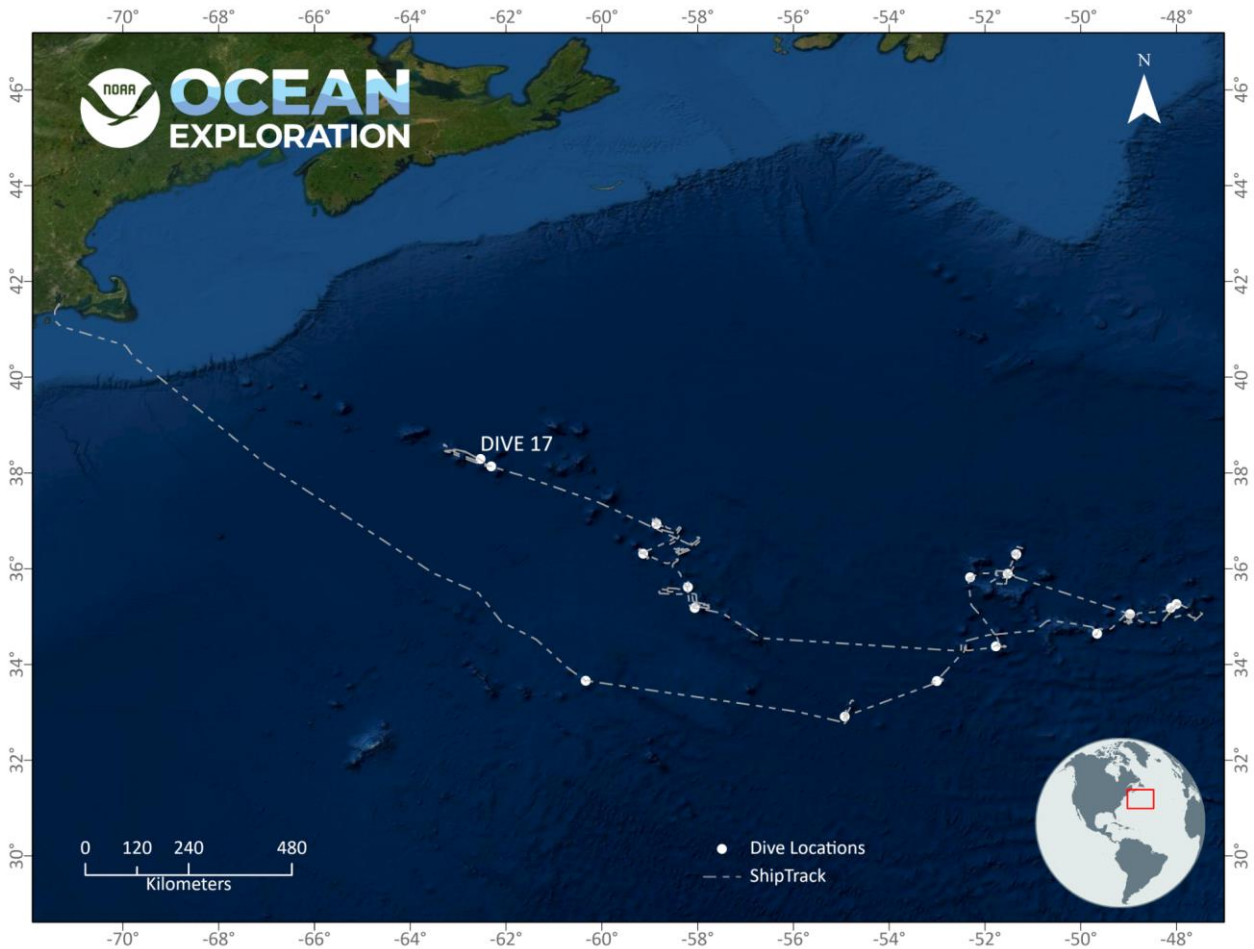


ROV Dive Summary, EX-21-04, Dive 17, July 24, 2021

General Location Map



Dive Information

Site Name	Gosnold Seamount (Shallow)
General Area Descriptor	Summit area, NW corner of seamount
Science Team Leads	Rhian Waller, Jason Chaytor
Expedition Coordinator	Kasey Cantwell, Kimberly Galvez (Expedition Coordinator in Training)
ROV Dive Supervisor	Chris Ritter

