NBP1005

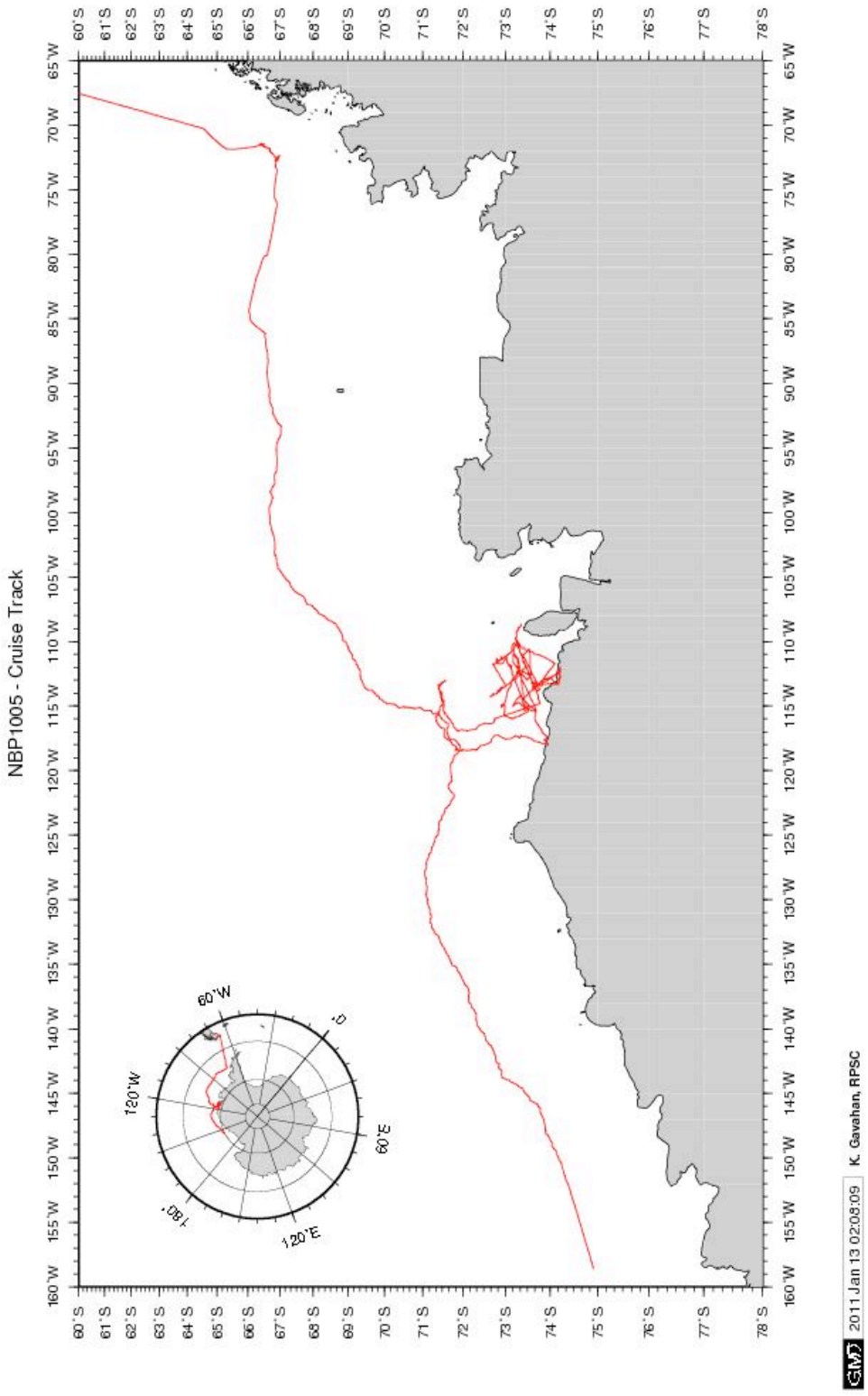
Multibeam
End of Cruise Report

Photo: K. Gavahan

