

THE NIPPON FOUNDATION-GEBCO

SEABED 2030

Report on the
Southern Ocean Regional Center
&
The International Bathymetric
Chart of the Southern Ocean
Version 2 (IBCSO v2)

Laura Hehemann
Data Manager



IHO

International
Hydrographic
Organization



2021
2030
United Nations Decade
of Ocean Science
for Sustainable Development



IBCSO v2

- Published in Scientific Data
 - DOI: 10.1038/s41597-022-01366-7
 - 60 authors, from 39 institutes
- Data in PANGAEA
 - DOI: 10.1594/PANGAEA.937574
 - Includes gridded products, coverage, and metadata
 - Registered IBCSO EPSG code: **9354**

SCIENTIFIC DATA

CONFIDENTIAL

COPY OF SUBMISSION FOR PEER REVIEW ONLY

Tracking no: SDATA-21-01258B

The International Bathymetric Chart of the Southern Ocean Version 2

Authors: Boris Dorschel (Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung), Laura Hehemann (Alfred-Wegener-Institut, Helmholtz Centre for Polar and Marine Research), Sacha Viquerat (Alfred-Wegener-Institut, Helmholtz Centre for Polar and Marine Research), Fynn Warnke (Alfred-Wegener-Institut, Helmholtz Centre for Polar and Marine Research), Simon Dreutter (Alfred-Wegener-Institut, Helmholtz Centre for Polar and Marine Research), Yvonne Schulze Tenberge (Alfred-Wegener-Institut, Helmholtz Centre for Polar and Marine Research), Daniela Accetella (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale), Lu An (University of California), Felipe Barrios (Servicio Hidrográfico y Oceanográfico de la Armada de Chile), Evgenia Bazhenova (Polar Marine Geosurvey Expedition), Jenny Black (GNS Science), Fernando Bohoyo (Geological Survey of Spain (CN IGME-CSIC)), Craig Davey (CSIRO), Laura De Santis (National Institute of Oceanography and Applied Geophysics OGS), Carlota Escutia Dotti (Instituto Andaluz de Ciencias de la Tierra (CSIC-UGR)), Alice Fremand (British Antarctic Survey), Peter Fretwell (British Antarctic Survey), Jenny Gales (University of Plymouth), Jinyao Gao (Second Institute of Oceanography), Luca Gasperini (Istituto di Scienze Marine (CNR ISMAR)), Jamin Greenbaum (Scripps Institution of Oceanography, University of California), Jennifer Henderson Jencks (IHO Data Centre for Digital Bathymetry, NOAA's National Centers for Environmental Information), Kelly Hogan, Jongkuk Hong (Korea Polar Research Institute), Martin Jakobsson (Stockholm University), Laura Jensen (HafenCity University Hamburg), Johnathan Kool (Australian Antarctic Division), Sergei Larin (Polar Marine Geosurvey Expedition), Robert Larter (British Antarctic Survey), German Leitchenkov (All Russian Research Institute for Geology and Mineral Resources of the World Ocean), Benoît Loubrieu (IFREMER), Kevin Mackay (National Institute of Water & Atmospheric Research Ltd (NWA)), Larry A. Mayer (Center for Coastal and Ocean Mapping, University of New Hampshire, Durham, NH, USA), Romain Millan (University of California Irvine), Mathieu Morlighem (Dartmouth College), Francisco Navidad (CSIRO), Frank Nitsche (Lamont-Doherty Earth Observatory of Columbia University), Yoshifumi Nogi (National Institute of Polar Research), Cécile Pertuisot (IFREMER, Centre Bretagne), Alexandra Post (Geoscience Australia), Hamish Pritchard (British Antarctic Survey), Autun Purser (Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung), Michele Rebesco (Istituto Nazionale di Oceanografia e Geofisica Sperimentale (OGS)), Eric Rignot, Jason Roberts (Australian Antarctic Division), Marzia Rovere (CNR - Consiglio Nazionale delle Ricerche, ISMAR), Jan Erik (Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung), Chiara Savi (National Institute of Oceanography and Applied Geophysics (OGS)),



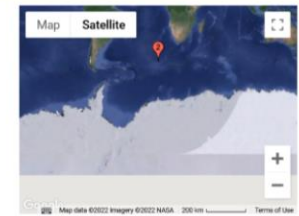
PANGAEA.

Data Publisher for Earth & Environmental Science

SEARCH SUBMIT HELP ABOUT CONTACT

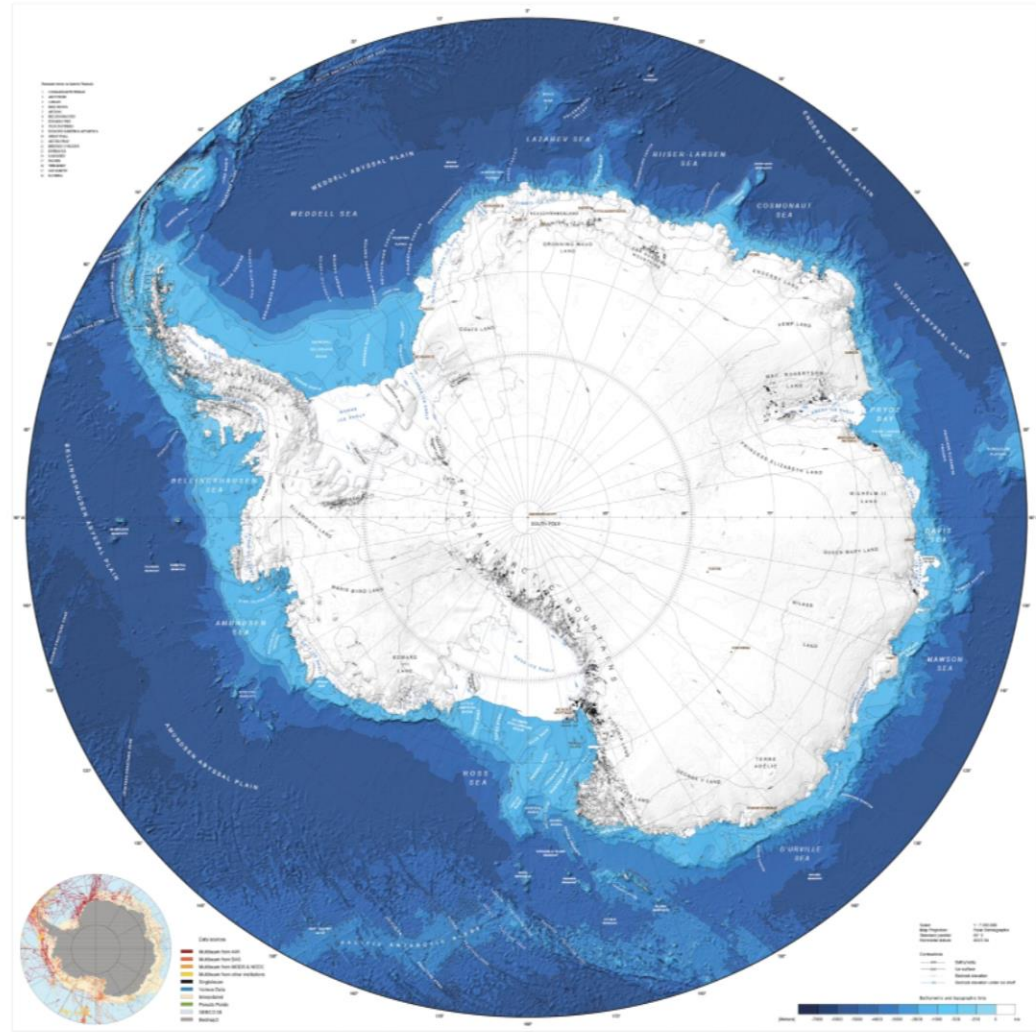
Citation:

