



## *Okeanos Explorer* ROV Dive Summary: EX-19-07, Dive 07, November 07, 2019

### Dive Information

|                         |   |
|-------------------------|---|
| General Location Map    |   |
| General Area Descriptor | U.S. Southeast, Northern Blake Plateau  |
| Site Name               | Habitat Response 01   |
| Science Team Leads      | Kimberly Galvez, University of Miami, Rosenstiel School of Marine and Atmospheric Science<br>Stephanie Farrington, Florida Atlantic University, Harbor Branch Oceanographic Institute |
| Expedition Coordinator  | Michael P. White, NOAA OER  |
| ROV Dive Supervisor     | Christopher Ritter, Global Foundation for Ocean Exploration   |
| Mapping Lead            | Shannon Hoy, NOAA OER   |

## ROV Dive Name

|             |  |
|-------------|--|
| Cruise      | 2019 Southeast U.S. Deep-sea Exploration |
| Dive Number | Dive 07                                  |

## Equipment Deployed

|  |  |                |                |
|--|--|----------------|----------------|
| ROV  | <i>Deep Discoverer</i>   |                |                |
| Camera Platform                            | <i>Seirios</i>   |                |                |
| ROV Measurements                           | ✓CTD   | ✓Depth         | ✓Altitude      |
|  | ✓Scanning Sonar  | ✓USBL Position | ✓Heading       |
|  | ✓Pitch   | ✓Roll          | ✓HD Camera 1   |
|  | ✓HD Camera 2   | ✓Low Res Cam 1 | ✓Low Res Cam 2 |
|  | ✓Low Res Cam 3   | ✓Low Res Cam 4 | ✓Low Res Cam 5 |
| Equipment Malfunctions                     | None   |                |                |
| ROV Dive Summary Data (from Processed ROV) | <p>In Water: 2019-11-07T13:33:22.455507<br/>31°, 0.96' N ; 78°, 23.3' W</p> <p>On Bottom: 2019-11-07T14:20:52.609495<br/>31°, 1.007' N ; 78°, 23.203' W</p> <p>Off Bottom: 2019-11-07T21:02:15.576094<br/>31°, 1.515' N ; 78°, 23.155' W</p> <p>Out Water: 2019-11-07T21:39:30.622045<br/>31°, 1.766' N ; 78°, 22.86' W</p> <p>Dive duration: 8:6:8</p> <p>Bottom Time: 6:41:22</p> <p>Max. depth: 807.0 m</p> |                |                |
| Special Notes                              |  |                |                |



