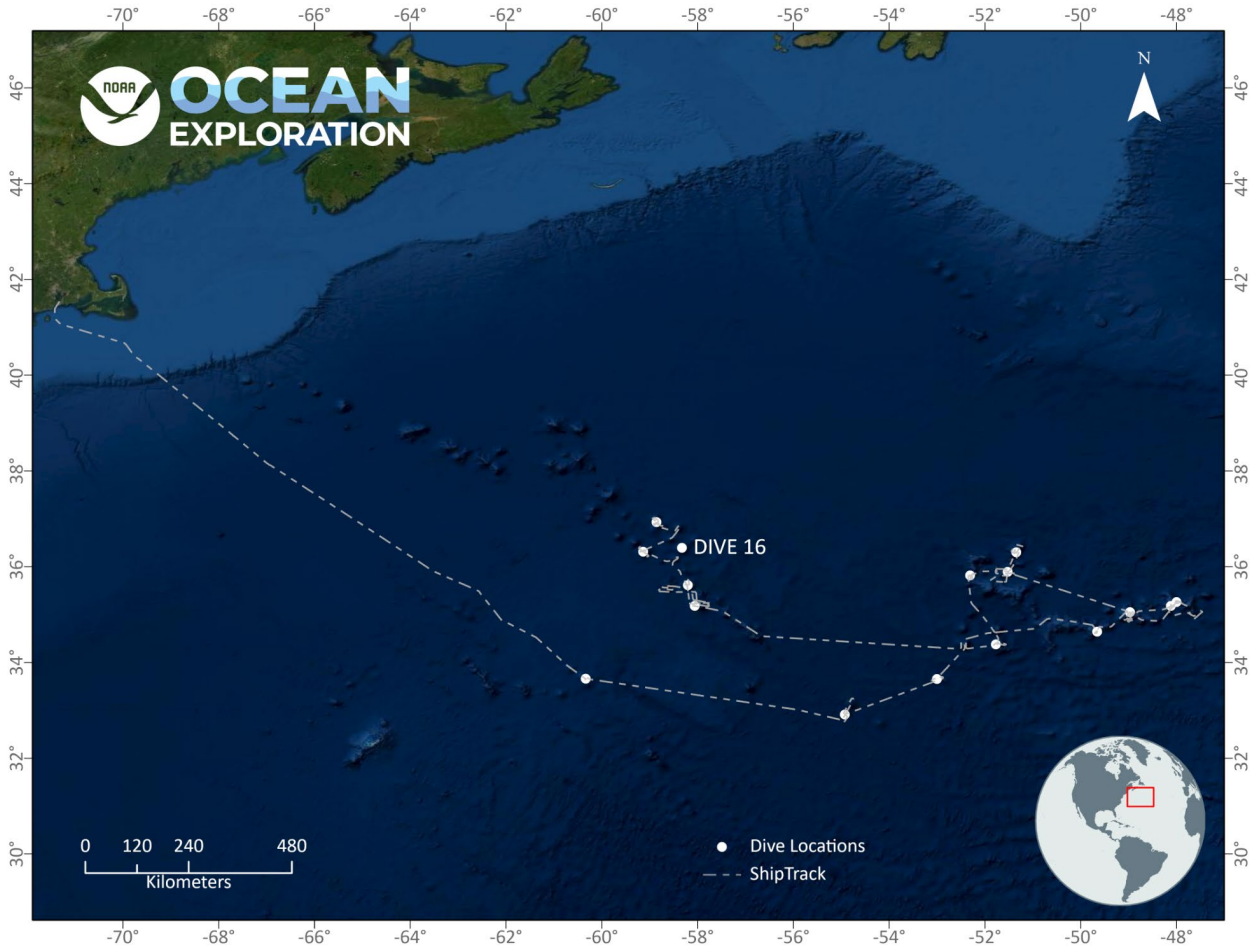


ROV Dive Summary, EX-21-04, Dive 16, July 23, 2021

General Location Map



Dive Information

Site Name	Gosnold Seamount
General Area Descriptor	Saddle area between the North and south peaks of Gosnold
Science Team Leads	Rhian Waller, Jason Chaytor
Expedition Coordinator	Kasey Cantwell, Kimberly Galvez (Expedition Coordinator in Training)