Dorschel, Boris; Hehemann, Laura; Viquerat, Sacha; Warnke, Fynn; Dreutter, Simon; Schulze Tenberge, Yvonne; Accetella, Daniela; An, Lu; Barrios, Felipe; Bazhenova, Evgenia A; Black, Jenny; Bohoyo, Fernando; Davey, Craig; de Santis, Laura; Escutia Dotti, Carlota; Fremand, Alice C; Fretwell, Peter T; Gales, Jenny A; Gao, Jinyao; Gasperini, Luca; Greenbaum, Jamin S; Henderson Jencks, Jennifer; Hogan, Kelly A; Hong, Jong Kuk; Jakobsson, Martin; Jensen, Laura; Kool, Johnathan; Larin, Sergey; Larter, Robert D; Leitchenkov, German L; Loubrieu, Benoît; Mackay, Kevin; Mayer, Larry; Millan, Romain; Morlighem, Mathieu; Navidad, Francisco; Nitsche, Frank-Oliver; Nogi, Yoshifumi; Pertuisot, Cécile; Post, Alexandra L; Pritchard, Hamish D; Purser, Autun; Rebesco, Michele; Rignot, Eric; Roberts, Jason L; Rovere, Marzia; Ryzhov, Ivan; Sauli, Chiara; Schmitt, Thierry; Silvano, Alessandro; Smith, Jodie E; Snaith, Helen; Tate, Alex; Tinto, Kirsty; Vandenbosch, Philippe; Weatherall, Pauline; Wintersteller, Paul; Yang, Chunguo; Zhang, Tao; Arndt, Jan Erik (2021): The International Bathymetric Chart of the Southern Ocean Version 2 (IBCSO v2). PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.937574> (dataset in review)



Abstract:

The International Bathymetric Chart of the Southern Ocean Version 2 (IBCSO v2) is a digital bathymetric model (DBM) for the area south of 50° S with special emphasis on the bathymetry of the Southern Ocean. IBCSO v2 has a resolution of 500 m × 500 m in a Polar Stereographic projection (EPSG: 9354). The total data coverage of the seafloor is 23.79% with a median data coverage of 99.99%. The median data coverage is 99.99% for the entire dataset. The median data coverage is 99.99% for the entire dataset. The median data coverage is 99.99% for the entire dataset.



THE INTERNATIONAL BATHYMETRIC CHART OF THE SOUTHERN OCEAN (IBCSO)

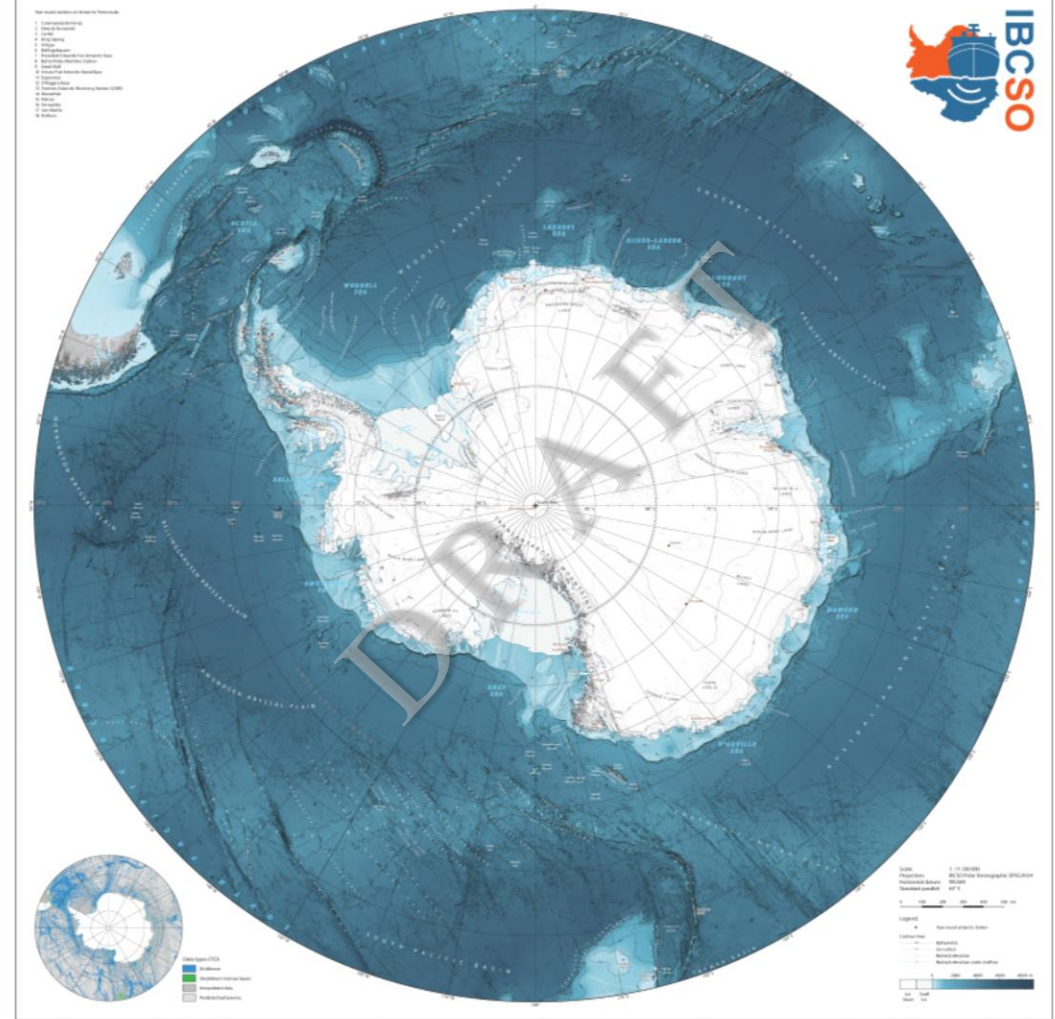
IBCSO v1 Bathymetric Chart

The IBCSO v1 Bathymetric Chart is a polar projection map of the Southern Ocean, showing bathymetry (seafloor topography) around Antarctica. The chart uses a color scale to represent depth, with shallower waters in lighter blue and deeper waters in darker blue. The map includes labels for various seas and regions, such as the Weddell Sea, Ross Sea, and Amundsen Sea. A small inset map in the bottom left corner shows the location of the Southern Ocean within the world's oceans. A legend in the bottom right corner provides details on the chart's scale and data sources.

