



Variability of Atlantic inflow to the Arctic Ocean from summer hydrographic observations in the Nordic Seas and Fram Strait

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Before reaching the Arctic Ocean, warm and salty water masses, originating from the North Atlantic, pass the eastern rims of the Norwegian and Greenland Seas and continue farther to the north through Fram Strait. During its northward advection the Atlantic water (AW) is continuously transformed and its temperature, salinity and heat content changes significantly. A part of the AW heat is released to the atmosphere while a major share is lost due to lateral exchanges and mixing with adjacent water masses. This study addresses summer-to-summer variability, transformation, and circulation patterns of the Atlantic water in the region between the northern Norway and northern Fram Strait. We will present results of the long-term summer measurements in the Norwegian-Atlantic and West Spitsbergen Currents, carried in 1996-2013 by Institute of Oceanology PAS, and compare them to continuous observations from the moored array maintained by Alfred Wegener Institute in the northern Fram Strait, to estimate the impact of seasonal variations on long-term changes in the AW properties.

Significant variability over different time scales has been observed in the properties of the AW over the studied period with the warmest AW inflow in late 90s and 2005-2006 and a significant positive trend in AW salinity. Time series of temperature and salinity at the standard hydrographic section at 76°30'N reveal a presence of three 5-6 years long cycles. Spatial distributions of AW properties and geostrophic velocities in the studied region show alternating phases of intensified AW inflow into the Barents Sea and periods of increased northward volume and heat transport through Fram Strait. Using available reanalysis data and meteorological measurements from Svalbard area we will attempt to explain possible links between observed changes and atmospheric forcing.

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