



# Okeanos Explorer ROV Dive Summary

## Dive Information

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

## ROV Dive Name

<p>Cruise</p>	<p>2019 Southeast U.S. Deep-sea Exploration</p>
<p>Dive Number</p>	<p>Dive 06</p>

## 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: 2019-11-06T13:22:39.388736 30°, 45.594' N ; 78°, 44.553' W</p> <p>On Bottom: 2019-11-06T14:03:43.928687 30°, 45.548' N ; 78°, 44.778' W</p> <p>Off Bottom: 2019-11-06T23:01:05.373780 30°, 46.217' N ; 78°, 44.668' W</p> <p>Out Water: 2019-11-06T23:39:37.049694 30°, 46.34' N ; 78°, 44.457' W</p> <p>Dive duration: 10:16:57</p> <p>Bottom Time: 8:57:21</p> <p>Max. depth: 842.0 m</p>		
Special Notes	Pre-planned extended dive 2 by 2 hours because we were spending an hour in midwater jumping from mound 1 to mound 2.		



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

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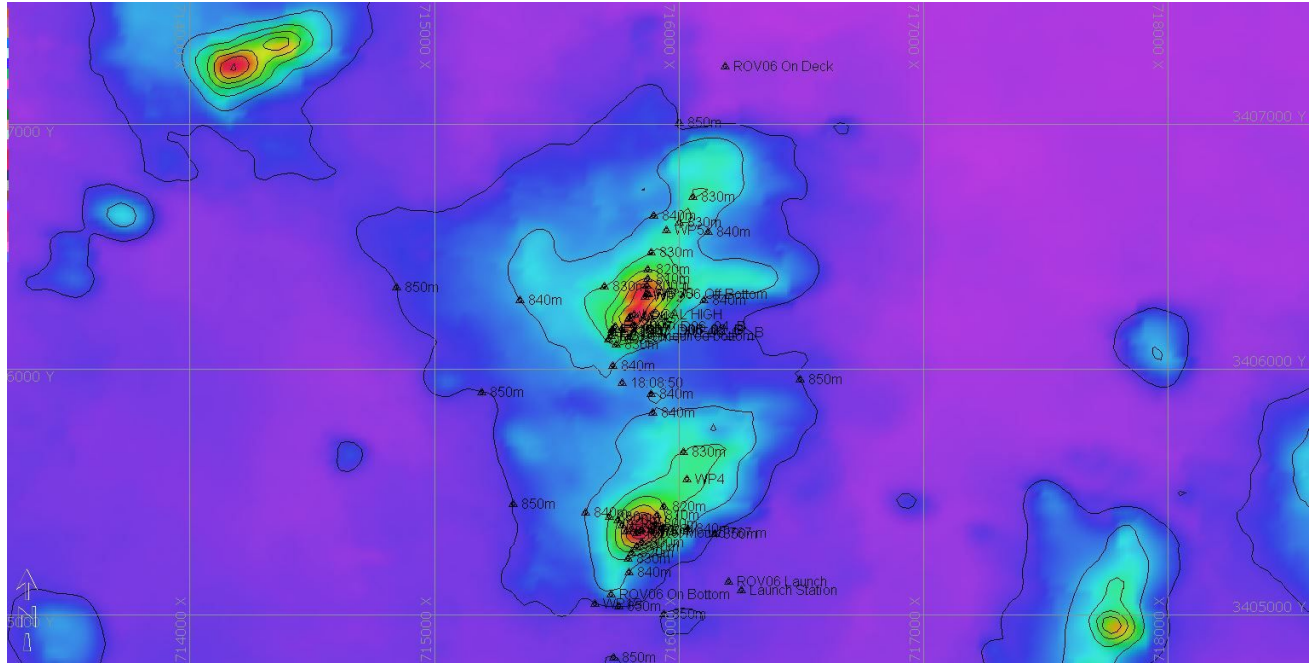
Dive Purpose	Dive is located on mapping data from EX1906. As part of our OER objective to map and characterize the deep US EEZ, these dives will be used to characterize newly generated mapping data. The mound features this dive is located on are known hotspots of biodiversity on the Blake Plateau. Dive is located outside of the Stetson-Miami Terrace HAPC and will provide information regarding connectivity of deep-water communities in and outside the HAPC. Dive is planned in an area that was recently mapped and contains interesting seafloor features that warrant further exploration. Dive objective will be to characterize newly acquired mapping data.
Dive Description	<p>Target: two Large mounds 780 - 840 m deep, 1400 m track planned includes a mid-water ROV-pull over the space between the mounds and extending the dive for 2 hours. We landed on the south toe-of-slope of the southern mound and headed north. The current conditions allowed a northern transect.</p> <p>On Bottom: coarse sands with <i>L. pertusa</i> coral rubble with phosphorite crust. Some of the first biota observed were white hexactinellid fan sponges, <i>Ophiocreas</i> (ECH), hydroids, small white sparsely branched octocorals, <i>Pentametrocrinus atlanticus</i> (5-armed crinoid) and <i>Ariosoma bellii</i> (ECH) but sparse in another otherwise barren on the 20° slope heading up the southern slope of mound. At the plateau area at the base of mound 1 there was an increase in biota and the coral rubble continues with more of the framework structure intact and a scattered sponge garden at the top. We saw a few <i>Solmissus</i> jellyfish in the water column. A pycnogonid sea spider with younglings