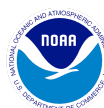




Okeanos Explorer ROV Dive Summary

Dive Information	
General Location Map	
General Area Descriptor	U.S. Caribbean Sea
Site Name	St. Croix Amphitheater
Science Team Leads	Stacey Williams (ISER) Steven Auscavitch (Temple)
Expedition Coordinator	Daniel Wagner (NOAA-OER)
ROV Dive Supervisor	Chris Ritter (GFOE)
Mapping Lead	Derek Sowers (NOAA-OER)
ROV Dive Name	
Cruise	EX1811
Dive Number	DIVE04
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 data)	In Water:	2018-11-04T14:50:25.060877 17°, 35.479' N ; 64°, 53.156' W																																																										
	On Bottom:	2018-11-04T15:17:51.323678 17°, 35.35' N ; 64°, 53.348' W																																																										
	Off Bottom:	2018-11-04T20:09:45.374939 17°, 35.355' N ; 64°, 53.241' W																																																										
	Out Water:	2018-11-04T20:33:44.653192 17°, 35.394' N ; 64°, 53.14' W																																																										
	Dive duration:	5:43:19																																																										
	Bottom Time:	4:51:54																																																										
	Max. depth:	564.0 m																																																										
Special Notes	N/A																																																											
Scientists Involved (provide name, affiliation, email)	<table border="1"> <thead> <tr> <th>Name</th> <th>Affiliation</th> <th>Email</th> </tr> </thead> <tbody> <tr> <td>Andrew Shuler</td> <td>NOAA/CSS</td> <td>andrew.shuler@noaa.gov</td> </tr> <tr> <td>Asako Matsumoto</td> <td>Chiba Institute of Technology</td> <td>amatsu@gorgonian.jp</td> </tr> <tr> <td>Christopher Mah</td> <td>National Museum of Natural History</td> <td>brisinga@gmail.com</td> </tr> <tr> <td>Debi Blaney</td> <td>NOAA/OER</td> <td>debi.blaney@noaa.gov</td> </tr> <tr> <td>Iris Costa</td> <td>Senckenberg am Meer, Germany</td> <td>irisfs@gmail.com</td> </tr> <tr> <td>Graciela Garcia-Moliner</td> <td>Caribbean Fishery Management Council</td> <td>graciela_cfmc@yahoo.com</td> </tr> <tr> <td>Jason Chaytor</td> <td>US Geological Survey</td> <td>jchaytor@usgs.gov</td> </tr> <tr> <td>Kenneth Sulak</td> <td>US Geological Survey</td> <td>jumpingsturgeon@yahoo.com</td> </tr> <tr> <td>Kevin Rademacher</td> <td>NOAA/NMFS</td> <td>kevin.r.rademacher@noaa.gov</td> </tr> <tr> <td>Mashkoor Malik</td> <td>NOAA/OER</td> <td>mashkoor.malik@noaa.gov</td> </tr> <tr> <td>Megan Cromwell</td> <td>NOAA/NCEI</td> <td>megan.cromwell@noaa.gov</td> </tr> <tr> <td>Megan McCuller</td> <td>North Carolina Museum of Natural Sciences</td> <td>megan.mcculler@naturalsciences.org</td> </tr> <tr> <td>Nolan Barrett</td> <td>Medical