respectively. Also, recover 4 Mini-BPRs at MPR benchmarks, then recon possible new benchmark deployment sites along the western and eastern caldera faults. However, dive was aborted after CMP-1 instrument was deployed at site Webb-1 and only 1 Mini-BPR was turned around at benchmark AX-104 due to problems with *Jason* jetway power supply.

J2-1429 - Basically a continuation of dive J2-1428, starting by deploying Webb instrument CMP-2 at the Webb-2 site, and picking up where we left off. Also deployed Webb instrument CMP-3 at the Webb-6 site and turned around Mini-BPRs at benchmarks AX-308 and AX-307. Collected suction sample of nudibranchs at benchmark AX-307. Then did recon along the western and eastern caldera faults and put out Markers at chosen sites for new benchmarks. Visited benchmark AX-101 in between and swapped the Mini-BPR there.

J2-1430 - First multi-day MPR pressure measurement dive, starting at benchmark AX-105 (the old reference site). Goal was to mix in recovering the Webb instruments from their first deployment. Webb instrument CMP-1 was recovered from the Webb-1 site and it was later redeployed at the Webb-4 site for its second deployment. The CMP-2 instrument was also recovered from the Webb-2 site (but the shield broke off during recovery). Made one circuit of all the MPR benchmarks and then made repeat pressure measurements at benchmarks AX-104, AX-310, AX-303, and AX-309. The *Jason* starboard-aft thruster had a ground fault and had to be secured mid-way through the dive, but it did not prevent us from accomplishing the dive goals. While at AX-309 the MPR got rotated inside the hose clamps that hold the handle and base on the MPR (due to getting caught on the MPR holster during deployment and the mesh sleeve on the MPR being too loose). This rotation would have compromised the subsequent pressure measurements, so the dive was aborted to remedy this situation.

J2-1431 - Second multi-day MPR pressure measurement dive, more or less continuing where the previous aborted dive left off. Dive started at benchmark AX-303 and proceeded in a clockwise direction around the benchmarks in the caldera (omitting benchmark AX-105). Deployed Webb instrument CMP-2 at the Webb-6 site (without a shield) and recovered CMP-3 (with a shield) from the same site. However, the shield apparently came loose during the instrument ascent and

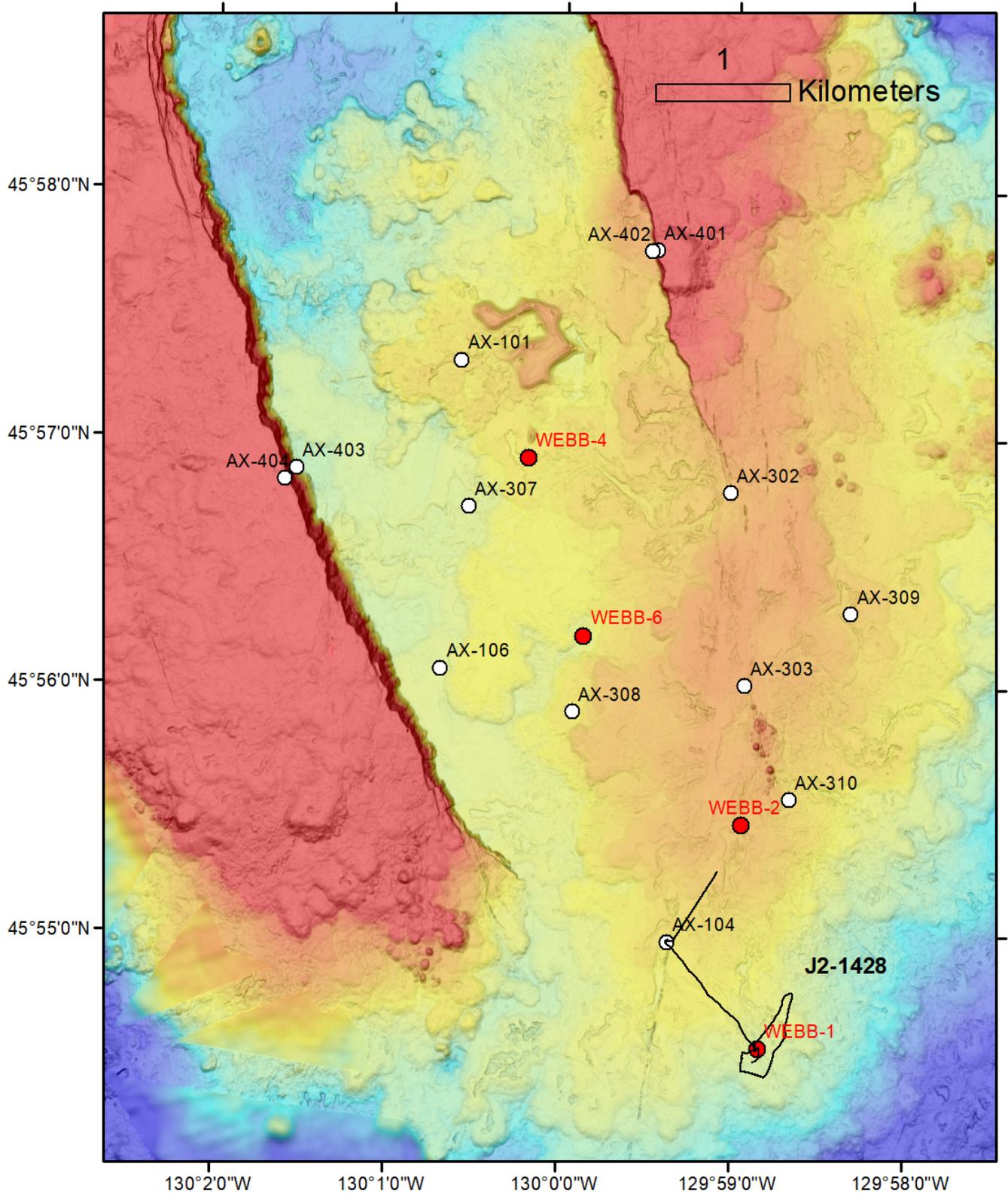
was no longer attached when the instrument was recovered at the surface. HOBO temperature probes were recovered at Diva and Castle vents in the International District vent field and at Vixen vent. Temperature probes were deployed at Diva, Vixen, and Casper vents. Dive ended with last pressure measurement at benchmark AX-308. The *Jason* starboard-aft thruster had a ground fault and had to be secured mid-way through the dive, but it did not prevent us from accomplishing the dive goals.

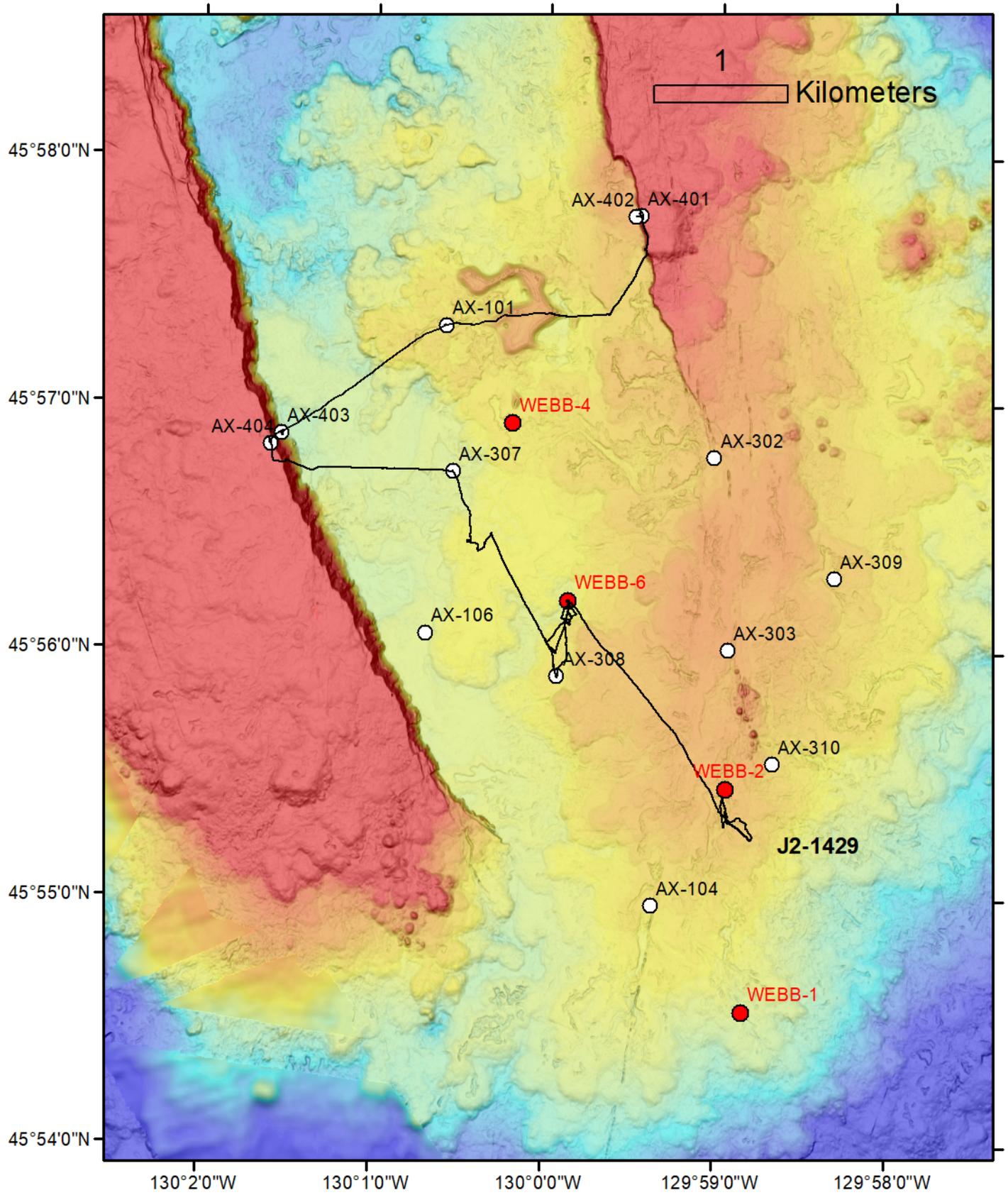
J2-1432 - Goal of this dive was to make MPR pressure measurements at the new benchmarks just deployed by the ship along the western and eastern caldera faults (one on the rim, one on the floor on each side). Dive started and ended at benchmark AX-101 at the Caldera Center. Benchmarks were deployed with 2 glass balls attached so they could be repositioned on the bottom with *Jason*. Once at their final position the glass balls were released and recovered with the ship. Mini-BPRs were placed on each new benchmark. The *Jason* starboard-aft thruster had a ground fault and had to be secured mid-way through the dive, but it did not prevent us from accomplishing the dive goals.

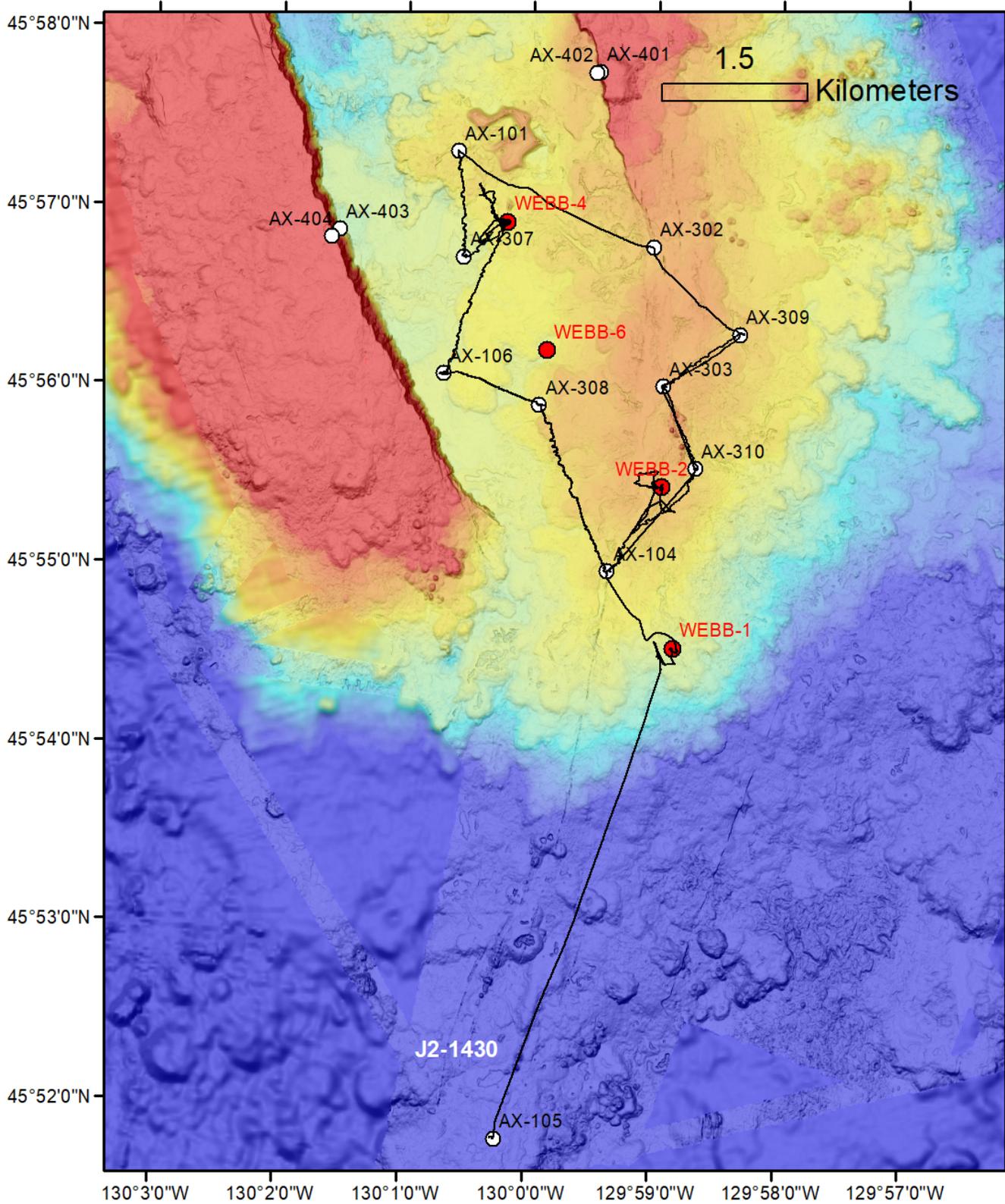
J2-1433 - Goal of this dive was to recover the two remaining Webb instruments: Instrument CMP-2 located at the Webb-6 site (without a shield), and instrument CMP-1 located at the Webb-4 site (with a shield). The *Jason* starboard-aft thruster had a ground fault and had to be secured mid-way through the dive, but it did not prevent us from accomplishing the dive goals.

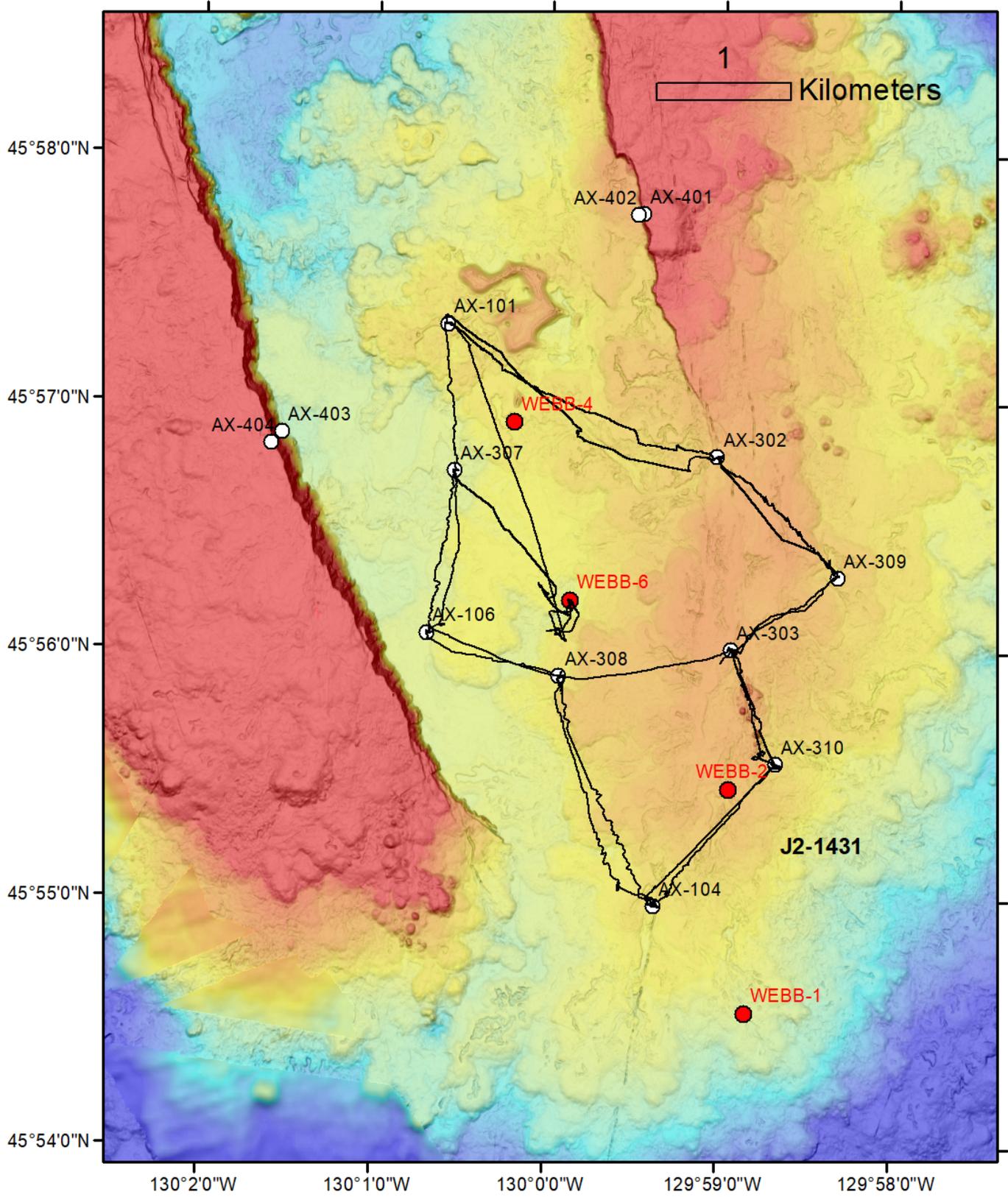


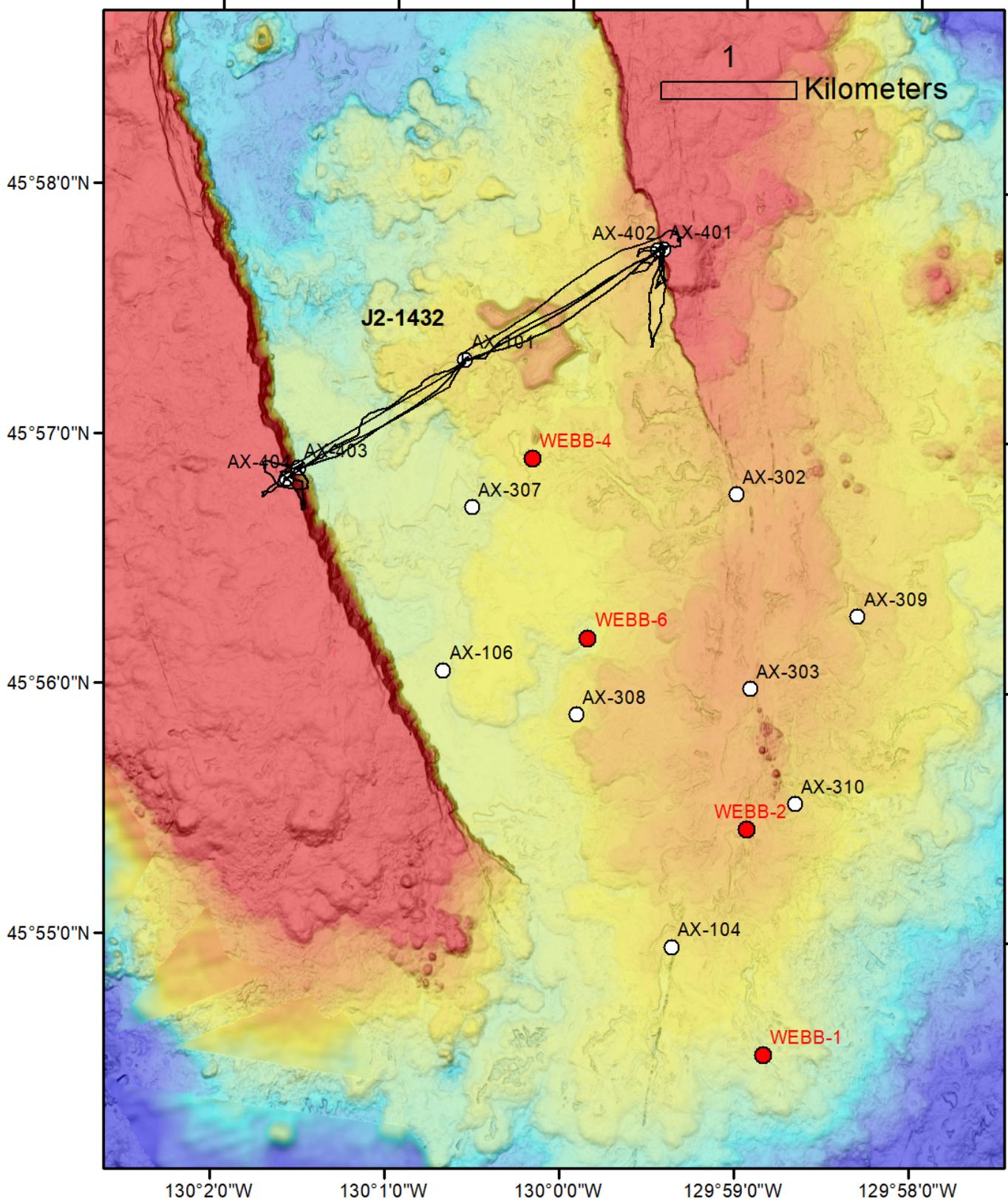
6.3 - ROV Jason Dive Maps

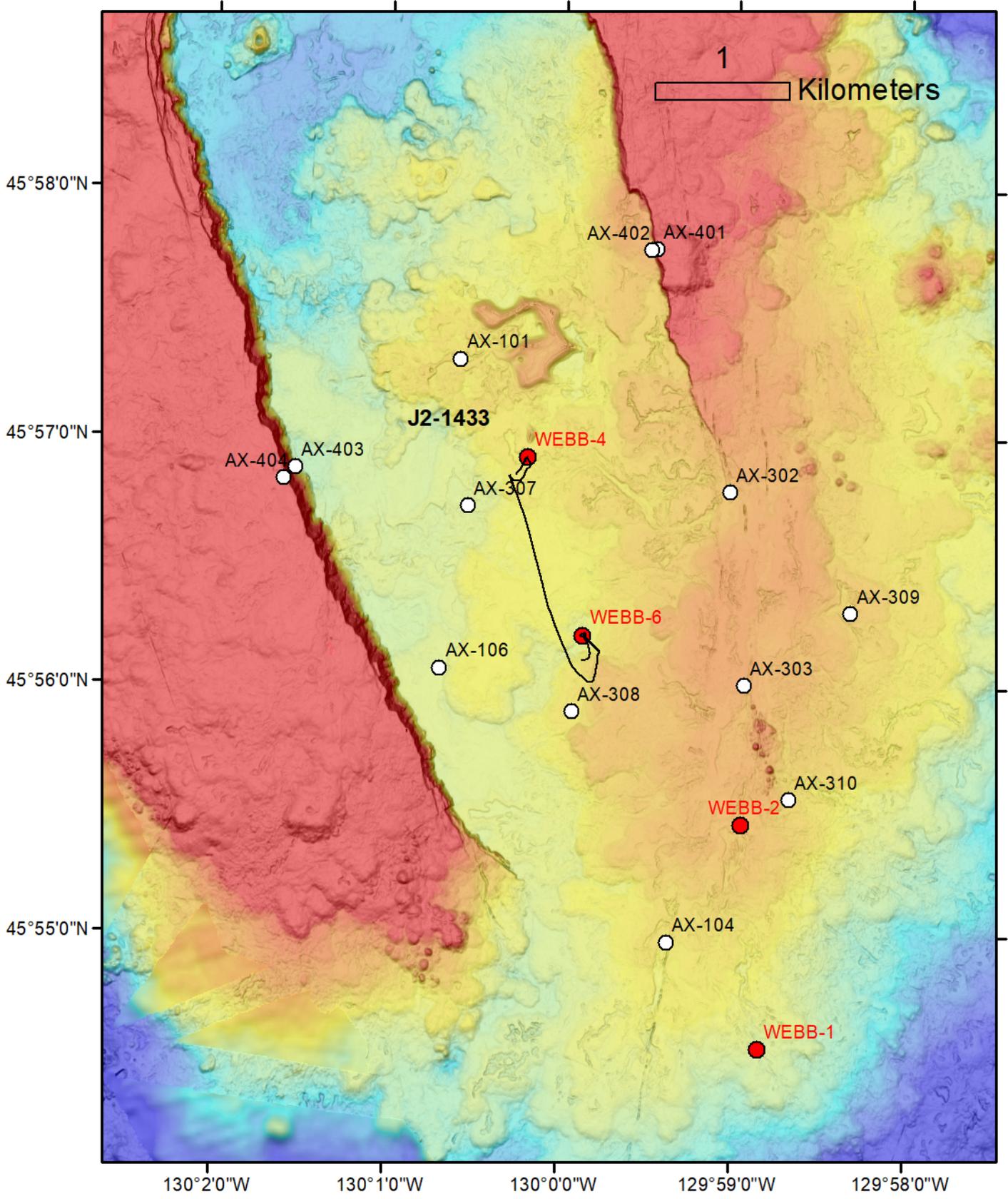












6.4 – ROV *Jason* Navigation

Navigation of ROV *Jason* was accomplished by USBL from *R/V Thompson* and in general was very good. We had no trouble finding the pressure benchmarks on the seafloor, or re-finding the Webb crustal compliance instruments deployed on previous dives (with acoustic beacons on them). Some new markers were deployed in 2022. They are listed in the table below.

Table 6.4.1 – New Marker Deployments in 2022

Mkr213	45.916209	-129.989374	1529	~10 m south of AX-104 benchmark
Mkr286	45.916167	-129.989257	1529	~10 m north of AX-104 benchmark
Mkr293	45.934361	-130.0111927	1542	Near AX-106 to make it easier to find
Mkr267	45.9343788	-130.0113591	1542	Near AX-106 to make it easier to find
AX-401/Mkr 201	45.96271	-129.99111	1475	Benchmark on the EAST caldera RIM
AX-402 Mkr245/251/225	45.96263	-129.99159	1522	Benchmark on the EAST caldera FLOOR.
AX-403/Mkr217	45.94782	-130.02570	1556	Benchmark on the WEST caldera FLOOR
AX-404/Mkr230	45.94709	-130.02677	1399	Benchmark on the WEST caldera RIM

6.5 – ROV *Jason* Samples

Only one sample was collected during TN404 on *Jason* dive J2-1429. It was a biological sample of a nudibranch from the flag pole attached to the AX-307 MPR benchmark (NNE of ASHES and south of the caldera center). Nudibranchs had been spotted here previously during TN383 in September 2020, and one was sampled this year to try to determine if it is a new species. The sample number is J-1429-Bio-01, collected by the *Jason* suction sampler between 15:37 to 15:57 on 06/22/2023. The lat, long, depth was 45.94533, -130.00908, 1542. The sample was shipped to Dr. Angel A. Valdes at California Polytech at Pomona for analysis (coordinated by Lonny Lundsten at MBARI).

6.6 – ROV Jason Dive Logs

ROV Jason dive J2-1428 Dive Log (edited/corrected from Jason Virtual Van after renav)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 07:08:21	45.908513	-129.980355	337.77	1.3	VEHICLE: Jason off deck
06/21/2022 07:08:28	45.908519	-129.980352	327.68	1.3	VEHICLE: Jason diving where CMP-1 instrument was deployed at Webb-1 site
06/21/2022 07:09:49	45.908362	-129.980274	79.94	1.3	VEHICLE: Jason in water
06/21/2022 07:11:21	45.908362	-129.980274	186.25	2.9	WATCH_CHANGE: new watchstander: Jeff Beeson and Haley Cabaniss took over at 12:00a just before Jason launch.
06/21/2022 07:18:41	45.908229	-129.980101	157.49	35.4	VEHICLE: Last float is on - Jason descending.
06/21/2022 08:22:32	45.908162	-129.981010	48.76	1516.2	VEHICLE: Jason on bottom
06/21/2022 08:23:53	45.908133	-129.981028	81.01	1535.8	TXT: Package in sight - Webb instrument CMP-1
06/21/2022 08:24:16	45.908132	-129.981020	77.24	1537.4	VEHICLE: On bottom
06/21/2022 08:27:13	45.908193	-129.980985	76.57	1542.1	NAV: Doppler Reset
06/21/2022 08:32:21	45.908193	-129.980817	142.4	1526.1	TXT: Jason has grabbed the float - to reposition the CMP-1 instrument
06/21/2022 08:46:11	45.909045	-129.980659	2.57	1528.0	TXT: Jason has released the float
06/21/2022 08:47:04	45.909040	-129.980710	103.71	1532.4	TXT: To clarify Jason has LET GO of the float. We are descending to position the instrument on the seafloor.
06/21/2022 08:49:23	45.909066	-129.980735	105.15	1539.7	TXT: Instrument on bottom
06/21/2022 08:50:45	45.909051	-129.980742	149.44	1543.2	TXT: Searching for flatter location to position instrument.
06/21/2022 08:53:33	45.909045	-129.980663	84.34	1538.0	TXT: Jason has grabbed the line to the float and is moving the instrument
06/21/2022 08:58:58	45.908886	-129.980755	173.39	1536.8	TXT: Jason has let go of the instrument
06/21/2022 09:01:41	45.908974	-129.980747	195.56	1545.1	TXT: Pilot is sitting Jason on the seafloor to read tilt
06/21/2022 09:01:49	45.908973	-129.980748	195.56	1545.1	TXT: Contact on bottom
06/21/2022 09:02:00	45.908970	-129.980749	195.56	1545.1	TXT: Jason tilt (roll) is 1.4 degrees pitch is 2.7
06/21/2022 09:02:12	45.908963	-129.980749	196.77	1544.5	TXT: Pete has okayed this location for deployment of the CMP-1 instrument
06/21/2022 09:04:43	45.908871	-129.980770	184.34	1542.8	TXT: Jason is repositioning the instrument to approved location
06/21/2022 09:07:51	45.908955	-129.980822	183.94	1544.4	TXT: Jason has placed the instrument back on bottom
06/21/2022 09:11:54	45.908973	-129.980806	184.37	1544.4	TXT: Jason has cut the ratchet straps attaching the instrument to the cover
06/21/2022 09:13:56	45.908964	-129.980776	251.42	1544.7	TXT: Strap 2 out of 4 is severed

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 09:15:31	45.908966	-129.980778	250.57	1544.7	TXT: Strap 3 out of 4 is severed
06/21/2022 09:17:53	45.908945	-129.980801	93.87	1544.2	TXT: Strap 4 out of 4 is severed
06/21/2022 09:22:40	45.908977	-129.980793	178.2	1543.6	TXT: Jason is removing the instrument from the shield
06/21/2022 09:25:32	45.909000	-129.980828	184.74	1543.5	TXT: Instrument is on bottom
06/21/2022 09:25:42	45.908999	-129.980831	190.62	1543.7	TXT: Backing off to survey instrument that appears tilted
06/21/2022 09:29:26	45.908991	-129.980837	165.05	1544.4	TXT: Instrument is being repositioned to more stable location
06/21/2022 09:30:44	45.908982	-129.980828	165.59	1543.6	TXT: Instrument is on bottom again - hard landing
06/21/2022 09:31:06	45.908984	-129.980827	165.85	1544.4	TXT: Backing off to survey instrument
06/21/2022 09:33:57	45.908959	-129.980829	121.25	1543.4	TXT: Instrument site has been approved by Pete and we are preparing to release the float
06/21/2022 09:35:50	45.908965	-129.980816	120.71	1543.3	TXT: Using knife to cut float pack from instrument
06/21/2022 09:36:06	45.908971	-129.980811	122.39	1543.3	TXT: Float pack cut and heading to surface
06/21/2022 09:38:49	45.908883	-129.981099	226.13	1537.3	TXT: Moving NW to follow float pack to surface
06/21/2022 09:41:02	45.908763	-129.981808	290.29	1511.5	TXT: Float pack heading to surface
06/21/2022 10:05:12	45.907351	-129.981041	133.37	1435.4	TXT: vessel following float to recover
06/21/2022 10:45:17	45.912159	-129.977402	22.08	1426.6	WATCH_CHANGE: new watchstander: Bill and Kelly Chadwick
06/21/2022 10:50:24	45.912418	-129.978137	202.92	1427.3	TXT: Float pack has been recovered by ship
06/21/2022 10:50:51	45.912325	-129.978176	202.86	1427.2	TXT: Jason returning to instrument CMP-1 on bottom
06/21/2022 11:39:11	45.909272	-129.980971	152.85	1537.5	VEHICLE: On bottom
06/21/2022 11:40:21	45.909195	-129.980903	152.43	1540.9	TXT: cool fish
06/21/2022 11:41:01	45.909119	-129.980853	152.92	1541.6	TXT: instrument in sight
06/21/2022 11:42:35	45.908989	-129.980800	113.62	1544.8	TXT: discussing how to position the instrument and cover
06/21/2022 11:44:32	45.908982	-129.980794	87.04	1545.1	TXT: discussing what needs to be done to prep the instrument (remove pull pins)
06/21/2022 11:45:46	45.908996	-129.980807	117.26	1544.7	TXT: there's a small obstruction that's impacting jason's positioning
06/21/2022 11:46:45	45.908999	-129.980822	168.61	1544.6	TXT: discussing how to deal with the obstruction
06/21/2022 11:48:18	45.908997	-129.980821	171.81	1545.4	TXT: discussing the ratchet strap that is in the way
06/21/2022 11:49:16	45.908998	-129.980805	169.83	1545.7	TXT: removing ratchet strap
06/21/2022 11:50:36	45.908999	-129.980797	169.68	1545.7	TXT: going to remove pull pins
06/21/2022 11:50:54	45.908999	-129.980797	169.44	1545.7	TXT: pull pin 1 removed
06/21/2022 11:51:32	45.908999	-129.980795	169.44	1545.7	TXT: removing the second pull pin

