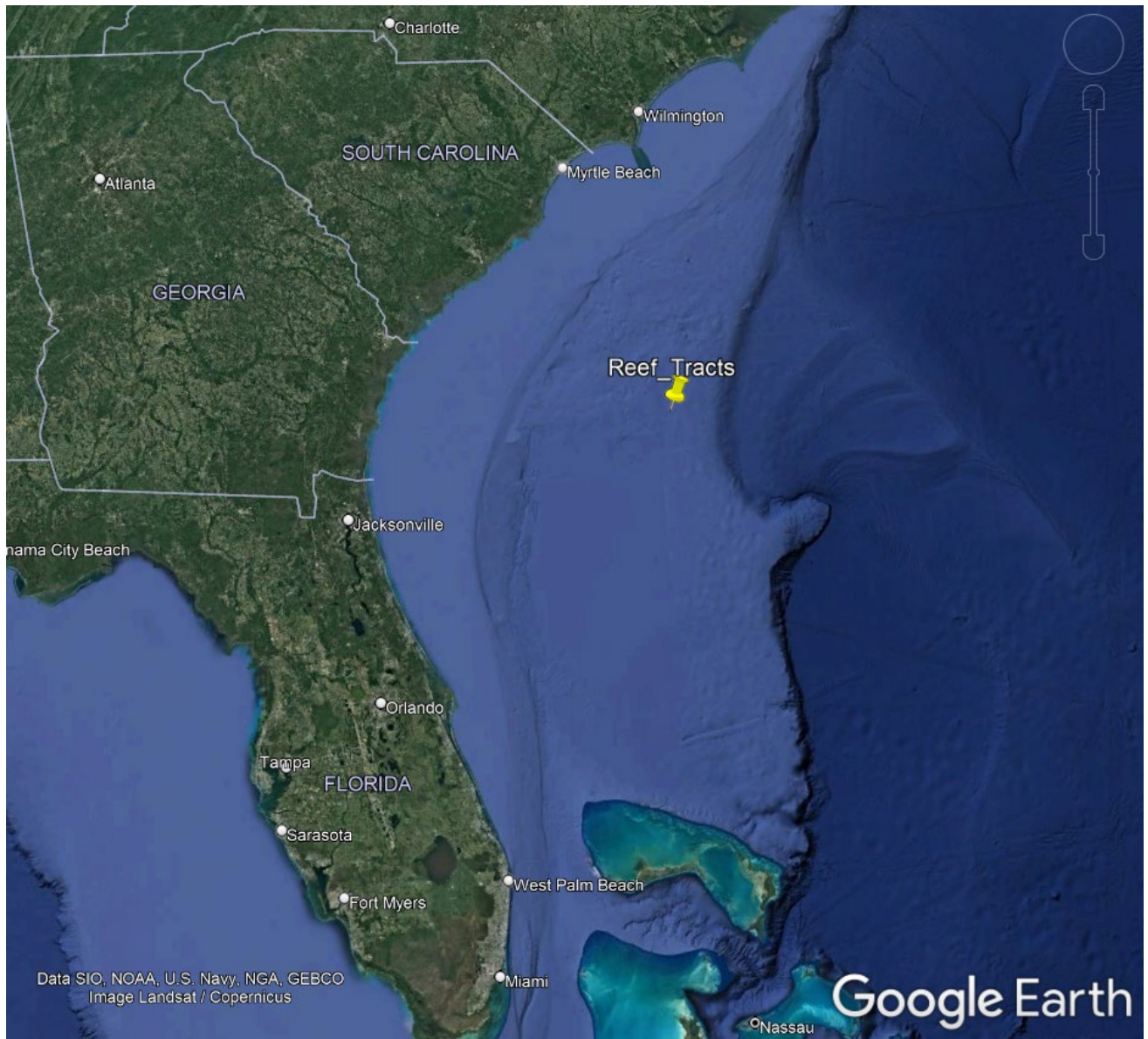


ROV Dive Summary, EX-21-07, Dive 01 October 27, 2021

General Location Map



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 *Ptychogastria* (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 *Enllopsammia* 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.

