

OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Unnamed Seamount 2 (Shark Tooth Bank)		
ROV Lead/Expedition Coordinator	Karl Mcletchie/ Brian RC Kennedy		
Science Team Leads	Daniel Wagner and Jonathan Tree		
General Area Descriptor	US EEZ south of Papahānaumokuākea Marine National Monument		
ROV Dive Name	Cruise Season	Leg	Dive Number
	EX1603	1	DIVE06
Equipment Deployed	ROV:	Deep Discoverer	
	Camera Platform:	Seirios	
ROV Measurements	<input checked="" type="checkbox"/> D2 CTD	<input checked="" type="checkbox"/> Depth	<input checked="" type="checkbox"/> Altitude
	<input checked="" type="checkbox"/> Scanning Sonar	<input checked="" type="checkbox"/> USBL Position	<input checked="" type="checkbox"/> Heading
	<input checked="" type="checkbox"/> Pitch	<input checked="" type="checkbox"/> Roll	<input checked="" type="checkbox"/> HD Camera 1
	<input checked="" type="checkbox"/> HD Camera 2	<input checked="" type="checkbox"/> ROV HD 2	<input checked="" type="checkbox"/> Seirios CTD
	Temperature Probe	<input checked="" type="checkbox"/> D2 DO Sensor	<input checked="" type="checkbox"/> Seirios DO sensor
Equipment Malfunctions	The Seirios CTD data had some erroneous spikes in the data.		
ROV Dive Summary (From processed ROV data)	Dive Summary: EX1603_DIVE06		
	~~~~~		
	In Water:	2016-03-09T18:33:42.018000 26°, 59.345' N ; 176°, 50.738' W	
	Out Water:	2016-03-10T04:35:34.791000 27°, 00.116' N ; 176°, 50.278' W	
	Off Bottom:	2016-03-10T04:13:08.321000 27°, 00.118' N ; 176°, 50.282' W	
	On Bottom:	2016-03-09T19:28:25.445000 26°, 59.553' N ; 176°, 50.743' W	
	Dive duration:	10:1:52	
	Bottom Time:	8:44:42	
Max. depth:	1294.0 m		
<b>Special Notes</b>			
<b>Scientists Involved (please provide name / location / affiliation / email)</b>	<b>Name</b>	<b>Affiliation</b>	<b>Email Address</b>
	Diva Amon	University of Hawaii	divaamon@hawaii.edu
	Amy Baco-Taylor	Florida State university	abacotaylor@fsu.edu
	Brian Boston	University of Hawaii	bboston@hawaii.edu
	Mundy Bruce	NOAA NMFS PIFSC	bruce.mundy@noaa.gov

Scott France	University of Louisiana at Lafayette	france@louisiana.edu
Deborah Glickson	FAU-HBOI	dglickson@fau.edu
Santiago Herrera	U Toronto; WHOI	sherrera@alum.mit.edu
Chris Kelley	University of Hawaii	ckelley@hawaii.edu
Spencer King	Nauticos LLC	spencerking@tampabay.rr.com
Christopher Mah	National Museum of Natural History (Smithsonian)	brisinga@gmail.com
Asako Matsumoto	Chiba Institute of Technology	amatsu@gorgonian.jp
Tina Molodtsova	P.P. Shirshov Institute of Oceanology RAS	tina@ocean.ru; tina.molodtsova@gmail.com
Andrea Quattrini	Harvey Mudd College	aquattrini@g.hmc.edu
Randy Singer	Florida Museum of Natural History	rsinger@flmnh.ufl.edu
Jonathan Tree	University of Hawaii Geology and Geophysics Department	jtree@hawaii.edu
Michael Vecchione	NMFS Systematics Lab	vecchiom@si.edu
Daniel Wagner	NOAA PMNM	daniel.wagner@noaa.gov
Les Watling	University of Hawaii	watling@hawaii.edu
Mary Wicksten	TexasA&M University	Wicksten@bio.tamu.edu
Katharine Woodard	NOAA/NCEI	katharine.woodard@noaa.gov

**Purpose of the Dive**

This dive was located on the top portion of an unnamed seamount west of Salmon Bank. The seamount was mapped for the first time during this expedition and had never been previously surveyed. Therefore, its geological age and fauna was completely unknown. The objectives of this dive were to (1) collect rock samples that could be used to determine the geological age of the seamount, and (2) survey biological communities over a large depth gradient that transversed the oxygen minimum layer (~800-1000 m). The target start point of the dive was on the crest of a ridge that extends to the south of the seamount at a depth of 1261 m. The plan was for the ROV to move north along the crest of the ridge until a depth of 701 m. At this point, the ROV would move west along the top of the seamount until reaching a final target depth of 669 m.

