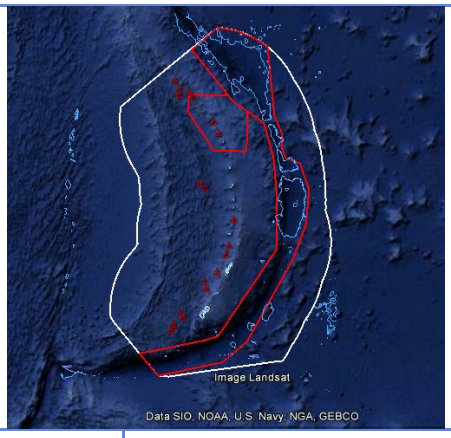
OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Vogt Guyot		
ROV Lead/Expedition Coordinators	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	DIVE19
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)			
Special Notes			

Scientists Involved *(please provide name / location / affiliation / email)*		
Diva Amon	University of Hawaii	divaamon@hawaii.edu
Robert Carney	Louisiana State Univ	rcarne1@lsu.edu
Mike Ford	NOAA Fisheries	michael.ford@noaa.gov
Scott France	University of Louisiana at Lafayette	france@louisiana.edu
Patricia Fryer	Univ. Hawai'i at Mānoa (UHM)	pfryer@hawaii.edu
Deborah Glickson	FAU-Harbor Branch Oceanographic Institute	dglickson@fau.edu
Tara Harmer Luke	Stockton University	luket@stockton.edu
Chris Kelley	University of Hawaii Manoa	ckelley@hawaii.edu
Asako Matsumoto	Chiba Institute of Technology (Chitech)	amatsu@gorgonian.jp

Allison Miller	National Park Service	a33miller@gmail.com
Tina Molodtsova	P.P.Shirshov Institute of Oceanology RAS	tina@ocean.ru, tina.molodtsova@gmail.com
Shirley Pomponi	FAU	spomponi@fau.edu
Gene Rankey	University of Kansas	grankey@ku.edu
Kenneth Sulak	USGS	ksulak@usgs.gov
Les Watling	University of Hawaii at Manoa	watling@hawaii.edu
Matt Dornback	NCEI	matt.dornback@noaa.gov
Charlie Wilkins	OMAO	charles.e.wilkins@noaa.gov
Jason Meyer	Meyer Hydrographic	jason7seas@gmail.com
Derek Sowers	OER	derek.sowers@noaa.gov
Nolan Barrett	College of Charleston/ HBOI	barrettnh@g.cofc.edu

Purpose of the Dive

This dive investigated a rift zone ridge extending west from Vogt Guyot, a Cretaceous seamount to the east of the Trench Unit of the monument. The dive addresses two of the CAPSTONE priorities and has objectives that include exploring for high density communities of deep-sea corals and sponges and doing an initial characterization of Mn-crust habitats on one of the presumed oldest seamounts on the Pacific plate. West Pacific guyots will be the first type of terrain mined for Mn-crusts and there is already a mining lease that has been issued by the International Seabed Authority (ISA) for the nearby Magellan Seamounts located just outside of the US EEZ.

Description of the Dive:

ROV *Deep Discoverer* (D2) landed on a surface with a thin sediment cover, and with large lumps of rounded blocks/boulders typically covered with a heavy MnO crust as on the upper flank of other guyots in the western Pacific. Unlike the flank of Fryer Guyot that we dove on two days ago, this surface was more highly populated with benthic animals (see below). The manganese coating was ubiquitous although there were some large boulders, unattached to the lumpy surface, that were heavily populated with sponges, corals, and crinoids along the track. The surface of the MnO coating was not as botryoidal as we have seen elsewhere, however.

As D2 rose up the slope, there were sediment patches that were covered with small MnO nodules. The sizes of “lumps” of manganese were variable along the track and the larger ones were suggestive of piles of talus beneath the MnO coating. D2 crossed over a couple of small vertical steps (~ 1.5 m high) nearer the edge of the wall and as we angled across slope toward the edge of the steep wall, we saw numerous fractures in the seafloor that paralleled the strike of the slope.

