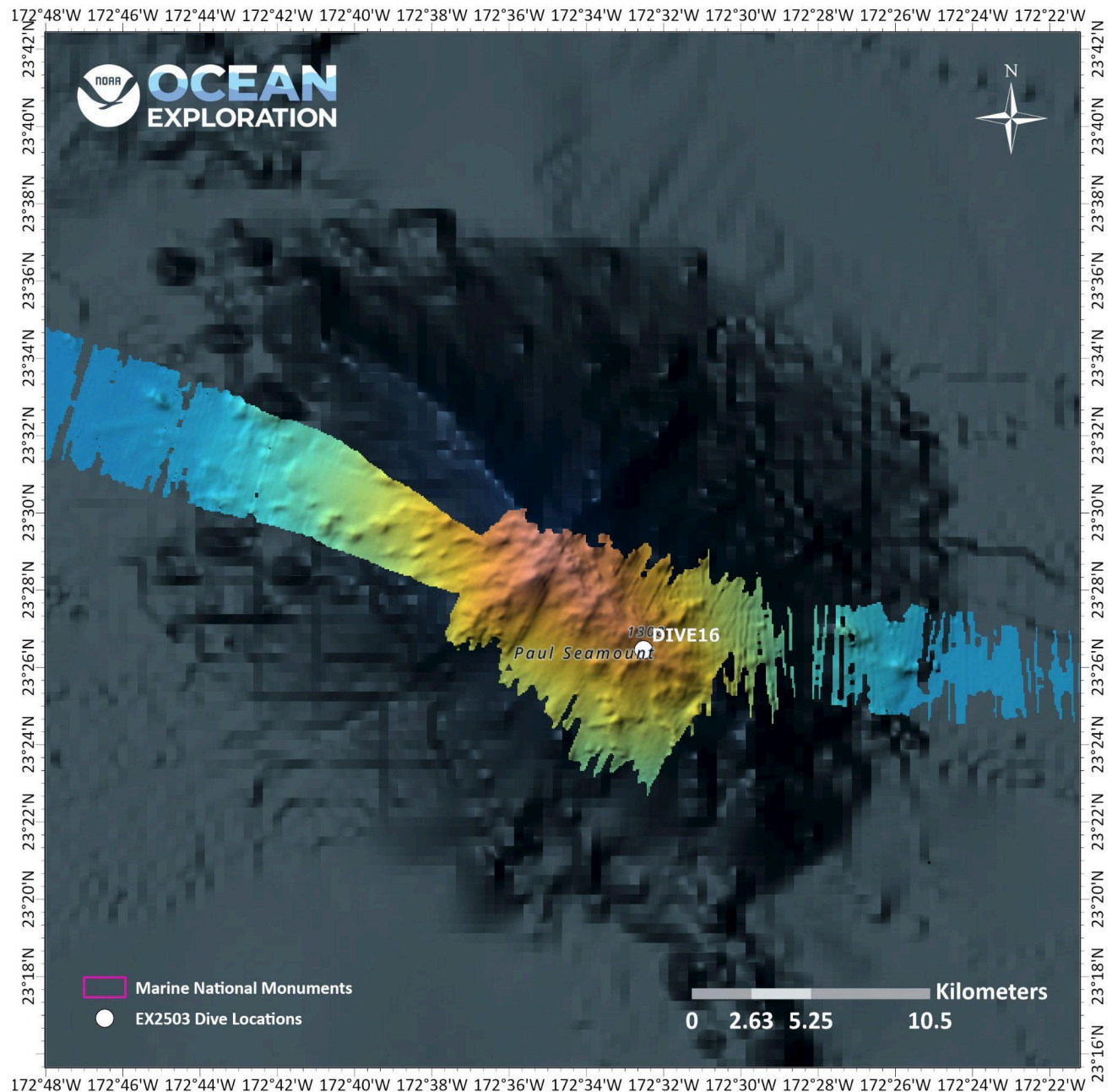


# ROV Dive Summary

## EX2503, Dive 16, April 30, 2025

### General Location Map



## Dive Information

Site Name	Paul 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 16 was to explore a southeastern ridge arm of Paul Seamount, an unexplored seamount in the Wentworth seamount chain. Exploration on a similar seamount just north of Paul seamount by E/V <i>Nautilus</i> in 2018 located an extremely large <i>Hemicorallum</i> community. Our goal was to dive at a similar depth range—between 1920 and 1740 meters depth—on a ridge of comparable bathymetry to see if a similar community was present on this unexplored seamount.
Maritime Heritage Restrictions	No

