



Arctic Intermediate Water in the Nordic Seas, 1991–2009

Emil Jeansson (1), Are Olsen (2), and Sara Jutterström (3)

(1) Uni Research Climate, Bjerknes Centre for Climate Research, Nygårdsgaten 112, 5008 Bergen, Norway (emil.jeansson@uni.no), (2) Geophysical Institute, University of Bergen and Bjerknes Centre for Climate Research, Allégaten 70, 5007 Bergen, Norway, (3) IVL Swedish Environmental Research Institute, Aschebergsgatan 44, 411 33 Gothenburg, Sweden

The evolution of the different types of Arctic Intermediate Water (AIW) in the Nordic Seas are evaluated and compared, utilising hydro-chemical data between 1991 and 2009 from the GLODAPv2 data product. These waters have been suggested to be important components of the dense overflows to the North Atlantic, and thus it is important to understand how they vary in properties and distribution with time. The AIW from the Greenland and the Iceland Seas, show different degrees of variability during the studied period, but only the Greenland Sea AIW (GSAIW) shows increasing temperature and salinity during the 2000s that considerably changed the properties of this water mass, resulting in a more Atlantic-dominated water type in 2009.

An optimum multiparameter (OMP) analysis performed to assess the sources of the Norwegian Sea AIW (NSAIW) show that both the Iceland Sea Arctic Intermediate Water (ISAIW) and the GSAIW contributes clearly to NSAIW, but at different densities, corresponding to their respective density range. This illustrates that they flow largely isopycnally from their source regions to the Norwegian Sea. The main source to the NSAIW, however, is the upper Polar Deep Water, which agrees with the lower concentrations of oxygen and chlorofluorocarbons, and higher salinity and silicate concentrations found in the NSAIW layer, compared to ISAIW and GSAIW.

The analysis shows how vital it is to include chemical tracers to any water mass analysis to correctly assess the sources.