HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P4-132

MISSION STATUS

Location: Kahoolawe, Dive Site #10

Latitude: 20° 32.037 **Longitude:** 156° 45.827

Mission Date: 16 Dec 2004 **Duration:** 8 hours 1 min

Maximum Depth: 129 m

Project Title: Exploration of Deepwater Macroalgal Meadows in the Main Hawaiian Islands

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Pilot 1: Terry Kerby **Pilot 2:** none

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

The objectives were to survey deep water macroalgal assemblages and associated organisms from 50 to 150 m depths to determine the composition, densities, lower depth limits, and breadth of deepwater macroalgae and macroalgal meadows. These data will be compared with surveys done in Sept. 2004 to test for any seasonal differences in the macrophyte assemblage. We were particularly interested in the abundance and lower depth limits of *Halimeda incrassata* meadows and associated epiphytes. A sediment pore water sample, water column sample, and sediment sample (#1) were collected at 78 m depth in a patch of barren, unvegetated sand inside the *H. incrassata* meadow. An additional sediment sample (#2) was collected at the same depth in a densely vegetated area inside the *H. incrassata* meadow. Deepwater macroalgae were surveyed using 3 lasers (1 laser was not working) for percent cover and density estimates, and collected with the manipulator arm. Lasers were calibrated prior to the cruise date.

The deepest occurring alga was psammophytic (sand-dwelling) *Lobophora/Distromium* brown, flabellate blades occurring from 128 to ~100 m depths, reaching densities up to ~1 alga/m^2. A filamentous red alga, *Spyridea filamentosa* was observed drifting over sand starting at 126 m depth, and collected as an epiphyte on *H. incrassata* at 79 m depth. A green alga *Ulva* sp. with small (< 5 cm) blades was observed from 123 to 109 m depths; it did not approach the densities estimated for the brown algal blade. *H. incrassata* was first observed at 85 forming sparse patches, with dense meadows beginning at 79 m depth. Small, benthic-dwelling fish appeared to be associated with the *H. incrassata*, but were difficult to quantify due to their cryptic nature. At three water depths, 79, 69, and 59 m, five representative *H. incrassata* plants were collected for canopy height, segment number, and epiphyte measurements. Approximately 10 reproductive *H. incrassata* individuals were observed over the entire depth range surveyed during the dive. *Caulerpa mexicana* was observed growing in the *H. incrassata meadows* at < 65 m depths, particularly in bare patches at the edges of meadows and infrequent. A large school of ~12 jacks were observed foraging in the *H. incrassata* meadows at 59 m depth. A warty holothurian (*Stichopus* sp.) was observed rolling down the sand at 120 m depth (the behavior was video taped) and was collected. Further processing of samples at the University of Hawaii will provide additional data on species identifications. Fish data from the submersible video will be provided by Frank Parrish. Associated invertebrates are being processed and identified by Pakki Reath.

Observations, findings, etc:
A deep water assemblage of psammophytic flabellate brown blades (gross morphology is similar to *Lobophora* or *Distromium,* however our collections may be a new species), heavy ephiphytism of *Spyridea* sp. on *H. incrassata* at its lower depth limit, expansive *H. incrassata* meadows, excellent video footage of crabs, a rolling *Stichopus* sp. , jacks and small fish foraging in a *H. incrassata* meadow, and observations of detached macroalgae being transported by currents to depths beyond the photic zone (potential source of food at deeper depths).

Species list:
Macroalgae and invertebrates were preserved for identification at the University of Hawaii. Fish will be identified at a later date. A gross tentative species list of macroalgae includes:

Flabellate brown blades
Halimeda incrassata
Ulva sp.
Spyridea filamentosa
Codium sp.
Dictyopteris plagiogramma
Cladophora sp.
Filamentous red algae
Coralline algae (rhodoliths)

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

No sonar on submersible

Recommendations for corrective action or improvement:

None

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

We were tremendously successful with the submersible dive in collecting numerous species and surveying macroalgal populations at multiple depths. A sediment pore water, water column, and 2 sediment samples were successfully collected in the desired locations.

List specimens or samples collected on the mission.
Algae and associated invertebrates were collected in 15 containers in the new collecting box. A sediment pore water sample, 2 sediment collections, and a water column sample were taken at 78 m depth. CTD data was taken throughout the dive.

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