

Compiling a new digital bathymetric model of the North Atlantic Ocean

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The proposed International Bathymetric Chart of the North Atlantic (IBCNA) is an undertaking to assemble and to rationalize all available bathymetric observations from the Atlantic Ocean and adjacent seas north of the Equator and south of 64°N into a consistent digital bathymetric model (DBM).

After almost one century of echo sounding activity having passed, the North Atlantic is arguably the best mapped ocean in the world, with a huge quantity of inconsistent sounding data featuring a tremendous variability in accuracy, resolution and density. However, the commonly used large scale DBMs of the area neither incorporate the significant amount of recent Multibeam echo sounding data available in the North Atlantic nor systematically address potential data compilation problems caused by the heterogeneity of the data basis such as error propagation, the incorporation of metadata or different interpolation algorithms. This makes the North Atlantic an ideal test area for data compilation techniques.

Geographical Information Systems and spatial relational databases are powerful tools allowing for a great flexibility concerning storage, handling, processing and visualization of both data and metadata. A data model has been developed that can flexibly accommodate all kinds of raw and processed data, representing data and metadata as a multidimensional, integrated data set.

Ongoing work includes data quality analysis based on metadata information and cross-survey checks, development of algorithms for merging and gridding heterogeneous sounding data using geostatistical methods and the issue of error propagation from the underlying echo soundings through the compilation process into the final gridded DBM.