



SCAR Expert Group on IBCSO Report to HCA-9

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- 3. Objectives**
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Retrospect

- Ad-hoc GEBCO-Meeting in Durham, May 2002
- IBCAO-Meeting in Hawaii, November 2002
- IOC-CGOM @ GEBCO Centenary Conference 2003



- Adoption: XXXVII IOC EC (Res. EC-XXXVII.5), 2004
- Kick-Off Meeting XXVIII SCAR, 2004
 - > SCAR GSSG Expert Group
- Implementation of the IBCSO EG Infrastructure



IBCSO is supported by:

SCAR Standing Scientific Group on GeoSciences (SSG-GS)

Intergovernmental Oceanographic Commission (IOC)

Hydrographic Commission on Antarctica (HCA) of IHO

General Bathymetric Chart of the Oceans (GEBCO)

Primary Goal:

Production of a high quality bathymetric chart of the SO
Marine geodata base for Antarctic sciences

&

Secondary Goal:

combine this DB with existing spatial
geophysical, geological, glaciological,
oceanographic data sets, etc., forming the
Southern Ocean Geographic Information System

Network of institutions & data centers:

AAD: Australian Antarctic Database

AWI: Alfred Wegener Institute & PANGAEA

BAS: Antarctic Digital Database (ADD)

BODC: GEBCO Digital Atlas (GDA)

LDEO: GeoMapApp / AMBS

NGDC: IHO Data Center for Digital Bathymetry

NOAA: National Geophysical Data Center

etc.

Recent data contributions:

Australia (Macquarie Island, Kerguelen Plateau)

Germany (Weddell Sea, Cooperation Sea)

Japan (Cosmonaut Sea)

New Zealand (Ross Sea)

United Kingdom (Scotia Sea, Bellinghousen Sea)

United States (BS, Amundsen Sea)

Ukraine (Antarctic Peninsula)

etc.



Integration with existing products:

Antarctic Digital Database (ADD)

Landsat Image Mosaic of Antarctica (LIMA)

Radarsat Antarctic Mapping Program (RAMP)

Antarctic Bedrock Topography (BEDMAP2)

Antarctic Digital Magnetic Anomaly Project (ADMMap)

Earth Topography (ETOPO2v2)

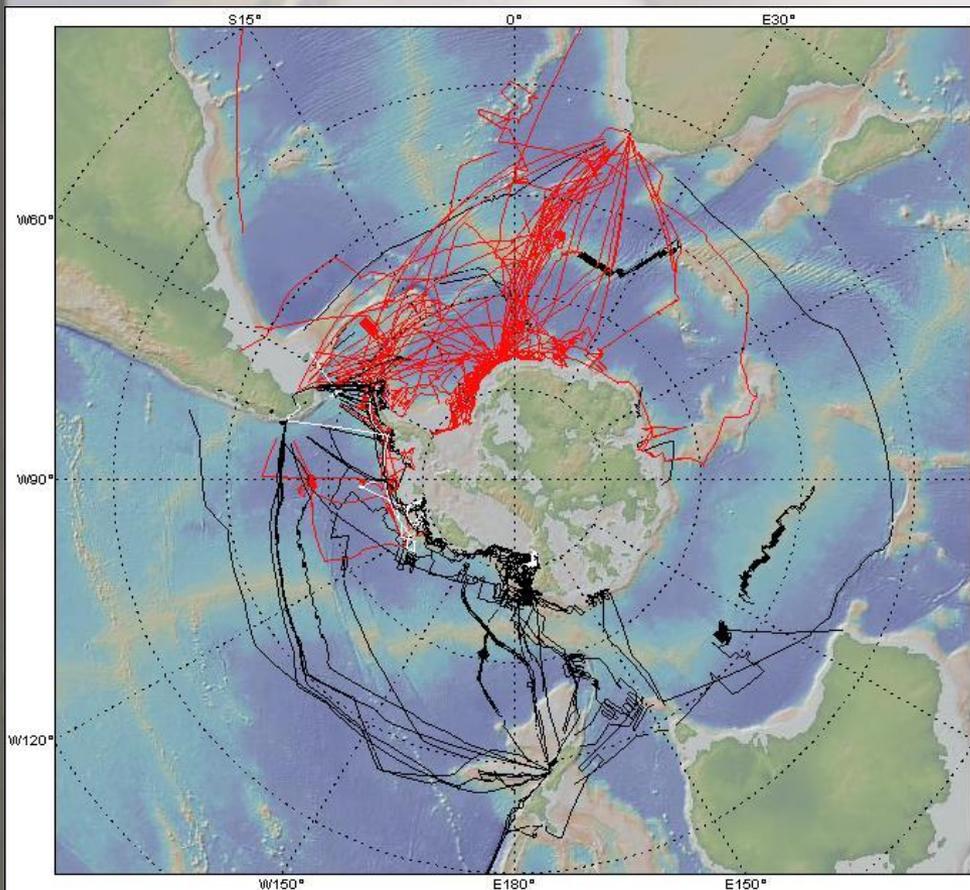
General Bathymetric Chart of the Oceans (GEBCO)

Sea and land nomenclature (SCUFN – CGA)

Gravity data from Satellite missions, etc.

will lead to SOGIS

Review of completed actions:








International Bathymetric Chart of the Southern Ocean



- [Work Plan](#)
- [News](#)
- [Contact](#)
- [Background](#)
- [Documentation](#)
- [Why IBCSO](#)
- [SOGIS::Data](#)
- [Weblinks](#)
- [POBACE](#)

Work Plan and Objectives ↑ TOP

The IBCSO Expert Group will collect existing bathymetric data from archives, data centers and databases from hydrographic offices and scientific institutions. The work plan in terms of data flow and data processing for the proposed IBCSO may be summarized with the following steps:

- conceptual design and implementation of the IBCSO database 'SOGIS'
- assembling of bathymetric, topographic, geophysical and geological data
- data preprocessing including quality control, analyses, and description
- data merge and processing including data modeling for optimized visualization
- generation of services and products: printed map series, web maps, database, ship track inventories
- gridded data release via internet for use in Antarctic data centers and scientific programs

The work plan in terms of data flow depends strongly on close collaboration. To ensure continuous data transfer, the establishment of the group with an associated communication network is crucial. This includes:

- buildup the international Expert Group
- setup the group infrastructure (Editorial Board, Advisory Board, and IBCSO Board)
- implementation of the communication network
- organizing Expert Group meetings and workshops
- intensify cooperation with other Southern Ocean programs and mapping projects

The work plan and objectives of the IBCSO mapping project are introduced by a poster series with special emphasis on:

- project and data management perspectives (file size: 7 MB) 
- bathymetric patch- and network for the Southern Ocean (file size: 12.5 MB) 
- database entitled 'Southern Ocean Geographic Information System - SOGIS' (file size: 7 MB) 

Open and save PDFs for printing.

Please subscribe to the IBCSO [mailing list](#) at the NGDC.
To post a message to all the list members, send email to ibcs0@mailman.ngdc.noaa.gov
To enter names on the list or to delist - please contact.

