

## *Okeanos Explorer* ROV Dive Summary: EX-19-07, Dive 11, November 18, 2019

### Dive Information

General Location Map	
General Area Descriptor	35 nautical miles southeast of Key West
Site Name	Key West Deep
Science Team Leads	Kimberly Galvez, University of Miami, Rosenstiel School of Marine and Atmospheric Science 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

Cruise	2019 Southeast U.S. Deep-sea Exploration
Dive Number	Dive 11

ROV	Deep Discoverer					
Camera Platform	Seirios					
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)	<div>Dive Summary:EX1907_DIVE11 ^^  In Water:                      2019-11-18T13:29:56.300517                          23°, 58.138' N ; 81°, 56.137' W    On Bottom:                     2019-11-18T14:35:50.383385                          23°, 58.558' N ; 81°, 55.932' W    Off Bottom:                    2019-11-18T20:44:34.328987                          23°, 58.76' N ; 81°, 56.363' W    Out Water:                     2019-11-18T21:28:42.640445                          23°, 59.068' N ; 81°, 56.206' W    Dive duration:                 7:58:46    Bottom Time:                  6:08:43    Max. depth:                    1218.0 m</div>					
Special Notes						

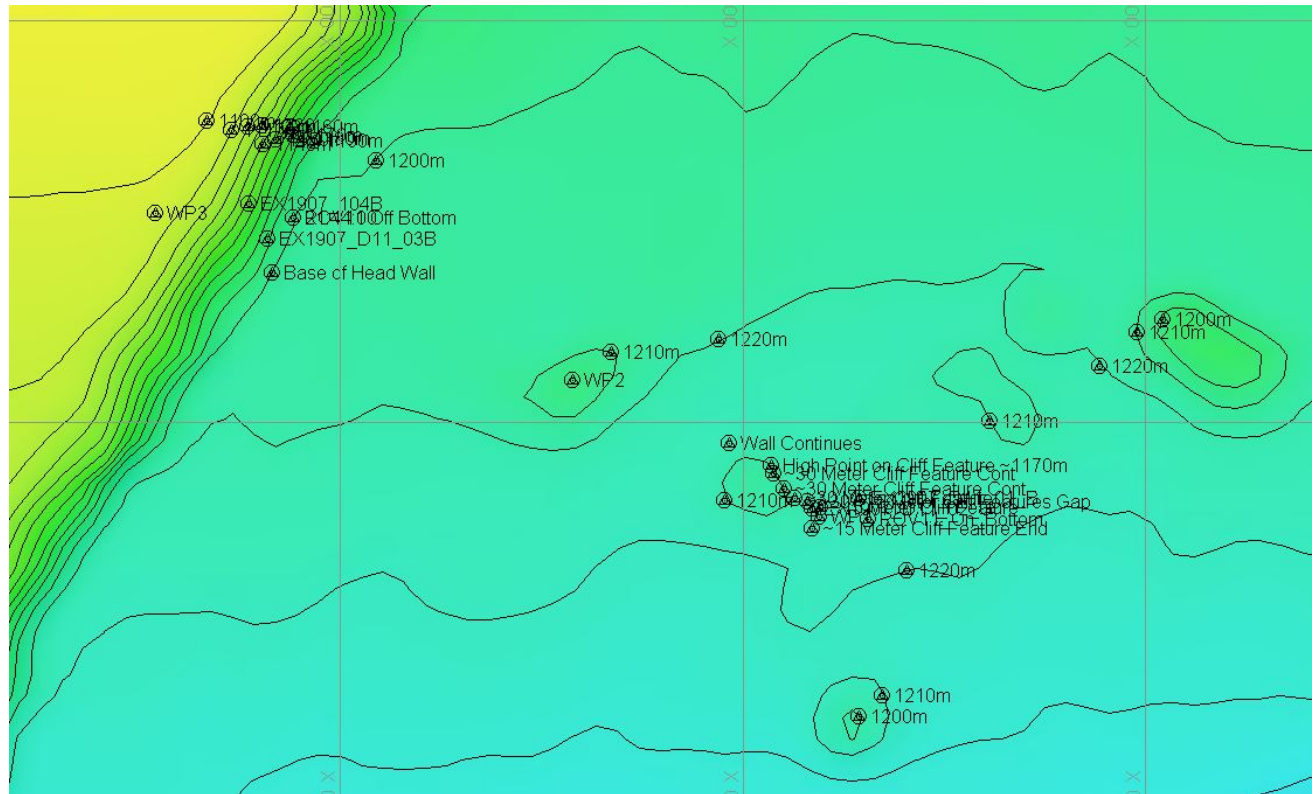
## Scientists Involved (provide name, affiliation, email)

