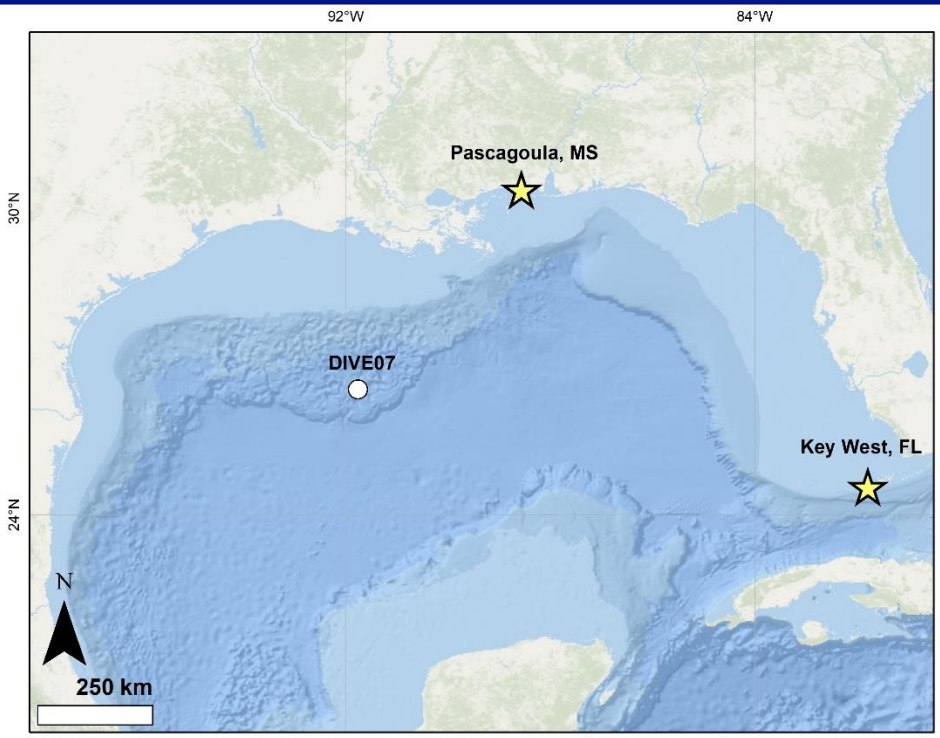
Ocean Exploration and Research

Okeanos Explorer ROV Dive Summary

Dive Information	
General Location Map	
General Area Descriptor	Gulf of Mexico
Site Name	Mud volcano in WR 488
Science Team Leads	Daniel Wagner (Biology) Adam Skarke (Geology)
Expedition Coordinator	Nikolai Pawlenko
ROV Dive Supervisor	Karl McLetchie
Mapping Lead	Mike White
ROV Dive Name	
Cruise	EX1803
Dive Number	DIVE07
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: EX1803_DIVE07 ^^ In Water: 2018-04-20T13:17:01.166076 26°, 28.212' N ; 91°, 43.753' W On Bottom: 2018-04-20T14:42:31.983200 26°, 28.243' N ; 91°, 43.683' W Off Bottom: 2018-04-20T20:17:03.651525 26°, 28.432' N ; 91°, 43.437' W Out Water: 2018-04-20T21:34:54.509039 26°, 28.843' N ; 91°, 42.668' W Dive duration: 8:17:53 Bottom Time: 5:34:31 Max. depth: 2249.0 m
Special Notes	

Scientists Involved (please provide name, location, affiliation, email)

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Purpose of the Dive	The purpose of the dive was to survey the geology and biology of a mud volcano in WR 488, an area that has never before been surveyed using deep-sea submersibles by the scientific community. The closest scientific dive survey, a single 2006 HOV *Alvin* dive, was conducted in WR 269 over 26 km to the north. The dive target area contained positive anomalies in the seafloor seismic amplitude map developed for the Gulf (BOEM 2017), indicating that it might contain some hard substrate. Overnight backscatter mapping data collected by NOAA Ship *Okeanos Explorer* at the site showed hard returns in the center of the mud volcano, further indicating that it might contain exposed substrate			

