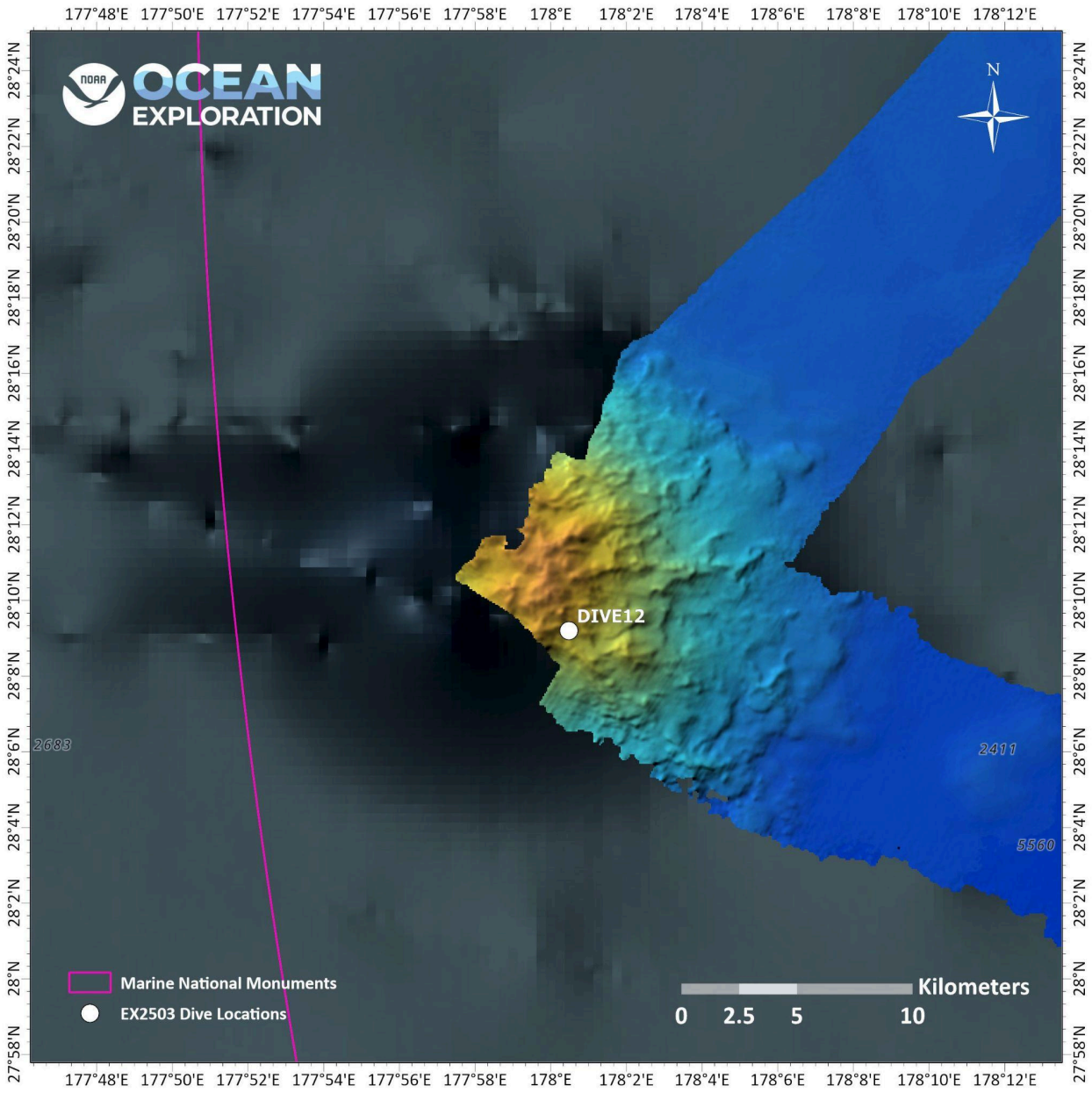
ROV Dive Summary
EX2503, Dive 12, April 25, 2025

General Location Map



Dive Information

Site Name	Unnamed Seamount 05 - Extreme Western Papahānaumokuākea
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 12 was to explore a recently discovered feature at the extreme western edge of Papahanaumokuakea. This likely volcanic feature has a summit depth of 2,000 meters and what appears to be highly variable terrain. As this feature has no close neighbors, it is an interesting ecological comparison between this region's communities and those in similar depths closer to the Hawaiian chain. In addition, because this feature is isolated and was discovered within the past year (by another *Okeanos* expedition), geological sampling is a priority to help determine the age and provenance of this feature and place it within the broader regional context.
Maritime Heritage Restrictions	No