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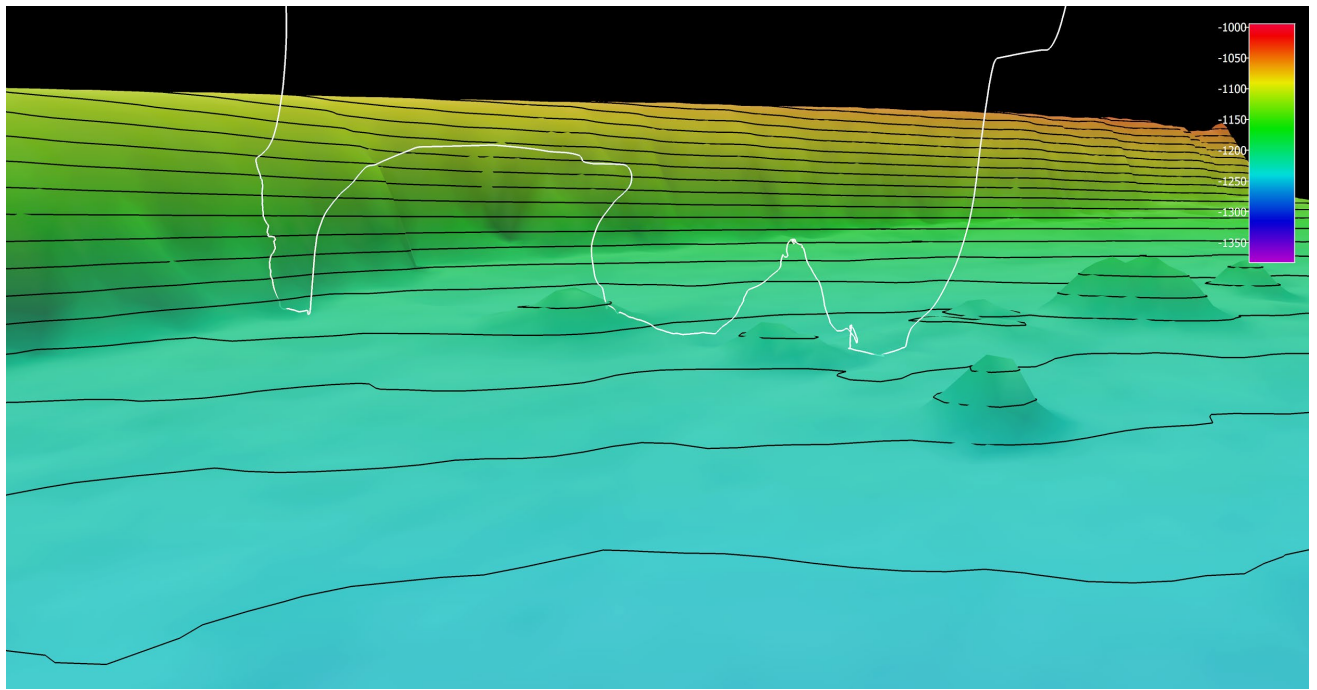
Dive Purpose	Characterizing this feature type will provide valuable information about the geologic makeup and biological communities that comprise these small mounds and escarpment. This dive will also provide valuable information about an area that very little deep submergence work in the vicinity.
Dive Description	<p>Target: 2 mounds that are about 5 m tall followed by a wall. 1210 m - 1110 m 100 m rise, 38 degrees, with a 900 m</p> <p>On bottom in the sand the 1st fish we spotted was a <i>Halosaur</i>. There were a few <i>Chondrocladia</i>- (new species?) carnivorous sponges. One that was collected (EX1907_D11_01B) was 10 cm tall and collected from base under sand getting the "roots". At the foot of the mound on the MB was actually an area where the sand changes to a large boulder/ 15 m tall wall encrusted with phosphorite or Fe-Mn. The boulder seemed out of place and was likely the result of a mass wasting event from the nearby escarpment. Individual stratigraphic layers were observed by erosional properties with sediments cascading on top of each terrace-like feature. At the top, the boulder was rimmed by the outer layer of encrusted material, effectively trapping unconsolidated sediments at the top and likely indicating the feature was once larger but has since eroded away.</p> <p>On the rock feature there was more life including: pink corals- <i>Candidella imbricata</i>, <i>Solenosmilia</i>, <i>Stichopathes</i>- whips black corals- common, bamboo corals, and <i>Chrysogorgia</i>- common, as well as a variety of glass sponges: <i>Lefroyella</i> and <i>Ferrea</i>. Many of the glass sponges were infested with yellow zoanthids.