University of South Carolina</td> <td>barrettnh@g.cofc.edu</td> </tr> <tr> <td>Scott France</td> <td>University of Louisiana at Lafayette</td> <td>france@louisiana.edu</td> </tr> <tr> <td>Stacey Williams</td> <td>Institute for Socio-Ecological Research</td> <td>stcmwilliams@gmail.com</td> </tr> <tr> <td>Steven Auscavitch</td> <td>Temple University</td> <td>steven.auscavitch@temple.edu</td> </tr> <tr> <td>Tara Harmer Luke</td> <td>Stockton University</td> <td>luket@stockton.edu</td> </tr> <tr> <td>Tina Molodtsova</td> <td>P.P. Shirshov Institute of Oceanology</td> <td>tina@ocean.ru</td> </tr> </tbody> </table>			Name	Affiliation	Email	Andrew Shuler	NOAA/CSS	andrew.shuler@noaa.gov	Asako Matsumoto	Chiba Institute of Technology	amatsu@gorgonian.jp	Christopher Mah	National Museum of Natural History	brisinga@gmail.com	Debi Blaney	NOAA/OER	debi.blaney@noaa.gov	Iris Costa	Senckenberg am Meer, Germany	irisfs@gmail.com	Graciela Garcia-Moliner	Caribbean Fishery Management Council	graciela_cfmc@yahoo.com	Jason Chaytor	US Geological Survey	jchaytor@usgs.gov	Kenneth Sulak	US Geological Survey	jumpingsturgeon@yahoo.com	Kevin Rademacher	NOAA/NMFS	kevin.r.rademacher@noaa.gov	Mashkoor Malik	NOAA/OER	mashkoor.malik@noaa.gov	Megan Cromwell	NOAA/NCEI	megan.cromwell@noaa.gov	Megan McCuller	North Carolina Museum of Natural Sciences	megan.mcculler@naturalsciences.org	Nolan Barrett	Medical University of South Carolina	barrettnh@g.cofc.edu	Scott France	University of Louisiana at Lafayette	france@louisiana.edu	Stacey Williams	Institute for Socio-Ecological Research	stcmwilliams@gmail.com	Steven Auscavitch	Temple University	steven.auscavitch@temple.edu	Tara Harmer Luke	Stockton University	luket@stockton.edu	Tina Molodtsova	P.P. Shirshov Institute of Oceanology	tina@ocean.ru
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Dive Purpose	The purpose of the dive was exploratory with an emphasis on surveying and characterizing deep-sea corals, specifically <i>Lophelia pertusa</i> , as well as deepwater sponges and demersal fish species.																																																											
Dive Description	Dive 04 began on a steep slope at the top of what appeared to be a slump feature in the multibeam bathymetry. Early on in the dive the seafloor was heavily sedimented, but rose quickly to near vertical walls of carbonate. Rocks in this area appeared to be dissolved carbonate rock, or karstic, in nature. Layers of sediment and harder rock appeared to be prominent in the rock wall face. Most of the dive occurred on this type of terrain. We also observed occasional deep gorges that extended into the wall which were not accessible by the																																																											

