MAGNETIC ANOMALY MAP OF THE ATLANTIC NORTH OF 30°

Geological Survey of Canada Open File 3280

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Mercator Projection

Scale 1:10 000 000 at the Equator

COMPILERS

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NOTES

This map is a portrayal of magnetic observations furnished by the organizations shown in the list of Data Contributors, and assembled into a coherent digital data base by a project team based at the Geological Survey of Canada (Atlantic) in Dartmouth, Nova Scotia.

Data sets were obtained in three formats: (1) digital profiles representing original observations along ship tracks and aircraft flight lines; (2) digital grids created by averaging and interpolating observations over a matrix of cells; (3) profiles and contours drawn on maps and requiring conversion to digital profiles or grids.

All data sets were processed to identify and correct obvious errors: profiles were examined to detect spikes and unlikely gradients, while grids were scanned for singular points and other irregularities. The International Geomagnetic Reference Field (IGRF) was applied to the profile data to correct for magnetic secular variation and to calculate the magnetic anomaly at each observation point. A statistical analysis of crossover errors on shipborne data was performed to check the internal consistency of each profile set as a function of observational discrepancies at ship track intersection points; correction factors were derived to reduce those errors, including those caused by diurnal variations. Profile sets were intercompared in order to improve their agreement through the elimination of spurious observations, or to derive additional adjustments.

On completion of the above procedures, all data sets were converted to separate 5 km x 5 km grids with a common origin. For profile data sets this was accomplished by defining a minimum curvature surface, upon which magnetic values were calculated at pre-defined matrix intersections. Existing grid data sets were generally re-sampled and filtered, but in some cases, special treatment was required to compensate for irregularities stemming from the distribution of the original observations, from methods used to compensate for secular variation, or from other handling.

Whether newly created or re-sampled, all grid segments were filtered to remove magnetic field components with wavelengths exceeding 400 km, and then combined with appropriate adjustments to minimize edge effects. The resulting merged grid was used to produce a shaded relief representation of the magnetic anomaly, in a form suitable for plotting at the scale and projection of the map.

A comprehensive project report contains detailed descriptions of the contributed data sets, and of the procedures employed for their handling and processing. The final 5 km grid of merged data is available on CD-ROM. For information on how to obtain a copy of this material, send an inquiry by e-mail to agc@agc.bio.ns.ca, by fax to +1(902)426-4266, or by letter to:

