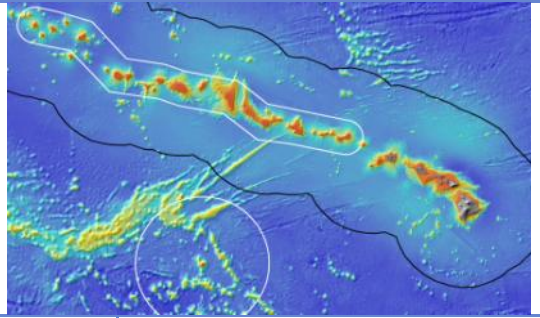


OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	Maro Crater		
ROV Lead/Expedition Coordinator	Karl McLetchie Kelley Elliott		
Science Team Leads	Chris Kelley (Biology) Daniel Wagner (Biology)		
General Area Descriptor	Northwestern Hawaiian Islands		
ROV Dive Name	Cruise Season	Leg	Dive Number
	EX1504	2	DIVE04
Equipment Deployed	ROV:	Deep Discoverer	
	Camera Platform:	Seirios	
ROV Measurements	<input checked="" type="checkbox"/> 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"/> Low Res Cam 1	<input checked="" type="checkbox"/> Low Res Cam 2
	<input checked="" type="checkbox"/> Low Res Cam 3	<input checked="" type="checkbox"/> Low Res Cam 4	<input checked="" type="checkbox"/> Low Res Cam 2
Equipment Malfunctions	The teleconference call between the shore-based and shipboard science team was dropped on a couple of occasions, and several shore side scientists reported losing the video on several occasions. All other equipment worked properly.		
ROV Dive Summary (From processed ROV data)	<p>Dive Summary: EX1504L2_DIVE04</p> <p>~~~~~</p> <p>In Water at: 2015-08-05T18:29:52.953000 25°, 09.614' N ; 169°, 53.124' W</p> <p>Out Water at: 2015-08-06T03:56:51.062000 25°, 10.378' N ; 169°, 51.797' W</p> <p>Off Bottom at: 2015-08-06T02:23:33.015000 25°, 09.858' N ; 169°, 52.537' W</p> <p>On Bottom at: 2015-08-05T20:08:33.703000 25°, 09.603' N ; 169°, 53.022' W</p> <p>Dive duration: 9:26:58</p> <p>Bottom Time: 6:14:59</p> <p>Max. depth: 3036.4 m</p>		
Special Notes			
Scientists Involved (please provide name / location / affiliation / email)	<p>Amy Baco-Taylor, HBOI ECC, FSU, abacotaylor@fsu.edu Andrea Quattrini, Pasadena, CA, USGS, aquattrini@usgs.gov Astrid Leitner, UH, UH, aleitner@hawaii.edu Brendan Roark, TAMUCC, TAMU, broark@geos.tamu.edu Bruce Mundy, IRC, NOAA, bruce.mundy@noaa.gov Charlotte Reid, NEU, c.seid@neu.edu Chris Kelley, EX, UH, ckelley@hawaii.edu Daniel Wagner, EX, PMNM, daniel.wagner@noaa.gov Diva Amon, UH, UH, divaamon@hawaii.edu Espirit Saucier, LSU, LSU, heestand.saucier@louisiana.edu Frank Parrish, IRC, NMFS PRD, Frank.Parrish@noaa.gov Jeff Drazen, UH, UH, jdrazen@hawaii.edu John R Smith, UH, UH, jrsmith@hawaii.edu Jonathan Tree, UH, UH, jtree@hawaii.edu Les Watling, UH, UH, watling@hawaii.edu Michael Garcia, UH, UH, mogarcia@hawaii.edu Michael Parke, Honolulu, HI, PIFSC, Michael.Parke@noaa.gov Michael Vecchione, SI, SI/NMFS, VECCHIOM@si.edu Mike Ford, SS, NMFS, Michael.ford@noaa.gov Nicole Morgan, HBOI ECC, FSU, nbmorgan11@gmail.com</p>		

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Purpose of the Dive

This dive was located on eastern ridge of a crater that is located East of Maro Reef. Its objectives were to explore for high density communities of deep-sea coral and sponges along the ridge of the crater, as well as gain insights into how this peculiar feature might have formed geologically. The target start point of the dive was a flat surface inside the crater located at a depth of 3035m. The plan was to move the inside base of the crater wall, and then survey up the slope to the crest of the crater rim. If time permitted, the plan was to drop down along the outside rim a short distance and survey back up to the crest on the outside of the rim. The final target depth was approximately at 2774m.

