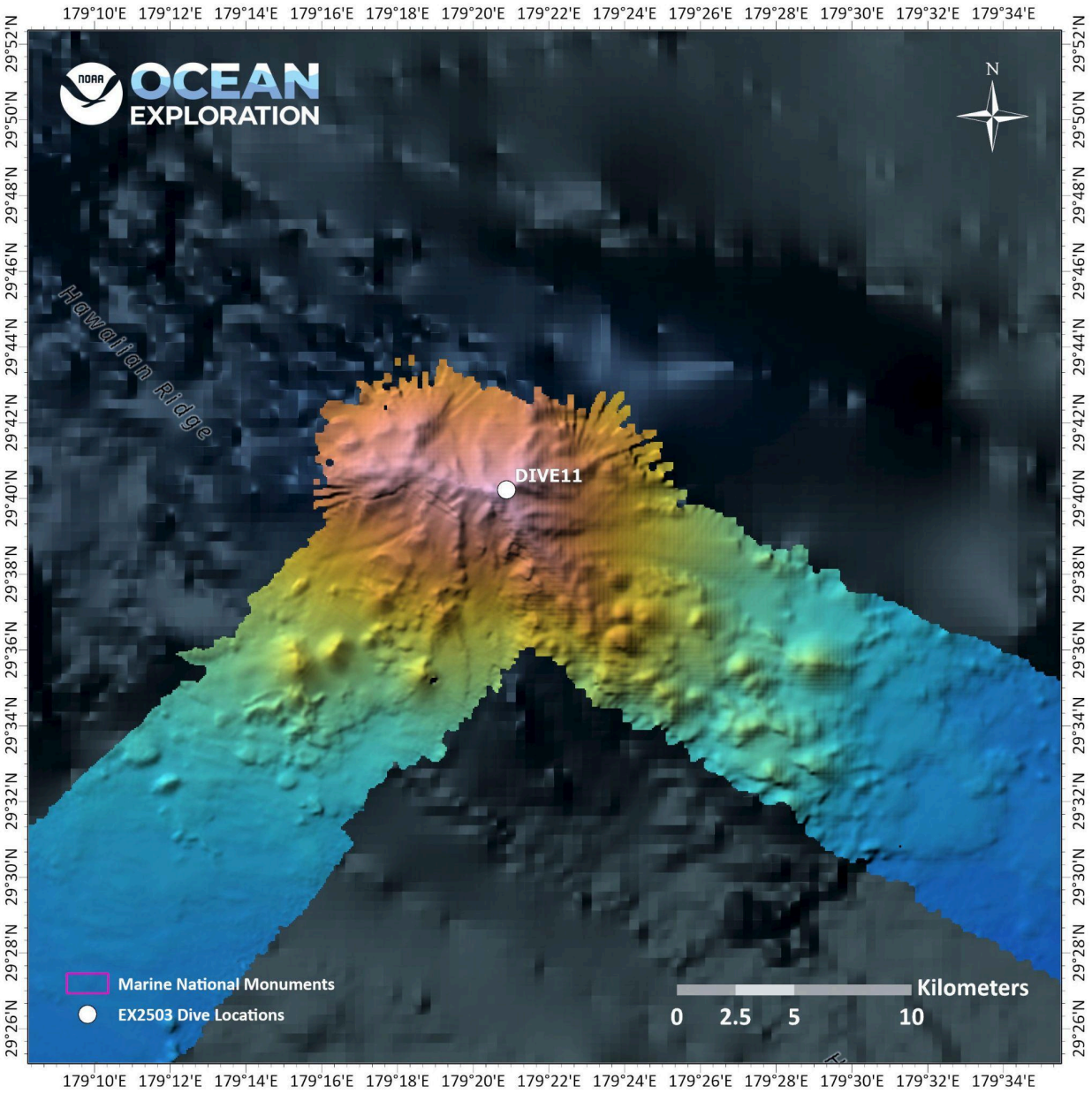
ROV Dive Summary
EX2503, Dive 11, April 24, 2025

General Location Map



Dive Information

Site Name	Unnamed Seamount 04 - Northwest of Holanikū (Kure Atoll)
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 11 was to explore the western ridge arm of an unnamed seamount northwest of Hōlanikū (Kure Atoll), in northwestern Papahānaumokuākea. As the shallowest dive of the expedition (summit at only 370 meters), this seamount represented a very different community than those seen previously. We expected to see a high number of mesopelagic fish and anticipated that the seamount may intersect with the daytime descent of the deep scattering layer. As this seamount is in the western portion of Papahānaumokuākea, this area is relatively much less explored than regions closer to the main Hawaiian Islands.
Maritime Heritage Restrictions	No

ROV Dive Summary Data	Dive Type: Normal In Water: 2025-04-24T18:26:01.645260 29.67102721050937 ; 179.34847902769013 On Bottom: 2025-04-24T18:54:34.866954 29.671156 ; 179.34888505537015 Off Bottom: 2025-04-25T01:18:23.650200 29.66968935824629 ; 179.3449558873032 Out Water: 2025-04-25T01:37:05.240674 29.67030766439226 ; 179.34833670205367 Dive Duration: 7:11:03 Bottom Time: 6:23:48 Max Vehicle Depth: 539.9 m Min Seafloor Depth: 367.1 m Distance Travelled: 428.9 m

