



Raytheon
Polar Services

NBP09-05A

Report on Operations

Cruise Dates: 10/7/09 to 10/12/09

Area of Operations:

40° 32' 11.35" S	77° 08' W
40° 38' 50.82" S	74° 40' W
42° 28' 48.00" S	74° 40' W
40° 21' 42.47" S	77° 23' W

**United States Antarctic Program
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Purpose:

The purpose of cruise NBP09-05A was to test and calibrate new and refurbished scientific research equipment on the *RVIB NATHANIEL B. PALMER*. Cruise dates were from October 8 – 12. Testing took place in an area off the Chilean coast approximately 316 nm from the port city of Talcahuano, where the PALMER recently completed its annual dry dock maintenance period at the ASMAR facility.

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Figure 1: Latitude and Longitude of offshore test area

Instrumentation tested and calibrated during this cruise

- Acoustic Doppler Current Profiler (ADCP)
- Kongsberg Multibeam EM120 upgrade/testing
- Teledyne Benthos sidescan sonar
- Kongsberg EK-500

Chronology of events

XBT (expendable bathymetric temperature probe)

One XBT was dropped on October 9, 2009 at 10:32 GMT (-40 35.649 -75 35.18). This was done to obtain a sound velocity profile for the Multibeam. This allowed the technicians to accurately convert time to depth.

ADCP

The ADCP operated for testing and calibration, following the reinstallation of the Ocean Surveyor 38 (OS38). Testing occurred for the first four days of the testing cruise.

Kongsberg Multibeam EM120

The Multibeam upgrade and testing began on 10/9/2009 at 10:49a.m. at coordinates -40 37.73 -75 36.10). It ran more or less continuously for first four days (see Figure 3 for specific times)

Teledyne Benthos 1625 side scan sonar

The sidescan sonar was towed by the vessel on October 10th and 11th (see Figure 3 for specific times)

EK-500

The EK-500 ran for the first four days and was calibrated on the fifth day. The location for the calibration test was determined in conjunction with Chilean pilots so that it would occur in a protected spot and yet one in which salmon pens would not be affected.

ID	Task Name	Start	Finish	Duration	Oct 2009					
					8	9	10	11	12	13
1	Underway ADCP Testing	10/8/2009	10/11/2009	4d	[Blue bar covering Oct 8-11]					
2	Multibeam Testing	10/9/2009	10/11/2009	3d	[Blue bar covering Oct 9-11]					
3	Sidescan Sonar Testing	10/10/2009	10/11/2009	2d	[Blue bar covering Oct 10-11]					
4	EK-500 Testing	10/8/2009	10/12/2009	5d	[Blue bar covering Oct 8-12]					

Figure 2: Chronology of test days

Continuously underway sensors

There is a suite of sensors that continually log data while the ship is underway. They were turned on once the vessel exited the 200 mile EEZ and ran continuously for the duration of the five day test period. A complete list of these sensors can be found on the cruise data report disc.

Acquisition log and significant events

This section lists start and stop times for data acquisition, problems with acquisition noted during this cruise including instrument failures, data acquisition system failures and any other factor affecting this data set. Times are reported in GMT.

Figure 3: Daily Data Acquisition Log

RVIB Nathaniel B. Palmer Underway Watch Log NBP09-05A Shakedown Cruise

Date	Julian Day	GMT	Lat.	Long.	Speed	CMG	Comments and Observations
10/7/2009	280						Departure Talcahuano.
10/7/2009	280						Something stuck in prop; return to Talcahuano to investigate
10/8/2009	281						Prop functioning again, returning to study area
10/9/2009	282	10:32	40 35.649	75 35.18	5.5	201.82	Launched XBT Probe
10/9/2009	282	10:47	40 37.50	75 36.10	10.1	203.03	Started logging Research Vessel Data Acquisition System (RVDAS)
10/9/2009	282	10:49	40 37.73	75 36.10	10	201.52	Multi Beam pinging began
10/9/2009	282	10:50	40 37.94	75 36 29	10	201.32	Multi Beam logging began
10/9/2009	282	11:07	40 40.77	75 37.85	10.1	199.55	Started first line of roll calibration test
10/9/2009	282	12:17	40 51.25	75 43.53	10	204.55	End line 1, start line 2 (turn)
10/9/2009	282	12:40	40 51.69	75 43.78	9.6	28.09	Start line 2 or roll calibration
10/9/2009	282	13:54	40 40.62	75 37.77	10	23.82	Stop line 2 of roll calibration
10/9/2009	282	14:32	40 41.70	75 41.07	10.2	213.27	Stop logging, stop pinging. Store roll bias of +0.05
10/9/2009	282	14:36	40 42.30	75 41.46	10.2	208.09	Start line 3 of roll calibration
10/9/2009	282	15:46	40 53.41	75 47.64	10.2	202.1	Turn. Begin line 4 of roll calibration
10/9/2009	282	16:08	40 53.02	75 47.33	10	28.06	Start line 4 of roll calibration
10/9/2009	282	17:14	40 42.42	75 41.63	10.2	21.64	End line 4 of roll calibration, start of turn to pitch site, changed depth mode to 'auto'
10/9/2009	282	22:54	41 35.01	75 15.57	9.5	93.2	Pitch test, line 1