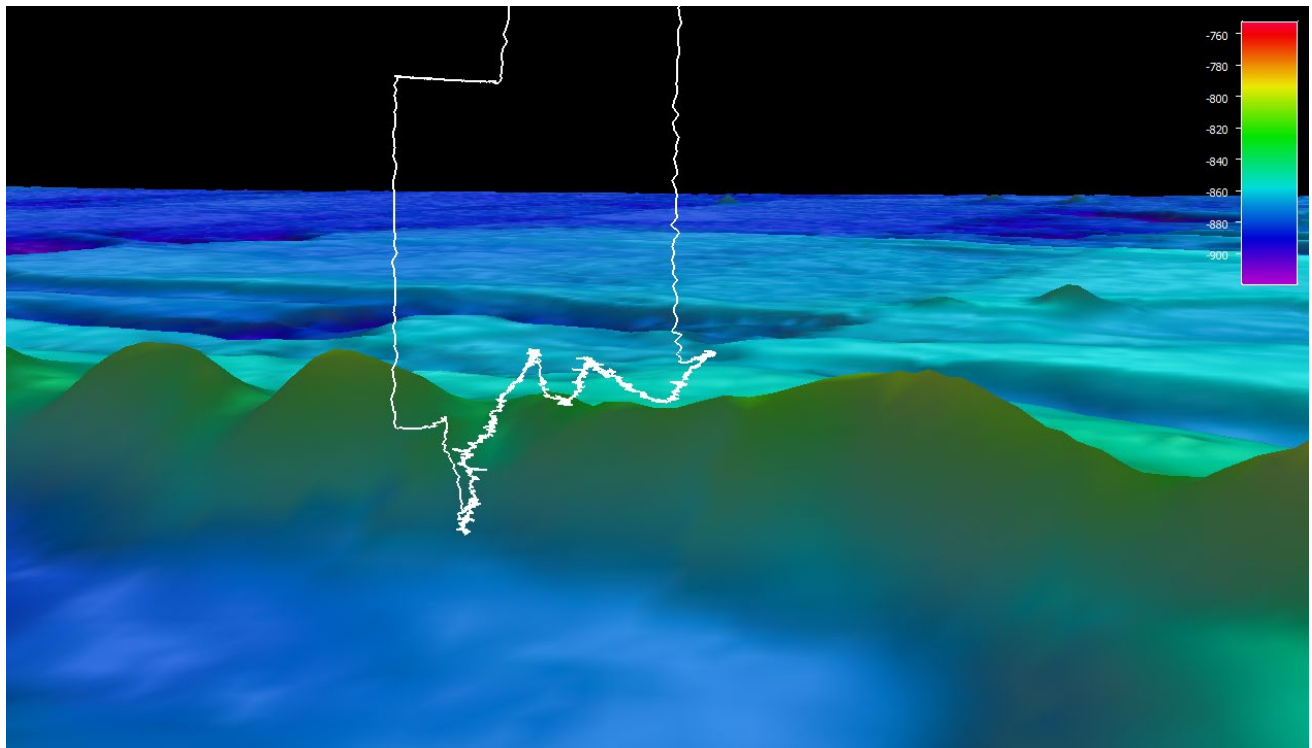
Grenadier fish (rare), *Nezumia aequalis*- Nose Down Macrourid (common), *Anthomastus*-like (common), one sea spider – Pycnogonida, family Colossendeidae.

| | |
|--|--|
| | <p><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.</p> <p>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>Pseudodrifia</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.</p> <p>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.</p> <p>End dive at 803 m.</p> |
| Notable Observations | Lophelia Bioherm |
| Community and habitat observations | <p>Corals and Sponges - (Present)</p> <p>Chemosynthetic Community - (Absent)</p> <p>High biodiversity Community - (Present)</p> <p>Active Seep or Vent - (Absent)</p> <p>Extinct Seep or Vent - (Absent)</p> <p>Hydrates - (Absent)</p> |
| CMECS Feature Type(s) | Plateau, Coral Rubble |
| SeaTube Link (science annotation system) | https://data.oceannetworks.ca/SeaTubeV3?resourceTypeld=600&resourceId=5720 |

Equipment Deployed

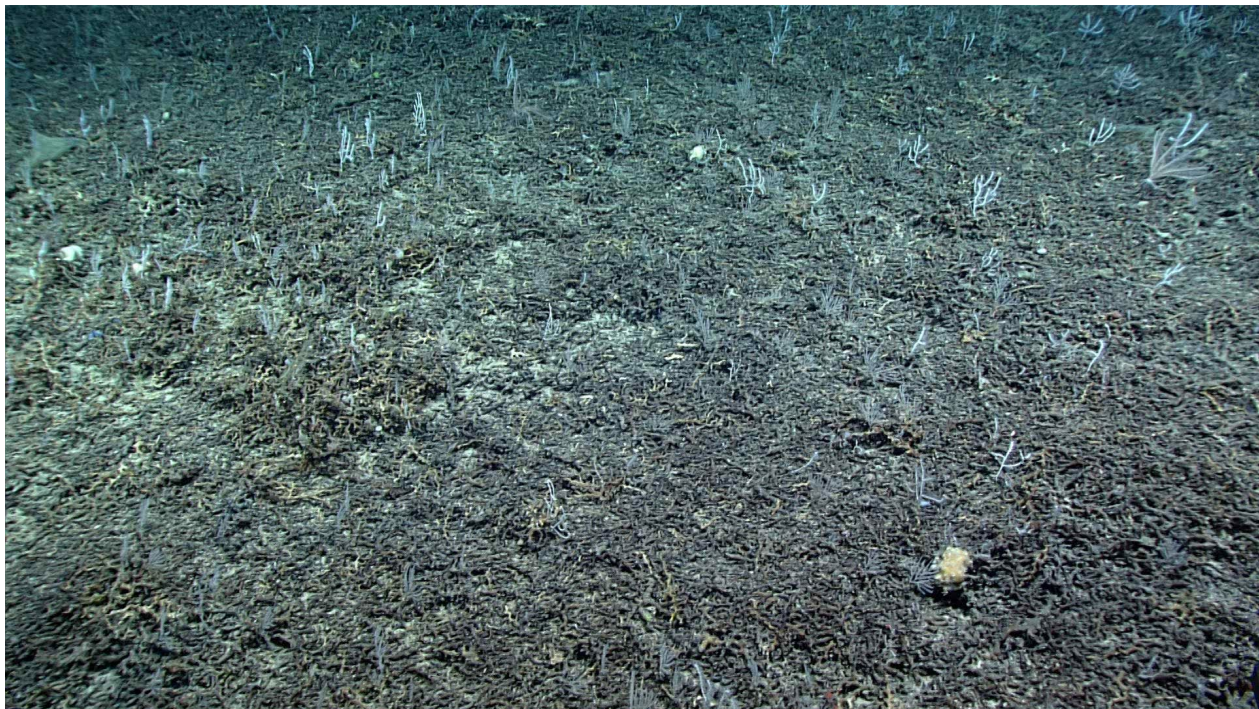
| | |
|------------------------|--|
| ROV | <i>Deep Discoverer</i> |
| Camera Platform | <i>Seirios</i> |
| ROV Measurements | The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution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