## Scientists Involved (provide name, affiliation, email)

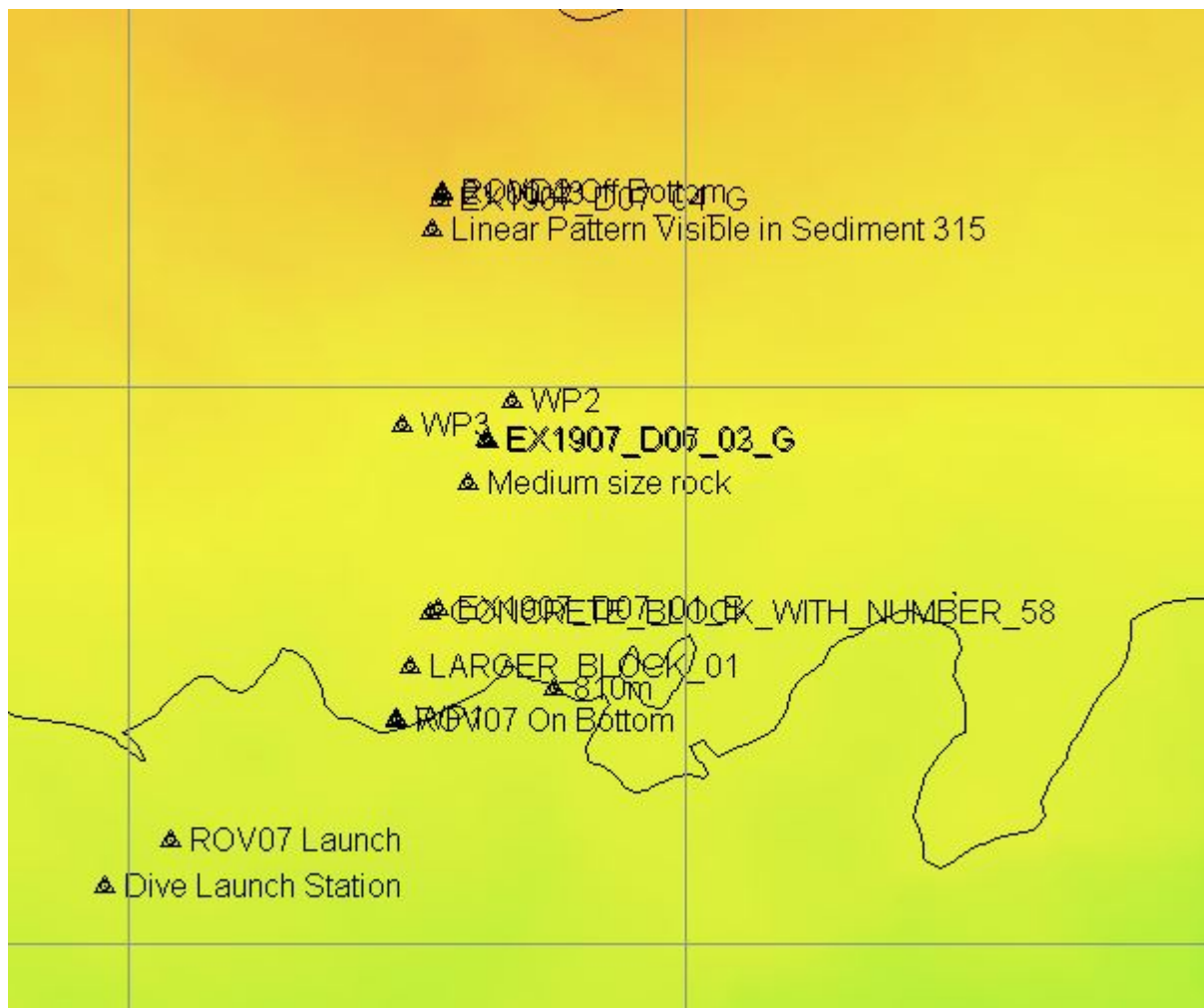
| Name                 | Affiliation  | Email                              |
|----------------------|--|------------------------------------|
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| Tina Molodtsova      | P.P.Shirshov Institute of Oceanology RAS                                 | tina@ocean.ru                      |
| Mark Muller          | Bureau of Ocean Energy Management  | mark.mueller@boem.gov              |
| Scott France         | University of Louisiana at Lafayette Department of Biology               | france@louisiana.edu               |
| James Masterson      | Florida Atlantic University. Harbor Branch Oceanographic Institute       | jmaster7@fau.edu                   |
| Michael Rasser       | Bureau of Ocean Energy Management  | michael.rasser@boem.gov            |
| Jason Chaytor        | United States Geologic Survey  | jchaytor@usgs.gov                  |
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| Megan McCuller       | North Carolina Museum of Natural Sciences                                | megan.mcculler@naturalsciences.org |
| Maria Cristina Diaz  | Florida Atlantic University. Harbor Branch Oceanographic Institute       | taxochica@gmail.com                |
| Heather Judkins      | University of South Florida  | judkins@mail.usf.edu               |
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| Robert Carney        | Louisiana State University   | rcarne1@lsu.edu                    |
|                      |  |                                    |
|                      |  |                                    |
|                      |  |                                    |
|                      |  |                                    |
|                      |  |                                    |



