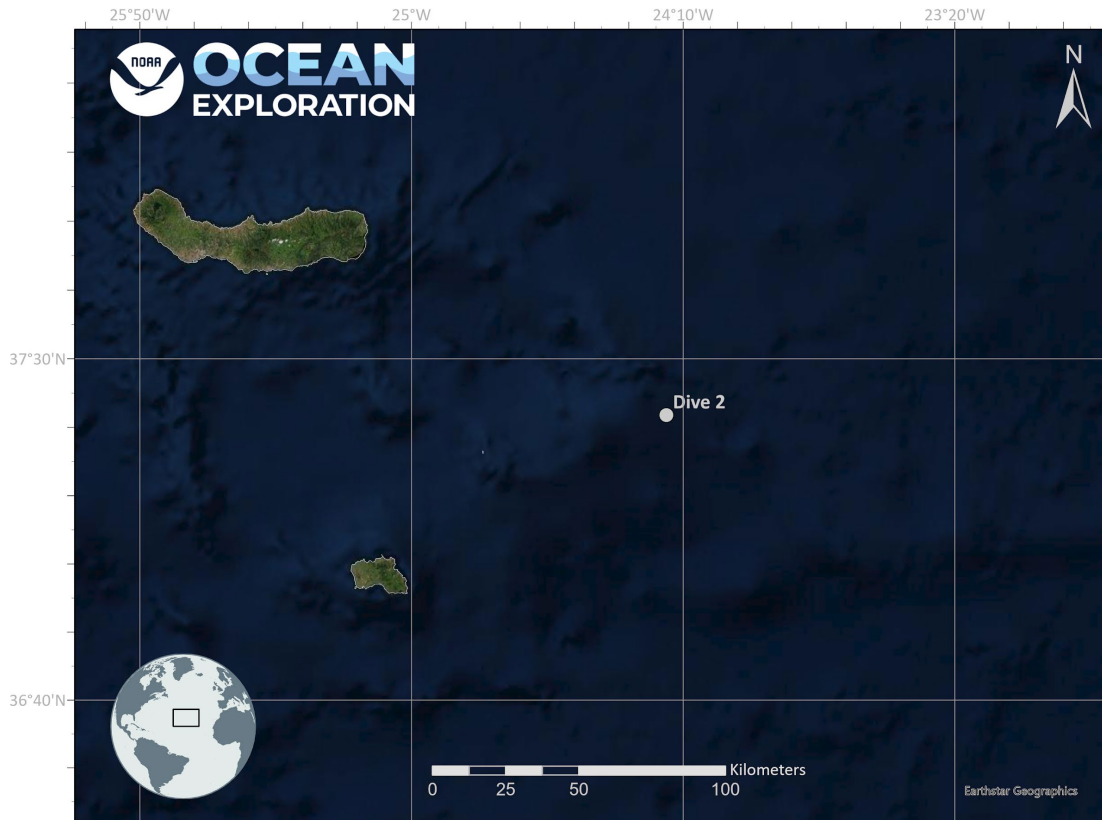


ROV Dive Summary, EX-22-06, Dive 02

August 08, 2022

General Location Map



Dive Information

Site Name	Dive 02 - East of Formigas Rift
General Area Descriptor	Azores Plateau
Science Team Leads	Joana Xavier (Biology), Deb Glickson (Geology)
Expedition Coordinator	Kasey Cantwell
ROV Dive Supervisor	Levi Unema

Sample Data Manager	Megan Cromwell
Mapping Lead	Sam Candio
Dive Purpose	The primary objective of this dive is to explore and characterize the geology of the Terceira Rift in the eastern part of the Formigas.
Was the dive restricted for Underwater Cultural Heritage?	No
ROV Dive Summary Data	<p>Dive Summary: EX2206_DIVE02 ^^^</p> <p>Dive Type: Normal</p> <p>In Water: 2022-08-08T10:31:57.615262 37.35600750772223 ; -24.382559167524693</p> <p>On Bottom: 2022-08-08T11:12:31.885977 37.35403485830997 ; -24.382375716619944</p> <p>Off Bottom: 2022-08-08T18:12:25.148406 37.35361905651596 ; -24.376476922417854</p> <p>Out Water: 2022-08-08T18:44:41.293140 37.353477 ; -24.376362</p> <p>Dive Duration: 8:12:43</p> <p>Bottom Time: 6:59:53</p> <p>Max Vehicle Depth: 844.8 m</p> <p>Min Seafloor Depth: 622.2 m</p> <p>Distance Traveled: 624.7 m</p>

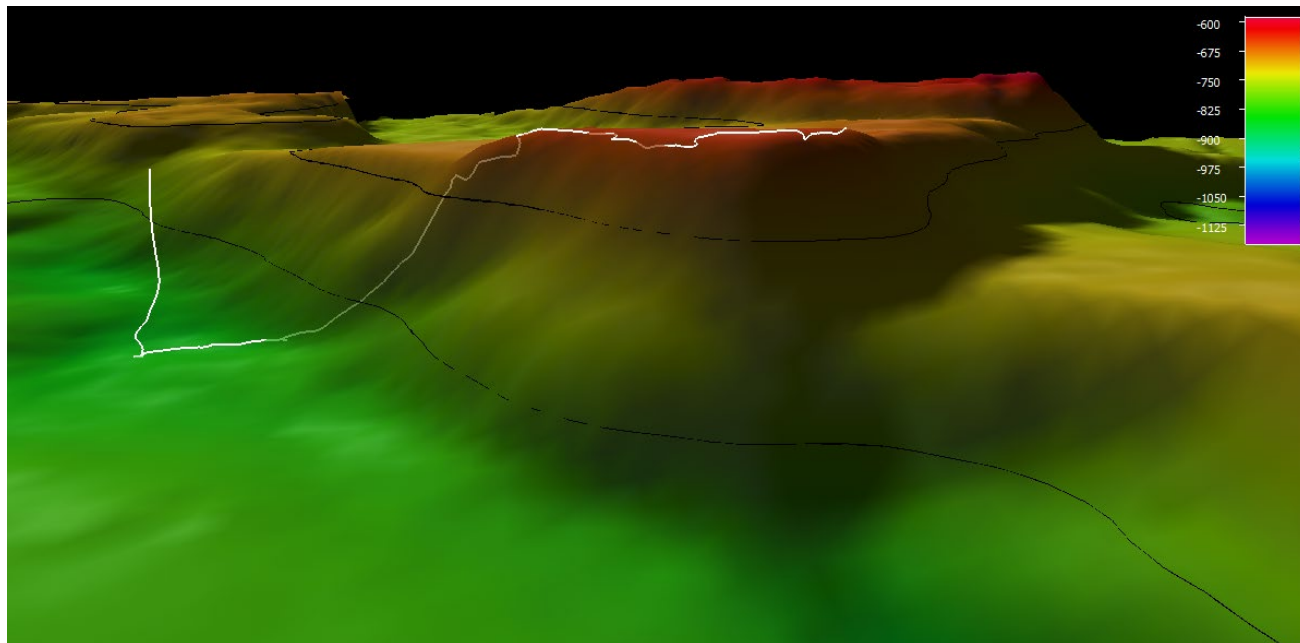
Dive Description	<p>This dive began on a flat plain mostly composed of coral rubble and a few darker, weathered boulders. We immediately saw sharks and a fish. The boulders could be breccia or could be volcanoclastic – they had a mix of light and dark colors with a sandy appearance. Several of the brecciated boulders had angular basaltic clasts within a matrix of what looked like sediment. Soon after, we stopped seeing any basalt clasts. These large boulders had many birds’ nest sponges (<i>Pheronema carpenteri</i>), with some sea urchins and the solitary scleractinian coral (<i>Leptosammia formosa</i>). At 1209 m, we collected a fragment of a large barrel-shaped haplosclerid sponge (<i>Haliclona cf. magna</i>). As we continued along the plain, we saw a few blackbelly rosefish, with scattered black rocks among the coral rubble. The boulders seemed incredibly weathered and were covered in white glass sponges, yellow sponges, and even some blue sponges (likely in the genus <i>Hymedesmia</i>). These encrusting sponges covered a lot of the rock surface. When we reached the wall, we saw a brecciated rock covered in sponges, with some rust-colored (iron?) oxidation. Octocorals were also seen, as well as a “living fossil” black crinoid (<i>Cyathidium foresti</i>). As we continued upslope, the rocks remained very weathered, may have all been volcanoclastic covered in sediment. Two encrusting sponge samples were collected, as well as a yellow coral.</p> <p>At the top of this faulted ramp, there were more animals. Many more encrusting sponges were seen, including several large individuals of <i>Haliclona cf. magna</i>. A soft coral, genus <i>Anthomastus</i>, was also seen. Three rocks were collected from the same location – a light-colored rock, a dark-colored rock, and a rust-colored rock. Although we thought the dark rock might be basalt, it turned out to be a volcanoclastic with a light manganese crust. Near the top of the slope, we collected a large <i>Placogorgia</i> and saw several carrying crabs (possibly <i>Paromola cuvieri</i>), one without its sponge or coral associate. This part of the ridge was a combination of consolidated biogenic sediment (such as coral hash), and interspersed darker red rocks that might be volcanoclastics. These rocks were very layered and platy, although well-indurated. There were also large fractures that extended down into the ramp feature.</p> <p>At the highest point of the slope, the rocks remained very weathered, and may have been carbonate or volcanoclastics. A large thickly encrusting yellow sponge (possibly in the genus <i>Spongosorites</i>) was sampled here. We then moved back to the edge of the ridge, where a sponge and a small rock were collected, and imagery of the dark brown volcanoclastic layers.</p>
Notable Observations	Many sponges throughout the dive, including large individuals of the barrel-shaped <i>Haliclona cf magna</i> ; weathered volcanoclastic rocks
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)	Spreading Center Scarp/wall Slope
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2663

