*Okeanos Explorer* ROV Dive Summary

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| Dive Information | | | | | |
| General Location | |  | | | |
| General Area Descriptor | | Gulf of Mexico | | | |
| Site Name | | Green Canyon Area, St. Tammany Basin (GC939) | | | |
| Science Team Leads | | Diva Amon and Charles Messing | | | |
| Expedition Coordinator | | Brian Kennedy | | | |
| ROV Dive Supervisor | | Dan Rogers | | | |
| Mapping Lead | | Mike White | | | |
| ROV Dive Name | | | | | |
| Cruise | | EX1711 | | | |
| Leg | | - | | | |
| Dive Number | | DIVE10 | | | |
| Equipment Deployed | | | | | |
| ROV | | Deep Discoverer | | | |
| Camera Platform | | Seirios | | | |
| 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 | | none | | | |
| ROV Dive Summary (from processed ROV data) | | Dive Summary: EX1711\_DIVE10  ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^  In Water: 2017-12-12T14:32:12.750000  27°, 02.649' N ; 091°, 11.379' W  Out Water: 2017-12-12T22:24:27.130000  27°, 03.289' N ; 091°, 11.167' W  Off Bottom: 2017-12-12T21:35:28.391000  27°, 03.005' N ; 091°, 11.098' W  On Bottom: 2017-12-12T15:30:38.700000  27°, 02.659' N ; 091°, 11.557' W  Dive duration: 7:52:14  Bottom Time: 6:4:49  Max. depth: 1635.0 m | | | |
| Special Notes | | none | | | |
| Scientists Involved  (please provide name, location, affiliation, email) | | |  |  |  | | --- | --- | --- | | **Name** | **Affiliation** | **Email** | | Alexandra Avila | Oregon State University / Nancy Foster Scholar (ONMS) | alexandra.m.avila@gmail.com | | Amanda Demopoulos | USGS | ademopoulos@usgs.gov | | Carolyn Ruppel | US Geological Survey | cruppel@usgs.gov | | Charles Messing | Nova Southeastern University | messingc@nova.edu | | Chris Horrell | Bureau of Safety and Environmental Enforcement | christopher.horrell@bsee.gov | | Daniel Wagner | NOAA | daniel.wagner@noaa.gov | | Diva Amon | Natural History Museum, London | divaamon@gmail.com | | Erik Cordes | Temple University | ecordes@temple.edu | | Lauren Jackson | NCEI-Stennis | Lauren.Jackson@noaa.gov | | Les Watling | University of Hawaii at Manoa | watling@hawaii.edu | | Meagan Putts | University of Hawaii | meagan.putts@noaa.gov | | Mike Ford | NOAA Fisheries | michael.ford@noaa.gov | | Rachel Bassett | NOAA NCCOS DCEL | rachel.bassett@noaa.gov | | Robert Carney | Oceanography and Marine Sciences, LSU | rcarne1@lsu.edu | | Tina Molodtsova | Shirshov Institute of Oceanology RAS | tina@ocean.ru | | Tracey Sutton | Nova Southeastern University | tsutton1@nova.edu | | | | |
| Purpose of the Dive | | The dive site was located near to a proposed Flower Garden Banks National Marine Sanctuary expansion zone, as well as a Habitat Area of Particular Concern (HAPC) proposed by the Gulf of Mexico Fishery Council. Extensive previous exploration and the presence of a pipeline in the proposed areas limited potential dive locations within proposed areas. Additionally, several methane bubble plumes and potential hard grounds detected approximately five kilometers south during multibeam surveys by the NOAA Ship *Okeanos Explorer* resulted in the dive being planned outside of proposed areas for management. Despite this, baseline data collected on the distribution, abundance, diversity, biogeography and connectivity of chemosynthetic communities and surrounding faunal assemblages, as well as the geological composition and origin of this area, will have implications for the management of these areas. | | | |
