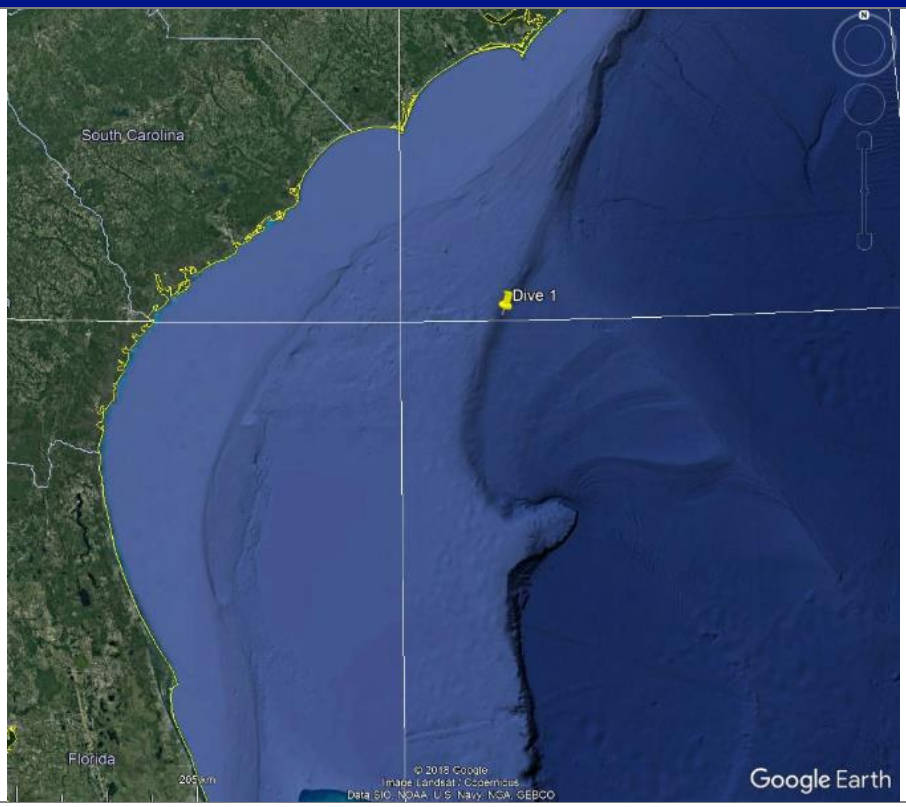
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location	
General Area Descriptor	Blake Escarpment, Southeast US Continental Margin
Site Name	Blake Escarpment North
Science Team Leads	Leslie Sautter / Cheryl Morrison
Expedition Coordinator	Kasey Cantwell
ROV Dive Supervisor	Bobby Mohr
Mapping Lead	Derek Sowers
ROV Dive Name	
Cruise	EX1806
Leg	-
Dive Number	DIVE01
Equipment Deployed	

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	The ship lost a generator during the dive. As this type of failure could cause the ship to lose station keeping ability, the vehicles came off the seafloor for a brief period.
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1806_DIVE01 ^^ In Water: 2018-06-14T13:10:39.434190 32°, 3.332' N ; 76°, 50.783' W On Bottom: 2018-06-14T14:16:50.351354 32°, 3.143' N ; 76°, 50.678' W Off Bottom: 2018-06-14T19:37:45.736748 32°, 3.195' N ; 76°, 50.817' W Out Water: 2018-06-14T20:54:38.806411 32°, 3.137' N ; 76°, 51.762' W Dive duration: 7:43:59 Bottom Time: 5:20:55 Max. depth: 1736.0 m
Special Notes	

Scientists Involved (please provide name, location, affiliation, email)