**Description of the Dive:**

The ROV landed on a steep slope next to the ridge at 1290 m. The substrate consisted of a botryoidal Mn-encrusted surface with scattered cobbles and rock ledges. There was a light layer of sediment and the dissolved oxygen concentration was 1.5 mg/L. Few animals were observed close to the landing site and included an eel, a halosaurid, sponges and corals. At 1291 m, the ROV collected a geological sample, which was angular, dense and lightly crusted with manganese. Based on the volume to weight of the sample, the volcanic core is most likely nonvesicular. As the ROV began its traverse up the ridgeline, the source outcrop for this loose sample was observed as a highly angular Mn-encrusted volcanic ledge. The density of animals increased significantly along the ridge and consisted mainly of primnoid corals, with some chrysogorgid corals in between. The density of animals was consistently moderate, with some portions of high density. Throughout the ascent along the ridge, the dissolved oxygen concentration continued to drop, reaching a concentration of <1.0 mg/L at ~900 m. During this portion of the dive, the substrate was composed of Mn-encrusted volcanic talus and rubble with interspersed, fully cemented manganese hardpan and botryoidal Mn-coating on larger rock features. Throughout this portion, the community changed from one dominated by primnoid corals to one dominated by moderate to high densities of chrysogorgid corals, particularly *Metallogorgia melanochristos*, as well as *Saccocalyx* sponges. At a depth of 1156 m, intact pillow lavas were observed along with a narrow and very elongated, pillow tumulus. Near the top of the ridge, the substrate changed to Mn-encrusted volcanics and pockets of heavy sediment composed of fine grained pelagic detritus and coral skeletons that appeared to be *Enallopsammia rostrata* and other scleractinian species. In these patches, there were clear ripples oriented parallel to the ridgeline. Higher velocity currents were also noted at this locality, close to which a sample of an unidentified bamboo coral was collected at 842 m. Shortly thereafter, the substrate changed to a blanketed unconsolidated sediment of pelagic detritus and fragments of scleractinian coral skeletons. The substrate was mostly void of animals with the exception of few anemones, seapens and fishes. As the ROV turned along the summit ridge and began to head E along the ridge, low relief lithified reef carbonates protruded from the sediments. These carbonates began to become more exposed further along the ridge and were hypothesized to be fossilized paleo-reef deposits. In some patches, there were very dense aggregations of *Novodinia* seastars and rockpens. The ROV collected an echinothurid urchin at 686 m in one of these patches. At a depth of 655 m, the substrate changed to volcanics, possibly indicating that the carbonates and sediments were a veneer atop of the volcanic edifice. The ROV left the bottom at 649 m after a total bottom time of 8:52 hrs. Over the course of the dive, the ROV covered a large depth range (~650 m) and transversed the oxygen minimum layer. The density of animals did not decrease in this layer, but rather changed from one dominated by primnoid corals to one dominated by chrysogorgid corals and tall *Saccocalyx* sponges.

