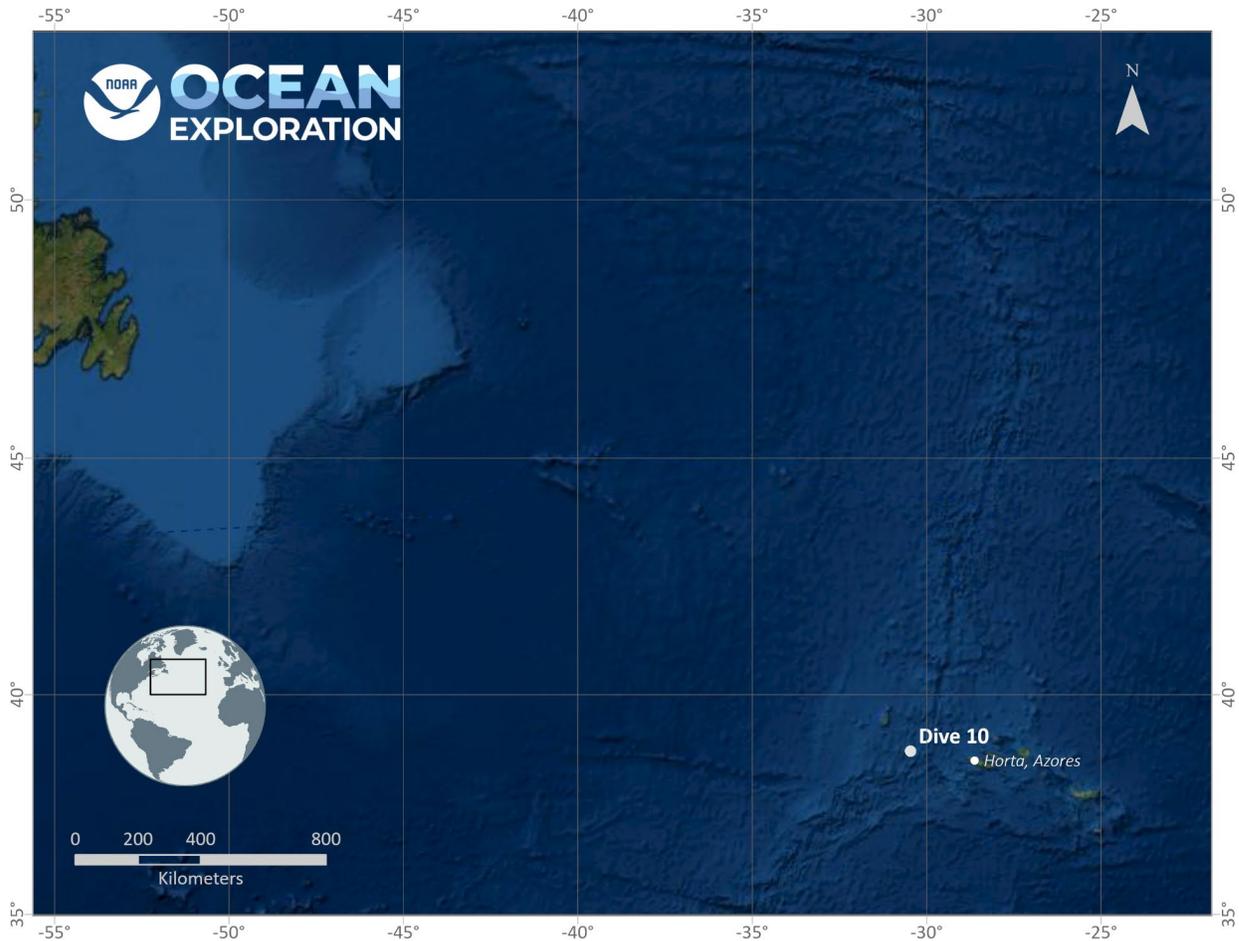


# ROV Dive Summary, EX-22-05, Dive 10, July 29, 2022

## General Location Map



## Dive Information

Site Name	Kai Ridge
General Area Descriptor	Azores Plateau, on the upper ridge of a north-south trending exposed fault
Science Team Leads	Dr. Scott France (Biology), Dr. Ashton Flinders (Geology)
Expedition Coordinator	Dr. Derek Sowers



