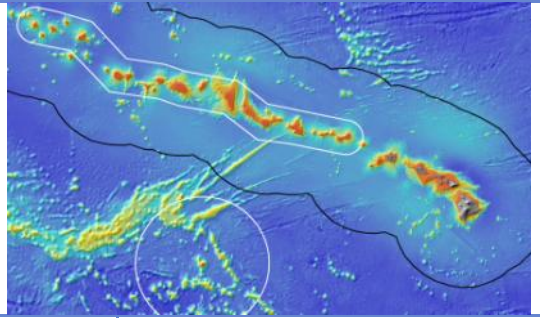


OKEANOS EXPLORER ROV DIVE SUMMARY

<b>Site Name</b>	Gardner Terrace		
<b>ROV Lead/Expedition Coordinator</b>	Karl McLetchie Kelley Elliott		
<b>Science Team Leads</b>	Chris Kelley (Biology) Daniel Wagner (Biology)		
<b>General Area Descriptor</b>	Northwestern Hawaiian Islands		
<b>ROV Dive Name</b>	Cruise Season	Leg	Dive Number
	EX1504	2	DIVE16
<b>Equipment Deployed</b>	ROV:	Deep Discoverer	
	Camera Platform:	Seirios	
<b>ROV Measurements</b>	<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
<b>Equipment Malfunctions</b>	There were only few communications issues between the shore-based and shipboard science team. The shore-based science team reported that the video froze on several occasions.		
<b>ROV Dive Summary (From processed ROV data)</b>	Dive Summary: EX1504L2_DIVE16 ~~~~~		
	In Water at:	2015-08-17T18:16:51.484000 25°, 38.346' N ; 168°, 51.213' W	
	Out Water at:	2015-08-18T02:28:46.296000 25°, 38.807' N ; 168°, 50.476' W	
	Off Bottom at:	2015-08-18T01:41:23.078000 25°, 38.726' N ; 168°, 50.656' W	
	On Bottom at:	2015-08-17T19:08:09.546000 25°, 38.271' N ; 168°, 50.988' W	
	Dive duration:	8:11:54	
	Bottom Time:	6:33:13	
	Max. depth:	1563.6 m	
<b>Special Notes</b>			
<b>Scientists Involved (please provide name / location / affiliation / email)</b>	<p>Abby Lapointe, UH, UH, abbylap@hawaii.edu  Amy Baco-Taylor, HBOI ECC, FSU, abacotaylor@fsu.edu  Andrea Quattrini, Pasadena, CA, USGS, aquattrini@usgs.gov  Asako Matsumoto, Tokyo, PERC/CIT, amatsu@gorgonian.jp  Bruce Mundy, IRC, NMFS, bruce.mundy@noaa.gov  Chris Kelley, EX, UH, ckelley@hawaii.edu  Daniel Wagner, EX, PMNM, daniel.wagner@noaa.gov  Dave Clague, MBARI, MBARI, clague@mbari.org  Espirit Saucier, LSU, LSU, heestand.saucier@louisiana.edu  John R Smith, UH, UH, jrsmith@hawaii.edu  Jonathan Tree, UH, UH, jtree@hawaii.edu  Les Watling, UH, UH, watling@hawaii.edu  Mackenzie Gerring, UH, UH, mgerring@hawaii.edu  Mary Wicksten, TX, TAMU, wicksten@bio.tamu.edu  Micheal Vecchione, SI, SI, VECCHIOM@si.edu  Nicole Morgan, FL, FSU, nbmorgan11@gmail.com  Rachel Clostio, ULL, ULL, rclostio@louisiana.edu  Scott France, ULL, ULL, france@louisiana.edu  Steve Auscavitch, Temple, Temple, steven.auscavitch@temple.edu  Tim Shank, WHOI, WHOI, tshank@whoi.edu</p>		

**Purpose of the Dive**

This dive site was located on what is believed to be an old reef terrace edge north of Gardner Pinnacles. The objective of this dive was to survey the terrace edge, which is now a 200m high narrow ridge, for corals and sponges, testing the hypothesis that high density communities can be found on ridge topography. One other previous Pisces submersible dive was conducted on this ridge in 2011, approximately 3 km to the east. Discovery of high density communities at this dive site will provide information about the extent and size of the community further along the ridge that will provide valuable information to NOAA's Deep Sea Coral and Technology Program (DSCTP). The target start point of the dive was a flat surface located at a depth of 1561m, which transitioned into a steep slope at approximately 1550m. The plan was to survey up the steep slope of the ridge until reaching the ridge crest at 1476m. Then the ROV would move east along the ridge crest to a final target depth of 1478m, documenting in particular the abundance of corals and sponges.