Description of the Dive:

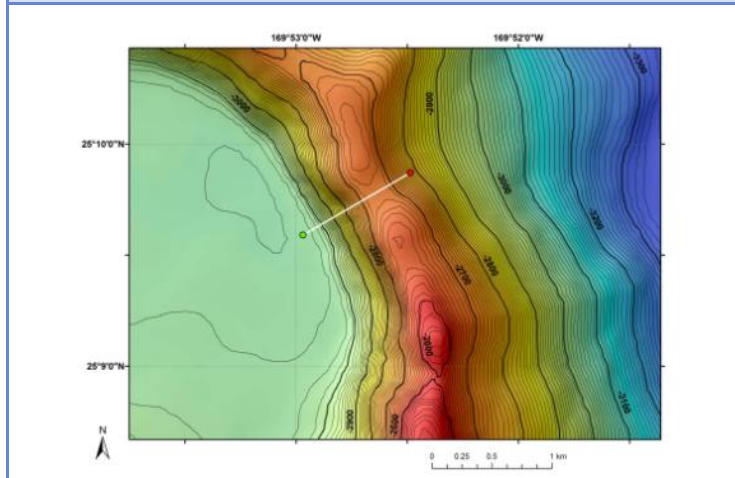
The ROV landed on flat, manganese-coated pavement at 3035m. The current was weak from the Northeast towards the Southwest. Very few animals were present at the landing site and included sea cucumbers, stalked sponges and an unbranched bamboo coral. A manganese crusted basalt rock was collected close to the ROV landing site at 3032m. As the ROV moved towards the base of the wall, a field of manganese nodules (2-5cm in diameter) was seen on a flat surface, and the density of animals remained very low. At the base of the wall, large boulders were present and there was a current from the Southeast towards the Northwest. As the ROV moved up the wall of the crater, the substrate changed to pillow lavas that occasionally had animals on them, including stalked crinoids, ophiuroids, tube worms and bamboo corals. At 2800m, the density of animals slightly increased and several stalked sponges, black corals, bamboo corals and sea cucumbers were seen. A second manganese-crusted basalt rock was collected at 2673m. On a few sediment covered locations, sand ripples were present, which indicated a current flowing from the Northeast towards the Southwest. The density of animals remained low as the ROV made its way over the crest of the ridge, and mostly included stalked crinoids and sponges. A chrysogorgid coral, which had a commensal squat lobster, was collected close to the top of the ridge at 2653m. As the ROV moved towards the outer edge of the ridge and moved down the outer edge of the crater, the density of animals remained low. An unbranched bamboo coral, which had both a crinoids and a gooseneck barnacle on it, was collected at 2676m. The ROV left the bottom after a total bottom time of 6:13h, having covered a linear distance of 942m. Few fishes were observed during this dive and included eels and rattails.

Animals observed during the dive are listed below:

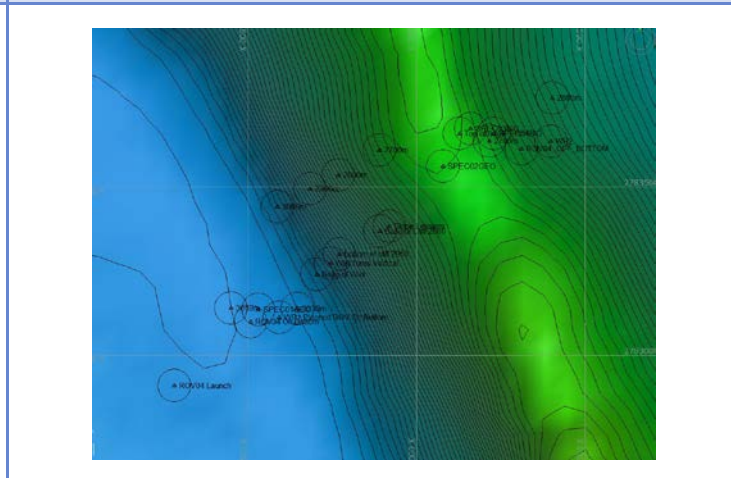
Phylum	Group	Species		
Cnidarians	Gorgonians	Metallogorgia melanotrichos		
		Unidentified branched Chrysogorgiid sp. (collected)		
		Unidentified unbranched isidid		
	Scleractinians	Unidentified cup coral		
		Antipatharians	Heteropathes sp.	
	Sponges		Bathypathes alternata	
			Bathypathes cf. patula	
			Trissopathes sp.	
		Hexactinellids	Stauropathes staurocrada	
			Actiniarians	Actinoscyphia sp. (on dead sponge stalk)
				Unidentified actinarian, possibly Exocoelactis sp
			Hydrozoans	Brachyocerianthus sp.
	Tunicate	Sphonophore	Thermopalialia sp.	
Echinoderms		Hexactinellids	Caulophacus sp.	
			Caulophacus (Caulodiscus) sp.	
		Bolosoma sp.		
		Bolosoma sp.1B		
Echinoderms	Ascidacea	Culeolus sp.		
	Asteroids	Hymenaster sp. (slime star)		
			Cheiraster sp?	
	Ophiuroids	Unidentified ophiuroids		
			Ophiocanthus sp	
	Crinoids	Unidentified comatulid		
			Hyocrinidae sp.	
			Proisocrinidae, potential new genus and species.	
	Holothuroids	Atelocrinidae? on unbranched isidid (collected)		
			Unidentified pink holothurians, possibly Synallactidae	
Echinoids		Psychropotes semperiana/longicauda		
		Echinothurioda		

