# OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Ahyi Seamount		
ROV Lead/Expeditio n 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		Image Landsat Data SIO NOAA, U.S. Navy, NGA, GEBCO
ROV Dive	Cruise	Leg	Dive Number
Name	EX1605	3	DIVE05
Equipment	ROV: Deep Discoverer		Deep Discoverer
Deployed	Camera Platform: Seirios		
	∑ CTD	Depth	Altitude
ROV	Scanning Sonar	USBL Position	
Measurements	☑ Pitch     ☑ HD Camera 2	Roll  Low Res Cam 1	<ul><li>✓ HD Camera 1</li><li>✓ Low Res Cam 2</li></ul>
	Low Res Cam 3	Low Res Cam 4	Low Res Cam 2
Equipment Malfunctions			
Dive Summary:		605L3_DIVE05	
	^^^^^^^^		
		.6-06-21T21:29:18.749000 , 25.927' N ; 145°, 01.671'	
ROV Dive		.6-06-22T05:33:13.815000 , 26.059' N ; 145°, 01.871'	
Summary (From processed ROV		2016-06-22T05:13:32.629000 20°, 26.097' N; 145°, 01.913' E	
data)		2016-06-21T22:18:58.736000 20°, 25.906' N; 145°, 01.673' E	
	Dive duration: 8:3	ion: 8:3:55	
	Bottom Time: 6:54:33		
	Max. depth: 363	3.4 m	
Special Notes			
Scientists Involved	Name	Institution	Email

(please provide
name / location /
affiliation / email)

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#### **Purpose of the Dive**

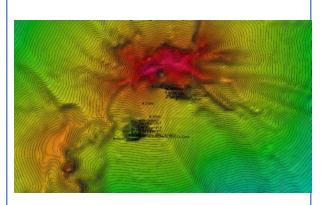
Ahyi Seamount is a part of the Vents Unit and is within the area of the Islands Unit of the Mariana Trench Marine National Monument. No ROV dives have ever been made here that we know of. Ahyi was originally mapped with multibeam sonar during NOAA-OER supported cruises in 2003 and 2004. Ahyi erupted for about 3 weeks in April-May 2014 creating underwater explosions that were heard by NOAA coral reef divers working at the adjacent island of Farallon de Pajaros and the explosions were detected remotely by USGS seismometers on other Mariana Islands. During subsequent OER-supported expeditions in the area in May 2014 (Hi'ialakai) and December 2014 (Revelle), remapping of Ahyi Seamount with multibeam sonar showed major depth changes (>100 m) at the summit where two new craters formed, and on the south flank where a major landslide occurred. The goals of the dive were to explore the new craters near the summit, sample any new erupted lava, and assess the impacts of the eruption on the local marine ecosystem.

#### **Description of the Dive:**

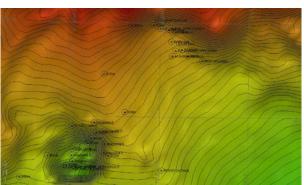
As expected, the descent for this dive was marked by cloudy water on most of the way to the bottom. We had hoped to see an area of recent eruption. The depth was shallower than anticipated as there was no crater in the area. Instead, the ROV landed on a slope covered with fine- to medium-sized volcaniclastics (fragments of volcanic rock) with larger rocks scattered about the slope. We recovered one of the larger rocks that turned out to be a black and rough-surfaced piece of lava. We had the ROV leave the bottom to transit toward the base of a scarp near the summit of the seamount. The volcaniclastics where the ROV landed were larger fragments than before. They rested against a steep rock wall of columnar igneous rock (huge through-going cracks formed as hot lava cools and shrinks). One area of the cliff was covered with small (~5 to 10 mm) barnacles and a sample of this rock was collected in order to recover some of the barnacles. The rock itself was a block of dark gray lava. We moved the ROV back to the slope of volcaniclastics to follow it up slope and soon we encountered patches of a white surface coating, likely bacterial, as it was filamentous on close inspection. It eventually nearly completely covered the sea floor like a dusting of snow. Farther up the slope, the white surface coating turned to yellow that persisted to the top of the slope. At the top, however, on a sharp break in slope, the nearly horizontal seafloor was covered again with the white coating. We recovered a piece of volcanic rock in the white area that turned out to be yellowbrown on the exposed surface and medium-gray (with a glassy groundmass) on the side under the surface. It had a strong sulfur smell. We turned the ROV eastward to the bounding wall and again encountered massive igneous rock. As we traversed the wall its character changed dramatically from smooth, massive rock, to jointed rock, to cemented rubble, to an area covered with a fine layer of ash, and back to jointed rock again.

Although we initially thought that there was a paucity of fauna at this site, we found not only the "usual" inhabitants (e.g., brittlestars, squat lobsters, a few crinoids, urchins, etc.), but also some very unusual invertebrates and behaviors. We observed an octopus, numerous squat lobsters (which the octopus was probably eating), and unusual snails (?Oenopota sp.) grazing on the bottom covered by white and yellow bacterial mats. We were unable to identify 2 crustaceans (crab? squat lobster?) burying themselves in the rubble. Siphonostome copepods were living in bacterial filaments on the rocks, and upon closer inspection, were found to be on the adjacent seafloor. Several individuals of a benthic platyctenid ctenophore, a weird Aliciidae anemone with yellow nematocyst batteries, and a type of sea slug (Pleurobranchidae) stimulated a lively chatroom discussion. In some of the crevices of the outcrops were aggregations of the shrimp *Plesionika cf. edwardsii*. There were numerous limpets on the rock outcrops. In general, the environment could be characterized as unstable; most of the animals we observed were mobile. There was some discussion about how long the attached fauna (e.g., the rare black coral and primnoid octocoral) had been there, and if they had survived the volcanic eruption in 2014. The fish fauna was equally exciting. These included several scorpionfish, as well as deepwater cardinalfish, oblique-banded snapper, soldierfish, and epigonids. Some of the more unusual fish were a cusk eel, duckbill, flatfish, and a snake mackerel (*Rexea*)— a new record of occurrence in the Marianas.

### **Overall Map of ROV Dive Area**



### **Close-up Map of Main Dive Site**



## **Representative Photos of the Dive**





Striking columnar jointing appeared on what is likely a dike up which we were traversing for much of the dive track.

This octopus moved along the bottom, in search of squat lobsters and other prey.

# Samples Collected

Sample ID	SPEC01GEO
Date (UTC)	20160621
Time (UTC)	224107
Depth (m)	360.14
Temperature (°C)	14.92
Field ID(s)	Clinkery Lava Block
	20.5x15x11



## Comments

Sample ID	SPEC02BIO
Date (UTC)	20160622
Time (UTC)	013121
Depth (m)	288.41
Temperature (°C)	16.71
Field ID(s)	Limpets



## 14 recovered from rock

## Comments

Sample ID	SPEC03GEO	
Date (UTC)	20160622	
Time (UTC)	022812	
Depth (m)	259.14	
Temperature (°C)	16.93	
Field ID(s)	Massive block of lava	The state of the s
Comments	27x18x12, Smells of su	alfur. No samples of filament were recovered.
Commis ID	SPEC04GEO	
Sample ID	20160622	
Date (UTC)		
Time (UTC)	013121	
Depth (m)	288.41	
Temperature (°C)	16.71	
Field ID(s)	Rock	
Comments	12x6x5, rock recovered with SPEC02BIO	
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