↓

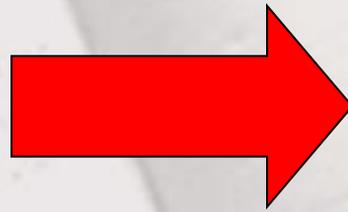
Upcoming ... ↑ TOP

Joint SCAR / IBCSO / IHO actions

- **SCAR/SCOR Circular 768 calling international support for IBCSO**
- **SCAR Circular 770 requesting nominations for natl. representatives to IBCSO**
- **Resolution 5 of XXXI ATCM in Kiev: requesting to improve OM in Antarctic waters**

Deliverables

- **Grids**
- **Contours**
- **DTM**
- **Shape files**
- **Meta data**



SCAR/ADD
GEBCO GDA
BEDMAP
SOOS

from future IBCSO/SOGIS web portal

Meetings/Outreach

IBCSO discussed/presented at Meetings:

- 1st IBCSO Business Meeting at the IAESC
- GEBCO/SCDB/GC Meetings (4)
- IHO/HCA Meetings (4)
- SCAR SC-AGI (1)

IBCSO Publications and reports:

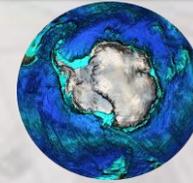
- EOS Transactions (1)
- Hydro International (2)
- Posters (3)
- Talks (3)

Next Actions

- 1. Strengthen/enlarge the IBCSO EG**
- 2. Activate the IBCSO infrastructure (EB/AB/IB)**
- 3. Implement a SOGIS communication network**
- 4. Organise intersessional EB-Meetings**
- 5. Cooperation with other SO mapping programs**



The IBCSO Network



– International Hydrographic Organization / HCA



– Intergovernmental Oceanographic Commission



– Scientific Committee on Antarctic Research



– General Bathymetric Chart of the Oceans



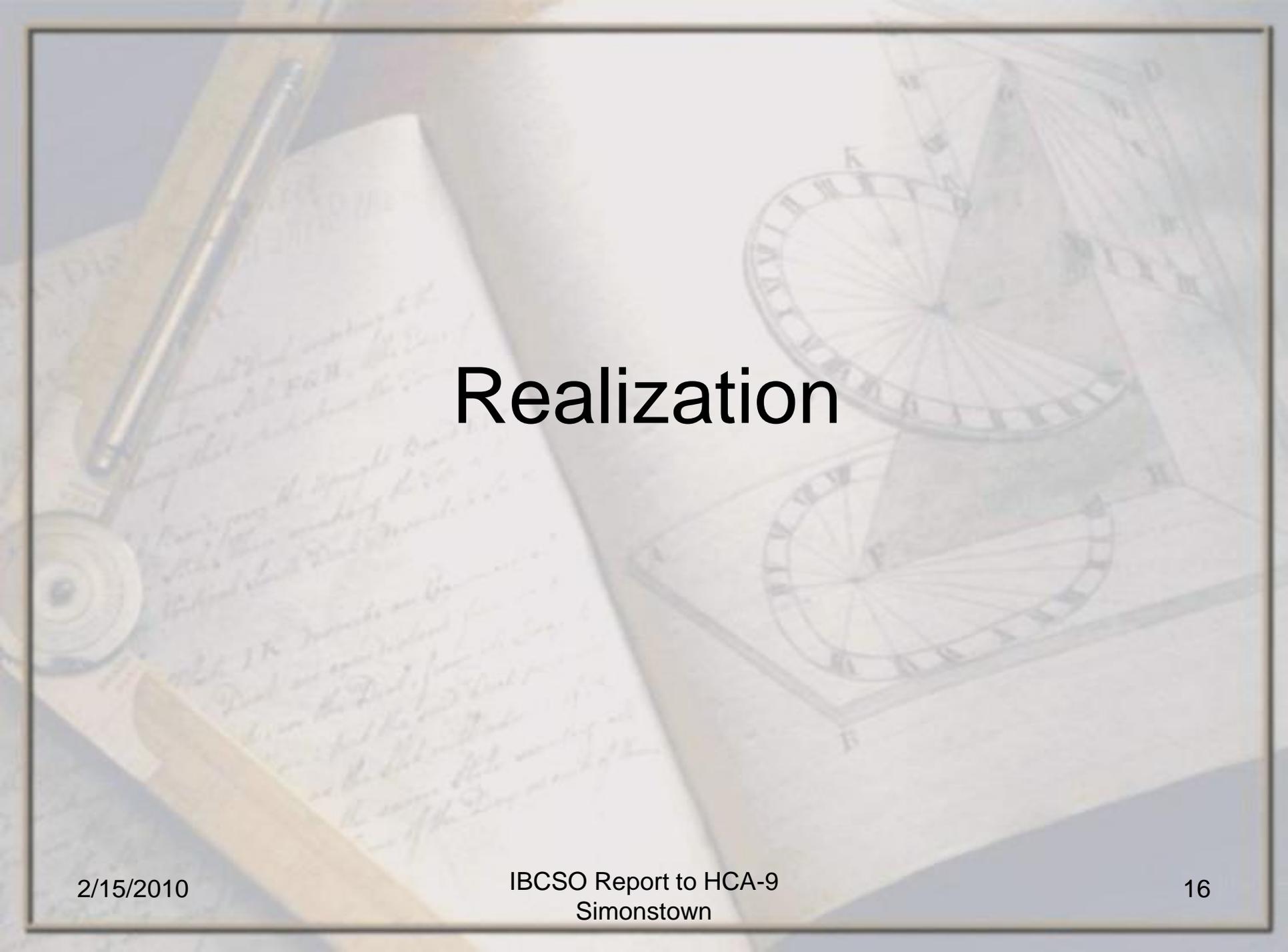
– IBC of the Southern Ocean

– and SCAR Member institutions

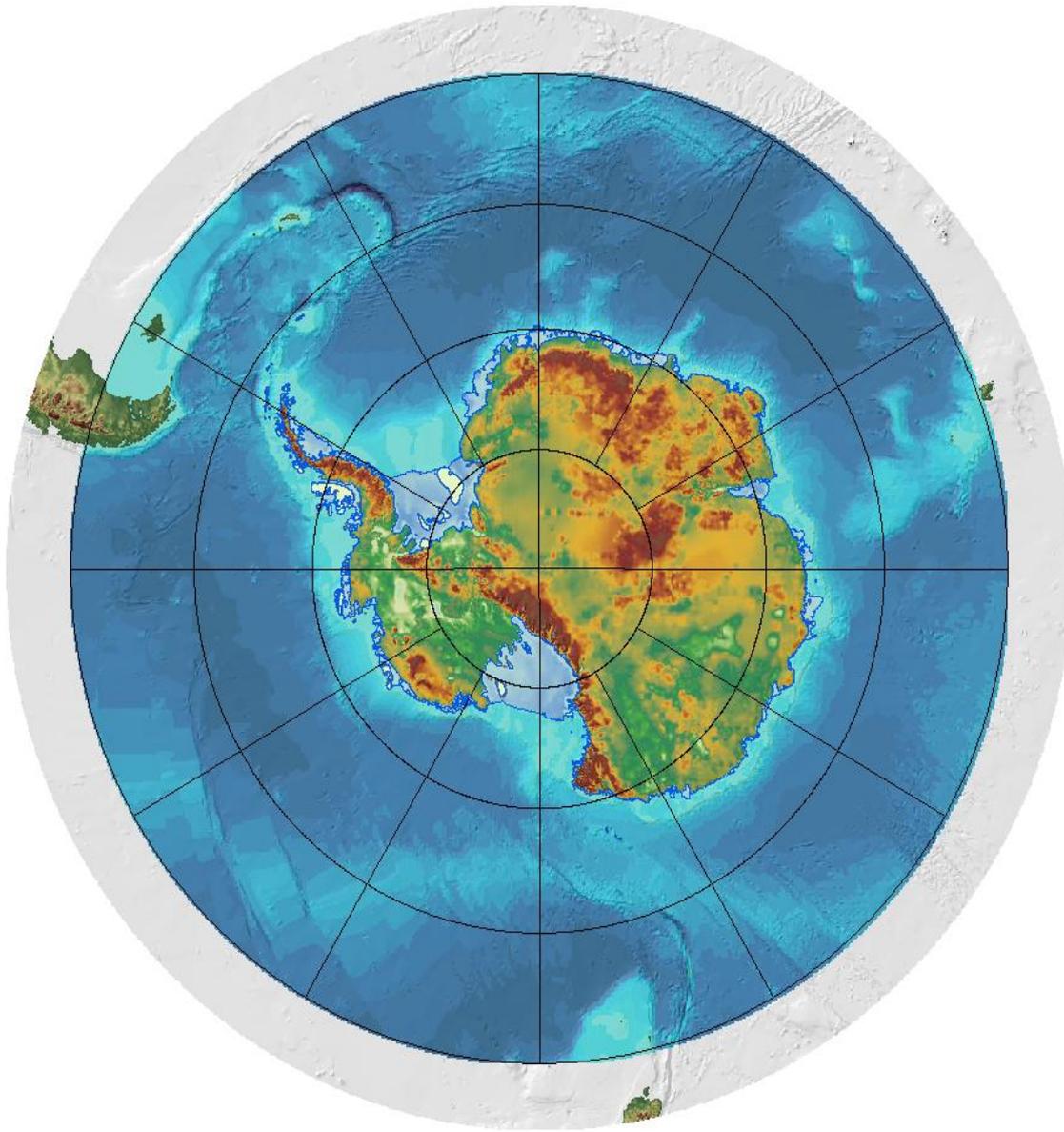


Upcoming

- Scheduled 3rd IBCSO Meeting to be held in Bremerhaven, 30 November 2009
- Consistent bathymetric database to be prepared in the 4th quarter 2009
- Digital elevation model to be prepared in the 2nd and 3rd quarter 2010
- Printed maps to be prepared in the 3rd quarter 2010
- Publication of the compiled IBCSO dataset in Pangaea
- Submission of IBCSO publications to relevant geoscientific journals



