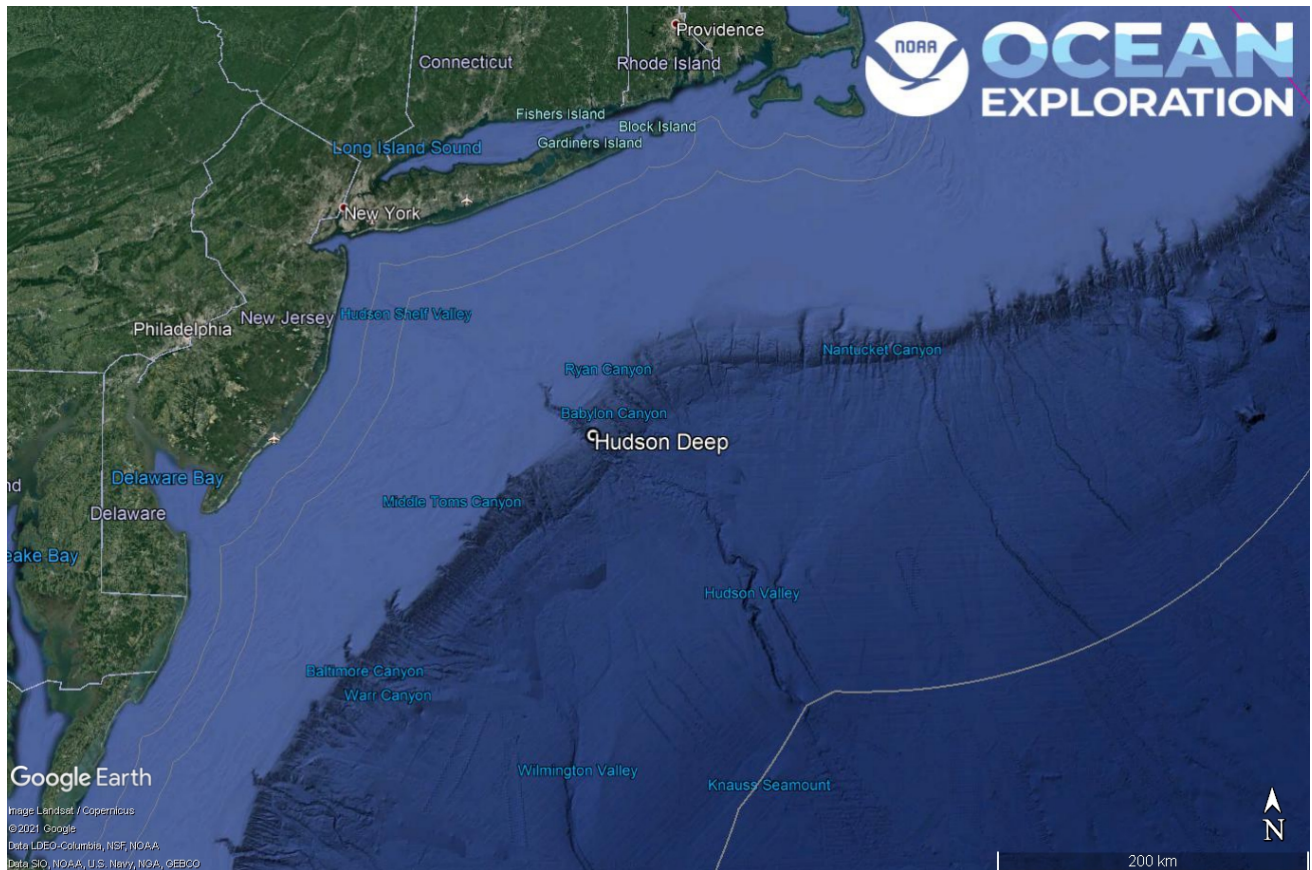


ROV Dive Summary, EX-21-03, Dive 09, June 24, 2021

General Location Map



Dive 09 named Hudson Deep. This site is in Hudson Canyon off of New York and New Jersey.