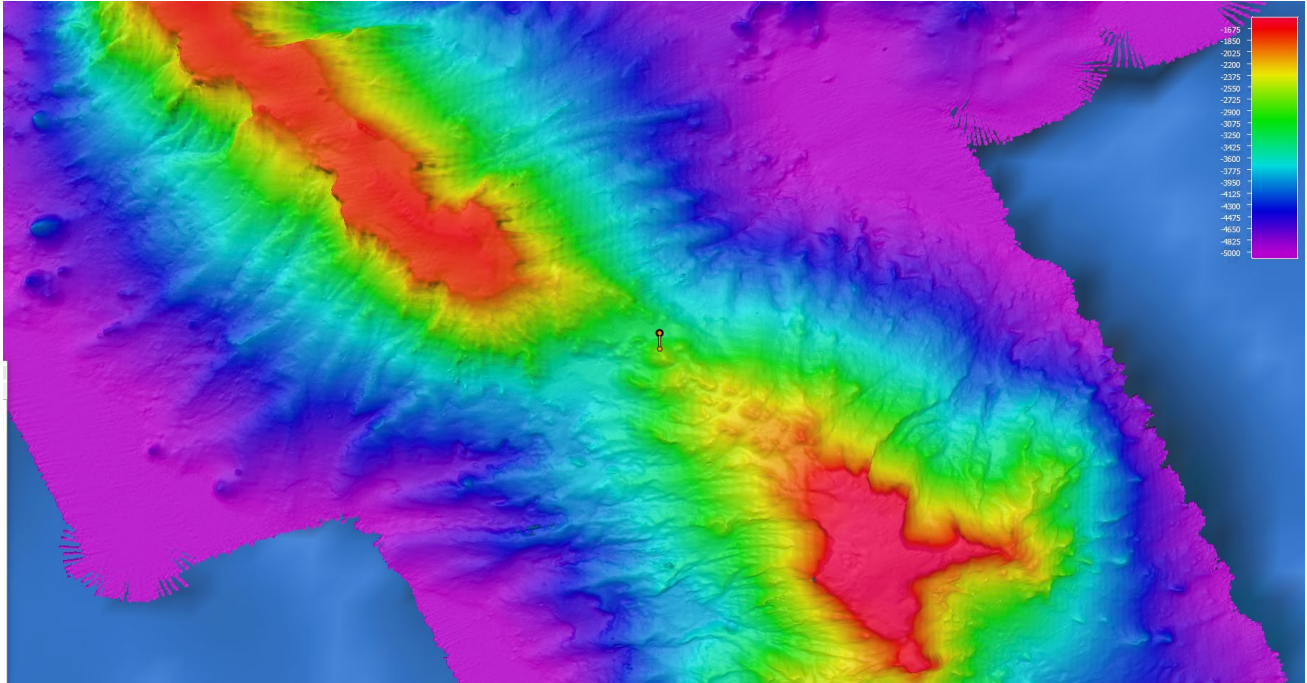
Dive Description	<p>A spectacular and unexpected field of FeMn nodules (awaiting later confirmation on internal structure) blanketing the entire seafloor was encountered on arrival at the bottom. The nodule field was initially thought to be a sediment free FeMn-coated pavement, but on inspection with the manipulator all of the nodules were found to be loose and sitting partially within a white, partially fine-grained biogenic sediment. A spherical (> 10 cm diameter) FeMn coated cobble was collected, along with many smaller nodules and sediment collected using the suction sampler. The nodule field continued unbroken for the rest of the dive (> 300 m horizontal distance), with the nodule size and distribution remaining similar to that found at the landing site for the initial several tens of meters transect. As the slope gradient began to increase, larger FeMn nodules and FeMn-encrusted cobbles/boulders started to appear mixed in with the smaller FeMn nodules. Closer inspection of the substrate at this time revealed the presence of what initially was thought to be plate- or chip-shaped FeMn-coated rock fragments, but which later were positively identified as barnacle plates/plate fragments when accumulations of FeMn-free plates and live barnacles were observed. Continuing upslope, the overall morphology of the bottom become more undulating (low relief ripples-nodule/nodule debris 'waves') with abundant cemented nodules and cobbles mixed in with the smaller nodules, fossil coral and barnacle debris, and biogenic sediment (now with visible pteropod tests). Two additional rock samples were collected, both cemented nodules/cobble conglomerates in the second half of the dive. The bulk of the smaller FeMn nodules were found to still be loose and sitting atop the white, somewhat fine-grained biogenic sediment at the following another manipulator test towards the end of the dive. No definitive in-situ volcanic rock outcrops or displaced material were observed during the dive.</p> <p>Biological observations were mostly on the small scale for this dive, with high densities of certain species (<i>Covexella</i> sp. primnoid octocoral, <i>Alcnoniid</i> sp. soft coral, <i>Parapagurus</i> sp. crabs with epizoanthus epiphytes) throughout the dive. The more moveable nodule field had a selection of smaller fauna, such as sponges (encrusting and small pen shaped), crinoids (stalked and unstaked), isopods, stalked tunicates, worm tubes and chitons. As we reached slightly more bouldery habitat some larger rosellid "mushroom" sponges were observed, stalked barnacles, a potential Eknomisis bamboo coral, anthomastus and a singular Paragorgia and Chrysogorgia sp. and several benthopelagic jellyfish Ptychogastria. Several synaphobranchids were present along the track (and one Ophidid), and may form range extensions and deepest depths for some of the species once identified. A potential tuna was seen on the descent.</p>
Notable Observations	<p>Ferromanganese (FeMn) nodules - high density High density of small <i>Convexella</i> sp. primnoid octocorals (low biomass), coral garden</p>
Community and habitat observations	<p>Corals and Sponges - Present Chemosynthetic Community - Absent High biodiversity Community - Absent 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)	<p>https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2393</p>

