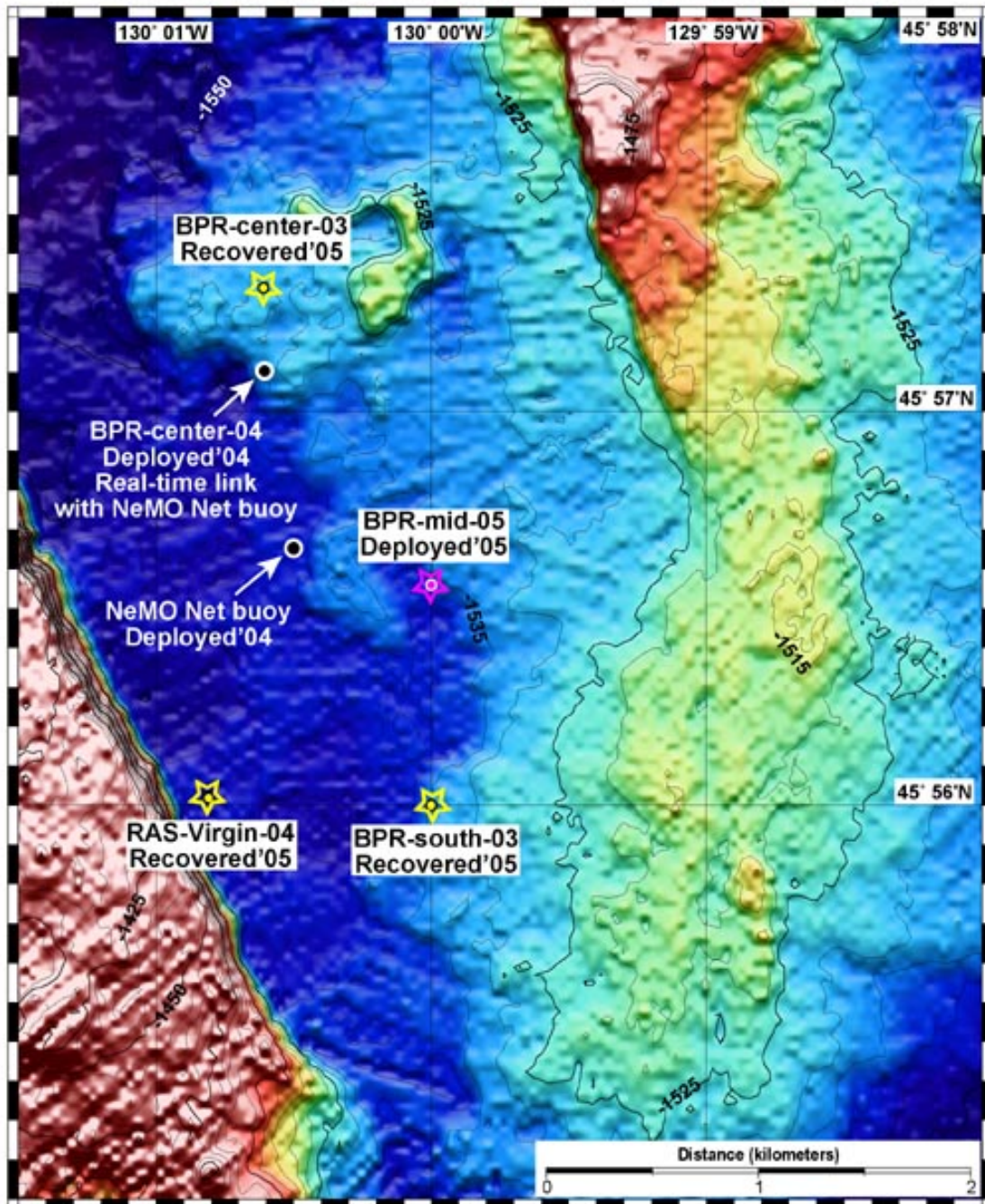


NeMO 2005 Deployments and Recoveries at Axial Caldera

EM300 bathymetry data. 35 meter grid cell size. 5 meter contour interval.



NeMO 2005 Cruise Science Summary

R/V *Wecoma* May 10-12, 2005

Dave Butterfield, Chief Scientist

The PMEL/Vents Program has been monitoring Axial Volcano with the NeMO project since 1998. The real-time data transmission system, NeMO-Net, began in 1999, and was improved and/or modified each year. From 2003 to 2005, the configuration of NeMO-Net was stable, with one interactive Remote Access Sampler (RAS) for vent fluid and particles deployed at Virgin Mound vent, and one real-time reporting Bottom Pressure Recorder (BPR).

In 2005, there was a crisis in ship-time funding that prevented us from staging a remotely-operated vehicle cruise. We elected to recover the RAS, while leaving the real-time buoy and BPR in place. This will maintain the real-time data stream, save significant resources this year, and potentially allow us to resume time-series sampling at Axial in 2006. The long-term goal is to monitor a complete cycle at Axial from eruption to eruption.

The goals for the 2005 *Wecoma* cruise were to recover and process the RAS time-series sampler, recover the two self-recording BPRs that were deployed in 2003, download their data, and re-deploy them for another two years. A secondary goal was to conduct CTD operations to measure hydrothermal plume intensity in the Axial caldera.