surrounding the body was seen. At this location, primnoid octocorals and a few bright yellow sponges that were previously collected was observed and the sponge diversity increases, including a thicker Rapsillediae (POR- mesh fan) at the plateau. We also spotted a <i>Pteroctopus tetracirrhus</i> octopus. <i>Lophelia</i> coral rubble frameworks become denser as we go upslope with little exposed carbonate substrate. Along the slope, <i>Heterotella</i> (POR) and some standing dead coral density increased and we spot a 4 legged seastar (<i>Henrecia cf. antelarium</i>) and <i>Remaster palmatus</i> (ECH). About 1/3 way up the slope the slope angle increased to 45° and an increase in dead coral rubble was seen along with a <i>Solaster</i> sp. and <i>Gilbertaster caribaea</i> sea stars, various solitary cupcorals and an <i>Ornithoteuthis antillarum</i> (a bird squid) in the water column displaying a defensive posture.</p> <p>On the top of mound one we found a healthy living <i>Lophelia</i> reef with abundant 3-4 m wide coral heads with standing dead corals about +50% cover as the remaining substrate was standing dead corals. <i>Aphocolistes</i> (glass sponge) was abundant along with cupcorals, <i>Henricia</i> and <i>Eumunida picta</i> (squat lobsters). There were only a few black corals including <i>Leiopathes</i> sp. and <i>Stichopathes</i> sp. On the northern side of the mound there was less living coral, but still lots of sporadic <i>Lophelia</i> thickets. On the eastern flank, ~ 50% of the <i>Lophelia</i> reef was living and 100% cover of dead coral across the bottom on a 45-50° slope at the peak of mound 1.</p> <p>Jumped over to mound 2 by dragging the ROV midwater for ~1 hour.</p> <p>Mound 2: At about 1/4 way up slope of southern flank of mound 2 there was 100% cover dead <i>Lophelia</i> rubble with 25% standing dead coral rubble. <i>C.f. Pachasterllida</i> sponges and nepthead corals were seen. We spotted a pink <i>Brisingida</i> sea star with 12 arms and spines on the sides of each arm, Chris Mah (NMNS) described each as a fine sock with pedisalaria. Also common were stalked crinoids with hydroids on the stalks. Coming up slope, we stop to collect EX1907_D06_01B, a 10 cm <i>Aphrocallistes</i> for an ASPIRE collection. Another 20 armed stalked crinoid was seen along with <i>Pentametrocrinus atlanticus</i>.</p> <p>A 10 cm wide yellow mesh fan bryozoan (potentially new genus) on the south flank of the 2nd mound was observed and collected (EX1907_D06_02B), possibly <i>c.f. Canda</i> sp. The branches laterally connected causing a distinct square mesh. As we were collecting the Bryozoan we also</p>



