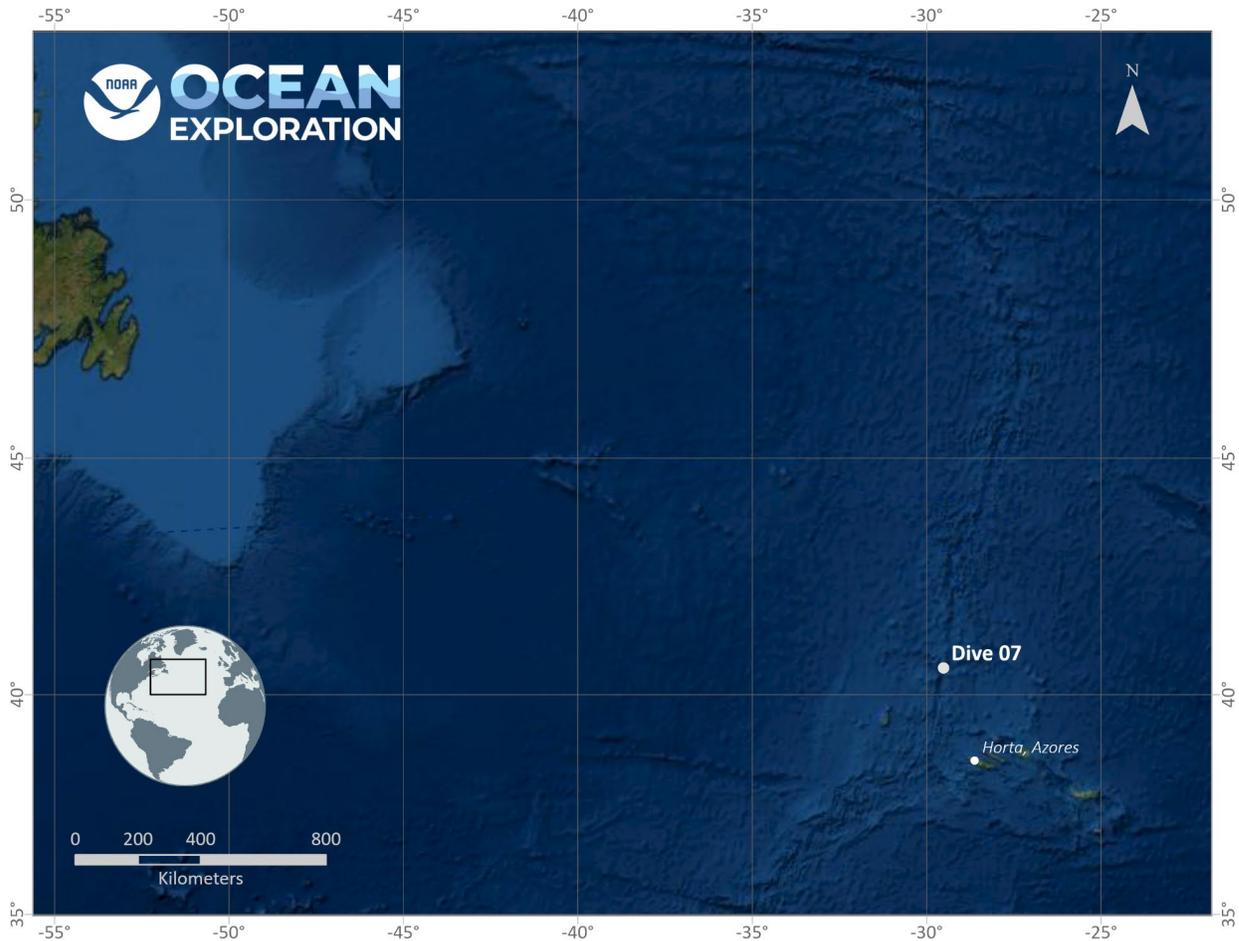


ROV Dive Summary, EX-22-05, Dive 07, July 26, 2022

General Location Map



Dive Information

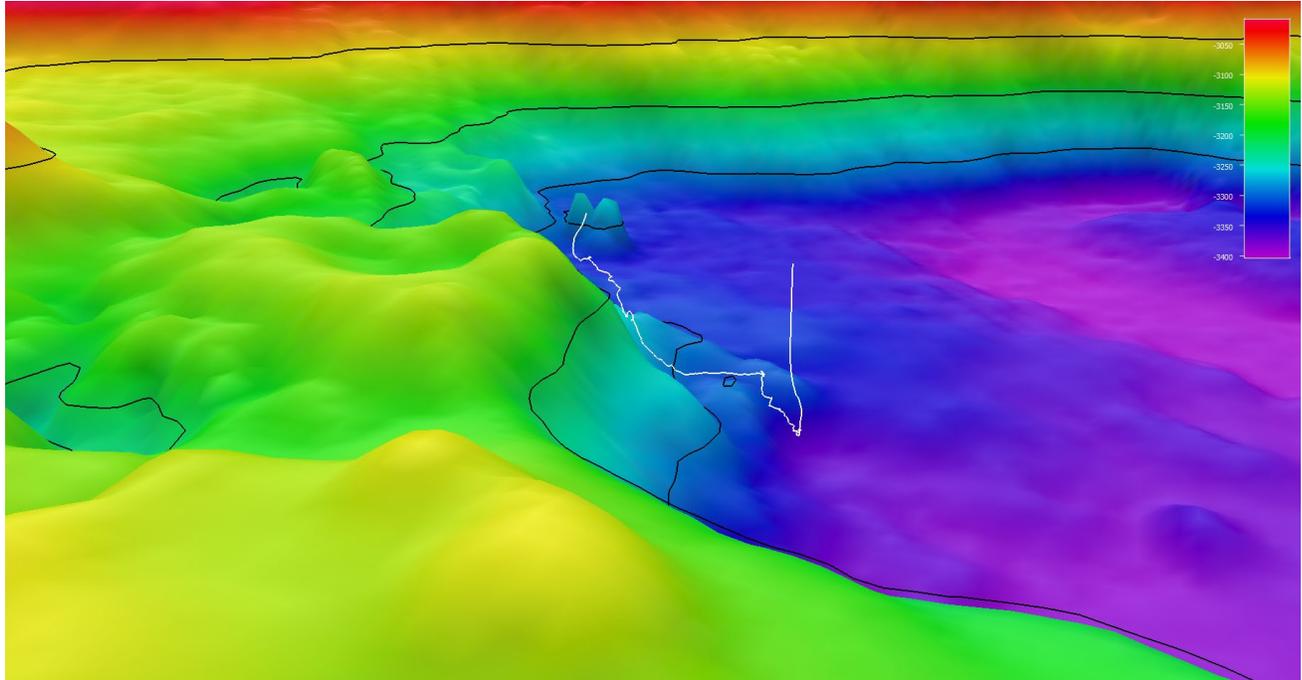
Site Name	Kurchatov Deep
General Area Descriptor	Kurchatov Fracture Zone, Mid-Atlantic Ridge
Science Team Leads	Dr. Scott France (Biology), Dr. Ashton Flinders (Geology)
Expedition Coordinator	Dr. Derek Sowers
ROV Dive Supervisor	Christopher Ritter

