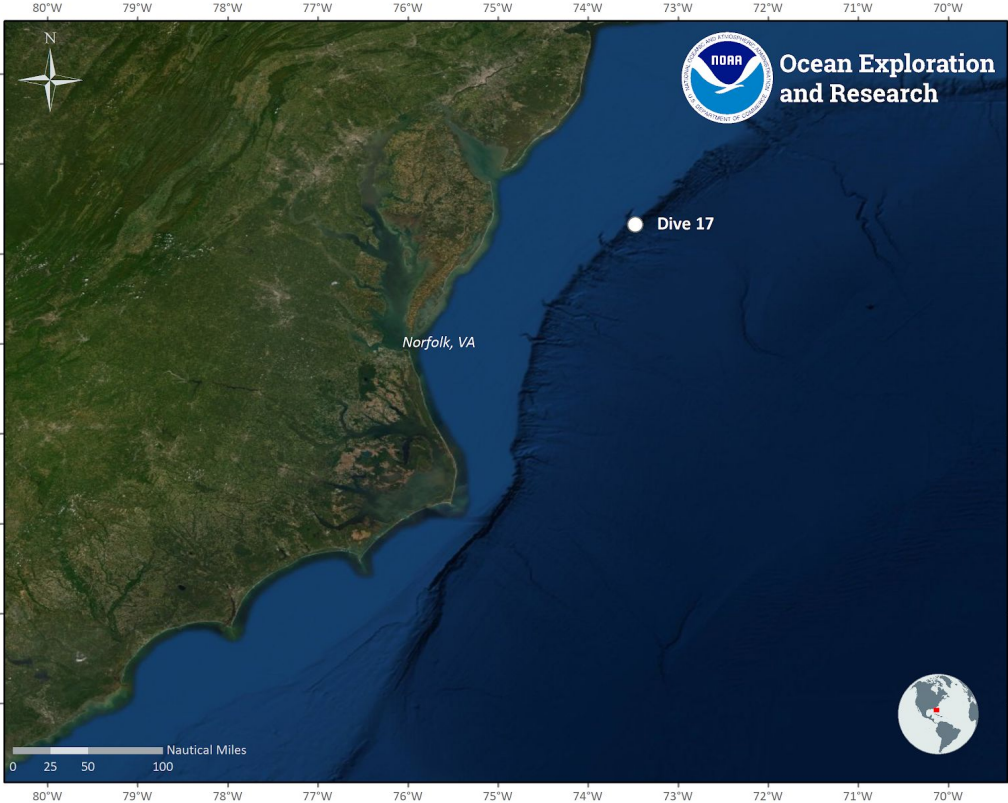




Okeanos Explorer ROV Dive Summary

Dive Information

General Location Map	
General Area Descriptor	U.S. Mid-Atlantic, Frank R. Lautenberg Deep Sea Coral Protection Area
Site Name	Wilmington Canyon
Science Team Leads	Amy Wagner (CSUS) and Alexis Winnig (Temple)
Expedition Coordinator	Kasey Cantwell (NOAA-OER)
ROV Dive Supervisor	Chris Ritter (GFOE)
Mapping Lead	Shannon Hoy (NOAA-OER)

ROV Dive Name

Cruise	EX1903L2
Dive Number	Dive 17

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			
ROV Dive Summary Data (from Processed ROV)	<div>Dive Summary: EX1903L2_DIVE17</div> <div>AAA</div> <div>In Water: 2019-07-09T12:23:10.675999</div> <div> 38°, 18.95' N ; 73°, 26.065' W</div> <div>On Bottom: 2019-07-09T13:19:28.309098</div> <div> 38°, 19.027' N ; 73°, 25.722' W</div> <div>Off Bottom: 2019-07-09T19:46:08.250876</div> <div> 38°, 19.286' N ; 73°, 25.629' W</div> <div>Out Water: 2019-07-09T20:36:25.752885</div> <div> 38°, 19.446' N ; 73°, 25.235' W</div> <div>Dive duration: 8:13:15</div> <div>Bottom Time: 6:26:39</div> <div>Max. depth: 1541.0 m</div>		
Special Notes			

Scientists Involved (provide name, affiliation, email)

First Name	Last Name	Affiliation	Email
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Michael	Vecchione	vecchiom@si.edu	NOAA National Systematics Lab
Robert	Carney	rcarne1@lsu.edu	LSU, Oceanography, emeritus