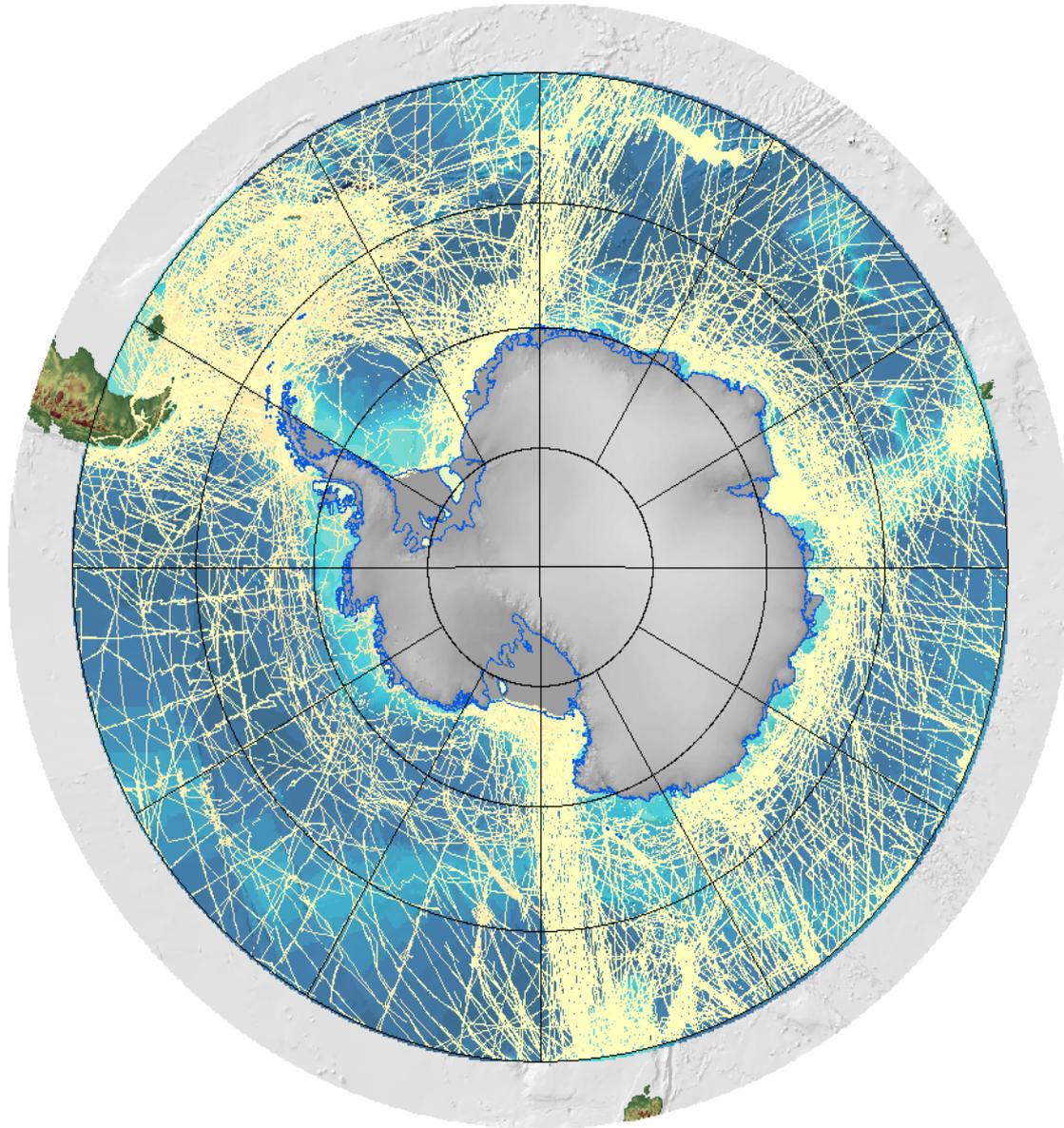
Realization



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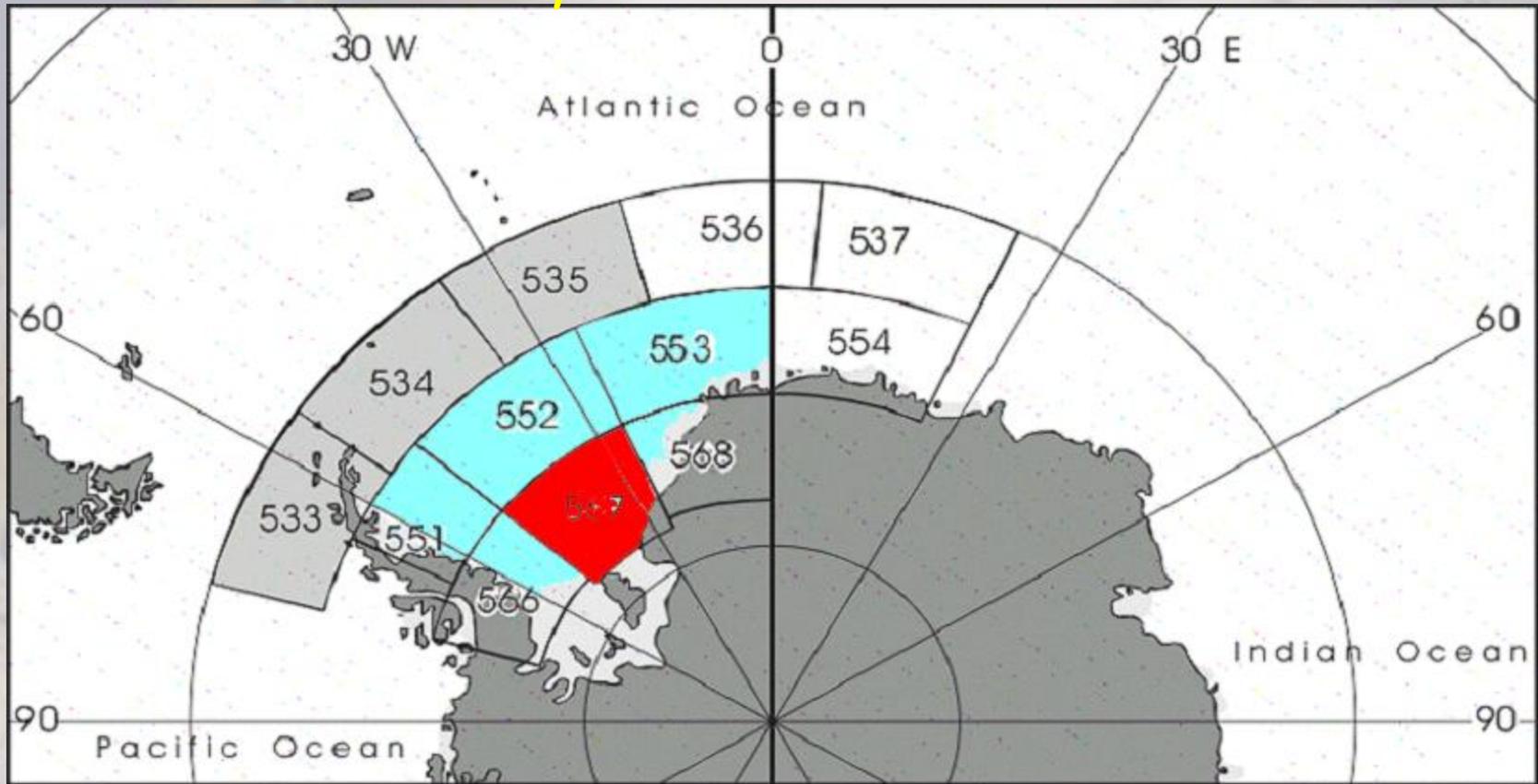