IBCSO v1 Bathymetric Chart

The IBCSO v1 Bathymetric Chart is a polar projection map of the Southern Ocean, showing bathymetry (seafloor topography) around Antarctica. The chart uses a color scale to represent depth, with shallower waters in lighter blue and deeper waters in darker blue. The map includes labels for various seas and regions, such as the Weddell Sea, Ross Sea, and Amundsen Sea. A small inset map in the bottom left corner shows the location of the Southern Ocean within the world's oceans. A legend in the bottom right corner provides details on the chart's scale and data sources.

IBCSO v1 Bathymetric Chart



INTERNATIONAL BATHYMETRIC CHART OF THE SOUTHERN OCEAN (IBCSO)
Version 2

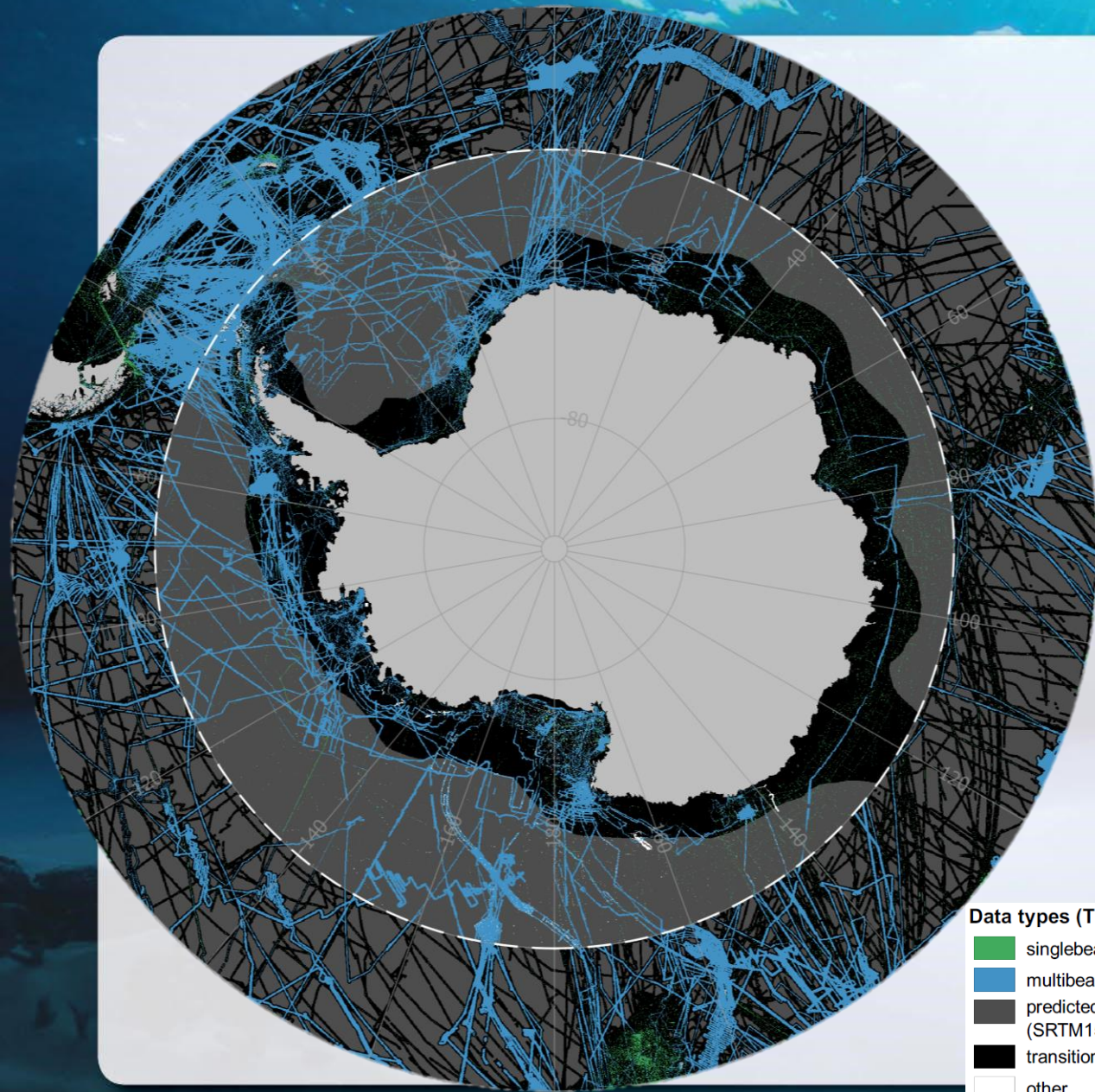
IBCSO v2 Bathymetric Chart

The IBCSO v2 Bathymetric Chart is a polar projection map of the Southern Ocean, showing bathymetry (seafloor topography) around Antarctica. The chart uses a color scale to represent depth, with shallower waters in lighter blue and deeper waters in darker blue. The map includes labels for various seas and regions, such as the Weddell Sea, Ross Sea, and Amundsen Sea. A small inset map in the bottom left corner shows the location of the Southern Ocean within the world's oceans. A legend in the bottom right corner provides details on the chart's scale and data sources.

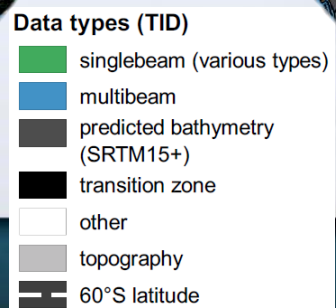
IBCSO v2 Bathymetric Chart

The IBCSO v2 Bathymetric Chart is a polar projection map of the Southern Ocean, showing bathymetry (seafloor topography) around Antarctica. The chart uses a color scale to represent depth, with shallower waters in lighter blue and deeper waters in darker blue. The map includes labels for various seas and regions, such as the Weddell Sea, Ross Sea, and Amundsen Sea. A small inset map in the bottom left corner shows the location of the Southern Ocean within the world's oceans. A legend in the bottom right corner provides details on the chart's scale and data sources.

