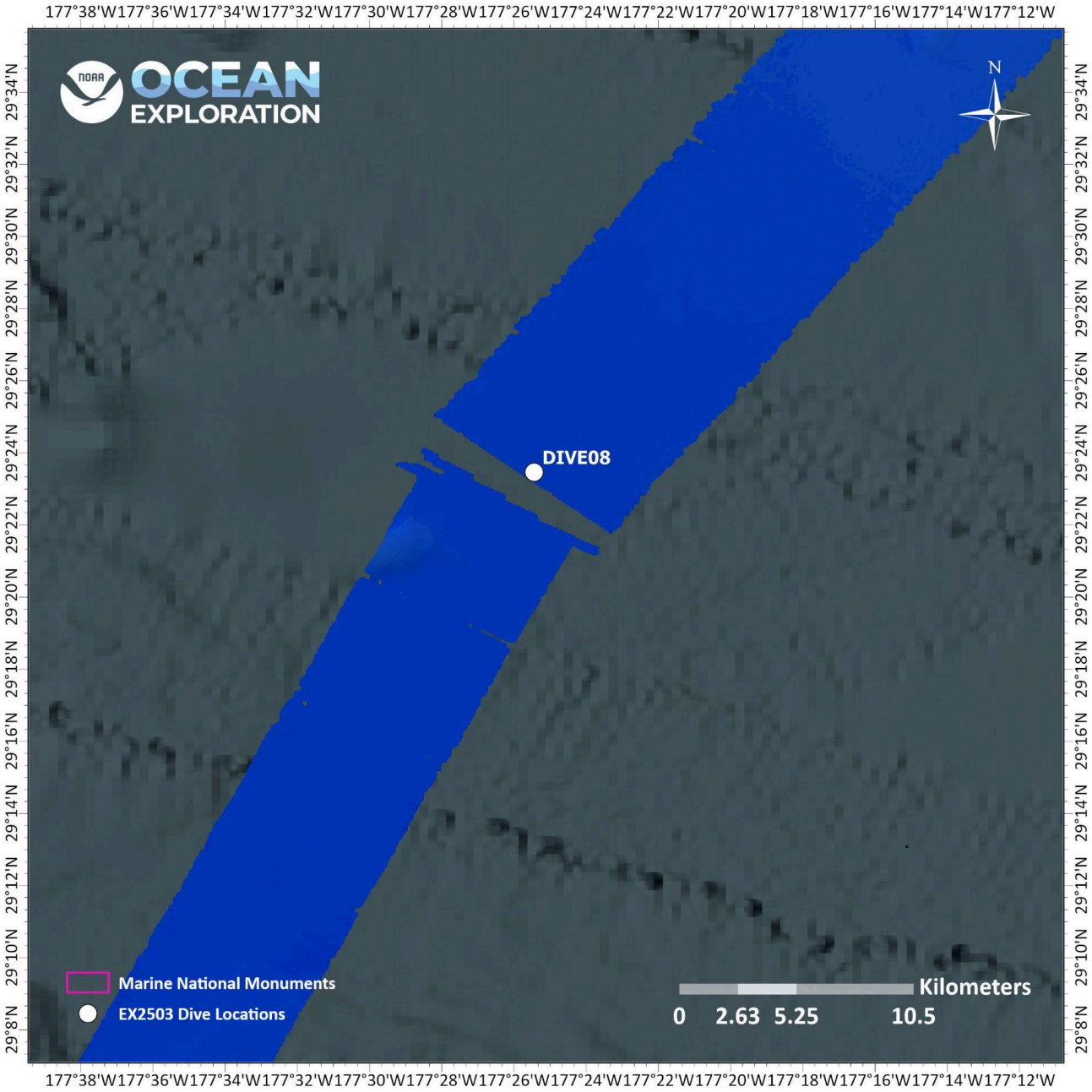
ROV Dive Summary
EX2503, Dive 08, April 21, 2025