ROV Dive Summary Data	Dive Type: Normal In Water: 2025-04-25T18:29:52.614259 28.154046044889927 ; 178.0073038037615 On Bottom: 2025-04-25T20:06:24.242066 28.158225941218323 ; 178.0077028207203 Off Bottom: 2025-04-26T00:58:02.309431 28.15996879730433 ; 178.0045880626853 Out Water: 2025-04-26T02:21:43.679516 28.16219439754211 ; 178.00814738876576 Dive Duration: 7:51:51 Bottom Time: 4:51:38 Max Vehicle Depth: 2394.9 m Min Seafloor Depth: 2253.3 m Distance Travelled: 414.7 m

Dive Description	EX2503 Dive 12 began with visualization of the ridge at 1004 HST. As we reached the bottom, we observed a number of mesopelagic organisms that are common in the deep scattering layer (planktonic foraminifera, radiolaria, ctenophores, trachymedusa jellies, chaetognaths, etc.). The outcrops here were primarily large pillow basalts, which were sampled for aging and further analysis. We also collected sediment at the bottom depth of the dive to characterize the carbonate contributions at this depth as well as the primary benthic infauna. While the community we encountered on this ridge arm was relatively low-density, it housed a surprising amount of diversity. Multiple species and morphologies of corals were present, including bottle brush Chrysogorgids, bamboo and Primnoid whips and fans of multiple species, and a number of *Hemicorallium* colonies. There were also occasional large *Poliopogon* sponges, which served as substrate for other organisms–including a likely new species of benthic ctenophore (*Tjalifella* sp. nov) that was sampled along with its *Poliopogon* host. We also observed a diversity of echinoderms on this dive, including a black Comatulid crinoid that may represent a new species. Multiple benthic holothurians (sea slugs) were observed, as well as a relatively high number of *Ahuastra gfoei*, often on the lobate lava flows that were visible as we continued up the ridge. Predatory Goniaster stars were also observed feeding on bamboo corals, as well as a number of Solasterids (sun stars) and Ophicanthid brittle stars. We also observed a number of *Astrophiura* sp., an extremely small brittle star that has yet to be described. We attempted to sample one individual and were successful at removing it from the substrate, but found it absent in the sample canister upon recovery. However, we observed the individual moving just prior to this sample attempt, which suggests they are motile rather than sessile (as previously thought).
Notable Observations	A benthic ctenophore (likely *Tjalfiella* sp. nov.) living on *Poliopogon* coral and feeding with extremely long tentacles. A small black Comatulid crinoid that may represent a new species. A relatively low abundance, high diversity community situated on stark, steep volcanic terrain composed of large pillow basalts and lobate flows with ferromanganese encrustation.

Community and Habitat Observations	Corals and Sponges — Present Chemosynthetic Community — Absent High biodiversity Community — Absent Active Seep or Vent — Absent Extinct Seep or Vent — Absent Hydrates — Absent
CMECS Feature Type(s)	Seamount > Slope > Terrace > Wall
SeaTube Link (science annotations)	https://data.oceannetworks.ca/app/dive-logs/2005

Equipment Deployed

ROV	*Deep Discoverer*
Camera Platform	*Seirios*
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 drawers 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