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-

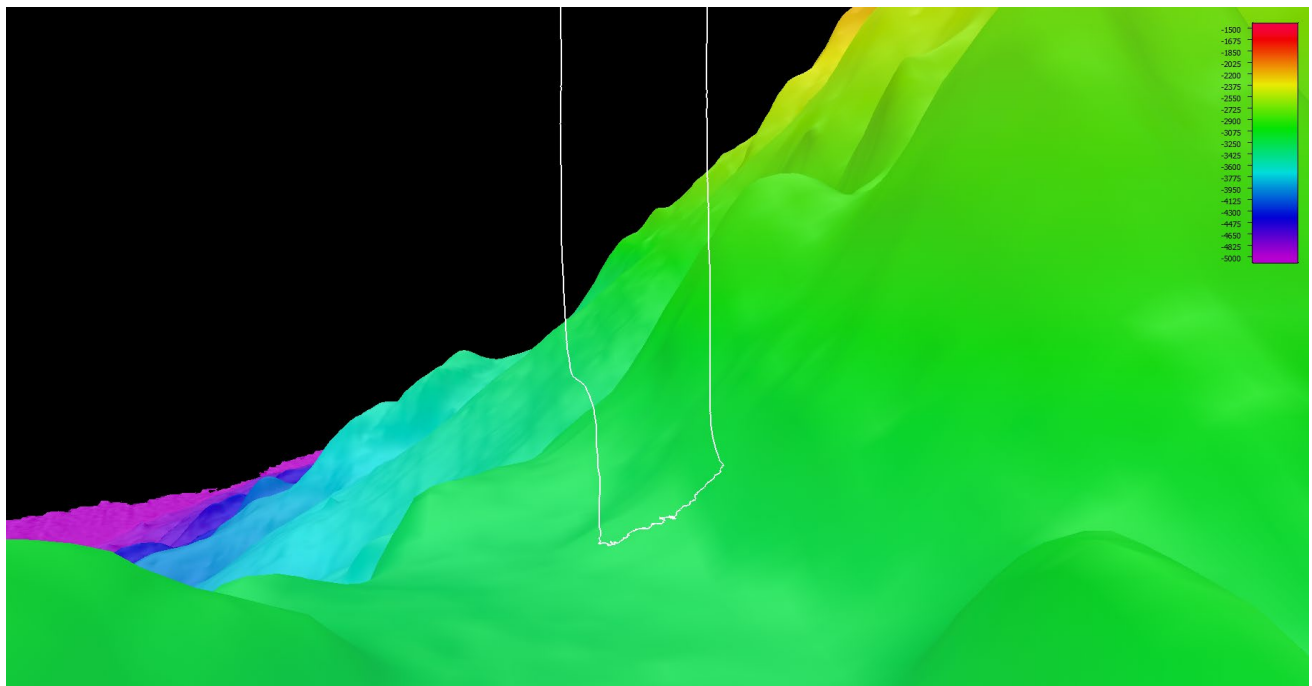
	resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The section below notes if any of these sensors were malfunctioning or not operational
Equipment Malfunctions	The ROV O2 sensor looked noisy during today's dive. It was changed with the spare.

Overview of Dive Site



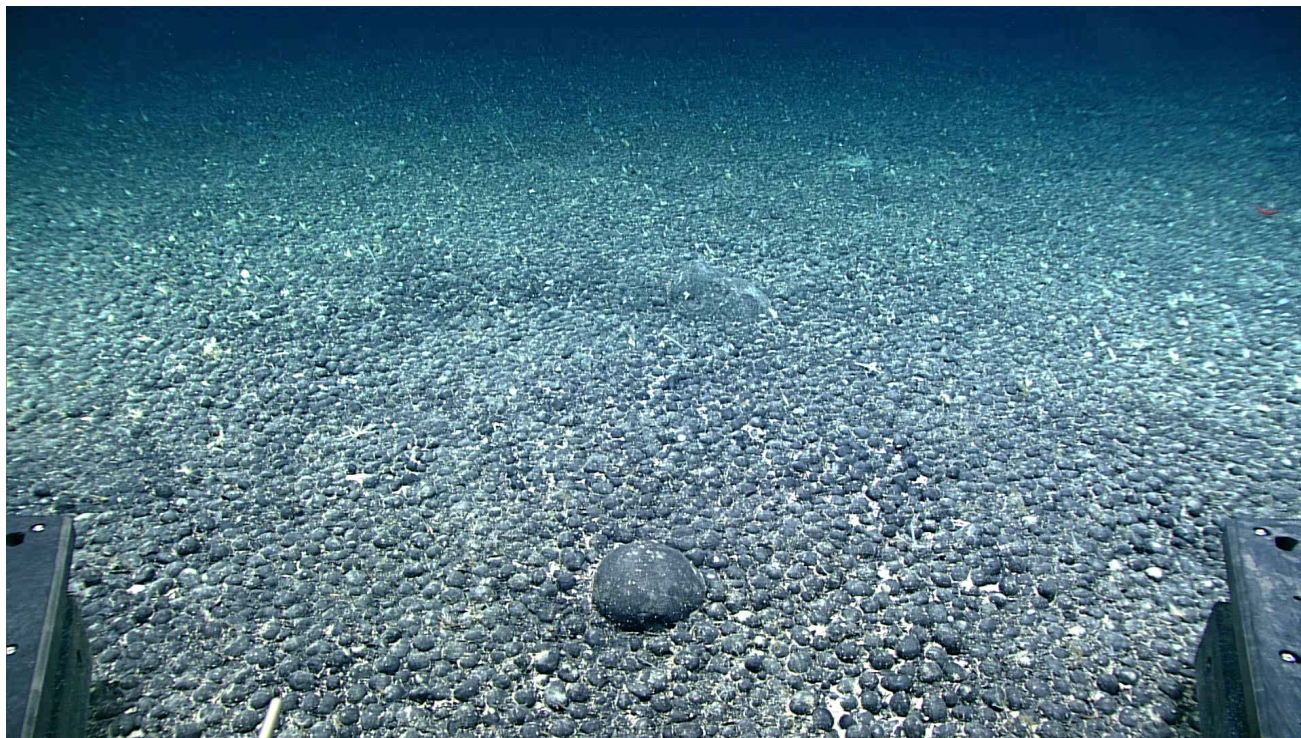
Smoothed ROV dive track (orange) on an overview bathymetry of the seamount, 3x vertical exaggeration.