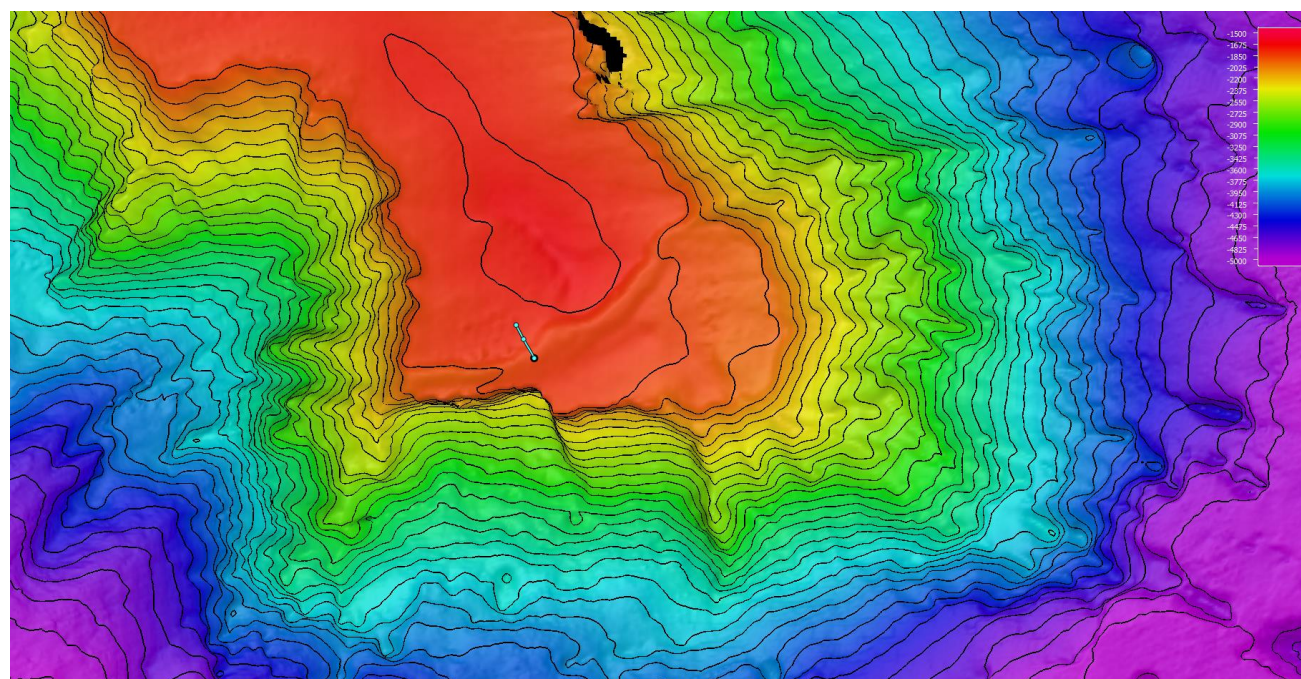
Dive Description	<p>Gosnold Seamount continued to greet us with unexpected seafloor geology, with a landing area covered by large (< 10 cm diameter) FeMn nodules, widely distributed across a relatively flat, sedimented, but current swept, seafloor. A large FeMn encrusted angular rock and four FeMn nodules were collected prior to departing the landing area. As the ROV began the traverse, a series of NE-SW oriented, linear current-formed bands of sediment (biogenic - pteropods, foraminifera, coral fragments and FeMn crust chips) with ripples (primarily linguoid, but some sinusoid), FeMn encrusted pavement, and FeMn nodules sitting on/in sediment were crossed. Further evidence of the strength, direction and persistence of the current in the region was seen by the development of 'flute-like' shadow regions that formed behind large boulders and even some of the large silicious sponges. On approach to the step in the middle of the transect, larger boulders and tabular cemented accumulations of nodules appear to increase in abundance, while sediment concentration remained the same or decreased. A large boulder with a noticeably different surface texture (but still FeMn coated) was inspected, which appeared to be a pitted/eroded (karst-like) suggesting that the underlying rock was potentially carbonate (rock was not collected). Large FeMn coated boulders, nodules (some appearing to have rolled downslope into their current position) and the tabular, almost sheet-like at times, layers of FeMn encrusted pavement continued up the entire slope of the step. A large FeMn nodule was collected at the top of the step prior to transitioning to the flatter summit plateau. Just after the transition to the summit plateau, the current-shaped linear bands similar to those at the beginning of the dive were encountered, but as the traverse continued across the plateau, the bottom changed to alternating wide patches of ripple-ornamented sediment (with pteropod tests and FeMn chips accumulating on the stoss-side) and pavement with FeMn coated cobbles/boulders and nodules.</p> <p>Biological communities were high biodiversity and high biomass throughout most of this dive, with large corals growing on the significantly larger nodules than encountered on Dive 16. Coral species encountered included - Antipatharians: Bathypathes, Stauropathes, Leiopathes, telopathes, parantipathes; Bamboo Corals: several species of Keatoisidae, Acanella, bramble form bamboo; Octocorals: Paragorgia (with and without encrusting zoanthid, Metallogorgia, Iridigorgia, Clavularia rudis, Anthomastus, Hemicorallium, Chrysogorgia; and the scleractinian Enallopsammia rostrata. Sponges were also well represented, with large <i>Hertwigia</i> sp. yellow sponges found throughout the dive, as well as multiple encrusting forms, demosponges, polymastia, and Euplectellid hexactinellids. We also observed large stands of ophiuroids covering rocks and nodules, stalked crinoids and several large seastars (including one collection of a Pseudoarchaster). A chimera rabbit fish also made an appearance, as well as an Ophidid fish and the pelagic gelatinous fauna was present throughout the dive, which, combined with the high benthic biodiversity, suggests this is potentially a highly productive area.</p>
Notable Observations	<p>FeMn nodules (on average large than those found during Dive 16, but less densely packed) Wide patches of sediment on the summit plateau that appear to be continually influence by strong unidirectional currents High diversity, high density coral gardens</p>
Community and habitat observations	<p>Corals and Sponges - Present Chemosynthetic Community - Absent High biodiversity Community - Present Active Seep or Vent - Absent Extinct Seep or Vent - Absent Hydrates - Absent</p>
CMECS Feature Type(s)	<p>Rock, Sediment (Fine & coarse unconsolidated)</p>

SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2403
---	---

Equipment Deployed

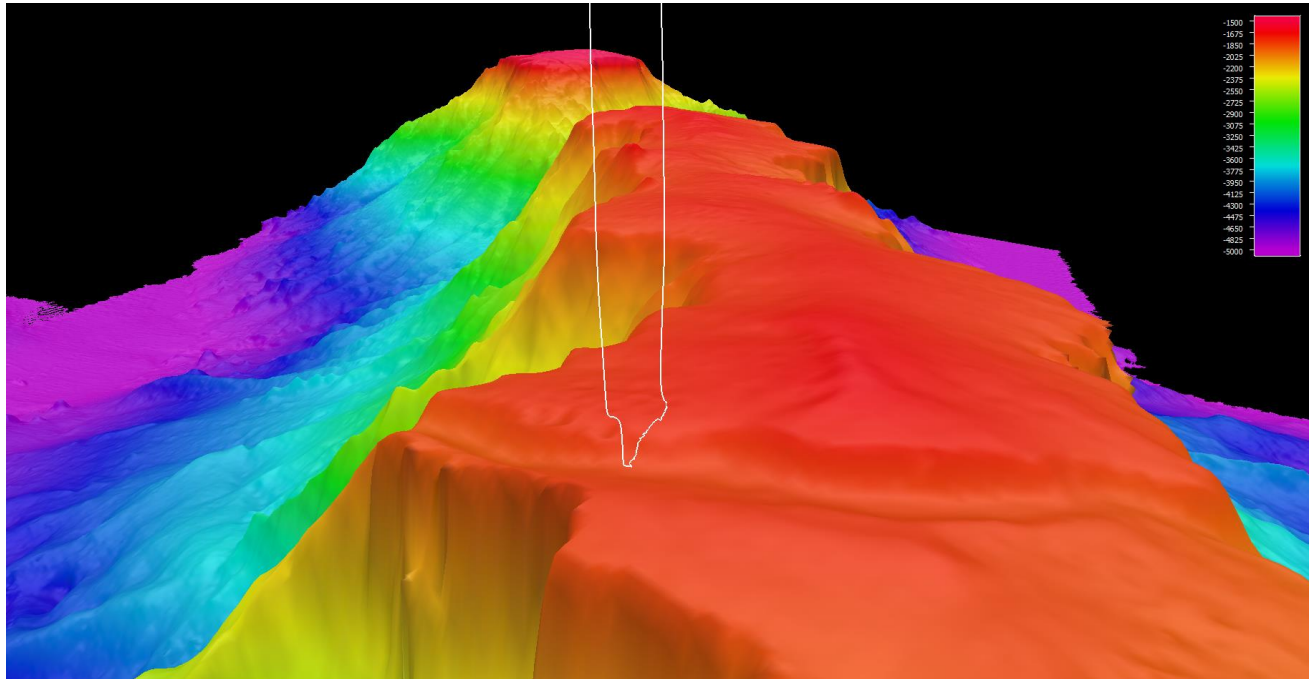
ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>
ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The section below notes