Equipment Deployed

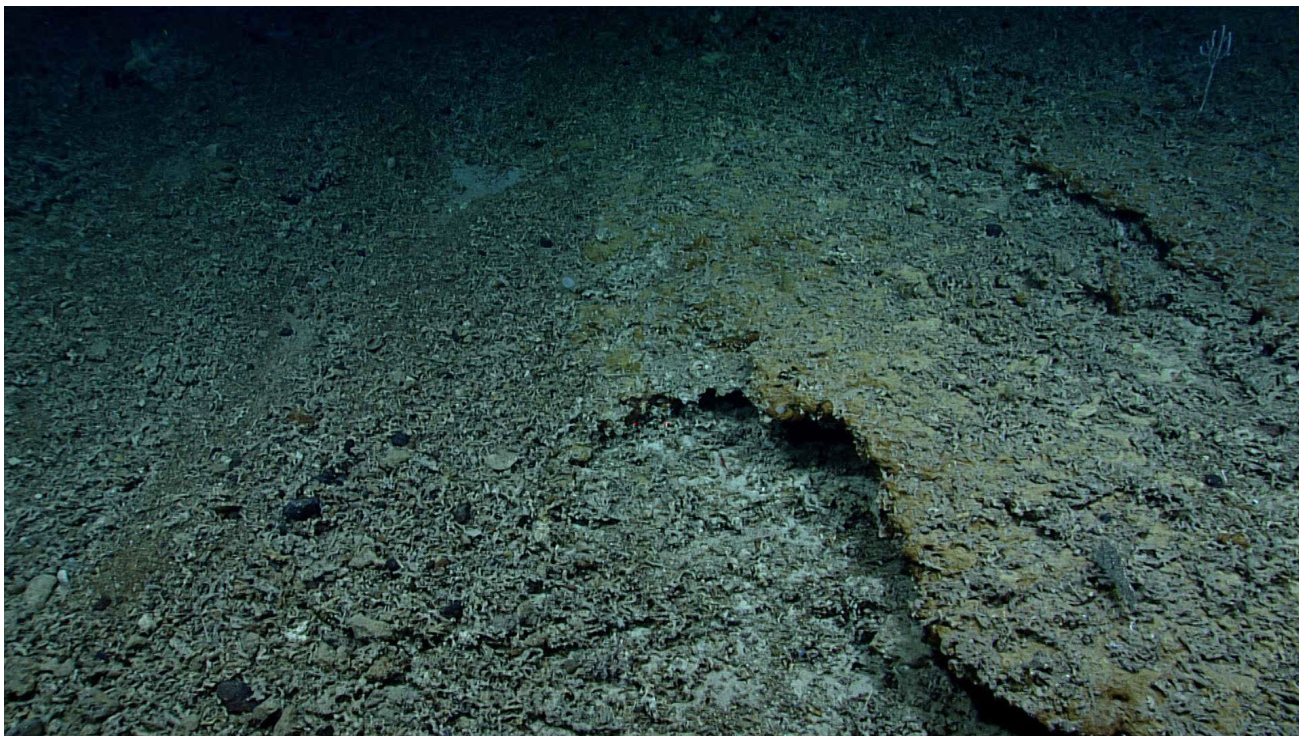
ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>