General Location Map



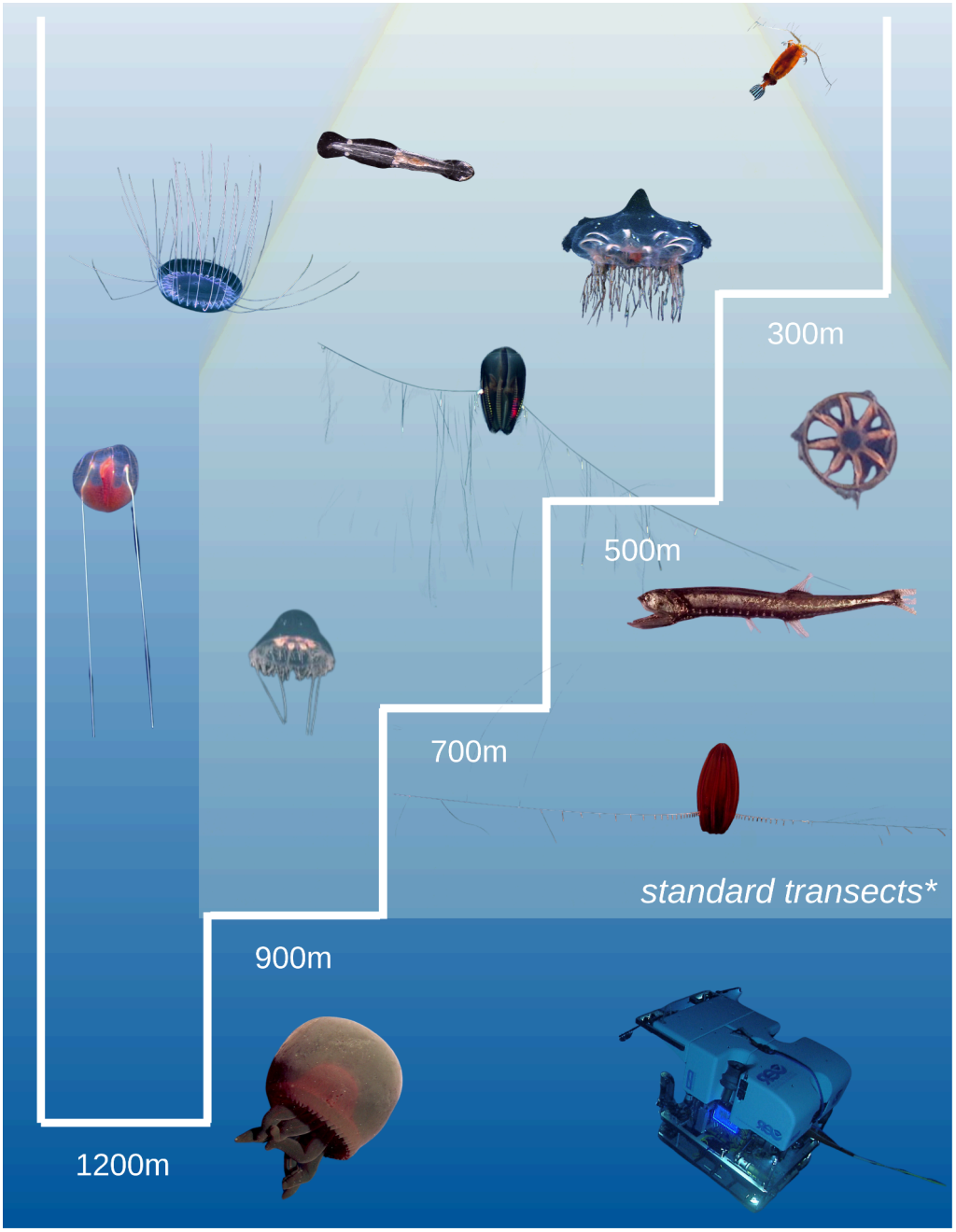


Figure 1. Planned Transects for Dive 08. Deepest depth will be 1200m. Following this depth, we will survey at four standard transect depths (900m, 700m, 500m, 300m). Two additional transects at 600m and 400m depths were added to the dive plan following review of ROV-based CTD and shipboard EK60/80 data. Note that pictured fauna (and ROV *Deep Discoverer*) are not to scale and may not be representative of midwater fauna at this unexplored site and/or at the depths at which they are represented.

Dive Information

Site Name	Midwater 01
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 06 was to explore the diversity and distribution of pelagic midwater communities in the northwestern region of Papahānamokuākea using high definition video at seven transects: 1200m, 900m, 700m, 600m, 500m, 400m, and 300m water depth. Biological specimens with high scientific impact, such as undescribed and/or new species were to be targeted for sampling. Environmental DNA (eDNA) sampling was to be conducted at standard transect depths (900m, 700m, 500m, 300m) and at one additional site as determined by shoreside scientists.
Maritime Heritage Restrictions	No