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 11:51:45	45.908998	-129.980794	169.16	1545.7	TXT: pull pin 2 removed
06/21/2022 11:52:47	45.908994	-129.980790	168.46	1545.2	TXT: repositioning jason
06/21/2022 11:54:40	45.908987	-129.980799	97.36	1545.1	TXT: the small obstruction is impacting jason's ideal positioning
06/21/2022 11:55:29	45.908986	-129.980804	95.94	1545.1	TXT: discussing how to pull the line
06/21/2022 11:56:38	45.908987	-129.980807	95.75	1545.1	TXT: pulling the rope buddle
06/21/2022 11:57:34	45.908988	-129.980809	94.93	1545.1	TXT: going to grab the connector between the two lines instead
06/21/2022 11:58:45	45.908979	-129.980806	94.84	1545.1	TXT: discussing what needs to be done with the lines
06/21/2022 11:59:31	45.908973	-129.980807	94.95	1545.1	TXT: the bottom line needs to be unfurled but not the top line
06/21/2022 11:59:56	45.908972	-129.980810	94.23	1545.0	TXT: unfurling the line now
06/21/2022 12:01:02	45.908977	-129.980824	97.39	1545.2	TXT: line is unfurled
06/21/2022 12:01:46	45.908983	-129.980834	97.27	1545.2	TXT: discussing the difficulty of putting the cover on with the small obstacle impacting jason's position
06/21/2022 12:02:36	45.908986	-129.980839	97.38	1545.2	TXT: positioning the line
06/21/2022 12:02:49	45.908985	-129.980838	97.39	1545.2	TXT: looking for the indicator tape on the line
06/21/2022 12:04:39	45.908988	-129.980836	97.43	1545.2	TXT: discussing putting the cover on from the other side of the instrument and then adjust from the current side
06/21/2022 12:05:50	45.909005	-129.980833	109.16	1544.4	TXT: moving to the instrument's other side
06/21/2022 12:07:27	45.909018	-129.980807	237.42	1545.2	TXT: going to grab and remove the ratchet strap
06/21/2022 12:08:06	45.909013	-129.980793	233.52	1545.7	TXT: removing strap now
06/21/2022 12:10:37	45.908983	-129.980758	245.94	1545.7	TXT: fish in the cover
06/21/2022 12:11:08	45.908982	-129.980755	245.96	1545.7	TXT: fish hanging out in the cover
06/21/2022 12:11:54	45.908984	-129.980755	245.96	1545.7	TXT: big fish
06/21/2022 12:13:48	45.908982	-129.980756	245.97	1545.7	TXT: getting the knife
06/21/2022 12:14:18	45.908981	-129.980754	245.97	1545.7	TXT: cutting the weight tether with the knife
06/21/2022 12:15:25	45.908979	-129.980744	245.97	1545.7	TXT: trying to move the brow cam
06/21/2022 12:16:22	45.908978	-129.980737	245.97	1545.7	TXT: cutting the tether now
06/21/2022 12:18:03	45.908975	-129.980740	246.01	1545.7	TXT: putting the knife away
06/21/2022 12:19:20	45.908975	-129.980739	246.07	1545.7	TXT: big fish
06/21/2022 12:20:13	45.908977	-129.980738	246.08	1545.7	TXT: dropped the knife and now picking it up
06/21/2022 12:20:38	45.908977	-129.980739	246.08	1545.7	TXT: knife snapped off

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 12:21:31	45.908979	-129.980747	246.08	1545.7	TXT: the knife blade is now sitting in the holder
06/21/2022 12:23:34	45.908979	-129.980750	246.09	1545.7	TXT: They want the window with the white line to be on the side of the instrument with the line that's extended
06/21/2022 12:23:58	45.908978	-129.980747	246.09	1545.7	TXT: discussing how to move the cover
06/21/2022 12:24:19	45.908977	-129.980745	246.1	1545.7	TXT: going to flip the cover now
06/21/2022 12:24:33	45.908977	-129.980744	246.1	1545.7	TXT: shooping the fish away
06/21/2022 12:25:06	45.908976	-129.980743	246.11	1545.7	TXT: going to flip the cover now
06/21/2022 12:26:34	45.908972	-129.980744	246.31	1545.7	TXT: realizing the other weight is still attached
06/21/2022 12:28:21	45.908970	-129.980742	246.67	1545.7	TXT: going to flip the cover with both arms and the weight still attached
06/21/2022 12:32:47	45.908975	-129.980754	248.66	1545.7	TXT: grabbing the weight
06/21/2022 12:34:59	45.908975	-129.980754	245.65	1545.0	TXT: trying to flip the cover
06/21/2022 12:35:25	45.908975	-129.980751	250.22	1543.9	TXT: going to focus on cutting the weight off
06/21/2022 12:38:18	45.908968	-129.980725	273.45	1545.6	TXT: getting the second knife to cut the weight's rope
06/21/2022 12:38:39	45.908967	-129.980725	273.46	1545.6	TXT: the second knife is broken
06/21/2022 12:38:48	45.908966	-129.980726	273.46	1545.6	TXT: both knives are broken
06/21/2022 12:40:52	45.908944	-129.980730	293.09	1545.2	TXT: going to try to flip the cover
06/21/2022 12:42:40	45.908924	-129.980757	58.54	1545.2	TXT: discussing how to flip the cover
06/21/2022 12:45:37	45.908936	-129.980740	70.26	1543.8	TXT: cover is flipped
06/21/2022 12:46:07	45.908934	-129.980726	58.73	1543.9	TXT: going to grab the side without the line on the window to position the cover over the instrument
06/21/2022 12:48:04	45.908933	-129.980685	316.56	1545.2	TXT: looking for the instrument so they know where to move
06/21/2022 12:48:46	45.908931	-129.980684	316.63	1545.2	TXT: grabbing the cover
06/21/2022 12:50:32	45.908930	-129.980684	317.86	1545.2	TXT: lifting the cover
06/21/2022 12:52:31	45.908954	-129.980701	316.38	1544.7	TXT: moving to the instrument
06/21/2022 12:55:32	45.908954	-129.980690	321.53	1543.4	TXT: jason off bottom to line the cover up higher
06/21/2022 12:57:43	45.908953	-129.980686	319.4	1542.5	TXT: trying to figure out position relative to the instrument
06/21/2022 12:59:09	45.908963	-129.980723	320	1542.3	TXT: moving the cover above the instrument
06/21/2022 13:03:17	45.908990	-129.980779	275.26	1544.1	TXT: Putting the cover over the instrument
06/21/2022 13:04:59	45.908996	-129.980766	275.35	1544.7	TXT: discussing how to finish lowering the cover
06/21/2022 13:06:54	45.908992	-129.980767	275.72	1545.5	TXT: letting go of cover with the left arm

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 13:07:33	45.908991	-129.980765	275.39	1545.6	TXT: lowering the cover
06/21/2022 13:07:44	45.908991	-129.980765	275.22	1545.6	TXT: cover is placed
06/21/2022 13:09:35	45.908993	-129.980778	270.82	1545.4	TXT: going to adjust the cover's positioning from the other side of the instrument
06/21/2022 13:09:57	45.908997	-129.980785	228.77	1545.0	TXT: the edge of the cover is off the bottom slightly maybe because it's on the instrument frame
06/21/2022 13:11:33	45.909006	-129.980778	203.44	1543.6	TXT: decided to go back to other side (the side without the line on the window) to pull it back a little
06/21/2022 13:13:36	45.908990	-129.980752	275.29	1545.8	TXT: pulled the cover so that its no longer caught on the instrument's frame
06/21/2022 13:14:13	45.908994	-129.980755	275.28	1545.8	TXT: nudging the cover to make it more parallel with the instrument
06/21/2022 13:15:14	45.909008	-129.980771	275.98	1545.8	TXT: adjusting the cover to make it a little more parallel by pushing from the left side
06/21/2022 13:16:23	45.909022	-129.980795	248.49	1545.4	TXT: moving to the side of the cover with the line on the window to see if it is positioned correctly
06/21/2022 13:17:32	45.909030	-129.980829	178.55	1545.6	TXT: shrimp
06/21/2022 13:17:37	45.909030	-129.980831	179.13	1545.6	TXT: shrimp is carrying something
06/21/2022 13:18:33	45.909026	-129.980846	179.27	1545.6	TXT: shrimp is carrying something
06/21/2022 13:19:06	45.909021	-129.980845	179.74	1545.6	TXT: shrimp dropped the thing
06/21/2022 13:19:22	45.909017	-129.980842	174.71	1545.5	TXT: resuming cover adjustment
06/21/2022 13:21:11	45.908988	-129.980809	96.47	1545.1	TXT: decided it looks well positioned - cover is now on top of CMP-1 instrument
06/21/2022 13:21:45	45.908980	-129.980806	62.15	1544.9	TXT: the three weights need to be placed on top of the cover ideally covering the holes on the top to prevent currents impacting the instrument
06/21/2022 13:23:11	45.908965	-129.980799	58.7	1545.0	TXT: going to start with the weight that is still attached to the cover
06/21/2022 13:23:58	45.908961	-129.980789	59.45	1545.0	TXT: accidentally moved the cover
06/21/2022 13:24:56	45.908959	-129.980785	58.82	1545.0	TXT: attempting to grab the weight that is still attached and move it on top of the cover
06/21/2022 13:29:40	45.908953	-129.980791	59.12	1545.0	TXT: first weight is being adjusted
06/21/2022 13:31:11	45.908967	-129.980782	16.03	1545.2	TXT: first weight has been placed on top of the cover
06/21/2022 13:31:28	45.908968	-129.980777	16.03	1545.2	TXT: going to collect the other weights
06/21/2022 13:34:07	45.908938	-129.980739	326.5	1545.5	TXT: picking up the next ratchet strap
06/21/2022 13:35:12	45.908941	-129.980736	327.82	1545.5	TXT: picking up the weights
06/21/2022 13:37:52	45.909005	-129.980793	190.91	1546.0	TXT: placing the weights on the top of the cover
06/21/2022 13:38:54	45.909013	-129.980800	190.89	1546.0	TXT: weight two is positioned
06/21/2022 13:40:07	45.909006	-129.980791	190.86	1546.0	TXT: weight three is positioned

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 13:40:12	45.909005	-129.980790	190.84	1546.0	TXT: all three weights are on the top
06/21/2022 13:40:20	45.909003	-129.980789	190.47	1545.9	TXT: Picking up the last ratchet strap
06/21/2022 13:41:50	45.908985	-129.980773	219.92	1546.0	TXT: last ratchet strap is collected
06/21/2022 13:43:38	45.908985	-129.980763	218.87	1546.0	TXT: checking the weight placement one last time
06/21/2022 13:44:47	45.908987	-129.980764	264.89	1545.9	TXT: adjusting one weight so it fully covers the hole on top
06/21/2022 13:45:48	45.908991	-129.980760	264.89	1545.9	TXT: CMP-1 instrument looks good - do a fly around to get highlights
06/21/2022 13:46:01	45.908993	-129.980761	264.89	1545.9	HIGHLIGHTS: 4K highlights start
06/21/2022 13:50:53	45.908973	-129.980742	339.14	1545.1	HIGHLIGHTS: 4K highlights stop
06/21/2022 13:53:16	45.909102	-129.980746	318.32	1545.1	TXT: start transit to benchmark AX-104
06/21/2022 13:54:08	45.909161	-129.980757	322.9	1544.5	Framegrab:
06/21/2022 13:54:27	45.909176	-129.980756	323.36	1544.3	TXT: looking at a cool rock formation
06/21/2022 14:48:05	45.914545	-129.987498	309.75	1528.7	WATCH_CHANGE: new watchstanders: Scott Nooner Sandra Slead and Kelli Scott
06/21/2022 15:15:08	45.916148	-129.989459	119.11	1528.2	TXT: arrived at benchmark AX-104 to swap Mini-BPRs
06/21/2022 15:16:47	45.916157	-129.989435	119.64	1528.2	TXT: right swingarm beginning to pull out Mini-BPR to deploy at AX-104
06/21/2022 15:17:41	45.916155	-129.989440	119.62	1528.2	TXT: right arm has grabbed Mini-BPR 2014-09 from starboard biobox then placed on seafloor
06/21/2022 15:21:46	45.916143	-129.989432	136.62	1529.2	TXT: Mini-BPR 2020-05 being picked up off of benchmark AX-104
06/21/2022 15:23:22	45.916138	-129.989434	136.28	1529.2	TXT: Mini-BPR 2020-05 in basket
06/21/2022 15:24:20	45.916137	-129.989432	136.27	1529.2	TXT: Mini-BPR 2014-09 being placed on benchmark AX-104
06/21/2022 15:24:51	45.916139	-129.989432	136.31	1529.2	TXT: Mini-BPR 2014-09 placed on benchmark AX-104
06/21/2022 15:25:49	45.916148	-129.989435	134.04	1528.2	TXT: Jason pulling away from AX-104
06/21/2022 15:29:18	45.916158	-129.989437	135.43	1528.2	TXT: Getting into position to place the old Mini-BPR 2020-05 in basket
06/21/2022 15:29:38	45.916168	-129.989441	135.77	1528.2	TXT: Finished at benchmark AX-104
06/21/2022 15:30:04	45.916186	-129.989442	146.84	1528.2	TXT: Beginning transit to Webb-2 deployment site
06/21/2022 15:52:50	45.918180	-129.987091	31.63	1523.9	TXT: jason went slightly into collapsed area
06/21/2022 15:53:31	45.918231	-129.987040	32.46	1524.0	TXT: collapsed area showed good view of lava flow layering
06/21/2022 16:19:49	45.920590	-129.984884	0	0.0	TXT: resetting power on jason (heading and depth numbers wrong)
06/21/2022 16:20:51	45.920619	-129.984859	0	1382.5	TXT: power from the jetway tripped
06/21/2022 16:21:03	45.920625	-129.984855	0	1376.9	TXT: power back on
06/21/2022 16:21:25	45.920635	-129.984847	0	1365.0	TXT: will take a while to get heading again

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1428 Logger Comment
06/21/2022 16:23:52	45.920712	-129.984794	0	1322.2	NAV: altitude and heading are down
06/21/2022 16:29:03	45.920971	-129.984648	188.41	1322.4	TXT: Decided to recover Jason and fix the jetway power issues - dive aborted - Jason leaving bottom
06/21/2022 16:41:22	45.921470	-129.984216	302.03	993.5	TXT: Decided that the Mini-BPRs are safe where they are in the basket for recovery
06/21/2022 16:44:35	45.921563	-129.984022	270.65	898.2	TXT: will troubleshoot on deck best case scenario is to deploy jason again around 13:00 local
06/21/2022 16:47:06	45.921564	-129.983917	165.99	835.6	TXT: power down again
06/21/2022 16:48:51	45.921644	-129.983912	165.99	835.6	TXT: ground fault detector not showing anything in the rack
06/21/2022 16:51:02	45.921771	-129.983927	165.99	835.6	TXT: power back on
06/21/2022 16:53:02	45.921911	-129.983952	165.99	674.7	TXT: jason's voltage is low
06/21/2022 17:00:27	45.922622	-129.983979	219.1	455.4	TXT: heading is back on
06/21/2022 17:05:00	45.923008	-129.983836	208.71	323.3	TXT: jetway holding steady at 104 volts
06/21/2022 17:05:31	45.923043	-129.983812	208.62	308.5	TXT: jason coming to a stop
06/21/2022 17:06:04	45.923090	-129.983784	208.41	299.4	TXT: bad lay on the cable
06/21/2022 17:07:44	45.923252	-129.983656	208.6	300.6	TXT: winch is not moving so they will pay back out
06/21/2022 17:09:51	45.923261	-129.983589	187	323.8	TXT: jason now being brought back in again
06/21/2022 17:20:29	45.923837	-129.982776	185.91	136.2	TXT: jason about to come out of the water
06/21/2022 17:26:34	45.924559	-129.982685	186.19	13.6	HIGHLIGHTS: jason coming out of the water highlights 1080 start
06/21/2022 17:27:53	45.924772	-129.982430	183.61	5.7	HIGHLIGHTS: jason coming out of the water highlights 4K highlights start
06/21/2022 17:33:00	45.925729	-129.981649	8.61	1.5	HIGHLIGHTS: jason on deck highlights 4K highlights stop
06/21/2022 17:33:02	45.925734	-129.981646	8.57	1.6	VEHICLE: Jason on deck
06/21/2022 17:34:01	45.925775	-129.981533	8.42	1.5	HIGHLIGHTS: jason on deck highlights 1080 stop

ROV Jason dive J2-1429 Dive Log (edited/corrected from Jason Virtual Van after renav)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/21/2022 20:37:09	45.7500074	-130.20003	357.95	1.35	VEHICLE: Jason off deck. Jason diving where CMP-2 instrument was deployed at Webb-2 site
06/21/2022 20:37:15	45.7500074	-130.20003	358.52	1.33	HIGHLIGHTS: 4k highlights start Jason deployment for videographers
06/21/2022 20:39:15	45.9214829	-129.98147	125.32	1.33	VEHICLE: Jason in water. Watchstanders are Jeff Beeson and Haley Cabaniss.
06/21/2022 20:39:44	45.9214829	-129.98147	179.05	2.95	HIGHLIGHTS: 4k highlights stop
06/21/2022 21:41:56	45.9217968	-129.98204	58.18	1518.88	VEHICLE: On bottom
06/21/2022 21:42:59	45.9218059	-129.98203	58.14	1519.05	NAV: Doppler Reset
06/21/2022 21:43:25	45.9218278	-129.98198	61.92	1519.44	TXT: Webb instrument CMP-2 in sight.
06/21/2022 21:44:02	45.9218706	-129.98187	62.07	1518.95	HIGHLIGHTS: 1080 start
06/21/2022 21:44:23	45.9218844	-129.98183	64.53	1514.44	TXT: Instrument appears to have landed inside a collapse structure on the seafloor.
06/21/2022 21:45:58	45.9218906	-129.98181	62.88	1514.37	HIGHLIGHTS: 1080 stop
06/21/2022 21:46:17	45.921885	-129.98181	64.49	1512.68	TXT: Jason has grabbed the instrument float and is moving the instrument.
06/21/2022 21:51:03	45.92176	-129.98201	63.43	1520.31	TXT: Instrument CMP-2 on bottom at new location
06/21/2022 21:51:20	45.9217624	-129.98203	68.6	1521.97	TXT: video logging possible problem
06/21/2022 21:54:47	45.9218091	-129.98205	98.65	1521.56	TXT: A brief 1080 and HD video were recorded but there was an issue with the software and they have not been logged here. Each video shows the potential location for Webb 2.
06/21/2022 21:55:13	45.9218026	-129.98203	106.11	1520.73	TXT: Video Logging computer is being reset.
06/21/2022 21:55:47	45.9217934	-129.98201	104.93	1521.05	HIGHLIGHTS: 4k highlights start
06/21/2022 21:57:57	45.921835	-129.98194	107.25	1521.57	TXT: Strap one of four is cut for CMP-2
06/21/2022 21:58:18	45.9218541	-129.98195	106.47	1521.21	HIGHLIGHTS: 4k highlights stop
06/21/2022 21:58:39	45.9218555	-129.98197	168.26	1520.01	TXT: Strap two of four is severed for CMP-2
06/21/2022 22:00:09	45.9218073	-129.98192	282.44	1521.98	TXT: Strap three of four is severed for CMP-2
06/21/2022 22:00:34	45.9218081	-129.9819	282.28	1521.96	TXT: Strap four of four is severed for CMP-2 (instrument is freed from shield)
06/21/2022 22:01:07	45.9218069	-129.98192	282.29	1521.99	TXT: Knife is returned to Jason basket
06/21/2022 22:03:16	45.9217779	-129.98202	113.19	1520.28	TXT: Jason is removing CMP-2 from the protective shield
06/21/2022 22:04:15	45.9217808	-129.98207	112.03	1520.69	HIGHLIGHTS: 1080 start
06/21/2022 22:05:03	45.9217876	-129.9821	113.03	1521.95	TXT: CMP-2 is separated from the shield and on the seafloor
06/21/2022 22:05:09	45.921789	-129.9821	113.05	1521.96	HIGHLIGHTS: 1080 stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/21/2022 22:05:38	45.9218065	-129.98209	116.58	1521.32	HIGHLIGHTS: 4k highlights start surveying CMP-2 position
06/21/2022 22:08:39	45.9218395	-129.98202	231.12	1520.6	HIGHLIGHTS: 4k highlights stop
06/21/2022 22:08:45	45.9218404	-129.98203	230.31	1520.81	HIGHLIGHTS: 4k highlights start Surveying site for potential fissure-like structure underneath the instrument. Ted is concerned about how well sealed the instrument will be once the cover is on top.
06/21/2022 22:09:55	45.9218527	-129.98202	215.22	1520.81	HIGHLIGHTS: 4k highlights stop
06/21/2022 22:13:35	45.9219365	-129.98214	294.27	1520.35	TXT: Jason needs to come off bottom in a few minutes for Sentry recovery. Exploring surrounding areas for better location for CMP-2.
06/21/2022 22:14:31	45.9219704	-129.98223	294.75	1520.37	TXT: New location identified and flagged. Following Sentry recovery instrument will be moved to this new target location.
06/21/2022 22:15:35	45.9219594	-129.98225	272.79	1519.11	VEHICLE: Off bottom Jason moving 100m off bottom for Sentry recovery
06/21/2022 22:45:49	45.9217383	-129.98249	178.27	1421.28	TXT: Forgot to start ASNAP but have turned it on now for auto-frame-grabs every 30 seconds
06/21/2022 22:49:24	45.9222511	-129.98263	178.27	1421.32	WATCH_CHANGE: new watchstander Kelly Chadwick and Bill Chadwick
06/21/2022 22:50:54	45.9224503	-129.98268	178.39	1421.36	TXT: waiting for Sentry recovery
06/21/2022 23:04:03	45.9235297	-129.98262	178.2	1435.83	TXT: Sentry is on deck
06/21/2022 23:09:20	45.9228811	-129.98234	172.31	1435.06	TXT: heading back down to bottom to instrument CMP-2
06/21/2022 23:12:08	45.9222833	-129.9822	173.3	1441.81	TXT: going to the bottom
06/21/2022 23:15:13	45.9225244	-129.98232	173.37	1514.16	VEHICLE: bottom in sight
06/21/2022 23:15:28	45.9224941	-129.98232	171.54	1518.65	VEHICLE: On bottom
06/21/2022 23:17:24	45.9222974	-129.98227	172.56	1518.53	TXT: Going to CMP-2
06/21/2022 23:20:13	45.9221501	-129.98223	174.08	1520.89	TXT: doing a fly over of Webb-2 site (where the instrument will be moved)
06/21/2022 23:22:50	45.9218545	-129.98213	173.7	1516.07	TXT: arrived at CMP-2
06/21/2022 23:25:11	45.9218277	-129.98209	173.09	1516.15	TXT: going to grab CMP-2 by the middle of the line and carry it to the new site
06/21/2022 23:27:27	45.9218245	-129.98207	173.8	1513.56	TXT: taking CMP-2 to WEBB-2 site
06/21/2022 23:30:11	45.921978	-129.98216	175.51	1513.37	TXT: arrived at WEBB-2 site
06/21/2022 23:30:54	45.9219704	-129.98218	173.69	1515.85	TXT: depositing CMP-2 instrument on seafloor
06/21/2022 23:31:00	45.9219706	-129.98218	173.41	1516.1	TXT: CMP-2 on the bottom
06/21/2022 23:31:24	45.9219768	-129.98218	173.1	1515.97	TXT: going down to look at CMP-2 placement to confirm before getting the shield
06/21/2022 23:32:07	45.9219979	-129.98217	165.2	1520.83	TXT: decided to move CMP-2 off a crack
06/21/2022 23:34:05	45.921972	-129.98217	165.48	1515.92	TXT: positioning CMP-2 now

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/21/2022 23:36:42	45.9219287	-129.98214	165.53	1513.76	TXT: setting CMP-2 down in new position
06/21/2022 23:37:18	45.9219292	-129.98214	165.55	1516.31	TXT: CMP-2 on bottom
06/21/2022 23:37:56	45.9219381	-129.98216	165.51	1516.57	TXT: going back down to look at CMP-2's position
06/21/2022 23:38:38	45.9219511	-129.98216	165.46	1520.99	TXT: discussing CMP-2 placement
06/21/2022 23:38:49	45.9219531	-129.98215	162.99	1521.13	TXT: going to look at CMP-2 from the other side
06/21/2022 23:40:00	45.9219557	-129.98212	246	1522.11	TXT: going to pull Jason up along side and set down to calculate the tilt of CMP-2 on bottom
06/21/2022 23:40:53	45.9219614	-129.98215	246.46	1522.97	TXT: pitch is under a degree
06/21/2022 23:41:09	45.9219613	-129.98215	246.46	1522.98	TXT: it's been decided that CMP-2 is well placed
06/21/2022 23:41:56	45.9219589	-129.98214	246.47	1522.98	TXT: going to release the float pack
06/21/2022 23:43:38	45.9219527	-129.98214	246.86	1521.88	TXT: getting a knife
06/21/2022 23:44:34	45.9219534	-129.98216	246.23	1522.02	TXT: lat: 45.921964 N
06/21/2022 23:44:50	45.9219548	-129.98215	246.33	1521.92	TXT: got the knife
06/21/2022 23:45:10	45.9219574	-129.98215	246.45	1521.89	TXT: calling bridge to let them know we're going to release the float pack
06/21/2022 23:46:41	45.9219573	-129.98215	215.49	1521.96	HIGHLIGHTS: 4k highlights start
06/21/2022 23:50:17	45.9219372	-129.98215	182.86	1522.14	HIGHLIGHTS: 4k highlights stop
06/21/2022 23:50:56	45.922007	-129.98213	252.88	1521.08	TXT: going to get the cover
06/21/2022 23:52:25	45.9222038	-129.98213	354.26	1518.55	TXT: discussing cover's position
06/21/2022 23:53:09	45.9222358	-129.9821	354.55	1517.89	Framegrab: cute crab
06/21/2022 23:54:46	45.9221676	-129.98222	322.78	1516.42	TXT: waiting for the ship to position for float recovery
06/22/2022 00:04:59	45.9214716	-129.98123	144.53	1421.07	TXT: waiting for float recovery
06/22/2022 00:44:53	45.9216819	-129.98028	144.88	1420.6	TXT: float on deck and being secured
06/22/2022 00:45:57	45.9217546	-129.98024	144.27	1420.73	TXT: going to be heading to the cover
06/22/2022 00:50:55	45.9221072	-129.98095	267.28	1514.7	TXT: bottom in sight
06/22/2022 00:51:26	45.9221271	-129.98104	269.05	1519.11	VEHICLE: On bottom
06/22/2022 00:53:41	45.9219445	-129.9814	270.76	1518.93	TXT: discussing whether this is the right location (possible nav offset)
06/22/2022 00:54:20	45.9219213	-129.9815	270.32	1517.61	TXT: moving 10-15 m to the west to look for the cover
06/22/2022 00:55:45	45.9218885	-129.98185	267.58	1518.53	TXT: cover in sight
06/22/2022 00:56:01	45.921875	-129.98188	268.7	1520.2	TXT: going to grab the cover
06/22/2022 00:58:12	45.921799	-129.98198	296.14	1523.12	TXT: crab looking in the window

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 00:59:03	45.9217962	-129.98197	296.57	1523.16	TXT: grabbing the cover
06/22/2022 00:59:50	45.9218143	-129.98201	297.26	1522.21	TXT: flipping the cover
06/22/2022 01:00:24	45.9218347	-129.98205	288.68	1522.23	TXT: cover is flipped
06/22/2022 01:01:40	45.9218543	-129.98202	293.9	1521.01	TXT: going to approach CMP-2 to figure out a game plan before attempting to move the cover
06/22/2022 01:03:22	45.9219062	-129.98213	0.23	1522.74	TXT: going to extend the line on the instrument
06/22/2022 01:04:36	45.9219004	-129.98215	61.97	1523.51	TXT: pulling the pull pins to release the line
06/22/2022 01:05:44	45.9218962	-129.98214	61.97	1523.51	TXT: pull pins are released
06/22/2022 01:06:26	45.9218981	-129.98215	61.97	1523.52	TXT: going to grab the bunch of line and unfurl it
06/22/2022 01:08:16	45.9218906	-129.98216	64.72	1523.36	TXT: line is unfurled
06/22/2022 01:09:00	45.921897	-129.98217	84.53	1523.27	TXT: Jason is up against an obstacle and will need to rotate a little to be able to pull the line taught
06/22/2022 01:09:56	45.9218993	-129.98218	76.68	1523.24	TXT: CMP-2 line is positioned
06/22/2022 01:10:42	45.9219025	-129.98218	76.66	1523.25	TXT: adjusting the top rope so it'll be flat
06/22/2022 01:11:36	45.92191	-129.98219	76.42	1523.25	TXT: going to the cover
06/22/2022 01:14:17	45.9218742	-129.98206	121.18	1521.68	TXT: going to pick up the cover from the side that doesn't have tape on the window
06/22/2022 01:16:23	45.9217972	-129.98203	27.07	1523.24	TXT: grabbing the cover now
06/22/2022 01:17:30	45.9218024	-129.98204	27.11	1523.24	TXT: lifting the cover
06/22/2022 01:18:23	45.9217985	-129.98203	27.21	1523.24	TXT: transiting cover to CMP-2
06/22/2022 01:26:07	45.9218788	-129.98204	13.25	1523.25	TXT: putting the cover down
06/22/2022 01:26:23	45.9218794	-129.98204	14.04	1523.3	TXT: decided to remove the weights because they're making carrying the cover difficult
06/22/2022 01:26:36	45.9218796	-129.98204	13.23	1523.32	TXT: removing the weights now
06/22/2022 01:29:40	45.9218824	-129.98203	13.7	1523.31	TXT: weights are free
06/22/2022 01:29:44	45.9218819	-129.98203	13.77	1523.31	TXT: replacing the knife
06/22/2022 01:30:43	45.9218676	-129.98205	13.82	1523.3	TXT: collecting the weights and putting them in Jason's basket
06/22/2022 01:32:31	45.9218729	-129.98205	14.85	1523.27	TXT: weights are in the basket
06/22/2022 01:32:38	45.9218745	-129.98205	15	1523.32	TXT: grabbing the cover
06/22/2022 01:33:52	45.921876	-129.98204	12.32	1523.31	TXT: holding the cover
06/22/2022 01:34:45	45.9218797	-129.98203	16.47	1523.28	TXT: lost grip on one arm
06/22/2022 01:35:43	45.9218814	-129.98203	16.51	1523.32	TXT: grabbing the cover again

