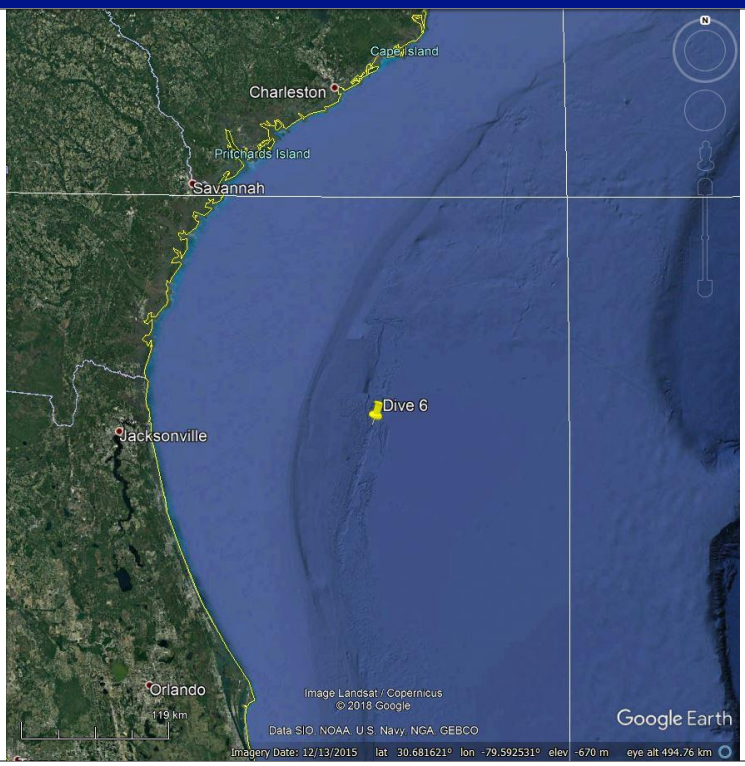
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location	
General Area Descriptor	Blake Plateau (Million Mounds)
Site Name	Stetson Mesa 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	DIVE06
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	Dive start was 2 hours delayed. At the start of power-on pre-dive checks, there was no communication to the motor saver sensor in the PDU. Once the issue was resolved, the pilots proceeded with pre-dive and the vehicles were in the water around 1000 EDT.
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1806_DIVE06 ^^ In Water: 2018-06-20T14:08:31.337110 30°, 23.916' N ; 79°, 36.073' W On Bottom: 2018-06-20T14:45:53.080627 30°, 24.203' N ; 79°, 35.891' W Off Bottom: 2018-06-20T20:02:48.270430 30°, 24.33' N ; 79°, 36.096' W Out Water: 2018-06-20T20:33:18.628169 30°, 24.723' N ; 79°, 35.96' W Dive duration: 6:24:47 Bottom Time: 5:16:55 Max. depth: 788.0 m
Special Notes	
Scientists Involved (please provide name, location, affiliation, email)	see table below