ROV Dive Summary Data	Dive Summary: EX2503_DIVE08 ^^ Dive Type: MID WATER ONLY DIVE In Water: 2025-04-21T18:30:29.401932 29.390895328524305 ; -177.42374491934606 On Bottom: N/A N/A ; N/A Off Bottom: N/A N/A ; N/A Out Water: 2025-04-22T02:39:01.211667 29.393403208563495 ; -177.42392574182125 Dive Duration: 8:08:31 Bottom Time: N/A Max Vehicle Depth: 1213 m Min Seafloor Depth: N/A Distance Travelled: N/A Mid Water Transects Summary ^^ Number of Transects: 7 Transect 1 Start: 19:39:57 29.391151863639276 ; -177.4226046628771 End: 20:26:17 29.391329509389408 ; -177.4237470536002 Duration: 0:46:19 Depth: 1202.0 m

Transect 2
Start: 20:46:02
29.39125139225957 ; -177.4238580212945

End: 21:30:38
29.39176061063825 ; -177.42525415607915

Duration: 0:44:36

Depth: 901.0 m

Transect 3
Start: 21:47:00
29.3917452545389 ; -177.42498464674762

End: 22:32:03
29.391588842490872 ; -177.42504594993918

Duration: 0:45:02

Depth: 702.0 m

Transect 4
Start: 22:42:03
29.39171588078165 ; -177.4250246615274

End: 23:27:22
29.391573826363068 ; -177.42488317363694

Duration: 0:45:19

Depth: 601.0 m

Transect 5
Start: 23:35:37
29.391786 ; -177.424992

End: 00:20:12
29.39228459847111 ; -177.42527512992356

Duration: 0:44:35

	Depth: 501.0 m Transect 6 Start: 00:34:20 29.39293365907383 ; -177.4257241440134 End: 01:19:17 29.39338772588043 ; -177.42575974192957 Duration: 0:44:56 Depth: 402.0 m Transect 7 Start: 01:30:00 29.39330837246306 ; -177.42586272334975 End: 02:16:37 29.39277166985648 ; -177.4259076220096 Duration: 0:46:36 Depth: 301.0 m

Dive Description	EX2503 Dive 08 was the first midwater dive of the expedition. Initial planned transects were 1200m, 900m, 700m, 500m, and 300m. Upon consultation of shipboard EK60/80 and ROV-based CTD outputs, shoreside scientists (including Adrienne Copeland, Allen Collins, Ashley Marranzino, Dhugal Lindsey, George Matsumoto, and Russell Hopcroft) selected two additional transects in an attempt to target the deep scattering layer: 600m and 400m. Each transect was 45 minutes. The dive began with the visualization of bottom depth (1200m) at 0940 HST. This depth included a number of unusual cnidarians, including undescribed morphotypes of *Arctapodema* and *Halicrea*, and a new species of ctenophore (one that had not been seen by the shoreside midwater specialists before and garnered much discussion about its potential taxonomic classification). The second transect (900m) began at 1046 HST. During this stage we observed a number of siphonophores, including a large *Erenna lacinata* (the lace siphonophore) that allowed us to visualize the colony in detail (including its bioluminescent red lures). More *Halicrea* were found at these depths, as were a number of helmet jelly (*Periphylla periphylla*). A niskin was collected for eDNA at the end of the transect. The third transect (700m) began at 1147 HST. At this depth, we observed numerous siphonophores (including juveniles) and more *Halicera* jellyfish. We also came upon a dragonfish (family Stomiidae) and captured close-up video of its gelatinous layer and long teeth, which extended past its eye when its mouth was closed! At this depth, we encountered a likely new species of glass squid (family *Cranchiidae*), which was sampled for description and analysis. A niskin was collected for eDNA at the end of the transect. The fourth transect (600m) began at 1242 HST. We observed *Deipoea* ctenophores and a particularly active pteropod. Another highlight was the observation of two *Solmissus* or dinner plate jellies. Notable at this depth was the abundance of foraminifera; D2 was able to collect close-up imagery that may be sufficient for species identification (incredible given the test diameter is ~150µm!).

