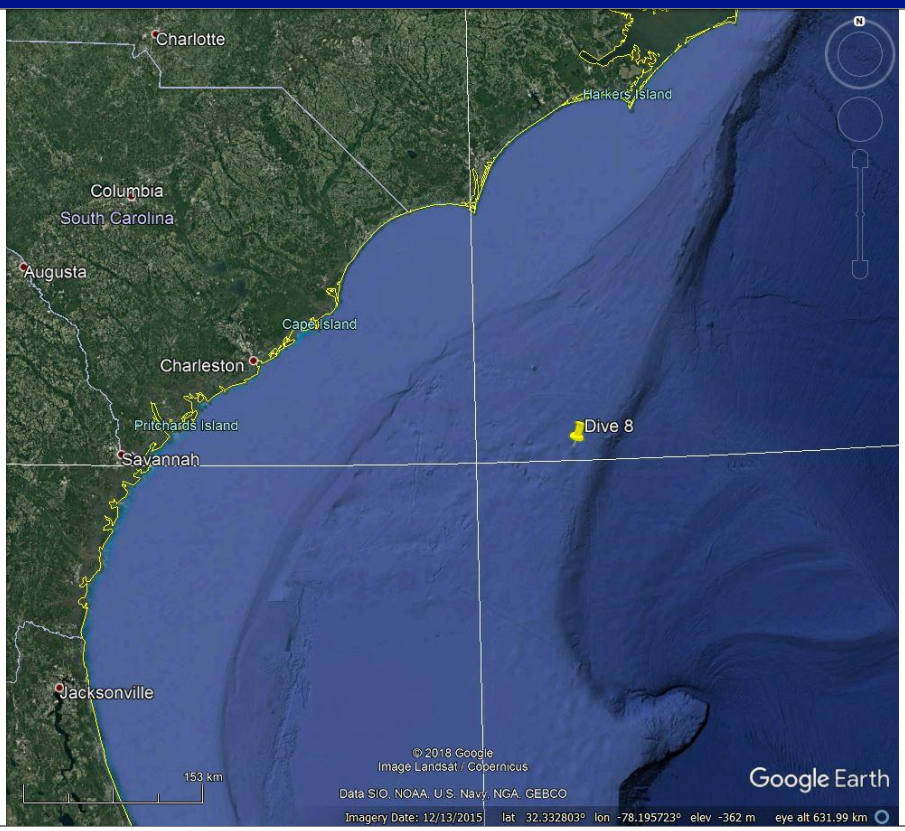
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location	
General Area Descriptor	Blake Plateau
Site Name	Richardson Scarp
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	DIVE08
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	During descent there was an issue with the ship's Dynamic Positioning system that resulted in a delay in acquiring bottom. Due to an issue with the compass on *Seirios*, the tether between the vehicles got a loop in the tether. The vehicles came off bottom to resolve this issue. Once the loop was removed, the vehicles re-acquired bottom and continued with the dive.
ROV Dive Summary (from processed ROV data)	Dive Summary: EX1806_DIVE08 ^^ In Water: 2018-06-22T12:22:05.511912 32°, 5.421' N ; 77°, 9.767' W On Bottom: 2018-06-22T13:27:38.293797 32°, 5.579' N ; 77°, 9.57' W Off Bottom: 2018-06-22T19:56:48.978178 32°, 5.6' N ; 77°, 9.954' W Out Water: 2018-06-22T20:35:16.741098 32°, 5.802' N ; 77°, 9.541' W Dive duration: 8:13:11 Bottom Time: 6:29:10 Max. depth: 1006.0 m
Special Notes	Today's weekly emergency drills were initially communicated as "not a drill." ROV team followed established emergency procedures- vehicles were brought into a safe configuration and pulled off the seafloor to a safe height. As the pilots got into final safe position, the false alarm was confirmed and the vehicle returned to the seafloor. Prior to the alarm, sampling operations were underway and were unable to be completed. Fortunately this sample was of the dominant fauna and once bottom was reacquired, a separate sample was collected.
Scientists Involved (please provide name, location, affiliation, email)	see table below

