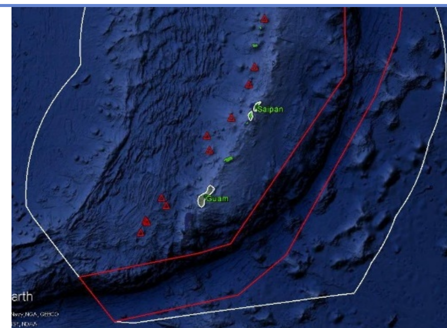
OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Enigma Seamount		
ROV Lead/ Expedition Coordinator	Jim Newman / Kelley Elliott		
Science Team Leads	Deborah Glickson & Diva Amon		
General Area Descriptor	Southern Marianas		
ROV Dive Name	Cruise Season	Leg	Dive Number
	EX1605	1	DIVE 04
Equipment Deployed	ROV:	Deep Discoverer	
	Camera Platform:	Seirios	
ROV Measurements	☒ D2 CTD	☒ Depth	☒ Altitude
	☒ Scanning Sonar	☒ USBL Position	☒ Heading
	☒ Pitch	☒ Roll	☒ HD Camera 1
	☒ HD Camera 2	☒ ROV HD 2	☒ Seirios CTD
	Temperature Probe	☒ D2 DO Sensor	☒ Seirios DO sensor
Equipment Malfunctions	After the dive ended, a mechanical problem occurred with the sheave. For safety reasons, the ROV is being reeled in at ~15% of its typical recovery rate. It will be early the next morning, and then the ROV and deck teams will assess the problem and determine a solution.		
ROV Dive Summary (From processed ROV data)	Dive Summary: EX1605L1_DIVE04 ^^ In Water: 2016-04-23T20:26:18.467000 11°, 24.908' N ; 144°, 46.691' E Out Water: 2016-04-24T18:16:26.489000 11°, 26.529' N ; 144°, 50.604' E Off Bottom: 2016-04-24T02:27:21.166000 11°, 24.750' N ; 144°, 47.062' E On Bottom: 2016-04-23T22:42:57.863000 11°, 25.002' N ; 144°, 46.960' E Dive duration: 21:50:8 Bottom Time: 3:44:23 Max. depth: 3784.1 m		
Special Notes			
Scientists Involved *(please provide name / location / affiliation / email)*	Jeff Drazen, UH; jdrazen@hawaii.edu Scott France, UL Lafayette; france@louisiana.edu Patty Fryer, UH; pfryer@soest.hawaii.edu Santiago Herrera, WHOI; sherrera@alum.mit.edu Taylor Heyl, WHOI; theyl@whoi.edu Mackenzie Gerringer, UH; mgerring@hawaii.edu Chris Kelley, UH; ckelley@hawaii.edu Alexander Kerr, University of Guam; alexander.kerr@aya.yale.edu		

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Purpose of the Dive

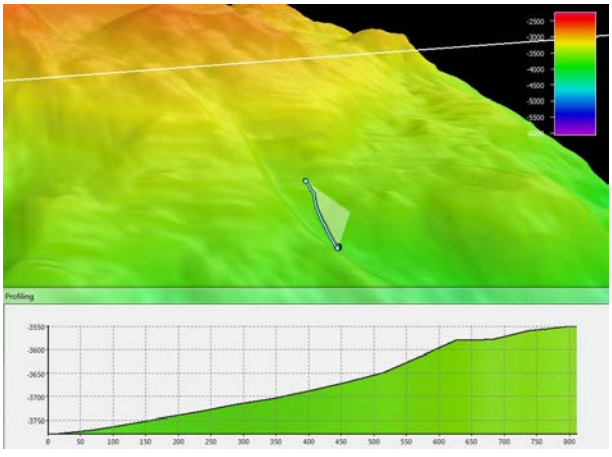
This dive will explore a seamount that may lie on a boundary between the Pacific Plate and a younger tectonic plate. The seamounts aligned along a NNW-SSE trend may denote the plate boundary and this seamount group is currently seismically active. Rock samples collected on this dive could be dated and would help to determine whether in fact the seamounts are younger than the adjacent Jurassic Pacific Plate or not. We plan to begin the dive at WP1 (depth 3778 m), and proceed up slope to the south for 800 m over the steeper slopes that would be more likely to reveal in situ exposures of rock. Ending depth is planned at ~3550 m.

