

OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Stegosaurus Ridge		
ROV Lead/Expedition Coordinator	Jim Newman/ Kasey Cantwell		
Science Team Leads	Shirley Pomponi (HBOI-FAU, CIOERT) Patty Fryer (UH)		
General Area Descriptor	Areas in and around the Marianas Trench Marine National Monument		
ROV Dive Name	Cruise	Leg	Dive Number
	EX1605	3	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 2
Equipment Malfunctions			
ROV Dive Summary (From processed ROV data)	Dive Summary: EX1605L3_DIVE10 AA		
	In Water:	2016-06-26T20:48:36.098000 22°, 07.285' N ; 145°, 08.138' E	
	Out Water:	2016-06-27T04:16:36.308000 22°, 06.796' N ; 145°, 08.574' E	
	Off Bottom:	2016-06-27T02:34:45.345000 22°, 07.447' N ; 145°, 08.215' E	
	On Bottom:	2016-06-26T23:03:35.078000 22°, 07.244' N ; 145°, 08.355' E	
	Dive duration:	7:28:0	
	Bottom Time:	3:31:10	
	Max. depth:	3218.5 m	
Special Notes			
Scientists Involved			

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Purpose of the Dive

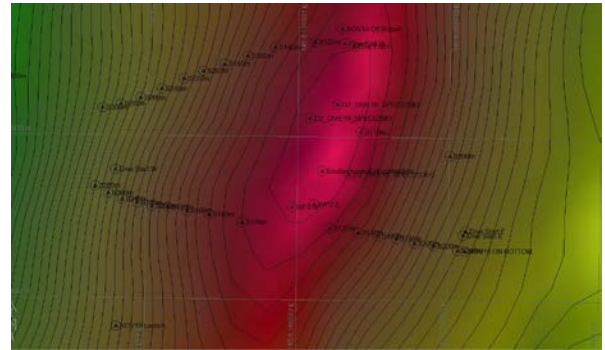
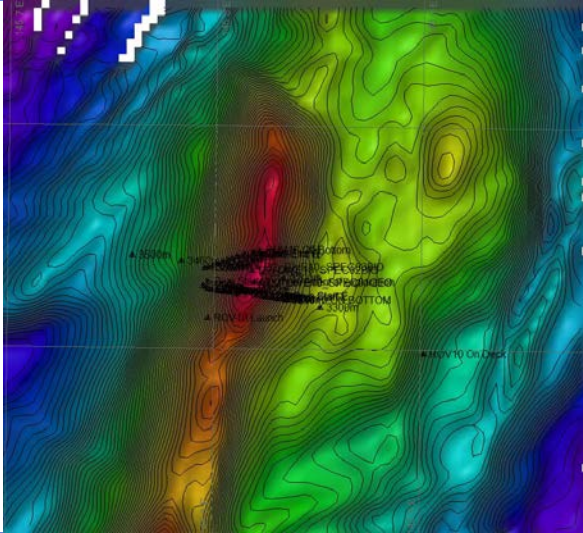
This dive will assess a newly discovered ridge feature that was mapped during EX1605L2. Stegosaurus Ridge lies at the shallow edge of the Mariana Trench, presenting a unique opportunity to explore the geomorphology of the western wall of the trench at shallower depths. Also, this steep feature is likely to be inhabited by deep sea corals and sponges. This is the only feature with similar characteristics to previously studied coral habitats in the vicinity. This feature is fully within the Trench Unit of the monument and represents uncharacterized monument habitat exploration.

