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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**

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	
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