Dive Information

Site Name	Hudson Deep
General Area Descriptor	Mid-Atlantic Canyons
Science Team Leads	Karl McLetchie
Expedition Coordinator	Kasey Cantwell/Matt Dornback
ROV Dive Supervisor	Karl McLetchie
Mapping Lead	Shannon Hoy

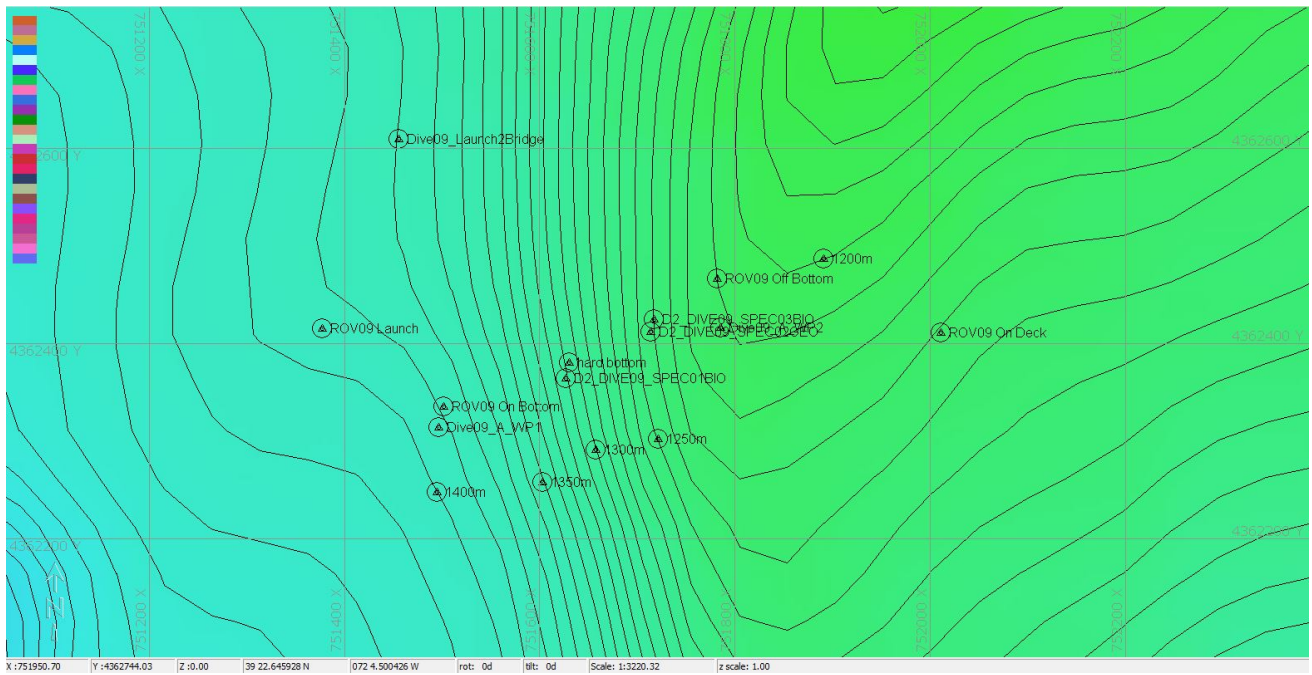
Dive Purpose	The ninth engineering dive of the ROV Shakedown. Primary objectives include pilot training, testing new motors, motor controllers, lights, cameras, and hydraulic systems on the ROVs. Secondary objectives include exploring the lower area of Hudson Canyon and collecting characteristic geological and biological samples.
Was the dive restricted for Underwater Cultural Heritage?	No
ROV Dive Summary Data	<p>Dive Summary: EX2103_DIVE09 ^^^ Dive Type: Normal</p> <p>In Water: 2021-06-24T12:39:21.978606 39.374224004896725 ; -72.08323420881409</p> <p>On Bottom: 2021-06-24T13:39:18.042315 39.373881596148145 ; -72.08035078844443</p> <p>Off Bottom: 2021-06-24T19:47:49.873472 39.374981685513866 ; -72.07706692227305</p> <p>Out Water: 2021-06-24T20:31:51.972303 39.37454468446772 ; -72.07450974598059</p> <p>Dive Duration: 7:52:29</p> <p>Bottom Time: 6:8:31</p> <p>Max Vehicle Depth: 1401.8 m</p> <p>Min Seafloor Depth: 1198.4 m</p> <p>Distance Travelled: 387.5 m</p>

Dive Description	Dive 9 descended to 1310m on Hudson Canyon and ascended a steep portion of the canyon wall to a depth of 791. Sedimentary rock layers were visible and many corals, sponges, hydroids, sea stars, squid, pycnogonid, holothurians, and fish were seen. There were at least five octopods observed today. Three samples taken, anthomastus, antipatharian, and rock sample. The anthomastus and antipatharian are animals requested for ASPIRE connectivity studies.
Notable Observations	Numerous octopods seen in dens.
Community and habitat observations	Corals and Sponges - Present Chemosynthetic Community - Absent High biodiversity Community - Absent Active Seep or Vent - Absent Extinct Seep or Vent - Absent Hydrates - Absent
CMECS Feature Type(s)	Submarine Canyon, Slope
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2223

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	Turbidity Sensor

Close-up Map of Main Dive Site



Hypack map of the Dive 09 waypoints. Depth is displayed by contour lines at 10 meter increments and by colors. Warm colors are shallower and cool colors are deeper.