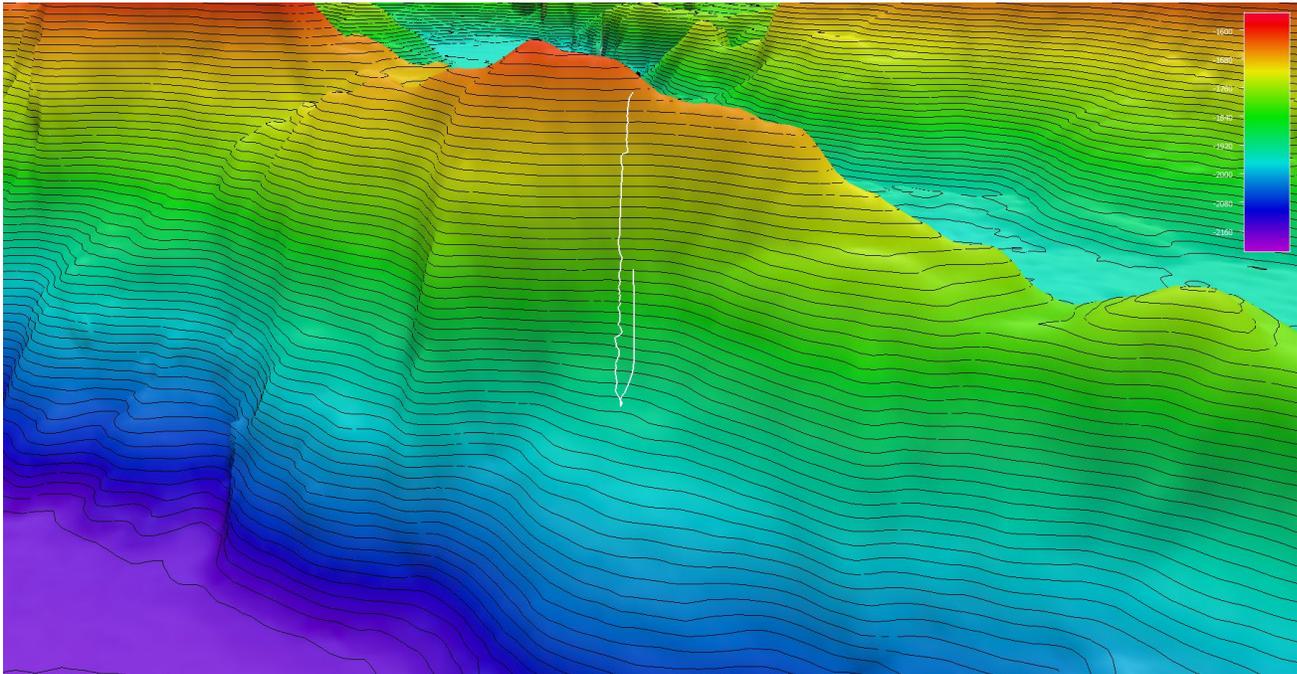
Dive Description	<p><i>Biology</i></p> <p>Throughout the dive we observed extensive coral rubble coated in ferromanganese. For the first half of the dive the sessile fauna were sparse, and dominated by low-growing and encrusting sponges, including glass sponges in Farreidae, Hyalonematidae, bird's nest sponge <i>Pheronema carpenteri</i>, <i>Hertwigia</i>, and demosponges <i>Polymastia</i>, <i>Geodia</i>. Other elements of the sessile community included bryozoans, tunicates and hydroids, while the mobile fauna were represented by several different asteroid sea stars, sea urchins, sea cucumbers (Holothuroidea, at least 3 species), munnopsid isopods, thread-legged shrimp, hermit crabs, and chitons.</p> <p>At about 1752 m depth and after 3.5 hours bottom time we started to observe a shift in the community, with diversity increasing and taller structural fauna seen more regularly. We hypothesized this was a result of the ridge we were climbing blocking the dominant current flow and affecting food supply; as we got closer to the ridge crest, the number and size of sessile fauna increased. The diversity on the latter half of the dive resembled that seen on dive 09. Octocorals seen included <i>Victorgorgia</i>, <i>Chrysogorgia</i>, <i>Iridogorgia</i>, particularly tall primnoid whips (one sampled), <i>Candidella</i>, keratoisidid bamboo corals, plexaurids, <i>Anthomastus</i> and stoloniferous and cornulariid ribbon-like taxa. Other cnidarians included black corals (<i>Aphanostichopathes</i>, <i>Bathypathes</i>), scleractinian corals (<i>Enallopsammia</i>, cup corals) and hydrocoral. Larger glass sponges were more numerous than on the first half of the dive, and included <i>Thenea</i>, <i>Chonelasma</i>, and <i>Hertwigia</i>. A couple of Ceriantharia tube anemones were seen, possibly the first of the expedition.</p> <p>Fish were relatively abundant and diverse compared to earlier dives. Among those identified were cusk eel (Ophidiidae), oreo, synaphobranchid eels, rattail <i>Bathygadus</i>, <i>Halosaurus</i>, lantern shark <i>Etmopterus</i>, and snailfish <i>Paralilparis</i>.</p> <p><i>Geology</i></p> <p>Initial dive area was relatively low slope with extensive sediment, coral skeletons covered in black precipitant. During ascent the slope became more steep and we observed more partially exposed but highly fractured and sheared pillow basalt. One outcrop of a possibly large portion of surface crust detachment (flake) with possible dissolution pockmarks/holes.</p>
Notable Observations	
Community and habitat observations	<p>Corals and Sponges - Present</p> <p>Chemosynthetic Community - Absent</p> <p>High biodiversity Community - Absent</p> <p>Active Seep or Vent - Absent</p> <p>Extinct Seep or Vent - Absent</p> <p>Hydrates - Absent</p>
CMECS Feature Type(s)	slope / ridge
SeaTube Link (science annotation system)	<a href="https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&amp;resourceId=2653">https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&amp;resourceId=2653</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

