



# Okeanos Explorer ROV Dive Summary: EX-19-07, Dive 04, November 04, 2019

## Dive Information

<p>General Location Map</p>	
<p>General Area Descriptor</p>	<p>U.S. Southeast, Blake Plateau, east of Stetson Mesa</p>
<p>Site Name</p>	<p>Stetson Mound Field 01</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

Cruise	2019 Southeast U.S. Deep-sea Exploration
Dive Number	Dive 04

## Equipment Deployed

ROV	Deep Discoverer		
Camera Platform	Seirios		
ROV Measurements	<input checked="" type="checkbox"/> CTD	<input checked="" type="checkbox"/> Depth	<input checked="" type="checkbox"/> Altitude
	<input checked="" type="checkbox"/> Scanning Sonar	<input checked="" type="checkbox"/> USBL Position	<input checked="" type="checkbox"/> Heading
	<input checked="" type="checkbox"/> Pitch	<input checked="" type="checkbox"/> Roll	<input checked="" type="checkbox"/> HD Camera 1
	<input checked="" type="checkbox"/> HD Camera 2	<input checked="" type="checkbox"/> Low Res Cam 1	<input checked="" type="checkbox"/> Low Res Cam 2
	<input checked="" type="checkbox"/> Low Res Cam 3	<input checked="" type="checkbox"/> Low Res Cam 4	<input checked="" type="checkbox"/> Low Res Cam 5
Equipment Malfunctions	None		
ROV Dive Summary Data (from Processed ROV)	Dive Summary:EX1907_DIVE04 ^^^ In Water:                      2019-11-04T13:25:02.103445 30°, 24.158' N ; 79°, 16.713' W  On Bottom:                      2019-11-04T14:03:05.983117 30°, 24.158' N ; 79°, 16.558' W  Off Bottom:                      2019-11-04T20:59:58.966097 30°, 23.835' N ; 79°, 16.589' W  Out Water:                      2019-11-04T21:34:50.406231 30°, 23.797' N ; 79°, 16.402' W  Dive duration:                      8:9:48  Bottom Time:                      6:56:52  Max. depth:                      836.0 m		
Special Notes			





**Ocean Exploration  
and Research**

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

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Dive Purpose	This site was first mapped on EX1906. Site has the potential to be a suitable habitat for deep sea corals and sponges and could very likely be an aggregation of cold-water coral mounds. Dives 4 and 5 are located in the same field of mound features, although the features seem to differ in morphology and sizes. These dives will compare mounds of different sizes and shapes. This area is also part of a Habitat Area of Particular Concern (HAPC) and is a priority for regional managers. Dive is planned in an area that was recently mapped and contains interesting seafloor features that warrant further exploration and characterization.
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The ROV landed on the bottom, at the first mound, with carbonate coarse-grained sand with *L. pertusa* rubble scattered. As we progressed through the dive, sand patches were visible with no coral rubble. In between the first and second mound, there was a large area of sand with little to no coral rubble present. Long and linear sediment ripples were observed, similar to that of Dive 03, indicating a unidirectional current regime (northward flow) in this area (although we are not sure if there is a semi-diurnal tidal regime over time). In the areas were some coral rubble at the troughs between the ripples. Coral rubble was observed in almost all locations. Coral rubble that had more of the framework structure intact were closer to the summits of the mounds, whereas at the bases there was more degraded rubble. On the second and third mound, hard substrate was exposed in the form of carbonate slabs and some irregular morphologies. Many small corals observed were amongst coral rubble, however, any large corals were strictly seen on exposed hard substrates.

On the first mound we observed an octopus- *Muusoctopus c.f. januarii*, *Enallopsammia rostrata* or yellow morph of *E. profunda* (CNI) and a *Deania profundorum* (arrowhead dogfish)- seen twice on this dive. In this area, a few *Leiopathes* with crinoids *Zenometra columnaris* as well as a *Geodia* sponge. We also observed a *Fenestraja plutonia*- ray.