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	None

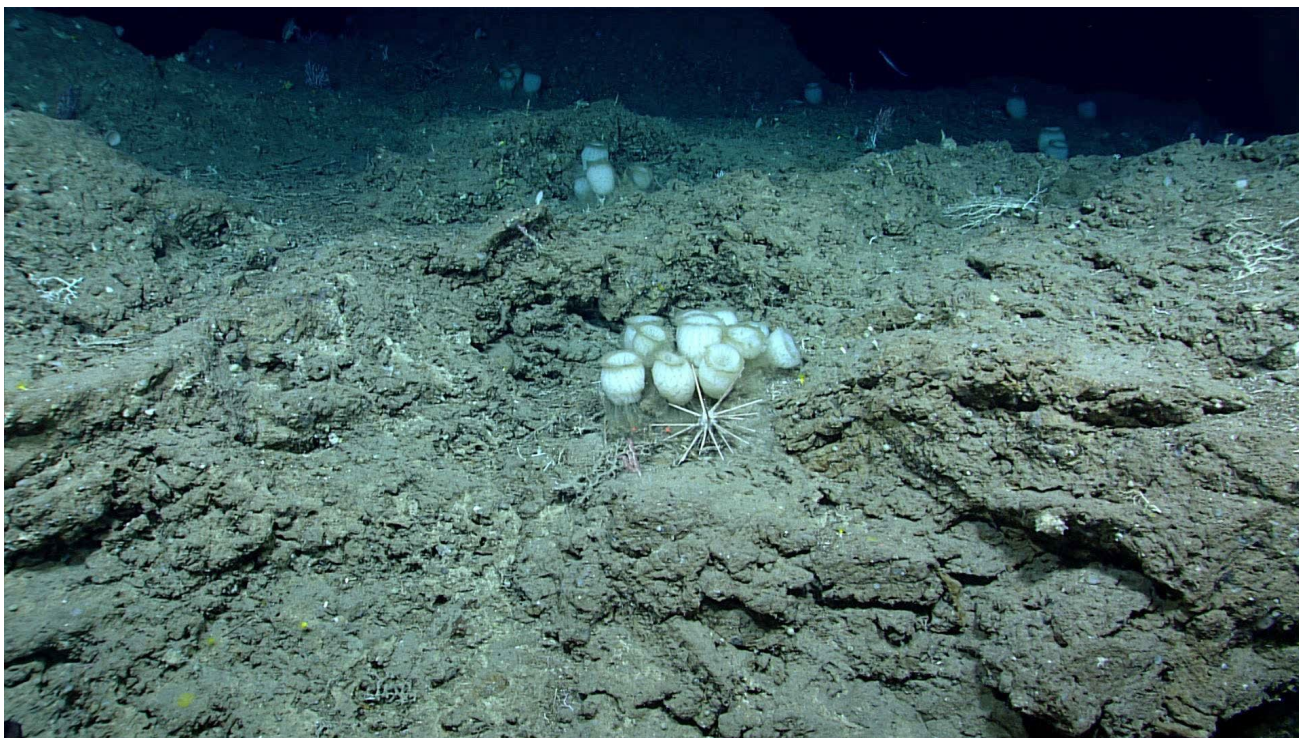
Close-up Map of Main Dive Site



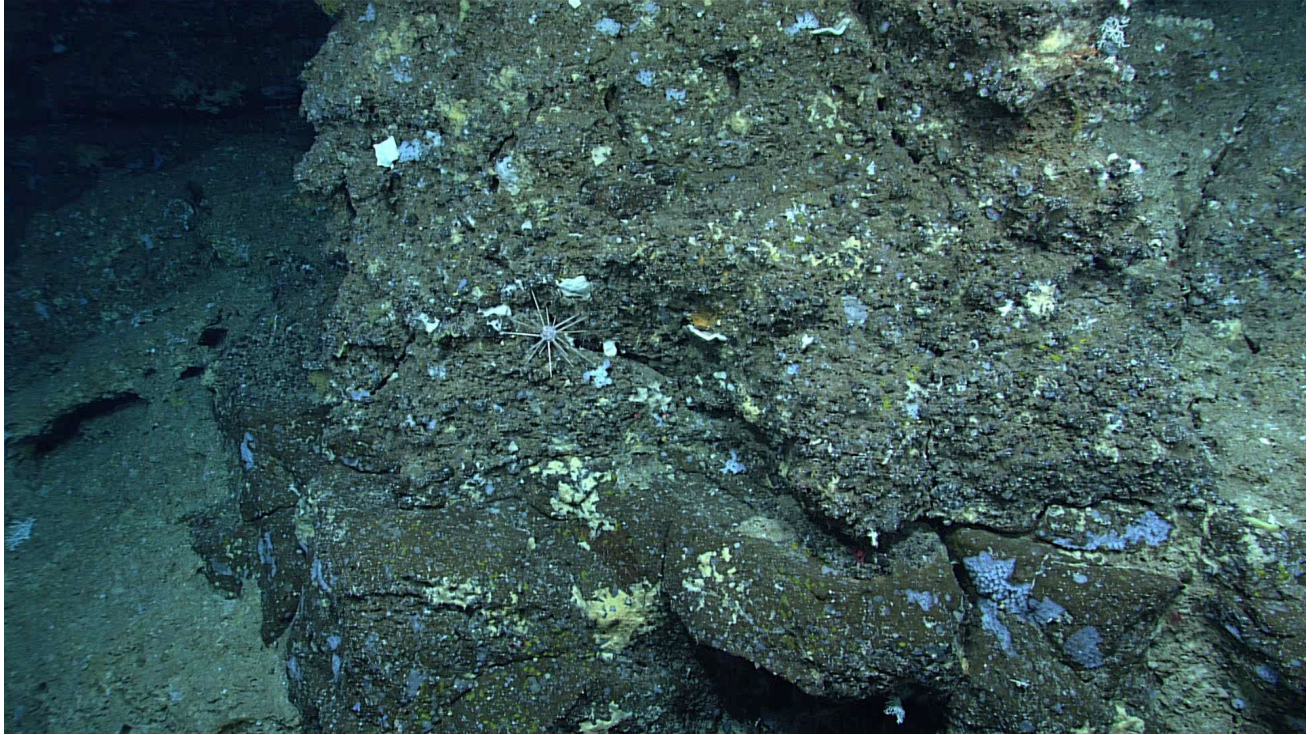
Smoothed ROV dive track in white on 25m resolution bathymetry, 1x vertical exaggeration, depth in meters, 100 meter contours.



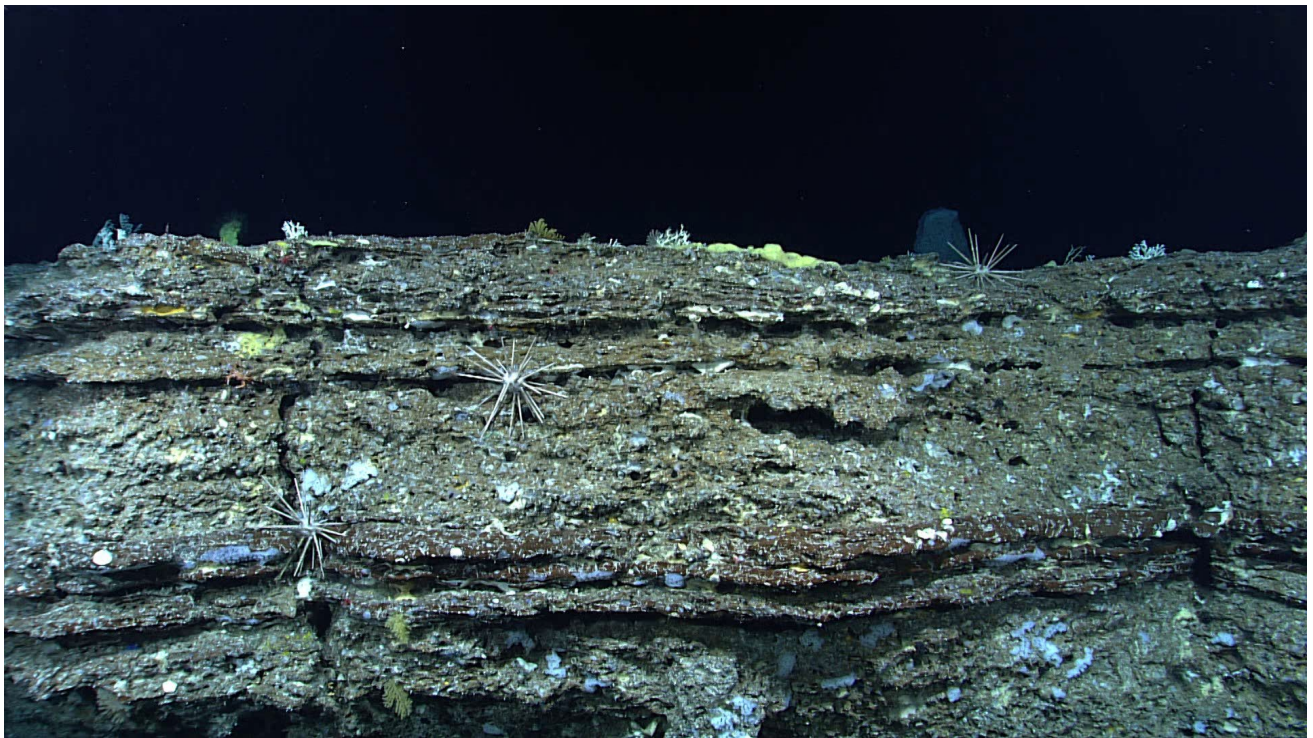
Large seafloor area covered in coral rubble.



Patches of the birds' nest glass sponge *Pheronema carpenteri*, here also with the sea urchin *Cidaris cidaris*.



Weathered rocks, which may be volcanoclastic, almost entirely covered in encrusting sponges and other biota.



Platy, layered volcanoclastics at the top of the ridge.

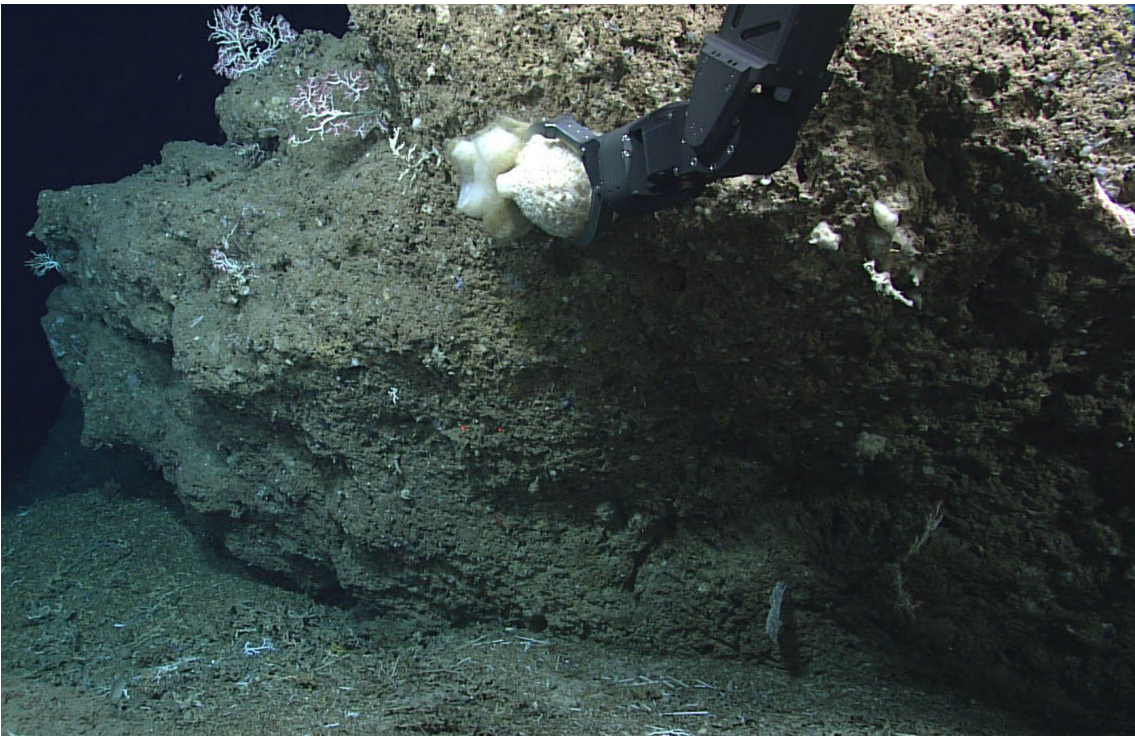


Example of a large individual of the sponge *Haliclona cf. magna*.