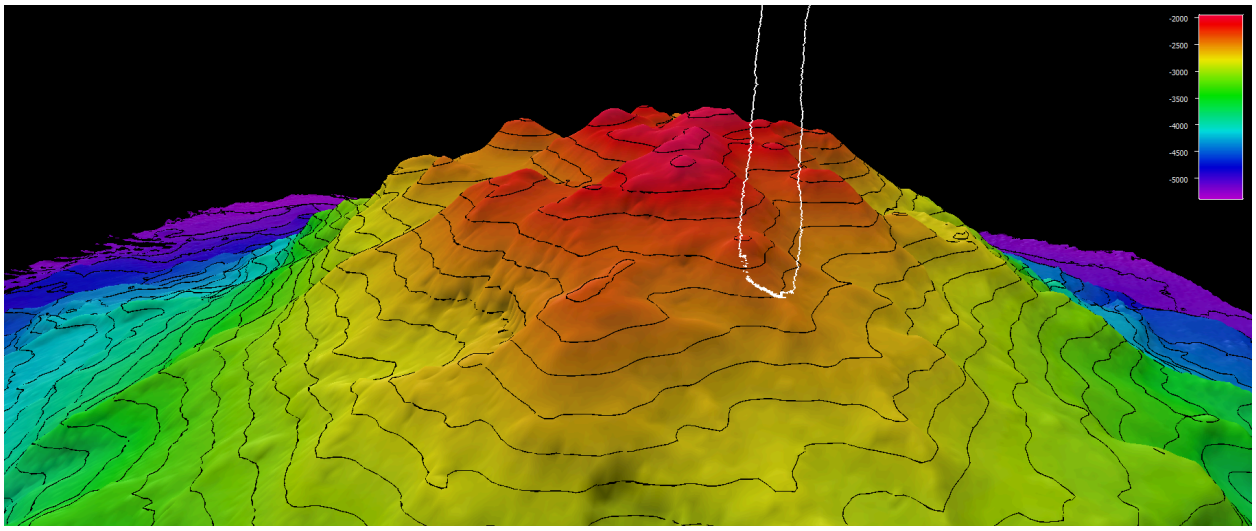


Figure 1: Dive 12 dive site. Shown in 1.5x vertical exaggeration; smoothed ROV dive track shown in white on 50x50 (interpolated) cell size bathymetry. Depth shown in meters; coloration based on depths with 100-meter contours overlain.

