HAWAII UNDERSEA RESEARCH LABORATORY
QUICK LOOK REPORT MISSION NO. P5-309 .

MISSION STATUS

Location: Pele's Pit, Loihi Seamount

Mission Date: Sept. 30, 1996

Maximum Depth: ~1200 m

Project Title: Structure and Composition of Marine Aggregates: Loihi

Principal Investigator: James P. Cowen

Address: Department of Oceanography/SOEST
University of Hawaii
1000 Pope Road
Honolulu, HI 96822

Phone: 808-956-7124

Observer 1: Charles Holloway **Observer 2**: second pilot

Address: as above

Scientific Data Acquired:

The primary objectives were collect flocculent material associated with several subenvironments related to hydrothermal venting: 1) primary microbial matt material generally found within or immediately adjacent to effluent flows; 2) the "nontronite-microbial matts" surrounding many diffuse flow areas; 3) the water column adjacent to and at increasing distance from active venting areas. Specific water column samples desired included water at about 2-5 m above the vent area, in the down draft region that has frequently been encountered on the northern wall of Pele's Pit, the upcurrent (exhaust) region that has been encountered further along the Pit wall (to the southwest), and at several distances above the pit on the order of 25-100 m. The PISCES pump sampler was the main sampler; it was modified in the addition of high surface area excurrent nitex screening to gently screen "in" large flocculent particles. In addition HURL technical support engineers modified the electric pump's power supply line, incorporating an ingenious, field-rigged resistor in a pressure compensated, oil filled container.

Pilots again quickly found the general vent area on the upper north Pele's Pit wall that had been visited the during Dives 304-307. Sampling began immediately. The pump sampler worked very well. Excellent samples of bacterial floc, bacterial floc plus "nontronite", and suspended flocculent material were collected using the pump sampler. Five samples were collected at and very near the vent orifices and three samples were collected in the water column, including an earlier sample from the landing site (the "channel" generally leading from the East Pit to the Pele's Pit). These samples were processed for future laboratory work. Subsamples were treated for carbon/nitrogen, lipid, carbohydrates and analytical electron microscopy. In addition to the pump sampler samples, one niskin bottle and 13 rosette bottle water samples were collected. The Niskin sample was collected directly over a vigorous vent. The other bottle samples were collected near the vent field or in the overlaying water column.

Limitations, failures, or operational problems noted:

All systems worked very well for this dive. The only exception was that 3 of the 16 rosette-mounted water bottles were empty and another 3 were only partially filled upon return to the lab.

Recommendations for corrective action or improvement:

Pump Sampler: I heartily applaud the efforts of the HURL technical staff (especially Craig Okeda and Tym Catterson) for making the temporary modifications to the pump sampler that permitted our study to go successfully forward. For the future I recommend providing a 12 volt line for the pump to accommodate the pump at smaller amperage. Also provide hydraulic pump option; pump needs to be pre-tested for adequate pump rates.

General Recommendation: Scientists should be encouraged to formally confer directly with pilots and HURL staff engineers and technicians with regard to all technical aspects of upcoming dives.

Did the mission achieve its purpose?

This dive was very successful and all samples sought were collected.

Specimens or samples collected on the mission.

8 pump samples of macroparticulate material
- Carbon/nitrogen
- lipids
- carbohydrates
- analyical TEM and SEM (geomicrobiology)

1 niskin sample of vent water
- methane stable carbon isotopes
- bacterial biomass
- analytical TEM and SEM

10 rosetted mounted (top of PISCES) water bottle samples .

Dive PS-309

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 Structure + Composition of Marine Aggregates: Loihi (project title)

held on 9/30/96 (date) in the following way:

a. CTD data by 9/30/98 (date)

b. voice transcripts, video, and still camera film by 9/30/98 (date)

c. other 9/30/98 (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).

James Hawren

Principal Investigator