HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT (QLR) for *Pisces* and *RCV-150*

DIVE: ___P4-164_____

(*Extend length of sections as needed/appropriate*)

MISSION STATUS

Location: _____Loihi_____

Latitude: __N18° 56.382_____ **Longitude:** _W155° 14.946_

Mission Date: 11 October 2006_____ **Duration:** _09_ hours _02_ mins

Maximum Depth: _____1167_____ meters

Project Title: Loihi's volcaniclastic deposits: interpreting explosive submarine eruptions and their effects

Principal Investigator: ___Bruce Houghton_____

Address: SOEST, Department of Volcanology, Geochemistry and Petrology

University of Hawaii, Manoa

SOEST, POST Building, East-West Road, Honolulu

Phone: _____

Observer 1: James White_____ **Observer 2:** C. Ian Schipper_____

Address: Geology Department__ **Address:** Geology Department_____

University of Otago___ University of Otago_

Dunedin, NZ_____ Dunedin, NZ_____

Pilot 1: Terry Kirby_____ **Pilot 2:** _____

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

Objectives:

Our program aims to obtain samples of fresh volcaniclastic samples that contain significant numbers of clasts in the 5-20 cm size range, suitable for study of particle density, vesicularity structure, and microlite characteristics that will allow evaluation of the style(s) of eruption that produced the clasts. Subaerial "Hawaiian" and "Strombolian"

eruption styles have been studied using these techniques, and we will test the hypothesis that similar eruptions on Loihi's summit platform are responsible for the volcaniclastic deposits there.

This dive aimed to re-visit the last sample site of dive P4-160, then traverse toward a site previously visited by David Clague in 1998 which was labelled "Deposit G". Our goals were to sample the former site in more detail than was previously possible, and then to locate the 11 meter thick "G" deposit identified in the Batiza, Clague and Head dives in 1998. The site we previously identified as "G" on P4-162 is significantly thinner, though the units present appear to be the same.

Observations, findings, etc:

We used two techniques to obtain samples; 1) valve scoops, which allowed collection of ~ 1 litre volumes of sediment in a sealed container, and 2) sediment scoops, which are obtained by using the manipulators to drive a plexiglass tube into loose sediment, then decant the contents of the tube into the "bio box" in which 15 ~ 1 litre containers are housed.

At site #1 today, we relocated where P4-160 had sampled, and made an extensive sampling (7 large samples) through a thick sequence of fragmental deposits associated with lavas. The deposits are exposed in a sub-vertical cliff face for much of their thickness, which required the pilot to nudge the sub against the face and hold it there while sampling, which was done by scooping up sediment and depositing it into specific bins in the bio-box. All samples were successfully acquired.

Sample site #2 is identical to the second sample site of dive 162, which is related to the Batiza, Clague and Head "G" deposit, is here associated with sheet lavas +/- lobate lavas with drainout shelves. One sample (P4-164-1-A) collected from within the lava stack consists almost entirely of *limu o' Pele*, which are small, thin sheets of glass formed by shattering of cm-scale lava bubbles.

Because we were looking for the 11 meter thick section, we left sample site 2 and traversed for some distance along the exposed face. Because we were nearing the end of our dive time, we stopped at site #3, which is slightly thinnner than site #2, and collected 3 samples through the section using valve scoops.

In a last attempt to locate the thick section, we traversed another part of the exposed face, finally giving up 20 minutes before time to leave bottom. In a section equivalent to #2 and #3, we collected three more samples with valve scoops, then left the bottom.

Observed Species list: *No idea.*

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

No limitations noted. We were able to collect numerous samples of generous proportions with no problems. At one point we decided to place a marker at site #1, and it took some

time to find the desired marker location because it was hidden in a sediment cloud that resulted from our sampling. Other than that small delay, the entire dive and sampling went like clockwork.

Recommendations for corrective action or improvement:

No corrective action. Given the excellent performance, apparent ease of use, and certain isolation of samples from one another, it would be advantageous to have a larger number of valve scoops made up (a dozen or more). These are great devices.

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

The mission was a stunning success.

Excellent sampling was achieved for all sampling targets, and particularly for the very interesting site #1.

List specimens or samples collected on the mission:

Samples are numbered P4-164-1 through P4-164-4. Each number indicates dive number and sample site. Where multiple samples are collected from a site, they are indicated by a letter (e.g. P4-164-2-A).

Site #1, 1168 m, N 18˚, 56.327' W 155˚ 14.829'. It is ~20 meters from site 1 of P4-162, the same as the last sample site of # P4-161, and equivalent to site "D" of the 1998 Batiza, Clague and Head mission. Samples are collected in an upward succession, with sample A below the cliff, samples B-E upward through the cliff, and samples F and G in the slope above the cliff. Total section is 20 meters.

Site #2, 1048.7 m (at sample 2-F) N 18˚ 55.794' W 155˚ 14.778'. This is probably NOT precisely equivalent to site "G" of the 1998 Batiza, Clague and Head mission, because they cite an 11 m thick section, however; this section could not be relocated (see sample site notes for #3 and #4, this dive. Sample A is from a lense within the sheet lavas (+/- lobate w/ shelves; = sample B of P4-162).

Site #3, 1055 m, N 18˚ 55.766' W 155˚ 14.764'. Equivalent along strike of site #2; 3 samples taken in upward succession.

Site #4, 1048 m, N 18˚ 55.813' W 155˚ 14.775' Equivalent along strike of site #2; 3 samples taken in upward succession.

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):

Loihi's volcaniclastic deposits: interpreting explosive submarine eruptions and their effects

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