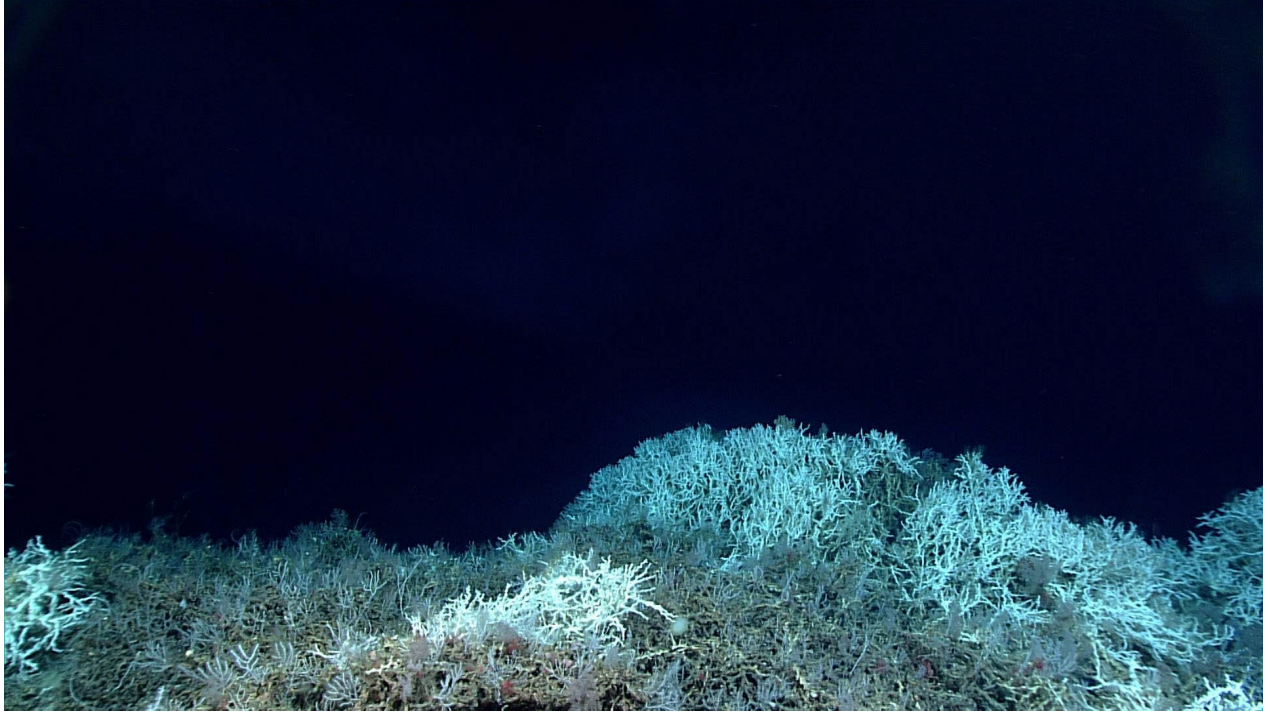
Close-up Map of Main Dive Site



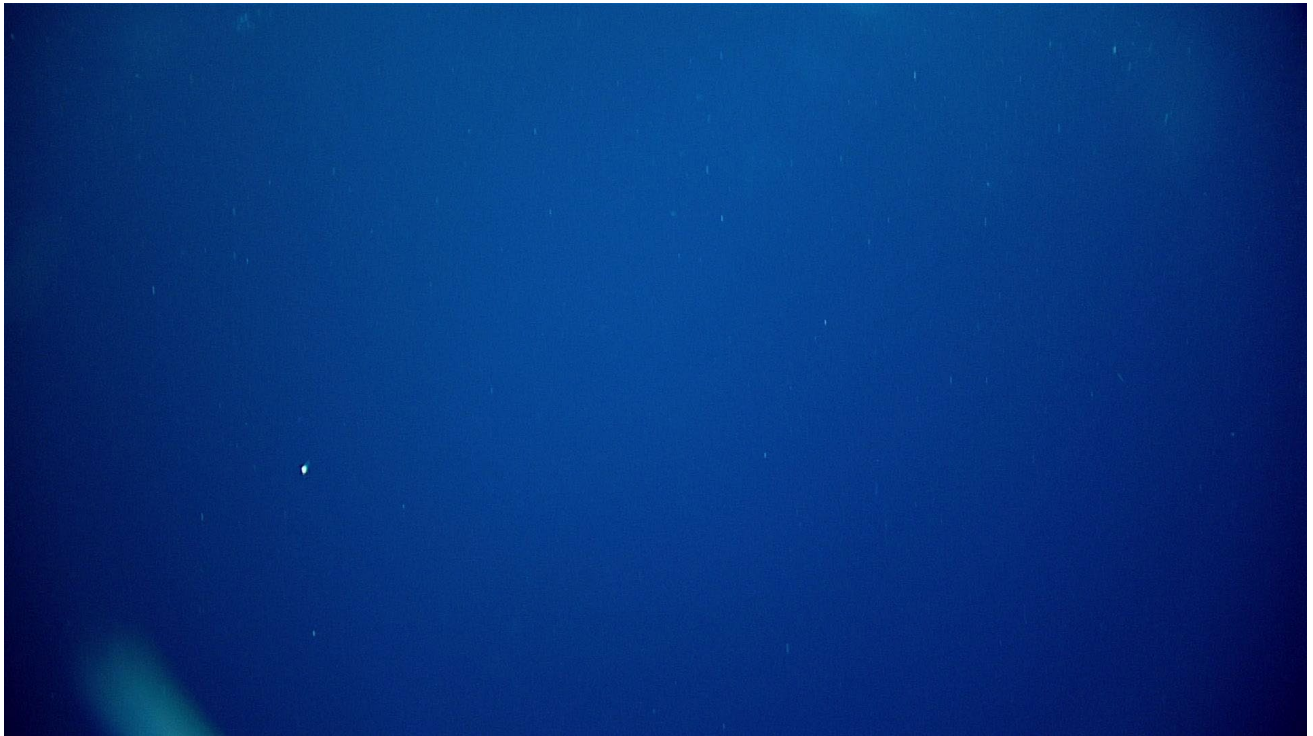
Oblique view of ROV dive track shown in white on 25 m resolution bathymetry, 3x vertical exaggeration, depth in meters.