**Description of the Dive:**

The ROV landed on a flat surface consisting of Mn-crusts pavement with pockets of sediment at 1560m. There was no current and no animals were present at the landing site. As the ROV moved northwestward towards the base of the ridge, several fishes were observed, as well as a low number of sponges and unbranched bamboo corals. On the way up towards the crest of the ridge, the ROV collected a sponge sample, which had a benthic ctenophore on it, at 1464m. The density of animals remained low on the flank of the ridge and included sponges, corals and anemones. Once the ROV arrived on the crest of the ridge, there was a higher sediment cover, as well as a higher density of sponges, which were all oriented with their surfaces perpendicular to the ridge. As the ROV moved northeastward along the crest of the ridge, the community was dominated by a single species of sponge and occasional tripod fishes. Towards the end of the dive, the ROV came upon very large boulders, which were 20m in height, and contained a higher density of sponges and corals. There was a modest current from the southeast towards the northwest. Shortly before leaving the bottom, the ROV collected a coral sample at 1412m. The ROV left the bottom at a depth of 1412m after a total bottom time of 6:36h, having covered a linear distance of 1,150m.

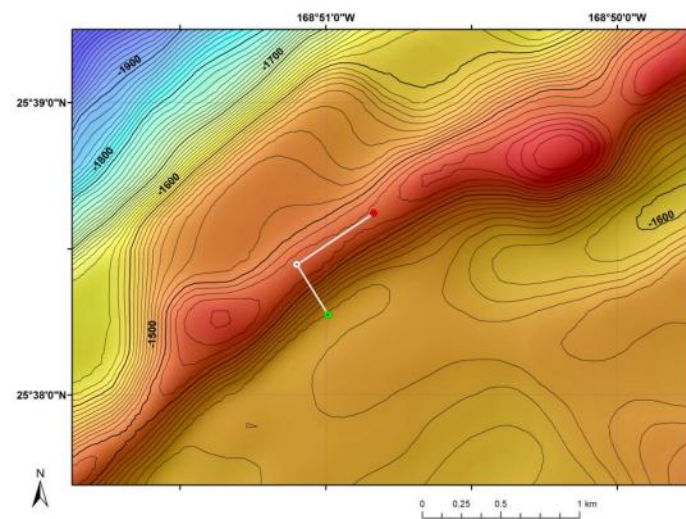
**Animals observed during the dive are listed below:**

<b>Phylum</b>	<b>Group</b>	<b>Species</b>
Anellida	Polychaetes	Polychaete
Anellida	Polychaetes	Polynoid
Arthropod	Crab	Hermit crab
Arthropod	Crab	Neolithodes sp.
Arthropod	Crab	Unidentified crab
Arthropods	Barnacles	Scalpellidae
Arthropods	Amphipod	Amphipod
Arthropods	Shrimp	Benthescymus sp.
Arthropods	Shrimp	Mysid
Arthropods	Shrimp	Nematocarcinus tenuisrostris
Arthropods	Shrimp	Pandalidae sp.
Arthropods	Shrimp	Unidentified shrimp in water column
Arthropods	Squat lobsters	Munidopsis sp.
Cephalopods	Cranchiidae	Leachia sp.
Cnidarians	Actinarians	Actinoscyphia sp.
Cnidarians	Actinarians	Actinostolidae
Cnidarians	Actinarians	Liponema sp.
Cnidarians	Actinarians	Hormathiidae
Cnidarians	Actinarians	Relicanthus daphnea
Cnidarians	Actinarians	Unidentified anemone
Cnidarians	Alcyonaceans	Anthomastus sp.
Cnidarians	Antipatharians	Bathypathes alternata
Cnidarians	Antipatharians	Stauropathes sp.
Cnidarians	Ceriantharian	Corallimorphus pillatus
Cnidarians	Gorgonians	Chrysogorgia geniculata

