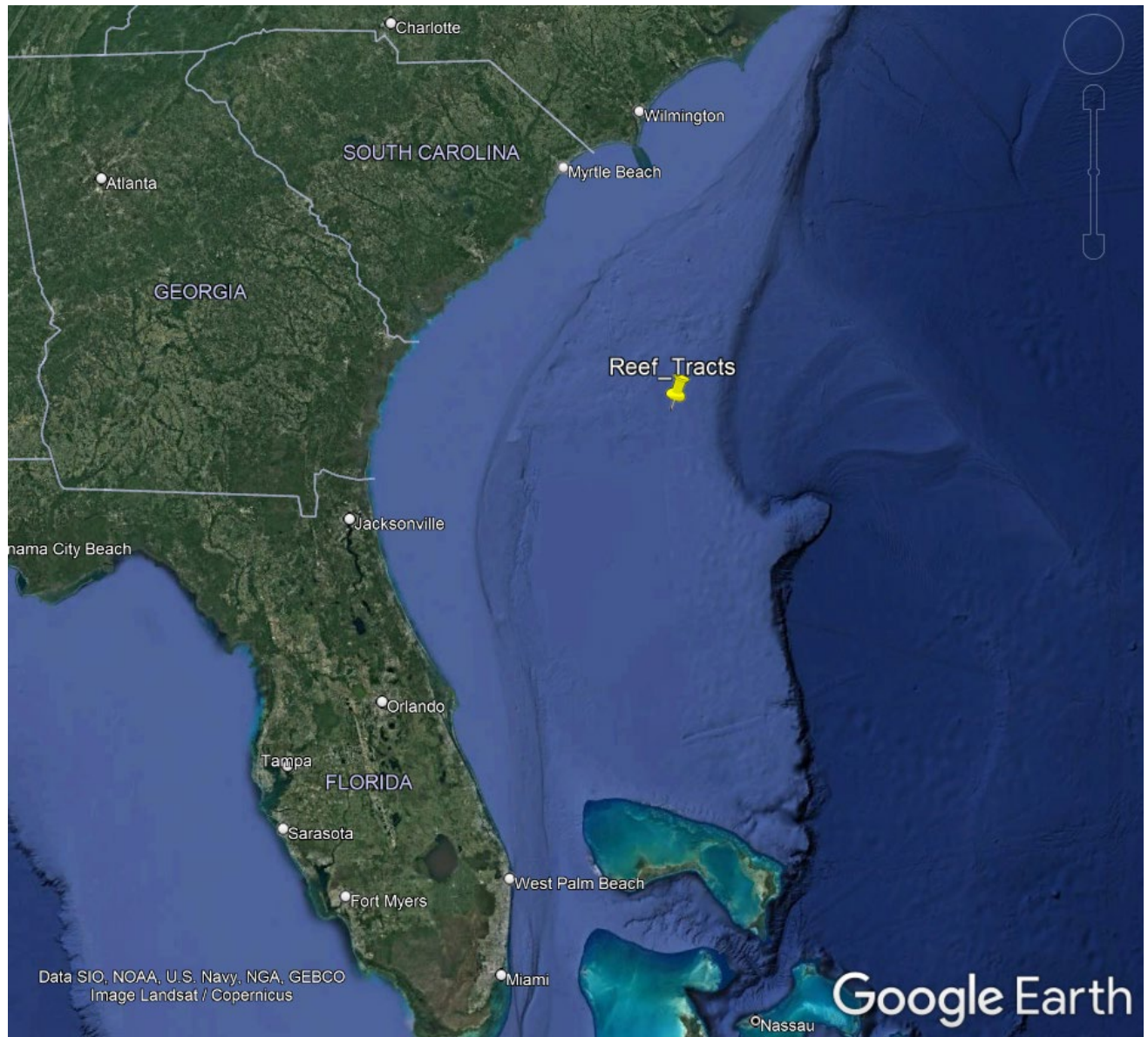


ROV Dive Summary, EX-21-07, Dive 01 October 27, 2021

General Location Map



Dive Information

[illegible]

Descent – Water/niskin bottle 1 (**EX2107_DIVE01_01W**) was fired at 500 m deep for eDNA collections.

On Bottom: Water/niskin bottle 2 (**EX2107_DIVE01_02W**) fired with the ROV 1 m from the bottom (Niskin bottles are located approximately 1 m from the bottom of the ROV so the samples were actually collected at 2 m off the bottom) for eDNA collections.

D2 landed on the base of the ridge in a flat area. The bottom was 100% *Lophelia/Enallopsammia* coral rubble. The rubble was old-dead, dark in color with the sclerites damaged. Bamboo corals of at least 3 different species, as well as the hexactinellid (glass) sponge *Vazella pourtalesii*, were present. A few areas with some standing dead coral bushes were also present. Anomurans (squat lobsters) were common in the rubble along with Bamboo coral (**EX2107_DIVE01_03B and 03B_01A**).

Making way to the slope and heading up the bottom portion of the mound, the 100% coral rubble continued on a visibly lithified substrate, strongly suggesting that we were ascending the slope of a bioherm. On the way to the first rise there were *Comactinia* – comatulid crinoids, as well as a few stalked crinoids.

Benthopelagic jellyfish were present in the water column near the bottom - juvenile *Ptychogasteria* (reminiscent of rhopalonematids). A sample (**EX2107_DIVE01_04B**) of the hydromedusa was collected.

Among the fish observed was a Birdbeak Dogfish (*Deania calcea*), an eastern Atlantic species, rarely seen this far west or south, which may mark a range extension. A Chimaera- juvenile *Chimaera monstrosa* was spotted associated with the bottom, as were *Nezumia* (rat tail fish), along with lacy fan bryozoans oriented with fan parallel with bottom. Primnoid corals were abundant growing attached to the coral rubble, along with bamboo corals from multiple species, with some knocked over, but seemingly healthy looking. Small 20-30 cm colonies of living *Enallopsammia* were growing among the coral rubble and standing dead corals. Other Octocorallia seen among the rubble were *Anthomastus*-like colonies and nephtheid soft corals.