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Index of the Bathymetric Chart of the Weddell Sea



AWI-BCWS 1:1 Mio

**50/100 m contour interval
9 sheets**

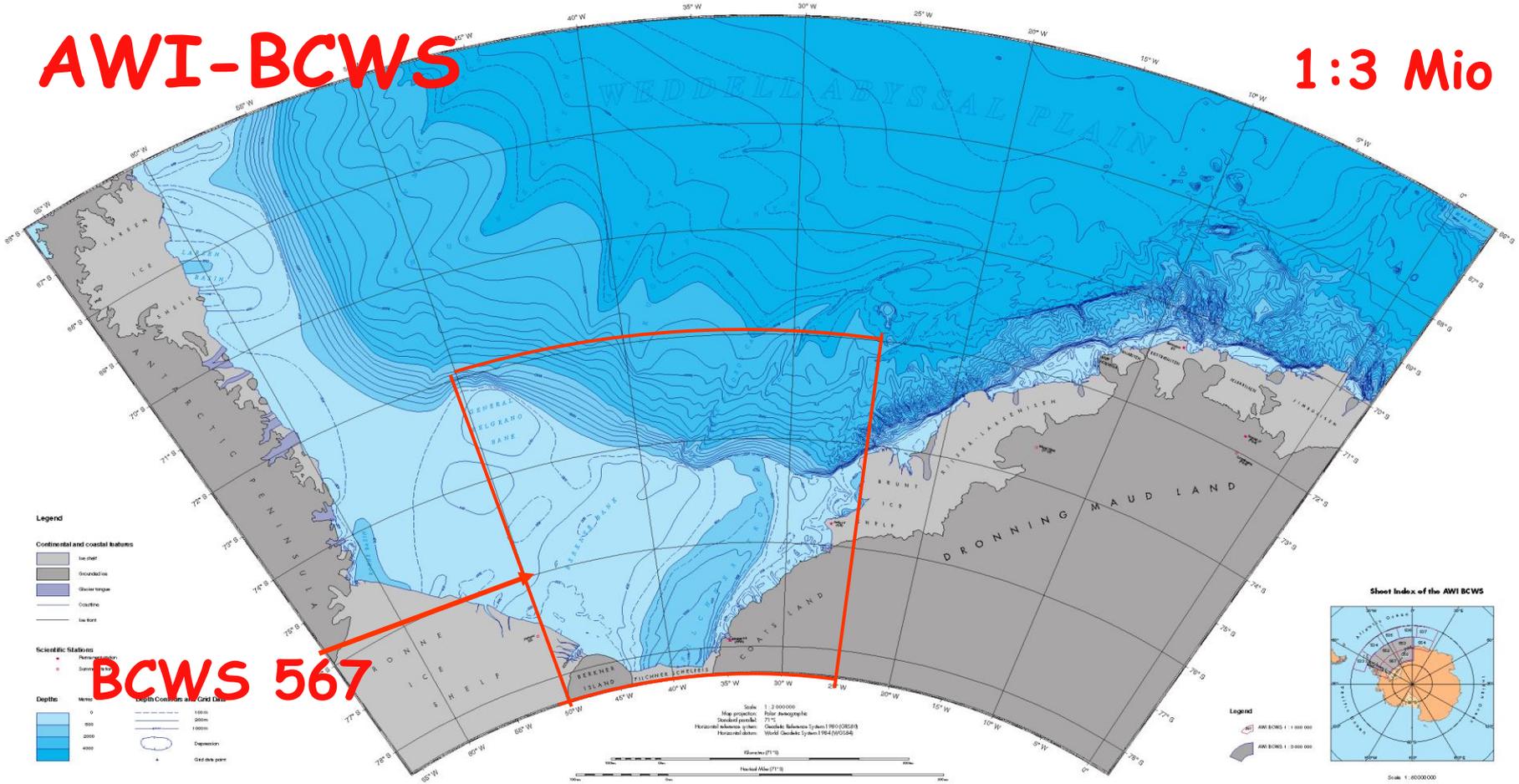
AWI-BCWS 1:3 Mio

200 m contours



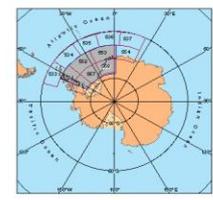
AWI-BCWS

1:3 Mio



BCWS 567

Sheet index of the AWI BCWS



- Legend**
- Continental and coastal features**
- Ice shelf
 - Groundline
 - Glacier tongue
 - Coastline
 - Ice front
- Scientific Stations**
- Permanent
 - Summer
- Depth**
- Metres
- 0
 - 1000
 - 2000
 - 3000
 - 4000
- Depth Contours as Grid Data**
- 1000
 - 2000
 - 3000
 - 4000
- Other data point**

General Information

This chart is based on the AWI-BCWS 1:3 000 000 chart of the Weddell Sea, Antarctica, 1992. The chart is based on the AWI-BCWS 1:3 000 000 chart of the Weddell Sea, Antarctica, 1992. The chart is based on the AWI-BCWS 1:3 000 000 chart of the Weddell Sea, Antarctica, 1992.

Scale

1 : 3 000 000

Map projection

Polar stereographic

Horizontal datum system

Geoidic Reference System 1980 (GRS80)

Vertical datum system

World Geodetic System 1984 (WGS84)

General Bathymetric Chart of the Oceans (from GEBCO Digital Atlas)

GEBCO Digital Atlas, 1998. Geographical coordinates in decimal degrees, latitude and longitude, based on the International Reference Meridian (IRM) and the International Reference Equator (IRE). The chart is based on the GEBCO Digital Atlas, 1998. The chart is based on the GEBCO Digital Atlas, 1998.

Hydrographic Institution

1. Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

2. Federal Hydrographic Office, Hamburg, Germany

3. Hydrographic Office, London, United Kingdom

4. Hydrographic Office, Monaco, Monaco

5. Hydrographic Office, Paris, France

6. Hydrographic Office, Rome, Italy

7. Hydrographic Office, Washington, D.C., USA

8. Hydrographic Office, Sydney, Australia

9. Hydrographic Office, Wellington, New Zealand

10. Hydrographic Office, Cape Town, South Africa

11. Hydrographic Office, Durban, South Africa

12. Hydrographic Office, Port Elizabeth, South Africa

13. Hydrographic Office, Johannesburg, South Africa

14. Hydrographic Office, Harare, Zimbabwe

15. Hydrographic Office, Lusaka, Zambia

16. Hydrographic Office, Windhoek, Namibia

17. Hydrographic Office, Gaborone, Botswana

18. Hydrographic Office, Maseru, South Africa

19. Hydrographic Office, Cape Town, South Africa

20. Hydrographic Office, Durban, South Africa

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Other Information

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Map projection

Polar stereographic

Horizontal datum system

Geoidic Reference System 1980 (GRS80)

Vertical datum system

World Geodetic System 1984 (WGS84)

Scale

1 : 3 000 000

Map projection

Polar stereographic

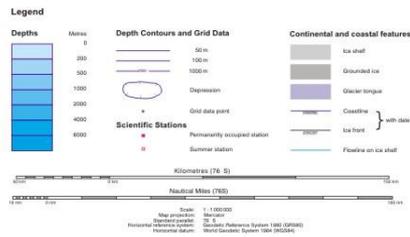
Horizontal datum system

Geoidic Reference System 1980 (GRS80)

Vertical datum system

World Geodetic System 1984 (WGS84)

NOT TO BE USED FOR NAVIGATION



Sheet Index of the AWI BCWS



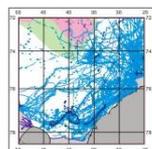
Sheet Index of the AWI Bathymetric Chart of the Weddell Sea, Antarctica (AWI BCWS)

This chart is part of a series of bathymetric charts of the Weddell Sea, Antarctica, covering the area from 50°W to 25°W and 72°S to 78°S. The charts are based on data from various sources, including the International Bathymetric Chart of the Pacific Ocean (IBCO), the International Bathymetric Chart of the Indian and Antarctic Oceans (IBCAO), and the International Bathymetric Chart of the Arctic Ocean (IBCAO). The charts are produced by the Alfred Wegener Institute for Polar and Marine Research, Germany.