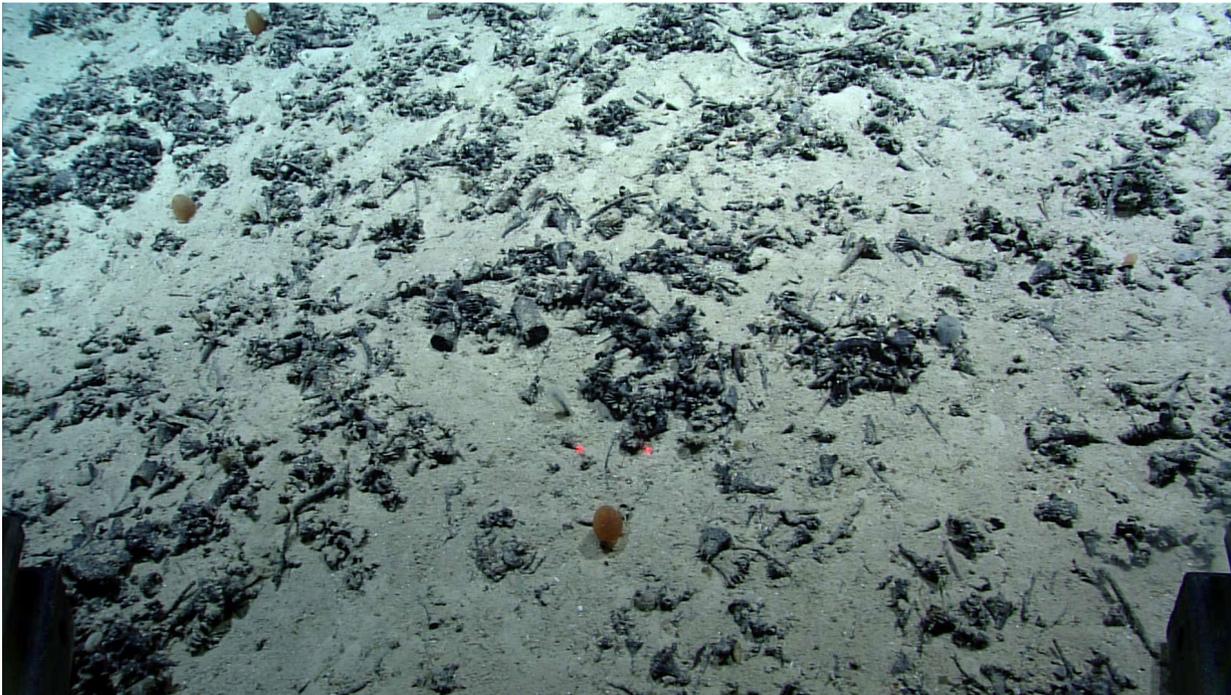
	drawers and thrusters. The section below notes if any of these sensors were malfunctioning or not operational.
Equipment Malfunctions	

**Close-up Map of Main Dive Site**

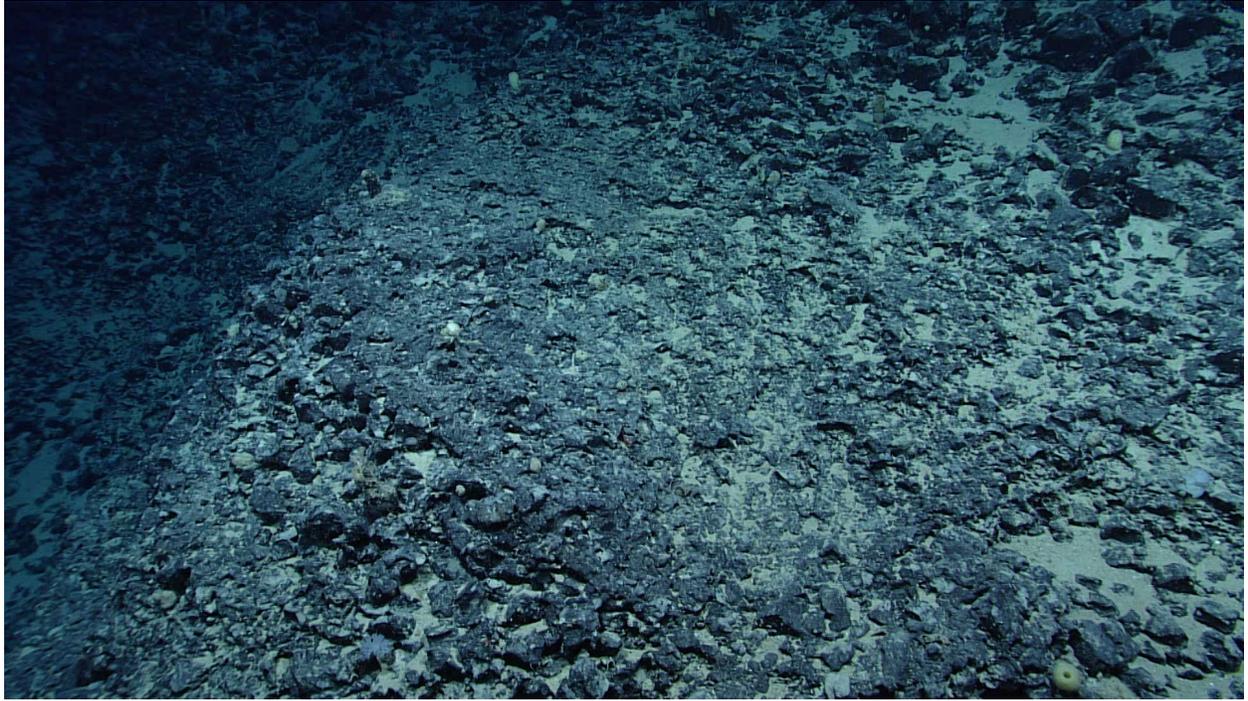


Smoothed ROV dive track in white on 25x25 cell size bathymetry, 3x vertical exaggeration, depth in meters, 10 meter contours.