All instruments were acoustically released from their anchors and recovered with no problem. The complete RAS instrument was taken on board with cables and funnel intact. The downloaded data from BPR-south-03 did not appear normal, and after consultation with EDD personnel on shore, it was decided not to re-deploy that instrument. The other BPR was refurbished and re-deployed at the mid-caldera position (see cruise log).

Three CTD casts were performed at known vent sites: Over Mushroom vent in the ASHES field, over marker N3 site, and over Snail vent (near Marker 33 vent). A caldera "background" cast was done away from known vent sites near the mid-caldera BPR site. Equipment for filtering Niskins and collecting helium samples was not available for this cruise. Samples were taken for total dissolvable metals and for potential pH anomaly measurement on shore.

NeMO 2005 Scientific Personnel

Dave Butterfield	Chief Scientist, University of Washington / NOAA Vents Program
Sheryl Bolton	University of Washington
Randy Bott	PMEL Engineering
Susan Merle	Oregon State University / NOAA Vents Program
John Shanley	PMEL Engineering

Operations Log Nemo 2005 Cruise W0505A - R/V <i>Wecoma</i> - Axial Volcano - May 10 - May 12						
Date (PST)	Time (PST)	Comments	Lat (deg)	Lat (min)	Long (deg)	Long (min)
PST is 7 hours behind UTC						
10-May	800	Depart Newport				
11-May	700	Arrive Axial				
	710	Released BPRsouth03	45	56	130	0
	750	BPR at the surface.				
	800	BPR-south-03 on deck.				
nemoe4.dat data file showed that the flash card was not functioning. Have pressure period all the way thru the year but height (mm) and temperature period stopped on 9/3/03. Have the temp data in deg C and pressure period (tidal fluctuations). On Scott Stalin's advice, it was not re-deployed.						
	832	Sent RAS release code. Confirmed and coming up at 35 m/min.				
	930	RAS at the surface (was at Virgin)	45	56.019	130	0.809
	950	RAS on board.				
RAS collected samples in all bottles, except for one (#17 had a closed valve). Removed intake lines and T1 cable. Removed Eh sensor and soaked in water. In situ preserved DNA filters were frozen immediately. Water samples were put on ice. GFF filters were rinsed with ~5ml MQ, suction dried, and air dried in petri slides.						
	1130	BPR-center-03 at the surface	45	57.313	130	0.61
	1140	BPR-center-03 on board				
nem4oe3.dat data file showed a drop out point at the same time and day that the nemoe4.dat file showed a drop out. After that point the data came back and looks OK.						
	1300	CTD cast 1 at ASHES (cast01.dat) in the water.	45	56.016	130	0.828
At 1550 m we saw a slight temperature and transmissometer spike. Filled 12 bottles, but bottles 4 and 6 didn't fill. Seasav2 is the program the marine techs were using (Marc and Dave are the techs).						
	1405	CTD cast 1 at ASHES back on deck.				
For processing of CTD water, we are taking pH samples in 60ml bottles by filling from a tube with no air and capping. Also took total dissolvable metal samples in 250ml or 500ml acid cleaned hdpe bottles. TM bottles were rinsed 3 times and then filled.						
	1440	Lining up to deploy BPRmiddle05				
	1445	BPRmiddle05 in the water.				
	1448	Drop position at the stern. 186 deg bearing.	45	56.559	130	0
BPR-middle-05 (also known as E-3 by PMEL engineers) has a mooring line ~30 meters long. The flash card from BPRcenter03 was used in BPRmiddle05. A new release was used.						
	1520	CTD cast 2 at Mkr-N3 (cast02.dat) in the water.	45	56.628	129	59.112

Operations Log Nemo 2005 Cruise W0505A - R/V <i>Wecoma</i> - Axial Volcano - May 10 - May 12						
Date (PST)	Time (PST)	Comments	Lat (deg)	Lat (min)	Long (deg)	Long (min)
	1632	CTD cast 2 at Mkr-N3 back on deck.				
	1700	CTD cast 3 at Snail (cast03.dat) in the water.	45	55.992	129	58.914
	1818	CTD cast 3 at Snail back on deck				
	1838	CTD cast 4 Background (cast04.dat) in the water.	45	56.3	130	0
	1950	CTD cast 4 Background back on deck.				
	2000	Heading back to Newport.				
12-May	1815	Back at the pier in Newport. End of cruise.				

NeMO Instrument Positions

Instrument / Experiment	Long (deg)	Long (min)	Lat (deg)	Lat (min)	Z (m)	Deployed / Recovered
Buoy-04	130	0.4998	45	56.65		Depl NeMO'04
BPR-center-04	130	00.50	45	57.10		Depl 10/31/04 (postcruise'04)
BPR-center-03	130	0.61	45	57.313	1534	Depl NeMO'03 / Rec NeMO'05
BPR-south-03						Depl NeMO'03 / Rec NeMO'05
BPR-middle-05 (E-3)	130	0	45	56.559		Depl NeMO'05
RAS-04 (at Virgin)	130	0.80899	45	56.019	1547	Depl NeMO'04 / Rec NeMO'05

BPR-middle-05 (mooring # E-3)

Deployed 5/11/05, Type 8242, Serial # 022764, Paros Serial # 40992