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 01:36:17	45.9218782	-129.98204	16.48	1523.36	TXT: getting a perspective on where CMP-2 is
06/22/2022 01:37:14	45.9218818	-129.98205	344.37	1523.69	TXT: picking up the cover
06/22/2022 01:37:52	45.9218882	-129.98204	341.55	1523.7	TXT: the metal bar on the cover is sliding off
06/22/2022 01:38:21	45.9218904	-129.98205	341.48	1523.7	TXT: attempting to pick up the cover again
06/22/2022 01:42:08	45.9219493	-129.9821	280.11	1520.84	TXT: approaching the CMP-2 with the cover
06/22/2022 01:42:55	45.9220026	-129.98211	238.69	1523.97	TXT: bottom integrity check
06/22/2022 01:43:23	45.9220106	-129.98209	238.69	1523.96	TXT: approaching CMP-2 again
06/22/2022 01:43:52	45.9220049	-129.98208	238.7	1523.97	TXT: discussing how to do this
06/22/2022 01:44:29	45.9219982	-129.98207	237.11	1523.97	TXT: one of the metal struts fell off
06/22/2022 01:46:33	45.9219841	-129.98207	236.97	1522.48	TXT: looking at the CMP-2
06/22/2022 01:47:08	45.921949	-129.98208	236.87	1523.46	TXT: going to drop off the weights near the instrument
06/22/2022 01:48:09	45.9219405	-129.9821	236.87	1523.47	TXT: weights are set on the bottom
06/22/2022 01:49:38	45.9219715	-129.98209	54.22	1523.11	TXT: grabbing the cover to move it over the instrument again
06/22/2022 01:49:59	45.9219607	-129.98208	52.77	1524	TXT: grabbing the cover from the side with the window that the tape is on
06/22/2022 01:51:29	45.9219712	-129.9821	54.34	1524.01	TXT: carrying the cover to CMP-2
06/22/2022 01:54:31	45.9219536	-129.98208	57.01	1523.82	TXT: discussing how to move it and how much the cover weights (30 lbs)
06/22/2022 01:54:41	45.9219548	-129.98208	54.71	1523.79	TXT: carrying the cover to CMP-2
06/22/2022 02:00:09	45.9219352	-129.98215	112.01	1521.26	TXT: there's a crab on the CMP-2 (inside the frame)
06/22/2022 02:00:56	45.9219299	-129.98216	89.9	1521.34	TXT: we'll need to get the crab off the instrument before we put the shield on to protect the quality of the data
06/22/2022 02:01:39	45.9219295	-129.98217	82.66	1521.41	TXT: discussing how to deal with the crab
06/22/2022 02:03:18	45.9219163	-129.98214	77.88	1521.64	TXT: going to place the cover and then if the crab is still there try to deal with the crab
06/22/2022 02:05:46	45.9219003	-129.98215	84.95	1523.64	TXT: trying to scare off the crab
06/22/2022 02:06:57	45.921908	-129.98215	75.4	1523.73	TXT: discussing crab issues!
06/22/2022 02:09:00	45.921908	-129.98212	79.27	1523.66	TXT: going to put the cover to the side and then deal with the crab
06/22/2022 02:10:05	45.921916	-129.98215	76.64	1522.93	TXT: discussing the dangers of messing with the crab while it's in the instrument
06/22/2022 02:10:15	45.9219133	-129.98215	74.25	1522.92	TXT: putting the cover down
06/22/2022 02:13:10	45.92192	-129.98219	78.31	1523.77	TXT: going to the crab
06/22/2022 02:14:44	45.921891	-129.98212	343.39	1523.67	TXT: approaching the crab

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 02:15:31	45.9219199	-129.98212	286.34	1523.82	TXT: preparing to use the slurp on the crab
06/22/2022 02:16:37	45.9219192	-129.98213	286.32	1523.82	HIGHLIGHTS: 4k highlights start
06/22/2022 02:18:16	45.9219114	-129.98213	286.26	1523.82	TXT: grabbed the crab with Jason's arm
06/22/2022 02:18:22	45.9219114	-129.98213	286.26	1523.82	TXT: moving it away from the instrument
06/22/2022 02:19:52	45.9219126	-129.98195	348.43	1523.03	TXT: dropping the crab off
06/22/2022 02:20:32	45.9219223	-129.98194	348.46	1523.59	HIGHLIGHTS: 4k highlights stop
06/22/2022 02:21:53	45.9219701	-129.9821	220.85	1521.48	TXT: returning to CMP-2 and the cover
06/22/2022 02:25:36	45.9219103	-129.98215	74.7	1523.85	TXT: grabbing the cover
06/22/2022 02:27:11	45.9219214	-129.98216	75.75	1523.85	TXT: lifting the cover
06/22/2022 02:27:49	45.9219225	-129.98216	75.93	1523.66	TXT: bringing the cover to CMP-2
06/22/2022 02:30:12	45.9218865	-129.98214	68.25	1522.55	TXT: placing the cover over the instrument CMP-2
06/22/2022 02:33:39	45.9218828	-129.98217	70.22	1523.73	TXT: cover is placed
06/22/2022 02:34:03	45.921883	-129.98217	70.22	1523.73	TXT: adjusting the cover at WEBB-2 site
06/22/2022 02:36:06	45.9218686	-129.98212	35.7	1522.66	TXT: looking for the weights
06/22/2022 02:37:43	45.9219274	-129.98212	256.47	1523.68	TXT: discussing the weights
06/22/2022 02:38:52	45.9219126	-129.98209	263.92	1523.51	TXT: found the weights
06/22/2022 02:39:43	45.9219093	-129.98208	263.53	1523.55	TXT: picking up the weights and putting them on jason's basket
06/22/2022 02:42:30	45.9219032	-129.98213	258.56	1523.75	TXT: going to put the weights on the top of the cover so that they cover the 6 holes on top
06/22/2022 02:43:13	45.9219071	-129.98214	258.22	1523.77	WATCH_CHANGE: new watchstanders Sandra and Kelli and Scott
06/22/2022 02:46:14	45.9219125	-129.98213	258.15	1523.79	TXT: placed two weights on top of the cover
06/22/2022 02:47:15	45.9219147	-129.98214	258.6	1523.76	TXT: third weight placed on the cover
06/22/2022 02:48:57	45.9219177	-129.98214	258.62	1523.73	TXT: moving the weights around so they cover the holes
06/22/2022 02:52:16	45.9219198	-129.98215	166.46	1523.85	TXT: maneuvering to a better position to continue moving the weights
06/22/2022 02:52:51	45.9219219	-129.98215	166.84	1523.83	TXT: second weight is in position
06/22/2022 02:53:47	45.9219115	-129.98217	167.44	1523.84	TXT: moving third weight into position
06/22/2022 02:54:16	45.9219081	-129.98219	166.69	1523.84	TXT: third weight is in position
06/22/2022 02:55:01	45.9219112	-129.98218	166.74	1523.87	TXT: leaving CMP-2 instrument deployed at Webb-2 site
06/22/2022 03:02:04	45.9223358	-129.98254	320.7	1517.71	TXT: big fish
06/22/2022 03:18:07	45.9239312	-129.98376	321.21	1518.25	NAV: Doppler Reset

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 03:40:47	45.9267966	-129.98633	323.22	1517.53	TXT: Kelli is driving the roV and practicing landing
06/22/2022 05:18:03	45.9362427	-129.99799	245.1	1500.14	TXT: on station at Webb-6 site and ready for CMP-3 to be deployed from ship
06/22/2022 05:28:10	45.9361526	-129.99815	245.59	1500.27	TXT: CMP-3 instrument with float pack was deployed
06/22/2022 05:33:21	45.9360767	-129.99811	199.95	1500.49	TXT: waiting for CMP-3 to reach the bottom
06/22/2022 06:16:40	45.9352796	-129.99755	353.55	1491.76	TXT: Jason is searching for CMP-3
06/22/2022 06:19:38	45.9354536	-129.99747	39.05	1529.63	TXT: on the bottom at the site
06/22/2022 06:20:29	45.9355572	-129.99742	38.98	1532.26	NAV: Doppler Reset
06/22/2022 06:22:44	45.9357108	-129.99708	62.81	1532.54	TXT: found CMP-3 instrument
06/22/2022 06:23:18	45.9357225	-129.99703	63.85	1530.7	TXT: planning to pick up CMP-3 and take it to the Webb-6 site
06/22/2022 06:25:57	45.9357891	-129.99693	329.41	1520.31	Framegrab: CMP-3 closeup
06/22/2022 06:26:31	45.9357986	-129.99693	329.94	1520.26	TXT: jason right arm grabbing CMP-3
06/22/2022 06:28:26	45.9358948	-129.99705	334.78	1511.69	TXT: jason is moving CMP-3 north
06/22/2022 06:46:52	45.9366088	-129.99784	320.58	1520.83	TXT: just reached the target site for CMP-3. going to search now for a flat area
06/22/2022 06:49:52	45.9366652	-129.99779	292.57	1537.73	TXT: jason near the bottom
06/22/2022 06:51:07	45.9366528	-129.9978	278.78	1537.45	TXT: the spot to place CMP-3 at Webb-6 has been selected
06/22/2022 06:53:37	45.9366178	-129.99786	33.91	1538.37	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/22/2022 06:54:14	45.9366218	-129.99786	33.69	1538.37	TXT: Jason has severed strap one of four for CMP-3 instrument
06/22/2022 06:56:00	45.9366276	-129.99787	33.8	1538.36	TXT: Jason has severed strap two of four for the CMP-3 instrument
06/22/2022 06:59:20	45.9366574	-129.99786	238.95	1538.46	TXT: Jason has severed strap three of four for the CMP-3 instrument
06/22/2022 06:59:56	45.9366636	-129.99787	238.89	1538.48	TXT: Jason has severed strap four of four for the CMP-3 instrument and the instrument is free from the shield
06/22/2022 07:04:26	45.9366974	-129.99782	254.09	1538.5	TXT: Jason has removed the instrument from the shield and placed it on the seafloor
06/22/2022 07:06:25	45.9366988	-129.99778	264.26	1536.9	HIGHLIGHTS: 1080 start
06/22/2022 07:09:06	45.9367068	-129.9978	224.63	1537.33	TXT: We are surveying the Webb-6 site for the placement of CMP-3. Pete is comfortable with this location.
06/22/2022 07:09:26	45.9367049	-129.99781	229.08	1537.41	HIGHLIGHTS: 1080 stop
06/22/2022 07:11:57	45.9366987	-129.99782	231.82	1538.52	TXT: Instrument has moved following its positioning.
06/22/2022 07:13:50	45.9366916	-129.99783	231.81	1538.5	TXT: Jason has released the float from the instrument. Instrument has moved slightly as a result.
06/22/2022 07:15:20	45.9367044	-129.99782	232.25	1538.33	VEHICLE: Off bottom

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 08:00:28	45.933446	-129.99929	197.52	1408.08	HIGHLIGHTS: 4k highlights start
06/22/2022 08:00:32	45.9334448	-129.99929	197.15	1408.09	HIGHLIGHTS: 4k highlights stop
06/22/2022 08:07:13	45.9332972	-129.99884	358.4	1408.52	TXT: Float pack on deck. Returning to instrument location.
06/22/2022 08:41:13	45.9366533	-129.99777	320.38	1535.45	TXT: Back at Webb-6 site and CMP-3 instrument
06/22/2022 08:42:34	45.9366455	-129.99782	330.81	1536.69	HIGHLIGHTS: 1080 start
06/22/2022 08:43:36	45.9366517	-129.99786	272	1537.46	HIGHLIGHTS: 1080 stop
06/22/2022 08:45:31	45.9366537	-129.99786	267.09	1538.07	TXT: Jason is cutting weights free from the shield
06/22/2022 08:49:24	45.9366544	-129.99787	266.59	1538.06	TXT: The Webb shield is freed of the weights and Jason is moving the shield
06/22/2022 08:54:22	45.9366661	-129.99785	34.05	1537.96	TXT: Jason is pulling the pins and extending the line to CMP-3
06/22/2022 09:04:06	45.9366324	-129.99786	32.58	1537.88	TXT: Lines to CMP-3 have been extended and we are preparing to flip the shield
06/22/2022 09:07:57	45.9366679	-129.99788	317.08	1537.73	TXT: Jason has flipped the shield and is moving it toward the site of the CMP-3 instrument
06/22/2022 09:15:31	45.9366576	-129.99785	37.07	1537.95	TXT: Jason has placed the shield over the CMP-3 instrument. Instrument was moved slightly during this process.
06/22/2022 09:15:49	45.936659	-129.99785	36.96	1537.95	HIGHLIGHTS: 4k highlights start
06/22/2022 09:16:13	45.9366594	-129.99785	36.96	1537.95	TXT: Pete is pleased with the placement of the shield over the CMP-3 instrument
06/22/2022 09:19:04	45.9367056	-129.99781	257.35	1536.85	HIGHLIGHTS: 4k highlights stop
06/22/2022 09:20:56	45.9366501	-129.99788	280.71	1537.98	TXT: Jason is placing weights in the basket to be placed on top of CMP-3
06/22/2022 09:23:49	45.9366805	-129.99783	304.58	1538.01	TXT: Jason has placed the first weight on top of the CMP-3 shield
06/22/2022 09:28:58	45.9366726	-129.99789	121.01	1538.19	TXT: Jason has placed the second weight on top of the CMP-3 shield
06/22/2022 09:29:23	45.9366749	-129.99788	120.6	1538.19	TXT: Jason has placed the third weight on top of the CMP-3 shield. Done with CMP-3 deployment.
06/22/2022 09:35:44	45.9366782	-129.99777	286.91	1534.29	TXT: 45.9367 -129.9977 is the Webb-6 location
06/22/2022 09:36:31	45.9366765	-129.99777	286.46	1534.35	TXT: We are navigating to benchmark AX-308
06/22/2022 10:26:15	45.9315892	-129.99875	223.32	1526.88	TXT: Benchmark in sight
06/22/2022 10:27:12	45.9315311	-129.99877	188.56	1526.96	HIGHLIGHTS: 4k highlights start
06/22/2022 10:29:22	45.9315119	-129.99877	115.78	1528.89	HIGHLIGHTS: 4k highlights stop
06/22/2022 10:30:28	45.9315219	-129.99879	115.18	1528.9	Framegrab: AX-308 Benchmark
06/22/2022 10:31:21	45.9315174	-129.99879	114.75	1528.91	TXT: Jason has picked up Mini-BPR 2020-01 from AX-308 and recovered it to the basket
06/22/2022 10:31:43	45.9315168	-129.99878	114.72	1528.91	TXT: Jason is deploying Mini-BPR 2014-13 at AX-308 Benchmark
06/22/2022 10:35:11	45.9315216	-129.99877	113.48	1528.91	Framegrab: Mini-BPR 2014-13 on Benchmark AX-308

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 10:36:17	45.9315334	-129.9988	118.88	1527.87	TXT: Mini-BPR 2020-01 has been placed in the right swing arm biobox
06/22/2022 10:36:37	45.9315406	-129.99881	117.3	1526.5	VEHICLE: Off bottom
06/22/2022 10:36:52	45.9315462	-129.99882	117.88	1526.41	TXT: Transiting to benchmark AX-307
06/22/2022 10:49:36	45.9325496	-129.9991	335.79	1527.97	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/22/2022 12:03:28	45.9403112	-130.00465	328.64	1530.48	TXT: Stopping the ship to allow Sentry to launch. We are in the middle of transit from benchmark AX-308 to AX-307
06/22/2022 13:10:49	45.9411578	-130.00527	328.24	1526.81	TXT: getting ready to launch Sentry
06/22/2022 13:25:51	45.940221	-130.006	240.02	1484.89	TXT: Sentry is in the water
06/22/2022 13:33:00	45.9401268	-130.00615	239.87	1485.13	TXT: Going a bit to the west to get out of Sentry's way
06/22/2022 13:35:11	45.9399879	-130.00646	239.87	1484.72	TXT: Waiting for Sentry to get to the bottom
06/22/2022 14:45:33	45.9420925	-130.00733	346.08	1531.27	TXT: We are resuming transit to AX-307. About 400 m to go.
06/22/2022 14:52:08	45.9426601	-130.00735	340.95	1535.78	WATCH_CHANGE: Sandra and Kelli and Scott
06/22/2022 15:06:41	45.9437969	-130.00818	330.82	1539.63	TXT: Still in transit about 200m to go
06/22/2022 15:20:06	45.9452694	-130.00894	321.46	1541.38	TXT: Looking for benchmark
06/22/2022 15:21:20	45.9453381	-130.00904	272.17	1541.36	TXT: AX-307 in sight
06/22/2022 15:23:43	45.9453447	-130.00911	263.94	1542.24	TXT: Jason landing next to flag pole to inspect for nudibranchs to possibly sample
06/22/2022 15:24:06	45.9453455	-130.00911	263.94	1542.24	HIGHLIGHTS: 4k highlights start
06/22/2022 15:24:34	45.9453445	-130.00911	263.94	1542.23	TXT: Nudibranch in sight
06/22/2022 15:25:17	45.9453391	-130.00911	263.92	1542.24	HIGHLIGHTS: 4k highlights stop
06/22/2022 15:27:32	45.9453332	-130.00911	307.74	1542.13	TXT: Mini-BPR 2020-06 on benchmark AX-307
06/22/2022 15:28:29	45.9453299	-130.0091	322.26	1542.28	TXT: Attempting to suction nudibranch from on the flag pole
06/22/2022 15:30:42	45.9453218	-130.00911	322.02	1542.24	HIGHLIGHTS: 1080 start
06/22/2022 15:34:55	45.9453209	-130.00911	323.39	1541.71	HIGHLIGHTS: 4k highlights start
06/22/2022 15:37:28	45.9453295	-130.00908	321.37	1542.21	TXT: SAMPLE collected at benchmark AX-307 J-1429-Bio-01 of nudibranch (probably only half an animal)
06/22/2022 15:37:30	45.9453296	-130.00908	321.34	1542.2	HIGHLIGHTS: 4k highlights stop
06/22/2022 15:38:36	45.9453292	-130.0091	321.38	1542.2	HIGHLIGHTS: 4k highlights start
06/22/2022 15:42:00	45.9453451	-130.00911	321.76	1542.2	TXT: Nudibranch on flag the first to be suctioned
06/22/2022 15:42:01	45.9453451	-130.00911	321.74	1542.19	HIGHLIGHTS: 4k highlights stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 15:42:40	45.9453416	-130.0091	321.42	1542.21	TXT: All nudibranchs are going into the same blue container on the suction sampler (all one sample)
06/22/2022 15:45:46	45.9453336	-130.00909	321.79	1542.2	TXT: Second attempt to collect another one higher on the flag pole
06/22/2022 15:45:48	45.9453362	-130.00909	321.85	1542.2	HIGHLIGHTS: 4k highlights stop
06/22/2022 15:45:52	45.9453366	-130.00909	321.7	1542.2	HIGHLIGHTS: 4k highlights start
06/22/2022 15:49:05	45.9453331	-130.0091	324.12	1541.53	TXT: Suctioned another nudibranch on a hydroid (not holding onto the flag pole) so got a whole animal this time
06/22/2022 15:49:07	45.9453332	-130.0091	325.18	1541.48	HIGHLIGHTS: 4k highlights stop
06/22/2022 15:50:44	45.9453425	-130.00912	229.25	1541.09	HIGHLIGHTS: 4k highlights start
06/22/2022 15:51:09	45.945343	-130.00913	229.62	1541.22	TXT: Searching for another nudibranch
06/22/2022 15:54:00	45.9453351	-130.00914	197	1542.19	HIGHLIGHTS: 4k highlights stop
06/22/2022 15:55:03	45.9453425	-130.00914	196.87	1542.19	TXT: Planning to keep suction on Jason since nudibranchs on pole difficult to recover
06/22/2022 15:55:44	45.9453447	-130.00913	208.99	1541.53	TXT: Benchmark AX-105 appeared to have nudibranchs so will look when back at that benchmark
06/22/2022 15:55:45	45.9453447	-130.00913	210.91	1541.43	HIGHLIGHTS: 1080 stop
06/22/2022 15:57:02	45.9453477	-130.00911	232.01	1541.48	TXT: Suction being put back onto holster on Jason basket
06/22/2022 15:57:49	45.9453532	-130.00912	232.68	1541.34	TXT: Blue containers where samples are stored being rotated so samples dont swim out
06/22/2022 16:00:54	45.9453386	-130.00909	299.83	1541.5	HIGHLIGHTS: 1080 start
06/22/2022 16:01:50	45.9453376	-130.00912	302.46	1542.19	TXT: Mini-BPR at benchmark AX-307 being recovered
06/22/2022 16:01:51	45.9453376	-130.00912	302.47	1542.18	HIGHLIGHTS: 4k highlights start
06/22/2022 16:02:41	45.9453427	-130.00914	302.43	1542.19	TXT: Picking up Mini-BPR 2020-06
06/22/2022 16:03:29	45.9453388	-130.00912	302.37	1542.18	TXT: Taking Mini-BPR 2014-12 out of bio box and being placed onto benchmark
06/22/2022 16:04:27	45.9453333	-130.0091	302.35	1542.15	HIGHLIGHTS: 4k highlights stop
06/22/2022 16:05:39	45.9453383	-130.0091	304.48	1540.98	HIGHLIGHTS: 1080 stop
06/22/2022 16:06:08	45.9453408	-130.0091	304.8	1541.11	HIGHLIGHTS: 1080 start
06/22/2022 16:08:20	45.9453419	-130.0091	305.16	1541.05	TXT: Recovered Mini-BPR 2020-06 being placed into milk crate next to rock samples
06/22/2022 16:11:00	45.9453126	-130.0091	305.16	1541.05	TXT: Mini-BPR 2020-06 secured in milk crate
06/22/2022 16:11:03	45.945311	-130.0091	305.06	1541.06	HIGHLIGHTS: 1080 stop
06/22/2022 16:12:50	45.9452761	-130.0092	271.83	1540.78	TXT: At benchmark AX-307 3rd-of-4 Mini-BPR successfully deployed (4th will be at AX-101)
06/22/2022 16:14:29	45.9453522	-130.00929	272.89	1539.94	TXT: In transit to high spot site on western caldera wall a bit south of waypoint W4

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 16:15:18	45.9453357	-130.00928	271.88	1539.83	HIGHLIGHTS: 1080 start
06/22/2022 16:17:13	45.9453026	-130.00932	271.56	1539.36	TXT: Two weights released onto seafloor from milk crate
06/22/2022 16:17:23	45.9453045	-130.00933	270.32	1540.21	HIGHLIGHTS: 1080 stop
06/22/2022 16:18:26	45.9453341	-130.00949	271.64	1540.4	TXT: Jason comes up about 65 meters to avoid Sentry
06/22/2022 16:20:49	45.9453568	-130.00974	272.17	1511.12	TXT: Jason going up to about 1300m depth and continuing transit to west rim of caldera
06/22/2022 16:35:08	45.9454222	-130.01227	271.9	1299.86	TXT: Having some problems with nav. Restarting NavG
06/22/2022 16:36:40	45.9454335	-130.01257	271.66	1299.87	TXT: Decided not to restart NavG. Waiting for help from James
06/22/2022 16:37:22	45.9454272	-130.01273	271.77	1299.86	TXT: Troubleshooting NavG issue
06/22/2022 16:39:10	45.945427	-130.01309	271.69	1299.86	TXT: Targets have been saved in NavG
06/22/2022 16:40:43	45.9454337	-130.01339	271.87	1299.87	TXT: Restarting NavG
06/22/2022 16:42:53	45.9454479	-130.01382	271.71	1299.87	TXT: Bridge not getting feed because NavG had crashed Bridge now taking control and continuing at same speed
06/22/2022 16:55:48	45.9454652	-130.01646	271.68	1299.83	TXT: James is setting all the NavG visualization preferences back up
06/22/2022 17:09:54	45.945505	-130.01939	271.97	1299.87	TXT: NavG has been set up
06/22/2022 17:34:48	45.9455213	-130.02352	297.62	1546	NAV: Doppler Reset
06/22/2022 17:35:10	45.9455373	-130.02359	296.48	1546.29	TXT: Reached base of west caldera wall
06/22/2022 17:43:35	45.945956	-130.02511	292.31	1494.6	HIGHLIGHTS: 4k highlights start
06/22/2022 17:46:07	45.9460012	-130.02522	292.19	1473.46	HIGHLIGHTS: 4k highlights stop
06/22/2022 17:49:46	45.9458366	-130.02528	281.95	1439.14	TXT: Going up the caldera wall
06/22/2022 17:53:39	45.9458261	-130.02559	282.6	1401.95	HIGHLIGHTS: 4k highlights start
06/22/2022 17:54:30	45.9458237	-130.02563	282.55	1395.39	TXT: Reached the rim
06/22/2022 17:54:37	45.9458236	-130.02563	282.46	1395.08	HIGHLIGHTS: 4k highlights stop
06/22/2022 17:57:27	45.9458576	-130.02599	282.29	1392.21	TXT: Scouting for site for benchmark
06/22/2022 17:59:39	45.9459449	-130.02643	342.09	1391.77	TXT: Heading north to proceed along the rim
06/22/2022 18:13:35	45.9475066	-130.02695	246.5	1399.79	HIGHLIGHTS: 1080 start
06/22/2022 18:15:07	45.9475262	-130.02694	45.79	1400.02	TXT: looking in collapse
06/22/2022 18:15:27	45.9475312	-130.02691	74.86	1399.64	HIGHLIGHTS: 1080 stop
06/22/2022 18:17:55	45.9475505	-130.02685	234.68	1400.93	TXT: Turning around and heading back south to flat area that was passed before
06/22/2022 18:22:03	45.9470979	-130.02677	95.2	1397.61	TXT: Site found for benchmark to be placed

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 18:22:05	45.9470975	-130.02677	103.88	1397.57	HIGHLIGHTS: 1080 start
06/22/2022 18:22:55	45.9470965	-130.02677	154.74	1398.72	TXT: Site is southwest of waypoint W4
06/22/2022 18:23:42	45.9470951	-130.02678	155.01	1398.68	HIGHLIGHTS: 4k highlights start
06/22/2022 18:23:48	45.9470945	-130.02678	155.07	1398.7	HIGHLIGHTS: 4k highlights stop
06/22/2022 18:27:27	45.9470926	-130.02681	154.74	1398.67	TXT: Setting out Marker 230
06/22/2022 18:27:29	45.9470925	-130.02681	154.75	1398.67	HIGHLIGHTS: 4k highlights start
06/22/2022 18:29:01	45.9470894	-130.02682	154.93	1398.69	HIGHLIGHTS: 4k highlights stop
06/22/2022 18:30:12	45.9471225	-130.02676	224.52	1397.51	HIGHLIGHTS: 1080 stop
06/22/2022 18:31:11	45.9471572	-130.02669	243.84	1397.84	Framegrab: Marker 230
06/22/2022 18:32:56	45.9472451	-130.02668	259.65	1401.87	TXT: Jason heading back down to the western caldera floor (below rim)
06/22/2022 18:35:45	45.9473274	-130.02666	259.21	1417.29	HIGHLIGHTS: 4k highlights start
06/22/2022 18:36:48	45.9473754	-130.02662	259.62	1422.46	HIGHLIGHTS: 4k highlights stop
06/22/2022 18:41:24	45.9475475	-130.02647	253.18	1455.54	TXT: Approaching the caldera floor
06/22/2022 18:50:46	45.9477263	-130.02615	238.5	1521.39	Framegrab: Edge of collapse near base
06/22/2022 18:52:20	45.9477763	-130.02601	236.01	1533.84	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/22/2022 18:52:58	45.94781	-130.02595	237.14	1537.96	TXT: Interesting horizontal banding observed on the west side of the caldera wall.
06/22/2022 19:05:08	45.9477179	-130.02555	324.65	1550.44	TXT: Still searching for a suitable location along the western base of the caldera wall.
06/22/2022 19:06:21	45.9477875	-130.02566	304.49	1547.86	HIGHLIGHTS: 4k highlights start
06/22/2022 19:06:27	45.9477923	-130.02566	305.65	1547.61	HIGHLIGHTS: 4k highlights stop
06/22/2022 19:08:45	45.9478101	-130.02573	3.07	1548.3	Framegrab: Potential location on the western caldera floor for new benchmark.
06/22/2022 19:09:25	45.9478075	-130.02573	2.95	1548.3	TXT: Pitch = 0 and Roll = 2.5 for potential benchmark site on west caldera floor
06/22/2022 19:11:27	45.947803	-130.02573	3.12	1548.29	TXT: Deploying Marker #217
06/22/2022 19:12:26	45.9478012	-130.02572	3.09	1548.29	Framegrab: New Marker 217 Potential benchmark location
06/22/2022 19:12:53	45.9478026	-130.02572	3.08	1548.29	Framegrab: New Marker 217 Potential benchmark location
06/22/2022 19:13:48	45.947807	-130.02572	3.1	1548.29	TXT: MKR 217 Placed at 45.945 -130.013
06/22/2022 19:15:41	45.9477956	-130.0257	303.79	1548.6	Framegrab: Three framegrabs showing the new MKR 217 from the side
06/22/2022 19:16:55	45.9477833	-130.02571	341.83	1546.89	TXT: Beginning transit to AX-101 benchmark
06/22/2022 21:01:59	45.9551975	-130.00998	233.21	1528.75	TXT: AX-101 Benchmark in sight
06/22/2022 21:02:55	45.9552004	-130.00999	237.7	1528.76	Framegrab: Benchmark AX-101

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/22/2022 21:03:52	45.9551987	-130.00999	237.81	1528.77	TXT: Jason is recovering Mini-BPR instrument 2020-02.
06/22/2022 21:04:08	45.955198	-130.00999	237.76	1528.75	TXT: Mini BPR 2020-02 is in the basket
06/22/2022 21:05:07	45.9551954	-130.00999	237.52	1528.75	TXT: Jason has deployed Mini-BPR 2016-10 at benchmark AX-101
06/22/2022 21:08:19	45.9551795	-130.01001	236.45	1528.79	TXT: Mini-BPR 2020-02 is in the left swing arm biobox
06/22/2022 21:08:53	45.9551776	-130.01001	236.09	1528.87	TXT: When moved from the basket to the left swing arm the green covering and instrument base slid off. Attempting to secure in the MPR holster
06/22/2022 21:10:15	45.9551834	-130.01001	236.59	1527.47	TXT: Discussion about where best to store the Mini BPR base. MPR bracket may not be the best place
06/22/2022 21:14:20	45.9551913	-130.01	235.39	1526.49	TXT: Mini-BPR base has been secured in the HOBO Bracket
06/22/2022 21:17:53	45.9551915	-130.00973	83.31	1525.81	TXT: Beginning transit to East Caldera Wall to E4 waypoint
06/22/2022 22:48:20	45.9559364	-129.99571	83.13	1527.46	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/22/2022 22:59:37	45.9561043	-129.99396	27.44	1523.54	TXT: Changed destination and heading
06/22/2022 23:00:34	45.9562461	-129.99384	26.34	1522.43	TXT: Transiting to E2 waypoint on eastern caldera rim
06/22/2022 23:38:26	45.959882	-129.99078	27.65	1517.37	TXT: At the base of the East Caldera Wall about 30 meters from the E2 waypoint
06/22/2022 23:44:04	45.9601629	-129.99055	42.56	1480.42	Framegrab: eastern caldera wall
06/22/2022 23:45:50	45.9602777	-129.99053	44.17	1471.05	TXT: looking around the E2 waypoint area to see if theres a good place to put a benchmark
06/22/2022 23:46:33	45.960324	-129.9905	43.03	1470.89	TXT: looking at a flat area at waypoint E2
06/22/2022 23:47:58	45.9603772	-129.99056	351.86	1469.82	TXT: examining the cracks around waypoint E2
06/22/2022 23:48:10	45.9603838	-129.99058	351.92	1469.85	TXT: Going to look at the edge of the east caldera wall
06/22/2022 23:48:42	45.9603997	-129.99065	352.01	1470.13	TXT: reached the edge of the wall
06/22/2022 23:48:53	45.9604063	-129.99067	356.63	1470.2	Framegrab: edge of the caldera wall
06/22/2022 23:49:41	45.9604387	-129.99072	19.09	1469.37	TXT: discussing where would be a good place for the benchmark and the accoustic ranging instrument (to be deployed later)
06/22/2022 23:50:48	45.9605008	-129.99066	29.38	1468.71	TXT: using the sonar to look for flat areas near the caldera edge
06/22/2022 23:51:15	45.960528	-129.99061	27.76	1469.38	TXT: going to land and check the pitch of this area
06/22/2022 23:52:11	45.9605691	-129.99054	30.8	1470.9	TXT: pitch is less than a degree at this area
06/22/2022 23:52:24	45.9605748	-129.99053	30.79	1470.9	TXT: putting a marker at this spot near waypoint E2
06/22/2022 23:55:45	45.9605452	-129.99054	28.79	1470.91	TXT: Placing the Marker 210 on this spot
06/22/2022 23:57:22	45.9605897	-129.99053	27.45	1469.14	TXT: going to look for another flat area for a benchmark to the north of here
06/22/2022 23:59:40	45.9608634	-129.99046	20.69	1469.48	TXT: so far nowhere looks flatter or less cracked than the Marker 210 area