Representative Photos of the Dive





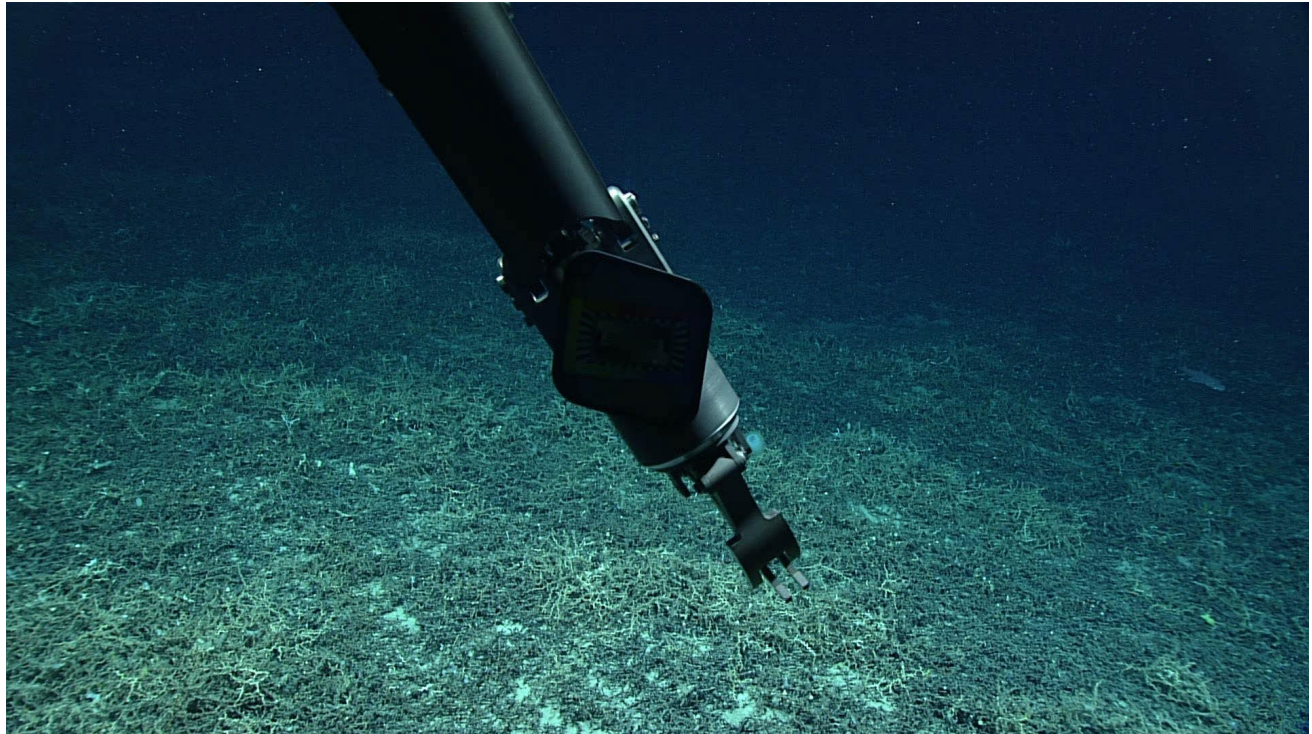
Samples Collected -



| | |
|------------|----------------|
| 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 |