Midway up slope of mound one- coral rubble disappears and it becomes mostly sediment. *Chrysogorgia* was first observed and continued to be sparse throughout the day. *Chimaera monstrosa* was seen early in the dive and then another *Chimaera* was later observed with darker fin tips, which may be a different species. The top of mound the *Lophelia* rubble continued, along with some *Phakellia* (elephant ear sponge) and a cusk eel.

Heading down the north slope of mound one; coral rubble decreases as we get closer to the base of mound one, where we filmed some great ctenophore footage. Sand ripples at the north base of mound 1 showing current in heading from the south with linear and consistent ripples. Here we saw our 1st green glass bottle.

At the north base of mound 2, the bottom was sediment veneered HB with sparse biota where we saw an *Echiostoma* fish with a chin lure in the water column as well as the second *Deania profundorum* (arrowhead dogfish) and a *c.f. Tamaria* sp. star

At the Top of mound 2 we stop to collect a Raspailiidae (POR- EX1907\_D04\_01B) soft, white mesh fan. Here we spotted a white nudibranch at the base of a bamboo coral that was encrusted with living *Lophelia*, and a large 20 armed crinoid.

Heading down the north slope of mound 2, with a 10-20° slope and standing dead coral. Here there was an increase of sand waves and less *Lophelia* rubble, similar yellow, fan sponges to the one collected yesterday and *Heterotella*, and *Ariosoma* (pancake urchin) was common. Sand hills were seen with patches of standing dead coral mixed with soft sediments and a few small white gorgonians and typical yellow sponge and bottle debris. A Goniasteridea (cookie cutter star) sample that Cris Mah (NMNH) suggested for collection was collected (EX1907\_D04\_02B).

North of mound 3, there were exposed slabs and dead standing corals with an increase of biota: fan *Phakellia* (POR), octocorals, *Heterotella* (POR) and bamboo corals were common and here we collected the "Swiss cheese" Demospongiae (EX1907\_D04\_03B).

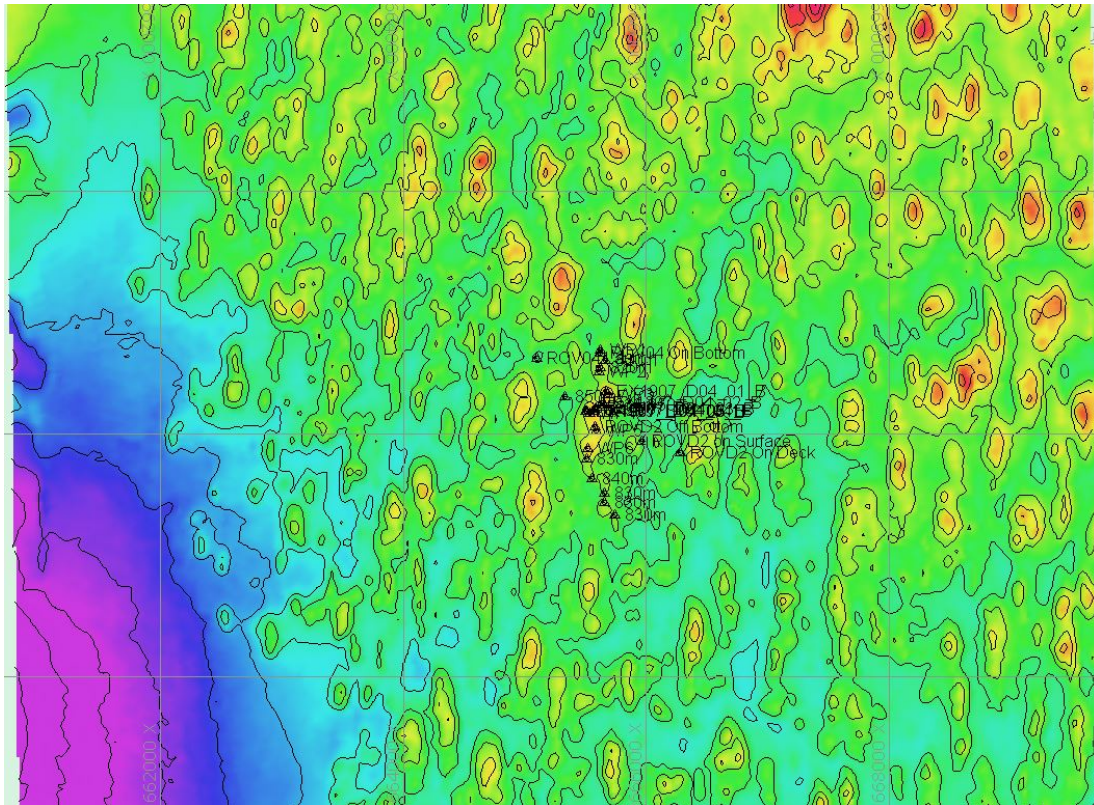
Approaching the top of the third mound, slabs of carbonate are exposed on the flank of the mound, indicating an underlying hard substrate. Standing dead corals increase on this 0-20° slope. We stopped to collect *c.f. Heterotella* (EX1907\_D04\_04B) with a defined marginallia spicule ring around the oscule. This was either a new species or expansion of a Asian species.

