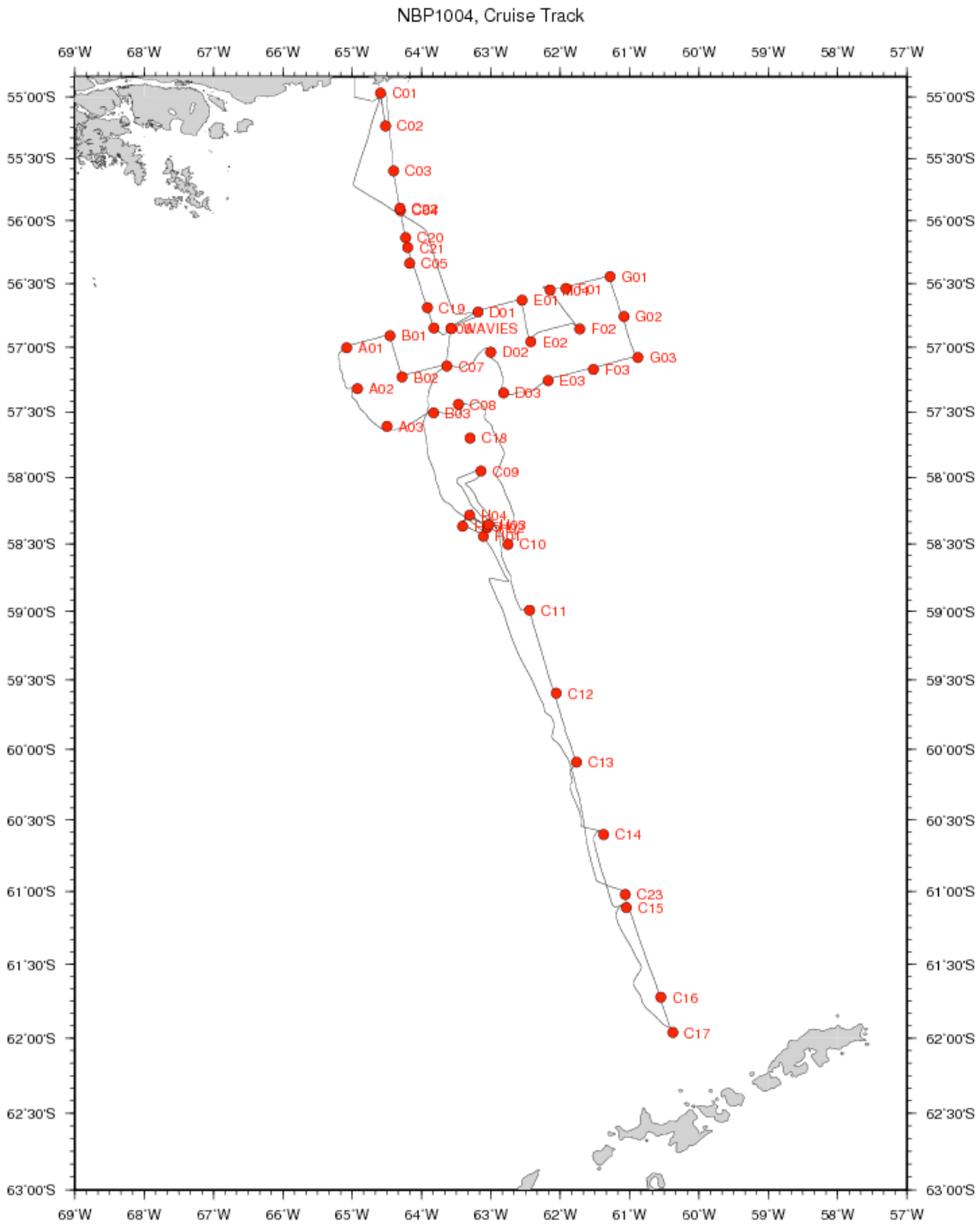
NBP1004

Multibeam
End of Cruise Report