The chart is a bathymetric chart, showing the depth of the sea floor. The depth is indicated by contour lines, with the depth increasing towards the south and east. The chart also shows the coastline of Antarctica, including the Filchner-Ronne Ice Shelf and the Brunt Ice Shelf. The chart is a Mercator projection, with a scale of 1:1,000,000.

The chart is part of a series of bathymetric charts of the Weddell Sea, Antarctica, covering the area from 50°W to 25°W and 72°S to 78°S. The charts are based on data from various sources, including the International Bathymetric Chart of the Pacific Ocean (IBCO), the International Bathymetric Chart of the Indian and Antarctic Oceans (IBCAO), and the International Bathymetric Chart of the Arctic Ocean (IBCAO). The charts are produced by the Alfred Wegener Institute for Polar and Marine Research, Germany.

Source Data Diagram

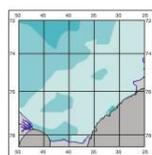


Data from	Area	Type	Date
IBCO	Blue	Contour	1980
IBCAO	Green	Contour	1980
IBCAO	Red	Contour	1980
Scientific Institutions	Yellow	Point	1980
Scientific Institutions	Purple	Point	1980
Scientific Institutions	Orange	Point	1980

Original and interpreted data, digital data and digitized data

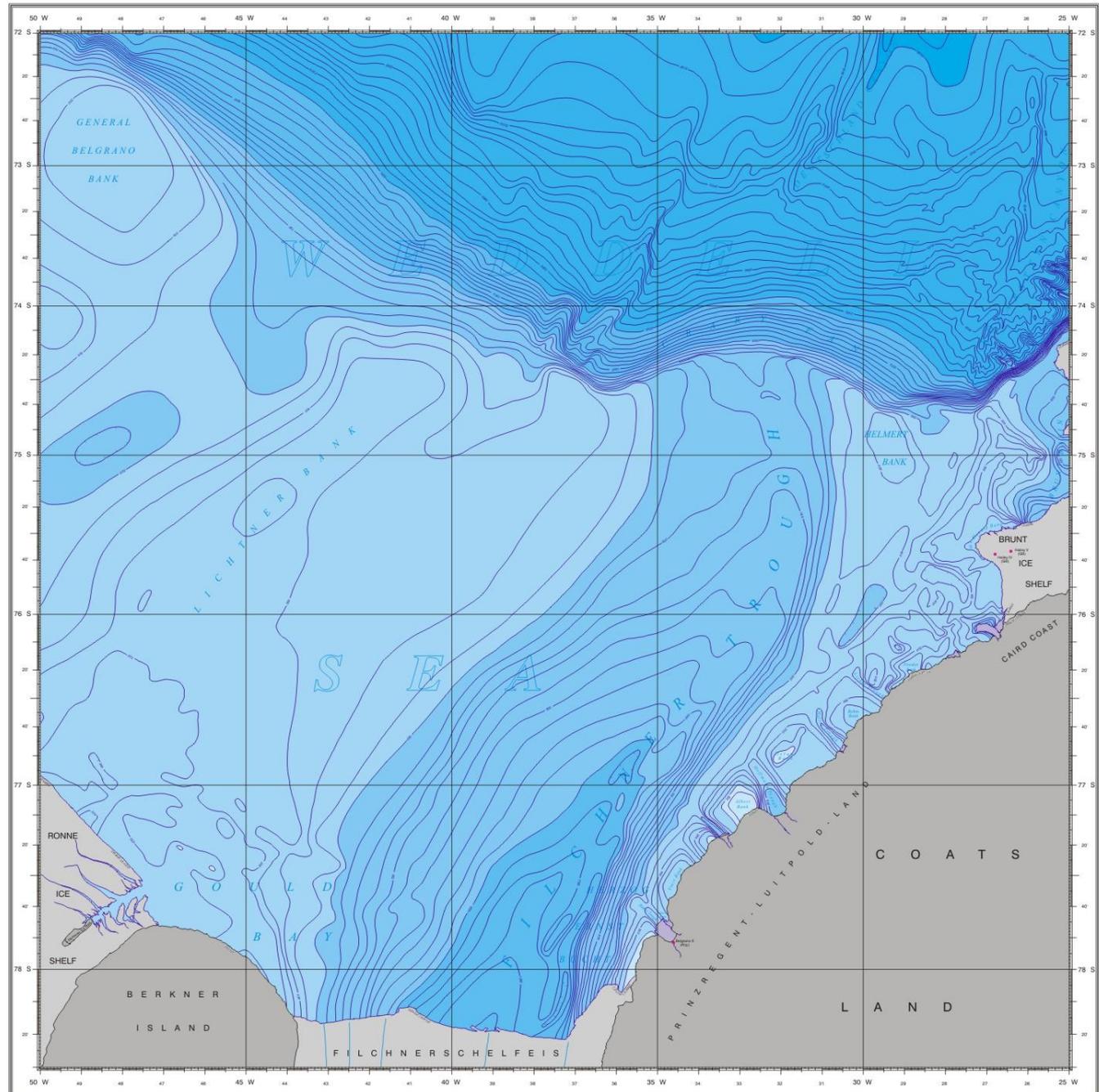
1. Original and interpreted data, digital data and digitized data
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3. Scientific institutions
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100. Hydrographic institutions

Accuracy of Bathymetric Depths

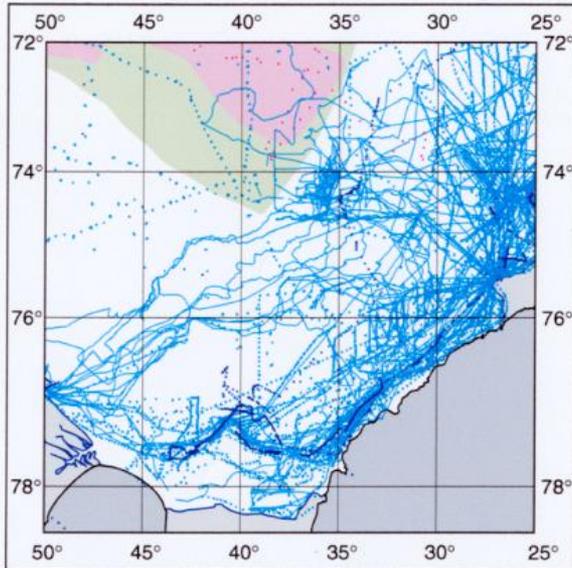


Accuracy

50 m
100 m
200 m
Worse than 200 m



Source Data Diagram



Scale 1 : 10 000 000

Data from	Area	Track Line	Spot Data
GEBCO			
Hydrographic Institutions			
Scientific Institutions			
Satellite Altimetry			

Contours/soundings from GDA

1990, 1990, and 1990, 1990, supporting volume to the GEBCO Digital Atlas, published on behalf of the Intergovernmental Oceanographic Commission (of UNESCO) and the International Hydrographic Organization as part of the General Bathymetric

Hydrographic Organisations

2.2 National Hydrographic Offices: Nautical Charts (various scales):

- Argentina
- Soviet Union / Russia
- United Kingdom

2.3 National Hydrographic Offices: Plotting Sheets (various scales)

- GEBCO Ocean Plotting Sheets (OPS) 1:1 000 000 by:
 - Argentina
 - Republic of South Africa
 - United Kingdom
- Plotting Sheets 1:500 000 by:
 - Soviet Union / Russia

2.4 National Hydrographic Offices: Digital Data

Scientific Institutions

- Alfred-Wegener-Institut für Polar- und Meeresforschung, Germany:
 - RV "Polarstern" Antarctic expeditions ANT (since 1983):
 - Multibeam data from SeaBeam and Hydrosweep system, single beam data from navigation echo sounder, narrow beam echo sounder, and Parasound sediment echo sounder.
- Norsk polar institutt, Oslo, Norway:
 - NARE expedition data 1977, 1979, 1985. A. Solheim, pers. comm.
- Sevmorgeologia, St. Petersburg, Russian Federation:
 - V. Krukov and V.S. Pozdeev, digital data, pers. comm.