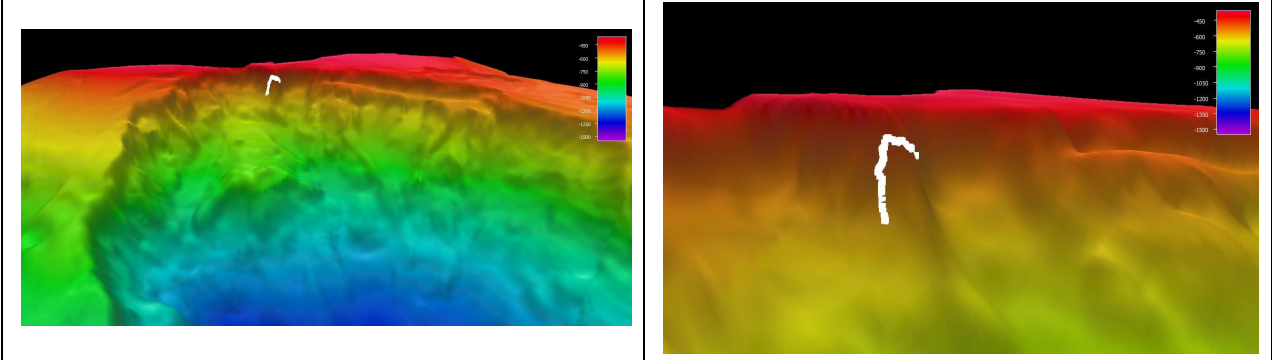


	<p>ROV. Upon reaching what appeared to be the top of this feature, we traversed along the drop-off along a semi-continuous ledge, where we saw many attached organisms and fishes.</p> <p>There were at least 10 species of fish during this dive. The start of the dive began on a gentle slope characterized by consolidated soft sediments. There were a lot of small shiny fish, Mueller’s pearlside (<i>Marrilicus meulleri</i>) hovering above the sediment. They were the most abundant in this habitat. We witnessed one of them sticking their heads in the sediment, which looked like something was preying on it, but they were actually foraging. They seem to be only localized around the soft sediments and at the base of the hardground. There were a couple beardfish, <i>Polymixia</i> sp., foraging around the soft sediment habitats. We also saw some green-eye fish (<i>Bembrops gobioides</i>) and a <i>Chaunax</i> sp. toadfish in the sandy sediment. The green-eye fish were also common along the wall, along with the roughy (<i>Gephroberyx</i> or <i>Hoplostethus</i> sp.). We also saw small bluefish with big eyes (<i>Epigonus</i> sp.). We observed two queen snappers (<i>Etelis oculatus</i>) at ~18:20 and 18:58 UTC. Towards the end of the dive there was <i>Chlorophthalmus agassizi</i> and an unknown fish possibly from the family Scorpaenidae (18:28 UTC). There was a small, thin silvery fish observed in the water column, which could be <i>Benthodesmus tenuis</i>.</p> <p>At the beginning of the dive and in the soft sediment habitat, there were a lot of dead irregular sea urchins (<i>Linopneustes</i> sp.). We did observe one live urchin but otherwise we saw mostly bare skeletons. There was a possibly new irregular sea urchin (red in color) spotted during this dive in the soft sediments. Sea stars were far more abundant at this site than on the last three dive sites. We observed at least four new species for this expedition on this dive, <i>Peltaster</i> sp. (small white sea star), <i>Henricia</i> sp. (white sea star), <i>Odontaster?</i> sp. (orange sea star), and a slime star. These sea stars were more abundant along the gentle sloping faces of the hardground. We also recorded two species of sea cucumber, but there were only located around the end of the dive, towards the tops of the wall and in the soft sediments. Throughout the dive, and mostly along the wall, we found at least two species of sea urchins in the families Cidaridae and Aspidodiadematidae. There was a unique brittle star observed on a whitish and yellowish <i>Stichopathes</i> sp. black coral, which might be <i>Asteronyx</i> sp. or a close relative.</p> <p>Glass sponges were the most abundant sponges. There were a few scattered colonies in the soft sediment. We observed smaller glass sponges along the walls. A newer, unidentified vase glass sponge was sighted at 17:02 UTC. Most of the sponges were small, whitish or yellowish in coloration. There were some demosponges, but they were mostly small in size.</p> <p>Much of the lower portion of the wall was dominated by black coral whips (<i>Stichopathes</i> sp.) with occasional <i>Asteronyx</i> sp. brittle stars. Scleractinians were less abundant on the wall compared to black corals. Cup corals (cf. <i>Javania</i> sp.), as well as a few colonial scleractinians (<i>Solenosmilia</i> cf. <i>variabilis</i>) were present on vertical faces. <i>Crypthelia</i> sp. hydrocorals were also present in abundance throughout this portion of the dive, usually associated with overhangs or lips. On more gentle slopes near the top of this feature, plexaurid octocorals were observed (?<i>Scleracis</i> sp.) attached to the underside of overhangs. None of these colonies were particularly large. Large branching structures, thought to be dead octocorals, seemed to be completely dominated by zoanthids over the entire dive length. Near the end of the dive, moving across slope near an extended platform, we encountered one bamboo coral (?<i>Cladarisis</i> sp. or similar), as well as a large unidentified black coral (cf. <i>Tanacetipathes</i> sp.). In the last half hour of the dive numerous small (<10 cm height) octocoral fans thought to be in the genus Primnoidae (possibly <i>Acanthopimnoa</i> sp. or similar) were observed in high densities.</p>
<p>Notable Observations</p>	<p>We observed some predation events. There was an anemone feeding on a pearlside at the beginning of the dive. We also saw a squat lobster feeding on another pearlside that might have been damaged from the ROV thrusters. There were also a lot of broken bivalve shells at the base of the hardground area.</p>

