



Okeanos Explorer ROV Dive Summary

Dive Information	
Dive Map	
Site Name	Howland Island Shallow
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ROV Lead(s)	Karl McLetchie
Science Team Lead(s)	Amanda Demopoulos and Steven Auscavitch
General Area Descriptor	Pacific Remote Islands Marine National Monument
ROV Dive Name	
Cruise	EX-17-03

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Purpose of the Dive	<p>The goal of this dive is to acquire baseline information on deep sea habitats, seafloor geology, and biological communities on Howland Island in the Howland & Baker Unit of the Pacific Remote Islands Marine National Monument. Deep-sea environments around Howland & Baker Islands are virtually unexplored leading to poor knowledge of biological resources protected by these reserves. This dive will target shallower depths (<600m) of Howland Island to examine deep-sea coral, sponge, and fish communities and contrast those observations to a similar dive profile at Baker Is. Understanding deep-sea coral habitat distribution as well as fish communities is of great importance to inform management in the area. This feature has been dated to 70-74MY old (*see Koppers et al 2007 Geochim. Geophys. Geosyst.)</p>		
Description of the Dive	<p>EX1703 dive 10 traversed the north slope of Howland Island. This was our 4th dive within the Pacific Remote Islands Marine National Monument. This dive traversed a depth range of 357-587 m in order to improve understanding of commercially important fish, as well as protected species, within the region. During descent, we noted several swimmers (small fish and crustaceans) in the water column, as well as high concentrations of particulate organic matter. We also noted a number of medusa (cf. Narcomedusae: <i>Aegina</i>), pyrosomes, and siphonophores.</p> <p>The dive track started at the base of a relatively steep slope, progressed upslope to about 415 m, then followed the depth</p>		

contour for a few hundred meters, then ascended to the 340m contour and traversed along that contour until the end of the dive. We observed a very high diversity of fishes, with approximately 38 taxa recorded. Specific fishes included midwater fishes (myctophids), and demersal species: goosefish (*Lophiomus* or *Lophiodes* spp.), sea toads (*Chaunax* spp.), codlings (Moridae: *Physiculus* sp.s), oreo fish (Oreosomatidae: *Neocyttus* cf. *acanthorhynchus*), scorpionfish (Bembridae: *Bembradium* sp., *Pontinus* sp.), rattails (Macrouridae: *Nezumia* sp., *Coelorinchus* spp.), tonguefish (Cynoglossidae: *Symphurus* spp.), congers (Congeridae: *Gnathophis*, Myrocongridae: *Myroconger* sp.), pearlfish (Carapidae: *Tetragondacnus spilotos*), dragonet (Callionymidae: *Synchiropus* sp.), roughy (*Hoplostethus* cf. *crassispinus*), sharks (*Echinorhinus cookei* and *Carcharhinus* sp.), greeneyes (Chlorophthalmidae: *Chlorophthalmus* sp.), deep-sea cardinal fish (Epigonidae: cf. *Epigonus atherinoides*), green-spotted duck billed fish (*Chironema chryseres*), snake eels (Ophichthidae: *Ophichthus*), cusk eels (Ophediidae: *Neobythites* sp.), spikefish (Triacanthodidae: cf. *Paratriacanthodes* and unknown), armored sea robin (Triglidae: *Satyrichthys* or *Scalicus* sp.), grappos (Callanthiidae: *Grammatonotus* sp.), amberjack (*Seriola* sp.), dory (Zeniontidae: *Cyttomimus* sp.), boar fish (*Antigonia*), and “ocean bass” (*Synagrops*). The two pearlfish observed are representatives from a recently described genus and represent range extensions; they were previously only reported near Indonesia. A few fish species were observed with ectoparasitic gnathiid isopods attached.

And now for something completely different.

