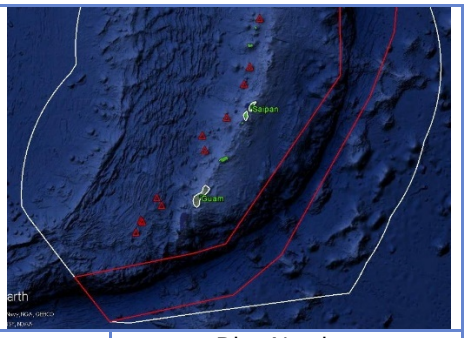
OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Kunanaf Hulo Seamount (Mud Volcano)		
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 13
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			
ROV Dive Summary (From processed ROV data)	Dive Summary: EX1605L1_DIVE13 In Water: 2016-05-03T20:23:31.228000 16°, 01.772' N ; 147°, 06.990' E Out Water: 2016-05-04T04:44:14.540000 16°, 02.139' N ; 147°, 07.351' E Off Bottom: 2016-05-04T02:36:45.308000 16°, 01.824' N ; 147°, 06.711' E On Bottom: 2016-05-03T22:35:37.558000 16°, 01.652' N ; 147°, 06.886' E Dive duration: 8:20:43 Bottom Time: 4:1:7 Max. depth: 3703.7 m		
Special Notes			
Scientists Involved *(please provide name / location / affiliation / email)*	Scott France, UL Lafayette; france@louisiana.edu Patty Fryer, UH; pfryer@soest.hawaii.edu Mackenzie Gerringer, UH; mgerring@hawaii.edu Tara Harmer Luke, Stockton University; Tara.Luke@stockton.edu Julie Huber, MBL; jhuber@mbl.edu Chris Kelley, UH; ckelley@hawaii.edu Jonathan Kellogg, U Victoria; jkellogg@uvic.ca Machel Malay, U Guam; machel.malay@gmail.com Asako Matsumoto, Chiba Institute of Technology; amatsu@gorgonian.jp		

Tina Molodtsova, Shirshov Institute of Oceanology; tina@ocean.ru
Bruce Mundy, NOAA PIFSC; bruce.mundy@noaa.gov
Shirley Pomponi, FAU/HBOI; spomponi@fau.edu
Robert Stern, UT Dallas; rjstern@utdallas.edu
Andrea Quattrini, Harvey Mudd College; aquattrini@g.hmc.edu
Daniel Wagner, NOAA PMNM; Daniel.Wagner@noaa.gov
Les Watling, UH; watling@hawaii.edu

Purpose of the Dive

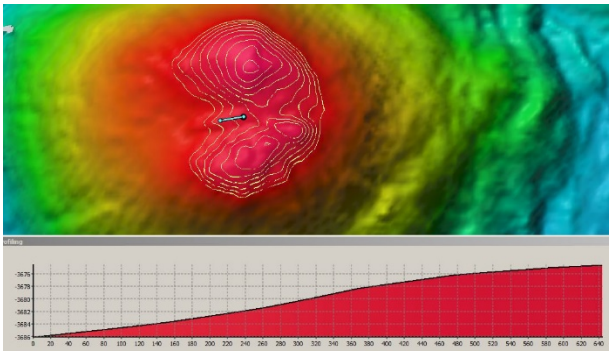
The edifice is very similar in morphology to other serpentinite mud volcanoes on the Mariana Forearc. It had never been dived on, and lies farther from the trench axis (thus a proxy for greater depth to the top of the subducting Pacific Plate) than nearby mud volcanoes that had been sampled. Active springs on these seamounts are known to have chimneys of carbonate and/or brucite. The morphology of chimney structures and their composition changes with distance from the trench at the springs. There are benthic animals at active springs and the sidescan show high backscatter that indicates a rough seafloor. Obtaining subbottom profiles would be very useful for determining if there are thick or thin mudflows on the summit area of this edifice. Usually there are thinner flows near active springs, but some mudflows appear to be voluminous and cover up to a half of the edifice flank. The dive track was planned to begin at 3685 m and to move along the crest for 650 m to a depth of 3675 m.

