

IHO



GEBCO

Established 1903



IOC

HCA11-07.3A

GEBCO Report to the 11th IHO Hydrographic Commission on Antarctica (HCA)

5-7 October 2011

Dr. Bruce Goleby
on behalf of GEBCO Guiding Committee



General Bathymetric Chart of the Oceans (GEBCO)

GEBCO's mission is to provide the most authoritative publicly-available bathymetry of the world's oceans.

It operates under the joint auspices of the Intergovernmental Oceanographic Commission (IOC) (of UNESCO) and the International Hydrographic Organization (IHO).

GEBCO

General Bathymetric Chart of the Oceans



GEBCO Recent Events

- **GEBCO 2010 Annual Meeting, Lima, Peru, Sep 11-18, 2010**
 - Guiding Committee and Technical Sub-Committees Met
 - >60 Hydrographers, Oceanographers, and Scientists
 - Meeting Minutes and Reports; <http://www.gebco.net>
- **GEBCO Data Flow Workshop, Boulder, CO, March 9-11, 2011**
 - Key GEBCO technical experts met to discuss improving the flow of data from contributors to GEBCO products
- **Arctic-Antarctic Seafloor Mapping Meeting, Stockholm, Sweden – May 3-5, 2011**
 - 42 Participants from 15 Countries
 - IBCAO and IBCSO action plans developed
 - New IBCAO Editorial Board established
 - Substantial amount of potential Arctic and Antarctic bathymetry contributions identified among participants
 - Agreement to make this meeting reoccurring
- **GEBCO 2011 Annual Meeting, California, USA, Oct 3-7, 2011**

Gridded Bathymetry Data

GEBCO provides bathymetry data sets for the world's oceans.



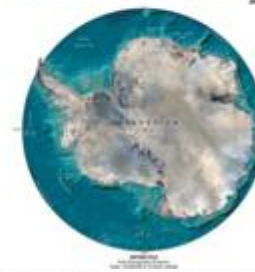
GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)
WORLD OCEAN BATHYMETRY

Scale: 1:100,000,000
Projection: Mercator
Reference Datum: Mean Sea Level (MSL)
Vertical Datum: Mean Sea Level (MSL)
Horizontal Datum: WGS 84
Vertical Accuracy: ± 100 meters
Horizontal Accuracy: ± 100 meters
Resolution: 1 minute of arc
Source: GEBCO
Version: 2019

GEBCO World Map (Composite Global Bathymetry)
(Geological Oceanography 2019)

Legend:
0 - 1000 meters
1000 - 2000 meters
2000 - 3000 meters
3000 - 4000 meters
4000 - 5000 meters
5000 - 6000 meters
6000 - 7000 meters
7000 - 8000 meters
8000 - 9000 meters
9000 - 10000 meters
10000 - 11000 meters
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98000 - 99000 meters
99000 - 100000 meters

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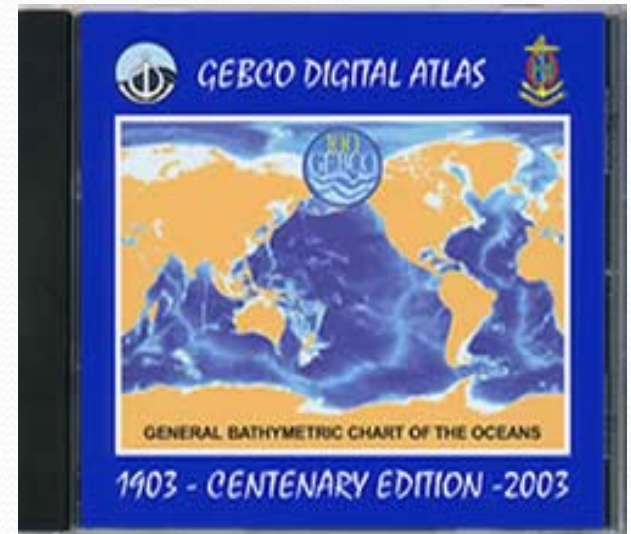


GEBCO Digital Atlas

The Centenary Edition of the GEBCO Digital Atlas (GDA) is a two-volume DVD and CDROM set which contains:

- the GEBCO_o8 global bathymetric grid at **30 arc-second** intervals (~ 1 km)
- the GEBCO One Minute Grid global bathymetric grid
- a global set of digital bathymetric contours and coastlines
- the GEBCO gazetteer of undersea feature names
- a software interface for viewing and accessing the data sets

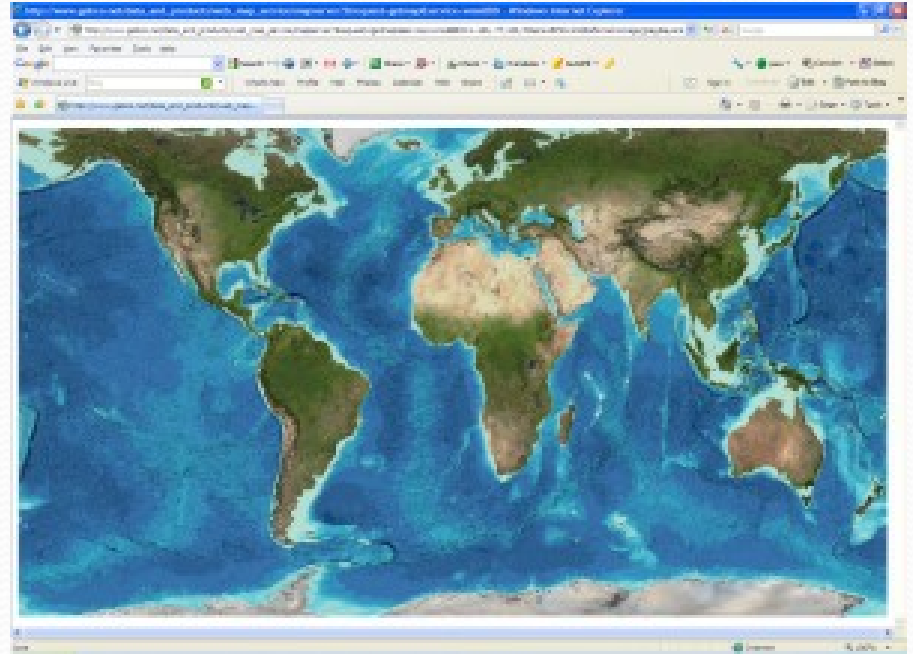
All products are also available free, online from the GEBCO Website



GEBCO Web Map Service

The GEBCO_o8 Grid is now available as a **Web Map Service**

- **WMS** - accessing geo-referenced map images over the internet
- Viewed in a web browser or Geographic Information System (GIS)
- Incorporate in your own web application.



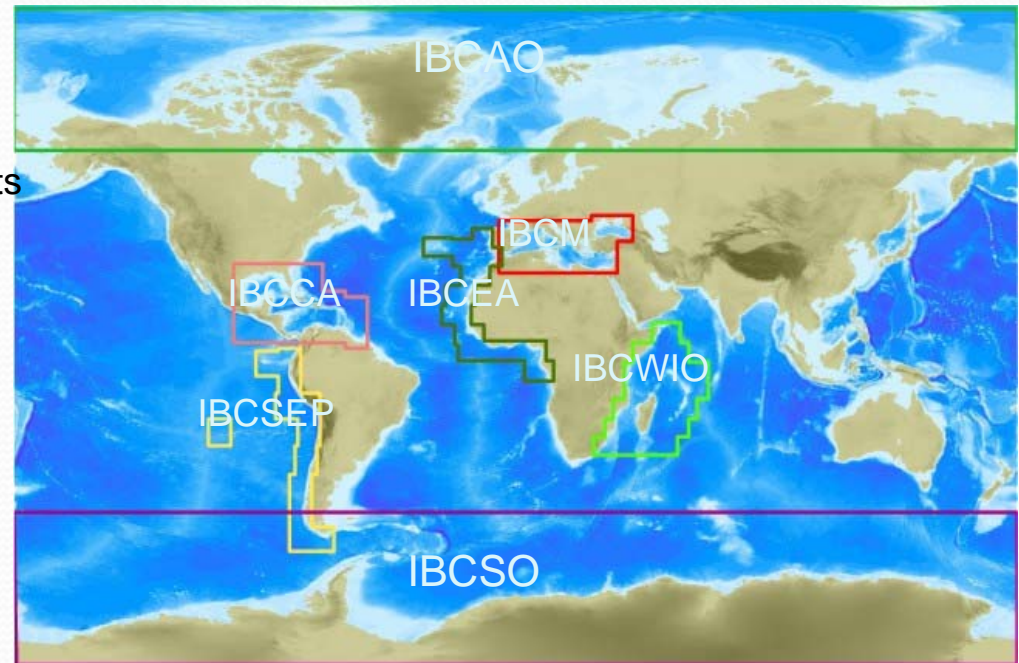
Interim Sub-Committee on Regional Undersea Mapping (iSCRUM)