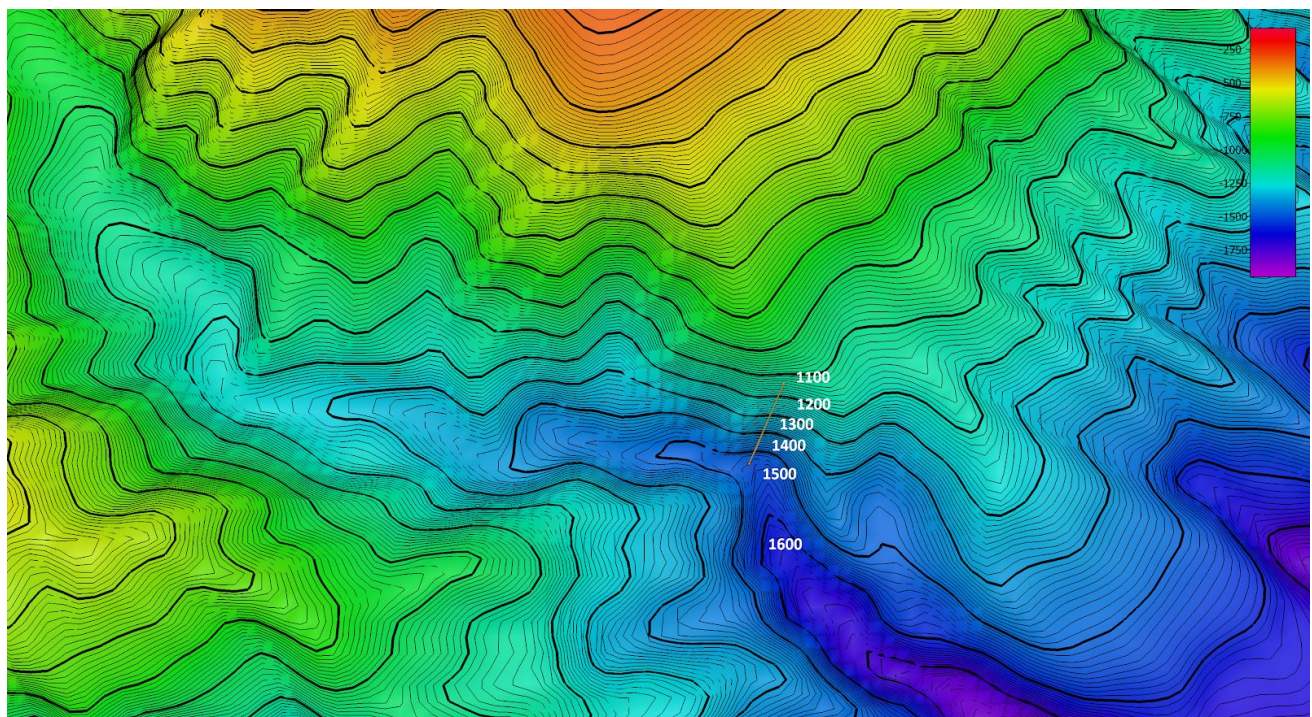
Tara	Harmer Luke	luket@stockton.edu; tara.luke@stockton.edu	Stockton University
Alexis	Weinnig	aweinnig@temple.edu	Temple University
Amy	Wagner	amy.wagner@csus.edu; amywagner98@gmail.com	California State University, Sacramento
Danielle	Power	danielle.l.power@noaa.gov	NOAA Ship Okeanos Explorer
J	Dunn	christopher.dunn@noaa.gov	NOAA OER
Kevin	Jerram	kjerram@ccom.unh.edu	UNH
Shannon	Hoy	shannon.hoy@noaa.gov	NOAA OER
Estefania	Rodriguez	erodriguez@amnh.org	American Museum of Natural History

Dive Purpose	The primary objective of this dive is to explore and characterize a mid-Atlantic canyon wall with a relatively steep slope that has the potential to be suitable habitat for deep-water coral, sponges, and associated fauna.
Dive Description	<p>This dive was conducted on a south facing wall in Wilmington Canyon. The ROV reached the bottom at 13:20 UTC at a depth of 1,533 meters in the trough of the canyon. This area was sedimented and had a high abundance of very small (~ 1 cm) swimming holothurians (Scotoanassa-type) on the seafloor as well as <i>Phorosoma sp.</i> and <i>Hygrosoma sp.</i> pancake urchins., a few large pycnogonid sea spiders (possibly <i>Colossendeis sp.</i>), a number of different sea pen varieties, the proboscis of a few spoon worms (Echiurans) extended on the sediment coming out of hole, a number of different types of fish (Synphobranchus eels, a deep-sea lizardfish (<i>Bathysaurus ferox</i>), and a number of small juvenile cusk eels sheltering in the spines of <i>Hygrosoma sp.</i> urchins, a halosaur (<i>Halosauropsis macrochir</i>). As we started moving up slope two different types of octopods were seen relatively quickly, a warty octopus (<i>Graneledone verrucosa</i>) and a <i>Muusoctopus johnsonianus</i>. As we encountered the first evidence of hard rock substrate (16:12 UTC, 1,494 meters) we started to observe brisingid sea stars, <i>Paramuricea sp.</i> octocorals, giant solitary hydroids (<i>Monocaulus sp.</i>), and the first citing of the dive of a warty octopus (<i>Graneledone verrucosa</i>) under a rock ledge in a poster guarding her eggs that were attached onto the rock surface. As the dive progressed we observed a high number of warty octopods (<i>Graneledone verrucosa</i>) (>15-30 individuals) in a brooding poster in crevices and small cave-like areas in the rock surface. At least half of the octopods had eggs that were visible and the others could have had eggs hidden by the arms. Various color variations were observed across the individual brooding octopods and this was suggested to be due to various levels of senescence since the mother likely stays and guards the eggs until they hatch, a similar species of warty octopod has been observed in the same brooding poster over a 4 year period. This dive had very interesting geology in that the rock features had imbedded fossilized fluid burrows - Jason Chaytor (USGS) has been studying these fossilized burrows and there is still uncertainty about their formation. In the rubble/sedimented area around the rocks we observed a number of <i>Acanella sp.</i> corals and various species of sea pens and on the rock surfaces we observed a lot of <i>Paramuricea sp.</i> (colonies of various sizes), <i>Acanthogorgia sp.</i>, Paragorgid (pink and white varieties) and likely <i>Swiftia sp.</i> of octocorals. The <i>Paramuricea sp.</i> and Paragorgid octocorals often had at least one, if not multiple, <i>Asteroschema sp.</i> associate. A few live cup corals (<i>Desmophyllum sp.</i>) were also observed. At the end of the dive (~19:30 UTC, 1,398 m) an <i>Acanella sp.</i>, <i>Paramuricea sp.</i>, and <i>Swiftia sp.</i> were collected into the bioboxes. The dive ended at ~19: 45 UTC and the vehicles were recovered on deck at 20:53 UTC.</p>