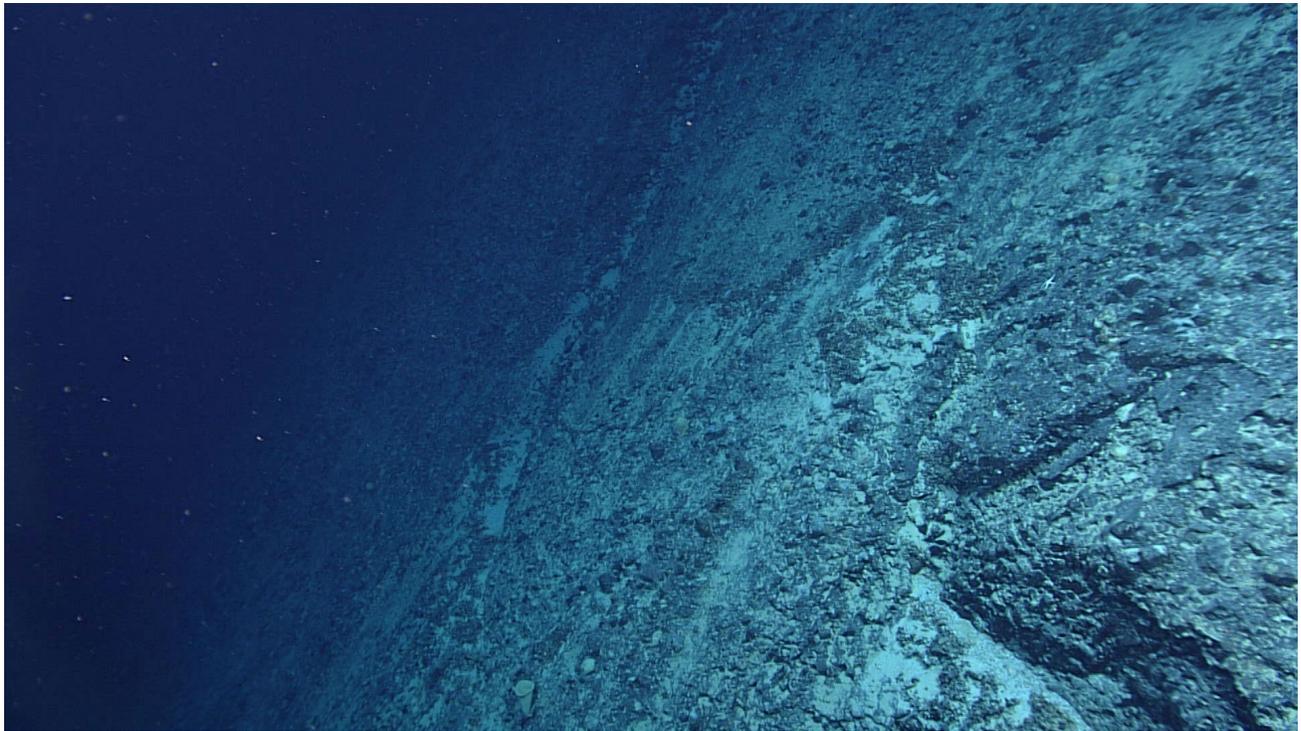
**Representative Photos of the Dive**



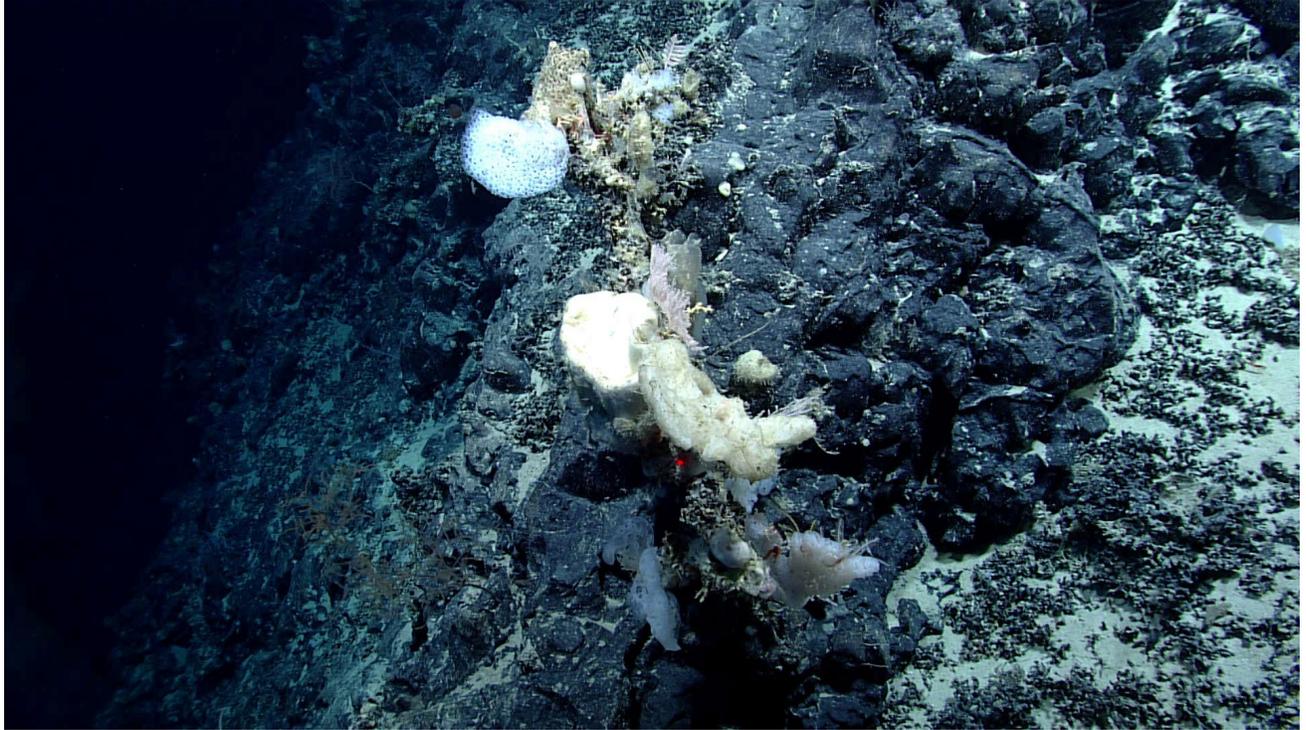
Extensive fine calcareous sediment intermixed with partially precipitant coated and remineralized coral skeletons.



