




Okeanos Explorer ROV Dive Summary

Dive Information

General Location Map	
General Area Descriptor	U.S. and Canadian Atlantic Continental Margin
Site Name	Verrill Steps
Science Team Leads	Meagan Putts (UH) Jeff Obelcz (USNRL)
Expedition Coordinator	Daniel Wagner (NOAA-OER)
ROV Dive Supervisor	Sean Kennison (GFOE)
Mapping Lead	Michael White (NOAA-OER)

ROV Dive Name

Cruise	EX1905L2
Dive Number	DIVE02

Equipment Deployed

ROV	<i>Deep Discoverer</i>		
Camera Platform	<i>Seirios</i>		
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	N/A		
ROV Dive Summary Data (from Processed ROV)	<p>In Water: 2019-08-30T14:25:08.171316 42°, 51.893' N ; 61°, 12.464' W</p> <p>On Bottom: 2019-08-30T15:56:59.103811 42°, 52.085' N ; 61°, 12.225' W</p> <p>Off Bottom: 2019-08-30T19:10:21.309162 42°, 52.183' N ; 61°, 12.434' W</p> <p>Out Water: 2019-08-30T20:37:14.988051 42°, 51.76' N ; 61°, 13.243' W</p> <p>Dive duration: 6:12:6</p> <p>Bottom Time: 3:13:22</p> <p>Max. depth: 2506.0 m</p>		
Special Notes	N/A		



Scientists Involved

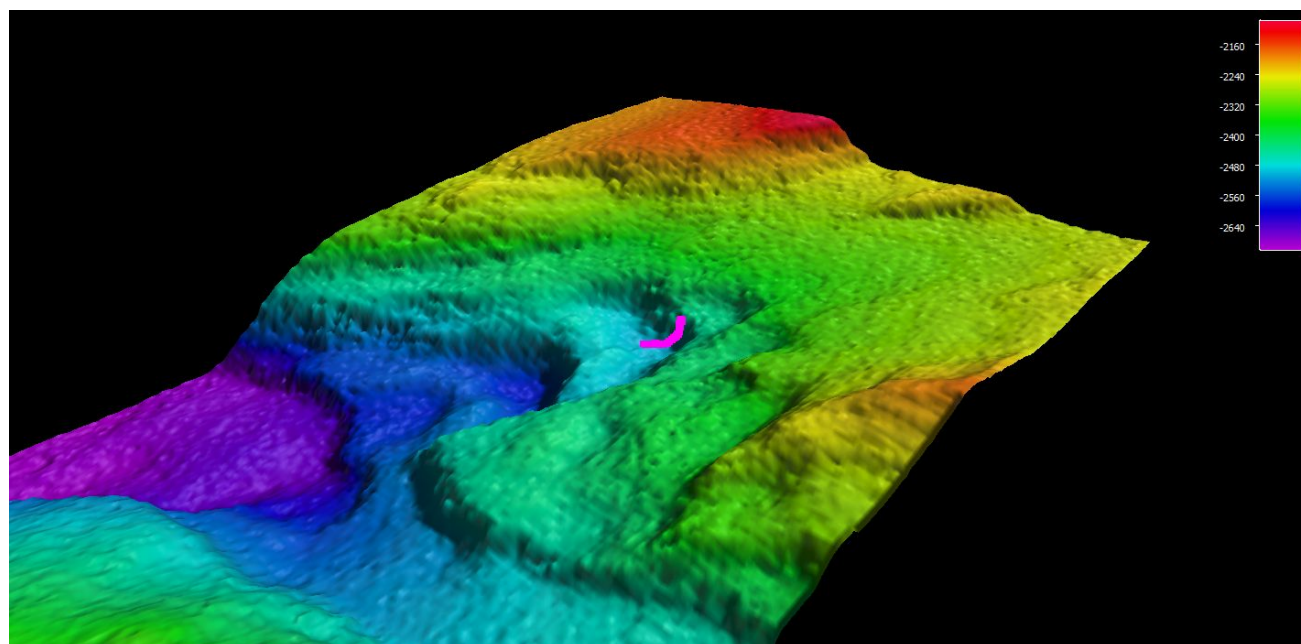
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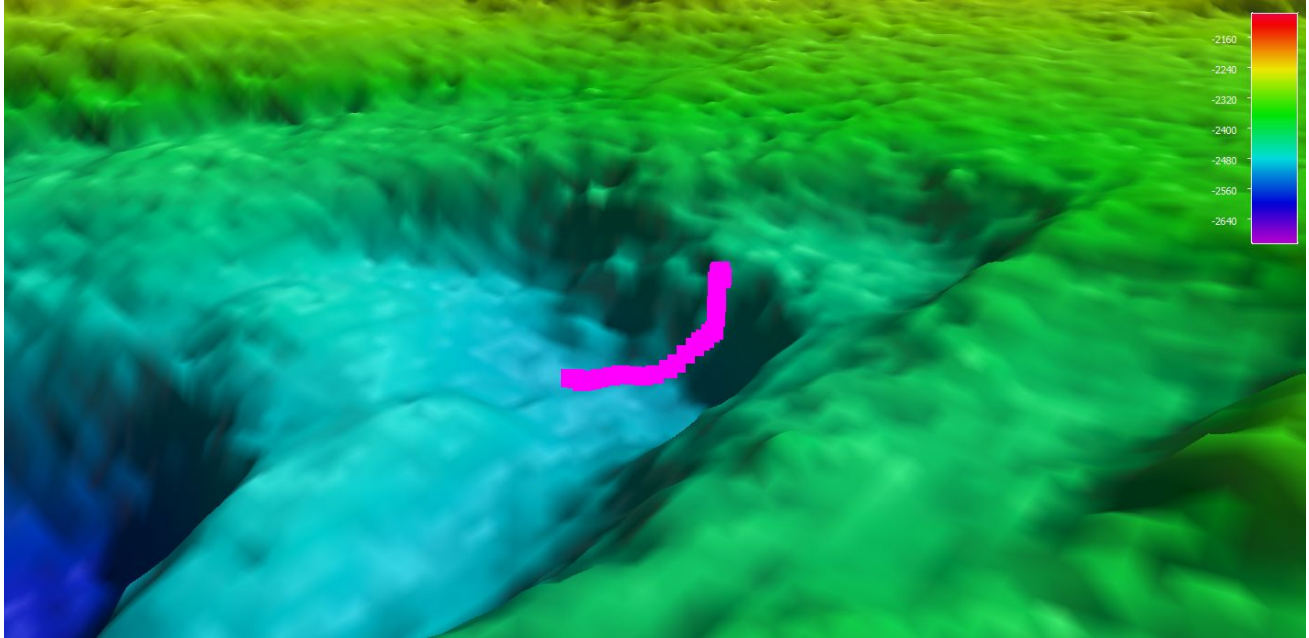
Dive Purpose and Description