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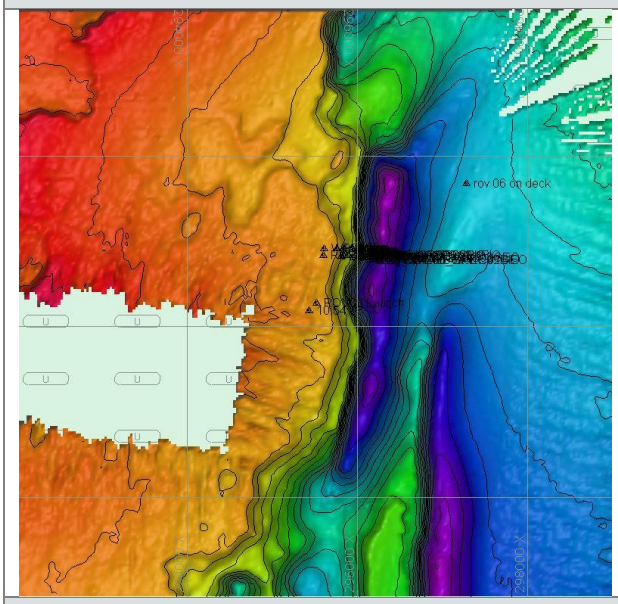
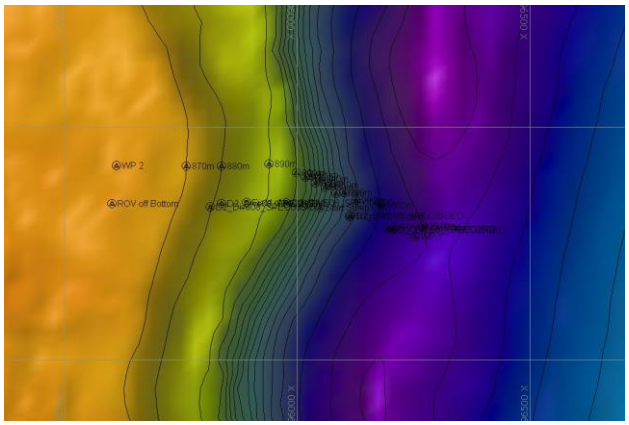
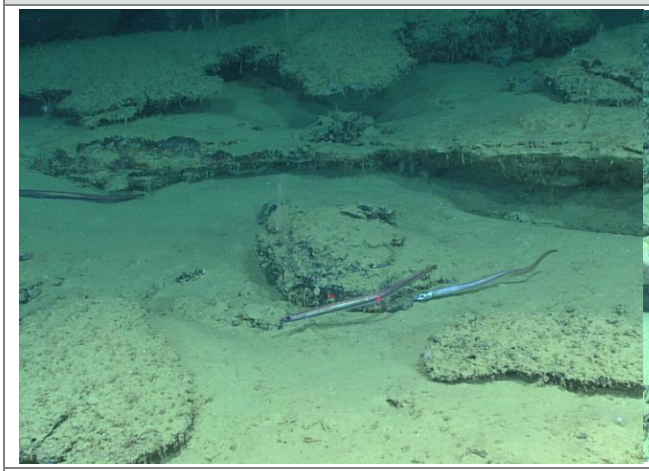
Purpose of the Dive	This dive is part of a series that investigates the similarities and differences in community composition between deepwater habitats of the SE US continental margin. This site is within a large under-explored area of the Miami Stetson CHAPC and is a high priority region for the Deep Search project, with the primary objective to identify presence / absence of deepwater corals and benthic communities in areas with the potential for offshore development. This region was first mapped during EX-18-05. New information will inform biogeographic patterns in the region, critical for refining habitat prediction models. Diving in the area will provide important information to groundtruth these models.		
Description of the Dive	This dive explored a steep scarp of eroded outcropping layers of sedimentary rock (strata). The dive began at approximately 1005 m where thick sediments and Fe-Mn-crusted rock dominated along with coarse calcareous sediments. As the gradient increased, numerous rock outcrops were observed, including mudstones, smoothly scoured claystone, highly bored, poorly indurated calcareous muds, and more Fe-Mn units. One section contained interbedded muds with differential erosion, resulting in a steep staircase feature. A 31 m vertical wall was observed beginning at 946 m, and appeared to be lithified muds or limestone. A broad terrace midway up the scarp was sediment covered with abundant Mn-nodules throughout. The last segment of the scarp included more calcareous mudstones. The scarp's top was another broad, sediment draped substrate with many Mn nodules and small slabs of Fe-Mn encrusted rock. Nearly all rock ledges observed provided suitable substrate for coral and sponge. This site had very different fauna relative to previous dives. Cladorhizid carnivorous sponges were common (one collection was made), along with antipatharian black corals (*Parantipathes* cf. *hirondelle* with hermit crab associate, *Bathypathes* seen with either scale worm or chirostylid squat lobster associates), a white lattice fan-shaped bryzoan (possibly *Membranipora* sp.), plus *Plumarella, Chrysogorgia* and *Anthomastes* octocorals. Unlike previous dives on coral mounds, bamboo corals were absent. There were few stony corals, the majority of which were *Solenosmilia variabilis*, along with several colonies of *Lophelia pertusa*, and *Madrepora oculata* once we got to the mesa. Asteroid sea stars included *Chondraster* sp. and the goniasterids *Pultaster placenta* (white) and *Plinthaster dentatus* (yellow). The octopus *Graneledone verrucosa* was also observed. Fish species included several *Chaunax coloratus*, eels (*Synaphobranchus affinis*), rattails (*Nezumia aequalis*), an ophidiod (*Monomitopus agassizi)* a macrourid (*Coryphaenoides armatus*), a scorpaeniform (*Cottunculus* sp.), and the skittleskate *Dactylobatus armatus*. Marine debris included a portion of a fishing net.		
Notable Observations	Mn-nodules were abundant on some of the flat terraces of the scarp. Several were collected for elemental analyses. This site had fewer stony corals than previous dives, mostly *Solenosmilia variabilis*, plus a few *Lophelia pertusa* and *Madrepora oculata* at the top of the scarp. Bamboo corals were not observed*. We encountered numerous cladorhizid carnivorous sponges, along with antipatharian black corals, a white lattice fan-shaped bryzoan, and Plumarella octocorals.*		