- Facilitate closer collaboration with all existing regional mapping efforts
- Coordinate and encourage incorporation of their compilations into GEBCO.
- Encourage establishment of new regional mapping projects as appropriate

IOC International Bathymetric Chart (IBC) projects

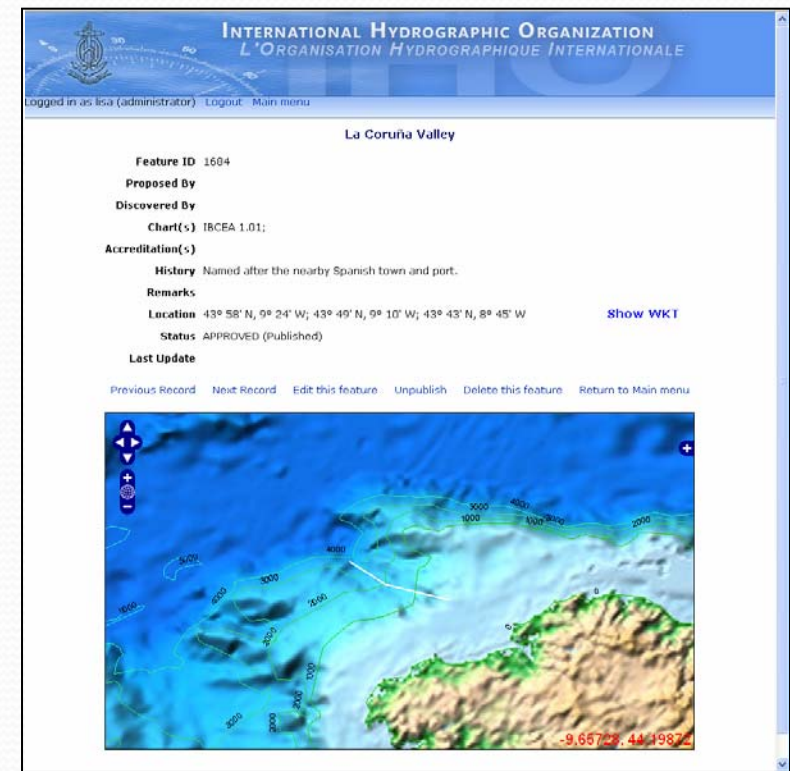
Chairman: Martin Jakobsson,
Stockholm University, Sweden

Vice Chairman: Colin Jacobs,
National Oceanography Centre,
Southampton, UK



GEBCO Sub-Committee on Undersea Feature Names

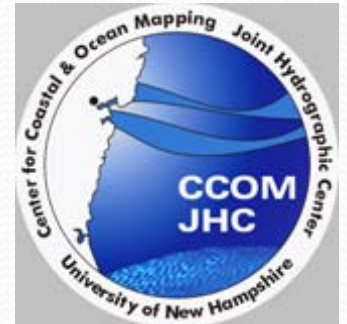
- Twelve members (6 IHO, 6 IOC): Argentina, Brazil, Germany, India, Japan, Korea, Mexico, New Zealand, Pakistan, Russia, United States
- Maintains the GEBCO **Gazetteer** for Undersea Feature Names - 3472 entries
- Provides on-line name proposal forms
- Reviews ~ 50 new name proposals per year
- Migrating to geospatially enabled database



New Gazetteer database administrative interface

GEBCO-Nippon Foundation Scholars

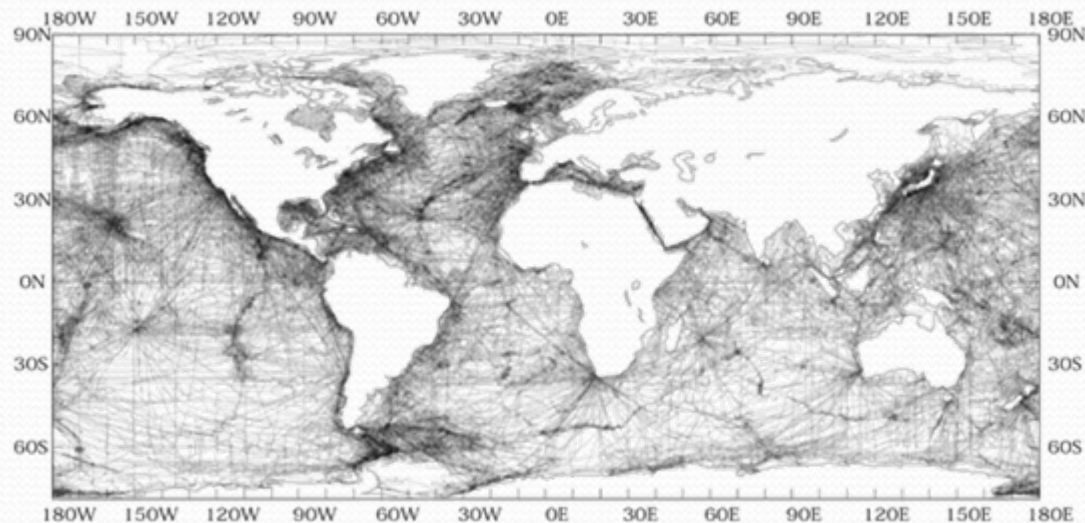
- Funded by the Nippon Foundation of Japan
- Designed to train a new generation of scientists and hydrographers in ocean bathymetry
- A 12-month course, leading to a **Postgraduate Certificate in Ocean Bathymetry** at the University of New Hampshire, USA
- Scholars are from 26 countries bounding on all the world's major oceans.
- Nippon Foundation has made additional funds available to allow further contributions of trained scholars following their training



IHO Data Center for Digital Bathymetry

Director: Ms. Lisa A. Taylor

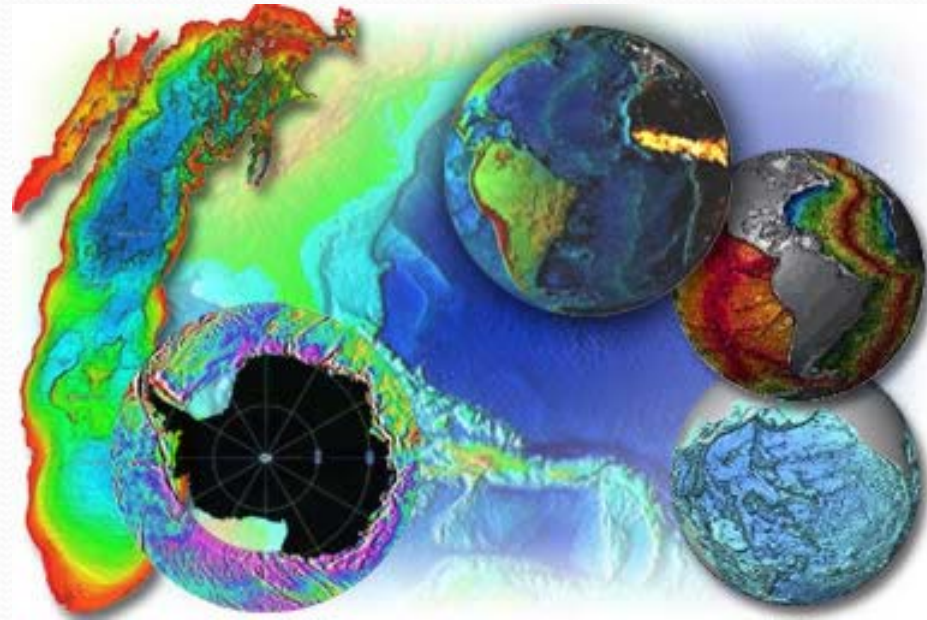
- A worldwide digital oceanic bathymetry data centre operated on behalf of the IHO Member States
- Hosted by the National Geophysical Data Center, a component of the National Oceanic & Atmospheric Administration, Boulder, CO
- The worldwide digital data bank of oceanic soundings, including the GEODAS global marine geophysical data base and the NOAA Hydrographic Survey Data System



Improved IHO-DCDB Website

The website will provide users with;

- unrestricted multibeam swath sonar data
- track line geophysical data
- digital elevation models
- point soundings archived at NGDC
- metadata for locating data not archived at NGDC