Close-up Map of Main Dive Site



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

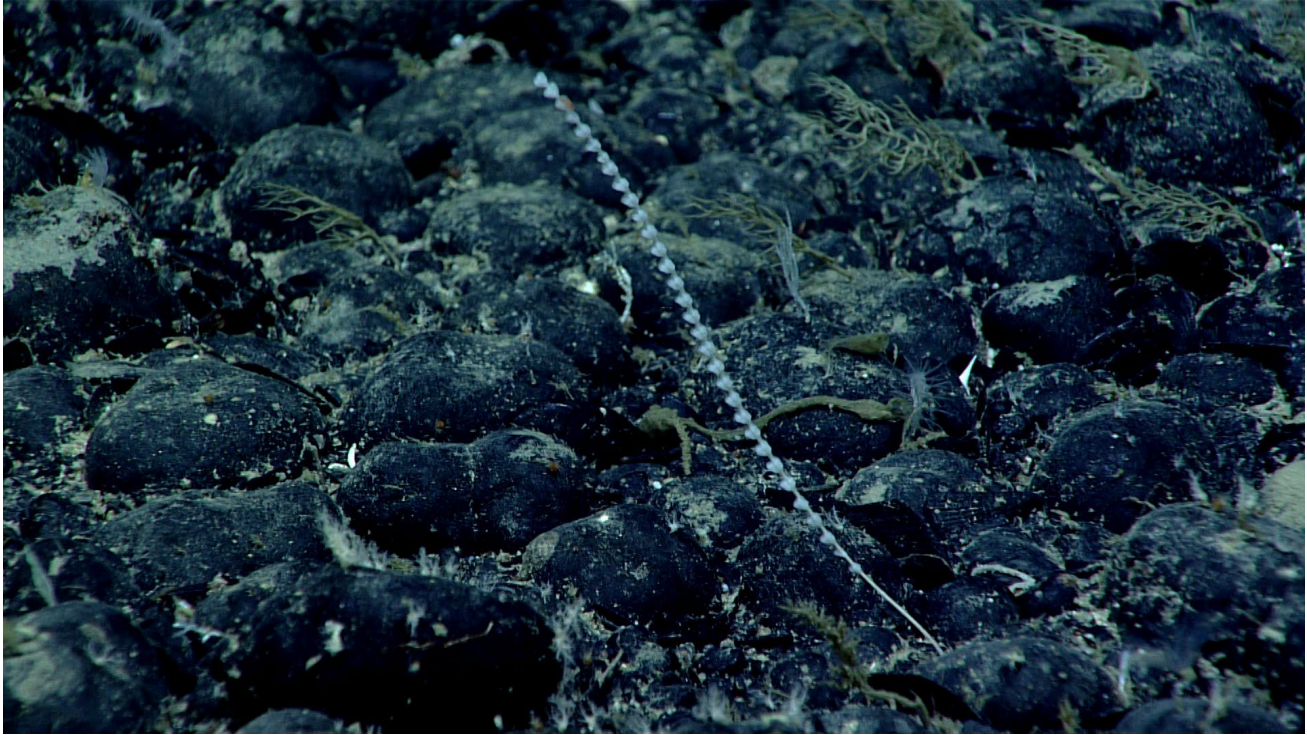
Representative Photos of the Dive



[FeMn nodule field that was encountered when D2 reached the seafloor.]



[Large FeMn nodule or encrusted cobble (rock will need to be sectioned to confirm) sampled at the beginning of the dive]



[Throughout the dive high densities of *Convexella* sp. were observed, though these corals are only ~6cm high. One was collected for confirmation of species.]



[In two locations were observed an unusual (potential) *Eknomisis* sp. bamboo coral - one was collected to confirm species.]



