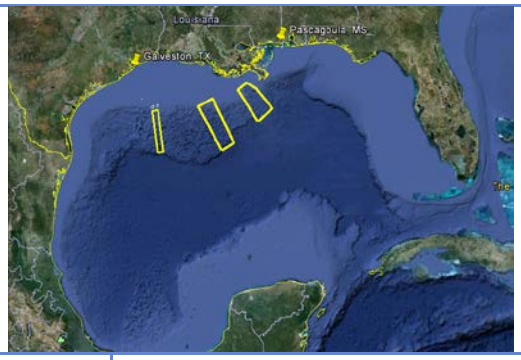
OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	South of Biloxi B		
ROV Lead	Dave Lovalvo		
General Area Descriptor	Northern Gulf of Mexico		
ROV Dive Name	Cruise Season	Leg	Dive Number
	EX1202	3	DIVE06
Equipment Deployed	ROV:	Little Hercules	
	Camera Platform:	Seirios	
ROV Measurements	☒ CTD	☒ Depth	☒ Altitude
	☒ Scanning Sonar	☒ USBL Position	☒ Heading
	☒ Pitch	☒ Roll	☒ HD Camera
	☒ Low Res Cam 1	☒ Low Res Cam 2	
Equipment Malfunctions	N/A		
ROV Dive Summary (From processed ROV data)	Dive Summary: EX1202L3_DIVE06 ^^ In Water at: 2012-04-18T13:33:11.766000 28°, 33.978' N ; 088°, 28.246' W Out Water at: 2012-04-18T21:33:47.182000 28°, 34.321' N ; 088°, 27.908' W Off Bottom at: 2012-04-18T20:28:06.225000 28°, 34.078' N ; 088°, 27.800' W On Bottom at: 2012-04-18T14:41:24.740000 28°, 33.968' N ; 088°, 28.308' W Dive duration: 8:0:35 Bottom Time: 5:46:41 Max. depth: 1740.8 m		
Special Notes			
Scientists Involved *(please provide name / location / affiliation / email)*	Jamie Austin (On-board science lead), EX, U. Texas, Austin, jamie@utig.ig.utexas.edu Erin Becker, EX, Penn State, erinbeckr@gmail.com Tom Weber (Flux work science lead), UNH, UNH CCOM, weber@ccom.unh.edu Kevin Jerram, UNH, UNH CCOM, kjerram@gmail.com Andrea Quattrini, Temple, Temple University, tub79176@temple.edu Bob Carney, LSU, LSU, rcarne1@lsu.edu Mike Vecchione, SI, NOAA/SI, VecchioneM@si.edu		

Purpose of the Dive

The two ROV track waypoints listed below represent relatively strong (compared to other known natural seep sites) acoustic indicators of gas in the water column initially observed during EX1102 (Aug/Sep 2011). These seep sites are not co-located with any indicators of hard grounds or near-surface gas in the seismic data we have available to us. There is a reported pipeline in between the two targets, but the distance between the targets and pipeline is considered to be too large (200 m from WP1 and 450 m from WP2) to readily identify the pipeline as the source. Our objective is to identify what the source of the water column gas is.

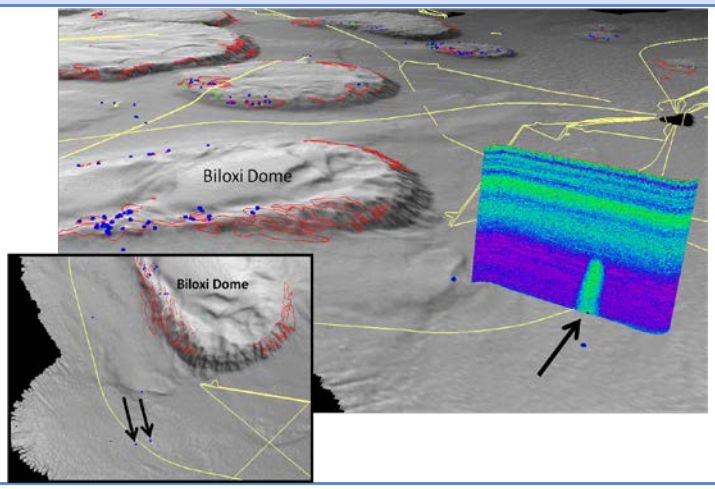
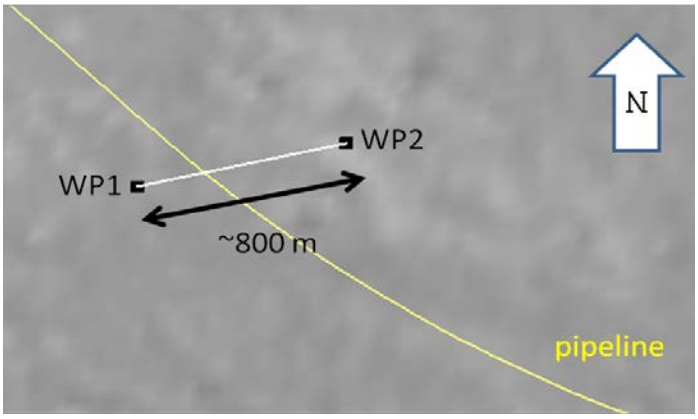
Description of the Dive:

