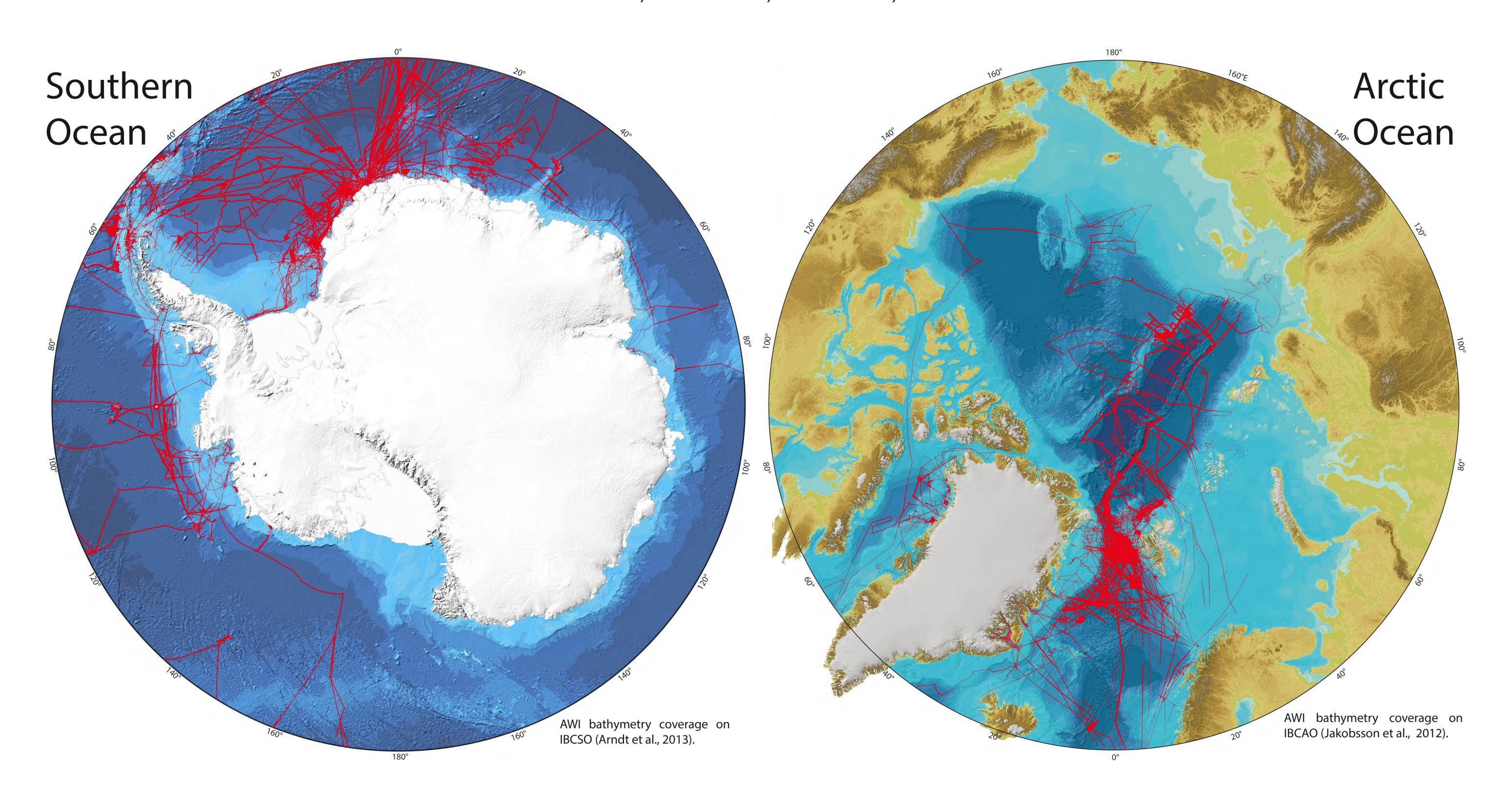
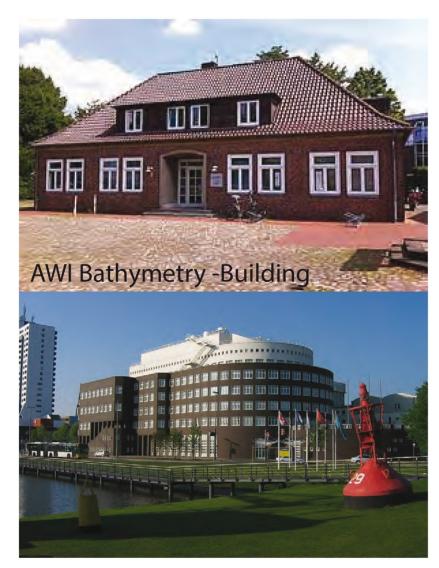