A pachastrellid-like sponge (veined elephant-ear, flat lobate) was sampled (**Sample EX2107_DIVE01_05B**). At the mid-dive point, a third water sample was taken at 1 m above the bottom for eDNA collections (**EX2107_DIVE01_06W**).

An octopus - *Muusoctopus januarii* was sighted and observed foraging or retreating from the ROV for a while. Antipatharian corals were spotted, but no exemplars were focused upon. A sample of a narrow volcano-shaped, tan demosponge, *Characella* sp. (**EX2107_DIVE01_07B**) was taken. This likely undescribed species was common but not densely situated on the reef.

The Upper part of each of the bathymetric highs had an increase of dead *Lophelia*, with living *Lophelia* colonies, 10-40 cm in size, increasing in abundance. These living and dead colonies were quite rugose, providing habitat for multiple species of small animals (solitary cup corals, stalked crinoids (rare), comatulid crinoids (common), Synaphobranchidae; *Synaphobranchus affinis* – thin Cutthroat Eels (common), hydroids of many species/forms were abundant, including one imaged colony of the aglaopheniid *Gymnangium*, with gonothecae), pink, long-spined ophiuroids (common). Volcano sponges (similar to sample **07B**, collected earlier), and possible cf. Petrosiidae-like sponges were also present. A couple of instances of a strikingly blue encrusting sponge spotted within the rubble.

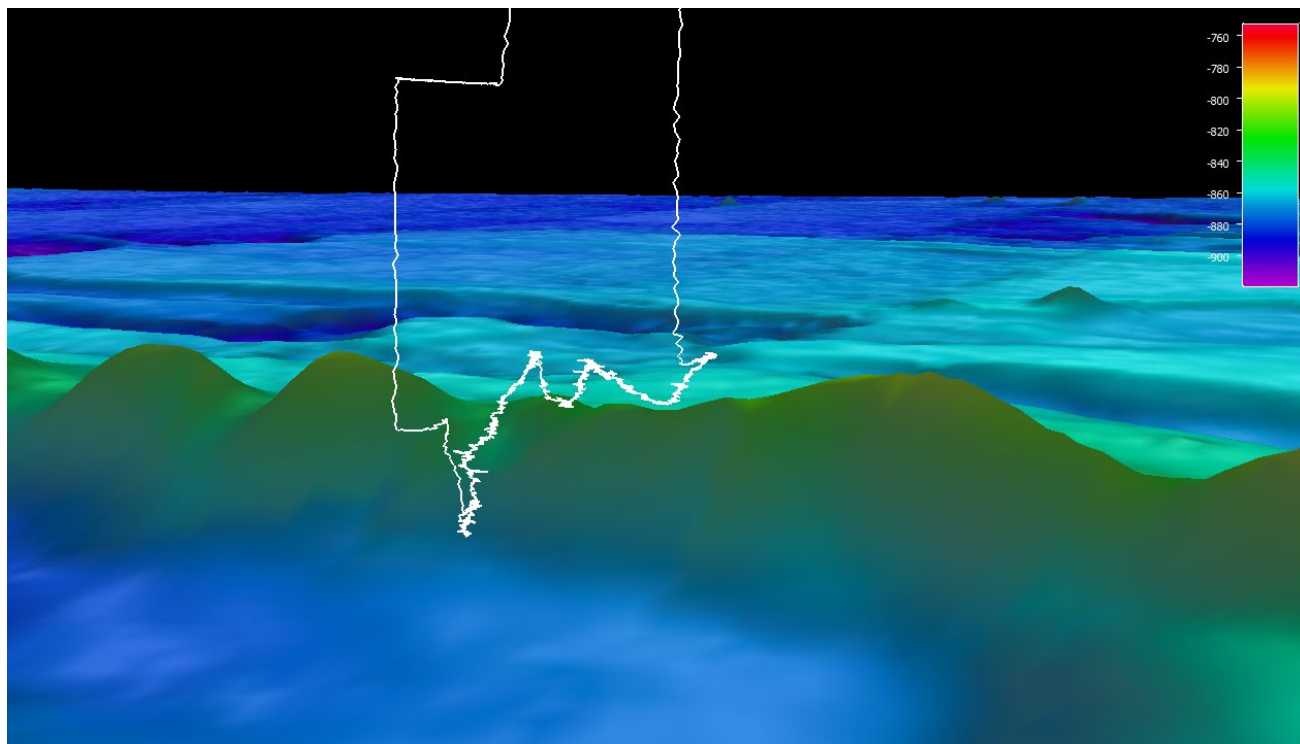
Grenadier fish (rare), *Nezumia aequalis*- Nose Down Macrourid (common), *Anthomastus*-like (common), one sea spider – Pycnogonida, family Colossendeidae.

	<i>Gilbertaster caribaea</i>- sea star (EX2107_DIVE01_08B) with associated amphipods (08B_02A) was sampled along with the small, delicate primnoid(?) (08B_01A) it seemed to be feeding on. Slope increased closer to the tops of each bathymetric high to about 45° up slope. Current was moving fast enough to cause gorgonians to flap around. Near the top of the mounds, there were increasing amounts of larger spaces among the structures created by broken rubble and standing dead colonies. The top of this mound had standing dead colonies interspersed with 10-40 cm living coral heads. <i>Chrysogorgia</i> (Sample EX2107_DIVE01_09B) with squat lobster associate (09B_A01) and associated penaeid shrimp (09B_A02) and a colony of the nephtheid soft coral <i>Pseudodrifra</i> (EX2107_DIVE01_10B) and nearby solitary cupcoral (EX2107_DIVE01_10B_A01) growing on dead coral were collected. Close zoom of a live colony of <i>Madrepora</i> showed many of the same animals mentioned above living inside/associated with the coral head. Water (EX2107_DIVE01_11W) was taken close to this coral head at 1 m above the bottom as the 4th sample for eDNA collections. <i>Nodostrella</i> glass sponges were common in this area. The apex of a 3rd mound was covered by a thick layer of dead standing coral colonies with 1-2 m thickets of living coral on top. <i>Laemonema melanurum</i> (coral hake) and primnoids were common on the mound tops. <i>Vazella</i> glass sponges were also present. A less commonly seen sponge morphotype, likely representing <i>Oceanapia</i> (EX2107_DIVE01_12B), was sampled. Niskin bottle 5 was used to sample (EX2107_DIVE01_13W), water 1 m above the bottom for eDNA collections. End dive at 803 m.
Notable Observations	Lophelia Bioherm
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)	Plateau, Coral Rubble
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeld=600&resourceId=5720