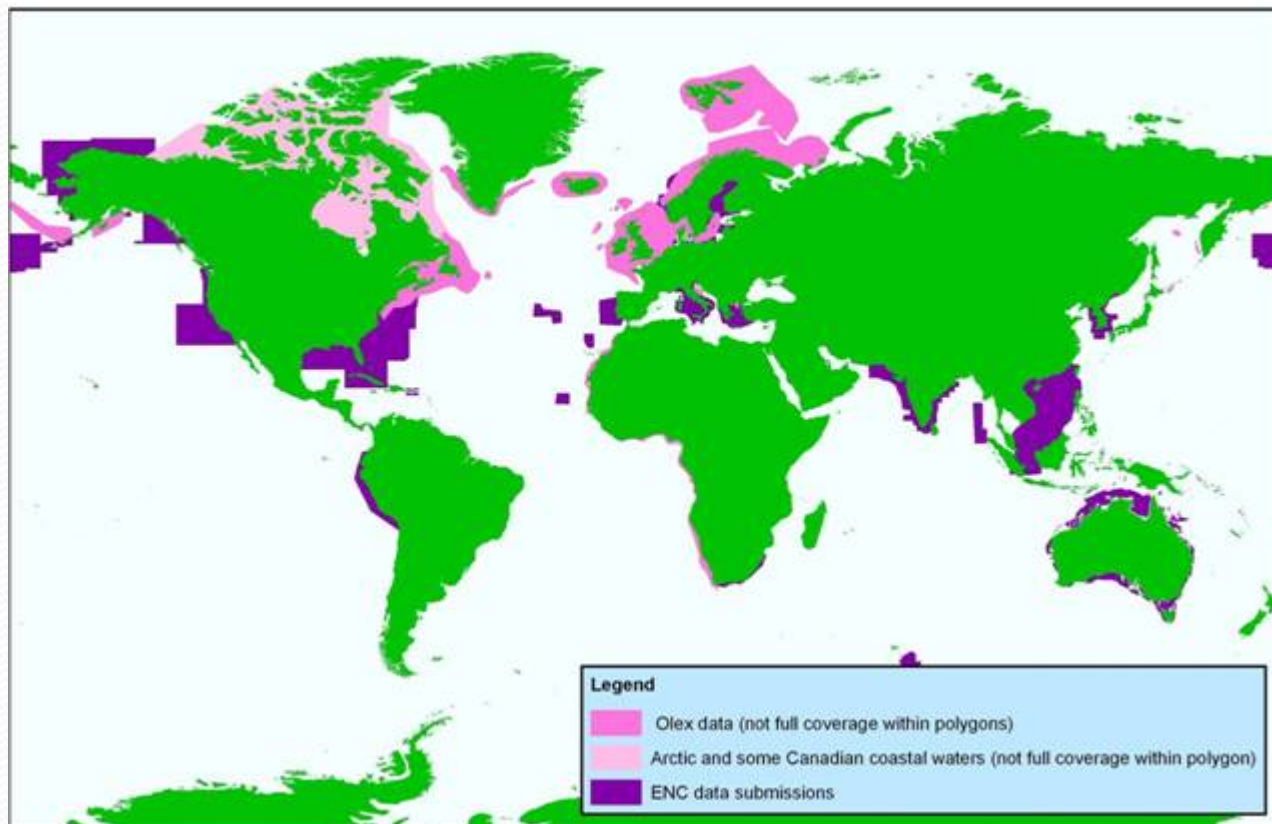
The website restructuring is part of a larger IHO effort to engage the **Regional Hydrographic Commission** members in contributing data and metadata to the IHO DCDB.

<http://www.ngdc.noaa.gov/mgg/bathymetry/iho.html>

Shallow Water Bathymetry

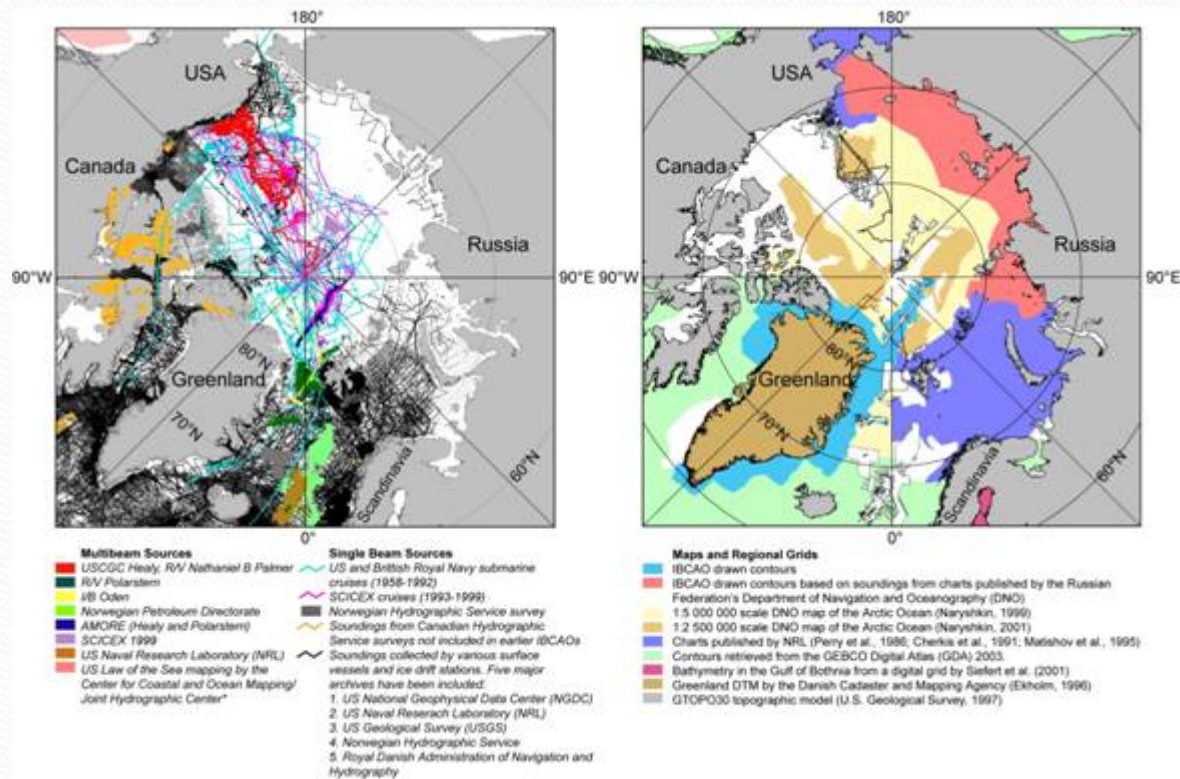
- GEBCO has increased emphasis on acquiring bathymetry in coastal areas.
- Essential for modeling run-up of tsunami for mitigation and preparation.

Distribution of shallower water data sets submitted to GEBCO

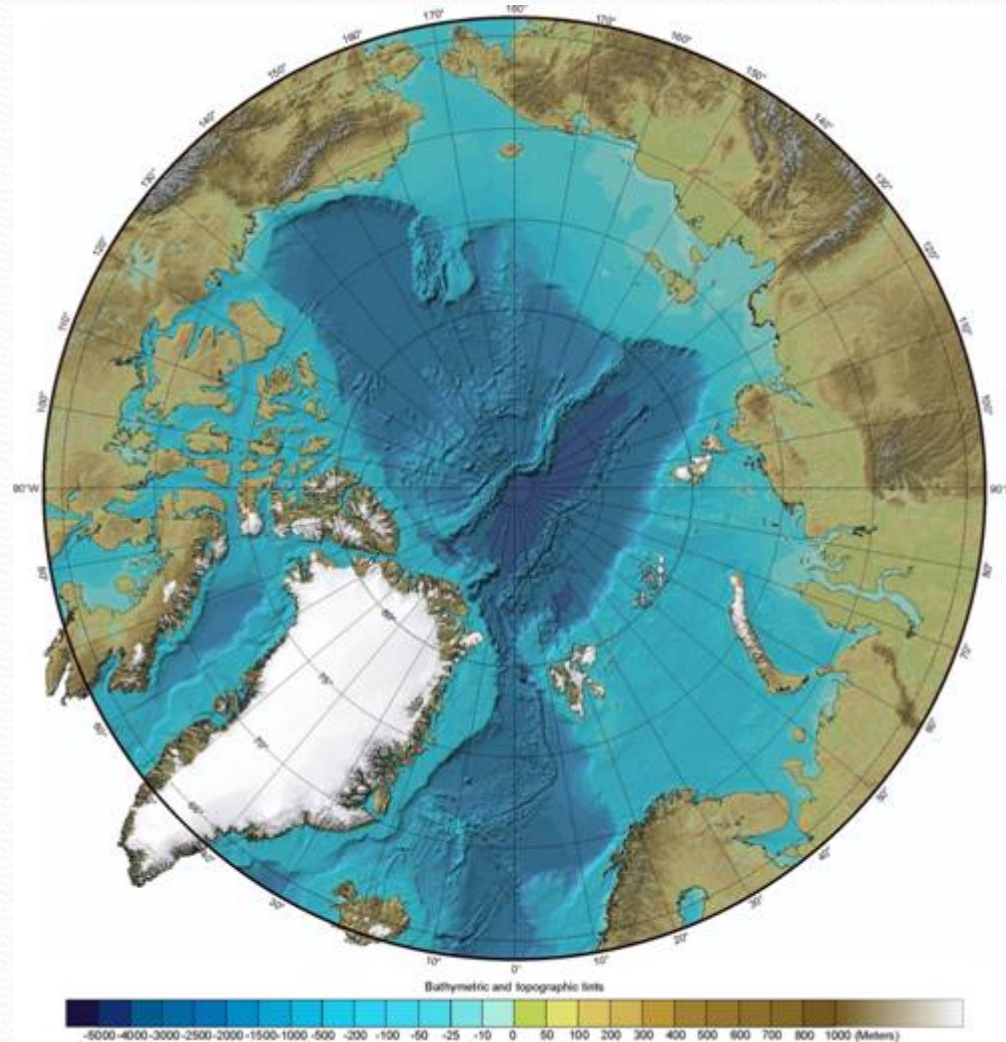


GEBCO Regional Mapping

- Regional projects provide the opportunity for capacity building and data sharing between countries and organizations.
- The International Bathymetric Chart of the Arctic Ocean (IBCAO) - an example of successful collaboration of IHO member states.