|                  |  |
|------------------|--|
| Dive Purpose     | <p>The purpose of this mission is to revisit a site that was historically subject to experimental deep sea mining to search for any signs of disturbance that can still be observed long after those activities occurred. We are hoping to gain insight into what impacts can be expected should future mining activities happen at other locations. Dives 7 and 8 are regional priorities for USGS and BOEM. Main objective is to acquire modern data over an area that has historically been subject to bottom disturbances</p>  |
| Dive Description | <p>Target: 810 m to 800 m deep, in the 1970s this was a test of the feasibility of some deep-sea mining techniques. In the 1980s: evaluated any environmental issues that may have occurred and added 100 concrete blocks to define markers at the region. The transect plotted out the previous dredge track and cross into where some mining occurred. This dive was more to observe the environmental response to disturbances over time. This data will be used with the archive data as a control for comparison by land-side scientists.</p> <p>Some of the target questions to answer on this dive: what species are here making use as habitat? What is here that may need to go into an environmental impact statement. What major elements and the coating on the rocks. - Jason Chaytor (USGS).</p> <p>The seafloor was covered in skeletal coarse carbonate sands (~&gt;250 µm) as we have seen in previous dives, except it is unlikely many coral fragments are among the sediments. On the sand, the seafloor was covered in unconsolidated Fe-Mn encrusted nodules ranging in sizes from 4-8 cm. During the dive, some areas showed the cobble-sized nodules in distinctive rows parallel to each other. Some sections contained exposed substrate with boulders of the Fe-Mn encrusted carbonate or phosphorite. Some areas appeared to have sediment drifts burying the exposed nodules with ripples showing current direction. There were 2 distinctive sites that appeared to have thick striations of cobbles and sands, as if something was dragged across the seafloor.