	The fifth transect (500m) began at 1335 HST. This transect was also notable for the number of foraminifera we observed (and successfully sampled for analysis), as well as for the potential new species of ctenophore we encountered and successfully sampled for description. The sixth transect (400m) began at 1434 HST. This transect was also notable for having many visible foraminifera, as well as a potential new species of siphonophore that we attempted to sample but were unable to collect. However, we were able to capture high-resolution video of this siphonophore. The seventh and final transect (300m) began at 1530 HST. This transect had many fewer live organisms, but many particles and particulates (including "hairballs" of dead foraminifera and/or radiolaria). Notably, we observed a group of colonial radiolarians at this depth (a first for the shoreside midwater experts on the call). In addition, we were able to capture high-resolution, close-up video of a potential larval fish. The dive concluded at 1618 HST.
Notable Observations	Six likely new or undescribed species of jellyfish, siphonophore, ctenophore, and squid, including five (5!) of which were sampled for description and analysis. High-resolution video of a larval fish and close-ups on live Retarians (foraminiferans, radiolarians, and a rare sighting of colonial radiolarians).
Community and Habitat Observations	Corals and Sponges — Absent Chemosynthetic Community — Absent High biodiversity Community — Present Active Seep or Vent — Absent Extinct Seep or Vent — Absent Hydrates — Absent
CMECS Feature Type(s)	N/A
SeaTube Link (science annotations)	https://data.oceannetworks.ca/app/dive-logs/1605

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 2: Dive 08 dive site. smoothed ROV dive track shown in white

