

HAWAI'I UNDERSEA RESEARCH LABORATORY
QUICK LOOK REPORT
DIVE: P5-624

MISSION STATUS

Location: Rumble V, Kermadec Arc

Latitude: *Begin* 36° 08.546'S

Longitude: *Begin* 178° 12.169'E

Mission Date: April 30, 2005

Duration: 6 hours 32mins (Bottom Time)

Maximum Depth (m): 651m

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

Principal Investigator: Bob Embley

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

Phone: (541) 867-0275

Observer 1: Ashley Rowden

Observer 2: None

Address: NIWA, PO Box 14-901, Wellington, New Zealand

Pilot 1: Terry Kerby

Pilot 2: Colin Wollerman

Scientific Data Acquired:

Objectives:

The goals of this dive were to (1) Explore Rumble V cone, (2) Sample hydrothermal rocks, minerals, fluids, animals and deposits

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

Landed someway SE of proposed landing point (WP1) at 08:52 at 651m. Moved towards WP1 over dark sediment with occasional small patches of yellow. Benthic fauna generally sparse, although there was area of large seapens and small white urchins on a low ridge. After reaching vicinity of WP1 changed direction to move upslope towards summit of cone. Encounter on route, first dead *Gigantidas gladius* (mussel) shells, and then area of diffuse venting characterised by live *G. gladius* and predator red seastar *Rumbleaster*. Place Marker 15 here at 452 m (is the same vent site as discovered on dive 622). Continue to move upslope (NW) and mussel bed starts to run out at 430m. At 413m encounter small white patches where shimmering venting occurring. Move towards summit in hope of finding more active venting. At summit (approx 370m) see a number of large 2+m high pinnacles (old chimneys?) from the bases of which venting is taking

place, marked by white'/yellow slashes on pinnacle sides. Unfortunately, pinnacles are strewn with old fishing lines (like a cobweb). Entanglement hazard sufficient to make sampling these vents too dangerous to even consider. Move downslope towards NW. At 379m find white patches and shimmering venting from cracks beneath rocks, cracks coated in white (bacteria?) and yellow (sulphur?). Vent fauna characterised by alvinocarid shrimp (*Alvinocaris niwa?*) nearest to vent, and then 50cm away *G. gladius*, sm. white anemones, gastropod (brown banded) whelk-like predator. Sample vent fluids. Temp=39.7C. This vent site also had fishing lines present. Move downslope (southwards) encountering small patches of mussels and red seastar. Once reached 452m contour place Marker 16 (to act as future guide upslope to venting just beneath summit). Begin to circumnavigate (anticlockwise) cone along 452m contour (below fishing line hazards but at depth which diffuse venting occurs - judging by occurrence of mussels at Marker 15) to explore remainder of cone. Encounter yellow/brown patch of bacteria and crust, sample some of this material and fluid where coming out of cracks, Temp= 22C. Pass Marker 15 (and note that mussel bed here is about 20m wide). Thereafter substrate is of dark sediment (tallus) which is densely populated with sm. white anemones (indicative of diffuse venting?) but not much other benthic fauna. On north side of cone come across another mussel bed - but here no *Rumbleaster*, rather main predator appears to be gastropod (*Fusitriton?*), also there are numerous sm. orange seastars. Bed is similar in dimensions to one at Marker 15. Also on north side of cone encounter fresh looking band (20m) of lava pillows. Pillows have anemones on them, inc. a large white/purple species. Numerous fish (roughy and alfonsino?) also associated with pillows. On remainder on track along the 452m contour the pattern is repeated: dark sediment sparse fauna (though in some places masses of sm white anemones) with patches of yellow/brown bacteria/crust, sometimes smaller white patches. Arrive back at Marker 16 at 15:24 to complete dive. Leave bottom at 15:31.

Species List:

unknown spiny crab
unknown stalked barnacle (on spiny crab)
unknown small orange seastar
unknown large white/purple anemone
large gastropod – *Fustriton?*
Gigantidas gladius (& commensal scale worms)
large turban-shaped gastropod
unknown hydroid
unknown small white anemone
unknown amphipod
unknown small white limpet
unknown banded whelk-like gastropod
Alvinocaris niwa
unknown large polychaete

MISSION EVALUATION:

A. Limitations, failures, or operational problems noted:

None

B. Recommendations for corrective action or improvement:

Probably not possible – but observer position means neck is strained – lowering the bench or raising the port would help.