Equipment Deployed

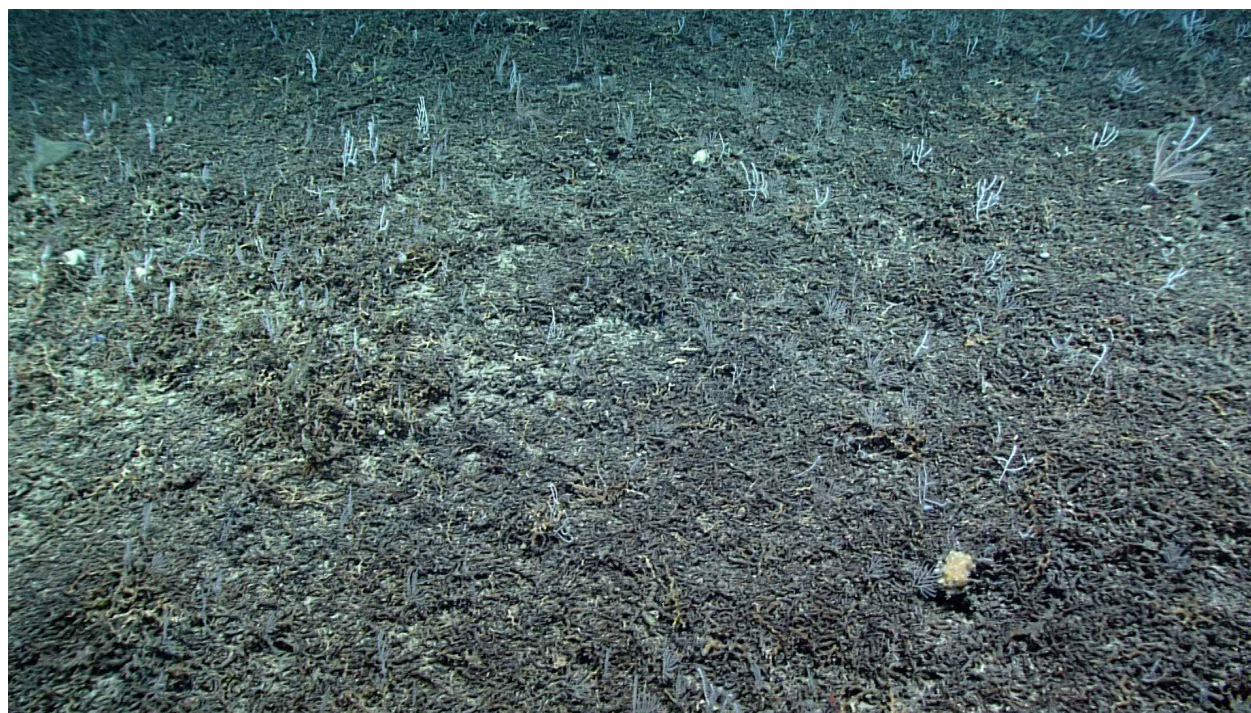
ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>
ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The section below notes if any of these sensors were malfunctioning or not operational
Equipment Malfunctions	None