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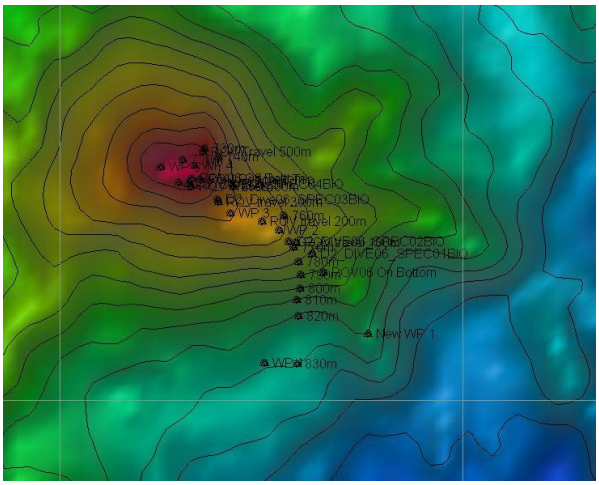
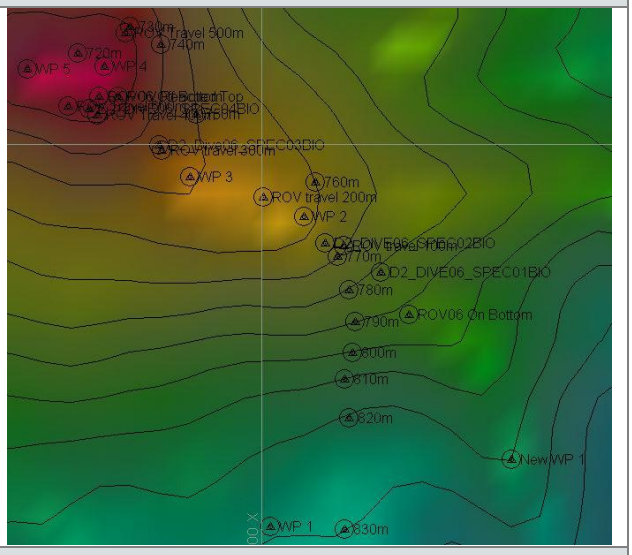
Purpose of the Dive	This dive is part of a series that investigates the similarities and differences in community composition between deepwater habitats of the SE US continental margin. The general area was proposed by several scientists representing the SAFMC, NOAA DSCRTP, NOAA NCCOS, BOEM and the Deep Search team, as this region is an unexplored area with strong potential habitat suitability for deep sea corals. High resolution multibeam bathymetry shows many mound features at depths ranging 400 to 800 m throughout the Stetson Mesa. The dive site was selected for its steep slopes and overall vertical relief, in order to compare deeper areas with those at the mound's crest where current flow is greatest. This area also served as an excellent comparison to mounds explored to the south on the previous dive (Dive05). The area known as Stetson Mesa shows high habitat suitability for deep-sea corals in existing models (Kinlan et al. 2013). The region was first mapped during EX-14-03 and acquiring new information will inform biogeographic patterns in the region. Diving in the area provides important information to groundtruth these models.		
Description of the Dive	The dive traversed a large, complex mound with ~100 m of relief, located beneath the outer edge of the Gulf Stream off Savannah, GA. Broad, relatively steep slopes of 15-20^{o} were encountered during the ascent, and a narrow ridge was crossed before the steepest climb to the mound's crest. Throughout the dive the seabed was comprised of old, Fe-Mn-stained dead coral rubble and coarse calcareous sediments made of micro-organism shell remains. Most of the area observed was rubble and sediment, with small areas of low-relief standing coral skeleton framework but did not host abundant living *Enallopsammia profunda*. These framework mounds provided habitat substrate for the cup corals *Bathypsammia* and *Javania* and the octocorals *Duva florida* (Alcyonacea), *Eunicella and/or Swiftia, Anthomastus, Pseudoanthomastus, Plumarella, Anthothela, Acanthogorgia, Chrysogorgia,* and numerous *Cladarisis* bamboo		

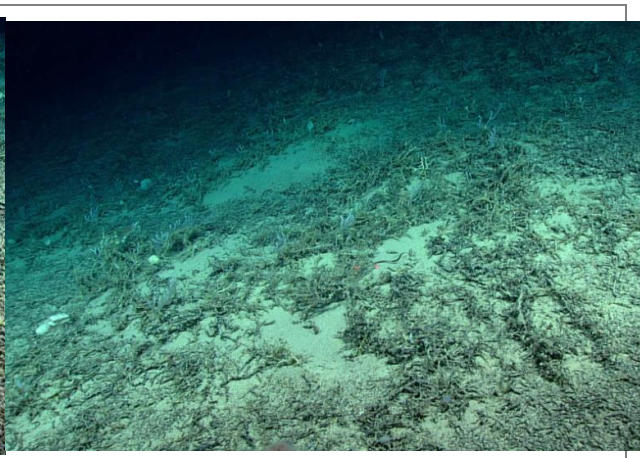
	corals plus Plumulariid hydroids and Stylasterid lace corals. The coral framework also provided substrate for invertebrate fauna, such as echinoderms: *Pentametrocrinus atlanticus* and stalked crinoids, *Areosoma* pancake urchins, *Cidaris abyssicola* pencil urchins, asteroid sea stars including *Goniaster, Henricia*, and *Solaster* sp.; sponges such as *Pheronema* and *Regadrella* glass sponges, *Oceanapia*, *Stylocordyla* sp., *Geodia pachydermata*, and Hyalonematidae; plus numerous Plumulariid hydroids, squat lobsters (*Munidposis* sp)., a pycnogonid sea spider, and a bobtail squid. The hagfish *Rubicundus lopheliae* was spotted within the coral rubble. Other fishes observed include: numerous Synaphobranchid eels (*Synaphobranchus affinis*), coral hakes (*Laemonema melanurum*), rattails (*Nezumia* sp.), and one scorpionfish, *Trachyscorpia cristuala*. At the crest of the mound, where currents were greatest, coral skeleton framework mounds made of live and dead *Lophelia* were greater in relief and breadth than those observed in deeper areas, and were dominated by *Lophelia pertusa* with *Madrepora oculata*. Bamboo corals (*Cladarisis* sp.) were also abundant and several *Leiopathes* black corals were observed. An encrusting black sponge, *Dercitus* sp., was observed on a flank of the mound crest.
Notable Observations	• This site had many species in common with the previous dive further south on the Stetson Mesa. A noticable difference between these sites was fewer species of black corals at this northern site. • Several black sponges, possibly *Dercitus* sp., were observed, and one sample was collected. This is likely a range extension from the northeastern Atlantic Ocean.