IBCSO v2 Bathymetric Chart

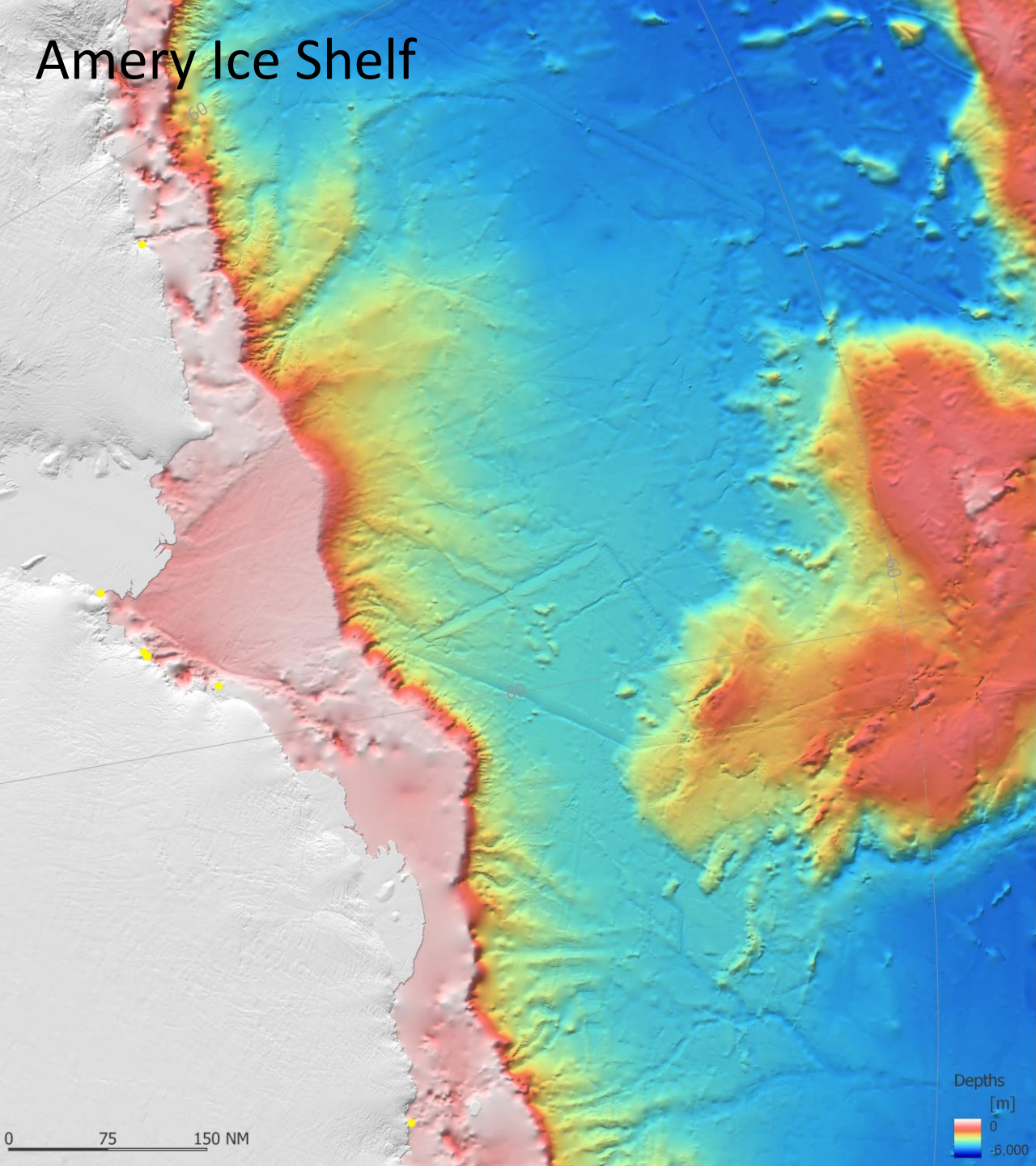


IBCSO v1 until 60°S

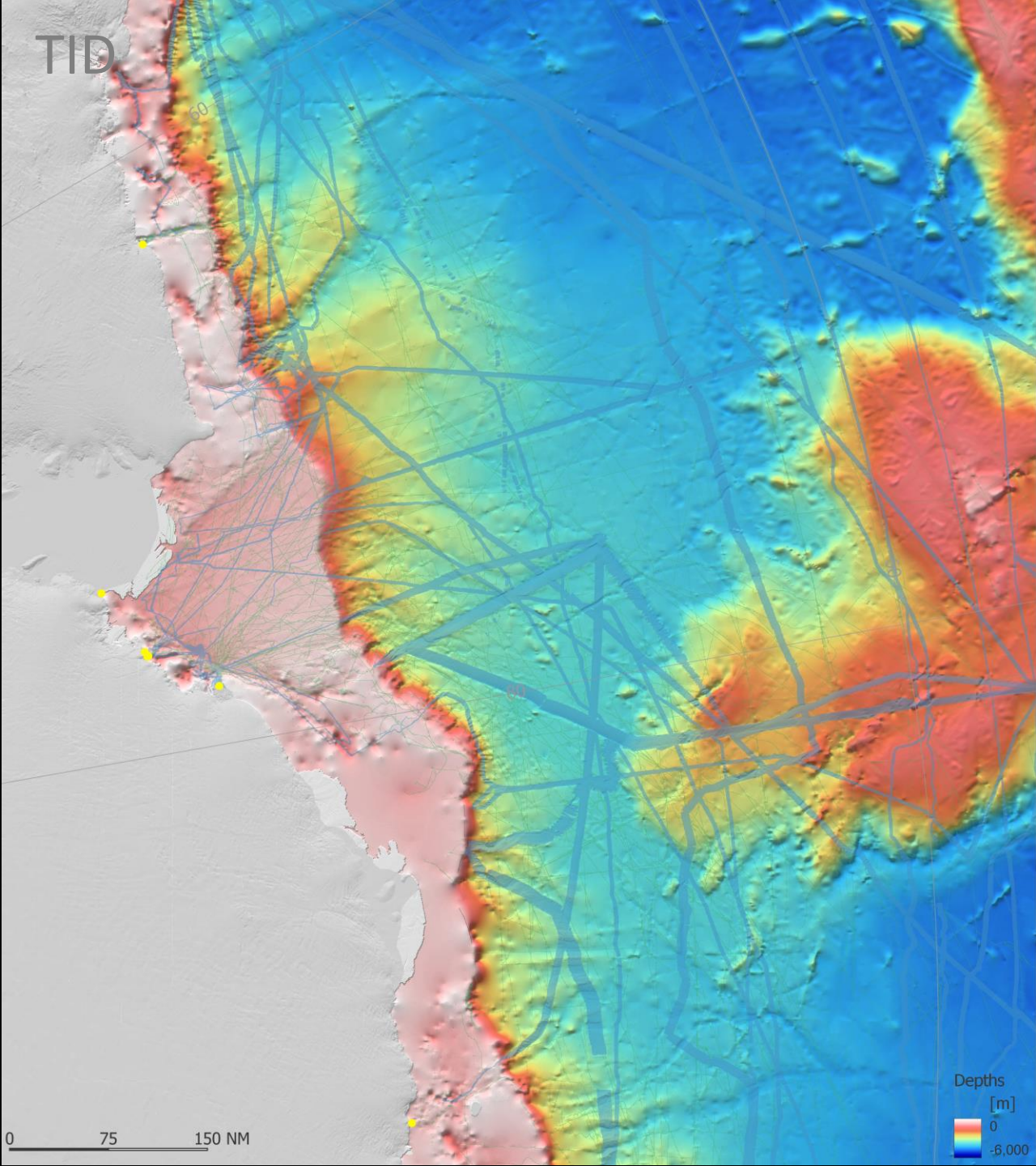


IBCSO v2

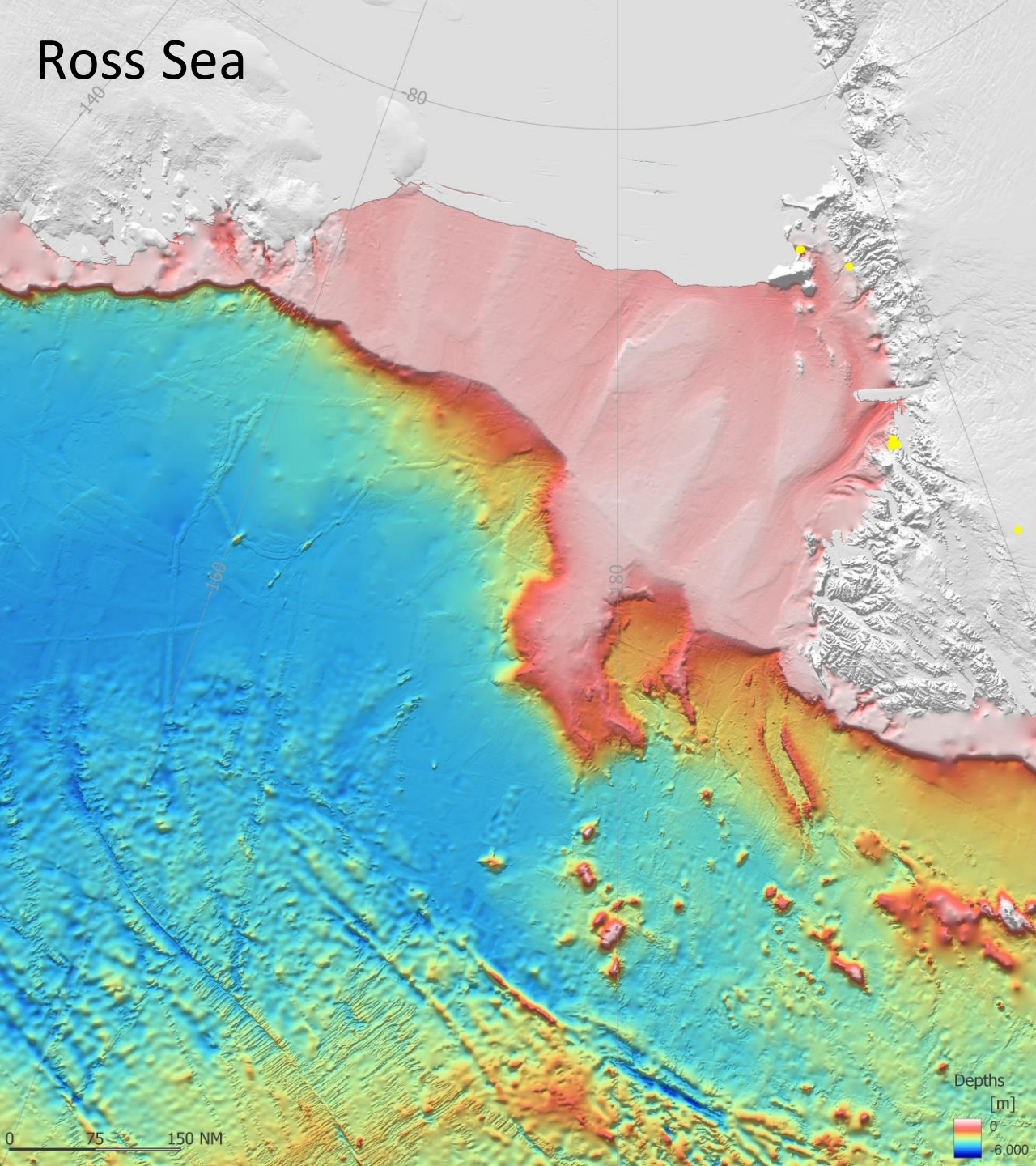
Amery Ice Shelf



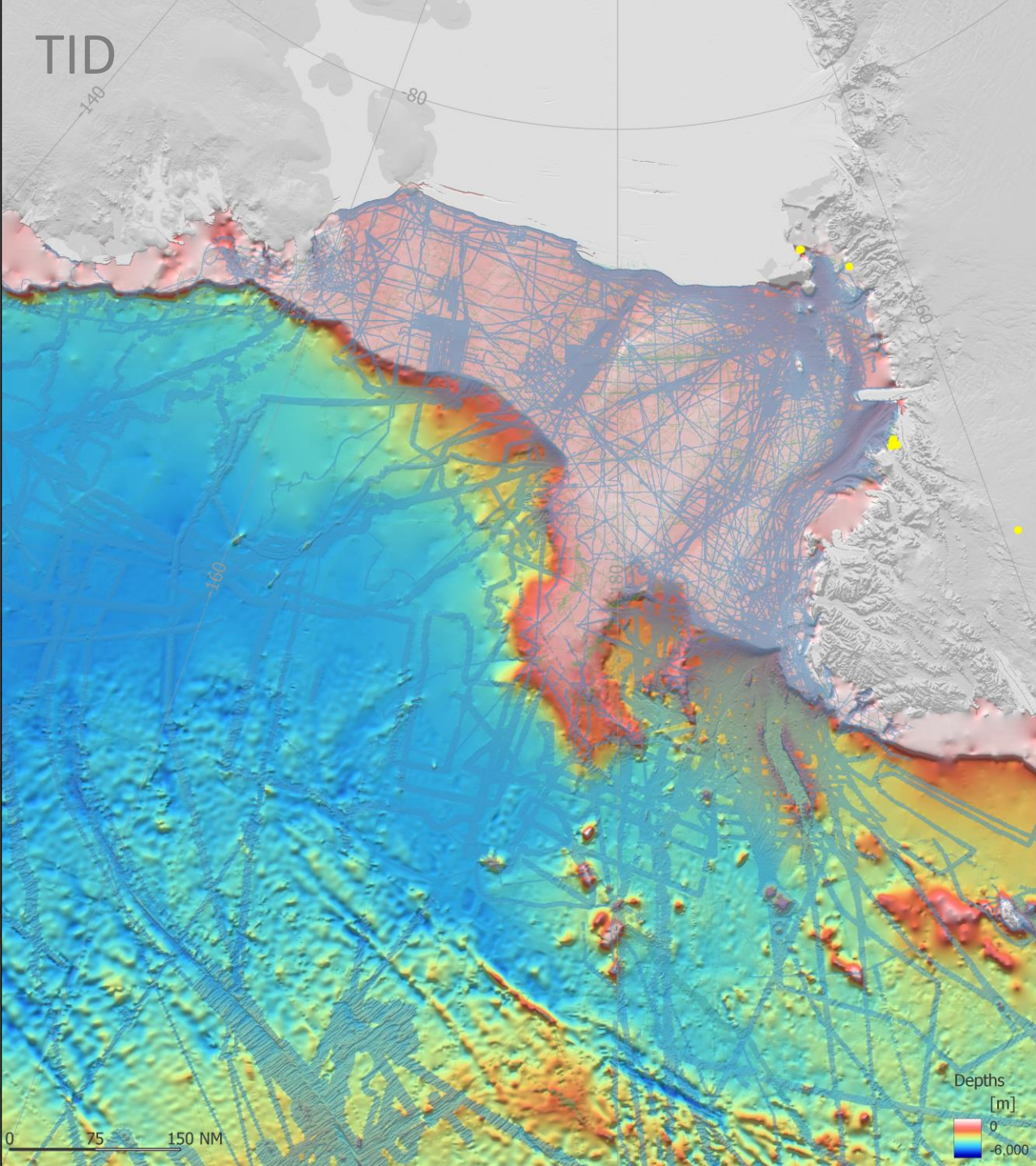
TID



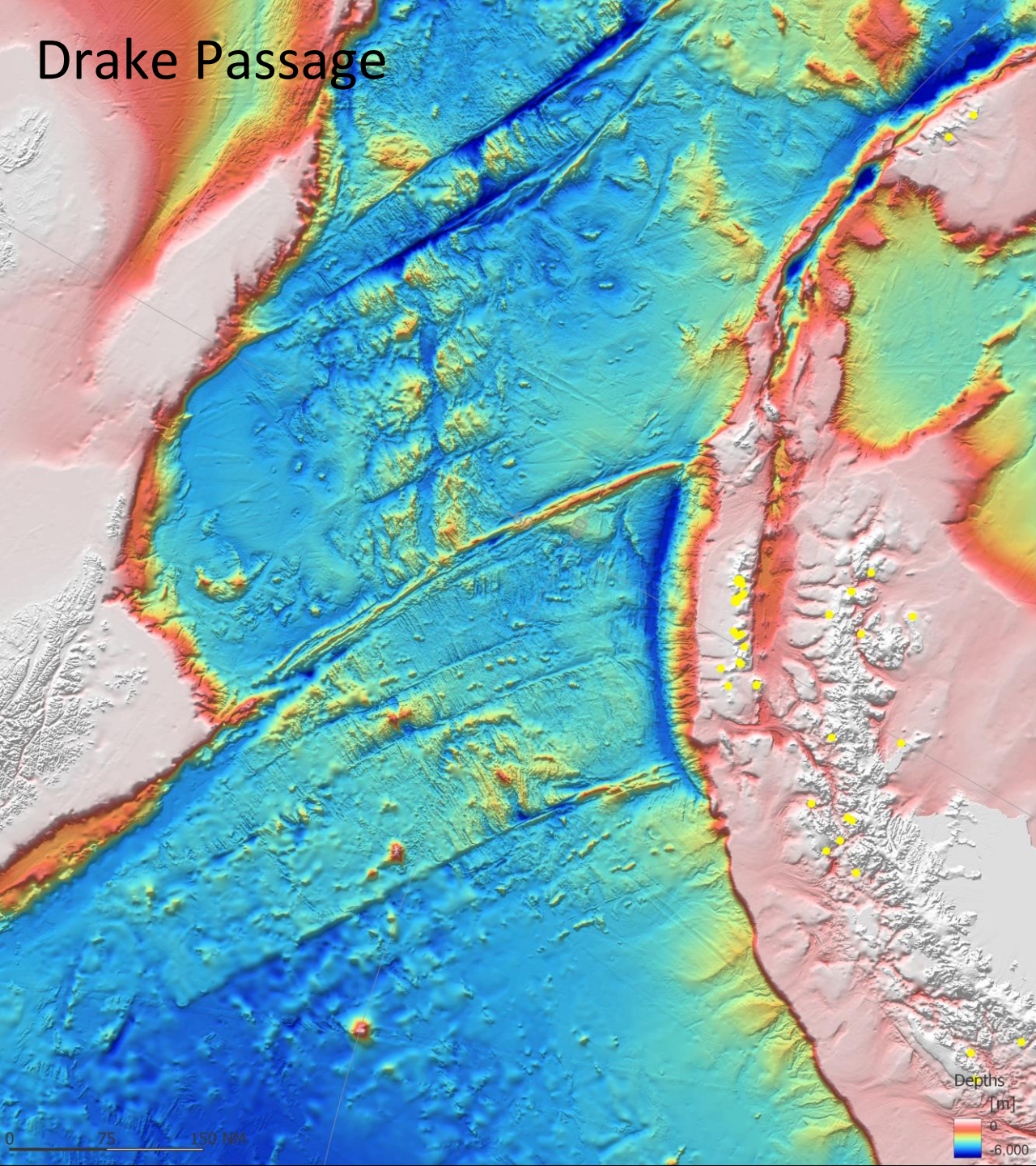
Ross Sea