Dive Description	<p><i>Biology</i></p> <p>As expected at the depths explored, fauna were relatively sparse, although regularly observed throughout the dive. The dive transect crossed areas that were heavily sedimented, with small outcrops of basalt, and more extensive areas of exposed pillow formations, and each of these had characteristic fauna. Sediments-associated fauna included 4 species of sea cucumbers (Holothuroidea), tubicolous fan worms (Sabellida, Polychaeta, Annelida), euplectellid glass sponges (<i>Dictyaulus</i>-like vases), sea pens, and two species of acorn worms (Enteropneusta). Rock outcrops supported multiple individuals of: at least 2 species of bamboo corals (Keratoisididae), initially “scraggly” thin-axis nodal-branchers and then higher up the slope larger <i>Jasonis</i> type colonies; primnoid octocorals (a fragment of a large, densely branched colony at 3280m was sampled); very tall unbranched carnivorous sponges (<i>Asbestopluma</i>, Cladorhizidae) and numerous glass sponges, including stalked euplectellids and rossellids; and anemones (Actiniaria). We repeatedly observed individuals of a small, brightly colored (red and yellow) hydromedusae, <i>Benthocodon</i>, and were able to sample a specimen. We observed few fish, those mainly cusk eels (Ophidiidae) and grenadiers (Macrouridae). At 3316 m we observed a grenadier that Ken Sulak suggested “is a species of genus <i>Ventrifossa</i>, but not one that is described as far as I know - and well below the known depth range of any other member of the genus.” Other benthic fauna observed included ophiuroid brittlestars, sea urchins, <i>Hymenaster</i> sea stars, pycnogonid sea spiders, polychaete worms, bryozoans, elasipodid sea cucumbers (Laetmogonidae), and a solitary predatory tunicate (<i>Megalodicopia</i> sp).</p> <p><i>Geology</i></p> <p>Started at the foot of eastern slope of the base of the volcanic feature, which was heavily sedimented, with small outcrops of basalt talus. As we climbed the slopes we observed more intact pillow lobes which looked unfaulted and not significantly altered. We arrived at the summit of a lower hill, before the main ascent and transited through the water column to the next slope. The base of the next slope was very heavily sedimented, and as we ascended we again observed much more intact pillow lobes with some well defined evacuated pillow lobes, some with intralobe horizontal plating (from pillow lava draining) and well defined breakouts.</p>
Notable Observations	Great examples of elongate pillow lava flows, breakouts, and internal pillow cooling/plating.
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)	Fracture Zone / Slope
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2623

Equipment Deployed

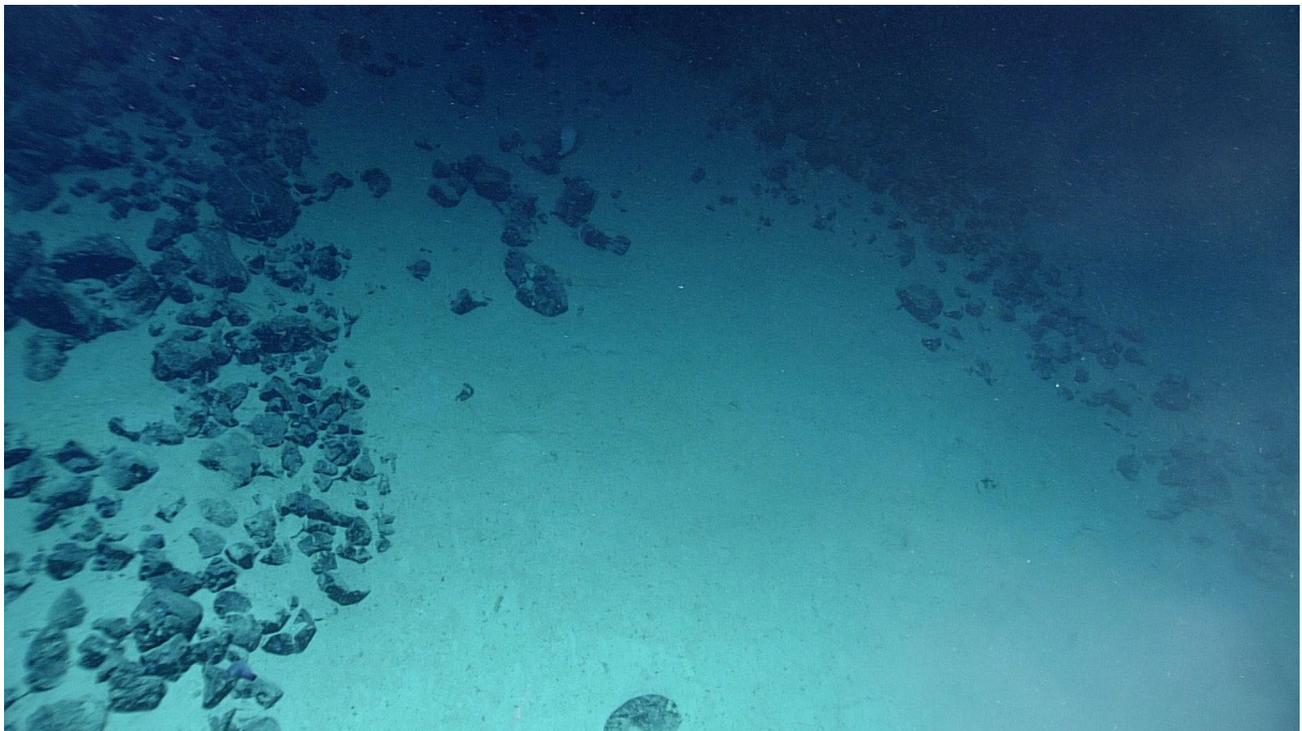
ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>
ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low resolution cameras, manipulator arms,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

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



Pillow rubble at foot of first slope covered in calcareous sediment.