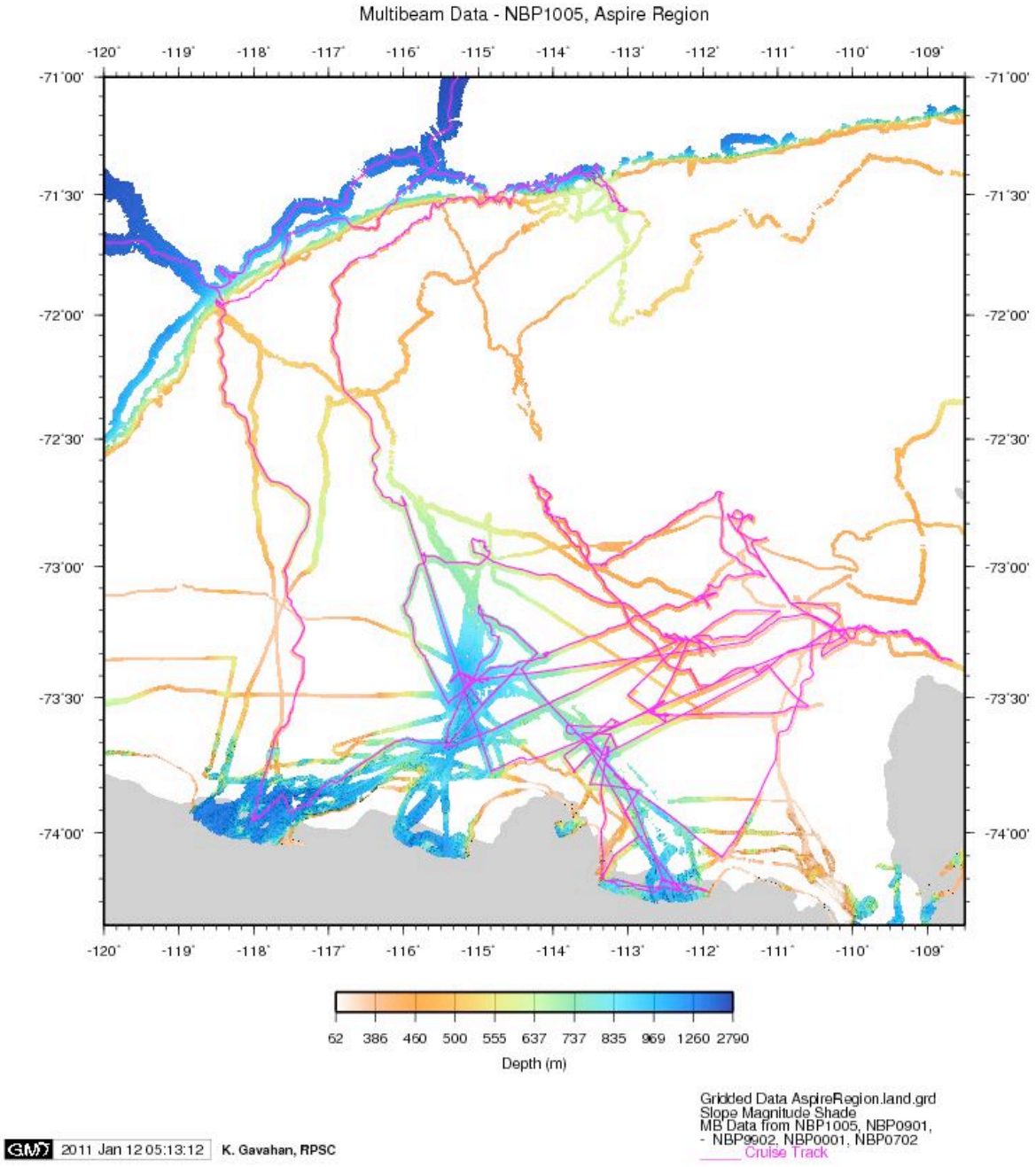
Prepared By Kathleen Gavahan
January 14, 2011