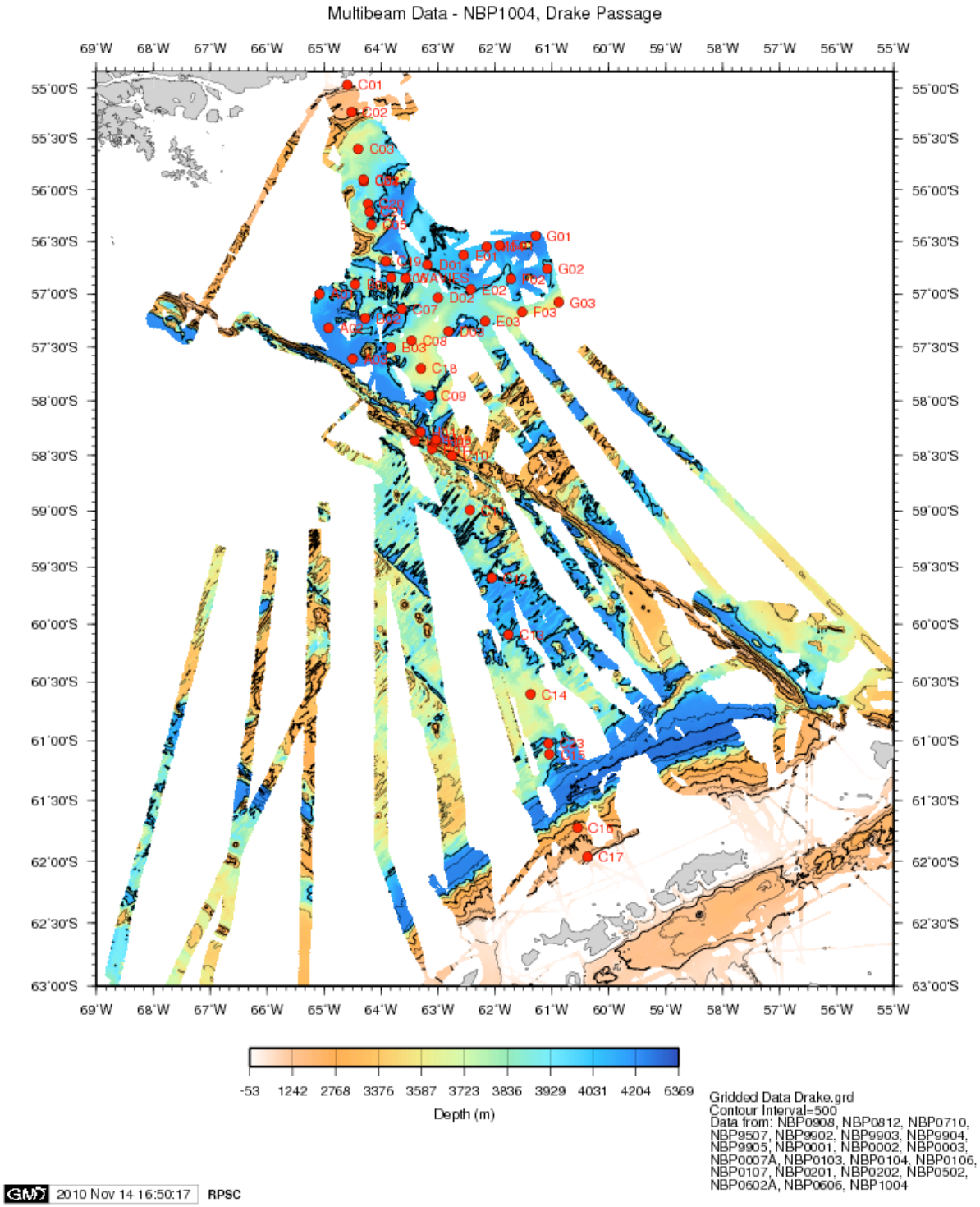
Prepared By Chris Linden
November 15, 2010