ROV Dive Summary  
Data

Dive Type: Normal

In Water: 2025-04-30T18:35:09.323624  
23.44177490752052 ; -172.5424036663758

On Bottom: 2025-04-30T19:43:01.712518  
23.445797830685795 ; -172.5411979716353

Off Bottom: 2025-05-01T01:35:18.361930  
23.447088824296863 ; -172.5449377547695

Out Water: 2025-05-01T02:37:43.242942  
23.448837300795184 ; -172.5411065661977

Dive Duration: 8:02:33

Bottom Time: 5:52:16

Max Vehicle Depth: 1899.9 m

Min Seafloor Depth: 1737.9 m

Distance Travelled: 590.5 m

## Dive Description

EX2503 Dive 16 began with visualization of the ridge arm at 0942 HST. At our beginning depth of 1895 meters, we noted an extremely strong downhill current, flowing over a high-density and high-diversity community of corals and sponges. This community had individuals from many coral taxa (*Chrysogorgia*, *Hemicorallium*, and *Keratoisididae*), as well as large *Poliopogon* sponges. Many corals exhibited evidence of predation, and a number of *Hippasteria* sea stars were quickly encountered within the community. We also encountered a number of crinoids with unique morphologies, including one sampled that may represent a new species within the genus *Antedon*, and a demosponge (likely *Stelodoryx* sp.) sampled as a potential range extension.

This high-density and diverse community very quickly faded away as we transitioned from basalt pavement to a cobble field. The current continued to be challenging; *D2* was at full lateral thruster in order to stay on target during this portion of the dive. This sparse community had a number of large *Poiopogon* sponges as well as multibranched, whip-morph corals (many *Chrysogorgia* that began as bottle-brush morphs, then transitioned to branched morphs). As the terrain transitioned from pavement to cobble to pavement, these high-density communities faded in and out again. The transitions were stark and particularly notable.

While the communities of “megafauna” were patchy and transitioned in sync with the terrain, microfauna were consistently abundant throughout the dive. We noted an extremely high abundance of arborescent foraminifera growing on hardground substrate, which appeared to carpet the seafloor on this ridge arm. In addition to arborescent foraminifera, we noted a number of other encrusting foraminifera, komokiaceans, hydroids, tube worms, and many other agglutinators. These observations highlight the contribution of microfauna to biomass on the seafloor.

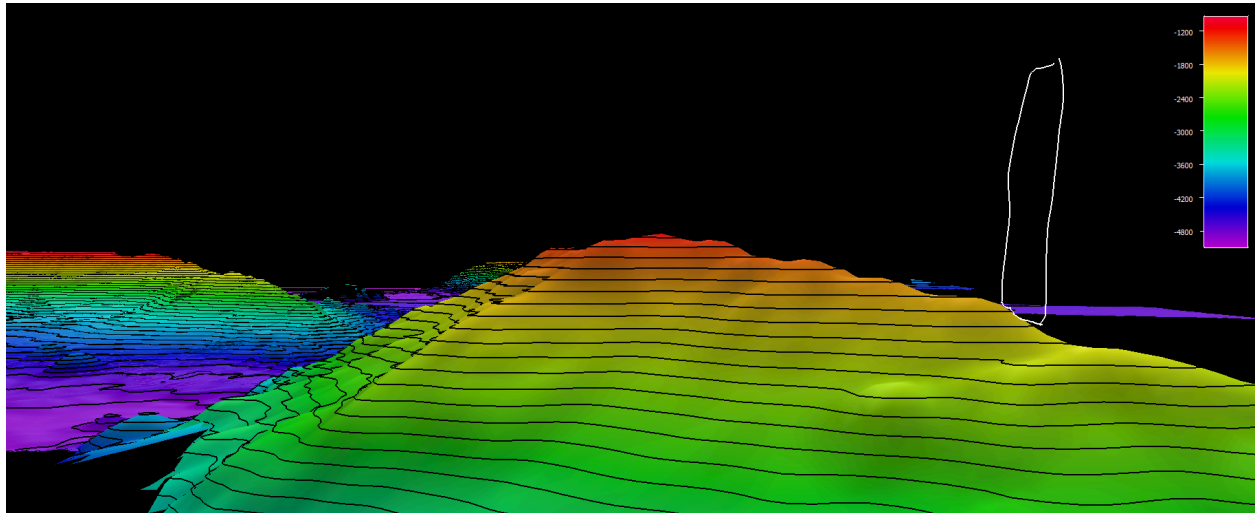
A number of unique and unusual specimens were collected during the dive. Benthic ctenophores, likely in the genus *Tjalfiella*, were collected from a large *Walteria* sponge and likely represent a new or undescribed species. In addition, an Ophiomyxid brittle star with a bright red central disk was collected that may also represent a new species, as was the *Antedon* crinoid mentioned above. A particularly interesting specimen that none of the shipboard and shoreside science party could identify beyond “Animalia” was also sampled for further analysis.