[*Alcnoniid* soft corals were also abundant throughout this dive and found in high densities, all very small in stature.]

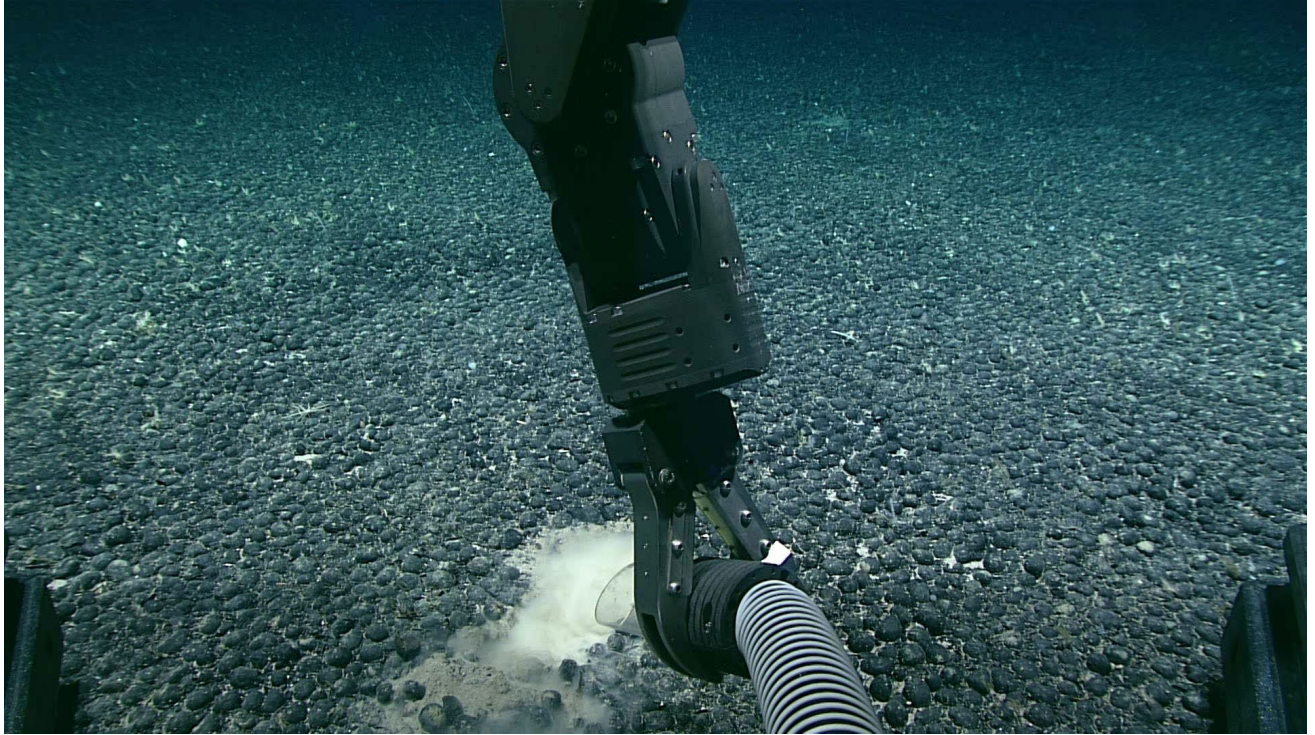
Samples Collected -



Sample ID	EX2104_D16_01G
Date (UTC)	20210723
Time (UTC)	145612

Depth (m)	3228.962
Latitude (decimal degrees)	38.134580
Longitude (decimal degrees)	-62.304330
Temp. (°C)	2.766
Field ID(s)	V Large FeMn Nodule
Comments	rounded FeMn coated cobble, 14cm long, 13.5cm wide, 14cm tall