<table>
<tr><td>Description of the Dive</td><td colspan="2">The ROV acquired bottom on a heavily-sedimented surface at a depth of 2240 m at 14:42 UTC. Several Lepidisis caryophylla bamboo corals were seen close to the landing spot, as was a plastic bag with anemones growing on it. After reaching the seafloor, the ROV ascended side of the mud volcano and proceeded east toward waypoint 2. As the ROV traversed the western side of the mound towards the local bathymetric high at waypoint two, the seafloor was characterized by continuous fine grained sediment cover with occasional patches (<15m^2) of stained sediment and bacterial mat suggesting discharge of subsurface fluids. At approximately 15:04 UTC a very small area (<1m^2) of exposed asphalt flow with attached anemones was observed. As the ROV continued to move towards waypoint two at the center of the mud volcano, seafloor bathymetry became more undulated and occasional small mounds were observed. At 15:48 UTC a small mound that appeared to be recently formed was observed on the side of a depression. Throughout the central portion of the mud volcano, small patches with bacterial mats and chemosynthetic communities were observed. At 18:30 UTC in one on these patches, a low mound was observed with white sediments on one side suggesting fluidized mud flow from a hole on the top of the mound. Closer inspection revealed fecal casts in that hole leading to uncertainty as to whether the origin of the small mound feature was geological or biological. Movement from waypoint two at the apex of the mud volcano to waypoint three on the northern rim revealed a similar benthic environment to what had been previously observed. After passing waypoint three the ROV moved to the outer edge of the volcano in search of hard substrate but found none. The transit towards waypoint 4 revealed a continuation of previous bed conditions. At 20:16 UTC at a point about halfway between waypoint 3 and 4 the dive concluded. With the exception of the asphalt flow, no rock or hardground habitat was observed on this dive.

The majority of the habitat surveyed during the dive consisted of heavily-sedimented slopes with sparse colonies of the bamboo coral Lepidisis caryophylla, Benthodytes sp. sea cucumbers, and Nematocarcinus ensifer shrimp. Other invertebrates recorded in these sedimented habitats included venus fly-trap anemones (both Homethiidae and Actinoschyphidae), shrimp (Mysidae, Hepomatus tener and Cerataspis sp.), Chiropdota sp. sea cucumbers, as well as a single individual of the sea pen Anthopthilum sp. and a tube-dwelling anemone (Ceriantharia). Fish observed included the spiny eel Polyacathonotus merretti, the rattail Coryphaenoides rudis, the cut-throat eel Synapobranchus sp., the halosaurid Aldrovandia sp., the tripod fish Ipnops murrayi, the cusk eel Cataetyx laticeps, and the nettastomatid eel Venefica procera.

Patches of chemosynthetic communities were also occasionally observed throughout the dive, which included high densities of the siboglinid tubeworms Sclerolinum sp., amphipods, Escarpia sp. shrimp, and Chirodota heheva sea cucumbers. The ROV left the bottom 20:15 UTC. No hard substrates were recorded on the dive.</td></tr>
<tr><td>Notable Observations</td><td colspan="2">[Can include number of communities, notable collections or observations, high density communities, etc.]</td></tr>
<tr><td>Community Presence/ Absence (community is defined as more than two species)</td><td>☒Corals and Sponges Present
☒Chemosynthetic Community Present
☐High biodiversity Community Present</td><td>☐Active Seep or Vent
☒Extinct Seep or Vent
☐Hydrates Present</td></tr>
<tr><td colspan="2">Overall Map of the ROV Dive Area</td><td>Close-up Map of Main Dive Site</td></tr>
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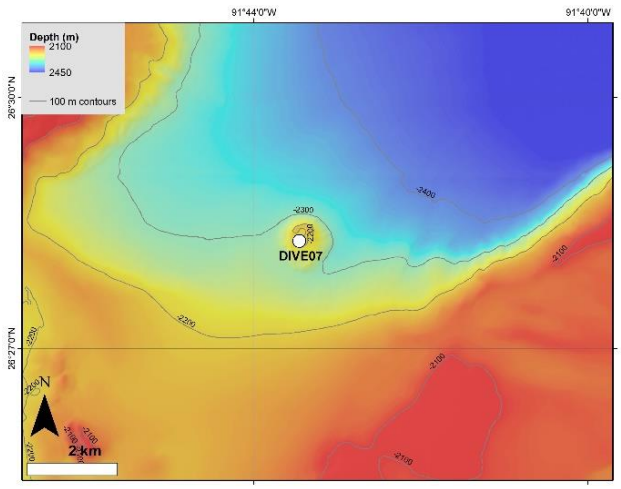
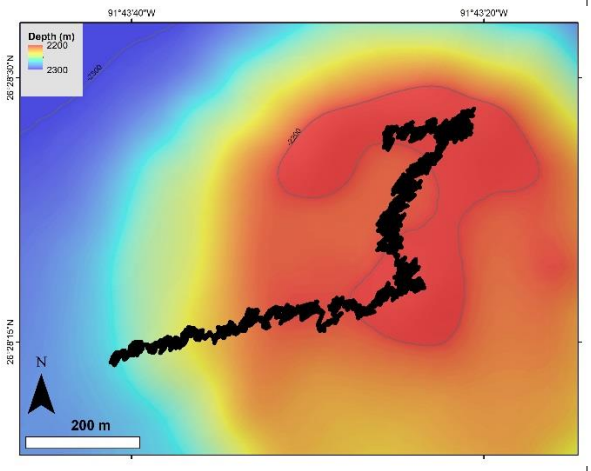
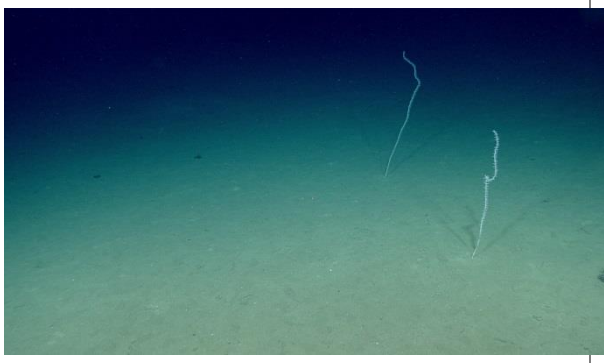