	A particularly notable feature of the high-density and diversity patches we encountered during this dive was the presence of multiple size classes of sponges and corals, indicating that this region may be a particularly favorable environment for larval settlement. We observed numerous juvenile <i>Poliopogon</i> sponges as well as a <i>Poliopogon</i> individual that was missing its outer matrix, suggesting that this sponge was near the end of its life. In addition, numerous coral and sponge stalks and subfossil individuals indicate that this community has been a favorable site for settlement for many generations (i.e., hundreds to thousands of years, given the long lifespan of deep-sea corals and sponges).
Notable Observations	<p>Rapid transitions between high-density, high-diversity communities to sparse, low-diversity communities appeared to correlate with changes in bathymetry and/or current strength.</p> <p>Multiple size classes of corals and sponges are present across the dive: juveniles, adults, late-stage morphs potentially near senescence, and subfossil remains. Evidence for this site being a healthy settlement environment for larval corals and sponges.</p> <p>Multiple large <i>Bolosoma</i> sponges (yellow morphotype - <i>B. sp. B</i>) with heads of close to a meter in width.</p>
Community and Habitat Observations	<p>Corals and Sponges — Present</p> <p>Chemosynthetic Community — Absent</p> <p>High biodiversity Community — Present</p> <p>Active Seep or Vent — Absent</p> <p>Extinct Seep or Vent — Absent</p> <p>Hydrates — Absent</p>
CMECS Feature Type(s)	Seamount > Boulder Field > Slope > Wall
SeaTube Link (science annotations)	<a href="https://data.oceannetworks.ca/app/dive-logs/2305">https://data.oceannetworks.ca/app/dive-logs/2305</a>

## Equipment Deployed

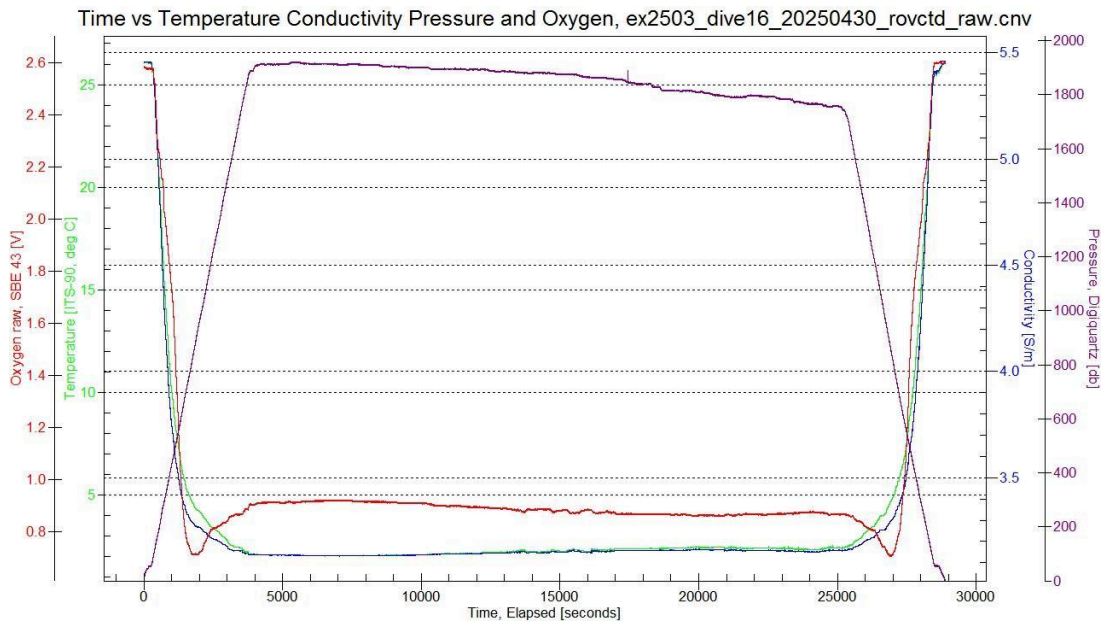
ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>
ROV Measurements	The following ROV measurements, data streams, and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low-resolution cameras, manipulator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

