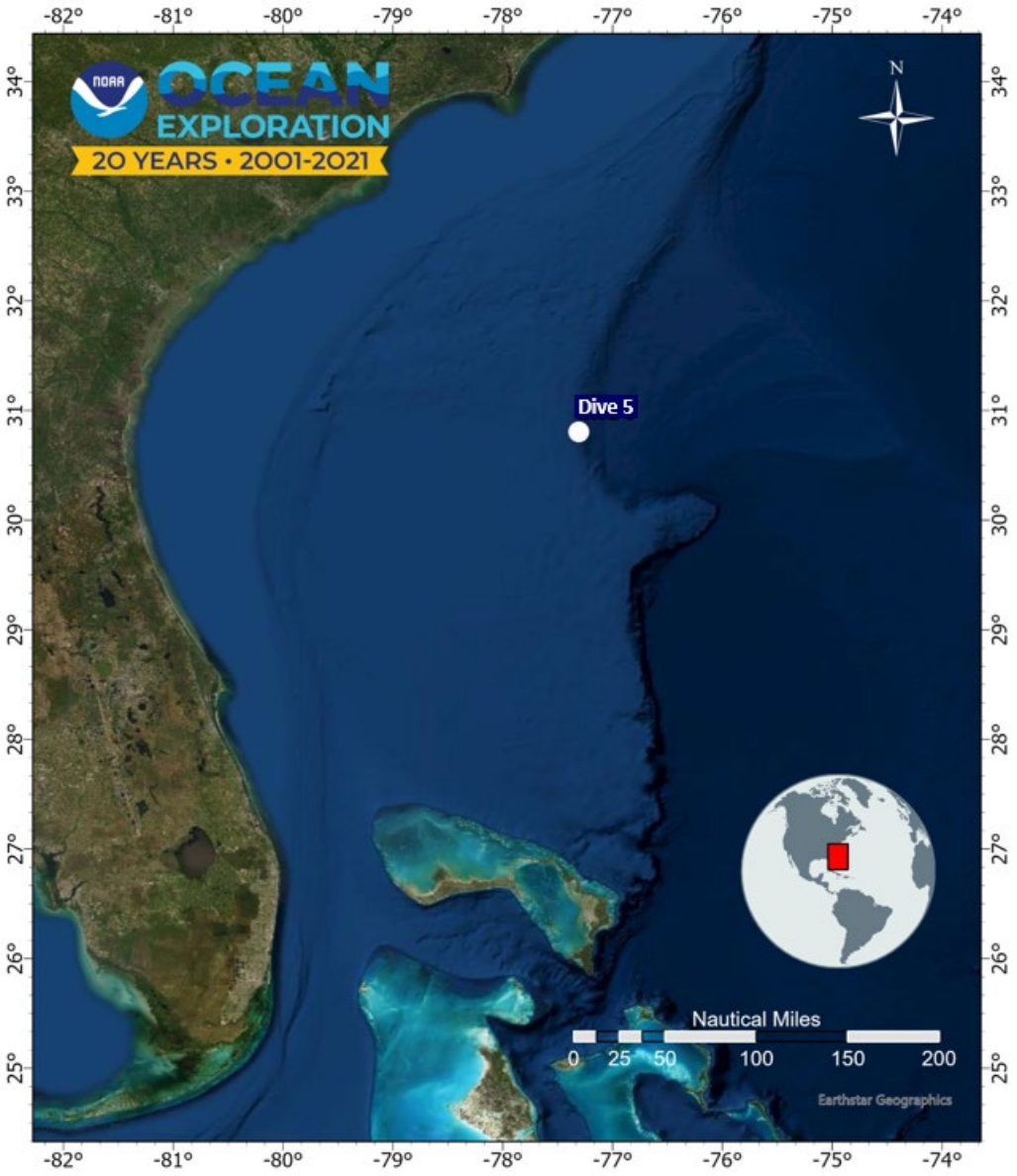
ROV Dive Summary, EX-21-07, Dive 05, November 02, 2021

General Location Map



Dive Information

Site Name	Deep Mound (Attempt 2- repeat of Dive 04)
General Area Descriptor	Along the eastern slope of the shelf break of the Blake Plateau

Science Team Leads	Stephanie Farrington, Allen Collins
Expedition Coordinator	Matt Dornback
Sample Data Manager	Madalyn Newman
ROV Dive Supervisor	Chris Ritter
Mapping Lead	Derek Sowers
Dive Purpose	Exploration and collections
Was the dive restricted for Underwater Cultural Heritage?	No
ROV Dive Summary Data	Dive Summary: EX2107_DIVE05 ^^ Dive Type: Normal In Water: 2021-11-02T17:24:30.493517 30.803753302486275 ; nan On Bottom: 2021-11-02T18:19:07.549745 30.805198789805043 ; -77.30665902548739 Off Bottom: 2021-11-02T21:35:51.554402 30.803941887791684 ; -77.308523 Out Water: 2021-11-02T22:24:55.750667 30.80479356109825 ; -77.30578366455796 Dive Duration: 5:00:25 Bottom Time: 3:16:44 Max Vehicle Depth: 1413.8 m Min Seafloor Depth: 1349.5 m Distance Travelled: 202.1 m