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1429 Logger Comment
06/23/2022 00:01:52	45.9611161	-129.99045	9.77	1470.24	TXT: different kind of crab
06/23/2022 00:04:43	45.9612259	-129.99043	8.03	1469.73	TXT: Found a spot with no cracks thats fairly flat
06/23/2022 00:05:05	45.9612247	-129.99043	8.05	1469.75	TXT: Bill likes this spot a little more than Marker 210 but they are pretty similar
06/23/2022 00:08:17	45.9612053	-129.99042	7	1469.77	TXT: Placing Marker 211 here
06/23/2022 00:09:31	45.9612087	-129.99044	7.99	1469.76	TXT: MKR 211 at 45.961 -129.990 depth - -1470
06/23/2022 00:22:11	45.9622713	-129.99097	346.02	1468.1	HIGHLIGHTS: 4k hightlights start Squid
06/23/2022 00:22:30	45.9622968	-129.99098	346.58	1467.46	HIGHLIGHTS: 4k highlights stop
06/23/2022 00:31:11	45.9627199	-129.99114	346.36	1469.61	TXT: After driving further north we are placing Marker #201 on the East Caldera Rim
06/23/2022 00:33:21	45.9627991	-129.99114	340.71	1468.17	TXT: Continuing north along the rim
06/23/2022 00:34:34	45.9628921	-129.99119	343.3	1468.8	TXT: The site at Marker 201 is probably still the best one
06/23/2022 00:35:46	45.962901	-129.99124	108.72	1466.91	TXT: Going back to Marker 201 to check the area (Bill was having dinner when it was placed)
06/23/2022 00:36:56	45.9628196	-129.99123	167.58	1467.91	TXT: approaching Marker 201
06/23/2022 00:38:22	45.9627374	-129.99115	225.18	1468.02	TXT: Bill says Marker 201 is the winner. It is close to the rim and seems flat and without big cracks nearby
06/23/2022 00:39:09	45.9627158	-129.99116	266.7	1466.64	TXT: Going back down to the base of the eastern caldera wall to find a benchmark site there
06/23/2022 00:43:50	45.9626438	-129.99158	6.06	1515.12	TXT: this area might work
06/23/2022 00:45:08	45.9626403	-129.99159	12.18	1516.45	TXT: going to place a marker here
06/23/2022 00:48:00	45.9626456	-129.99157	12.17	1516.47	TXT: Placing Marker 245 at the benchmakr site on the eastern caldera floor
06/23/2022 00:48:50	45.9626318	-129.99159	9.95	1515.68	TXT: So Markers 210 and 211 and 201 are on the eastern caldera rim with 201 being the favorite. And 245 is the marker on the eastern caldera floor.
06/23/2022 00:48:58	45.9626288	-129.99159	10.18	1515.35	TXT: going to get some overview shots of the area
06/23/2022 00:50:02	45.9626234	-129.99165	25.91	1512.24	TXT: End of dive. Going to start hauling Jason up
06/23/2022 00:50:52	45.9626555	-129.9917	301.17	1502.06	TXT: approximately 50 minutes until recovery
06/23/2022 01:10:32	45.9625294	-129.99162	172.4	935.3	TXT: about 950 meters from the surface
06/23/2022 01:39:00	45.9615779	-129.99181	247.85	142.8	TXT: proceeding with recovery
06/23/2022 01:49:20	45.9617287	-129.9914	247.29	3.13	TXT: jason on surface
06/23/2022 01:52:06	45.9620173	-129.99123	74.77	1.58	VEHICLE: Jason on deck

ROV Jason dive J2-1430 Dive Log (edited/corrected from Jason Virtual Van after renav)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/23/2022 11:18:47	45.862895	-130.004000	254.92	15.55	VEHICLE: Jason in water. First MPR pressure measurement dive starting at benchmark AX-105.
06/23/2022 12:14:08	45.862329	-130.005106	254.41	1351.28	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/23/2022 12:31:36	45.863285	-130.004264	62.46	1711.7	TXT: bottom in sight
06/23/2022 12:32:28	45.863306	-130.004084	105.6	1714.33	VEHICLE: On bottom
06/23/2022 12:35:27	45.863099	-130.003795	227.37	1712.89	TXT: looking for the benchmark
06/23/2022 12:35:41	45.863104	-130.003799	256.68	1714.21	TXT: found AX-105 benchmark
06/23/2022 12:35:49	45.863109	-130.003801	254.07	1714.36	NAV: Ship moving
06/23/2022 12:38:30	45.863120	-130.003821	333.39	1716.28	TXT: setting down in front of benchmark
06/23/2022 12:39:21	45.863116	-130.003826	333.37	1716.29	TXT: opening left bio box
06/23/2022 12:40:15	45.863115	-130.003821	333.36	1716.29	TXT: getting a close up of the instruments
06/23/2022 12:41:34	45.863121	-130.003821	333.36	1716.3	TXT: Recovering Mini-BPRs 2020-8 and 2020-3 from benchmark AX-105. We will not deploy any here.
06/23/2022 12:42:04	45.863126	-130.003822	333.36	1716.31	TXT: Collecting Mini-BPRs 2020-08 and 2020-03
06/23/2022 12:42:29	45.863134	-130.003821	333.37	1716.31	TXT: Both Mini-BPRs 2020-08 and 2020-03 are being stored in the left swingarm biobox
06/23/2022 12:50:29	45.863118	-130.003835	333.36	1716.36	TXT: Both Mini-BPRs 2020-08 and 2020-03 are secured
06/23/2022 12:51:57	45.863118	-130.003833	333.36	1716.37	TXT: Going to quickly look for any nudibranchs. None found.
06/23/2022 12:56:07	45.863133	-130.003820	333.35	1716.39	TXT: placing MPR on the AX-105 benchmark
06/23/2022 12:58:14	45.863123	-130.003818	333.36	1716.4	TXT: MPR is placed on AX-105 benchmark
06/23/2022 12:58:25	45.863121	-130.003818	333.36	1716.4	TXT: checking MPR placement
06/23/2022 12:59:13	45.863114	-130.003816	333.36	1716.4	TXT: MPR is good
06/23/2022 13:00:32	45.863145	-130.003831	333.36	1716.41	MPR: start pressure measurement (later aborted)
06/23/2022 13:02:30	45.863132	-130.003847	333.36	1716.42	TXT: the tilt of the MPR may be off
06/23/2022 13:02:49	45.863136	-130.003852	333.36	1716.42	TXT: making an adjustment to the MPR and then restart
06/23/2022 13:02:50	45.863136	-130.003852	333.36	1716.42	MPR: stop pressure measurement (aborted)
06/23/2022 13:03:20	45.863145	-130.003863	333.36	1716.42	TXT: checking the tilt
06/23/2022 13:04:03	45.863145	-130.003848	333.36	1716.43	TXT: the tilt is still slightly off
06/23/2022 13:04:14	45.863139	-130.003846	333.36	1716.43	TXT: picking up the MPR to try placement again

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/23/2022 13:04:42	45.863124	-130.003861	333.36	1716.43	TXT: there is a brittle star in the MPR slot
06/23/2022 13:05:00	45.863123	-130.003878	333.36	1716.43	TXT: trying to encourage the brittle start to leave the space
06/23/2022 13:05:43	45.863137	-130.003854	333.36	1716.43	TXT: the brittle start is making slow progress
06/23/2022 13:09:09	45.863184	-130.003890	333.36	1716.45	TXT: brittle star has stalled with two limbs still in the MPR slot
06/23/2022 13:09:19	45.863183	-130.003888	333.36	1716.45	TXT: encouraging the brittle star to continue to move
06/23/2022 13:11:17	45.863119	-130.003819	333.36	1716.46	TXT: nudging the MPR into position
06/23/2022 13:13:04	45.863129	-130.003833	333.36	1716.47	MPR: start pressure measurement
06/23/2022 13:33:05	45.863121	-130.003813	333.36	1716.56	MPR: stop pressure measurement
06/23/2022 13:33:29	45.863122	-130.003820	333.36	1716.57	TXT: Recovering the MPR now
06/23/2022 13:35:11	45.863117	-130.003832	333.36	1716.58	TXT: MPR is secured
06/23/2022 13:37:10	45.863121	-130.003792	62.29	1711.17	TXT: Beginning transit to Webb-1 site
06/23/2022 14:57:15	45.873633	-129.998875	19.74	1445.7	WATCH_CHANGE: new watchstanders Sandra and Kelli and Scott
06/23/2022 18:42:27	45.901989	-129.984294	19.62	1445.92	TXT: 45 minutes until we reach Webb-1 site where we will drop the float pack for recovery of the CMP-1 instrument
06/23/2022 19:30:09	45.907441	-129.982179	4.32	1445.92	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/23/2022 19:30:41	45.907505	-129.982185	4.57	1445.92	TXT: We have arrived at the Webb-1 site (100 m off bottom). Waiting for float pack to be deployed.
06/23/2022 21:23:07	45.907828	-129.980503	312.59	1519.74	TXT: We are descending to the seafloor at the Webb-1 site
06/23/2022 21:24:06	45.907915	-129.980558	313.69	1540.03	VEHICLE: On bottom
06/23/2022 21:25:08	45.908045	-129.980632	314.49	1541.56	TXT: Float pack in sight
06/23/2022 21:27:51	45.908188	-129.980778	241.06	1539.59	TXT: Jason has grabbed the float pack and we are navigating toward the CMP-1 instrument location
06/23/2022 21:37:04	45.908993	-129.980670	298.73	1538.79	TXT: CMP-1 instrument in sight
06/23/2022 21:39:56	45.908964	-129.980823	292.35	1543.05	TXT: Jason has dropped the float pack next to the instrument line
06/23/2022 21:41:29	45.908946	-129.980861	6.45	1544.37	TXT: Jason has removed weight one of three from the top of the instrument shield
06/23/2022 21:45:00	45.908952	-129.980864	6.41	1544.32	TXT: One of the three weights were still tied to the shield. Jason has cut the weight free of the shield.
06/23/2022 21:45:33	45.908951	-129.980864	6.31	1544.33	TXT: Jason has removed weight two of three from the top of the instrument shield
06/23/2022 21:46:03	45.908950	-129.980873	6.19	1544.34	TXT: The third weight was connected to the second and all three weights have now been removed from the instrument shield
06/23/2022 21:48:04	45.908955	-129.980905	98.62	1544.22	TXT: Jason has grabbed the instrument shield and is attempting to remove it from the CMP-1 instrument

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/23/2022 21:49:59	45.908951	-129.980910	99.87	1540.52	TXT: The instrument shield has been removed from the instrument. The instrument was disturbed during this process.
06/23/2022 21:52:13	45.908942	-129.980930	100.63	1544.03	TXT: The instrument shield has been placed on the seafloor
06/23/2022 21:53:21	45.908966	-129.980923	169.67	1544.39	TXT: The line from the instrument to the seafloor is stuck underneath the shield. Jason is attempting to remove the line now.
06/23/2022 21:53:34	45.908966	-129.980924	169.76	1544.36	TXT: Pete has noted that the instrument appears to be tilted.
06/23/2022 21:53:50	45.908965	-129.980925	170.31	1544.34	TXT: The line has been recovered from underneath the instrument shield.
06/23/2022 21:54:58	45.908960	-129.980927	170.65	1544.25	TXT: Jason has connected one of the carabiners to the eyebolt on the instrument shield
06/23/2022 21:58:21	45.908978	-129.980859	207.1	1542.01	TXT: Jason is grabbing the line to the float pack
06/23/2022 22:03:53	45.908972	-129.980912	155.02	1541.65	TXT: The line to the float pack is wrapped around the bar. Attempting to fix the line.
06/23/2022 22:06:18	45.908990	-129.980853	252.98	1541.8	TXT: The line has been freed!
06/23/2022 22:10:29	45.908952	-129.980853	22.03	1544.39	TXT: Jason has connected the line to the float pack from the CMP-1 instrument
06/23/2022 22:14:14	45.908995	-129.980848	289.86	1544.86	TXT: Jason has pulled the pin to the weight pack
06/23/2022 22:14:50	45.908971	-129.980832	289	1544.89	TXT: Liftoff!
06/23/2022 22:15:33	45.908933	-129.980805	288.11	1544.06	VEHICLE: Off bottom
06/23/2022 22:58:22	45.910425	-129.982833	359.63	1392.07	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/23/2022 23:10:18	45.909995	-129.983682	359.17	1376.7	TXT: float pack and instrument CMP-1 is on the surface
06/23/2022 23:38:55	45.911055	-129.984772	359.43	1394.21	TXT: float pack and instrument CMP-1 are on deck and recovered from the Webb-1 site.
06/23/2022 23:49:25	45.911422	-129.984904	336.36	1388.32	TXT: transiting to benchmark AX-104 (Bag City)
06/24/2022 00:34:35	45.915910	-129.989443	355.54	1446.33	TXT: Jason is heading back down to the bottom as we approach benchmark AX-104
06/24/2022 00:37:02	45.915790	-129.989467	356.15	1526.79	VEHICLE: On bottom
06/24/2022 00:37:33	45.915828	-129.989457	359.87	1527.74	TXT: approaching benchmark AX-104
06/24/2022 00:39:01	45.916050	-129.989422	356.72	1527.46	TXT: fat head scuplin fish!
06/24/2022 00:39:59	45.916060	-129.989436	356.34	1527.32	HIGHLIGHTS: 4k hightlights start
06/24/2022 00:42:37	45.916060	-129.989406	357.98	1527.14	HIGHLIGHTS: 4k highlights stop
06/24/2022 00:44:05	45.916138	-129.989460	358.56	1528.77	TXT: Looking at Mini-BPR 2014-09 on the AX-104 benchmark (deployed on dive J2-1428)
06/24/2022 00:45:24	45.916143	-129.989403	357.29	1529.17	TXT: Placing the MPR on benchmark AX-104
06/24/2022 00:47:20	45.916124	-129.989463	356.8	1529.17	TXT: adjusting the MPR
06/24/2022 00:48:34	45.916116	-129.989484	356.8	1529.18	MPR: start pressure measurement (later aborted)
06/24/2022 00:48:52	45.916118	-129.989483	356.8	1529.18	MPR: stop pressure measurement (aborted)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 00:49:01	45.916117	-129.989481	356.8	1529.18	TXT: adjusting the MPR placement
06/24/2022 00:50:04	45.916119	-129.989465	356.79	1529.19	TXT: still not quite right going to continue adjustments
06/24/2022 00:56:33	45.916132	-129.989452	356.78	1529.26	MPR: start pressure measurement
06/24/2022 00:57:43	45.916132	-129.989472	356.78	1529.26	NAV: Doppler reset
06/24/2022 01:16:35	45.916134	-129.989472	356.78	1529.34	MPR: stop pressure measurement
06/24/2022 01:16:47	45.916134	-129.989472	356.77	1529.34	TXT: picking up MPR
06/24/2022 01:19:09	45.916136	-129.989478	356.79	1529.36	TXT: MPR is secured
06/24/2022 01:19:50	45.916141	-129.989406	34.99	1525.68	TXT: begining transit to benchmark AX-310
06/24/2022 02:17:39	45.922062	-129.981982	34.72	1521.19	TXT: passed by the Webb-2 site
06/24/2022 02:24:11	45.922809	-129.981033	34.5	1518.69	TXT: 20 minutes of transit to go
06/24/2022 02:46:11	45.925132	-129.978241	34.55	1520.19	WATCH_CHANGE: new watchstander Sandra and Kelli and Scott
06/24/2022 02:52:38	45.925750	-129.977710	41.82	1526.09	TXT: reached OOI cable and J-box
06/24/2022 02:53:20	45.925806	-129.977668	355.78	1525.17	TXT: searching for benchmark flag at AX-310
06/24/2022 02:54:21	45.925839	-129.977814	250.55	1525.18	TXT: found benchmark AX-310
06/24/2022 02:54:45	45.925799	-129.977876	264.55	1525.72	TXT: approaching benchmark AX-310
06/24/2022 02:56:29	45.925781	-129.977930	284.48	1527.51	HIGHLIGHTS: 1080 start
06/24/2022 02:56:50	45.925784	-129.977927	284.14	1527.57	TXT: Jason grabbing MPR
06/24/2022 02:57:37	45.925780	-129.977925	284.11	1527.55	TXT: orienting the instrument so that the cable is on the left
06/24/2022 02:57:59	45.925779	-129.977925	284.23	1527.53	TXT: jason has placed the MPR on benchmark AX-310
06/24/2022 02:58:03	45.925779	-129.977925	284.09	1527.52	HIGHLIGHTS: 4k highlights start
06/24/2022 02:59:03	45.925776	-129.977933	284.34	1527.53	TXT: jason has released the MPR
06/24/2022 02:59:48	45.925773	-129.977940	284.02	1527.57	TXT: the cable is slightly underneath the MPR
06/24/2022 03:00:08	45.925773	-129.977940	284.15	1527.56	TXT: Jason is dragging the cable away from the MPR
06/24/2022 03:01:07	45.925775	-129.977923	284.22	1527.55	TXT: jason is nudging the MPR
06/24/2022 03:01:52	45.925771	-129.977922	284.1	1527.54	TXT: jason is repositioning the MPR because it is on the lip
06/24/2022 03:02:37	45.925772	-129.977930	284	1527.53	TXT: jason has released the MPR and now it's fitting into the indentation on the benchmark
06/24/2022 03:02:45	45.925773	-129.977930	284.14	1527.53	HIGHLIGHTS: 4k highlights stop
06/24/2022 03:03:30	45.925779	-129.977927	284.25	1527.52	MPR: start pressure measurement
06/24/2022 03:04:03	45.925780	-129.977925	284.17	1527.53	HIGHLIGHTS: 1080 stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 03:22:58	45.925778	-129.977934	284.01	1527.58	TXT: zooming in on benchmark flag to look for nudibranchs
06/24/2022 03:23:15	45.925776	-129.977934	284	1527.58	MPR: stop pressure measurement
06/24/2022 03:23:29	45.925776	-129.977934	284.07	1527.58	HIGHLIGHTS: 1080 start
06/24/2022 03:24:03	45.925780	-129.977936	283.9	1527.62	TXT: jason is picking up the MPR from benchmark AX-310
06/24/2022 03:25:22	45.925791	-129.977932	284.08	1527.67	TXT: jason is placing the MPR in the basket
06/24/2022 03:25:56	45.925774	-129.977939	283.85	1527.65	TXT: the MPR has been released in the basket
06/24/2022 03:26:06	45.925770	-129.977941	284.1	1527.67	TXT: jason has placed the bungee cord over the MPR
06/24/2022 03:26:37	45.925767	-129.977938	284.23	1527.61	TXT: finished at AX-310 and now transitting to benchmark AX-303
06/24/2022 03:27:41	45.925767	-129.977900	333.97	1525.78	HIGHLIGHTS: 1080 stop
06/24/2022 03:30:34	45.926029	-129.978005	335.67	1523.01	NAV: Doppet Reset
06/24/2022 04:08:36	45.930377	-129.980531	336.42	1503.05	HIGHLIGHTS: 4k highlights start
06/24/2022 04:10:01	45.930529	-129.980561	335.33	1501	HIGHLIGHTS: 4k highlights stop
06/24/2022 04:32:46	45.933348	-129.982203	323.79	1513.76	TXT: arrived at benchmark AX-303
06/24/2022 04:33:30	45.933406	-129.982286	243.5	1513.98	HIGHLIGHTS: 4k highlights start
06/24/2022 04:35:48	45.933408	-129.982278	184.06	1514.8	TXT: jason is removing the bungee cord from the MPR
06/24/2022 04:36:03	45.933411	-129.982278	184.12	1514.8	TXT: jason is taking the MPR out of the basket
06/24/2022 04:36:35	45.933411	-129.982273	184.17	1514.8	TXT: jason is rotating the MPR so the cable is on the left side
06/24/2022 04:36:56	45.933410	-129.982263	184.09	1514.8	TXT: jason is placing the MPR on the concrete benchmark
06/24/2022 04:37:52	45.933408	-129.982249	184.18	1514.79	HIGHLIGHTS: 4k highlights stop
06/24/2022 04:38:18	45.933401	-129.982255	184.13	1514.8	TXT: jason is setting the MPR into the groove on the benchmark
06/24/2022 04:41:12	45.933403	-129.982257	184.16	1514.79	TXT: jason nudging the MPR so it fits better in the groove
06/24/2022 04:41:56	45.933412	-129.982267	184.25	1514.8	TXT: the MPR is sitting on the rope so needs to be repositioned
06/24/2022 04:42:34	45.933409	-129.982284	184.29	1514.8	TXT: jason is picking up the MPR and putting it back down again
06/24/2022 04:43:33	45.933400	-129.982283	184.28	1514.8	TXT: jason once again nudging the MPR so it settles into the groove
06/24/2022 04:44:05	45.933401	-129.982275	184.2	1514.8	TXT: the MPR is now in place on benchmark AX-303
06/24/2022 04:44:21	45.933402	-129.982273	184.19	1514.79	MPR:
06/24/2022 04:45:09	45.933404	-129.982266	184.15	1514.79	MPR: pressure start pressure measurement
06/24/2022 05:04:10	45.933406	-129.982272	184.15	1514.77	MPR: stop pressure measurement
06/24/2022 05:04:24	45.933407	-129.982271	184.35	1514.78	MPR:

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 05:05:13	45.933409	-129.982270	184.27	1514.77	TXT: jason has picked up the MPR from benchmark AX-303 and is placing it in the basket
06/24/2022 05:05:48	45.933408	-129.982270	184.29	1514.78	TXT: the MPR is in the basket
06/24/2022 05:06:07	45.933407	-129.982271	184.3	1514.78	TXT: jason is placing the bungee cord over the MPR
06/24/2022 05:06:56	45.933409	-129.982269	183.85	1514.76	TXT: finished with the MPR at benchmark AX-303
06/24/2022 05:07:23	45.933413	-129.982269	184.58	1513.65	TXT: jason is repositioning
06/24/2022 05:09:40	45.933408	-129.982292	179.42	1514.69	TXT: jason is in position to recover the Mini-BPR on benchmark AX-303
06/24/2022 05:10:29	45.933410	-129.982287	179.67	1514.68	TXT: jasons left arm has grabbed Mini-BPR 2020-07 and is placing it in the basket
06/24/2022 05:10:34	45.933410	-129.982286	179.68	1514.68	HIGHLIGHTS: 1080 start
06/24/2022 05:12:11	45.933399	-129.982289	179.59	1514.69	TXT: Mini-BPR 2020-07 is not yet stowed completely. Jason is now taking Mini-BPR 2016-05 out of the basket to deploy on benchmark AX-303
06/24/2022 05:12:49	45.933405	-129.982292	179.6	1514.72	TXT: Placing Mini-BPR 2016-05 on the concrete benchmark AX-303
06/24/2022 05:13:19	45.933420	-129.982282	179.53	1514.69	TXT: Jason's right arm has released the Mini-BPR and the location has been approved
06/24/2022 05:13:20	45.933421	-129.982282	179.38	1514.71	HIGHLIGHTS: 1080 stop
06/24/2022 05:14:34	45.933437	-129.982272	183.2	1513.85	TXT: Jason's right arm closing the biobox that Mini-BPR 2016-05 was taken out of
06/24/2022 05:15:40	45.933440	-129.982274	183.9	1513.84	TXT: the box referenced above has been put away
06/24/2022 05:16:21	45.933429	-129.982277	183.24	1513.86	TXT: Stowing Mini-BPR 2020-07
06/24/2022 05:17:20	45.933425	-129.982268	183.38	1513.86	TXT: finding a good place in the basket for Mini-BPR 2020-07
06/24/2022 05:18:35	45.933418	-129.982251	183.44	1513.84	TXT: Mini-BPR 2020-07 has been stowed in the basket
06/24/2022 05:19:04	45.933416	-129.982253	183.31	1513.84	TXT: placing the bungee cord over Mini-BPR 2020-07
06/24/2022 05:19:44	45.933433	-129.982260	183.28	1513.83	TXT: all finished at benchmark AX-303
06/24/2022 05:21:05	45.933472	-129.982329	299.06	1510.33	TXT: transitting to benchmark AX-309
06/24/2022 06:30:40	45.938352	-129.972111	2.54	1520.06	TXT: spotted benchmark AX-309 marker flag
06/24/2022 06:32:27	45.938447	-129.972091	243.44	1525.42	TXT: jason has arrived at benchmark AX-309
06/24/2022 06:33:45	45.938447	-129.972102	242.04	1525.98	TXT: right arm is grabbing the MPR from the basket
06/24/2022 06:34:51	45.938441	-129.972128	242.26	1525.98	TXT: placing the MPR on concrete benchmark AX-309
06/24/2022 06:36:33	45.938450	-129.972117	242.3	1525.97	TXT: maneuvering the MPR so the cable is not in the way and is on the left
06/24/2022 06:38:12	45.938453	-129.972107	242.35	1525.97	TXT: right arm giving the MPR a slight nudge to slide it into the groove on the concrete benchmark
06/24/2022 06:38:45	45.938448	-129.972115	242.43	1525.96	TXT: checking the shackle and cable to make sure they are free
06/24/2022 06:39:50	45.938465	-129.972110	242.46	1525.96	TXT: repositioning the MPR so the cable is free

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 06:41:34	45.938456	-129.972108	242.08	1525.93	TXT: gave the MPR another nudge to get it in the groove. it is now in place on concrete benchmark AX-309
06/24/2022 06:41:50	45.938457	-129.972106	242.01	1525.93	MPR: start pressure measurement
06/24/2022 06:49:20	45.938448	-129.972097	241.84	1525.88	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/24/2022 07:08:35	45.938450	-129.972093	241.59	1525.75	MPR: stop pressure measurement
06/24/2022 07:09:11	45.938451	-129.972102	241.88	1525.76	TXT: Jason has removed the MPR from the benchmark and placed it in the holster
06/24/2022 07:10:01	45.938446	-129.972098	241.97	1525.75	TXT: Beginning transit to benchmark AX-302 (Trevi vent)
06/24/2022 08:48:57	45.946017	-129.983623	342.65	1516.53	Framegrab: Spanish steps hydrothermal vent
06/24/2022 08:49:37	45.946033	-129.983601	342.65	1516.26	HIGHLIGHTS: 4k highlights start
06/24/2022 08:49:42	45.946039	-129.983595	343.13	1516.28	HIGHLIGHTS: 4k highlights stop
06/24/2022 08:52:29	45.946304	-129.983659	319.96	1514.95	TXT: flag in sight
06/24/2022 08:52:55	45.946338	-129.983711	306.84	1515.59	TXT: Arrived at AX-302 Benchmark (Trevi)
06/24/2022 08:56:27	45.946387	-129.983831	228.47	1517.69	TXT: Jason has removed the MPR from the holster and is placing it on the benchmark
06/24/2022 08:56:59	45.946386	-129.983825	228.52	1517.67	TXT: Stopped MPR Transit logging
06/24/2022 08:59:51	45.946385	-129.983821	227.85	1517.67	TXT: The MPR is well positioned on the benchmark. Tilt in x-direction = -0.6 y-tilt = 0.2
06/24/2022 08:59:53	45.946385	-129.983821	227.85	1517.68	MPR: start pressure measurement
06/24/2022 09:24:07	45.946380	-129.983841	227.85	1517.52	MPR: stop pressure measurement
06/24/2022 09:24:55	45.946379	-129.983841	227.58	1517.52	TXT: Jason has removed the MPR from AX-302 and secured it in the holster
06/24/2022 09:27:23	45.946379	-129.983834	227.99	1517.47	TXT: Jason has recovered Mini-BPR 2020-04 from benchmark AX-302
06/24/2022 09:33:06	45.946378	-129.983835	227.65	1517.45	TXT: Mini-BPR 2016-04 has been deployed at AX-302 Benchmark
06/24/2022 09:33:42	45.946394	-129.983829	227.07	1514.74	TXT: Beginning transit to benchmark AX-101
06/24/2022 09:33:54	45.946399	-129.983827	226.73	1514.76	TXT: Begin logging MPR transit
06/24/2022 10:48:56	45.949633	-129.995644	295.74	1524.41	WATCH_CHANGE: new watchstander Kelly Chadwick and Bill Chadwick
06/24/2022 12:04:09	45.954661	-130.008820	309.56	1524.08	TXT: passing an OOI cable on the seafloor
06/24/2022 12:08:46	45.955104	-130.009737	305.36	1526.41	TXT: arriving at the benchmark AX-101
06/24/2022 12:10:47	45.955167	-130.009893	281.85	1527.05	TXT: arrived at benchmark AX-101
06/24/2022 12:11:10	45.955172	-130.009906	273.55	1526.59	TXT: going to pick up a cap from a Mini-BPR that is on the seafloor
06/24/2022 12:12:20	45.955177	-130.009921	243.41	1528.38	TXT: decided to pick the cap up on our way out
06/24/2022 12:13:06	45.955169	-130.009910	243.38	1528.8	TXT: there's a couple brittle stars on the MPR spot

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 12:16:12	45.955160	-130.009983	242.75	1528.78	TXT: trying to get rid of the brittle stars
06/24/2022 12:18:25	45.955167	-130.009982	241.33	1528.79	TXT: placing the MPR now
06/24/2022 12:21:10	45.955191	-130.009936	240.93	1528.78	MPR: start pressure measurement
06/24/2022 12:41:08	45.955171	-130.009974	240.87	1528.82	MPR: stop pressure measurement
06/24/2022 12:43:18	45.955181	-130.009969	240.85	1528.84	TXT: recovering the MPR
06/24/2022 12:43:33	45.955179	-130.009970	240.83	1528.87	TXT: going to pick up the Mini-BPR end cap
06/24/2022 12:45:31	45.955207	-130.009942	281.21	1526.08	TXT: looking at anemone on the marker
06/24/2022 12:46:32	45.955233	-130.009978	231.26	1527.28	HIGHLIGHTS: 4k highlights start
06/24/2022 12:50:43	45.955227	-130.009999	206.21	1527.37	HIGHLIGHTS: 4k highlights stop
06/24/2022 12:53:12	45.955197	-130.009949	183.2	1525.94	TXT: decided to collect the Mini-BPR end cap later
06/24/2022 12:53:38	45.955142	-130.009936	182.36	1526	TXT: beginning transit to benchmark AX-307
06/24/2022 14:08:17	45.945441	-130.009107	179.89	1537.87	TXT: arrived at benchmark AX-307
06/24/2022 14:11:29	45.945375	-130.008821	179.33	1541.44	TXT: placing the MPR
06/24/2022 14:13:38	45.945351	-130.008964	179.31	1541.46	TXT: checking the tilt
06/24/2022 14:14:26	45.945356	-130.008940	179.31	1541.46	MPR: start pressure measurement
06/24/2022 14:21:22	45.945368	-130.008838	179.32	1541.5	TXT: looking around for nudibranchs to sample. Did not find any.
06/24/2022 14:34:02	45.945379	-130.008767	179.31	1541.58	MPR: stop pressure measurement
06/24/2022 14:35:18	45.945388	-130.008770	179.29	1541.58	TXT: recovering MPR
06/24/2022 14:36:58	45.945424	-130.008645	243.74	1540.19	TXT: beginning transit to Webb-4 site to re-deploy Webb instrument CMP-1
06/24/2022 14:46:08	45.946451	-130.006863	38.72	1534.98	WATCH_CHANGE: new watchstander Kelli and Sandra and Scott
06/24/2022 15:13:18	45.948535	-130.003563	68.01	1530.4	NAV: Doppler Reset
06/24/2022 15:17:02	45.948610	-130.003200	67.49	1530.66	TXT: At Webb-4 site
06/24/2022 15:25:47	45.948581	-130.002866	69.03	1530.7	TXT: Moving Jason to west side of ship
06/24/2022 16:15:47	45.948862	-130.004324	12.4	1530.47	TXT: About to deploy CMP-1 instrument at Webb 4 site
06/24/2022 16:16:34	45.948851	-130.004301	357.38	1530.47	TXT: Coming up 50m for deployment of CMP-1 at Webb 4 site
06/24/2022 16:28:45	45.949388	-130.005237	306	1483.49	TXT: CMP-1 instrument and float pack released over side of ship
06/24/2022 17:14:49	45.951016	-130.006838	274.69	1483.5	TXT: CMP-1 instrument has reached the bottom at Webb-4 site
06/24/2022 17:36:08	45.952094	-130.006942	203.92	1483.7	TXT: Jason heading back down to the bottom
06/24/2022 17:47:07	45.950601	-130.005690	153.58	1483.49	TXT: Jason moving to find CMP-1 instrument at Webb-4 site