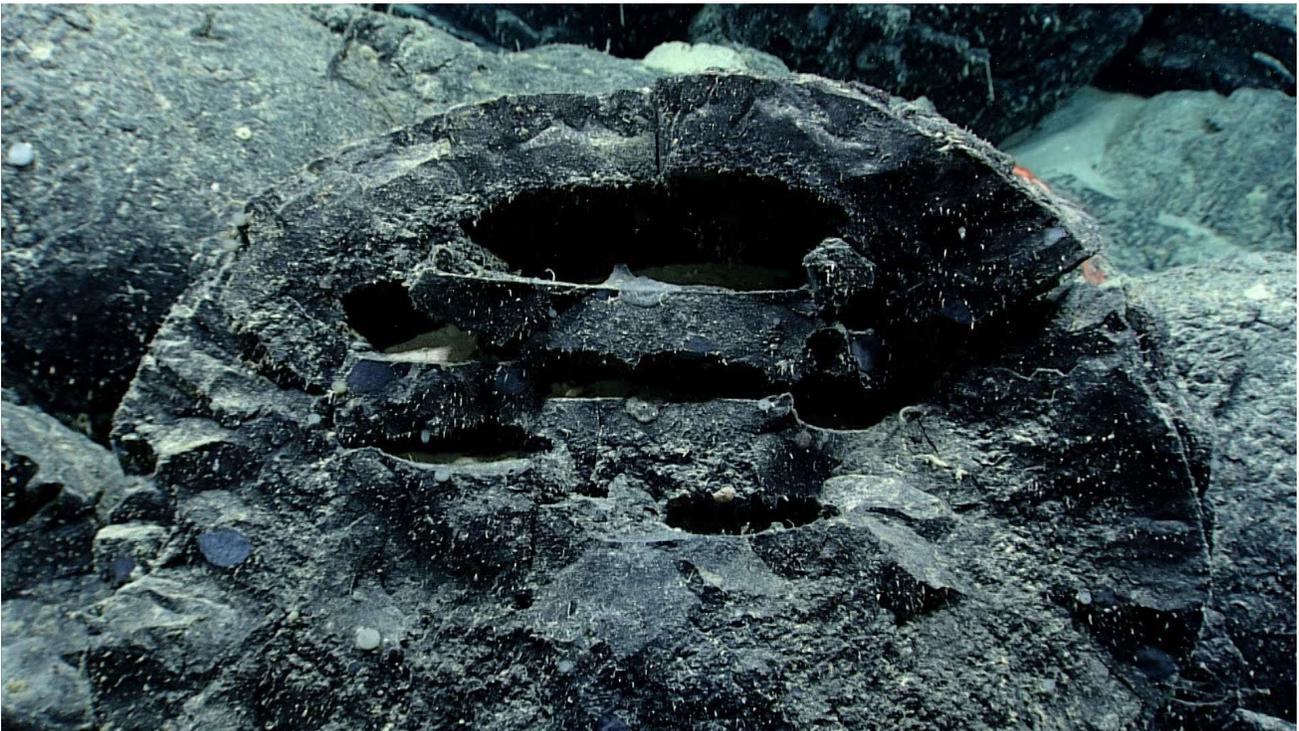
Pillow rubble.



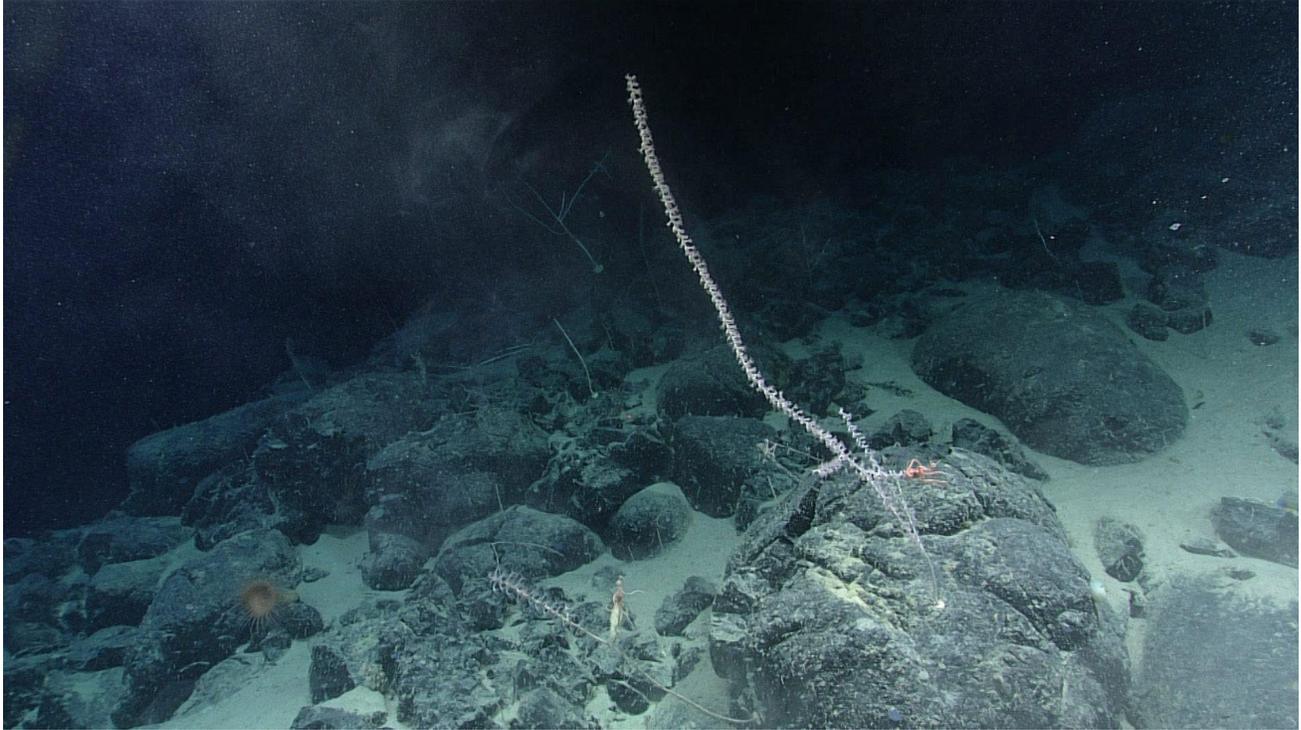
Sampling of a large pillow lobe, likely in place.



A beautiful example of a pillow breakout from an existing fairly cooled pillow lobe.