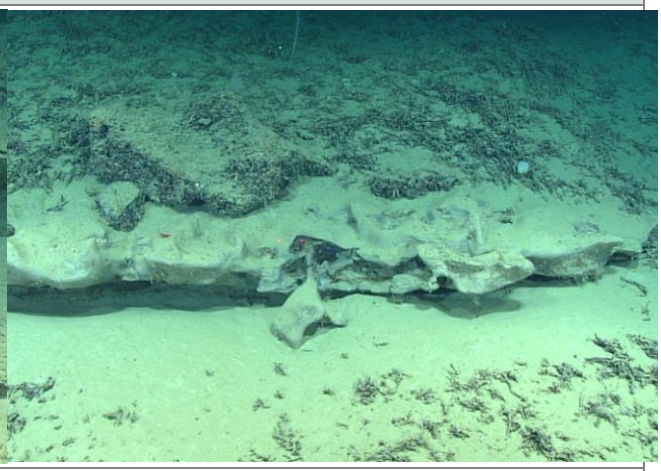
Community Presence/ Absence (*community is defined as more than two species*)	X Corals and Sponges Present	☐Active Seep or Vent
	☐Chemosynthetic Community Present	☐Extinct Seep or Vent
	☐High biodiversity Community Present	☐Hydrates Present

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

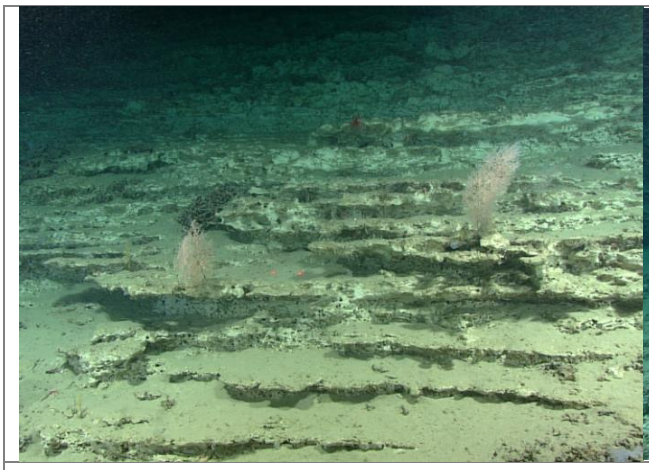
Representative Photos of the Dive



The base of the scarp was comprised of thick sediments and Fe-Mn encrusted, consolidated sediments. Cutthroat eels *(Synaphobranchus affinis)* were common.



The scarp was a 24 m sequence of outcropping sedimentary strata, most of which appeared to be calcareous mudstones of varying resistance to erosion. One of the unusual layers (SPEC03GEO) was a smooth claystone with undulating scour marks.

