OSNAP: Overturning in the Subpolar North Atlantic Program

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Overview

OSNAP is a US-led international program designed to provide a continuous record of the full-water column, trans-basin fluxes of heat, mass, and freshwater in the subpolar North Atlantic. The OSNAP observing system consists of two legs: one extending from southern Labrador to the southwestern tip of Greenland across the mouth of the Labrador Sea (OSNAP West), and the second from the southeastern tip of Greenland to Scotland (OSNAP East). The observing system also includes subsurface floats (OSNAP floats) in order to trace the pathways of overflow waters in the basin and to assess the connectivity of currents crossing the OSNAP line. The location of the OSNAP East and West legs purposefully melds with a number of long-term observational efforts in the North Atlantic: the Canadian repeat AR7W program in the Labrador Sea; the German Labrador Sea western boundary array at 53°N; the global Ocean Observatories Initiative node recently placed in the southwestern Irminger Sea; the repeat A1E/AR7E hydrographic sections across the Irminger and Iceland basins; and the Ellett line in the Rockall region. This observing system, in conjunction with the RAPID/MOCHA array at 26^{0}N and the EU THOR/NACLIM program, will provide a comprehensive measure of the North Atlantic Meridional Overturning Circulation and provide a means to evaluate intergyre connectivity in this basin. In addition to the US, the observing system has significant measurement contributions from the UK, Germany, Netherlands, and Canada. China and France plan measurement contributions beginning in the summer of 2015.

Recent results and activities

The entire OSNAP observing system (OSNAP East, OSNAP West and OSNAP Floats) was deployed in the summer of 2014 during six cruises for which UK, US, French and Canadian research vessels were employed. In addition to moorings, RAFOS floats and a glider were deployed. The first data return from the moored instrumentation will be in the summer of 2015, although data from the full array will not be recovered until the summer of 2016. Apart from a few test RAFOS floats, the floats will surface after two years. More floats are scheduled to be deployed in 2015 and 2016.

Prior to this full data retrieval, a myriad of OSNAP research projects are underway. Many of these research projects are the focus of student and post-doc projects. OSNAP students and postdocs are analyzing a host of datasets: their combined work involves the use of data from the 53°N mooring array, the Angmagssalik mooring array just south of the Denmark Strait, the Extended Ellett Line, satellite, gliders, Argo floats and RAFOS floats. For a full description of these projects, see http://www.o-snap.org/partners/students-postdocs/.