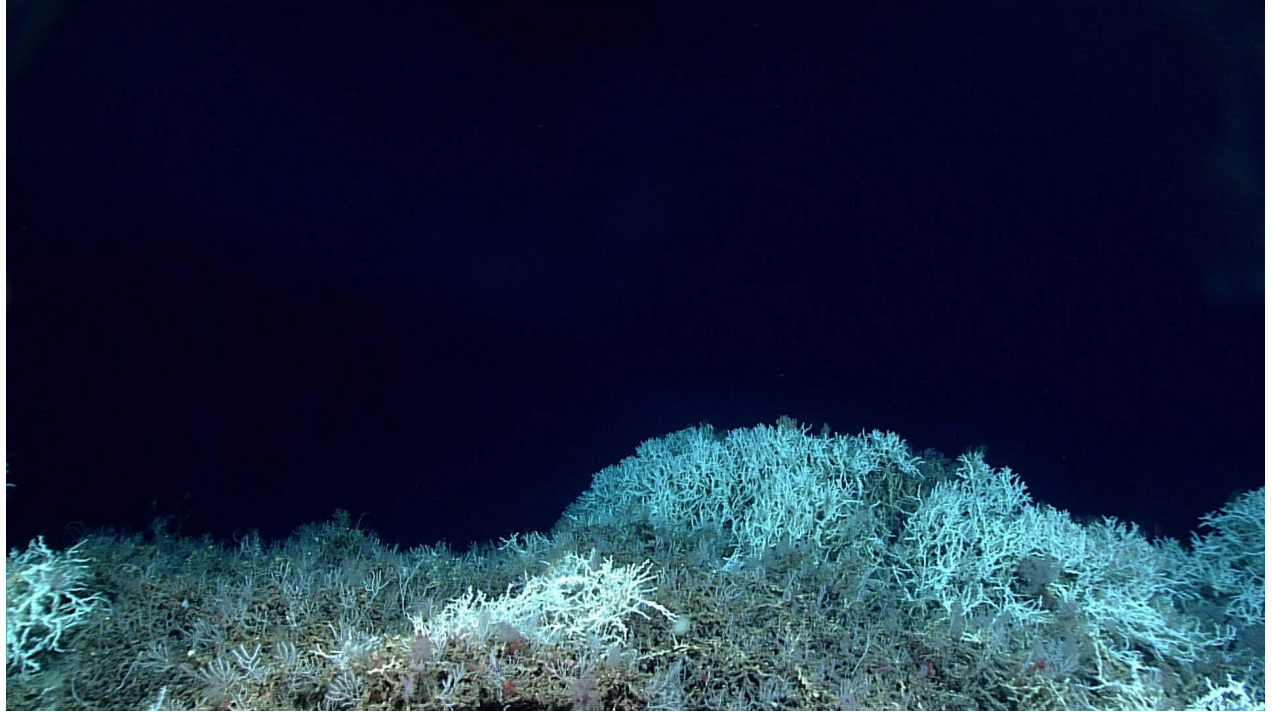
Close-up Map of Main Dive Site



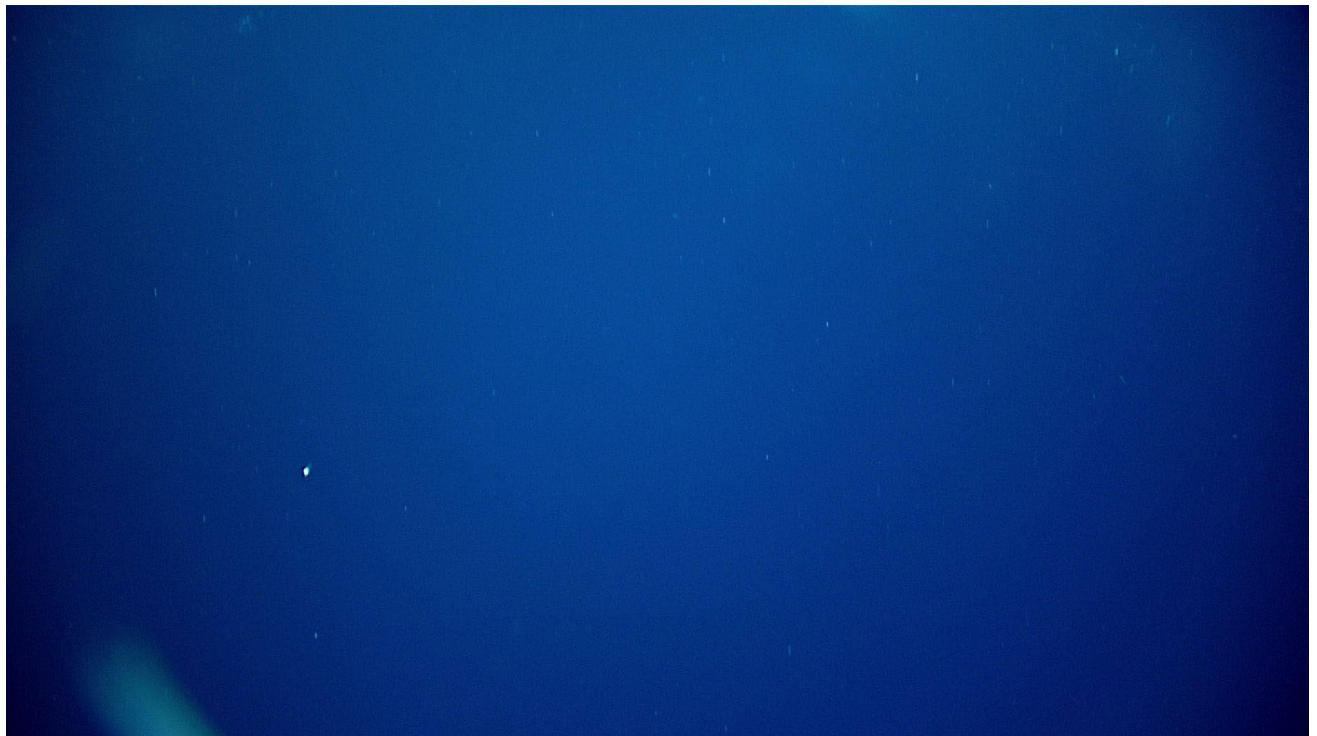
Oblique view of ROV dive track shown in white on 25 m resolution bathymetry, 3x vertical exaggeration, depth in meters.

Representative Photos of the Dive





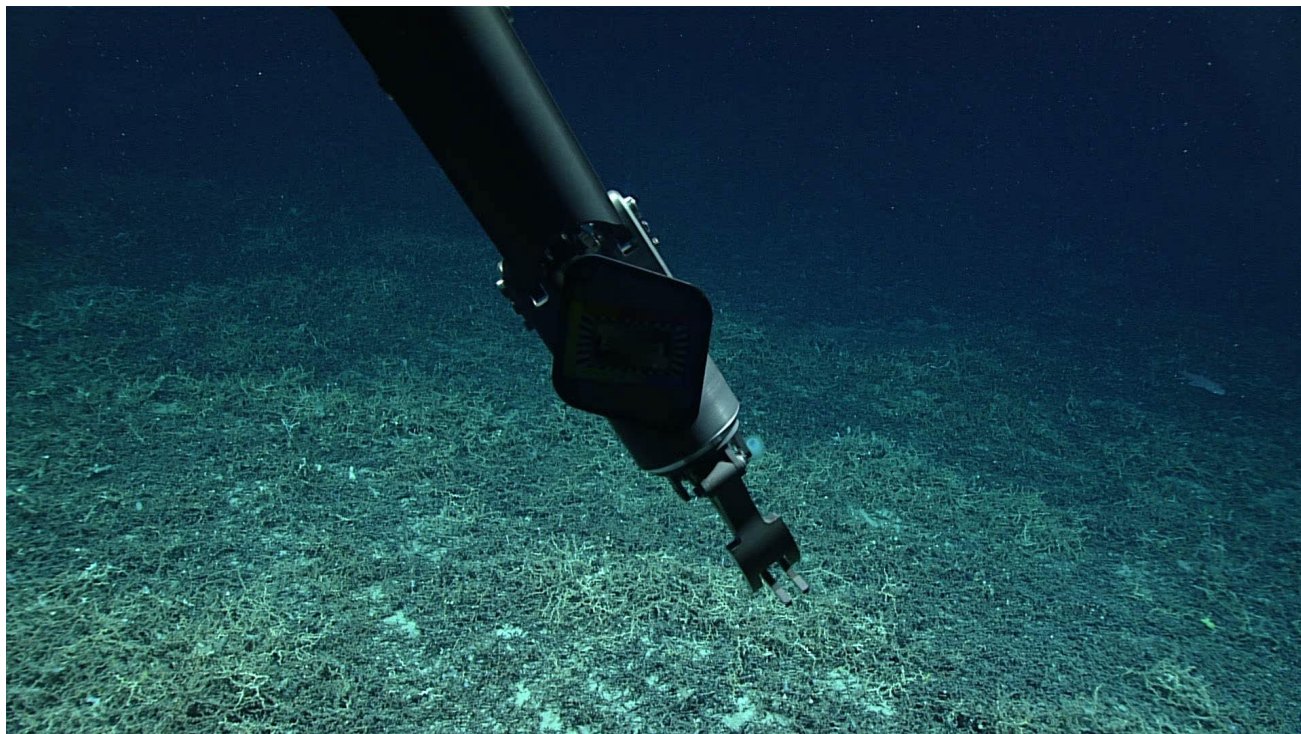
Samples Collected -



Sample ID	EX2107_D01_01W
Date (UTC)	20211027
Time (UTC)	1:11:33 PM
Depth (m)	505.0898