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)	Latitude	Longitude	Depth(m)	Comments
		Min/decM	Min/decM		
		36°S	178°E		
PV-624-1-B	9.51	8.380	12.000	497 large polychaete feeding on dead crab	
	10.09	8.432	11.863	452 MARKER 15	
PV-624-2-B	10.57	8.362	11.744	379 sm. <i>Gigantidas gladius</i> mussels (vent temp = 39.7C)	
PV-624-3-SS #1	11.05	8.362	11.744	379 vent shrimps (? <i>Alvinocaris niwa</i>)	
PV-624-4-SS #2	11.06	8.362	11.744	379 vent shrimps (? <i>Alvinocaris niwa</i>)	
PV-624-5-R	11.07	8.362	11.744	379 white/yellow rock from vent	
PV-624-6-MS #Y	11.12	8.362	11.744	379 major fluid sample (yellow)	
PV-624-7-GT #Y	11.15	8.362	11.744	379 gas tight fluid sample (yellow)	
PV-624-8-MIN #1	11.34	8.378	11.733	390 white sediment, gastropod, sm. white limpets	
PV-624-9-B/R	11.40	8.378	11.733	390 rock with white covering, sm. white limpets	
PV-624-10-MIN #4	12.09	8.394	11.733	414 red/yellow crust, anemone	
PV-624-11-R	12.09	8.394	11.733	414 brown rock	
PV-624-12-SS #3	12.14	8.394	11.733	414 crustal material, sm. seastars	
PV-624-13-SS #4	12.16	8.394	11.733	414 crustal material, sm. seastars	
PV-624-14-B/R	12.31	8.445	11.729	452 brown/black rocks, hydroids, sm. Anemone [MARKER 16]	
PV-624-15-SS #5	12.49	8.449	11.723	453 sm. white chimneys, fil. bacteria, & crust	
PV-624-16-MS #B	13.09	8.449	11.723	454 major fluid sample (blue) at vent (vent temp = 22.0C)	
PV-624-17-B	13.40	8.293	11.784	452 large turban-shape gastropod	
PV-624-18-B	13.51	8.288	11.784	448 large <i>Gigantidas gladius</i> (diffuse venting = 12.6C)	
PV-624-19-B/R	14.06	8.293	11.707	453 lava pillow rock frag., large white/purple anemones, gastropod	
PV-624-20-SS #6	14.32	8.275	11.647	453 brown crust, sm. starfish	
PV-624-21-B	14.53	8.343	11.594	433 large spiny crab (not well - missing two legs)	

Time (L)	Z (m)	Lat. -36	Long. 178	Observations
8:52	651	8.546	12.169	On bottom - landed SE of WP1 - dark sediment - move off to NE
9:00	650			Rattail (<i>Coelorinchus aspercephalus?</i>)
9:03				begin to see seapens (1m tall) 2m or so separation. Dark sediment. Fish (juv roughy, rattail), hermit crabs
9:08				bellowfish (<i>Centriscoops obliquus?</i>)
9:11	596			Begin to see signs of sediment alteration - yellow patches of bacteria?
9:13				short arm seastar, <i>Munidopsis</i> , urchin, anemones
9:14	583			patch of alteration, yellow bacteria? crust, strikes upslope
9:15				move off cont. yellow patch back to dark sediment (which does still have very sm patches of yellow), some seapens, rattails, gastropods (on sm. rocks), hermits, scorpion fish
9:16	561			strike of yellow crust upslope at 285deg, seastar, hermit crabs nearby
9:19				sm. (3-5cm) white regular urchins, other spp. of urchin too, gastropod (<i>Fustriton?</i>), hermit, bluenose <i>Hyperglyphe antarctica</i>)
9:20	549			Temp taken (12C) in small yellow patch
9:23				lots of sm. white urchins on a ridge running NW 293deg (like "Milky Way"), Moving up ridge line, <i>Dermechinus</i> , seastar, hermits, <i>Munidopsis</i> , dark sediment with patches of yellow
9:27				cross trail of yellow - looks unnatural - our old sled tracks? breaking through crust
9:30	519			4 x large <i>Anthomastus</i> ,
9:34	511			moving upslope over dark sediment still with sm white urchins, but with some crusts in parallel arrangement at 311deg
9:35				school of bluenose
9:37	502			altered bottom, patches of yellow and crust edges, anemones on rocks, ophiuroids, rattails where away from yellow patches
9:40	497	8.380	12.000	stop to get position, are just north of WP1
9:51	497			gastropods (<i>Fustriton?</i>) feeding on dead crab, 6 large (30cm) polychaetes moving in to feed. One poly sampled P5-624-1B.
9:53				Move upslope, see altered bottom, quite large patches
9:55				start encountering tallus field, anemones, stylasterids, anthomastus, sm white urchins, moving off to west
9:58	473			start to encounter dead <i>Gigantidas gladius</i> shells on surface, sm orange seastar

