HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-562

MISSION STATUS

Location: South Oahu, Dive Site #1

Latitude: 21° 14.929 **Longitude:** 158° 04.000

Mission Date: 3 Sept 2004 **Duration:** 7 hours 14 mins

Maximum Depth: 322 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.

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. Deepwater macroalgae were surveyed using 4 lasers for percent cover and density estimates, and collected with the suction sampler and manipulator arm. Lasers were calibrated prior to the cruise date. The lower depth limit of macroalgal growth was 115 m depth. Dense meadows of the calcified green alga, *Udotea* sp., were found from 81 to 56 m depths (the shallowest depth surveyed). This is the first report of the genus *Udotea* in Hawaii, and may represent a new species. Small fish appeared to be associated with the *Udotea* meadows, although limited time at depth did not allow for quantitative surveys of fish populations. The invasive green alga *Avrainvillea amadelpha* was found from 76 to 56 m depths, co-occurring with *Udotea* sp. meadows. This is the deepest report of *A. amadelpha* in Hawaii, and future surveys will elucidate any possible invasive interactions of *A. amadelpha* with *Udotea* sp. 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 meadows of *Udotea* sp., observations of small fish associated with *Udotea* sp. meadows, abundant populations of the invasive alga *Avrainvillea amadelpha* in deep water, collections of macroalgal species new to Hawaii and possibly new to science, observations of small fish associated with *Udotea* sp. meadows. Excellent video footage of an octopus with beer bottles was taken at 267 m depth.

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

Udotea sp.
Avrainvillea amadelpha
Ulva sp.
Caulerpa sp.
Kallymenia sp.
Filamentous red algae
Large red, brown, and green macroalgae
Calcareous macroalgae (crusts)

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

Video was distorted at depths < 100 m. Manipulator arm locked early in the dive, limiting the number of macroalgal collections. Submersible pilot was able to troubleshoot problem at depth, allowing most of the sampling to be accomplished using the suction device and the Hyco manipulator arm.

No ROV operations.

Recommendations for corrective action or improvement:

Clear, high-quality video is needed at all depths, especially at depths < 100 m. Additional lightening may be needed at shallower depths. 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 species and surveying macroalgal populations at multiple depths.

List specimens or samples collected on the mission.
Algae and associated invertebrates were collected in 8 suction sample buckets (jars) and 2 rock samples with algae and invertebrates attached were collected into 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