Latitude (decimal degrees)	31.210164
Longitude (decimal degrees)	-77.853175
Temp. (°C)	18.14976
Field ID(s)	Water
Comments	For eDNA

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



Sample ID	EX2107_D01_02W
Date (UTC)	20211027
Time (UTC)	1:49:39 PM
Depth (m)	511.4854
Latitude (decimal degrees)	31.210114
Longitude (decimal degrees)	-77.852542
Temp. (°C)	4.7221
Field ID(s)	Water
Comments	eDNA

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

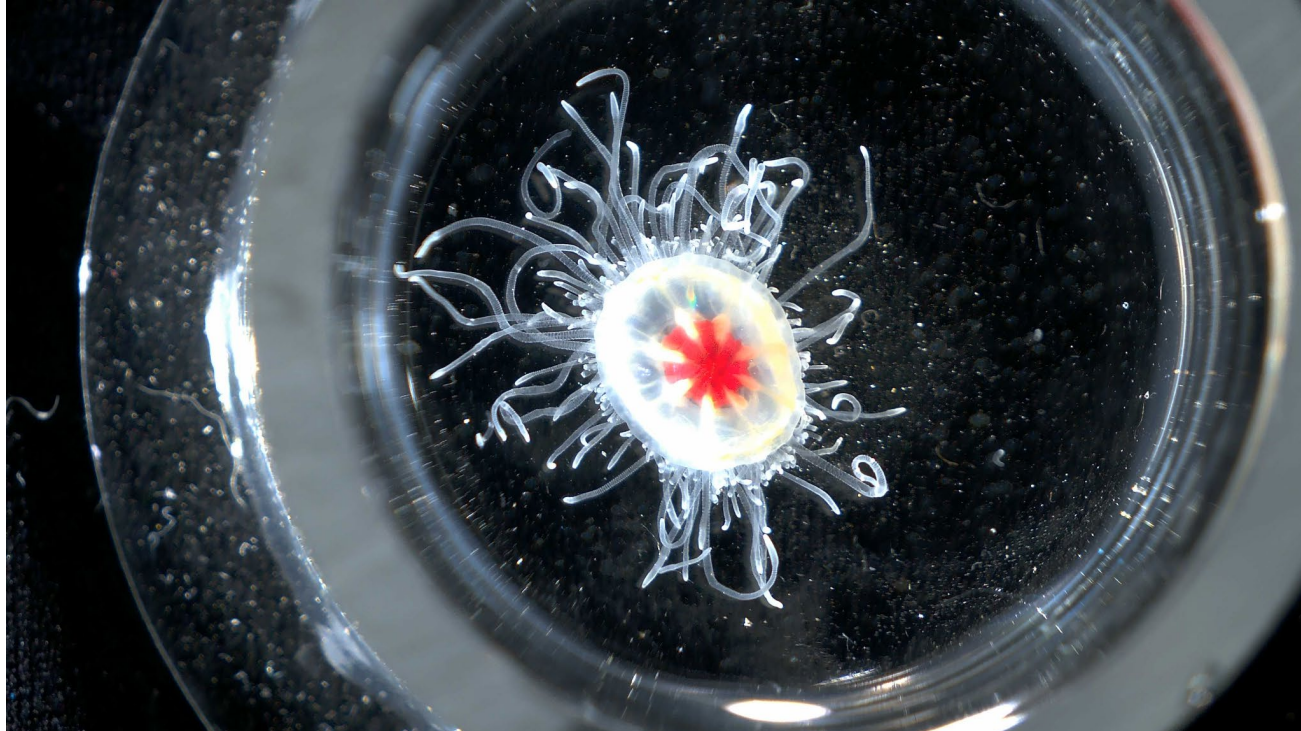


Sample ID	EX2107_D01_03B
Date (UTC)	20211027
Time (UTC)	2:34:00 PM

Depth (m)	866.7572
Latitude (decimal degrees)	31.211579
Longitude (decimal degrees)	-77.852514
Temp. (° C)	4.71909
Field ID(s)	Primnoidae; Bamboo Coral
Comments	white, sparsely branched

