Geophysical Research Abstracts
Vol. 15, EGU2013-4443, 2013
EGU General Assembly 2013

Variability of the Atlantic Water in the Arctic Ocean according to numerical simulations

Elena Golubeva and Gennady Platov

Institute of Computational Mathematics and Mathematical Geophysics SB RAS, Novosibirsk, Russian Federation (elen@ommfao.sscc.ru)

Based on the numerical modeling we present an analysis of Arctic Ocean climatology with a focus on the circulation of waters that originates in the Atlantic Ocean. The Atlantic Water is one of the main sources of heat in the Arctic Ocean. As the recent observations show dramatic changes of the Arctic atmosphere–ice–ocean system, the spatial and temporal variability of these water masses requires serious investigation. Despite a large increase in the observations in the last decades, it is still poorly known about water mass pathways, physical properties of this flow and exchange processes between the boundary current and the deep ocean regions or the shallow arctic shelves.

We will present an analysis of the interannual variability of Atlantic Water propagation into and inside the Arctic Ocean for the period 1948-2011 years from a series of numerical experiments. The basic model is a regional coupled ice-ocean model developed in the ICMMG SB RAS. The numerical model is the same for the experiments but numerical grid has different spatial resolution. The NCEP/NCAR and CORE reanalysis was used as the atmospheric forcing.

On the basis of the numerical experiments, we investigated the processes of heating and cooling occurred in the Atlantic water layer. The model results indicate the significant variation of the Atlantic Water path in the surface and intermediate layers of the ocean, caused by changes in atmospheric circulation. The sensitivities of the model results to the numerical grid spatial resolution will be discussed.