

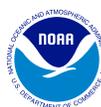


## Okeanos Explorer ROV Dive Summary

Dive Information	
General Location	<p style="text-align: center;"><b>Gulf of Mexico 2017</b></p>
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



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Purpose of the Dive	<p>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 <i>Okeanos Explorer</i> 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.</p>		
Description of the Dive	<p>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 <i>Bathymodiolus</i> sp. shells were observed, which gradually transitioned to patchy areas of reduced sediment and bacterial mats.</p> <p>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 <i>Bathymodiolus brooksi</i> and shells of many mussels that appeared to have drowned in the brine. Nearby were bacterial mats, <i>Neolithodes agassizi</i>, Siboglinidae sp., <i>Munidopsis</i> sp., <i>Alvinocaris muricola</i>, and amphipods. Farther along, we observed two more seepage areas with <i>B. brooksi</i> mussel beds and invertebrates. One very large bed hosted a high diversity, including <i>Neolithodes agassizi</i>, <i>Chaceon fenneri</i>, <i>C. quinquedens</i>, <i>Munidopsis</i> sp., <i>Alvinocaris muricola</i>, Polynoidae sp., Ophiuroidea sp., <i>Chiridota heheva</i>, <i>Sclerolinum contortum</i>, and amphipods. The <i>Bathymodiolus</i> mussels varied in size, indicating</p>		



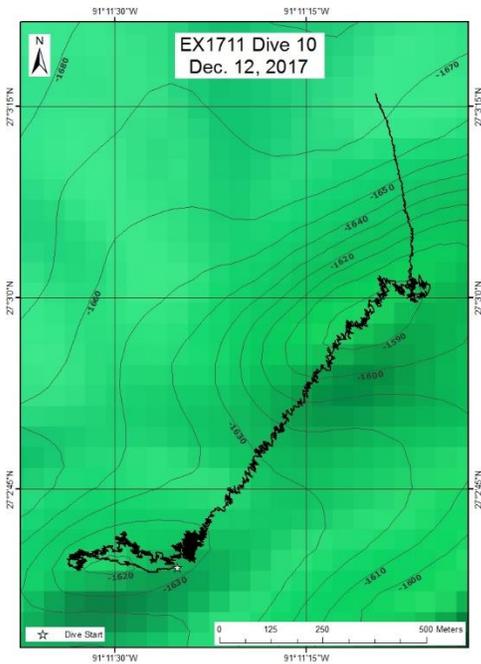
multiple recruitment events. We observed methane hydrate accumulating under a neighbouring overhang of authigenic carbonate that hosted actinarians.

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.

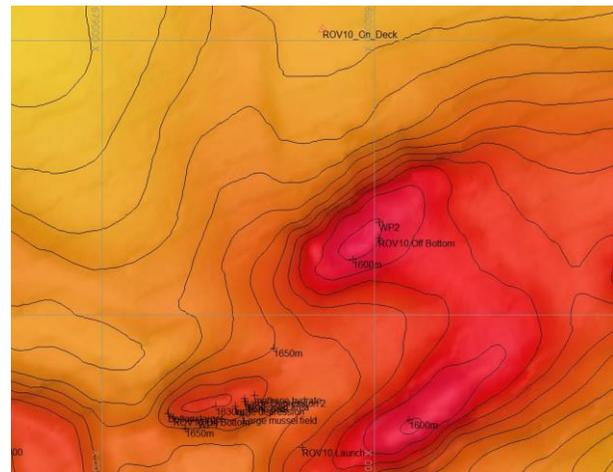
Fish diversity during this dive was high, with several *Coryphaenoides mexicanus*, *C. carapinus*, Macrouridae sp., *Polyacanthonotus merreti*, *Stephanoberyx monae*, *Cyclothone* sp., *Dicrolene intronigra*, *Cataetyx laticeps*, *Harriotta raleighiana*, *Rhinochimaera atlanticus*, *Aldrovandia affinis*, *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



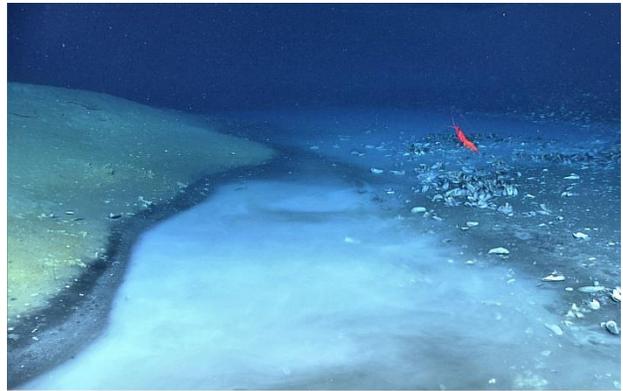
Close-up Map of Main Dive Site



Representative Photos of the Dive



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	
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)	

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