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
	X High biodiversity Community Present	☐Hydrates Present

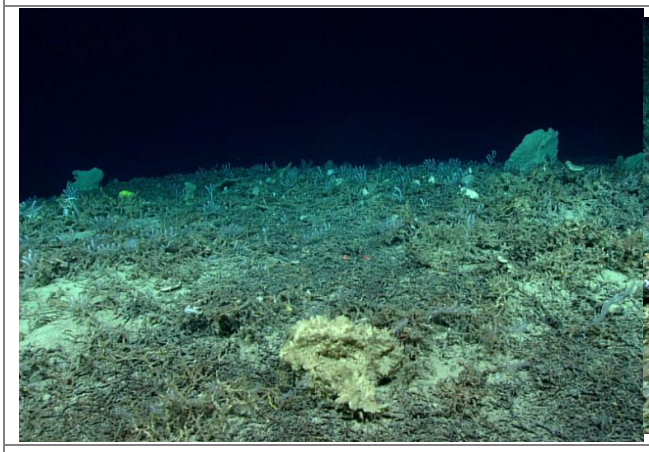
Overall Map of the ROV Dive Area	Close-up Map of Main Dive Site
	

Representative Photos of the Dive

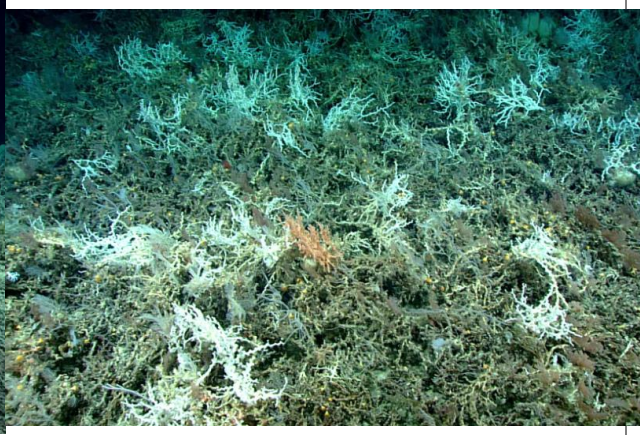
Low-relief dead coral skeletal framework was found on slopes near the base of the mound. *Regadrella* glass sponges and demosponges were observed.



Several of the sloped areas showed smaller areas of coral skeletal framework patches with fewer populations of corals and sponges.



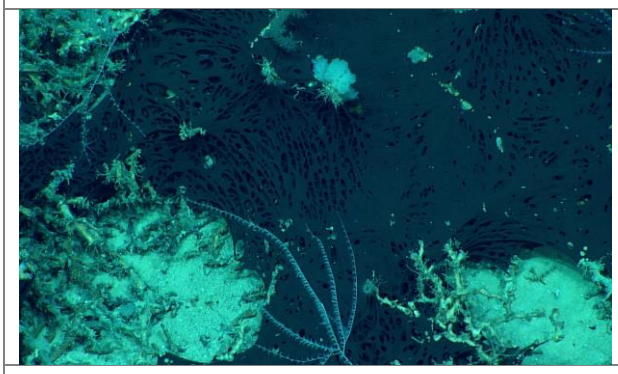
On the broad ridge below the crest, skeletal framework was similar to deeper areas.



Near the crest of the mound feature, large stands of live *Lophelia pertusa* (white coral) living on the dead coral skeleton framework were observed, occasionally with the stony coral *Madrepora oculata* (orange coral, center).