## Close-Up Map of Main Dive Site



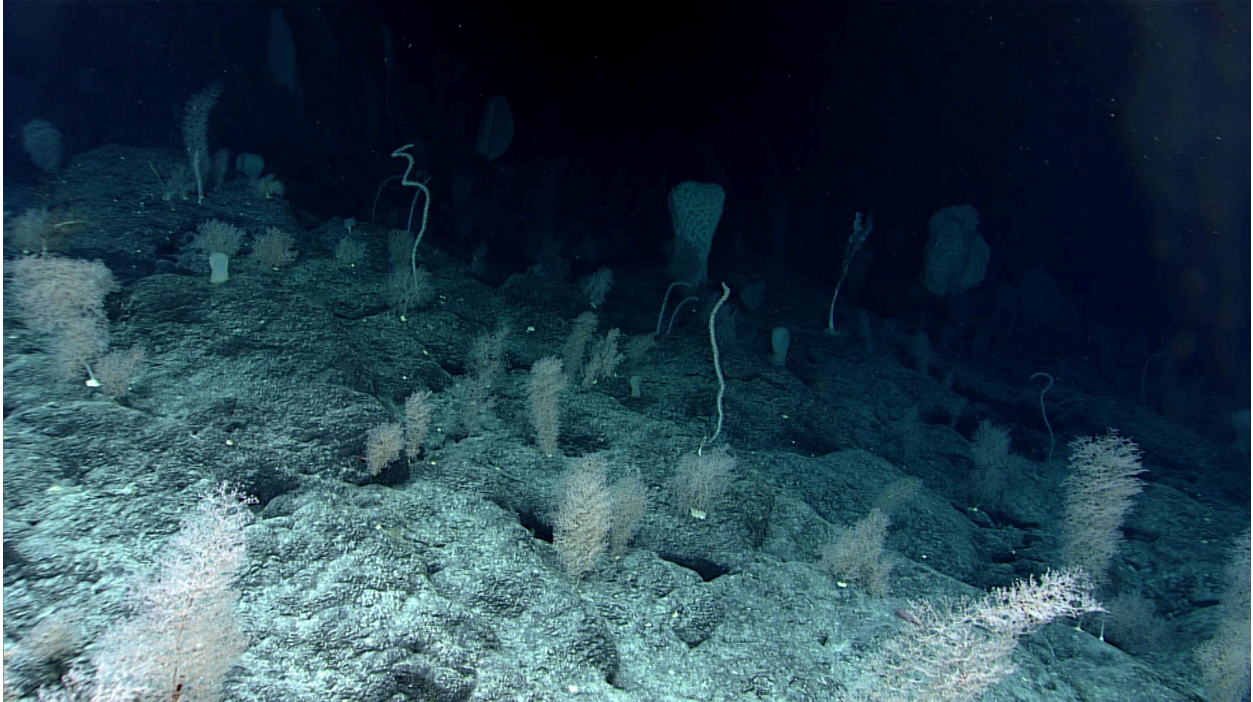
**Figure 1: Dive 16 dive site.** Shown in 2x vertical exaggeration; smoothed ROV dive track shown in white on 50x50 (interpolated) cell size bathymetry. Depth shown in meters; coloration based on depths with 100-meter contours overlain.