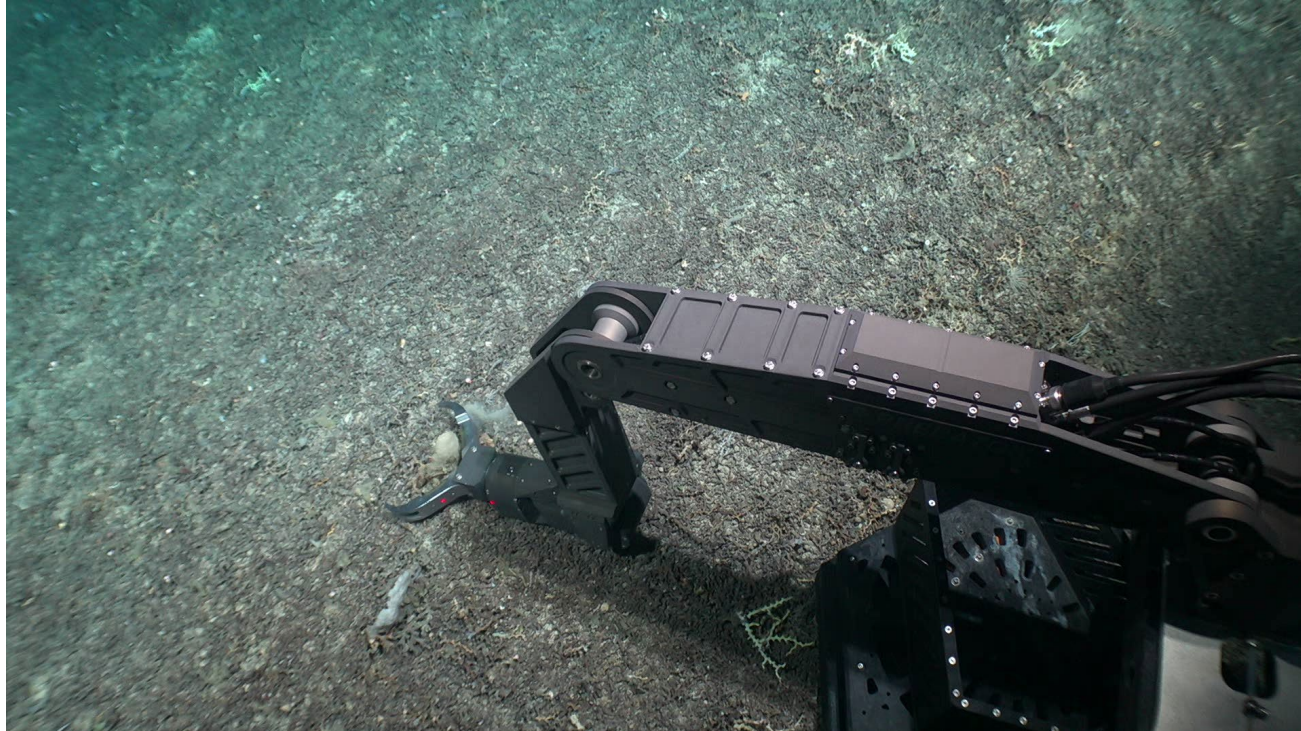
Associates Sample ID	Field Identification	Count
EX2107_D01_03B_01A	Anomura- Squat lobster; <i>Uroptychus</i> sp.	1





Sample ID	EX2107_D01_04B
Date (UTC)	20211027
Time (UTC)	2:47:59 PM
Depth (m)	861.507
Latitude (decimal degrees)	31.211441
Longitude (decimal degrees)	-77.852521
Temp. (°C)	4.73509
Field ID(s)	Rhopalonematidae
Comments	yellow gonads attached completely along radial canals, red gut, two size classes of tentacles, small nipple at apex of bell, yellow margins.

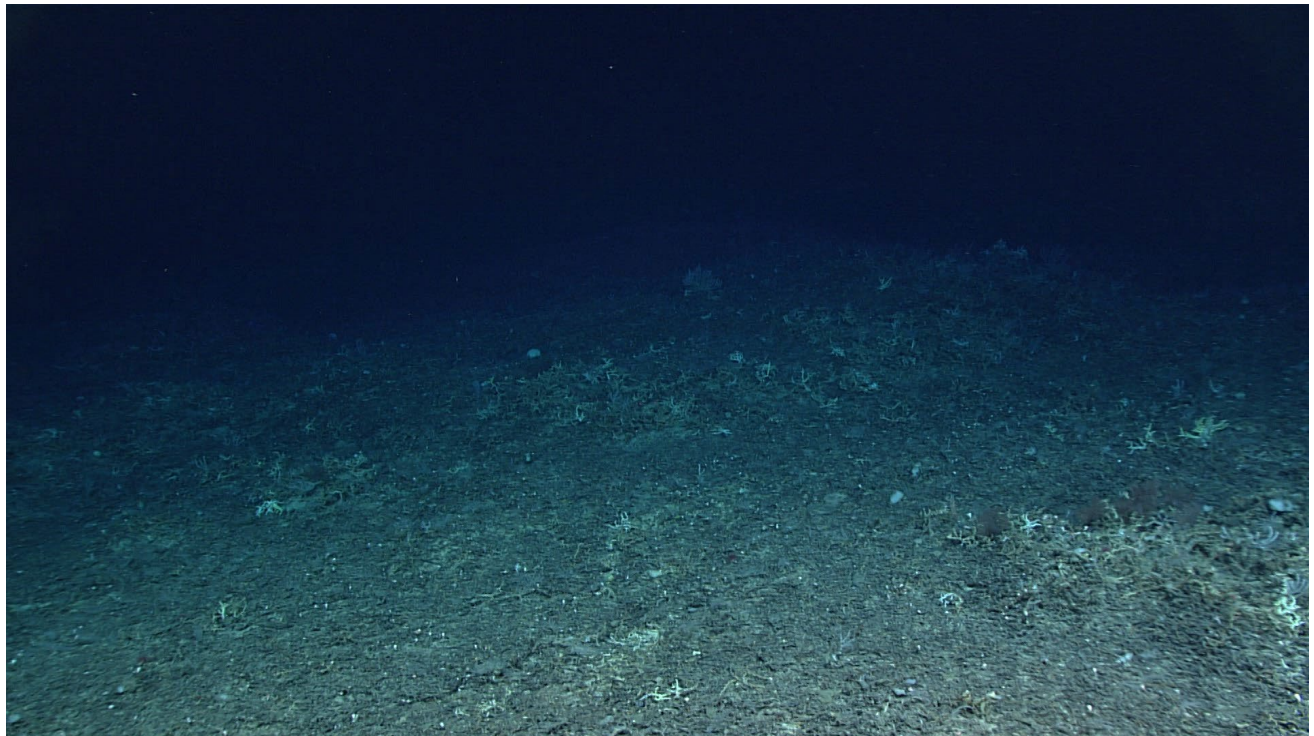
Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2107_D01_05B
Date (UTC)	20211027
Time (UTC)	4:02:30 PM
Depth (m)	844.758
Latitude (decimal degrees)	31.210588
Longitude (decimal degrees)	-77.852432
Temp. (°C)	6.78786

Field ID(s)	Porifera; Axinellidae
Comments	less than 1 cm thick, elongated lobe, elephant ear, vein like structures on one side, 15cm. One side lots of hairy spicules.