Representative Photos of the Dive

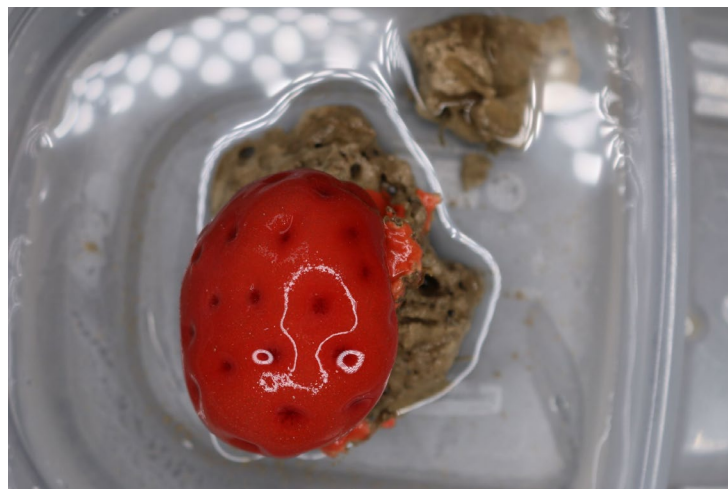


An octopus in its den.



Hydroids on the canyon wall.

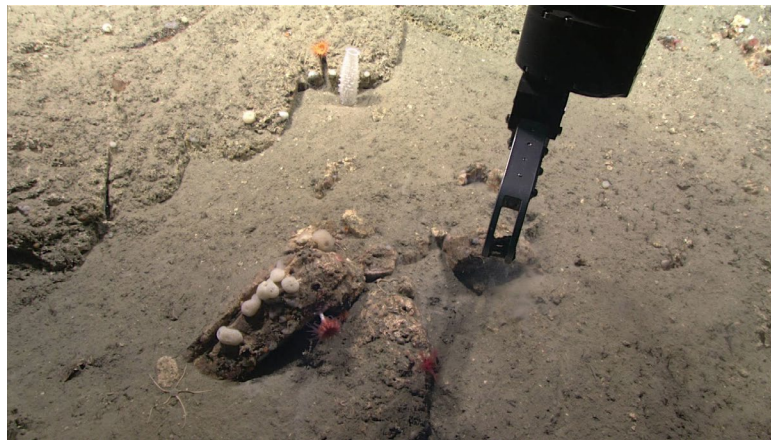
Samples Collected -



Sample ID	EX2103_D09_01B
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Date (UTC)	6/24/2021
Time (UTC)	155118
Depth (m)	1344.77
Latitude (decimal degrees)	39.3742
Longitude (decimal degrees)	-72.0788
Temp. (°C)	4.254
Field ID(s)	Cnidaria Anthomastus
Comments	approx 6cm x 3 cm; on a mudstone that will be removed, good condition; some discussion if this was sudoanthomastus; collected with the suction sampler; might be tissue damage; not immediately apparent

Associates Sample ID	Field Identification	Count
Ex2103_D09_01B_A01	Mudstone	1



Sample ID	EX2103_D09_02G
Date (UTC)	6/24/2021

Time (UTC)	180241
Depth (m)	1257.441
Latitude (decimal degrees)	39.3745
Longitude (decimal degrees)	-72.078
Temp. (°C)	4.326
Field ID(s)	Sediment Rock
Comments	One large chunk; pretty angular rock; bunch of smaller pieces with it. Will put all in one rock bag; 11cm x 12cm x 9cm

Associates Sample ID	Field Identification	Count
EX2103_D09_02G_A01	Cnidaria Dendrophylliidae (cup coral)	1
EX2103_D09_02G_A02	Cnidaria Actiniaria (sea anemone)	1
EX2103_D09_02G_A03	Porifera (sponges)	2





Sample ID	EX2103_D09_03B
Date (UTC)	6/24/2021
Time (UTC)	183704
Depth (m)	1241.464
Latitude (decimal degrees)	39.3746
Longitude (decimal degrees)	-72.0778
Temp. (°C)	4.406
Field ID(s)	Cnidaria Antipatharia (thorny corals)
Comments	approx 18 cm; a couple of branches towards the bottom that are denuded, opiuroid associate wrapped in branches

Associates Sample ID	Field Identification	Count
EX2103_D09_03B_A01	Echinodermata Ophiuroidea (brittle star)	1

Niskin Sampling Summary

No niskin samples were taken.

Scientists Involved (provide name, email, affiliation)

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