The cyrtocrinid crinoid *Cyathidium foresti*, considered a living fossil.

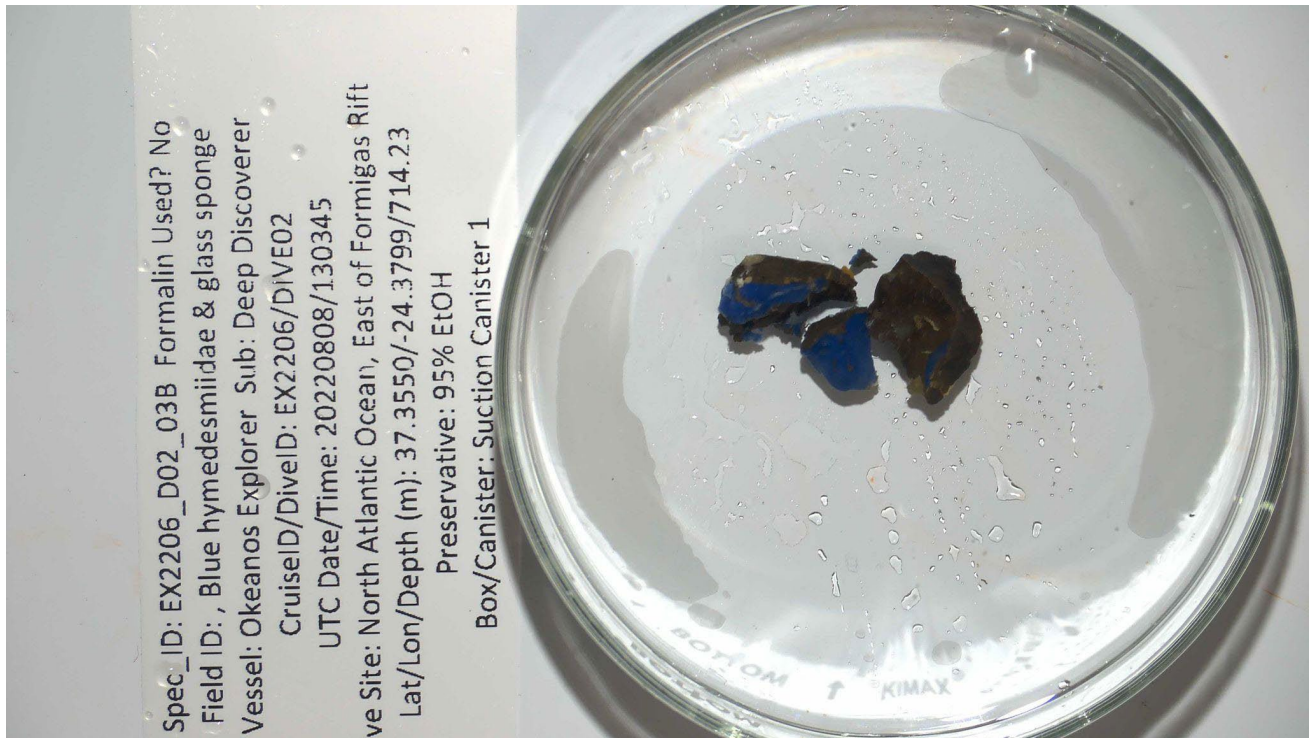
Samples Collected



Sample ID	EX2206_D02_02B
Date (UTC)	20220808

Time (UTC)	121126
Depth (m)	838.111
Latitude (decimal degrees)	37.35480
Longitude (decimal degrees)	-24.38128
Temp. (°C)	8.532
Field ID(s)	Haliclona cf. magna
Comments	Multiple pieces of the sample, dead hydroids attached. Massive barrel sponge, deep atrial cavity, very rugose on external wall. Extremely crumbly.

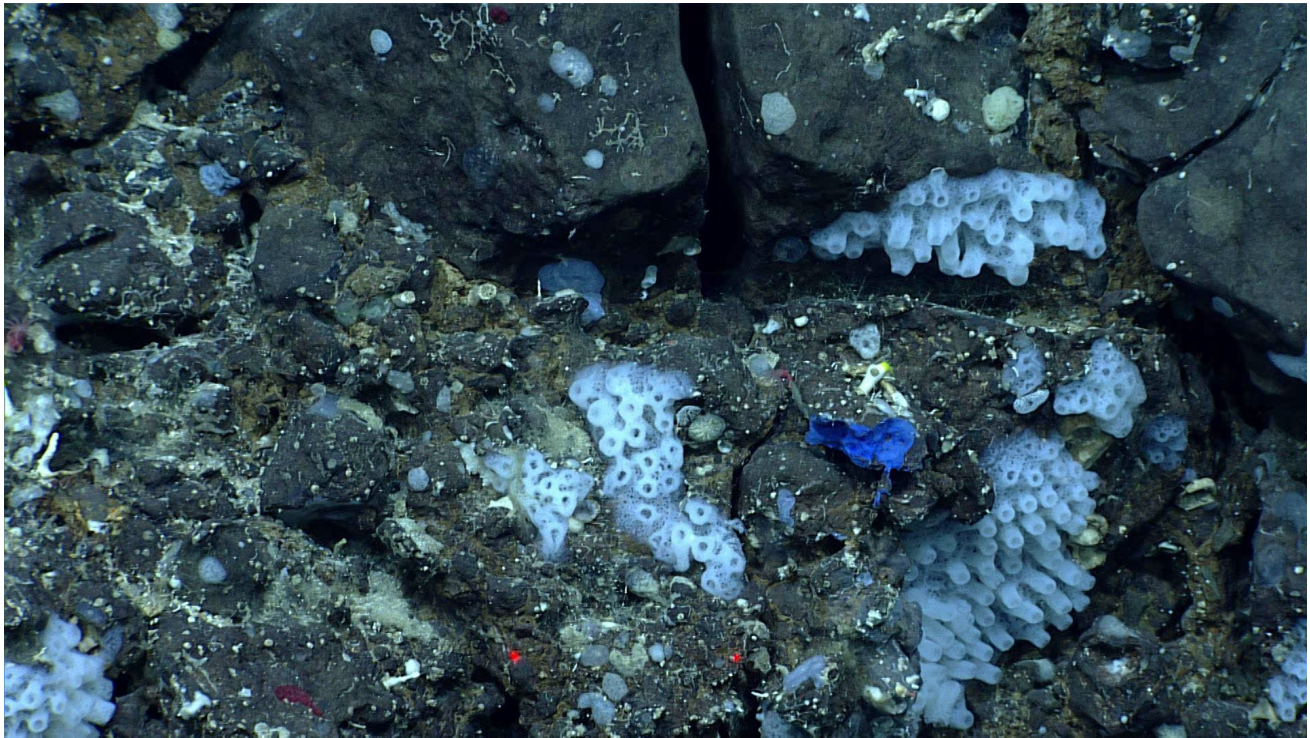
Associates Sample ID	Field Identification	Count
EX2206_D02_02B_A01	Hydroida	2





Sample ID	EX2206_D02_03B
Date (UTC)	22020808
Time (UTC)	130345
Depth (m)	714.234
Latitude (decimal degrees)	37.35503
Longitude (decimal degrees)	-24.37988
Temp. (°C)	10.361
Field ID(s)	Blue hymedesmiidae
Comments	3 pieces, thinly encrusting blue sponge, pore areas visible.

