HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5-644

MISSION STATUS

Location: Nafanua – Vailulu'u East crater (14°12.87'S 169° 03.58'W)

Mission Date: Tuesday, July 4, 2005

Maximum Depth: 984 m

Project Title: Exploration for hot venting at Vailulu'u Seamount; Eel trapping

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Observer 1: Stan Hart
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Scientific Data Acquired: Prepare an abstract outlining your objectives, techniques, findings, etc.

Dive P5-644 was launched on the west summit of Nafanua cone, at 14°12.861'S 169° 03.631W. We reached the bottom at 745m, 9:05AM, and proceeded upslope toward the summit. Swimming eels were first noted at ~ 734m, and eel colonies at ~ 726m. Ambient temperature at 726m was 5.6°C; temperature probe inserted into thick biomat here registered 13.6°C. At 712m, on top of west pinnacle, highly porous basalts were infested with eels. Trap deployed on Dive 642 at Marker 3 was empty; two more baited traps were deployed. Summit of Nafanua consists of at least three separate pinnacles rising some 5-10m above jumbled terrain.

Dive proceeded down SE flank of Nafanua, entering SW reentrant of east crater basin. Bottom here at 938m is tan fine-grained sediment with sporadic emergent basalt boulders. Surface has "pebbly" texture, and is very fluffy, not at all indurated. Temperature probe inserted into sediment records 5.3°C, versus 5.2°C ambient. Explored edges and top of small E-W oriented basalt ridge, the extension of the south crater bench further to the west, in search of vent sites. No venting found, and basalt outcrops were all heavily dusted with sediment. Proceeded east to the juncture of crater floor with east crater wall; fired Niskin bottle at 972m. Sediment plain in this area is smooth, with mild undulations, sporadic boulder outcrops. Subsurface, sediment is layered with blackish silt, possibly

hyaloclastite ash. Area is littered with small (4-6") dead fish in varying states of decomposition; no other signs of life. In advanced stages of decomposition, fish appear on surface as large flattish areas of black and white gelatinous mounds.

Proceeded north along 970m contour at base of east crater wall, then west into deepest part of east crater basin, where the far distal skirt of Nafanua impinges on basin floor. Surface here is a smooth rolling sediment fan covered with a vast area of biomat, with exposed white altered basalt, numerous small fissure and crevice systems. Probe inserted in biomat registered 7.9°C, versus 5.2°C ambient. No shimmering water was noted, though one open fissure appeared to have biomat fragments "floating on air" – possibly these were floating on a brine layer? The visibility throughout this "plain of death" area was 5-7 meters, and seemed better than the higher regions on Nafanua.

Climbed north flank of Nafanua to check eel traps (empty); swimming eels noted at 725m, eel colonies at 720m. Traversed through water column to NW breach, Marker #1– retrieved ADCP. RF-interference between ADCP and sub sonar indicates ADCP still chirping! Black sand bottom with ripple marks spaced 6"-12", punctuated by exposed boulders of tan/white-surfaced basalt. Angle of marker tether indicates moderate current flow into crater. Proceeded on a ESE course down the inner wall of crater, noting cliffs of fractured pillow basalt interspersed with steep slopes of scree and talus. No biomat or macrofauna noted. Pilot noted moderate downward current acting on sub. At 3:35PM, 865m, left bottom for return to surface.

Dive P5-644

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

All equipment operated properly and the pilots used every system expertly and efficiently. Launch and recovery were crisp and flawless. One planned station was not established due to observer oversight.

Recommendations for corrective action or improvement:

A mid-dive change in cruise plan, requested by the surface science team, was awkward and required some quick re-shuffling. Recommend that all invested parties review and certify the cruise plan before launch.

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

We explored almost as much survey area as planned. While no high-temperature focused flow domains were discovered, vast areas of active biomat and diffuse venting were delineated for future attention. The large "zone-of-death" observed in the deep east crater basin was unexpected, and as yet without explanation.

List specimens or samples collected on the mission.

9:05 rock sample #1 at 752m.
11:08 Sediment scoop #10 collected, 939m.
12:00 Niskin bottle fired, 971m. Sample # 644-1
12:50 Suction sample #1, 986m.
14:17 Water sample in small pvc-valve unit, 707m.

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

Bio-Hydro-Lithosphere Interactions on Vailulu'u (project title)

held on July 4th, 2005 (date) in the following way:

a. CTD data by any (date)

b. voice transcripts, video, and still camera film by July 4th, 2007 (date)

c. other rock samples by July 4th, 2007 (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).

Hubert Staudigel and Craig M. Young Principal Investigators