Dive Description	EX2503 Dive 11 began with visualization of the seamount ridge at 0855 HST. Upon first look we observed evidence of coral rubble, carbonate sediments, and a high number of fish and coral colonies. The substrate at this depth on the seamount ridge is composed of a carbonate reef with fossil corals, mollusks, tube worms, and other likely carbonate producers in a largely carbonate matrix. Macro-scale features visible on ROV video suggest that this area is a fossil reef, with large karst features visible in deeper areas of the dive where hardgrounds were more abundant. The deeper regions of this dive (~540m to ~410m) had a higher density of Primnoid and Paramuriceid corals. The primnoids were home to a diversity of echinoderms, ranging from small ophioplinthacan brittle stars that had floral central disks that were similar in size and color to the coral's polyps, to large basket stars with a similar pink hue. This region was teeming with life, made evident by both the sediment (much of which was comprised of mollusk shells and otoliths–fish earbones!) and the observations made during our transect. Around ~490m, we observed an increase in marine snow and began to observe midwater diel vertical migrating taxa (chaetognaths, larvaceans, radiolaria, foraminifera, ctenophores, siphonophores, etc.) interacting with the benthos. Upon sample recovery we observed a number of midwater taxa entangled in our primary samples, which we separated for additional description and analysis. At ~410m depth, the dominant coral cover transitioned to purple Nidaliidae (possibly *Siphonogorgia*). These covered the ridge's hillside until we left the bottom, and appeared to be growing in rows, potentially downslope and/or aligned with the current flow. These abundant soft corals are likely a new species, making their dominance particularly striking. Associated with many of these corals were ophiuroid sea stars, which are also likely a new species – highlighting the importance of exploring these far western regions of Papahānaumokuākea. Notably absent were black corals, driving one shoreside scientist to remark that this is "one of the stranger communities [they] have seen in the Hawaiian archipelago."

	This dive presented us with a marked abundance of novel species, both for this expedition and for science. In total, we collected 15 potentially undescribed or new species (likely more given the diversity of associates collected with each primary sample). These included a number of echinoderms (sea stars and brittle stars), a Polycerid nudibranch, an aplacophoran mollusk, two species of Alcyoniina (true soft corals), and one Paramuriceid coral. We would have likely encountered more, but reached our maximum sampling capacity on *Deep Discoverer*–and even had to double up in a number of cases.
Notable Observations	A high-density community composed of a likely new species of soft coral, *Siphonogorgia* sp. nov., and potentially 15 (!) new species. Very noticeable community composition transitions over a small depth range. Notable presence of midwater diel vertical migrating taxa interacting with the benthos.
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 > Slope > Terrace > Wall
SeaTube Link (science annotations)	https://data.oceannetworks.ca/app/dive-logs/1905

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

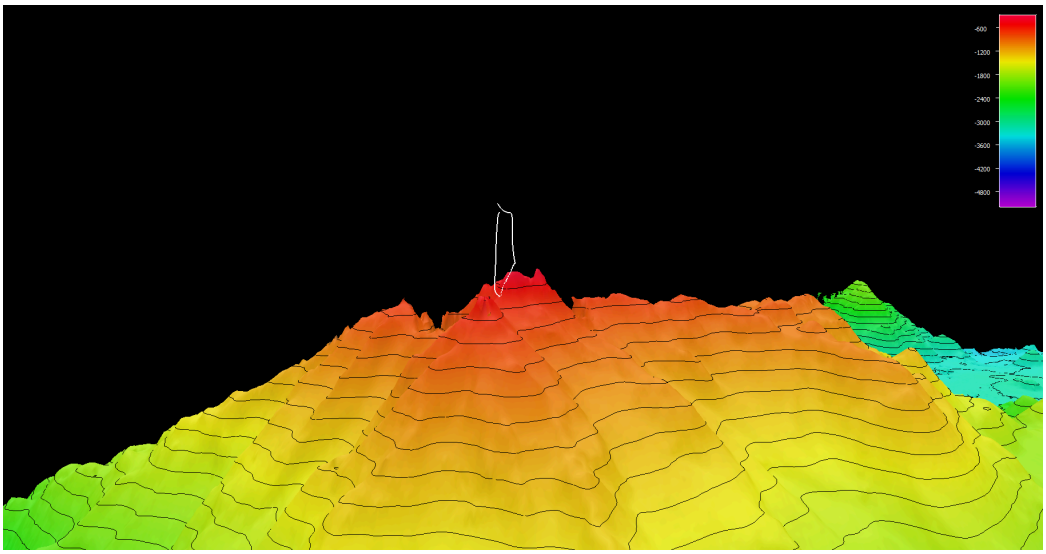


Figure 1: Dive 11 dive site. Shown in 2x vertical exaggeration; smoothed ROV dive track shown in white on 50x50 cell size bathymetry. Depth shown in meters; coloration based on depths with 100-meter contours overlain.