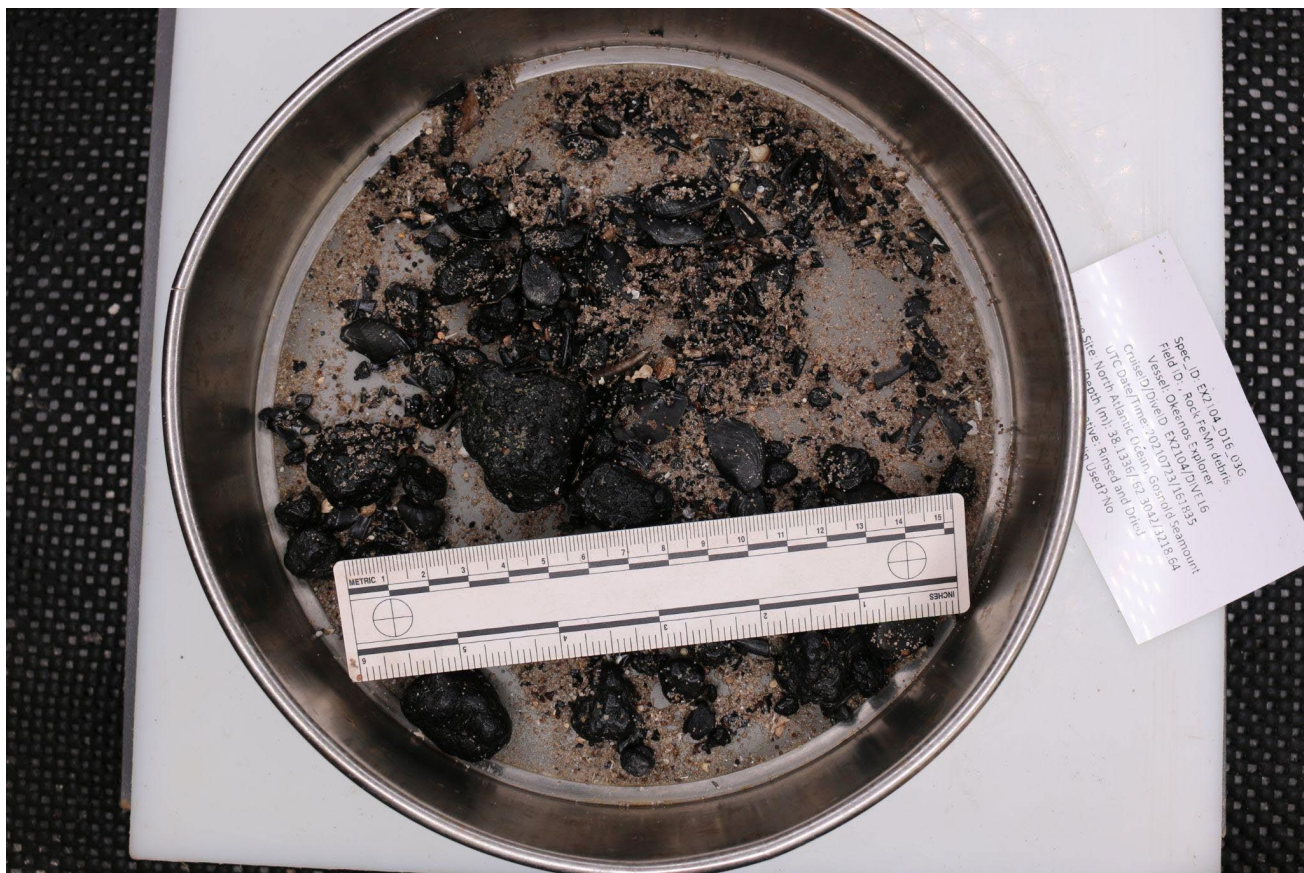
Associates Sample ID	Field Identification	Count
NA	NA	NA



Sample ID	EX2104_D16_02G
Date (UTC)	20210723
Time (UTC)	145942
Depth (m)	3229.004
Latitude (decimal degrees)	38.134530

Longitude (decimal degrees)	-62.304180
Temp. (°C)	2.774
Field ID(s)	small nodules
Comments	20 nodules, 1 broken, 3cm long, 3.5cm wide, 3cm high, largest nodule measured, barnacle shell debris

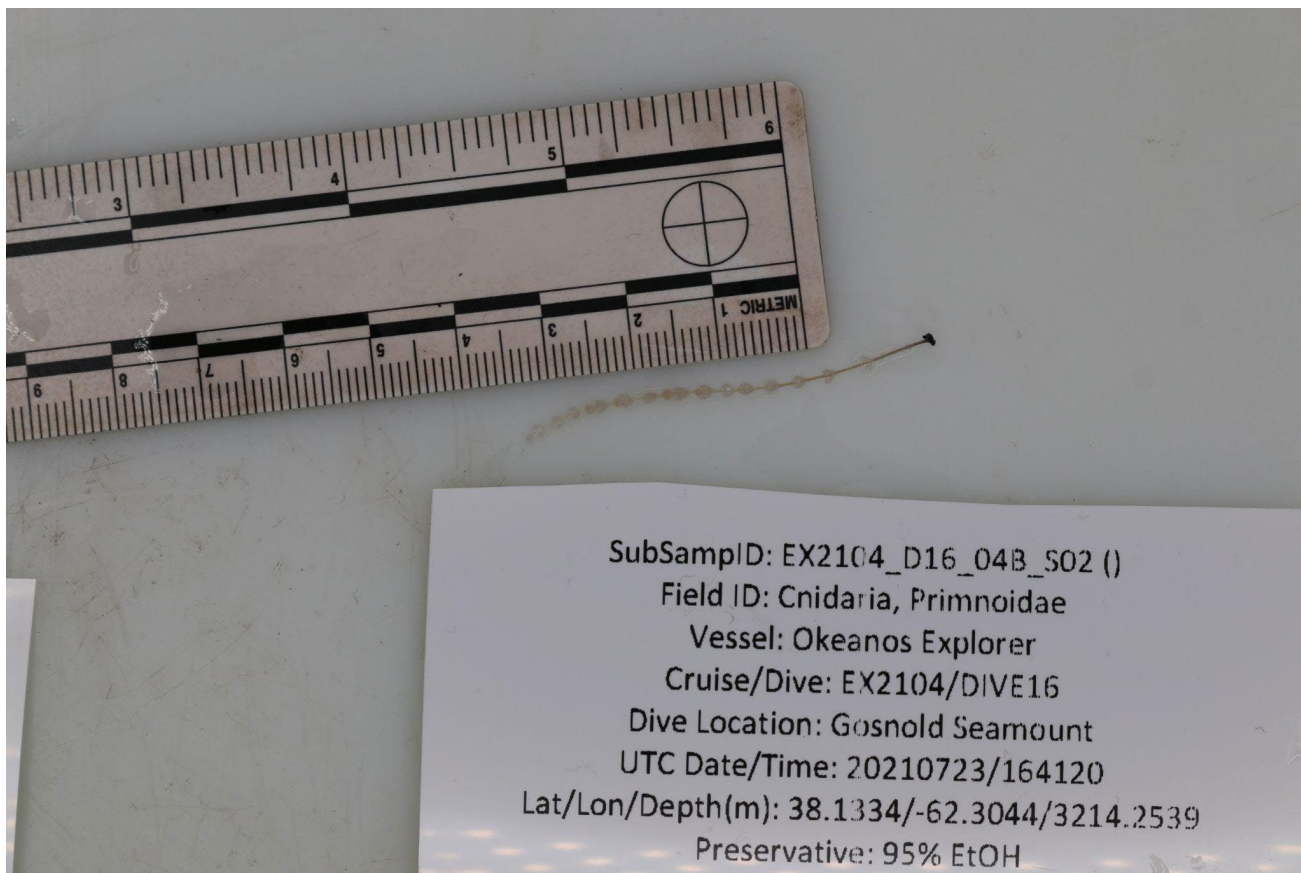
Associates Sample ID	Field Identification	Count
NA	NA	NA