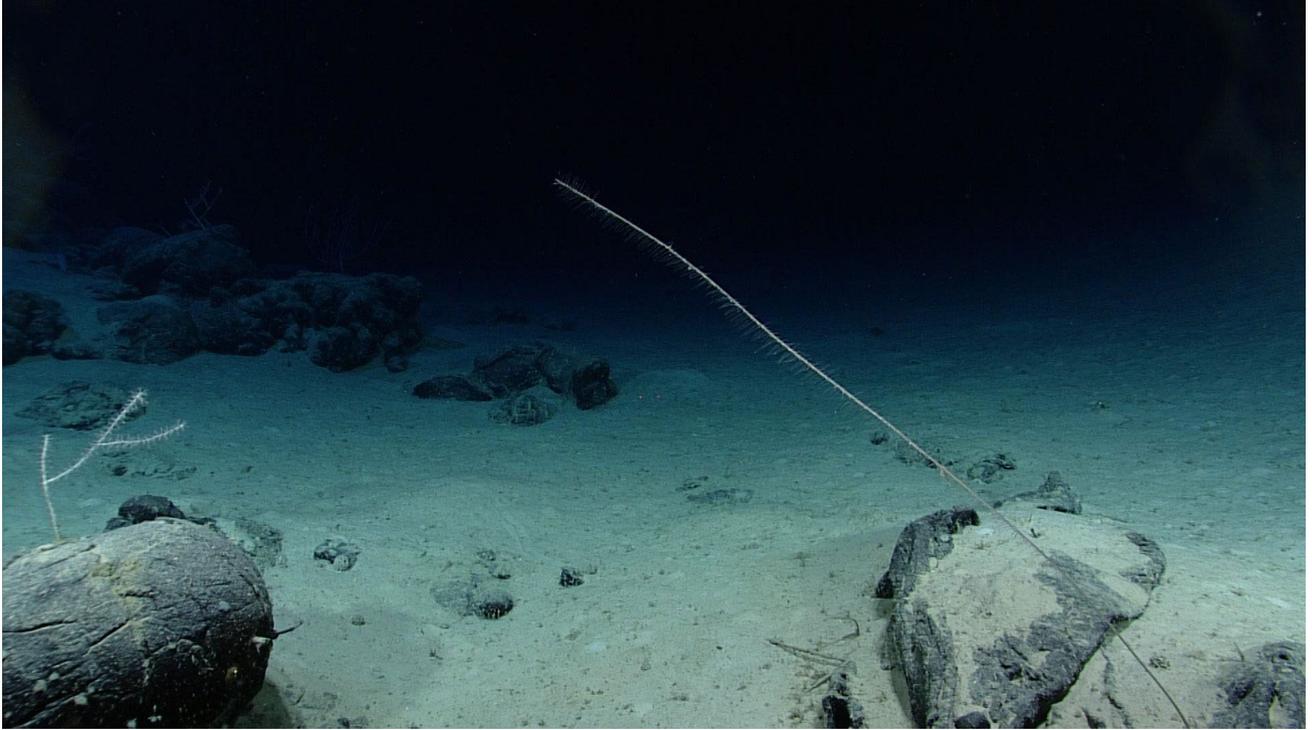
Example of intra-lobe cooling skim surfaces from variable pillow breakouts fed by this pillow tube.



Example of sparsely distributed octocorals growing on pillow basalts, here at 3329 meters depth.



A macrourid grenadier, possibly in the genus *Ventrifossa*, at 3316 m depth.



A tall, stick-like *Asbestopluma* carnivorous sponge at 3277 m depth.

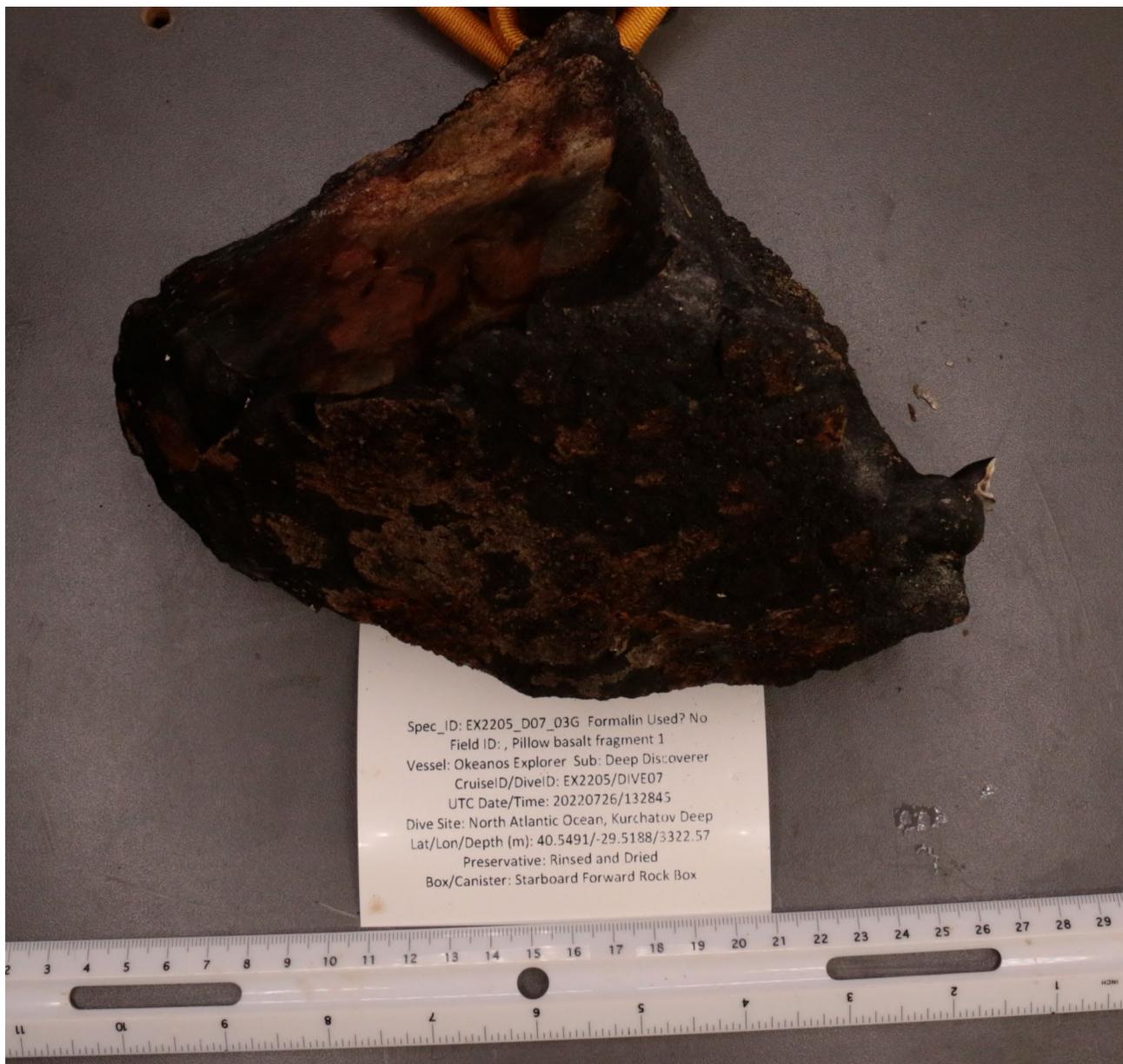


Close-up of the "scraggly" thin-axis nodal-branching bamboo coral seen frequently.



Tergivelum cinnabarinum, one of two species of deposit-feeding acorn worms (Enteropneusta) observed during the dive.