Sound Speed Manager Image of ROV CTD Profile

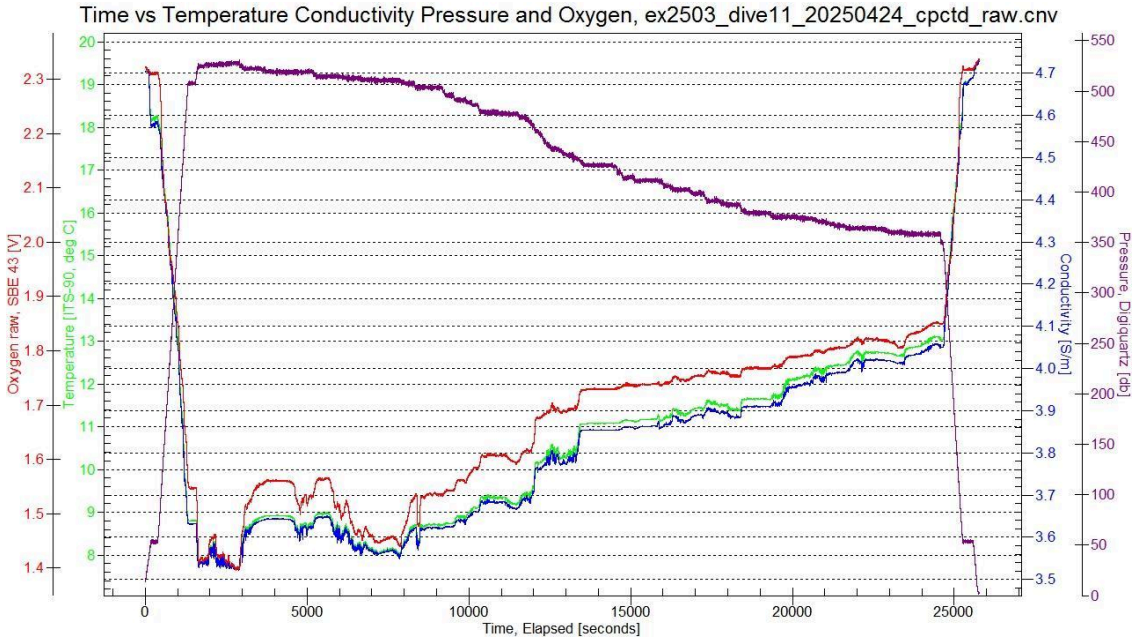
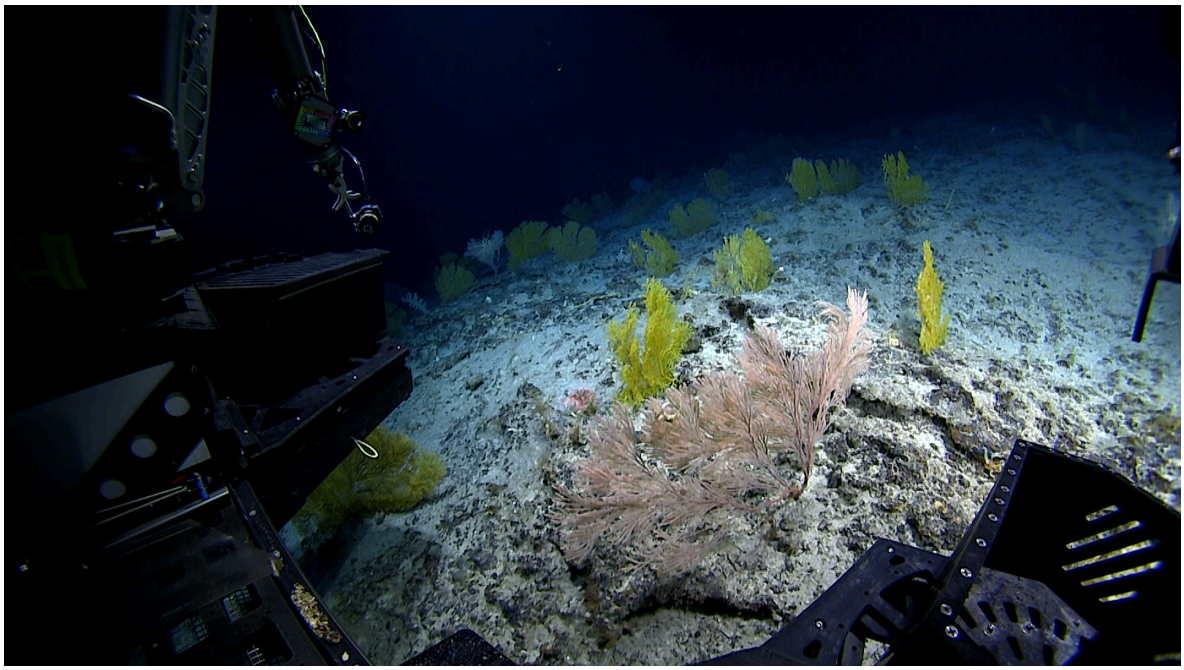
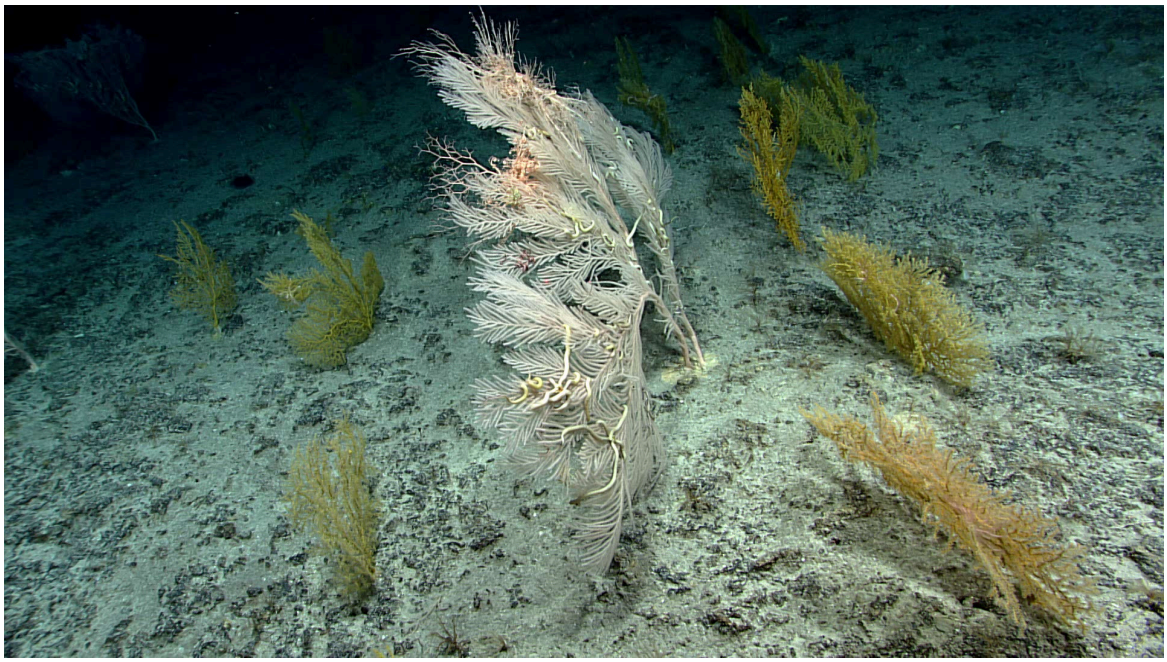