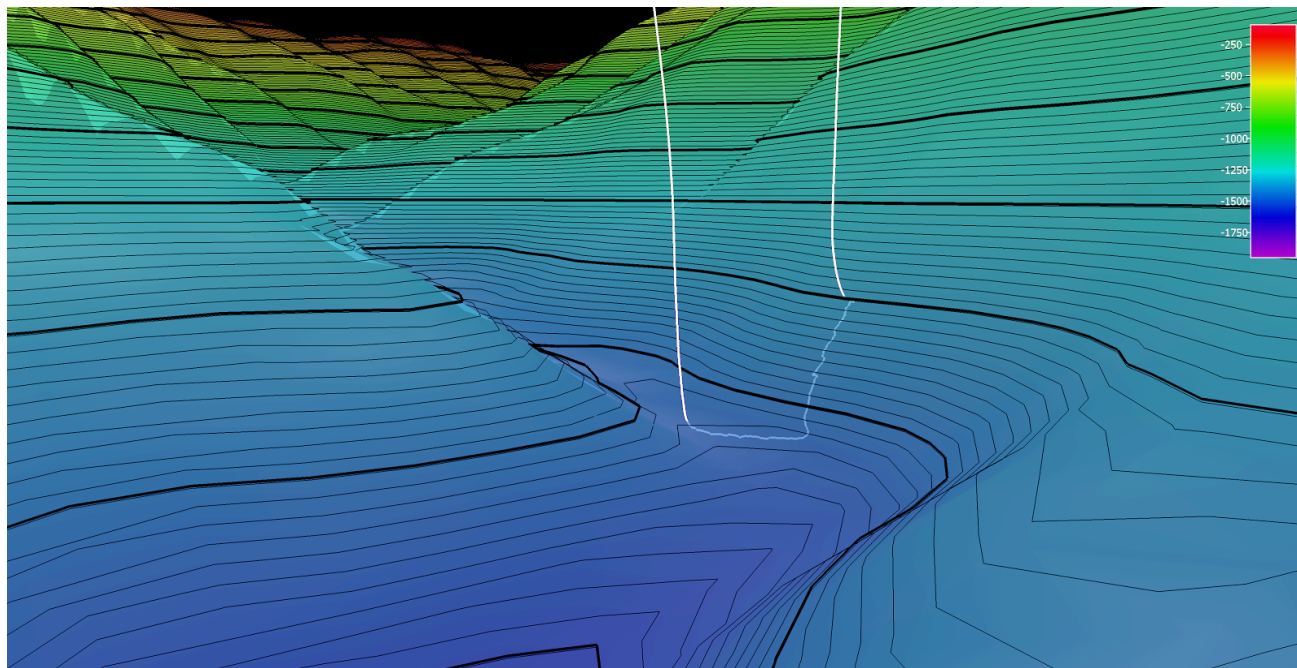


Notable Observations	MANY brooding warty octopus (<i>Graneledone verrucosa</i>) female with eggs in crevices/caves of the rock features - many paramuricea sp. corals (various sizes)
Community Presence/ Absence (community is defined as more than two species)	<ul style="list-style-type: none"> ✓ Corals and Sponges ✓ Chemosynthetic Community ✓ High biodiversity Community ✓ Active Seep or Vent ✓ Extinct Seep or Vent ✓ Hydrates
Feature Type	Submarine Canyon, Scarp/wall
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV2?resourceTypeId=1000&resourceId=23621&divId=1503