Samples Collected -

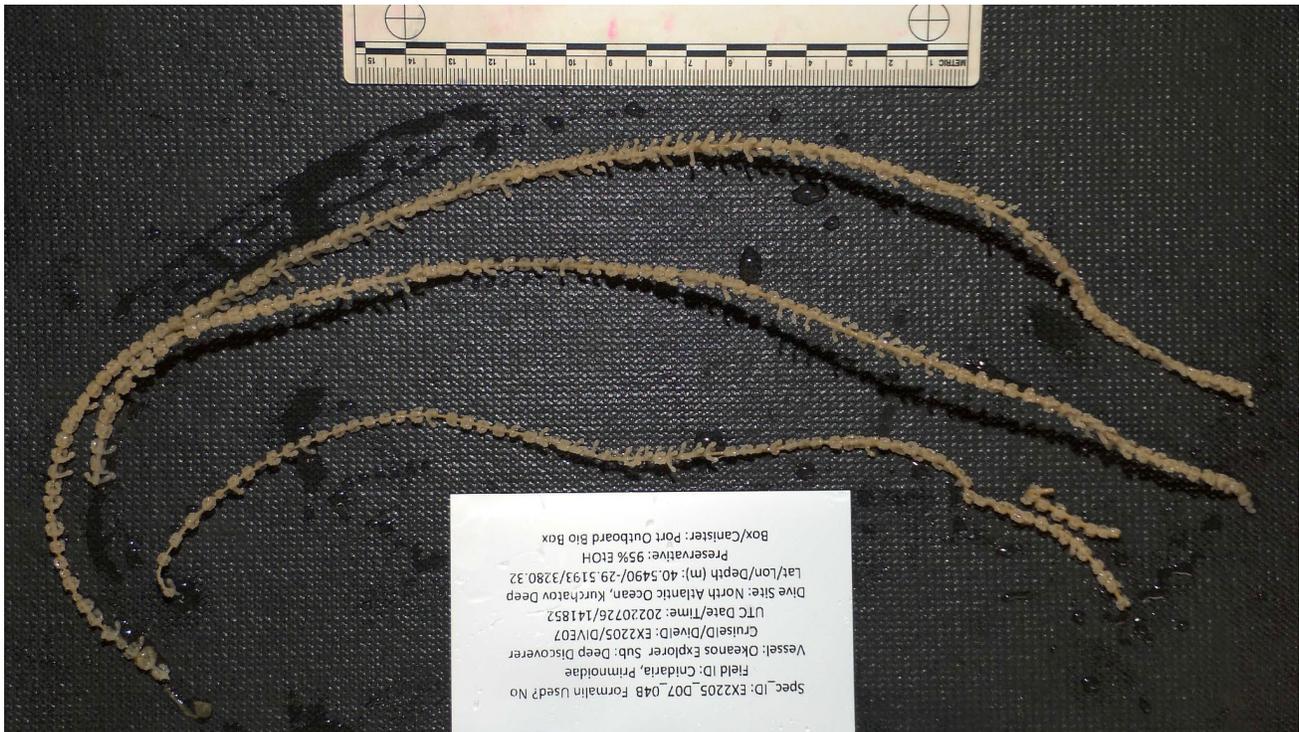
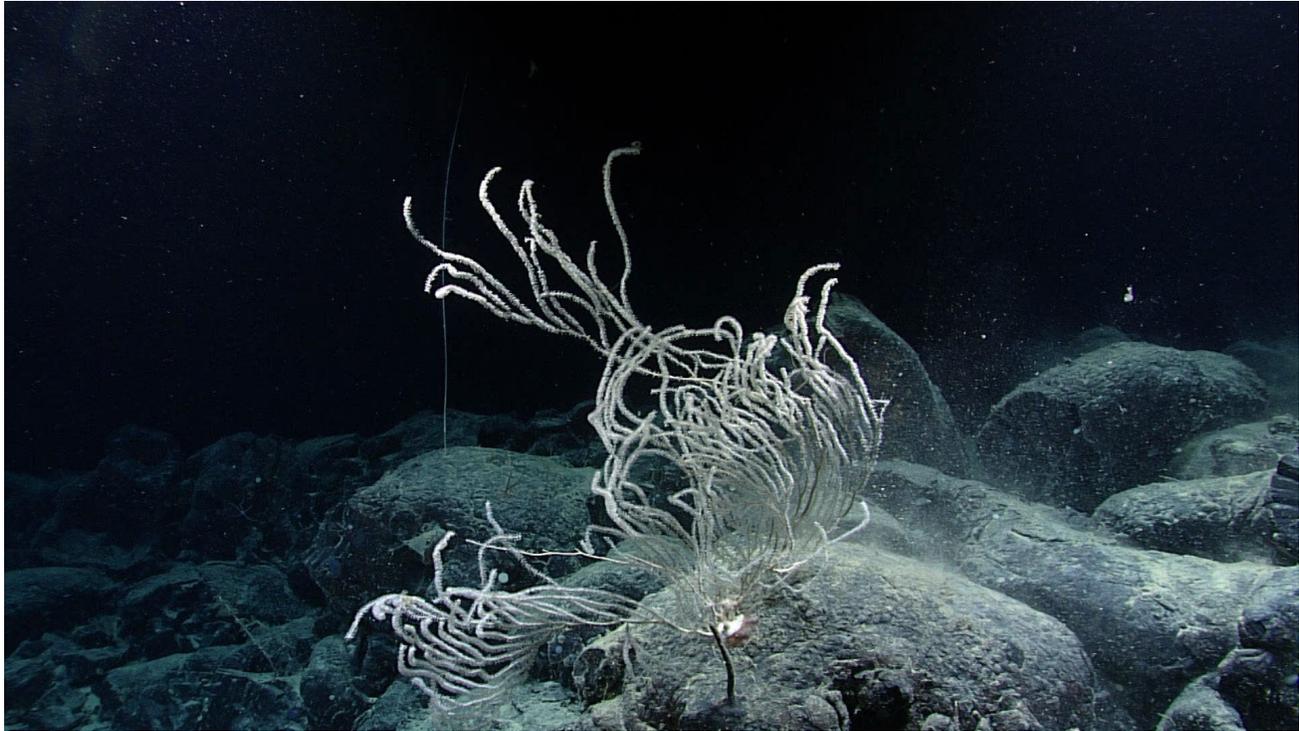


Spec_ID: EX2205_D07_03G Formalin Used? No
 Field ID: , Pillow basalt fragment 1
 Vessel: Okeanos Explorer Sub: Deep Discoverer
 Cruise/DiveID: EX2205/DIVE07
 UTC Date/Time: 20220726/132845
 Dive Site: North Atlantic Ocean, Kurchatov Deep
 Lat/Lon/Depth (m): 40.5491/-29.5188/3322.57
 Preservative: Rinsed and Dried
 Box/Canister: Starboard Forward Rock Box

