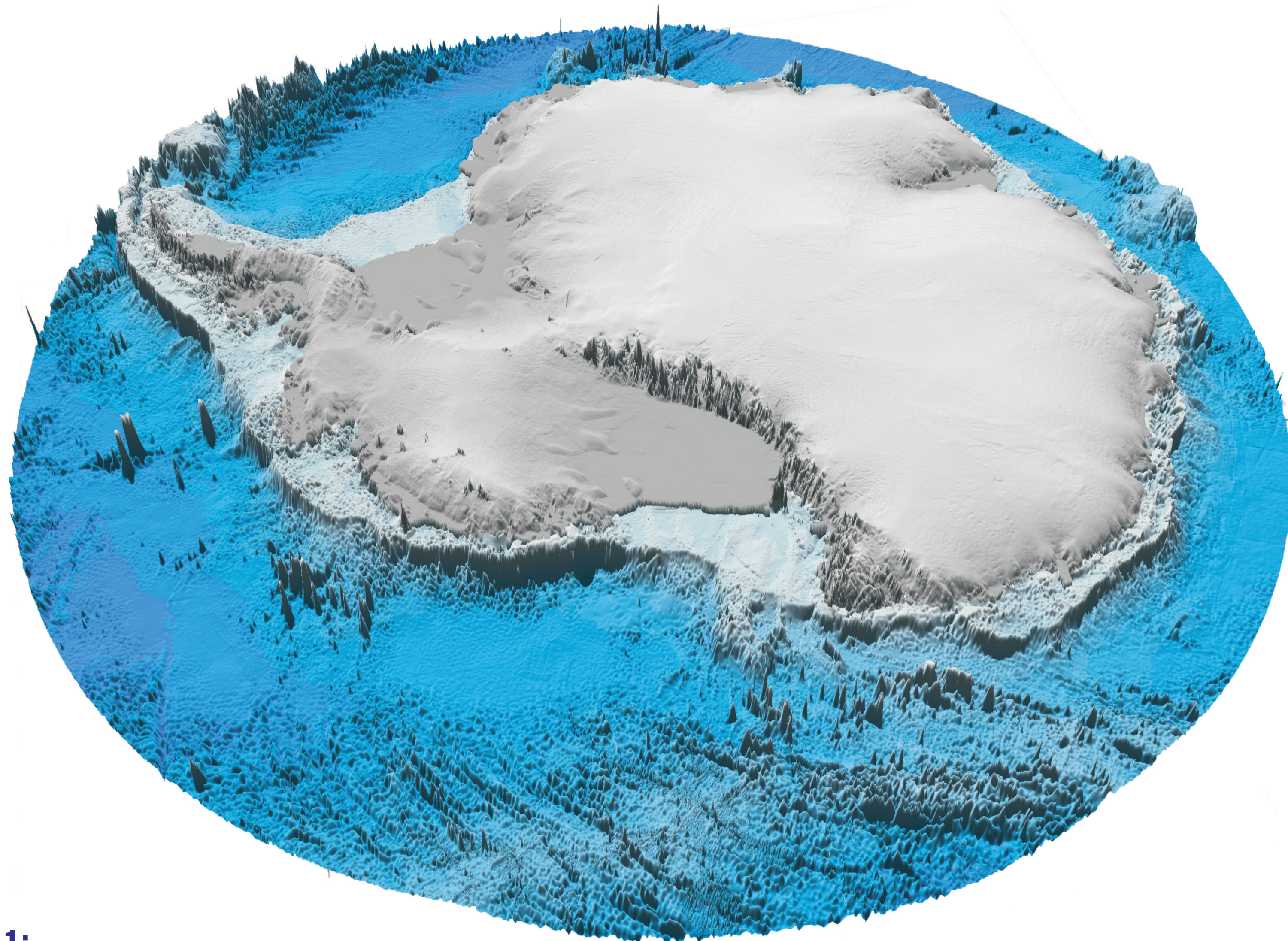
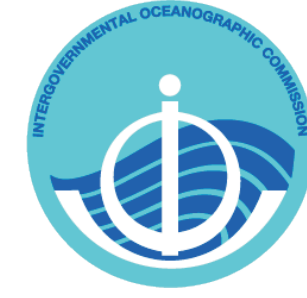




# The International Bathymetric Chart of the Southern Ocean IBCSO



Can we delete the last „White Spots“ in Antarctica?