</p> <p>The biota was sparse through the whole dive. Common species observed:</p> <p><b>Porifera:</b><br/> Pachastrella, Euplectellidae, oddly shaped euplectella, Lithistida (rock sponges: Leiodermatium and Coralostes type), Suberitida (golfball on a tee sponge or lollipop sponge), Pachastrellididae-Astrophorid, Haplosclerida (Potential for new species collected, EX1907_D07_01B) Hyalonema, volcano sponge: Petrosiidae (rare), Oceanapea tube, Ferrea, Leiodermatium.</p> <p><b>Cnidaria:</b><br/> Pink and yellow cup corals, hydroids, mephitidae, unbranched white octocoral c.f. Eunicella, Stylasters- common, jellyfish, Chrisogorgia, small cup corals (two closely related species were observed), Bathypsammia and Thecopsammia, primnoids, and corallimorphs.</p> <p><b>Echinodermata:</b><br/> Stalked and comatulid crinoids, Ariosoma- common, long white legged brittle star, Stylocidaris, tiny white star- 6 legs, 5 armed star, pudgy 5 leg star, goniaster, small gastropods.</p> <p><b>Fish:</b><br/> Benthodesmus or Lepidopus (related to cutlassfish but with caudal fin), Tongue fishes 7-8 cm (c.f. Cynoglossidae), Ogcocephalidae (batfishes), Sawbellies (Hoplostetetus), torpedo ray- c.f. Benthobatis, Ergasilid copepod parasite on 2 different cutthroat eels.</p> <p><b>Arthropoda:</b><br/> Portunidae (swimming crabs), small shrimps, squat lobsters, munnopsid isopods, and a decorator crab</p> <p>Several bird squid: Ornithoteuthis antillarum</p> |

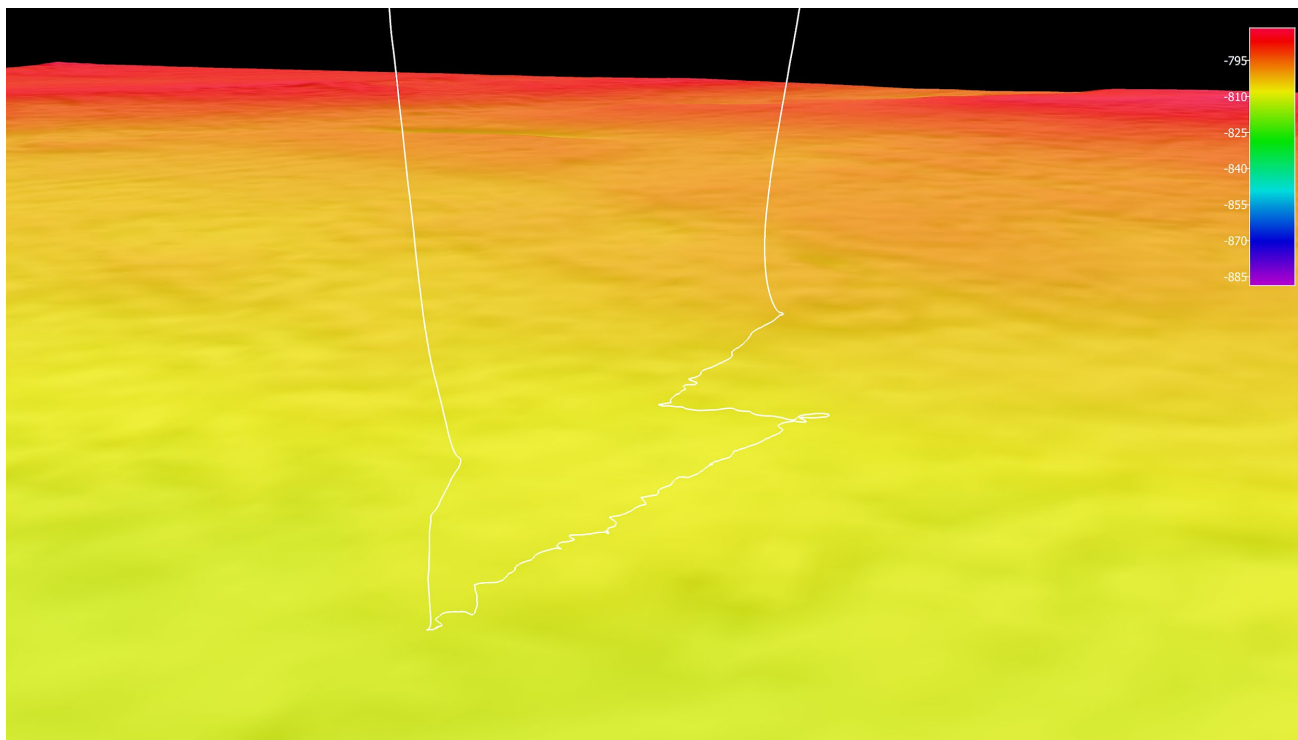
|   |   |
|---|---|
| Notable Observations  | Fe-Mn encrusted Nodules   |
| Community Presence/<br>Absence<br>(community is defined as more than two species) | X Corals and Sponges<br><input type="checkbox"/> Chemosynthetic Community<br><input type="checkbox"/> High biodiversity Community<br><input type="checkbox"/> Active Seep or Vent<br><input type="checkbox"/> Extinct Seep or Vent<br><input type="checkbox"/> Hydrates |
| CMECS Feature Type  | Flat  |
| SeaTube Link (science annotation system)  | <a href="https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&amp;resourceId=23621&amp;divId=3810">https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&amp;resourceId=23621&amp;divId=3810</a>   |