if any of these sensors were malfunctioning or not operational
Equipment Malfunctions	none

Overview of Dive Site



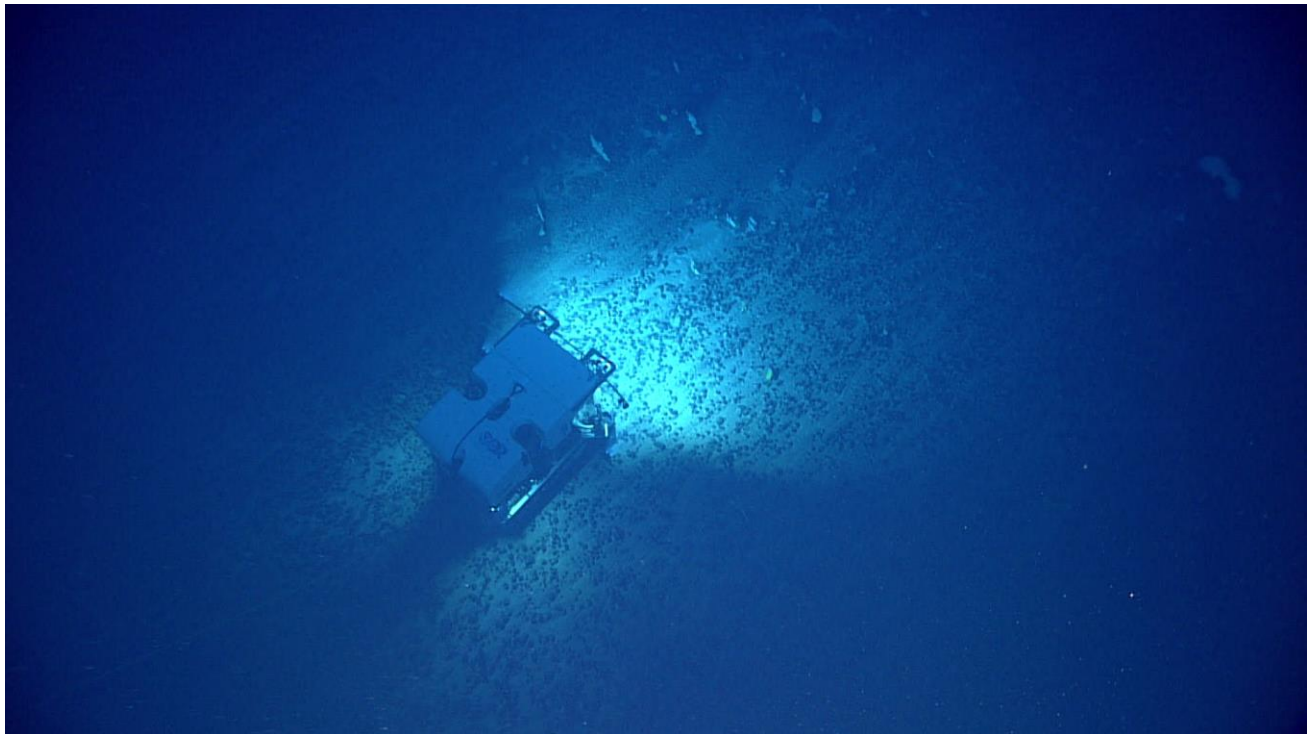
Smoothed ROV dive track (blue) on an overview bathymetry of the seamount, 3x vertical exaggeration.

