Geophysical Research Abstracts
Vol. 16, EGU2014-506, 2014
EGU General Assembly 2014

Impact of largescale ocean-air interaction on thermohaline anomalies in Northwest Atlantic and Nordic Seas

Anastasia Vyazilova

FSBI "Arctic and Antarctic Research Institute", Ocean-air interaction, Saint-Petersburg, Russian Federation (nev5199@gmail.com)

Oceanography of Northwest Atlantic and Nordic Seas are formed by similar large-scale processes: export of warm and saline North Atlantic Water and flows of cold fresh water from Arctic Ocean. These processes in both regions develop in some opposition driven by the atmospheric circulation presented by NAO and AO indexes.
Temperature and salinity time series indicates that convection in Labrador Sea became deeper since mid-1960s till early 1990s as the same time deep water of the Greenland Sea is warmer and saltier since the early 70s. NAO/AO circulation modes have an effect on air temperature in the Nordic Seas and NW Atlantic that influences on winter convection. When index NAO is negative air temperature is reduced in Greenland Sea. During positive phase of NAO air temperature is dropped in Labrador Sea. Correlation between air temperature and water temperature in upper 500 m in both regions is 0.6÷0.7.
Inflow of freshened water to the Northwest Atlantic (the Labrador Sea and Baffin Bay) and Nordic Seas (the Norwegian and Greenland seas) has an effect on thermohaline anomalies and convective processes in both regions. The fresh water flows from the Arctic through the Fram Strait with the East-Greenland current and through the Baffin Bay and the Davis Strait. Summer warming in 1960s and 1990-2000s are followed by increasing freshwater in the Labrador Sea and Baffin Bay, there is also correlation between NAO phases and fresh water anomalies. Correlation between thermohaline and atmosphere anomalies over these regions enable to value mutual impact of atmosphere and ocean with defining time lag. This analyze allows to compare spatial-temporal variability of thermohaline anomalies with climate change in the regions.