**Figure 1:**  
3D-Overview of the region included in the upcoming IBCSO v1 grid. This view was created with the GEBCO 08 dataset in which IBCSO will be integrated.

Jan Erik Arndt<sup>1)</sup>, Hans Werner Schenke<sup>1)</sup>, Jenny Black<sup>2)</sup>,  
Martin Jakobsson<sup>3)</sup>, Frank O. Nitsche<sup>4)</sup> and Alexander J. Tate<sup>5)</sup>

<sup>1)</sup> Alfred Wegener Institute, Bremerhaven, Germany

<sup>2)</sup> Institute of Geological and Nuclear Sciences, Lower Hutt, New Zealand

<sup>3)</sup> Stockholm University, Stockholm, Sweden

<sup>4)</sup> Lamont Doherty Earth Observatory, Columbia University, Palisades, NY, USA

<sup>5)</sup> British Antarctic Survey, Cambridge, UK

## Introduction

IBCSO is a major project for the entire Ocean and Earth Science community since it not only contributes to international research programmes but also to global mapping projects like the General Bathymetric Chart of the Oceans (GEBCO) and to the production of Nautical Charts in Antarctic waters. The IBCSO Editorial Board comprises representatives from SCAR-nations conducting specific research in the Antarctic Treaty Area and has an interest in developing an improved bathymetric chart of the Southern Ocean for scientific purposes. These include (a) creating a chart of the seafloor for interpreting seabed geology, (b) building the basis for habitat maps and modelling, and (c) mapping and tracing the pathways of deep oceanic currents. The objective of IBCSO is the production of a homogeneous and seamless bathymetric grid for the Southern Ocean with an associated meta-database.

## Dataset

Echosounding data in these harsh regions are heterogeneous in terms of age, acquisition system, environmental condition, accuracy, and documentation. In ice-covered regions, systematic multibeam surveys are rare. As a consequence, the production of a bathymetric grid requires special expertise in hydrography and ocean mapping. Metadata is needed for quality assessment and accurate sonar data processing and gridding. Bathymetric grids have been compiled in regions of special research activities around the Antarctic continent. The results of these regional compilations will be used as basis for the production of the first seamless Circum-Antarctic bathymetric map.

## IBCSO v1

The first version, IBCSO v1, will consequently be an assembly of existing grids produced by different research institutes. The regions not covered will be modelled by using single- and multibeam sonar data in combination with predicted bathymetry. Professional production of this bathymetric chart requires the utilization of a Geographic Information System (GIS) for data collection, storage, manipulation, and visualization. IBCSO v1 will cover the ocean and land topography of the Antarctic Treaty Area south of 60°S, and include the coastline, and toponymic. The horizontal resolution of the IBCSO v1 grid will be 2km by 2km.