Dive Description	The initial attempt at this dive site during the morning failed due to a D2 technical issue. Because the attempt went below 50 m, it was considered an official dive, EX2107 Dive 4. This exploration of the same dive site is EX2107 Dive 5. Water was sampled for environmental DNA (**EX2107_D05_01W**) at 500 m during descent. When we reached bottom, a second water sample for environmental DNA (**EX2107_D05_02W**) was taken. However, when Niskin bottle 2 was triggered, it did not actually fire at that time. Niskin 3 was fired at that same time and counted as **EX2107_D05_02W.** Niskin bottle 2 was later observed to have fired at about this same time so it was counted as the last sample of the day **EX2107_D05_10W.** The following morning the video team was able to show that the time Niskin 2 was actually fired was 18:25:47, about the same time as **02W**. Thus, they are essentially replicate samples. At the bottom (1415 m), the substrate consisted of large, 0.5 - 4 m wide, <1 m tall slabs of rock boulders, with soft silty sand between. The rocks were sparsely covered in a wide variety of fauna. The most abundant species at the base of the mound was *Aphanostichopathes* (Antipatharia), *Stauropathes* (Antipatharia), *Farrea* or Euretidae (white hexactinellids with characteristic folded tubes), Primnoidae (gorgonians), Pachastrellidae and *Phakellia* (white fan sponges). Many of the gorgonians had pink hermit crabs that had climbed their stalks, something that was commented upon as unusual to community onshore scientists participating in the dive. A small rock (13-15 cm in length) sample (**EX2107_D05_03G**) was collected, along with numerous small associated sponges, two hydroids (possibly dead) and a worm tube. Small gorgonian colonies were noted, indicating relatively recent recruitment. A white goniasterid star - *Henricia* was observed. *Metallogorgia melanotrichos* colonies, each with its characteristic solitary ophiuroid, were common. A stalked hexactinellid of the subfamily Bolosominae (*Saccocalyx* or *Rhabdoplectella* **EX2107_D05_04B)** was collected with 3 associated samples living within the body of the sponge (one hermit crab [likely the same pink one seen on many of the corals], an amphipod, three individuals of a polychaete species). A knocked over white colony of Coralliidae (*Corallium* or *Hemicorallium*) was seen; similar upright colonies observed later in dive. The lobate ctenophore *Bathocyroe* occasionally seen floating by in current. Some plastic debris was also observed a few times. A beautiful 2 m Clade I4 candelabra-shaped bamboo coral was recorded in great detail; showed asymmetrical growth. *Narella* primnoids, *Bathypathes*, and a sea spider (Pycnogonida, family Colossendeidae) eating an anemone were spotted on the way up the 15-30° slope where the boulders became less slabby and more blocky with higher relief. *Anthomastus*-like colony (perhaps *Bathyalcyon* or *Heteropolypus*) imaged briefly, as was a sponge (likely *Polymastia*). Some sponges were seen with a fine covering (mucus entrained fine sediment?). A few fish were spotted through the dive including: Macrouridae rattials (*Nezumia aequalis*). *Laemonema*- like codling, Blue Hake, the codling *Antimora rostrata*, *Chaunacops roseus* (rosy coffin fish; or *C. coloratus*), Ophidiformes cusk eels. Among the fishes observed, shore-based scientist Ken Sulak observes “Most notable is the mottled pinkish *Gaidropsarus ensis*, a Gadidae, a boreal slope fish - not known (to my knowledge) south of Cape Hatteras - thus a notable OE record.” Further, Sulak states regarding a larger black ophidiform fish, “Head shape, relative eye diameter, longish and largish pectoral fin, indistinct lateral line, far forward origin of dorsal fin, and particularly the distinctly separate lobe-like caudal fin prompts me to consider this a specimen of the rare genus *Holcomycteronus*. There are six described species in this circumtropical genus, but there has been no revision. Probably the number of valid species would be reduced upon revision - perhaps to 1-2 circumglobal species. Generally, most records (less than about 10-15 total I believe) are from abyssal depths, down to 7000 m. But there are a few records from the 1500 m horizon. Depth for the image from the OE Event Log annotation

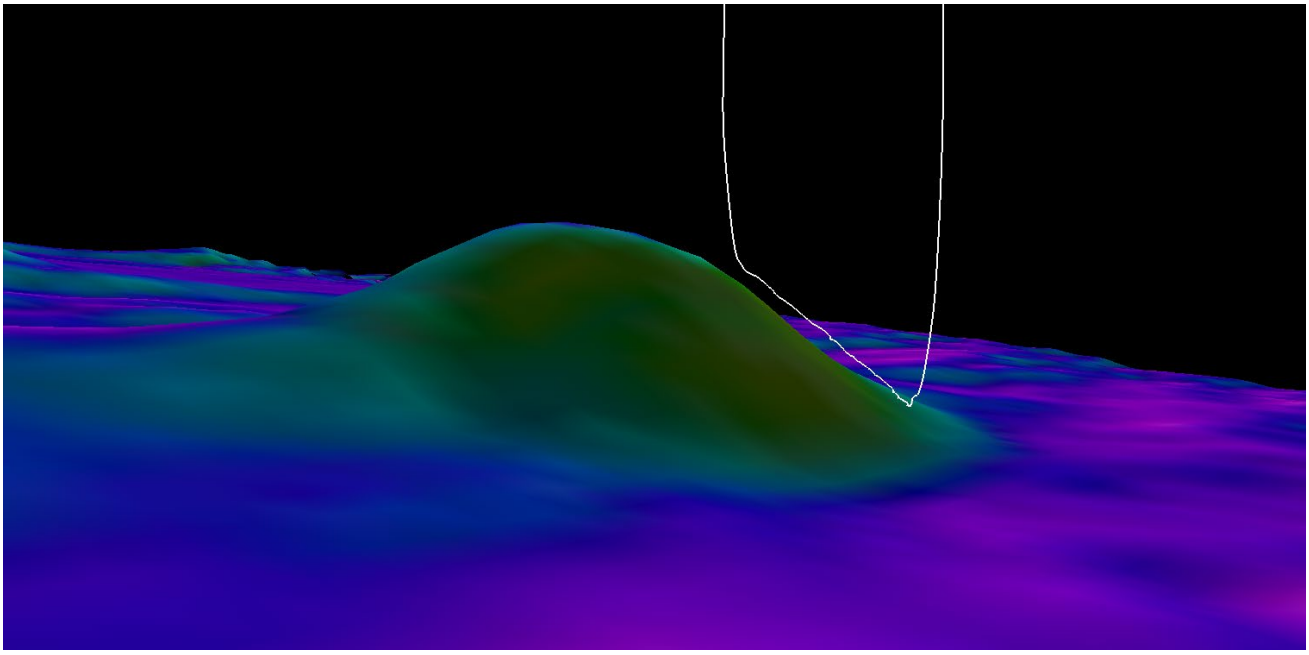
	is 1398 m. No nominal species of this genus has ever been imaged in situ to my knowledge. So, this is a notable record for OE." We stopped to observe the asteroid *Circeaster americanus*, with forked hooks on the tips of its five arms, feeding on what appeared to be a small primnoid or paramuricid. Multiple *Calibelemnon* - Rock Sea Pen. 5 cm wide and 10 cm tall- were spotted suctioned onto the black rocks (**EX2107_D03_05B**), followed by **2107_D05_06B** - *Paramuricia* with its ophiuroid *Asteroschema* associate were collected for ASPIRE connectivity studies. Mid-dive - **EX2107_D03_07W** along with the sea star *Mediaster* **2107_D05_08B** were collected. Farther up the slope, hexactinellid sponges, including *Hertwigia* and a large cone-shaped *Conorete* (possibly; *Nodastrella* another possibility but seems less likely), as well as the black coral: *Bathypathes* were encountered but not common. In contrast, *Leiopathes* seemed to increase in abundance as we transected up-slope. A single puffy, pink, 5-armed slime star- *Pteraster* and a single unknown antipatharian that resembles a pine-tree branch were spotted and imaged with close up zooms. *Metallogorgia* colonies remained common on the upper part of the slope along with the appearance of dead coral rubble (possibly *Lophelia* or *Enallopsamia*) that started to appear just before leaving the bottom. One notable observation was that of *Metallogorgia* growing off of another gorgonian. Additional hermit crabs on upright stems of colonies continued to be observed occasionally in this portion of the dive. The last water sample **EX2107_D05_09W** was collected just before departure. Unfortunately, the top of the mound was never observed due to time but the presence of coral rubble indicates there may have been a coral mound at the top of this 100 m tall feature. Human Debris: A large plastic bag was seen between the rocks and a small piece stuck in a *Metallogorgia*'s upper branches.
Notable Observations	• We observed the boreal slope fish Gaidropsarus ensis (Gadidae), which had not been seen south of Cape Hatteras, thus a range extension • We observed the rare fish genus Holcomycteronus, which had never been imaged in situ
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)	Mound, Slope
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2463