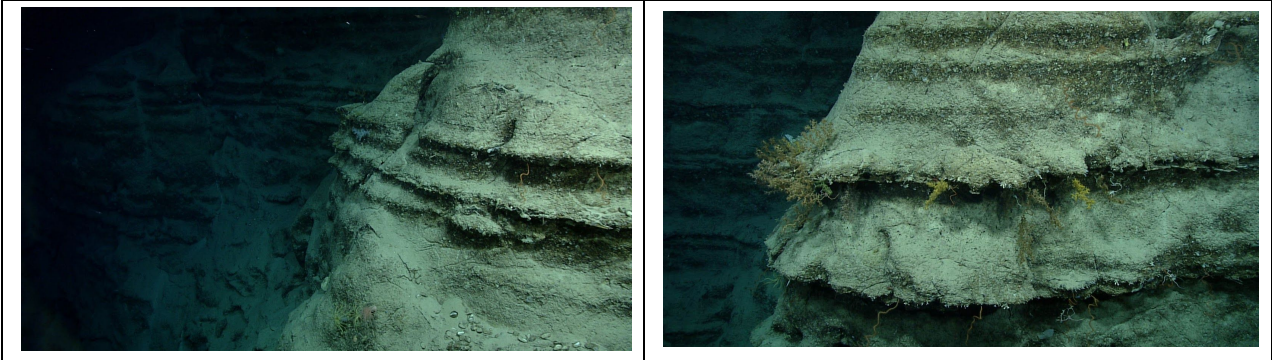


Community Presence/Absence (community is defined as more than two species)	<input checked="" type="checkbox"/> Corals and Sponges
	<input type="checkbox"/> Chemosynthetic Community
	<input checked="" type="checkbox"/> High biodiversity Community
	<input type="checkbox"/> Active Seep or Vent
	<input type="checkbox"/> Extinct Seep or Vent
	<input type="checkbox"/> Hydrates

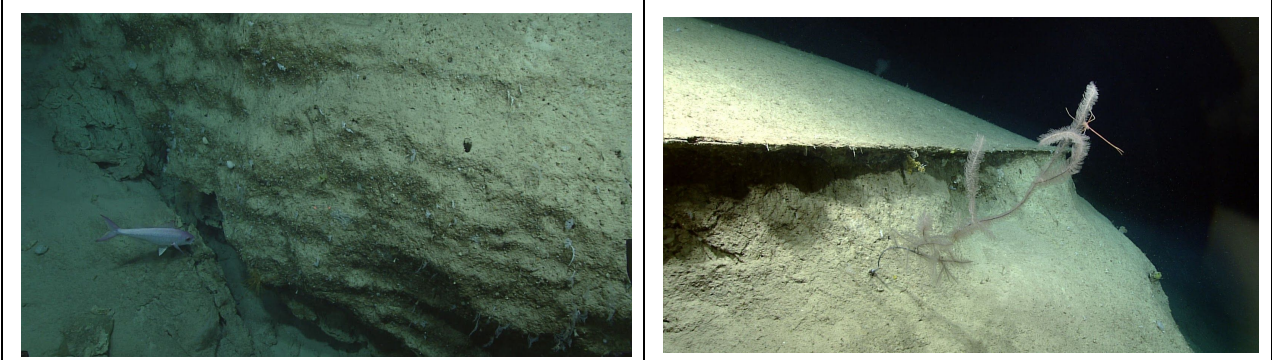
Overall Map of the ROV Dive Area	Close-up Map of Main Dive Site
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Representative Photos of the Dive	
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<p>Steep karst formations dominated the seafloor geomorphology for much of this dive. Deep cuts, extending into the wall, were often observed. Small overhangs were colonized by attached fauna.</p>	<p>On vertical surfaces, while organism density was not high, certain portions of the wall contained substantial diversity of colors and forms of cnidarians (zoanthids). The structures they were overgrowing appear to be former octocoral or black coral colonies.</p>
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<p>Fishes, while rare, were occasionally observed in deep cuts in the rock. One Queen snapper is shown here.</p>	<p>An unidentified black coral under a small overhang that was frequently encrusted and covered with attached organisms like octocoral fans and stylasterids.</p>
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Samples Collected				
Sample ID	EX1811_D04_S1B			
Date (UTC)	20111104			
Time (UTC)	184050			
Depth (m)	456.745			
Temp. (°C)	13.525			
Field ID(s)	Plexauridae			
Commensals	No commensals			
Comments	Possibly <i>Scleracis</i> sp.			
Sample ID	EX1811_D04_02B			
Date (UTC)	20181104			
Time (UTC)	193116			
Depth (m)	446.94			
Temp. (°C)	13.503			
Field ID(s)	Antipatharian			
Commensals	Commensal Sample ID		Field Identification	Count
	EX1811_D04_02B_A01		Chirostylidae	1
	EX1811_D04_02B_A02		Shrimp. Possibly Mysid?	2
Comments				

Please direct inquiries to:

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 Silver Spring, MD 20910
 (301) 734-1014

