HAWAI'I UNDERSEA RESEARCH LABORATORY
QUICK LOOK REPORT
DIVE: P5-615

MISSION STATUS

Location: Monowai, Kermadec volcanic arc

Latitude: ***Begin*** 24° 48.213'S **Longitude:** ***Begin*** 177° 10.005'W

Mission Date: April 10, 2005 **Duration:** 5 hours 34mins (Bottom Time)

Maximum Depth (m): 1228m

Project Title: New Zealand American Submarine Ring of Fire Leg II

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Pilot 1: Terry Kerby **Pilot 2:** None

Scientific Data Acquired:

Objectives:
The goals of this dive were to (1) Sample vent fluids at the top of Mussel Ridge, (2) Sample hydrothermal animals and possible sulfides on the top of Mussel Ridge, and (3) Conduct an Imagenex sonar survey over Mussel Ridge.

Observations, findings, etc: (Also see Appended Dive Log)

Started dive near Marker 8 on the NE slope of the volcanic ridge that the previous 3 dives have been. Headed upslope to top of the ridge, collecting samples along the way. The Imagenex scanning sonar was on the sub for this dive, but we could not establish communication with it, and so no sonar data were collected. Instead we explored the cone located NW of Mussel Ridge and found another distinct biological community on the southern flank.

Species List: (seen & sampled)

Unknown small gastropods
Paralomis sp.
Rattails *(Coelorinchus innotabilis* and *Coryphaenoides* sp.)
Bathymodiolus sp.
Anemones
Vestimentiferan worms (*Lamellibrachia* sp.?)
Large jellyfish
Stalk barnacles (*Vulcanolepis osheai*?)
Chaceon sp.

MISSION EVALUATION:

A. Limitations, failures, or operational problems noted:

On this dive the video recorder was only recording in black and white due to a loose connection. Also the Fornari digital still camera was not turned on until very late in the dive, so the only digital still for most of the dive are from the handheld camera. Finally the CTD data was not written to a file at the end of the dive, so there is no digital record of sub depth during the dive. Imagenex sonar system did not operate.

B. Recommendations for corrective action or improvement:

Attend to the above system faults.

C. In your opinion, did the mission essentially achieve its purpose?

Not quite – because the sonar mapping survey not undertaken.

D. Compare actual work accomplished with the work that was expected to be accomplished.

No sonar mapping survey undertaken as expected.

E. List specimens or samples collected on the mission. (See Sample List Below):

		10-Apr-05	Time Zone: -11		
Sample Number	**Time (L)**	**Latitude**	**Longitude**	**Depth(m)**	
		Min/decM	**Min/decM**		**Comments**
		25degS	**177degW**		
PV-613-1-MIN	11:12	48.255	10.110	1143	Sulfur crusts sampled in sediment corer
PV-613-2-B	11:15	48.255	10.110	1143	Biology grab of tubeworms, crabs, mussels, anenomes
PV-613-3-MS-Blue	12:32	48.367	10.173	1025	Vent fluid from top of

					ridge, T=13.2C
PV-613-4-GT-Black	12:43	48.367	10.173	1025	Vent fluid from top of ridge, T=13.2C
PV-613-5-GT-Red	12:48	48.367	10.173	1025	Vent fluid from top of ridge, T=13.2C
PV-613-6-R/B	13:34	48.323	10.149	1038	Rock & mussel from outcrop at top of ridge
PV-613-7-SS1	15:37	48.133	10.513	990	Suction sample of yellow fluffy bacterial mat; small vents at base of large pillows, T=11.0C
PV-613-8-R	15:31	48.133	10.513	989	Rock with yellow iron oxide stain from top of cone