Sound Speed Manager Image of ROV CTD Profile

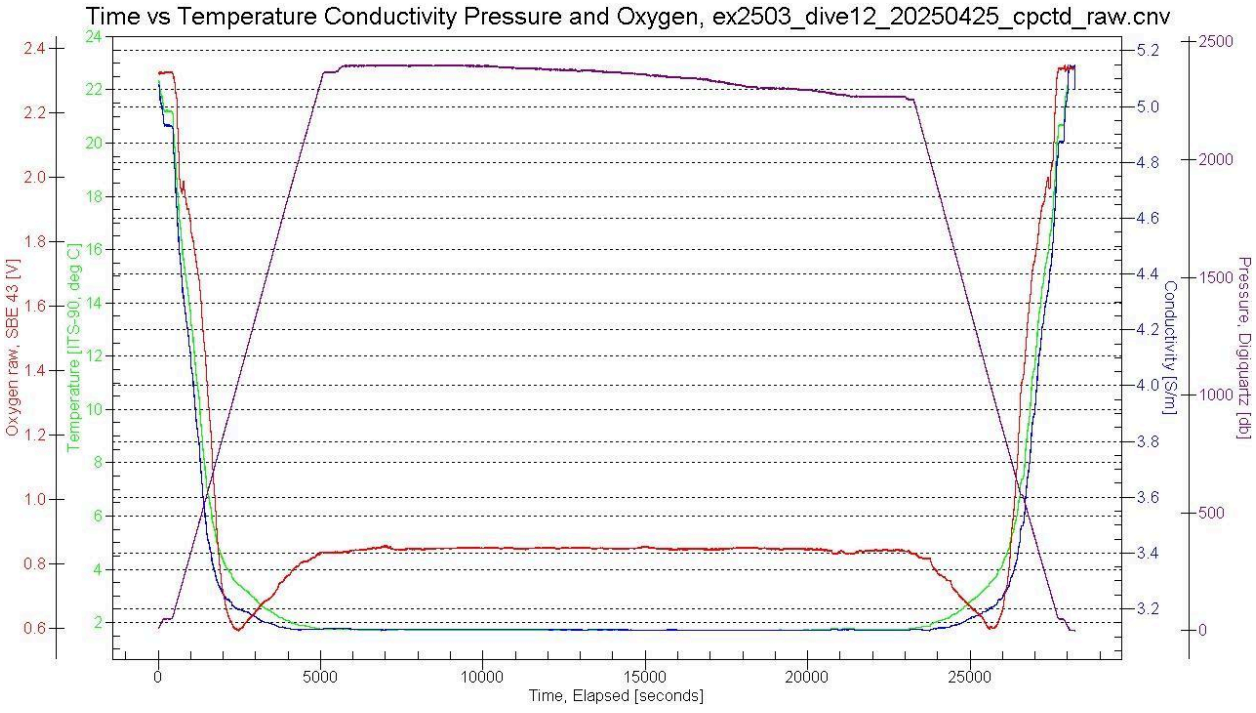
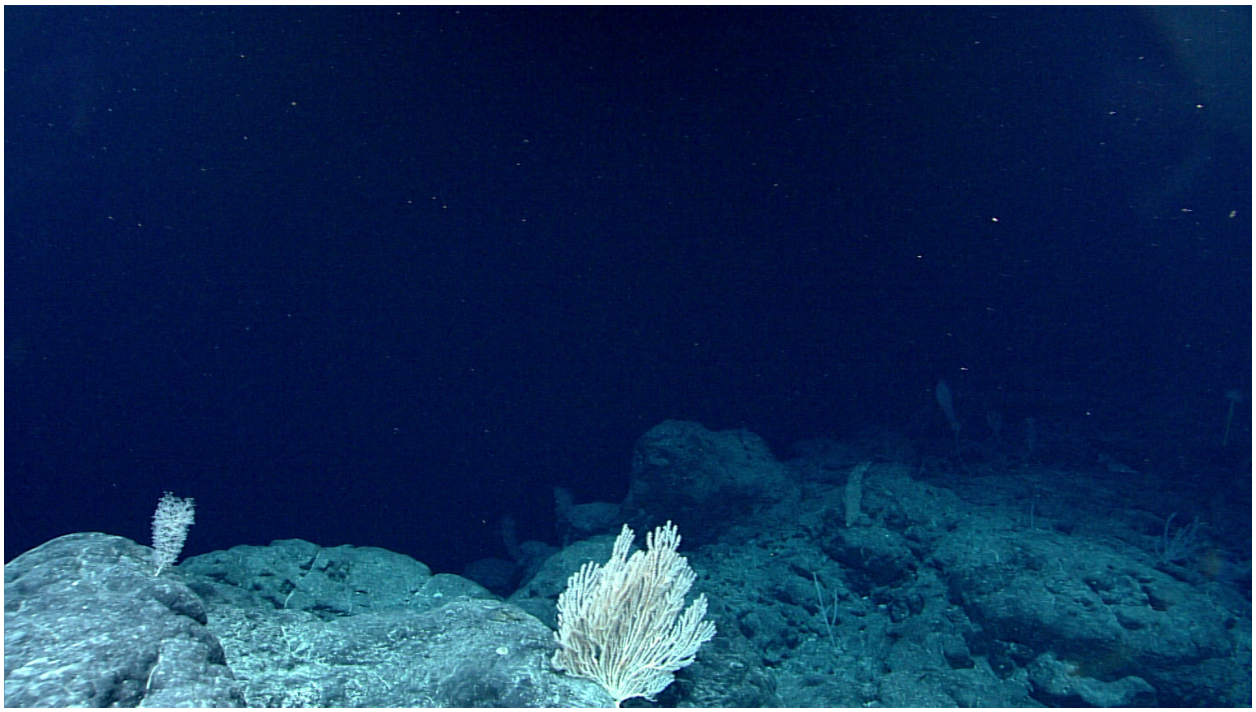
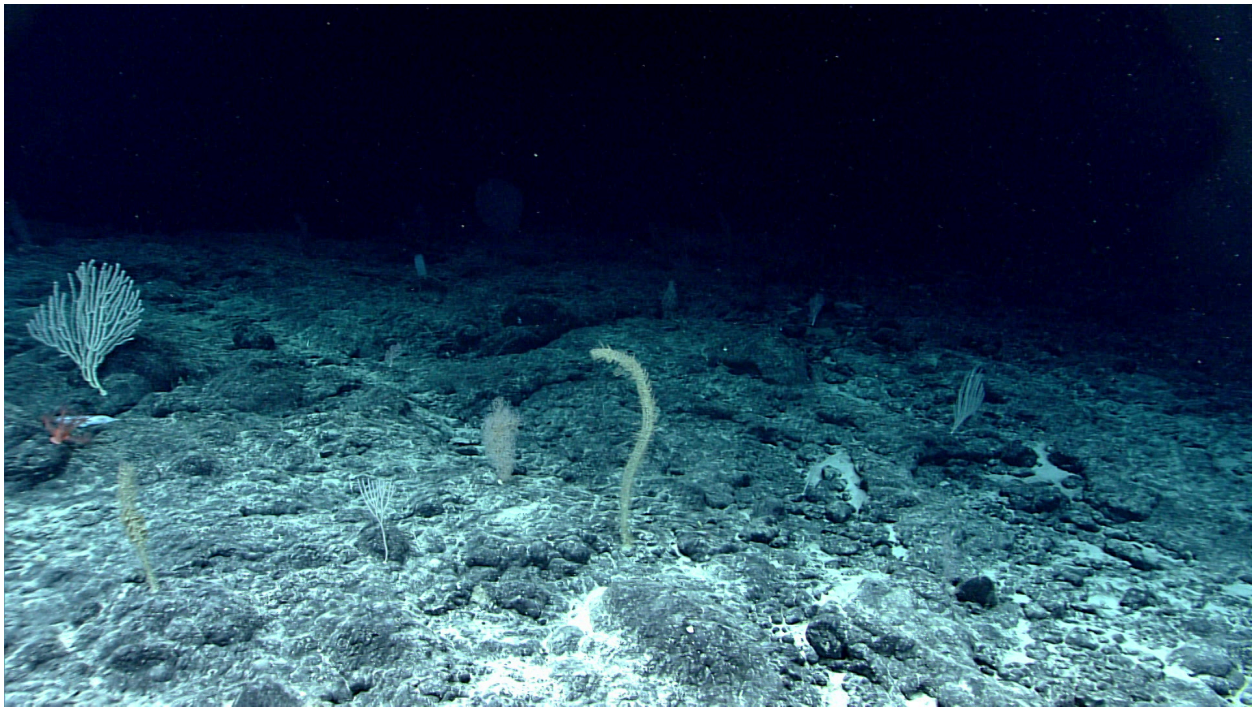


