

**HAWAI'I UNDERSEA RESEARCH LABORATORY
QUICK LOOK REPORT
DIVE: P5-612**

MISSION STATUS

Location: Monowai Volcano, Kermadec Arc

Latitude: Begin 25° 48.040'S

Longitude: 177° 10.32'W

Mission Date: April 07, 2005

Duration: 5 hours 40mins (Bottom Time)

Maximum Depth (m): 1372

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

Principal Investigator: Bob Embley

Address: NOAA/PMEL, 2115 SE O.S.U. Dr., Newport, OR 97365

Phone: (541) 867-0275

Observer 1: Bob Embley

Observer 2: None

Address: Same as above

Address: --

Pilot 1: Terry Kerby

Pilot 2: Steve Price

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

Objectives:

- (1) Explore the volcanic ridge at SW area of caldera of Monowai Volcano
- (2) Recover geologic, biologic and fluid samples, make video and camera surveys

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

The dive began on the floor of the caldera near a SW-NE trending tectonic ridge that extended from the central cone of the caldera floor into the SW wall of the caldera. The plan was to proceed upslope to the SE to the top of the NW-SE trending volcanic ridge where mussels had been dredged by the New Zealand Research vessel *R/V Tangaroa* in 2005. A constant heading to the SE was not obtained because of faulty compass readings and the dive track veered South to Southwest (the navigation fixes were called down from the surface). A traverse upslope towards the target ridge passed over alternating areas of pillow lavas, heavily sedimented areas and talus slopes. At about 1200 meters

depth, those portions of the lavas not covered with sediments were colonized by dense communities of small bivalves and limpets. At 11:37L PISCES V changed course to the SE to traverse directly upslope to the crest of the target ridge. At 11:53 at a depth of 1078, swarms of shrimp were observed on the ledges of outcrops and at 12:26 at 1056 m dense mussel beds and swarms of crabs and shrimp were observed. The remainder of the dive occurred at the top of the ridge. The mussel beds were mapped for more than 300 meters along the crest of the ridge to the southeast before. In places the mussels almost completely covered the seafloor. The crab population was very large, and competition for space on the mussel beds was fiercely contended. Samples of mussels, rocks (with animals attached) and whelks were collected during the dive.

Species List:

Don't know all of species found. Mussels, crabs, octopus, shrimp, whelks, limpets, other bivalves, other.

MISSION EVALUATION:

A. Limitations, failures, or operational problems noted:

- None

B. Recommendations for corrective action or improvement:

- Gyrocompass would be a good improvement

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

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

- Same

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

Sample Number	Time (L) Time Zone -11	Latitude Min/decM 25degS	Longitude Min/decM 177degW	Depth(m)	Comments
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PV-612-1R/B	1105	48.040	10.320	1198	<i>Diver: R. Embley</i> Rock with animals (limpets?)
PV-612-2R/B	1210	48.300	10.260	1070	Top of lava flow with limpets?
PV-612-3B	1240	48.330	10.250	1050	mussels
PV-612-4R	1321	48.370	10.180	1029	Gray Rock
PV-612-5B	1336	48.340	10.200	1026	Large Mussels
PV-612-6B	1434	48.410	10.040	1111	Whelk

Dive Log PV-612

7-Apr-05

Pilot - Terry Kirby

Co-Pilot - Steve Price

Observer - Bob Embley

Note: GMT: -11; e.g., 10:00 a.m. Local = 2100 GMT

Time (L)	Z (m)	Lat.	Long.	Observations
		-25	-177	
10:09:00	1372	47.738	10.253	On Bottom
10:17:00				Sedimented slope with some pillow outcrops looking at long pillows covered with sediments Still at landing place
10:18:00				Discussion about Waypts. Tracking doesn't have them
10:21:00				begin moving south; sedimented talus slope
10:22:00				Nice Pillows; sponges and anenomes where there is bare rock ; Extensive outcrop here
10:24:00				Same but more truncated pillows with elephant-skin morphology; Terry sees bivalves (limpets?)
10:26:00				Looking pillow tubes with sessiles on truncated lobes have anenomes; see small white bivalves; Nice video Nice video of pillows; also good still pictures??
10:27:15				Start moving south again; saw beautiful pillow skin
10:27:15				
10:29:20				See pumice? Stopping briefly
10:30:00	1356			Begin moving upslope to south again; still lot of sediment Big venusflytrap anenome
10:31:00				Hesitating again, then moving
10:32:15				On bench, going off bottom towards next target: 50 m
10:33:00	1321			15 m off bottom, going south
10:24:15				
10:35:00				Wall in sight; more pillow tubes in place
10:36:00				Holothurian; lots of sediment
10:36:30				Climbing steep slope
10:37:30				Going up heavily sedimented slope
10:38:15				Big hole - possibly collapse
10:38:45				Heavily sedimented slope; no outcrops
10:40:00				Off bottom a few meters
10:41:00				

