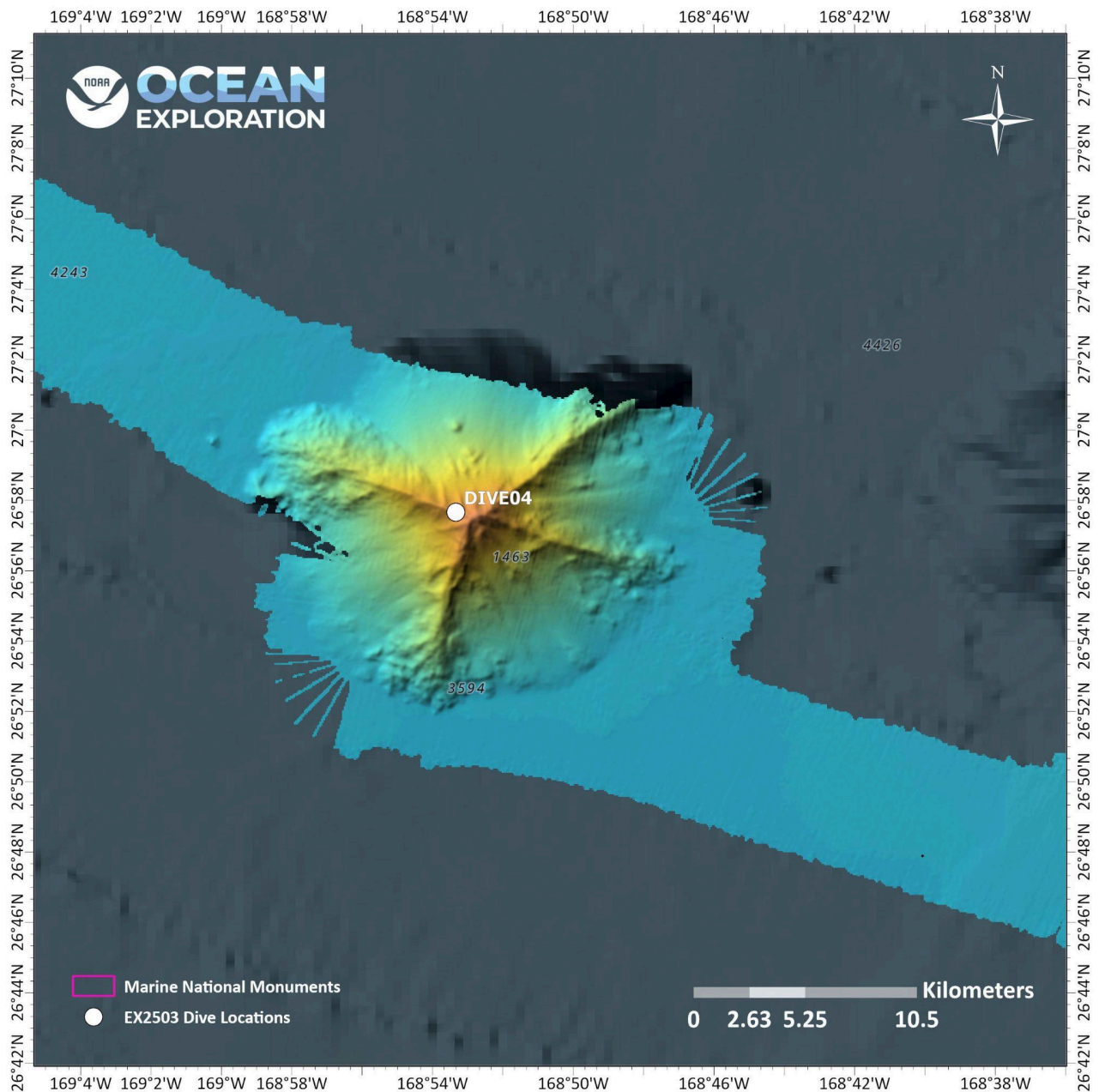


ROV Dive Summary

EX2503, Dive 04, April 14, 2025

General Location Map



Dive Information

Site Name	Unnamed Seamount 02 (Northwest of Volador Seamount)
General Area Descriptor	Papahānaumokuākea
Science Team Leads	Sara Kahanamoku-Meyer (UH Mānoa/HI Sea Grant) and Brian Kennedy (ODL/BU)
Expedition Coordinator	Sam Cuellar (NOAA Ocean Exploration)
ROV Dive Supervisor	Chris Ritter (GFOE)
Mapping Lead	Neah Baechler (NOAA Ocean Exploration/UCAR)
Sample Data Manager	Anna Lienesch and Jordan Schweizer (NCEI)
Dive Purpose	The goal of EX2503 Dive 04 was to investigate the western ridge arm of an unnamed seamount northwest of Volador seamount. This seamount is to the east of Unnamed Guyot 01, which was the focus of Dive 03. This dive was targeted to investigate the biological and habitat diversity within a seamount in a similar spatial transect as a previous dive, yet with markedly different overall morphology. Our focus was to characterize communities of sponges, corals, and other taxa along the rift arm and document transitions between habitat types. Sampling priorities also included the collection of geological samples and eDNA water samples to further characterize the geology and ecology of this region.
Maritime Heritage Restrictions	No

ROV Dive Summary
Data

Dive Type: Normal

In Water: 2025-04-14T18:30:37.065031
26.96109770076101 ; -168.88893394490108

On Bottom: 2025-04-14T19:32:00.945822
26.959834555719937 ; -168.88486519082844

Off Bottom: 2025-04-15T01:39:28.026729
26.95845802643729 ; -168.88176568135404

Out Water: 2025-04-15T02:36:57.704046
26.954817171089527 ; -168.8723196712724

Dive Duration: 8:06:20

Bottom Time: 6:07:27

Max Vehicle Depth: 1624.2 m

Min Seafloor Depth: 1486.3 m

Distance Travelled: 469.5 m

Dive Description

EX2503 Dive 04 explored a rift arm of an unnamed seamount northwest of Volador Seamount that was previously visited by OET. Our goal was to investigate shallower depths to gauge the diversity of habitat types along this seamount and characterize the near-summit community.