Sample ID	EX2104_D16_03G
Date (UTC)	20210723
Time (UTC)	161835
Depth (m)	3218.642
Latitude (decimal degrees)	38.133610

Longitude (decimal degrees)	-62.304250
Temp. (°C)	2.806
Field ID(s)	Rock FeMn debris
Comments	FeMn coated nodules, barnacle shell pieces and debris, forams and pteropods, no size or weight recorded

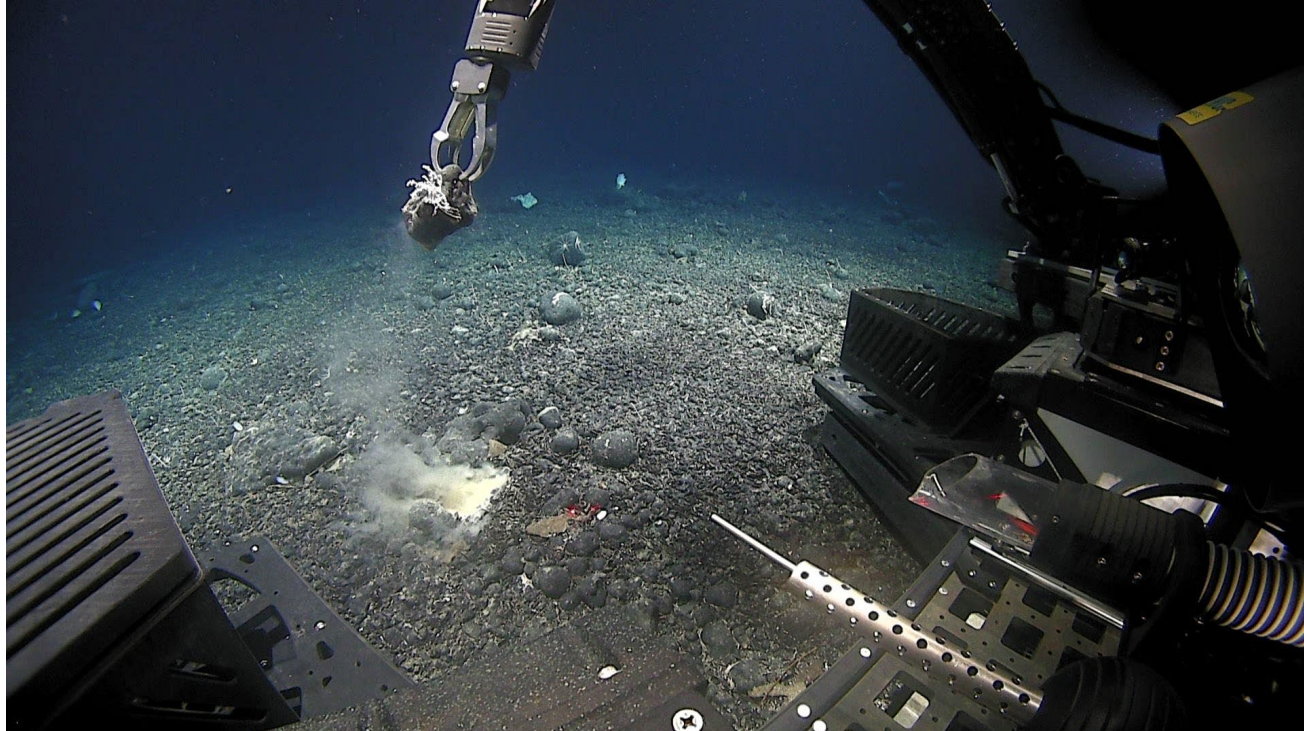
Associates Sample ID	Field Identification	Count
NA	NA	NA