Ocean mapping activities at the Alfred Wegener Institute

B. Dorschel, J.E. Arndt, P. Slabon, L. Jensen





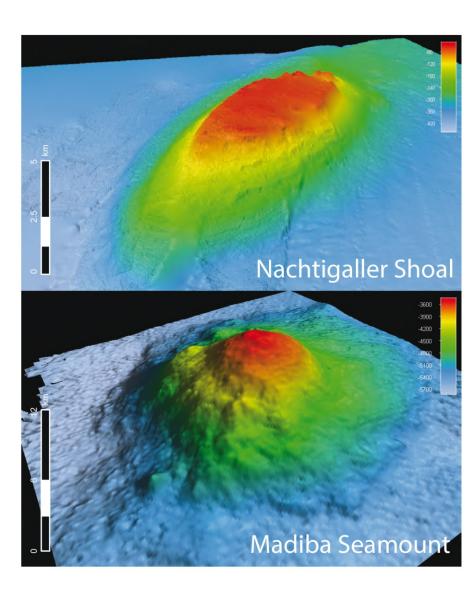
AWI Bathymetry

The Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI) is one of the major polar institutes worldwide. The Bathymetry Group at the AWI is located in Bremerhaven, Germany. Our main focus is to chart the ocean floor in high latitudes to provide key baseline information for various scientific disciplines. Our projects reach from high resolution habitat mapping studies to regional bathymetric compilations. These compilations are produced in the frame of GEBCO projects.



Research Vessels

The icebreaker RV Polarstern is the flagship of the AWI and as such is a pivotal resource for German polar research. Since her commission in 1982, she has sailed more than 1.5 million nautical miles. RV Polarstern is one of the most advanced polar research vessels in the world, operating in both polar regions about 310 days a year. For bathymetric surveys, she is equipped with a hull-mounted deep sea multibeam echosounder Hydrosweep DS3. In addition to work on RV Polarstern, in dedicated projects, the AWI bathymetry group also conducts surveys on RV Maria S. Merian and RV Sonne.

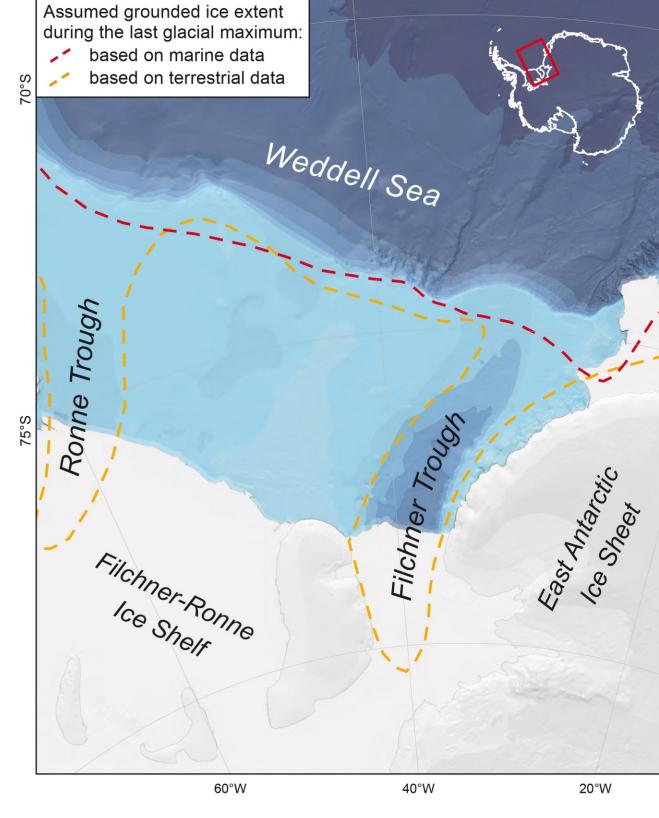


Recent Discoveries AWI bathymetric surveys in remote

parts of the world have repeatedly discovered undersea features. The latest discoveries are Nachtigaller Shoal and Madiba Seamount. Nachtigaller Shoal was discovered during expedition ANT XXIX/3 at 63°54.2′S/055°36.4′W in the northwest Weddell Sea et al., 2014). Madiba (Dorschel Seamount was discovered during ANT-XXIX/8 expedition 27.3'S/017° 21.0'E south of South Africa. Both features are now implemented in the GEBCO Undersea Feature Names Gazetteer.