Dive 04 began with visualization of the seamount rift arm at 0931 HST. Our starting depth was ~1620 meters. Benthic habitat was comprised primarily of MnFe-encrusted basalt, the features of which provided clues to the geologic history of the seamount. Large intrusive dikes were visible for much of the dive, as were columnar basalts and, at shallower depths, pillow basalts that provided a variety of terrain for benthic organisms.

Upon reaching the bottom, it was apparent that this site contained a low density of macrofauna at this depth. In spite of the low density of organisms, this dive provided rich insights into the diversity of organismal interactions present in these deep seamount ridge habitats. Towards the beginning of the dive, we observed a commensal zooanthid living on a euplectellid sponge. The predominant large organisms visible for much of the beginning of the dive were hexactinellid sponges (including an unusual sponge morphotype that was sampled for further analysis). Continuing up the rift arm, the benthic community gradually shifted towards including more bamboo corals, many of which had “whip” morphologies. A close-up video of a bamboo coral allowed us to observe evidence that bamboo coral polyps are likely connected by a nerve net that allows them to coordinate their responses to distal stressors (i.e., a nudge from D2’s manipulator arm). As we continued to shallow up, we encountered an undescribed species of squat lobster (*Uroptychus* sp. nov.) that is likely a specialist on the black coral *Umbellapathes litocrata*, and sampled both to support the species’ description. Observations of symbioses continued with the sighting of a shrimp and its isopod parasite host, a hermit crab with an anemone for a shell, and numerous examples of brittle and basket stars seeking higher ground on coral and sponge stalks (both dead and alive). At ~1485m water depth, we encountered a community with strikingly high density and diversity, living on large, cleaved basalt slabs in an area with a relatively high apparent sedimentation rate. This community had a high density of Hemicoraliids, Iridogorgia and Rhodaniridogorgia, Paragorgia, and Paramurceids. We ended the dive by sampling a novel morphotype of Paramuricea for further study.