Description of the Dive:

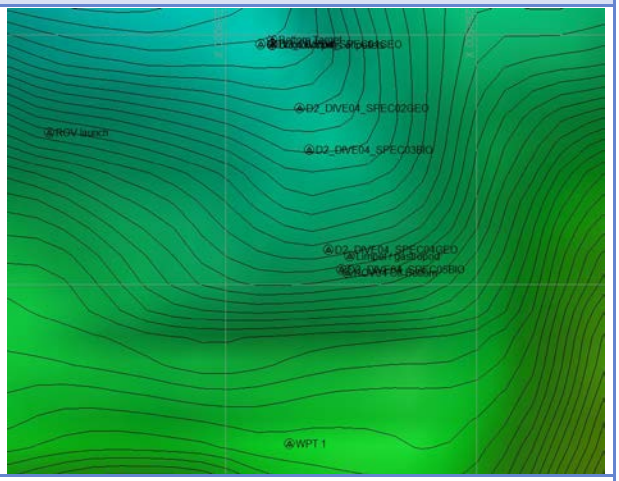
The dive began at 3730 m on the side of the seamount, and moved south for ~900 m to a final target depth of ~3615. The ROV touched down in a sedimented area with some loose rocks, probably of volcanic origin. As we looked for a potential rock sample, we noticed that the area had large concentrations of small, rounded balls of what looked like sediment. We continued to see these balls for at least 1.5 hours before they were tentatively identified as *Gromia sphaerica*, or a close relative. We collected a subangular, Mn-coated rock in this area (D2_DIVE04_SPEC01GEO). As we moved upslope, we found a small outcrop of what we thought were pillow basalts. We sampled a rounded, Mn-crusted, possibly quite altered rock (D2_DIVE04_SPEC02GEO). We continued to move up the center of a small valley, encountering scree slopes, small to medium sized talus that appeared volcanic, and sediment cover that ranged from fine to pebbly. We speculate that in the more pebbly areas, the fine sediments have been swept away by a current. There were also whitish patches of bioturbation within the pebbly sediment. With about an hour left in the dive, we turned and headed out of the valley and toward a ridge feature. This turned out to be several pillow mounds (possibly hornitos) that were at least 10 m high. We collected a subangular, unaltered pillow basalt fragment very close to intact pillows (D2_DIVE04_SPEC04GEO).

The biology observed during this dive was limited, especially within the valley. This was hypothesized to have been because of low currents as suspension feeders (stalked crinoids, *Freyella* brisingids, and primnoid corals) were noted on the outcrops and hornitos. Two primnoids were collected (D2_DIVE04_SPEC03BIO and D2_DIVE04_SPEC05BIO). Several swimming accrocirid polychaetes, as well as a *Bassozetus* ophidiid. Other fauna observed included large Caulophacus sponges, a cladhorizid sponges, Rhopalonematidae, a *Munidopsis* squat lobster, and at least two *Nematocarcinus* shrimp.

Map of ROV Dive Area

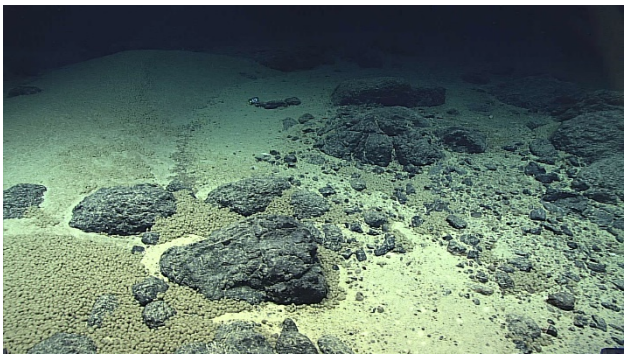


Fledermaus map of planned dive EX1605L1-DIVE04 track.