10:04	457				mix of dead and some live <i>G. gladius</i> (some dead insitu), other dead tend to align up/down slope (think this is area identified by TAN0107 photo survey)
10:09	452	8.432	11.863		MARKER 15 placed. Essentially last position of dive 622
10:12					move upslope over mostly live mussels, though still plenty of dead, white fluff? on some surface Hydroids?
10:14	436				start to encounter <i>Rumbleaster</i> feeding on mussels, masses of sm white anemones over surface of mussels
10:22	430				still moving up slope, now live mussels more common than dead, gastropods, <i>Rumbleaster</i>
10:25					stargazer (mottled)
10:28	413				white patches on ridge edge - shimmering, masses of sm anemones, cover almost all surface of ridge, sm gastropod same as sampled on previous dive (brown band), move then up ridge towards summit hoping for more obvious venting
10:30					encounter pinnacles (old chimneys?) at peak - these have many ropes across them like a cobweb. Pins covered with anemones. Among pinnacles are white patches of white deposits - presumably venting
10:34	376				see white cracks in pins where venting taking places. Dead <i>G. gladius</i> , not possible to see if live mussels in white area because sub moving to avoid entanglement
10:38					3 Hapuku
10:40	380	8.362	11.744		landed just NW of pinnacle summit to get position. Surface covered with sm. white anemones
10:55					Tape 1 ends
13:40	379	8.362	11.744		a collection of small venting sites seen
11:05	379	8.362	11.744		less than 10m from previous position. Active vent. 39.7C. 100s of alvinocarid shrimp at centre of vent where white, some yellow colour too. Then sharp boundary where no shrimp but <i>G. gladius mussels</i> occur. Mussels taken - P5-624-2B
11:07	379	8.362	11.744		Sample of shrimp P5-624-3SS1 & 2
11:12	379	8.362	11.744		Sample of white/yellow rock P5-624-5R
11:15	379	8.362	11.744		Major fluid sample P5-624-6MS (yellow)
11:24	384	8.362	11.744		Gas tight fluid sample P5-624-7GT (yellow)
11:34	390	8.378	11.733		move off downslope SW, encounter diffuse venting, large white patch
11:40	390	8.378	11.733		lots of sm white limpets on surface of white patch. Take scoop sample which also captures gastropod see feeding earlier on mussels, also limpets. P5-624-8MIN temp = 25.7C
11:46					rock with white covering taken with limpets on P5-624-9RB
11:57					small patches of young? <i>G. gladius</i> on white patch. Also shrimp and brown banded gastropod
11:58	399				larger patches of young mussels seen tallus with mussels and <i>Rumbleaster</i>