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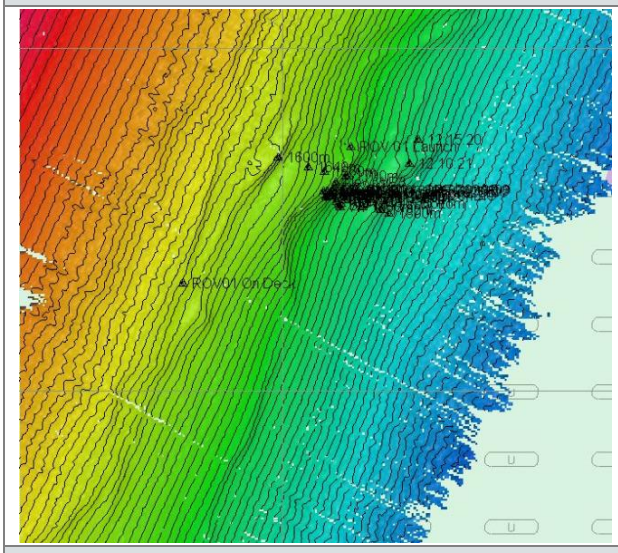
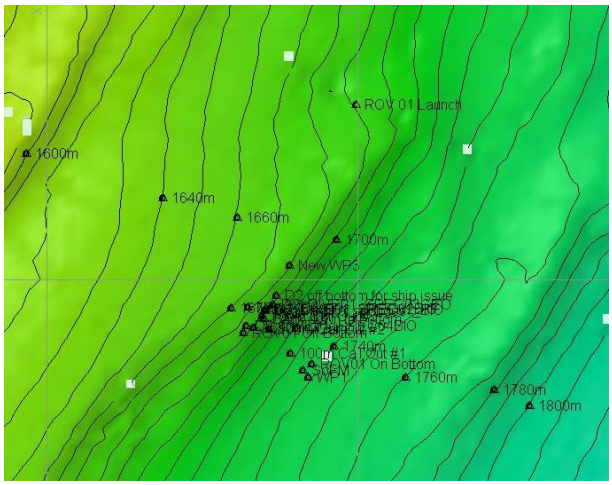
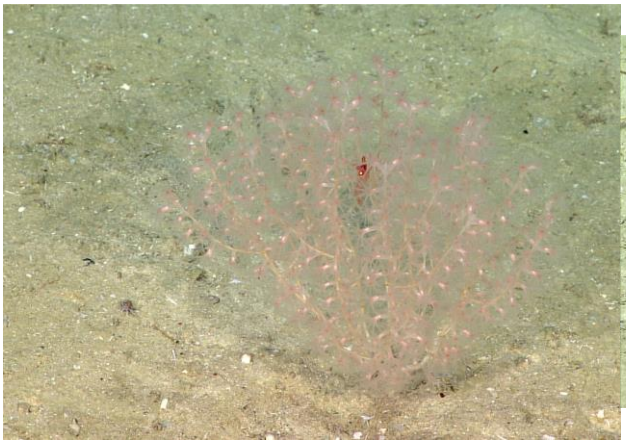
Purpose of the Dive	The primary objective for this dive was to characterize the distribution and abundance of benthic fauna at depths greater than 1500 m. A comparison of the diversity/distribution of coral and sponge communities across the region and to the broader Atlantic is of particular importance to understanding biogeography and connectivity of communities in the Atlantic. This site was proposed by Peter Etnoyer in support of SEDCI objectives, as an unexplored area with potential habitat suitability for corals and sponges. This region was first mapped during EX-18-05 and new information will inform biogeographic patterns in the region.
Description of the Dive	This site is approximately 300 km off the coast of Charleston, SC, on the Southeast US continental margin. It lies on the outer edge of the Blake Plateau, a broad, flat region with water depths ranging 400 to 1300 m. The eastern edge of the plateau in this area descends to depths of 3000 m and is known as the Blake Escarpment. The escarpment's seafloor is influenced by the cold southward-flowing Western Boundary Undercurrent, rather than by the warm northward-flowing Gulf Stream. The seafloor at this site is relatively low relief, with flat expanses of sediment, punctuated by a series of north-south trending rock outcrops which provide areas of hard-bottom exposure and low-slope relief. This site included a 14o slope scarp with a total relief of approximately 65 m. The dive began at the base of the scarp and traveled over flat, soft sediment with a gentle slope (approximately 4 degrees). Typical soft sediment invertebrate fauna were observed in this habitat, including sea pens (*Pennatula*), *Acanella* bamboo corals with shrimp associates (*Bathypalaemonella*), cerianthid tube anemones, *Ophiomusium lymani* brittle stars, *Circeaster* and brisingid sea stars, stalked crinoids, trails in sediment possibly made by Hygrosoma petersi heart urchins, pyconogonid sea spiders, hermit crabs. Fishes included *Antimora rostrata* and *Bathypterois phenax* tripod fishes. Debris observed included what was initially thought to be a SCUBA buoyancy compensator device (BCD), but may have been a massage cushion for a car seat. Reaching the scarp where the slope increased, numerous broken slabs of rock were encountered and were observed to the scarp's