</p> <p>After leaving the 1st mound to transect to the second mound there were <i>Bathynomus</i> x 2 (giant isopods) in the sandy area. The 2nd mound was very similar to the 1st boulder with a 90° angle slope and 30 m in height to the top. Terrace-like features were also visible with this boulder. Outer crusted material appeared sheet-like, with sections that likely broke off and slide to the base of the boulder. Many of the same species were spotted on this second mound with the addition of a siphonophore- dandelion.</p> <p>We came off bottom to get to the escarpment to the west so we could make it to the top before the end of the dive. There were some mid water invertebrates in the water: jellies, <i>Enypniastes</i>, and squid.</p> <p>Unconsolidated sediment area at the base of ledge: <i>Opisthoteuthis agassizii</i> - Dumbo octopus - however "<i>Opisthoteuthis</i> should have rows of light spots along the arms and onto the mantle. Could also be <i>Opisthoteuthis grimaldii</i>."- M. Vecchione (NMNH). Small blocks are seen near the base of the escarpment, composed of diagenetically altered (unconfirmed) carbonate limestone. None of these blocks had phosphorite or Fe-Mn crusts, indicating they broke off from the escarpment post-deposition of crusting material.</p> <p>base of escarpment (1200 m) The escarpment was similar to the large boulders previously seen on the dive with all the same attributes of carbonate limestone. Some sections were encrusted while other ones seemed exposed after calving from the escarpment, with a white chalky texture. Larger terraces were seen with unconsolidated sediment cover.</p> <p><i>Stichopathes</i>, mucus sacks, Black corals- <i>Parantapathes</i>, Forcipulatida star (white with slight pink tint very palpate skin- 5+ legs). On some of the ledges there were carnivorous sponges <i>Chondrocladia</i> (EX1907_D11_03B) up to 60 cm tall as well as <i>Hyalonema</i> (cotton candy sponge) and <i>Chaceon quinquedens</i> (red crab), bamboo coral, yellow c.f. <i>Ferrea</i>, <i>Solenosmilia</i> and <i>Geodia</i> (EX1907_D11_04B- 10 cm ball sponge- new species).</p>
Notable Observations	