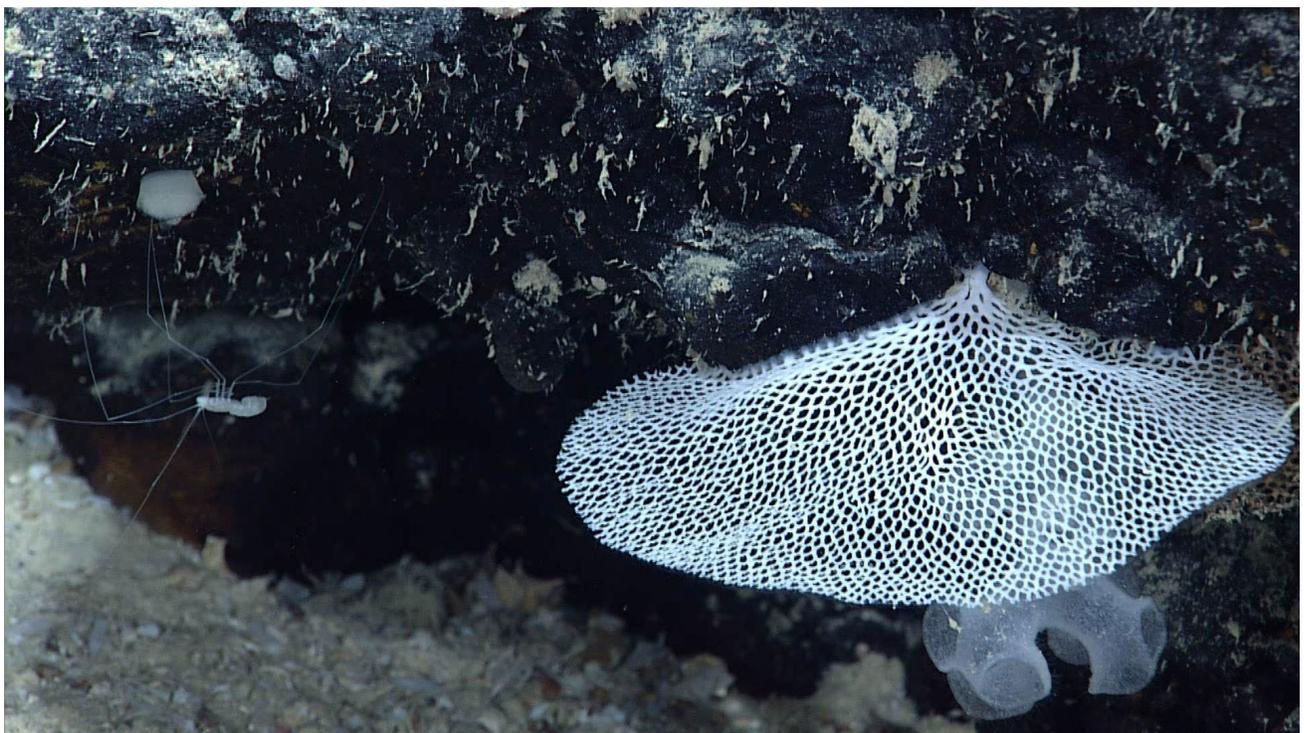
Heavily mineralized and precipitant coated corals and calcareous detritus.



The steep angle of the exposed fault.



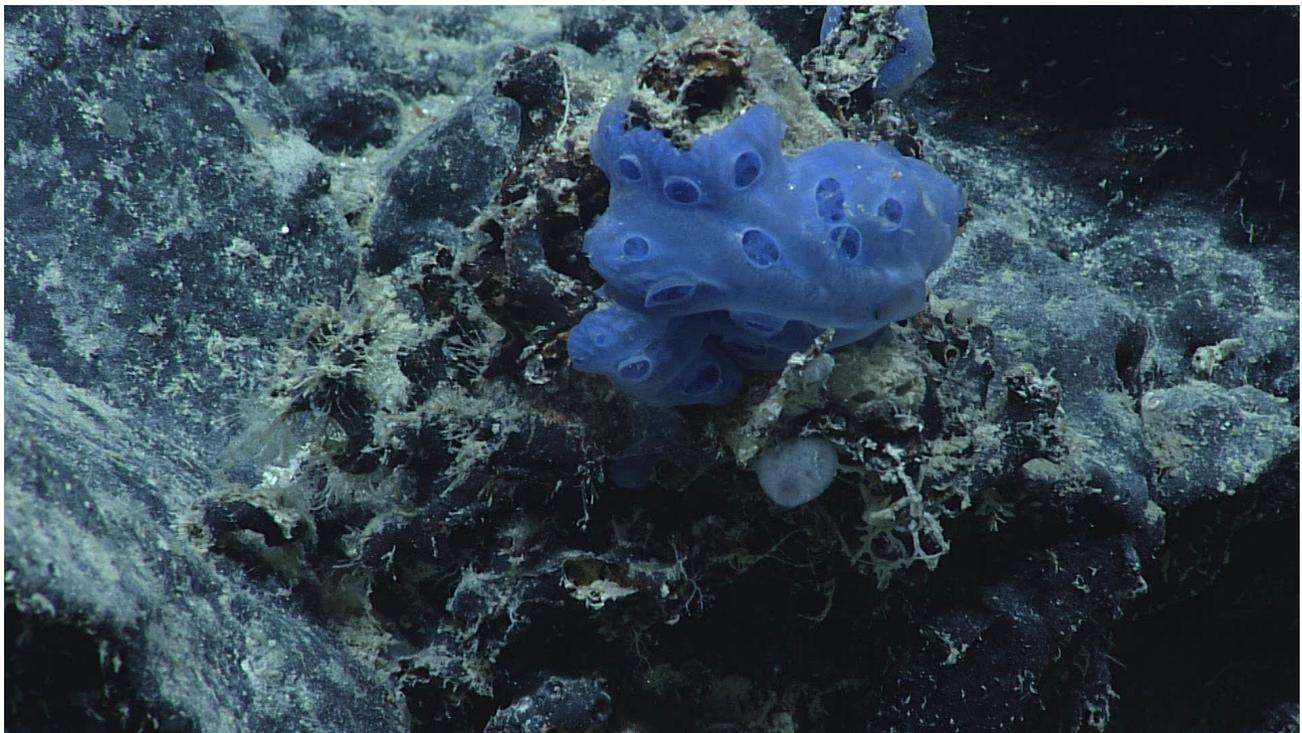
Heavily fragmented but likely in-situ pillow basalt fragments, characteristic of previous exposures on the upper flanks of exposed faults.



