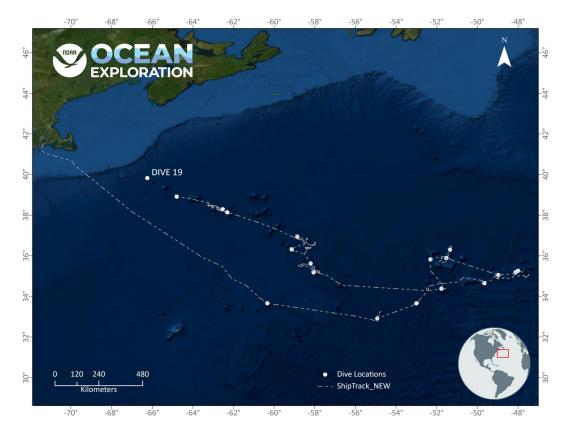


ROV Dive Summary, EX-21-04, Dive 19, July 27, 2021

General Location Map



Dive Information

Site Name	Retriever Seamount
General Area Descriptor	Northern summit pinnacle
Science Team Leads	Rhian Waller, Jason Chaytor
Expedition Coordinator	Kasey Cantwell, Kimberly Galvez (Expedition Coordinator in Training)
ROV Dive Supervisor	Chris Ritter
Mapping Lead	Shannon Hoy
Dive Purpose	Shallowest dive to date on Retriever, exploring a cone feature on the top of the plateau

Was the dive	No	
restricted for		
Underwater		
Cultural Heritage? ROV Dive	Dive Summary: EX2104_DIVE19	
Summary Data	^^^^	
	Dive Type: Normal	
	In Water: 2021-07-27T12:16:34.303201 39.84088187021615 ; -66.22634024335788	
	33.84088187021013 , -00.22034024333788	
	On Bottom: 2021-07-27T14:36:40.659616 39.8389189609384 ; -66.22864668750128	
	Off Bottom: 2021-07-27T19:25:56.125799 39.83656325953254 ; -66.23144329066136	
	Out Water: 2021-07-27T20:40:58.674994 39.84023291498903 ; -66.22327086805369	
	Dive Duration: 8:24:24	
	Bottom Time: 4:49:15	
	Max Vehicle Depth: 1935.8 m	
	Min Seafloor Depth: 1822.1 m	
	Distance Travelled: 410.9 m	
Dive Description	Although the dive was restricted to a single pinnacle on the summit of Retriever Seamount, a wide variety of bottom types were encountered and imparted significant control on the distribution of benthic fauna. The dive started in a region of abundant loose FeMn encrusted rocks from gravel-sized to large boulders covering biogenic-volcanoclastic sediments and scattered low-relief outcrops. A thin, angular rock was collected from the landing area. The gravel material was varied in shape and color, either representing variation in FeMn patina thickness or perhaps reflecting an ice-rafted debris (dropstone) input. Preceding up the pinnacle, a series of distinctly different bottom-types were crossed, with the transitions occurring rapidly - including a gravel (multi-color, variable shape and size) mantled sediment [almost like a pavement] with numerous xenophyophores, sediment with scattered pebbles and cobbles (FeMn coated) and lineations indicative of current flow and/or downslope transport, and mixed outcrop/sediment/gravel/boulder terrain with narrow debris chutes filled with displaced material. The outcrops, while initially devoid of any diagnostic morphology, transitioned at around the middle of the dive to include lobate/pillow-type shapes, with breached/collapsed pillow-type exposures which became the dominant bottom type for the rest of the dive. At the end of the dive, scattered rock debris continued to be observed sitting on the lobate/pillow lava outcrops, suggesting that both the pinnacle was perhaps a late stage eruption site, and that it remains largely susceptible to continued erosional modification. Although no dropstones/IRD were definitively identified, cobbles and boulders with morphologies reminiscent of these processes were observed throughout the dive.	
	Biologically this was a dense, high biomass, high diversity coral garden site, broken only by small plateaus of sediment in places (though even sediments contained Caryophyllia (ambrosia?) cup corals, and colonies attached to larger rocks). Overall 29 species of coral were observed directly during this dive, alongside numerous species of sponge (including unidentified encrusting forms, Polymastia, Hertwiga which was present throughout and Regadrella hexactinellid vases) and other fauna (mass aggregations of ophiuroids and crinoids,	