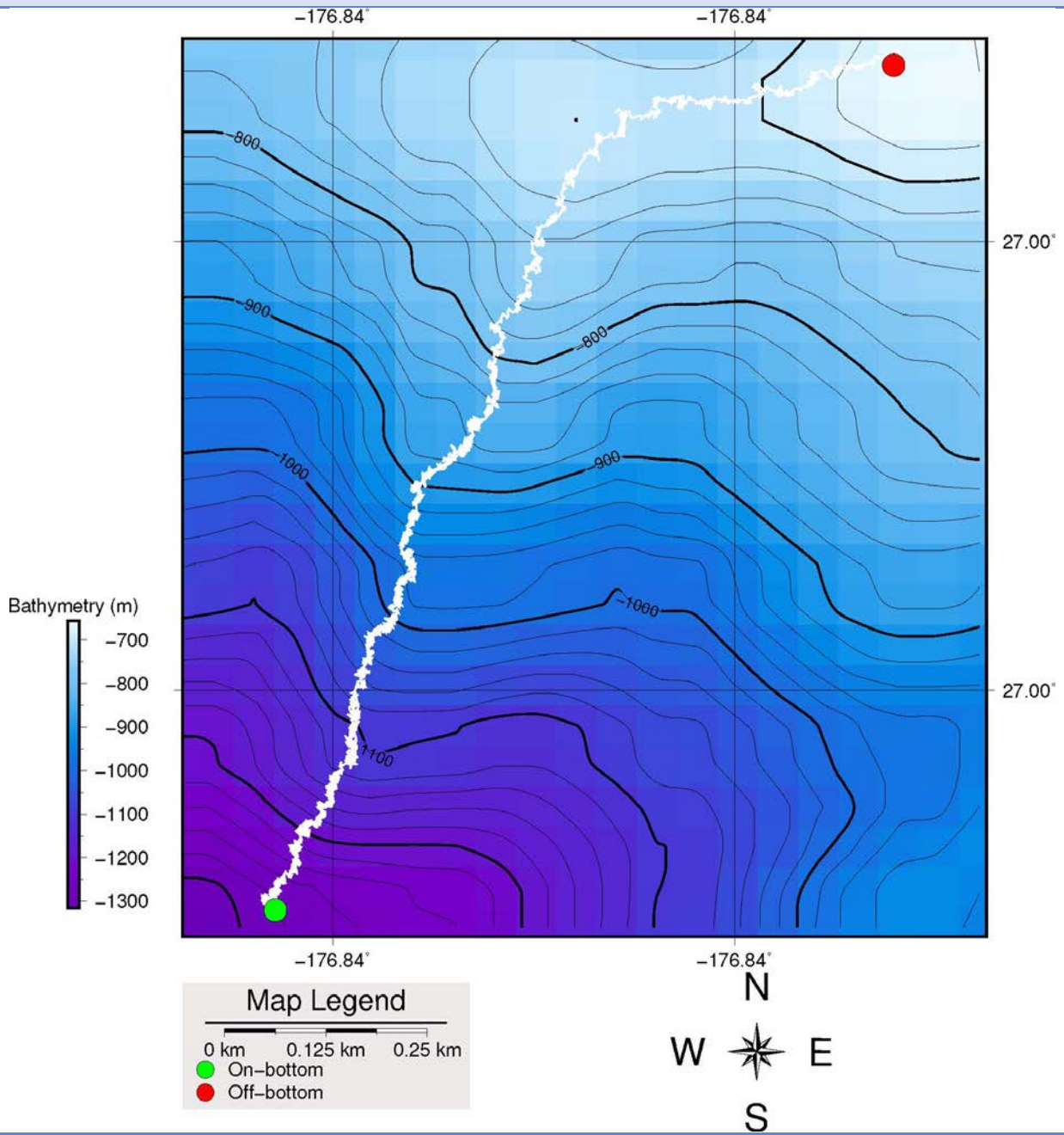
### Animals observed during dive

Phylum	Group	Species
Anellida	Polychaetes	Polynoid
Arthropod	Crab	Cyrtomania smithi
Arthropod	Crab	Unidentified crab
Arthropods	Barnacles	Scalpellidae
Arthropods	Shrimp	Acantephyra eximia
Arthropods	Shrimp	Aristeidae

Arthropods	Shrimp	Bathypalaemonella sp.