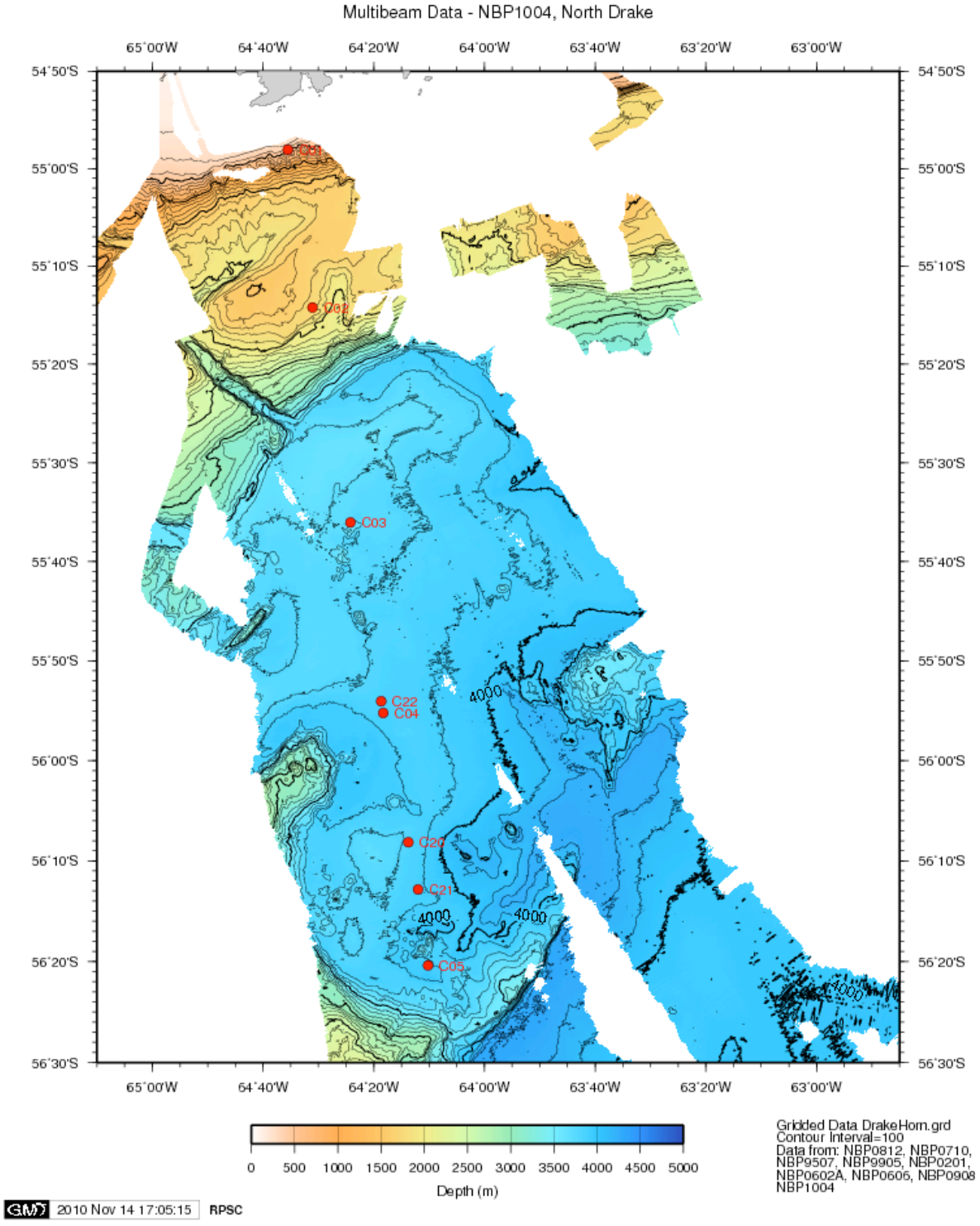
Contents

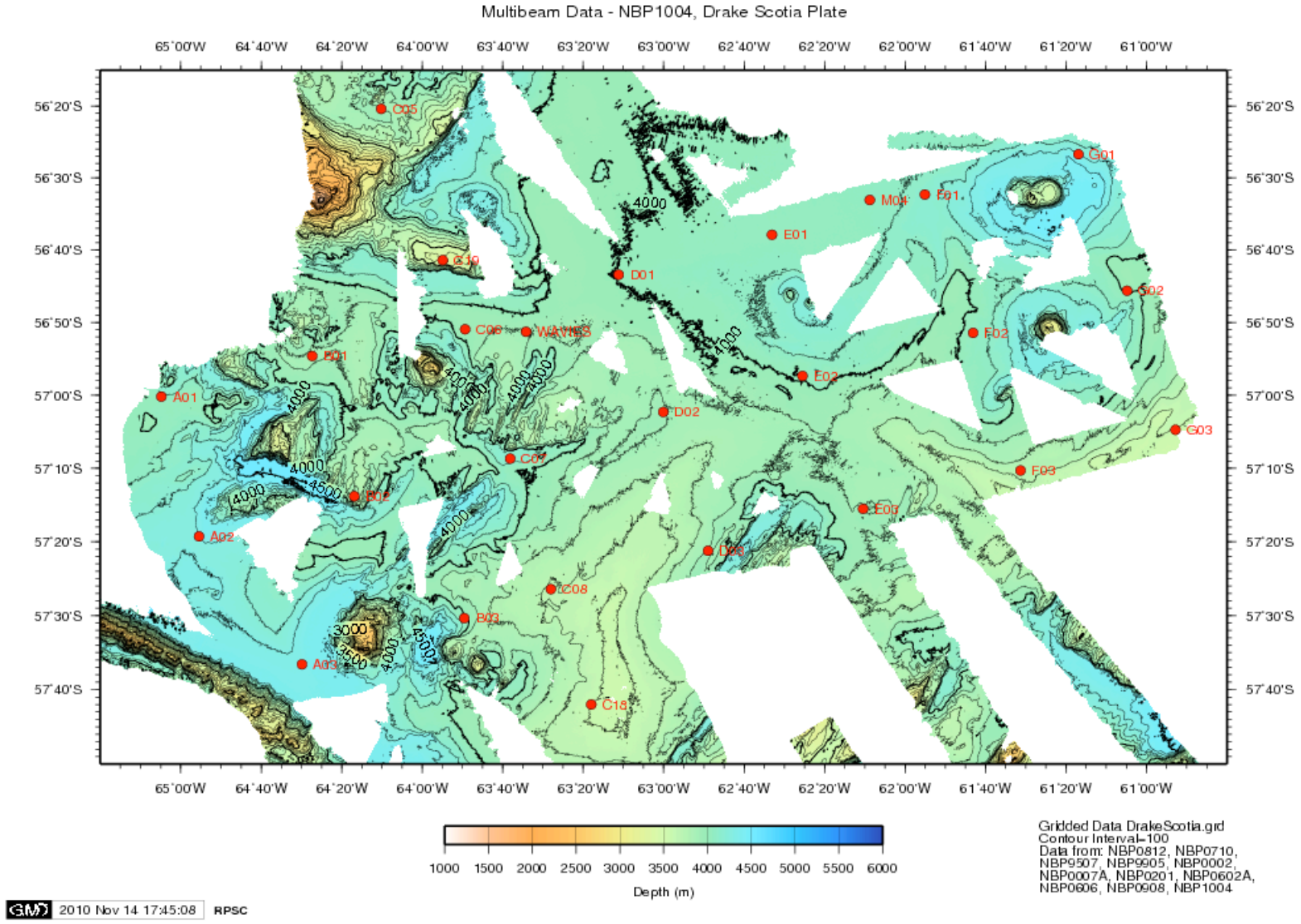
Cruise Track Plot

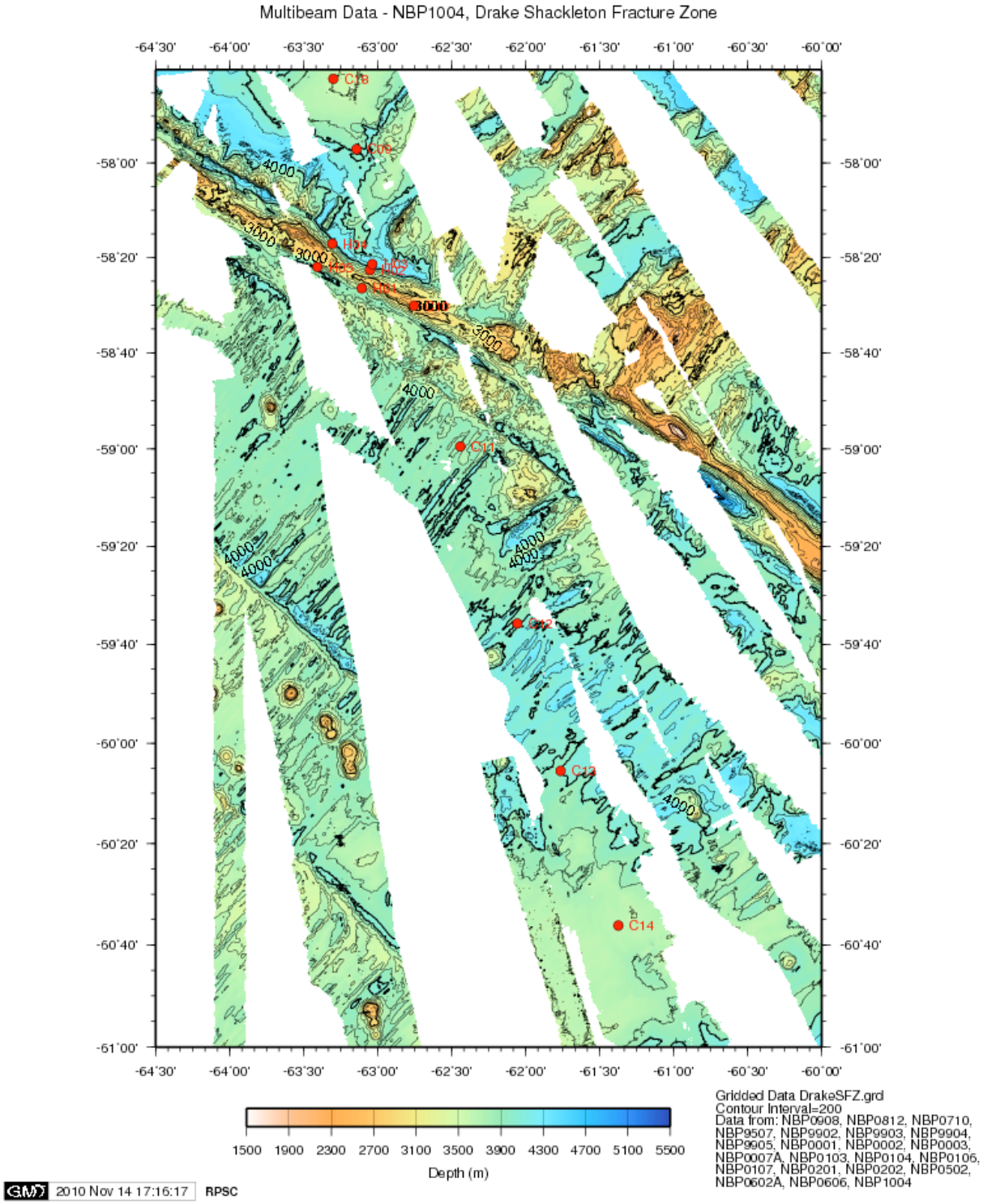


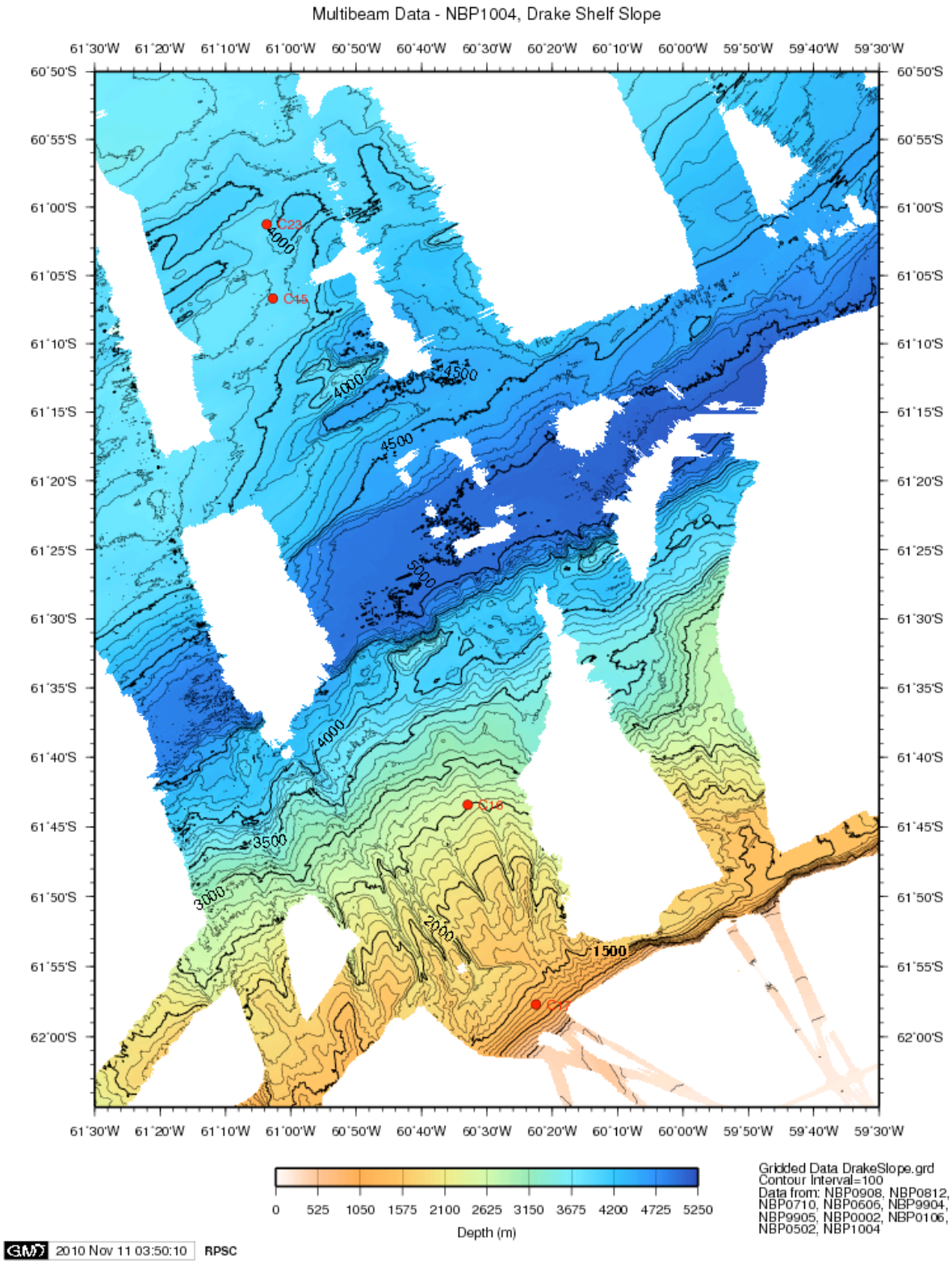
Multibeam Work Area Plots

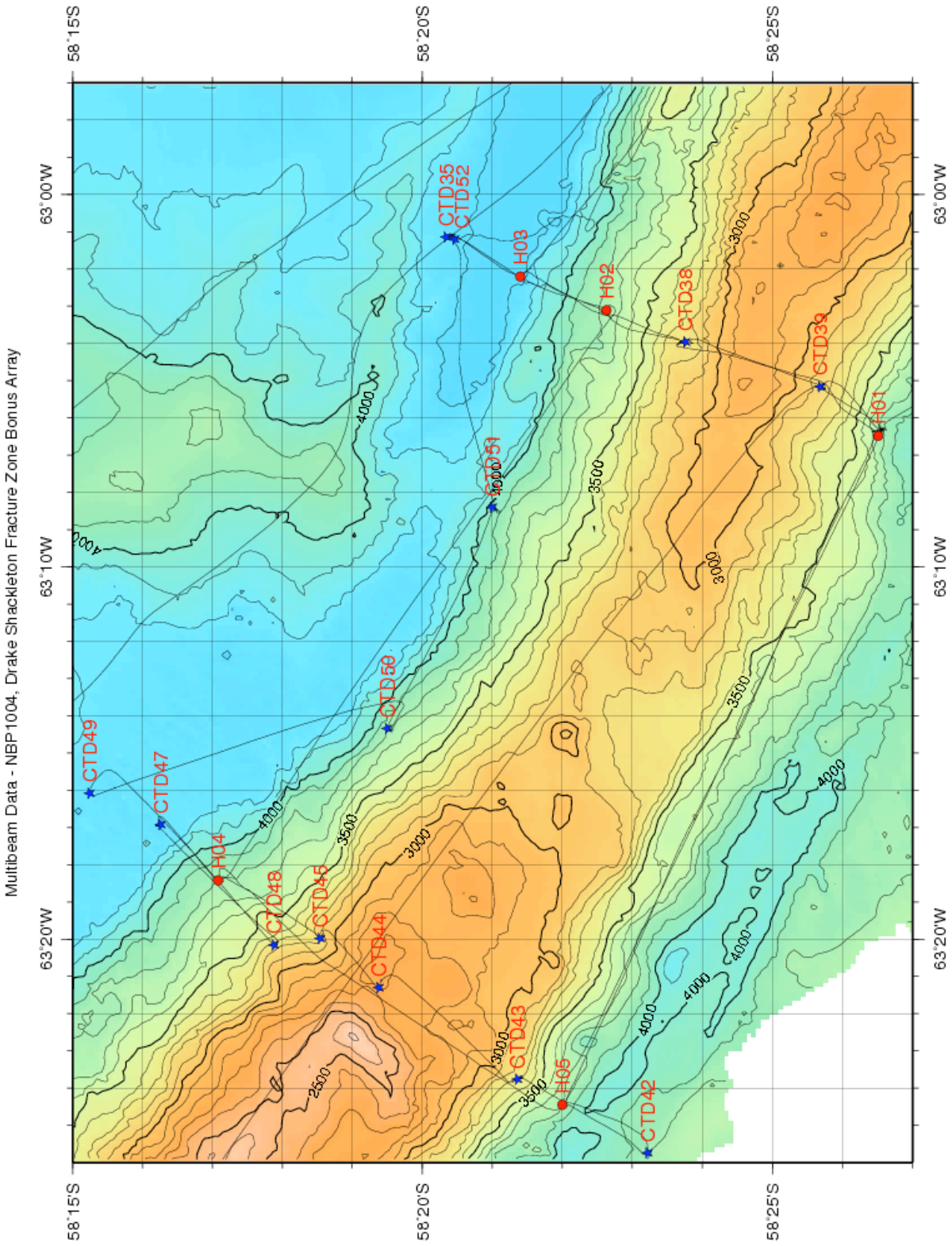



Multibeam Data - NBP1004, North Drake
65°00'W
64°40'W
64°20'W