Overall Map of the ROV Dive Area



Close-up Map of Main Dive Site

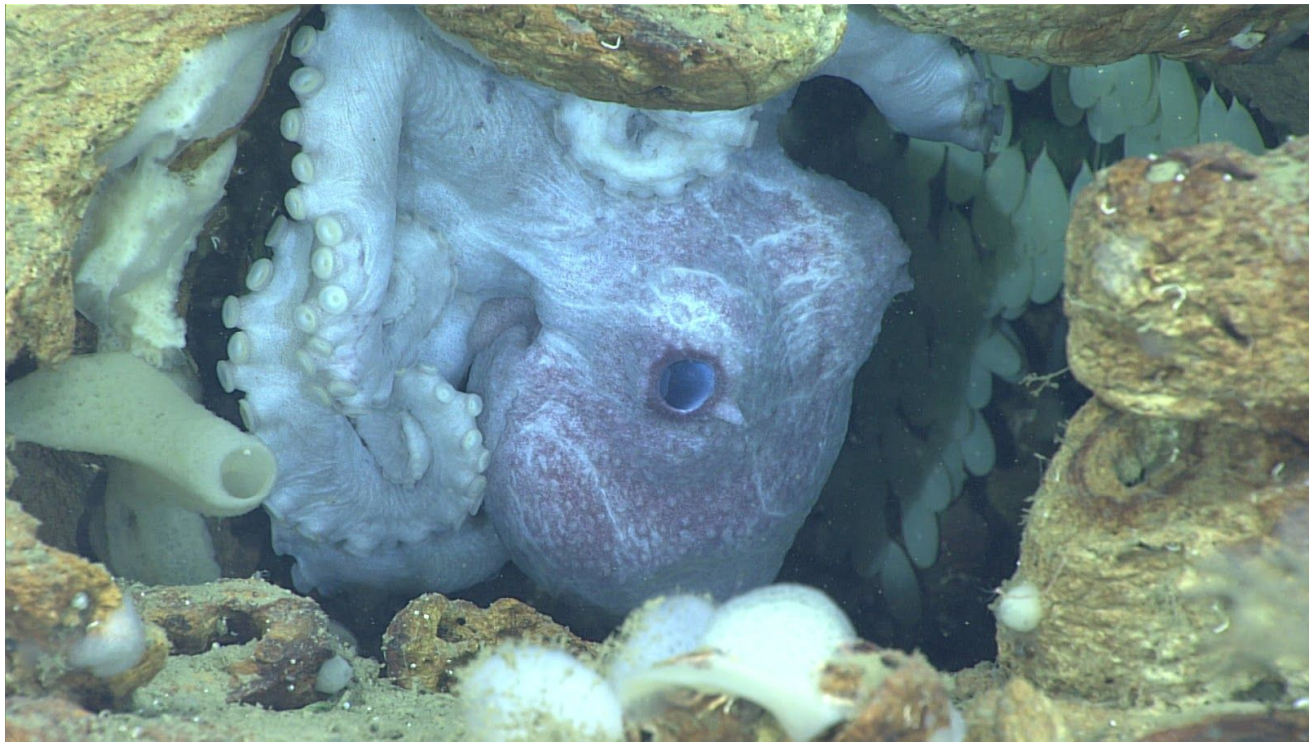


Representative Photos of the Dive

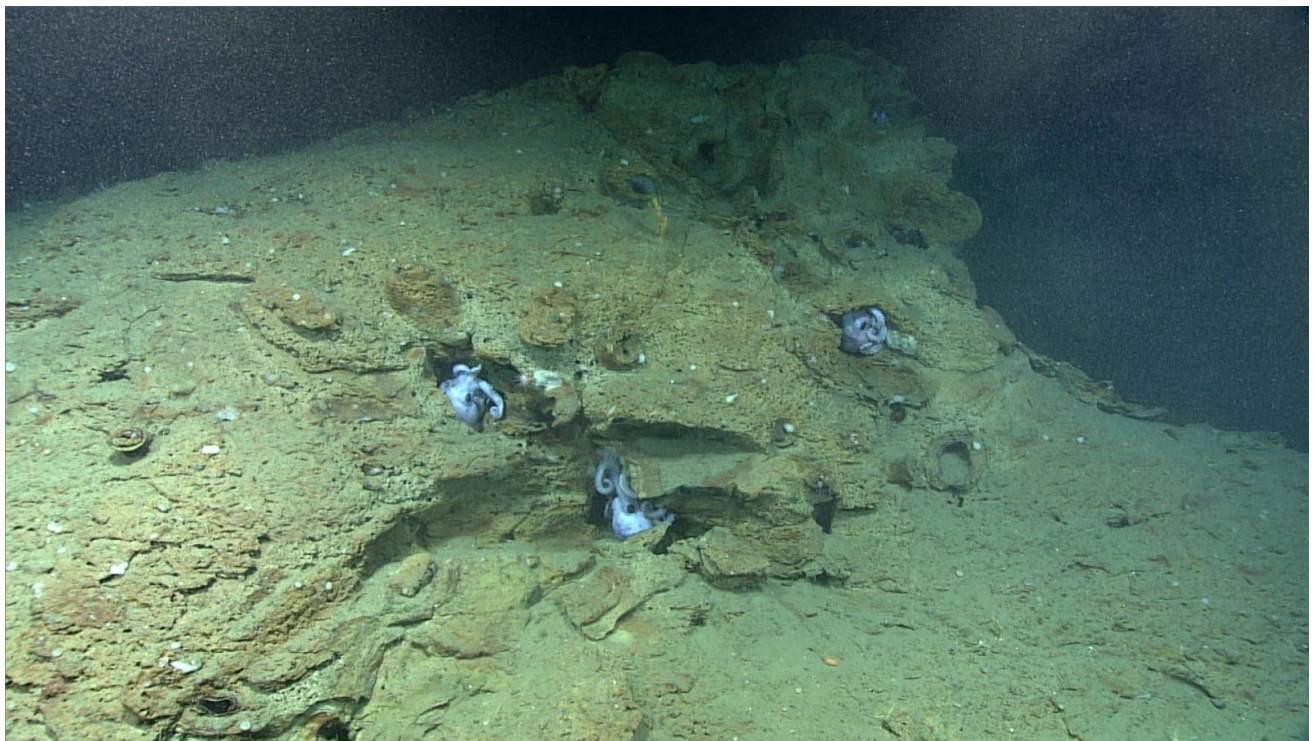


Small juvenile cusk eel sheltering in the spines of *Hygrosoma* sp. urchins and a swimming holothurian (Scotoanassa-type)