Equipment Deployed

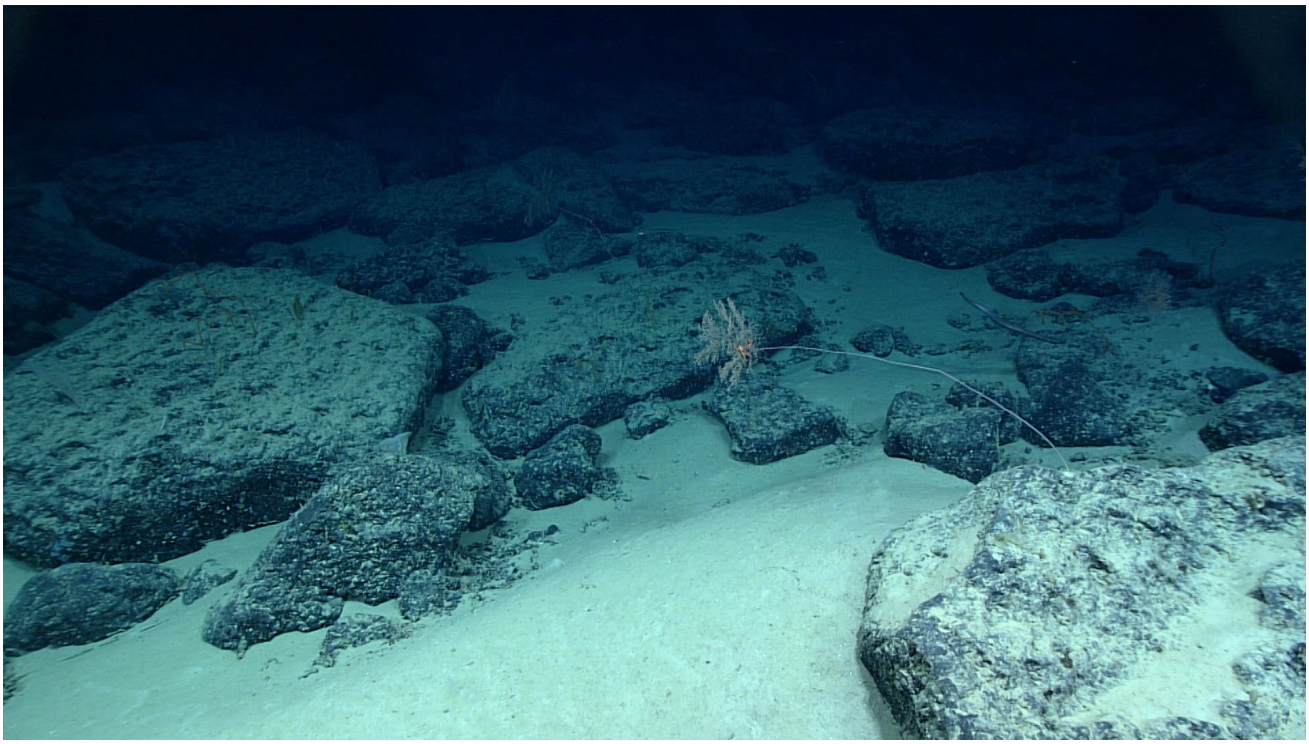
ROV	*Deep Discoverer*
Camera Platform	*Seirios*
ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-

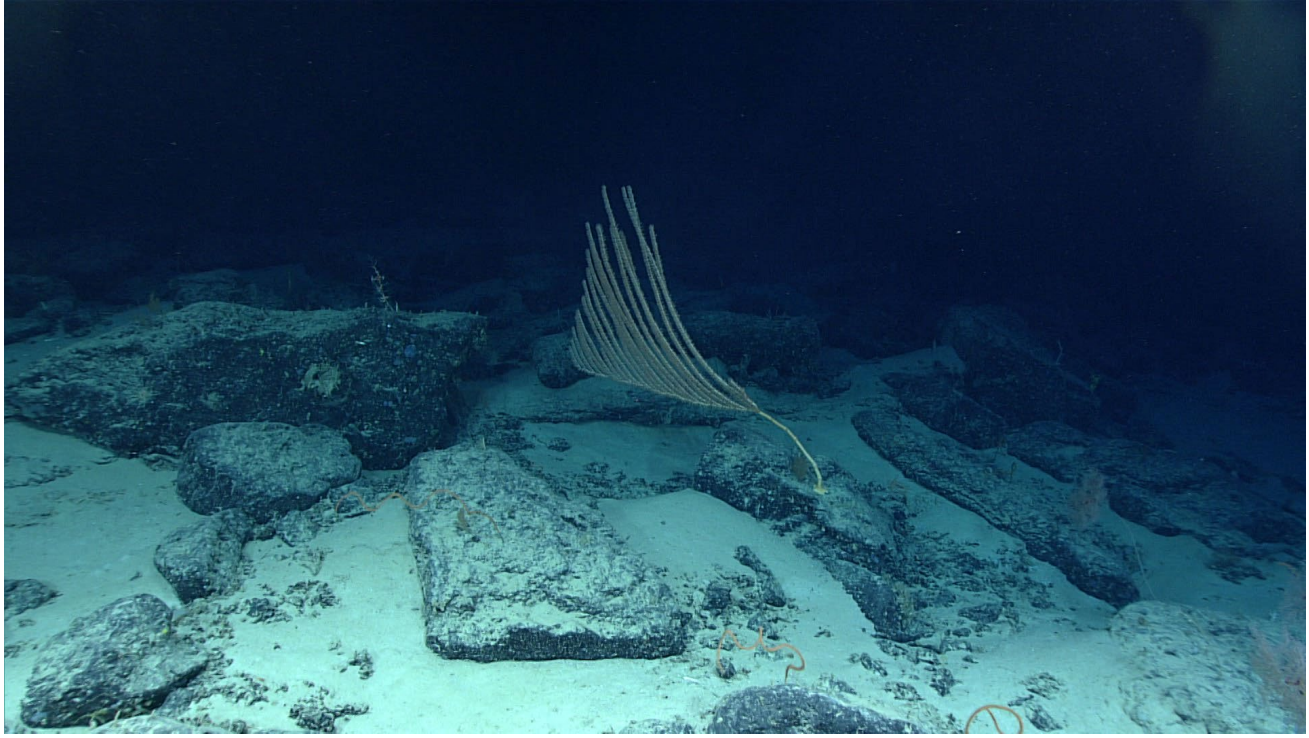
	resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The section below notes if any of these sensors were malfunctioning or not operational
Equipment Malfunctions	