## Current Status

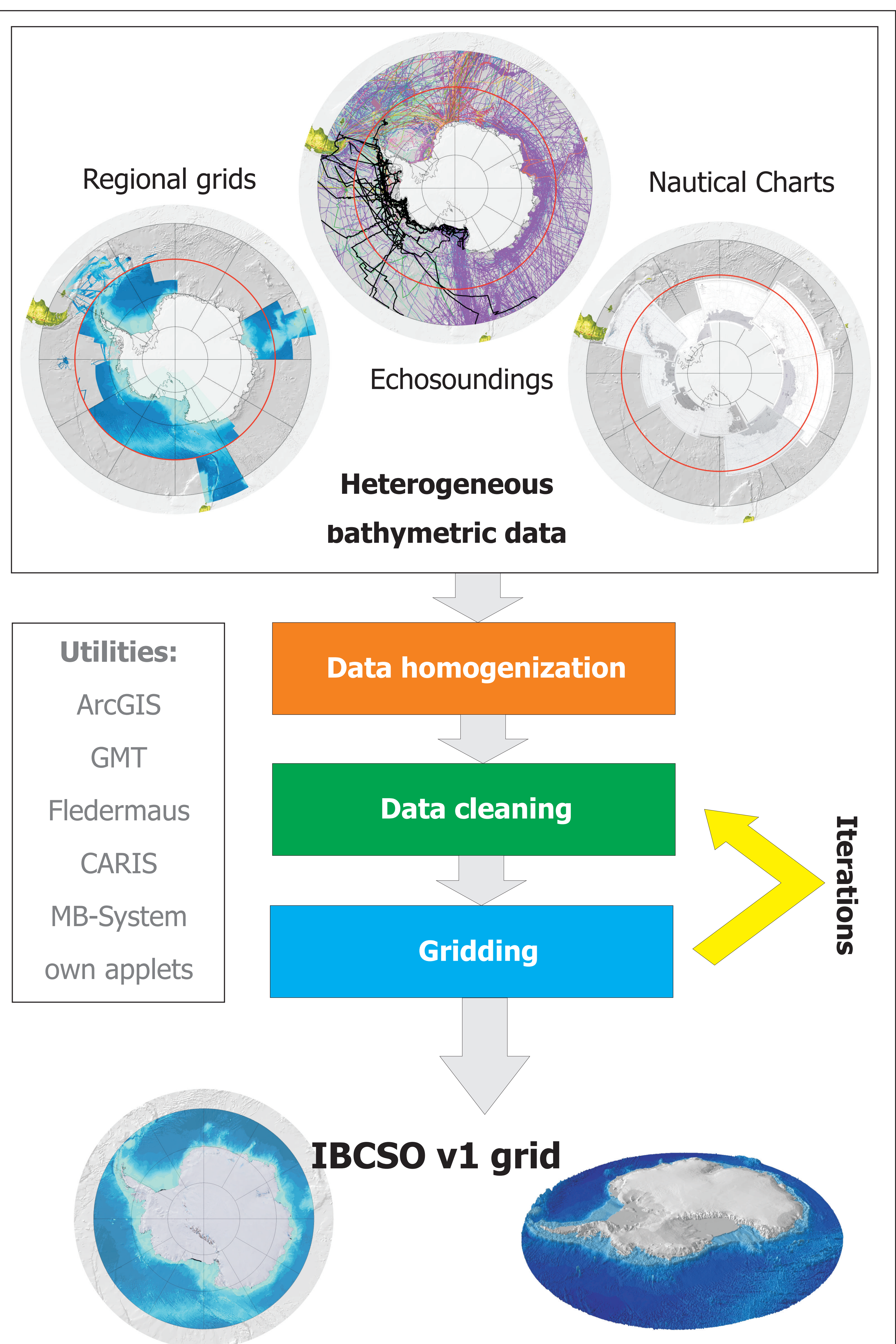
The IBCSO dataset today contains 11 regional bathymetric grids. Some more grids and updated versions of already integrated grids will follow until spring 2012. Data of shipcruises with multibeam and singlebeam measurements are as far as possible accumulated. In addition nautical charts are getting digitized to densify the data in remote, less investigated areas of the Southern Ocean. For the gridding process these heterogeneous datasets have to be converted to an appropriate format. Today the bigger part of current IBCSO data is converted. In the next steps the formatted data will be cleaned and gridded using functions of ArcGIS, Fledermaus and GMT. The calculated grid will be reviewed for artefacts resulting from erroneous source data. Following this data gets cleaned and a new improved grid will be calculated. This step is an iterative process, lasting as long as no more artifacts are detected in the grid. A scheme of the working process and the involved utilities can be seen in Figure 2. The IBCSO v1 grid is scheduled to be finished in fall 2012. Afterwards it will be made available to the public.

## IBCSO contact addresses

**Hans Werner Schenke** ([Hans-Werner.Schenke@awi.de](mailto:Hans-Werner.Schenke@awi.de)) and

**Jan Erik Arndt** ([Jan.Erik.Arndt@awi.de](mailto:Jan.Erik.Arndt@awi.de)) of the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany.

Information about IBCSO: [www.ibcso.org](http://www.ibcso.org)



**Figure 2:**  
Gridding the IBCSO v1 demands the implementation of several steps using a set of utilities. In particular the homogenization and cleaning of the large dataset are time consuming tasks. This figure gives an overview of the used data, the working process and the utilities.