Time (L)	Z (m)	Lat. -25	Long. -177	Observations
9:27	0			Pisces in the water at surface
10:16	1228	48.213	10.005	On bottom, ~150 m south of drop target in muddy sediments. Stirred up a bunch of sediment. Waiting for it to settle. Small gastropods all over slope.
10:22				Going to head upslope, then contour to Marker 8
10:37	1165			Very cloudy water at first, but now it's clear water. Contouring to the northwest. Range to Marker 8 is 90m. Rattail fishes frequent, *Coelorinchus innotabilis* and *Coryphaenoides* sp.
10:44	1166			White deposits on the slope & shrimp & crabs. This is the first signs of venting. Seeing sulfur crusts.
10:48	1165	48.230	10.070	At Marker 8. The current is to the south.
10:51	1165			Continued NW from Marker 8 at same depth to see the extent of the venting. It diminished rapidly just past Marker 8 (10m or so)..
10:52	1165			Turning around to drive back SE toward Marker 8.
10:53	1168			Back at Marker 8. Venting area is only 20-40 m wide (E-W) around Marker 8
10:54				Turning to head upslope toward top of ridge.
10:56	1153			Sediment on slope looks darker. Lots of sulfur crusts and venting areas, mostly around rocky outcrops. Lots of *Paralomis* crabs.
11:04	1143	48.255	10.110	At rocky outcrop with sulfur, tubeworms, etc. Sampling.
11:12	1143	48.255	10.110	Sample 1 (PV-615-1-MIN). Sulfur crusts from a large outcrop sampled with the sediment corer.
11:15	1143	48.255	10.110	Sample 2 (PV-615-2-B). Biology grab sample of tubeworms, mussels, crabs, anenomes, etc.
11:26	1143			Sampling done. Heading upslope toward top of ridge. Waypoint 2 at the top of the ridge is at a range of 240m and a bearing of 218.
11:39	1095			All rocky outcrops have venting and biota. Visibility suddenly bad (cloudy).

11:42	1078			Just saw depression a few meters across with very cloudy white milky fluid coming out of it. Very different than anything else we have seen!
11:43	1072			Pillows
11:47	1069			Video of small live tubeworms (can see the red tips)
11:59	1037			On bottom covered in a sheet of mussels as far as we can see. No obvious shimmering water, but we put the temperature probe down in the sediments and got a temperature of 9.8C. Probe is about 1 foot long and was pushed all the way down into the sediments. Ambient temperature is 4.1C.
12:05				Good visibility. Some outcrops appearing now after interval of seeing none.
12:10	1025	48.367	10.173	On bottom at small vent at top of ridge near Waypoint 2. Looks like a good fluid sampling site.
12:17				End video tape 1. Start video tape 2.
12:19	1025	48.367	10.173	At very top of ridge. On bottom for water sample. Max temp with temperature probe is 13.2C (ambient=4.2)
12:26	1025	48.367	10.173	Tried to use White Major Sampler, but it didn't trigger. Pushed trigger in, but it wouldn't release.
12:32	1025	48.367	10.173	Sample 3 (PV-615-3-MS-Blue). Tripped Blue Major Sampler.
12:43	1025	48.367	10.173	Sample 4 (PV-615-4-GT-Black). Tripped Black Gas Tight.
12:48	1025	48.367	10.173	Sample 5 (PV-615-5-GT-Red). Tripped Red Gas Tight. We weren't sure that it tripped because we couldn't hear it, but it turns out that it had. Tried to actuate it several times to be sure.
12:57	1025	48.367	10.173	Stowed all sampling bottles in basket. Short break for lunch.
13:11	1025			Driving to NW to look for possible sulfide stumps seen on the first dive. Couldn't find anything that looked like sulfide.
13:34	1038	48.323	10.149	Sample 6 (PV-615-6-R/B). Rock from outcrop with mussels on it sticking up from the surroundings at the top of the ridge. This is like the ones seen on the first dive that were thought to possibly be sulfide, but they are clearly lava under the mussels. One mussel was attached to the rock.
13:40				Heading to start of Imagenex Line 1. Range and bearing is 295m at 252deg
13:46				Time on CTD computer is 33 seconds slow compared to the "mission time" on the other in-sub computer. Also the depth read-out on the CTD is 7m shallower than the other depth sensors.
13:54				Range and bearing to Line 1 is 100m at 269deg.
13:59				Range and bearing to Line 1 is 49m at 270deg.
14:03				Range and bearing to Line 1 is 25m at 260deg.