Close-up Map of Main Dive Site

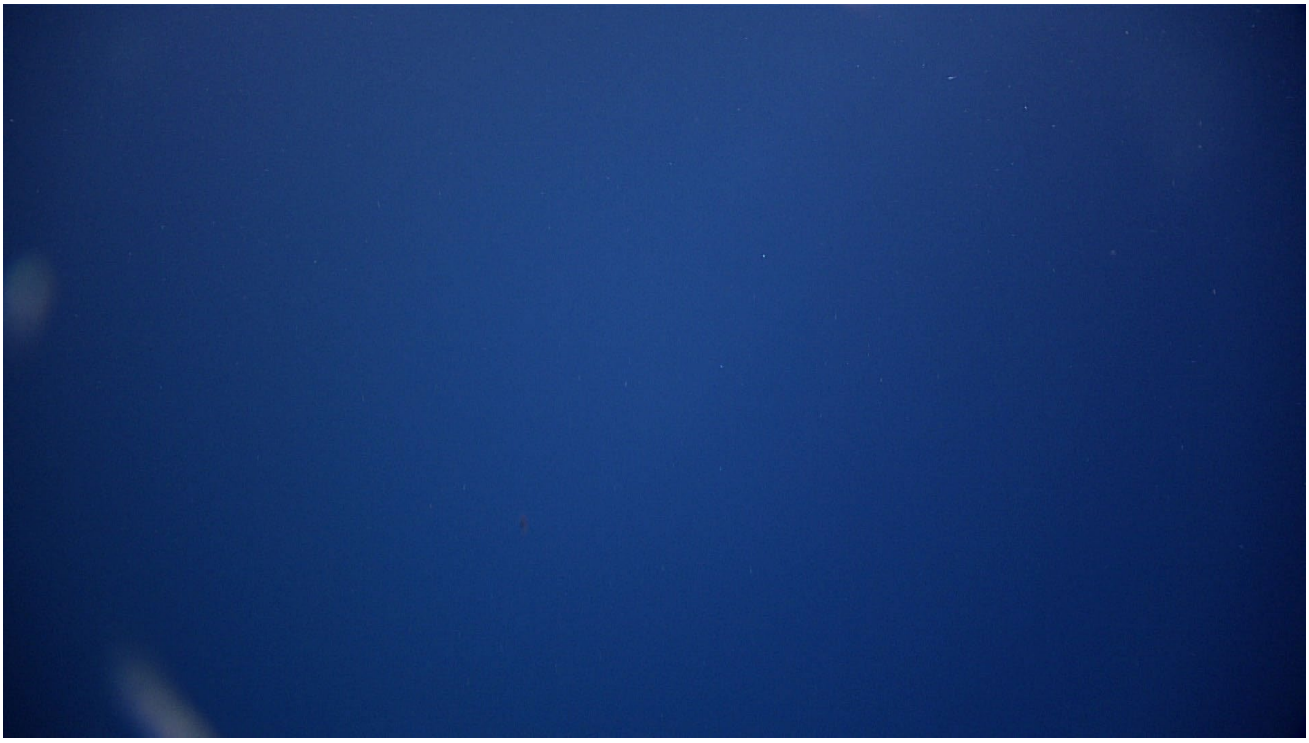


Representative Photos of the Dive





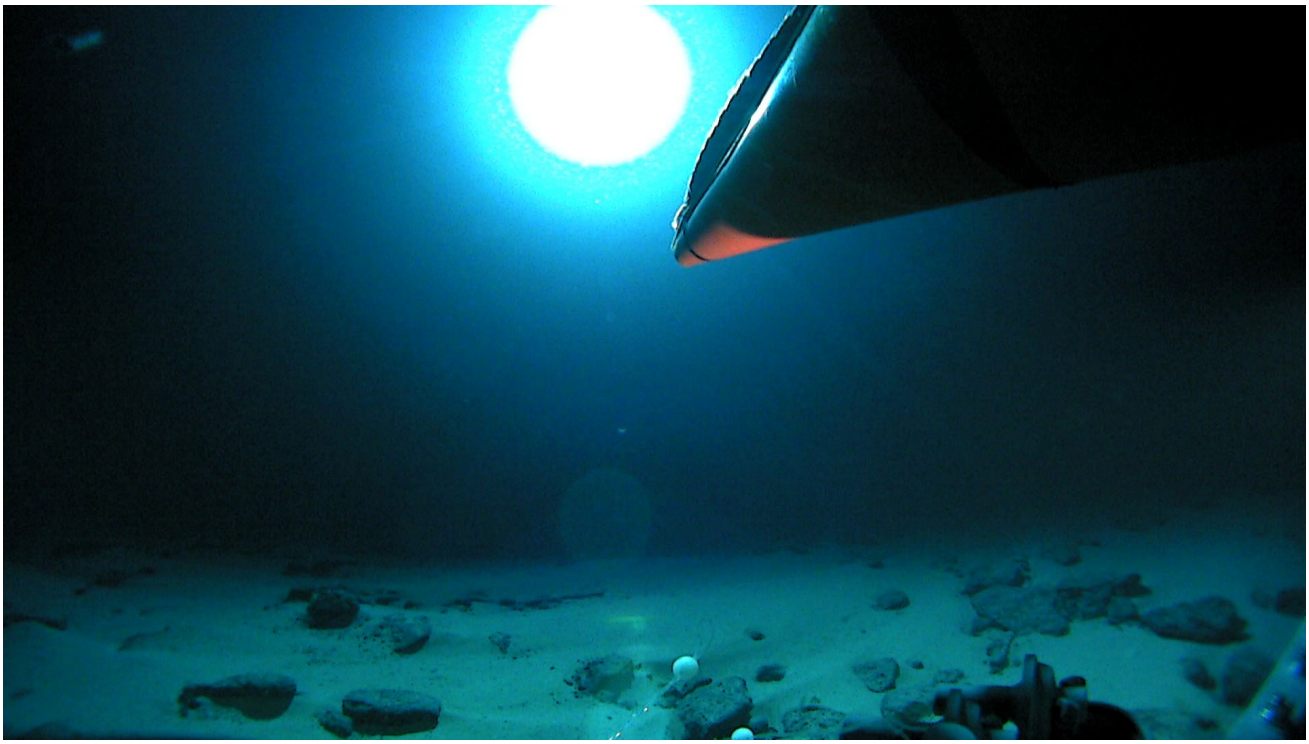
Samples Collected -



Sample ID	EX2107_D05_01W
Date (UTC)	20211102
Time (UTC)	17:46

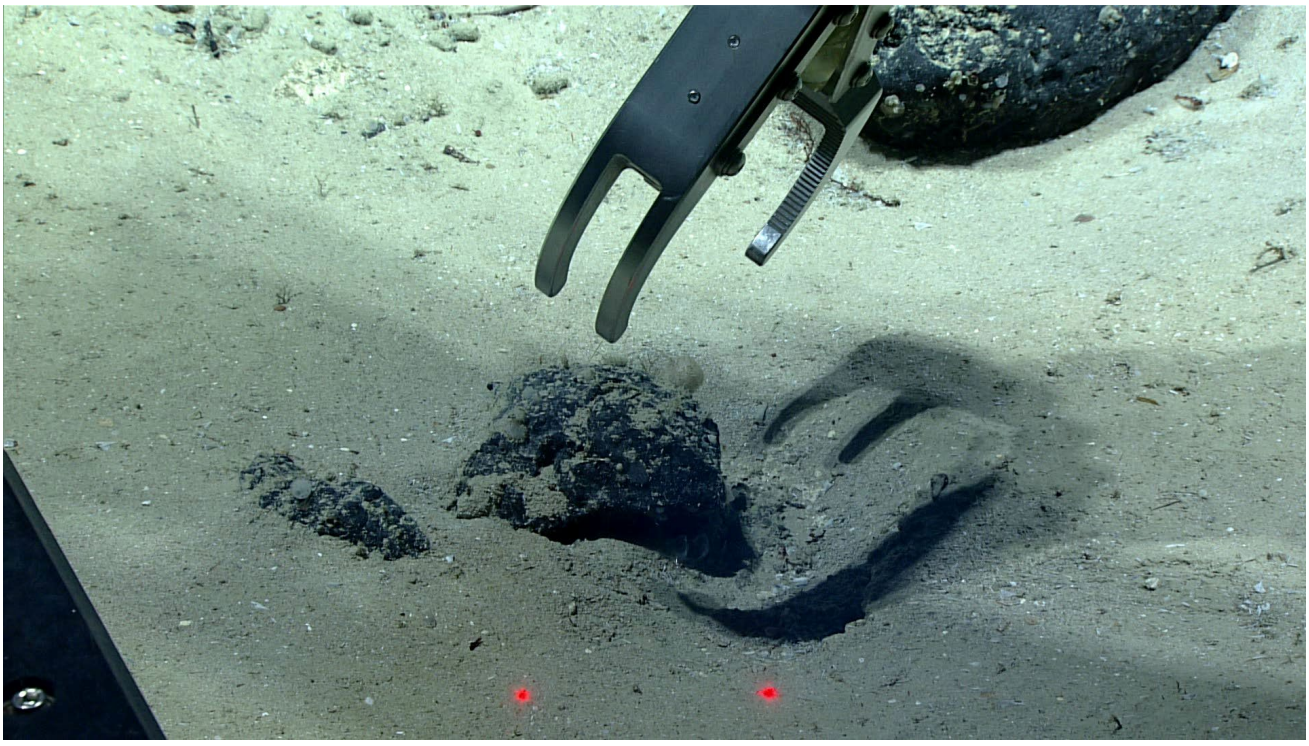
Depth (m)	508.472
Latitude (decimal degrees)	30.804700
Longitude (decimal degrees)	-77.306660
Temp. (°C)	18.335
Field ID(s)	Water sample