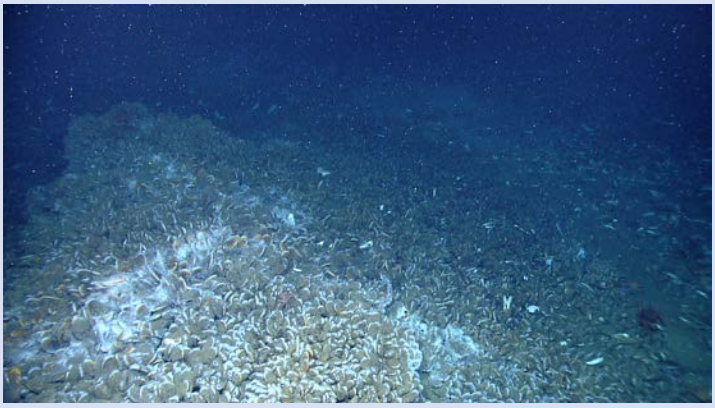
After a routine descent to 1730 m and after stabilizing the vehicles, Little Herc began a side-to-side sweep pattern searching for evidence of gas bubbles escaping the seabed near WP1. Evidence suggesting the presence of methane – mussel shells, carbonate formations, staining - was quickly found. As the vehicle continued to explore the seafloor near WP1, a very large mussel bed was found. There was a large size range of mussels including some clusters of very small individuals, suggesting new recruitment to this area. Mussels were sometimes attached to the sides of carbonates up to a meter off of the seafloor. There were also several clumps of vestimentiferan tubeworms (*Lamellibrachia* and *Escarpia laminata*), and some of the rocks were encrusted with white sponges. Gas bubbles were found escaping the seabed from several discrete locations in a small area (termed Seep 5). Approximately 2-3 minutes of video was collected at the bubble source. On the periphery of the mussel bed, as we began to move toward WP2, we observed many dense aggregations of small-medium sized tubeworm "bushes". A few of the tubeworm aggregations were surrounded by an extremely dense swarm of swimming copepods, and the tubeworm tubes were completely covered in stoloniferans.

There were no signs of seepage or seep-related animals on the transit from WP1 to WP2. We observed usual deep sea fauna including burrowing anemones, fish (halosaur, rattail), shrimp, and crabs (magid and *Chaceon*). The seafloor was relatively featureless with occasional burrows, mounds and furrows, and was relatively devoid of biological activity in comparison with the area near WP1. A known pipeline was traversed midway between waypoints 1 and 2.

After reaching WP1, approximately 800 m to the ENE of WP1, the seafloor rather abruptly began showing evidence of staining and broken shells. A potential bubble seep target was observed in the Seirios scanning sonar, and as the vehicle conducted a search pattern toward this location, observations were made of and extensive bed of living mussels, tube worms, and exposed methane hydrate. A continuous stream of bubbles was found rising from at least seven discrete locations on the seabed contained within a small (~10-20 cm) area of the seafloor, with different rates at each location. Several minutes of video was collected at the bubble source. This site was termed seep 6, and physical marker M29 was dropped approximately 3 m from the source of the bubbles.

The vehicles then made a routine ascent back to the surface, where they were recovered.

Overall Map of ROV Dive Area	Close-up Map of Main Dive Site
	

Representative Photos of the Dive	
	
An aggregation of vestimentiferan tubeworms surrounded by a dense swarm of copepods (tiny swimming crustaceans). The vestimentiferan tubes are covered in stoloniferan anemones.	An extensive mussel bed near WP2.
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