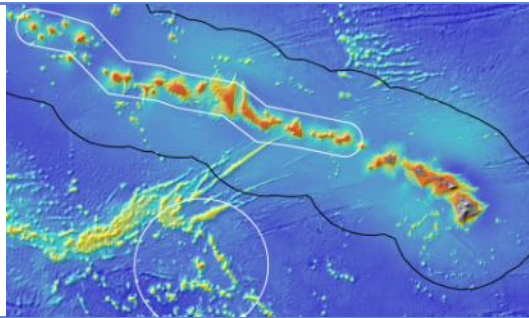


OKEANOS EXPLORER ROV DIVE SUMMARY

Site Name	East North Gardner			
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	DIVE17	
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	There were several communications issues between the shore-based and shipboard science team. The teleconference line was dropped for prolonged periods of time and the shore-based team reported that the video froze on multiple occasions.			
ROV Dive Summary (From processed ROV data)	<p>Dive Summary: EX1504L2_DIVE17</p> <p>~~~~~</p> <p>In Water at: 2015-08-18T18:08:49.468000 25°, 52.697' N ; 167°, 47.146' W</p> <p>Out Water at: 2015-08-19T04:30:41.687000 25°, 53.459' N ; 167°, 46.252' W</p> <p>Off Bottom at: 2015-08-19T01:56:27.203000 25°, 53.247' N ; 167°, 46.837' W</p> <p>On Bottom at: 2015-08-18T19:27:46.015000 25°, 52.825' N ; 167°, 46.877' W</p> <p>Dive duration: 10:21:52</p> <p>Bottom Time: 6:28:41</p> <p>Max. depth: 2085.9 m</p>			
Special Notes				
Scientists Involved (please provide name / location / affiliation / email)	<p>Allen Collins, SI, SI, collinsa@si.edu Amy Baco-Taylor, HBOI ECC, FSU, abacotaylor@fsu.edu Asako Matsumoto, Tokyo, PERC/CIT, amatsu@gorgonian.jp Bruce Mundy, IRC, NMFS, bruce.mundy@noaa.gov Chris Kelley, EX, UH, ckelley@hawaii.edu Chris Mah, SI, SI, mahch@si.edu Daniel Wagner, EX, PMNM, daniel.wagner@noaa.gov John R Smith, UH, UH, jrsmith@hawaii.edu Jonathan Tree, UH, UH, jtree@hawaii.edu Liz Shea, DE, DMNH, eshea@delmnh.org Mary Wicksten, TX, TAMU, wicksten@bio.tamu.edu Micheal Vecchione, SI, SI, VECCHIOM@si.edu Rachel Clostio, ULL, ULL, rclostio@louisiana.edu Santiago Herrera, Toronto, U. Toronto & WHOI, sherrera@alum.mit.edu Scott France, ULL, ULL, france@louisiana.edu Tim Shank, WHOI, WHOI, tshank@whoi.edu Tina Molodtsova, Washington, DC, PPSIO, tina@ocean.ru</p>			
Purpose of the Dive	This dive site was located just outside the boundaries of the Monument on a ridge that extends north of Gardner Pinnacles. Its			

objectives were to survey a completely unexplored area for corals and sponges, testing the hypothesis that high density communities can be found on ridge topography. No previous dives have ever been conducted at this site. Discovery of high density communities will provide valuable information to NOAA's Deep Sea Coral and Technology Program (DSCTP). The target start point was on the east slope of the ridge below the crest at 2108m. The plan was to survey up the slope of the ridge until reaching the ridge crest at 2053m. Then the ROV would move northeastward along the crest of the ridge to a final target depth of 1991m, documenting in particular the abundance of corals and sponges.

In addition to the surveying the seafloor, this dive would also include the second mid-water transects of the expedition, which would be carried out during the ROV's ascent towards the surface. The objective of the mid-water transects was to explore depths between 800-1200 m in order to examine the potential prey field for deep-diving toothed whales, as well as documenting other nekton and gelatinous megaplankton. The mid-water transects were planned to begin after the ROV came up from the seafloor and ascended to 1200m. Five mid-water transects were planned, each conducted for 10 minutes at 100m depth increments between 1200 and 800m (10-minute transect at 1200m, 1100m, 1000m, 900m, and 800m). Additionally, a fifth 10 minute transect was planned for a depth to be determined to contain the thickest backscattering layer, as revealed by the EK60 sonar prior to the surveys. During each transect, the ROV would be below and in sight of Seirios, moving at ~0.5 knots or less. The ship would move stern-first using dynamic positioning. If the ROV encountered any large object during transects, the ROV would stop and image it.