	crest. These rocks are highly compacted (indurated) muds that have a Mn-Fe crust on all exposed surfaces, and crumble easily. Faunal populations became more abundant and diverse, including several species that were not seen in the sediment habitat. At the top of the scarp the rock outcrops were colonized by a variety of octocorals (*Paragorgia* sp. , *Chrysogorgiidae*, *Anthomastus* in clusters, stoloniferan octocorals, plus *Stauropathes* black corals. Sponges were also common, including the Demospongiae *Plymastia*, *Phakellia* and *Geodia*, along with Hexactinellid glass sponges. A type of cusk eel (possibly *Luciobrotula*) was observed, along with a skate. Anthropogenic litter was observed at least three times. The ROV followed the outcrops along the scarp crest to the North for at least 100 m before we had to temporarily come off the seafloor due to a ship generator malfunction. After a short time, we were able to return to the ridge, and we proceeded in the opposite direction, following the current flow, along the rock outcrops until the dive ended.
Notable Observations	Observation of a benthic brittle star swimming Low-relief scarp outcrops supported a diverse fauna including octocorals and sponges.

Community Presence/ Absence (*community is defined as more than two species*)		
	X Corals and Sponges Present	☐Active Seep or Vent
	☐Chemosynthetic Community Present	☐Extinct Seep or Vent
	☐High biodiversity Community Present	☐Hydrates Present

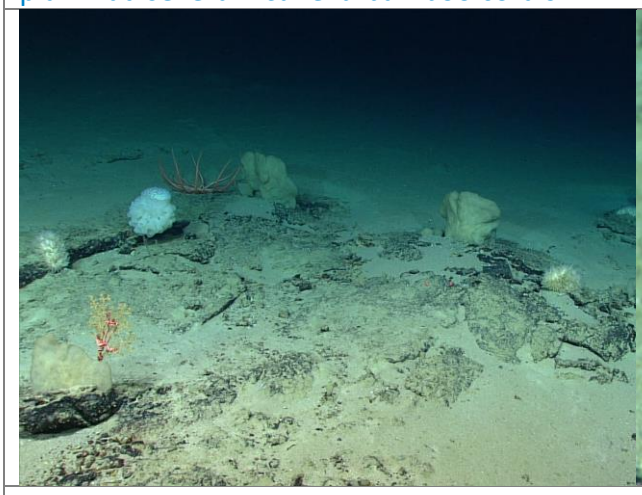
Overall Map of the ROV Dive Area	Close-up Map of Main Dive Site
	

Representative Photos of the Dive

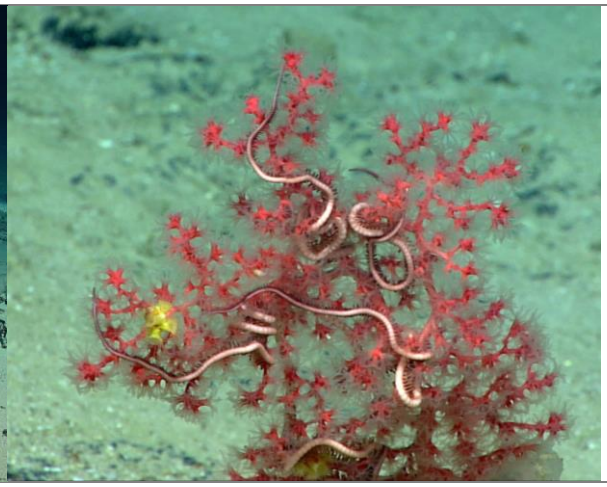


Before reaching the scarp, the sediment plain had several *Acanella* bamboo corals.

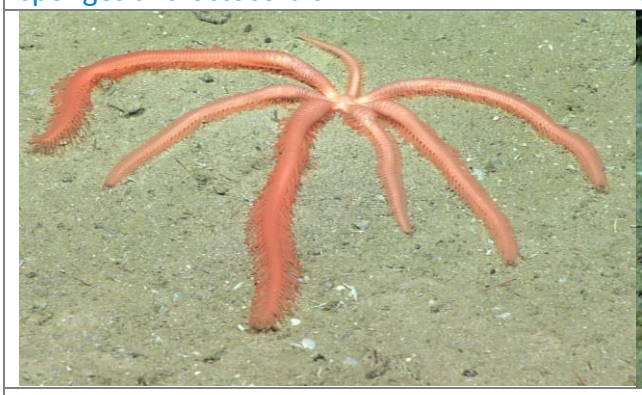
Several tripod fishes (*Bathypterois phenax*) were observed.



Low relief rocky outcrop habitat with sponges and octocorals.



A Paragorgiidae species was observed at least twice.



Several brisingid asteroids were also observed.

This *Polymastia* sponge was observed frequently.