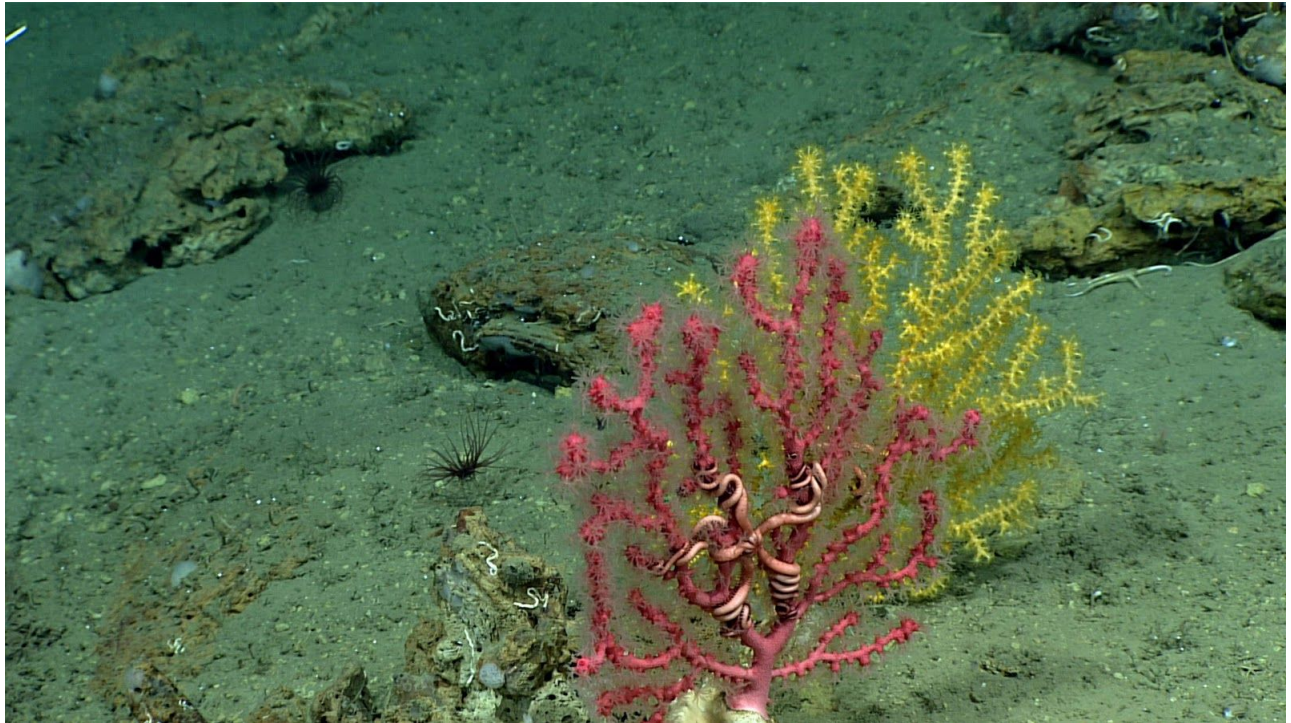




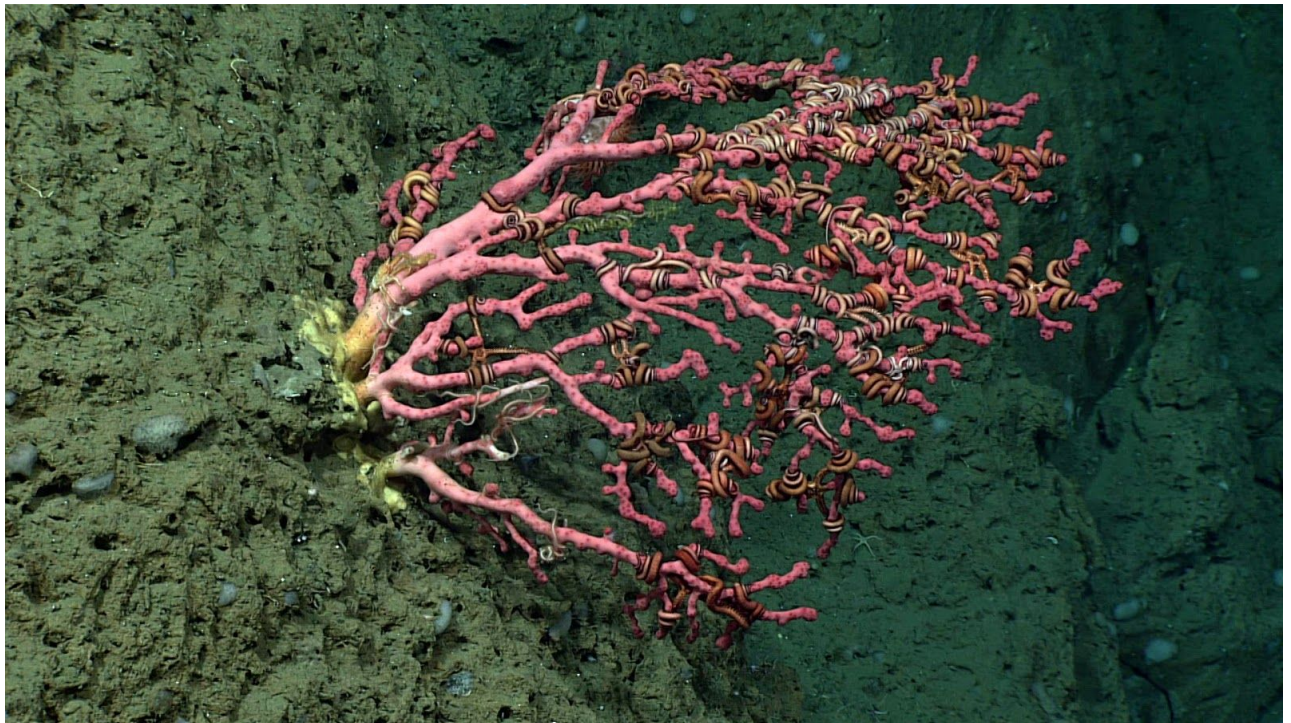
A warty octopus (*Graneledone verrucosa*) under a rock ledge in a poster guarding her eggs (balloon shaped sacks) that were attached onto the rock surface