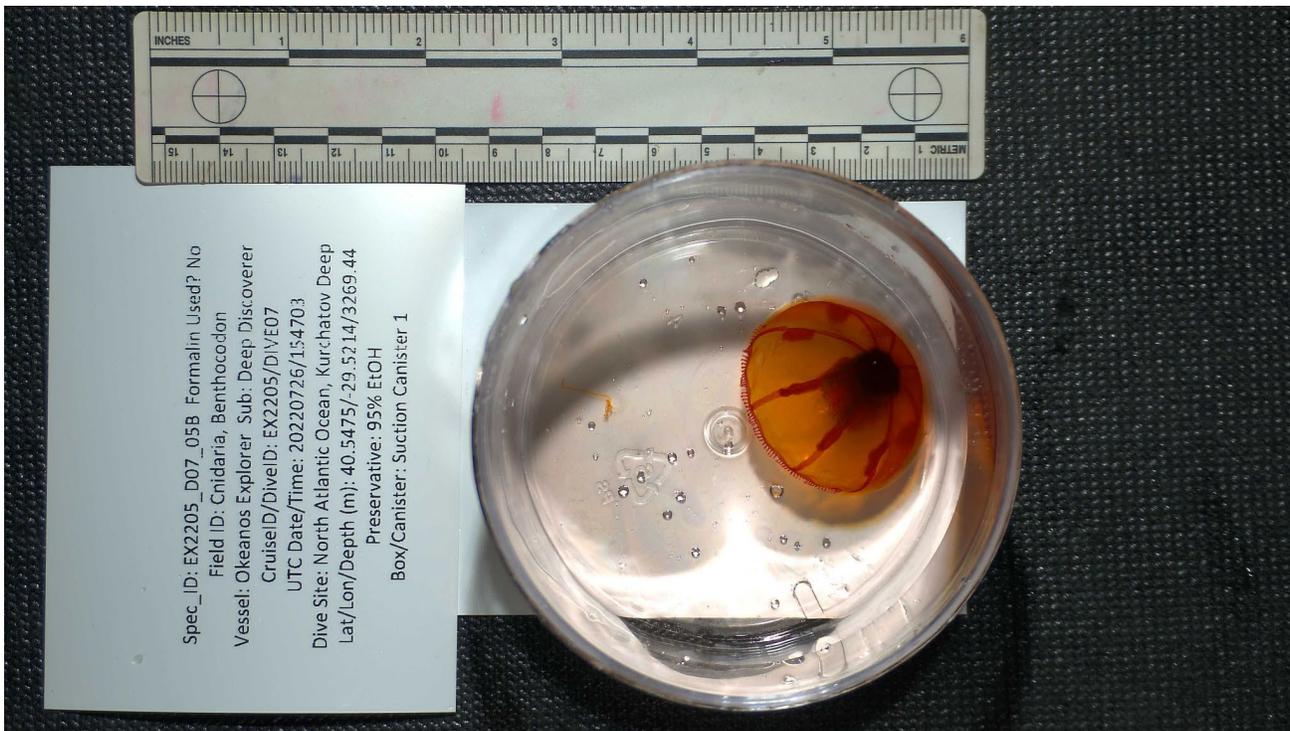
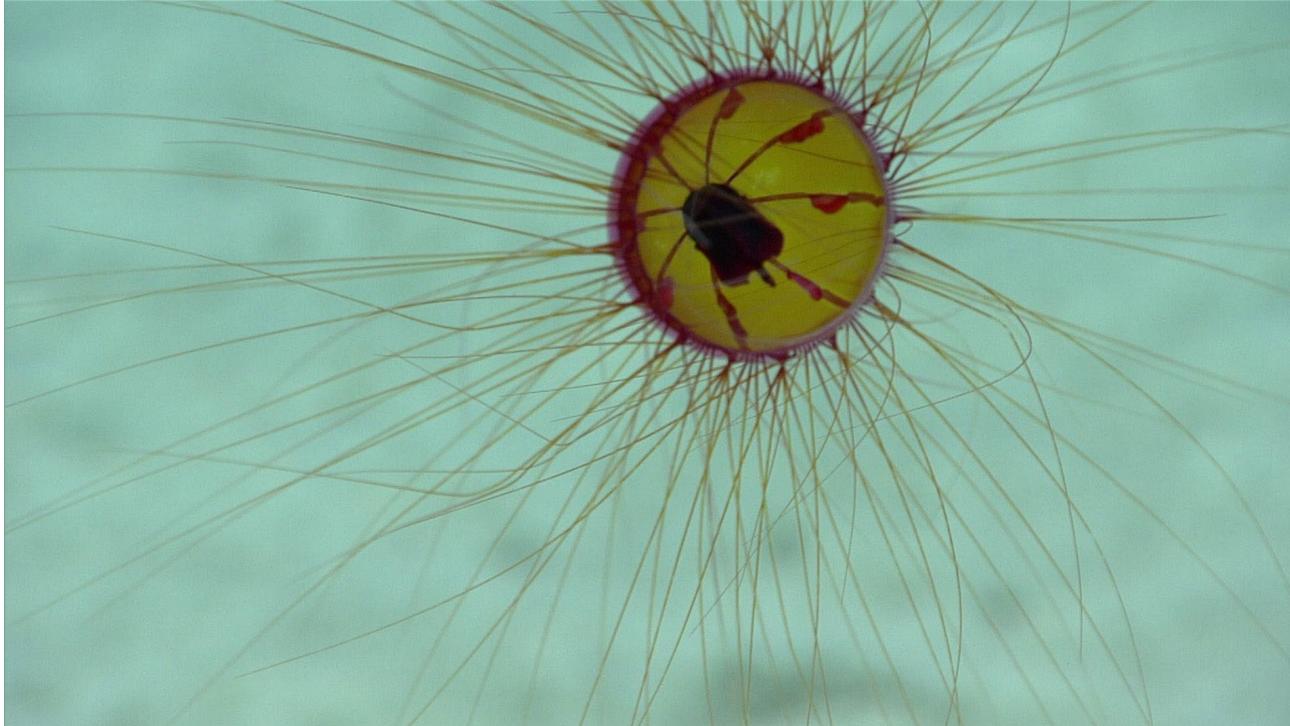
Sample ID	EX2205_D07_03G
Date (UTC)	20220726
Time (UTC)	13:28:45
Depth (m)	3322.6
Latitude (decimal degrees)	40.5491
Longitude (decimal degrees)	-29.5188
Temp. (°C)	3.40
Field ID(s)	Pillow basalt fragment 1

Comments	In place pillow basalt fragment, the outside surface is patchworked with glass on the rind surface. Dense crystal rich inner rind of ~5cm thick. 2-3 mm glass rind. Pyramidal shape ~15x15x15 cm.
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Associates Sample ID	Field Identification	Count
EX2205_D07_03G	Porifera	1