## Overall Map of the ROV Dive Area



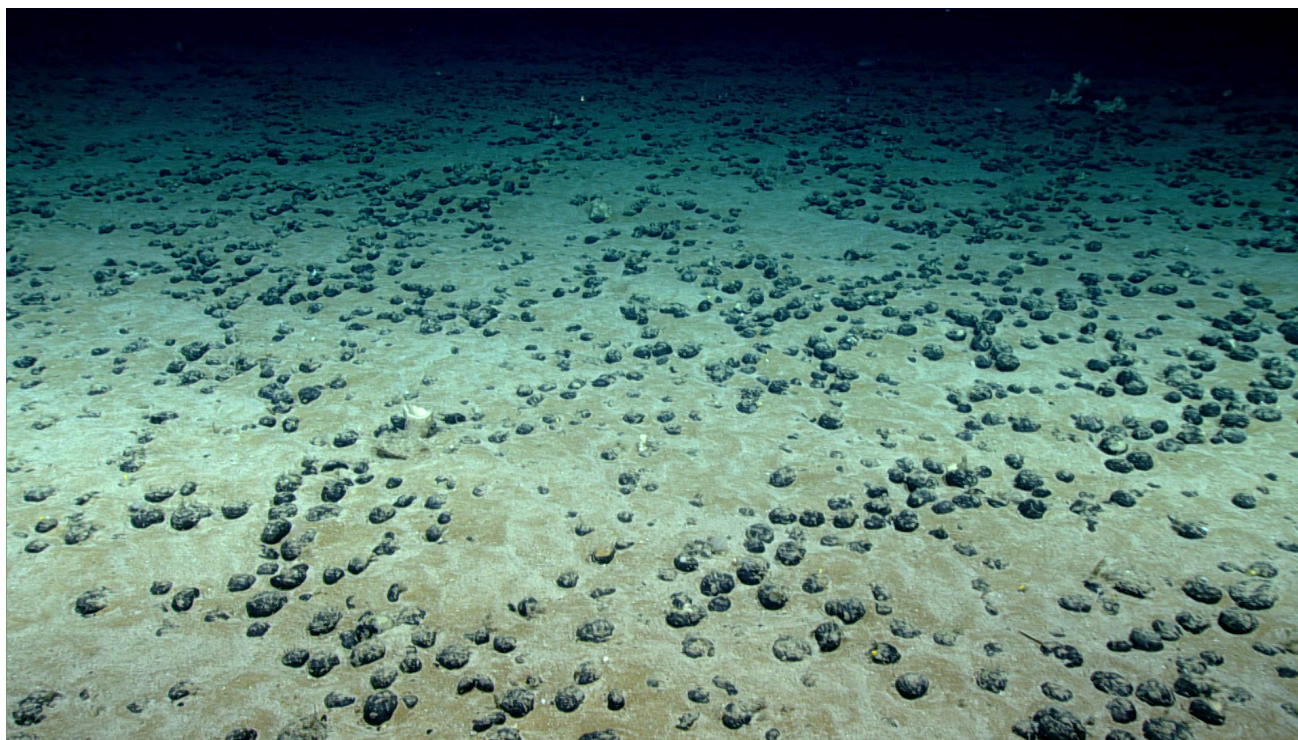


## Close-up Map of Main Dive Site



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

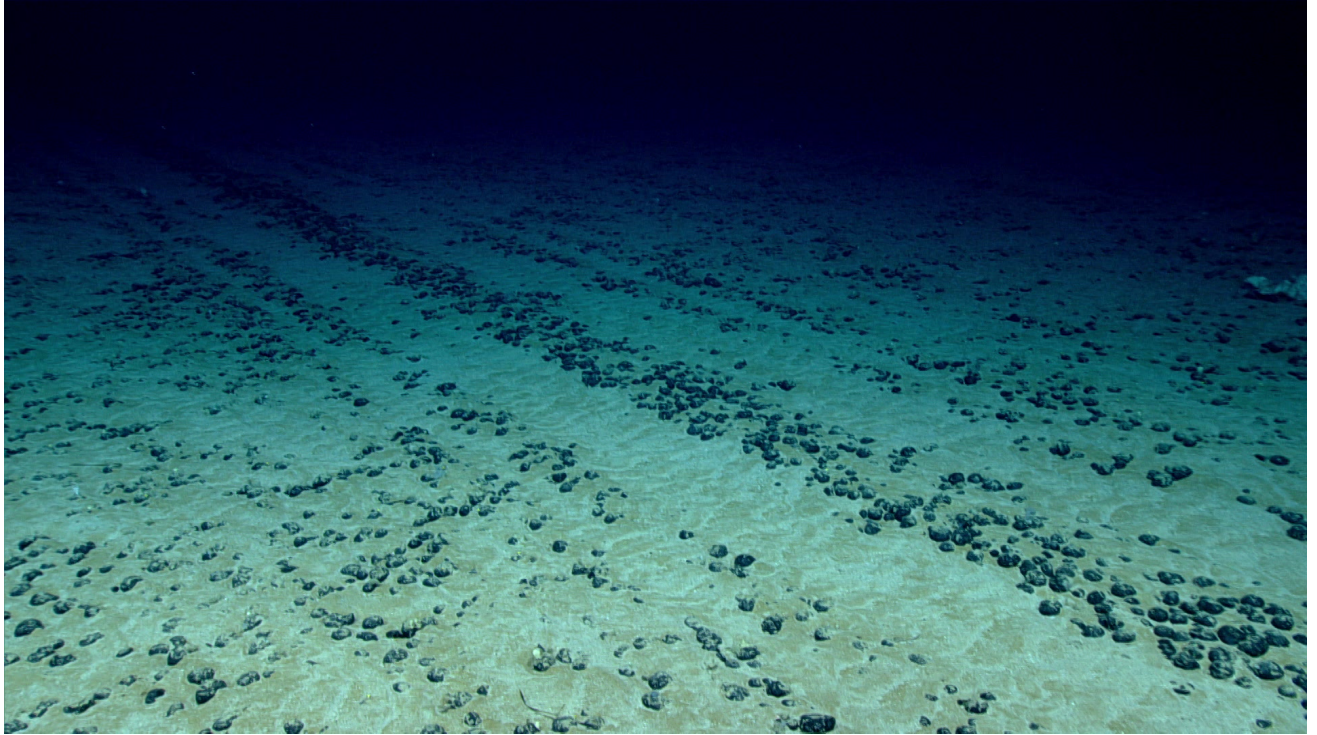


Typical sandy bottom with 5-15 cm cobble size nodules.