Close-up Map of Main Dive Site

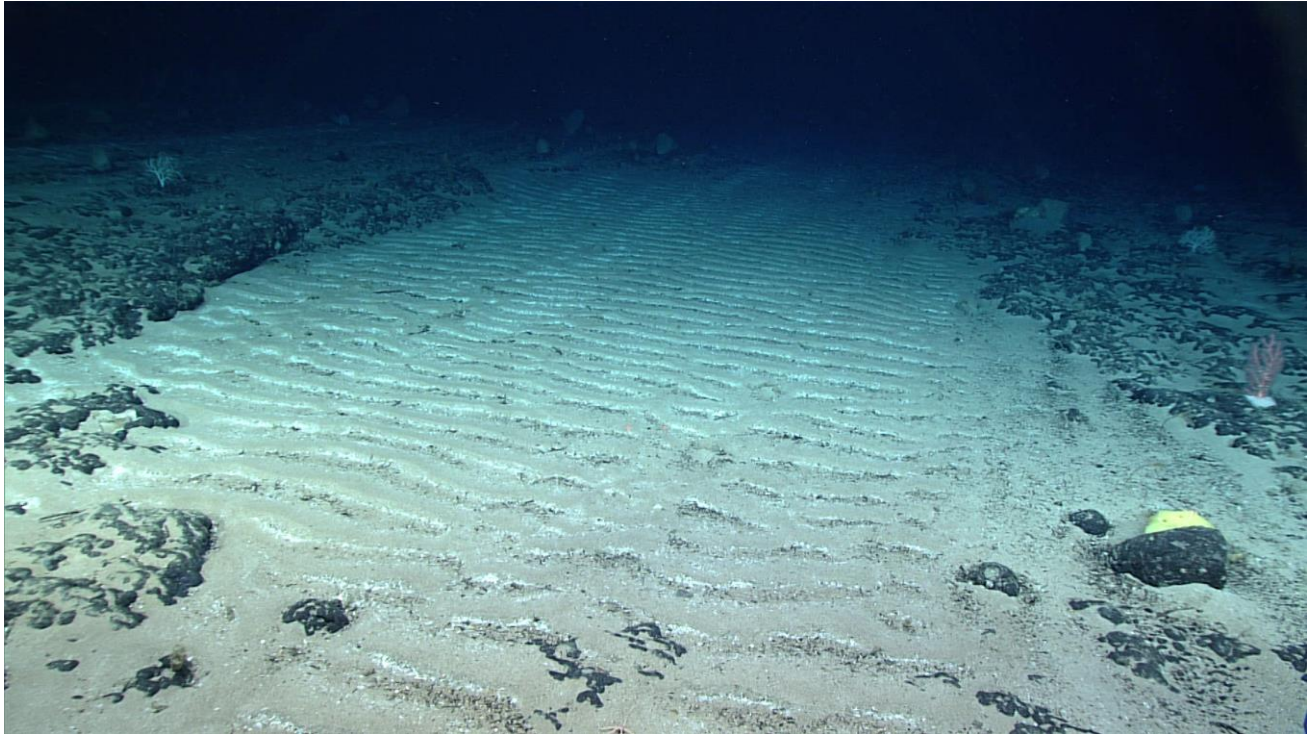


Smoothed ROV dive track in white on 25x25 cell size bathymetry, 3x vertical exaggeration, depth in meters.