Sound Speed Manager Image of ROV CTD Profile

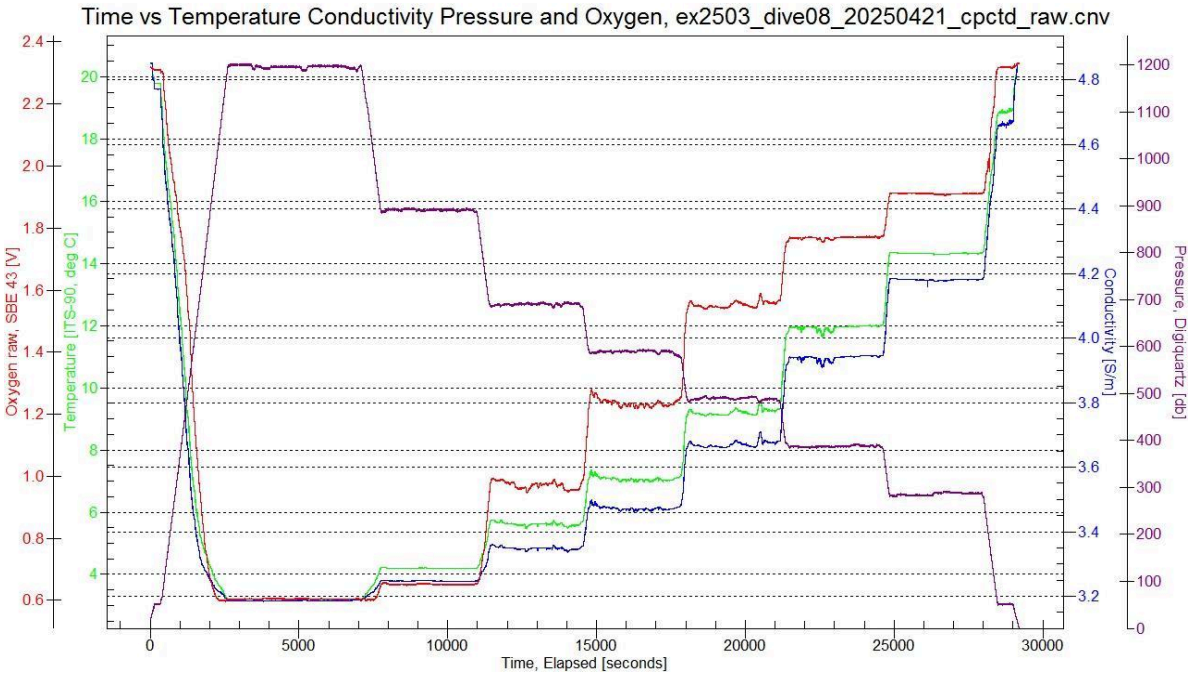
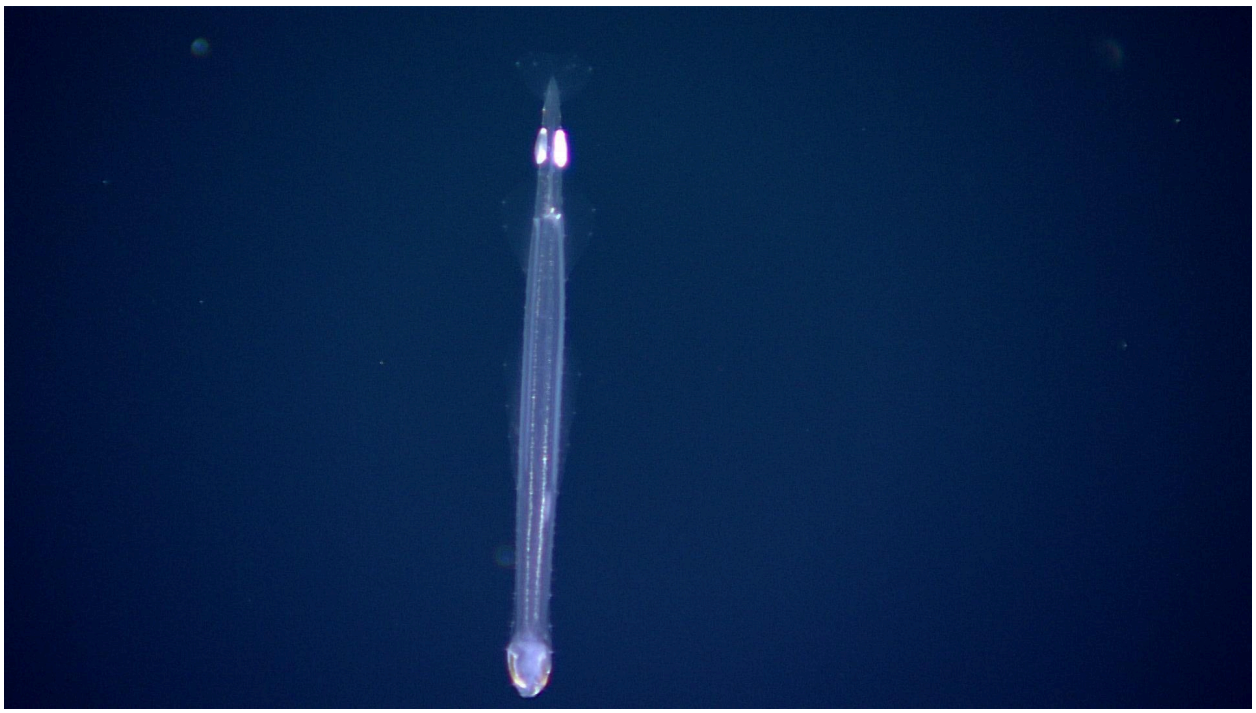
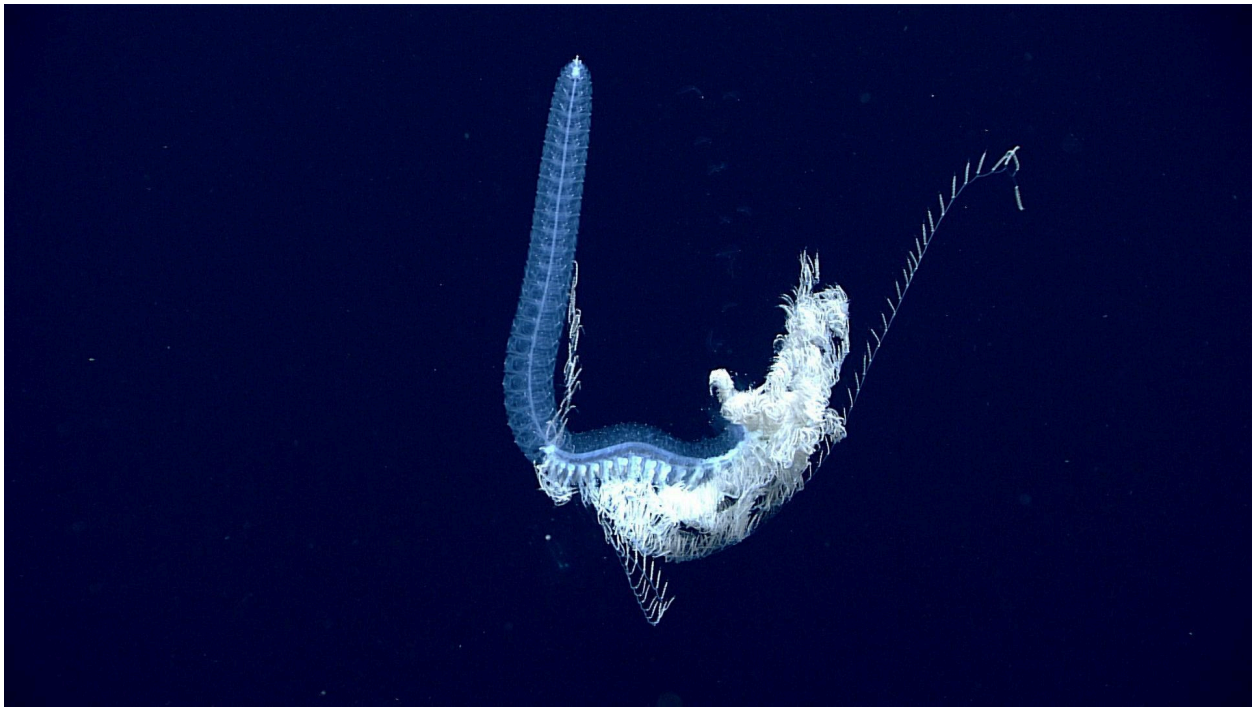