On a rock face at 1917 m depth close-ups reveal detail and diversity: a delicate bryozoan colony (right) in front of a glass sponge and a long-legged munnopsid isopod below a different type of sponge.



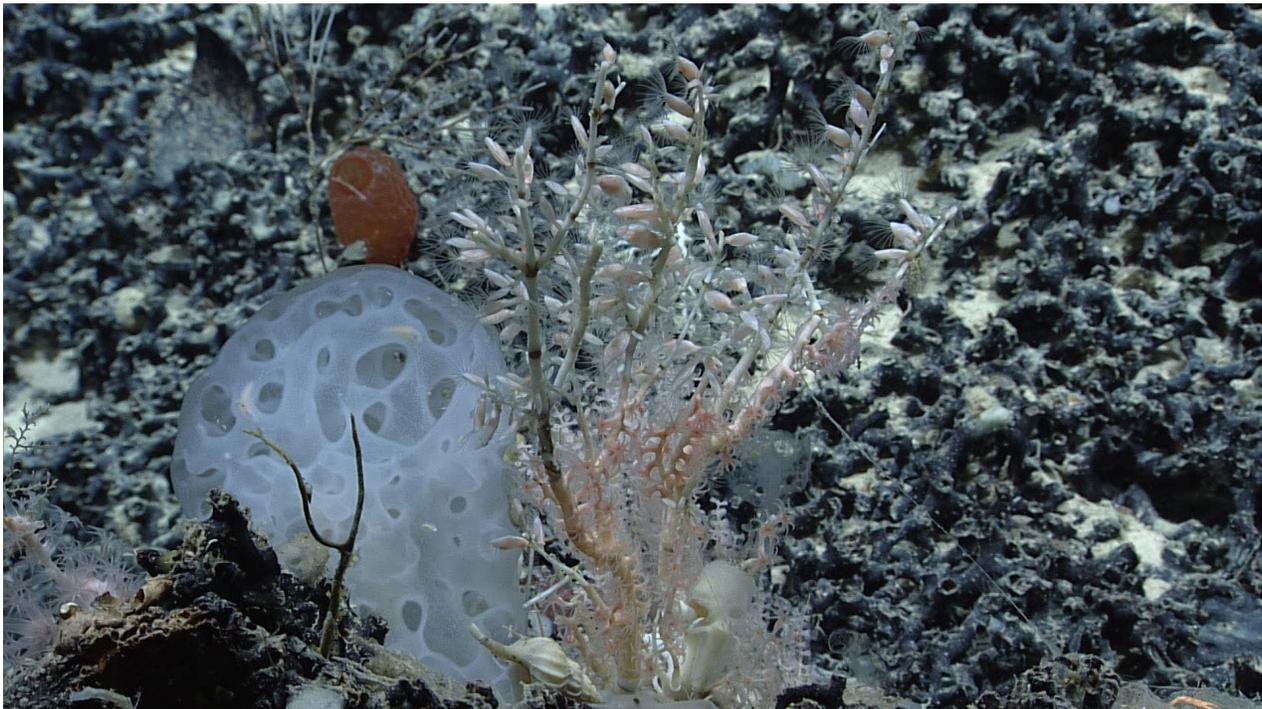
An unidentified organism, likely a tunicate, at 1876 m depth; many individuals of this morphology were observed.



A diversity of sponges were observed throughout the dive, including several that could not be identified, such as this blue encrusting form at 1842 m depth.



In the absence of tall corals and sponges on the first half of the dive, shorter sessile fauna stood out more, such as these compound tunicates at 1775 m depth.