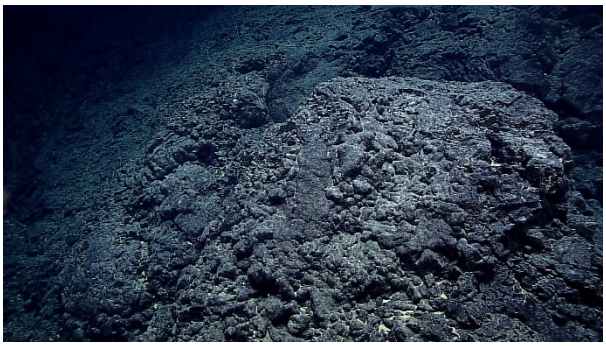


Hypack screengrab of actual dive EX1605L1-DIVE04 track

Representative Photos of the Dive



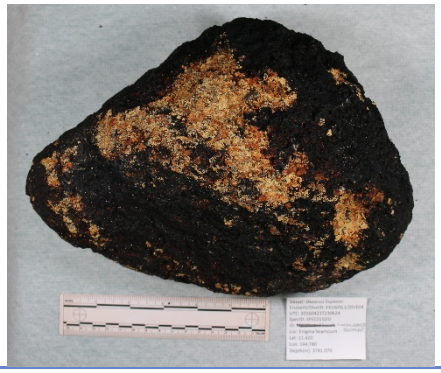
Unknown spheres on the seafloor as well as a can, two of the most definitive objects observed during this dive.



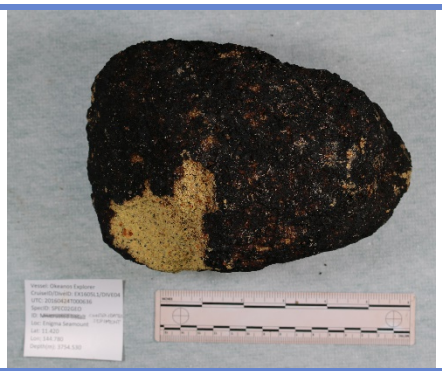
Lightly-sedimented volcanic outcrop encountered during DIVE 06.

Samples Collected

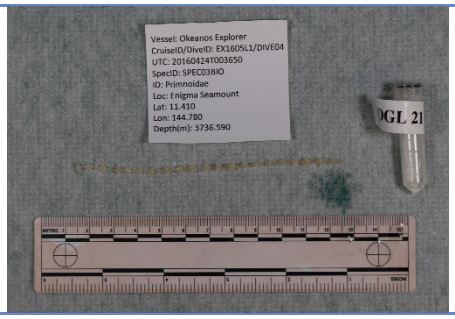
Sample ID	D2_DIVE04_SPEC01GEO
Date (UTC)	20160423
Time (UTC)	23:06:24
Depth (m)	3781
Temperature (ºC)	1.541
Field ID(s)	Clastic sedimentary rock with Mn coating
Comments	No commensals



Sample ID	D2_DIVE04_SPEC02GEO
Date (UTC)	20160424
Time (UTC)	00:06:36
Depth (m)	3754
Temperature (ºC)	1.541
Field ID(s)	Clastic sedimentary rock with Mn coating
Comments	No commensals.



Sample ID	D2_DIVE04_SPEC03BIO
Date (UTC)	20160424
Time (UTC)	00:36:50

Depth (m)	3736	
Temperature (ºC)	1.534	
Field ID(s)	Primnoid coral	
Comments	No commensals.	
Sample ID	D2_DIVE04_SPEC04GEO	
Date (UTC)	20160424	
Time (UTC)	01:39:36	
Depth (m)	3684	
Temperature (ºC)	1.533	
Field ID(s)	Pillow Basalt	
Comments	No commensals.	
Sample ID	D2_DIVE04_SPEC05BIO	
Date (UTC)	20160424	
Time (UTC)	02:16:09	
Depth (m)	3643	
Temperature (ºC)	1.555	
Field ID(s)	Primnoid coral	
Comments	No commensals.	
Please direct inquiries to:	NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10th Floor) Silver Spring, MD 20910 (301) 734-1014	