



The GOCINA Mean Dynamic Topography Models and Impact on Ocean Circulation Modelling.

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A major goal of the EU project GOCINA (Geoid and Ocean Circulation In the North Atlantic) was to determine an accurate mean dynamic topography model in the region between Greenland and the UK. The impact of the new improved mean dynamic topography on the modelling of volume and heat transport in the GOCINA area has been tested using three existing operational systems (FOAM, TOPAZ, and MERCATOR). The volume transports through the straits between Greenland and the UK have been validated against oceanographic observations. In the three operating systems the GOCINA MDT was used for the assimilation of satellite altimetry. In all cases, the use of the GOCINA MDT improved the modelling of the transports and increased the agreement with the observations. The use of the new GOCINA MDT decreased the modelled net northward heat transport through the straits between Greenland and the UK. Furthermore, the GOCINA MDT associated simulations of the Atlantic Thermohaline circulation show improvements. Finally, the GOCINA project will support the GOCE mission in two distinct cases, namely (1) to educate and prepare the community in using GOCE data for oceanography including sea level and climate research as well as operational prediction; and (2) to develop methods for generating regional gravity fields and to use them to generate a best possible regional gravity field and geoid model for the North Atlantic that can be used in validation of the GOCE products.