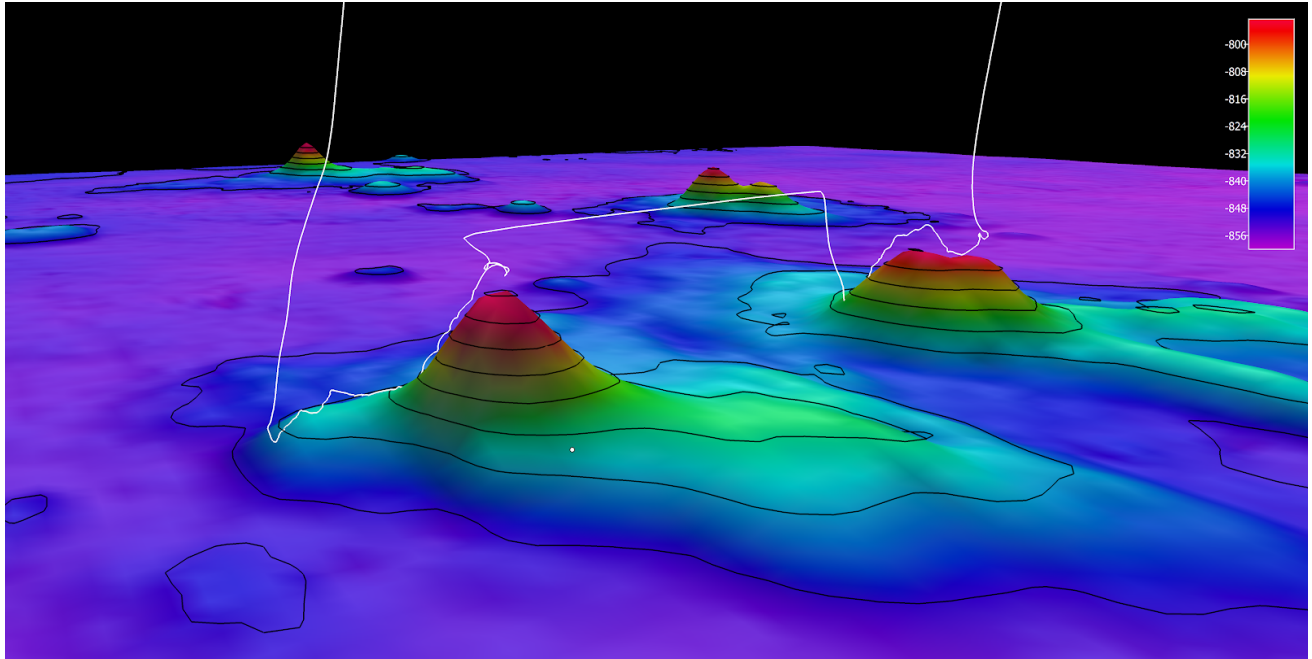
	<p>collected EX1907_D06_03G- <i>Lophelia</i> rubble. Common are <i>Ophiocreas</i> (not <i>Ophiothrix</i> as stated in previous reports). We also collected living <i>Lophelia pertusa</i> (EX1907_D06_04B) a 20 cm tall white colony as an ASPIRE collection. Spotted in this area of the slope was also a black-bellied rosefish.</p> <p>At 798 m, thickets of <i>Enallopsamia c.f. rostrata(?)</i> or <i>c.f. profunda</i> with an increase in density of standing dead coral frameworks. There was another sighting <i>Gilbertaster caribaea</i> star at this location. On the southwest side coral thickets increased to 50% cover of living <i>Lophelia</i>. Sighted was <i>Echinus tyloides</i> (knotted sea urchin) and <i>Haplosclerida</i> chimney sponges. Living coral increased in as we got closer to the top of pinnacle 1 of mound 2. There was a 10-20% live coral cover on the northern side of mound 2. Coral abundance decreased as well as most fauna. The back side of mound 2 is 100% coral rubble. At the top of the second summit of mound 2 there was an increase in <i>Lophelia</i> again. The dominant reef returned with 50%+ living coral with &gt; 3-5 m wide coral thickets along with an increase in <i>Aphrocallistes</i> sponges abundance.</p>
Notable Observations	Dense lophelia thickets on two separate mound features.
Community Presence/Absence (community is defined as more than two species)	<p>X Corals and Sponges</p> <ul style="list-style-type: none"> <li>✓ Chemosynthetic Community</li> </ul> <p>X High biodiversity Community</p> <ul style="list-style-type: none"> <li>✓ Active Seep or Vent</li> <li>✓ Extinct Seep or Vent</li> <li>✓ Hydrates</li> </ul>
CMECS Feature Type	Mounds, Slope
SeaTube Link (science annotation system)	<a href="https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&amp;resourceId=23621&amp;divId=3800">https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&amp;resourceId=23621&amp;divId=3800</a>