Community Presence/Absence (community is defined as more than two species)	<ul style="list-style-type: none"> <li>Corals and Sponges</li> <li>Chemosynthetic Community</li> <li>High biodiversity Community</li> <li>Active Seep or Vent</li> <li>Extinct Seep or Vent</li> <li>Hydrates</li> </ul>
CMECS Feature Type	outcrop/rock outcrop, scarp/wall
SeaTube Link (science annotation system)	<a href="https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&amp;resourceId=23621&amp;divId=3860">https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&amp;resourceId=23621&amp;divId=3860</a>

## Overall Map of the ROV Dive Area



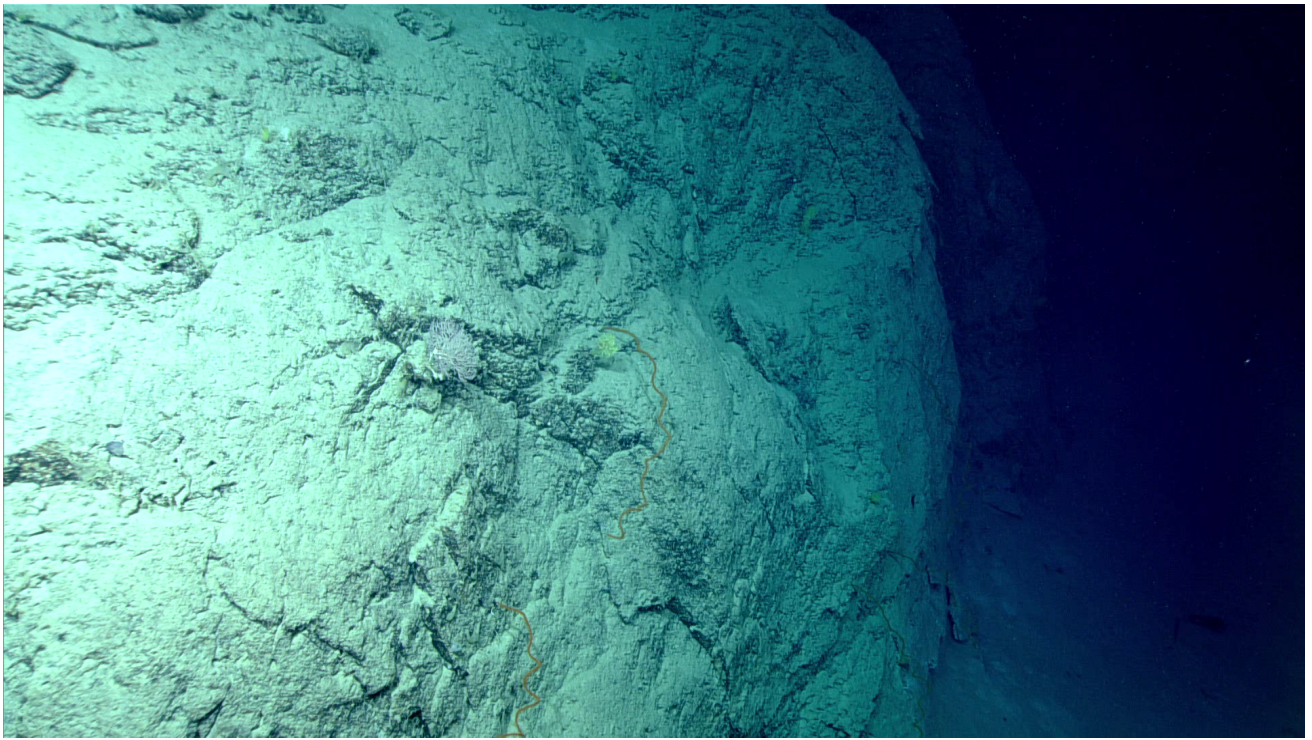
## Close-up Map of Main Dive Site



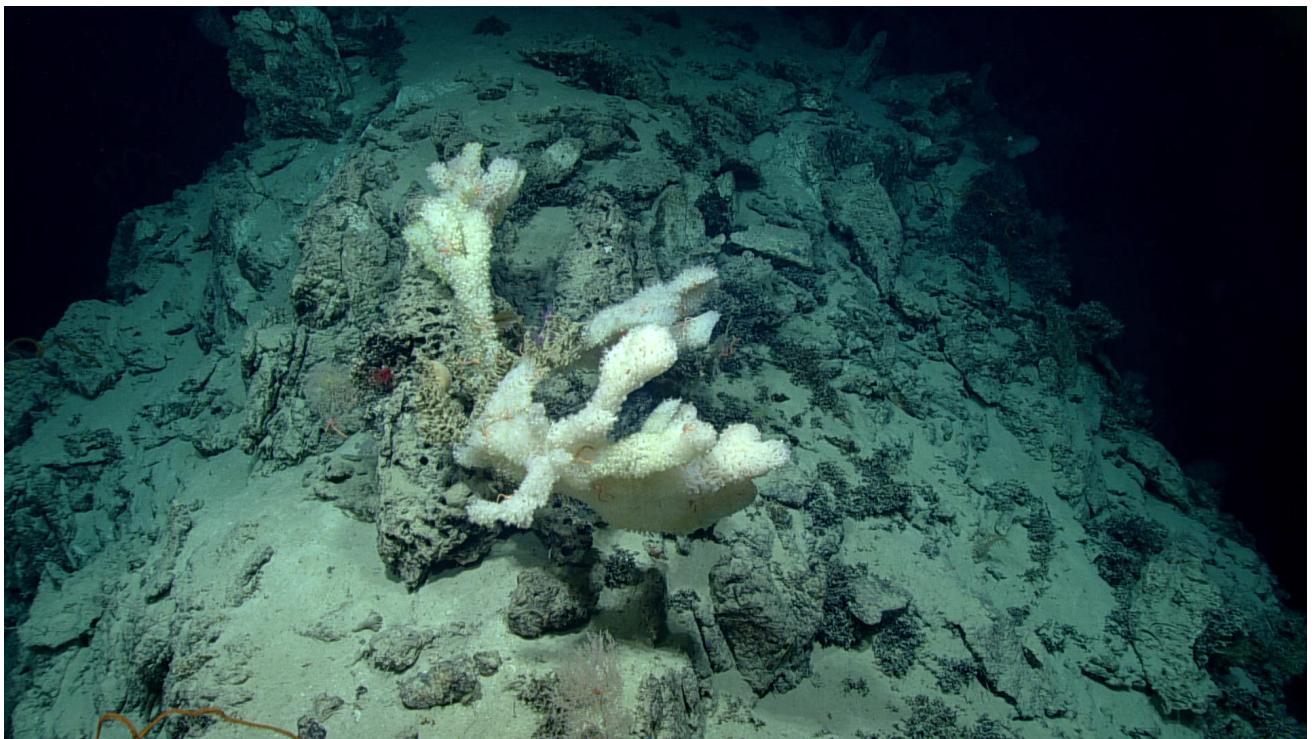
Smoothed ROV dive track in white on 25x25 cell size bathymetry, 3x vertical exaggeration, depth in meters, 10 meter contours