Assoc Spec ID: EX2206_002_03B_A01
 Host #:
 Field ID: , Glass sponge
 Vessel: Okeanos Explorer
 Cruise/Dive: EX2206/DIVE02
 Dive Site: North Atlantic Ocean, East of Formigas Rift
 UTC Date/Time: 20220808/130345
 Lat/Lon/Depth(m): 37.3550/-24.3799/714.23
 Preservative: 95% EtOH
 Formalin Used? No



Associates Sample ID	Field Identification	Count
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EX2206_D02_03B_A01

Glass sponge

~10



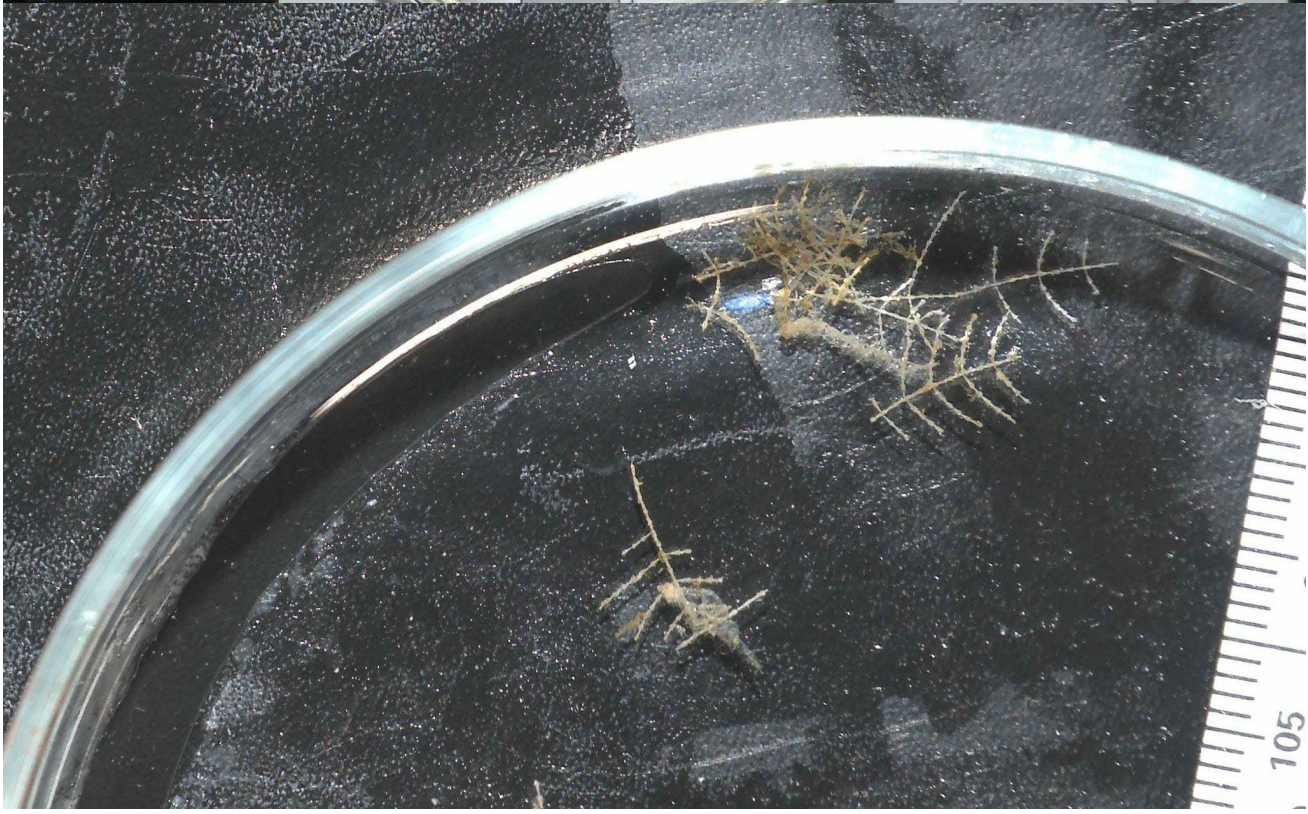


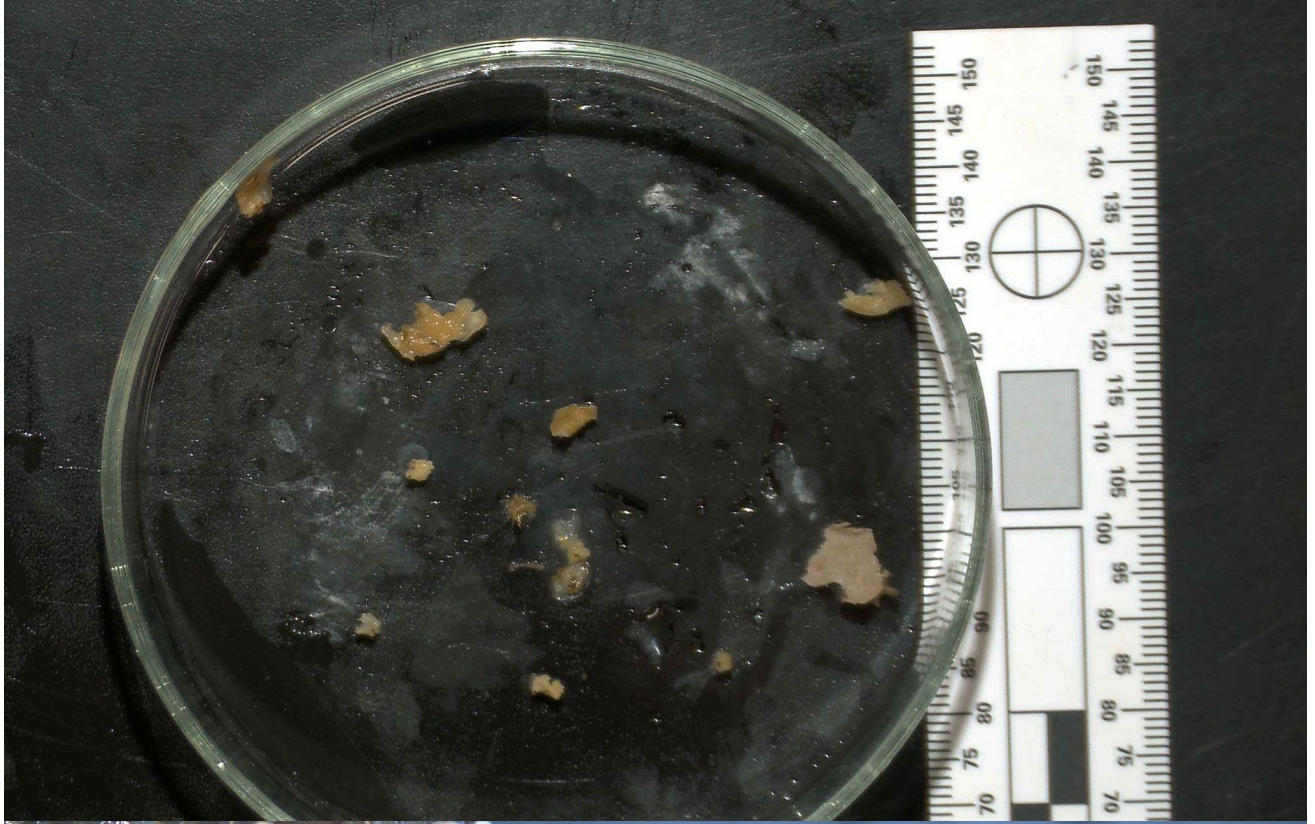
Sample ID	EX2206_D02_04B
Date (UTC)	20220808
Time (UTC)	130711
Depth (m)	713.8
Latitude (decimal degrees)	37.35503