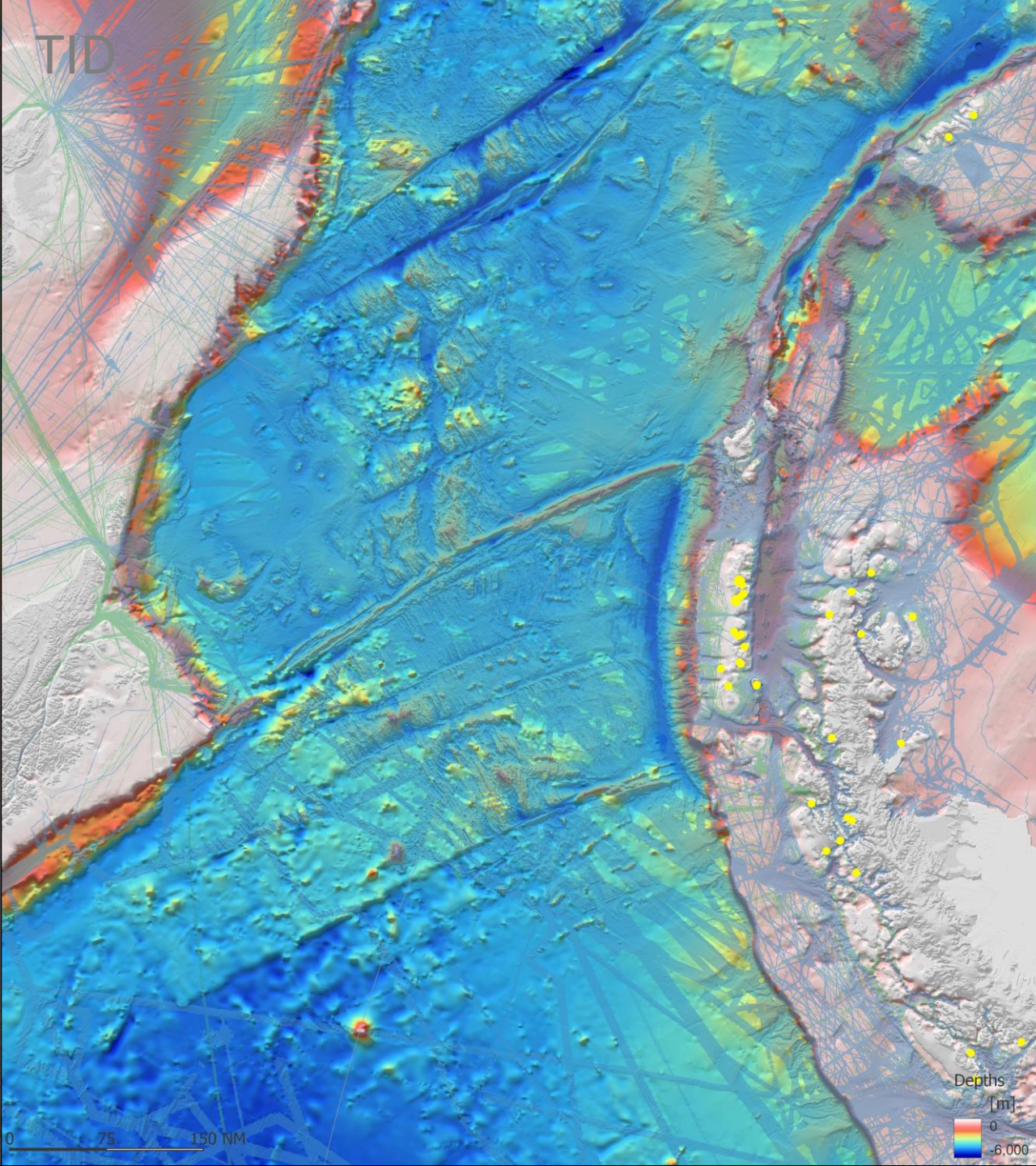
TID



Drake Passage

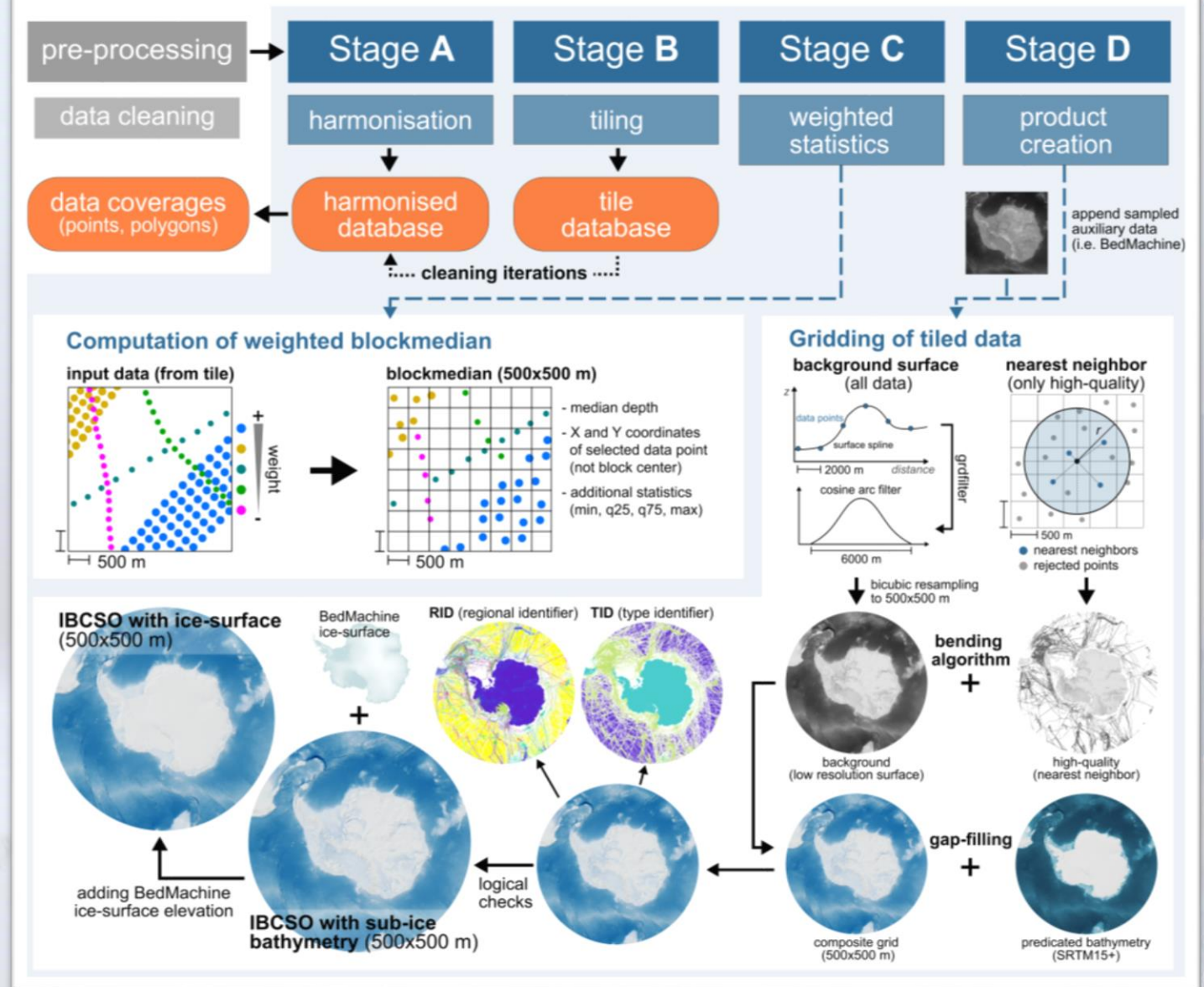


TID



Database

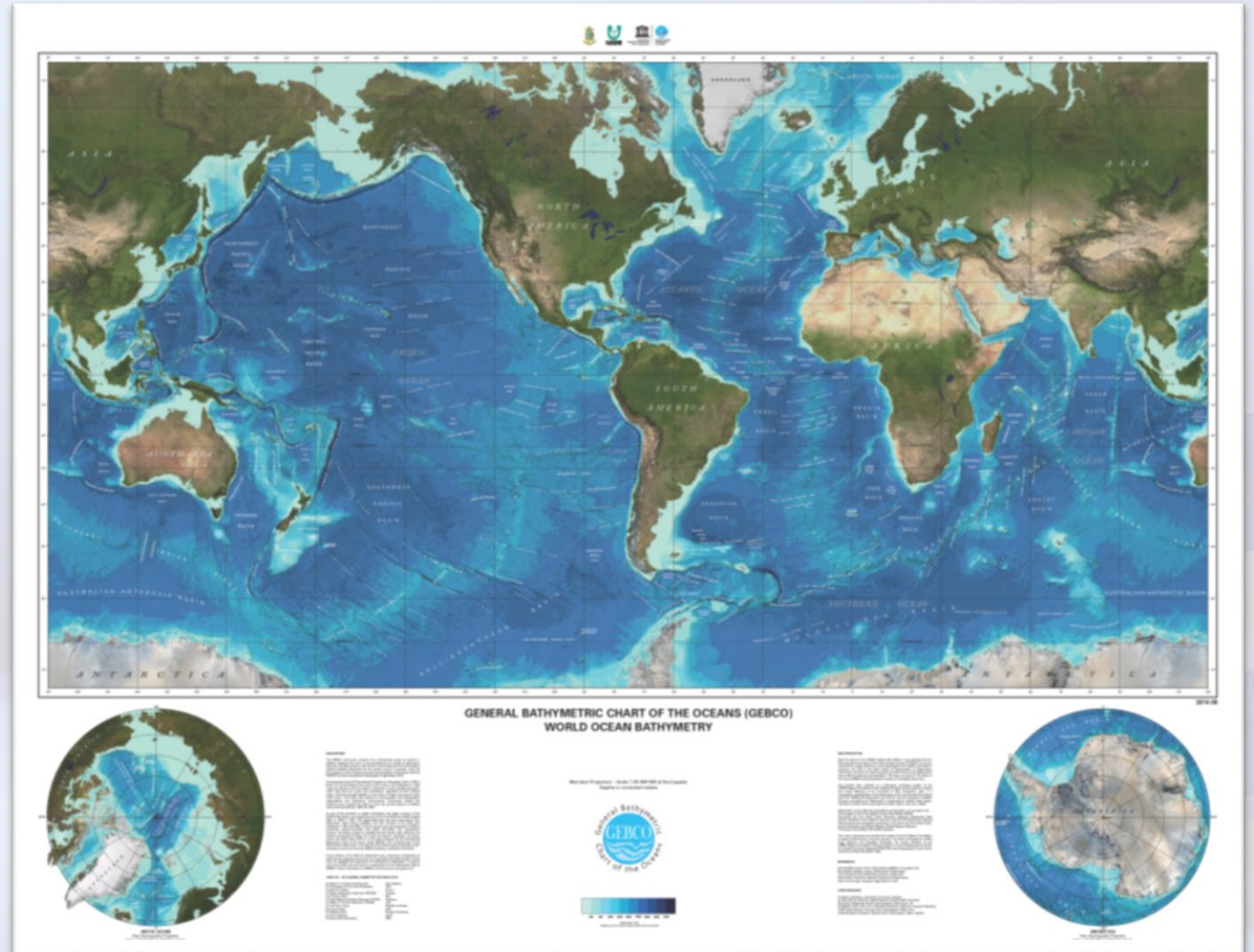
- xyz database
- High-speed processing
- 1,480 datasets
- 10 data types
- 25.5 billion soundings
 - 4.2 IBCSO v1
- 23.6% coverage