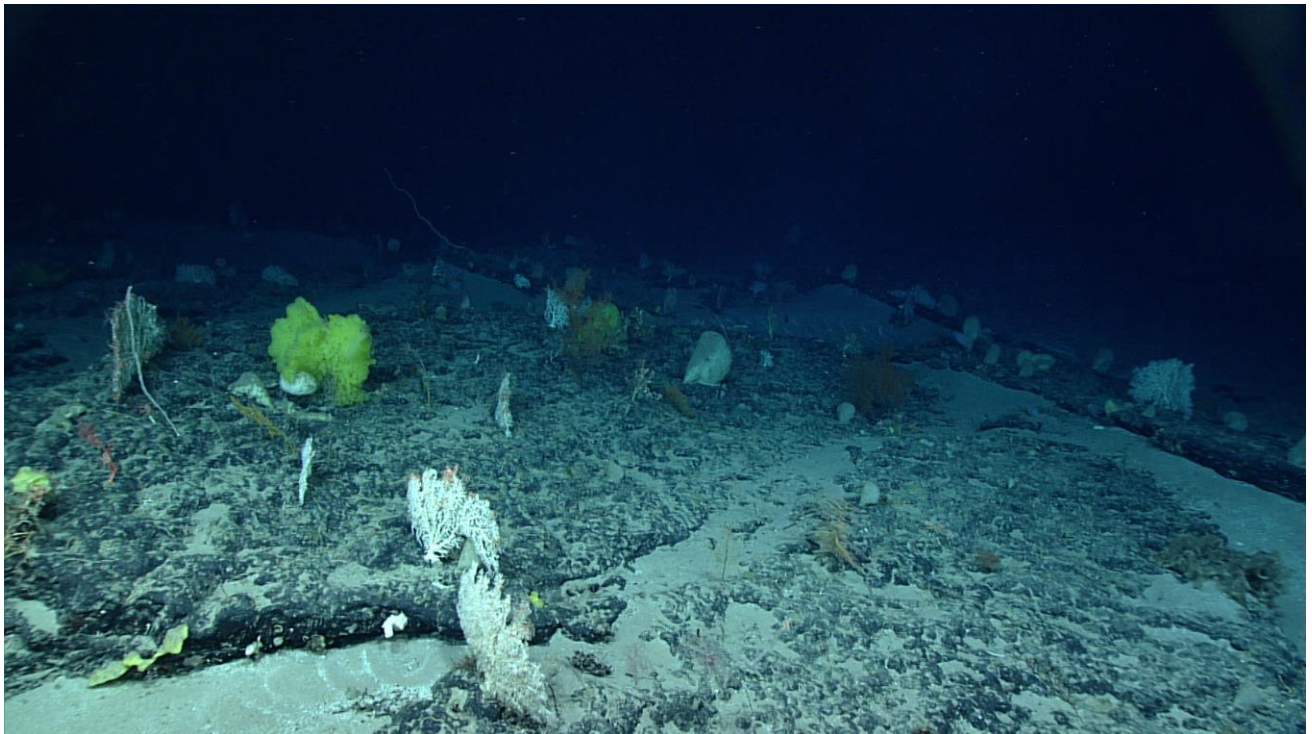
Representative Photos of the Dive



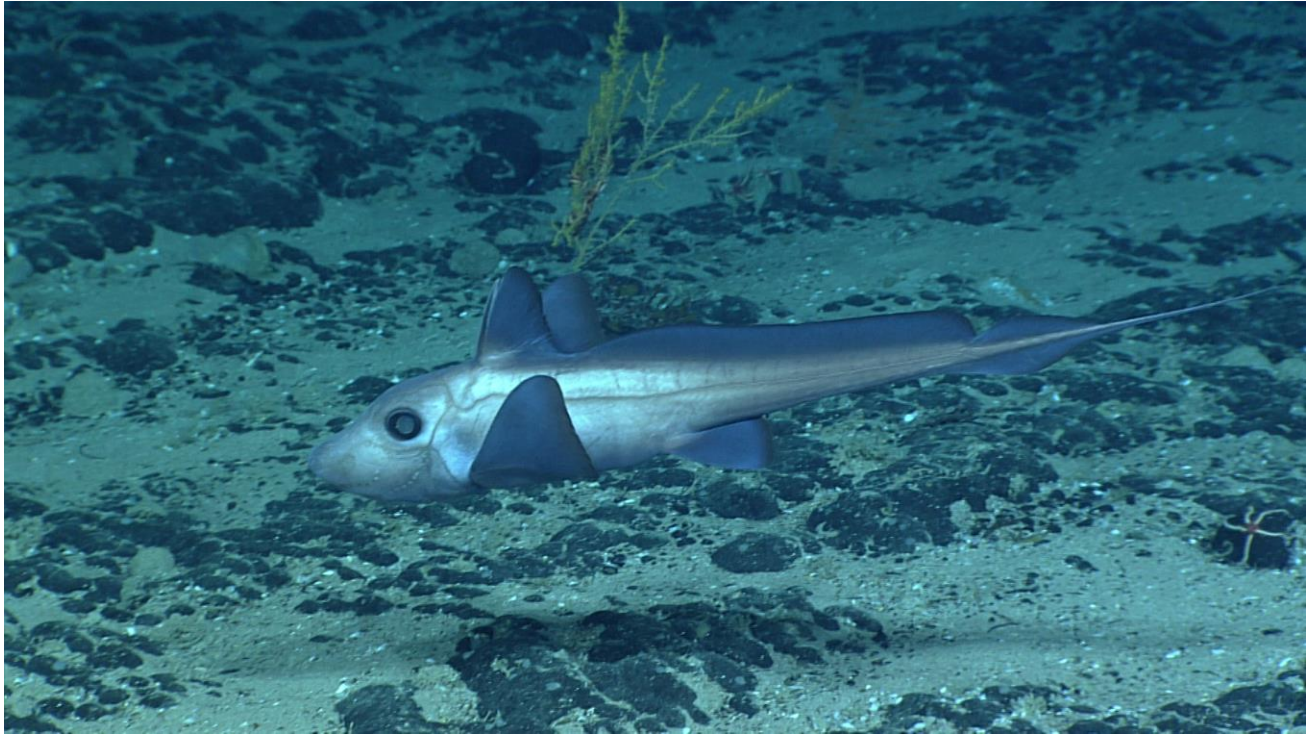
[The view from Seirios of D2 and extensive field of FeMn nodules that formed the bulk of the hard substrate for much of the dive.]



[Sinusoid to linguoid/cuspate ripples formed atop a narrow band of sediment, one of the abundant forms of current-generated bottom morphologies observed during the dive]



[High biodiversity and density coral gardens were present throughout the dive, and particularly on areas of more consolidated rock surfaces]



[A chimera rabbit fish was observed during this dive]

Samples Collected -



Sample ID	EX2104_D17_01G
Date (UTC)	20210724
Time (UTC)	145624
Depth (m)	1784.663
Latitude (decimal degrees)	38.293910
Longitude (decimal degrees)	-62.533180
Temp. (°C)	4.044
Field ID(s)	Rock with Crinoid and Coral Associate
Comments	angular, FeMn encrusted rock, encrusting worm tubes, had a stalked crinoid when collected, 17cm long, 12cm wide, 8.5cm tall

Associates SampleID	Field Identification	Count
EX2104_D18_01G_A01	Crinoidea	1
EX2104_D18_01G_A02	Stolonifera	1