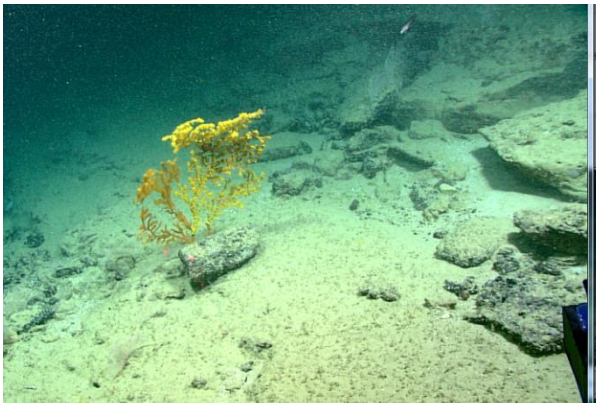


One section of the scarp had interbedded layers that formed a terrace, showing differential erosion. Several *Chrysogorgia* were observed.

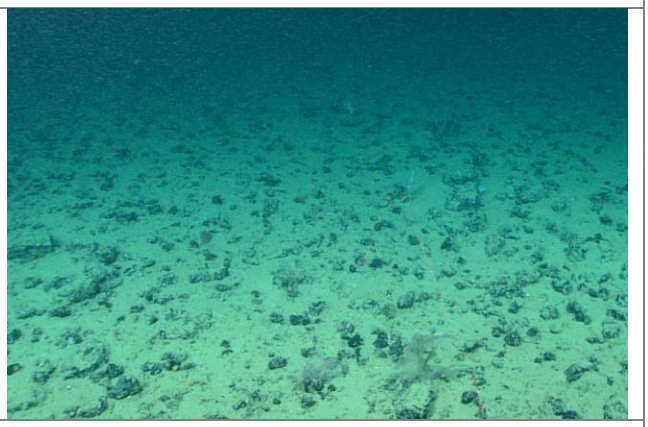
At the base of the 31 m vertical wall, more erosion-resistant layers outcropped. Their composition is unknown.

A thick sequence of lithified rock (arenites or limestones?) were substrate for numerous individual organisms, such as venus fly-trap anemones and *Solenosmilia variabilis* corals.

After a broad sediment-draped terrace with scattered Mn-nodules, the scarp began to rise again with mudstone outcrops. Occasional black corals were seen in this environment.



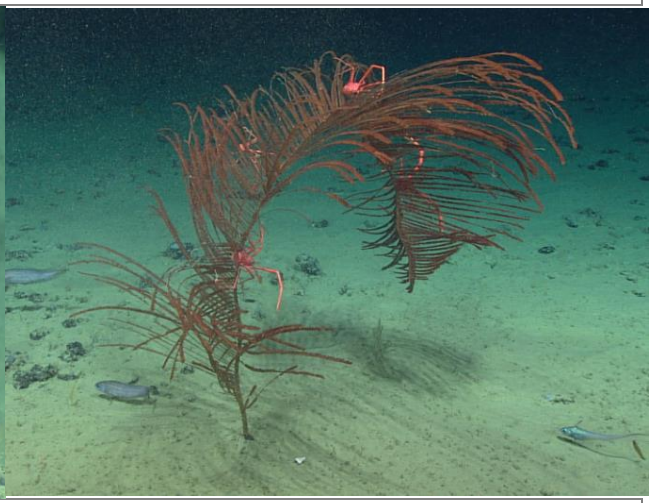
Indurated mudstones continued to provide substrate for corals and sponges, including plexaurid gorgonian sea fans. A portion of



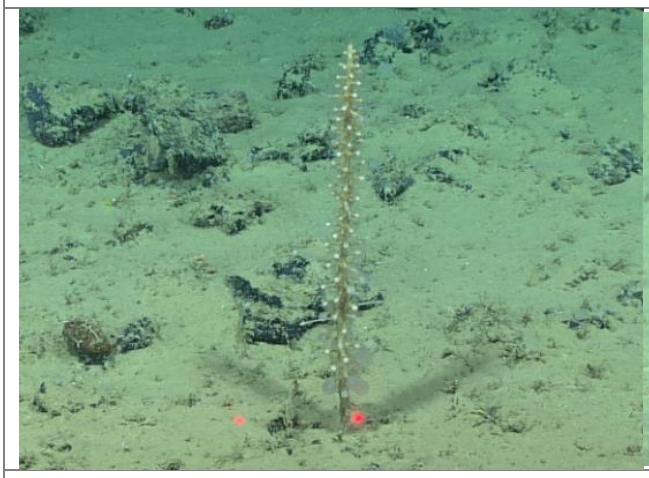
Mn-nodules (exact composition unknown) littered the flat-lying sedimented areas.

the coral skeleton seen here was covered with yellow zoanthids (possibly *Kulamanamana haumeaae*)

An unusual seastar, *Chondraster* sp. was observed on one of the rocks.