International Bathymetric Chart of the Arctic Ocean (IBCAO)



International Bathymetric Chart of the Southern Ocean (IBCSO)

- GEBCO funding the production of the first version of the International Bathymetric Chart of the Southern Ocean (IBCSO Ver 1).
- Result from GEBCO's 2011 Arctic-Antarctic Seafloor Mapping Meeting in Stockholm.
- Work being done by Institute for Polar and Marine Research, Alfred-Wegener-Institut für Polar- und Meeresforschung.
- Area covered is equivalent to the region of the Antarctic Treaty (south of 60°S).



**Alfred-Wegener-Institut für
Polar- und Meeresforschung**
in der Helmholtz-Gemeinschaft

Institute for Polar and Marine Research

Prof. Dr. Hans Werner Schenke
Telefon: +49/471-48 31-1222
Telefax: +49/471-48 31-1977
E-Mail: hans-werner.schenke@awi.de

GEBCO International Bathymetric Chart of the Southern Ocean

Specifications for the IBCSO map generation Parameter Specification

Version	Bathymetry with ice surface (GLAS/ICESat) Antarctic coast line
Coverage Area	South of 60°S latitude, including Antarctica
Coordinate System	Geographic decimal degrees,
Map Projection	Polar Stereographic (true scale at 65°S)
Horizontal Datum	World Geodetic System 1984 (WGS 84)
Vertical Datum	Mean Sea Level (MSL)
Vertical Units	Meters
Grid Spacing	1 arc-minute, 2 km
Grid Format	ASCII Grid
Coastline	ADD (2006), RAMP (1997), LIMA (2008)

GEBCO International Bathymetric Chart of the Southern Ocean

Major contributions

- Alfred Wegener Institute for Polar and Marine Research (AWI), Germany
- Australian Government Antarctic Division (AAD), Australia
- British Antarctic Survey (BAS), United Kingdom
- Geoscience Australia (GA), Australia
- IHO Data Center for Digital Bathymetry (IHO DCDB) at NGDC
- Institute of Geological Sciences (IGS), Ukraine
- Instituto Anadaluz de Ciencias de la Tierra (IACT), Spain
- Lamont-Doherty Earth Observatory (LDEO), Columbia University, New York, USA
- National Institute of Geology and Nuclear Sciences (GNS), New Zealand
- National Institute of Polar Research (NIPR), Japan
- NOAA's National Geophysical Data Center (NGDC), United States
- Polar Marine Geosurvey Expedition (PMGE), Russia
- Scripps Institution of Oceanography (SIO), University of California, USA
- United Kingdom Hydrographic Office (UKHO), United Kingdom
- Universidad de Granada UG), Spain
- Vernadsky Institute of Geochemistry (GEOKHI), Russia
- VNIIOkeangeologia, Russia
- Woods Hole Oceanographic Institution (WHOI), USA