Sample ID	EX2104_D17_02G
-----------	----------------

Date (UTC)	20210724
Time (UTC)	150801
Depth (m)	1785.287
Latitude (decimal degrees)	38.293860
Longitude (decimal degrees)	-62.533440
Temp. (°C)	4.054
Field ID(s)	FeMn Nodules
Comments	crust 5 mm thick likely thicker, specifications of biggest specimen 9.5 cm wide, 8cm tall, 10.5 cm long, encrusting worm tubes and various other encrusting organisms, weight is a total weight of all 4 nodules

Associates Sample ID	Field Identification	Count
NA	NA	NA



Sample ID	EX2104_D17_03B
-----------	----------------

Date (UTC)	20210724
Time (UTC)	164846
Depth (m)	1751.498
Latitude (decimal degrees)	38.292470
Longitude (decimal degrees)	-62.532850
Temp. (°C)	4.074
Field ID(s)	Seastar Pseudachaster
Comments	15 cm

Associates Sample ID	Field Identification	Count
NA	NA	NA



Sample ID	EX2104_D17_04G
-----------	----------------

Date (UTC)	20210724
Time (UTC)	173856
Depth (m)	1732.092
Latitude (decimal degrees)	38.291650
Longitude (decimal degrees)	-62.532730
Temp. (°C)	3.995
Field ID(s)	Large Nodule with Biota
Comments	fine botryoidal texture, FeMn crusted cobble, likely a nodule, various stoloniferous octocorals and other encrusting organisms, 13cm long, 13.5cm wide, 11.5 cm tall

Associates SampleID	Field Identification	Count
EX2104_D17_04G_A01	Stolonifera	1
EX2104_D17_04G_A02	Ophiuroidea	1

Scientists Involved (provide name, email, affiliation)

First Name	Last Name	Email	Affiliation
Asako	Matsumoto	amatsu@gorgonian.jp	Chiba Institute of Technology
Christopher	Mah	brisinga@gmail.com	Dept. Invertebrate Zoology, National Museum of Natural History
Cindy	Van Dover	clv3@duke.edu	Duke University
Daniel	Woods	djw73@duke.edu	Duke University
Emily	Crum	emily.crum@noaa.gov	NOAA Ocean Exploration
Harold	Carlson	harold.carlson@noaa.gov	NOAA, USC
Jason	Chaytor	jchaytor@usgs.gov	USGS
Jaymes	Awbrey	C00227433@louisiana.edu	University of Louisiana at Lafayette
Kasey	Cantwell	kasey.cantwell@noaa.gov	NOAA Ocean Exploration
Kenneth	Sulak	jumpingsturgeon@yahoo.com	USGS
Kevin	Konrad	Kevin.Konrad@unlv.edu	University of Nevada, Las Vegas
Kimberly	Galvez	kimberly.galvez@noaa.gov	NOAA Ocean Exploration
Megan	Cromwell	megan.cromwell@noaa.gov	NOAA NCEI
Peter	Auster	peter.auster@uconn.edu	UConn & Mystic Aquarium

Rhian	Waller	rhian.waller@maine.edu	University of Maine
Robert	Carney	rcarne1@lsu.edu	LSU Dept Oceanography and Coastal Sciences
Scott	France	france@louisiana.edu	University of Louisiana at Lafayette
Steve	Auscavitch	steven.auscavitch@temple.edu	Boston University
Tina	Molodtsova	tina@ocean.ru	P.P.Shirshov Institute of Oceanology RAS
Upasana	Ganguly	upasana.ganguly1@louisiana.edu	University of Louisiana at Lafayette
Vonda	Wareham-Hayes	vonda.wareham-hayes@dfo-mpo.gc.ca	DFO Newfoundland and Labrador Region

Please direct inquiries to:

NOAA Office of Ocean Exploration & Research
1315 East-West Highway, SSMC3 RM 10210
Silver Spring, MD 20910
oceanexplorer@noaa.gov