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 17:57:00	45.949510	-130.005030	159.81	1528.29	TXT: CMP-1 instrument in view
06/24/2022 18:01:37	45.949398	-130.005040	182.55	1516.14	HIGHLIGHTS: 1080 start
06/24/2022 18:05:43	45.949392	-130.005035	192.06	1516.18	TXT: Jason begins moving CMP-1 nstrument to Webb 4 site
06/24/2022 18:06:05	45.949383	-130.005034	192.18	1514.96	TXT: Jason moves up 10m with instrument
06/24/2022 18:06:32	45.949376	-130.005030	192.5	1514.37	HIGHLIGHTS: 1080 stop
06/24/2022 18:25:43	45.948587	-130.003422	139.74	1530.56	TXT: CMP-1 instrument placed on bottom
06/24/2022 18:28:24	45.948579	-130.003550	140.38	1532.61	TXT: Cutting four ratchet straps on the inside of instrument
06/24/2022 18:29:20	45.948582	-130.003389	140.35	1532.61	HIGHLIGHTS: 1080 start
06/24/2022 18:38:10	45.948572	-130.003473	142.09	1532.54	HIGHLIGHTS: 1080 stop
06/24/2022 18:43:13	45.948565	-130.003508	141.33	1532.51	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/24/2022 18:51:17	45.948572	-130.003429	264.3	1532.49	TXT: Jason has cut all of the ratchet straps that connect CMP-1 to the shield
06/24/2022 18:59:38	45.948575	-130.003440	268.45	1532.52	TXT: Jason has removed CMP-1 from the instrument shield and has placed it on the seafloor.
06/24/2022 19:00:36	45.948573	-130.003440	269.16	1532.49	TXT: Jason has repositioned CMP-1 to a different location.
06/24/2022 19:01:01	45.948577	-130.003439	270.57	1532.11	HIGHLIGHTS: 1080 start
06/24/2022 19:02:23	45.948590	-130.003472	188.78	1530.61	HIGHLIGHTS: 4k highlights stop
06/24/2022 19:03:03	45.948572	-130.003477	198.05	1532.55	TXT: Pete has approved the positioning of CMP-1 at the Webb-4 location
06/24/2022 19:06:18	45.948561	-130.003438	197.44	1532.54	TXT: Jason has released the float pack from the CMP-1 instrument. The instrument shifted slightly because of this.
06/24/2022 19:06:44	45.948581	-130.003447	197.83	1531.43	VEHICLE: Off bottom
06/24/2022 19:58:39	45.947068	-130.005078	67.02	1428.92	TXT: The float pack has been recovered and we are returning the Webb 4 Site
06/24/2022 20:05:29	45.948237	-130.003710	58.24	1530.64	VEHICLE: On bottom
06/24/2022 20:06:00	45.948272	-130.003675	53.33	1531.62	HIGHLIGHTS: 4k highlights start
06/24/2022 20:06:40	45.948320	-130.003791	55.12	1531.76	HIGHLIGHTS: 4k highlights stop
06/24/2022 20:09:07	45.948424	-130.003577	40.76	1531.02	TXT: CMP-1 instrument in sight
06/24/2022 20:11:20	45.948536	-130.003382	306.44	1532.3	TXT: Jason is pulling the pear link to extend the lines to the instrument (that show where shield should be placed)
06/24/2022 20:15:13	45.948536	-130.003292	293.22	1531.34	TXT: Lines are fully extended. Pete has approved.
06/24/2022 20:18:16	45.948512	-130.003088	4.21	1532.32	TXT: Jason has severed the first weight from the instrument shield
06/24/2022 20:20:37	45.948479	-130.003059	8.52	1531.79	TXT: Jason has severed the second weight from the instrument shield
06/24/2022 20:23:36	45.948531	-130.003218	173.59	1532.24	TXT: Jason has lifted the instrument shield and flipped it so that all ratchet straps fall out

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/24/2022 20:27:12	45.948541	-130.003125	291.64	1532.16	TXT: Jason has placed the instrument shield on top of the CMP-1 instrument
06/24/2022 20:31:08	45.948546	-130.003296	309.57	1530.62	HIGHLIGHTS: 4k highlights start
06/24/2022 20:32:49	45.948550	-130.003249	161.63	1531.4	HIGHLIGHTS: 4k highlights stop
06/24/2022 20:33:11	45.948548	-130.003136	156.77	1532.25	TXT: Pete has approved the placement at CMP-1 and Jason is placing weights on top of instrument shield
06/24/2022 20:39:07	45.948555	-130.003320	300.07	1532.27	TXT: Jason has covered all of the holes in the shield with the weights. Second deployment of CMP-1 at Webb-4 site is finished.
06/24/2022 20:42:14	45.948519	-130.003326	270.31	1530.8	TXT: Beginning transit to benchmark AX-106
06/24/2022 22:47:33	45.934456	-130.011750	265.7	1536.85	WATCH_CHANGE: new watchstander Kelly Chadwick and Bill Chadwick
06/24/2022 22:49:42	45.934425	-130.012117	264.66	1536.65	TXT: looking for benchmark AX-106
06/24/2022 22:51:41	45.934391	-130.012067	271.78	1536.81	TXT: Bill saw a jellyfish and thought it was the flag. got mocked
06/24/2022 22:58:49	45.934330	-130.011328	87.23	1538.38	TXT: benchmark in sight
06/24/2022 22:59:37	45.934371	-130.011158	85.38	1538.39	TXT: arrived at benchmark AX-106
06/24/2022 23:00:35	45.934377	-130.011140	70.92	1539.61	TXT: Jason's position at the actual AX-106 benchmark is 20 to 30 meters from the target (apparent navigation offset - probably bad USBL calibration)
06/24/2022 23:02:42	45.934380	-130.011316	68.29	1539.92	TXT: placing the MPR on the AX-106 benchmark
06/24/2022 23:03:59	45.934389	-130.011372	68.29	1539.92	TXT: trying to get the brittle stars to vacate
06/24/2022 23:07:36	45.934382	-130.011346	68.28	1539.93	TXT: adjusting MPR placement
06/24/2022 23:09:35	45.934387	-130.011307	68.28	1539.93	TXT: checking the tilt
06/24/2022 23:10:22	45.934378	-130.011117	68.28	1539.93	MPR: start pressure measurement
06/24/2022 23:29:57	45.934363	-130.011208	68.28	1539.94	MPR: stop pressure measurement
06/24/2022 23:31:09	45.934383	-130.011373	68.28	1539.94	TXT: recovering the MPR
06/24/2022 23:33:08	45.934366	-130.011187	73.81	1539.73	TXT: going to set out some additional markers to make the benchmark is easier to find in the future
06/24/2022 23:37:41	45.934364	-130.011300	90.03	1539.12	TXT: setting out the first marker (Marker 267)
06/24/2022 23:50:11	45.934355	-130.011355	90.33	1539.88	TXT: setting out a second marker at AX-106 (Marker 293)
06/24/2022 23:58:32	45.934489	-130.010413	70.36	1535.63	TXT: beginning transit to benchmark AX-308
06/25/2022 01:18:58	45.931549	-129.998188	283.38	1529.53	TXT: arriving at benchmark AX-308
06/25/2022 01:26:40	45.931538	-129.998185	282.93	1529.7	MPR: start pressure measurement
06/25/2022 01:47:43	45.931551	-129.998384	282.93	1529.81	MPR: stop pressure measurement
06/25/2022 01:50:04	45.931552	-129.998452	282.52	1529.85	TXT: MPR recovered

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/25/2022 01:50:20	45.931553	-129.998442	282.63	1528.52	TXT: beginning transit to benchmark AX-104 (Bag City)
06/25/2022 02:50:46	45.925326	-129.995256	157.82	1528.89	WATCH_CHANGE: new watchstander Kelli and Sandra and Scott
06/25/2022 03:31:03	45.920169	-129.992279	157.66	1528.94	HIGHLIGHTS: 4k highlights start
06/25/2022 03:31:09	45.920161	-129.992293	157.96	1529.39	HIGHLIGHTS: 4k highlights stop
06/25/2022 04:09:36	45.916139	-129.989241	35.97	1528.76	TXT: Jason arrived at benchmark AX-104
06/25/2022 04:11:50	45.916153	-129.989221	338.7	1530.03	TXT: Positioning MPR on benchmark AX-104
06/25/2022 04:14:35	45.916154	-129.989213	338.52	1530.04	TXT: MPR deployed
06/25/2022 04:18:04	45.916167	-129.989042	338.44	1530.05	TXT: Possible collapse underneath benchmark. Will assess TIFFGrab and past notes to ensure this MPR data will be correct
06/25/2022 04:26:01	45.916157	-129.989196	337.8	1530.08	TXT: Collapse present in 2020 cruise
06/25/2022 04:34:20	45.916161	-129.989397	337.66	1530.11	MPR: stop pressure measurement
06/25/2022 04:35:16	45.916170	-129.989455	337.63	1530.11	TXT: MPR placed back on Jason
06/25/2022 04:36:14	45.916159	-129.989445	338.93	1530.11	TXT: MPR secured on Jason
06/25/2022 04:36:51	45.916156	-129.989439	337.66	1529.91	HIGHLIGHTS: 4k highlights start
06/25/2022 04:38:25	45.916198	-129.989361	23.72	1529.34	HIGHLIGHTS: 4k highlights stop
06/25/2022 04:42:27	45.916502	-129.988909	40.28	1527.92	TXT: Leaving benchmavr AX-104 (Bag City) for transit to Webb-2 site
06/25/2022 05:39:13	45.922675	-129.983696	13.39	1521.45	TXT: About 10 minutes from Webb-2 site
06/25/2022 05:56:21	45.923921	-129.983253	286.24	1508.47	TXT: At Webb-2 site getting close to dropping the float pack over the side for recovery of CMP-2 instrument
06/25/2022 05:58:44	45.924032	-129.983577	343.26	1500.39	TXT: Float pack going in the water now
06/25/2022 06:18:38	45.925421	-129.983629	278.1	1499.33	TXT: Sentry is also deployed over the side
06/25/2022 06:22:55	45.925363	-129.983674	262.23	1499.4	TXT: Jason moving 100m west to avoid Sentry
06/25/2022 06:49:40	45.924416	-129.985845	234.81	1499.41	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/25/2022 07:03:48	45.924308	-129.985597	79.75	1494.4	TXT: Sentry is underway. We are navigating to the float pack site.
06/25/2022 07:05:23	45.924300	-129.985409	102.06	1517.07	VEHICLE: On bottom
06/25/2022 07:11:00	45.924163	-129.984554	95.13	1517.86	TXT: Jason's starboard horizontal thruster is grounded and power secured to it.
06/25/2022 07:21:09	45.924043	-129.983000	63.46	1516.51	TXT: Float pack in sight
06/25/2022 07:25:26	45.924076	-129.982978	359.24	1516.39	TXT: Jason has grabbed the float pack and is beginning transit to the site of the CMP-2 instrument at the Webb-2 site
06/25/2022 07:36:55	45.923909	-129.982369	141.03	1519.79	TXT: We are having some trouble locating CMP-2 at Webb-2. There may be a USBL calibration issue?

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/25/2022 08:36:51	45.921939	-129.982003	271.44	1517.67	TXT: We have arrived on site at the CMP-2 location!
06/25/2022 08:47:08	45.921916	-129.982217	77.83	1522.83	TXT: Jason has removed the weights from the CMP-2 instrument shield
06/25/2022 08:49:31	45.921914	-129.982216	58.78	1521.56	TXT: Jason has removed the shield from CMP-2
06/25/2022 08:52:53	45.921920	-129.982227	97.7	1522.84	TXT: Jason is having trouble releasing the line from the instrument. The instruments position has been somewhat shifted as a result.
06/25/2022 08:55:39	45.921918	-129.982224	98.52	1522.81	TXT: Jason has freed the line from CMP-2 instrument and has attached it to the shield
06/25/2022 09:04:25	45.921960	-129.982195	182.78	1519.72	TXT: Jason has released the recovery line from the float pack
06/25/2022 09:11:23	45.921966	-129.982233	183.54	1522.72	TXT: Jason has attached the recovery line from the float pack to the CMP-2 instrument bridle
06/25/2022 09:16:37	45.921989	-129.982181	273.19	1522.47	TXT: Jason has released the weights and the instrument is on its way to the surface
06/25/2022 09:17:41	45.921949	-129.982110	18.07	1518.72	VEHICLE: Off bottom
06/25/2022 10:25:01	45.919730	-129.986017	351.42	1414.91	TXT: Float pack has been recovered.
06/25/2022 10:28:27	45.919713	-129.986080	358.99	1451.95	TXT: The line from the instrument to the shield was severed upon recovery and the shield is on its way back to the bottom.
06/25/2022 10:31:20	45.919797	-129.985951	6.43	1467.46	TXT: We are continuing to navigate toward benchmark AX-310. A potential recovery of the instrument shield at a later time is being discussed.
06/25/2022 10:34:14	45.919826	-129.985879	24.52	1521.15	VEHICLE: On bottom
06/25/2022 10:48:21	45.920676	-129.984149	27.81	1519.73	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/25/2022 10:49:09	45.920760	-129.984242	27.62	1519.7	TXT: one of jason's thrusters is not working which is impacting Jason's ability to transit
06/25/2022 10:53:03	45.920996	-129.984156	33.76	1518.14	TXT: the current plan is to continue to AX-310 with one thruster for now. once more people are awake the thruster issue can be addressed
06/25/2022 10:54:59	45.920991	-129.983939	37.17	1511.7	TXT: testing jason's ability to move with just one forward thruster by moving laterally instead
06/25/2022 11:03:51	45.921339	-129.982885	337.26	1504.65	TXT: we're moving sideways to take advantage of the two lateral thrusters we have and it has improved our speed. downside is we can't see in the direction we're moving
06/25/2022 12:12:59	45.925394	-129.977991	15.15	1522.43	VEHICLE: On bottom
06/25/2022 12:13:36	45.925459	-129.977958	18.04	1522.53	TXT: looking forward again instead of moving sideways while we look for the benchmark
06/25/2022 12:15:52	45.925606	-129.977908	66.39	1520.8	TXT: benchmark flag in sight
06/25/2022 12:18:10	45.925674	-129.977798	39.5	1522.6	TXT: arrived at benchmark AX-310
06/25/2022 12:21:31	45.925721	-129.977663	284.89	1526.11	TXT: placing the MPR on benchmark AX-310
06/25/2022 12:25:48	45.925709	-129.977630	283.57	1526.05	TXT: adjusting the MPR position
06/25/2022 12:29:11	45.925711	-129.977531	284.45	1526.08	MPR: start pressure measurement
06/25/2022 12:49:04	45.925709	-129.977531	285.26	1526.08	MPR: stop pressure measurement

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/25/2022 12:49:16	45.925710	-129.977529	284.93	1526.1	TXT: recovering the MPR
06/25/2022 12:51:09	45.925717	-129.977597	288.88	1523.97	TXT: beginning transit to benchmark AX-303 (M33 vent)
06/25/2022 14:00:39	45.932807	-129.982003	16.11	1509.5	VEHICLE: On bottom
06/25/2022 14:00:56	45.932818	-129.982057	358.98	1510.01	TXT: looking for benchmark AX-303
06/25/2022 14:11:16	45.933387	-129.982085	139.24	1509.83	TXT: arrived at AX-303
06/25/2022 14:14:06	45.933367	-129.981847	190.49	1513.06	TXT: placing the MPR
06/25/2022 14:16:26	45.933405	-129.981886	190.5	1513.07	TXT: checking the tilt
06/25/2022 14:16:59	45.933403	-129.981908	190.51	1513.07	MPR: start pressure measurement
06/25/2022 14:37:01	45.933395	-129.982010	190.5	1513.19	MPR: stop pressure measurement
06/25/2022 14:37:52	45.933394	-129.982045	190.5	1513.19	TXT: recovering MPR
06/25/2022 14:41:49	45.933395	-129.982021	194.47	1510.66	TXT: beginning transit to benchmark AX-309 (eastern caldera)
06/25/2022 14:42:17	45.933405	-129.982009	247.82	1500.51	WATCH_CHANGE: new watchstander Sandra and Kelli and Scott
06/25/2022 15:50:51	45.938452	-129.972193	121.73	1521.93	TXT: Benchmark AX-309 (eastern caldera) in sight
06/25/2022 15:52:27	45.938532	-129.972079	168.37	1520.46	TXT: approaching AX-309 concrete benchmark
06/25/2022 15:56:47	45.938489	-129.972084	229.28	1525.05	TXT: jason landed on bottom at AX-309 concrete benchmark
06/25/2022 15:57:40	45.938416	-129.971889	233.54	1525.07	HIGHLIGHTS: 1080 start
06/25/2022 15:58:00	45.938405	-129.971847	233.58	1525.07	TXT: right arm removing bungee cord from the MPR
06/25/2022 15:58:48	45.938460	-129.971926	234.74	1525.08	TXT: right arm taking the MPR out of the basket
06/25/2022 15:59:21	45.938505	-129.972028	234.73	1525.09	TXT: the MPR got caught on something while being dragged out
06/25/2022 16:00:34	45.938477	-129.972035	234.73	1525.12	TXT: the holster the MPR is sitting in was catching the plastic mesh on the MPR. the decision was to drag it out anyway and take a pressure measurement
06/25/2022 16:00:49	45.938479	-129.972028	234.72	1525.12	TXT: the right arm is carrying the MPR to the benchmark
06/25/2022 16:02:30	45.938458	-129.971959	234.7	1525.14	TXT: the MPR is being positioned on the benchmark. It is sitting on the shackle so needs to be repositioned
06/25/2022 16:05:18	45.938464	-129.971894	235.21	1524.98	HIGHLIGHTS: 1080 stop
06/25/2022 16:05:47	45.938457	-129.971902	256.02	1524.89	TXT: Comment on previous issue: the MPR is rotated within the handle and base so it is in a different orientation when sitting on the benchmark compared to previous measurements
06/25/2022 16:06:51	45.938430	-129.971846	248.91	1525.23	TXT: A way to visualize the rotation within the holster is to compare the Scripps logo sticker on the back side
06/25/2022 16:10:20	45.938358	-129.971579	248.91	1525.23	TXT: Clarification: the holster is the thing that holds the MPR down in the Jasons basket. It has a tab that caught the white plastic on the MPR as it was being brought out. This caused the

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
					mesh cover on the MPR to slide along with the hose clamps both backwards along the length of the MPR and in the rotational direction
06/25/2022 16:10:55	45.938406	-129.971751	248.87	1525.22	TXT: The J-tube on the MPR seems like it is fine
06/25/2022 16:11:40	45.938463	-129.971996	248.87	1525.23	TXT: Based on the tilt measurement the correction that would need to be made due to this issue is very large
06/25/2022 16:13:23	45.938423	-129.971785	248.87	1525.24	MPR: start pressure measurement (later aborted)
06/25/2022 16:13:57	45.938424	-129.971787	248.87	1525.24	TXT: taking a pressure measurement anyway to compare and see whether the correction that needs to be made is doable
06/25/2022 16:14:51	45.938411	-129.971718	248.88	1525.25	MPR: stop pressure measurement (aborted)
06/25/2022 16:15:14	45.938398	-129.971658	248.87	1525.26	TXT: the MPR was not quite in the groove on the concrete benchmark so repositioning it to redo the pressure measurement
06/25/2022 16:15:41	45.938399	-129.971655	248.87	1525.25	TXT: the MPR is now properly in the groove
06/25/2022 16:15:50	45.938405	-129.971677	248.87	1525.25	MPR: start pressure measurement
06/25/2022 16:35:25	45.938479	-129.971984	246.24	1525.36	MPR: stop pressure measurement
06/25/2022 16:36:00	45.938472	-129.971983	246.18	1525.37	TXT: Jason's right arm is picking up the MPR
06/25/2022 16:36:53	45.938465	-129.971974	246.17	1525.37	TXT: placing the MPR back in the holster on the basket
06/25/2022 16:37:38	45.938478	-129.971996	246.16	1525.38	TXT: the MPR is now in the holster. right arm is replacing the bungee cord over top.
06/25/2022 16:38:39	45.938508	-129.971932	232.42	1523.27	TXT: Jason is pulling away from benchmark AX-309
06/25/2022 16:39:02	45.938510	-129.971890	252.75	1522.56	TXT: Decided to end dive and beginning Jason recovery
06/25/2022 16:40:23	45.938370	-129.971920	39.41	1518.63	TXT: More background on decision to recover: the tilt of the MPR was 26 degrees which is very large. Recovering the MPR and repositioning it in its original orientation by hand will make the correction that needs to be done much easier. Making more measurements with the MPR in the rotated position would negatively impact the pressure measurements.
06/25/2022 16:50:58	45.939167	-129.972833	38.97	1451.61	Framegrab: MPR orientation in basket during Jason recovery after benchmark AX-309
06/25/2022 16:58:44	45.939171	-129.972745	39.86	1225.91	TXT: 44 mins until Jason reaches surface
06/25/2022 17:45:19	45.939019	-129.972724	330.93	45.77	HIGHLIGHTS: 1080 start
06/25/2022 17:48:31	45.939073	-129.972580	339.52	5.8	HIGHLIGHTS: 4k highlights start
06/25/2022 17:52:17	45.939066	-129.972562	282.11	3.26	HIGHLIGHTS: 4k highlights stop
06/25/2022 17:52:20	45.939066	-129.972562	273.48	3.21	HIGHLIGHTS: 4k highlights start
06/25/2022 17:52:55	45.939066	-129.972562	280.43	1.53	TXT: Jason breached water surface
06/25/2022 17:54:41	45.939066	-129.972562	176.21	1.55	HIGHLIGHTS: 4k highlights stop
06/25/2022 17:55:07	45.938508	-129.972652	117.66	1.51	VEHICLE: Jason on deck

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1430 Logger Comment
06/25/2022 17:55:20	45.938484	-129.972648	117.47	1.5	TXT: Dive J2-1430 ended
06/25/2022 17:55:35	45.938455	-129.972645	117.73	1.48	HIGHLIGHTS: 1080 stop

ROV Jason dive J2-1431 Dive Log (edited/corrected from Jason Virtual Van after renav)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/25/2022 21:14:34	45.932768	-129.982724	288.4	3.2	TXT: Jason in the water - Diving at benchmark AX-303 (M33 vent) to resume the MPR pressure dive
06/25/2022 21:16:03	45.932745	-129.982734	288.2	10.0	VEHICLE: Jason in water
06/25/2022 22:22:20	45.932566	-129.983175	28.4	1509.9	VEHICLE: On bottom
06/25/2022 22:27:33	45.933035	-129.982620	30.3	1511.7	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/25/2022 22:36:18	45.933519	-129.982384	177.3	1511.1	NAV: Doppler Reset
06/25/2022 22:44:33	45.933434	-129.982436	90.1	1509.6	TXT: We are having trouble finding the benchmark. AX-303 does not appear to be at the target location on the map.
06/25/2022 22:45:29	45.933421	-129.982172	90.1	1509.1	TXT: AX-303 in sight!
06/25/2022 22:47:58	45.933403	-129.981939	174.6	1513.6	TXT: We have arrived at AX-303 benchmark.
06/25/2022 22:51:01	45.933410	-129.981925	174.1	1513.6	TXT: Jason has placed the MPR on the benchmark.
06/25/2022 22:51:07	45.933409	-129.981926	174.0	1513.6	TXT: adjusting the MPR
06/25/2022 22:53:39	45.933397	-129.981958	173.8	1513.6	MPR: start pressure measurement
06/25/2022 23:13:13	45.933383	-129.981883	174.3	1513.6	MPR: stop pressure measurement
06/25/2022 23:14:59	45.933400	-129.981910	174.2	1513.5	TXT: the MPR is recovered
06/25/2022 23:15:52	45.933399	-129.981868	174.0	1512.3	TXT: beginning transit to AX-308
06/26/2022 00:50:05	45.931531	-129.998252	283.1	1526.3	TXT: benchmark in sight
06/26/2022 00:51:39	45.931573	-129.998326	268.7	1528.2	TXT: arrived at AX-308
06/26/2022 00:53:42	45.931564	-129.998305	268.7	1529.5	TXT: placing MPR on benchmark
06/26/2022 00:57:05	45.931560	-129.998561	269.0	1529.5	MPR: start pressure measurement
06/26/2022 01:17:02	45.931555	-129.998399	268.9	1529.6	MPR: stop pressure measurement
06/26/2022 01:17:12	45.931555	-129.998381	268.9	1529.6	TXT: recovering the MPR
06/26/2022 01:18:46	45.931553	-129.998396	269.6	1529.6	TXT: beginning transit to AX-106
06/26/2022 02:35:31	45.934482	-130.011011	267.1	1536.5	TXT: flag in sight
06/26/2022 02:39:48	45.934391	-130.011372	76.4	1540.2	TXT: arrived at AX-106 (ASHES)
06/26/2022 02:40:54	45.934401	-130.011605	74.6	1540.5	TXT: placing the MPR
06/26/2022 02:44:59	45.934398	-130.011284	74.6	1540.5	WATCH_CHANGE: new watchstanders Sandra and Kelli and Scott
06/26/2022 02:46:24	45.934397	-130.011216	74.6	1540.5	TXT: positioning the MPR on benchmark AX-106

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/26/2022 02:47:23	45.934388	-130.011207	74.6	1540.5	TXT: the MPR is in place on benchmark AX-106
06/26/2022 02:47:28	45.934389	-130.011214	74.6	1540.5	TXT: Sentry will use transducer (preparing to be recovered)
06/26/2022 02:49:48	45.934395	-130.011373	74.6	1540.6	TXT: Again repositioning the MPR in the groove
06/26/2022 02:50:24	45.934399	-130.011358	74.6	1540.6	MPR: start pressure measurement
06/26/2022 03:10:13	45.934395	-130.011398	74.6	1540.7	MPR: stop pressure measurement
06/26/2022 03:10:28	45.934392	-130.011376	74.6	1540.7	TXT: Jason picking up the MPR
06/26/2022 03:11:08	45.934392	-130.011345	74.6	1540.7	TXT: Placing MPR in the basket
06/26/2022 03:12:04	45.934390	-130.011345	74.6	1540.7	TXT: The MPR has been placed in the basket. Placing the bungee cord over it
06/26/2022 03:13:04	45.934438	-130.011436	147.9	1538.0	TXT: Pulling away from benchmark AX-106. Now moving up to wait for Sentry to be recovered
06/26/2022 03:14:01	45.934501	-130.011515	273.1	1530.0	TXT: jason off the bottom
06/26/2022 03:34:47	45.934535	-130.011650	282.4	1511.7	TXT: Sentry is off bottom
06/26/2022 04:11:04	45.934919	-130.010130	282.8	1511.8	TXT: Sentry almost on deck
06/26/2022 04:13:54	45.934948	-130.010134	308.5	1511.7	TXT: Sentry is on deck and strapped down
06/26/2022 04:20:19	45.934875	-130.010113	10.6	1511.8	TXT: Beginning transit to AX-307
06/26/2022 05:44:19	45.945214	-130.008972	336.9	1540.2	TXT: Benchmark AX-307 in sight
06/26/2022 05:46:34	45.945366	-130.009089	182.5	1542.2	TXT: arrived at benchmark AX-307
06/26/2022 05:46:56	45.945355	-130.009089	184.3	1542.9	VEHICLE: On bottom
06/26/2022 05:48:30	45.945364	-130.009105	185.8	1542.9	TXT: removing the bungee cord from the MPR
06/26/2022 05:48:51	45.945362	-130.009109	185.8	1542.9	TXT: picking up the MPR from the holster
06/26/2022 05:49:33	45.945347	-130.009102	185.8	1542.9	TXT: rotating the MPR so the cable is on the left
06/26/2022 05:50:28	45.945335	-130.009106	185.7	1542.9	TXT: waving the MPR around to move the brittle stars away from the groove on the benchmark
06/26/2022 05:52:18	45.945313	-130.009041	185.7	1542.9	TXT: Placing the MPR into the groove on benchmark AX-307
06/26/2022 05:53:09	45.945306	-130.009011	185.5	1542.9	TXT: The MPR is properly placed in the groove on benchmark AX-307
06/26/2022 05:53:17	45.945306	-130.009008	185.5	1542.9	MPR: start pressure measurement
06/26/2022 06:06:41	45.945320	-130.009108	185.0	1542.9	HIGHLIGHTS: 4k highlights start
06/26/2022 06:08:47	45.945321	-130.009091	185.0	1542.9	HIGHLIGHTS: 4k highlights stop
06/26/2022 06:13:16	45.945334	-130.009208	185.0	1542.9	MPR: stop pressure measurement
06/26/2022 06:13:50	45.945336	-130.009209	185.0	1542.9	TXT: Jason picking up the MPR
06/26/2022 06:14:33	45.945319	-130.009125	185.1	1542.9	TXT: Placing the MPR in the holster in the basket

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/26/2022 06:15:12	45.945307	-130.009038	185.1	1542.9	TXT: Placing the bungee cord over the MPR
06/26/2022 06:15:36	45.945311	-130.009026	185.0	1542.9	TXT: The MPR has been stowed
06/26/2022 06:16:15	45.945331	-130.009026	185.0	1539.7	TXT: Jason is pulling away from benchmark AX-307
06/26/2022 06:16:35	45.945332	-130.009038	182.2	1539.6	TXT: Beginning transit to Webb-6 site to deploy the CMP-2 instrument (without shield) and recover the CMP-3 instrument (with shield)
06/26/2022 06:19:45	45.944862	-130.009028	149.7	1539.9	TXT: The 1431 dive timeline says that the transit from Webb-6 to AX-101 is 30 minutes but it will actually take around an hour and a half
06/26/2022 06:29:01	45.944299	-130.008263	142.1	1538.7	TXT: Jason has a ground fault again in one of the aft thrusters
06/26/2022 06:29:22	45.944312	-130.008258	197.4	1538.6	TXT: Pilot is trying to figure out what is going on
06/26/2022 06:32:08	45.944202	-130.007934	142.8	1539.9	TXT: starboard thruster has a ground fault
06/26/2022 06:33:52	45.944028	-130.007670	141.8	1539.7	TXT: starboard thruster is still working but the pilot still isn't sure what's happening with it
06/26/2022 06:46:56	45.943183	-130.005944	134.7	1532.8	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/26/2022 08:33:07	45.937005	-129.999922	226.2	1521.2	TXT: Float pack (single disk) with CMP-2 instrument has just been deployed at Webb-6 site. We are waiting for the float pack to descend.
06/26/2022 09:27:34	45.935730	-129.998131	92.9	1532.8	VEHICLE: On bottom
06/26/2022 09:27:56	45.935738	-129.998125	120.2	1534.1	TXT: Instrument CMP-2 and float pack is in sight
06/26/2022 09:30:39	45.935706	-129.997928	126.6	1535.5	Framegrab: Shows landing site for CMP-2 at Webb-6 site
06/26/2022 09:31:07	45.935689	-129.997946	87.9	1534.8	HIGHLIGHTS: 4k highlights start
06/26/2022 09:32:51	45.935680	-129.997852	333.0	1536.1	TXT: Instrument CMP-2 landed in a pillow basalt flow stradling a boulder
06/26/2022 09:33:26	45.935679	-129.997855	330.7	1534.6	HIGHLIGHTS: 4k highlights stop
06/26/2022 09:35:35	45.935707	-129.997810	332.7	1530.8	TXT: Jason has grabbed the CMP-2 instrument and is beginning to relocate it toward the Webb-6 target site
06/26/2022 09:48:01	45.936352	-129.997820	29.3	1538.3	TXT: Jason has placed CMP-2 on a flat area of the seafloor ~30m south of the Webb-6 target.
06/26/2022 09:49:46	45.936347	-129.997781	31.0	1538.6	TXT: Jason is repositioning the CMP-2 instrument slightly but Pete has approved this area.
06/26/2022 09:51:26	45.936362	-129.997794	25.9	1538.5	TXT: Bill has suggested we move the instrument to an area with less sediment.
06/26/2022 09:52:15	45.936385	-129.997745	14.2	1535.9	TXT: We are moving the CMP-2 instrument closer to the Webb-6 target (where CMP-3 is currently deployed)
06/26/2022 09:55:14	45.936648	-129.997708	354.6	1534.6	TXT: CMP-3 is in sight.
06/26/2022 09:56:41	45.936666	-129.997705	53.2	1538.4	TXT: Jason has placed CMP-2 on the seafloor near CMP-3 at the Webb-6 site
06/26/2022 09:57:47	45.936661	-129.997783	48.3	1537.5	HIGHLIGHTS: 4k highlights start
06/26/2022 10:01:05	45.936687	-129.997620	3.0	1538.3	TXT: Jason is scraping the seafloor to gauge how much sediment cover is in this location