# Overall Map of the ROV Dive Area



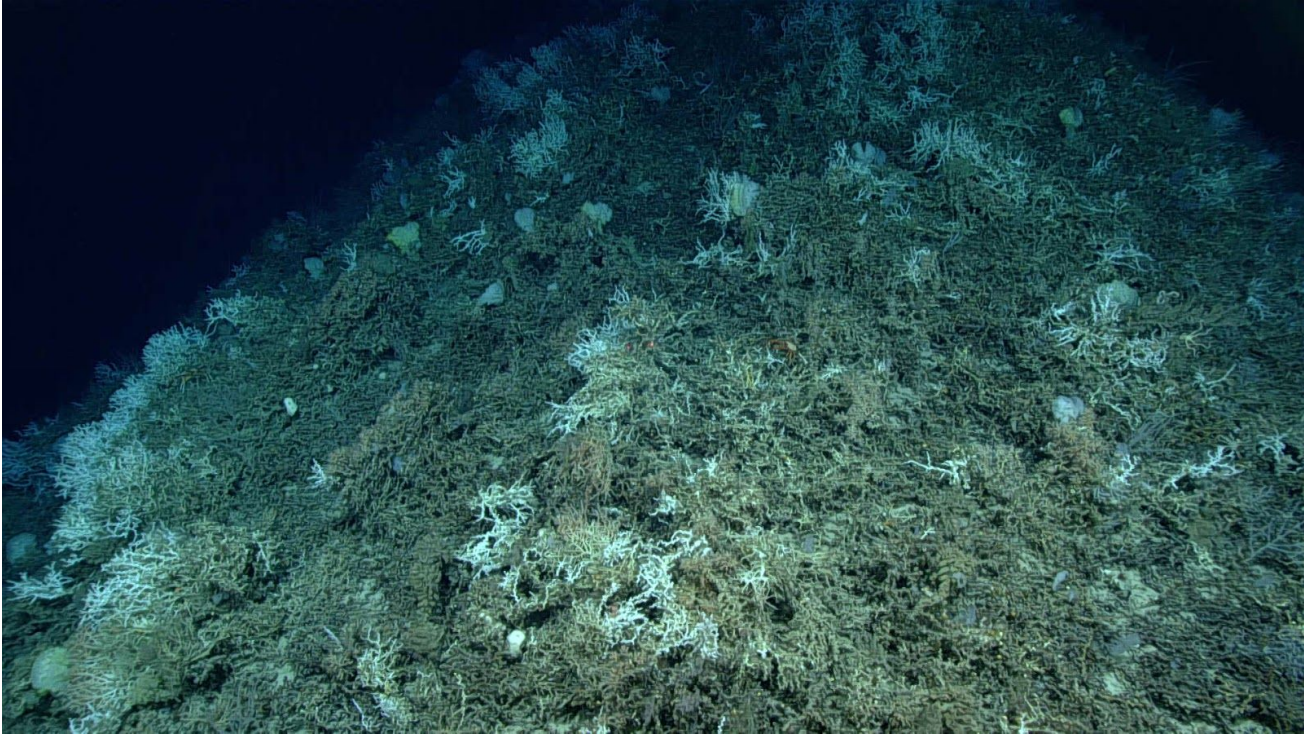
## Close-up Map of Main Dive Site



Smoothed ROV dice track in white on 25x25 cell size bathymetry, 3x vertical exaggeration, depth in meters, 10 meter contours