Scientific projects by region

Filchner Trough, Antarctica



The aim of this project is to reveal past bed conditions and the retreat behaviour of the Filchner Ice Stream system in Antarctica. Filchner Trough once was carved by one of the largest ice streams in Antarctica during full glacial conditions and reaches a depth of more than 1700 m below present sea level at the modern day ice sheets grounding line. The size and inaccessibility of the area necessitates a joint investigation of hydro-acoustic data and sediment cores acquired by the AWI as well as the British Antarctic Survey within a close collaborati-

on.

References

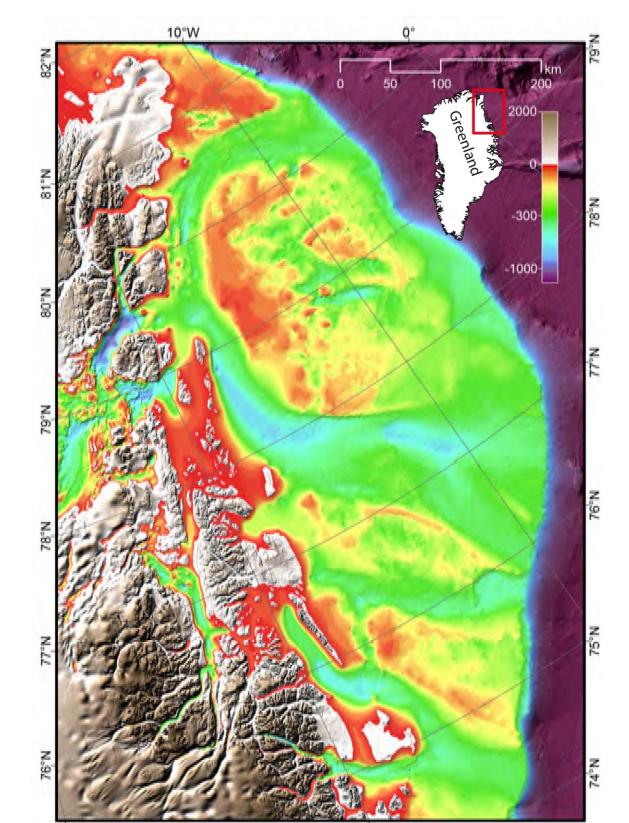
Contact: Jan.Erik.Arndt@awi.de

Arndt J.E., Jokat W., Dorschel B., Myklebust R., Dowdeswell J.A., Evans J., 2015. A new bathy-

metry of the Northeast Greenland continental shelf: Constraints on glacial and other processes. Geochemistry, Geophysics, Geosystems 16, 3733-3753, doi: 10.1002/2015GC005931.

Arndt J.E., Schenke H.-W., Jakobsson M., Nitsche F.O., Buys G., Goleby B., Rebesco M., Bohoyo F., Hong J., Black J., Greku R., Udintsev G., Barrios F., Reynoso-Peralta W., Taisei M., Wigley R., 2013. The International Bathymetric Chart of the Southern Ocean (IBCSO) Version 1.0—A new bathymetric compilation covering circum-Antarctic waters. Geophysical Research Letters 40, 1-7, doi: 10.1002/grl.50413, 2013.

Northeast Greenland



This project investigates the past glacial conditions on the northeast Greenland continental shelf. Swath bathymetric data acquired by the RV Polarstern over the last three decades is investigated to identify glacial landforms that are indicators for ice-flow directions, ice extent and the rate of ice retreat. The figure above shows a new bathymetric compilation of the northeast Greenland shelf area (Arndt et al., 2015). The new bathymetric model has 250 x 250 m resolution and revealed so far undiscovered landforms formed by ice and other geological processes.

