HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-780

MISSION STATUS

Location: Waiahukini, Big Island

Latitude: 18° 56.877' N **Longitude:** 155° 42.840' W

Mission Date: 09-30-11 **Duration:** 8 hours 12 mins

Maximum Depth: 455 m

Project Title: Recolonization and community succession of deep-water coral communities in response to disturbance

Principal Investigator: Dr. Samuel E. Kahng

Address:

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Observer 1: Sam Kahng
Address: Same as P.I.

Observer 2: Daniel G. Luck
Address: Same as P.I.

Pilot 1: Max Cremer

Pilot 2:

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

Objectives:

Explore and characterize the poorly known, deep-water benthic communities including the unique photosynthetic communities in the lower photic zone, commercially valuable precious corals, and cold water corals at extreme depths. Examine the ecological dynamics of slow growing, long-lived benthic organisms in response to episodic disturbance and the recovery processes recorded across multi-decadal and multi-century time-scales by using the well documented historic and prehistoric lava flows on the Big Island of Hawaii.

Multiple stations will be surveyed on successively older lava flows to enable a view back in time to the birth of deep water coral communities on newly formed volcanic island substrata. Coral community structure on a lava flow of known age can be compared to

adjacent, “undisturbed” habitat of much older age. At each station (i.e., lava flow) surveys will be conducted at strategic, fixed depth contours (e.g. 400 m for precious corals) to reveal how rates of community development changes with depth. Constant depth contour transects will be surveyed, and video data analysis will be used to characterize community ecology (i.e., species richness, species diversity, % live benthic cover, density, and size-frequency distribution of a key organism at each depth contour).

Observations, findings, etc:

We started the dive along a 450 m contour. The landing spot at 450 within the 1868 debris cone had *Corallium* spp. in great abundance. We identified at least two morphs that may have been separate species or may have simply reflected ecotypic variation, likely as result of variations in current strength. Black corals of the genus *Myriopathes* or perhaps *Dendropathes* were the second most abundant sessile megafauna, and may have even been underestimated because they tended to blend in with the substrate. Bamboo coral and *Gerardia* sp. were scattered throughout but in much lower abundance than *Corallium*. We estimated that perhaps one in every five bamboo corals was parasitized by *Gerardia*.

The new (1868) flow had significantly more hard substrate than the older flow. Most rocks within that flow were boulder sized basalts but there were occasional pillow lavas as well. At transitions between debris cones and also between old and new flows carbonate sediments were common. The old flow had significantly finer substrate, with pillow lavas interspersed between large tracks of sand. *Corallium* was much less abundant in the old flow.

At mesophotic depths we observed *Leptoseris* as deep as 140 m but could not collect samples there. Tiny plate colonies of *Leptoseris hawaiiensis* were present on most hard substrate between 135 – 120 m, but overall we encountered much less hard substrate than anticipated.

We returned to the vicinity of our starting location via a 400 m contour. *Corallium* spp. in both flow ages were in lower abundance here than at the 450 m contour. However, the community did seem to be more diverse with bamboo coral, *Gerardia* sp., and black corals relatively more common.

Species list:

Corallium spp., likely *C. secundum* and *C. regale*
Gerardia sp.
Bamboo Corals *(*family Isididae)
Myriopathes or Dendropathes sp.
Cirripathes sp.
Regadrella sp.
Leptoseris hawaiiensis

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

On the 400 m contour we were unable to make it through the entire new flow.

Recommendations for corrective action or improvement:

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.

We collected at least one sample from all of the species observed (listed above) except *Cirripathes*. We also collected four rock samples from flows of contrasting ages.

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_____(date) in the following way:

a. CTD data by_____(date)

b. video and images by_____(date)

c. other_____(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).

_____Principal Investigator