64°00'W
63°40'W
63°20'W
63°00'W
54°50'S
55°00'S
55°10'S
55°20'S
55°30'S
55°40'S
55°50'S
56°00'S
56°10'S
56°20'S
56°30'S
C01
C02
C03
C22
C04
C20
C21
C05
4000
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000
Depth (m)
Gridded Data DrakeHorn.grd
Contour Interval=100
Data from: NBP0812, NBP0710, NBP9507, NBP9905, NBP0201, NBP0602A, NBP0606, NBP0908 NBP1004
GMT 2010 Nov 14 17:05:15 RPSC


Multibeam Data - NBP1004, Drake Scotia Plate
65°00'W
64°40'W
64°20'W
64°00'W
63°40'W
63°20'W
63°00'W
62°40'W
62°20'W
62°00'W
61°40'W
61°20'W
61°00'W
56°20'S
56°30'S
56°40'S
56°50'S
57°00'S
57°10'S
57°20'S
57°30'S
57°40'S
C05
C10
C06
WAYPT3
B01
A01
A02
A03
B04
B03
C07
C08
C18
D01
D02
D03
E01
E02
E07
M01
F01
F02
F03
G01
G02
G03
4000
4500
3000
1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000
Depth (m)
Gridded Data DrakeScotia.grd
Contour Interval=100
Data from: NBP0812, NBP0710, NBP9507, NBP9905, NBP0002, NBP0007A, NBP0201, NBP0602A, NBP0606, NBP0908, NBP1004
GMT 2010 Nov 14 17:45:08 RPSC