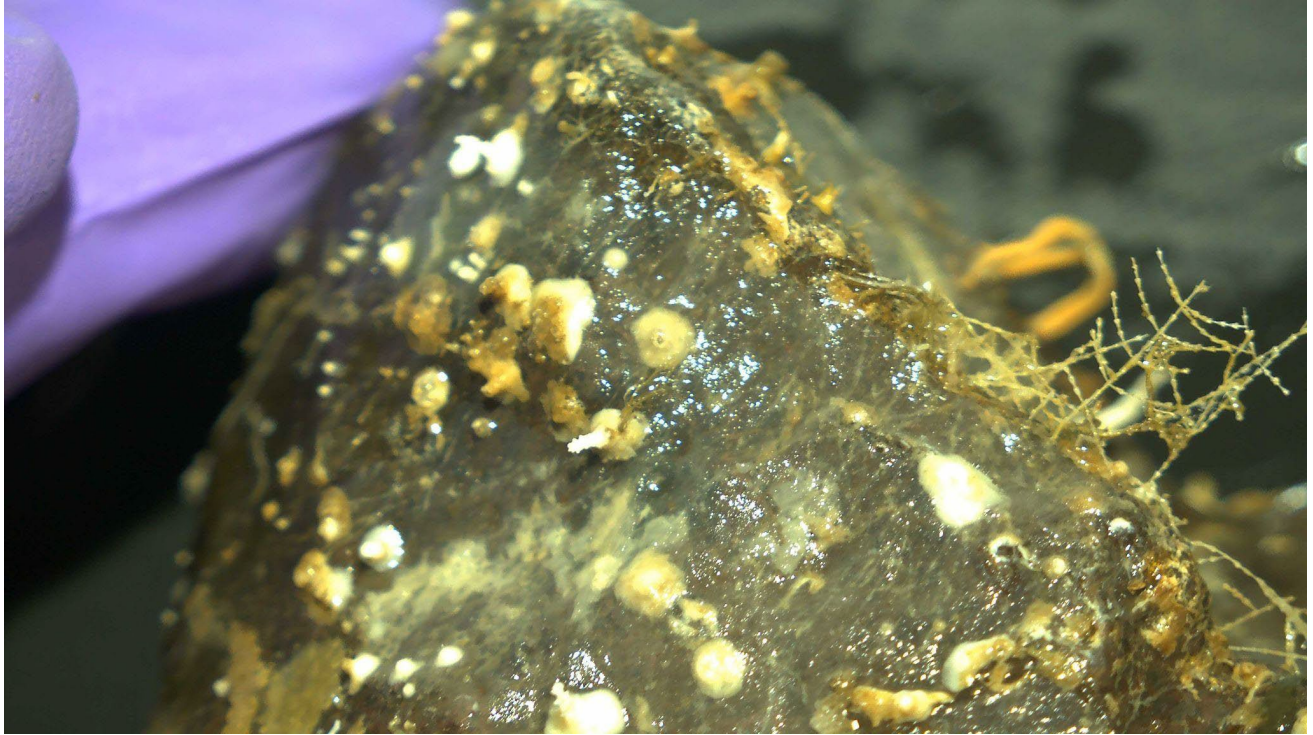
Longitude (decimal degrees)	-24.37989
Temp. (°C)	10.34
Field ID(s)	Acanthogorgia (possibly <i>A. armata</i> ?)
Comments	Planar branching colony, with orange polyps serially placed on all sides. The colony turned blue in ethanol.



Assoc Spec ID: EX2206_D02_04B_A03
Host Assoc: none
Field ID: , Tunicate
Vessel: Okeanos Explorer
Cruise/Event: EX2206/DIVE02
Dive Site: North Atlantic Ocean, East of Formigas Rift
UTC Date/Time: 20220808/130711
Lat/Long: 37.3550/-24.3799/713.80
Depth(m):
Preservative:
Formalin Used? No







Associates Sample ID	Field Identification	Count
EX2206_D02_04B_A01	Mixed lot Ophiuroid	2
EX2206_D02_04B_A02	Elongated Sponge	2 pieces of 1
EX2206_D02_04B_A03	Tunicate	2
EX2206_D02_04B_A04	Mixed lot hydrozoans	3
EX2206_D02_04B_A05	Mixed lot encrusting sponges	multiple
EX2206_D02_04B_A06	Fine grained volcanoclastic	1

Specimen Name:
 Formalin Used? No
 Field ID: , volcanoclastic and pyroclast
 Vessel: Okeanos Explorer Sub: Deep Discoverer
 CruiseID/DivID: EX2206/DIVE02
 UTC Date/Time: 20220808/140006
 Dive Site: North Atlantic Ocean, East of Formigas Rift
 Lat/Lon/Depth (m): 37.3550/-24.3793/663.03
 Preservative: Rinsed and Dried
 Box/Canister: Port Forward Rock Box





Sample ID	EX2206_D02_05G
Date (UTC)	20220808
Time (UTC)	140006
Depth (m)	663.025
Latitude (decimal degrees)	37.35497
Longitude (decimal degrees)	-24.37927
Temp. (°C)	10.854
Field ID(s)	Volcaniclastic and pyroclast (2 separate rocks)
Comments	Both possibly volcaniclastic. The lighter rock has vesicular texture, reddish and black crystals or inclusions. Almost looks like the vesicular portion is welded onto another layer of rock. The darker rock is weathered and has a thin manganese crust.



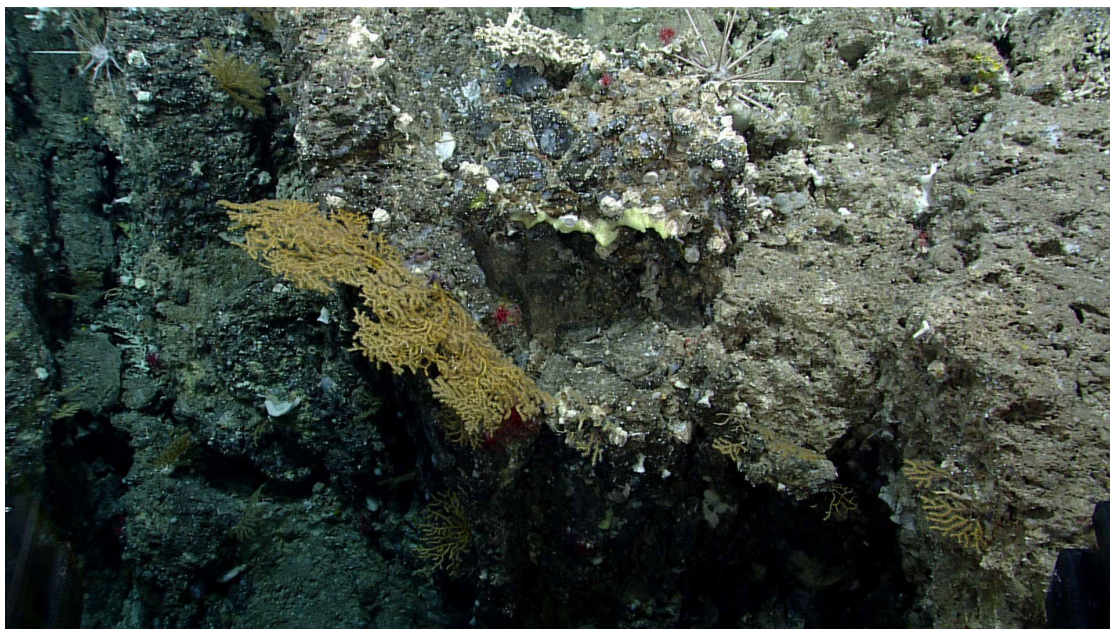


Associates Sample ID	Field Identification	Count
EX2206_D02_05G_A01	Anthomastus	1
EX2206_D02_05G_A02	Mixed lot of tiny sponges	Multiple



