### Okeanos Explorer ROV Dive Summary

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Alvin Canyon – Shallow 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROV Lead/Expedition</td>
<td>Brian Bingham/ Kelley</td>
</tr>
<tr>
<td>Coordinator</td>
<td>Elliott</td>
</tr>
<tr>
<td>Science Team Leads</td>
<td>Tim Shank (Shore)</td>
</tr>
<tr>
<td></td>
<td>Andrea Quattrini (Ship)</td>
</tr>
<tr>
<td>General Area Descriptor</td>
<td>Northwest Atlantic Ocean;</td>
</tr>
<tr>
<td></td>
<td>Northeast U.S. Canyons</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROV Dive Name</th>
<th>Cruise Season</th>
<th>Leg</th>
<th>Dive Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX1304</td>
<td></td>
<td>1</td>
<td>DIVE09</td>
</tr>
</tbody>
</table>

#### Equipment Deployed

- **ROV:** Deepwater Discoverer
- **Camera Platform:** Seirios

#### ROV Measurements

- CTD
- Scanning Sonar
- Pitch
- HD Camera 2
- Low Res Cam 3
- Depth
- USBL Position
- Roll
- Low Res Cam 1
- Low Res Cam 4
- Altitude
- Heading
- HD Camera 1
- Low Res Cam 2

#### Equipment Malfunctions


- Dive duration: 6:59:52
- Bottom Time: 5:47:27
- Max. depth: 926.9 m

#### Special Notes

- **Primary**
  - Tim Shank, Woods Hole (shore-based science team lead), WHOI, tshank@whoi.edu
  - Andrea Quattrini, EX (onboard science team lead), Temple, Andrea.Quattrini@temple.edu
  - Brendan Roark, EX, TAMU, broark@geos.tamu.edu
  - Taylor Heyl, Woods Hole, MA; WHOI, theyl@whoi.edu
  - Santiago Herrera Woods Hole, MA; WHOI, sherrera@whoi.edu
  - Scott France, Lafayette, LA; U. Louisiana at Lafayette, france@louisiana.edu
  - AJ Turner, Charleston, NOAA, aj.turner@noaa.gov
  - Amanda Demopoulos, Gainesville, FL; USGS SE Ecological Science Center, ademopoulos@usgs.gov
  - Les Watling, Darling Marine Center, Maine, watling@maine.edu
  - Kelly McCulloch, Woods Hole, MA; WHOI, williamsk@allegheny.edu
  - Kerry McCulloch, Woods Hole, MA; WHOI, mcculloch@uoregon.edu

- **Secondary**
  - Kelly Williams, Woods Hole, MA; WHOI, mcculloch@uoregon.edu

#### Scientists Involved

(please provide name / location / affiliation / email)
Purpose of the Dive
The purpose of the dive was to characterize 1) the submarine canyon geomorphology and benthic habitats, including possible coral and sponge communities at a depth of ~900 m on the west wall of Alvin Canyon and 2) groundtruth a model of predicted deep-sea coral occurrence.

Description of the Dive:
The ROV reached the seafloor covered in soft sediment at a time of 13:53 UTC and a depth of 926 m (4.7 deg C). Numerous red crabs (*Chaceon quinquedens*), squat lobsters (*Galatheoids*), witch flounder (*Glyptocephalus cynoglossus*), cutthroat eels (*Synaphobranchidae*), dogfish (*Centroscyllium fabricii*), and midwater organisms including fishes (*Myctophidae, Phosichthyidae*) were evident. It appeared that we were in a nepheloid layer with poorer visibility than previous dives. A strong current was not evident. At 14:14, we began moving over this soft substrate bottom, and the ROV traversed large sediment scars. Downslope of the scars were boulders, suggesting that these boulders recently rolled down slope. The boulders appeared to be carbonate cemented sediment, silt/mudstone and clay rich; similar to the geology in Atlantis canyon. Two different species of *Apristurus* catsharks were noted here. At 14:40, the ROV reached the base of a vertical wall, where fishes were abundant and sessile fauna were evident. The wall was heavily bored with anemones and polychaetes tubeworms projecting from the holes. Attached to the wall included several species of sponges, cup corals (*Desmophyllum* and *Javania*), and a few bamboo corals (*Isididae*). A DVL target was dropped (wallbase01). Several “white lines” were running down the wall, and it was noted that they were associated with fissures/fractures of various depths. A small fragment of *Lophelia pertusa* was observed at 15:11 at a depth of 893 m, but it was unclear whether any live tissue was associated with this branch. The ROV began to move up-slope towards waypoint 1 at 15:19, transiting up a very steep vertical wall. At 15:28, mudstone blocks covered in bamboo corals and sponges with a thin veneer of sediment was apparent. The ROV continued up slope covered in a fairly thick layer of fine, silty sediment. At 15:54, the ROV moved off the slope to the base of the feature, below waypoint 2. Numerous ctenophores were seen in the water column. ROV approached the bottom again at 16:30 and began moving up slope towards waypoint 2. The rock wall again had numerous “white lines” running down the face. A noteworthy observation of an oreo, *Neocyttus helgae*, was documented at a depth of 866 m at a time of 16:51. In addition, numerous skates were prevalent in the area. As the ROV moved up a very steep slope, it was noted that overall there was a lack of conspicuous attached fauna, and a low diversity of corals here. However, cup corals, bamboo corals, anemones, and bivalves were fairly abundant at a depth of 860 m growing under a small overhang. Fishing line was observed on the bottom at 17:29. Also, numerous ophiuroid brittle stars with their discs buried in the sediments and their arms sticking out in the water column were noted. At 17:42 UTC and a depth of 827 m, the ROV reached the top of the feature and then entered the water column to move to the base of the feature below waypoint 3. In the water column, numerous ctenophores, salp chains, and *Phronima* were noted. The ROV reached the bottom again at 18:26 UTC and a depth of 906 m over a soft sediment bottom, noting numerous red crabs and squat lobsters. The ROV made its way up-slope to waypoint 3, again approaching a large vertical wall that appeared to be white, cemented carbonate with a light sediment cover. Cup corals and *Solenosmilia variabilis* colonies were growing under ledges. ROV left bottom at 20:00 at a depth of 863 m. Overall, minimal, conspicuous attached fauna was evident on the rock faces, with the exception of corals and sponges growing under overhangs. Also, it was noted that the ledges sticking out might have more carbonate cement or different grain size preventing the cement from being attacked, while the eroded layers may have only minor amounts of cement or none at all. This is normally termed an
interbedded sequence. Also on this dive, it was noted that numerous skates were prevalent in the area.

Overall Map of ROV Dive Area

Close-up Map of Main Dive Site

Representative Photos of the Dive

The face of a vertical wall with a “white line” or fissure that was seen numerous times in this area. Time 19:21. Depth 852 m.

An oreo, *Neocyttus helgae*, swimming along a rock face, with attached sponges and cup corals. Time 16:50. Depth of 866 m.

Please direct inquiries to:
NOAA Office of Ocean Exploration & Research
1315 East-West Highway (SSMC3 10th Floor)
Silver Spring, MD 20910
(301) 734-1014