Time (L)	Z (m)	Lat.	Long.	Observations
10:41:45				Wall 60 m ahead
10:43:00				Off Bottom going south towards wall
10:44:00				Realized compass is off: going more west
10:45:00	1294	47.877	10.284	Stopped on heavily sedimented slope to get fix
10:50:15				Moving south again; up in water column a few m
10:53:00				Slowly moving south?
10:54:30				Moving south again over talus chutes interspersed with sediment
10:55:45				Moving some fresh talus chutes broken by sed covered areas
10:56:45				Mostly sediment covered with some talus
10:57:30				More talus with old sedimented pillows between
10:58:00				Solid talus, some large pillow fragments; talus chutes have different size pieces
11:00:00	1224	47.877	10.284	Over slope completely covered with pillow talus, mostly old
11:00:45				Over slope completely covered with pillow talus, mostly old
11:01:30				Still talus with some pillows; going SSW (but supposed to go SSE either current or bad compass
11:02:30				Talus
11:03:45				go back and forth from talus to sedimented slope
11:04:20				Fresh surfaces on rocks covered with small bivalves (limpets?)
11:05:00	1198	48.045	10.318	Stopping to get fix on slope with alternating talus and sed
11:07:00				Getting fix Sample PV-612-1R/B; piece of old weathered vesicular basalt with from talus with small bivalves
11:14:15				Start moving south again
11:15:00				Talus faces completely covered by bivalves
11:15:30				Stopping to look at octopus with big eyes Good video and pictures
11:17:00				Turned data frame off to get good video of octopus
11:17:45				Moving on south again upslope
11:18:00				Heavily sedimented old talus
11:20:00				Stopped to see another octopus- even bigger eyes all rock faces have sessiles Great video of octopus (same species as previous?)
11:20:20				took data off video to get best.... Put on lower light
11:22:45				Put data back on
11:23:15				Moving upslope again
11:23:35				See crab
11:23:47	1172			Heavily sedimented with some outcrop or large talus
11:25:00				Heavily sedimented; some anenome, fish; sessiles coat rock faces
11:25:30				Ripple marks at high angle to slope
11:26:02	1156			Heavily sedimented with some outcrop or large talus
11:26:30				More ripple marks
11:27:15				Large field of ripple marks
11:28:00	1150			Still ripple marks
11:30:00				Ripples, continuous sediment cover
11:31:00	1141	48.18	10.337	Stopping to get fix
11:36:35				Moving south again
11:37:15				Over talus and sediment alternately

Time (L)	Z (m)	Lat.	Long.	Observations
11:46:45				Has been mostly sedimented slope- flying pretty high off bottom
11:47:22	1127			Nice big ripple marks; heading 135, not sure it's accurate
11:48:30				Shell debris in scour channel
11:50:00				Mostly rippled and scoured sedimented terrain with occasional outcrops; outcrop faces completely covered with sessiles
11:51:30				More rock outcrops; nice picture of faces covered with bivalves
				Observations
				Nice video of faces covered with animals
11:53:30				Beautiful ripples and channel with shell debris inc. crab parts
11:54:00				More dead crabs or shed parts
11:54:45				More outcrops; outcrop faces completely covered with sessiles
11:55:10	1078	48.316	10.262	Stopping -Tubular pillows with shrimp swarms under ledges and Stopping; this is the spot that Fornari camera took great pics. No obvious flow here
				Good video and pictures of pillow tubes
12:02:33				Manuvering around big pillow tubes looking for sample place
12:03:40				Close in view of pillows.
12:05:00				Taking sample of basalt crust with animals; put in biobox
				Sample PV-612-2R/B
12:20:10				End Station; Start upslope over solid pillow tubes; lots of shrimp and sessiles on rock faces; Pretty steep slope
12:21:30				See small reddish brown mats, oxides.
12:22:15				Small dead oxide chimneys?; mostly sediment covered now
12:23:00				Over the crest and onto bench or dropoff
12:24:45				Pillows with lots of animals all over faces
12:25:00	1056			
12:25:30				Seeing some bivalves on rock
12:26:35				Stopped to look at mussel clumps; definite venting
				On NW side of ridge. Lots of shrimp.
12:28:10	1050	48.334	10.25	
12:29:05				Still at same spot
12:38:00				Same spot
				Collecting mussels into biobox
				Same spot
				Sample PV-612-3B; mussels
12:43:20				Still at same spot ; view of slope in front with anenomes, mussels, crabs etc.
12:43:45				Moving upslope a bit to look at another spot to take temperature
				Lots of crusts
12:44:45				Stopped a few meters from Sample 2 spot
12:45:00				Moving upslope again; gets more sedimented again
12:46:05				Seeing whelks on sediment surface
12:47:15				outcrop covered with shrimp and mussels
12:47:20				Nice video of outcrop with biota; data off for a couple of spots (GOOD VIDEO CLIP)
				No sign of any shimmering water.
12:48:00				Going to try Fornari camera; Data frame off again
12:50:00				Start moving again
13:51:00				Moving over sedimented terrain
12:51:28				Crossed boundary with solid mussel base, not much sediment or rock