GEBCO International Bathymetric Chart of the Southern Ocean

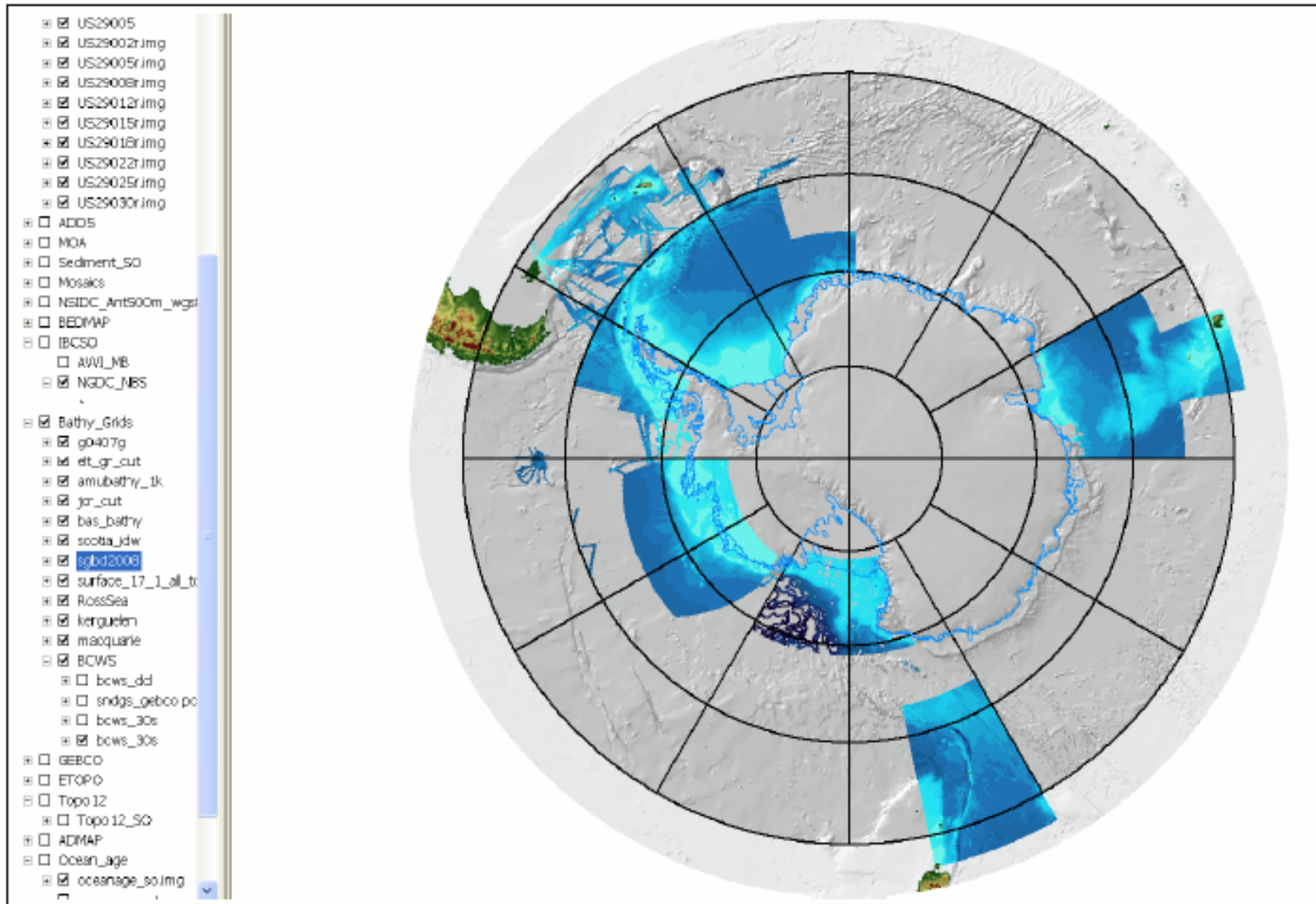


Figure 1: Existing grids from different institution

GEBCO International Bathymetric Chart of the Southern Ocean

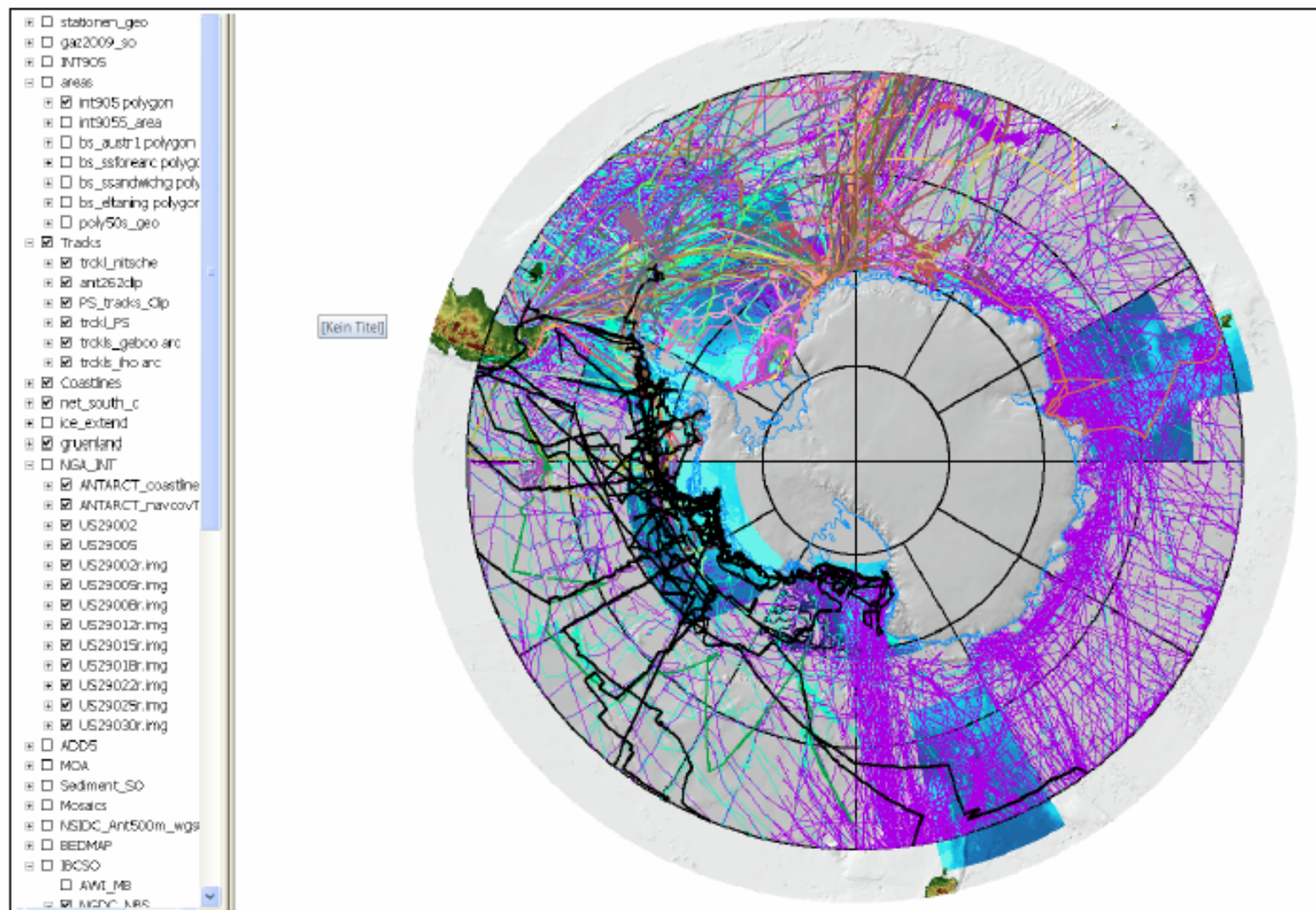
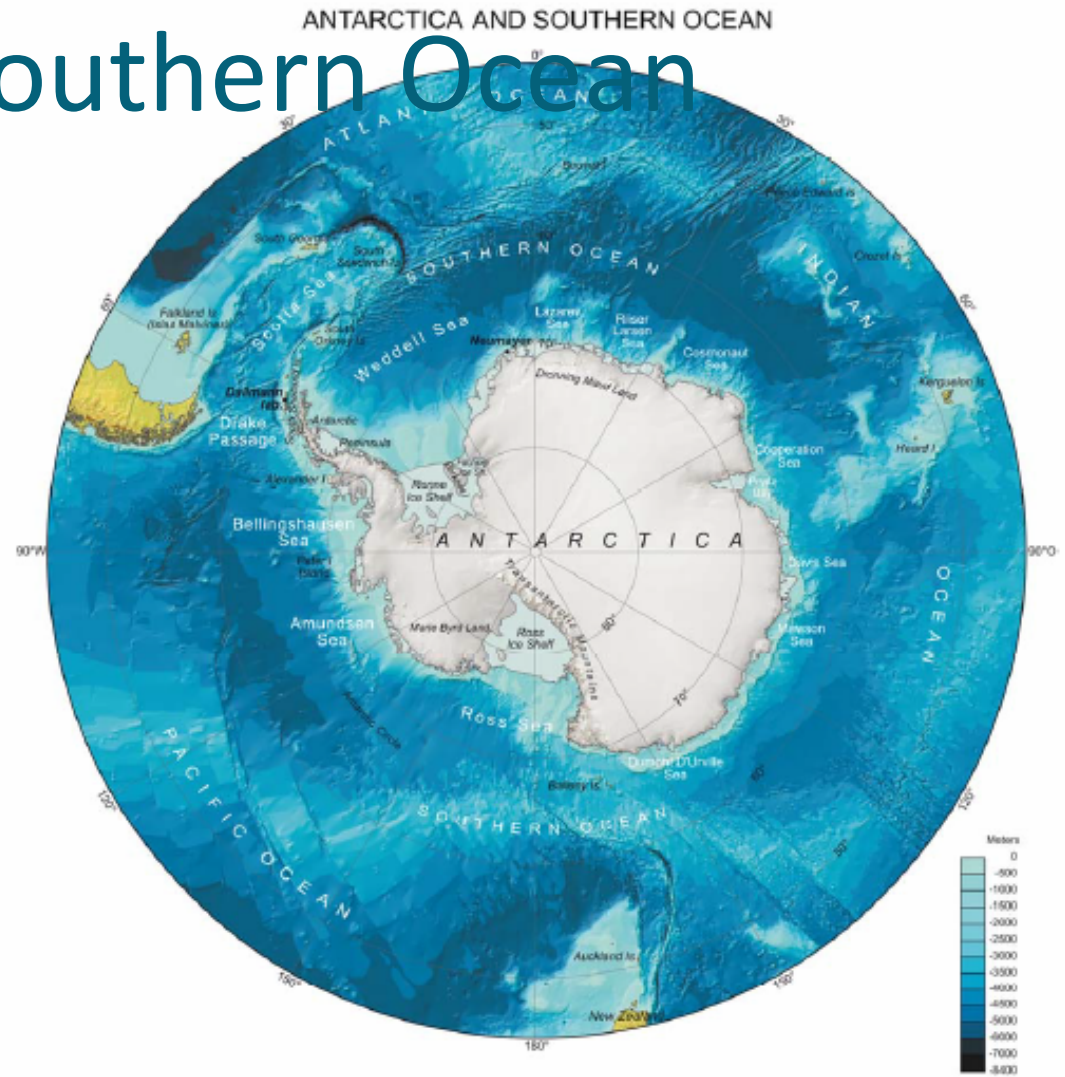


Figure 3: Track control around Antarctica

GEBCO International Bathymetric Chart of the Southern Ocean

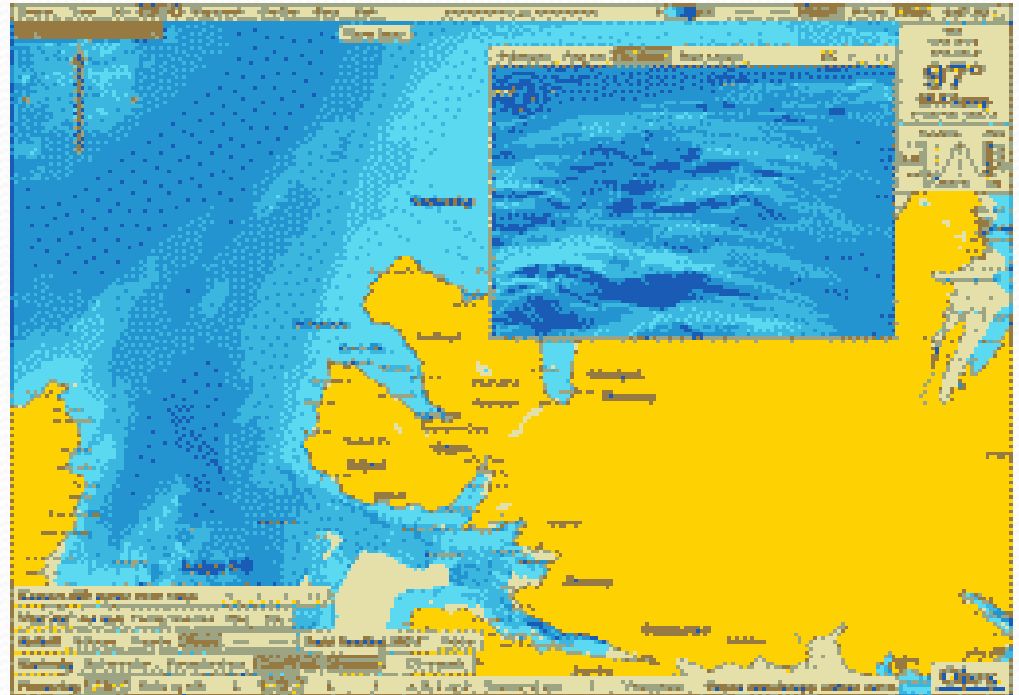


Cartography: D. Gröfke, Alfred Wegener Institute. Modified from: IOC, IHO and BODC (2003), Centenary Edition of the GEBCO Digital Atlas, published on CD-ROM on behalf of the Intergovernmental Oceanographic Commission and the International Hydrographic Organization as part of the General Bathymetric Chart of the Oceans, British Oceanographic Data Centre Liverpool, UK.

