HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5- 551

MISSION STATUS

Location: Kealekekua Bay 1877 Flow

Mission Date: Dec 10, 2003

Maximum Depth: 1721

Project Title: Microbial Glass Alteration

Principal Investigator: Dr. Hubert Staudigel

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Observer 1: Hubert Staudigel **Observer 2:** Dan Rogers

Address: Scripps Institution of Oceanogr. **Address:** Woods Hole Oceanographic Institution

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

The overall goal of our study is to explore how microbial activity mediates the dissolution and alteration of volcanic glass. We hope to understand the feedbacks between microbial activity and water-rock chemical exchange and the relevance of these processes to the origin of life, global chemical cycles, and the ocean floor ecology. To this end we study surfaces of natural rocks and we use exposure of known materials for studying the alteration process over the period of exposure. Dive 547 was devoted to sample some microbial mats and to visit our exposure experiments at Marker 17, for an exchange of experiments and for collecting additional samples

Specifically we aimed to (1) explore the current status of previous exposure experiments in this region, (2) to recover microbial mats, rock samples and a subset of the exposure experiments deployed previously, (3) to deploy new experiments, including a reaction chamber that exposes experimental charges to hydrothermal fluid in situ, and (4) to explore new potential exposure sites.

The 1877 flow offers a unique opportunity to study the alteration of a historic flow and compare these results with our exposure experiments. We quickly found our M1 using our 2002 navigation data and a map provided courtesy of M. Garcia SOEST that represents the flow very well. We deployed SIO 63, 64, WHOI 22, 24 in a cluster slightly separated from the previous experiments and recovered SIO 16, We recovered a rock specimen from nearby M1 (X1). Then, we moved to the W side of the flow, verified its location on the

Garcia map, and took some rock samples from a small cliff at the western edge of the flow (X2, 3). We proceeded NE and explored the plateau N of M1 and it appears to be littered with collapse holes that may be isolated or aligned in directions that vary from N/S to EW. After an excursion into the plains East of the flow (to find a channel identified a year earler), we moved back into the flow, and moved north to take a series of rock samples (X4-6).

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

none

Recommendations for corrective action or improvement:

N/a

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.

7 rock samples

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

Microbial Glass Alteration (project title)

held on December 4, 2003 (date) in the following way:

a. CTD data by n/a (date)

b. voice transcripts, video, and still camera film by December 2005 (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