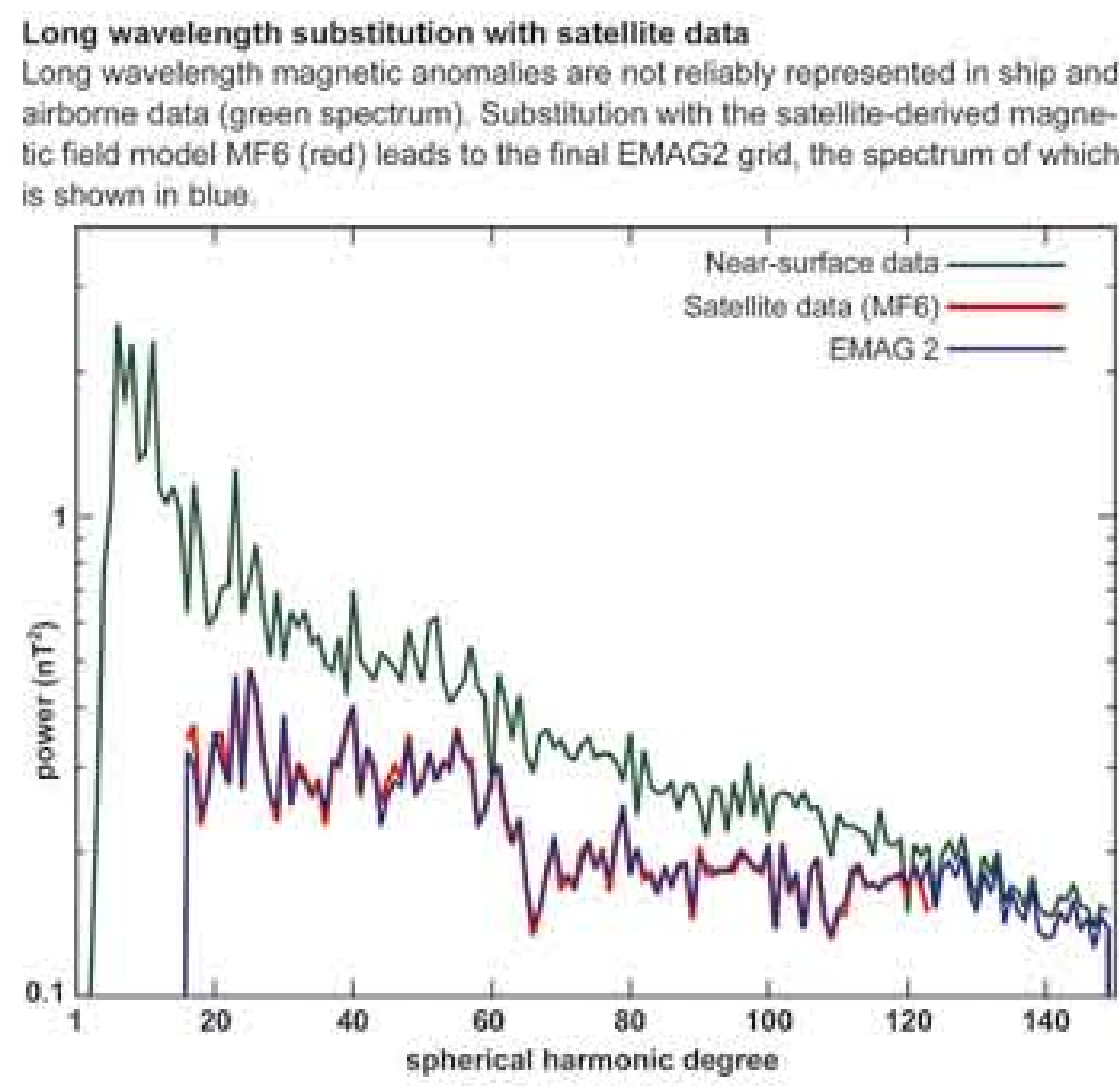