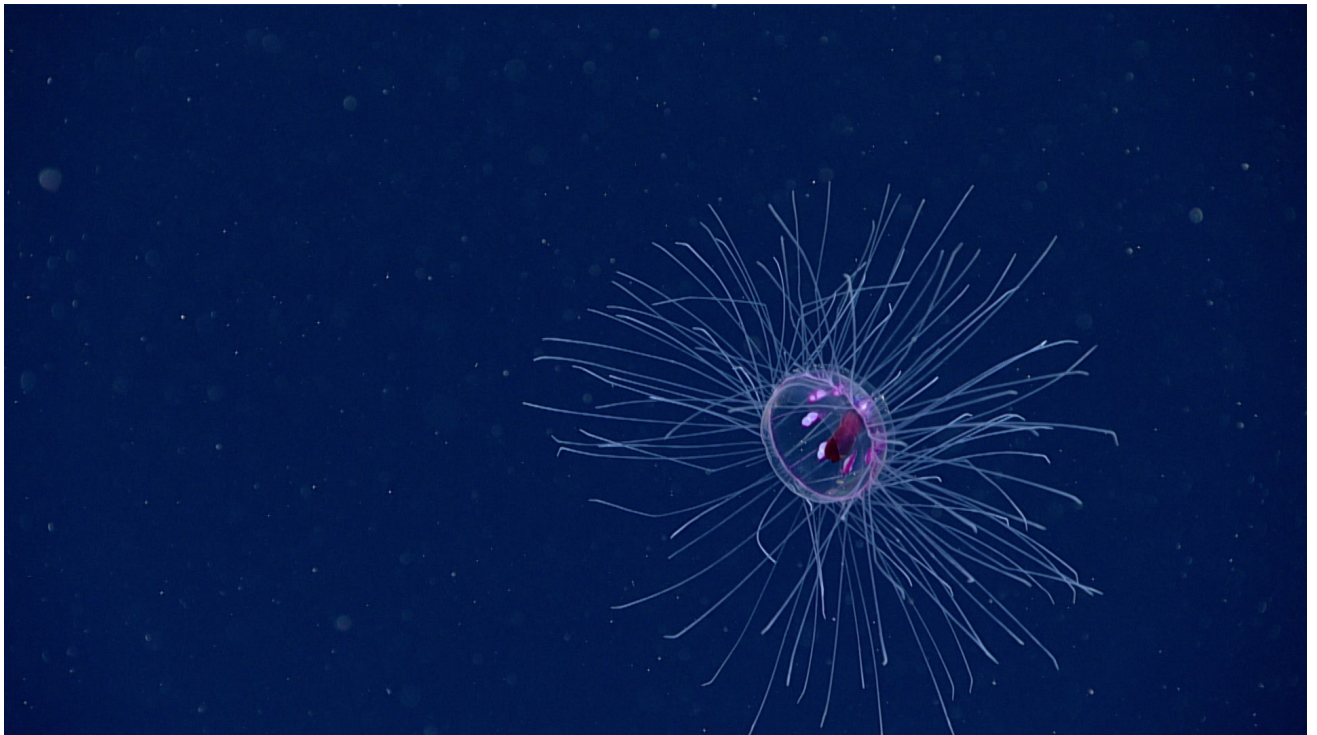


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Distinct lines in the sediment seen toward the end of the dive.



An amazing jelly - *Crossota millsae* feeding in the water column above the substrate.

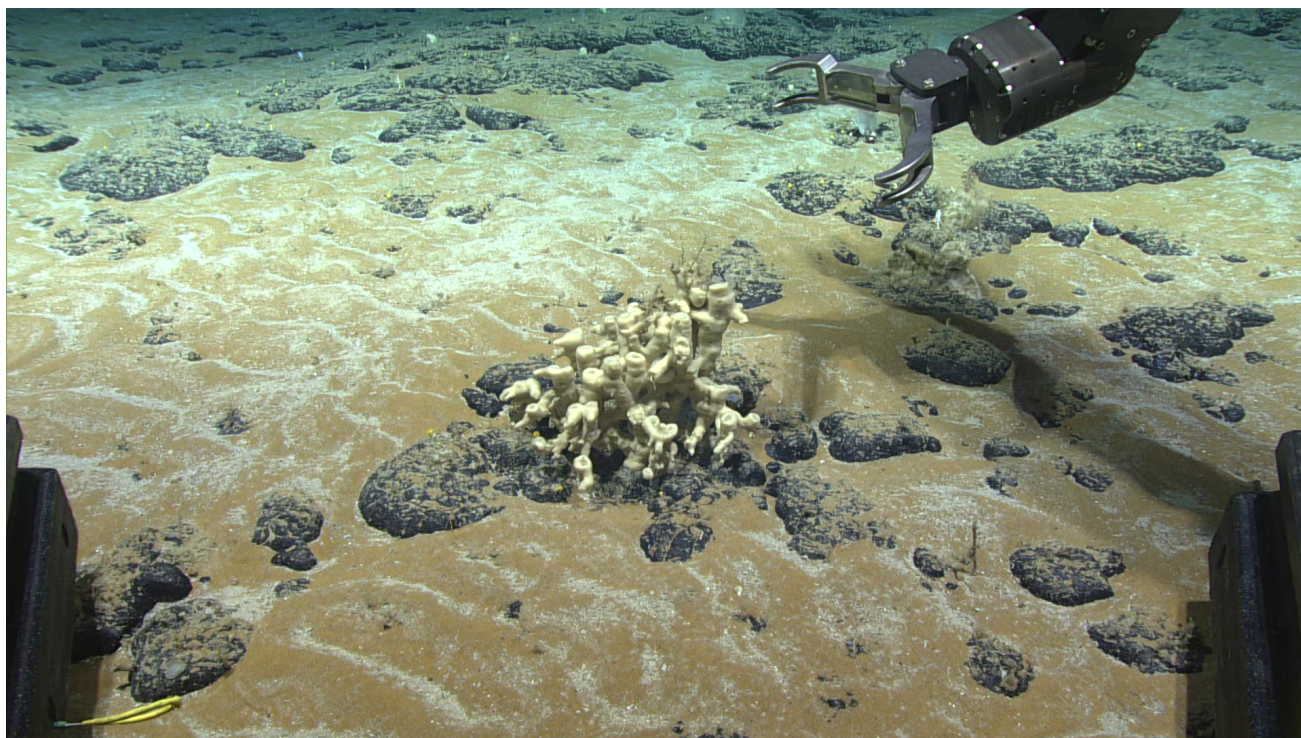






Haplosclerida sponges were the most common species in the area.