3.2 Scientific Publications

- Hoppe, H., F. Thyssen 1988: Ice thickness and bedrock elevation in Western Neuschwabenland and Berkner Island, Antarctica. *Annals of Glaciology*, vol.11, 42-45, 1988.
- Huybrechts, P. 1992: The Antarctic ice sheet and environmental change: a three-dimensional modelling study. *Berichte zur Polarforschung* 99, 1992.
- Pozdeyev, V.S., R.G. Kurinin 1987: Nowyje dannyye o morfologii ledovoj tolschtschi i reljefe podlednogo losha i morskogo dna v jushnoj tschasti bassejna Morja Ueddella (Sapadnaja Antarktika). *Antarktika, Doklady Komissii*, 26, 66-71, 1987.

3.3 Other Sources

- Doake, C.S.M., BAS, UK:
 - Filchner-Ronne Ice Shelf oversnow traverse gravity data, calculation by B. Harrods, pers. comm.
- Hinze, H., AWI, Germany:
 - Southern Ocean and Antarctica collected depth and bathymetric data. Internal report.

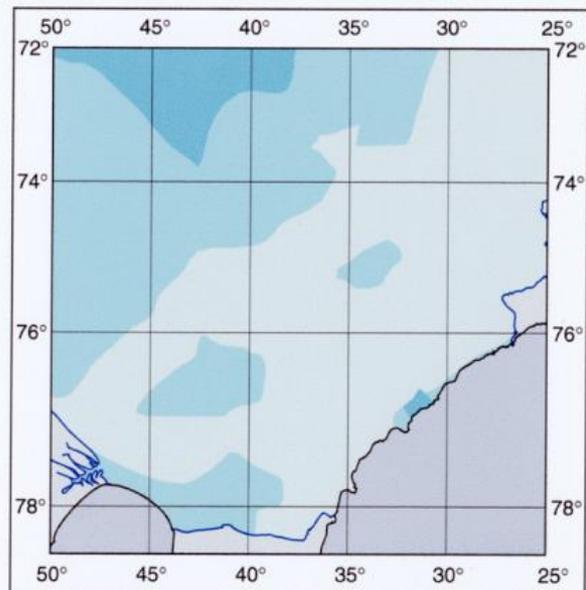
Satellite Altimetry Data

Ein Beitrag zum Schwerfeld im Bereich des Weddellmeers, Antarktis. Nutzung von Altimetermessungen

Topographic Data

Geodäsie, Frankfurt am Main.

Accuracy of Bathymetric Depths



Scale 1 : 10000000

Accuracy	
	± 50 m
	± 100 m
	± 200 m
	Worse than ± 200 m

The bathymetry contained in this chart is evaluated from various data sets of different quality, and is therefore of varying accuracy. Compilation and contouring are in accordance with the IHO standards (IHB S-44), applied to Antarctic waters.

Reported but unconfirmed or suspect depths were omitted if they conflicted with morphologic evidence from other sources.

Reference: Hinze, H., 1994: Charting the Bathymetry of Weddell Sea, Antarctica. Marine Geodesy, vol.17, 139-145.

The positional accuracy of bathymetric data, contour lines and features in relation to the graticule is approximately 1 mm (or 1 kilometre on the Earth).

Mean positional error: horizontal accuracy e_h for contour lines of the given scale may be estimated by Koppe's empirical formula, which depends on the terrain slope α (a=50 m, b=2000 m):

$$e_h = b + a \cdot \cot \alpha;$$

A vertical accuracy of better than 2% of depth was achieved with the compilation from heterogeneous depth data. However, some suspect data still may be present within the map.

Mean depth error: accuracy e_d of a contour or interpolated depth value from the map may be estimated by

$$e_d = a + b \cdot \tan \alpha;$$

a=50 m and b=500 m.

In areas with slopes greater than 20° the error may exceed 200 m due to generalisation effects.

Despite an automatic accuracy estimation, a classification may reflect how closely the ideal has been approached under the existing constraints, e.g. inhomogeneous data and seabed roughness. Thus, categories for the accuracy of bathymetric depths were chosen. The 1 : 10 000 000 inset map of bathymetric accuracy gives an overview of accuracies, but it does not reflect special features, e.g. canyons or seamounts. Areas with depths estimated worse accurate than 200 m, better than 200 m, better than 100 m, and better than 50 m are given.

Caution.

Due to incomplete survey coverage dangers may exist, particularly within the 200 metre depth contour. Vessels should therefore navigate with due caution.

For further information on navigation, magnetic variation, ocean currents, and ice in the area of this map see Sailing Directions and Routing Charts and contact the Hydrographic Offices or IHB. For further information on research stations and glaciology contact the SCAR. For further informations on bathymetry contact the IHB-IOC GEBCO Committee or AWI.

Koppe's Formula:

$$e_h = b + a \cdot \cot \alpha$$

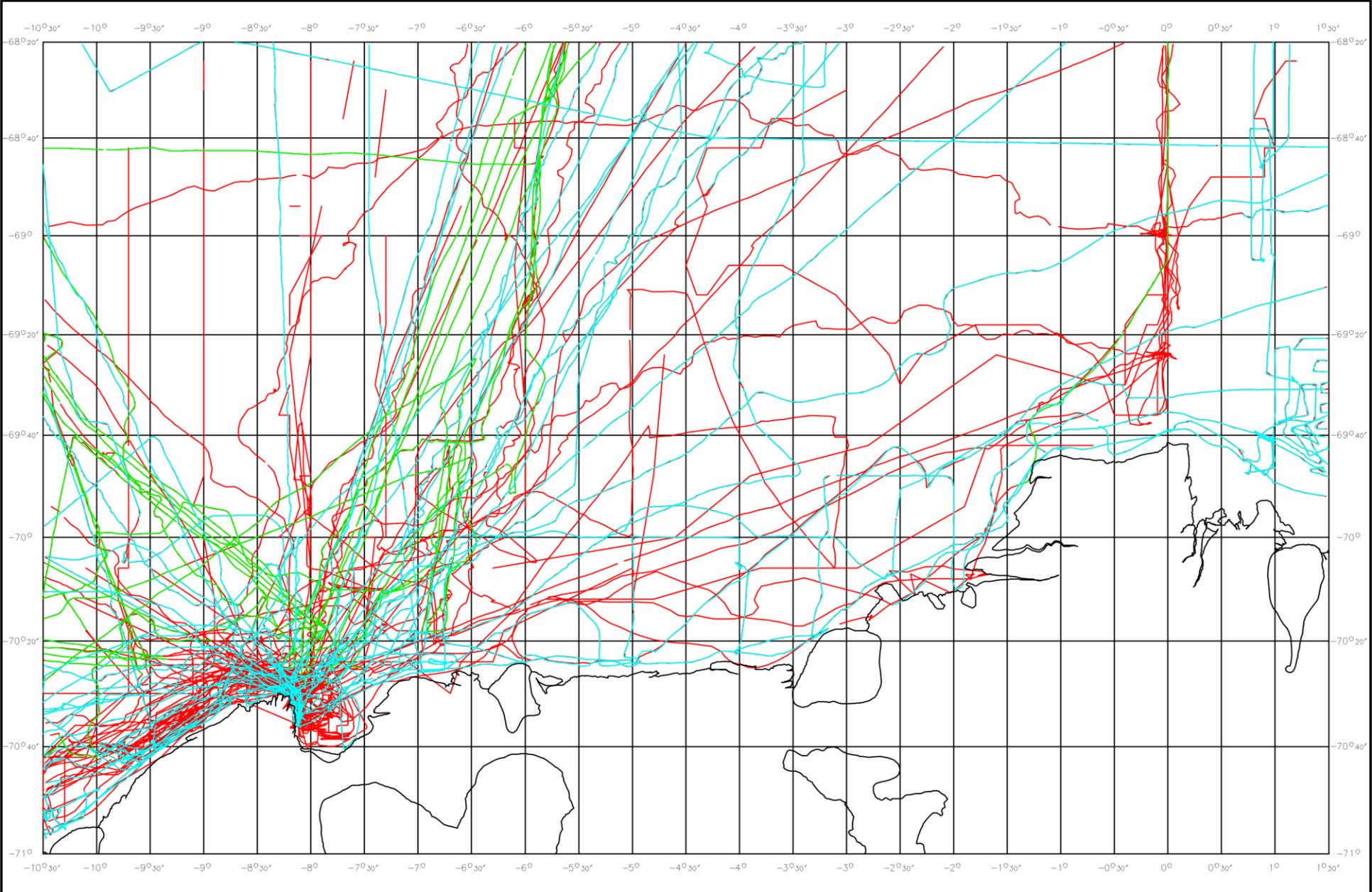
$$a=50m$$

$$b=2000m$$

$$e_d = a + b \cdot \tan \alpha$$

$$a=50m$$

$$b=500m$$

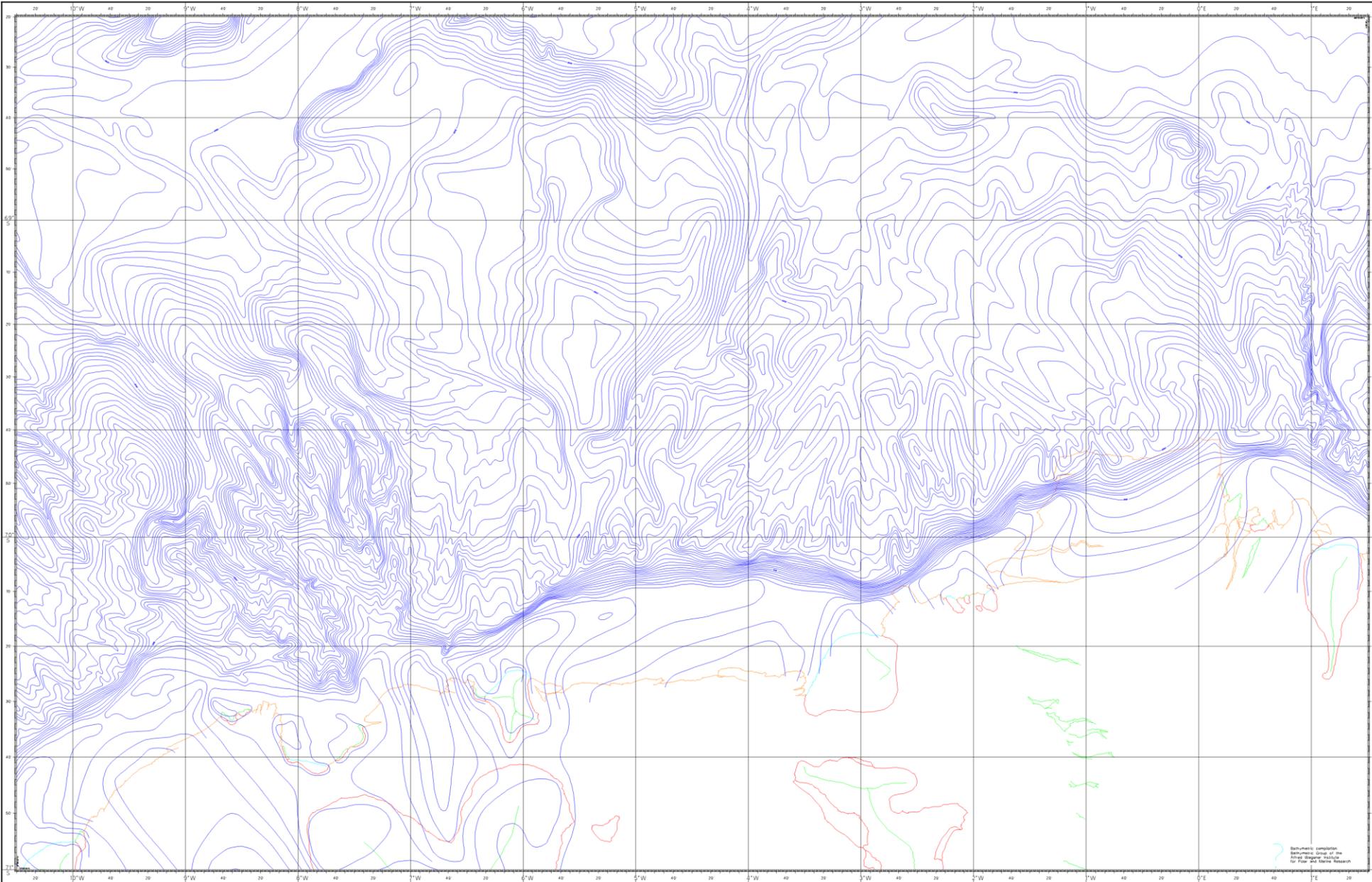


Polarstern 1984 - 2003

red = NBS
green = Seabeam, cyan = Hydrosweep

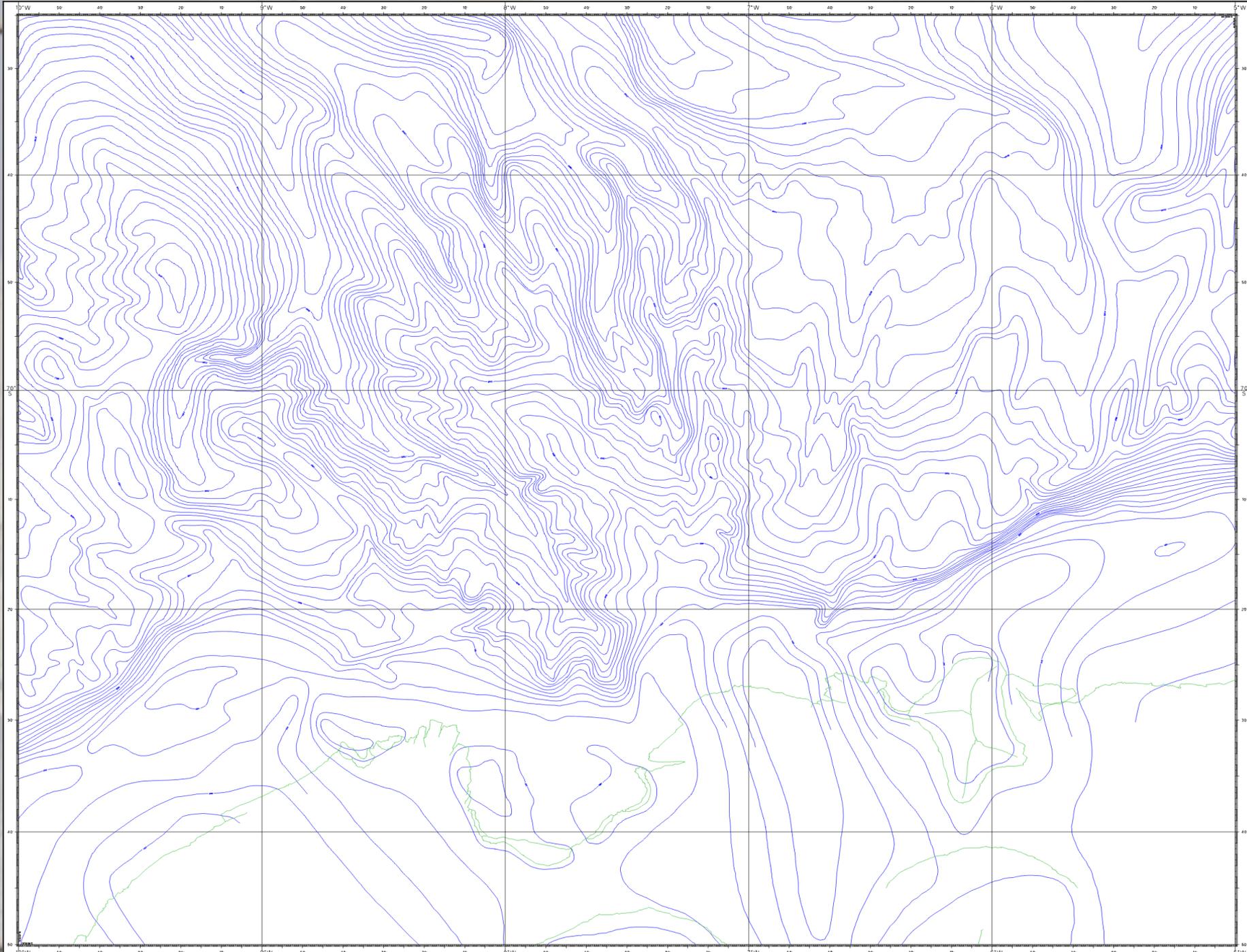
Mercator Projection
Scale: 1 : 2000000
Standard Parallel: 66°S
World Geodetic System 1984 (WGS 84)