Figure 4: Recent status of the Southern Ocean Bathymetric Chart

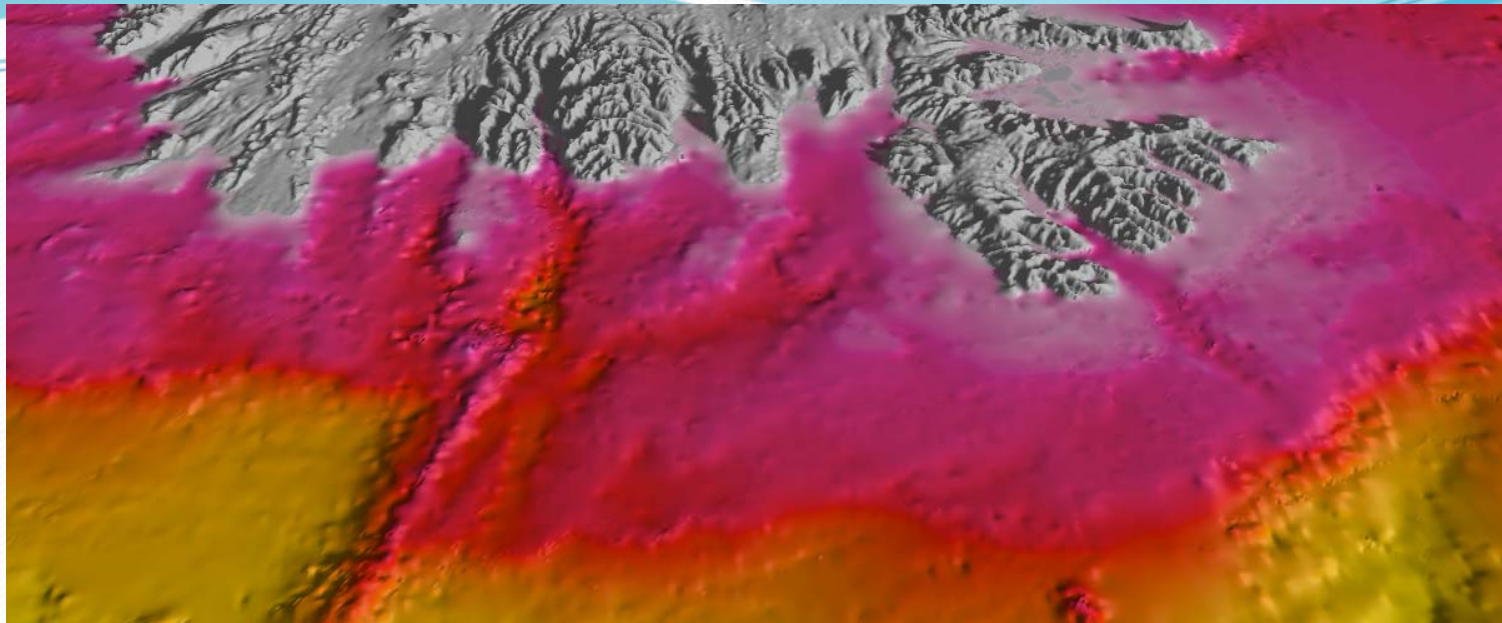
OLEX Fishing Data

- Olex mapping and visualization software
- Widely used on fishing vessels
- Sounding data collected automatically by fishing vessels
- Sent electronically to Olex
- Olex processes and quality controls all data
- Database continuously updated
- Redistributed to the users