Figure 2. Ambient conditions during Dive 11. Plot shows Temperature (˚C), Conductivity (S/m), Pressure (db), and Oxygen (V; as measured by SBE43).

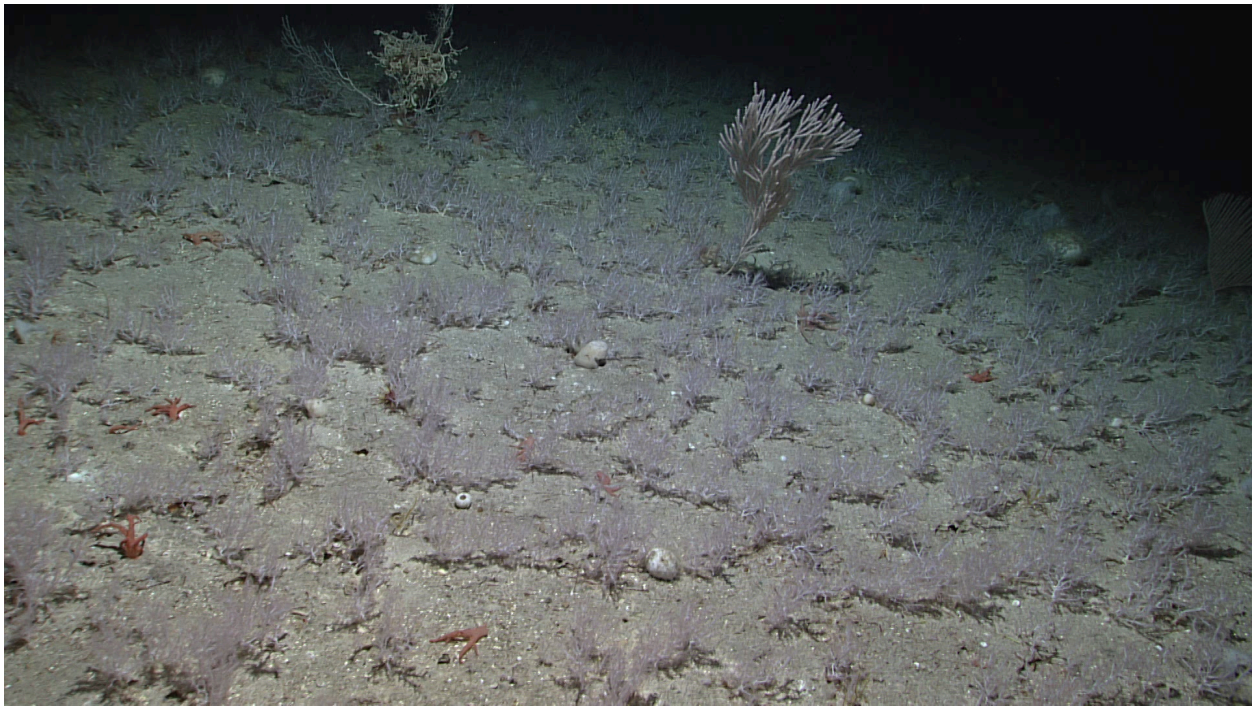
Representative Photos of the Dive



A Primnoid (light pink) and Paramuriceid (yellow) community was prevalent between 540 and 410 meters. Fossil reef hardground was interspersed with coarse-grained carbonate sediment.



Callagorgia, one of the dominant coral taxa at the middle depths of this dive, with echinoderm associates (including two large pink basket stars).