## Samples Collected -



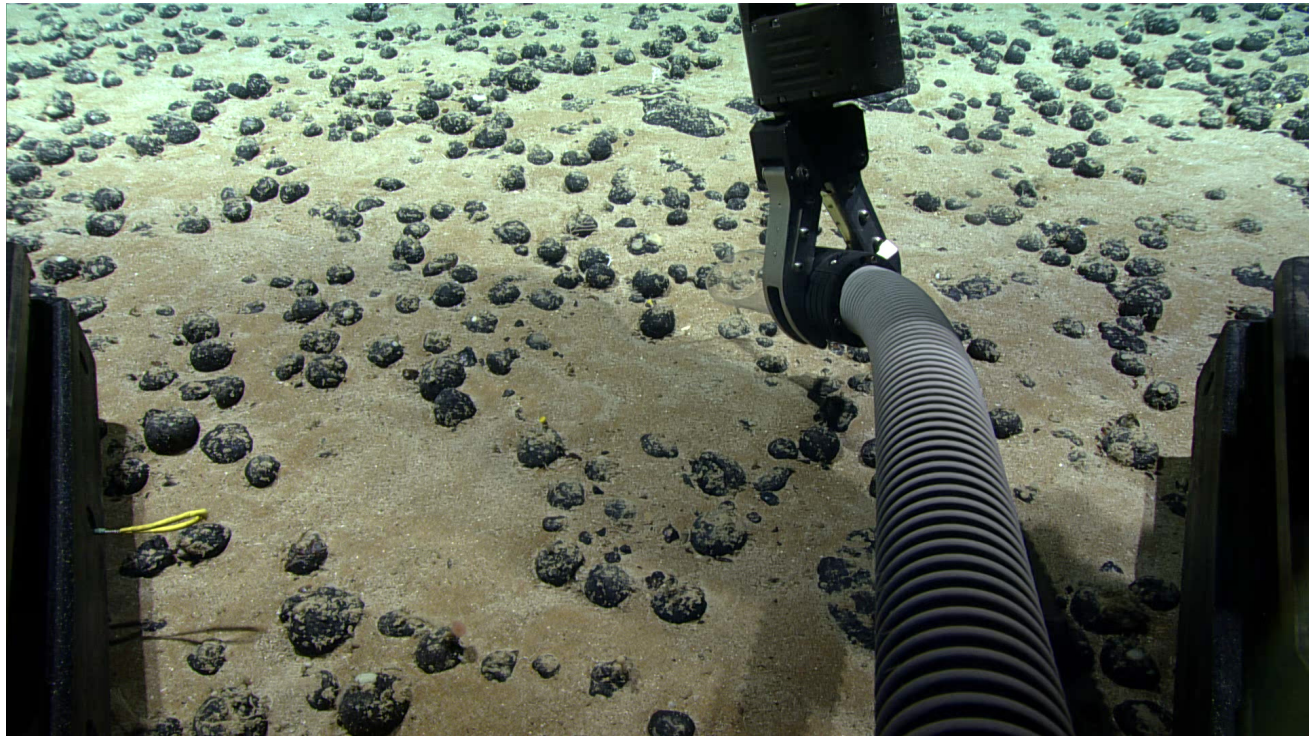
|            |                   |
|------------|-------------------|
| Sample ID  | EX1907_D07_01B    |
| Date (UTC) | November 07, 2019 |
| Time (UTC) | 15:48             |
| Depth (m)  | 805 m             |



