HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-694

MISSION STATUS

Location: East French Frigate Shoals, NWHI

Latitude: 23° 54.864'N **Longitude: 165° 23.126'W**

Mission Date: 6 Nov 07 **Duration: 8 hours 17 mins**

Maximum Depth: 367 meters

Project Title: Deep sea coral research activities in Papahanaumokuakea Marine National Monument (Monument permit # PMNM-2007-050)

Principal Investigator: Dr. Robert B. Dunbar

Address: **Geological and Environmental Sciences**
Stanford University
Stanford, CA 94305-2115

Phone: **650-725-6830** **e-mail: dunbar@stanford.edu**

Observer 1: Robert B. Dunbar
Address:
Geological and Environmental Sciences
Stanford University
Stanford, CA 94305-2115

Observer 2: E. Brendan Roark
Address:
Geological and Environmental Sciences
Stanford University
Stanford, CA 94305-2115

Pilot 1: Terry Kerby

Pilot 2:

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

Objectives: Deep-sea corals are a new and unique paleoclimate/paleoceanographic archive that can extend our observations of ocean physics and climate to periods well before the onset of the instrumental record. Using a collection of submersible- and ROV-recovered specimens of a variety of deep sea coral species our research program is working on the development of climate time series that will improve our understanding of North Pacific variability over decadal to centennial timescales. Preliminary results on deep-sea corals from Hawaii, the Line Islands, and the Gulf of Alaska document great longevity (live collected corals that are over 4,000 yrs old) and good preservation of even older fossil corals.

The primary objective of our research efforts in the PMNM is to recover a suite of different deep-sea corals, both living and dead, from a range of locations and depths (300-1800) to develop long climate time series. We will focus the majority of our work in the

upper 700 meters where deep-sea corals are most abundant and are also at an optimal depth to monitor variations in the permanent thermocline. Different sites are needed to assess the degree to which we are seeing artifacts associated with island or bathymetry effects that can influence the extent to which any specific site records regional versus local signals.

Deep sea coral species such as *Corallium* spp., Dendrophyllia, sp., and *Isididae* as well as colonial zooanthids such as *Gerardia* (gold corals) and *Leiopathes* (black corals) collected alive are the primary objectives. These are the species we have been working with to date as they hold the greatest promise as paleoclimate archives and are sometimes harvested as part of the precious coral trade.

Observations, findings, etc:

This dive began at 360 m near, but not in, the Frank Parrish FFS study region. Based on ROV dives the preceding evening (Nov 5, 2007, ROV dives R-392 and R-393) we planned for a P5 dive to collect deep sea corals and fossils along the flanks of a large mound-like feature at FFS. The mound depths range from 345 meters to ~370 meters. Deep sea corals are most abundant above 365 m. After touching down and trimming up we proceeded NE, observing and collecting corals. We mainly collected dead, toppled *Gerardia* stumps and branches. In one section along the dive transect we observed many branching bamboo corals, some of which had been overgrown by *Gerardia* polyps. The overgrowth must have been relatively recent as the bamboo internodes were all clearly visible beneath the *Gerardia* tissue. We collected one specimen of the bamboo coral that had both live bamboo tissue as well as Gerardia tissues on it. After proceeding about 300 m to the NE we turned west for about 250 m and collected more *Gerardia* stumps. Then we headed south towards a large *Leiopathes* seen on dive P5-692. We removed the smallest of the 3 main branches so as to get a living sample without destroying an ancient coral tree. We also collected two dead *Leiopathes*.

Species list:

Coral samples were taken as follows:

Sample 1	Gerardia sp. (dead)	9:08 AM	23	54.895	N	165	23.19	W	356
Sample 2	Gerardia sp. (dead)	9:14 AM	23	54.895	N	165	23.19	W	356
Sample 3	Bamboo (branching)	10:10 PM	23	54.905	N	165	23.11	W	351
Sample 4	Gerardia sp. (dead)	10:30 PM	23	54.905	N	165	23.1	W	352
Sample 5	Gerardia sp. (dead)	10:40 PM	23	54.905	N	165	23.085	W	353
Sample 6	Gerardia sp. (dead)	10:50 PM	23	54.909	N	165	23.067	W	354
Sample 7	Gerardia sp. (dead)	11:06	23	54.9	N	165	22.994	W	355

		PM							
Sample 8	Leiopathes (dead)	11:55 PM	23	54.964	N	165	22.949	W	359
Sample 9	Gerardia sp. (dead)	12:12 PM	23	54.96	N	165	23.033	W	354
Sample 10	Gerardia sp. (dead)	12:20 PM	23	54.96	N	165	23.03	W	354
Sample 11	Leiopathes (dead)	1:05 PM	23	54.948	N	165	23.2	W	356
Sample 12	Bamboo base (dead)	1:22 PM	23	54.896	N	165	23.143	W	358
Sample 13	Bamboo (branching)	1:37 PM	23	54.851	N	165	23.138	W	356
Sample 14	Gerardia branch	2:18 PM	23	54.99	N	165	23.16	W	356
Sample 15	Leiopathes branch	2:25 PM	23	54.99	N	165	23.16	W	356
Sample 16	Gerardia sp. (dead)	3:34 PM	23	55	N	165	23.15	W	358

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

The Titan arm worked fine during the mission. The basket worked well for corals, especially the new “lid” to help keep corals in the basket during recovery.

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, we achieved our main objectives.

List specimens or samples collected on the mission. (see above)

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 11/2/07 (date) in the following way:

a. CTD data by immediately (date)

b. video and images by 11/2/08 (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

Robert B. Dunbar (dunbar@stanford.edu)