# HAWAII UNDERSEA RESEARCH LABORATORY
# QUICK LOOK REPORT MISSION NO. P5-307 .

## MISSION STATUS

**Location:** Pele's Pit, Loihi Seamount

**Mission Date:** Sept. 28, 1996

**Maximum Depth:** ~1200 m

**Project Title:** Structure and Composition of Marine Aggregates: Loihi

**Principal Investigator:** James P. Cowen

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**Observer 1:** James Cowen **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 only in the addition of high surface area excurrent nitex screening to gently screen "in" large flocculent particles.

Pilots quickly found the general vent area on the upper north Pele's Pit wall that had been visited the previous two dives. However, the venting was not as vigorous nor the attached bacterial matt abundance as great as recalled from previous two dives. It was

not sampled at this visit because Cowen deemed that there was insufficient primary bacterial matt to make a complete particle sample. We continued looking for previous dive's vent site with its more luxurious bacterial growth, not realizing that we were already there and the dynamic nature of the unstable walls had precipitated a change in the venting site. Subsequently, we could not locate additional venting area nor could we refind the initial vent site. Due to the extreme difficulty of the terrain, the starboard thruster was damaged and the dive was immediately aborted. Attempted to acquire a pump sample during initial ascent, but the the electric pump tripped the breaker in less than 3 seconds.

**Limitations, failures, or operational problems noted:**

Due to the extreme difficulty of the terrain (vertical walls, high relief, overhangs, tight "box-like" canyons, loose gravel and boulders, strong and variable currents) the starboard thruster was damaged and made inoperative. The mission was aborted immediately.

The electric pump (for "pump sampler") kept tripping the breaker after less than three seconds. It was running on a 24 volt battery and drawing ~30 amps. It is a 12 volt pump.

**Recommendations for corrective action or improvement**:

Pilots were very impressive, no corrective action recommended in terms of thruster damage (crew has already repaired it).

Pump Sampler: 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.

NOTE: HURL technical support staff were outstanding in there efforts to correct the pump sampler problem for our next dive, working very long (late) hours to produce operative and creative modification to the pump assembley.

**Did the mission achieve its purpose**?

Unfortunately, the mission did not meet any of its sampling objectives: no large particle (floc) samples were recovered. Due to the untimely termination of the dive, water bottle samples were not obtained.

**Specimens or samples collected on the mission**.

1 "sediment" sample collected with scooper from a recent sediment slide. The slide was characterized by a thin, layered outer crust overlaying the loose, flocculant orange "nontronite" material.

Dive PS-307

# 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: Lahi (project title) held on 9/20/96 (date) in the following way:

a. CTD data by 9/27/98 (date)

b. voice transcripts, video, and still camera film by 9/27/98 (date)

c. other 9/27/98 (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 Haven
Principal Investigator