## Representative Photos of the Dive

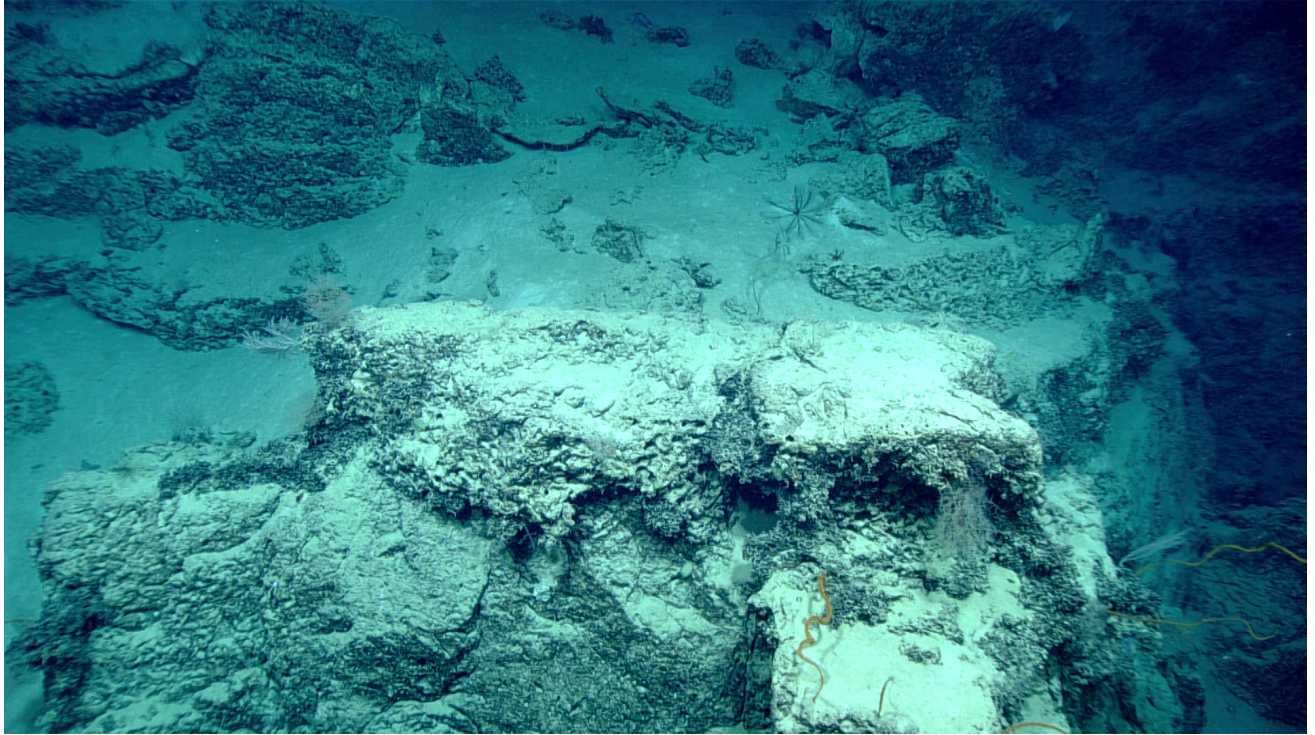


The first large mound we found was faced with this 90° angle rock wall.



Large *Lefroyella* hexactinellid sponge of the face of mound 1.





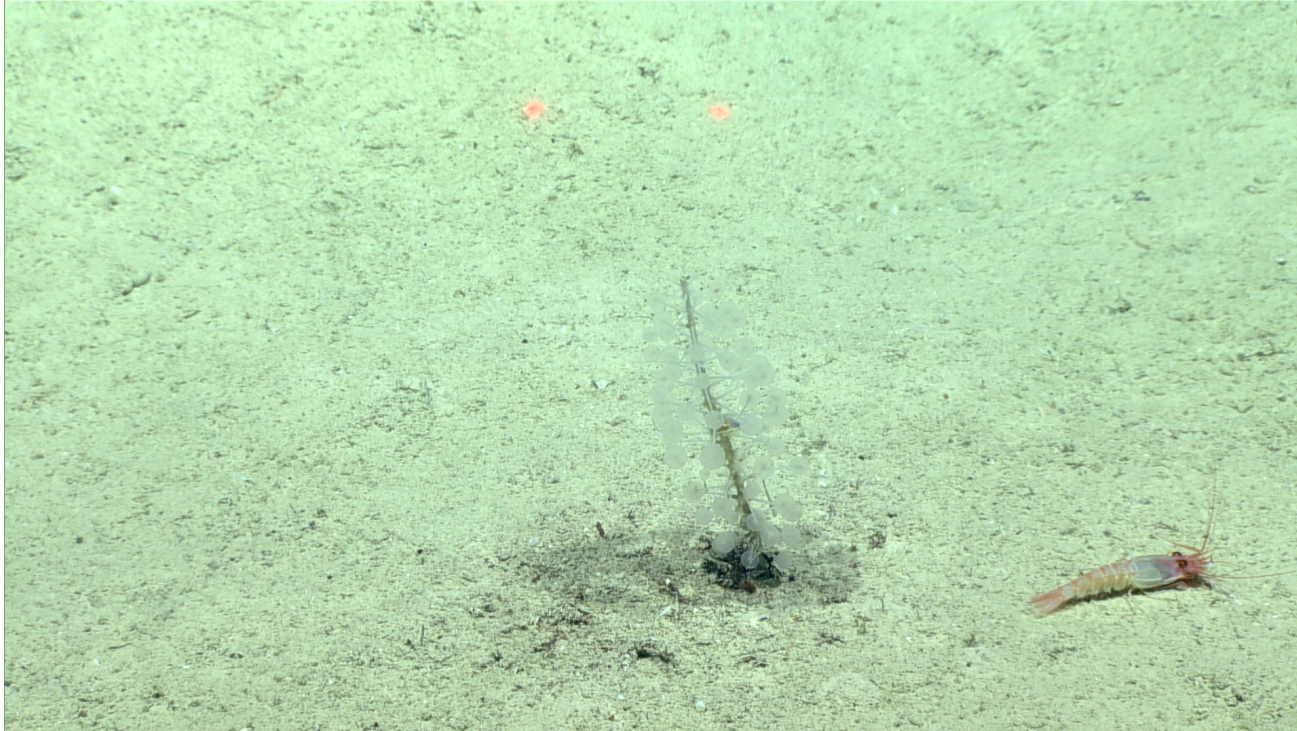
Typical face of the mounds showing sparse octocorals.



