

Comparison and evaluation of publicly available grids in the Arctic

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In this study we compare and evaluate the quality of bathymetry datasets which provide Arctic coverage. This study intends to facilitate improvement of current bathymetry datasets, assess differences between them, and provide guidance on the choice depending on the purpose.

The datasets analyzed are separated into two major types: Type A, datasets based on sounding source data and Type B, datasets based on two combined data sources such as gravity and bathymetry. Our comparison is done in terms of regional depth accuracy, internal consistency and interpolation reliability, which are defined as main quality criteria of any bathymetry dataset. Additionally all datasets are compared in terms of global depth distribution, resolution of the coastline and registration issues.

We find that bathymetry datasets of Type A are more consistent and have smoother appearance, have higher accuracy over different morphological provinces, especially over the continental shelf. At the same time, Type B datasets provide information on seafloor features such as seamounts and ridges not reflected in Type A datasets.

Finally, we propose quality model and metrics which are important for the choice of the bathymetry grid and leave the choice of the grid to a user.