Sample ID	EX2104_D16_04B
Date (UTC)	20210723
Time (UTC)	164120
Depth (m)	3214.254

Latitude (decimal degrees)	38.133410
Longitude (decimal degrees)	-62.304350
Temp. (°C)	2.785
Field ID(s)	Primnoidae
Comments	< 6 cm

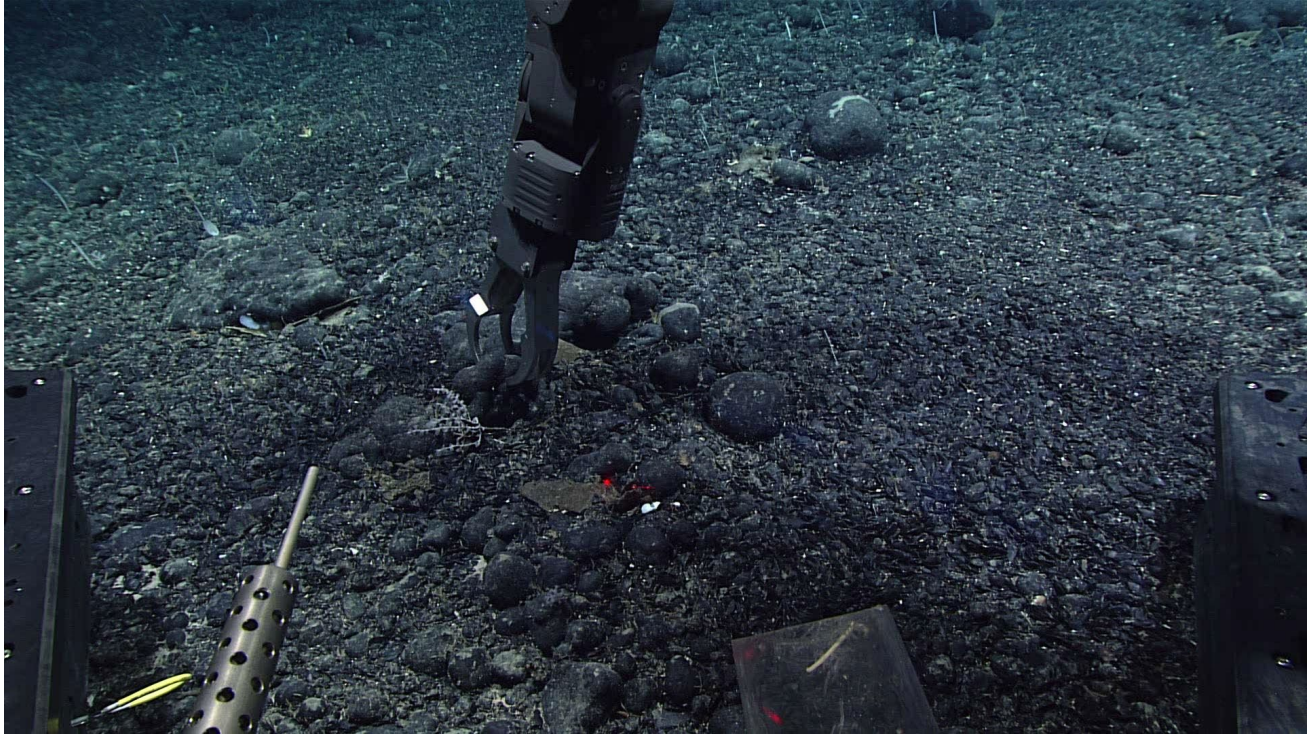
Associates Sample ID	Field Identification	Count
NA	NA	NA



Sample ID	EX2104_D16_05G
Date (UTC)	20210723
Time (UTC)	170002
Depth (m)	3210.032
Latitude (decimal degrees)	38.133140

Longitude (decimal degrees)	-62.304310
Temp. (°C)	2.795
Field ID(s)	Large rock nodule FeMn
Comments	large conglomerate of cobbles/nodules cemented together, coated in FeMn, micro botryoidal, 30cm long, 21 cm wide, 15cm high

Associates Sample ID	Field Identification	Count
EX2104_D16_05G_A01	Foraminifera	1
EX2104_D16_05G_A02	Barnacle	1
EX2104_D16_05G_A03	Bryozoan colony	1
EX2104_D16_05G_A04	Hexactinellidae	1



Sample ID	EX2104_D16_06B
Date (UTC)	20210723
Time (UTC)	170545
Depth (m)	3210.174
Latitude (decimal degrees)	38.133280

Longitude (decimal degrees)	-62.304120
Temp. (°C)	2.805
Field ID(s)	Eknomisis
Comments	

Associates Sample ID	Field Identification	Count
EX2104_D16_06B_A01	rock	1
EX2104_D16_06B_A02	Polychaeta	1

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