Figure 2. Ambient conditions during Dive 12. Plot shows Temperature (˚C), Conductivity (S/m), Pressure (db), and Oxygen (V; as measured by SBE43).

Representative Photos of the Dive

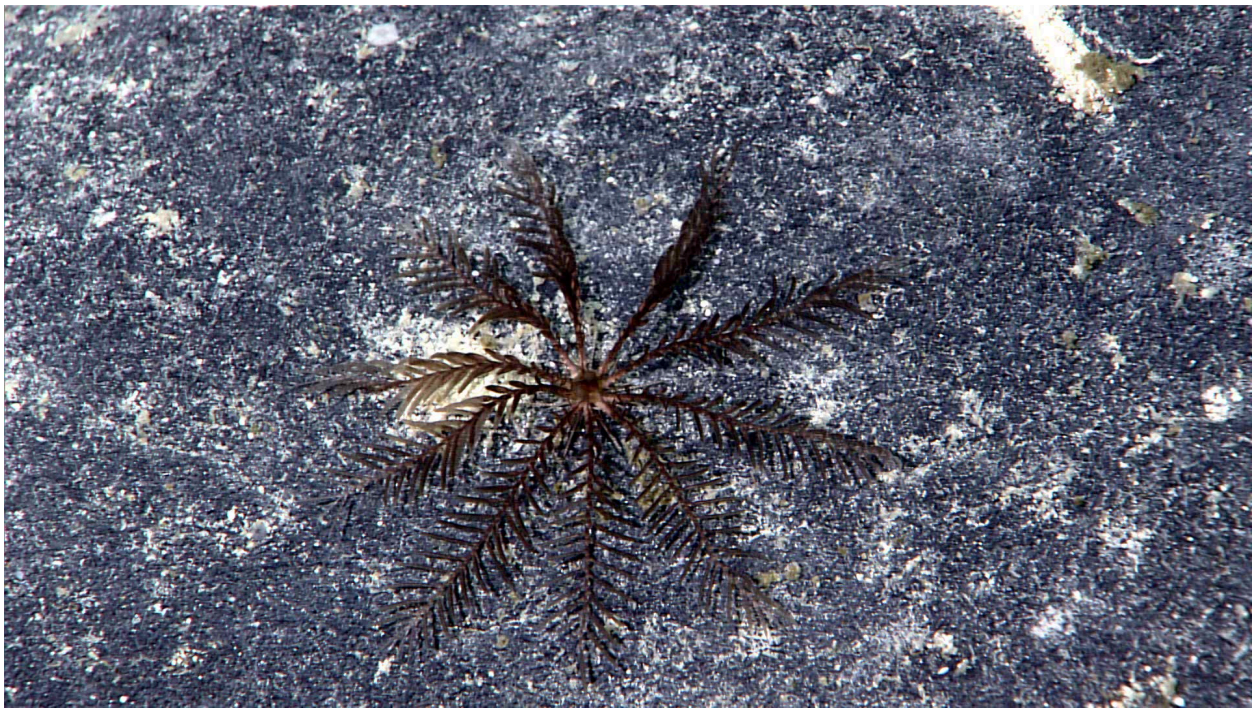


EX2503 Dive 12 took place on the ridge of an isolated volcanic feature, which was covered in pillow basalt and lobate flows. The edge of this ridge formed a relatively stark wall, seen here in the distance.