At the top of mound 3, *Hyalonema* was common with many small white sparsely branched Ellisellidae octocorals and 100% cover of coral rubble. Here we stopped to collect *Eunicella c.f. modesta* (EX1907\_D04\_05B) which are very common but maybe an unknown specimen never collected before. Most species in this family are found <200 m. Finally we collected our last

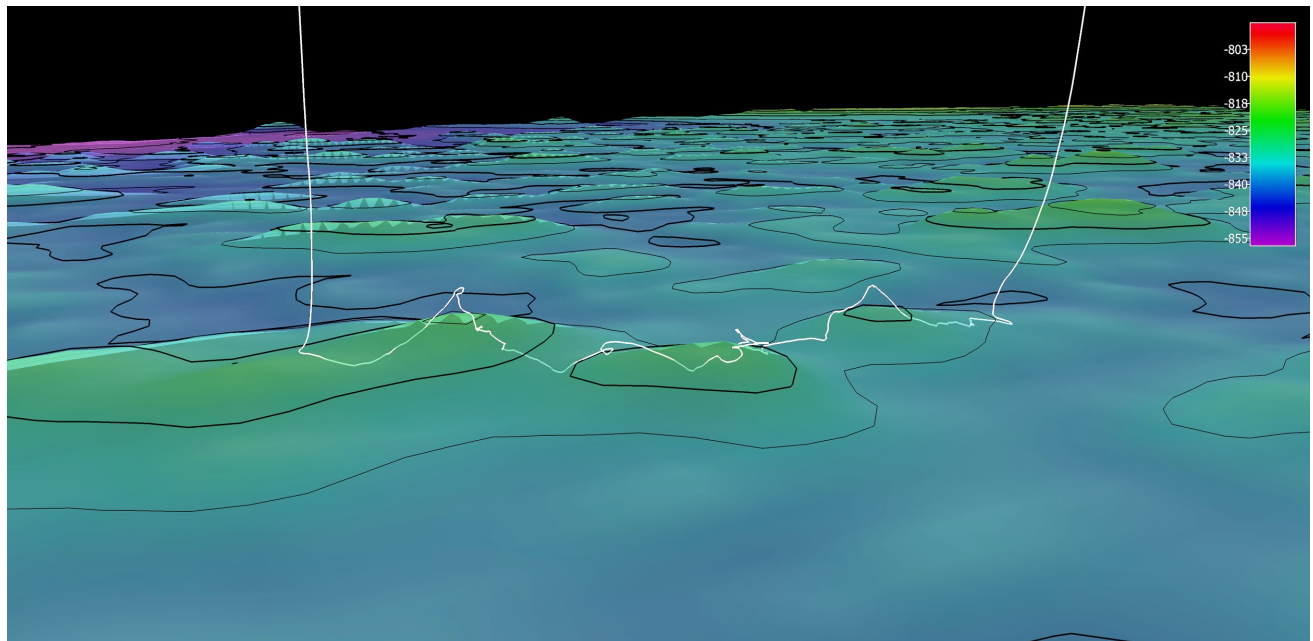
	<p>sample: <i>Enallopsammia c.f. profunda</i> (EX1907_D04_06B), a 10 cm yellow, bushy coral with coralites on alternating sides of the coral stalk causing a "zig zag" like shape. <i>Enallopsammia profunda</i> is not usually yellow, so this is either a new species or a new color morph of <i>E profunda</i>. One <i>Staurocalyptus</i> sponge was spotted.</p> <p>Head down slope of the northern side of the 3rd mound the low rugosity and 90% cover <i>Lophelia</i> rubble continues ending at the base in a rippled sediment patch. Here we spotted an 8 legged starfish possibly <i>Solaster</i> which is common in the Pacific ending the dive with a 20 cm <i>Madrepora</i>- (pink 20-30 cm) and a branching black coral (<i>Antipatharia</i>).</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	Mound, Slope