Description of the Dive:

The ROV landed on the wall consisting of Mn-crusts dike rock and rubble at 2065m. The substrate did not contain any sediment and was overgrown by several fan-shaped bamboo corals. There was no current at the landing spot. A Mn-crusts dike rock and hexactinellid sponge sample was collected close to the landing spot at 2082m. As the ROV moved up the flank of the ridge, the density of animals increased, and included fan-shaped and unbranched corals. The substrate consisted of Mn-crusts pillows and rubble, which were free of sediment. There was a slight current from the northwest towards the southeast. Once the ROV reached the crest of the ridge, the substrate changed to hardpan, which was overgrown by fan-shaped and unbranched corals, mushroom corals and sponges. There was a strong current from the northwest towards the southeast. As the ROV moved northeastward along the crest of the ridge, it passed through several patches where the substrate consisted of smaller cobble, and there was a concomitant decrease in the density of animals. The ROV moved over to the northern end of the ridge and surveyed down the flank of the ridge, where the density of animals was moderate. A second Mn-crusts rock sample was collected on the northern flank of the ridge at 2041m, as well as a coral sample (*Hemicorallium* sp.) at 2022m. The ROV then moved up towards the summit of the cone, where it collected a demosponge (*Stelodoryx* sp) and a mushroom coral (*Pseudoanthomastus* sp.) at 1980m. The ROV left the bottom at a depth of 1980m after a total bottom time of 6:33h, having covered a linear distance of 890m. Mid-water transects were conducted for 10 minutes each at 1200m, 1100m, 1000m, 900m, 800m and 550m, the latter being where the EK60 sonar showed the densest backscatter layer. A few animals were observed during the mid-water transects, including jellyfishes, ctenophores, siphonophores, shrimps, copepods, fishes, and a squid.

Animals observed during the bottom portion of the dive:

Phylum	Group	Species
Anellida	Polychaeta	Polychaete
Arthropod	Crab	Hermit crab with symbiotic anemone
Arthropod	Crab	Neolithidae sp.
Arthropod	Crab	Urotychus sp.
Arthropods	Barnacles	Oxynaspis sp.
Arthropods	Barnacles	Poecilasmataidae
Arthropods	Barnacles	Scalpellidae
Arthropods	Pycnogonids	Pycnogonid
Arthropods	Amphipod	Amphipod
Arthropods	Amphipod	Caprellid amphipod
Arthropods	Shrimp	Mysid
Arthropods	Shrimp	Nematocarcinus tenuisrostris
Arthropods	Shrimp	Unidentified shrimp in water column
Arthropods	Squat lobsters	Urotychus sp.
Arthropods	Squat lobsters	Munidopsis sp.
Bryozoans	Bryozoan	Bryozoan
Cnidarians	Actinarians	Actinoscyphia sp.
Cnidarians	Actinarians	Exocoelactis sp.
Cnidarians	Actinarians	Hormathiidae
Cnidarians	Actinarians	Unidentified anemone