While the density of macrofauna was relatively low, there was substantial diversity within this ridge arm community.

A potential new species of benthic ctenophore (*Tjalfella* sp. nov.?) was found and collected. Another was later observed with its tentacles unfurled, stretching many times longer than its body length into the current.

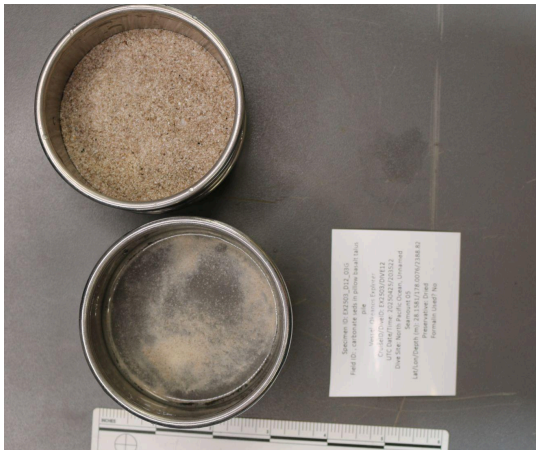


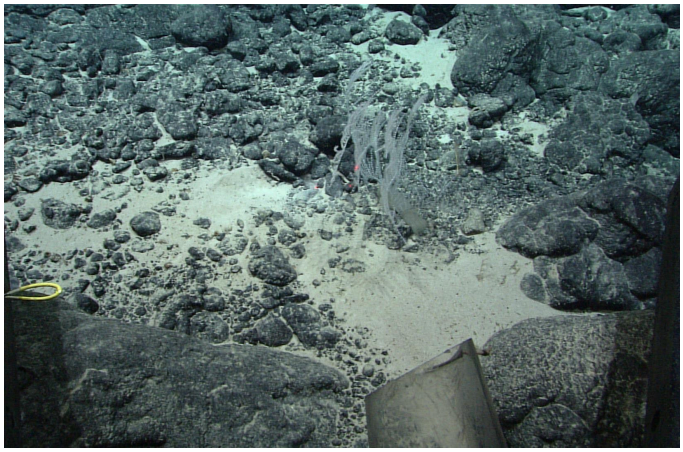
A potential new species of Comatulid crinoid, with a small *Astrophiura* sp. visible in the upper left corner of the image.

Samples Collected

Sample ID	EX2503_D12_02G
Date (UTC)	20250425
Time (UTC)	202739
Depth (m)	2389.2548828125
Latitude (decimal degrees)	28.1582927703857
Longitude (decimal degrees)	178.007614135742
Temp. (°C)	1.69400000572205
Field ID(s)	encrusted pillow basalt - 2387m
Comments	Encrusted, likely basalt; two surfaces much more lightly encrusted with crumbly nodule texture. One tube worm encruster

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





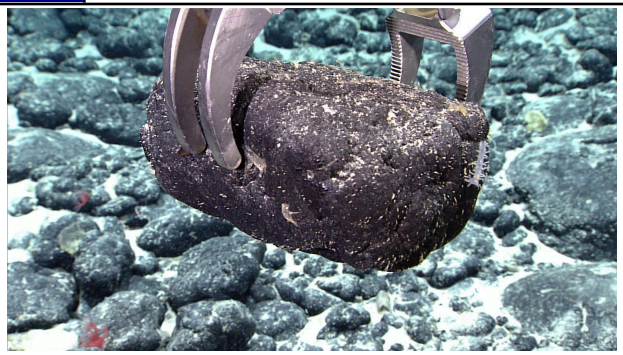
Sample ID	EX2503_D12_03G
Date (UTC)	20250425
Time (UTC)	203522
Depth (m)	2388.82006835938
Latitude (decimal degrees)	28.1581192016602
Longitude (decimal degrees)	178.007583618164
Temp. (°C)	1.68599998950958
Field ID(s)	Carbonate sediments in pillow basalt talus pile
Comments	>250 microns. Carbonate ooze.