Comments	eDNA

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



Sample ID	EX2107_D05_02W
Date (UTC)	20211102
Time (UTC)	18:24
Depth (m)	1416.682
Latitude (decimal degrees)	30.805120
Longitude (decimal degrees)	-77.306640
Temp. (°C)	4.203
Field ID(s)	water sample
Comments	eDNA

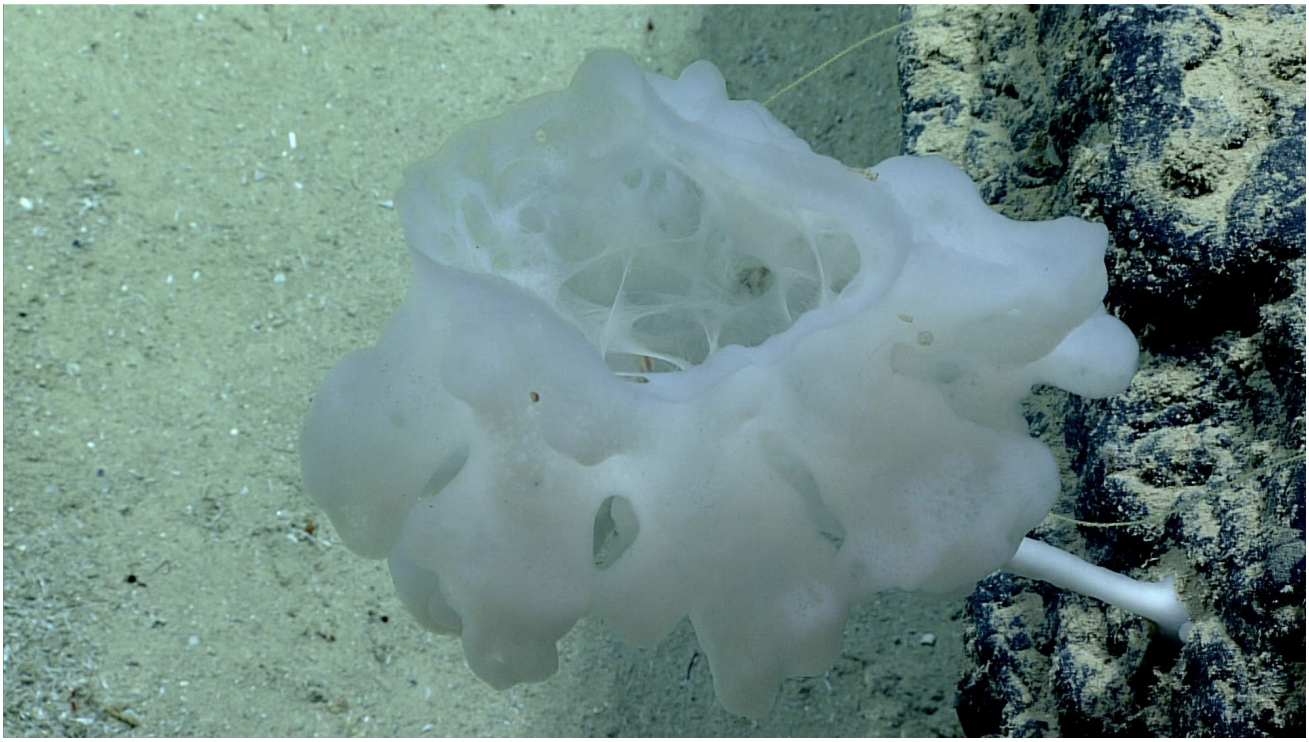
Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2107_D05_03G
Date (UTC)	20211102