The summit community of the seamount was carpeted in these small, unidentified purple Nidaliidae.

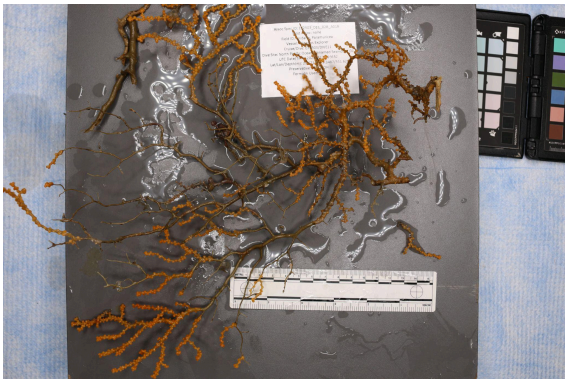
Close-up of the dominant unidentified purple Nidaliidae. One sample was collected of this morphotype.

In-situ image of an undescribed *Paranepanthia* eating a demosponge. A similar specimen was collected nearby.

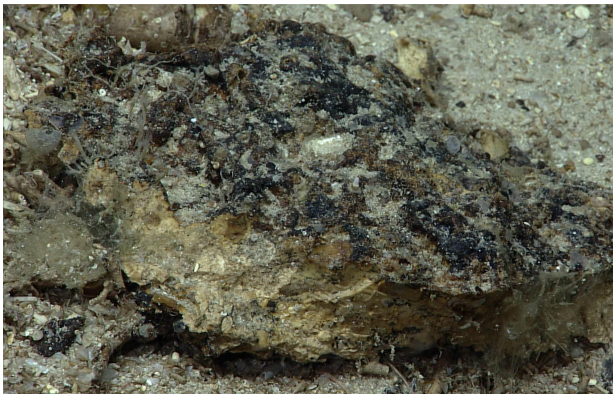
Samples Collected

Sample ID	EX2503_D11_02B
Date (UTC)	20250424
Time (UTC)	195652
Depth (m)	531.622009277344

Latitude (decimal degrees)	29.6711444854736
Longitude (decimal degrees)	179.348663330078
Temp. (°C)	7.72200012207031
Field ID(s)	Hippasteria
Comments	With Paramuriceid associate. New or undescribed species. Pink in color, spikey all over appearance, five tube feet rows.

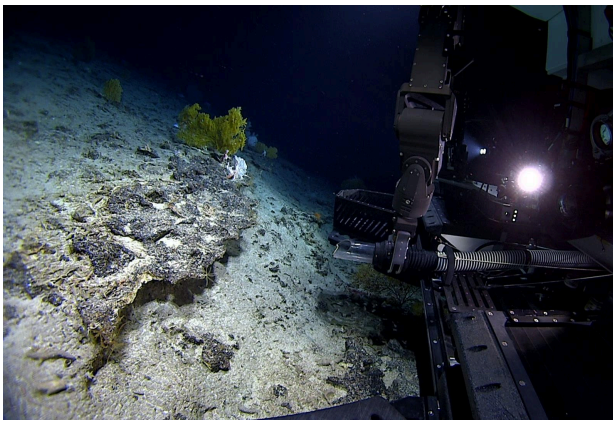


Associates Sample ID:	EX2503_D11_02B_A01B
Field Identification:	Paramuricea
Count:	1



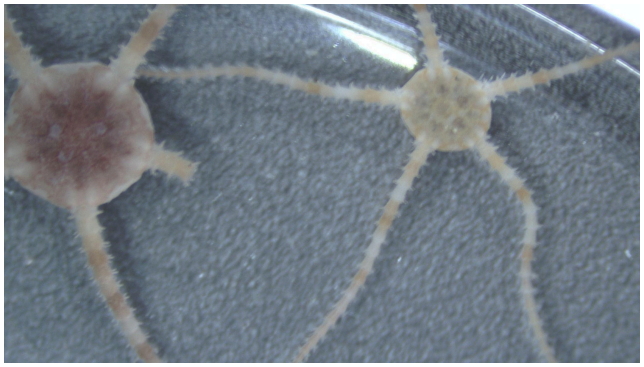
Sample ID	EX2503_D11_03G
Date (UTC)	20250424
Time (UTC)	195748
Depth (m)	531.72900390625
Latitude (decimal degrees)	29.6711483001709
Longitude (decimal degrees)	179.348663330078
Temp. (°C)	7.80499982833862
Field ID(s)	fragmented piece of fossil reef
Comments	carbonate floatstone or framestone. Unclear which without cross section at this time. Primary component likely coral. Sparse Mn encrustation. Heavily weathered. Bryozoan.