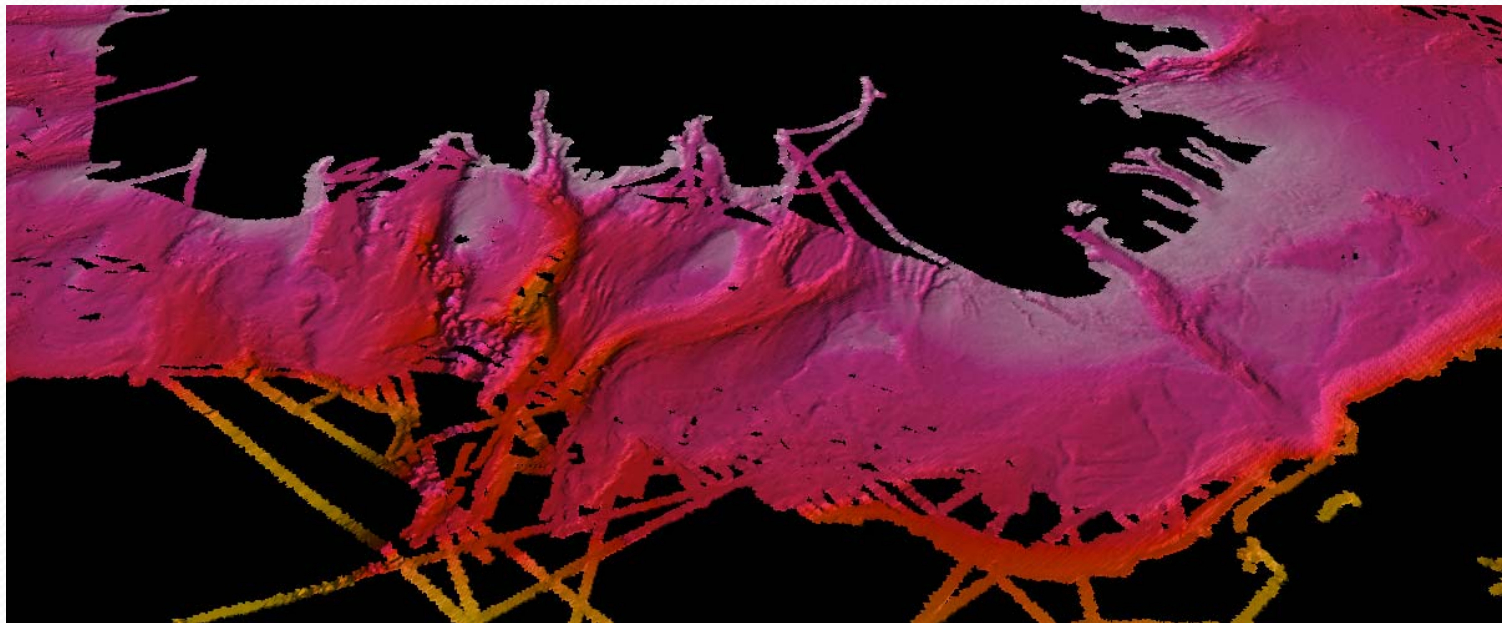


OLEX

IBC Arctic
1km grid



OLEX
400m grid

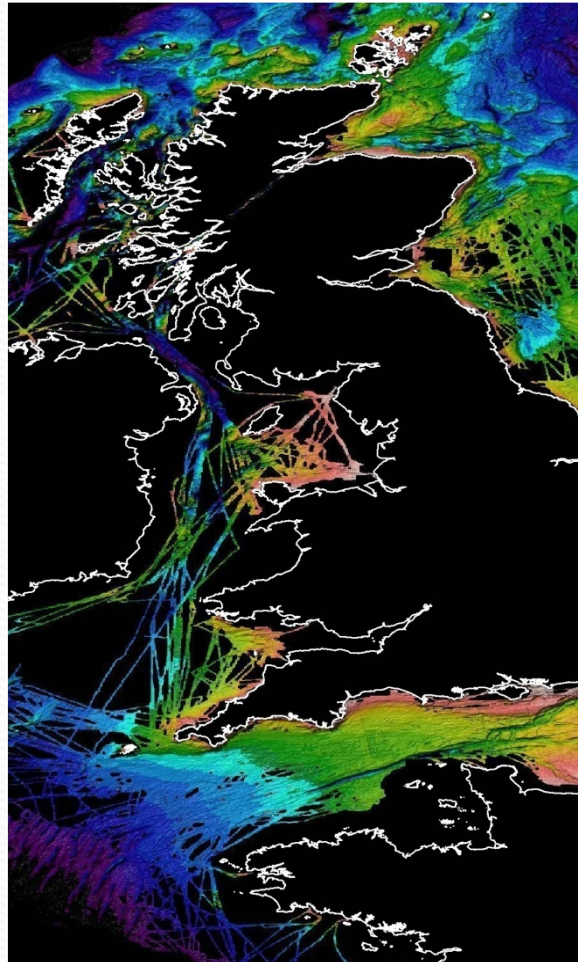


OLEX Fishing Data

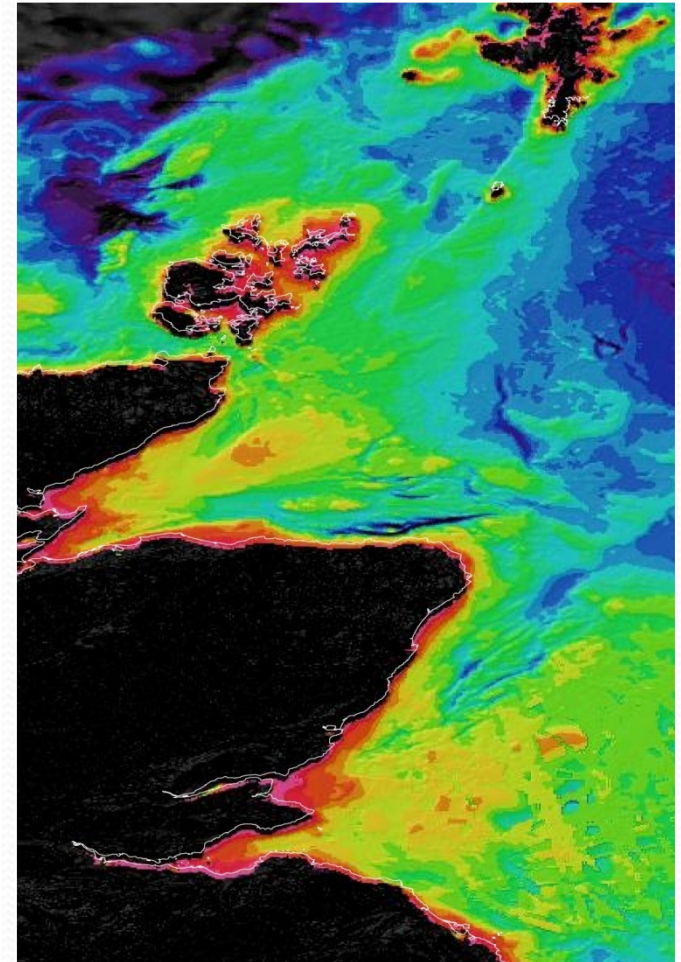
GEBCO_08 Grid

Data from Olex included in the GEBCO_08 Grid for some shallow water regions around the UK.

The data are collected by fishing vessels.



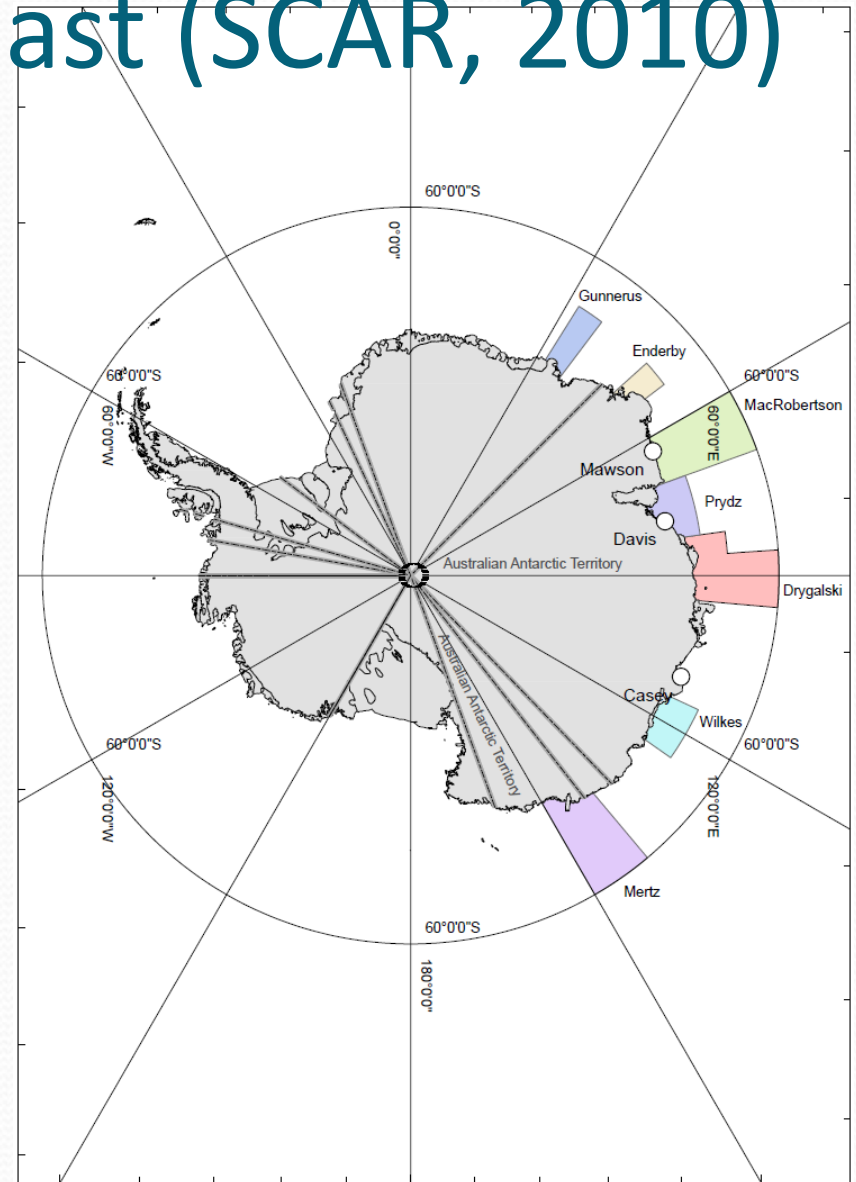
Coverage of Olex gridded data



Bathymetry data from the GEBCO_08 Grid

Proposed Marine Protected Areas on the Antarctic Coast (SCAR, 2010)

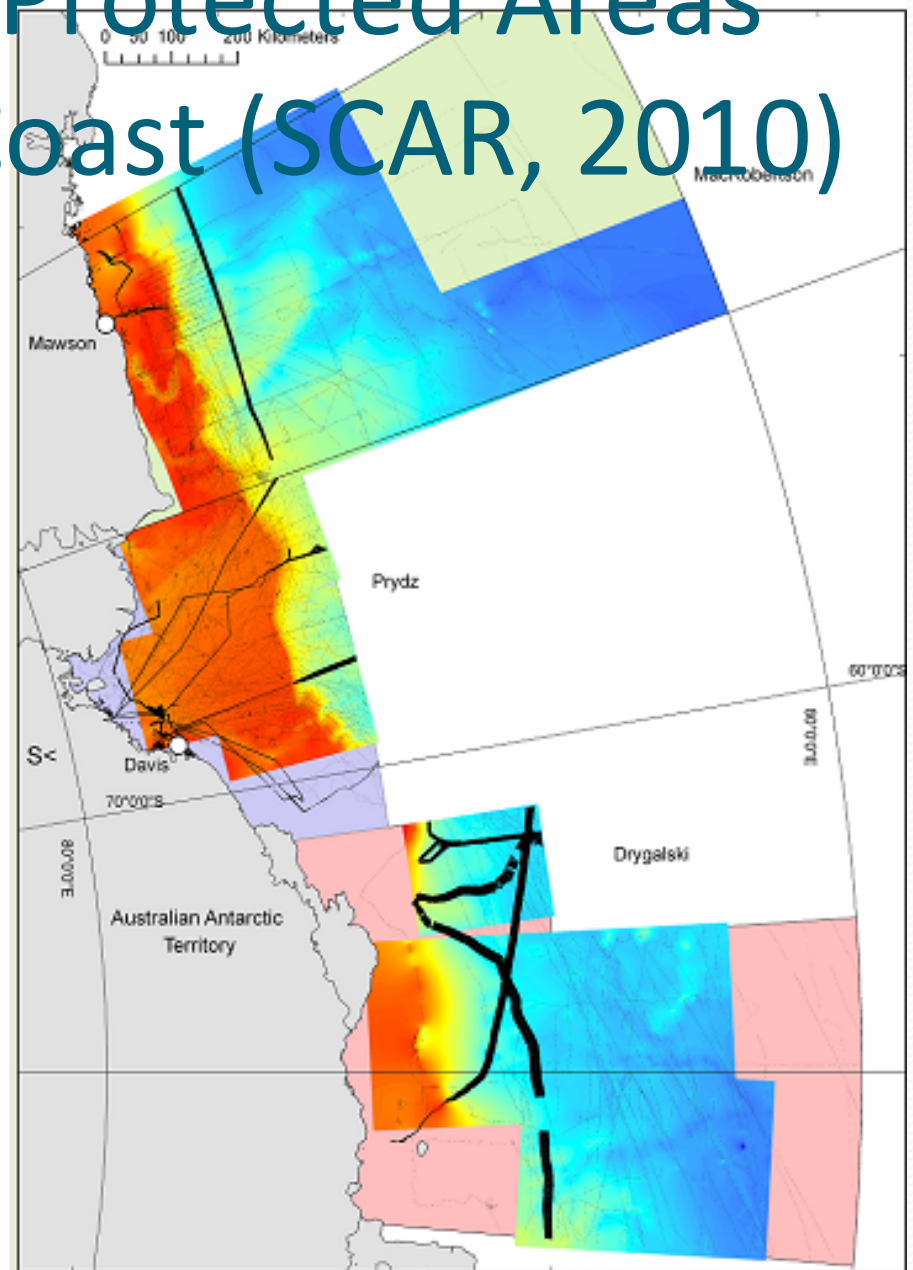
Australian Activities



South Pole Stereographic Projection

Proposed Marine Protected Areas on the Antarctic Coast (SCAR, 2010)