Notable Observations	Observations of coordinated behavior of bamboo coral polyps in response to stimuli. Collection of an undescribed species of <i>Uroptychus</i> .
Community and Habitat Observations	Corals and Sponges — Present Chemosynthetic Community — Absent High biodiversity Community — Present Active Seep or Vent — Absent Extinct Seep or Vent — Absent Hydrates — Absent
CMECS Feature Type(s)	Seamount > Ridge > Boulder Field
SeaTube Link (science annotations)	https://data.oceannetworks.ca/app/dive-logs/1205

Equipment Deployed

ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>
ROV Measurements	The following ROV measurements, data streams, and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low-resolution cameras, manipulator arms, suction sampler, sample drawer,s and thrusters. The following row notes if any of these sensors were malfunctioning or not operational.
Equipment Malfunctions	

Close-Up Map of Main Dive Site

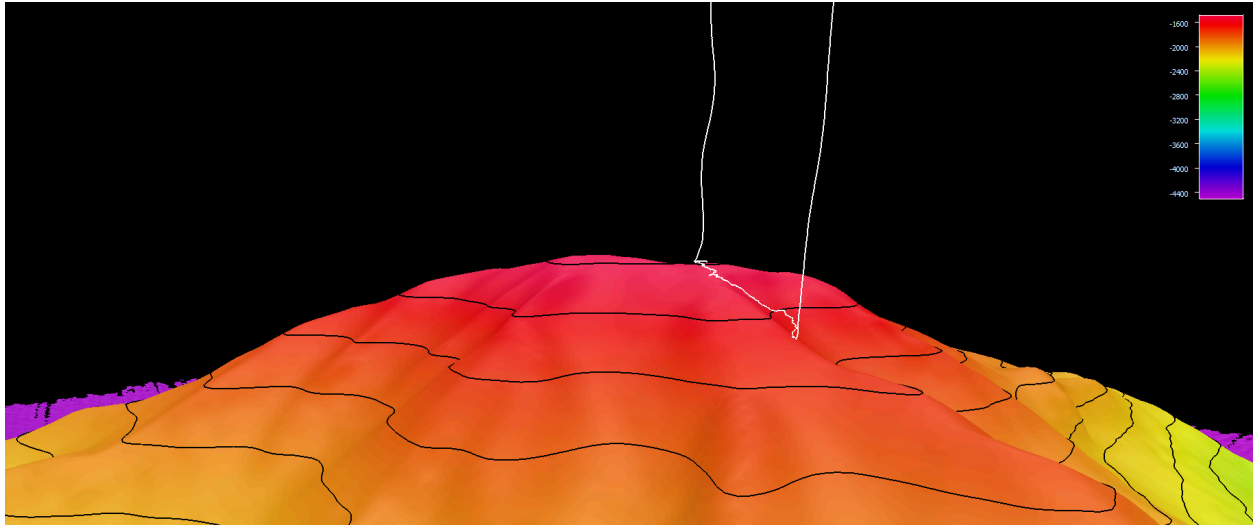


Figure 1: Dive 04 dive site. Shown in 3x vertical exaggeration; smoothed ROV dive track shown in white on 25x25 cell size bathymetry. Depth shown in meters; coloration based on slope steepness with 100-meter contours overlain.