Multibeam Data - NBP1004, Drake Shackleton Fracture Zone
-64°30'
-64°00'
-63°30'
-63°00'
-62°30'
-62°00'
-61°30'
-61°00'
-60°30'
-60°00'
-58°00'
-58°20'
-58°40'
-59°00'
-59°20'
-59°40'
-60°00'
-60°20'
-60°40'
-61°00'
C08
C09
H04
H05
H02
H01
C11
C12
C13
C14
4000
3000
1500 1900 2300 2700 3100 3500 3900 4300 4700 5100 5500
Depth (m)
Gridded Data DrakeSFZ.grd
Contour Interval=200
Data from: NBP0908, NBP0812, NBP0710, NBP9507, NBP9902, NBP9903, NBP9904, NBP9905, NBP0001, NBP0002, NBP0003, NBP0007A, NBP0103, NBP0104, NBP0106, NBP0107, NBP0201, NBP0202, NBP0502, NBP0602A, NBP0606, NBP1004
GMT 2010 Nov 14 17:16:17 RPSC


Multibeam Data - NBP1004, Drake Shelf Slope
61°30'W 61°20'W 61°10'W 61°00'W 60°50'W 60°40'W 60°30'W 60°20'W 60°10'W 60°00'W 59°50'W 59°40'W 59°30'W
60°50'S
60°55'S
61°00'S
61°05'S
61°10'S
61°15'S
61°20'S
61°25'S
61°30'S
61°35'S
61°40'S
61°45'S
61°50'S
61°55'S
62°00'S
C23
C15
C13
C11
4000
4500
5000
3500
3000
2000
1500
0 525 1050 1575 2100 2625 3150 3675 4200 4725 5250
Depth (m)
Gridded Data DrakeSlope.grd
Contour Interval=100
Data from: NBP0908, NBP0812, NBP0710, NBP0606, NBP9904, NBP9905, NBP0002, NBP0106, NBP0502, NBP1004
GMT 2010 Nov 11 03:50:10 RPSC


Multibeam Data - NBP1004, Drake Shackleton Fracture Zone Bonus Array
58°15'S
58°20'S
58°25'S
63°00'W
63°10'W
63°20'W
CTD35
CTD52
H03
H02
CTD38
CTD39
H01
CTD51
CTD50
CTD49
CTD47
H04
CTD48
CTD45
CTD44
CTD43
H05
CTD42
4000
3500
3000
2500

NBP1004 Multibeam Description of Work

This report covers the Simrad EM120 Multibeam data collection and processing for the RVIB Nathaniel B. Palmer cruise NBP1004. This cruise started in Punta Arenas, Chile on October 23, 2010 (GMT) and ended in Punta Arenas, Chile on November 15, 2010. The Chief Scientist was Teresa Chereskin (Scripps.) The principal investigators were Kathleen Donohue (URI) and Randy Watts (URI). Chris Linden (RPSC) was responsible for Multibeam data acquisition, processing, and ping editing quality control.

The first day of Multibeam data collection was October 24 and the last day was November 13, 2010. While data quality was mixed, most of the data was very good considering the area in which we were working. For the most part, data was collected only when we were going to cover areas where MB data had not been collected before on the NBP; however, much over-lapping data was recorded. Here is a day by day summary of the data collection:

20101024 files 0-17; All of the data was on the shelf; none of it was edited.
20101025 files 18-25; mixed quality data – some extreme crabbing
20101026 - no MB
20101027 - no MB
20101028 files 26-33; edited but pretty rough to start with
20101029 - no MB
20101030 - no MB
20101031 files 34-40; the editors did a good job
20101101 files 41-44; decent data
20101102 files 45-53; decent and nice data; file 49 does not exist
20101103 files 54-68; ugly data - good editing
20101104 files 69-75; mostly nice data
20101105 files 76-92; mixed quality data - good editing
20101106 - no MB
20101107 files 93-111 ugly data - good editing
20101108 files 112, 113; 2 nice files
20101109 files 114-116; 3 nice files
20101110 - no MB
20101111 - no MB

The raw Multibeam data were logged in approximately one hour-long files in the Kongsberg-Simrad EM120 raw format. This is a complex format that is not described in this report. The MB-System[1] software package may be used to access the files if additional work is to be done with the data. MB-System version 5.1.1 was used for processing of data on this cruise. These raw data files are named xxxx_yyyymmdd_hhmmss_raw.all where xxxx is a consecutive line number within the survey, yyyy is the year, mm is the month, dd is the day, hh is the hour, mm is the minute, and ss is the seconds that the file was started.