Arthropods	Copepod	Unidentified copepod
	Shrimp	Nematocarcinus tenuirostris Mysidacea (on unbranched Isidid) Unidentified shrimp in water column Aristeopenaeus sp.
	Squat lobsters	Unidentified squat lobster (on collected Isidid) Munidopsis sp.
Anellida	Isopod	Asellote isopod
	Polychaetes	Polynoid (floating) Tubeworm
Mollusks	Gastropods	Unidentified gastropod (tumbling), possibly Trochidae
Fishes	Macrourids	Coryphaenoides longicirrus
	Ophidiids	Ophidiid
	Eels	Synaptobranchid unidentified

Overall Map of Dive Area	Actual track of ROV dive
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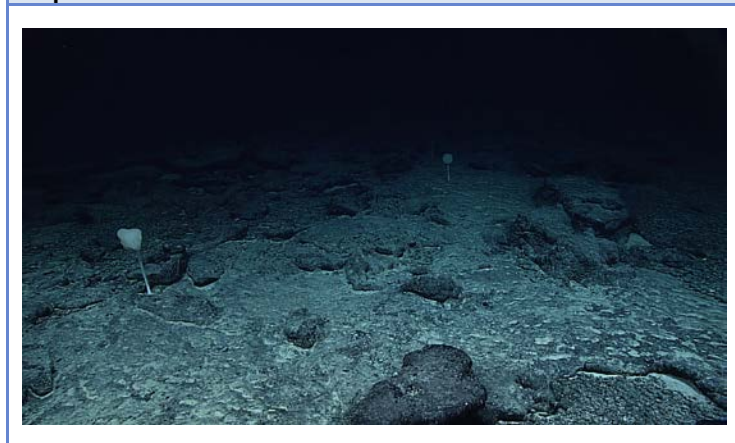


Bathymetry data for the dive site. Planned dive start and end points are shown as green and red dots, respectively.

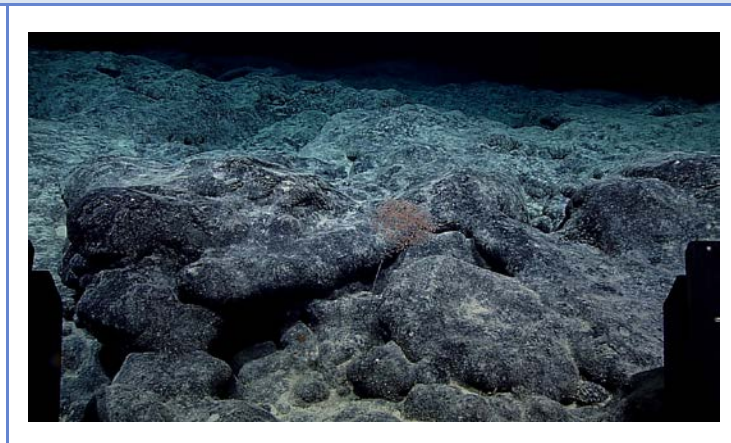


Hypack screen grab showing waypoints dropped during actual ROV dive track.