The coral hake *(Laemonema melanurum*) was observed frequently during the dive.

Pancake urchins (Echinothuridae: *Aerosoma*) were frequently observed on coral rubble substrate.



Three areas covered by an black encrusting sponge (possibly *Dercitus*) were observed. This is likely a range extension from the northeastern Atlantic Ocean.

This pink hagfish (*Rubicundus lopheliae*) was spotted hiding in the coral rubble, it's known habitat.

Samples Collected

Sample

Sample ID	D2_DIVE06_SPEC01BIO
Date (UTC)	20180620
Time (UTC)	154840
Depth (m)	778.61
Temperature (˚C)	8.50
Field ID(s)	*Pheronema* sp.
Reason for Collection	There was debate among the scientists in the chat room about the species, and this may be a new species or a range extension.

Notes	

Associates

Associate ID	Field Identification	Notes
A01	calcareous ooze with coral rubble	Very little fine grained material; nearly 100% skeletal remains of calcareous organisms (foraminifera, pteropods), with some sponge spicules (opaline); coral rubble removed and stored separately
A02	Pteropod and heteropod shells	Shells from numerous pteropod and heteropod species were incorporated into the spicule matrix of the base of the primary specimen
A03	Ophiuroidea	
A04	coral rubble	

Sample

Sample ID	D2_DIVE06_SPEC02BIO
Date (UTC)	20180620
Time (UTC)	163041
Depth (m)	760.11
Temperature (°C)	8.47
Field ID(s)	Primnoidae

Reason for Collection	*There was debate among the scientists about both the genus and species of this octocoral. It was rare at this site and has not been observed yet on this expedition.*
Notes	

Associates

Associate ID	Field Identification	Notes
None		

Sample

Sample ID	D2_DIVE06_SPEC03BIO
Date (UTC)	20180620
Time (UTC)	180730
Depth (m)	737.21
Temperature (°C)	8.72
Field ID(s)	*Geodia pachydermata*

Reason for	*This is an ASPIRE connectivity tier I target species.*

Collection	
Notes	

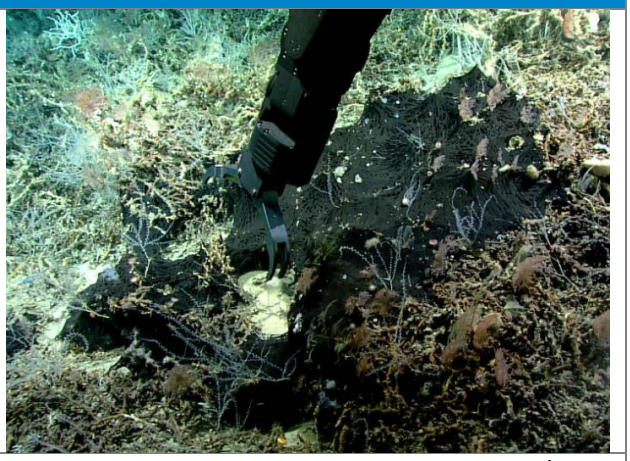
Associates

[Notes section here can include number of organisms, condition of organism(s) upon retrieval or photos as needed]

Associate ID	Field Identification	Notes
A01	Plexauridae	
A02	Plexauridae	
A03	Crinoidea	stalked
A04	Ophiuroidea	
A05	Crinoidea (3)	stalked
A06	Polychaeta (5)	
A07	Polychaeta (6)	
A08	Gastropoda	
A09	Heterobranchia	
A10	Ophiuroidea	
A11	coral rubble	

Sample

Sample ID	D2_DIVE06_SPEC04BIO
Date (UTC)	20180620
Time (UTC)	195514
Depth (m)	717.59
Temperature (°C)	8.66
Field ID(s)	*Dercitus* sp.?



Reason for Collection	*This genus has not been found in the NW Atlantic. This is likely a range extension and/or a new species.*
Notes	

Associates

[Notes section here can include number of organisms, condition of organism(s) upon retrieval or photos as needed]

Associate ID	Field Identification	Notes
A01	*Cladarisis* sp. (2)	bamboo coral
A02	*Duva florida*	
A03	Hydrozoa	hydroid
A04	Demospongiae?	
A05	Ophiuroidea	
A06	coral rubble	

	A07	Isopoda	On A04

Please direct inquiries to:

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