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/26/2022 10:01:29	45.936690	-129.997638	3.2	1538.3	HIGHLIGHTS: 4k highlights stop
06/26/2022 10:02:29	45.936663	-129.997674	326.8	1537.3	TXT: There is about 0.5" of sediment at the proposed location for CMP-2. Repositioning to compare with CMP-3.
06/26/2022 10:04:26	45.936695	-129.997652	311.9	1537.3	TXT: Sediment at the site of CMP-3 is comparable with the site of CMP-2. Pete has approved the site of CMP-2.
06/26/2022 10:07:17	45.936715	-129.997703	313.2	1538.2	TXT: CMP2 is located at new target location called Webb6-CMP-2
06/26/2022 10:07:34	45.936713	-129.997702	313.2	1538.2	TXT: Jason is preparing to release the single disk float pack from CMP-2
06/26/2022 10:10:30	45.936694	-129.997721	313.1	1538.2	TXT: Jason has released the float pack from CMP-2
06/26/2022 10:11:12	45.936689	-129.997724	309.6	1537.7	VEHICLE: Off bottom
06/26/2022 10:11:38	45.936654	-129.997721	83.9	1530.8	TXT: Jason is off bottom as we await the recovery of the float pack.
06/26/2022 10:47:45	45.934593	-129.999864	178.9	1484.6	WATCH_CHANGE: new watchstander Kelly Chadwick and Bill Chadwick
06/26/2022 10:53:36	45.934618	-129.999907	179.5	1484.6	TXT: Single disk float pack on the surface. Recovered by ship at 11:03. Reconfigured into a 3-disk float pack for recovery of the CMP-3 instrument.
06/26/2022 11:17:47	45.934375	-129.999111	178.6	1484.4	NAV: Ship moving into position for launch of 3-disk float pack
06/26/2022 11:37:22	45.934904	-129.999212	178.8	1464.0	TXT: 3-disk float pack is launched for recovery of the CMP-3 instrument
06/26/2022 12:06:35	45.935957	-129.997574	9.8	1527.9	TXT: float in sight on the bottom
06/26/2022 12:10:38	45.936012	-129.997554	0.2	1532.3	TXT: Jason picking up the float pack
06/26/2022 12:13:03	45.936031	-129.997574	354.3	1525.1	TXT: moving float pack to CMP-3 instrument
06/26/2022 12:14:15	45.936011	-129.997646	281.1	1516.2	TXT: moving sideways because theres still some issues with a thruster
06/26/2022 12:22:34	45.936664	-129.997793	311.2	1532.0	TXT: arrived at CMP-3 instrument
06/26/2022 12:23:15	45.936678	-129.997820	316.7	1534.0	TXT: there's a crab on the cover
06/26/2022 12:23:38	45.936672	-129.997828	307.6	1533.8	TXT: float pack is on the bottom beside CMP-3
06/26/2022 12:28:13	45.936655	-129.997865	57.4	1535.9	TXT: jason is setting down to remove the weights from on top of the cover of CMP-3
06/26/2022 12:30:34	45.936682	-129.997862	48.0	1537.4	TXT: first weight is removed
06/26/2022 12:31:29	45.936697	-129.997861	50.2	1537.2	TXT: two weights have been removed. moving to the other side of the cover to remove the last weight
06/26/2022 12:34:27	45.936723	-129.997855	214.5	1537.6	TXT: the third weight has been removed
06/26/2022 12:34:32	45.936724	-129.997855	214.5	1537.6	TXT: picking up the cover now
06/26/2022 12:39:23	45.936731	-129.997883	215.0	1537.2	TXT: placing the cover beside the CMP-3 instrument
06/26/2022 12:46:10	45.936696	-129.997840	35.5	1537.4	TXT: attaching the CMP-3 instrument to the cover
06/26/2022 12:47:15	45.936697	-129.997859	36.0	1537.4	TXT: checking to make sure the line is not hung up on anything

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/26/2022 12:48:43	45.936672	-129.997889	61.2	1535.3	TXT: the line is still taped to the frame but they think it will free itself
06/26/2022 12:48:51	45.936672	-129.997892	95.5	1534.6	TXT: going to the float pack
06/26/2022 12:48:59	45.936673	-129.997893	125.0	1533.9	TXT: crab by the float pack
06/26/2022 12:52:43	45.936688	-129.997839	142.7	1534.6	TXT: releasing the pull pin holding the line on the float pack
06/26/2022 12:55:10	45.936678	-129.997849	141.7	1534.5	TXT: unfurling the float's line
06/26/2022 12:55:38	45.936681	-129.997843	141.6	1534.7	TXT: the bungee attaching the line to the float pack is not coming loose despite the removal of the pull pin
06/26/2022 12:56:40	45.936678	-129.997842	143.3	1534.7	TXT: trying to remove the bungee
06/26/2022 12:57:30	45.936678	-129.997827	142.0	1534.6	TXT: bungee is away
06/26/2022 12:58:41	45.936692	-129.997840	140.9	1534.6	TXT: unfurling the line
06/26/2022 13:00:16	45.936691	-129.997835	141.9	1534.6	TXT: dropped the line on purpose
06/26/2022 13:02:34	45.936709	-129.997865	188.2	1537.2	TXT: the crab is on our landing site
06/26/2022 13:03:27	45.936696	-129.997854	172.2	1537.5	TXT: may have squished the crab not sure
06/26/2022 13:04:48	45.936703	-129.997865	173.0	1537.5	TXT: grabbing the CMP-3 instrument tether
06/26/2022 13:05:49	45.936699	-129.997863	173.0	1537.5	TXT: picking up the instrument to bring it closer to the float pack
06/26/2022 13:06:47	45.936700	-129.997870	173.2	1537.5	HIGHLIGHTS: 4k highlights start
06/26/2022 13:08:34	45.936696	-129.997865	173.3	1537.5	HIGHLIGHTS: 4k highlights stop
06/26/2022 13:09:56	45.936704	-129.997885	173.3	1537.5	TXT: CMP-3 is connected to the float (line from the float pack is connected to the bridle)
06/26/2022 13:10:15	45.936709	-129.997880	173.3	1537.5	TXT: ready to pull the pin and send it up to the surface (float pack + CMP-3 + shield)
06/26/2022 13:11:23	45.936685	-129.997786	298.8	1535.0	HIGHLIGHTS: 4k highlights start
06/26/2022 13:11:37	45.936669	-129.997769	354.7	1535.1	TXT: the crab survived!
06/26/2022 13:12:09	45.936647	-129.997779	3.4	1534.8	HIGHLIGHTS: 4k highlights stop
06/26/2022 13:13:31	45.936687	-129.997814	348.4	1537.3	HIGHLIGHTS: 4k highlights start
06/26/2022 13:14:14	45.936693	-129.997818	348.5	1537.2	TXT: float pack is away
06/26/2022 13:14:17	45.936693	-129.997818	348.5	1537.2	TXT: Instrument CMP-3 is up
06/26/2022 13:14:20	45.936694	-129.997818	348.5	1537.2	TXT: Cover is up
06/26/2022 13:14:42	45.936692	-129.997816	348.5	1537.2	HIGHLIGHTS: 4k highlights stop
06/26/2022 13:16:38	45.936646	-129.997756	1.7	1529.9	VEHICLE: Off bottom
06/26/2022 13:16:47	45.936632	-129.997758	4.3	1528.6	TXT: waiting for float to make it to the surface

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/26/2022 14:11:36	45.934510	-129.998601	266.1	1460.9	TXT: float pack on the surface. Instrument CMP-3 was recovered on the ship at 14:26
06/26/2022 14:26:48	45.934102	-129.998474	264.5	1460.9	TXT: there was no shield with the float pack. the cover must have fallen off during the ascent
06/26/2022 14:41:01	45.934134	-129.998231	251.3	1460.8	TXT: Watch change: Kelli and Sandra and Scott
06/26/2022 14:48:35	45.935105	-129.998619	248.7	1460.7	TXT: transiting from Webb-6 site to benchmark AX-101 (Caldera Center)
06/26/2022 16:55:15	45.951802	-130.006868	236.3	1460.3	TXT: About 30 minutes from AX-101
06/26/2022 17:33:30	45.955231	-130.009750	228.6	1527.4	TXT: Approaching benchmark AX-101
06/26/2022 17:37:23	45.955203	-130.009929	213.2	1529.7	HIGHLIGHTS: 4k highlights start
06/26/2022 17:38:11	45.955197	-130.009927	212.4	1529.8	TXT: Positioning MPR on benchmark AX-101
06/26/2022 17:41:08	45.955204	-130.009917	213.3	1529.7	HIGHLIGHTS: 4k highlights stop
06/26/2022 17:41:13	45.955204	-130.009916	213.1	1529.7	MPR: start pressure measurement
06/26/2022 18:03:06	45.955195	-130.009940	213.2	1529.9	MPR: stop pressure measurement
06/26/2022 18:04:12	45.955198	-130.009932	212.5	1529.9	TXT: Picking up MPR from benchmark and placing back onto Jason
06/26/2022 18:05:03	45.955194	-130.009936	212.9	1529.9	TXT: MPR secured on Jason
06/26/2022 18:06:30	45.955228	-130.009865	132.9	1525.4	TXT: Beginning transit to benchmark AX-302 (Trevi vent)
06/26/2022 18:13:32	45.955773	-130.010003	39.0	1519.1	TXT: Sentry planning on going into the water halfway through transit (approx 1hr)
06/26/2022 18:59:08	45.953666	-130.005576	52.0	1469.4	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/26/2022 20:12:02	45.947700	-129.997182	84.1	1467.4	TXT: Sentry is in the water and we are still transiting toward benchmark AX-302
06/26/2022 21:36:48	45.946161	-129.984072	302.8	1515.4	VEHICLE: On bottom
06/26/2022 21:39:50	45.946336	-129.983943	76.1	1518.1	TXT: AX-302 Benchmark in sight
06/26/2022 21:48:22	45.946421	-129.983747	250.3	1518.4	TXT: Jason is attempting to place the MPR on the benchmark. A brittle star is making this difficult...
06/26/2022 21:52:10	45.946382	-129.983760	250.3	1518.3	TXT: Jason has placed the MPR on the benchmark.
06/26/2022 21:52:30	45.946385	-129.983769	250.4	1518.4	MPR: start pressure measurement
06/26/2022 22:13:12	45.946389	-129.983807	250.4	1518.3	MPR: stop pressure measurement
06/26/2022 22:14:42	45.946381	-129.983755	250.5	1518.3	TXT: Jason has removed the MPR from the benchmark and secured it in the holster
06/26/2022 22:17:35	45.946249	-129.983484	66.0	1480.4	TXT: We are beginning the transit to benchmark AX-309
06/26/2022 23:35:51	45.938402	-129.972308	98.6	1517.8	VEHICLE: On bottom
06/26/2022 23:37:29	45.938500	-129.972173	110.8	1519.6	TXT: arrived at benchmark AX-309
06/26/2022 23:40:13	45.938478	-129.972055	238.7	1525.2	TXT: placing the MPR

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/26/2022 23:43:00	45.938467	-129.971957	238.7	1525.2	MPR: start pressure measurement
06/27/2022 00:07:49	45.938485	-129.971966	238.7	1525.1	MPR: stop pressure measurement
06/27/2022 00:08:40	45.938486	-129.972036	238.6	1525.1	TXT: recovered MPR
06/27/2022 00:09:20	45.938493	-129.972026	227.5	1524.4	TXT: beginning transit to AX-303 (M33 vent)
06/27/2022 01:12:46	45.933438	-129.981661	263.8	1508.9	TXT: flag in sight
06/27/2022 01:15:52	45.933478	-129.981898	245.6	1509.6	TXT: a crab on the Mini BPR
06/27/2022 01:19:51	45.933446	-129.982256	236.8	1512.8	TXT: arrived at benchmark AX-303
06/27/2022 01:20:01	45.933445	-129.982252	237.6	1512.3	TXT: difficult landing with one thruster out
06/27/2022 01:20:12	45.933445	-129.982245	269.8	1511.8	TXT: crab is still on the benchmark
06/27/2022 01:24:27	45.933416	-129.981827	220.3	1513.5	TXT: placing the MPR
06/27/2022 01:24:51	45.933415	-129.981845	220.3	1513.5	HIGHLIGHTS: 4k highlights start
06/27/2022 01:26:31	45.933423	-129.981866	220.3	1513.5	HIGHLIGHTS: 4k highlights stop
06/27/2022 01:28:07	45.933422	-129.982012	220.3	1513.5	MPR: start pressure measurement
06/27/2022 01:34:02	45.933435	-129.981819	220.4	1513.5	TXT: crab is still here
06/27/2022 01:48:05	45.933430	-129.981748	220.4	1513.6	MPR: stop pressure measurement
06/27/2022 01:48:22	45.933431	-129.981721	220.4	1513.6	TXT: beginning transit to AX-310 (ID)
06/27/2022 02:42:02	45.928108	-129.979366	256.3	1466.4	WATCH_CHANGE: new watchstander Kelli and Sandra and Scott
06/27/2022 03:05:51	45.925940	-129.978031	289.4	1520.1	HIGHLIGHTS: 4k highlights start
06/27/2022 03:06:15	45.925936	-129.978048	194.9	1520.6	VEHICLE: On bottom
06/27/2022 03:10:09	45.925768	-129.978090	105.1	1523.8	TXT: Benchmark AX-310 in sight
06/27/2022 03:22:25	45.925795	-129.977929	294.6	1527.2	HIGHLIGHTS: 4k highlights start
06/27/2022 03:23:36	45.925751	-129.977752	294.8	1527.2	TXT: Arrived at benchmark AX-310 placing MPR on the benchmark
06/27/2022 03:24:27	45.925734	-129.977709	294.8	1527.2	MPR: start pressure measurement
06/27/2022 03:25:07	45.925723	-129.977665	295.3	1527.1	HIGHLIGHTS: 4k highlights stop
06/27/2022 03:31:27	45.925676	-129.977463	295.3	1527.2	HIGHLIGHTS: 4k highlights start
06/27/2022 03:33:25	45.925692	-129.977520	295.1	1527.2	HIGHLIGHTS: 4k highlights stop
06/27/2022 03:45:36	45.925670	-129.977425	295.0	1527.2	MPR: stop pressure measurement
06/27/2022 03:46:02	45.925666	-129.977414	294.6	1527.3	TXT: Taking MPR off of benchmark and securing back onto Jason
06/27/2022 03:49:40	45.925614	-129.977380	345.3	1524.1	TXT: Jason leaving bottom and starting transit to benchmark AX-104 (Bag City)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/27/2022 03:53:07	45.925527	-129.978004	57.9	1513.5	TXT: Jason transiting at about 1400 meters
06/27/2022 05:35:59	45.916914	-129.988085	154.6	1525.5	VEHICLE: On bottom
06/27/2022 05:45:39	45.916289	-129.989138	196.6	1526.4	TXT: Looking for AX-104 benchmark
06/27/2022 05:46:22	45.916258	-129.989163	288.7	1526.4	TXT: Benchmark AX-104 in sight
06/27/2022 05:49:47	45.916148	-129.989291	356.0	1530.1	TXT: Taking MPR off Jason
06/27/2022 05:50:06	45.916148	-129.989278	355.9	1530.1	TXT: Arrived at AX-104
06/27/2022 05:50:12	45.916149	-129.989273	355.6	1530.1	HIGHLIGHTS: 1080 start
06/27/2022 05:51:52	45.916154	-129.989232	353.5	1530.1	TXT: Positioning MPR on benchmark AX-104
06/27/2022 05:55:59	45.916161	-129.989371	352.7	1530.1	MPR: start pressure measurement
06/27/2022 05:56:30	45.916162	-129.989343	352.7	1530.1	HIGHLIGHTS: 1080 stop
06/27/2022 06:03:27	45.916179	-129.989390	354.6	1530.1	HIGHLIGHTS: 4k highlights start
06/27/2022 06:06:43	45.916189	-129.989329	357.5	1530.1	HIGHLIGHTS: 4k highlights stop
06/27/2022 06:16:06	45.916119	-129.989035	358.1	1530.1	MPR: stop pressure measurement
06/27/2022 06:16:36	45.916116	-129.989028	356.0	1530.1	TXT: Placing MPR back onto Jason
06/27/2022 06:17:54	45.916118	-129.988987	355.7	1530.1	HIGHLIGHTS: 4k highlights start
06/27/2022 06:20:55	45.916172	-129.989462	356.2	1530.1	TXT: When MPR placed on benchmark it may have had something under it so observing to see if new measurement needs to be taken
06/27/2022 06:21:19	45.916169	-129.989422	356.7	1530.1	HIGHLIGHTS: 4k highlights stop
06/27/2022 06:22:18	45.916157	-129.989447	358.4	1530.1	TXT: Going to try using suction on Jason to slurp off possible concrete chunk on benchmark that causes wobble when MPR is placed on it
06/27/2022 06:24:21	45.916152	-129.989485	0.5	1530.1	HIGHLIGHTS: 4k highlights start
06/27/2022 06:26:50	45.916145	-129.988989	0.0	1530.1	TXT: Done suctioning now will attempt to place MPR on benchmark again
06/27/2022 06:26:58	45.916144	-129.989053	0.0	1530.1	HIGHLIGHTS: 4k highlights stop
06/27/2022 06:30:20	45.916116	-129.989030	355.3	1530.1	TXT: MPR placed on benchmark again but not sure if it still is wobbling
06/27/2022 06:33:10	45.916116	-129.988973	355.5	1530.1	MPR: start pressure measurement
06/27/2022 06:33:44	45.916119	-129.988956	355.3	1530.1	TXT: MPR seems to be fully on benchmark without wobble so measurement is being repeated at benchmark AX-104
06/27/2022 06:45:40	45.916120	-129.989024	357.3	1530.1	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/27/2022 06:57:40	45.916118	-129.988989	359.4	1530.1	MPR: stop pressure measurement
06/27/2022 06:58:46	45.916120	-129.988904	356.2	1530.1	TXT: Jason has removed the MPR from benchmark AX-104 and secured it in the holster

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/27/2022 07:00:43	45.916122	-129.988973	65.6	1522.9	TXT: We are beginning our transit to benchmark AX-308
06/27/2022 09:15:18	45.931536	-129.998405	285.9	1528.3	TXT: Benchmark AX-308 is in sight.
06/27/2022 09:22:27	45.931559	-129.998673	271.1	1529.9	TXT: Jason has placed the MPR on benchmark AX-308
06/27/2022 09:23:05	45.931560	-129.998677	271.1	1529.9	MPR: start pressure measurement
06/27/2022 09:48:33	45.931566	-129.998613	271.0	1529.7	MPR: stop pressure measurement
06/27/2022 09:49:28	45.931559	-129.998617	271.0	1529.7	TXT: Jason has removed the benchmark from AX-308 and secured it in the holster.
06/27/2022 09:50:06	45.931570	-129.998498	273.0	1529.3	TXT: We are beginning our transit to AX-106 (ASHES)
06/27/2022 10:47:19	45.933040	-130.008437	27.1	1480.7	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/27/2022 11:06:14	45.933990	-130.011443	3.0	1535.8	VEHICLE: On bottom
06/27/2022 11:11:33	45.934402	-130.011555	41.4	1537.3	TXT: arrived at benchmark AX-106 (ASHES)
06/27/2022 11:14:02	45.934403	-130.011523	75.7	1539.5	TXT: placing the MPR
06/27/2022 11:14:59	45.934401	-130.011537	75.7	1539.5	TXT: adjusting the MPR on the benchmark
06/27/2022 11:17:09	45.934411	-130.011458	75.6	1539.5	MPR: start pressure measurement
06/27/2022 11:25:29	45.934442	-130.011160	75.6	1539.4	TXT: looking at the flag pole biology
06/27/2022 11:27:42	45.934406	-130.011405	75.6	1539.4	TXT: looking at brittle stars
06/27/2022 11:27:51	45.934407	-130.011408	75.6	1539.4	Framegrab: brittle stars
06/27/2022 11:30:14	45.934409	-130.011409	75.6	1539.4	Framegrab: fish
06/27/2022 11:31:19	45.934415	-130.011388	75.6	1539.3	Framegrab: shrimp
06/27/2022 11:33:25	45.934397	-130.011571	75.6	1539.3	Framegrab: spiky cucumber
06/27/2022 11:34:15	45.934399	-130.011624	75.6	1539.3	Framegrab: spiky cucumber close up
06/27/2022 11:37:28	45.934401	-130.011609	75.6	1539.3	MPR: stop pressure measurement
06/27/2022 11:38:25	45.934403	-130.011611	75.6	1539.3	TXT: recovering the MPR
06/27/2022 11:41:26	45.934407	-130.011416	74.8	1539.3	TXT: beginning transit to benchmark AX-307
06/27/2022 13:10:34	45.945204	-130.009092	350.7	1533.3	VEHICLE: On bottom
06/27/2022 13:14:00	45.945299	-130.009022	77.6	1537.0	TXT: we are looking for the benchmark
06/27/2022 13:15:31	45.945315	-130.008959	101.3	1537.2	TXT: found the benchmark
06/27/2022 13:15:46	45.945324	-130.008926	103.2	1537.2	TXT: arrived at benchmark AX-307
06/27/2022 13:19:02	45.945326	-130.008800	176.3	1540.5	TXT: placing the MPR
06/27/2022 13:21:02	45.945323	-130.008652	176.2	1540.5	TXT: successfully removed brittle stars

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06/27/2022 13:21:13	45.945323	-130.008645	176.2	1540.5	TXT: adjusting the MPR
06/27/2022 13:22:56	45.945326	-130.008631	176.2	1540.5	MPR: start pressure measurement
06/27/2022 13:25:32	45.945331	-130.008758	176.2	1540.5	Framegrab: urchin
06/27/2022 13:27:12	45.945327	-130.008650	176.2	1540.5	Framegrab: sea star on the flag
06/27/2022 13:34:21	45.945328	-130.008894	176.2	1540.5	Framegrab: spiky cucumber
06/27/2022 13:42:07	45.945334	-130.008792	176.2	1540.5	MPR: stop pressure measurement
06/27/2022 13:42:19	45.945333	-130.008797	176.2	1540.5	TXT: recovering the MPR
06/27/2022 13:43:40	45.945332	-130.008780	176.1	1540.5	TXT: beginning transit to benchmark AX-101 (Caldera Center)
06/27/2022 14:51:17	45.952466	-130.009685	83.9	1491.2	WATCH_CHANGE: new watchstanders Sandra and Kelli and Scott
06/27/2022 15:07:28	45.954601	-130.010001	82.3	1491.2	TXT: jason beginning descent from transit depth to start looking for benchmark AX-101
06/27/2022 15:18:15	45.955198	-130.009766	123.2	1525.7	TXT: Benchmark AX-101 in sight
06/27/2022 15:21:02	45.955173	-130.009574	226.9	1528.0	TXT: Benchmark location seems like it is to the east from what is on the map
06/27/2022 15:21:44	45.955168	-130.009537	232.9	1528.5	TXT: Jason on bottom at benchmark AX-101
06/27/2022 15:22:21	45.955169	-130.009499	233.0	1528.5	TXT: Sentry's transducer is about to be used (preparing for Sentry recovery)
06/27/2022 15:22:59	45.955174	-130.009528	236.4	1528.5	TXT: Jason is removing bungee cord from MPR
06/27/2022 15:23:33	45.955174	-130.009543	234.9	1528.5	TXT: Jason is picking up the MPR from the holster
06/27/2022 15:24:47	45.955166	-130.009535	236.1	1528.5	TXT: Jason trying to wave the MPR around to make the sea creatures on the benchmark to move
06/27/2022 15:24:49	45.955166	-130.009535	236.3	1528.5	HIGHLIGHTS: 4k highlights start
06/27/2022 15:27:00	45.955161	-130.009460	234.2	1528.6	HIGHLIGHTS: 4k highlights stop
06/27/2022 15:27:41	45.955168	-130.009445	245.5	1528.3	TXT: jason is off bttom to reposition to get a better angle for removing a brittle star in the groove on the benchmark
06/27/2022 15:31:00	45.955165	-130.009533	227.3	1528.6	TXT: jason back on bottom
06/27/2022 15:31:29	45.955164	-130.009548	227.3	1528.6	TXT: jason waving the MPR around again to get the brittle star to move
06/27/2022 15:33:19	45.955166	-130.009516	227.3	1528.6	TXT: the brittle star has been moved. Placing the MPR down on concrete benchmark AX-101
06/27/2022 15:34:04	45.955169	-130.009507	227.4	1528.6	TXT: Jason is nudging the MPR to get it firmly in the groove
06/27/2022 15:34:10	45.955170	-130.009511	227.9	1528.6	MPR: start pressure measurement
06/27/2022 15:39:19	45.955152	-130.009555	228.7	1528.6	HIGHLIGHTS: 4k highlights start
06/27/2022 15:41:26	45.955180	-130.009629	228.9	1528.6	HIGHLIGHTS: 4k highlights stop
06/27/2022 15:54:18	45.955125	-130.009518	228.8	1528.7	MPR: stop pressure measurement

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/27/2022 15:54:53	45.955135	-130.009536	228.4	1528.7	TXT: jason picking up the MPR from benchmark AX-101
06/27/2022 15:55:42	45.955145	-130.009540	228.4	1528.8	TXT: Jason placing the MPR back in its holster
06/27/2022 15:56:03	45.955151	-130.009546	228.4	1528.8	TXT: Jason placing bungee cord over the MPR
06/27/2022 15:57:29	45.955109	-130.009520	44.0	1524.6	TXT: Beginning transit to benchmark AX-302 (Trevi)
06/27/2022 16:10:08	45.954617	-130.008401	59.6	1491.4	TXT: Stopping to recover Sentry first. We will arrive at the Sentry pickup point in 30 minutes
06/27/2022 17:04:35	45.953476	-130.006364	34.9	1491.3	TXT: Sentry has been recovered and is strapped down on deck
06/27/2022 17:08:37	45.953451	-130.006406	33.8	1491.3	TXT: Resuming transit to AX-302 (Trevi)
06/27/2022 18:03:33	45.950164	-129.998829	46.7	1483.7	NAV: Doppler Reset
06/27/2022 18:46:01	45.947196	-129.990930	35.5	1483.6	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/27/2022 19:37:14	45.946470	-129.983133	194.5	1514.0	TXT: Benchmark AX-302 is in sight
06/27/2022 19:42:30	45.946331	-129.983242	242.0	1518.6	Framegrab: Massive crab at AX-302
06/27/2022 19:42:40	45.946331	-129.983251	242.6	1518.6	TXT: Jason has removed the MPR from the MPR holster and placed it on benchmark AX-302
06/27/2022 19:44:02	45.946372	-129.983354	246.8	1518.6	MPR: start pressure measurement
06/27/2022 20:06:12	45.946357	-129.983592	251.0	1518.6	MPR: stop pressure measurement
06/27/2022 20:07:41	45.946361	-129.983698	251.0	1518.6	TXT: Jason has removed the MPR and secured it in the holster.
06/27/2022 20:08:21	45.946345	-129.983714	253.3	1518.7	TXT: We are beginning transit to benchmark AX-309.
06/27/2022 21:34:38	45.938442	-129.972184	120.3	1519.1	TXT: Benchmark AX-309 in sight.
06/27/2022 21:43:39	45.938515	-129.972055	243.4	1525.7	TXT: Jason has placed the MPR on the benchmark.
06/27/2022 21:45:00	45.938486	-129.972070	243.4	1525.7	MPR: start pressure measurement
06/27/2022 21:50:25	45.938469	-129.972046	243.4	1525.7	Framegrab: Sea Pig
06/27/2022 21:55:33	45.938467	-129.972088	243.4	1525.7	HIGHLIGHTS: 4k highlights start
06/27/2022 21:57:53	45.938431	-129.972083	243.4	1525.7	HIGHLIGHTS: 4k highlights stop
06/27/2022 22:06:46	45.938466	-129.971962	243.4	1525.7	MPR: stop pressure measurement
06/27/2022 22:08:01	45.938459	-129.971997	243.4	1525.7	TXT: Jason has removed the MPR and secured it in the holster.
06/27/2022 22:08:30	45.938464	-129.971993	240.1	1524.7	TXT: We have begun the transit to AX-303 (M33 vent)
06/27/2022 23:14:11	45.933375	-129.982051	335.3	1511.1	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/27/2022 23:14:19	45.933373	-129.982064	349.9	1511.2	VEHICLE: On bottom
06/27/2022 23:15:36	45.933351	-129.982138	335.9	1511.2	TXT: arrived at benchmark AX-303
06/27/2022 23:22:11	45.933390	-129.982162	193.5	1510.3	TXT: difficult moving to the site with one thruster out

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/27/2022 23:23:27	45.933427	-129.982198	188.1	1513.8	TXT: placing the MPR
06/27/2022 23:26:27	45.933456	-129.982161	179.0	1513.8	TXT: adjusting the MPR
06/27/2022 23:32:08	45.933406	-129.982249	179.9	1513.8	MPR: start pressure measurement
06/27/2022 23:51:58	45.933432	-129.982198	179.9	1513.7	MPR: stop pressure measurement
06/27/2022 23:52:05	45.933434	-129.982196	180.1	1513.7	TXT: recovering the MPR
06/27/2022 23:54:35	45.933419	-129.982182	181.1	1513.5	TXT: beginning transit to Diva Vent (ID) to swap HOBO temp probes there
06/28/2022 00:50:54	45.926624	-129.978988	193.6	1516.4	VEHICLE: On bottom
06/28/2022 00:54:32	45.926424	-129.979021	196.2	1513.2	TXT: arrived at Diva Vent
06/28/2022 00:54:49	45.926416	-129.979016	194.0	1514.0	TXT: the marker at Diva Vent is 232
06/28/2022 00:56:05	45.926382	-129.979010	202.6	1516.6	TXT: setting down at Diva Vent
06/28/2022 00:57:03	45.926383	-129.979006	216.2	1519.0	TXT: landed at Diva Vent
06/28/2022 00:58:05	45.926393	-129.978983	211.2	1518.7	TXT: examining Diva Vent
06/28/2022 00:58:14	45.926392	-129.978983	211.6	1518.7	Framegrab: diva vent
06/28/2022 00:59:10	45.926373	-129.979001	211.6	1518.7	HIGHLIGHTS: 4k highlights start
06/28/2022 01:04:50	45.926361	-129.979023	210.5	1518.7	HIGHLIGHTS: 4k highlights stop
06/28/2022 01:06:52	45.926391	-129.978981	209.1	1518.7	TXT: grabbing the HOBO temp probe at Diva Vent (HOBO 153)
06/28/2022 01:07:08	45.926391	-129.978978	209.1	1518.6	HIGHLIGHTS: 4k highlights start
06/28/2022 01:07:35	45.926390	-129.978977	209.0	1518.7	TXT: Diva Vent Hobo placed beside the vent
06/28/2022 01:07:50	45.926386	-129.978982	207.4	1518.6	TXT: removing replacement hobo from the basket
06/28/2022 01:07:56	45.926384	-129.978984	208.2	1518.7	HIGHLIGHTS: 4k highlights stop
06/28/2022 01:08:55	45.926364	-129.978995	207.8	1518.7	TXT: replacement hobo freed from pull pin
06/28/2022 01:09:28	45.926378	-129.978980	207.4	1518.7	TXT: picking up replacement hobo
06/28/2022 01:09:57	45.926395	-129.978971	207.8	1518.7	TXT: HOBO 130 is the replacement to be deployed
06/28/2022 01:10:45	45.926383	-129.978991	208.9	1518.7	HIGHLIGHTS: 4k highlights start
06/28/2022 01:11:24	45.926351	-129.979019	208.8	1518.7	TXT: placing HOBO 130 in Diva Vent
06/28/2022 01:12:06	45.926340	-129.979023	209.2	1518.7	TXT: set down HOBO 130 but it fell out
06/28/2022 01:12:17	45.926341	-129.979022	209.3	1518.7	TXT: trying to place HOBO 130 again
06/28/2022 01:13:16	45.926353	-129.979033	209.1	1518.7	TXT: discussing HOBO 130s ideal placement
06/28/2022 01:13:40	45.926348	-129.979032	208.7	1518.7	TXT: making another attempt

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06/28/2022 01:16:59	45.926355	-129.979027	207.9	1518.7	TXT: continuing to try to place the HOBO
06/28/2022 01:17:41	45.926362	-129.979031	209.1	1518.6	TXT: examining HOBO 130 placement at Diva vent
06/28/2022 01:18:48	45.926345	-129.979038	209.5	1518.6	TXT: discussing placement
06/28/2022 01:19:09	45.926345	-129.979034	207.6	1518.7	TXT: making an adjustment
06/28/2022 01:20:24	45.926366	-129.979015	211.9	1518.6	TXT: cant reach the HOBO well with the right arm. trying the left
06/28/2022 01:21:12	45.926372	-129.978993	209.6	1518.6	TXT: HOBO continues to fall over and out of the vent when placed on the ground
06/28/2022 01:22:33	45.926344	-129.979040	210.3	1518.6	TXT: HOBO 130 is placed in the vent
06/28/2022 01:23:42	45.926378	-129.978994	209.4	1518.6	TXT: going to grab the original Diva Vent HOBO 153 and put it in the basket
06/28/2022 01:24:02	45.926379	-129.978993	209.1	1518.7	TXT: recovering HOBO 153
06/28/2022 01:26:30	45.926373	-129.979008	208.8	1518.7	TXT: securing HOBO 153 in the basket
06/28/2022 01:27:18	45.926374	-129.979007	209.0	1518.6	TXT: HOBO 153 is recovered and secured
06/28/2022 01:27:46	45.926380	-129.979004	210.7	1518.7	TXT: going to fly over to El Guapo vent and have a look at it
06/28/2022 01:32:01	45.926404	-129.979238	309.4	1507.4	TXT: passing the 9m chimney
06/28/2022 01:32:38	45.926410	-129.979332	313.1	1507.4	TXT: passing Hermosa chimney
06/28/2022 01:33:42	45.926406	-129.979473	334.4	1507.6	TXT: looking at El Guapo Vent
06/28/2022 01:34:28	45.926410	-129.979480	358.4	1507.4	HIGHLIGHTS: 4k highlights start
06/28/2022 01:36:02	45.926462	-129.979484	354.7	1506.8	TXT: Might put a HOBO in El Guapo on the next dive. Want to look at the top to see what it looks like
06/28/2022 01:37:47	45.926476	-129.979480	355.1	1498.4	HIGHLIGHTS: 4k highlights stop
06/28/2022 01:38:38	45.926497	-129.979482	357.2	1498.7	HIGHLIGHTS: 4k highlights start
06/28/2022 01:39:53	45.926496	-129.979487	356.1	1498.8	TXT: going back down the side of el Guapo chimney
06/28/2022 01:40:11	45.926497	-129.979481	357.0	1499.8	TXT: Next stop is Castle Vent to recover another HOBO temperature probe
06/28/2022 01:45:01	45.926447	-129.979536	352.9	1512.5	HIGHLIGHTS: 4k highlights stop
06/28/2022 01:45:43	45.926468	-129.979511	356.3	1512.9	HIGHLIGHTS: 4k highlights start
06/28/2022 01:46:59	45.926648	-129.979256	350.0	1513.3	TXT: Saw Marker 285 at the base of El Guapo
06/28/2022 01:47:10	45.926643	-129.979256	353.9	1513.3	HIGHLIGHTS: 4k highlights stop
06/28/2022 01:47:34	45.926625	-129.979269	356.1	1513.4	TXT: heading to Castle Chimney
06/28/2022 01:55:21	45.926186	-129.979867	1.7	1513.1	TXT: passing by a marker and a bucket near flat top
06/28/2022 01:55:52	45.926239	-129.979847	24.7	1512.9	TXT: examining a white area on one of the vents