## Sound Speed Manager Image of ROV CTD Profile



**Figure 2. Ambient conditions during Dive 16.** Plot shows Temperature ( $^{\circ}\text{C}$ ), Conductivity (S/m), Pressure (db), and Oxygen (V; as measured by SBE43).

## Representative Photos of the Dive



EX2503 Dive 16 began in a high-density and high-diversity coral and sponge community comprised of numerous species of *Chrysogorgia*, *Hemicorallium*, and bamboo corals; *Poliopogon*, *Stelodoryx*, *Farrea*, and *Bolosoma* sponges; and a variety of smaller associates, including brittle stars, squat lobsters, mollusks, foraminifera, hydroids, and many other taxa.



While *Deep Discoverer* and *Seirios* allowed participants of EX2503 Dive 16 to be the first humans to “visit” Paul Seamount, human impacts preceded our visit. Pictured here is marine debris entangled in a *Chrysogorgia* coral.



This black coral (*Stauropathes*) covered an unusual individual that shoreside and shipboard scientists had difficulty identifying. Upon recovery, this organism was tentatively identified as a large aplacophoran (shell-less mollusk), covered in spicules that give it a “fuzzy” appearance.



A number of large, yellow *Bolosoma* sponges (*B. sp. B*) were observed on this dive, with heads measuring close to a meter in width.

## Samples Collected



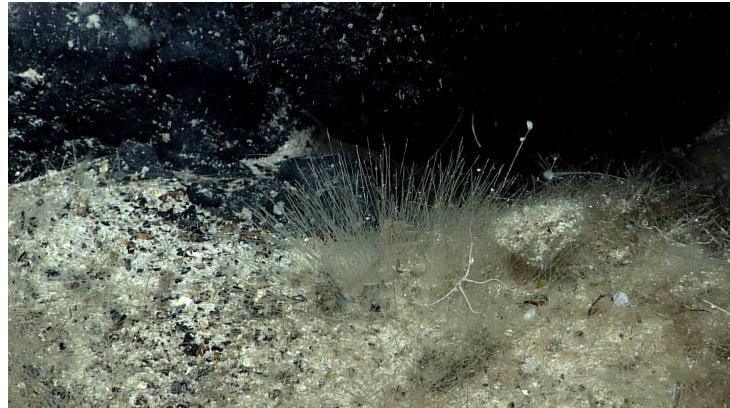
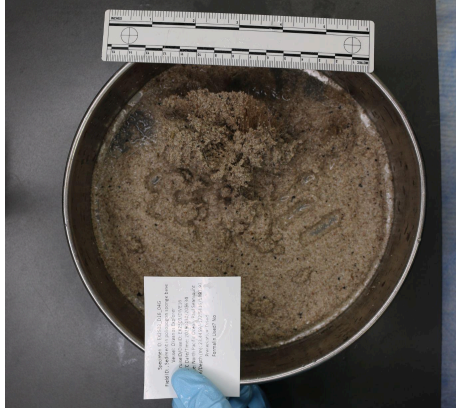
Sample ID	EX2503_D16_02G
Date (UTC)	20250430
Time (UTC)	195959
Depth (m)	1892.71301269531
Latitude (decimal degrees)	23.4458179473877
Longitude (decimal degrees)	-172.541259765625
Temp. (°C)	2.09200000762939
Field ID(s)	encrusted basalt
Comments	Encrusted basalt, areas of notable current polish, multiple foram encrusters present on one surface

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



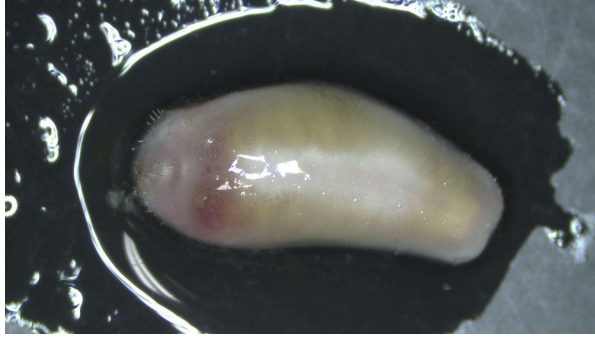
Sample ID	EX2503_D16_03B
Date (UTC)	20250430
Time (UTC)	202651
Depth (m)	1892.64794921875
Latitude (decimal degrees)	23.4457988739014
Longitude (decimal degrees)	-172.541091918945
Temp. (°C)	2.02900004386902
Field ID(s)	Stelodoryx
Comments	Matrix branching pattern, semi transparent, whiteish in color