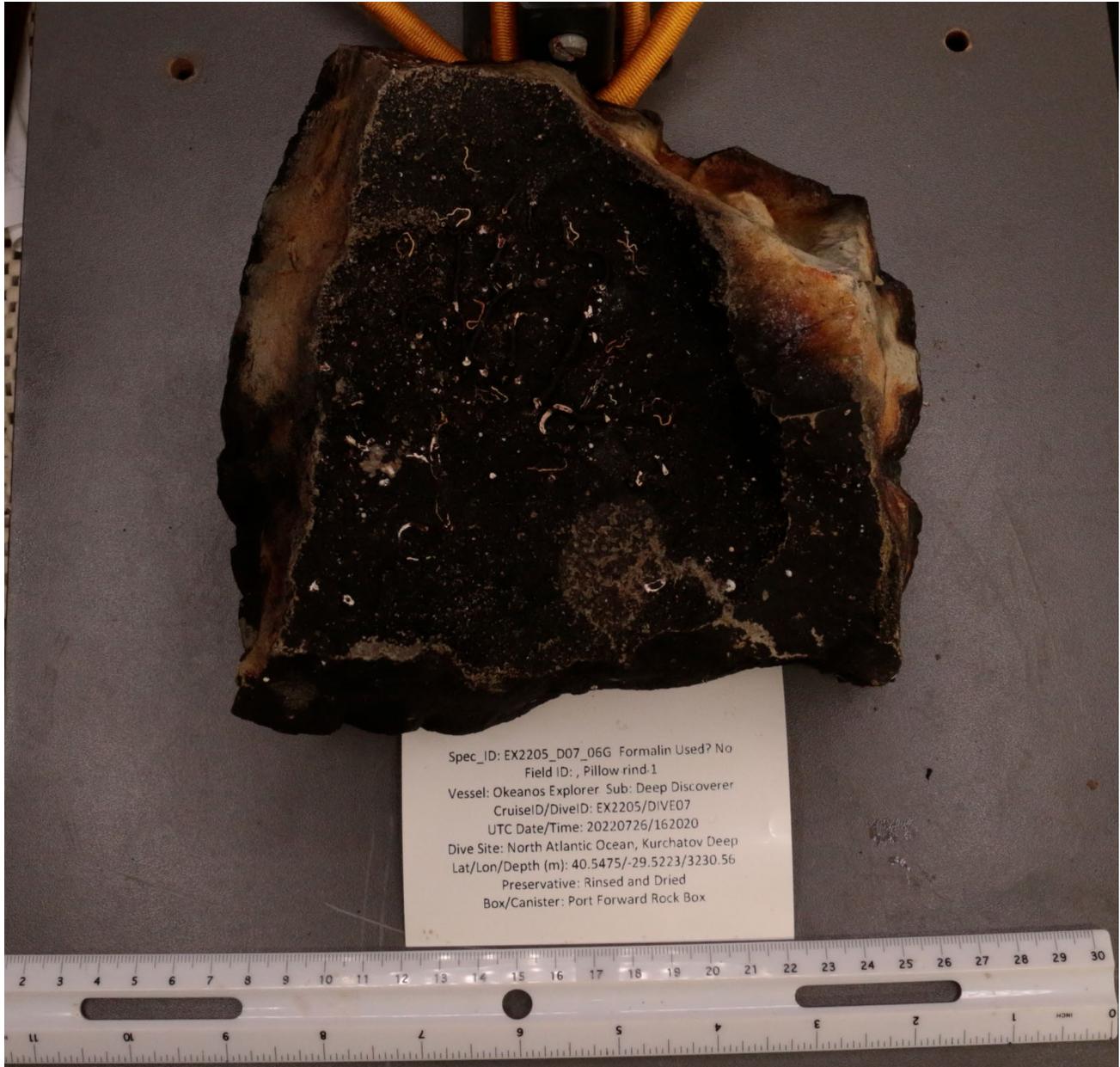


Sample ID	EX2205_D07_04B
Date (UTC)	20220726
Time (UTC)	14:18:52
Depth (m)	3280.3
Latitude (decimal degrees)	40.549
Longitude (decimal degrees)	-29.519
Temp. (°C)	3.391
Field ID(s)	Primnoidae
Comments	



Sample ID	EX2205_D07_05B
Date (UTC)	20220726
Time (UTC)	15:47:03
Depth (m)	3280.3
Latitude (decimal degrees)	40.549
Longitude (decimal degrees)	-29.519
Temp. (°C)	3.391

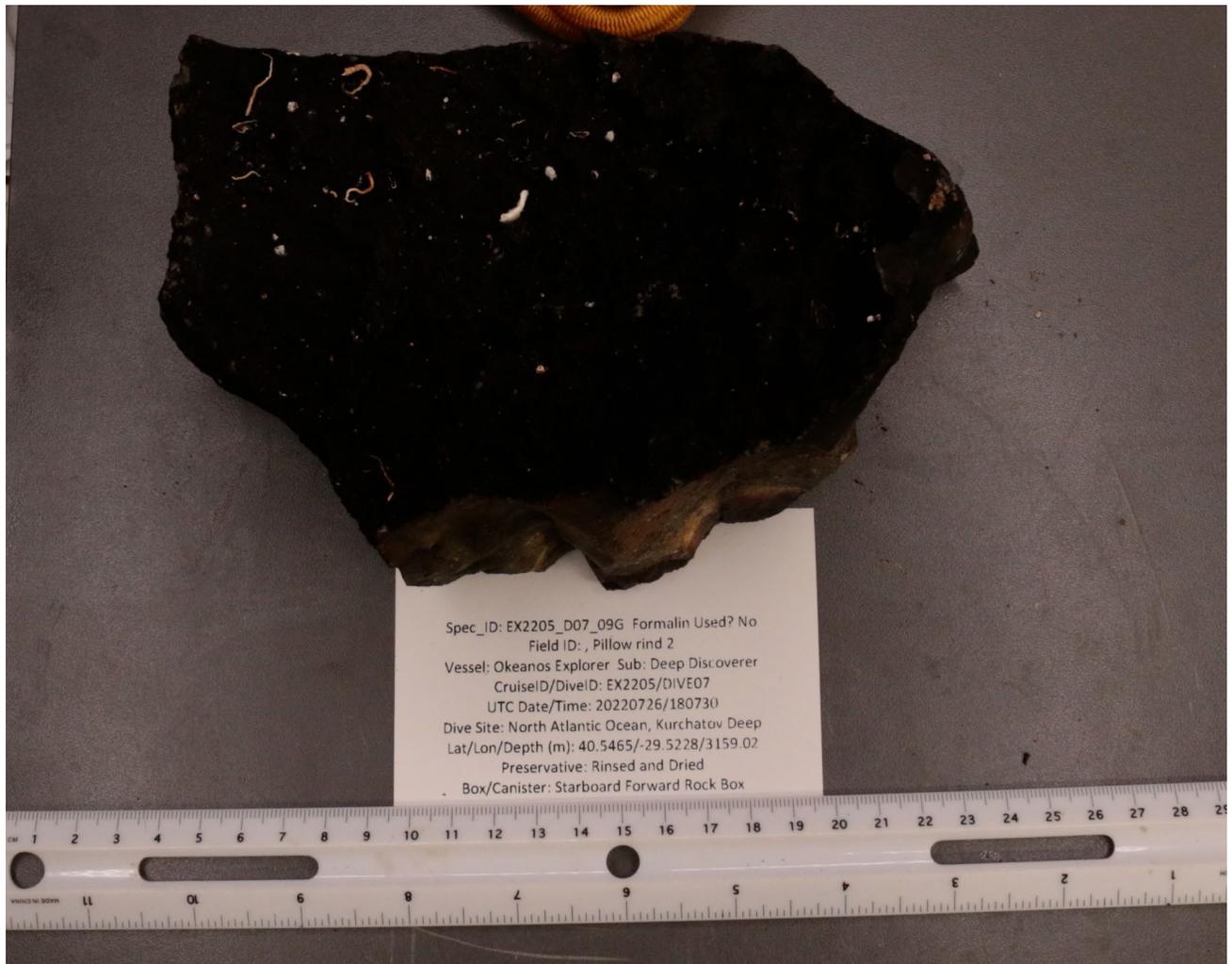
Field ID(s)	<i>Benthocodon</i>
Comments	



Sample ID	EX2205_D07_06G
Date (UTC)	20220726
Time (UTC)	16:20:20
Depth (m)	3230.6
Latitude (decimal degrees)	40.5475
Longitude (decimal degrees)	-29.5223
Temp. (°C)	3.39

Field ID(s)	Pillow rind 1
Comments	In place basalt pillow fragments, with outside surface patch-worked with fragmented glass. Dense crystal rich interior ~5 cm thick. 2-3 mm glas rind. ~18x16 cm rectangular shape.