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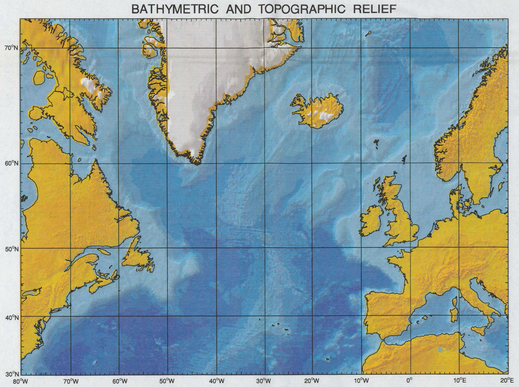
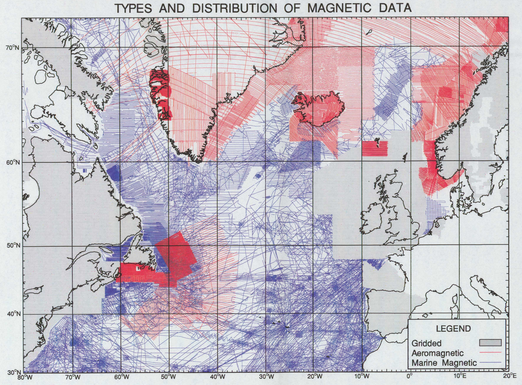
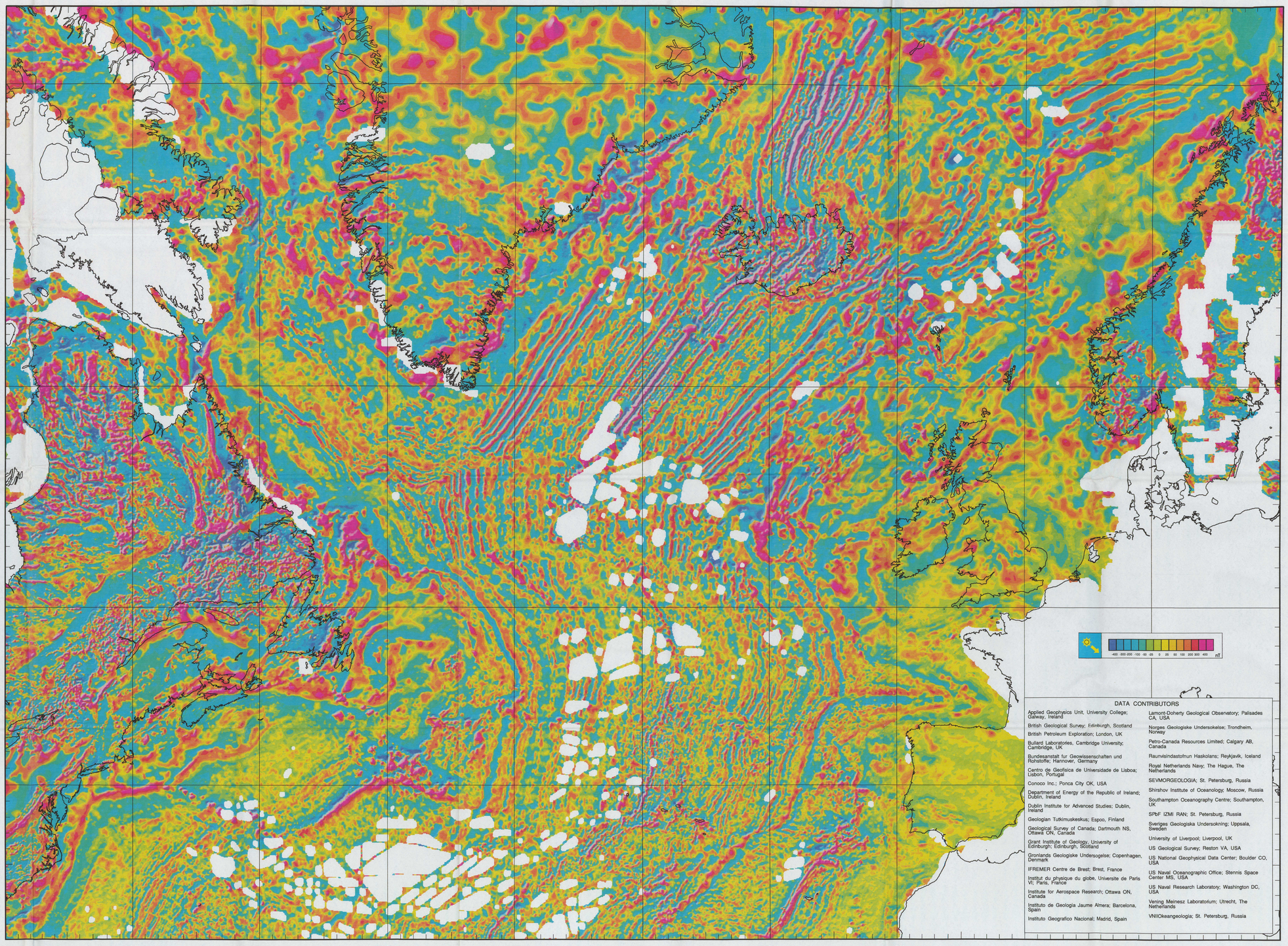
BATHYMETRIC AND TOPOGRAPHIC RELIEF



TYPES AND DISTRIBUTION OF MAGNETIC DATA





DATA CONTRIBUTORS

Applied Geophysics Unit, University College; Galway, Ireland

British Geological Survey; Edinburgh, Scotland

British Petroleum Exploration; London, UK

Bullard Laboratories, Cambridge University; Cambridge, UK

Bundesanstalt fur Geowissenschaften und Rohstoffe; Hannover, Germany

Centro de Geofisica de Universidade de Lisboa; Lisbon, Portugal

Conoco Inc.; Ponca City OK, USA

Department of Energy of the Republic of Ireland; Dublin, Ireland

Dublin Institute for Advanced Studies; Dublin, Ireland

Geologian Tutkimuskeskus; Espoo, Finland

Geological Survey of Canada; Dartmouth NS, Ottawa ON, Canada

Grant Institute of Geology, University of Edinburgh; Edinburgh, Scotland

Gronlands Geologiske Undersogelse; Copenhagen, Denmark

IFREMER Centre de Brest; Brest, France

Institut du physique du globe, Universite de Paris VI; Paris, France

Institute for Aerospace Research; Ottawa ON, Canada

Instituto de Geologia Jaume Almera; Barcelona, Spain

Instituto Geografico Nacional; Madrid, Spain

Lamont-Doherty Geological Observatory; Palisades CA, USA

Norges Geologiske Undersokelse; Trondheim, Norway

Petro-Canada Resources Limited; Calgary AB, Canada

Raunvisindastofnun Haskolans; Reykjavik, Iceland

Royal Netherlands Navy; The Hague, The Netherlands

SEVMORGEOLOGIA; St. Petersburg, Russia

Shirshov Institute of Oceanology; Moscow, Russia

Southampton Oceanography Centre; Southampton, UK

SPbF IZMI RAN; St. Petersburg, Russia

Sveriges Geologiska Undersokning; Uppsala, Sweden

University of Liverpool; Liverpool, UK

US Geological Survey; Reston VA, USA

US National Geophysical Data Center; Boulder CO, USA

US Naval Oceanographic Office; Stennis Space Center MS, USA

US Naval Research Laboratory; Washington DC, USA

Vening Meinesz Laboratorium; Utrecht, The Netherlands

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