



On temporal and spatial variability of T,S-characteristics and volume rate of Atlantic water in the Arctic Ocean based on NABOS CTD-data

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CTD-data from transects across continental slope of the Eurasian and Makarov Basins of Arctic Ocean in longitude range 31–159°E performed during NABOS project in 2002–2015 and during R/V Polarstern cruise in 1996 were collected in unified dataset and processed. Obtained data were analyzed and used for study of temporal and spatial variability of T,S-characteristics of different water masses in considered region. The volume rate of the geostrophic flow carrying the Atlantic water along the continental slope of the Eurasian Basin was also assessed on every transect using dynamic method and CTD-data.

One branch of Atlantic water enters the Eurasian Basin through the Fram Strait and forms eastward subsurface baroclinic boundary current with a core of increased temperature and salinity adjacent to the continental slope. The second branch of Atlantic water enters the Basin from St. Anna Trough and consists of water masses, which are strongly cooled due to mixing with shallow waters of the Arctic shelf seas (the Barents and Kara seas). The performed analysis showed that the volume rate of geostrophic flow greatly decreases when moving away from areas of Atlantic water inflow in Eurasian Basin. This decrease may primarily be due to a decrease in the flow rate. Another reason is the weakening of the horizontal gradients of potential density caused by the outflow of water masses in the direction perpendicular to the eastward geostrophic flow. Such outflow may be explained by the processes of formation of intrusions and eddies, which are typically observed in intermediate and deep layers of Arctic Ocean.

It is shown that the intense warming of the Atlantic water, recorded in 2006, was accompanied by an increase in salinity and volume rate of the geostrophic flow. All these phenomena observed simultaneously can be caused not only by the warming of the Atlantic water, but also by the increase of the inflow of the Atlantic water to the Eurasian Basin through the Fram Strait and St. Anna's Trough.

The assessed values of the hydrological parameters are presented as a table. The obtained results are important scientific reference information and can also be used for estimates of the variability of the T,S-indices arising from climate change in the Arctic Basin.

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