Australian Activities



Bathymetric data density (shown in black and white) and resulting interpolated surface (colour) (UPS South projection)

77°40'E

77°50'E

78°0'E

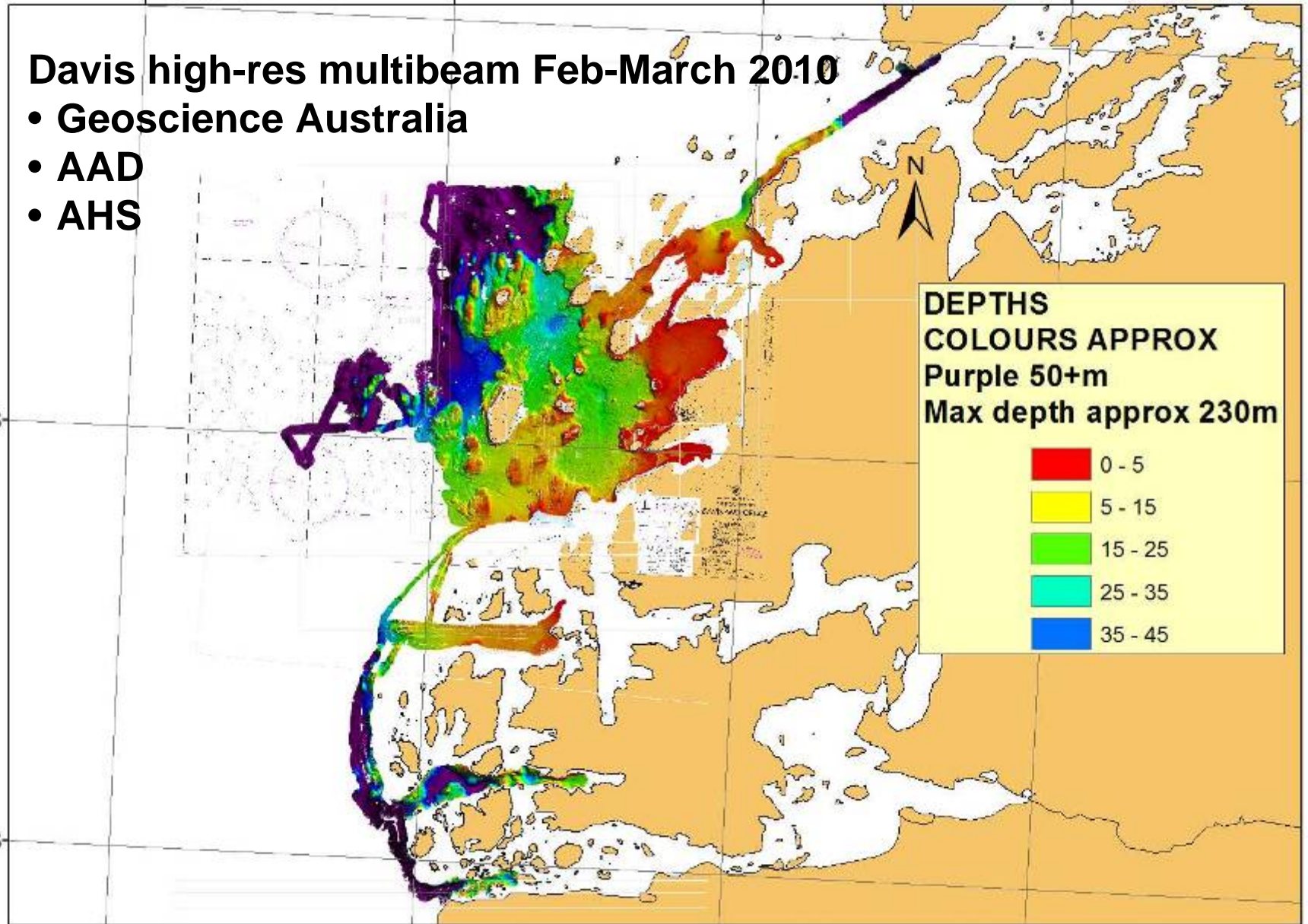
78°10'E

Davis high-res multibeam Feb-March 2010

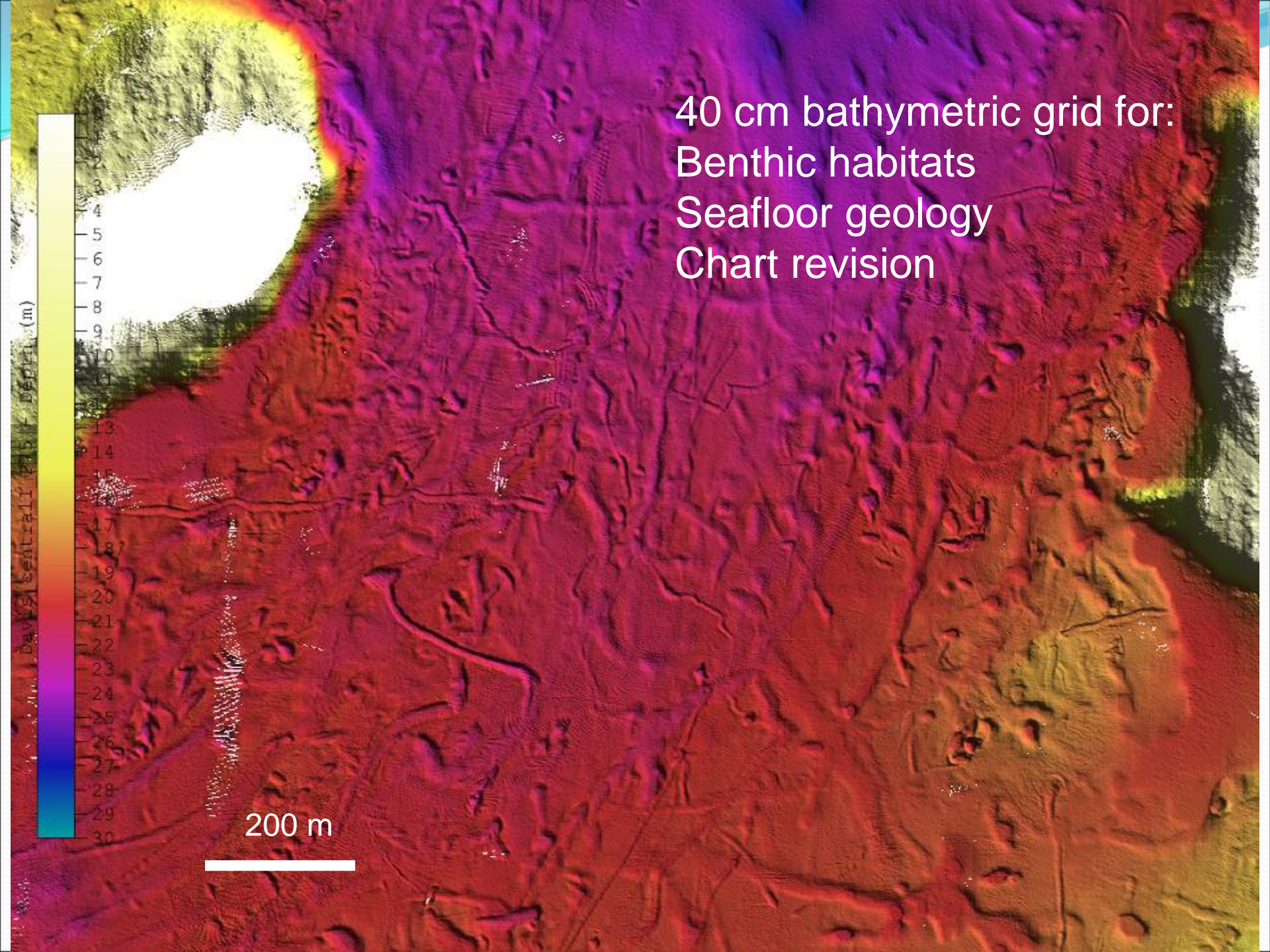
- Geoscience Australia
- AAD
- AHS

68°35'S

68°40'S



40 cm bathymetric grid for:
Benthic habitats
Seafloor geology
Chart revision





Thank-you