[1] The MB-System software package was used for all Multibeam data handling. This package was developed at Lamont-Doherty Earth Observatory. This system is designed to manipulate, process, list and display many kinds of Multibeam bathymetry, amplitude, and sidescan data. It has been successfully installed on many different computer platforms. To obtain more information about the MB-System programs or to obtain a copy of the current distribution, contact the authors David W. Caress (caress@mbari.org) and Dale N. Chayes (dale@lamont.ldeo.columbia.edu)

The logged Multibeam data files were transferred from the data acquisition computer to a data storage area just after the end of each day. The raw hourly data files were converted from MB-System format 56 (the raw Simrad format) to format 57 using mbcopy and made available for manual editing. The format 57 files are named xxx_yyyymmdd_hhmmss.mb57 where the first part of the name is identical to the raw file. All data files were edited while at sea.

The science party was responsible for editing the Multibeam data. Mbclean was used to flag bad data points outside the valid depth range for each hour of data. Mbedit was used to manually remove bad data points from these files. Data files were edited with mbnavedit to correct navigational problems. Navigation corrections were made after the files were edited. If the velocity was observed to be incorrect, a new sound velocity was generated using mbvelocitytool and was applied to the data.

The edited files were checked using mbedit, the statistics from mbinfo, and hourly contour plots. If these checks failed, the files were re-edited by Chris Linden. When the data quality was judged acceptable, the edits were applied to the data using mbprocess. The edited files are named xxxx_yyyymmdd_hhmmssp.mb57 where the p in the dataset name denotes a processed file. Page size plots were produced of the edited data. Daily plots were also produced which showed one days worth of gridded data.

The UNIX tar command was used to write the digital data to DDS tapes at the end of the cruise. These tapes were checked before distribution. The tapes contain the raw and processed data for the entire cruise. The processing scripts and gridded data for each survey are included in the processed data directory. The contents of these tapes and an itemized distribution list are located on separate pages of this report.

Speed of Sound Corrections

The travel time of sound in water was corrected at the surface by a sound velocity calculated from the Thermosalinograph (TSG). This value was supplied directly to the EM120 system serial port and the data was transmitted by the RVDAS program rv_tsg. Sound velocity profiles were calculated from CTD casts, which were combined with the Levitus historical database. The CTD data have been provided on the RVDAS data distribution. The calculated sound velocities files and plots are in the process/svp directory in this multibeam data distribution.

NBP1004 Data Distribution

Multibeam data has been provided on DDS 4mm tapes to the science party and RPSC. The distribution consists of one (1) tape and a copy of this data report. The tapes were created on Linux computers using the command tar cvf /dev/st0 and verified to be sound on Linux and Sun computers before they were distributed.

The contents of the tapes are described below. The processed data is in mbio format 57 in the process directory. The raw data is in mbio format 56 in the Raw directory. The processed data

includes gridded files, processing scripts and postscript plots divided into subdirectories for each day and map area.

Each Full DDS4 Data Set Includes:

1. DDS4
   a) **Raw** has raw data and ancillary files for October 24 through November 13, 2010. The files are divided into directories by days
   b) **process** has the edited data and daily processing divided into directories by days for October 24 through November 13, 2010.
   c) **maps** contains additional maps request by the science team in the primary study area.

Portions of this cruise took place in the EEZ (exclusive economic zone) of Argentina. Argentina will be provided with the complete distribution by the decision of the Chief Scientist through the clearance holder of record for the NBP.

All full data distributions also include a printed copy of this report.

A copy of the full data distribution will be sent to the Antarctic Multibeam Synthesis at the MGDS (http://www.marine-geo.org/). You can locate the all information for and download data from this cruise at the web site by selecting your cruise name from the data link tool. You can also download and use the java application GeoMapApp to interactively access multibeam and other data sets. Data sent to the database will not be downloadable until the Chief Scientist has released the proprietary hold.

You can contact the MGDS at:

MGDS Data Manager
Lamont-Doherty Earth Observatory
61 Route 9W
Palisades NY 10964 USA
845-818-3745 Phone/Fax
info@marine-geo.org

Data Distribution Information:

S/N	Who	Description	Type
1	Chereskin 1	24 Oct. – 13 Nov. 2010 raw, processed, maps	DDS4
2	Chereskin 2	24 Oct. – 13 Nov. 2010 raw, processed, maps	DDS4
3	NBP	24 Oct. – 13 Nov. 2010 raw, processed, maps	DDS4
4	RPSC	24 Oct. – 13 Nov. 2010 raw, processed, maps	DDS4
5	MGDS	24 Oct. – 13 Nov. 2010 raw, processed, maps	DDS4