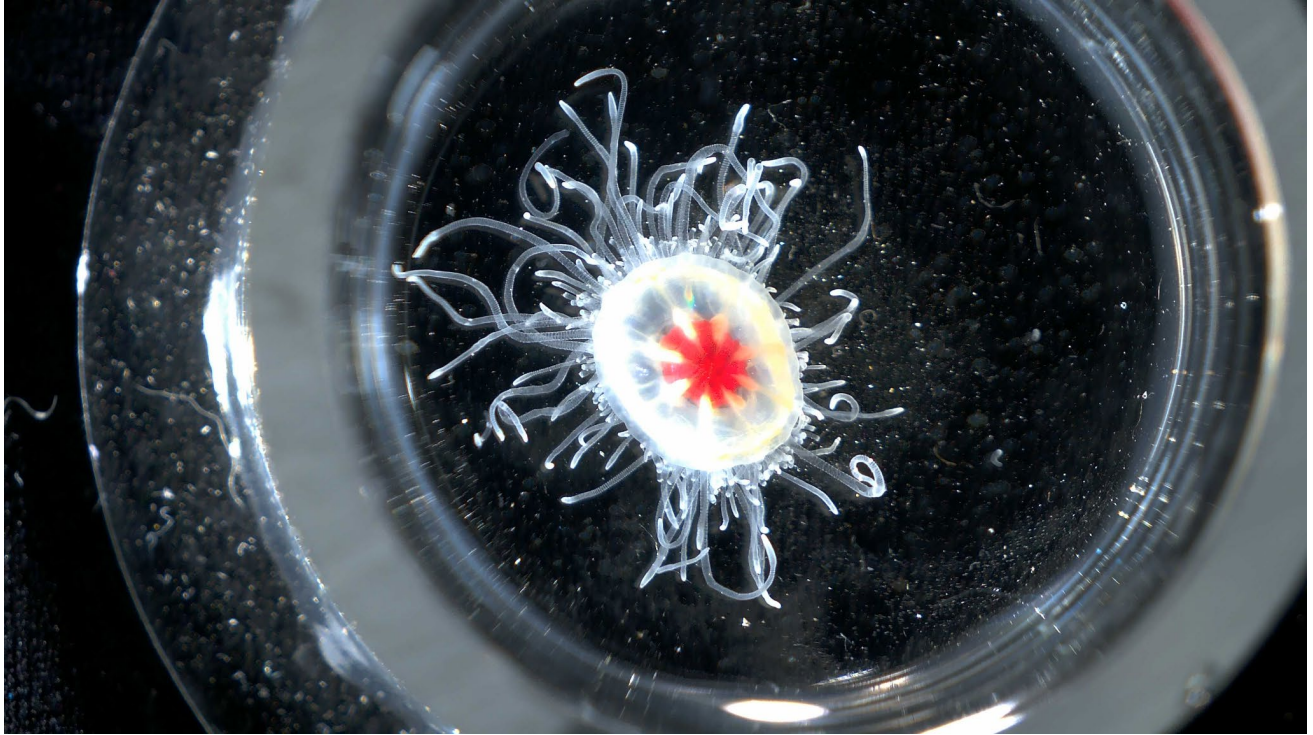


| | |
|------------|-----------------------|
| Sample ID | EX2107_D01_03B |
| Date (UTC) | 20211027 |
| Time (UTC) | 2:34:00 PM |

| | |
|-----------------------------|--------------------------|
| 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 |