14:04				Clock on Imagenex laptop is 2 sec slow compared to "mission time" in the sub. Sub in position at NW end of Line 1, about 20-30 m above the bottom.
14:05				Started file of sub heading at 14:05. Range and bearing to end of Line 1 is 408m at 129deb. We are at the start of line 1, but having trouble getting the laptop to communicate with the Imagenex sonar.
14:17	1144	48.320	10.341	After many attempts to communicate with the sonar, we are giving up. Cannot communicate with the sonar. Sub is now on the bottom. The sub is also running low on power.
14:25				Decided to head for Waypoint 4 at the top of the cone NW of Mussel Ridge, which has not yet been visited. Range and bearing to WP4 is 457m at 316deg.
14:27				End video tape 2. Start video tape 3.
14:31				Encounter with large jellyfish. It was right in front of the pilot's viewport, so got some great video and handheld pictures.
14:36	1157			Leaving jellyfish. Continuing on a heading of 316deg toward the top of the NW cone.
14:38	1163			In sedimented flat between Mussel Ridge and the NW cone. Going up slope of NW cone.
14:40	1134			Sandy slope. Some mussel shell debris in narrow drainages.
14:42	1108			Steep slope. Not many outcrops. Scattered rattails.
14:44	1087			First signs of vent animals: mussels. More surface crusts and yellowish deposits.
14:45	1078			Came into a dense biological community. Rock outcrops covered with stalked barnacles, which we have not seen before. Crabs are large *Chaceon* which were infrequent on Mussel Ridge.
14:46				Area of mostly mussels with small tubeworms, crabs (*Paralomis* on mussels), and gastopods. Can see shimmering water and discoloration on the slope. More barnacles.
14:47	1062			Cloudy water. Rocky outcrops. Temperature measurement in small rock pile with small live tubeworms showed 11.7C (ambient is 4.1C).
14:54	1054			Moving upslope again. Scattered fauna.
14:55	1039			Range and bearing to WP4 is 194m at 339deg
14:56	1039			Stopped at the top of this ridge to get a position. Very different fauna here than on Mussel Ridge.
14:57	1039	48.242	10.515	Position at top of ridge located south of the top of the NW cone. Still in dense biological community.
15:02	1061			Topped over the ridge heading N, and went down 20 m. In the bottom of a saddle. Going back upslope again.
15:05	1052			Muddy slope, suddenly no biota. Now not much shell debris coming down from upslope.

15:08	1019			
				Nothing on pillow rock outcrops except large anenomes.
15:10	1004			Very large pillows (2-3 m across). Very small ?stalked barnacles on them.
15:12	1004			There is orange bacterial staining around the base of the pillows. Looks very fluffy and is probably evidence of low-level active venting.
15:15	984			Big crabs of a different species (*Chaceon*) that we have seen on Mussel Ridge.
15:16	978			Starting to see shell debris
15:18	977	48.130	10.530	We are at Waypoint 4 at the top of the NW cone. Set down for a minute, then continued north.
15:22	979			Talus on N slope.
15:24	983			Small pockets of white mat. Rock strewn slope. Must be a little venting. A few shells on slope.
15:27	990			Mostly pillows and large anemones
15:29	990			Orange staining and fluffy bacterial mat on the bottom of pillows again. We are in about the same place as we were when we saw them before. We went over the cone summit then contoured back around.
15:32	990	48.130	10.530	Temperature measurement of 11.0C (ambient = 4.2). Temperature probe is at the base of a pillow with orange mat. There is no other biota visible here. We are right near WP4.
15:37	990	48.130	10.530	Sample 7 (PV-615-7-SS1). Suction sample into bottle 1. Orange mat collected at the base of a pillow.
15:44	989	48.130	10.530	Sample 8 (PV-615-8-R). Rock sample of lava with yellow iron oxide stain taken at same site as suction sample.
15:49	989			Dropped weights. End of dive.