Sound Speed Manager Image of ROV CTD Profile

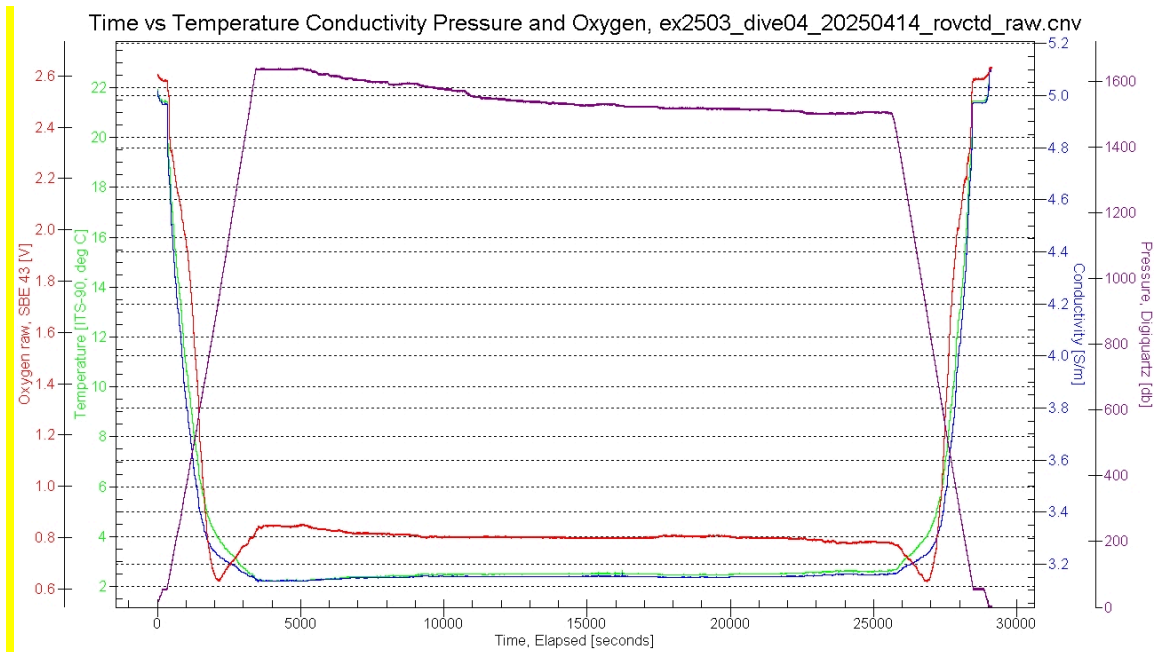
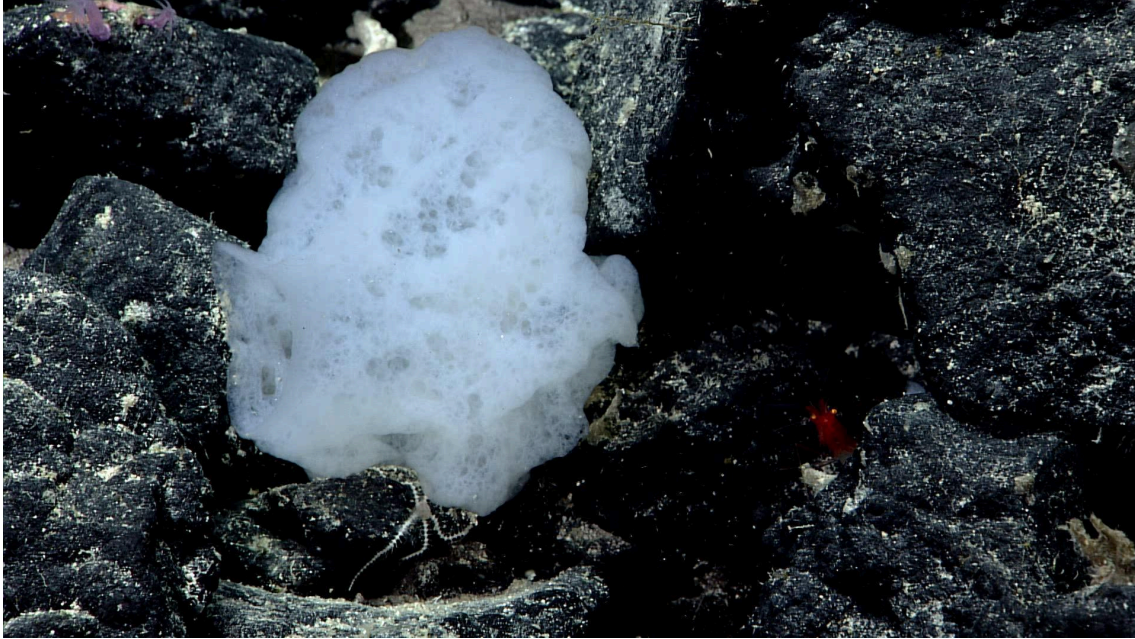


Figure 2. Ambient conditions during Dive 04. Plot shows Temperature ($^{\circ}\text{C}$), Conductivity (S/m), Pressure (db), and Oxygen (V; as measured by SBE43).

Representative Photos of the Dive



Collection of a currently unidentified Euplectlecid.



