B07-O20

THE ATLANTIC WATER IMPACT ON THE SHELF-BASIN EXCHANGE AT THE BOUNDARY BETWEEN THE BARENTS SEA AND THE GREENLAND SEA.

Ilona Goszczko *(Institute of Oceanology Polish Academy of Sciences / IO PAN - Centre for Polar Studies KNOW (Leading National Research Centre), Poland)*

ilona_g@iopan.gda.pl

The following research study considers the area south and west of Spitsbergen during the observed Arctic sea ice cover decline. Hydrographical data from summer observations performed between 1998 and present across the shelf-break, slope and deep basins and time series from several shelf-located moored instruments are analyzed. The physicochemical parameters (temperature, salinity, density, oxygen saturation and nutrients) of water masses interacting across that boundary - warm and saline Atlantic water (AW) and fresh and cold Arctic water (ArW) - vary from summer to summer. Occasionally, sections and vertical profiles show cascading and spreading of dense water plume from the Storfjord Trough and its mixing with the ambient water. Values of momentary magnitude and directions of ocean currents derived from LADCP measurements indicate strong near-bottom velocity, however not every year dense water cascade manages to reach the bottom beneath the slope. The observed diversified conditions lead to assume that there is a certain mechanism which controls advection of the AW on the shelf occupied by the ArW or rather its assembly with other water masses (brine-enriched shelf water and fresh, surface water from ice melting, besides AW). Profiles and trajectories from a few Argo floats deployed upstream of the Norwegian Atlantic Current confirm that mesoscale eddies frequently occur westward from the studied area. In summer 2014 massive AW advection was observed at the whole shelf of the west Spitsbergen, also far into the Storfjord Trough. Monthly sea ice concentration and sea surface temperature obtained from gridded satellite data provide a closer look at the variability of the Polar Front location and its instability being interrelated with AW northward flow and local atmospheric and sea ice conditions in the era of warming Arctic climate.

This study is based on the research performed by IOPAN during its summer Arctic Experiments aboard r/v Oceania. Additional support is provided by MIXAR – a grant from the Polish National Science Centre and PAVE – a grant from the Polish-Norwegian Research Programme. Argo floats were launched under the EU Euro-Argo RI.