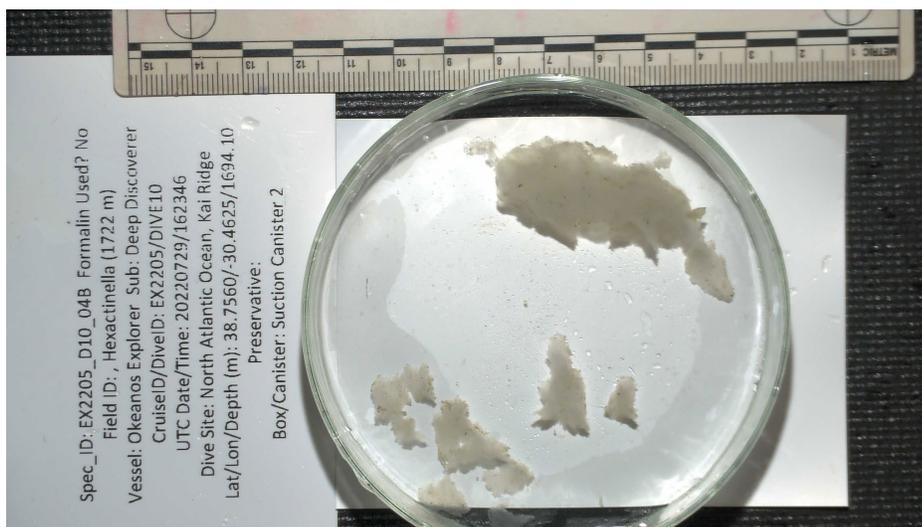


Coral skeletons provide habitat. Here the distal tips of a bamboo coral colony have been stripped of tissue, providing a settlement substrate for many pedunculate barnacles. Other fauna in the image include a predatory snail, glass sponge, tunicate and bryozoan fan.



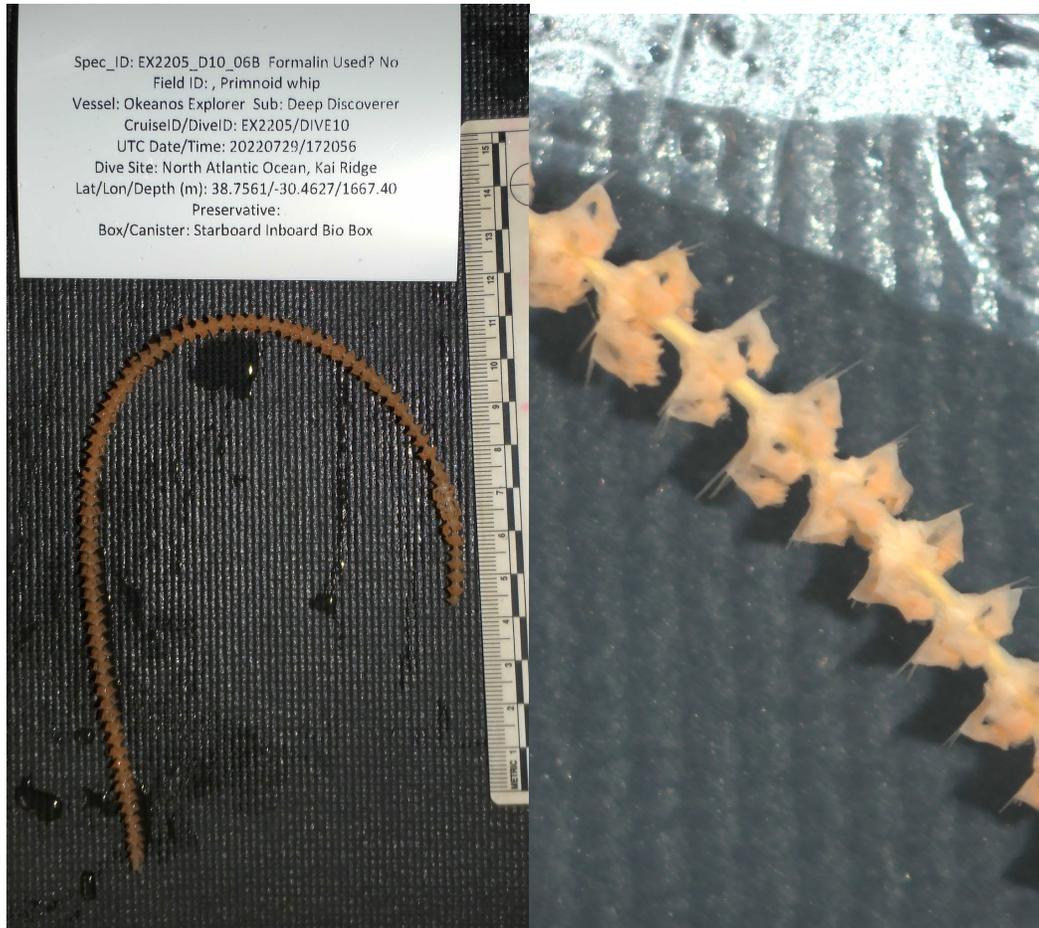
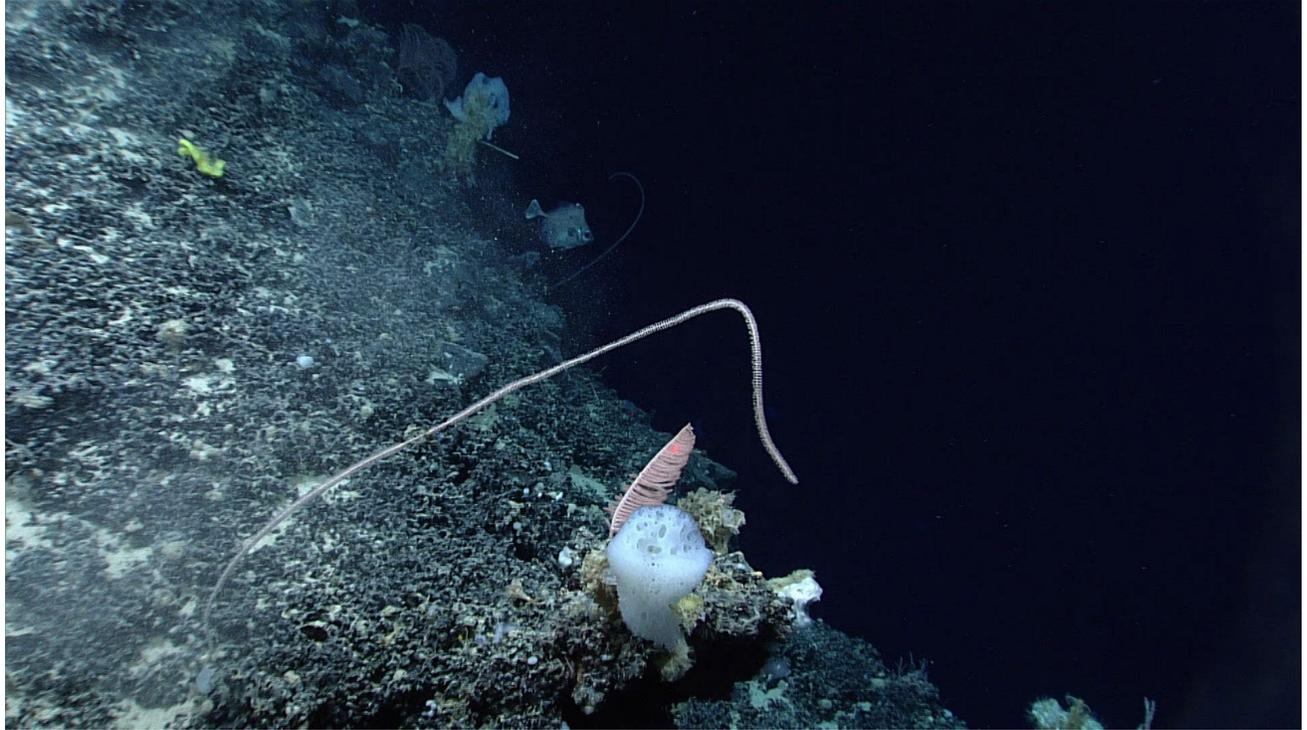
Shallower than 1752 m depth we observed a shift in the community with the appearance of taller corals and sponges, although the density remained low and the distribution patchy. Shown here are *Chrysogorgia*, *Iridogorgia*, *Candidella* and *Paramuricea* octocorals along with *Hertwigia* sponges.