## Overall Map of the ROV Dive Area



## Close-up Map of Main Dive Site

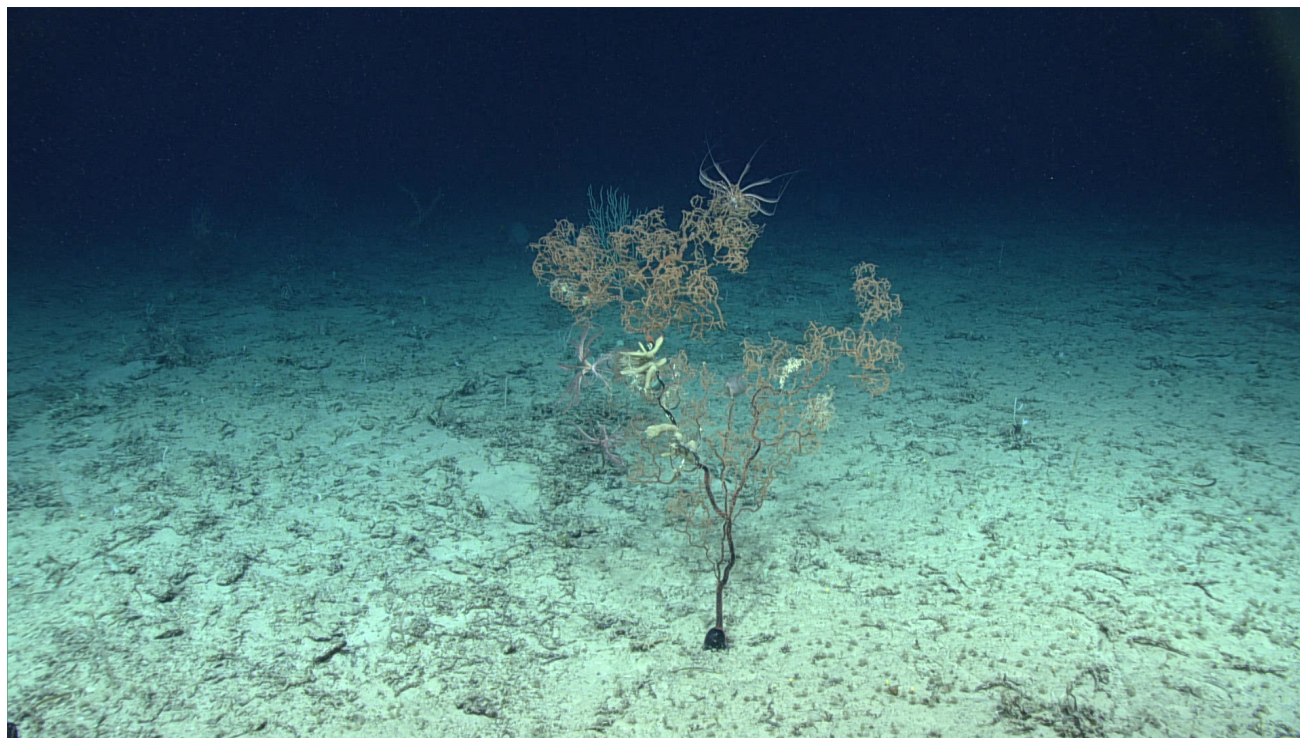


Smoothed ROV dive track in white on 25x25 cell size bathymetry, 3x vertical exaggeration, depth in meters, 10 meter contours

## Representative Photos of the Dive



Octopus



*Leipathes* with many epibionts on a typical sand/coral rubble bottom







*Lophelia* and a 20 armed crinoid in the base of a bamboo coral.



*Echiostoma* fish with a chin lure in the water column.



## Samples Collected -



Sample ID	EX1907_D04_01B		
Date (UTC)	November 04, 2019		
Time (UTC)	16:40		
Depth (m)	821 m		