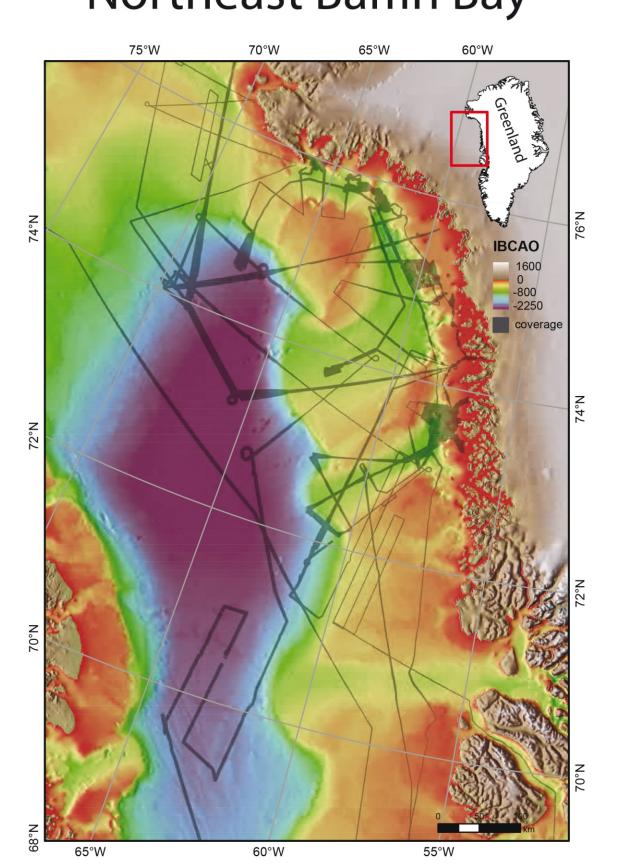
Contact: Jan.Erik.Arndt@awi.de

Dorschel B., Gutt J., Piepenburg D., Schröder M., Arndt J.E., 2014. The influence of the geomorphological and sedimentological settings on the distribution of epibenthic assemblages on a flat topped hill on the over-deepened shelf of the western Weddell Sea (Southern Ocean). Biogeosciences 11,

Jakobsson M., Mayer L.A., Coakley B.J., Dowdeswell J.A., Forbes S., Fridman B., Hodnesdal H., Noormets R., Pedersen R., Rebesco M., Schenke H.-W., Zarayskaya Y., Accettella D., Armstrong A., Anderson R.M., Bienhoff P., Camerlenghi A., Church I., Edwards M.H., Gardner J.V., Hall J.K., Hell B., Hestvik O.B., Kristoffersen Y., Marcussen C., Mohammad R., Mosher D., Nghiem S.V., Pedrosa M.T.,

3797-3817, doi: 10.5194/bg-11-3797-2014.

Northeast Baffin Bay

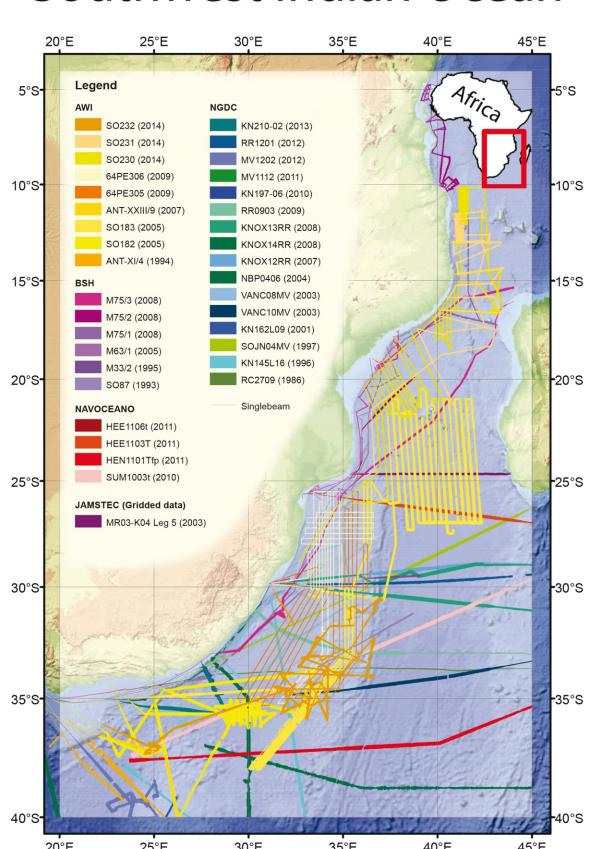


This project focuses on the deglaciation in Melville Bay, northeast Baffin Bay, on the northwest Greenland continental shelf since the last glacial maximum. Bathymetric data were acquired during expedition MSM-44 with the RV Maria S. Merian in July 2015 and during expedition ARK-XXV/3 with the RV Polarstern in 2010. These data sets give new insights in the ice stream retreat processes. Especially glacigenic features (e.g. moraines and glacial lineations) identified in the datasets allow for the reconstruction of the retreat history of the northwest Greenland ice sheet (Slabon et al., in review).

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Travaglini P.G., Weatherall P., 2012. The International Bathymetric Chart of the Arctic Ocean (IBCAO) Version 3.0. Geophysical Research Letters 39, L12609, doi: 10.1029/2012GL052219. Slabon, P., Dorschel, B., Jokat, W., Myklebust, R., Hebbeln, D., Gebhardt, C., in review, Greenland Ice Sheet Retreat History in the Northeast Baffin Bay, Quaternary Science Reviews

Southwest Indian Ocean



The southwest Indian Ocean Bathymetric Compilation (swIOBC) combines high resolution AWI bathymetric data sets with additional external bathymetric data and predicted bathymetry. It improves former mostly satellite altimetry derived bathymetric models. The aim of swIOBC is to produce a homogeneous, high resolution bathymetric grid and a corresponding map for the area from 5° to 39° S and 20° to 44° E. The swIOBC will support geological and climate research in this region.

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