Arthropods	Shrimp	Heterocarpus laevigatus
Arthropods	Shrimp	Mysidae
Arthropods	Shrimp	Nematocarcinus tenuisrostris
Arthropods	Squat lobsters	Gastroptychus sp. iaspis
Arthropods	Squat lobsters	Munidae
Arthropods	Squat lobsters	Munidopsis sp.
Arthropods	Squat lobsters	Pseudomunida sp.
Arthropods	Squat lobsters	Uroptychus sp.
Cnidaria	Hydrozoans	Siphonophore
Cnidarians	Actinarians	Actinoscyphia sp.
Cnidarians	Actinarians	Exocoelactis sp.
Cnidarians	Actinarians	Liponema sp.
Cnidarians	Actinarians	Phelliactis sp.
Cnidarians	Actinarians	Relacanthis sp.
Cnidarians	Alcyonaceans	Anthomastus sp.
Cnidarians	Alcyonaceans	Pseudoanthomastus sp.
Cnidarians	Ceriantharian	Ceriantharian
Cnidarians	Gorgonians	Acanthogorgia? sp.
Cnidarians	Gorgonians	Calyptrophora wyvellei
Cnidarians	Gorgonians	Calyptrophora? sp.
Cnidarians	Gorgonians	Chrysogorgia geniculata
Cnidarians	Gorgonians	Chrysogorgia stellata
Cnidarians	Gorgonians	Hemicorallium sp.
Cnidarians	Gorgonians	Iridogorgia bella
Cnidarians	Gorgonians	Iridogorgia magnispiralis
Cnidarians	Gorgonians	Jasonisis/Orstomisis sp.
Cnidarians	Gorgonians	Metallogorgia melanotrichos
Cnidarians	Gorgonians	Narella dichotoma
Cnidarians	Gorgonians	Narella sp.
Cnidarians	Gorgonians	Paragorgia sp.
Cnidarians	Gorgonians	Plexauridae sp.
Cnidarians	Gorgonians	Unbranched Isididae
Cnidarians	Gorgonians	Victorgorgia nuttingi
Cnidarians	Hydrozoans	Hydromedusa
Cnidarians	Pennatulaceans	Anthoptilum sp.
Cnidarians	Pennatulaceans	Halipteris sp.
Cnidarians	Pennatulaceans	Pennatula inflata
Cnidarians	Scleractinians	Enallopsammia rostrata
Cnidarians	Scleractinians	Unidentified cup coral
Echinoderms	Asteroids	Asthenactis sp.
Echinoderms	Asteroids	Brisinga sp
Echinoderms	Asteroids	Henrecia pauperrima
Echinoderms	Asteroids	Hymenaster sp.
Echinoderms	Asteroids	Mediaster sp.
Echinoderms	Asteroids	Mediaster/Gilbertaster sp.
Echinoderms	Asteroids	Novodonia sp.

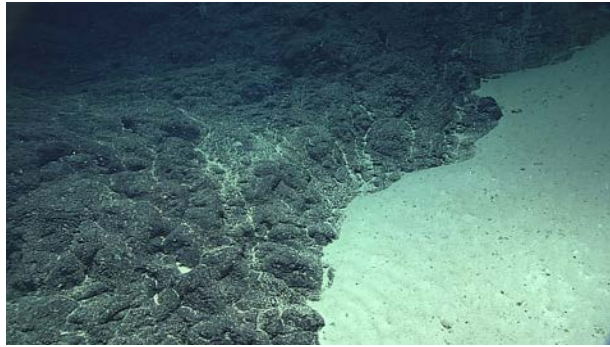
Echinoderms	Asteroids	Pteraster reticulatus
Echinoderms	Asteroids	Pteraster sp.