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



Sample ID	EX2107_D01_06W
Date (UTC)	20211027
Time (UTC)	4:06:54 PM
Depth (m)	844.6795
Latitude (decimal degrees)	31.210585
Longitude (decimal degrees)	-77.852452
Temp. (°C)	6.85379
Field ID(s)	Water
Comments	eDNA

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



Sample ID	EX2107_D01_07B
Date (UTC)	20211027
Time (UTC)	163152
Depth (m)	840.6085205
Latitude (decimal degrees)	31.21042061
Longitude (decimal degrees)	-77.85248566
Temp. (°C)	7.094359875

Field ID(s)	<i>Characella sp.</i>
Comments	Possibly undescribed species, common on the reef. 15cm, crispy hollow tube, very heavily spiculated, distinct, oscule at top has no membrane, volcano shaped

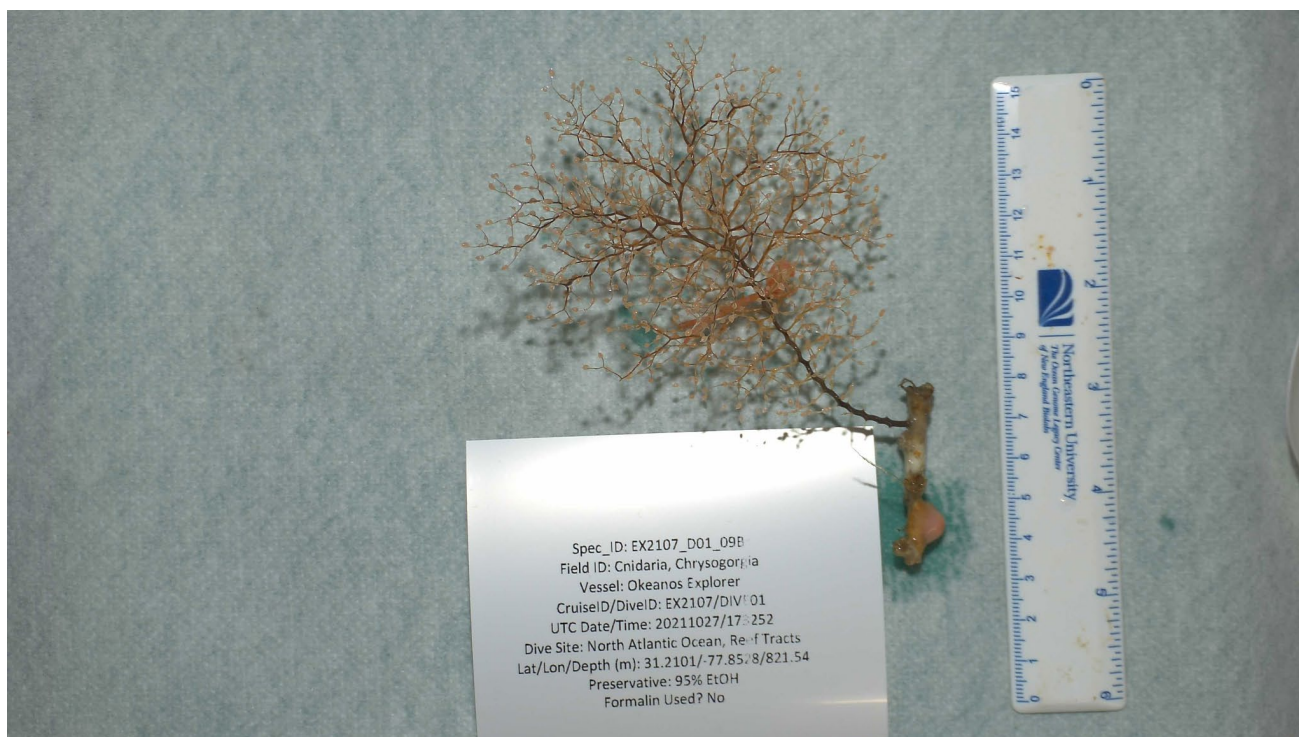
Associates Sample ID	Field Identification	Count
N/A	N/A	N/A





Sample ID	EX2107_D01_08B
Date (UTC)	20211027
Time (UTC)	5:04:26 PM
Depth (m)	831.5980225
Latitude (decimal degrees)	31.210175
Longitude (decimal degrees)	-77.852624
Temp. (°C)	7.39789
Field ID(s)	<i>Gilbertaster caribaea</i>
Comments	Rare, feeding on Primnoid (Associate 1A) five arms cookie star, biscuit star, was eating a possible octocoral. Has amphipods and cnidaria associates.

Associates Sample ID	Field Identification	Count
EX2107_D01_08B_A01	Cnidaria; Primnoid?	2
EX2107_D01_08B_A02	Amphipods	2 present - 1 in DNA, 1 standard



Sample ID	EX2107_DIVE01_09B
Date (UTC)	20211027
Time (UTC)	5:32:52 PM
Depth (m)	821.5385
Latitude (decimal degrees)	31.210087
Longitude (decimal degrees)	-77.852799
Temp. (°C)	7.54934

Field ID(s)	Chrysogorgia sp.
Comments	About 10 cm, bushy branching. Growing off of <i>lophelia</i> (dead). <i>Lophelia</i> has hydroid. Associate will be in the same container with primary.

Associates Sample ID	Field Identification	Count
EX2107_D01_09B_A01	Galatheaidea	1
EX2107_D01_09B_A02	Penaeidae	1





Sample ID	EX2107_D01_10B
Date (UTC)	20211027
Time (UTC)	5:38:19 PM
Depth (m)	821.4911
Latitude (decimal degrees)	31.210073
Longitude (decimal degrees)	-77.852771
Temp. (°C)	7.59658
Field ID(s)	<i>Pseudodrifia</i> sp.
Comments	Octocoral, on a piece of dead <i>Lophelia</i> , <i>Lophelia</i> has hydroid and cup coral. Cup coral was sampled as associate with no DNA sample

Associates Sample ID	Field Identification	Count
EX2107_D01_10B_A01	Scleractinia- solitary cup	1- No DNA



Sample ID	EX2107_D01_11W
Date (UTC)	20211027
Time (UTC)	6:04:49 PM
Depth (m)	809.2019
Latitude (decimal degrees)	31.210044
Longitude (decimal degrees)	-77.852982
Temp. (°C)	7.67008
Field ID(s)	Water
Comments	eDNA