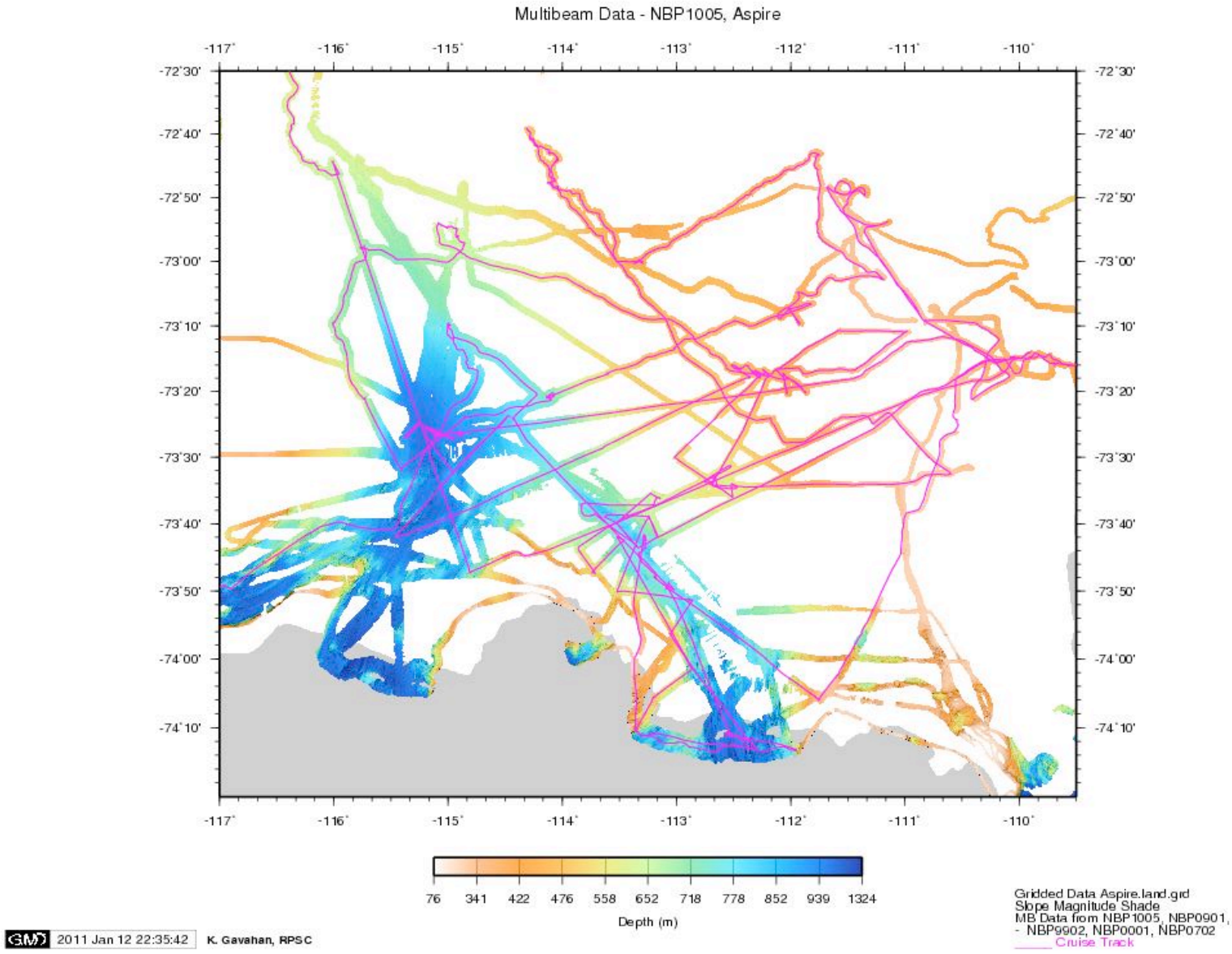
Contents

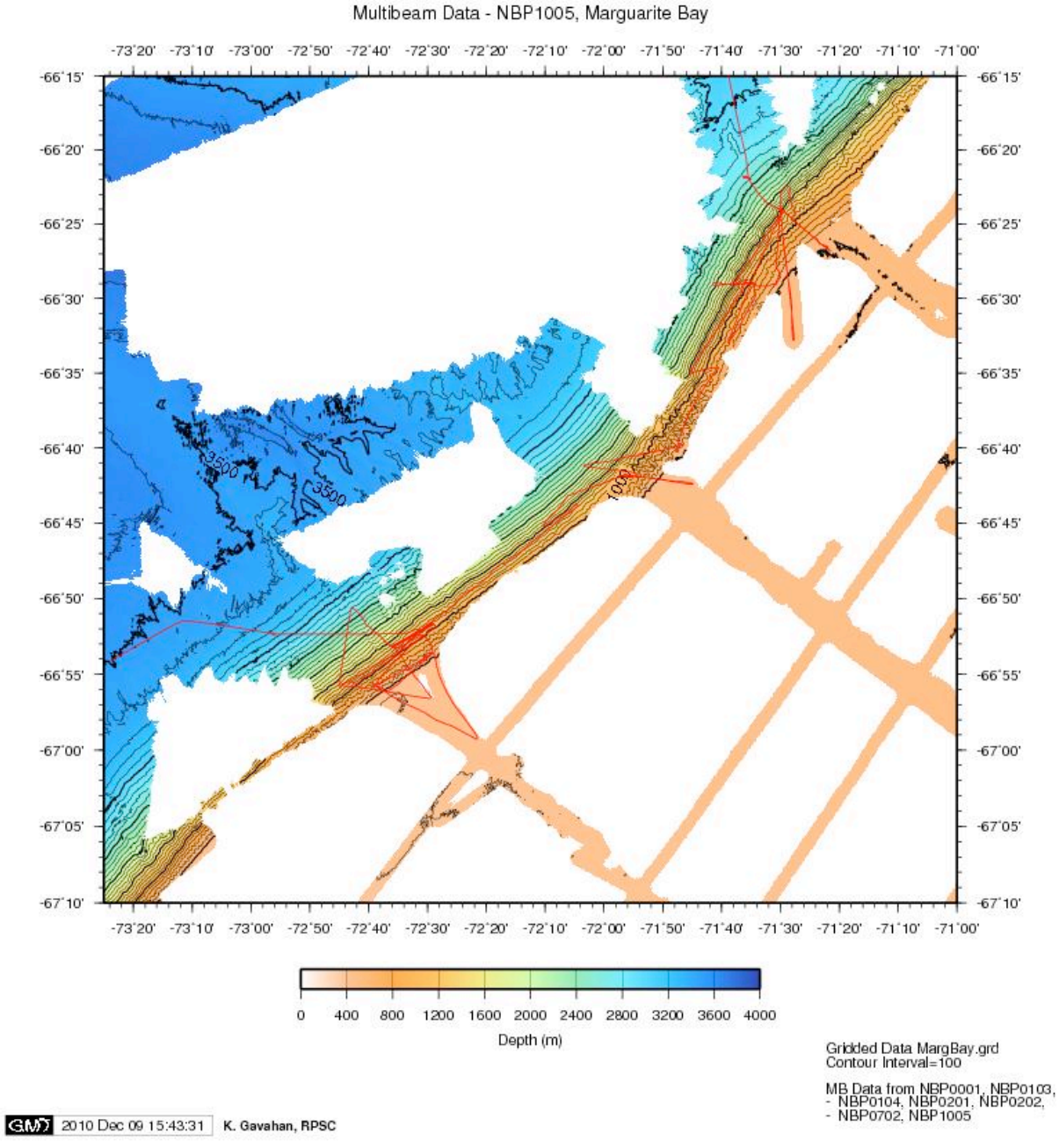
Cruise Track Plot



Multibeam Work Area Plots




Multibeam Data - NBP1005, Aspire
-117°
-116°
-115°
-114°
-113°
-112°
-111°
-110°
-72°30'
-72°40'
-72°50'
-73°00'
-73°10'
-73°20'
-73°30'
-73°40'
-73°50'
-74°00'
-74°10'
76
341
422
476
558
652
718
778
852
939
1324
Depth (m)
GMT 2011 Jan 12 22:35:42
K. Gavahan, RPSC
Gridded Data Aspire.land.grd
Slope Magnitude Shade
MB Data from NBP1005, NBP0901,
- NBP9902, NBP0001, NBP0702
Cruise Track


Multibeam Data - NBP1005, Marguarite Bay
-73°20' -73°10' -73°00' -72°50' -72°40' -72°30' -72°20' -72°10' -72°00' -71°50' -71°40' -71°30' -71°20' -71°10' -71°00'
-66°15' -66°20' -66°25' -66°30' -66°35' -66°40' -66°45' -66°50' -66°55' -67°00' -67°05' -67°10'
3500
3500
1000
0 400 800 1200 1600 2000 2400 2800 3200 3600 4000
Depth (m)
Gridded Data MargBay.grd
Contour Interval=100
MB Data from NBP0001, NBP0103,
- NBP0104, NBP0201, NBP0202,
- NBP0702, NBP1005
GMT 2010 Dec 09 15:43:31 K. Gavahan, RPSC