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06/28/2022 01:56:32	45.926223	-129.979923	72.4	1512.9	TXT: arrived at Castle vent
06/28/2022 01:56:40	45.926215	-129.979944	61.2	1512.7	TXT: found the HOBO at Castle Vent
06/28/2022 01:56:52	45.926202	-129.979970	61.8	1512.5	TXT: we are going to be recovering the HOBO here but not deploying a new one
06/28/2022 01:57:03	45.926185	-129.979989	56.1	1512.2	HIGHLIGHTS: 4k highlights start
06/28/2022 01:58:11	45.926183	-129.979946	47.0	1513.4	TXT: landing
06/28/2022 01:58:54	45.926217	-129.979939	53.6	1514.5	HIGHLIGHTS: 4k highlights stop
06/28/2022 01:59:41	45.926211	-129.979955	50.7	1514.8	TXT: discussing how best to retrieve the HOBO (which is MISO 101)
06/28/2022 02:00:11	45.926219	-129.979957	50.6	1514.8	TXT: the pilot is going to grab the HOBO's tube because he doesn't believe he can get at the body of the instrument
06/28/2022 02:00:49	45.926214	-129.979963	50.5	1514.8	Framegrab: happy tubeworms
06/28/2022 02:01:19	45.926229	-129.979913	49.4	1514.9	TXT: attempting to recover the HOBO
06/28/2022 02:02:12	45.926211	-129.979928	46.9	1514.8	TXT: picking up the HOBO
06/28/2022 02:02:51	45.926192	-129.979978	47.6	1514.8	TXT: we were not initially planning to retrieve this HOBO so theres some issue with where to put it in the Jason basket
06/28/2022 02:02:59	45.926187	-129.979986	47.7	1514.8	TXT: HOBO (MISO 101) has been recovered
06/28/2022 02:04:46	45.926151	-129.980019	49.3	1514.8	HIGHLIGHTS: 4k highlights start - Castle vent
06/28/2022 02:07:38	45.926184	-129.979953	49.4	1514.8	HIGHLIGHTS: 4k highlights stop
06/28/2022 02:08:25	45.926188	-129.979955	48.2	1512.5	HIGHLIGHTS: 4k highlights start
06/28/2022 02:09:23	45.926170	-129.980007	45.2	1507.4	TXT: looking at Castle Vent chimney
06/28/2022 02:09:25	45.926170	-129.980008	46.7	1507.3	Framegrab: Castle Vent
06/28/2022 02:12:13	45.926224	-129.980035	144.8	1507.4	Framegrab: crab in the castle
06/28/2022 02:12:30	45.926229	-129.980034	159.0	1507.4	Framegrab: crab in the castle 2
06/28/2022 02:13:13	45.926240	-129.980013	194.5	1507.4	Framegrab: crab in the castle 3
06/28/2022 02:13:47	45.926242	-129.980004	220.8	1507.4	HIGHLIGHTS: 4k highlights stop
06/28/2022 02:15:22	45.926269	-129.979960	188.7	1505.4	TXT: beginning transit to benchmark AX-310
06/28/2022 02:42:50	45.925817	-129.977999	98.8	1520.2	VEHICLE: On bottom
06/28/2022 02:45:02	45.925843	-129.977943	96.5	1523.3	WATCH_CHANGE: new watchstanders Sandra and Kelli and Scott
06/28/2022 02:49:21	45.925770	-129.977899	302.7	1526.8	TXT: Arrived at benchmark AX-310
06/28/2022 02:49:31	45.925771	-129.977900	302.7	1526.8	TXT: Removing bungee cord from the MPR
06/28/2022 02:49:48	45.925770	-129.977899	302.8	1526.8	HIGHLIGHTS: 1080 start

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/28/2022 02:51:22	45.925789	-129.977838	303.0	1526.8	TXT: Placing MPR on the benchmark
06/28/2022 02:51:39	45.925790	-129.977834	302.8	1526.8	TXT: Waving MPR around to move brittlestars
06/28/2022 02:57:10	45.925784	-129.977838	302.7	1526.8	HIGHLIGHTS: 1080 stop
06/28/2022 02:59:58	45.925781	-129.977841	302.5	1526.8	TXT: Brittlestars have evacuated the benchmark. The MPR has been set down into the groove.
06/28/2022 03:01:42	45.925786	-129.977840	302.9	1526.8	MPR: start pressure measurement
06/28/2022 03:21:10	45.925798	-129.977839	302.4	1526.9	MPR: stop pressure measurement
06/28/2022 03:22:02	45.925794	-129.977837	302.0	1526.9	TXT: Jason removing MPR from benchmark AX-310
06/28/2022 03:22:39	45.925790	-129.977839	301.6	1527.0	TXT: Placing the MPR in the holster
06/28/2022 03:22:55	45.925788	-129.977841	301.8	1527.0	TXT: Placing the bungee cord back over the MPR
06/28/2022 03:23:33	45.925780	-129.977849	303.9	1526.6	TXT: Pulling away from benchmark AX-310
06/28/2022 03:24:42	45.925770	-129.977875	314.2	1527.3	TXT: Bringing the basket out to see where the HOBO being carried by the left swingarm should be placed.
06/28/2022 03:25:46	45.925774	-129.977887	314.8	1527.3	TXT: Placing the HOBO down in the basket
06/28/2022 03:27:13	45.925777	-129.977873	318.7	1523.2	TXT: HOBO (MISO 101) has been stowed in the left milk crate
06/28/2022 03:28:25	45.925769	-129.977859	315.5	1523.4	TXT: Beginning transit to benchmark AX-104 (Bag City)
06/28/2022 03:33:42	45.925522	-129.978198	316.8	1501.6	NAV: Doppler Reset
06/28/2022 05:09:36	45.916766	-129.989917	256.1	1522.9	TXT: Jason on the bottom and beginning to look for benchmark AX-104
06/28/2022 05:15:43	45.916249	-129.989349	269.7	1525.8	TXT: AX-104 in sight
06/28/2022 05:18:35	45.916209	-129.989376	330.8	1529.8	TXT: jason on the bottom at benchmark AX-104
06/28/2022 05:19:16	45.916208	-129.989376	330.8	1529.8	VEHICLE: On bottom
06/28/2022 05:19:45	45.916202	-129.989381	329.7	1529.9	TXT: jasons right arm is removing the bungee cord from the MPR
06/28/2022 05:20:14	45.916199	-129.989382	330.1	1529.9	TXT: jasons right arm is taking the MPR out of the holster
06/28/2022 05:20:56	45.916203	-129.989378	329.6	1529.9	TXT: jason's right arm is carrying the MPR to benchmark AX-104.
06/28/2022 05:21:10	45.916205	-129.989376	329.6	1529.9	TXT: Placing the MPR in the groove on the benchmark. No brittlestars here to move
06/28/2022 05:22:38	45.916202	-129.989378	329.7	1529.9	TXT: The MPR is in place on concrete benchmark AX-104
06/28/2022 05:22:44	45.916202	-129.989377	329.6	1529.9	MPR: start pressure measurement
06/28/2022 05:35:06	45.916259	-129.989338	329.7	1529.9	HIGHLIGHTS: 4k highlights start
06/28/2022 05:37:34	45.916242	-129.989354	329.5	1529.9	HIGHLIGHTS: 4k highlights stop
06/28/2022 05:42:13	45.916276	-129.989335	329.5	1529.9	MPR: stop pressure measurement

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/28/2022 05:42:52	45.916349	-129.989294	329.4	1529.9	TXT: Jason's right arm picking up the MPR
06/28/2022 05:43:07	45.916365	-129.989283	329.4	1530.0	TXT: Placing the MPR in the holster
06/28/2022 05:43:37	45.916363	-129.989277	329.1	1530.0	TXT: Placing the bungee cord over the MPR
06/28/2022 05:44:53	45.916504	-129.989195	329.9	1528.6	TXT: Pulling away from benchmark AX-104
06/28/2022 05:45:06	45.916516	-129.989204	335.7	1528.7	TXT: Beginning transit to Vixen vent
06/28/2022 06:10:57	45.917467	-129.992686	339.5	1505.0	NAV: Doppler Reset
06/28/2022 06:14:40	45.917504	-129.992781	314.8	1528.8	TXT: Marker 218 in sight at Vixen vent
06/28/2022 06:16:10	45.917470	-129.992899	322.3	1530.1	HIGHLIGHTS: 4k highlights start
06/28/2022 06:16:47	45.917481	-129.992939	275.0	1529.9	TXT: Marker 122 also in sight next to a chimney.
06/28/2022 06:17:25	45.917434	-129.992932	265.1	1529.0	HIGHLIGHTS: 4k highlights stop
06/28/2022 06:17:36	45.917414	-129.992925	272.7	1528.8	TXT: Looking around the area near markers 218 and 122
06/28/2022 06:21:40	45.917225	-129.992826	303.6	1528.4	TXT: Marker 122 in sight.
06/28/2022 06:23:07	45.917462	-129.992845	22.6	1528.1	TXT: Scott says marker 57 must be a relic name
06/28/2022 06:23:31	45.917605	-129.992746	24.5	1529.8	TXT: Marker 218 in sight at Vixen vent
06/28/2022 06:23:44	45.917628	-129.992722	24.9	1530.6	HIGHLIGHTS: 4k highlights start
06/28/2022 06:23:56	45.917630	-129.992718	16.0	1531.8	TXT: Jason is landing near Vixen vent.
06/28/2022 06:24:28	45.917580	-129.992739	27.4	1532.5	TXT: Jason on the ground at Vixen vent
06/28/2022 06:24:30	45.917573	-129.992743	27.4	1532.5	VEHICLE: On bottom
06/28/2022 06:25:37	45.917543	-129.992777	27.4	1532.5	TXT: Deciding which order is best for HOB0 placement and recovery
06/28/2022 06:26:19	45.917499	-129.992805	28.1	1532.4	HIGHLIGHTS: 4k highlights stop
06/28/2022 06:26:22	45.917494	-129.992808	28.2	1532.4	HIGHLIGHTS: 4k highlights start
06/28/2022 06:27:17	45.917589	-129.992756	29.0	1532.4	TXT: Jason's left arm picking up/recovering HOB0 103 from Vixen
06/28/2022 06:27:42	45.917600	-129.992758	29.0	1532.4	TXT: HOB0 (MISO 103) set down on the basket but not yet properly stowed
06/28/2022 06:28:54	45.917459	-129.992836	29.0	1532.5	HIGHLIGHTS: 4k highlights stop
06/28/2022 06:29:39	45.917524	-129.992788	29.1	1532.4	HIGHLIGHTS: 4k highlights start
06/28/2022 06:32:09	45.917363	-129.992891	29.1	1532.4	TXT: Jason's right arm placing unknown HOB0 into the vent (HOB0 was not shown to the camera before placement)
06/28/2022 06:33:08	45.917516	-129.992782	29.2	1532.4	TXT: Unknown HOB0 has been placed in the vent
06/28/2022 06:34:05	45.917539	-129.992776	29.2	1532.5	HIGHLIGHTS: 4k highlights stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/28/2022 06:34:24	45.917531	-129.992793	29.4	1532.5	TXT: The HOBO placed at Vixen is MISO 102
06/28/2022 06:35:50	45.917594	-129.992740	30.0	1532.4	TXT: Jasons right arm took HOBO 129 out of the basket so it's ready to deploy at the next site
06/28/2022 06:35:55	45.917598	-129.992737	30.0	1532.4	HIGHLIGHTS: 4k highlights start
06/28/2022 06:37:15	45.917615	-129.992746	29.9	1532.4	TXT: Jason's left arm moving recovered HOBO (MISO 103) to a better location in the basket
06/28/2022 06:37:16	45.917614	-129.992747	29.9	1532.4	HIGHLIGHTS: 4k highlights stop
06/28/2022 06:40:34	45.917581	-129.992765	30.3	1532.4	TXT: HOBO 103 has been stowed on the bracket that previously held the HOBOS that were removed (120 and 129)
06/28/2022 06:42:06	45.917651	-129.992716	30.2	1532.5	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/28/2022 06:44:54	45.917641	-129.992735	32.4	1530.6	TXT: Transiting to Casper vent to deploy another HOBO temperature probe
06/28/2022 06:48:16	45.917542	-129.992854	70.4	1532.5	TXT: Arrived on site at Casper vent (MKR-128)
06/28/2022 06:48:30	45.917473	-129.992918	70.5	1532.5	TXT: Jason is deploying the HOBO (MISO 129) at Casper vent.
06/28/2022 06:48:49	45.917432	-129.992958	70.9	1532.5	HIGHLIGHTS: 4k highlights start
06/28/2022 06:50:29	45.917508	-129.992899	71.4	1532.5	HIGHLIGHTS: 4k highlights stop
06/28/2022 06:51:50	45.917478	-129.992929	61.0	1532.6	TXT: Jason has had some difficulty deploying the HOBO securely in the vent and has repositioned to try again.
06/28/2022 06:52:08	45.917462	-129.992939	63.0	1532.6	HIGHLIGHTS: 4k highlights start
06/28/2022 06:54:21	45.917472	-129.992933	66.0	1532.6	HIGHLIGHTS: 4k highlights stop
06/28/2022 06:55:22	45.917462	-129.992943	70.5	1532.6	TXT: Jason has deployed MISO-129 as securely as possible in the Casper vent.
06/28/2022 06:57:02	45.917671	-129.992841	39.1	1521.0	TXT: We are beginning the transit to benchmark AX-308
06/28/2022 08:49:03	45.931623	-129.998438	301.9	1529.5	TXT: Benchmark AX--308 in sight.
06/28/2022 08:57:08	45.931816	-129.998536	278.0	1530.4	TXT: Arrived on site at AX-308.
06/28/2022 08:58:35	45.931819	-129.998547	276.7	1530.4	TXT: Jason has placed the MPR on benchmark AX-308
06/28/2022 08:59:11	45.931803	-129.998555	276.7	1530.4	MPR: start pressure measurement
06/28/2022 09:18:12	45.931687	-129.998628	276.4	1530.2	TXT: A fish got caught in one of the vertical thrusters and the MPR was pulled from the benchmark onto the seafloor
06/28/2022 09:18:23	45.931688	-129.998632	276.3	1530.2	MPR: stop pressure measurement
06/28/2022 09:18:41	45.931678	-129.998632	276.5	1530.2	TXT: MPR measurement was stopped as the instrument was pulled off of the benchmark
06/28/2022 09:20:16	45.931624	-129.998584	276.5	1530.2	TXT: Instrument seems to be okay and Jason has secured it back in the holster
06/28/2022 09:21:38	45.931511	-129.998564	298.7	1528.5	TXT: We've left the scene of the crime
06/28/2022 09:29:43	45.931223	-129.998810	320.7	1530.7	TXT: We have finished primary science objectives for this dive and are waiting for watch change to wake others for Jason recovery.

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1431 Logger Comment
06/28/2022 09:30:48	45.931185	-129.998810	318.1	1530.7	TXT: This is being used as an opportunity to train new Jason pilots
06/28/2022 09:40:06	45.931231	-129.998768	318.9	1530.7	TXT: Future pilot is learning to pick up rocks
06/28/2022 09:50:13	45.930884	-129.998432	217.3	1530.4	VEHICLE: Off bottom
06/28/2022 09:50:37	45.930906	-129.998370	266.9	1519.8	TXT: Jason is beginning to ascend for recovery.
06/28/2022 10:48:07	45.931422	-129.996995	301.3	36.8	WATCH_CHANGE: new watchstander Kelly Chadwick
06/28/2022 10:48:32	45.931436	-129.996962	214.5	25.9	TXT: taking off the floats
06/28/2022 10:53:55	45.931700	-129.996734	222.6	3.1	VEHICLE: on surface
06/28/2022 10:57:06	45.932731	-129.996239	26.2	1.5	VEHICLE: Jason on deck

ROV Jason dive J2-1432 Dive Log (edited/corrected from Jason Virtual Van after renav)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/29/2022 15:04:08	45.750026	-130.200001	59.86	1.12	HIGHLIGHTS: 4k highlights start
06/29/2022 15:04:28	45.750026	-130.200001	99.72	1.2	TXT: Jason leaving deck
06/29/2022 15:07:09	45.954102	-130.008488	234.1	2.91	VEHICLE: Jason off deck. Diving at benchmark AX-101
06/29/2022 15:07:22	45.954102	-130.008488	244.83	4.23	VEHICLE: Jason in water. Plan for this dive is to make pressure measurements at the new benchmarks along the west and east caldera faults
06/29/2022 15:08:18	45.954102	-130.008488	232.59	8.84	HIGHLIGHTS: 4k highlights stop
06/29/2022 15:08:43	45.954102	-130.008488	242.21	8.87	HIGHLIGHTS: 1080 stop
06/29/2022 15:13:57	45.954133	-130.008386	238.3	26.5	TXT: Last float down
06/29/2022 15:29:41	45.954242	-130.007438	238.59	401.02	TXT: In transit to benchmark AX-101. Watchstanders are Sandra and Kelli and Scott.
06/29/2022 16:02:53	45.954765	-130.009767	323.2	1333.86	NAV: Doppler Reset
06/29/2022 16:16:02	45.954925	-130.009801	1.01	1521.02	VEHICLE: On bottom
06/29/2022 16:17:05	45.955061	-130.009823	326.22	1525.61	TXT: Benchmark AX-101 in sight
06/29/2022 16:18:23	45.955167	-130.009928	249.55	1527.61	TXT: Arrived at AX-101
06/29/2022 16:20:02	45.955166	-130.009947	241.8	1528.33	TXT: Jason removing MPR and placing on benchmark
06/29/2022 16:21:55	45.955169	-130.009949	241.15	1528.33	TXT: Positioning MPR on benchmark AX-101
06/29/2022 16:23:16	45.955169	-130.009971	241.65	1528.33	MPR: start pressure measurement
06/29/2022 16:43:08	45.955183	-130.009974	241.86	1528.45	MPR: stop pressure measurement
06/29/2022 16:44:24	45.955184	-130.009968	241.58	1528.48	TXT: Placing MPR back onto Jason
06/29/2022 16:46:12	45.955161	-130.009984	240.97	1528.16	TXT: Jason leaving AX-101 and transiting to base of west caldera wall and to reposition new benchmark AX-403
06/29/2022 16:55:30	45.954698	-130.010713	236.05	1526.08	HIGHLIGHTS: 4k highlights start
06/29/2022 16:58:44	45.954636	-130.010780	238.78	1526	HIGHLIGHTS: 4k highlights stop
06/29/2022 17:00:16	45.954572	-130.010992	237.28	1525.48	HIGHLIGHTS: 4k highlights start
06/29/2022 17:01:18	45.954569	-130.011026	239.13	1525.53	HIGHLIGHTS: 4k highlights stop
06/29/2022 18:15:21	45.948882	-130.022933	248.26	1546.44	TXT: Benchmark AX-403 in sight
06/29/2022 18:15:55	45.948864	-130.023005	249.64	1547.9	TXT: Jason picking up benchmark AX-403 to move to correct location
06/29/2022 18:21:25	45.948883	-130.023011	4.91	1551.16	TXT: Jason released descent weights on benchmark AX-403
06/29/2022 18:21:50	45.948860	-130.023029	4.88	1551.15	TXT: Placing the cord used to release weights into milk crate

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/29/2022 18:27:45	45.948743	-130.023123	0.85	1545.5	TXT: Starboard aft thruster has another ground fault
06/29/2022 18:28:52	45.948755	-130.023110	359.68	1546.82	TXT: Turned starboard aft thruster off
06/29/2022 18:33:29	45.948798	-130.023098	3.97	1548.01	TXT: Jason grabbing chain on the float attached to AX-403 benchmark to move it
06/29/2022 18:36:38	45.948774	-130.023129	3.29	1542.92	TXT: Moving 20 meters off bottom to transport benchmark to Mkr 217 at base of west caldera wall
06/29/2022 18:38:29	45.948787	-130.023166	348.33	1544.93	TXT: Moving back down to ground to readjust the benchmark
06/29/2022 18:39:25	45.948761	-130.023160	358.71	1547.14	TXT: Red line of descent anchor still attached to benchmark
06/29/2022 18:41:50	45.948855	-130.023031	63.97	1551.46	TXT: Red line of anchor now detached from benchmark
06/29/2022 18:43:23	45.948896	-130.023011	22.34	1545.78	TXT: Jason moving up 20 meters to move benchmark AX-403 to Mkr-217
06/29/2022 18:44:47	45.948952	-130.022961	315.76	1544.09	TXT: moving benchmark 200 meters to Mkr-217
06/29/2022 18:46:54	45.948860	-130.023064	319.74	1543.75	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/29/2022 19:02:16	45.948104	-130.024512	336.5	1543.62	TXT: We are moving Benchmark AX-403 to Mkr-217
06/29/2022 19:11:26	45.947809	-130.025623	319.38	1544.65	TXT: Mkr 217 is in sight
06/29/2022 19:16:38	45.947843	-130.025672	311.53	1548.25	HIGHLIGHTS: 1080 start
06/29/2022 19:18:11	45.947820	-130.025681	335.88	1547.58	HIGHLIGHTS: 1080 stop
06/29/2022 19:18:38	45.947817	-130.025683	322.37	1548.29	TXT: Position of AX-403 is approved and we are preparing to release the glass floats
06/29/2022 19:21:46	45.947816	-130.025680	313.38	1548.73	TXT: Jason has released the glass balls
06/29/2022 19:23:06	45.947795	-130.025677	287.3	1542.58	TXT: Jason ascending of bottom in prep for glass ball recovery
06/29/2022 19:59:57	45.947534	-130.028802	31.06	1354.34	TXT: Glass balls have been recovered and we are beginning our transit back to AX-403.
06/29/2022 20:34:01	45.947909	-130.025578	149.45	1544.13	TXT: Benchmark AX-403 is in sight
06/29/2022 20:38:20	45.948031	-130.025431	324.72	1549.14	TXT: Jason has placed the MPR on the benchmark.
06/29/2022 20:39:04	45.948036	-130.025426	324.75	1549.13	HIGHLIGHTS: 1080 start
06/29/2022 20:39:37	45.948036	-130.025423	324.76	1549.13	HIGHLIGHTS: 1080 stop
06/29/2022 20:40:34	45.948048	-130.025413	324.76	1549.15	TXT: MPR has a significant tilt. Jason is nudging the MPR to parse out whether this is because of the MPR placement or if it is the tilt of the benchmark
06/29/2022 20:41:12	45.948067	-130.025400	325.03	1549.11	TXT: MPR placement looks good despite 8.6deg tilt in the x-direction. We have attributed this to the tilt of the benchmark.
06/29/2022 20:41:50	45.948085	-130.025382	324.91	1549.12	MPR: start pressure measurement
06/29/2022 21:02:13	45.948070	-130.025391	324.93	1549.17	MPR: stop pressure measurement
06/29/2022 21:04:15	45.948051	-130.025410	324.83	1549.19	TXT: Jason has removed the MPR and secured it in the holster

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/29/2022 21:06:36	45.948036	-130.025416	324.53	1549.16	TXT: Jason has deployed Mini-BPR 2020-05 from the right swing arm biobox at benchmark AX-403.
06/29/2022 21:07:28	45.948040	-130.025401	325.1	1549.17	HIGHLIGHTS: 4k highlights start
06/29/2022 21:08:22	45.948057	-130.025305	301.65	1548.59	HIGHLIGHTS: 4k highlights stop
06/29/2022 21:10:21	45.948063	-130.025379	318.03	1533.33	TXT: We are beginning the transit to benchmark AX-404 which is up on the western caldera rim
06/29/2022 21:39:24	45.946060	-130.028999	128.64	1395.9	TXT: Banchmark AX-404 in sight.
06/29/2022 21:48:44	45.945894	-130.029025	168.65	1399.71	TXT: We have arrived at AX-404 and are removing line to the anchor.
06/29/2022 21:49:48	45.945909	-130.029003	168.73	1399.71	TXT: Jason has picked up benchmark AX-404
06/29/2022 21:50:24	45.945920	-130.028985	177.3	1397.5	TXT: Jason is moving benchmark AX-404 to Mkr -230
06/29/2022 22:19:58	45.946979	-130.026936	80.94	1396.99	TXT: Mkr-230 in sight
06/29/2022 22:23:23	45.947111	-130.026744	123.28	1399.59	TXT: Jason has placed benchmark AX-404 at Marker 230
06/29/2022 22:24:21	45.947123	-130.026742	123.53	1399.61	HIGHLIGHTS: 4k highlights start
06/29/2022 22:26:05	45.947140	-130.026754	150.78	1398.01	HIGHLIGHTS: 4k highlights stop
06/29/2022 22:28:30	45.947134	-130.026729	98.73	1399.7	TXT: Jason has released the glass balls. The benchmark was disturbed during this process.
06/29/2022 22:29:27	45.947128	-130.026719	2.19	1391.71	TXT: Jason is ascending in preparation for the glass balls recovery
06/29/2022 22:45:46	45.945957	-130.025149	60.69	1349.71	WATCH_CHANGE: new watchstanders Kelly Chadwick and Bill Chadwick
06/29/2022 23:09:20	45.945096	-130.024961	61.5	1349.19	TXT: glass balls are recovered
06/29/2022 23:30:42	45.947043	-130.026660	22.16	1394.76	VEHICLE: On bottom
06/29/2022 23:31:18	45.947047	-130.026690	25.59	1395.19	TXT: benchmark AX-404 in sight
06/29/2022 23:31:33	45.947050	-130.026697	18.19	1394.14	TXT: arrived at benchmark AX-404
06/29/2022 23:34:13	45.947127	-130.026712	205.85	1397.87	TXT: touching down in front of AX-404
06/29/2022 23:37:28	45.947123	-130.026718	232.92	1399.23	TXT: placing the MPR
06/29/2022 23:38:24	45.947131	-130.026721	232.75	1399.22	TXT: adjusting the MPR
06/29/2022 23:41:00	45.947129	-130.026719	232.94	1399.23	MPR: start pressure measurement
06/29/2022 23:49:30	45.947106	-130.026733	232.69	1399.2	TXT: Bill is taking a bunch of Tiff grabs from different cameras to get angles on AX-404
06/29/2022 23:52:40	45.947145	-130.026705	232.6	1399.19	TXT: looking at the life around AX-404
06/29/2022 23:53:38	45.947144	-130.026709	232.59	1399.18	TXT: looking at the tube palm frond things
06/30/2022 00:01:56	45.947154	-130.026716	232.48	1399.15	MPR: stop pressure measurement
06/30/2022 00:04:04	45.947154	-130.026710	231.99	1399.14	TXT: going to place a Mini-BPR at benchmark AX-404

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 00:04:48	45.947157	-130.026711	231.88	1399.14	TXT: Placing Mini-BPR 2020-01 at benchmark AX-404
06/30/2022 00:08:57	45.947160	-130.026712	233.07	1399.12	TXT: struggling to position the Mini-BPR
06/30/2022 00:09:27	45.947161	-130.026711	233.23	1399.12	TXT: It would be easier if the Mini-BPR base was oriented so that the one foot was on the end with the handle instead of the end with two feet
06/30/2022 00:10:31	45.947161	-130.026712	233.35	1399.12	TXT: BPR 2020-01 is successfully positioned at benchmark AX-404
06/30/2022 00:10:43	45.947161	-130.026712	233.34	1399.11	TXT: replacing Jason temp probe in its holster (it was used to aid in the positioning)
06/30/2022 00:10:59	45.947162	-130.026713	233.33	1399.11	TXT: beginning transit to benchmark AX-101
06/30/2022 02:08:53	45.955165	-130.009979	232.9	1528.7	VEHICLE: On bottom
06/30/2022 02:09:09	45.955164	-130.009981	225.58	1529.57	TXT: arrived at benchmark AX-101
06/30/2022 02:09:39	45.955169	-130.009978	225.6	1529.58	TXT: placing the MPR brittle star removal is likely needed
06/30/2022 02:12:38	45.955176	-130.009969	225.52	1529.58	TXT: adjusting MPR placement
06/30/2022 02:17:55	45.955182	-130.009949	225.39	1529.57	MPR: start pressure measurement
06/30/2022 02:38:58	45.955381	-130.009611	225.4	1529.57	MPR: stop pressure measurement
06/30/2022 02:39:11	45.955383	-130.009608	225.4	1529.57	TXT: recovering the MPR now
06/30/2022 02:41:09	45.955384	-130.009607	225.19	1529.57	TXT: looking around for the Mini-BPR end cap on the seafloor before we leave
06/30/2022 02:43:28	45.955397	-130.009569	229.17	1528.25	WATCH_CHANGE: new watchstanders Kelli and Sandra and Scott
06/30/2022 02:46:16	45.955149	-130.009997	216.56	1529.48	TXT: Found Mini-BPR end cap and putting it into milk crate
06/30/2022 02:51:26	45.955629	-130.010075	320.58	1521.58	TXT: Leaving AX-101 now in transit to AX-401
06/30/2022 02:58:16	45.956088	-130.009033	325.34	1499.63	TXT: Going to rim of East wall to benchmark AX-401 to release floats that dont have a strobe while it is still light out then transiting to base of east wall AX-402 to recover float with strobe
06/30/2022 04:43:48	45.963376	-129.989444	137.26	1467.83	VEHICLE: On bottom
06/30/2022 04:48:28	45.963534	-129.989413	158.9	1468.25	TXT: Looking for benchmark AX-401 on seafloor
06/30/2022 04:58:03	45.963009	-129.989435	285.76	1468.06	TXT: Benchmark AX-401 flag spotted
06/30/2022 05:00:42	45.962918	-129.989461	298.93	1470.28	TXT: Pulling pin to release descent weights from benchmark AX-401
06/30/2022 05:02:00	45.962932	-129.989411	298.76	1470.34	TXT: Pin pulled and now being put into milk crate on Jason
06/30/2022 05:02:26	45.962931	-129.989420	298.47	1470.38	TXT: Moving benchmark AX-401 to Mkr 201
06/30/2022 05:02:30	45.962931	-129.989423	298.26	1470.38	HIGHLIGHTS: 1080 start
06/30/2022 05:04:28	45.962919	-129.989622	334.48	1467.97	HIGHLIGHTS: 1080 stop
06/30/2022 05:14:31	45.962792	-129.991063	307.54	1470.28	TXT: At Mkr-201 and placing benchmark AX-401 on bottom
06/30/2022 05:15:15	45.962786	-129.990986	326.95	1469.75	HIGHLIGHTS: 4k highlights start