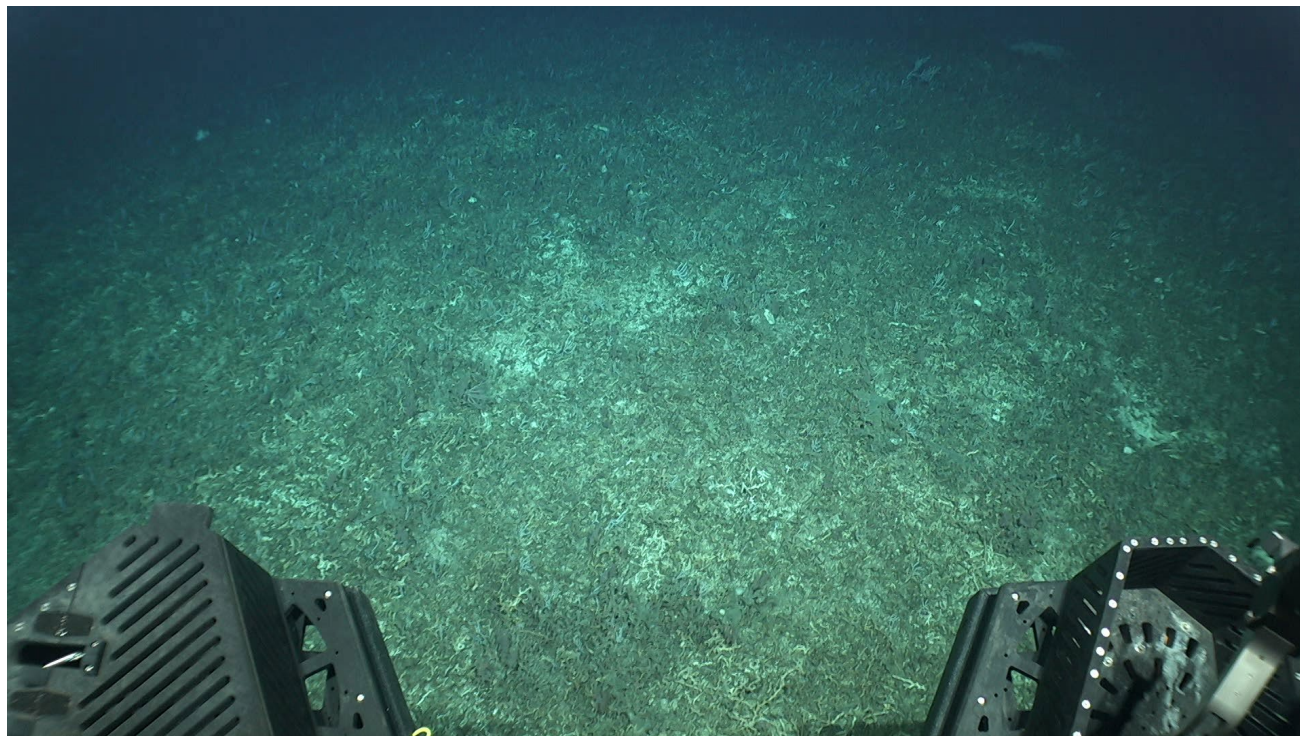
Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2107_D01_12B
Date (UTC)	20211027
Time (UTC)	7:33:16 PM
Depth (m)	814.8426
Latitude (decimal degrees)	31.210672
Longitude (decimal degrees)	-77.854619
Temp. (°C)	8.14084

Field ID(s)	<i>Oceanapia</i> sp.
Comments	Firm, amorphous, fistula, on <i>Lophelia</i> rubble, tan inside, tan outside, dermal layer, has an <i>ircinia</i> -like strong scent.

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



Sample ID	EX2107_D01_13W
Date (UTC)	20211027
Time (UTC)	7:50:36 PM
Depth (m)	802.7205
Latitude (decimal degrees)	31.210832
Longitude (decimal degrees)	-77.854869
Temp. (°C)	8.84597
Field ID(s)	Water
Comments	eDNA

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

Scientists Involved (provide name, email, affiliation)

First Name	Last Name	Email	Affiliation
Scott	France	scott.france@louisiana.edu	University of Louisiana Lafayette
Christopher	Mah	brisinga@gmail.com	National Museum of Natural History
Cris	Diaz	taxochica@gmail.com	Harbor Branch Oceanographic Institute
Cristiana	Castello Branco	cristianacbranco@gmail.com	National Museum of Natural History
Asako	Matsumoto	amatsu@gorgonian.jp	Chiba Institute of Technology
Mike	Vecchione	vecchiom@si.edu	NMFS and National Museum of Natural History
Tom	Hourigan	tom.hourigan@noaa.gov	NOAA Deep Sea Coral Research & Technology Program
Peter	Auster	peter.auster@uconn.edu	UConn & Mystic Aquarium
Andrea	Quattrini	quattriniA@si.edu	National Museum of Natural History
Kimberly	Galvez	kimberly.galvez@noaa.gov	NOAA Ocean Exploration
Jason	Chaytor	jchaytor@usgs.gov	United States Geological Survey
Tabitha	Pearman	tpearman@saeri.ac.fk	South Atlantic Environmental Research Institute
Cindy	Van Dover	clv3@duke.edu	Duke University
Nick	Bezio	nickbezio@gmail.com	University of Maryland & National Museum of Natural History
Megan	McCuller	megan.mcculler@naturalsciences.org	North Carolina Museum of Natural Sciences
John	Reed	jreed12@fau.edu	Harbor Branch Oceanographic Institute
Kevin	Rademacher	kevin.r.rademacher@noaa.gov	NOAA/NMFS
Steve	Auscavitch	steven.auscavitch@temple.edu	Boston University
Steve	Ross	rosss@uncw.edu	University of North Carolina Wilmington
Upasana	Ganguly	upasana.ganguly1@louisiana.edu	University of Louisiana at Lafayette
ISC	Watchstander	innerspacecenter@gmail.com	URI Inner Space Center

Please direct inquiries to:

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