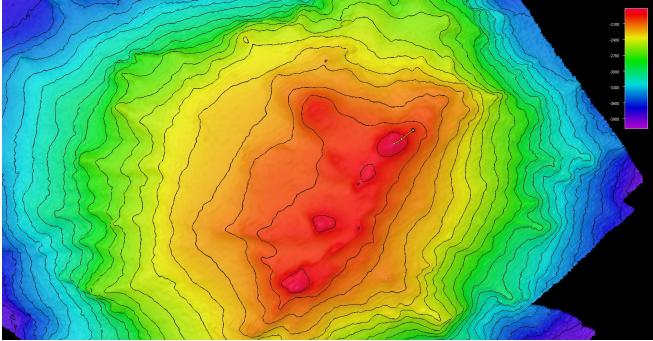
	Echinus, Hygrosoma, Chondraster, Actinerus anemones, and aggregations of hydroids and bryzoans), including several species of fish (Chaunax coffin fish, Neolithodes, Lepidion, <i>Malacocephalus occidentalis</i>). Notable coral species on this dive include - Metallogorgia, Paramuricea, Acanella, Paramuricea, Hemicorallium, Acanthogorgia, Clavularia, Anthomastus, Iridigorgia (2 species), Paragorgia, Isidella, Swiftia, Candidella, Chrysogorgia, D- clade Keratoisis, B-Clade forked whip bamboo corals, non forked whip bamboo corals, unknown stoloniferous octocoral Stauropathes, Parantipathes, Telopathes magna, Bathypathes, thin black coral whip, Pennatula, Halipteris, rock pen Desmophyllum dianthus, Caryophyllia Notable ecological observations include an Irridogorgia that had calcified over what looked like squid eggs, crinoid covered corals (including an Irridgorgia) an Echinus seemingly having eaten over half of a bamboo whip coral, and several really large coral colonies (Paragorgia (~100yrs old), unknown plexuarid, telopathes and a Jasonis bamboo coral that may date at around 1600 years old using age data for bamboo corals from Alaska (Andrews et al., 2007) towards the peak of the pinnacle.
Notable Observations	Dense, high diversity coral garden habitat Four large (>1.5m), and therefore old, octocorals towards the peak of the pinnacle
Community and habitat observations	Corals and Sponges - Present Chemosynthetic Community -Absent High biodiversity Community - Present Active Seep or Vent - Absent Extinct Seep or Vent - Absent Hydrates - Absent
CMECS Feature Type(s)	Rock, Sediment (Fine & coarse unconsolidated)
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2423

Equipment Deployed

ROV	Deep Discoverer
Camera Platform	Seirios
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 salinity sensor on Seirios is still showing bad data.

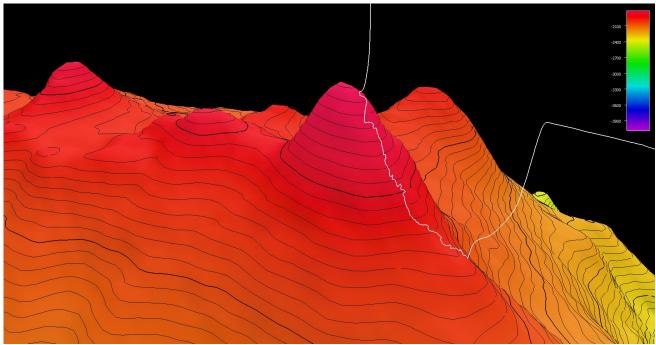
Overview of Main Dive Site





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, 10 meter contours

Representative Photos of the Dive





[High diversity coral environments were found throughout the dive track, particularly on areas with displaced FeMn-encrusted boulders and lobate/pillow lava outcrops.]



[Penatula sp. on a gravel/cobble-mantled sediment]





[Large Paragorgia arborea was observed during this dive track. Based on published radial growth rates for this species, this colony is approximately 100 years old]



[Live Desmophyllum dianthus were observed in several locations, particular underhangs. In this image 4 large colonies can be seen, but also three new recruits as well on the top area of the rock.]



Samples Collected -



Sample ID	EX2104_D19_01G
Date (UTC)	20210727
Time (UTC)	144316
Depth (m)	1937.102051
Latitude (decimal degrees)	39.83892822
Longitude (decimal degrees)	-66.22882843



Temp. (°C)	3.553999901
Field ID(s)	Angular Rock
	18cm x 16cm x 4cm. Possible volcanic. Feeding trails present. FeMn crusted rock. Worm tubes.

Associates Sample ID	Field Identification	Count
N/A	N/A	N/A





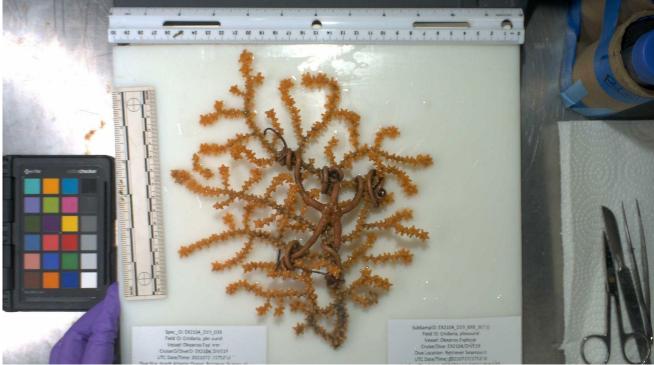


Sample ID	EX2104_D19_02G
Date (UTC)	20210727
Time (UTC)	165136
Depth (m)	1895.498047
Latitude (decimal degrees)	39.83752441
Longitude (decimal degrees)	-66.23006439
Temp. (°C)	3.71600008
Field ID(s)	Partially Rounded Rock
	19cm long x 12cm wide x 7cm tall. Lots of pits and holes, seemingly just in the crust. Worm tubes present. Rusting. FeMn crust. Unknown rock type.

Associates Sample ID	Field Identification	Count
EX2104_D19_02G_A01	Unknown Brachiopod	3
EX2104_D19_02G_A02	Hydroida	multiple







Sample ID	EX2104_D19_03B
Date (UTC)	20210727
Time (UTC)	175250
Depth (m)	1868.646973
Latitude (decimal degrees)	39.83721161
Longitude (decimal degrees)	-66.2302475
Temp. (°C)	3.677999973



Field ID(s)	plexaurid
Comments	24cm

Associates Sample ID	Field Identification	Count
EX2104_D19_03B_A01	Asteroschema (Ophiocreas)	1

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