Figure 3. Ambient conditions during Dive 08. Plot shows Temperature (˚C), Conductivity (S/m), Pressure (db), and Oxygen (V; as measured by SBE43).

Representative Photos of the Dive

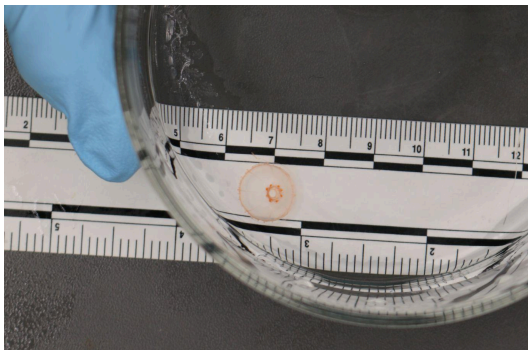


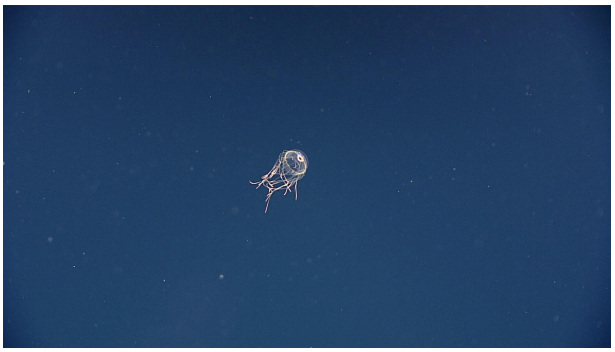
Chaetognathas were a common sight throughout the dive



Numerous siphonophores were imaged during our exploration of the midwater.

Samples Collected

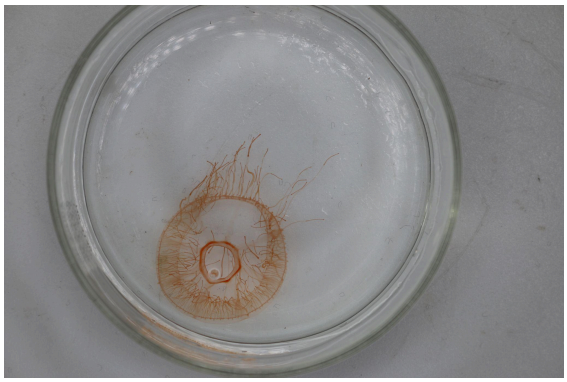


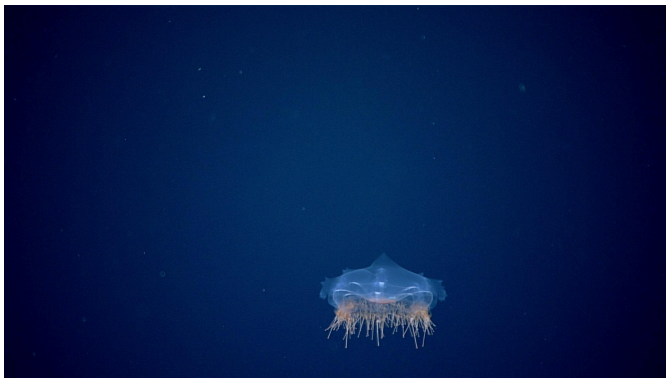


Sample ID	EX2503_D08_01B
Date (UTC)	20250421
Time (UTC)	195915
Depth (m)	1198.416015625

Latitude (decimal degrees)	29.3910140991211
Longitude (decimal degrees)	-177.423095703125
Temp. (°C)	3.13199996948242
Field ID(s)	Arctapodema
Comments	Tentacles appear damaged. Placed in freezer