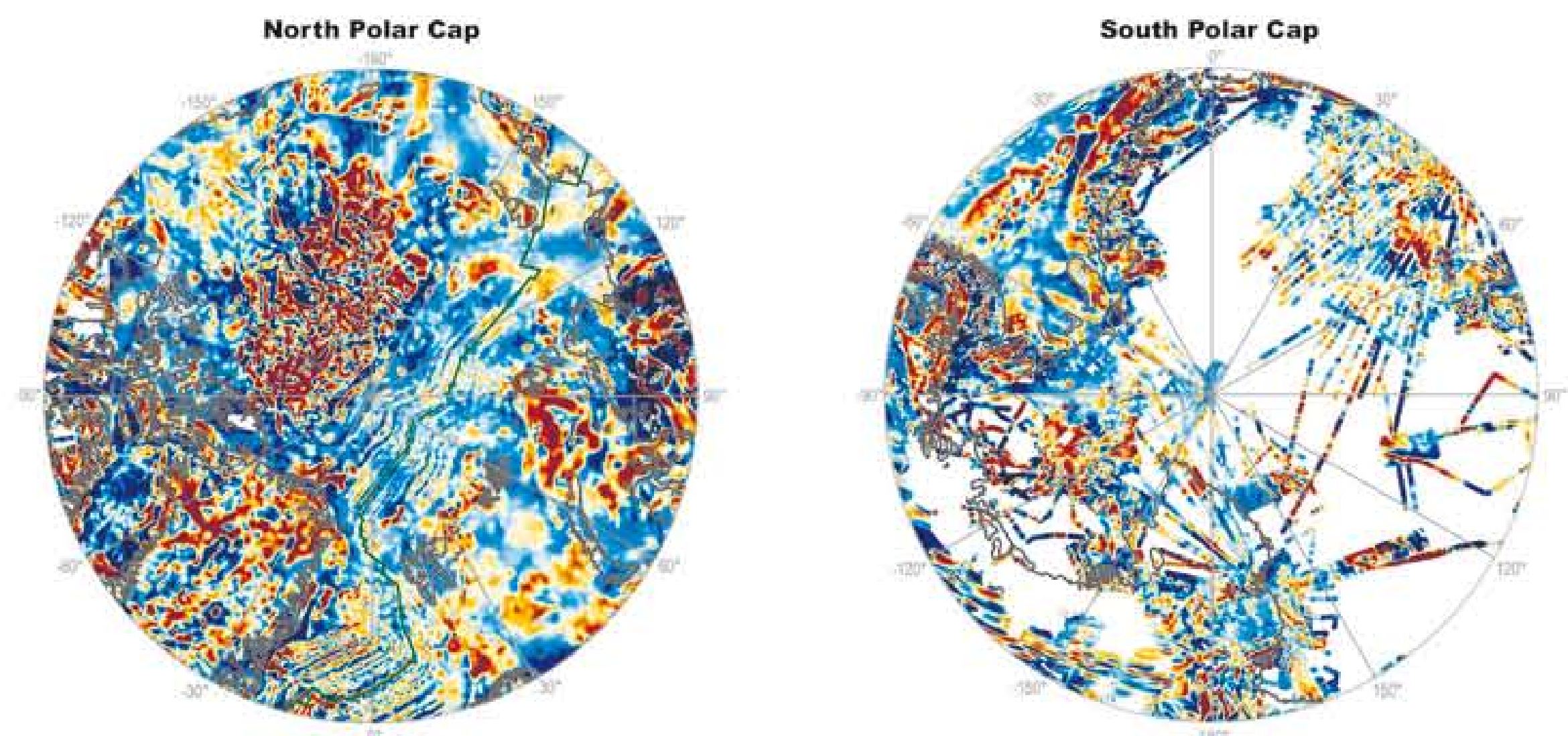