Description of the Dive:

After landing on a talus slope, the ROV rose up the eastern ridge and at ~23:00 UTC we began to see vertical or near vertical outcrops of dark fractured rock with both vertical and horizontal fractures and a rough blocky surface. By 23:35 UTC it became clear that the rock face of the wall of the ridge was of a layered accumulation of sediment. At 23:36:42 UTC we crossed a contact between dark (below) and light (above), layered sediment and at 23:38:38 UTC the bedding observed was contorted in some of the light layers, but generally it can be seen dipping to the east at about 15° (measured off the video image with a protractor). The contorted bedding in the light sediment in this area is reminiscent of turbidite flow channeling. Above this lighter layer the rock is again dark and coarser grained. A zoom close on a white squat lobster showed pebble-sized volcanoclastic fragments that were sub-rounded. At the top of the ridge, for most of its length, the seafloor is covered with mostly fine to coarse sediment and pebble-sized surrounded rock fragments, with occasional, somewhat flattened cobbles or large boulders. Interestingly, some rocks have a dark (MnO coating), whereas some do not (?). Near the northern part of the traverse the sediment layers were outcropping in 0.5- to 1.0-m-sized steps that also looked to be dipping to the right down-slope (eastward).

The slope was surprisingly sparse in sponges and octocorals, however, hydroids, stalked barnacles, and representatives of each class of echinoderms were present. One of the more interesting was the “mudstar”, whose tube feet have points instead of suckers to help them dig into the sediment. Several individuals of the hexactinellid sponge, *Semperella* sp., were observed and one specimen was collected (SPEC02BIO). These individuals were definitely a new record of occurrence and possibly a new species. At the top of the ridge were many carnivorous (cladorhizid) demosponges—at least 3 different species. SPEC03BIO, a loose rock with at least 2 of the species, as well as a second hexactinellid sponge, and even an amphipod tube was collected at 3089 m. The biggest surprise was a baby bamboo coral at the top of the ridge. It was still too young to see the characteristic segmented “stalk”, but the video was sharp enough for us to see sclerites in the tissue of the 4 small polyps.

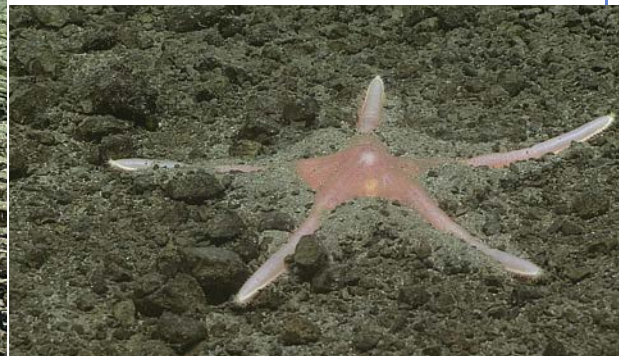
Overall Map of ROV Dive Area**Close-up Map of Main Dive Site**



Representative Photos of the Dive



A typical rock sequence shows a thick layer of sediments at lower left, below a well-defined set of thinner sediment layers in the center of the image (dipping eastward, to the right), and a sequence of much thinner and contorted beds in the upper sequence in the field of view.



The mudstar has points on its tube feet to help it dig into the sediment and bury itself.

Samples Collected

Sample ID	SPEC01GEO
Date (UTC)	20160627
Time (UTC)	000412
Depth (m)	3097.17
Temperature (°C)	1.53
Field ID(s)	ROCK SED; VITRIC SILTSTONE



Comments	Larger piece 17x9x8.5cm, small 6x4x3cm. Vitric siltstone. Came from immediately below layered outcrop.	
Sample ID	SPEC02BIO	
Date (UTC)	20160627	
Time (UTC)	013005	
Depth (m)	3091.08	
Temperature (°C)	1.52	
Field ID(s)	HEXACTINELLIDA; SEMPERELLA SP.	
Comments		
Sample ID	SPEC03BIO	
Date (UTC)	20160627	
Time (UTC)	015606	
Depth (m)	3089.66	
Temperature (°C)	1.53	
Field ID(s)	CLADORHIZID SPONGE ON ROCK WITH OTHER COMMENSALS	
Comments		
Sample ID	Vitric siltstone	
Date (UTC)	20160627	
Time (UTC)	015606	
Depth (m)	3089.66	
Temperature (°C)	1.53	
Field ID(s)	Vitric siltstone	
Comments	14x14x13cm, from top of ridge, from SPEC03BIO	
Please direct inquiries to:		NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10 th Floor) Silver Spring, MD 20910 (301) 734-1014