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

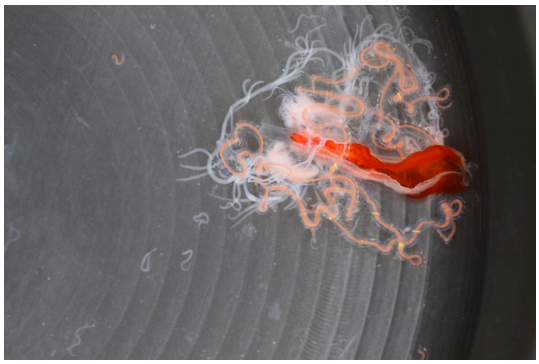


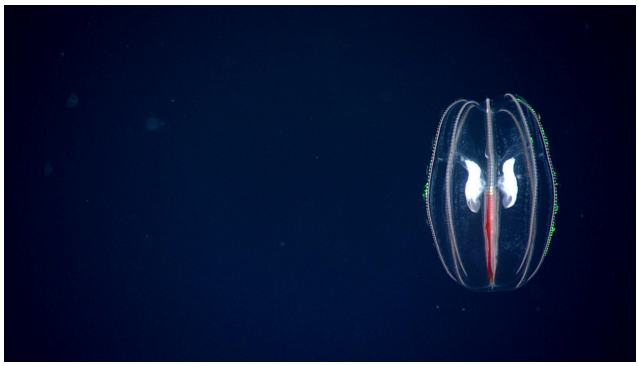


Sample ID	EX2503_D08_02B
Date (UTC)	20250421
Time (UTC)	200614
Depth (m)	1202.76000976563
Latitude (decimal degrees)	29.3912105560303
Longitude (decimal degrees)	-177.423492431641
Temp. (°C)	3.13599991798401
Field ID(s)	Halicreas

Comments	Appears intact upon recovery, several tentacles removed for DNA

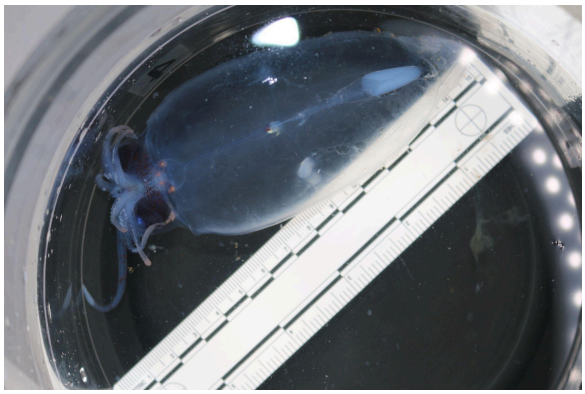
Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A





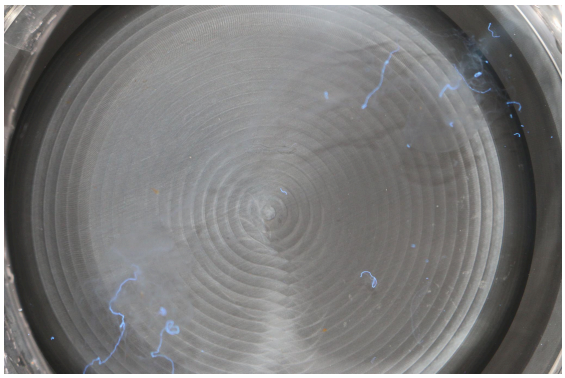
Sample ID	EX2503_D08_03B
Date (UTC)	20250421
Time (UTC)	202605
Depth (m)	1203.41296386719
Latitude (decimal degrees)	29.3913383483887
Longitude (decimal degrees)	-177.423721313477
Temp. (°C)	3.13599991798401
Field ID(s)	Ctenophora
Comments	Largely disintegrated, unable to get a top down photo, ctenes are still wiggling, ctenes rows survived better than clear gelatinous, white tentacles streaming off body, red colored main core survived. Placed in freezer.

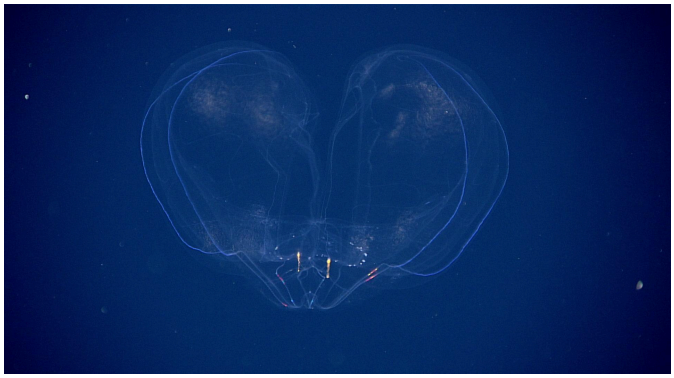
Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A