Cnidarians	Gorgonians	Chrysogorgia sp.
Cnidarians	Gorgonians	Hemicorallium cf. lauense
Cnidarians	Gorgonians	Pleurocorallium kishinouyei
Cnidarians	Gorgonians	Eknomisis sp?.
Cnidarians	Gorgonians	Iridogorgia bella
Cnidarians	Gorgonians	Iridogorgia magnispiralis
Cnidarians	Gorgonians	Isididae yellow new genus
Cnidarians	Gorgonians	Isidella sp. lyrate
Cnidarians	Gorgonians	Keratoisis sp.
Cnidarians	Gorgonians	Lepidisis sp.
Cnidarians	Gorgonians	Metallogorgia melanotrichos
Cnidarians	Gorgonians	Paragorgia sp.
Cnidarians	Gorgonians	Radicipes cf. spiralis
Cnidarians	Gorgonians	Rhodanirigorgia sp.
Cnidarians	Gorgonians	Unbranched isidid
Cnidarians	Hydrozoans	Hydromedusae
Cnidarians	Hydrozoans	Unidentified hydroids
Cnidarians	Pennatulaceans	Anthoptilum sp.
Cnidarians	Pennatulaceans	Calibelemnon sp.
Cnidarians	Pennatulaceans	Protoptilum sp.
Cnidarians	Pennatulaceans	Umbellula sp.
Cnidarians	Scleractinians	Desmophyllum sp.
Ctenophores	Ctenophores	Platyctenid ctenophore
Echinoderms	Asteroids	Brisingid
Echinoderms	Crinoids	Comatulid crinoid
Echinoderms	Holothuria	Unidentified holothurian
Echinoderms	Ophiuroids	Asteroschema sp.
Echinoderms	Ophiuroids	Unidentified ophiuroids
Echinoderms	Urchin	Sperosoma cf. obscurum
Fishes	Eel-like	Aldrovandia sp.
Fishes	Eels	Synaphobranchus brevidorsalis
Fishes	Gonostomatidae	Cyclothone sp.
Fishes	Ipnopidae	Bathypterois atricolor
Fishes	Macrourids	Coryphaenoides sp.
Fishes	Ophidiidae	Monomitopus/Pycnocraspedum sp.
Fishes	Nettastomatidae	Venefica sp.
Fishes	Congridae	Congridae
Mollusks	Gastropods	Gastropod
Sponges	Hexactinellids	Bolosoma sp.
Sponges	Hexactinellids	Caulophacus sp.
Sponges	Hexactinellids	Corbitellinae new genus
Sponges	Hexactinellids	Euretidae sp.
Sponges	Hexactinellids	Farrrea nr occa erecta
Sponges	Hexactinellids	Poliopogon sp.
Sponges	Hexactinellids	Poliopogon sp.D
Sponges	Hexactinellids	Saccocalyx cf. pedunculatus
Sponges	Hexactinellids	Semperella sp.

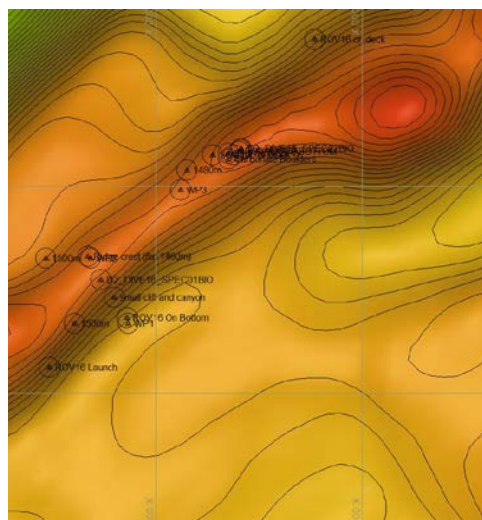
Sponges	Hexactinellids	Tretopleura sp.
Sponges	Hexactinellids	Uncinateridae new genus.
Sponges	Hexactinellids	Walteria cf. leuckarti