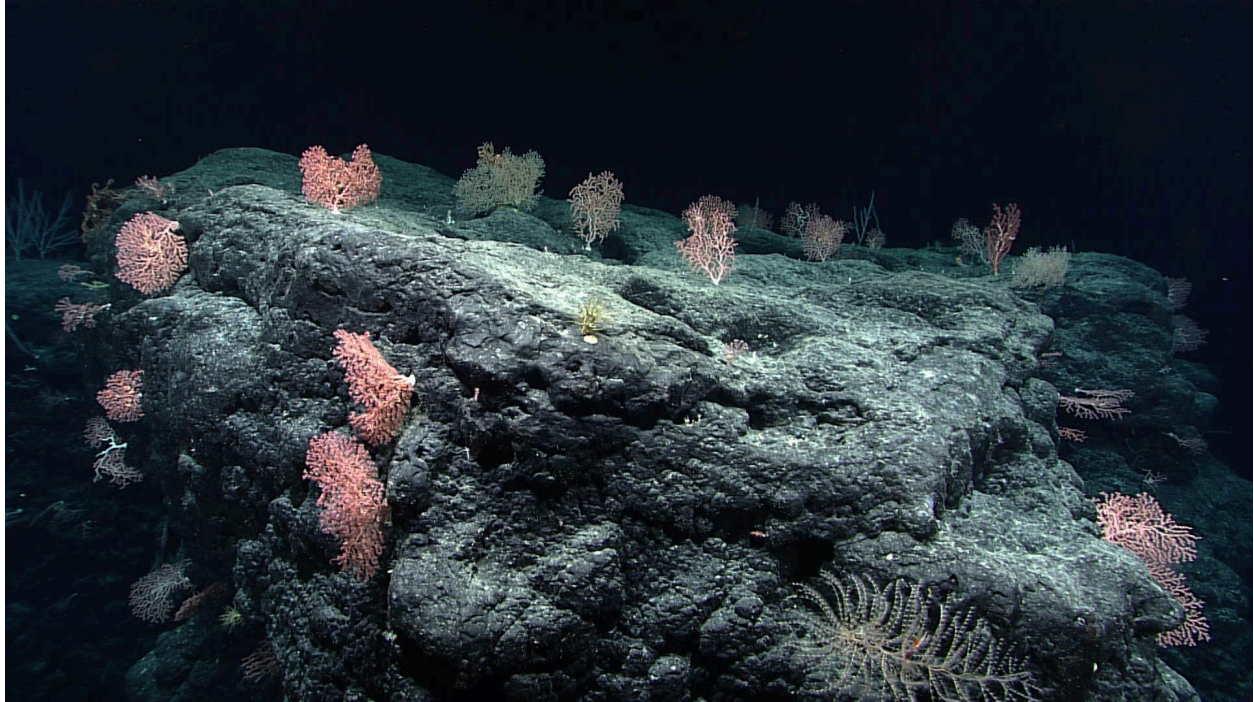
Uroptychus sp. nov. was collected along with its host coral *Umbellapathes litocrata*.



Two representative Mn-Fe encrusted samples were collected during the dive. Pictured in an Mn-Fe encrusted pillow basalt from a region near the seamount summit.

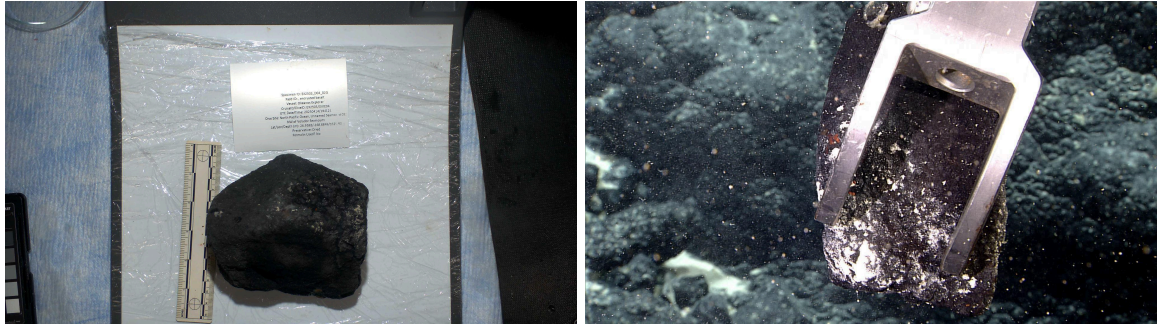


Carbonate sediments from the shallowest and deepest dive sites were collected using the ROV's slurrp sampler. Pictured is sediment from the shallowest dive site containing apparent burrow features.