Sample ID	EX2503_D08_05B
Date (UTC)	20250421
Time (UTC)	222919
Depth (m)	706.807006835938
Latitude (decimal degrees)	29.3916072845459
Longitude (decimal degrees)	-177.425109863281
Temp. (°C)	5.28299999237061
Field ID(s)	Cranchiidae
Comments	

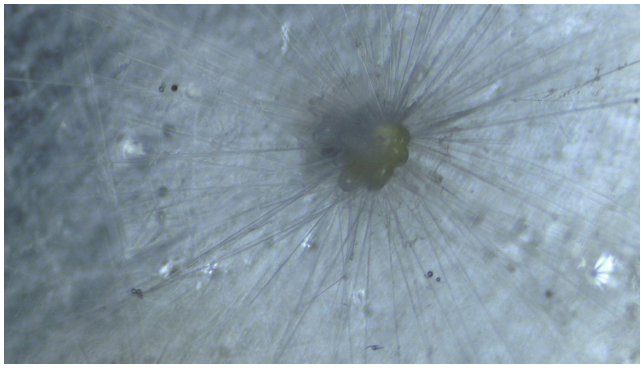
Associates Sample ID:	N/A
Field Identification:	N/A
Count:	N/A





Sample ID	EX2503_D08_07B
Date (UTC)	20250422
Time (UTC)	001328
Depth (m)	493.550994873047
Latitude (decimal degrees)	29.3920497894287
Longitude (decimal degrees)	-177.425140380859
Temp. (°C)	9.10700035095215
Field ID(s)	Ctenophora
Comments	Neon blue ctene rows? Present in addition to semi transparent ctene rows, sample heavily degraded

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



Sample ID	EX2503_D08_08B
Date (UTC)	20250422
Time (UTC)	002016
Depth (m)	500.111999511719
Latitude (decimal degrees)	29.3922824859619
Longitude (decimal degrees)	-177.425277709961
Temp. (°C)	8.96100044250488
Field ID(s)	Hastigerinella digitata
Comments	Digitate foram, pseudopodia intact, most abundant foram at this site, apparent key component of water column between 600 and 400 meters, cell occupancy does not include final two chambers

Niskin Sampling Summary

Sample ID	EX2503_D08_04W
Date (UTC)	20250421
Time (UTC)	213136
Depth (m)	902.263977050781

Latitude (decimal degrees)	29.3917388916016
Longitude (decimal degrees)	-177.425231933594
Bottle Number	Niskin Bottle 1
Temperature	4.09800004959106
Dissolved Oxygen (mg/L)	1.13499999046326
Treatment	DNA/RNA Shield

Sample ID	EX2503_D08_06W
Date (UTC)	20250421
Time (UTC)	223257
Depth (m)	702.284973144531
Latitude (decimal degrees)	29.391580581665
Longitude (decimal degrees)	-177.42497253418
Bottle Number	Niskin Bottle 2
Temperature	5.32200002670288
Dissolved Oxygen (mg/L)	2.79999995231628
Treatment	DNA/RNA Shield

Sample ID	EX2503_D08_09W
Date (UTC)	20250422
Time (UTC)	002047
Depth (m)	501.502014160156
Latitude (decimal degrees)	29.3923187255859

Longitude (decimal degrees)	-177.425323486328
Bottle Number	Niskin Bottle 3
Temperature	8.96500015258789
Dissolved Oxygen (mg/L)	5.73899984359741
Treatment	DNA/RNA Shield

Sample ID	EX2503_D08_10W
Date (UTC)	20250422
Time (UTC)	012029
Depth (m)	404.899993896484
Latitude (decimal degrees)	29.3933849334717
Longitude (decimal degrees)	-177.425765991211
Bottle Number	Niskin Bottle 4
Temperature	11.3159999847412
Dissolved Oxygen (mg/L)	6.46299982070923
Treatment	DNA/RNA Shield

Sample ID	EX2503_D08_11W
Date (UTC)	20250422
Time (UTC)	013503
Depth (m)	297.093994140625
Latitude (decimal degrees)	29.3933219909668
Longitude (decimal degrees)	-177.425842285156

Bottle Number	Niskin Bottle 5
Temperature	14.0369997024536
Dissolved Oxygen (mg/L)	6.71400022506714
Treatment	DNA/RNA Shield

Scientists Involved

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