Echinoderms	Crinoids	Glyptometra lateralis
Echinoderms	Crinoids	Thaumacrinus
Echinoderms	Crinoids	Unidentified comatulid
Echinoderms	Holothurians	Deimatiidae
Echinoderms	Ophiuroids	Asteroschematidae
Echinoderms	Ophiuroids	Ophiocantidae
Echinoderms	Ophiuroids	Ophiuridae
Echinoderms	Urchin	Aspidodiadema cf. hawaiiensis
Echinoderms	Urchin	Echinothurididae sp.
Echinoderms	Urchin	Echinothurididae sp.
Echinoderms	Urchin	Echinus sp.
Fishes	Eel-like	Aldrovandia phalacra
Fishes	Eel-like	Aldrovandia sp.
Fishes	Eel-like	Diplacanthopoma sp.
Fishes	Eels	Ilyophinae
Fishes	Eels	Nettastoma parviceps
Fishes	Eels	Synaphobranchus sp.
Fishes	Eels	Synaptobranchid (juvenile)
Fishes	Gonostomatidae	Cyclothone sp.
Fishes	Macrourids	Caelorhynchus sp.
Fishes	Macrourids	Coelorhynchus tokiensis
Fishes	Macrourids	Coryphaenoides longicirrus
Fishes	Macrourids	Gadomus sp.
Fishes	Macrourids	Nezumia sp.
Fishes	Macrourids	Unidentified macrourid
Fishes	Moridae	Laemonema sp.
Fishes	Moridae	Lepidion sp.
Fishes	Neoscopelidae.	Neoscopelus sp.
Fishes	Squater	Solocisquama erythrina
Mollusks	Cephalopod	Squid
Mollusks	Gastropods	Brachiopod
Mollusks	Gastropods	Gastropod
Retaria	Foramnifera	Xenophyophora
Sponges	Hexactinellids	Atlantisella sp.
Sponges	Hexactinellids	Dictyaulus sp.
Sponges	Hexactinellids	Farrea nr occa
Sponges	Hexactinellids	Farrea nr occa erecta
Sponges	Hexactinellids	Saccocalyx sp.
Sponges	Hexactinellids	Walteria sp.
Tunicate	Ascidacea	Pyrosoma sp.
Tunicate	Ascidacea	Octanematidae

Overall Map of ROV Dive Area



Representative Photos of the Dive






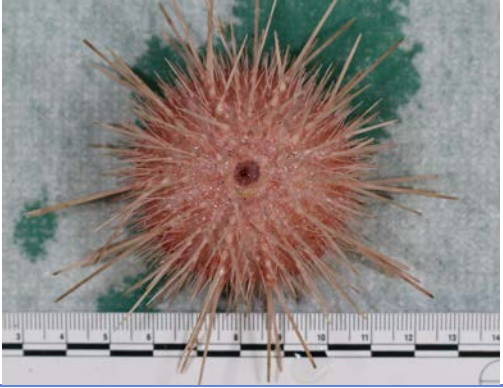
**Samples Collected**

<b>Sample ID</b>	SPEC01GEO
<b>Date (UTC)</b>	20160309
<b>Time (UTC)</b>	19:39:13
<b>Depth (m)</b>	1291.7
<b>Temperature (°C)</b>	2.92
<b>Field ID(s)</b>	Mn-encrusted volcanic



**Comments**

<b>Sample ID</b>	SPEC02BIO
<b>Date (UTC)</b>	20160310
<b>Time (UTC)</b>	01:21:53
<b>Depth (m)</b>	841.85

<b>Temperature (°C)</b>	4.49	
<b>Field ID(s)</b>	Isididae sp.,	
<b>Comments</b>		
<b>Sample ID</b>	SPEC03BIO	
<b>Date (UTC)</b>	20160310	
<b>Time (UTC)</b>	032140	
<b>Depth (m)</b>	685.25	
<b>Temperature (°C)</b>	4.99	
<b>Field ID(s)</b>	Echinothuriidae sp.	
<b>Comments</b>		
<b>Please direct inquiries to:</b>		NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10 th Floor) Silver Spring, MD 20910 (301) 734-1014