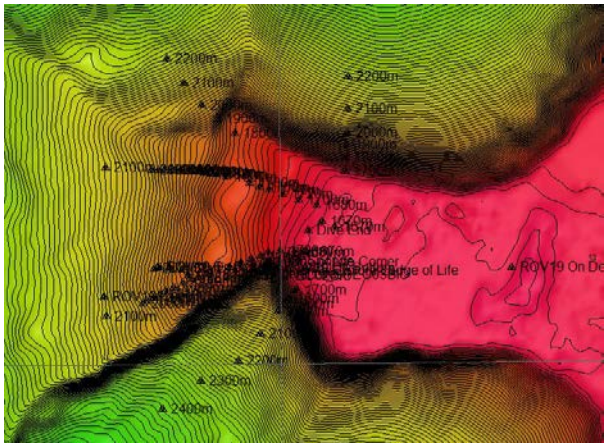
At the edge of the slope the bottom dropped away precipitously and we saw several places where the wall was vertical to overhanging. A few thick MnO ledges projected out over the edge of the wall and in a few places we could see "fresh" exposures of the sequences underneath the MnO coating. These patches of outcrop that were *in situ* were light color, suggestive of reef material, as we might have expected on the edge of the guyot summit. However, even very close zooms were not diagnostic of any fossil shapes preserved in the wall. Toward the end point of the dive we saw a few fractures roughly perpendicular to the wall, and some had caused separations of a meter or more between blocks of the wall itself. This area provided a variety of surfaces for a rich diversity of fauna to take hold and flourish.

This dive was planned to document the biodiversity at a site that might be a target for deep sea mining activities, and wow—were we amazed with the abundance and diversity of both corals and sponges. We’ll have to review the video to get estimates of the numbers. Corals included several different (and new) species of primnoids, isidids, chryosogorgiids, plexaurids, coralliids,

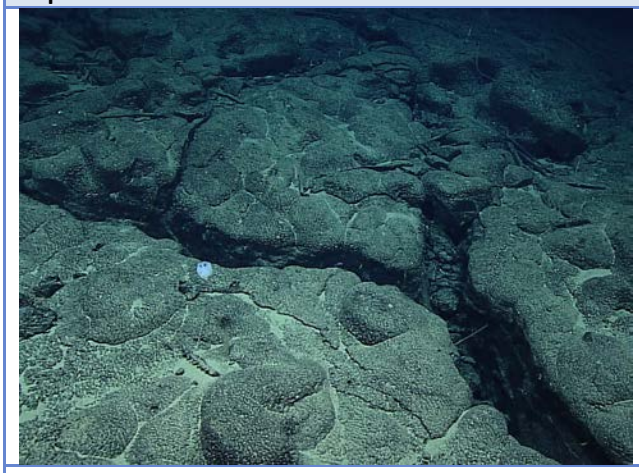
and antipatharians, as well as cup corals, zoanthids, and hydrozoans. Sponges were dominated by several species of hexactinellids (pheronematids, *Tretopleura*, euplectellids). As we observed on previous dives, there was an abundance of Mn-encrusted stalks of dead sponges. Based on the abundance of *Walteria* cf. *leuckarti* at this site, it is possible that these stalks are the remains of that species.

As D2 got closer to the edge, the density of organisms increased even more, as did the composition of the fauna. It seems as though the corals living on the edge of the ridge are much better able to survive in the stronger currents. And were we amazed at the SIZE of both the corals and sponges! There were gigantic bamboo corals (possibly *Eknomisis* n. sp. and the relatively smaller ?*Isidella* n. sp.) as well as 1- to 2 m diameter *Poliopogon* sponges (also new species).

Although we did not observe many fish, we got some good close-up imagery of diagnostic morphological features of the slick head (family Alepocephalidae), along with its parasitic isopods.

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

Representative Photos of the Dive

	
The manganese oxide coating on the sea floor gave the bottom a “softened” look as though a blanket had been thrown over the surface, but here, near a nearly vertical drop-off, there were fractures about a meter wide. These broken blocks will eventually fall off the edge of the wall to join talus blocks at the base of the steep drop.	Giant bamboo corals (Eknomisis sp.) are living on the edge of the guyot. They may have adapted to survival in the strong currents by reinforcing their stalks.

Samples Collected		
Sample ID	SPEC01GEO	
Date (UTC)	20160705	
Time (UTC)	213733	
Depth (m)	1943.77	
Temperature (°C)	2.26	
Field ID(s)	ROCK (POSSIBLY WITH DEAD SPOHEX STALK)	
Comments		
Sample ID	SPEC02BIO	
Date (UTC)	20160705	
Time (UTC)	231358	
Depth (m)	1859.25	
Temperature (°C)	2.29	
Field ID(s)	HEXACTINELLIDA; ?EUPLECTELLIDAE	
Comments	Possible new species	
Sample ID	SPEC03BIO	
Date (UTC)	20160706	
Time (UTC)	013752	
Depth (m)	1765.53	
Temperature (°C)	2.26	
Field ID(s)	HEMICORALLIUM W/ENCRUSTING OCTOCORAL	
Comments	A corallium with an encrusting commensal (?Zoanthid) moving up the branches.	

Please direct inquiries to:	NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10th Floor) Silver Spring, MD 20910 (301) 734-1014