Time (UTC)	18:45
Depth (m)	1416.875
Latitude (decimal degrees)	30.805100
Longitude (decimal degrees)	-77.306660
Temp. (°C)	4.203
Field ID(s)	Rock with associated fauna
Comments	17cm long, cobble sized with several species of sponges attached and preserved as associates, dense and dark in color

Associates Sample ID	Field Identification	Count
EX2107_D05_03G_A01	Porifera	1
EX2107_D05_03G_A02	Porifera	1



Sample ID	EX2107_D05_04B
Date (UTC)	20211102
Time (UTC)	19:20
Depth (m)	1412.484
Latitude (decimal degrees)	30.805040
Longitude (decimal degrees)	-77.306770
Temp. (°C)	4.202
Field ID(s)	Bolosominae
Comments	15cm, white with large oscule, stalk looks fleshy

Associates Sample ID	Field Identification	Count
EX2107_D05_04B_A01	Paguroidea	1
EX2107_D05_04B_A02	Polychaeta	3
EX2107_D05_04B_A03	Amphipoda	1

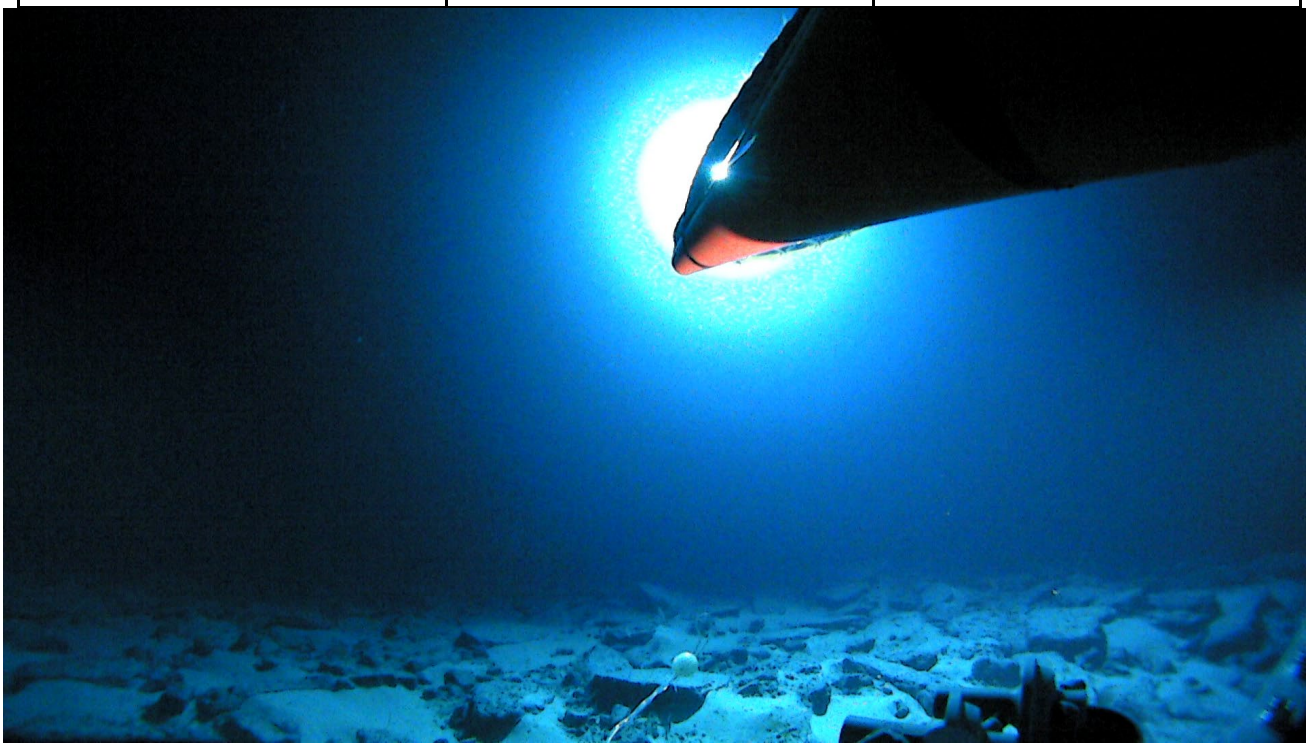
Sample ID	EX2107_D05_05B
Date (UTC)	20211102
Time (UTC)	20:20
Depth (m)	1393.623
Latitude (decimal degrees)	30.804880
Longitude (decimal degrees)	-77.307370
Temp. (˚C)	4.199

Field ID(s)	Calibelemnon
Comments	5cm wide and 10cm tall, found attached to rock, caudal peduncle very visible in video

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

Sample ID	EX2107_D05_06B
Date (UTC)	20211102
Time (UTC)	20:30
Depth (m)	1390.915
Latitude (decimal degrees)	30.804890
Longitude (decimal degrees)	-77.307420
Temp. (°C)	4.2
Field ID(s)	Paramuricea
Comments	planar, sparsely branched, polyps exert yellow