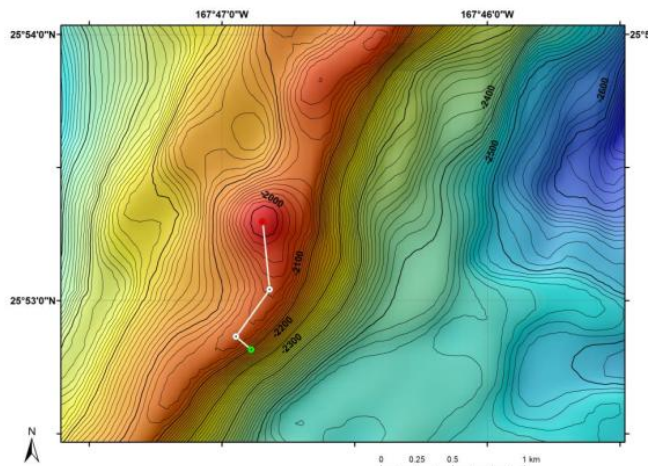
Cnidarians	Alcyonaceans	Pseudoanthomastus fisheri?
Cnidarians	Alcyonaceans	Pseudoanthomastus sp.
Cnidarians	Alcyonaceans	Anthomastus tahinodus
Cnidarians	Alcyonaceans	Stoloniferous octocoral
Cnidarians	Antipatharians	Bathypathes alternata
Cnidarians	Antipatharians	Bathypathes conferta
Cnidarians	Antipatharians	Stauropathes sp.
Cnidarians	Antipatharians	Trissopathes cf. pseudotristicha
Cnidarians	Gorgonians	Acanella weberi
Cnidarians	Gorgonians	Candidella gigantea
Cnidarians	Gorgonians	Chrysogorgia geniculata
Cnidarians	Gorgonians	Chrysogorgia sp.
Cnidarians	Gorgonians	Hemicorallium sp.
Cnidarians	Gorgonians	Iridogorgia bella
Cnidarians	Gorgonians	Iridogorgia magnispiralis
Cnidarians	Gorgonians	Isidella sp. lyrate
Cnidarians	Gorgonians	Jasonisis sp.
Cnidarians	Gorgonians	Keratoisis sp.
Cnidarians	Gorgonians	Lepidisis sp.
Cnidarians	Gorgonians	Metallogorgia melanotrichos
Cnidarians	Gorgonians	Narella alata?
Cnidarians	Gorgonians	Narella sp.
Cnidarians	Gorgonians	Paragorgia sp.
Cnidarians	Gorgonians	Pleurogorgia sp.
Cnidarians	Gorgonians	Unbranched isidid
Cnidarians	Hydrozoans	Anthecate hydroids
Cnidarians	Hydrozoans	Hydromedusae
Cnidarians	Hydrozoans	Solitary hydroid
Cnidarians	Hydrozoans	Unidentified hydroids
Cnidarians	Pennatulaceans	Anthoptilum sp.
Cnidarians	Pennatulaceans	Halipterus sp.
Cnidarians	Zoanthid	Corallizoanthus sp.
Cnidarians	Zoanthid	Bullagummizoanthus sp.
Cnidarians	Zoanthid	Unidentified zoanthid overgrowing bamboo coral
Cnidarians	Zoanthid	Unidentified zoanthid overgrowing Paragorgia
Echinoderms	Asteroids	Henricia sp.
Echinoderms	Crinoids	Comatulid crinoid
Echinoderms	Crinoids	Hyocrinidae?
Echinoderms	Ophiuroids	Asteroschema sp.
Echinoderms	Ophiuroids	Unidentified ophiuroids
Fishes	Eels	Synaphobranchus brevadorsalis
Fishes	Eels	Synaphobranchus sp.
Fishes	Eels	Lyophinae sp.
Fishes	Macrourids	Coryphaenoides longicirrus
Fishes	Macrourids	Trachonurus/Malacocephalus sp.
Sponges	Demosponges	Stelodoryx sp
Sponges	Hexactinellids	Bolosoma sp.

Sponges	Hexactinellids	Caulophacus sp.
Sponges	Hexactinellids	Euretinae new genus sp.
Sponges	Hexactinellids	Farrrea nr occa erecta
Sponges	Hexactinellids	Poliopogon sp.
Sponges	Hexactinellids	Regadrella sp.
Sponges	Hexactinellids	Tretopleura sp.
Sponges	Hexactinellids	Euretidae

Animals observed during the mid-water transect:

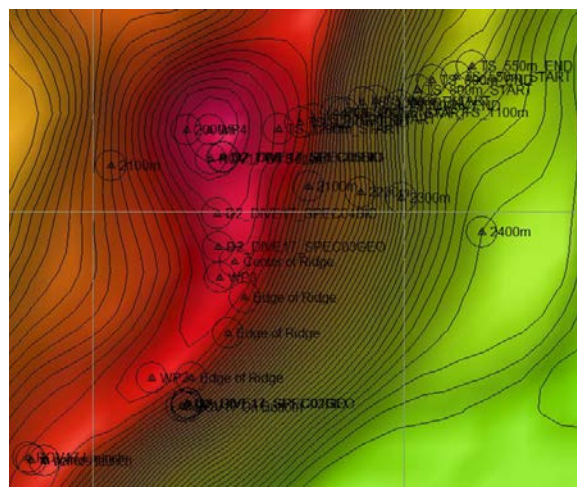
Group	Species
Arthropod	Shrimp
Arthropod	Copepod
Cephalopods	Walvisteuthis youngorum
Chaetognaths	Chaetognaths
Ctenophore	Bathocyroe sp.
Ctenophore	Cydidippidae
Ctenophore	Ctenophore
Ctenophore	Lobate ctenophores
Fishes	Gonostomatidae
Fishes	Unidentified
Hydromedusae	Narcomedusae
Hydromedusae	Trachymedusae
Hydromedusae	Unidentified jellyfishes
Hydromedusae	Halicreas sp
Hydromedusae	Solmissus sp.
Polychaetes	Tomopteris sp.
Siphonophore	Siphonophore
Siphonophore	Calycophoran
Siphonophore	Physonect
Tunicate	Larvacean

Overall Map of Dive Area



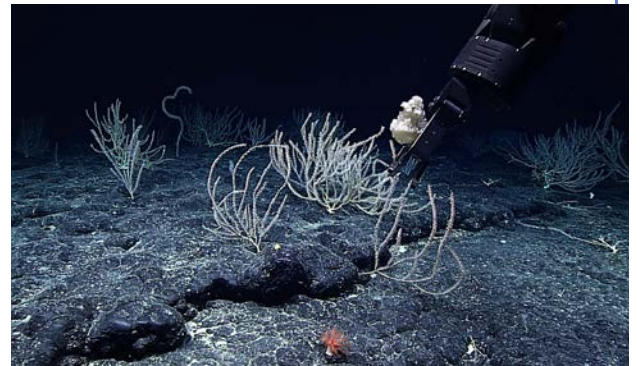
Bathymetry data for the dive site. Planned dive start and end points are shown as green and red dots, respectively.