Associates Sample ID:	EX2503_D11_03G_A01B
Field Identification:	Stolonifera
Count:	1

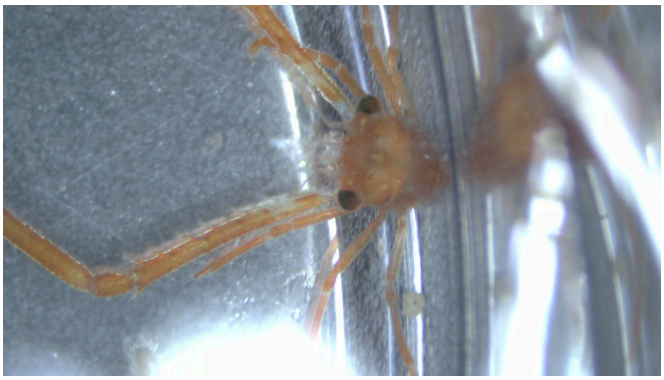


Sample ID	EX2503_D11_04G
Date (UTC)	20250424
Time (UTC)	200554
Depth (m)	530.75
Latitude (decimal degrees)	29.6711521148682
Longitude (decimal degrees)	179.348663330078
Temp. (°C)	7.91900014877319
Field ID(s)	carbonate seds and reef rubble

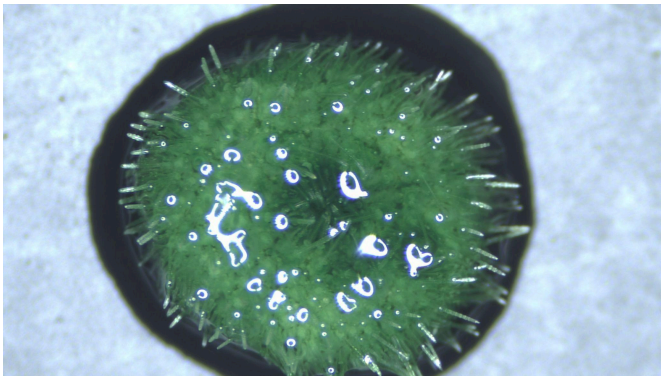
Comments	Lots of otoliths and pteropod shells are present.



Associates Sample ID:	EX2503_D11_04G_A01B
Field Identification:	Ophiuroidea
Count:	6



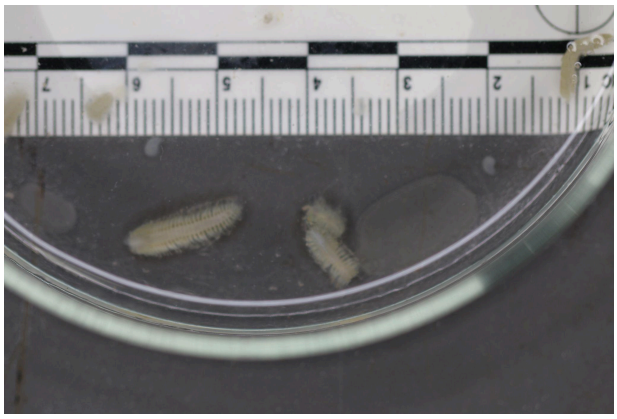
Associates Sample ID:	EX2503_D11_04G_A02B
Field Identification:	Chirostylidae
Count:	1



Associates Sample ID:	EX2503_D11_04G_A03B
Field Identification:	Echinoidea
Count:	1

Sample ID	EX2503_D11_05B
Date (UTC)	20250424
Time (UTC)	203013
Depth (m)	523.530029296875
Latitude (decimal degrees)	29.6711082458496
Longitude (decimal degrees)	179.348510742188
Temp. (°C)	7.8769998550415
Field ID(s)	Alcyonacea

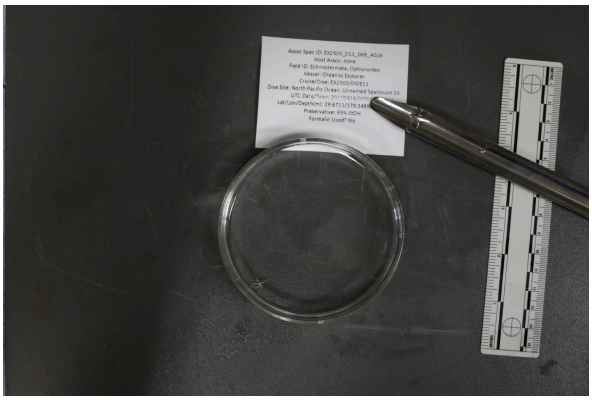
Comments	Lots of scale worms. White filaments visible in polyps (mesentery filaments?) Polyps are mostly retracted. The central body acts as honey comb pattern structure.



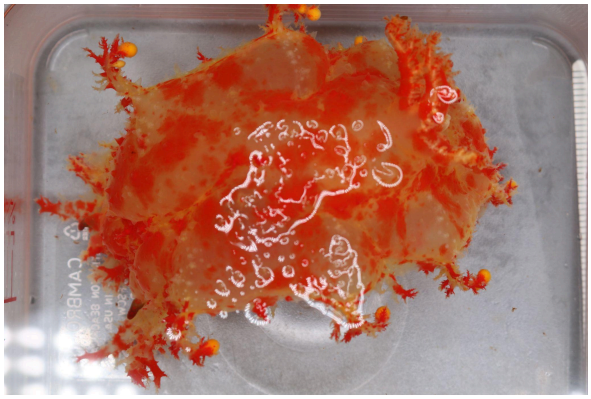
Associates Sample ID:	EX2503_D11_05B_A01B
Field Identification:	Polynoidae
Count:	6

Sample ID	EX2503_D11_06B
Date (UTC)	20250424
Time (UTC)	203605
Depth (m)	524.039001464844

