HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-811

MISSION STATUS

Location: Ka' iwe Ledge between Oahu and Molokai

Latitude: 21 28.90 **Longitude:** -157 30.48

Mission Date: 7/24/2013 **Duration:** 5 hours 25 mins

Maximum Depth: 1010 m

Project Title: First Exploration of the Uplifted Edge of the Ka'iwi Channel Platform

Principal Investigator: Dr. Brian Taylor, Dean of SOEST, University of Hawai'i

Address: POST Building, Rm 802, University of Hawaii, Honolulu, HI 96822

Phone: 808-956-6182

Observer 1: Brian Taylor
Address: Same as above

Observer 2: Christopher Kelley
Address: HURL

Pilot 1: Terry Kerby **Pilot 2:**

Scientific Data Acquired: Prepare an abstract outlining your objectives, techniques, findings, etc.

Objectives:

The goal of this one dive project was to explore the south-tilted and uplifted northern edge of the Ka'iwi Channel platform located at 750-800 m water depth (Fig. 9). The possible implications of this unusual geomorphology were that it could have been the result of flexural footwall uplift resulting from crustal unloading caused by the giant Tuscaloosa landslide. Its orientation relative to the M2 tidal flow could be creating strong flow acceleration that may have led to a large sediment-free hard substrate area behind the platform edge. Associated nutrient enrichment may be fostering an unknown, unexplored, and thriving benthic ecosystem despite the oxygen minimum zone found at these depths. The dive will begin at approximately 1000 m below the edge, which is located at 700 m water depth, then proceed up and over the edge to examine its geologic characteristics. The submersible will continue along the edge and the drowned lagoon, surveying for the presence of corals and other animals.

Observations, findings, etc:

The submersible landed at on the steep platform slope at 1010m. Current was negligible, which continued throughout the dive. The substrate appeared to be sediment dusted mn-crusted basalt talus. Samples were taken for confirmation. As the submersible moved upslope toward the uplifted platform edge, it encountered above 861m in situ fractured pillows, also sampled. In situ tubular pillows were seen at 820m. The first carbonate deposits appeared where the slope rolls over above 760m, and were sampled. This appeared to be consolidated carbonate sand and relict corals. Clearly recognizable platelike and a few branching fossil corals were observed, and sampled, from this terrace. A basalt wall was encountered at 748m-740m, forming the platform edge. A basalt terrace was encountered as the submersible moved over the edge onto more level terrain. Moving south, basalt was replaced by carbonate at 755m. Multitudes of platy and other relict corals littered the seafloor. We lifted off the bottom at 757m, rather than traversing another half mile to the south to encounter the onlapping modern sediments.

The biological community at this site was sparse, with the hexactinellid Poliopogon sp4 being the dominant sponge present, particularly on the terrace above the edge. An odd scleractinian hard coral that was is either a species of Madrepora or Enallopsammia was the dominant coral. A few other corals were observed, however none were observed in abundance. Two species of urchins, one echinothurid and the other a probable pedinid, were the dominant echinoderms, while the fish community was dominated by the halosaur, Aldrovandria phalacra, and the cutlass eel, Synaphobranchus affinis, along the slope. Conger eels were dominant on the terrace above the platform edge.

Species list:

Fishes
Aldrovandria phalacra
Unidentified myctophids
Synaphobranchus affinis
Bathyuroconger vicinus
Unidentified congrids
Nettastoma parviceps
Gnathophis sp
Centroscyllium nigrum
Unidentified macrourids, either Kumba or Nezumia sp
Unidentifed ophidiid
Unidentified alepocephalid

Sponges
Poliopogon spA, spB and sp4
Tretopleura sp
Lefroyella ceramensis? (collected)
Farrea sp1 and sp2 nr occa
Farrea sp3 nr occa erecta
Bolosoma spA
Saccocalyx nr pedunculatus
Dictyocalyx new sp1

Walteria sp (collected)
Bathydorus sp
Caulophacus sp3 (collected)
Rossellid vase

Cnidarians
Liponema brevicornis
Actinostolid tan
Boloceroides daphneae
Exocoelactis sp
Paragorgia sp
Chrysogorgia geniculata
Iridogorgia magnaspiralis
Anthothela nuttingi?
Metallogorgia melanotrichos
Corallium imperiale
Keratoisis flabellum
Keratoisis sp (sparse branching)
Calyptrophora wyvillei
Narella dichotoma
Unidentified gorgonian, which could be Narella hawaiiensis
Enallopsammia rostrata or Madrepora oculata (collected)
Single polyp scleractinians

Echinoderms
Hymenaster pentagonalis
Asthenactis papyraceus
Unidentified holothurian, either a laetmogonid or synallactid
Aspidodiadema hawaiiensis
Phormosoma bursarium
Unidentified urchin, possibly a sp of Caenopedina
Unidentified echinothurid (white one with red center)

Crustaceans
Unidentified homolid crab, possibly Lamoha williamsi (didn’t see well enough)
Nematocarcinus tenuirostris
Heterocarpus laevigatus
Unidentified shrimp in water column

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

Communications were poor and positions could not be relayed down to the pilot and observers. Fortunately the dive plan was straight forward and a precisely planned dive path was not required.

Recommendations for corrective action or improvement:

HURL operations is already working on correcting the problem, which should be fixed by the following dive.

In your opinion, did the mission essentially achieve its purpose? Compare actual work accomplished with the work that was expected to be accomplished.

Yes.

List specimens or samples collected on the mission.

Eleven rock samples were collected. Three of these were carbonate and included one consolidated sand sample and two fossil coral samples. The other eight included manganese crust and basalt.

Three hexactinellid sponges were collected that included a possible Lefroyella ceramensis, which if confirmed would be the first record in Hawaii, a species of Walteria, either W. flemmingi or W. nr leukarti, and a potentially new species of Caulophacus.

One scleractinian coral specimen was collected that was identified as belonging to either Madrepora or Enallopsammia. The specimen has characteristics of both genera, and therefore may represent a new species.

One single polyp scleractinian, a very young farreid sponge, and possibly an anemone were removed from one of the rock samples.

DATA RELEASE

Data may be retained by the project leader for up to 2 years after the mission date with the following exception. NOAA may request to use photos for publication or publicity purposes at any time.

Fill in the appropriate statement below and sign this form.

I hereby release the data archived by HURL for public consumption following mission (project title)

held on 7/25/2013 (date) in the following way:

a. CTD data by na (date)

b. video and images by 7/25/14 (date)

c. other 7/25/14 (date)

d. I will give my written consent to individuals wishing to use these data prior to the above dates depending on the nature of the request(s).

Brian Taylor Principal Investigator