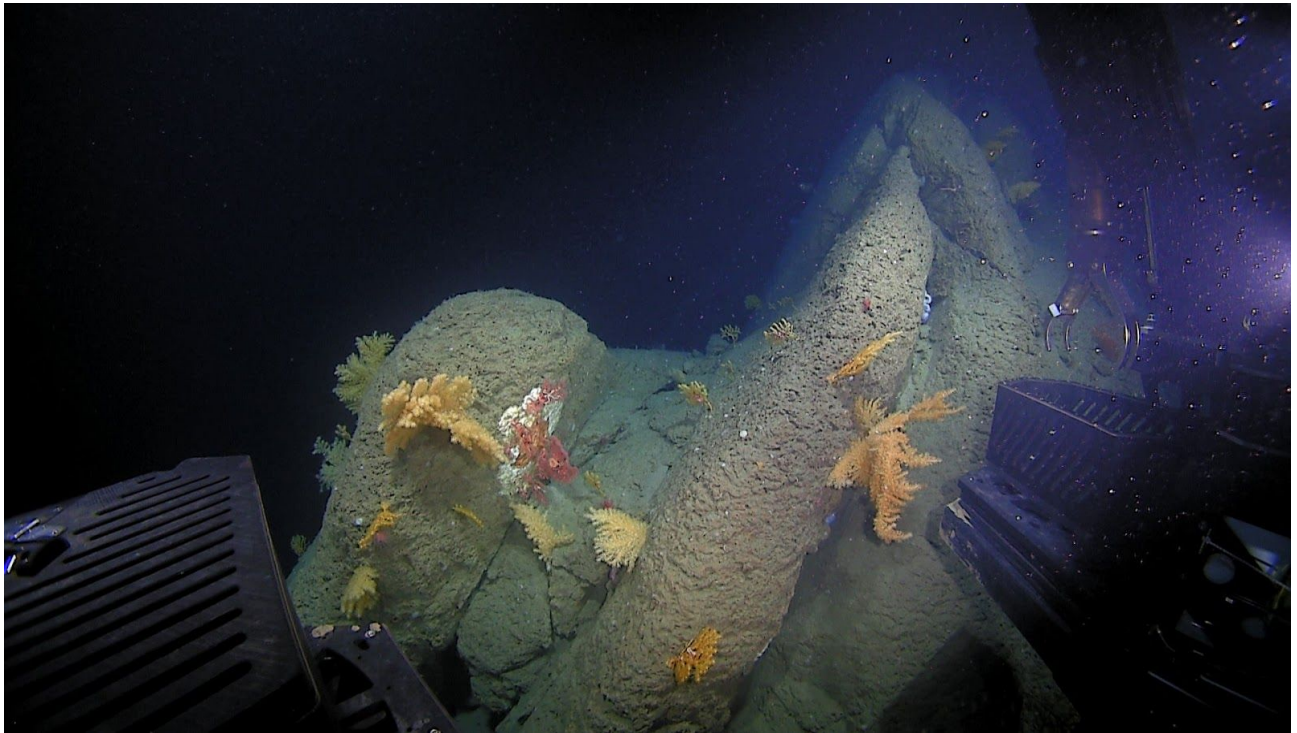
Three warty octopods (*Graneledone verrucosa*) in brooding positions among the cracks of this rock



Paragorgia (pink) octocoral with *Asteroschema* brittle star and a Plexaurid (yellow)