Time (L)	Z (m)	Lat.	Long.	Observations
12:53:30	1040			visible Vast plain of mussel beds and their companions Lots of crabs, shrimp; lot of open valves, probably from crab feasts
12:52:50	1040	48.337	10.23	Stopped for position
12:56:44				Just got position
12:59:30				Start moving again
12:59:45				A bit patchier now
13:00:30				Thicker
13:01:40				Are currents delivering the gases? Haven't seen any sort of venting; 7 m of altitude
13:02:40				Extensive cover again
13:03:20				Nice video of mussel mound
13:03:30				Stopping to look at venting ; beautiful view of biology
13:06:00				Manuvered around to vent from other side; microbial mats
13:11:50				Moved around again; stirred everything up
13:15:15				manuvered and waiting for cloud to dissipate to get temperature Max T = 10.1 deg C
13:20:00				Some excellent video of vent biology
13:23:30				Sample PV-612-4R. Took sample of grey rock
13:24:00				Going to change soda-sorb
13:27:30				Moving towards top; Over dense biology
13:28:45				Stopping at another vent; very thin tube worm bunches
13:31:00	1026			Taking temperatures; Taking temperature of fluids coming out of outcrop of grey rock; 8.6 deg C highest T
	Shallowest point on dive			Took a few tubeworms; hardly any made it into the biobox
				Sample PV-612-5B; Large clams and a few tubeworms
13:37:50				Area of greyish rock with water coming out
13:38:30				moving north; lose bottom as it drops off to NW
13:39:15				A few larger tubeworms
13:42:30	1028	48.341	10.204	More venting; still very dense; stopped for position
13:45:45				Begin moving again- going E
13:47:00				Seeing chimney type structures, still lots of biota
13:50:00				Bottom drops off
13:50:40				Can't see bottom, heading East; can
13:51:50				Start moving SE; seeing dense biota and chimney structures; lot of vent fish/eels
13:52:00				Dense biota, see chimneys; stop for a minute
13:53:00				Saw another old chimney-like structure
13:53:30	1028	48.369	10.133	Stopped to get position; dense biota here
13:56:40				Begin moving again
13:57:45				Start going SE
13:59:00				Off bottom
13:59:10				Bottom in sight; lots of biota still
14:00:00				Just saw another large structure, still lots biota
14:01:20				Still lots biota; on and off bottom
14:02:25				Going S even though he's steering SE
14:03:00				Off bottom; can't see anything
14:03:45				End Tape 2 of 3; off bottom

Time (L)	Z (m)	Lat.	Long.	Observations
14:05:00				Begin Tape 3 of 3
14:05:30				On bottom, still dense biota
14:06:20				Turning to continue SE
14:08:00				In cloud of stirred up stuff; can't see much, turning
14:10:00				Can't see bottom, heading SE; going to sit and get a position
14:10:50	1069	48:132	10.111	On bottom, no biota; going to get position
14:13:30				Lift off bottom and start moving
14:15:10				Start moving upslope to north
14:16:00				Can't see bottom
14:17:30				See bottom again-still sedimented, no vent biota some burrowing
14:18:10				Saw a few shells
14:19:00				Seeing whelks on sediment surface
14:20:20	1045			Seeing patches of mussels and others; patchy
14:21:15				Still sitting at site; want to go East
14:22:00				Back in thicker mussel beds
14:22:45				Lost bottom for a bit, now seeing mussels again
14:24:30				Seeing dense mussel beds here; ~2 m off bottom
14:24:50				Losing bottom again; going SE
14:34:45	1111	48.407	10:043	On bottom again; several whelks, mussel shells; on periphery of venting Sample PV-632-6b ; Whelk shell in biobox
14:41:45				Start moving again
13:42:20				Back into patchy stuff
14:43:00				Stopped briefly to take video of closed anemone
13:44:00				Start moving again
14:44:45				Going upslope up biodebris channel? Going south upslope
14:48:50	1085			Going south; patchy stuff, not sure how much is alive Most dead
14:50:20				At outcrop with live shrimp; overhang bumped into
14:51:25				Getting near or at top; pretty barren, but debris must have come from somewhere
14:53:10				Going to get position; can't see bottom now
14:56:30				Seeing bottom, some shrimp
15:05:00				Been maneuvering, now briefly see sedimented bottom
15:11:20				On bottom again; sedimented with pillow outcrop, no venting
15:12:50				At SE end of ridge; no biota here
15:13:00	1061			No animals here
	1077			back on bottom after being lost in clouds
15:26:00				Rocks covered with shrimp, but no mussels
15:28:30	1070			Up off bottom again
15:32:15	1057			more biota
15:32:45	1053			Back into thick live mussel beds
15:33:20	1052			Stopped in mussel beds to get final position Tripping majors
15:48:45				Off bottom; End Dive PV-612