Description of the Dive:

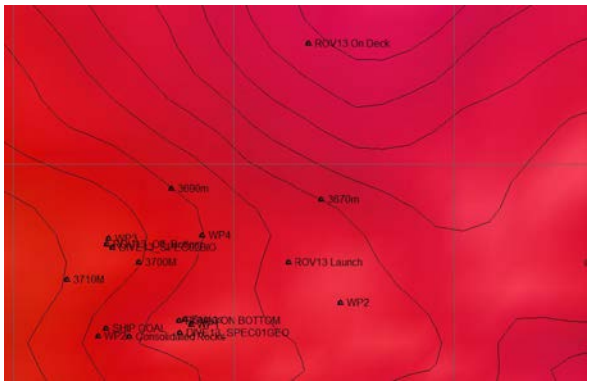
This dive began at a depth of 3662 m near a ridge at the summit of the Kunanaf Hulo mud volcano. This was fairly heavily sedimented area with small areas of rocks, none of which were in situ. Most rocks appeared to have a Mn crust. We picked up a small Mn-crusted rock in this area (D2_DIVE13_SPEC01GEO). As we moved, we saw more indurated platy sediment and some rocks. We saw also small Mn nodules in areas with less sediment. After traversing to the west along our WP line, we then traversed north for 300 m and then headed east. The entire dive had very little relief or slope. We also did not encounter any seeps or venting.

Most of the biology encountered on this dive was what is commonly seen on sedimented abyssal plains and was similar to that seen at these depths elsewhere in the Pacific Ocean. There was a high abundance of lebensspuren, indicating that there are many sediment-dwelling fauna, although few were actually seen. One of the dominant fauna observed was a *Caulophacus* sp. with a *Relicanthus* living commensally on the stalk. Other interesting fauna observed included *Ipnops meadi*, enteropneusts, benthic ctenophores, and a parapagurid hermit crab with commensal actinarian. One biology sample was collected: one of the *Caulophacus* sp. which had a root structure likely acting as an anchor for this individual in the sediment (rather than the more conventional attachment base to hard substrate).

Map of ROV Dive Area

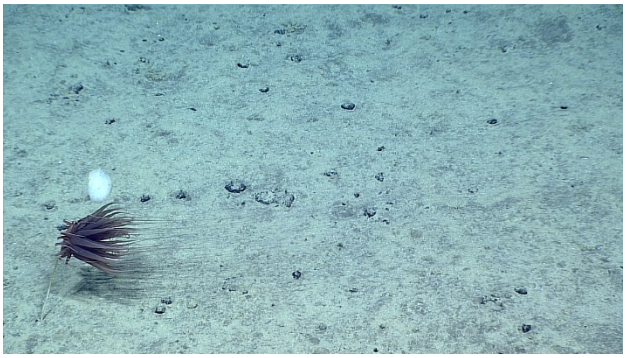


Fledermaus map of planned dive EX1605L1-DIVE13 track.



Hypack screengrab of actual dive EX1605L1-DIVE13 track.

Representative Photos of the Dive



Most of Dive 13 was on a sedimented seafloor with patchy outcrops. Here, a *Relicanthus* sp. is seen on a *Caulophacus* sp.

An enteropneust observed during Dive 13.

Samples Collected

Sample ID	D2_DIVE13_SPEC01GEO
Date (UTC)	20160503
Time (UTC)	23:14:07
Depth (m)	3677.3
Temperature (ºC)	1.504
Field ID(s)	Mn-crusted rock
Comments	One commensal juvenile crinoid (D2_DIVE13_SPEC01BIOCO1)

Sample ID	D2_DIVE13_SPEC02BIO
Date (UTC)	20160504
Time (UTC)	02:22:36
Depth (m)	3701.0
Temperature (ºC)	1.483
Field ID(s)	*Caulophacus* sp.
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