A high density coral community that only occupied two boulders was found near the summit.

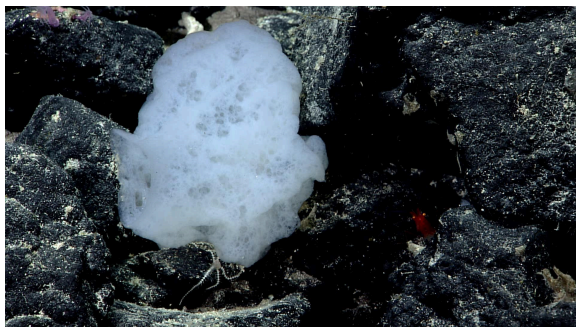
Samples Collected



Sample ID	EX2503_D04_02G
Date (UTC)	20250414
Time (UTC)	194121
Depth (m)	1620.93103027344

Latitude (decimal degrees)	26.9597663879395
Longitude (decimal degrees)	-168.884902954102
Temp. (°C)	2.21399998664856
Field ID(s)	encrusted basalt
Comments	Basalt encrusted with MeFn, numerous microfaunal encrusters on all sides of rock. Potential agglutinating polychaete worms, juvenile sponge or tunicate? Two notable large red encrustations apparently biological.

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



Sample ID	EX2503_D04_03B
Date (UTC)	20250414
Time (UTC)	194926
Depth (m)	1621.28100585938
Latitude (decimal degrees)	26.9598121643066
Longitude (decimal degrees)	-168.884826660156

Temp. (°C)	2.24399995803833
Field ID(s)	Porifera
Comments	Euplectellid. Very soft, no apparent sclerates, small. Multiple central openings.

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



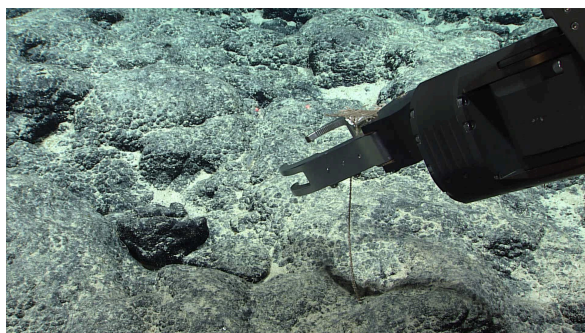
Sample ID	EX2503_D04_04G
Date (UTC)	20250414
Time (UTC)	225621
Depth (m)	1514.65002441406
Latitude (decimal degrees)	26.9590282440186
Longitude (decimal degrees)	-168.882308959961
Temp. (°C)	2.5090000629425
Field ID(s)	carbonate seds from 1515m
Comments	

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



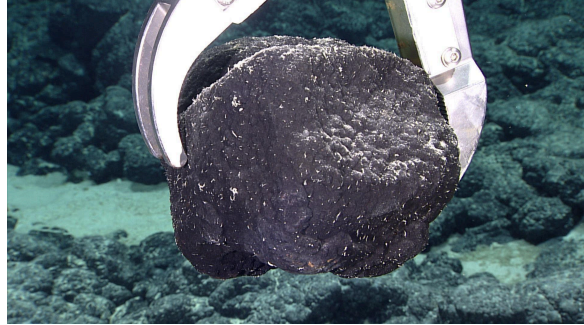
Sample ID	EX2503_D04_05B
Date (UTC)	20250414
Time (UTC)	234242
Depth (m)	1503.72998046875
Latitude (decimal degrees)	26.9587669372559
Longitude (decimal degrees)	-168.882263183594
Temp. (°C)	2.46900010108948
Field ID(s)	Uroptychus
Comments	Potentially novel Uroptychus sp. Very spikey. White tips on claws. Brighter purple coloring just behind rostrum eyes. Removing lower portion of middle leg on the left side for genetics.