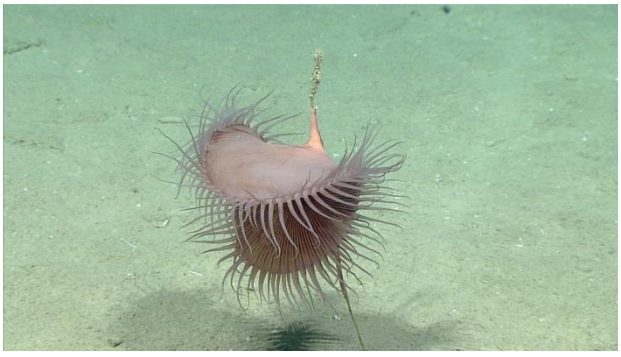


Representative Photos of the Dive

Spiny eel *Polyacathonotus merretti*.



Two colonies of the unbranched bamboo coral *Lepidisis caryophylla*.



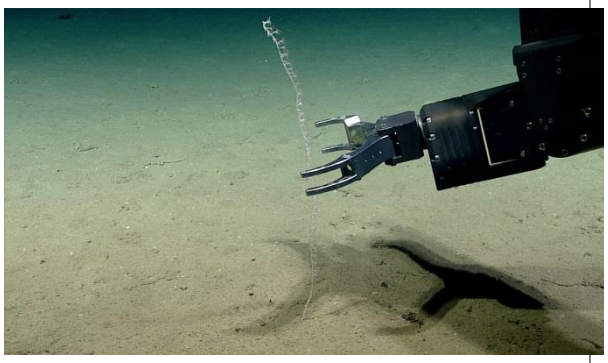
Venus fly-trap anemone (*Actinoschyphia* sp.).

Seastar in bed of chemosynthetic tubeworms *Sclerolinum* sp.

Samples Collected

Sample

Sample ID	EX1803_20180420T184836_D2_DIVE07_SPEC01BIO
Date (UTC)	20180420
Time (UTC)	184836
Depth (m)	2188.74
Temperature (°C)	4.28
Field ID(s)	*Lepidisis caryophylla*



Commensals

Commensal ID	Field Identification	Notes
none		

Comments

Sample

Sample ID	EX1803_20180420T192841_D2_DIVE07_SPEC02BIO
Date (UTC)	20180420
Time (UTC)	192841
Depth (m)	2168.31
Temperature (°C)	4.28
Field ID(s)	*Sclerolinum* sp.

Commensals

Commensal ID	Field Identification	Notes
EX1803_20180420T192841_D2_DIVE07_SPEC02BIO_A01	Ophioroidea	N=5
EX1803_20180420T192841_D2_DIVE07_SPEC02BIO_A02	Gastropoda A	N=3
EX1803_20180420T192841_D2_DIVE07_SPEC02BIO_A03	Polychaeta	N=1
EX1803_20180420T192841_D2_DIVE07_SPEC02BIO_A04	Gastropoda B	N=46+

Gastropoda B are different species then the Gastropoda A. There was many of B in the sample and probably many more in the main specimen.

Comments: Many Sclerolinum specimens collected in one 'colony'.

Please direct inquiries to:

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