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



Sample ID	EX2503_D16_04G
Date (UTC)	20250430
Time (UTC)	205634
Depth (m)	1887.92602539063
Latitude (decimal degrees)	23.4458694458008
Longitude (decimal degrees)	-172.541580200195
Temp. (°C)	2.05699992179871
Field ID(s)	Sediment in poliopogon sponge base
Comments	carbonate ooze, sampled from base of poliopogon sponge, many spicules present, noted meiofauna diversity from sample site

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



Sample ID	EX2503_D16_05B
Date (UTC)	20250430
Time (UTC)	212626
Depth (m)	1879.38305664063
Latitude (decimal degrees)	23.4459800720215
Longitude (decimal degrees)	-172.541839599609
Temp. (°C)	2.09699988365173
Field ID(s)	Unknown
Comments	Hairy, potential Aplacophoran? Appears to have sclerites on exterior, notably one line is a different color. Deuterostome. Sclerites differentiated in color? Central line on dorsal surface is white, digestive track visible through transparent body. Spines on posterior surface

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

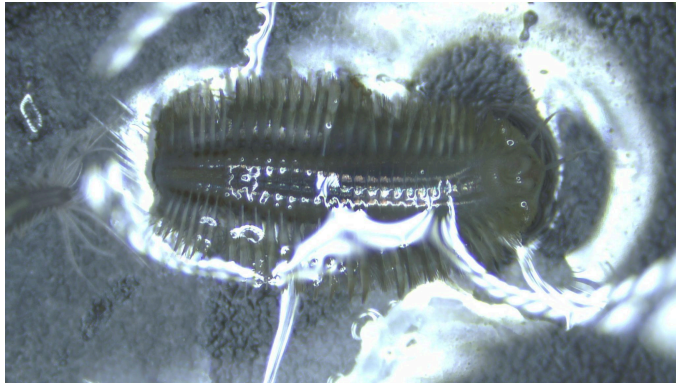


Sample ID	EX2503_D16_06B
Date (UTC)	20250430
Time (UTC)	214608
Depth (m)	1874.70202636719
Latitude (decimal degrees)	23.446252822876
Longitude (decimal degrees)	-172.542083740234
Temp. (°C)	2.14599990844727
Field ID(s)	Foraminifera
Comments	agglutinating arborescent forams living on polipopogon sponge base. Dominant fauna at this site.

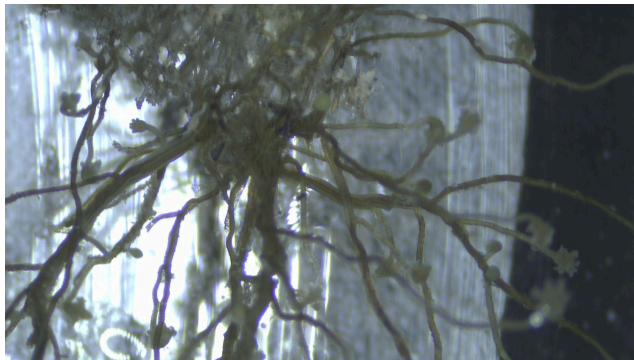


Associates Sample ID:	EX2503_D16_06B_A01B
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Field Identification:	Ophiuroidea
Count:	5



Associates Sample ID:	EX2503_D16_06B_A02B
Field Identification:	Polychaeta
Count:	5



Associates Sample ID:	EX2503_D16_06B_A03B
Field Identification:	Hydroida
Count:	1



Date (UTC)	20250430
Time (UTC)	225417
Depth (m)	1854.23303222656
Latitude (decimal degrees)	23.4464244842529
Longitude (decimal degrees)	-172.543060302734
Temp. (°C)	2.37400007247925
Field ID(s)	Tjalfiella
Comments	Semi transparent, two tentacles, red body