| Description of the Dive | | As with most dives during EX1711, the ROV touched down in a sedimented area with evidence of bioturbation and few obvious fauna. Proceeding towards the seep targets, sparse *Bathymodiolus* sp.shells were observed, which gradually transitioned to patchy areas of reduced sediment and bacterial mats.  Near the first bubble target, the terrain became more undulating with chemosynthetic habitats located in large depressions. The floor of the first depression revealed a brine pool/river with live *Bathymodiolus brooksi* and shells of many mussels that appeared to have drowned in the brine. Nearby were bacterial mats, *Neolithodes agassizi*, Siboglinidae sp., *Munidopsis* sp., *Alvinocaris muricola*, and amphipods. Farther along, we observed two more seepage areas with *B. brooksi* mussel beds and invertebrates. One very large bed hosted a high diversity, including *Neolithodes agassizi*, *Chaceon fenneri, C. quinquedens*, *Munidopsis* sp., *Alvinocaris muricola*, Polynoidae sp., Ophiuroidea sp., *Chiridota heheva*, *Sclerolinum contortum*, and amphipods. The *Bathymodiolus* mussels varied in size, indicating multiple recruitment events. We observed methane hydrate accumulating under a neighbouring overhang of authigenic carbonate that hosted actinarians.  To enable exploration of the second bubble target on the other local high in the area, the ROV transited quickly over a sedimented plain with sparse *Bathymodiolus brooksi* shells, Ceriantharia sp., several *Umbellula* sp. with commensal mysid shrimp and a pair of amphipods, *Nematocarcinus* sp., and holothurians (*Pseudostichopus* sp., and an Aspidodiadematidae sp.). As we approached the second bubble stream, we observed increasingly numerous patches of reduced sediments and bacterial mats. A community of *Lamellibrachia* sp., *Munidopsis* sp. and *Alvinocaris muricola* were observed on an outcrop of authigenic carbonate. In this area, *Actinernus* sp. anemones were also abundant.  Fish diversity during this dive was high, with several *Coryphaenoides mexicanus*, *C. carapinus*, Macrouridae sp., *Polyacanthonotus merreti*, *Stephanoberyx monae*, *Cyclothone* sp., *Dicrolene intronigra*, *Cataetyx laticeps*, *Harriotta raleighiana*, *Rhinochimaera atlanticus*, *Aldrovandia affinis*, *A. gracilis*, *A. phalacra* or *A. oleosa*, *Bathygadus favosus*, *Venefica procera*, and a *Bassogigas*? sp. in the depressions.  Notable observations included a possibly pregnant Bythitidae sp. in an excavated pit (perhaps a birthing nest); two other fish, *Haptenchelys texis* and *Rajella bathyphila*, which may not have been imaged underwater previously; the yellow ctenophore encountered on Dive 9, and several pieces of marine debris and sargassum. | | | |
| Overall Map of the ROV Dive Area | | | Close-up Map of Main Dive Site | | |
| ../HypackScreenGrabs/DIVE10_Hypack_wide.JPG | | | ../HypackScreenGrabs/DIVE10_Hypack_zoom.JPG | | |
| Representative Photos of the Dive | | | | | |
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| A narrownose chimaera, *Harriotta raleighiana*, swims by *Deep Discoverer* at a depth of 1,618 m. | | | A brine lake clouded with a possible barite precipitate lies between a black anoxic shoreline at left and bed of dead *Bathymodiolus* sp. chemosynthetic mussels at right, at a depth of 1,624 m. | | |
|  | | |  | | |
| A vast bed of *Bathymodiolus* sp. chemosynthetic mussels spanning at least 30 m across, with clusters of the sea cucumber *Chiridota heheva*, at a depth of 1,621 m. | | | The lithodid crab, *Neolithodes agassizii*, feeding on a *Bathymodiolus* sp. mussel, or its byssus, at a depth of 1,622 m. | | |
|  | | |  | | |
| Samples Collected | | | | | |
| Sample | | | | | |
| Sample ID | EX1711\_20171212T211213\_D2\_DIVE10\_SPEC01BIO | | C:\EX_SODA\dive10\EX1711_IMG_20171212T211025Z_D2_DIVE10_SPEC01BIO_04.jpg | | |
| Date (UTC) | 20171212 | |  | | |
| Time (UTC) | 211213 | |  | | |
| Depth (m) | 1581.81 | |  | | |
| Temperature (°C) | 4.27 | |  | | |
| Field ID(s) | Actinernus Anemone | |  | | |
| Commensal ID and Field Identification | Polychaeta N=1  Carbonate rock (host of primary) | | | | |
| Comments |  | | | | |

# Please direct inquiries to:

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