NBP1005 Multibeam Description of Work

This report covers the Simrad EM120 Multibeam data collection and processing for the RVIB Nathaniel B. Palmer cruise NBP1005. This cruise started in Punta Arenas, Chile on November 26 2010 (GMT) and ended in McMurdo, Antarctica on January 16, 2011. Multibeam data collection for this distribution goes from November 28, 2010 through January 12, 2011. The Chief Scientist was Dr. Patricia Yager. Kathleen Gavahan (RPSC) was responsible for Multibeam data acquisition, processing, and ping editing quality control.

Multibeam data acquisition began November 28, 2010 and ended January 12, 2011. Approximately 9510 km of data consisting of 665253 pings was collected during this cruise. Data quality was usually good. The exceptions were when we experienced strong winds and heavy seas or sea ice. 228,589,182 of the 254,126,646 beams were edited. Approximately 8.6% of the edited data were flagged as bad. Most bad data was caused by travel through sea ice. Data was collected during the entire cruise with the exception of CTD, pumping and mooring operations.

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 5.0.7 was used for processing of data on this cruise. MBSystem versions 5.0.9 and 5.1.0 are available, but these newer distributions do not correctly handle sidescan data for the EM120 system. It is recommended that users who are interested in this data continue to use MBSystem 5.0.7 until a distribution that correctly handles the EM120 sidescan data is released. 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.

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. The science party did not edit the data. Data in important science areas was edited by the Multibeam Analyst and the IT staff. However, not all data was edited.

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. Some 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 K. Gavahan. 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

[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)

size plots were produced of the edited data. Daily plots were also produced which showed one days worth of gridded data.

The following files were edited: 0-20, 42-181, and 278-810. Files 21-41, 182-277 and 811-883 were not edited. The unedited data is in the transit to Marguarite Bay, the transit from Marguarite Bay to the Aspire area, and the transit from the Aspire area to McMurdo.

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 maps 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 mb_vel. Sound velocity profiles were calculated from CTD casts and XBTs, which were combined with the Levitus historical database. The CTD and XBT 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.

NBP1005 Data Distribution

Multibeam data has been provided on DDS 4mm tapes to the science party and MGDS. The maps directory containing xyz grids and maps is included on the RVDAS data distribution CD. This distribution consists of 2 tapes 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 map area.

Each Full DDS4 Data Set Includes:

1. DDS4 tape 1
   a) **Raw** has raw data and ancillary files for November 28 to December 31, 2010. The files are divided into directories by days.
   b) **process** has the edited data and daily processing divided into directories by days for November 28 to December 31, 2010.
2. DDS4 tape2
   a) **Raw** has raw data and ancillary files for January 1 to January 12, 2011. The files are divided into directories by days.

b) **process** has the edited data and daily processing divided into directories by days for January 1 to January 12, 2011. This directory includes the maps and grids. It also includes the sound velocity profiles used during multibeam data acquisition.

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

A copy of the maps directory which includes netctf grids of the data areas and images of the maps created for this cruise has been included on the RVDAS data distribution disk.

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	Yager 1	28 Nov – 31 Dec 2010 Raw, process	DDS4
2	Yager 2	28 Nov – 31 Dec 2010 Raw, process	DDS4
3	MGDS	28 Nov – 31 Dec 2010 Raw, process	DDS4
4	NBP	28 Nov – 31 Dec 2010 Raw, process	DDS4
5	RPSC	28 Nov – 31 Dec 2010 Raw, process	DDS4
6	Yager 3	28 Nov – 31 Dec 2010 Raw, process	DDS4
7	Yager 1	1 Jan – 12 Jan 2011 Raw, process, maps	DDS4
8	Yager 2	1 Jan – 12 Jan 2011 Raw, process, maps	DDS4
9	MGDS	1 Jan – 12 Jan 2011 Raw, process, maps	DDS4
10	NBP	1 Jan – 12 Jan 2011 Raw, process, maps	DDS4
11	RPSC	1 Jan – 12 Jan 2011 Raw, process, maps	DDS4
12	Yager 3	1 Jan – 12 Jan 2011 Raw, process, maps	DDS4