### 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

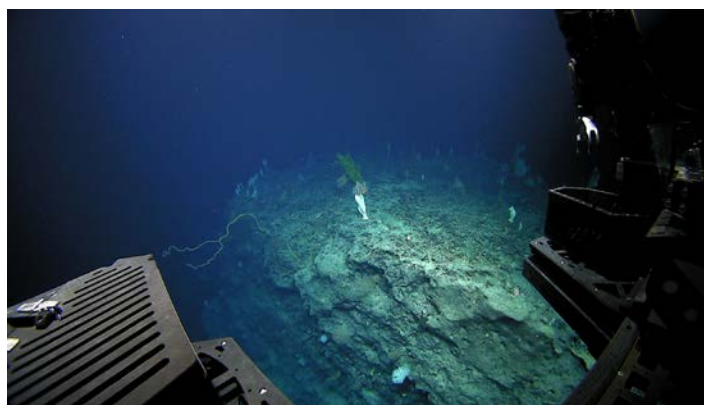


Hypack screen grab showing waypoints dropped during actual ROV dive.

### Representative Photos of the Dive



Example of what the top of the ridge looked like through much of the dive: Barren sediment covered low relief carbonate with a sparse community consisting mostly of two species of hexactinellid sponges.

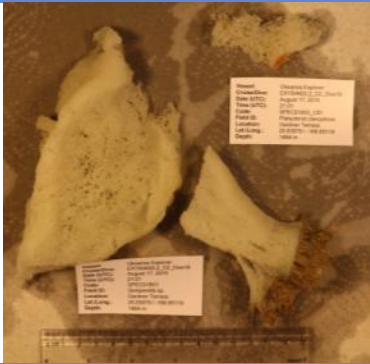
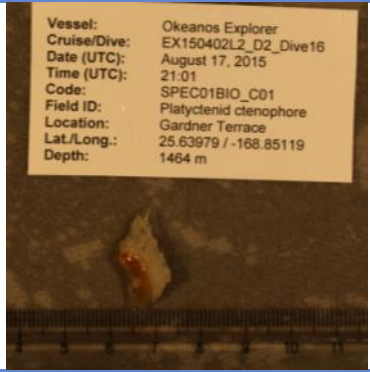



Large blocks encountered just past waypoint 4. The walls and tops of the blocks had a diversity of corals and sponges.

### Samples Collected

Sample ID	EX1504L2_20150817210126_D2_Dive16_ SPEC01BIO
Date (UTC)	2015/08/17
Time (UTC)	21:01:26
Depth (m)	1464



<b>Temperature (°C)</b>	2.64945	
<b>Oxygen (mL/L)</b>	2.13879	
<b>Field ID(s)</b>	Semperella sp.	
<b>Comments</b>	Sponge had commensal benthic ctenophores on it that were also collected.	
<b>Sample ID</b>	EX1504L2_20150817210126_D2_Dive16_ SPEC01BIO_C01	
<b>Date (UTC)</b>	2015/08/17	
<b>Time (UTC)</b>	21:01:26	
<b>Depth (m)</b>	1464	
<b>Temperature (°C)</b>	2.64945	
<b>Oxygen (mL/L)</b>	2.13879	
<b>Field ID(s)</b>	Platyctenid ctenophore	
<b>Comments</b>	Ctenophores were attached to sponge sample that was also collected	
<b>Sample ID</b>	EX1504L2_20150818013702_D2_Dive16_ SPEC02BIO	
<b>Date (UTC)</b>	2015/08/18	
<b>Time (UTC)</b>	01:37:02	
<b>Depth (m)</b>	1412	
<b>Temperature (°C)</b>	2.7738	
<b>Oxygen (mL/L)</b>	2.0494	
<b>Field ID(s)</b>	Eknomisis sp.	
<b>Comments</b>		
<b>Please direct inquiries to:</b>	NOAA Office of Ocean Exploration & Research 1315 East-West Highway (SSMC3 10 <sup>th</sup> Floor) Silver Spring, MD 20910 (301) 734-1014	