10/10/2009	283	0:03	41 35.06	75 00.39	9.4	87.95	Stop line pitch 1 and start turn, File 20
10/10/2009	283	0:10	41 35.43	74 59.09	8.9	77	Start line pitch 2, File 21, 22
10/10/2009	283	1:42	41 35 01	75 17.32	9.2	269.94	Start turn, File 23
10/10/2009	283	1:58	41 35.04	75 17.58	6.2	90.49	Start line pitch 3, File 24, 25
10/10/2009	283	3:52	41 35.05	75 00.14	6.1	93.66	Start turn, File 26
10/10/2009	283	4:12	41 35.05	75 00.02	6.2	276.61	Start line pitch 4, file 27, 28
10/10/2009	283	5:59	41 35.03	75 16.05	6.7	270	End of pitch line 4; Completed MB Pitch Test, file 29
10/10/2009	283	6:24	41 34.82	75 19.39	6.1	171.3	End of file 29
10/10/2009	283	6:38	41 34.98	75 17.38	7	67.42	Stopped logging and pinging; noticed around 6:30 that display was not updating, no pinging was audible in dry lab, intensity screen blank, cross track blank, seabed blank, no new data on geographical
10/10/2009	283	6:43	41 34.73	75 16.47	9.6	74.55	clicked start pinging in SIS, heard nothing, nothing changed
10/10/2009	283	7:08	41 33.61	75 11.30	9.5	72.43	discovered that network connectivity to transceiver had been lost; could not ping; shut down transceiver
10/10/2009	283	7:49	41 31.73	75 02.63	11.3	76.51	Powered on x-ceiver; ran BIST tests; failure of TX via Rx three times
10/10/2009	283	8:40	41 48.84	74 86.99	9.4	71.8	pinging began, but slowly
10/10/2009	283	8:41	41 48.75	74 86.65	9.76	71.2	pinging stopped
10/10/2009	283	9:09	41 46.46	74 77.13	9.58	72.4	shut down transceiver
10/10/2009	283	10:30	41 46.33	74 69.87	6.6	214.4	Started pinging
10/10/2009	283	10:41	41 46.98	74 70.95	4.06	300.2	Pinging failed
10/10/2009	283	14:15	41 46.15	74 81.31	2.17	244.8	Re-started boards on transducer P.U.; pinging resumed
10/10/2009	283	15:02	41 45.87	74 79.02	3.36	87.12	Pinging failed
10/10/2009	283	15:40	41 45.68	74 74.43	3.46	84.8	Pinging resumed
10/10/2009	283	16:26	41 27.31	74 41.30	3.3	88.5	Pinging stopped (manually); headed 10 miles S/SW to start swath mapping area to be covered later by side-scan sonar.
10/10/2009	283	16:44	41 27.99	74 40.85	5.4	199.9	Started and stopped pinging.
10/10/2009	283	16:52	41 28.57	74 41.12	7.5	199.5	Started pinging
10/10/2009	283	17:31	41 32.25	74 43.14	9.7	206	Stopped pinging

10/10/2009	283	17:44	41 34.71	74 44.79	9.8	205.8	Started pinging
							Began pull test for 860 cable to be used with tow fish
10/10/2009	283	18:19	41 37.90	74 46.20	3.5	117.6	
10/10/2009	283	18:36	41 38.39	74 44.93	3.1	126.9	Finished pull test
10/10/2009	283	19:07	41 40.06	74 40.54	7	16.4	Stopped pinging
10/10/2009	283	19:25	41 39.35	74 41.39	3.1	292.3	Pinging started
10/10/2009	283	20:27	41 39.56	74 40.47	6.8	197.3	Pinging stopped
10/10/2009	283	20:39	41 39.28	74 41.72	3	300.8	Pinging started
10/10/2009	283	21:03	41 38.85	74 72.70	3	311.2	Deployed Datasonics tow fish
10/10/2009	283	22:33	41 36.61	74 47.73	3.1	299.2	Retrieved Datasonics tow fish
10/11/2009	284	0:01	41 37.68	74 41.05	8.1	302	Pinging stopped
10/11/2009	284	0:07	41 62.35	74 69.45	7.9	299.57	Started pinging but IPPS off
10/11/2009	284	0:12	41 61.81	74 70.74	7.9	299.5	Pinging stopped. GUI closed 1 pps back
10/11/2009	284	0:34	41 59.46	74 76.44	7.93	300.1	Pinging stopped again in the last few minutes-- bad seas--no indication SIS stopped and restarted
10/11/2009	284	9:40	41 66.37	74 67.18	8.5	180.1	Pinging stopped-- lost bottom-- headed south, winds at 27kn rel.
10/11/2009	284	9:52	41 67.86	74 68.62	9.4	299.2	Back to stable pinging
10/11/2009	284	9:57	41 67.23	74 70.06	8.96	297.85	"Inspection" mode not working. Logging and pinging stopped. SIS stopped and restarted.
10/11/2009	284	13:01	41 72.20	74 67.60	7.81	238.39	Pinging stopped, turned for new line
10/11/2009	284	13:20	41 70.06	74 73.04	9.09	295.7	Reset transducer and SIS. Began pinging.
10/11/2009	284	15:03	41 42.53	75 45.48	8.9	298.2	Pinging stopped and started
10/11/2009	284	16:28	41 36.65	74 40.98	3.1	206	Deployed Datasonics tow fish
10/11/2009	284	22:09	41 43.03	74 46.32	3.2	200.4	Retrieved Datasonics tow fish
10/11/2009	284	23:09	41 71.40	74 76.96	4.02	208.23	Multi Beam logging ceased
10/11/2009	284	23:52	41 42.83	74 40.95	6.4	75.6	ADCP logging ceased