

BIANNUAL ACHIEVEMENTS REPORT January 2016

The UK Overturning in the Subpolar North Atlantic Program (UK-OSNAP)

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Date: 07/01/16

Programme Status: **Green** - everything is on track.

Programme's key achievements and overall progress over the last 6 months:

1. Successful implementation of the OSNAP observing array

In summer 2015, the UK parts of the OSNAP array were serviced, and data processing and quality checking began. Some equipment in a high risk fishing area was lost (slope current trawl-proof frame and ADCP). Frame, buoyancy and release were insured (£25k), but capital resources need to be identified to replace ADCP. EU funds awarded to enhance eastern moorings with biogeochemical sensors. Planning for array servicing cruises in 2016 on NERC ship (with US and NIOZ) is in progress.

2. Analysis and Research

(i) A new method for estimating of subpolar gyre mixing and circulation using historical Argo float data is being implemented with encouraging results. (ii) Analysis of four decades of measurements in the eastern boundary region show that transport is largest in the Iceland Basin, and variability of is greatest in the Rockall Trough. (iii) Glider and historical data are being analysed to quantify and understand the seasonal signal in transport. (iv) The subpolar MOC is estimated to be ~20 Sv based on the OSNAP CTD section in summer 2014. (v) The CTD section, model output and reanalysis products are being used to define and test MOC metrics appropriate for the subpolar region; these will be different to the RAPID metrics reflecting subpolar dynamics. This work is being led by UK and US OSNAP investigators. (vi) UK OSNAP gave talks at the RAPID/OSNAP open science meeting in July 2015, and at the GO-SHIP/Argo/IOCCP Conference on sustained ocean observations in Sept 15.

3. Outreach and stakeholder engagement

We are regularly tweeting (@ukosnap), blogging (ukosnap.wordpress.com, www.o-snap.org/news-events/blog/) and posting animations (<https://goo.gl/2VZCOe>). We have contributed to videos by NIOZ on OSNAP (<https://www.youtube.com/watch?v=a-lhCIQjE4c&feature=youtu.be>) and PML on related NERC project RAGNARoCC (https://www.youtube.com/watch?v=vuu9_PzSgdI).

4. Additional funds levered and related projects

EU ATLAS (678760-2, April 2016), supported by H2020. A Trans-Atlantic Assessment and deep-water ecosystem-based Spatial management plan for Europe. EU AtlantOS (1/1/15 to 31/7/19), supported by H2020. Optimizing and Enhancing the Integrated Atlantic Ocean Observing System. EU Blue Arctic Climate (in prep), supported by H2020-BG10. Extended Ellett Line (NERC, National Capability).

Overall progress:

Progress has been good overall. The new observations from the OSNAP array are being processed and analysed. Work on the adjoint model analysis is restarting now a new postdoc has been recruited following departure of original employee. Joint papers with international OSNAP colleagues are planned. UK OSNAP participates in the international programme through co-ordinated field work, research and planning. Holliday is a member of the OSNAP Scientific Steering Committee, and Holliday and Cunningham are members of the new OSNAP Data Products Working Group (tasked to define optimum MOC metrics). UK OSNAP held a joint meeting with NERC projects RAMOC and DYNAMOC in Dec 15 in order to promote interaction with the climate modelling community. The OSNAP report to the Programme Advisory Group was well received and prompted useful feedback.

Upcoming events:

PIs will be presenting at the AGU Open Science meeting in Feb 16, and attending the international OSNAP PI meeting and the NAVIS workshop on the Sunday before. Array servicing cruises in 2016 are on NERC ship RRS Discovery and provide an opportunity for filming and outreach (DY053 Principal Scientist Cunningham in Jun/Jul, and DY054 Principal Scientist Holliday in Jul/Aug).