# Samples Collected -



Sample ID	EX2205_D10_04B
Date (UTC)	20220729
Time (UTC)	16:23:46
Depth (m)	1694.1
Latitude (decimal degrees)	38.756
Longitude (decimal degrees)	-30.462
Temp. (°C)	4.579
Field ID(s)	Hexactinellida
Comments	

Associates Sample ID	Field Identification	Count
EX2205_D10_04B_A01	Lepadiformes	3
EX2205_D10_04B_A02	Cornulariidae	1



Spec\_ID: EX2205\_D10\_06B Formalin Used? No  
 Field ID: , Primnoid whip  
 Vessel: Okeanos Explorer Sub: Deep Discoverer  
 CruiseID/DiveID: EX2205/DIVE10  
 UTC Date/Time: 20220729/172056  
 Dive Site: North Atlantic Ocean, Kai Ridge  
 Lat/Lon/Depth (m): 38.7561/-30.4627/1667.40  
 Preservative:  
 Box/Canister: Starboard Inboard Bio Box

Sample ID	EX2205_D10_06B
Date (UTC)	20220729
Time (UTC)	17:20:56

Depth (m)	1667.4
Latitude (decimal degrees)	38.756
Longitude (decimal degrees)	-30.463
Temp. (°C)	4.583
Field ID(s)	Primnoid whip
Comments	

Associates Sample ID	Field Identification	Count

### Niskin Sampling Summary

Sample ID	EX2205_D10_01W
Date (UTC)	20220729
Time (UTC)	10:44:31
Depth (m)	579.9
Latitude (decimal degrees)	38.756523
Longitude (decimal degrees)	-30.460222
Bottle number	Niskin 1
Temperature (°C)	11.2328
Dissolved Oxygen (ml/L)	6.08721
Treatment	eDNA

Sample ID	EX2205_D10_02W
Date (UTC)	20220729
Time (UTC)	11:42:30
Depth (m)	1922.4
Latitude (decimal degrees)	38.755767
Longitude (decimal degrees)	-30.459332
Bottle number	Niskin 2

Temperature (°C)	4.53431
Dissolved Oxygen (ml/L)	7.78219
Treatment	eDNA

Sample ID	EX2205_D10_05W
Date (UTC)	20220729
Time (UTC)	17:01:11
Depth (m)	1678.9
Latitude (decimal degrees)	38.756031
Longitude (decimal degrees)	-30.46256
Bottle number	Niksin 3
Temperature (°C)	4.58014
Dissolved Oxygen (ml/L)	7.7441
Treatment	eDNA

Sample ID	EX2205_D10_07W
Date (UTC)	20220729
Time (UTC)	17:32:43
Depth (m)	1653.2
Latitude (decimal degrees)	38.756024
Longitude (decimal degrees)	-30.462836
Bottle number	Niskin 4
Temperature (°C)	4.60611
Dissolved Oxygen (ml/L)	7.66843
Treatment	eDNA

Sample ID	EX2205_D10_08W
Date (UTC)	20220729
Time (UTC)	18:12:31

Depth (m)	563.9
Latitude (decimal degrees)	38.754252
Longitude (decimal degrees)	-30.46369
Bottle number	Niskin 5
Temperature (°C)	11.14561
Dissolved Oxygen (ml/L)	5.99896
Treatment	eDNA

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