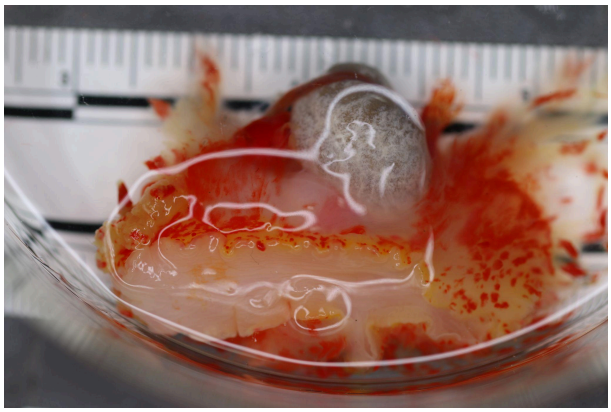
Latitude (decimal degrees)	29.6711006164551
Longitude (decimal degrees)	179.348526000977
Temp. (°C)	7.88600015640259
Field ID(s)	Strophomenia
Comments	Strophomenia sp. nov. ? Sclerites are relatively small (to body). Sampled at the base of a soft coral colony (05B) that was collected for sampling.



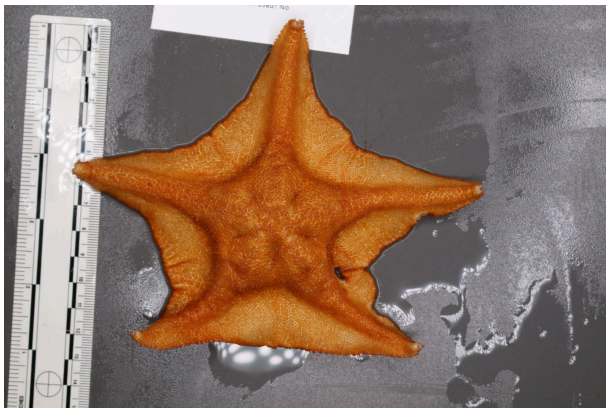
Associates Sample ID:	EX2503_D11_06B_A01B
Field Identification:	Ophiuroidea
Count:	1



Sample ID	EX2503_D11_07B
Date (UTC)	20250424
Time (UTC)	205743
Depth (m)	517.315002441406
Latitude (decimal degrees)	29.6709938049316
Longitude (decimal degrees)	179.348419189453
Temp. (°C)	7.95499992370605
Field ID(s)	Polyceridae
Comments	Red, gold translucent body, tan brown foot. Treated in half strength magnesium chloride for an hour. Dorsal fringe contains bright yellow spheres at end of cerata. Rhinophores appear to be originating from a single stalk and appear to be branching out.



Associates Sample ID:	EX2503_D11_07B_A01B
Field Identification:	Polyceridae
Count:	1



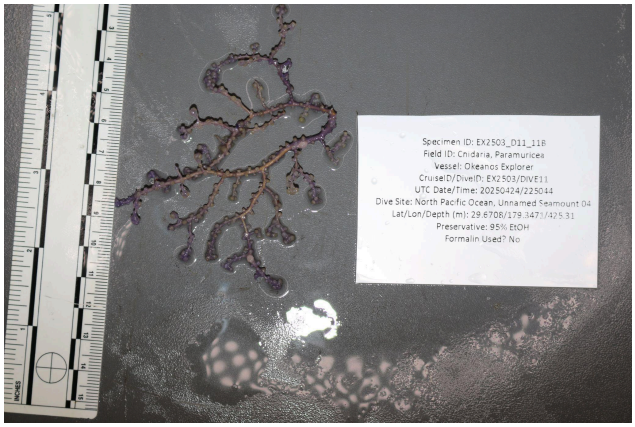
Sample ID	EX2503_D11_09B
Date (UTC)	20250424
Time (UTC)	222306
Depth (m)	437.748992919922
Latitude (decimal degrees)	29.6708488464355
Longitude (decimal degrees)	179.347274780273
Temp. (°C)	10.2399997711182
Field ID(s)	Paranepanthia

Comments	Orange in color. 5 arms. Membranes extending from the body in between arms. Light injury in the membrane in between two of the arms that is partially healed.

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

SAMPLE WAS ABSENT IN CANISTER ONCE ON DECK

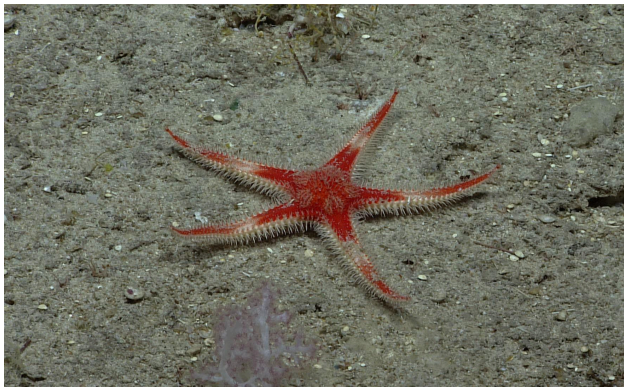
Sample ID	EX2503_D11_10B
Field ID(s)	Foraminifera, Hastigerinella



Sample ID	EX2503_D11_11B
Date (UTC)	20250424
Time (UTC)	225044

Depth (m)	425.31298828125
Latitude (decimal degrees)	29.6708202362061
Longitude (decimal degrees)	179.347061157227
Temp. (°C)	11.1350002288818
Field ID(s)	Paramuricea
Comments	Purple. Small sclerites. Minimally visible when polyps are retracted.