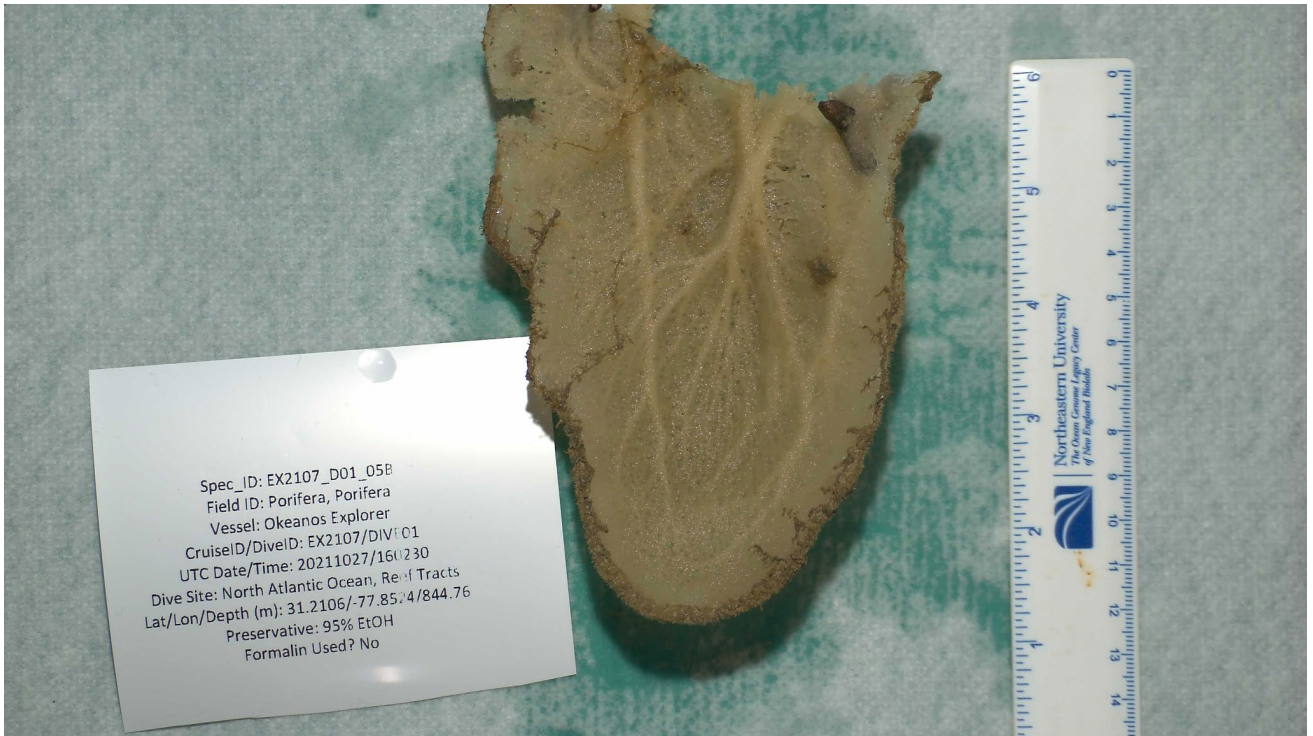
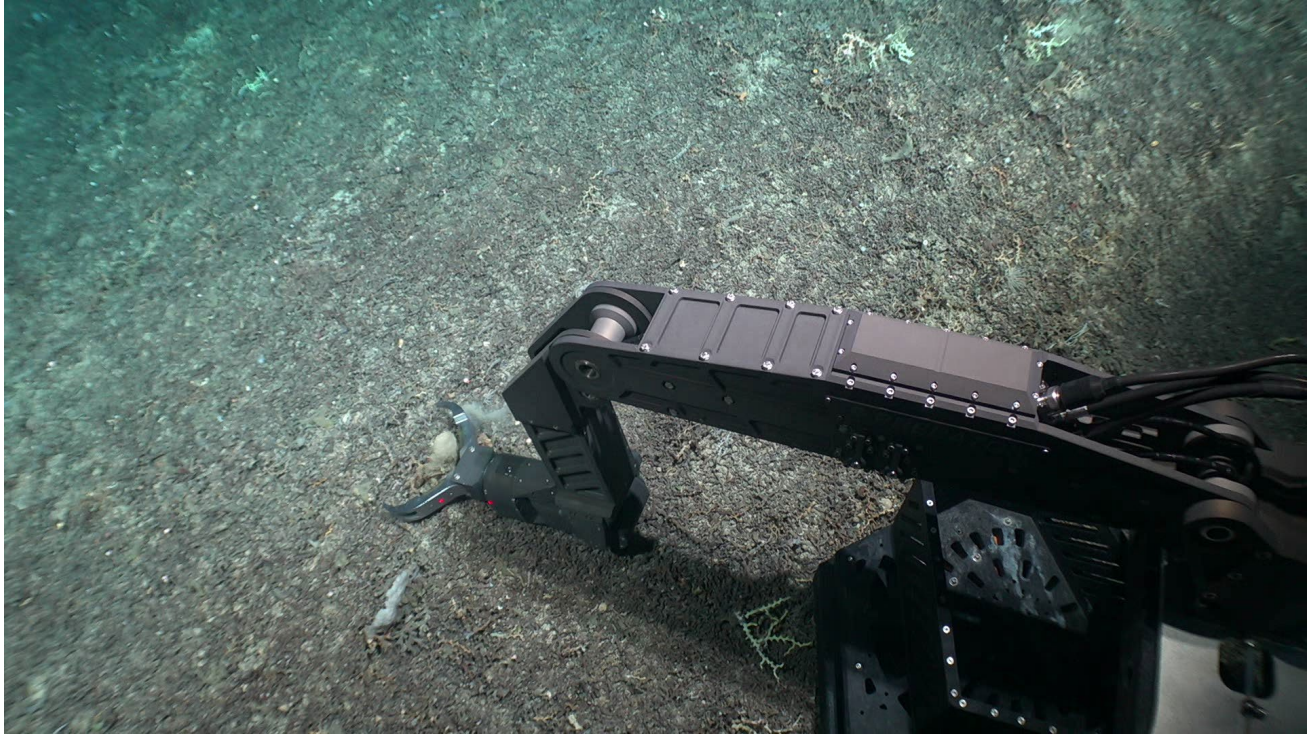
| Associates Sample ID | Field Identification | Count |
|---------------------------|---|-------|
| EX2107_D01_03B_01A | Anomura- Squat lobster; <i>Uroptychus</i> sp. | 1 |





| | |
|-----------------------------|--|
| 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. |