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

Sample ID	EX2503_D12_04B
Date (UTC)	20250425
Time (UTC)	210623
Depth (m)	2390.99096679688
Latitude (decimal degrees)	28.1584129333496
Longitude (decimal degrees)	178.007247924805
Temp. (°C)	1.70000004768372
Field ID(s)	Tjalfiella
Comments	On poliopogon sponge. One tentacle removed for genetic sample.

Associates Sample ID:	EX2503_D12_04B_A01B
Field Identification:	Poliopogon

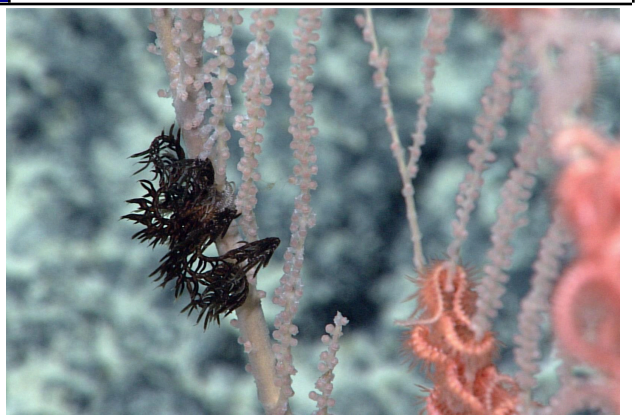
Count:	1



Sample ID	EX2503_D12_05G
Date (UTC)	20250425
Time (UTC)	230447
Depth (m)	2335.3359375
Latitude (decimal degrees)	28.1587734222412
Longitude (decimal degrees)	178.005264282227
Temp. (°C)	1.71800005435944
Field ID(s)	Heavily encrusted pillow basalt? from nodule field
Comments	FeMn crust. Likely basalt? Slightly shiny. One Walteria associate being removed.

Associates Sample ID:	EX2503_D12_05G_A01B
Field Identification:	Walteria

Count:	1

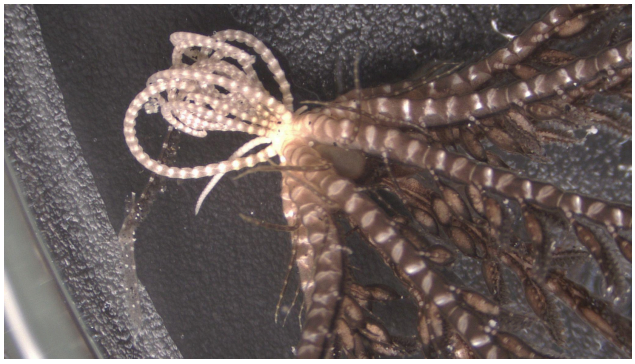


Sample ID	EX2503_D12_06B
Date (UTC)	20250425
Time (UTC)	235055
Depth (m)	2288.89794921875
Latitude (decimal degrees)	28.1596927642822
Longitude (decimal degrees)	178.005096435547
Temp. (°C)	1.70200002193451
Field ID(s)	Comatulida
Comments	Black. Came up intact but started shedding arms and cirri when in lab for observations. Stripped cirri. Two arms are partially regrown.

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

SAMPLE WAS ABSENT IN CANISTER ONCE ON DECK

Sample ID	EX2503_D12_07B
Field ID(s)	Astrophiura



Associates Sample ID:	EX2503_D12_07B_A01B
Field Identification:	Comatulida
Count:	1

Niskin Sampling Summary

Sample ID	EX2503_D12_01W
Date (UTC)	20250425
Time (UTC)	201158
Depth (m)	2386.42504882813
Latitude (decimal degrees)	28.1581058502197

Longitude (decimal degrees)	178.007827758789
Bottle Number	Niskin Bottle 1
Temperature	1.69599997997284
Dissolved Oxygen (mg/L)	3.29800009727478
Treatment	DNA/RNA Shield

Sample ID	EX2503_D12_08W
Date (UTC)	20250426
Time (UTC)	005353
Depth (m)	2253.78491210938
Latitude (decimal degrees)	28.1602516174316
Longitude (decimal degrees)	178.004867553711
Bottle Number	Niskin Bottle 2
Temperature	1.75199997425079
Dissolved Oxygen (mg/L)	3.13000011444092
Treatment	DNA/RNA Shield

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