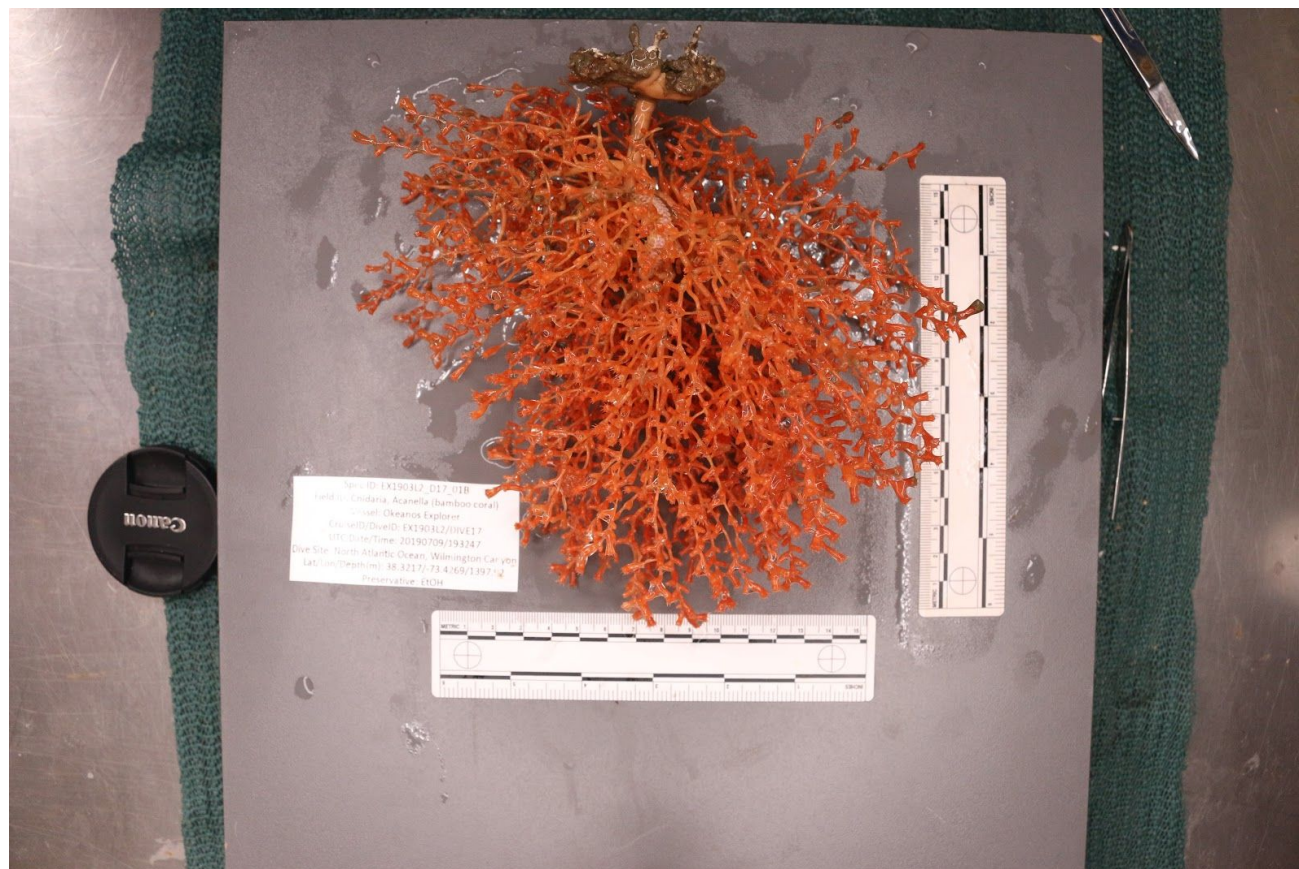


Paragorgia (pink) octocoral with a high density of *Asteroschema* brittle stars on the colony

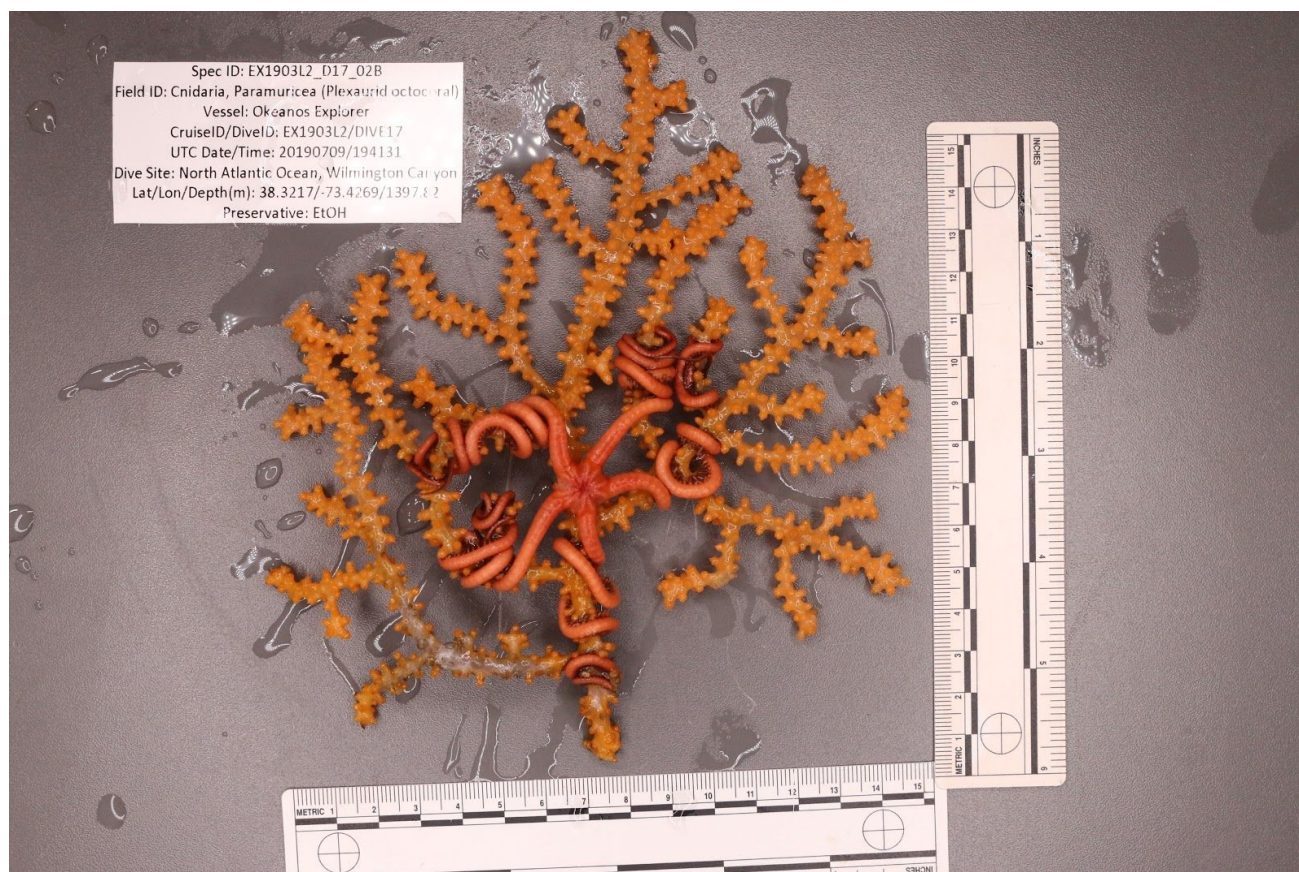


Wide angle camera view of rock outcrops with *Paragorgia*, Plexaurid, and *Acanthagorgia* coral colonies