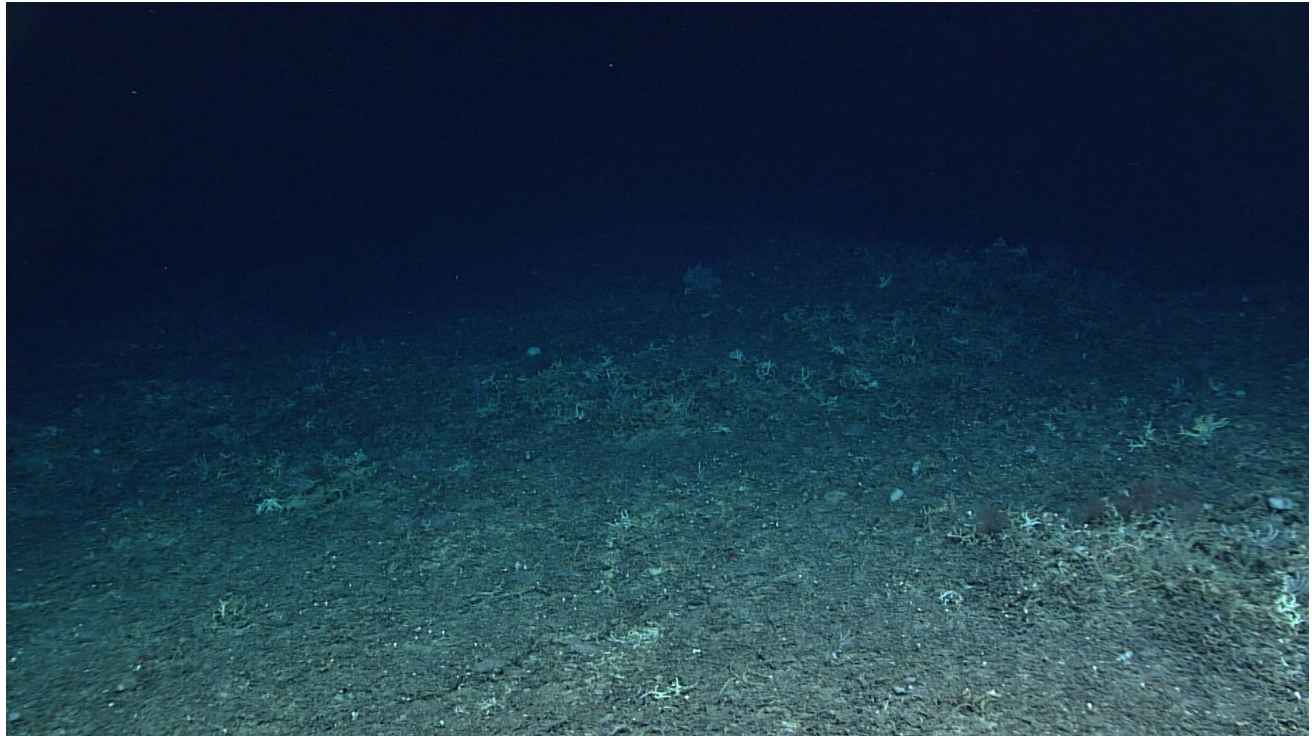
| Associates Sample ID | Field Identification | Count |
|----------------------|----------------------|-------|
| N/A | N/A | N/A |



| | |
|-----------------------------|-----------------------|
| 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 |

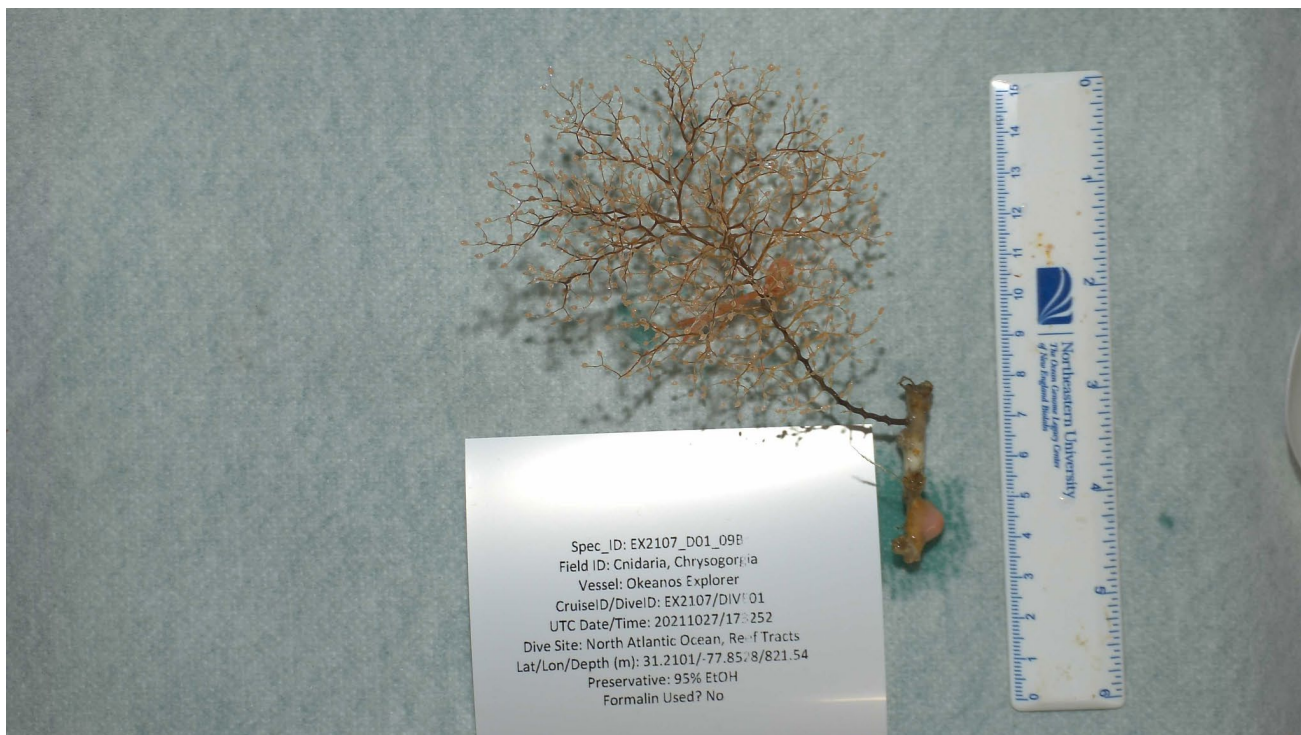
| Associates Sample ID | Field Identification | Count |
|----------------------|----------------------|-------|
| N/A | N/A | N/A |