Actual track of ROV dive



Hypack screen grab showing waypoints dropped during actual ROV dive.

Representative Photos of the Dive



Large bamboo coral fans (*Keratoisis* sp.) observed at the beginning of the dive. Many were oriented downslope indicating across ridge prevailing current flow.

Collection of a demosponge (*Stelodoryx* sp.) and a mushroom coral (*Pseudoanthomastus* sp., lower center of photo) at the end of the dive.

Samples Collected

Sample ID	EX1504L2_20150818193756_D2_Dive17_SPEC01GE O
Date (UTC)	2015/08/18
Time (UTC)	19:37:56
Depth (m)	2082
Temperature (°C)	1.90364
Oxygen (mL/L)	3.00535
Field ID(s)	Mn-crsuted dike rock



Comments

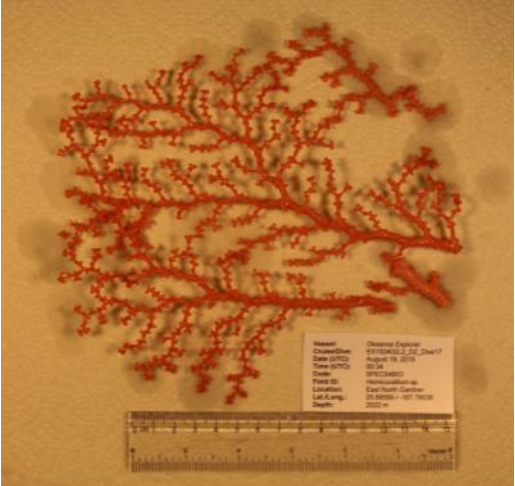



Sample ID	EX1504L2_20150818194204_D2_Dive17_SPEC02BIO
Date (UTC)	2015/08/18
Time (UTC)	19:42:04
Depth (m)	2082
Temperature (°C)	1.88749
Oxygen (mL/L)	3.00168
Field ID(s)	Hexactinellid sp.



Comments

Sample ID	EX1504L2_20150818234530_D2_Dive17_SPEC03GE O
Date (UTC)	2015/08/18
Time (UTC)	23:45:30
Depth (m)	2041
Temperature (°C)	1.86912
Oxygen (mL/L)	2.99507



Field ID(s)	Mn-crusted rock	
Comments		
Sample ID	EX1504L2_20150819003422_D2_Dive17_SPEC04BIO	
Date (UTC)	2015/08/19	
Time (UTC)	00:34:22	
Depth (m)	2022	
Temperature (°C)	1.88328	
Oxygen (mL/L)	2.95145	
Field ID(s)	<i>Hemicorallium</i> sp.	
Comments		
Sample ID	EX1504L2_20150819013748_D2_Dive17_SPEC05BIO	
Date (UTC)	2015/08/19	
Time (UTC)	01:37:48	
Depth (m)	1980	
Temperature (°C)	1.91512	
Oxygen (mL/L)	2.90973	
Field ID(s)	Sponge	
Comments	Sponge was determined to be a demosponge based on preliminary examination of its spicules.	
Sample ID	EX1504L2_20150819014542_D2_Dive17_SPEC06BIO	
Date (UTC)	2015/08/19	
Time (UTC)	01:45:42	
Depth (m)	1980	
Temperature (°C)	1.93313	
Oxygen (mL/L)	2.85255	
Field ID(s)	<i>Pseudoanthomastus</i> sp.	
Comments		
Sample ID	EX1504L2_20150819020000_D2_Dive17_SPEC07BIO	
Date (UTC)	2015/08/19	
Time (UTC)	02:00:00	
Depth (m)	1980	
Temperature (°C)	1.93313	

Oxygen (mL/L)	2.85255	
Field ID(s)	Keratoisis sp.	
Comments	Coral came up attached to ROV. The environmental and position information was estimated based on where the last specimen was collected.	
Sample ID	EX1504L2_20150819??????_D2_Dive17_SPEC0?BIO_C01	
Date (UTC)	2015/08/19	
Time (UTC)	?	
Depth (m)	?	
Temperature (°C)	?	
Oxygen (mL/L)	?	
Field ID(s)	Commensal polychaete	
Comments	Commensal polychaete came up in bio box which contained multiple specimens. Thus, it is not possible to determine from which sample it originated, and no metadata is available for the specimen.	
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