**Representative Photos of the Dive**



Top of the Lophelia mound 1





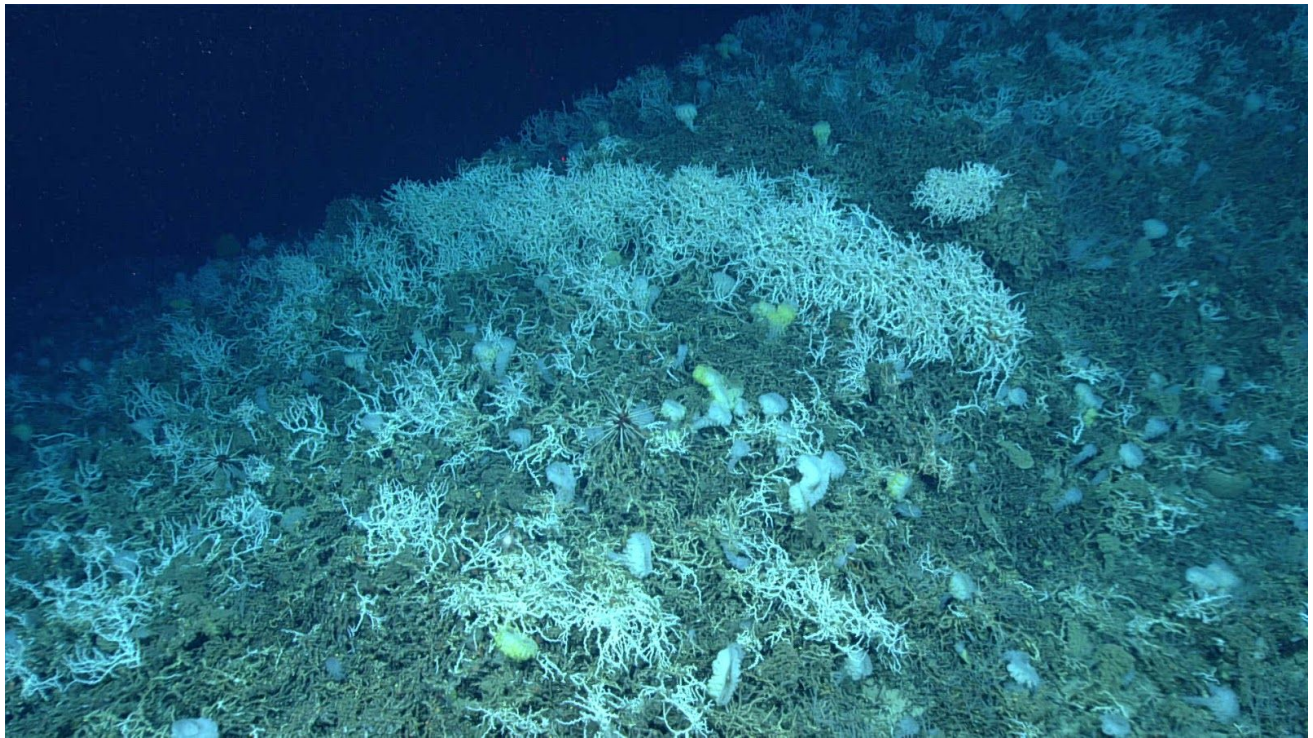


Pycnogonida with babies



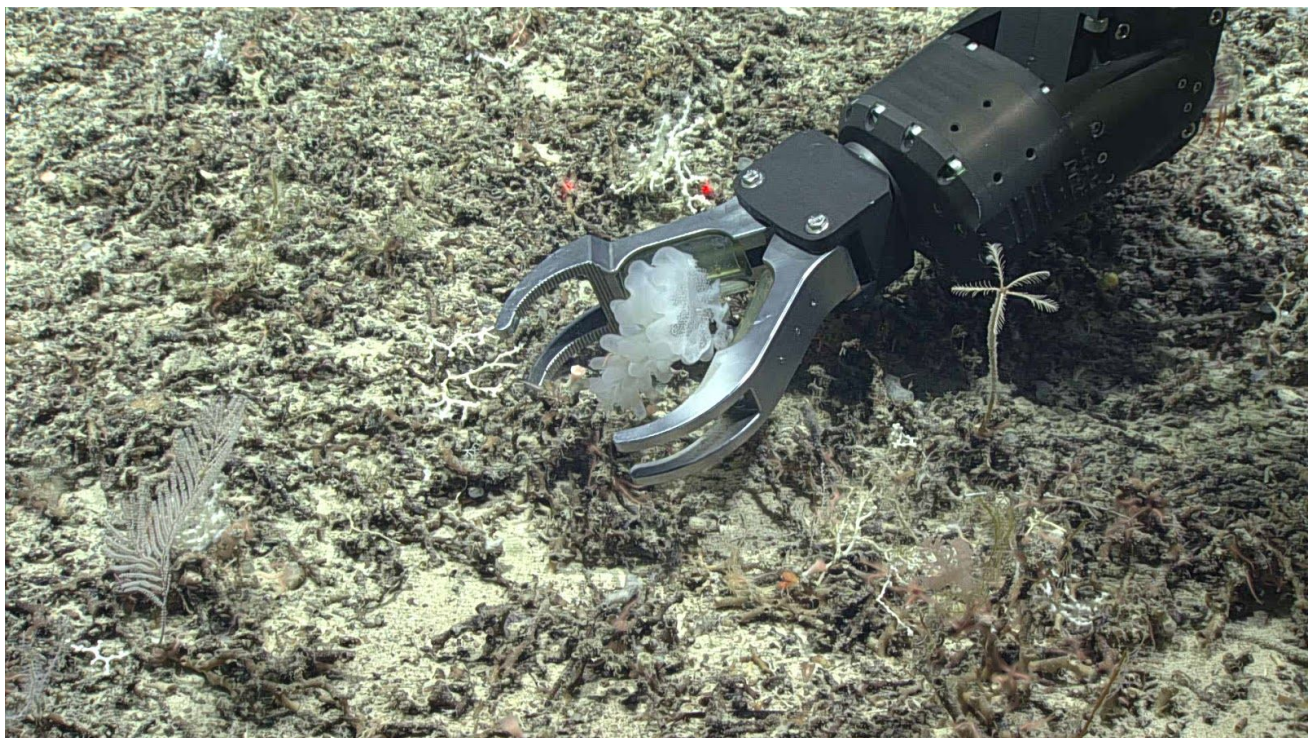
20+ armed crinoid.





5 m long Lophelia thicket on the top of the last pinnacle of the dive.

## Samples Collected -



Sample ID	EX1907_D06_01B		
Date (UTC)	November 06, 2019		
Time (UTC)	19:21		
Depth (m)	819 m		
Temp. (°C)	8.534		
Field ID(s)	Aphrocallistes beatrix   ID: 134380 [WORM]		
Associates			
	Associates Sample ID	Field Identification	Count
Comments	10 cm Aphrocallistes, ASPIRE collection.DNA sub sample, suction bucket 1		