Temp. (°C)	8.402		
Field ID(s)	Raspailiidae   ID: 131642 [WORM]		
Associates	Associates Sample ID	Field Identification	Count
	EX1907_20191104T164558_D 2_DIVE04_SPEC01BIO_A01	Ophiuroidea	1
Comments	5 cm mesh fa; White, soft texture.		



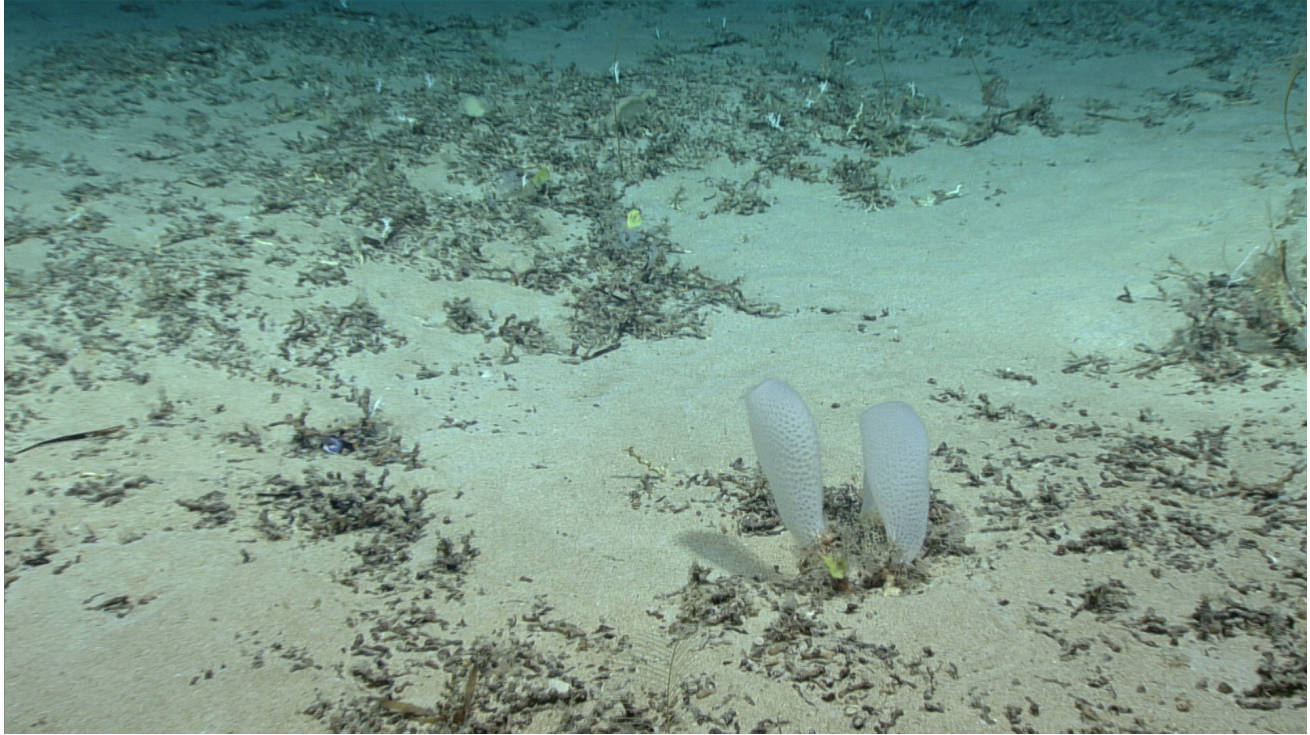
Sample ID	EX1907_D04_02B		
Date (UTC)	November 04, 2019		
Time (UTC)	17:59		
Depth (m)	825 m		
Temp. (°C)	8.371		
Field ID(s)	Goniaster   ID: 123294 [WORM]		
Associates	Associates Sample ID	Field Identification	Count
Comments	5 cm wide- pink associated with a stylaster coral.undescribed species- last seen a few years ago.		