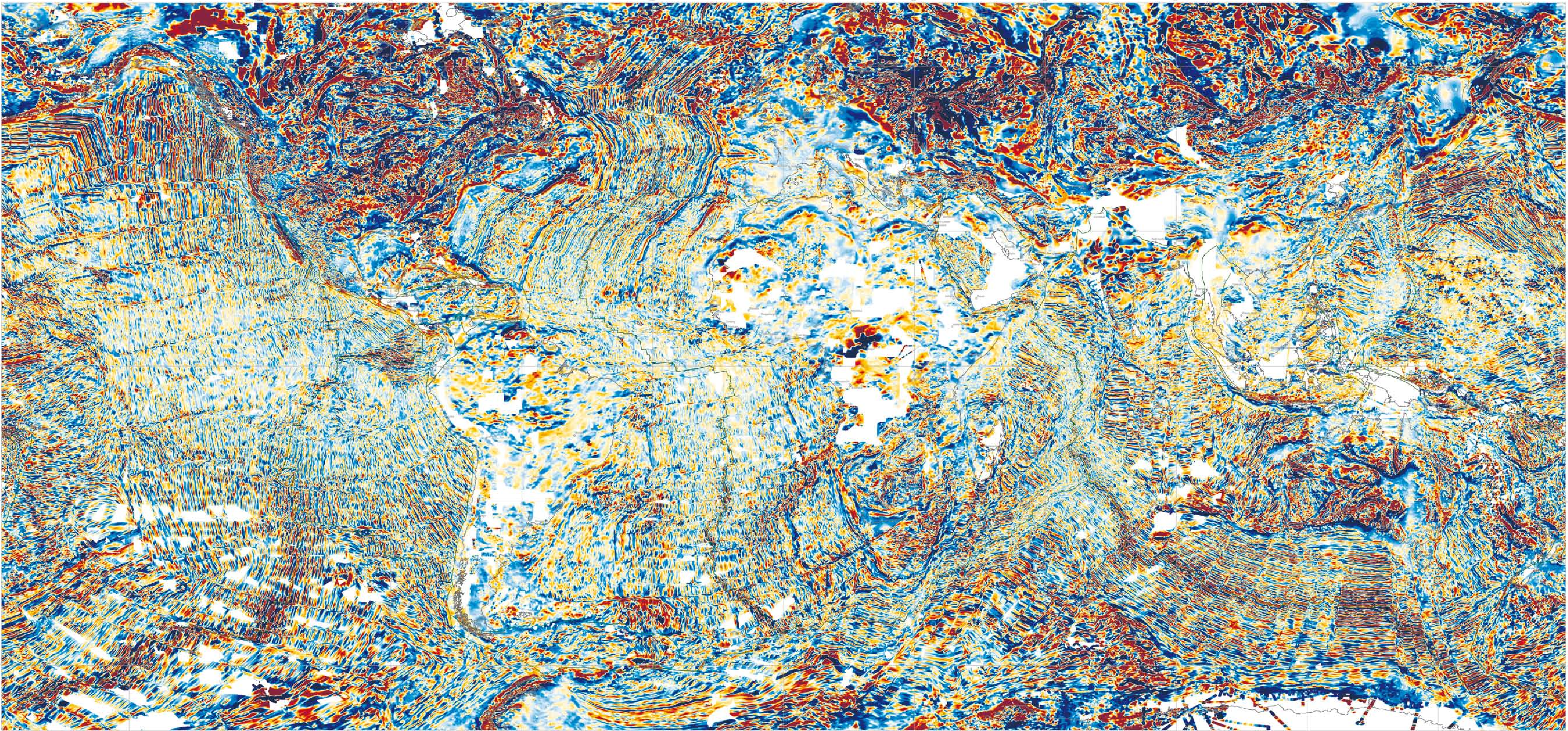