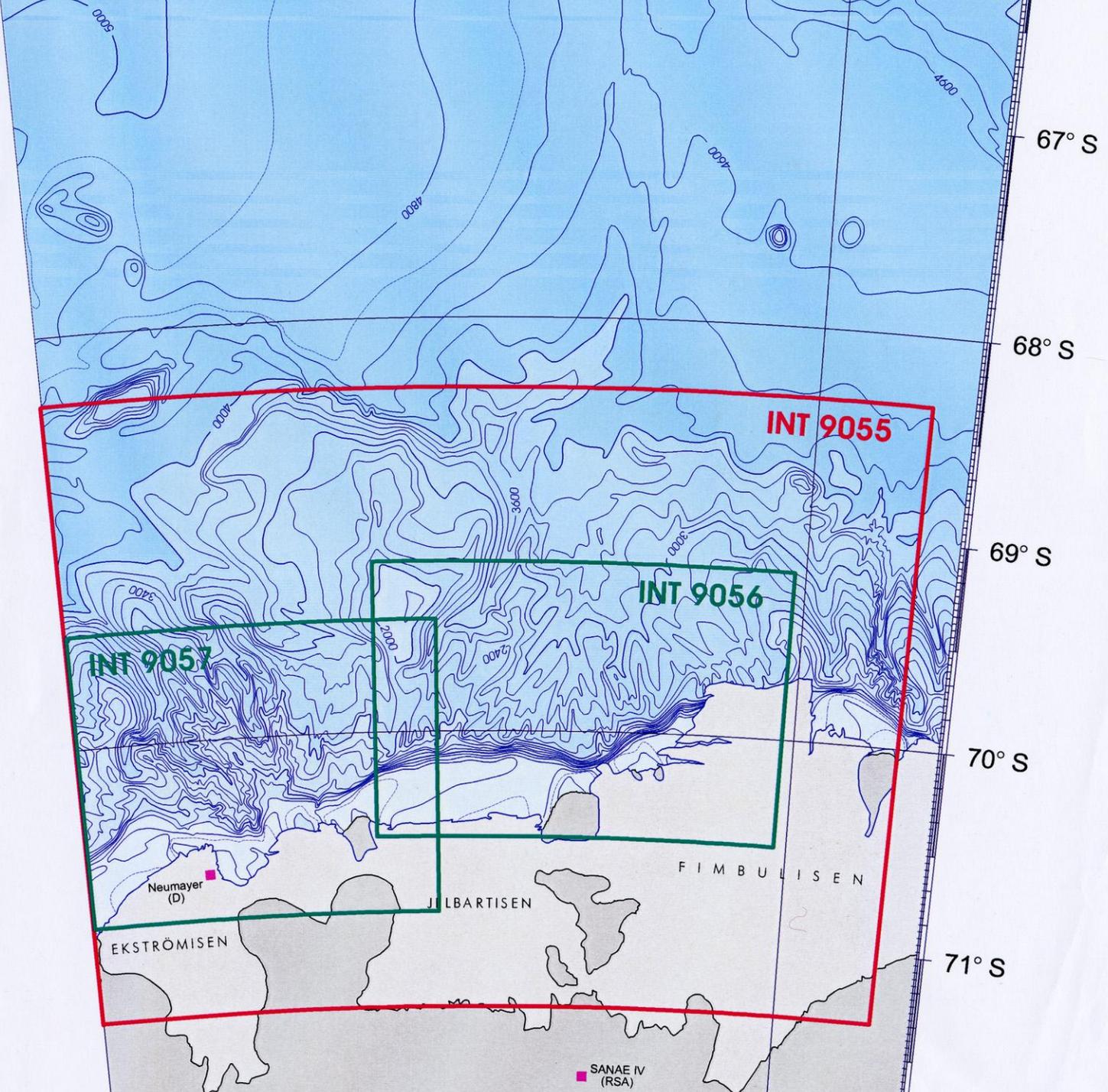


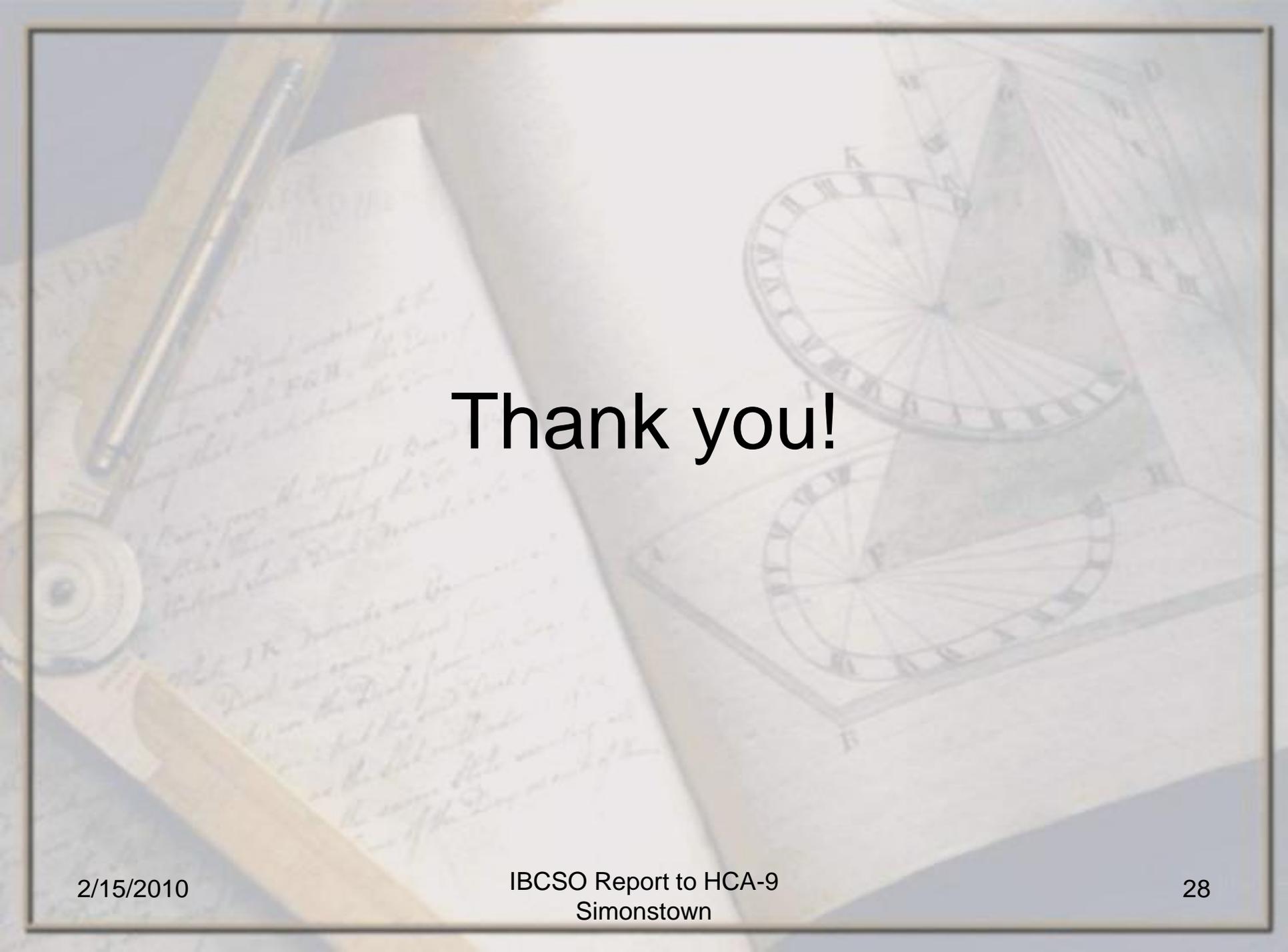


2/15/2010

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Thank you!