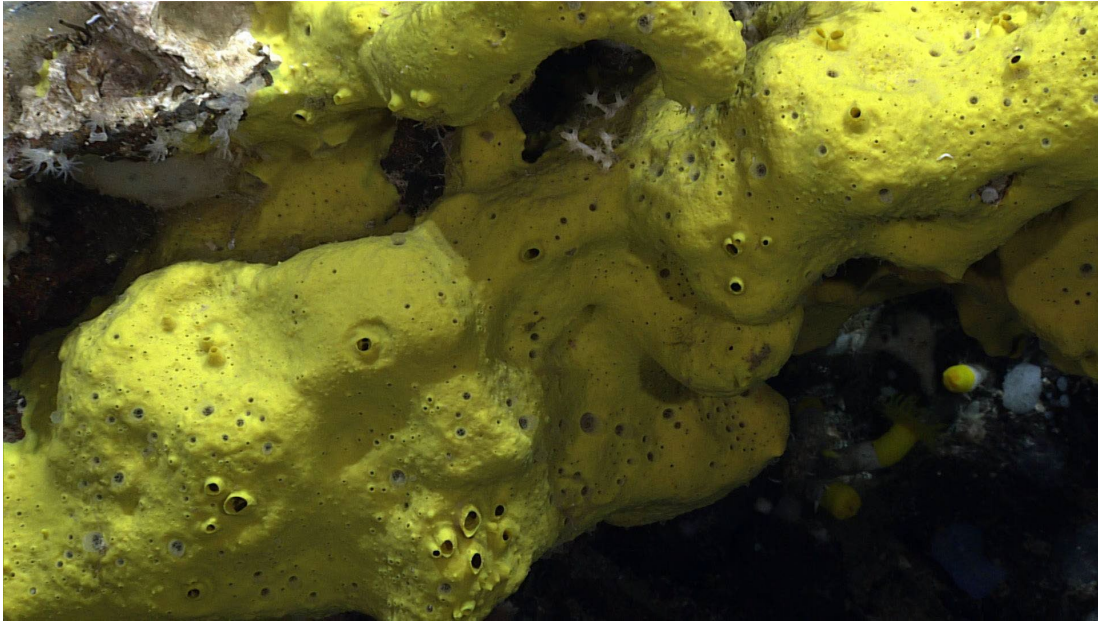


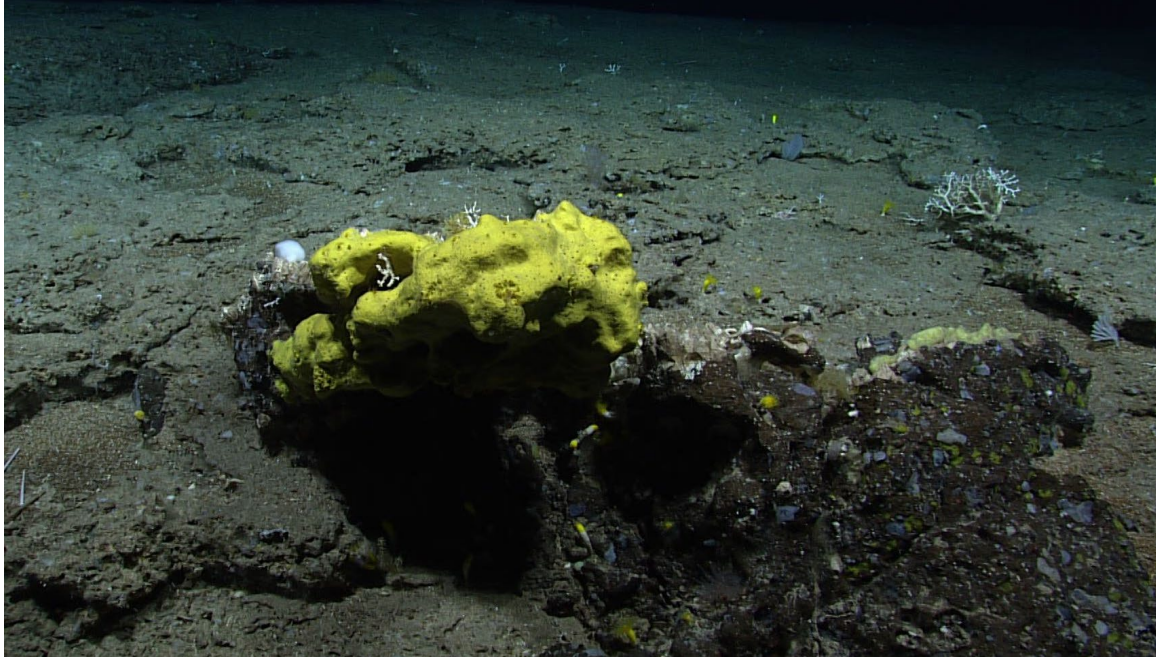
Sample ID	EX2206_D02_06G
Date (UTC)	20220808
Time (UTC)	140549
Depth (m)	662.729
Latitude (decimal degrees)	37.354970
Longitude (decimal degrees)	-24.379250
Temp. (°C)	10.858
Field ID(s)	Volcaniclastic
Comments	Reddish, rust colored volcaniclastic. A small piece broke off (2 pieces now). Obsidian inclusions. Fine grained.



Sample ID	EX2206_D02_07B
Date (UTC)	20220808
Time (UTC)	144553
Depth (m)	635.126
Latitude (decimal degrees)	37.3549
Longitude (decimal degrees)	-24.37896
Temp. (°C)	10.771

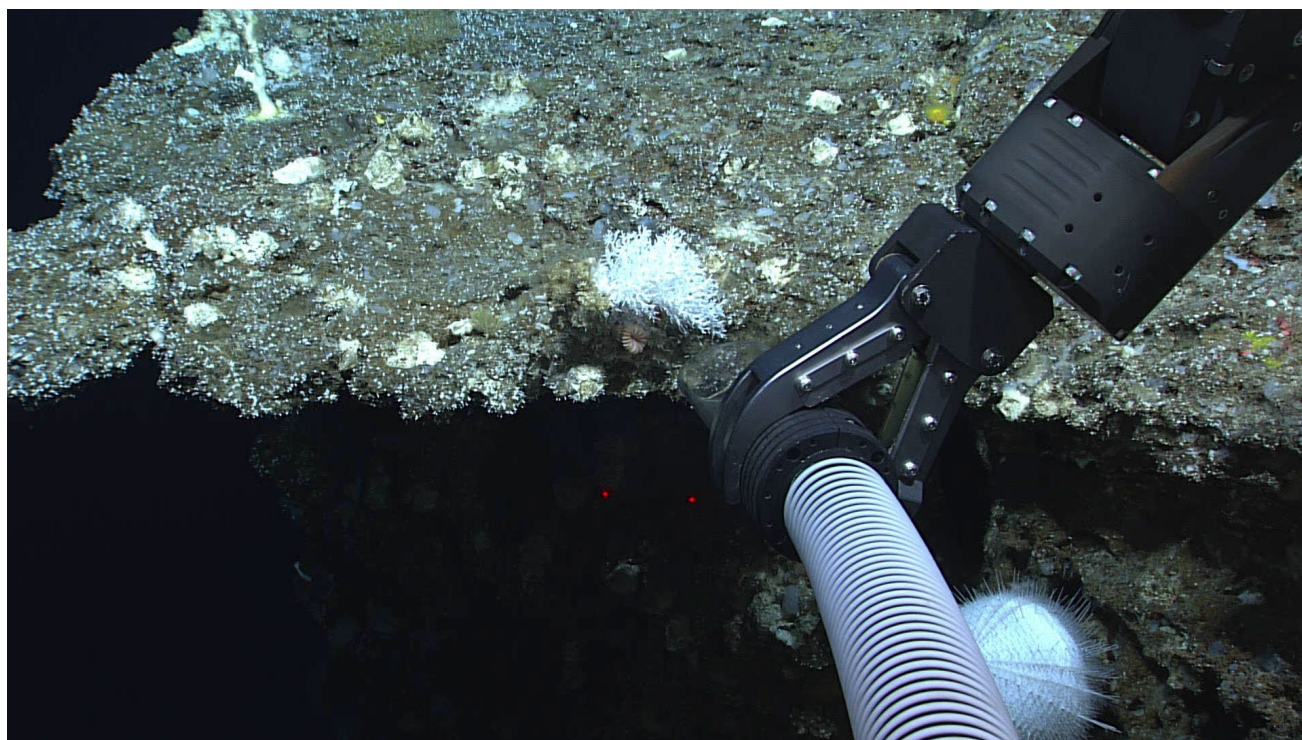
Field ID(s)	Placogorgia
Comments	Large planar branching colony, live color is orange, but turning dark brown in ethanol. Polyps are small and very densely packed along the branches.





Sample ID	EX2206_D02_08B
Date (UTC)	20220808
Time (UTC)	170149
Depth (m)	629.2
Latitude (decimal degrees)	37.35378
Longitude (decimal degrees)	-24.37765
Temp. (°C)	10.598
Field ID(s)	Demospongiae, likely Spongisorites sp.
Comments	Bright yellow massive sponge with numerous visible oscules. Dense and rubbery consistency. Three fragments (1 larger and 2 smaller ones). Part of the sponge seemed to be covering barnacle plates. Note: Spongisorites is known to have antiviral and antimicrobial properties.

