Geophysical Research Abstracts
Vol. 15, EGU2013-8698-1, 2013
EGU General Assembly 2013

Modeling Spitsbergen fjords by hydrodynamic MIKE engine.

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Two Svalbard's fjords – Hornsund (on the western side of the most southern part of Spitsbergen island) and Kongsfjorden (also on the western side of Spitsbergen island, but in the northern part) are quite different – the first one is "cold" and second one is "warm". It is obvious that both of them are under influence of West Spitsbergen Current (WSC), which curry out warm Atlantic water and cold East Spitsbergen Current detaches Hornsund. But there is also freshwater stored in Spitsbergen glaciers that have strong influence on local hydrology and physical fjord conditions. Both, local and shelf conditions have impact on state of the fjord and there is no answer which one is the most important in each fjord.
Modeling could help to solve this problem - MIKE 3D model has been implemented for both fjords. Mesh-grid of the each fjord has been extended for covering shelf area. External forces like tides, velocities at the boundary and atmospheric forces together with sources of cold and dens fresh water in the fjords will give reliable representation of physical conditions in Hornsund and Kongsfjorden. Calculations of balances between cold fresh water and warm and salt will provide additional information that could help to answer the main question of the GAME (Growing of the Arctic Marine Ecosystem) project - what is the reaction of physically controlled Arctic marine ecosystem to temperature rise.