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



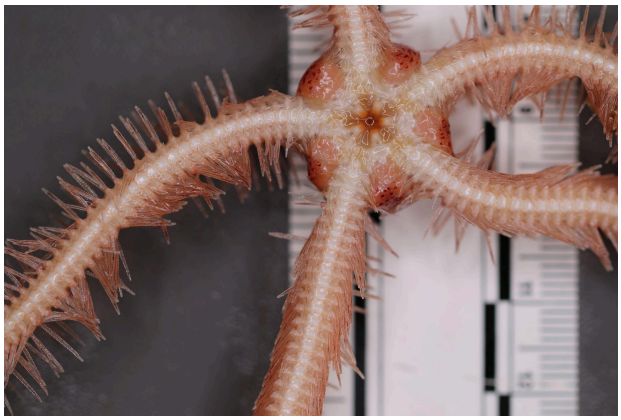
Sample ID	EX2503_D11_12B
Date (UTC)	20250424
Time (UTC)	230707
Depth (m)	416.582000732422
Latitude (decimal degrees)	29.6707515716553
Longitude (decimal degrees)	179.346832275391

Temp. (°C)	11.2049999237061
Field ID(s)	Benthopectinidae
Comments	Defense posture is curled. Red and white striped arms. Spikey things on center of body on dorsal surface. Dorsal surface of arms with no spikes. Spikes on ventral and medial sides of arms.

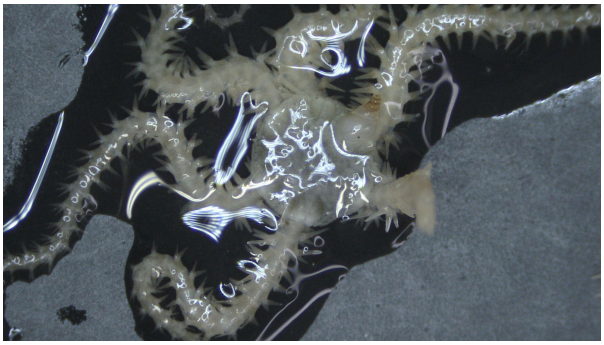
Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A

Sample ID	EX2503_D11_13B
Date (UTC)	20250424
Time (UTC)	235926
Depth (m)	389.578002929688
Latitude (decimal degrees)	29.6704254150391
Longitude (decimal degrees)	179.346099853516
Temp. (°C)	11.2329998016357

Field ID(s)	Siphonogorgia
Comments	With multiple associates. Fairly steady, did not retract beyond the polyps. Polyps are reddish purple, stalk is white. Extremely small polyps. Amphopod, translucent shrimp found as an associate in branches. Sclerites present in white portion of stalk.

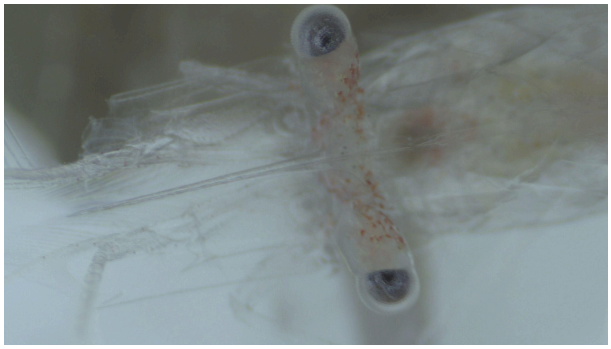


Associates Sample ID:	EX2503_D11_13B_A01B
Field Identification:	Ophiuroidea
Count:	1



Associates Sample ID:	EX2503_D11_13B_A02B
Field Identification:	Ophiuroidea
Count:	1

Associates Sample ID:	EX2503_D11_13B_A03B
Field Identification:	Siphonophora
Count:	1



Associates Sample ID:	EX2503_D11_13B_A04B
Field Identification:	Mixed Arthropoda
Count:	3

Niskin Sampling Summary

Sample ID	EX2503_D11_01W
Date (UTC)	20250424
Time (UTC)	190813
Depth (m)	538.135986328125
Latitude (decimal degrees)	29.6711254119873
Longitude (decimal degrees)	179.348937988281
Bottle Number	Niskin Bottle 1
Temperature	7.37099981307983
Dissolved Oxygen (mg/L)	5.05499982833862
Treatment	DNA/RNA Shield

Sample ID	EX2503_D11_08W
Date (UTC)	20250424
Time (UTC)	221054
Depth (m)	445.834991455078
Latitude (decimal degrees)	29.6708354949951
Longitude (decimal degrees)	179.347396850586
Bottle Number	Niskin Bottle 3
Temperature	10.1850004196167
Dissolved Oxygen (mg/L)	6.3899998664856
Treatment	DNA/RNA Shield

Sample ID	EX2503_D11_14W
Date (UTC)	20250425
Time (UTC)	011339
Depth (m)	368.825012207031
Latitude (decimal degrees)	29.6698894500732
Longitude (decimal degrees)	179.345001220703
Bottle Number	Niskin Bottle 4
Temperature	12.4849996566772
Dissolved Oxygen (mg/L)	6.61100006103516
Treatment	DNA/RNA Shield

Scientists Involved

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