HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-563

MISSION STATUS

Location: South Penguin Banks, Dive Site #4

Latitude: N 21 ° 01.4 **Longitude:** W 157 ° 17.5

Mission Date: 4 September 2004 **Duration:** 7 hours 56 mins

Maximum Depth: 250 m

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

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Observer 2: Frank Sansone
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Pilot 1: Max Cremer **Pilot 2:** none

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

Objectives:

The objectives were to survey macroalgal assemblages from 50 to 200 m depths to determine the composition, densities, lower depth limits, and breadth of deepwater macroalgae and macroalgal meadows. In addition, a prototype sediment pore water sampler was deployed to collect sediment pore water from a single depth in the sediment and sediment depth was measured at multiple locations with a sediment probe. Deepwater macroalgae were surveyed using 4 lasers for percent cover and density estimates, and collected with the suction sampler and manipulator arm. Submersible laser calibrations were inspected the night before the submersible dive to ensure proper calibration. A large brown alga, *Spatoglossum macrodentum*, was the deepest occurring macroalga at 208 m. The green algae *Ulva* sp. and invasive alga *Cladophora sericea* were found from 190 to 80 m depths (shallowest depth surveyed), forming scattered large clumps on sandy substrate with *Spatoglossum macrodentum* and various Dictyotales. Small filaments and clumps of *Cladophora sericea* were observed floating in the current and being transported

along the bottom of the substrate throughout the dive, suggesting possible dispersal mechanisms via vegetative dispersal to other depths and locations. A dense *Halimeda incrassata* meadow was discovered from 86 to at least 80 m depths, and appeared to continue into shallower water. The sediment pore water sampler was deployed successfully at 88 m depth, but was later damaged by the manipulator arm, and the pore water sample was lost. Macroalgal collections included many new species to Hawaii. Further processing of samples at the University of Hawaii will provide additional data on species identifications.

Observations, findings, etc:
Large deepwater populations of the macroalgae *Cladophora sericea*, *Spatoglossum macrodentum, Ulva sp.,* and Dictyotales species. *Halimeda* sediment was observed at 155 to 80 m depths, indicating transport of *Halimeda* fragments from shallower depths. Large depressions were found at all depths in the sand, and drift macroalgae often collected in the bottom of these depressions. Shimmering water, suggesting freshwater flux from the sediment, was observed at 80 m depth.

Species list:
Macroalgae and invertebrates were preserved for identification at the University of Hawaii. A gross tentative species list of macroalgae includes:

Cladophora sericea
Spatoglossum macrodentum
Halimeda incrassata
Ulva sp.
Caulerpa sp.
Codium sp.
Dictyotales
Filamentous red algae
Large red, brown, and green macroalgae
Calcareous macroalgae (crusts)

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

A strong current limited the distance traveled by the submersible, thus we were not able to sample at depths less than 80 m. Video was distorted and color was difficult to discern at depths < 100 m. The sediment pore water sample was lost due to damage from the manipulator arm.

No ROV operations.

Recommendations for corrective action or improvement:

Additional lighting or placing the video camera closer to the brightest light source might increase visibility of algae at shallower depths. Alternatively, a digital camera with strobes could be used for sampling with the lasers in addition to the video camera. The ROV needs to be operational to achieve the scientific objectives.

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

Without ROV operations, approximately half of the research could not be accomplished. Fish surveys, larger scale mapping of macroalgal meadows, scouting new dive locations for future cruises, and rapid assessments of the target habitats were not carried out as a result. However, we were tremendously successful with the submersible dive in collecting numerous specimens and surveying macroalgal populations at multiple depths over a variety of habitats.

List specimens or samples collected on the mission.

Algae and associated invertebrates were collected in 8 suction sample buckets (jars.) Two rock samples with algae and invertebrates, and individual samples of *Halimeda incrassata* and *Spatoglossum* were collected and placed in the covered crate.

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