12:05	414	8.394 11.733	in shallow depression with yellow/brown crusts, sm white anemones
12:09	414	8.394 11.733	Scoop of crust taken P5-624-10MIN (#4)
12:12	414	8.394 11.733	rock sample taken with anemone P5-624-11R
12:14	414	8.394 11.733	Suction samples of crust and small orange seastar taken P5-624-12 and 13 SS (#3, 4)
12:18			move down slope in S to get to contour 452m - depth where previously found mussels
12:28	452	8.445 11.729	Tallus, gastropod, sm white anemones Put out MARKER 16, then begin to circum volcano at 452m contour going anti-clockwise (Marker is immediately downslope of vents)
12:31	452	8.445 11.730	sampled 2 brown rocks with hydroids and anemone P5-624-14BR
12:42	453	8.449 11.723	encounter patch of altered substrate, mottled colour, tiny yellowish filamentous chimneys. No obvious macrofauna. Temp=21C
12:49	453	9.449 11.724	Sample of sm (4cm) yellow/white chimney and brown sub crust P5-624-15SS (#5)
12:54	454	10.449 11.725	just to side of sm chimney area encounter sm patch of brown with shimmering vent at crack at base of rock with white filamentous material on edge of crack End of Tape 2
13:03	454	9.449 11.724	Temp 22C.
13:09	454	10.449 11.725	Take major fluid sample P5-624-16MS (blue)
13:17	451		Move off eastwards along 452m contour
13:20			tallus, some dead mussel shells, some white patches white patches, dead <i>G. gladius</i> , dark fluffy covering on rocks
13:23	451		See MARKER 15 - <i>G. gladius</i> mostly live (seems this bed is about 20m across, vertical extent unknown?), sm orange seastars
13:25	451		Continue to circum cone northeastwards along contour 452m, mussel bed ends just after MARKER 15
13:27			dead <i>G. gladius</i> , sm orange seastar, gastropods sparsely distributed on extensive dark sediment some sm rocks, bluenose
13:32	452		lots of sm. white anemones in dark substrate otherwise quite 'barren' of fauna
13:36	452		some sort of morwong?
13:38	452		see large gastropod covered in anemones, similar looking anemones in substrate all around
13:40	452	8.293 11.784	stop to sample turban-like gastropod P5-624-17B
13:40			yellow patch encountered
13:46	452		find bed of live <i>G. gladius</i> mussel on north side of cone (think this might line up with bed found on TAN0107), gastropods
13:51	448	8.288 11.75	Temp=12.6C. Take clump of large mussels P5-624-18B

13:58			mussel bed continues - must be in diffuse venting, densely packed mussels, gastropod (<i>Fusitriton?</i>) as predator here?, sm orange seastar, NO <i>Rumbleaster</i>
???			move off bed after few 10s of metres - but no time on video to mark edge
???			pillow lava with large (10cm) white anemones with purple tentacles [still no time stamp on video]
14:06	453	8.293 11.707	sample of pillow lava rock and anemones, and gastropod (<i>Fustriton?</i>) P5-624-19BR
14:18	453	8.293 11.707	Pillow lavas fresh looking, few metres high and extending up slope, can't see how far extend down slope. Sm anemones as well (good close up shots), urchins, lots of fish associated with this feature - roughys and alfonsino? and one morwong? moving among cracks (good footage of latter)
14:20	453		move off pillow lavas - so only 10 or so metres wide
14:25	453		paler sediment patches just off lava then back to dark sediment and dead <i>G. gladius</i> , white urchins with long thin spines
14:28			barren substrate with isolated rocks on which get groups of anemones (yellow/white), some gastropods (<i>Fusitriton?</i>)
14:29	453		paler sediment, orange crust
14:32	453	8.275 11.707	Sample crust P5-624-20SS (#6) also takes sm orange seastar. Now at NW position on cone.
14:37			rock with 10s of <i>Dermechinus</i> urchins and nearby stone with very yellow anemones, also sm. orange seastars and gastropods, bluenose
14:41			move off SW over dark sediment
14:43	452		crusty sediment, biscuits of crust, then back to dark sediment with the odd dead mussel shell, quite a lot of <i>Munidopsis</i> all facing the same direction (angled downslope)
14:45			dark sediment continues, large ophiuroids (bit like snake legs), urchins with fine spines, sm orange seastar, sm white urchins too, hermits with anemones
14:48			fish with modified pelvic fins that look like a number of 'feelers'
14:53	433	8.343 11.594	encounter spiny crab with stalk barnacles on carapace, missing a few legs, not well. P5-624-21B. Now at Western side of cone. End of Tape 3
14:58		8.343 11.594	bluenose
15:00	449		moving off SE on contour 452m
15:03			encounter altered surface, yellow, brown crusts, bit jelly looking in places
15:05			mussel debris, rattails, sm. white urchins,
15:06			back to brownish crusts

15:07	452		yellow/brown patch of bumpy surface - bacteria over tallus? At least 10m in all directions around position. Few dead mussel shells, presumably washed down slope, couple of sm live urchins
15:10	452	8.424 11.696	taking suction samples in above substrate P5-624-22SS (7&8), temp =27.5C
15:17			moving off eastwards towards MARKER 16
15:19	452		dark sediment with few dead mussel shells, sm white urchins, sm orange seastars, gastropods (<i>Fustriton?</i>)
15:24	452		return to MARKER 16 - circum cone complete