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



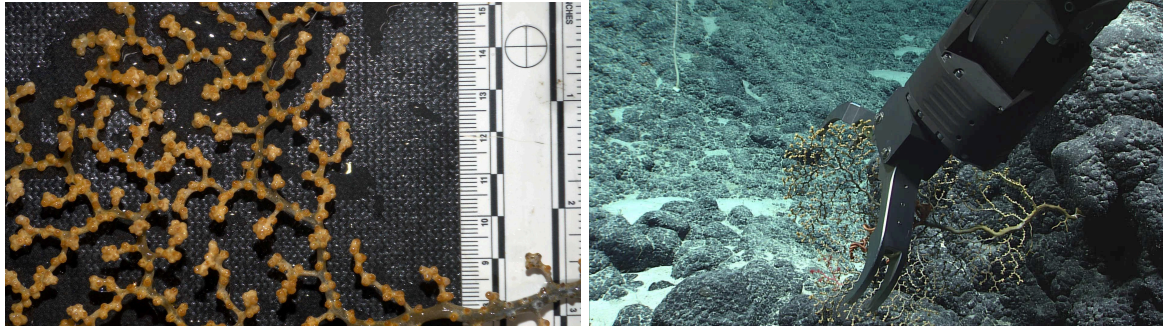
Sample ID	EX2503_D04_06B
Date (UTC)	20250414
Time (UTC)	234717
Depth (m)	1503.63403320313
Latitude (decimal degrees)	26.9587898254395
Longitude (decimal degrees)	-168.882202148438
Temp. (°C)	2.4779999256134
Field ID(s)	Umbellapathes litocrada
Comments	4 primary branches, two branches appear to be fused together. One of 4 branches was removed as a subsample for BISH.

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



Sample ID	EX2503_D04_07G
Date (UTC)	20250415
Time (UTC)	000923
Depth (m)	1502.32800292969
Latitude (decimal degrees)	26.9586486816406
Longitude (decimal degrees)	-168.882064819336
Temp. (°C)	2.50399994850159
Field ID(s)	pillow? basalt
Comments	Pillow basalt with MnFe crust. Numerous encrusters; agglutinated forams or polychaete worms? Juvenile sponge or tunicate?

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



Sample ID	EX2503_D04_09B
Date (UTC)	20250415
Time (UTC)	013043
Depth (m)	1491.00695800781
Latitude (decimal degrees)	26.9582710266113
Longitude (decimal degrees)	-168.88151550293
Temp. (°C)	2.6010000705719
Field ID(s)	Paramuriceidae
Comments	- main axis fine branchlets irregularly branching three sides of polyps; flexible.

Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



Sample ID	EX2503_D04_10G
Date (UTC)	20250415
Time (UTC)	013615
Depth (m)	1491.18005371094
Latitude (decimal degrees)	26.9581813812256
Longitude (decimal degrees)	-168.881484985352
Temp. (°C)	2.60899996757507
Field ID(s)	carbonate seds 1490m
Comments	near high-density coral patch 1490m water depth. Carbonate ooze. >500 microns

Niskin Sampling Summary

Sample ID	EX2503_D04_01W
Date (UTC)	20250414
Time (UTC)	193546
Depth (m)	1620.60400390625
Latitude (decimal degrees)	26.9597988128662
Longitude (decimal degrees)	-168.884887695313

Bottle Number	Niskin Bottle 1
Temperature	2.22199988365173
Dissolved Oxygen (mg/L)	2.43199992179871
Treatment	DNA/RNA Shield

Sample ID	EX2503_D04_08W
Date (UTC)	20250415
Time (UTC)	010906
Depth (m)	1489.23095703125
Latitude (decimal degrees)	26.9583759307861
Longitude (decimal degrees)	-168.881759643555
Bottle Number	Niskin Bottle 2
Temperature	2.6159999370575
Dissolved Oxygen (mg/L)	1.90799999237061
Treatment	DNA/RNA Shield

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