Dive Purpose	The purpose of this dive was to explore deeper depths (~2500 m) inside Verrill Canyon, which have not previously been surveyed. Specifically, this dive sought to explore step-like features of Verrill Canyon, thought to have been formed by turbidity currents; the steep relief between steps was expected to provide suitable habitat for deep-sea corals and sponges. The dive further sought to explore the geological setting of the steps, as well as survey and sample biological communities along them.
Dive Description	The start of Verrill Steps dive was delayed slightly due to rough weather in transit. Bottom was reached at approximately 1600 UTC. The flat bench we landed on was relatively unremarkable, characterized by fine grained, unconsolidated sediment and sparse benthos, including sea stars, sea pens and urchins. Human generated debris was also observed at various points in this area. At approximately 1730 UTC, the toe of the “step” was reached, where seafloor substrate shifted to boulders, cobbles, and debris mantled in fine grained sediment. Two large vase-like glass sponges were sampled from sheer step walls, Chonelasmatinae and Farriedae. Geological samples of interest were also obtained, including (1) an oblong, rounded, friable clast plucked from the steep face of a step, believed to be a chemical concretion, and (2) a flattened cylinder-shaped clast believed to be precipitate from subsurface fluid flow, exiting the canyon wall.
Notable Observations	<ul style="list-style-type: none"> - Fine grained, soft sediment on top of step, combination of sheer walls and fine grained sediment on face of step - Two possible new species of sponges or known species in a new geographical range - Geological samples of various chemical precipitates
Community Presence/Absence (community is defined as more than two species)	<ul style="list-style-type: none"> ✓ Corals and Sponges <input type="checkbox"/> Chemosynthetic Community ✓ High-biodiversity Community <input type="checkbox"/> Active Seep or Vent <input type="checkbox"/> Extinct Seep or Vent <input type="checkbox"/> Hydrates

Overall Map of the ROV Dive Area



Close-up Map of Main Dive Site



Representative Photos of the Dive



Chonelasmata vase glass sponge anchored to sheer step face.





The toad fish *Chaunacops coloratus* swimming through the water column after first observed on the seabed.