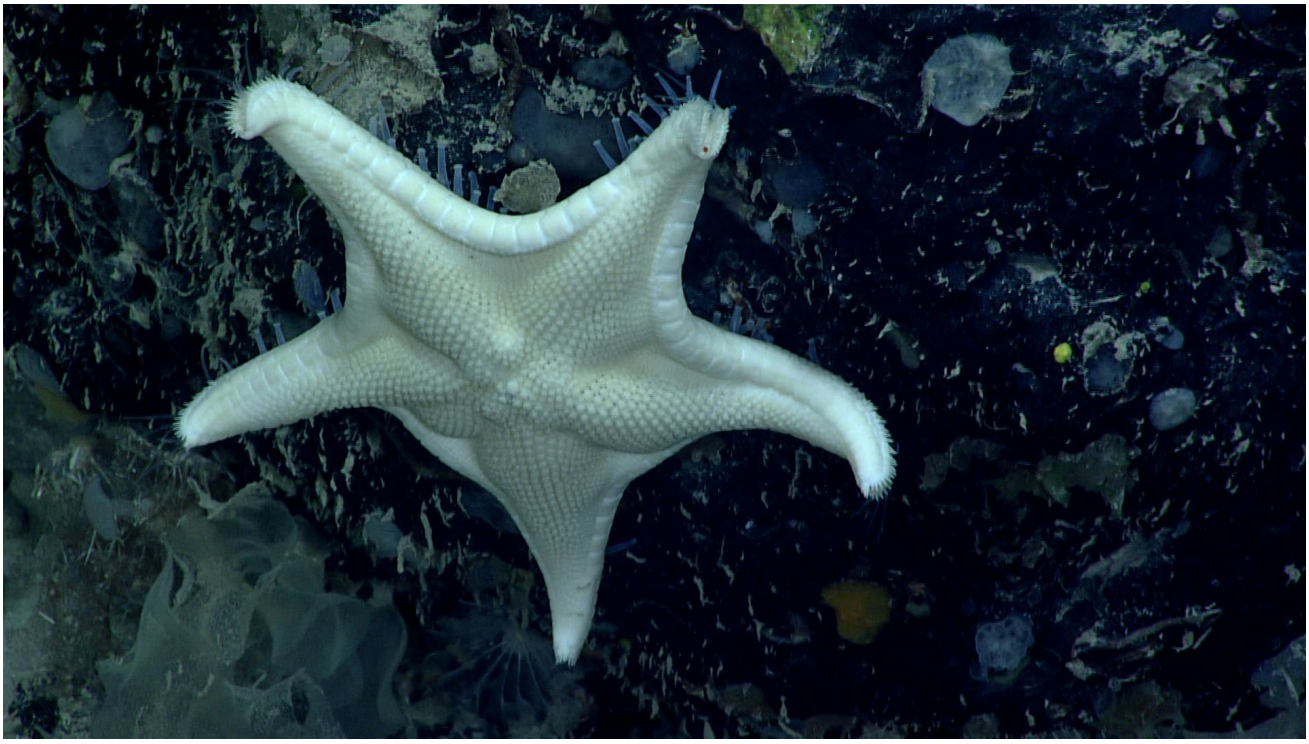
Associates Sample ID	Field Identification	Count
EX2107_D05_06B_A01	Asteroschema	1

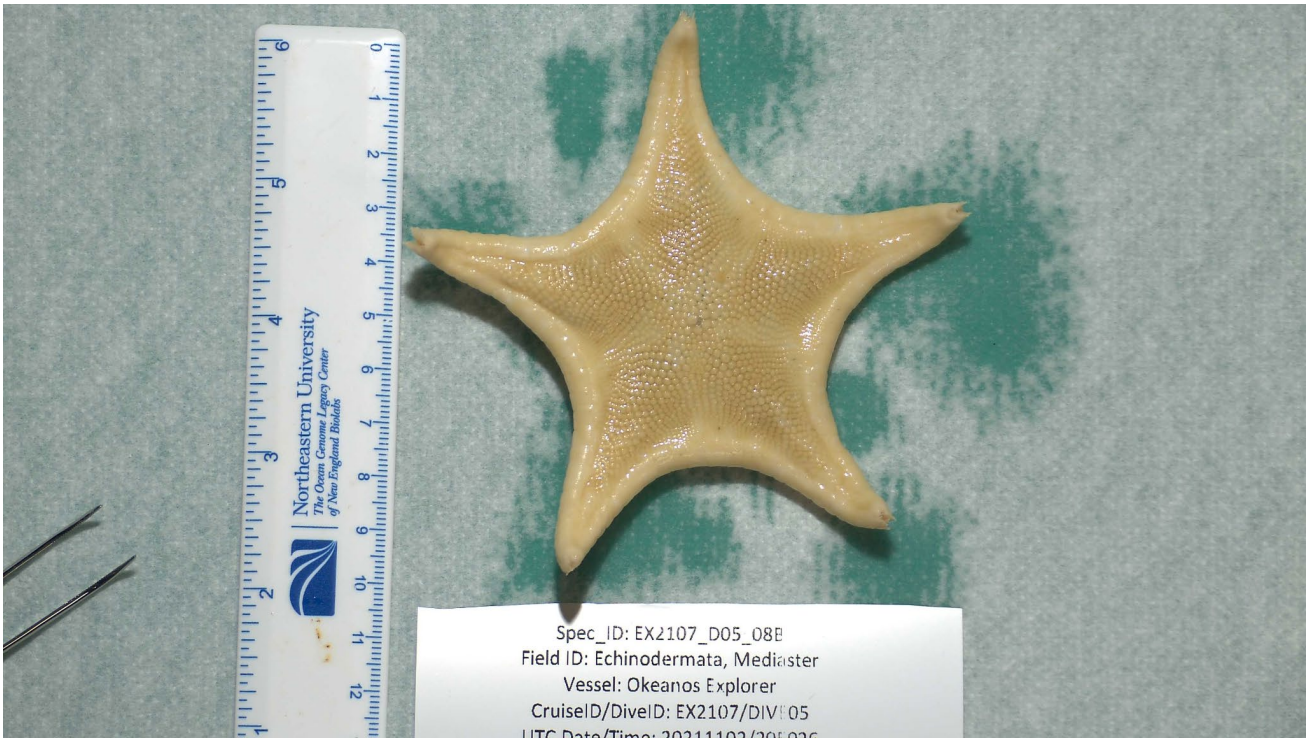


Sample ID	EX2107_D05_07W
Date (UTC)	20211102
Time (UTC)	20:34
Depth (m)	1386.709
Latitude (decimal degrees)	30.804800
Longitude (decimal degrees)	-77.307530
Temp. (°C)	4.199
Field ID(s)	Water sample

