

BIANNUAL ACHIEVEMENTS REPORT



BIANNUAL ACHIEVEMENTS REPORT REQUEST – RESEARCH GRANTS

Reporting Period: Q2, 2018/19

Dear Colleague

Please find attached a template to report on the outcomes and impacts of the NERC Highlight Topic or Discovery Science Large grant for which you are the lead Principal Investigator. Please email your completed report to reporting@nerc.ac.uk.

Please provide narrative under the following headings:

- *Key achievements (please try to keep within 200 words each)*
- *Overall progress with the project (100-200 words as a guide)*
- *Any notable issues encountered (if any and remedial actions undertaken, if needed)*
- *Any newsworthy activity planned or known about in the next 6-9 months*

This reporting process is intended to be high-level, light touch and flexible. Please try to be concise. Ideally, the whole report should not exceed one side.

Between reports, if there are any significant good news stories, delays or issues affecting the grant, please let us know as soon as possible at researchgrants@nerc.ac.uk.

If you require further help in completing the report, please do not hesitate to contact us reporting@nerc.ac.uk.

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Research Grant Reference	NE/K010948/1, NE/K010875/1, NE/K010972/1, NE/K010700/1		
Grant Title	The UK Overturning in the Subpolar North Atlantic Program (UK-OSNAP)		
Completed by	Penny Holliday	Date	10 October 2018

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Key achievements

- Between April-October 2018, 2 glider sections on OSNAP Mission #11 were achieved across the Rockall-Hatton Basin. From Sept 2018 the UK OSNAP no longer funds glider missions, but missions across the same section are now being run under National Capability (NC) programme CLASS (the Ellett Array), and those data underpin the OSNAP array.
- In June 2018 UK OSNAP moorings in the Irminger Sea were recovered on the *RV Maria S Merian* (led by Johannes Karstensen GEOMAR), and all instruments recovered successfully. UK OSNAP no longer operates moorings in the Irminger Sea, instead we are focussing on the Iceland Basin in order to align the UK OSNAP measurement programme geographically and scientifically with the NC Ellett Array.
- In July 2018 UK OSNAP moorings in the Rockall Trough were recovered on the *RV Neil Armstrong* (led by Bill Johns, Uni Miami), all instruments recovered successfully. This cruise deployed new UK OSNAP moorings in the Iceland Basin, and Ellett Array moorings in the Rockall Trough.
- 5 new papers accepted and published online
- A further 3 new papers have been submitted
- A major synthesis of the achievements and vision for the future of UK and international OSNAP has been written by UK OSNAP, in preparation for NERC's International RAPID/OSNAP Review in Jan 2019.
- UK OSNAP at NOC has recruited an excellent new researcher starting January 2019.
- UK OSNAP at SAMS is presently recruiting to fill a postdoc researcher position.

Overall progress

- Overall progress is **very good** as several manuscripts are now published and submitted, including a high profile, high impact paper presenting the primary project goal: the time series of subpolar North Atlantic overturning circulation and property transport (Lozier et al). This paper has received positive reviews and we anticipate publication shortly.
- The array results are providing a sea change in our understanding of the Atlantic meridional overturning circulation and a significant challenge to the interpretation of model results.
- Model analysis results are providing new understanding of the sensitivity of the overturning circulation to forcing by the atmosphere.
- UK OSNAP has developed a novel technique to use historical data to estimate the magnitude of overturning circulation before the array was in place, and to quantify water mass transformation.
- To add to the 8 new papers accepted and submitted, a further 6 manuscripts are in advance stages of preparation.
- The array is in the water for another 2 year period which will give a total of 6 years of array measurements by 2020.
- The UK OSNAP fieldwork has made a smooth transition into phase 2 during 2018, as we adapt the programme design to build on the underpinning CLASS NC observations.

Notable issues (if any)

The glider data on the final UK OSNAP mission have quality problems. The glider has developed some technical problems and we are presently trying to find a recovery solution (it is in mid-Rockall Trough).

Upcoming newsworthy activities

Publication of the OSNAP array results expected in Nov/Dec 2018 We should aim for this to be accompanied by a major NERC press release.