Samples Collected	
Sample	
Sample ID	EX1806_D01_SPEC01BIO

Date (UTC)	20180614
Time (UTC)	171713
Depth (m)	1684.11
Temperature (˚C)	3.89
Field ID(s)	Phakellia (Demospongae)
Reason for Collection	This was a dominant species at this site, so a representative sample was taken to verify the species

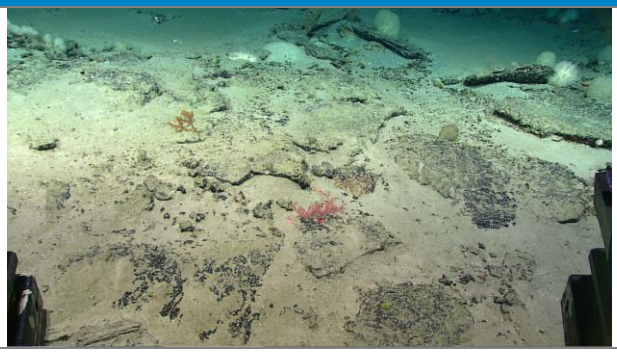
Associates

Associate ID	Field Identification	Notes
A01	hydroid (Hydrozoa)	
A02	mudstone	

Comments

Sample

Sample ID	EX1806_D01_SPEC02BIO
Date (UTC)	20180614
Time (UTC)	173225
Depth (m)	1684.62
Temperature (˚C)	3.89
Field ID(s)	Paragorgiidae



Reason for Collection	Specimen was collected in order to determine species ID

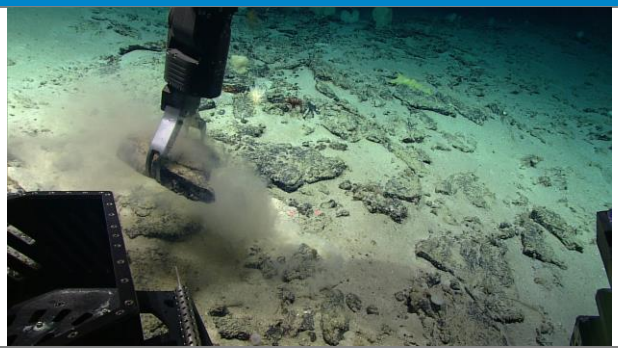
Associates

Associate ID	Field Identification	Notes
A01	Ophiuroidea	

Comments: Paragorgia or Sibogorgia

Sample

Sample ID	EX1806_D01_SPEC03GEO
Date (UTC)	20180614
Time (UTC)	175525
Depth (m)	1684.49
Temperature (˚C)	3.88
Field ID(s)	Well-indurated mudstone



Notes	This slab of mudstone has homogeneous clay-sized particles. It disaggregates easily and is not fully lithified. All exposed surfaces have a (presumably) Fe-Mn crust that is ~1cm thick.

	It does not effervesce w/vinegar (no HCl available), suggesting it is not calcareous in composition. The surface has numerous grazing tracks (or burrows) preserved.
Reason for Collection	To characterize the rocky substrate of the scarp

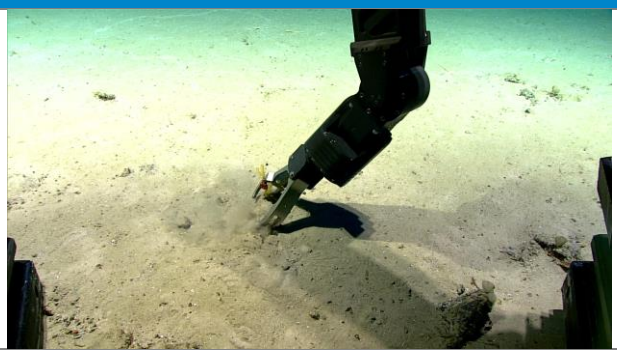
Associates

Associate ID	Field Identification	Notes
A01	sponges	polyphyletic
A02	hydroids (Hydrozoa)	polyphyletic

Comments

Sample

Sample ID	EX1806_D01_SPEC04BIO
Date (UTC)	20180614
Time (UTC)	192259
Depth (m)	1682.21
Temperature (°C)	3.88
Field ID(s)	Paramuricea



Reason for Collection	Collected for inclusion in the ASPIRE connectivity program

Associates

Associate ID	Field Identification	Notes
A01	Ophiuroidea	
A02	Polychaeta	burrowing just below surface of mudstone
A03	Desmophyllum	dead
A04	Mudstone	2 small slabs of well-indurated mud w/ some Fe-Mn crust; easily disaggregates; not lithified; does not effervesce w/vinegar (no HCl available); clay-sized particles

Comments

Please direct inquiries to:

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