



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 |

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Purpose:

The purpose of cruise NBP09-05A was to test and calibrate new and refurbished scientific research equipment on the *R/V B 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.

| | |
|------------------|-----------|
| 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 |

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 | | | | | | |
| 2 | Multibeam Testing | 10/9/2009 | 10/11/2009 | 3d | | | | | | |
| 3 | Sidescan Sonar Testing | 10/10/2009 | 10/11/2009 | 2d | | | | | | |
| 4 | EK-500 Testing | 10/8/2009 | 10/12/2009 | 5d | | | | | | |

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 |
| 10/10/2009 | 283 | 18:19 | 41 37.90 | 74 46.20 | 3.5 | 117.6 | Began pull test for 860 cable to be used with tow fish |
| 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 |