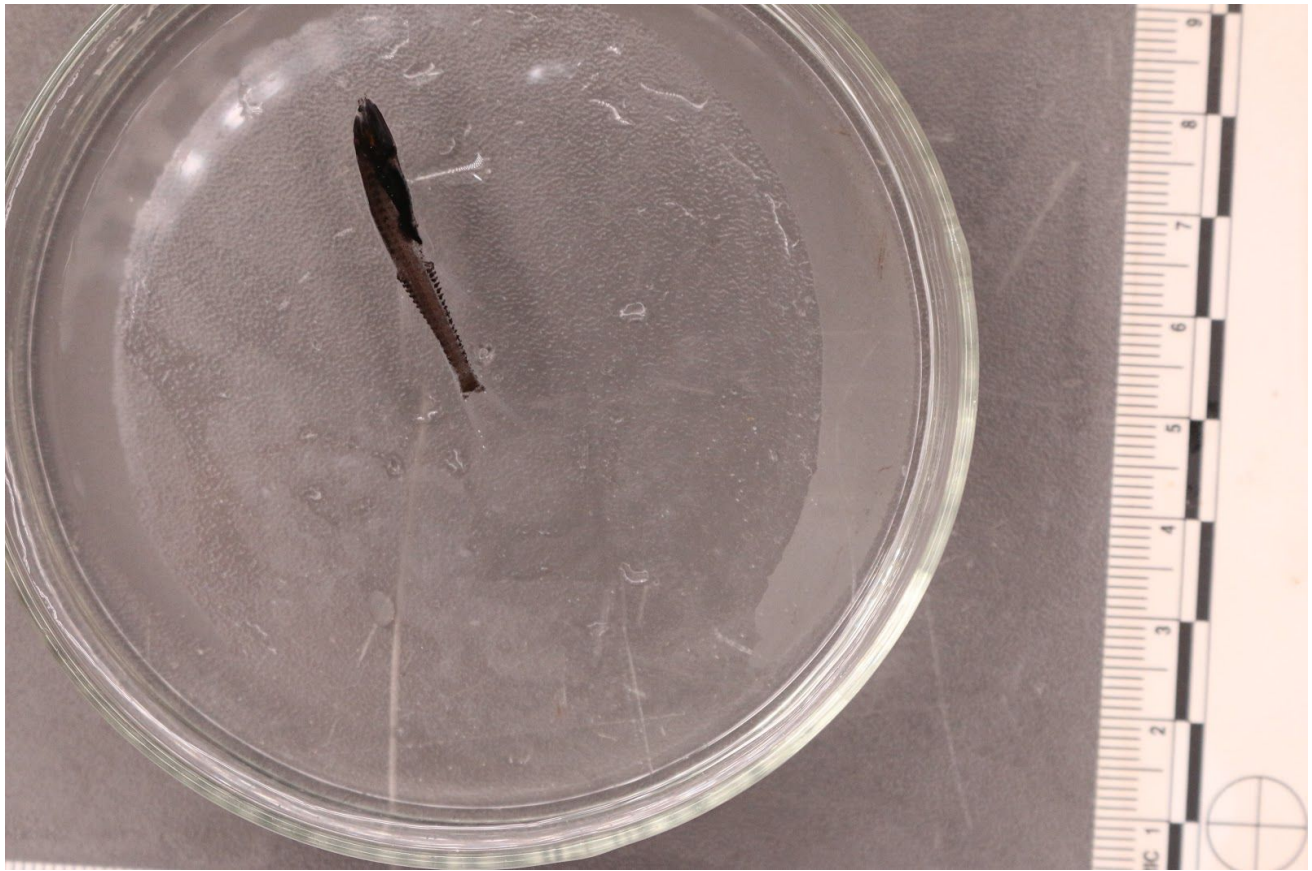
Samples Collected



Sample ID	EX1903L2_D17_01B	
Date (UTC)	20190709	
Time (UTC)	193247	
Depth (m)	1397.9	
Temp. (°C)	3.824	
Field ID(s)	Acanella (bamboo coral)	
Associates	Associates Sample ID	Field Identification
	EX1903L2_D17_01B_A01	Potential Egg Mases
	EX1903L2_D17_01B_A02	Scale worm (Polynoidae)
Comments		



Sample ID	EX1903L2_D17_02B	
Date (UTC)	20190709	
Time (UTC)	194131	
Depth (m)	1397.8	
Temp. (°C)	3.826	
Field ID(s)	Paramuricea (Plexaurid octocoral)	
Associates	Associates Sample ID	Field Identification
	EX1903L2_D17_02B_A01	Plexauridae swiftia sp
	EX1903L2_D17_02B_A02	Asteroscema (Ophiroid)
	EX1903L2_D17_02B_A03	Plexauridae
	EX1903L2_D17_02B_A04	Scale worms (Polynoidae)
Comments		



Sample ID	EX1903L2_D18_01B	
Date (UTC)	20190709	
Time (UTC)	opportunistic sample- time of collection not known	
Depth (m)	NA	
Temp. (°C)	NA	
Field ID(s)	Fish (Osteichthyes)	
Associates		
	Associates Sample ID	Field Identification
	No associates	
Comments	Unintentional Sample	

Please direct inquiries to:

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 Silver Spring, MD 20910
 (301) 734-1014



**Ocean Exploration
and Research**