HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5-498

MISSION STATUS

Location: Loihi Seamount: Markers 18, 48, and the Pit

Mission Date: Monday, November 11, 2002

Maximum Depth: 1328 m

Project Title:

Principal Investigator: Dr. Hubert Staudigel

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

This was a very ambitious dive from the start. We had many objectives we wished to complete. Our original plan was to dive to Marker 18 and deploy several charges both from Woods Hole Oceanographic Inst. (WHOI) and Scripps Institute of Oceanography (SIO), which I will describe later. We were also to pick up some previous exposure experiments of Hubert Staudigel's that were exposed for one year at Marker 18. This portion of the dive went very well. The dive started at 8:43 a.m. We arrived at Marker 18 at 10:27. We were able to retrieve HS's exposure experiment and place it in the biobox, while deploying two WHOI experiments (4, 7) and three SIO experiments (10, 11, 12). We also used a ball valve scoop (6) to collect samples from the surrounding area. A slurp gun sample was also taken and loaded into bottle #1. Black glassy sand was present in both slurp and scoop samples. We also grabbed three rocks from the ocean floor that looked like fresh glassy, basaltic material and placed them in the exposed basket for transport to the surface.

From Marker 18, we ran through the shoot and landed in the middle of the pit at 1328m and 12:08. Here we attempted to take a push core, but only succeeded in digging in approximately 3". Unfortunately, the Titan arm on the sub started shaking and ended up shaking the entire sample out of the push core. Only small

amounts of rubble remained in the core. We also took a slurp gun sample of the bottom silt into rosette bottle #4.

From the pit, we headed to Marker 42 and the "Boiling Pot" at a depth of 1311m and a time of 12:58. We confirmed that the boiling pot is no longer active due to a recent rockslide. We picked up a shiny rock that appeared to have lots of sulfides growing on the outside and placed it in the open basket.

We next headed to Marker 48 at a depth of 1268m, which is a vent site with lots of microbial mat and slow venting. We arrived at 13:32. We placed the temperature probe in the sediment and took a reading of 73.3°C with an outside ambient temperature of 3.8°C approximately 1-2" above the vents. We took two more ball valve scoop samples (4, 5). Scoop 4 was taken in a black sand venting region. Scoop 5 was more mat material. We also took another temperature probe and noted 75.6°C. We also triggered the Niskin bottle with vent water flowing through. We were able to deploy WHOI #3 and SIO #4, 5, and 6. We also took a slurp gun sample in rosette bottle #5. Unfortunately, a bolt on the fingers of the Titan arm had shaken loose in all the rattling associated with the Titan arm and fell into the basket, so we had to cease all operations with the Titan arm.

From Marker 18, we started ascending up "Hilolo Tower" and finally summated at 1201m. A lot of venting was seen all over the summit with small finger chimneys prevalent. We then crossed to the north wall and again ascended while noting a particularly active venting site, albeit slow venting, at 1130m where we had a position taken by the KOK. Lat: 18°54.549' Long: 155°15.454' Lots of microbial mats were present in a yellow and reddish color. We finally left the bottom at a depth of 1047m at 15:32.

We did run out of time at the end which made us miss our only uncompleted objective which was to run back up to Pisces Peak and deploy one more WHOI charge. But the problems with the Titan arm did not allow for that possibility even if we had more time. Even with this objective not completed, we had an extremely successful dive!!! Lots of fun!

Charges deployed:
SIO: 3" diameter ABS tubes drilled and ventilated with basalt, granite, schist, and marble weights in the bottom. Thin sections of rhyolite and basalt were in all charges with reduced and oxidized basalt thin sections in charge #5. Seven sashays are filled with different minerals and sewn together with nylon thread (basalt, olivine, quartz, oxidized basalt, reduced basalt, manganese-doped basalt, rhyolite). All charges were sewn together with fishing line.

WHOI: White 3" diameter containers with black mesh on the top. Several different thin sections screwed to a weight with nylon screws.

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

The only problem that occurred with this dive was that the Titan arm was very jittery and ended up losing a bolt which caused the loss of the mechanical arm.

Recommendations for corrective action or improvement:

Check the arm before going down to ensure proper functionality.

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

I believe this to be a VERY successful mission. The arm did not stop working until we were done with 95% of the work we had planned. Terry and Steve did a great job even with the arm on the fritz and we accomplished almost all of our objectives. It was an ambitious dive to start with, so the last deployment of one chamber was insignificant compared to the amount of samples that we obtained.

List specimens or samples collected on the mission.

Deployments:
Marker 18: WHOI #4, 7. SIO # 10, 11, 12
Marker 48: WHOI #3, SIO #4, 5, 6

Sample pickups:
Slurp Gun: #1 at Marker 18, #4 in the pit, and #5 at Marker 48
Whole rock samples: three basalt rocks at Marker 18, one basalt rock with sulfide in the Pit.
SIO scoop samples: scoop #6 at Marker 18, scoop #5 at Marker 48, scoop #3 at Marker 48
Niskin bottle: Marker 48 vent water

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)

held on November 11, 2002 (date) in the following way:

a. CTD data by_____(date)

b. voice transcripts, video, and still camera film 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