Earth Magnetic Anomaly Grid (2-arc-minute resolution)



A global Earth Magnetic Anomaly Grid (EMAG2) was compiled from satellite, ship and airborne magnetic measurements. (Maus et al., 2009) Over the continents and the Arctic we made use of existing magnetic anomaly grids, whereas original ship and airborne trackline data were processed over the rest of the oceans, wherever available. CHAMP satellite magnetic measurements provided the magnetic field at wavelengths above 330 km. The EMAG2 grid is available at <http://geomag.org> and <http://ngdc.noaa.gov>

Cartographic editor: Christa Vinnemann, BGR Hannover
Printed by: Michéris Aelter, Braunschweig, Germany
Sole: www.geoshop-hannover.de
Topography based on: ESRI Data & Maps 9.3.1
Map projection: World Miller Cylindrical
North_Pole Stereographic
South_Pole Stereographic
Datum: D_WGS_1984
www.bgr.bund.de

EMAG2	S. Maus et al.	Earth Magnetic Anomaly Grid	1 : 35,000,000	BGR	Hannover	2010
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Plate boundary

Total intensity anomaly (nT)

Processing sequence

- Merged grids at 4 km altitude above geoid using Least Squares Collocation
- From all original ship and airborne measurements: Subtracted main and external fields as given by the Comprehensive Model (Sabaka et al., 2004)
- Line-leveled the trackline data, reducing cross-over errors from 92 nT to 70 nT rms and the misfit to the merged grid from 121 nT to 97 nT rms.
- Merged the trackline data with the grid at 4 km altitude using Least Squares Collocation with anisotropic correlation function ("directional gridding")
- Substituted spherical harmonic degrees ≤ 120 (330 km wavelength) with the CHAMP satellite magnetic anomaly model MF6 (Maus et al., 2008)

Directional gridding

Due to the sparsity of magnetic field measurements in the southern oceans, it is necessary to interpolate the magnetic field between tracklines. Our interpolation algorithm takes the direction of the magnetic lineations into account. The lineations are parallel to the isochrons, which are perpendicular to the gradient of the age of the oceanic crust. We use the age grid of Müller et al. (2008).

The magnetic field at a given grid point is computed by Least Squares Collocation from the surrounding measurements. If the point is on land, we use an isotropic correlation function with $R_c = 14$ km correlation length. Over the oceans we use $R_c = 56$ km parallel to the isochrons and $R_c = 14$ km in the spreading direction. Measurements separated from the grid point by an age discontinuity or a topographic feature are excluded from the collocation.

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Earth Magnetic Anomaly Grid

(2 arc-minute resolution)

A 2-arc-minute resolution global magnetic anomaly grid
compiled from
satellite, airborne and marine magnetic data
produced by

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U. Barchhausen	H. Lühr	O. Olesen
H. Berkenbosch	P. Milgrom	M. Pilkington
N. Bournas	S. Mogren	R. Salas
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J.D. Fairhead	S. Golynsky	

Data Providers:

Alaska Department of Natural Resources, USA
Alfred Wegener Institute for Polar Research, Germany
Algerian Ministry of Energy and Mines
B.N.D.O. / C.N.E.X.O., France
Bedford Institute for Oceanography, Canada
Boston Edison, USA
British Antarctic Survey
British Geological Survey
British Oceanographic Data Center
Canadian Department of Energy, Mines and Resources
Canadian Hydrographic Service
Center for Inter-American Mineral Resource Investigations (CIMRI), USA
China University, Japan
Council for Geosciences, South Africa
Department of Energy, USA
Far East Scientific Center, Russia
Federal Institute for Geosciences and Natural Resources (BGR), Germany
First Institute of Oceanography, China
French Research Institute for the Exploitation of the Sea (IFREMER), France
Geological Survey of Canada
Geological Survey of Denmark and Greenland
Geological Survey of Finland
Geological Survey of India
Geological Survey of Japan
Geological Survey of Norway
Geological Survey of Sweden
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