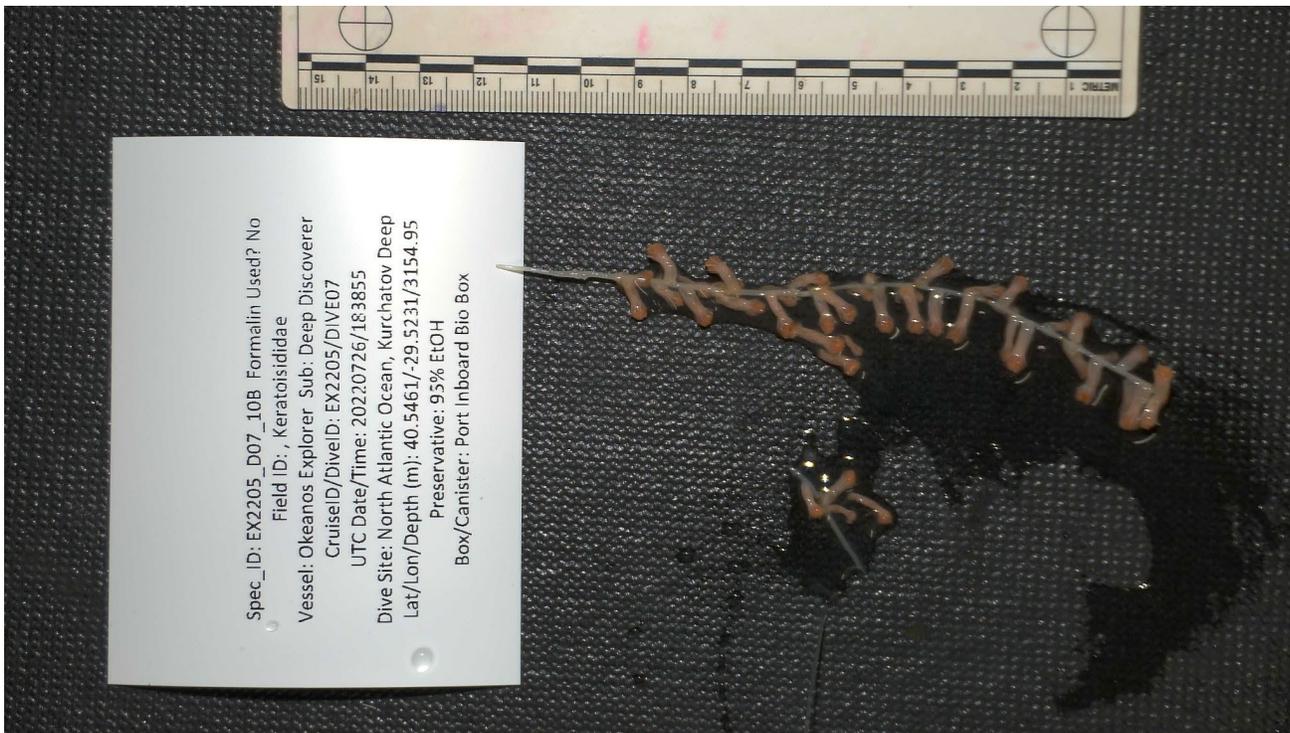
Associates Sample ID	Field Identification	Count
EX2205_D07_06G_A01	Porifera	3
EX2205_D07_06G_A02	Polychaeta	1
EX2205_D07_06G_A03	Porifera	1
EX2205_D07_06G_A04	Porifera	1



Sample ID	EX2205_D07_09G
Date (UTC)	20220726
Time (UTC)	18:07:30

Depth (m)	3159.0
Latitude (decimal degrees)	40.5465
Longitude (decimal degrees)	-29.5228
Temp. (°C)	3.38
Field ID(s)	Pillow rind 2
Comments	In place pillow basalt fragment, outside surface patchworked with fragmented glass. Dense crystal rich interior, ~8 cm thick. 1 mm glass rind. ~15x12 oval shape.

Associates Sample ID	Field Identification	Count
EX2205_D07_09G_A01	Porifera	1



Sample ID	EX2205_D07_010B
Date (UTC)	20220726
Time (UTC)	18:38:55
Depth (m)	3154.9
Latitude (decimal degrees)	40.546
Longitude (decimal degrees)	-29.523
Temp. (°C)	3.376

Field ID(s)	Keratoisididae
Comments	

Niskin Sampling Summary

Sample ID	EX2205_D07_01W
Date (UTC)	20220726
Time (UTC)	10:59:39
Depth (m)	596.8
Latitude (decimal degrees)	40.5486
Longitude (decimal degrees)	-29.5157
Bottle number	Niskin Bottle 1
Temperature (°C)	11.47
Dissolved Oxygen (ml/L)	6.75
Treatment	eDNA

Sample ID	EX2205_D07_02W
Date (UTC)	20220726
Time (UTC)	12:44:09
Depth (m)	3341.8
Latitude (decimal degrees)	40.5491
Longitude (decimal degrees)	-29.5183
Bottle number	Niskin Bottle 2
Temperature (°C)	3.40
Dissolved Oxygen (ml/L)	7.82
Treatment	eDNA

Sample ID	EX2205_D07_07W
Date (UTC)	20220726
Time (UTC)	16:29:00
Depth (m)	3221.2

Latitude (decimal degrees)	40.5475
Longitude (decimal degrees)	-29.5224
Bottle number	Niskin Bottle 3
Temperature (°C)	3.38
Dissolved Oxygen (ml/L)	7.83
Treatment	eDNA

Sample ID	EX2205_D07_08W
Date (UTC)	20220726
Time (UTC)	16:29:47
Depth (m)	3221.0
Latitude (decimal degrees)	40.5474
Longitude (decimal degrees)	-29.5222
Bottle number	Niskin Bottle 4
Temperature (°C)	3.39
Dissolved Oxygen (ml/L)	7.88
Treatment	eDNA

Sample ID	EX2205_D07_11W
Date (UTC)	20220726
Time (UTC)	20:10:05
Depth (m)	575.2
Latitude (decimal degrees)	40.5442
Longitude (decimal degrees)	-29.5344
Bottle number	Niskin Bottle 5
Temperature (°C)	11.42
Dissolved Oxygen (ml/L)	6.70
Treatment	eDNA

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