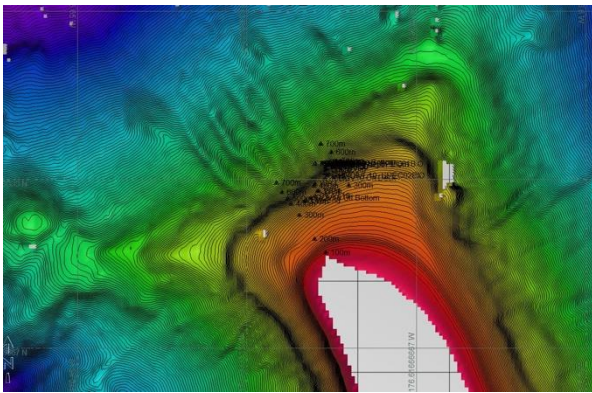
During the transit upslope, the rock face resembled features on Baker Island, with heavily eroded karstic terrain, interspersed with sedimented channels. Large patches of sediment were composed of small carbonate rocks with coral and shell fragments. Several different corals were observed clinging to vertical and near vertical rock ledges, including the precious coral, Coralliidae: cf. *Pleurocorallium*, *Corallium*, *Hemicorallium*, scleractinians (white and yellow *Enallopsammia*, a few cup coral species), plexaurids (*Paracis* sp. and cf. *Swiftia*), bamboos (branching and whip), primnoids (cf. *Calyptrophora*, collected, *Callogorgia* cf. *formosa*), acanthogorgiid, black corals (cf. *Stichopathes*, *Bathypathes*, *Parantipathes*?, *Hexapathes*?, and unknown black coral with long, extended branches), and colonial hydroid (*Solanderia*?). Dense colonies of *Stichopathes* and *Callogorgia* were observed on gently sloping

sedimented terrain. We also noticed several tubes, both large and small in size, on the sedimented slope, that lacked an obvious inhabitant.

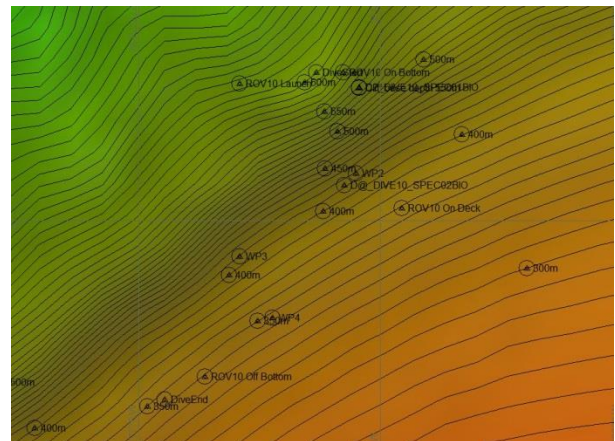
Coral associates observed included some of the largest ophiuroids (asteroschematids), chirostylids, shrimps, solitary hydroid, and amphipods. Along the rock walls, on the sediment surface, and within burrows, we observed several different kinds of squat lobsters, Galatheididae, shrimp (*Heterocarpus*), sea urchins (Benthopectinidae: *Caenopedina* cf. *pulchella*), several sponges (demosponges-collected one), a large hermit crab with anemone house, homolid crab without biological camouflage, a shy octopus hiding out in the sediment, and a portunid crab swimming and moving along the sediment. Underneath eroded carbonate overhangs, we saw limid bivalves. In one of the rock ledges, we observed the proboscis of spoonworm, Echiura, moving around in the water column, possibly suspension feeding.

Seastars encountered on the dive included *Tarsastrocles verrilli*, cookie stars (cf. Goniasteridae: *Plinthaster*), coral predator (Goniasteridae: *Circeaster sandrae*), slime star (Pterasteridae: *Pteraster obesus*), Asterinidae: *Tremaster mirabilis* (several), and Goniasteridae: *Mediaster*.

Overall Map of the ROV Dive Area



Close-up Map of Main Dive Site



Representative Photos of the Dive



This is the first image of *Tetragondacnus spilotus* seen alive and represents a significant range extension



This *Echinorhinus cookei* was one of several sharks seen during the dive

Samples Collected

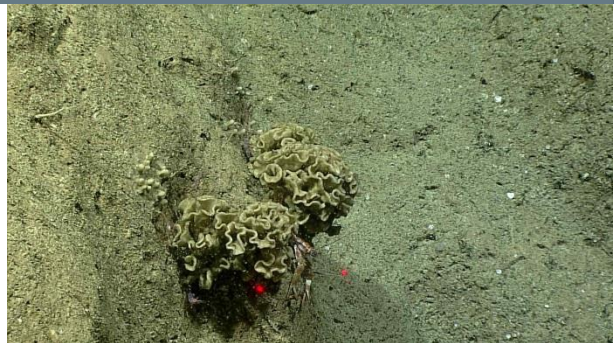
Sample

Sample ID	EX1703_20170317T210958_D2_DIVE10_SPEC01BIO
Date (UTC)	20170317
Time (UTC)	21:09:58
Depth (m)	544.54
Temperature (°C)	6.85
Field ID(s)	Calyptraphora sp.
Comments	



Sample

Sample ID	EX1703_20170317T235520_D2_DIVE10_SPEC02BIO
Date (UTC)	20170317
Time (UTC)	23:55:20
Depth (m)	424.5
Temperature (°C)	9.65
Field ID(s)	Demospongiae
Comments	



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