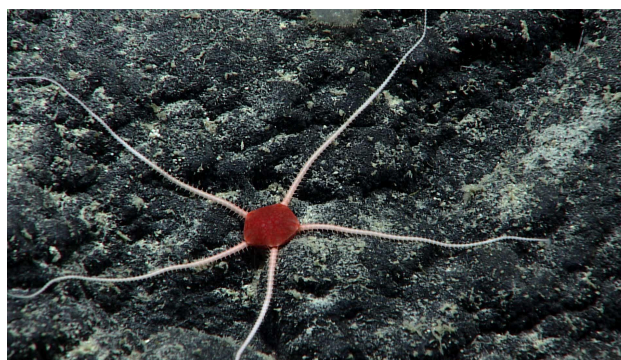
Associates Sample ID:	EX2503_D16_08B_A01B
Field Identification:	Walteria
Count:	1



Sample ID	EX2503_D16_09B
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Date (UTC)	20250430
Time (UTC)	231258
Depth (m)	1841.26696777344
Latitude (decimal degrees)	23.4463195800781
Longitude (decimal degrees)	-172.543319702148
Temp. (°C)	2.30399990081787
Field ID(s)	Antedonidae
Comments	all arms appear frozen in posture with cirri elevated, arms are fragile

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



Sample ID	EX2503_D16_10B
Date (UTC)	20250501
Time (UTC)	000443
Depth (m)	1794.51098632813
Latitude (decimal degrees)	23.4463138580322

Longitude (decimal degrees)	-172.544143676758
Temp. (°C)	2.46799993515015
Field ID(s)	Ophiomyxidae
Comments	Appears hollow, tissue in ventral surface of central disk appears either missing or retracted,

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



Sample ID	EX2503_D16_12G
Date (UTC)	20250501
Time (UTC)	010215
Depth (m)	1766.39501953125
Latitude (decimal degrees)	23.4465847015381
Longitude (decimal degrees)	-172.544815063477
Temp. (°C)	2.36800003051758
Field ID(s)	large cobble the size of a small cobble

Comments	Large encrusted basalt, angular edges, diverse community of encrusting foraminifera on surface present
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## Niskin Sampling Summary

Sample ID	EX2503_D16_01W
Date (UTC)	20250430
Time (UTC)	194601
Depth (m)	1890.97705078125
Latitude (decimal degrees)	23.4457187652588
Longitude (decimal degrees)	-172.541275024414
Bottle Number	Niskin Bottle 1
Temperature	2.08500003814697
Dissolved Oxygen (mg/L)	2.93099999427795
Treatment	DNA/RNA Shield

Sample ID	EX2503_D16_07W
Date (UTC)	20250430
Time (UTC)	222909
Depth (m)	1858.70202636719
Latitude (decimal degrees)	23.4461822509766
Longitude (decimal degrees)	-172.542922973633
Bottle Number	Niskin Bottle 2
Temperature	2.24399995803833

Dissolved Oxygen (mg/L)	2.74300003051758
Treatment	DNA/RNA Shield

Sample ID	EX2503_D16_11W
Date (UTC)	20250501
Time (UTC)	001000
Depth (m)	1788.16296386719
Latitude (decimal degrees)	23.446325302124
Longitude (decimal degrees)	-172.544128417969
Bottle Number	Niskin Bottle 3
Temperature	2.46700000762939
Dissolved Oxygen (mg/L)	2.57599997520447
Treatment	DNA/RNA Shield

Sample ID	EX2503_D16_13W
Date (UTC)	20250501
Time (UTC)	013306
Depth (m)	1739.62194824219
Latitude (decimal degrees)	23.4471702575684
Longitude (decimal degrees)	-172.545043945313
Bottle Number	Niskin Bottle 4
Temperature	2.41400003433228
Dissolved Oxygen (mg/L)	2.58800005912781

Treatment	DNA/RNA Shield
Sample ID	EX2503_D16_14W
Date (UTC)	20250501
Time (UTC)	014150
Depth (m)	1601.75305175781
Latitude (decimal degrees)	23.4466285705566
Longitude (decimal degrees)	-172.545135498047
Bottle Number	Niskin Bottle 5
Temperature	2.57599997520447
Dissolved Oxygen (mg/L)	2.53099989891052
Treatment	DNA/RNA Shield

## Scientists Involved

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