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 05:17:02	45.962780	-129.990953	344.57	1469.78	HIGHLIGHTS: 4k highlights stop
06/30/2022 05:17:28	45.962783	-129.990953	344.57	1469.79	TXT: Benchmark AX-401 placed on seafloor near Marker 201
06/30/2022 05:18:21	45.962797	-129.990928	344.65	1469.8	TXT: Decision made to take MPR measurement and release floats next time we are at this benchmark (not enough daylight left)
06/30/2022 05:18:55	45.962810	-129.990894	344.66	1469.8	TXT: Setting up to take MPR measurement at benchmark AX-401
06/30/2022 05:25:22	45.962893	-129.990639	127.48	1469.27	TXT: Moving Mkr-201 out of the way
06/30/2022 05:28:45	45.962855	-129.990732	148.17	1470.39	HIGHLIGHTS: 4k highlights start
06/30/2022 05:29:47	45.962806	-129.990728	145.91	1470.39	TXT: Repositioning benchmark AX-401
06/30/2022 05:29:59	45.962797	-129.990724	145.06	1470.35	HIGHLIGHTS: 4k highlights stop
06/30/2022 05:33:10	45.962763	-129.990846	143.73	1470.26	HIGHLIGHTS: 1080 start
06/30/2022 05:33:26	45.962768	-129.990848	144.4	1470.26	TXT: Taking MPR off Jason
06/30/2022 05:34:23	45.962788	-129.990819	144.73	1470.22	TXT: Positioning MPR on benchmark AX-401
06/30/2022 05:37:13	45.962788	-129.990861	142.97	1470.22	TXT: Using Jason arm to push benchmark into ground to be more level and stable
06/30/2022 05:37:15	45.962786	-129.990867	142.75	1470.21	MPR: start pressure measurement
06/30/2022 05:37:19	45.962784	-129.990874	142.86	1470.22	HIGHLIGHTS: 1080 stop
06/30/2022 05:57:03	45.962721	-129.991097	143.09	1470.33	MPR: stop pressure measurement
06/30/2022 05:59:00	45.962723	-129.991089	143.07	1470.4	TXT: Placing MPR back onto Jason
06/30/2022 05:59:11	45.962723	-129.991088	143.03	1470.4	TXT: Grabbing Mini-BPR from swing arm biobox
06/30/2022 06:01:24	45.962722	-129.991087	143.55	1470.37	TXT: Mini-BPR 2020-02 going onto benchmark AX-401
06/30/2022 06:02:49	45.962721	-129.991092	144.53	1470.35	TXT: One remaining Mini-BPR in left swingarm biobox is 2020-06
06/30/2022 06:02:52	45.962721	-129.991092	144.64	1470.34	HIGHLIGHTS: 4k highlights start
06/30/2022 06:04:29	45.962720	-129.991086	144.47	1470.36	TXT: Mini BPR 2020-02 placed on benchmark AX-401
06/30/2022 06:04:30	45.962720	-129.991086	144.64	1470.34	HIGHLIGHTS: 4k highlights stop
06/30/2022 06:06:14	45.962721	-129.991085	144.57	1470.33	TXT: Placing weight release cord in left bio box
06/30/2022 06:11:07	45.962749	-129.991222	177.37	1468.75	TXT: Transiting to base of EAST wall to reposition benchmark AX-402
06/30/2022 06:33:12	45.962243	-129.993425	290.29	1511.37	VEHICLE: On bottom
06/30/2022 06:33:30	45.962240	-129.993426	291.75	1515.57	TXT: Float in sight
06/30/2022 06:33:58	45.962238	-129.993430	285.66	1515.49	TXT: Benchmark AX-402 in sight
06/30/2022 06:34:51	45.962260	-129.993453	192.31	1515.75	TXT: Benchmark AX-402 lost its flag on the way down to the seafloor

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 06:37:38	45.962239	-129.993523	200.68	1519.69	TXT: Pulling weight pin from benchmark to release descent weights
06/30/2022 06:37:51	45.962238	-129.993526	202.41	1519.68	TXT: Pin released
06/30/2022 06:38:38	45.962239	-129.993528	203.29	1519.68	TXT: Placing pin with cord in right bio box
06/30/2022 06:38:58	45.962240	-129.993526	202.78	1519.72	TXT: Another pin with cord also in right bio box
06/30/2022 06:41:38	45.962243	-129.993518	203.51	1519.73	TXT: Bio box secured
06/30/2022 06:42:28	45.962239	-129.993518	202.67	1519.75	TXT: Moving benchmark AX-402 to Mkr-245
06/30/2022 06:56:39	45.962634	-129.991682	3.52	1514.32	TXT: Mkr 254 is in sight.
06/30/2022 06:56:51	45.962640	-129.991658	348.1	1514.46	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
06/30/2022 07:02:21	45.962690	-129.991562	176.85	1517.18	TXT: Jason has placed benchmark AX-402 on the seafloor
06/30/2022 07:05:14	45.962697	-129.991538	177.22	1516.13	HIGHLIGHTS: 4k highlights start
06/30/2022 07:07:00	45.962693	-129.991490	295.74	1514.64	HIGHLIGHTS: 4k highlights stop
06/30/2022 07:10:07	45.962683	-129.991562	123.47	1517.28	TXT: Jason has moved Mkr-235 a few feet to create a better landing space for the vehicle at the benchmark
06/30/2022 07:12:16	45.962689	-129.991553	122.87	1517.29	TXT: The flag on benchmark AX-402 fell off during deployment. We are placing an additional marker with reflective tape (Mkr-251) at this site to make it more visible for future visits.
06/30/2022 07:14:27	45.962708	-129.991577	122.99	1517.3	TXT: Jason has released the glass balls from benchmark AX-402. The benchmark position was disturbed during this process.
06/30/2022 07:15:22	45.962711	-129.991612	122.91	1515.96	TXT: Jason is ascending in preparation for the recovery of the glass balls.
06/30/2022 07:57:31	45.961684	-129.992131	188.47	1418.34	TXT: Glass balls are back on deck. We are returning the benchmark AX-402.
06/30/2022 08:13:41	45.962615	-129.991585	343.48	1514.57	TXT: Benchmark AX-402 is in sight.
06/30/2022 08:16:50	45.962669	-129.991572	95.24	1517.31	TXT: Jason has removed the MPR and placed it on the benchmark.
06/30/2022 08:19:32	45.962668	-129.991577	94.46	1517.33	MPR: start pressure measurement
06/30/2022 08:31:01	45.962659	-129.991565	84.53	1517.33	TXT: Jason swallowed a fish (in a thruster) and it pulled the vehicle. The MPR didnt seem to move when this happened.
06/30/2022 08:40:14	45.962658	-129.991574	84.42	1517.32	MPR: stop pressure measurement
06/30/2022 08:42:17	45.962673	-129.991560	85.17	1517.39	TXT: Jason has removed the MPR from benchmark AX-402 and secured it in the holster.
06/30/2022 08:46:49	45.962674	-129.991554	84.42	1517.36	TXT: Jason has removed Mini-BPR 2020-06 from the left swing arm biobox and placed it on benchmark AX-402
06/30/2022 08:48:46	45.962670	-129.991562	82.93	1517.06	TXT: We are beginning our transit to benchmark AX-101.
06/30/2022 08:48:58	45.962669	-129.991561	81.22	1516.52	HIGHLIGHTS: 4k highlights start
06/30/2022 08:49:40	45.962666	-129.991564	87.82	1516.43	HIGHLIGHTS: 4k highlights stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 10:50:48	45.955141	-130.009788	352.38	1525.73	VEHICLE: On bottom. Watch change: Watchstanders are Kelly Chadwick and Bill Chadwick.
06/30/2022 10:52:08	45.955160	-130.009850	300.81	1526.08	TXT: arrived at benchmark AX-101
06/30/2022 10:57:42	45.955151	-130.009926	260.33	1530.13	TXT: placing MPR
06/30/2022 10:59:48	45.955169	-130.009917	260.33	1530.11	TXT: adjusting MPR placement
06/30/2022 11:00:30	45.955164	-130.009932	260.33	1530.1	MPR: start pressure measurement
06/30/2022 11:20:29	45.955155	-130.009935	260.32	1529.93	MPR: stop pressure measurement
06/30/2022 11:20:42	45.955153	-130.009934	260.32	1529.93	TXT: recovering MPR
06/30/2022 11:22:05	45.955153	-130.009931	260.32	1529.92	TXT: transiting to benchmark AX-402 (eastern caldera floor). Sentry will likely be picked up before we do the pressure measurement there
06/30/2022 13:12:50	45.962229	-129.991631	5.41	1509.3	VEHICLE: On bottom
06/30/2022 13:20:42	45.962639	-129.991587	71.2	1513.69	TXT: arrived at benchmark AX-402
06/30/2022 13:21:08	45.962646	-129.991580	96.11	1513.04	TXT: AX-402 lost its flag but has two markers by it and reflective tape on the pole where the flag used to be
06/30/2022 13:23:19	45.962674	-129.991583	126.07	1515.43	TXT: placing the MPR
06/30/2022 13:24:56	45.962673	-129.991578	126	1515.41	MPR: start pressure measurement
06/30/2022 13:31:03	45.962702	-129.991539	118.53	1515.02	Framegrab: fish
06/30/2022 13:45:00	45.962756	-129.991461	119.3	1514.98	MPR: stop pressure measurement
06/30/2022 13:45:11	45.962774	-129.991436	119.19	1514.97	TXT: recovering the MPR
06/30/2022 13:47:49	45.962876	-129.991311	138.67	1511.99	TXT: putting out an additional marker at AX-402. then we're going to pick up a pull pin.
06/30/2022 13:51:10	45.962904	-129.991086	138.39	1512.91	TXT: collecting the pull pin
06/30/2022 13:51:27	45.962908	-129.991081	140.42	1512.88	TXT: setting the pull pin down on a rock
06/30/2022 13:52:56	45.962894	-129.991102	139.77	1512.85	TXT: putting the pull pin rope in the right swing arm biobox
06/30/2022 13:56:19	45.962841	-129.991173	136.23	1512.97	TXT: Placing Marker 225 near benchmark AX-402 (eastern caldera floor)
06/30/2022 13:58:04	45.962825	-129.991223	138.73	1512.89	TXT: going to get a view of the marker and the benchmark
06/30/2022 13:59:13	45.962813	-129.991317	88.4	1510.73	TXT: marker and benchmark in sight
06/30/2022 14:45:19	45.956629	-129.992047	84.27	1386.26	WATCH_CHANGE: new watchstanders Sandra and Kelli and Scott
06/30/2022 15:00:22	45.956529	-129.991886	160.09	1387.61	TXT: Sentry recovered by ship
06/30/2022 15:00:26	45.956532	-129.991882	112.46	1387.33	TXT: transiting to benchmark AX-401 on eastern caldera rim
06/30/2022 15:40:51	45.962027	-129.991262	97.68	1424.52	TXT: Jeremy added a target for benchmark AX-402 to NavG because it was missing
06/30/2022 15:53:44	45.962864	-129.991084	106.55	1463.6	TXT: Benchmark AX-401 in sight. Waiting for ship to get into position

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 15:57:06	45.962746	-129.991119	87.03	1466.61	TXT: Arrived at benchmark AX-401
06/30/2022 15:57:34	45.962729	-129.991094	49.75	1467.03	TXT: Planning to pull the pin to release the glass balls hopefully without moving the benchmark at all
06/30/2022 15:58:45	45.962808	-129.990948	39.97	1468.04	HIGHLIGHTS: 1080 start
06/30/2022 16:00:13	45.962857	-129.990901	38.91	1468.06	TXT: Jason's right arm moving the yellow cord out of the way
06/30/2022 16:00:43	45.962836	-129.990928	38.84	1467.99	TXT: Jason's left arm moving in to pull the pin to release the glass balls
06/30/2022 16:02:24	45.962805	-129.990952	38.94	1468.02	TXT: Jason's right arm moving the yellow cord further out of the way
06/30/2022 16:03:13	45.962821	-129.990938	39.18	1468.02	TXT: Jason's right arm using the yellow cord to pull the pin out
06/30/2022 16:03:18	45.962825	-129.990934	39.02	1468	TXT: The glass balls have been released
06/30/2022 16:03:55	45.962833	-129.990933	39.01	1468.05	HIGHLIGHTS: 1080 stop
06/30/2022 16:04:27	45.962788	-129.990981	66.03	1466.23	TXT: Jason coming off the bottom to wait for the ship to recover the glass balls
06/30/2022 16:05:30	45.962654	-129.991077	113.04	1466.01	HIGHLIGHTS: 4k highlights start
06/30/2022 16:06:48	45.962441	-129.991164	92.86	1465.85	HIGHLIGHTS: 4k highlights stop
06/30/2022 16:37:20	45.960425	-129.991245	154.08	1456.48	TXT: Glass balls almost recovered
06/30/2022 16:40:49	45.960608	-129.990820	138.95	1456.7	TXT: Glass balls are on deck
06/30/2022 16:42:38	45.960603	-129.990802	82.46	1456.69	TXT: Jason going back down to benchmark AX-401 (western caldera rim)
06/30/2022 16:54:34	45.961924	-129.991012	86.58	1440.06	TXT: Deleting all the "On Bottom" benchmarks from NavG since all the benchmarks have already been re-positioned
06/30/2022 16:59:46	45.962641	-129.991051	89.08	1440.12	TXT: Final locations for benchmarks AX-403 and AX-404 and their markers were not recorded in NavG
06/30/2022 17:04:58	45.962684	-129.991097	74.64	1464.4	TXT: Jason reached the bottom near AX-401
06/30/2022 17:06:24	45.962693	-129.991120	122.1	1468.38	TXT: Jason has landed at benchmark AX-401
06/30/2022 17:06:29	45.962693	-129.991119	121.41	1468.32	VEHICLE: On bottom
06/30/2022 17:07:11	45.962696	-129.991098	119.94	1468.43	TXT: Right arm removing bungee cord from MPR
06/30/2022 17:07:32	45.962697	-129.991088	120.09	1468.43	HIGHLIGHTS: 1080 start
06/30/2022 17:08:14	45.962709	-129.991093	119.76	1468.42	TXT: Jason is positioning the MPR on the benchmark so the cable is on the left
06/30/2022 17:10:12	45.962733	-129.991189	120.12	1468.44	TXT: Nudging the MPR into the groove
06/30/2022 17:10:39	45.962719	-129.991169	120.14	1468.41	TXT: The MPR is in place on benchmark AX-401 (first measurement without the glass balls attached)
06/30/2022 17:10:41	45.962718	-129.991167	120.08	1468.41	MPR: start pressure measurement
06/30/2022 17:10:49	45.962713	-129.991158	120.2	1468.41	HIGHLIGHTS: 1080 stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 17:30:07	45.962710	-129.991120	120.61	1468.54	MPR: stop pressure measurement
06/30/2022 17:31:42	45.962704	-129.991124	120.67	1468.55	TXT: MPR has been placed back in the holster
06/30/2022 17:32:17	45.962708	-129.991133	119.6	1467.36	TXT: Beginning transit to benchmark AX-101 (Caldera Center)
06/30/2022 19:37:05	45.955138	-130.009880	330.22	1525.73	TXT: Benchmark AX-101 is in sight
06/30/2022 19:40:32	45.955143	-130.009971	238.28	1529.67	TXT: Jason has removed the MPR and placed it on the benchmark.
06/30/2022 19:42:43	45.955162	-130.009950	239.17	1529.69	MPR: start pressure measurement
06/30/2022 20:03:01	45.955163	-130.009929	241.45	1529.81	MPR: stop pressure measurement
06/30/2022 20:05:13	45.955168	-130.009931	237.51	1529.85	TXT: Jason has removed the MPR from the benchmark and secured it in the holster
06/30/2022 20:06:05	45.955163	-130.009917	238.83	1528.71	TXT: We are beginning the transit to benchmark AX-403 (eastern caldera floor)
06/30/2022 21:54:28	45.947851	-130.025638	263.42	1548.53	TXT: Benchmark AX-403 is in sight.
06/30/2022 21:57:21	45.947822	-130.025692	328.04	1549.25	TXT: Jason has removed the MPR and placed it on the benchmark.
06/30/2022 22:00:56	45.947815	-130.025702	328.35	1549.23	MPR: start pressure measurement
06/30/2022 22:22:14	45.947821	-130.025718	328.66	1549.24	MPR: stop pressure measurement
06/30/2022 22:24:00	45.947827	-130.025717	328.64	1549.27	TXT: Jason has removed the MPR from the benchmark and secured it in the holster.
06/30/2022 22:24:37	45.947823	-130.025721	329.08	1549.13	TXT: We are begining the transit to benchmark AX-404 (western caldera rim)
06/30/2022 22:38:53	45.947023	-130.026697	24.23	1393.28	TXT: Benchmark AX-404 in sight.
06/30/2022 22:42:14	45.947130	-130.026751	221.67	1399.48	TXT: Jason has placed the MPR on benchmark AX-404
06/30/2022 22:44:02	45.947126	-130.026754	221.92	1399.47	MPR: start pressure measurement (later aborted)
06/30/2022 22:44:45	45.947125	-130.026754	221.94	1399.47	MPR: stop pressure measurement (aborted)
06/30/2022 22:45:13	45.947125	-130.026755	221.99	1399.47	TXT: We decided to stop and re-start the measurement because there was some concern about the MPR positioning on the benchmark.
06/30/2022 22:45:29	45.947125	-130.026755	221.99	1399.47	MPR: start pressure measurement
06/30/2022 22:50:25	45.947120	-130.026749	222.01	1399.46	Framegrab: fish
06/30/2022 22:54:23	45.947122	-130.026757	222.02	1399.46	Framegrab: fish looking at jason
06/30/2022 22:57:36	45.947130	-130.026757	222.02	1399.45	TXT: watching a fish vs crab showdown
06/30/2022 23:03:23	45.947126	-130.026758	222.01	1399.44	TXT: crab approaching
06/30/2022 23:04:03	45.947123	-130.026760	222.02	1399.44	Framegrab: crab
06/30/2022 23:06:10	45.947118	-130.026753	222.02	1399.44	HIGHLIGHTS: 4k highlights start
06/30/2022 23:07:47	45.947124	-130.026758	222.27	1399.43	HIGHLIGHTS: 4k highlights stop

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1432 Logger Comment
06/30/2022 23:10:57	45.947144	-130.026674	330.21	1378.69	MPR: stopped pressure measurement at 23:07-ish
06/30/2022 23:11:17	45.947154	-130.026650	329.22	1379.88	TXT: beginning transit to benchmark AX-101 (Caldera Center)
07/01/2022 00:58:44	45.955042	-130.009926	322.06	1520.63	TXT: arrived at benchmark AX-101
07/01/2022 01:03:23	45.955197	-130.009997	247.81	1529.85	TXT: placing the MPR at AX-101
07/01/2022 01:04:42	45.955188	-130.009994	247.8	1529.85	TXT: checking the tilt
07/01/2022 01:05:09	45.955187	-130.009994	247.81	1529.85	TXT: adjusting the MPR
07/01/2022 01:06:43	45.955183	-130.009987	247.82	1529.84	MPR: start pressure measurement
07/01/2022 01:26:06	45.955181	-130.009993	248.11	1529.78	MPR: stop pressure measurement
07/01/2022 01:26:55	45.955181	-130.009989	248.12	1529.78	TXT: recovering the MPR
07/01/2022 01:28:39	45.955188	-130.009982	248.11	1529.77	VEHICLE: Off bottom. End of dive.
07/01/2022 02:29:53	45.955042	-130.007813	258.61	3.4	HIGHLIGHTS: 1080 start
07/01/2022 02:33:54	45.954508	-130.005494	82.18	1.58	HIGHLIGHTS: 1080 stop
07/01/2022 02:33:59	45.954493	-130.005457	82.28	1.54	VEHICLE: Jason on deck

ROV Jason dive J2-1433 Dive Log (edited/corrected from Jason Virtual Van after renav)

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1433 Logger Comment
07/01/2022 11:08:28	45.750025	-130.200008	53.3	1.1	HIGHLIGHTS: 1080 start . Diving right after 3-disk float pack was launched at the Webb-6 site.
07/01/2022 11:11:01	45.936234	-129.997357	229.4	1.1	VEHICLE: Jason off deck. Goal of dive is to recover the remaining Webb instruments CMP-1 at Webb-4 and CMP-2 at Webb-6 starting at the latter
07/01/2022 11:11:25	45.936234	-129.997357	205.1	1.2	HIGHLIGHTS: 1080 stop
07/01/2022 11:11:36	45.936234	-129.997357	188.6	2.3	VEHICLE: Jason in water. Watchstanders are Kelly Chadwick and Bill Chadwick
07/01/2022 11:38:17	45.935436	-129.999111	235.0	466.9	HIGHLIGHTS: 4k highlights start
07/01/2022 11:40:31	45.935313	-129.999170	235.2	526.9	HIGHLIGHTS: 4k highlights stop 1080
07/01/2022 12:26:04	45.935073	-129.997807	254.1	1522.3	VEHICLE: On bottom
07/01/2022 12:30:07	45.935796	-129.997148	350.4	1526.8	TXT: float pack in sight
07/01/2022 12:33:02	45.935953	-129.997225	215.7	1531.7	TXT: picking up float pack and transporting it to the CMP-2 instrument at the Webb-6 site
07/01/2022 12:36:19	45.935955	-129.997223	215.8	1530.7	TXT: forgot to ballast so had some trouble picking up the float
07/01/2022 12:40:53	45.935949	-129.997228	212.5	1532.3	TXT: picking up the float pack
07/01/2022 12:41:05	45.935947	-129.997228	212.5	1532.8	TXT: transporting the float pack to Webb-6
07/01/2022 12:48:18	45.936669	-129.997697	344.3	1534.9	TXT: arrived at CMP-2 instrument at the Webb-6 site
07/01/2022 12:48:49	45.936665	-129.997694	344.6	1534.9	TXT: going to make a quick look around the area to see if we see the missing cover that detached with the CMP-3 instrument was recovered from here earlier
07/01/2022 12:55:35	45.936843	-129.997837	343.4	1537.6	HIGHLIGHTS: 4k highlights start - awesome encounter with octopus!
07/01/2022 12:58:08	45.936839	-129.997859	344.6	1538.5	HIGHLIGHTS: 4k highlights stop
07/01/2022 13:04:32	45.936643	-129.997652	354.3	1534.9	TXT: Did not find instrument cover but got great video of an octopus. Returning to the CMP-2 instrument
07/01/2022 13:08:43	45.936685	-129.997740	165.8	1535.2	TXT: removing the pull pin attaching the line to the float pack
07/01/2022 13:08:59	45.936686	-129.997741	166.4	1535.2	TXT: pull pin deposited in jason's basket
07/01/2022 13:09:38	45.936690	-129.997746	165.3	1535.2	TXT: pulling the line free from the float pack
07/01/2022 13:14:18	45.936672	-129.997730	30.5	1538.2	TXT: attaching the float pack's line to the bridle on the CMP-2 instrument (Webb-6 site)
07/01/2022 13:14:53	45.936671	-129.997733	30.5	1538.2	TXT: float pack and instrument are attached (there is no shield here to recover)
07/01/2022 13:15:14	45.936671	-129.997733	30.5	1538.2	TXT: everyone agrees the connection between float pack and CMP-2 looks secure
07/01/2022 13:18:32	45.936684	-129.997721	238.4	1537.9	TXT: releasing the weights from the float pack
07/01/2022 13:19:55	45.936684	-129.997723	238.2	1537.8	TXT: float pack is away

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1433 Logger Comment
07/01/2022 13:20:03	45.936684	-129.997723	238.2	1537.9	TXT: instrument CMP-2 is away
07/01/2022 14:03:16	45.933612	-129.997102	346.3	1493.5	TXT: float pack and CMP-2 instrument are on deck
07/01/2022 14:07:00	45.933634	-129.997327	62.3	1493.7	TXT: transiting to Webb-4 site
07/01/2022 14:10:14	45.933939	-129.997806	63.0	1493.9	TXT: Jason's rear starboard thruster is out again
07/01/2022 14:46:03	45.936886	-130.000180	62.2	1475.0	WATCH_CHANGE: new watchstanders Kelli and Sandra and Scott
07/01/2022 15:49:24	45.945451	-130.003939	76.8	1463.1	TXT: Ship at Webb 4 site preparing to launch 3-disk float pack for recovery of CMP-1 instrument
07/01/2022 15:51:19	45.945671	-130.004053	76.2	1463.0	TXT: Float pack deployed from ship
07/01/2022 16:11:17	45.947399	-130.005031	72.2	1525.4	VEHICLE: On bottom
07/01/2022 16:11:37	45.947393	-130.005028	70.8	1527.1	TXT: 100m left for float pack to reach bottom
07/01/2022 16:13:37	45.947182	-130.004835	56.2	1526.6	TXT: Float pack on bottom
07/01/2022 16:18:16	45.947100	-130.003910	35.1	1526.7	TXT: Float pack in sight
07/01/2022 16:20:00	45.947158	-130.003883	113.3	1525.3	TXT: Jason at float pack
07/01/2022 16:20:52	45.947174	-130.003884	119.4	1525.1	TXT: Jason has picked up float pack
07/01/2022 16:21:08	45.947175	-130.003882	119.5	1524.8	TXT: Jason taking float pack to CMP-1 instrument at Webb-4 site
07/01/2022 16:21:37	45.947186	-130.003861	113.0	1519.5	TXT: Jason coming up 5 meters
07/01/2022 16:36:34	45.948587	-130.003405	85.2	1527.0	VEHICLE: On bottom
07/01/2022 16:36:54	45.948581	-130.003419	85.0	1527.4	TXT: Looking for CMP-1 instrument at Webb-4 site
07/01/2022 16:40:18	45.948561	-130.003531	112.3	1530.8	TXT: Jason on seafloor moving float pack to CMP-1
07/01/2022 16:42:20	45.948647	-130.003364	181.6	1526.0	TXT: At CMP-1 instrument (Webb-4 site)
07/01/2022 16:44:57	45.948594	-130.003389	170.8	1530.9	HIGHLIGHTS: 1080 start
07/01/2022 16:45:28	45.948596	-130.003397	170.2	1530.9	TXT: Setting float pack next to CMP-1 instrument
07/01/2022 16:46:36	45.948609	-130.003399	167.2	1530.0	TXT: Taking weights off of cover
07/01/2022 16:51:45	45.948598	-130.003361	300.5	1530.9	TXT: All weights off cover
07/01/2022 16:54:28	45.948592	-130.003343	300.0	1529.1	TXT: Cover being picked up and moved
07/01/2022 16:54:32	45.948591	-130.003341	300.6	1529.2	HIGHLIGHTS: 1080 stop
07/01/2022 16:56:13	45.948561	-130.003319	333.3	1530.9	HIGHLIGHTS: 1080 start
07/01/2022 16:56:33	45.948562	-130.003316	333.4	1531.0	TXT: Cover off and on ground next to instrument
07/01/2022 16:58:37	45.948575	-130.003338	300.9	1527.5	TXT: Crab climbing float
07/01/2022 16:59:34	45.948565	-130.003387	16.2	1529.9	HIGHLIGHTS: 4k highlights start

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1433 Logger Comment
07/01/2022 17:00:34	45.948567	-130.003414	354.9	1531.0	HIGHLIGHTS: 4k highlights stop
07/01/2022 17:01:01	45.948571	-130.003418	354.9	1531.0	HIGHLIGHTS: 4k highlights start
07/01/2022 17:03:57	45.948551	-130.003408	4.3	1530.5	TXT: Jason pulling cord on instrument
07/01/2022 17:04:40	45.948538	-130.003399	61.2	1531.0	TXT: Clipping attachment cord from instrument to cover
07/01/2022 17:04:51	45.948536	-130.003398	67.2	1531.0	HIGHLIGHTS: 4k highlights stop
07/01/2022 17:04:57	45.948535	-130.003397	66.6	1531.0	HIGHLIGHTS: 4k highlights start
07/01/2022 17:08:04	45.948536	-130.003391	68.1	1531.0	HIGHLIGHTS: 4k highlights stop
07/01/2022 17:08:10	45.948536	-130.003391	68.2	1531.0	HIGHLIGHTS: 4k highlights start
07/01/2022 17:11:47	45.948530	-130.003395	66.9	1531.0	TXT: Attaching cord to extra rope to secure cover
07/01/2022 17:12:55	45.948528	-130.003396	66.8	1531.0	HIGHLIGHTS: 4k highlights stop
07/01/2022 17:14:14	45.948523	-130.003396	66.7	1531.0	TXT: Unscrewing T pin from rope
07/01/2022 17:14:25	45.948522	-130.003396	66.8	1531.0	TXT: T pin unscrewed
07/01/2022 17:14:34	45.948521	-130.003397	67.1	1531.0	HIGHLIGHTS: 1080 stop
07/01/2022 17:15:25	45.948520	-130.003398	66.1	1531.0	HIGHLIGHTS: 1080 start
07/01/2022 17:17:34	45.948522	-130.003404	65.7	1531.0	TXT: Screwing T pin into eyehole on cover
07/01/2022 17:22:34	45.948518	-130.003399	66.3	1531.0	TXT: Struggling to get T pin in eyehole on cover
07/01/2022 17:23:43	45.948522	-130.003395	66.8	1531.0	HIGHLIGHTS: 1080 stop
07/01/2022 17:24:12	45.948520	-130.003394	66.1	1531.0	TXT: Moving to top eyehole to see if T pin can fit better in there
07/01/2022 17:25:16	45.948516	-130.003397	64.9	1531.0	HIGHLIGHTS: 1080 start
07/01/2022 17:43:56	45.948515	-130.003415	81.1	1531.1	HIGHLIGHTS: 1080 stop
07/01/2022 17:44:44	45.948518	-130.003420	80.4	1531.2	TXT: T Pin secured
07/01/2022 17:44:58	45.948519	-130.003423	80.5	1531.2	TXT: Now attaching line from float pack to CMP-1 instrument
07/01/2022 17:47:00	45.948540	-130.003457	353.5	1531.2	HIGHLIGHTS: 1080 start
07/01/2022 17:49:42	45.948552	-130.003444	356.0	1528.5	HIGHLIGHTS: 4k highlights start
07/01/2022 17:50:09	45.948553	-130.003445	356.5	1528.5	TXT: Pulling pin on floatpack to release line
07/01/2022 17:50:22	45.948553	-130.003445	357.5	1528.5	Framegrab: Pulling pin on floatpack line
07/01/2022 17:50:33	45.948552	-130.003445	356.7	1528.5	HIGHLIGHTS: 4k highlights stop
07/01/2022 17:51:35	45.948546	-130.003440	359.7	1529.5	HIGHLIGHTS: 1080 stop
07/01/2022 17:51:48	45.948545	-130.003439	10.7	1530.4	HIGHLIGHTS: 1080 start

Date/Time (GMT)	Latitude	Longitude	Gyro	Depth (m)	J2-1433 Logger Comment
07/01/2022 17:55:23	45.948535	-130.003439	25.5	1531.3	TXT: Line from float pack is attached to the CMP-1 instrument
07/01/2022 17:58:45	45.948537	-130.003459	25.5	1531.2	HIGHLIGHTS: 1080 stop
07/01/2022 18:00:13	45.948549	-130.003497	123.4	1531.2	TXT: Picking up straps
07/01/2022 18:00:24	45.948550	-130.003500	123.4	1531.2	TXT: Storing them in bio boxes
07/01/2022 18:02:13	45.948553	-130.003506	123.3	1531.2	TXT: Straps secured in bio box
07/01/2022 18:02:23	45.948554	-130.003505	123.3	1531.2	TXT: Moving to collect rocks
07/01/2022 18:24:54	45.948368	-130.003517	102.6	1526.6	TXT: Rocks in milk crates
07/01/2022 18:25:02	45.948379	-130.003510	110.9	1526.5	TXT: Now moving back to release float pack and instrument CMP-1
07/01/2022 18:26:50	45.948535	-130.003468	63.3	1531.4	HIGHLIGHTS: 1080 start
07/01/2022 18:26:58	45.948540	-130.003469	65.0	1531.4	HIGHLIGHTS: 4k highlights start
07/01/2022 18:28:27	45.948537	-130.003484	67.7	1531.4	TXT: Pulling pin from weights on float pack
07/01/2022 18:30:19	45.948526	-130.003485	63.9	1531.4	HIGHLIGHTS: 1080 stop
07/01/2022 18:30:25	45.948526	-130.003484	65.2	1531.4	HIGHLIGHTS: 1080 start
07/01/2022 18:33:45	45.948489	-130.003520	56.9	1526.5	TXT: Pin pulled
07/01/2022 18:33:59	45.948480	-130.003528	56.8	1526.2	TXT: Float and instrument and cover ascending
07/01/2022 18:34:01	45.948479	-130.003530	56.8	1526.2	HIGHLIGHTS: 4k highlights stop
07/01/2022 18:34:14	45.948468	-130.003540	56.6	1526.5	HIGHLIGHTS: 1080 stop
07/01/2022 18:54:01	45.946052	-130.005289	295.8	1467.9	WATCH_CHANGE: new watchstanders Haley Cabaniss and Jeff Beeson
07/01/2022 20:04:34	45.949588	-130.005612	257.6	199.2	TXT: CMP-1 instrument recovered on deck at 19:54. Jason is now 215m from the sea surface. Estimated recovery is 20:34.
07/01/2022 20:12:41	45.949680	-130.004897	256.2	34.8	HIGHLIGHTS: 4k highlights start
07/01/2022 20:15:26	45.949751	-130.004461	245.4	3.7	HIGHLIGHTS: 4k highlights stop
07/01/2022 20:15:30	45.949750	-130.004455	243.2	3.6	HIGHLIGHTS: 4k highlights start
07/01/2022 20:17:37	45.949739	-130.004347	242.8	3.3	HIGHLIGHTS: 4k highlights stop
07/01/2022 20:18:07	45.949739	-130.004347	243.3	3.3	HIGHLIGHTS: 4k highlights start
07/01/2022 20:19:51	45.949366	-130.003158	279.6	1.7	TXT: Jason out of the water.
07/01/2022 20:21:44	45.949175	-130.002568	77.0	1.6	VEHICLE: Jason on deck
07/01/2022 20:21:57	45.949153	-130.002506	77.2	1.6	HIGHLIGHTS: 4k highlights stop

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