



The Hornsund fjord – modeling of the general circulation, heat exchange and water masses transport.

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The MIKE3D hydrodynamic model has been implemented for diagnosis an ecosystem status in the most southern fjord of the Svalbard Archipelago. The model is based on MIKE 3 Flow Model FM that uses flexible mesh grid. The spatial discretization in solutions of equations is performed by the finite element method. The regional scale of the model implicated implementation of external data at the lateral boundary region. In our case Flather's boundary condition let us to force the model with combined information. At the same time tidal ordinate and barotropic component of velocity that reflects the West Spitsbergen Current are implemented. Also salinity and temperature were nested at the boundary area. The upper boundary conditions was also introduced. The data for the boundary were taken from Global Tide Model (all tidal components), an 800 m ROMS simulation of the Svalbard area made by the Norwegian Institute of Marine Research (barotropic velocities, temperature and salinity), European Centre for Medium Weather Forecast (ECMWF) and also from Global Data Assimilation System (GDAS).

Implemented model was validated and the mean circulation and its seasonal variability will be presented. Also influence of the shelf water masses on the fjord will be discussed. Fresh water transport from glaciers, run off and snow will be estimated.

Results are based on 5 years simulation (2005-2010)

This work was partially performed in the frame of the projects GAME (DEC-2012/04/A/NZ8/00661) and AWAKE2 (Pol-Nor/198675/17/2013)