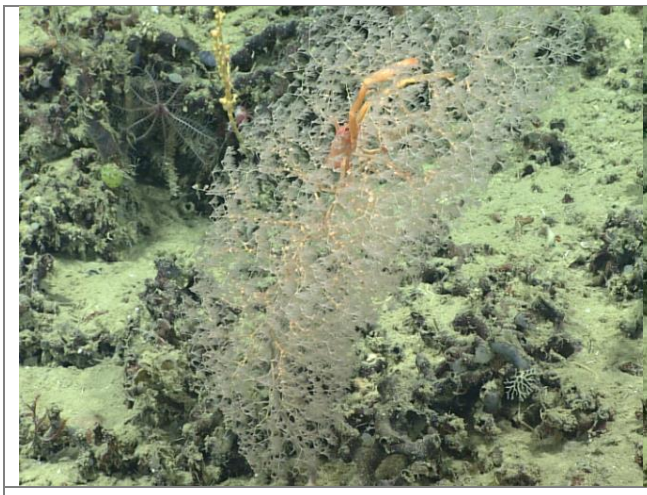


This black coral (possibly *Telopathes* sp.) was seen several times. This individual hosted four squat lobsters (Chirostylidae).

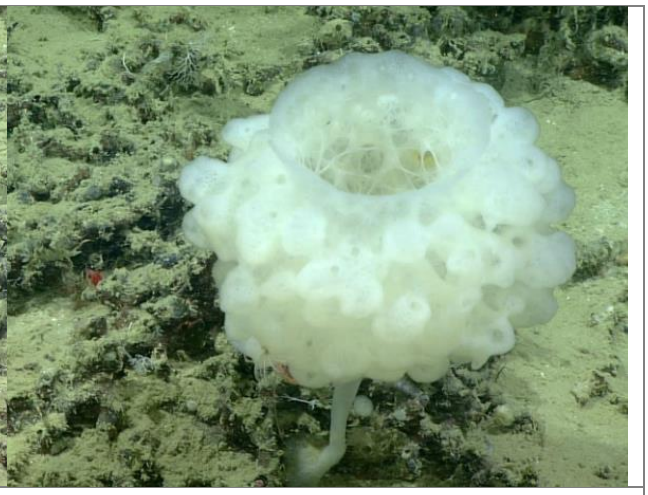


The carnivorous sponge, Chondrocladia, was the dominant sponge seen throughout the dive.

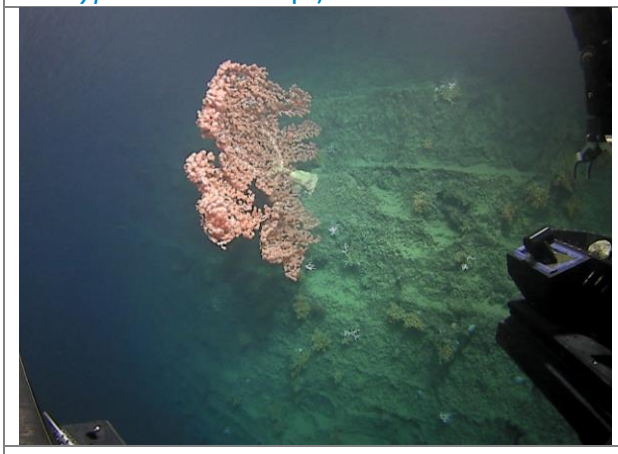
This black coral (*Bathypathes*) had a polychaete scale worm associate along its stem.



Several *Chrysogorgia* octocorals were observed, each with an associate of either a squat lobster (Chirostylidae, possibly *Uroptychus* sp.) or a shrimp (possibly *Bathypalaemonella* sp.).



This stalked glass sponge (Euplectellidae: *Saccocalyx* sp.) was seen at several locations, always attached to a rock.