*Bathynomus* hanging on to its food as it swims away from the ROV.

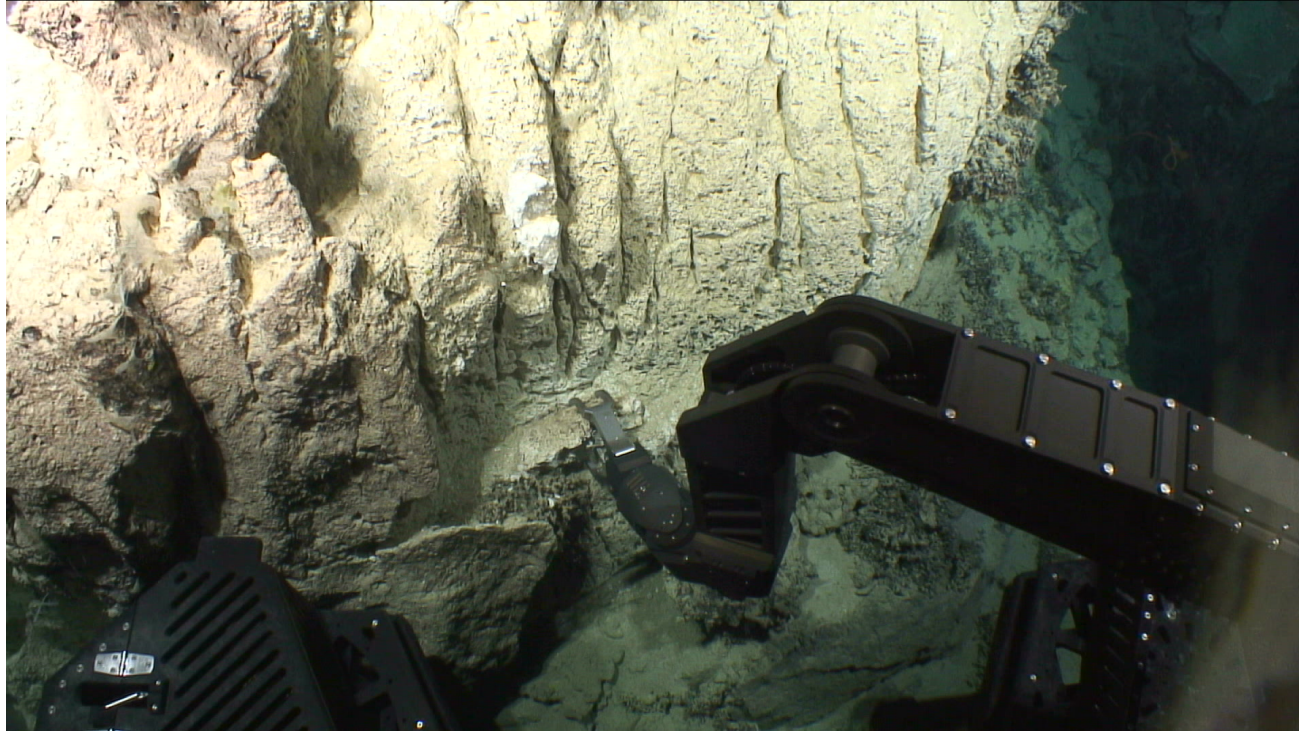
## Samples Collected -





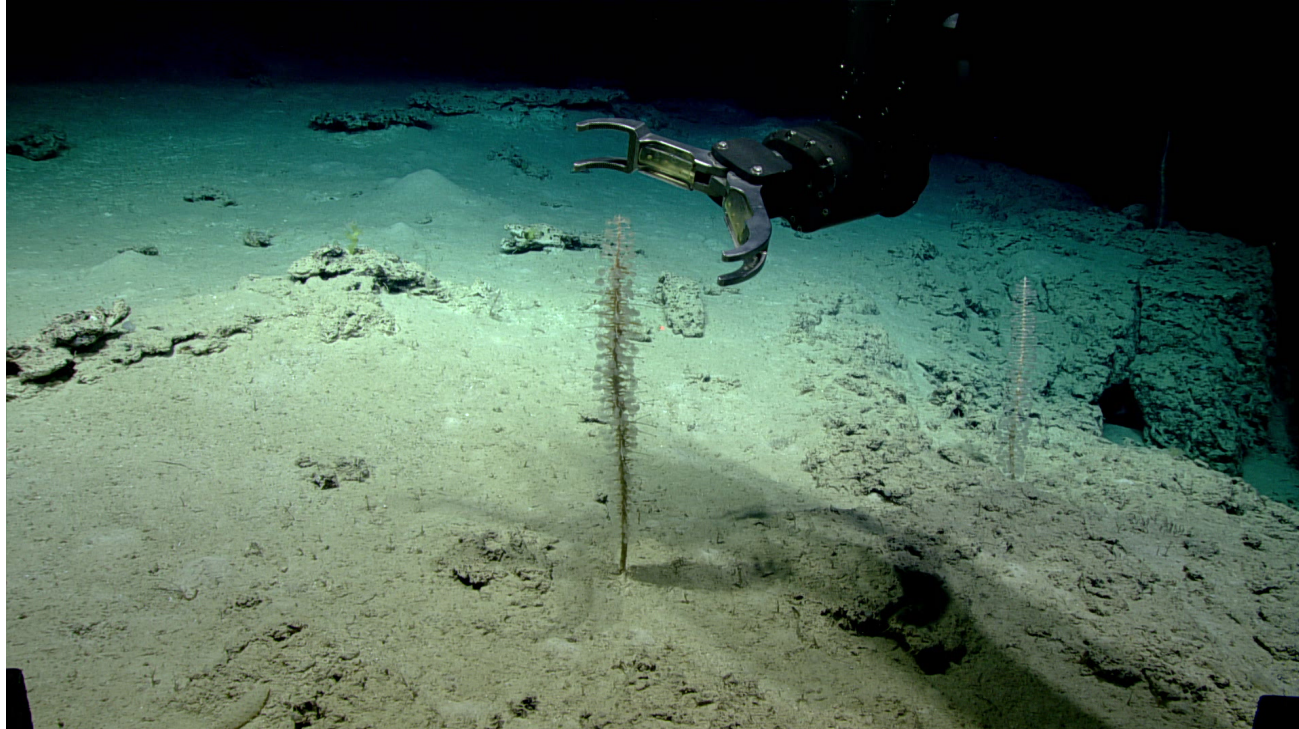
Sample ID	EX1907_D11_01B		
Date (UTC)	20191118		
Time (UTC)	14:53		
Depth (m)	1218		
Temp. ( °C)	4.303		
Field ID(s)	Chondrocladia   ID: 131894 [ <a href="#">WORM</a> ]		
Associates			
	Associates Sample ID	Field Identification	Count
Comments	10 cm tall collected from base under sand getting the "roots"		

[INSERT IMAGE]



Sample ID	EX1907_D11_02G		
Date (UTC)	20191118		
Time (UTC)	15:22		
Depth (m)	1205		
Temp. ( °C)	4.298		
Field ID(s)	rock		
Associates			
	Associates Sample ID	Field Identification	Count
Comments	Rock from the 1st wall		





Sample ID	EX1907_D11_03B		
Date (UTC)	20191118		
Time (UTC)	20:07		
Depth (m)	1169		
Temp. ( °C)	4.316		
Field ID(s)	Geodia   ID: 132005 [ <a href="#">WORM</a> ]		
Associates	Associates Sample ID	Field Identification	Count
	EX1907_D11_04B_A01	limestone associate	
Comments	10 cm ball sponge; new species; with limestone associate		





Sample ID	EX1907_D11_04B		
Date (UTC)	20191118		
Time (UTC)	20:33		
Depth (m)	1140		
Temp. ( °C)	4.333		
Field ID(s)	Chondrocladia   ID: 131894 [ <a href="#">WORM</a> ]		
Associates	Associates Sample ID	Field Identification	Count
	EX1907_D11_04B_A01	limestone rock	1
Comments	60 cm tall - took a piece		

**Please direct inquiries to:**

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