Sample ID	EX1907_D04_03B		
Date (UTC)	November 04, 2019		
Time (UTC)	18:48		
Depth (m)	826 m		
Temp. (°C)	8.34		
Field ID(s)	Demospongiae (horny sponges; demosponges)   ID: 164811 [WORM]		
Associates	Associates Sample ID	Field Identification	Count
	EX1907_20191104T185207_D 2_DIVE04_SPEC03BIO_A01		
	EX1907_20191104T185207_D 2_DIVE04_SPEC03BIO_A02		
Comments	Demospongiae "Swiss cheese" sponge. 10-20 cm sponge, tan amphitheater shaped, with rounded holes (not oscules) throughout		





Sample ID	EX1907_D04_04B		
Date (UTC)	November 04, 2019		
Time (UTC)	19:08		
Depth (m)	823 m		
Temp. ( °C)	8.472		
Field ID(s)	<i>Heterotella</i>   ID: 171862 [WORM]		
Associates	Associates Sample ID	Field Identification	Count
Comments	Margin at the top, Heterotella or Euplectella 10-20 cm tall, 10 cm tall, ring of marginallia spicules. Either new species or expansion of a Asian species		





Sample ID	EX1907_D04_05B		
Date (UTC)	November 04, 2019		
Time (UTC)	19:43		
Depth (m)	818 m		
Temp. (°C)	8.546		
Field ID(s)	<i>Eunicella c.f. modesta</i>   ID: 177818 [WORM]		
Associates	Associates Sample ID	Field Identification	Count
Comments	white sparsely branched. we never see tentacles.very common here: unknown specimen name. never collected before.most in this family are less then 200 m		





Sample ID	EX1907_D04_06B		
Date (UTC)	November 04, 2019		
Time (UTC)	19:53		
Depth (m)	817 m		
Temp. (°C)	8.483		
Field ID(s)	<i>Enallopsammia c.f. profunda</i> (deepwater stony coral)   ID: 157965 [WORM]		
Associates	Associates Sample ID	Field Identification	Count
	EX1907_20191104T200831_D 2_DIVE04_SPEC06BIO_A01		
Comments	10 cm Yellow, bushy with coralites on alternating sides of the coral stalk causing a "zig zag" like shape. <i>Enallopsammia profunda</i> is not usually yellow, so this is either a new species or a new color morph of <i>E. profunda</i> .		

**Please direct inquiries to:**

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