Geophysical Research Abstracts
Vol. 15, EGU2013-12043-1, 2013
EGU General Assembly 2013


# Variability of Atlantic Water in the Barents Sea

Laurent Oziel (1), Joel Sudre (2), Fernanda Jardon (1), Veronique Garçon (2), Christine Provost (1), and Jean-Claude Gascard (1)

(1) LOCEAN, 4 place Jussieu, 75252 paris Cedex 05,France (laolod@locean-ipsl.upmc.fr), (2) CNRS/LEGOS, 18 av. E.Belin, 31401 Toulouse Cedex 9, France

The Barents Sea (BS) is a sub-arctic shallow continental shelf Sea where drastic climatic changes are currently happening. This is one of the two pathway areas where the warm and saline Atlantic Waters (AW) meet the colder and fresher Arctic Waters (ArW). The Barents Sea is thus a key region to understand present and future Arctic climate change. The decrease in sea ice cover allowed us to consider it as the first almost ice-free Arctic Sea. Only the very northern part between Svalbard and Franz Joseph Islands remains a Marginal Ice Zone (MIZ) in winter. BS has experienced since the last 40 years a warming from the increase of both atmospheric temperature and heat transport (Smedsrud et al., 2010). However, the main heat source comes from the Atlantic inflow through the Fugloya-Burnoya transect, also called the Barents Sea Opening (BSO) in the southwestern part. It would drive the decennial hydrological variation of the Barents Sea toward an Atlantification (Arthun and Shrum, 2010). Lind and Ingvaldsen (2012) indicate furthermore that the ArW in the Northern BS is mainly heated from below. Four water mass sources (i.e. Norvegian Coastal Current Water (NCCW), AW, Atlantic intermediate Waters (AiW) and ArW) are identified as the main ones in presence in the Barents Sea. To quantify this Atlantification, a multi-parametric analysis has been applied on several strategic sections to determine the relative mixing proportions of the water mass sources within the BS and highlight a possible interannual variability. It indicates with enough robustness the subsurface increase in AW proportion further North in the BS. Within the surface layer, NCCW and ArW are mostly observed and they can easily be discriminated with temperature. Considering the huge seasonal variability of NCCW due to its high sensitivity to the atmospheric forcing, we chose to define it by season.