Geophysical Research Abstracts
Vol. 20, EGU2018-14519, 2018
EGU General Assembly 2018

Circulation in the Eastern Subpolar North Atlantic Based on Three Years of Mooring Measurements

Stuart Cunningham (1), Loïc Houpert (1), Clare Johnson (1), Neil Fraser (1), Stefan Gary (1), Mark Inall (1), and Penny Holliday (2)

(1) Scottish Association for Marine Science, Oban, United Kingdom, (2) National Oceanography Centre, Southampton, United Kingdom

The subpolar North Atlantic is a globally important region for climate, where ocean-atmosphere exchanges are intense. Around two thirds of the Atlantic Meridional Overturning Circulation (AMOC) deep limb is formed through deep winter mixing in the Nordic Seas, and entrainment as overflows cross the Greenland-Scotland Ridge. The desire to understand the variability of volume, heat and freshwater fluxes and their relationship with water mass transformations, led to the establishment of a purposefully designed international observing system. The Overturning in the Subpolar North Atlantic Program (OSNAP) was deployed in July 2014 and consists of multiple transatlantic mooring arrays supplemented by hydrographic and glider observations. Here, we present the first three years of results from the eastern boundary of the array which comprises of four moorings within the Rockall Trough. These moorings capture the warmest and saltiest branch of Atlantic Water on the OSNAP section: transporting heat and salt to the Nordic Seas. Transports at the boundaries of the Rockall Trough are estimated from direct current measurements, whilst fluxes in the interior are calculated from end-point density moorings referenced to altimetry. The resulting transports are the first continuous, direct measurements for the warm water path through the Rockall Trough. Using the OSNAP data we are able to quantify the mean flow and short-term variability year-round for the first time. Finally, we place our results in context by comparison with multi-decadal length hydrographic time-series and discuss the implications for both the regional and large-scale circulation in the subpolar North Atlantic.