Spec_ID: EX2206_D02_10B Formalin Used? No
Field ID: Cnidaria, Stylaster
Vessel: Okeanos Explorer Sub: Deep Discoverer
CruiseID/DiveID: EX2206/DIVE02
UTC Date/Time: 20220808/175138
Dive Site: North Atlantic Ocean, East of Formigas Rift
Lat/Lon/Depth (m): 37.3538/-24.3768/627.80
Preservative: 95% EtOH
Box/Canister: Suction Canister 4



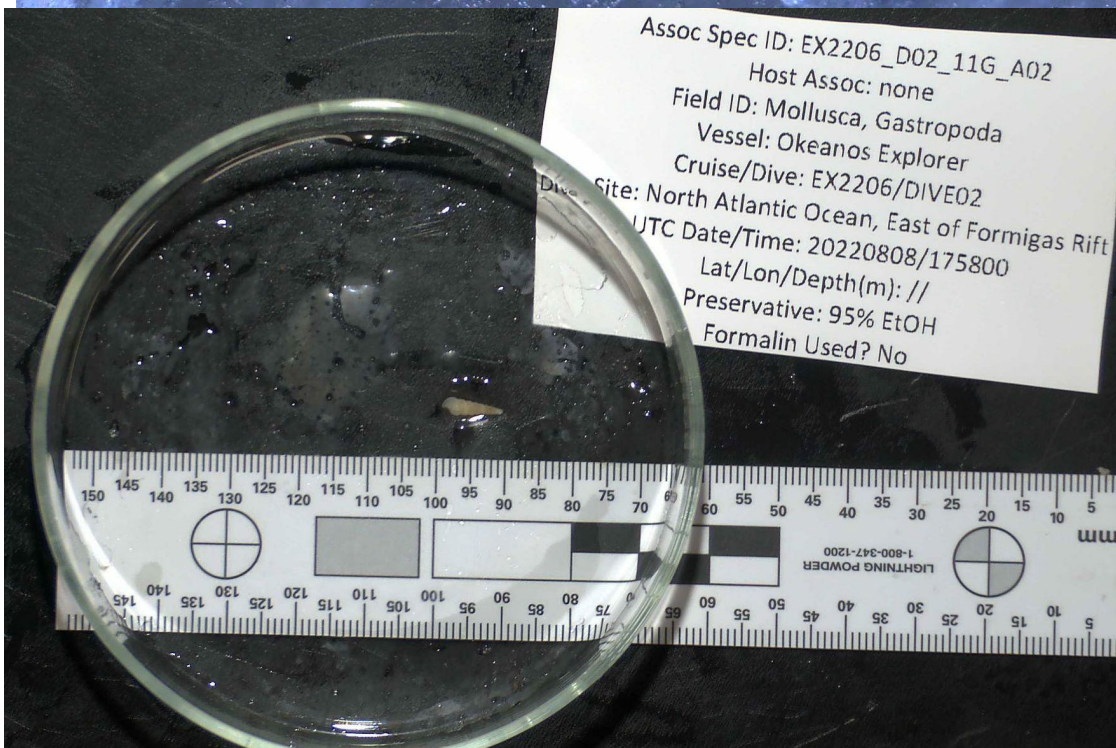
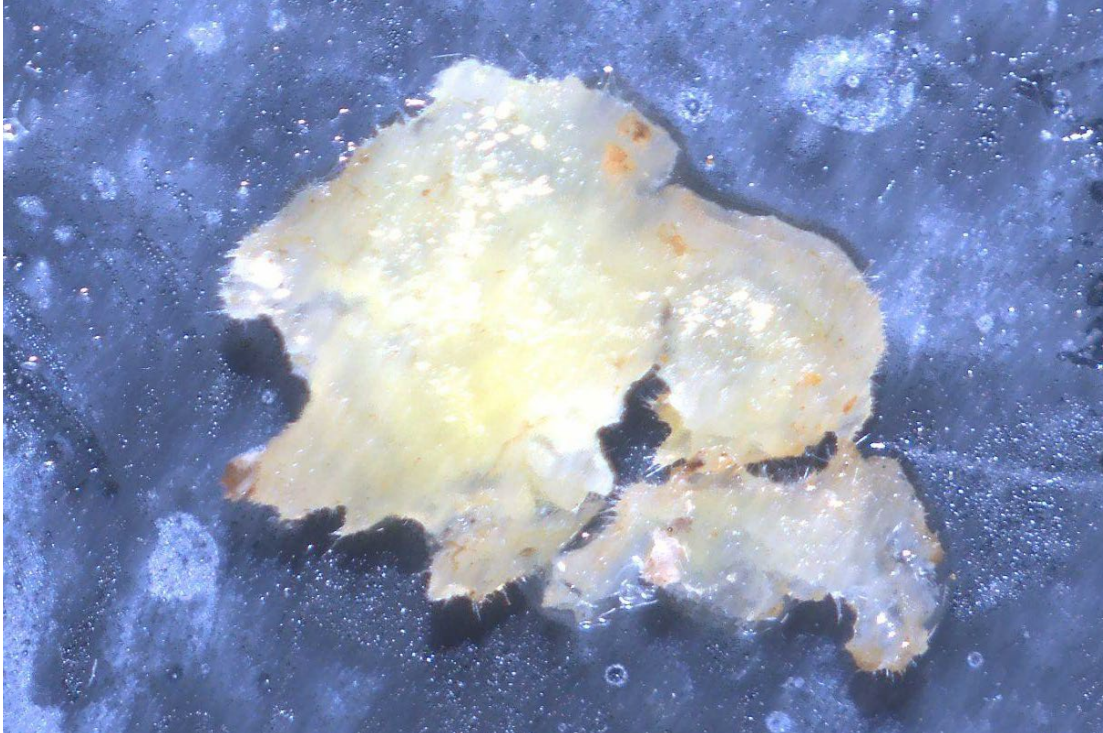
Sample ID	EX2206_D02_10B
Date (UTC)	20220808
Time (UTC)	175138

Depth (m)	627.798
Latitude (decimal degrees)	37.35378
Longitude (decimal degrees)	-24.37677
Temp. (°C)	10.533
Field ID(s)	Stylaster
Comments	White hydrocoral colony branching in increasingly thinner branches, and in various directions (bush like), very brittle.





Sample ID	EX2206_D02_11G
Date (UTC)	20220808
Time (UTC)	175800
Depth (m)	627.0301
Latitude (decimal degrees)	37.35381
Longitude (decimal degrees)	-24.37627
Temp. (°C)	10.43214
Field ID(s)	Volcaniclastic Rock
Comments	Tan colored, fine grained rock fragments with crystalline bits in the matrix as well as what looks like inclusion of other rocks. Inclusions of obsidian(?).



Associates Sample ID	Field Identification	Count
EX2206_D02_11G_A01	Demosponge	2



Sample ID	EX2206_D02_12B
Date (UTC)	20220808
Time (UTC)	180500
Depth (m)	627.3713
Latitude (decimal degrees)	37.35383
Longitude (decimal degrees)	-24.37670
Temp. (°C)	10.18421
Field ID(s)	5.92662 Neoschrammeniella
Comments	Ear shaped (roughly triangular), very hard consistency, creamy white color, surface is minutely hispid. No clear oscules.

Niskin Sampling Summary

Sample ID	EX2206_D02_01W
Date (UTC)	20220808
Time (UTC)	111729
Depth (m)	843.739
Latitude (decimal degrees)	37.35402
Longitude (decimal degrees)	-24.382410
Bottle number	NISKIN 1
Temperature (°C)	8.596
Dissolved Oxygen (ml/L)	6.238
Treatment	eDNA

Sample ID	EX2206_D02_09W
Date (UTC)	20220808
Time (UTC)	174106
Depth (m)	629.231
Latitude (decimal degrees)	37.35381
Longitude (decimal degrees)	-24.37677
Bottle number	NISKIN 2
Temperature (°C)	10.61
Dissolved Oxygen (ml/L)	5.994
Treatment	eDNA

Scientists Involved

Name	Email	Affiliation
Carlos Dominguez-Carrió	carlosdominguezcarrio@gmail.com	University of the Azores
Cindy Van Dover	clv3@duke.edu	Duke University
Deb Glickson	DGlickson@nas.edu	National Academies of Sciences, Engineering, and Medicine
Íris Sampaio	irisfs@gmail.com	Tel Aviv University
Joana Xavier	joanarxavier@gmail.com	CIIMAR - Interdisciplinary Centre of Marine and Environmental Research
Manuela Ramos	manuramo@gmail.com	OKEANOS/IMAR
Michael Vecchione	vecchiom@si.edu	NOAA and Smithsonian NMNH
Tara Harmer Luke	tara.luke@stockton.edu	Stockton University
Allen Collins	Allen.Collins@noaa.gov	Smithsonian NMNH
Christa Rabenold	christa.rabenold@noaa.gov	NOAA
Daphne Cuvelier	daphne.cuvelier@gmail.com	Institute of Marine Science, University of the Azores
Jaymes Awbrey	C00227433@louisiana.edu	University of Louisiana at Lafayette
Jean-Marc Gagnon	jmgagnon@nature.ca	Canadian Museum of Nature
Asako Matsumoto	amatsu@gorgonian.jp	Chiba Institute of Technology

Please direct inquiries to:

NOAA Office of Ocean Exploration & Research
1315 East-West Highway, SSMC3 RM 10210
Silver Spring, MD 20910
oceanexplorer@noaa.gov