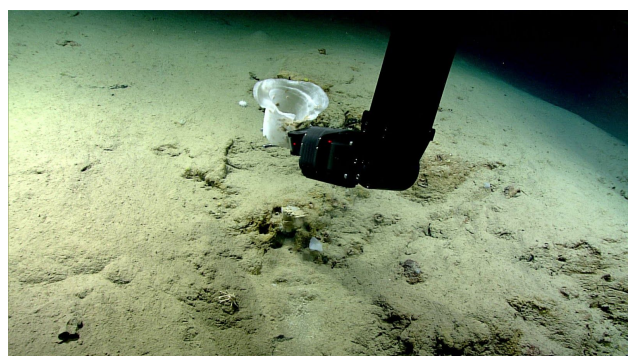
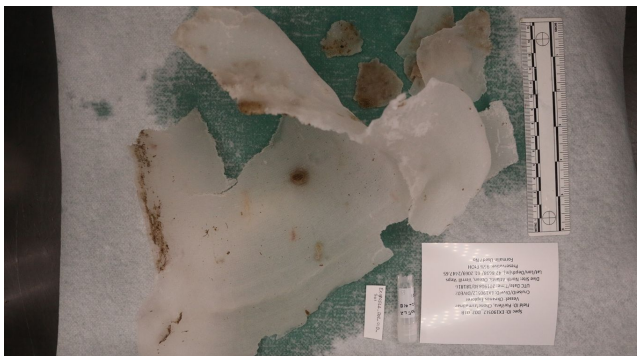


Cementation nodule in step face being sampled during the dive.



Pipe-like fluid channels on step face. One of these was sampled.

Samples Collected

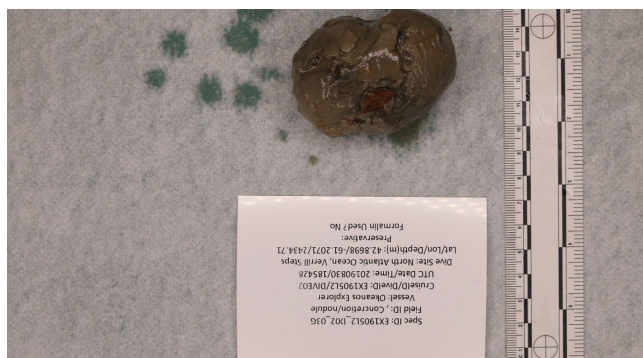


Sample ID	EX1905L2_D02_01B		
Date (UTC)	20190830		
Time (UTC)	181816		
Latitude	42.86980		
Longitude	-61.20690		
Depth (m)	2447.6		
Temp. (°C)	3.062		
Field ID(s)	Chonelasmatinae		
Commensals	Commensal Sample ID	Field Identification	Count
	EX1905L2_D02_01B_A01	Aplacophora	4
Comments	N/A		

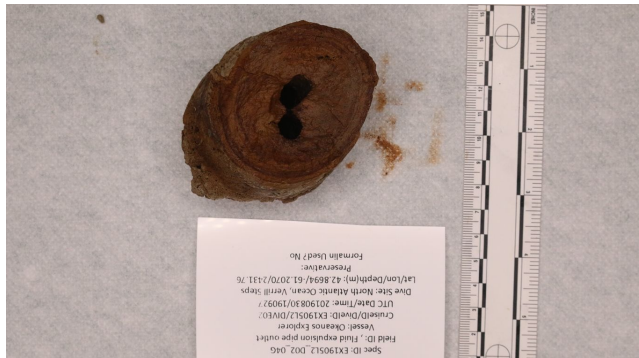




Sample ID	EX1905L2_D02_02B		
Date (UTC)	20190830		
Time (UTC)	184100		
Latitude	42.86980		
Longitude	-61.20710		
Depth (m)	2437.9		
Temp. (°C)	3.059		
Field ID(s)	Farreidae		
Commensals	Commensal Sample ID	Field Identification	Count
	EX1905L2_D02_02B_A01	Tubularidae	1
Comments	N/A		



Sample ID	EX1905L2_D02_03G		
Date (UTC)	20190830		
Time (UTC)	185428		
Latitude	42.86980		
Longitude	-61.20710		
Depth (m)	2434.7		
Temp. (°C)	3.058		
Field ID(s)	Concretion/nodule		
Commensals	No commensals		
Comments	N/A		



Sample ID	EX1905L2_D02_04G
Date (UTC)	20190830
Time (UTC)	190927
Latitude	42.86940
Longitude	-61.20700
Depth (m)	2431.8
Temp. (°C)	3.064
Field ID(s)	Fluid expulsion pipe outlet
Commensals	No commensals
Comments	N/A

Please direct inquiries to:

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