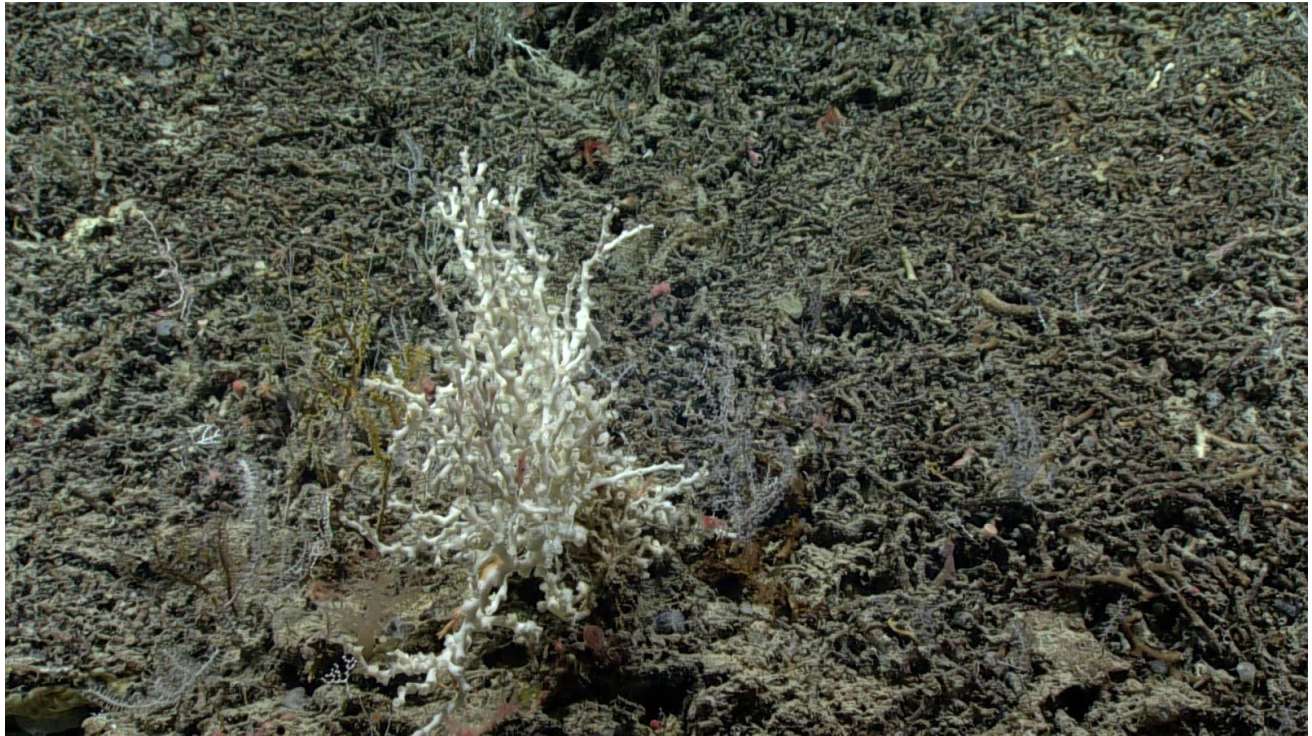


Sample ID	EX1907_D06_02B		
Date (UTC)	November 06, 2019		
Time (UTC)	19:58		
Depth (m)	813 m		
Temp. (°C)	8.534		
Field ID(s)	Canda   ID: 205600 [WORM] (c.f. Canda sp. or cf. Reteporellina)		

Associates	Associates Sample ID	Field Identification	Count
Comments	10 cm Yellow mesh fan. Branches laterally connected causing a distinct square mesh Starboard inner		



Sample ID	EX1907_D06_03G		
Date (UTC)	November 06, 2019		
Time (UTC)	19:58		
Depth (m)	813 m		
Temp. (°C)	8.534		
Field ID(s)	Sediment		
Associates	Associates Sample ID	Field Identification	Count
Comments	sediment collected in canister 2 unintentionally while collecting sample 02B		



Sample ID	EX1907_D06_04B		
Date (UTC)	November 06, 2019		
Time (UTC)	20:24		
Depth (m)	805 m		
Temp. (°C)	8.534		
Field ID(s)	Lophelia pertusa (spider hazards; white stony coral)   ID: 135161 [ <a href="#">WORM</a> ]		
Associates	Associates Sample ID	Field Identification	Count
	EX1907_20191106T203231_D2_DIVE06_SPEC04BIO_A01	barnacle	1
	EX1907_20191106T203231_D2_DIVE06_SPEC04BIO_A02	sediment and coral rubble	1
Comments	20 cm tall white colony, ASPIRE collection, DNA, Suction #3		

**Please direct inquiries to:**

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