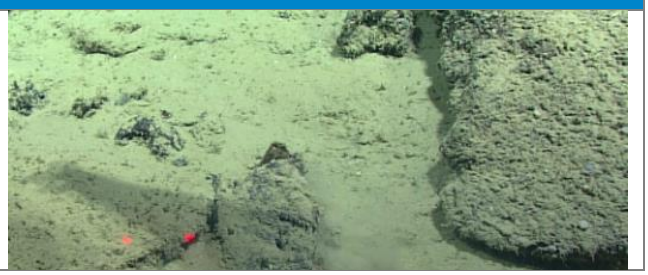
An enormous (>1m) bubble gum coral (*Paragorgia arborea*) was seen growing horizontally from the vertical wall.

A squat lobster (Chirostylidae, possibly *Gastroptychus* sp.) perches on a *Bathypathes* black coral, awaiting a meal.

Samples Collected

Sample

Sample ID	D2_DIVE08_SPEC01GEO
Date (UTC)	20180622
Time (UTC)	134051
Depth (m)	1005.81
Temperature (˚C)	4.47



Field ID(s)	Mudstone with Fe-Mn crust
Reason for Collection	*Site characterization - one of the outcropping strata of this scarp.*
Notes	

Associates

Associate ID	Field Identification	Notes
A01	Cirripedia	
A02	Gastropoda	limpet
A03	Bryozoa	
A04	Bivalvia	
A05	Octocorallia	
A06	Stylasteridae (2)	
A07	Scleractinia	
A08	Hydrozoa	hydroid
A09	Hexactinellida? (6)	
A10	Brachiopoda	

Sample

Sample ID	D2_DIVE08_SPEC02BIO
Date (UTC)	20180622
Time (UTC)	140534
Depth (m)	1003.51
Temperature (˚C)	4.47
Field ID(s)	Bryozoan (Membranipora?)

Reason for Collection	*Potential new species*
Notes	Fragile, lace-like fan

Associates

Associate ID	Field Identification	Notes
None		

Sample

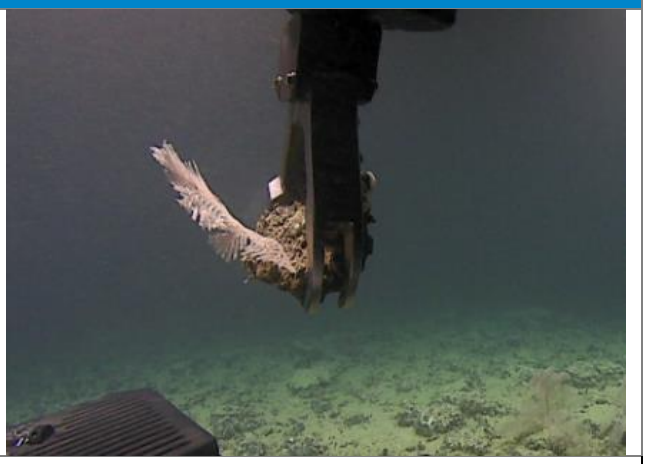
Sample ID	D2_DIVE08_SPEC030GEO
Date (UTC)	20180622
Time (UTC)	144557
Depth (m)	992.52
Temperature (˚C)	4.48

Field ID(s)	Claystone - smooth with undulating scour marks. No bores or other trace fossils.
Reason for Collection	*Site characterization - one of the outcropping strata of this scarp.*
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
none		

Sample

Sample ID	D2_DIVE08_SPEC04BIO
Date (UTC)	20180622
Time (UTC)	173727
Depth (m)	893.42
Temperature (˚C)	4.51
Field ID(s)	*Plumarella* sp.



Reason for Collection	*Potential 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
01	Mn-encrusted mudstone	

Sample

Sample ID	D2_DIVE08_SPEC05BIO

Date (UTC)	20180622
Time (UTC)	184245
Depth (m)	883.80
Temperature (°C)	4.63
Field ID(s)	*Cup coral, Bathypsammia sp.?*
Reason for Collection	*Site characterization*
Notes	This collection was made using a scoop.

Associates

Associate ID	Field Identification	Notes
A01	Mn nodules	2-5 cm, scattered across two of the broad terraces and at the scarp's top
A02	Sediment	coarse calcareous ooze
A03	Tunicata	encrusting

Sample

Sample ID	D2_DIVE08_SPEC06BIO
Date (UTC)	20180622
Time (UTC)	190035
Depth (m)	880.62
Temperature (°C)	4.65
Field ID(s)	*Cladorhiza* sp.

Reason for Collection	
Notes	This carnivorous sponge was found throughout the dive.

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	Polynoidae	scale worm
A02	Polychaeta	partial
A03	Bryozoa	

Please direct inquiries to:

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