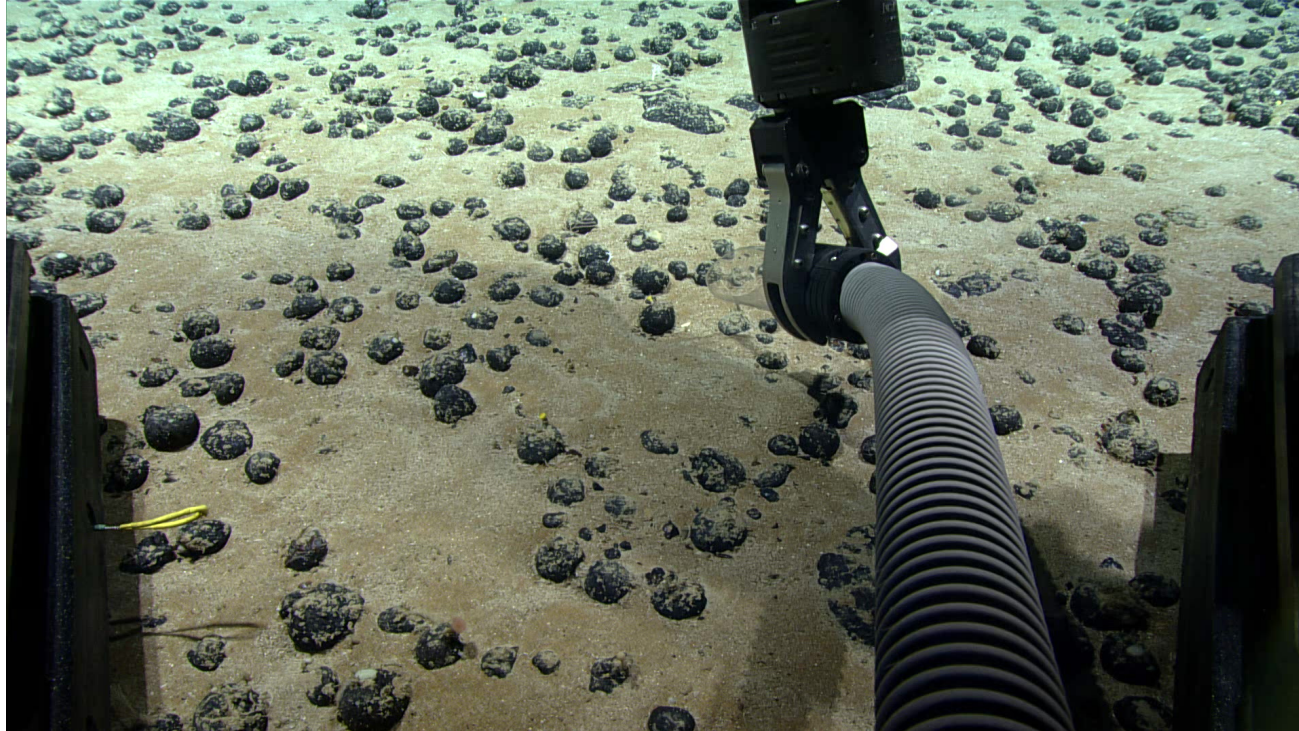
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|             |   |                      |       |
|-------------|---|----------------------|-------|
| Temp. (°C)  | 8.921   |                      |       |
| Field ID(s) | Haplosclerida   ID: 131598 [WORM]   |                      |       |
| Associates  |   |                      |       |
|             | Associates Sample ID  | Field Identification | Count |
|             |   |                      |       |
|             |   |                      |       |
| Comments    | Potential for new species.<br>cluster of hollow tubes. tan. 30 cm wide and 20 cm tall. port inner |                      |       |



|             |   |                         |       |
|-------------|---|-------------------------|-------|
| Sample ID   | EX1907_D07_02G                                    |                         |       |
| Date (UTC)  | November 07, 2019                                 |                         |       |
| Time (UTC)  | 18:02   |                         |       |
| Depth (m)   | 805 m   |                         |       |
| Temp. (°C)  | 8.927   |                         |       |
| Field ID(s) | Rock cobble and                                   |                         |       |
| Associates  |   |                         |       |
|             | Associates Sample ID                              | Field Identification    | Count |
|             | EX1907_20191107T180834_D2_DIVE07_SPEC02GEO_A01    | cup coral- Scleractinia | 1     |
|             | EX1907_20191107T180834_D2_DIVE07_SPEC02GEO_A02    | Stylaster               | 1     |
| Comments    | 10 cm cobble with black crust. 2 small 5 cm rocks |                         |       |



|             |  |                      |       |
|-------------|--|----------------------|-------|
| Sample ID   | EX1907_D07_03G   |                      |       |
| Date (UTC)  | November 07, 2019  |                      |       |
| Time (UTC)  | 18:02  |                      |       |
| Depth (m)   | 805 m  |                      |       |
| Temp. (°C)  | 8.929  |                      |       |
| Field ID(s) | Sediment   |                      |       |
| Associates  | Associates Sample ID   | Field Identification | Count |
|             |  |                      |       |
|             |  |                      |       |
| Comments    | Stop to sample EX1907_D07_03G<br>Sediment at the same time- Suction bucket 5 |                      |       |





|             |   |                      |       |
|-------------|---|----------------------|-------|
| Sample ID   | EX1907_D07_04G  |                      |       |
| Date (UTC)  | November 07, 2019   |                      |       |
| Time (UTC)  | 20:54   |                      |       |
| Depth (m)   | 801   |                      |       |
| Temp. (°C)  | 8.938   |                      |       |
| Field ID(s) | Rock Cobbles- 10-15 cm spherical  |                      |       |
| Associates  | Associates Sample ID  | Field Identification | Count |
|             |   |                      |       |
|             |   |                      |       |
| Comments    | Stop to collect EX1907_D07_04G<br>Rock Cobble.<br>15 cm rock - x2<br>SB inner |                      |       |

### Please direct inquiries to:

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