Representative Photos of the Dive





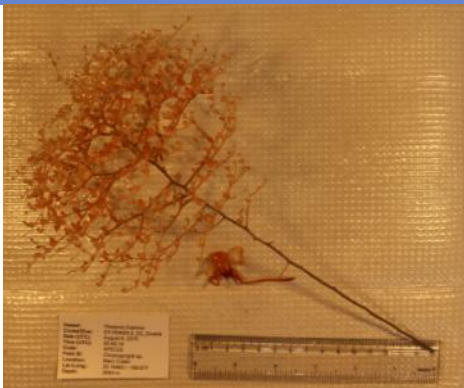

[Hexactinellid sponge on the crater floor before the ROV began its ascent up the inside of the crater rim.



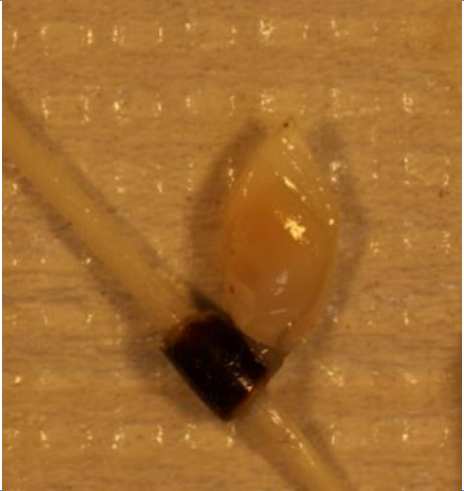


Gorgonian coral observed on the crater rim.

Samples Collected

Sample ID	EX1504L2_20150805202453_D2_Dive04_SPEC01GEO
Date (UTC)	2015/08/05
Time (UTC)	20:24:53
Depth (m)	3032

Temperature (°C)	1.66267	
Oxygen (mL/L)	3.65745	
Field ID(s)	Mn-crust basalt	
Comments		
Sample ID	EX1504L2_20150806000131_D2_Dive04_SPECO2GEO	
Date (UTC)	2015/08/06	
Time (UTC)	00:01:31	
Depth (m)	2673	
Temperature (°C)	1.64852	
Oxygen (mL/L)	3.50145	
Field ID(s)	Mn-crust basalt	
Comments		
Sample ID	EX1504L2_20150806004014_D2_Dive04_SPECO3BIO	
Date (UTC)	2015/08/06	
Time (UTC)	00:40:14	
Depth (m)	2654	
Temperature (°C)	1.63944	
Oxygen (mL/L)	3.53591	
Field ID(s)	Chrysogorgid	
Comments	Specimen contained commensal squat lobster that was also sampled.	
Sample ID	EX1504L2_20150806004014_D2_Dive04_SPECO3BIO_C01	
Date (UTC)	2015/08/06	
Time (UTC)	00:40:14	
Depth (m)	2654	
Temperature (°C)	1.63944	
Oxygen (mL/L)	3.53591	
Field ID(s)	Commensal squat lobster	
Comments	Specimen commensal on branched Chrysogorgid	
Sample ID	EX1504L2_20150806014300_D2_Dive04_SPECO4BIO	
Date (UTC)	2015/08/06	

Time (UTC)	01:43:00	
Depth (m)	2676	
Temperature (°C)	1.65211	
Oxygen (mL/L)	3.55772	
Field ID(s)	Unbranched Isidid	
Comments	Specimen contained commensal crinoid and gooseneck barnacle.	
Sample ID	EX1504L2_20150806014300_D2_Dive04_ SPEC04BIO_C01	
Date (UTC)	2015/08/06	
Time (UTC)	01:43:00	
Depth (m)	2676	
Temperature (°C)	1.65211	
Oxygen (mL/L)	3.55772	
Field ID(s)	Commensal crinoid	
Comments	Crinoid attached to the top of an unbranched Isidid coral that was also collected.	
Sample ID	EX1504L2_20150806014300_D2_Dive04_ SPEC04BIO_C02	
Date (UTC)	2015/08/06	
Time (UTC)	01:43:00	
Depth (m)	2676	
Temperature (°C)	1.65211	
Oxygen (mL/L)	3.55772	
Field ID(s)	Commensal gooseneck barnacle	
Comments	Barnacle attached to the top of an unbranched Isidid coral that was also collected.	
Please direct inquiries to:		NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10 th Floor) Silver Spring, MD 20910 (301) 734-1014