| | |
|-----------------------------|---|
| 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 |





Spec_ID: EX2107_D01_10B
 Field ID: Cnidaria, Pseudodrifia
 Vessel: Okeanos Explorer
 CruiseID/DiveID: EX2107/DIV# 01
 UTC Date/Time: 20211027/17: 819
 Dive Site: North Atlantic Ocean, Reef Tracts
 Lat/Lon/Depth (m): 31.2101/-77.8578/821.49
 Preservative: 95% EtOH
 Formalin Used? No

| | |
|-----------------------------|--|
| 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 |

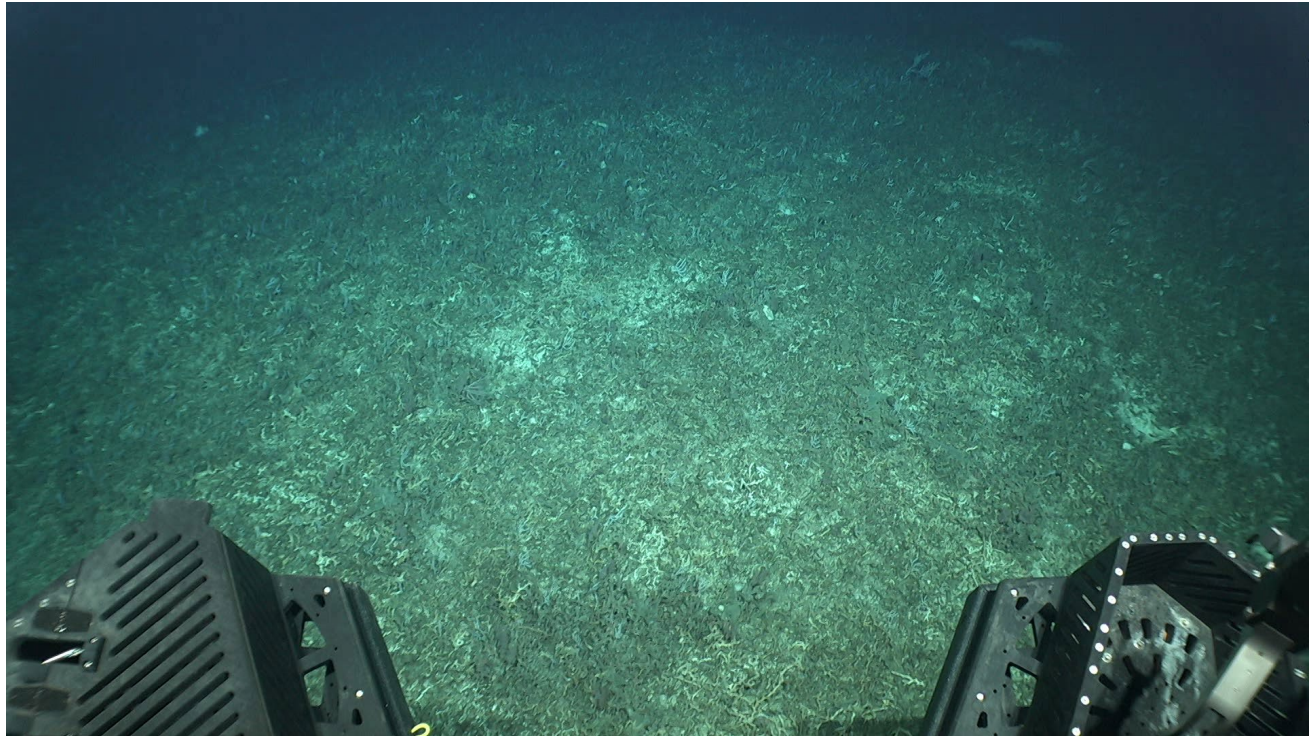
| Associates Sample ID | Field Identification | Count |
|----------------------|----------------------|-------|
| N/A | N/A | N/A |



| | |
|-----------------------------|-----------------------|
| 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