SEAHORSE workflow (stages A – D)

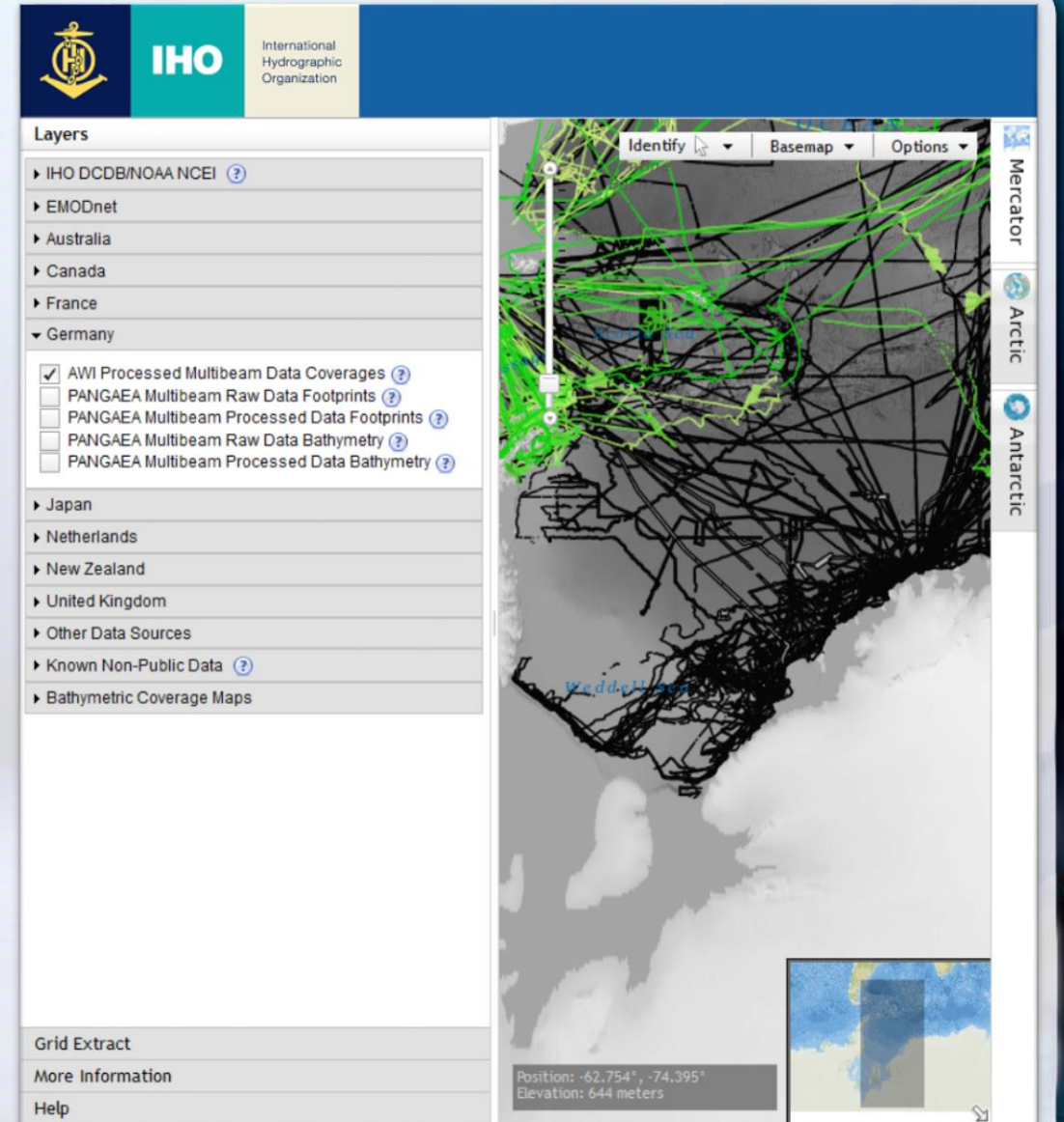
GEBCO

- Annual releases
- Next release June 2022
- IBCSO grid is incorporated
- In-between IBCSO releases there will be yearly GEBCO products
- Visit: seabed2030.org



Data Storage

- IHO Data Centre for Digital Bathymetry (DCDB) preferred
- Accommodate data holdings at AWI internally
- Data policy agreements in place



Data Acquisition



- RV Polarstern expeditions 2022:
 - PS128, Jan – Weddell Sea
 - PS134, Dec – Weddell Sea & Bellingshausen Sea / West Antarctic
- Others?
- Access the coverage / TID grid prior to expeditions to identify gaps
 - gebco.net OR
 - E-mail us directly: ibcso@awi.de



Data Contributions



- To improve the next versions of IBCSO & GEBCO products
- Contributions welcome anytime
- Submit to IHO DCDB directly or please contact us:
 - ibcso@awi.de or
 - southern-ocean@seabed2030.org





Thank you!