Comments	eDNA

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

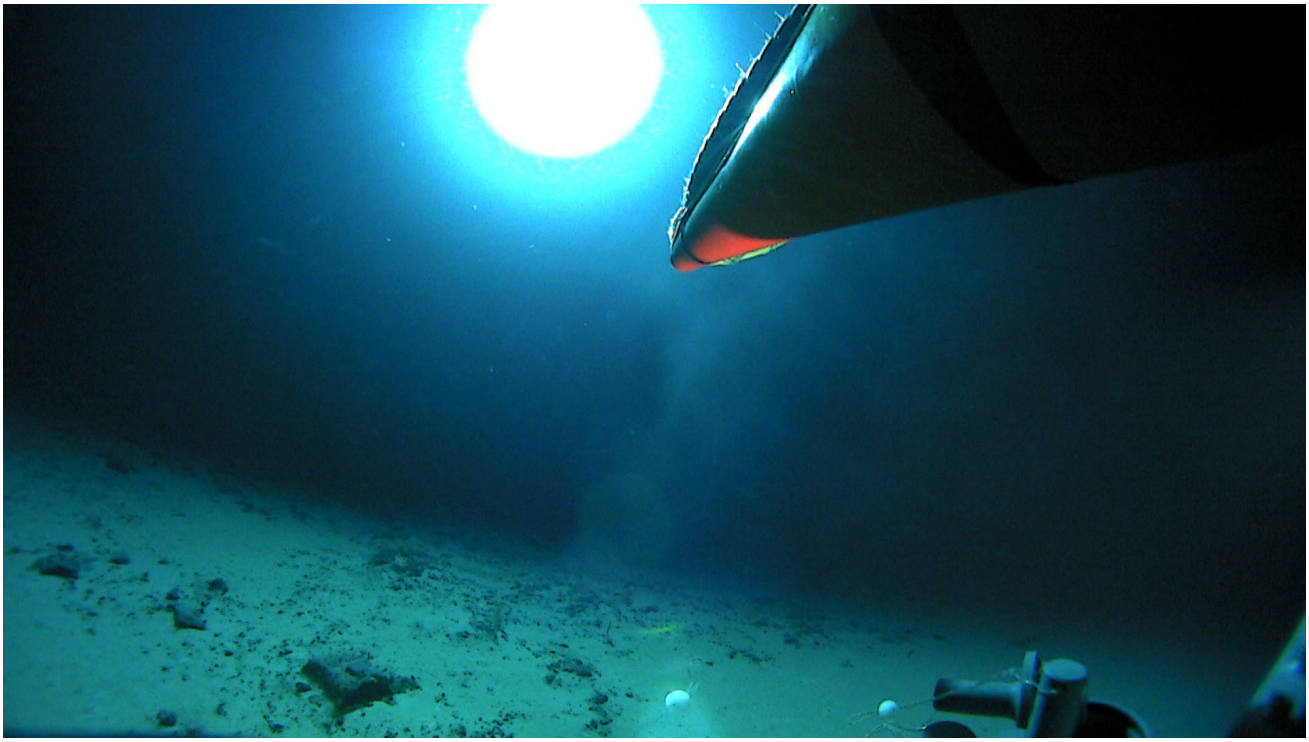




NOAA OCEAN EXPLORATION

Sample ID	EX2107_D05_08B
Date (UTC)	20211102
Time (UTC)	20:50
Depth (m)	1385.73
Latitude (decimal degrees)	30.804810
Longitude (decimal degrees)	-77.307540
Temp. (˚C)	4.2
Field ID(s)	Mediaster
Comments	5 armed biscuit star, cream colored

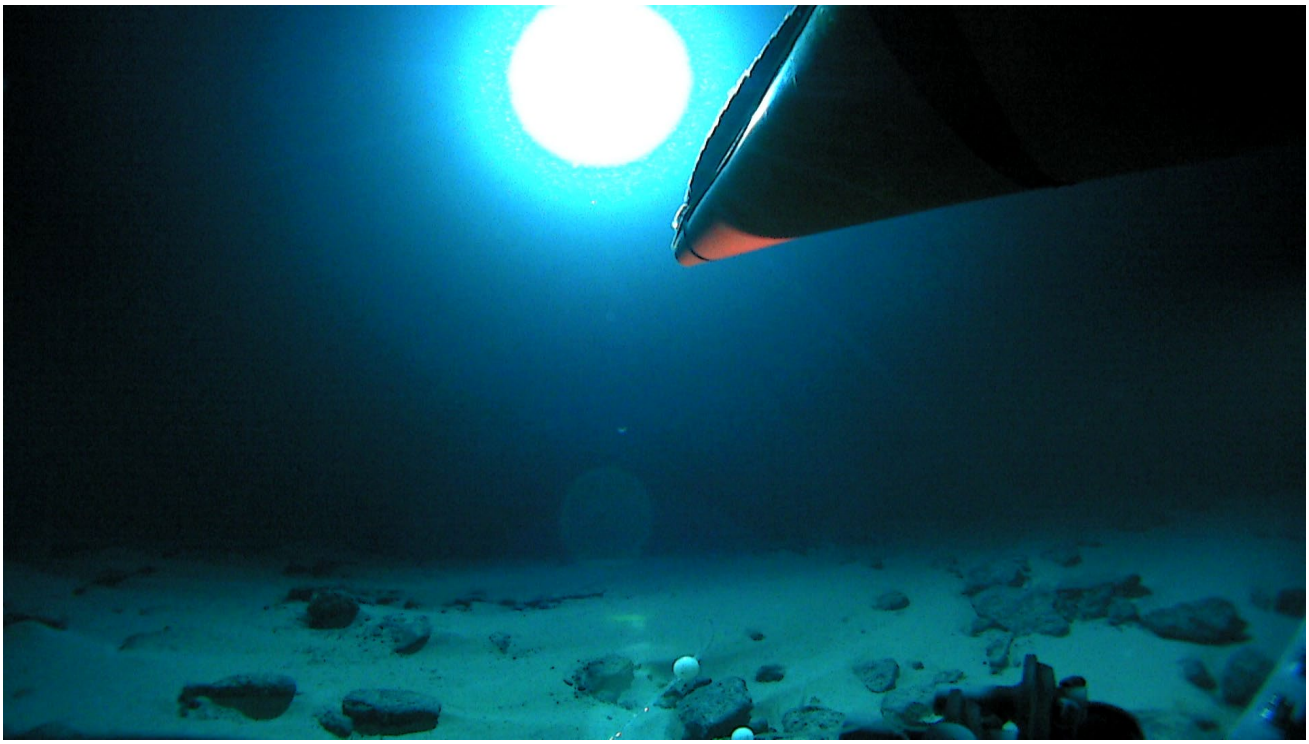
Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2107_D05_09W
Date (UTC)	20211102
Time (UTC)	21:30
Depth (m)	1355.064
Latitude (decimal degrees)	30.804230
Longitude (decimal degrees)	-77.308460
Temp. (˚C)	4.197

Field ID(s)	water sample
Comments	eDNA

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



Sample ID	EX2107_D05_10W
Date (UTC)	20211102
Time (UTC)	18:25
Depth (m)	1416.682
Latitude (decimal degrees)	30.80512
Longitude (decimal degrees)	-77.306640
Temp. (°C)	4.203
Field ID(s)	water sample
Comments	Niskin Bottle 2 was attempted when D2 reached the bottom but didn't actually fire at that time. We counted Niskin sample as 10W bc we didn't know the time of fire until we looked at the video footage after the dive 18:25:47

Associates Sample ID	Field Identification	Count

N/A	N/A	N/A

Scientists Involved (provide name, email, affiliation)

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