Geophysical Research Abstracts
Vol. 18, EGU2016-6889, 2016
EGU General Assembly 2016

A high resolution salinity time series (1993-2012) in the North Atlantic

Ilaria Stendardo (1), Monika Rhein (1,2), and Rainer Hollmann (3)

(1) University of Bremen, Institude of Environmental Physics, Department of Oceanography, Bremen, Germany (ilaria.stendardo@uni-bremen.de), (2) MARUM - Center for Marine Environmental Sciences, University of Bremen, Bremen, Germany, (3) Deutscher Wetterdienst DWD, Offenbach, Germany

Due to the lack of temporal and spatial resolution of observations, salinity anomalies up to now could only be studied by averaging over 5 years. Only since the early 2000s with the beginning of the Argo program, the temporal and spatial resolution of salinity and temperature profiles significantly improved. The North Atlantic, in particular, is one of the most densest sampled regions due to its central role in the overturning circulation and the extreme large variability, although this is still not enough to investigate salinity variation in detail. In order to expand the era of high-resolution data, we combined Argo and altimeter data to exploit the relationship between T/S profiles and dynamic height in the North Atlantic by using the Gravest Empirical Mode (GEM) technique. This technique gives us the opportunity to extend the investigation of the salinity variability, with extremely high temporal (daily) and spatial (1/4°) resolution, back to 1993, corresponding to the beginning of the altimetry data. The method is valid in the upper 700 m mainly at and near the pathways of the North Atlantic Current (NAC). The salinity fields are used together with the freshwater fluxes of the updated HOAPS 3.3 climatology to study seasonal, interannual and long-term changes. Results from this analysis will help us to better understand the role of freshwater fluxes, advection and shift of the subpolar front on salinity changes.