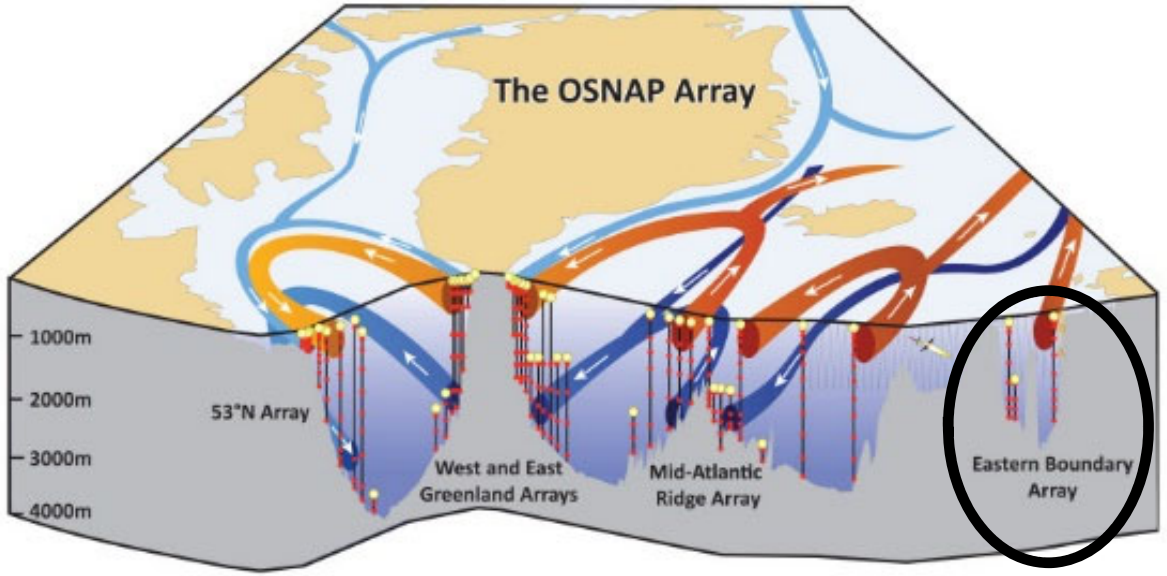
Integration of physical and ecosystem-relevant measurements at the Ellett Array

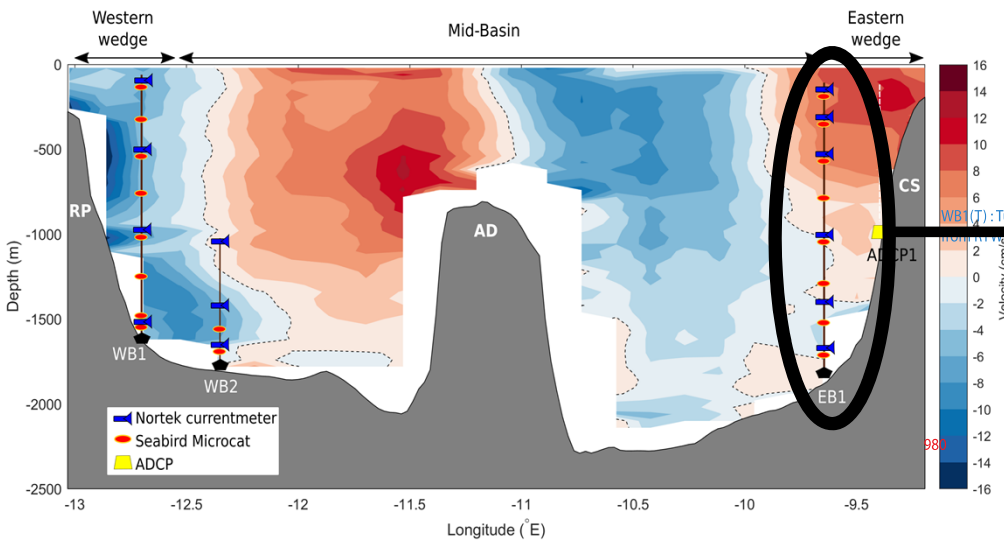
Clare Johnson[1], Alan Fox[1], Stuart Cunningham[1], Neil Fraser[1], Loic Houpert[2], Sam Jones[1]

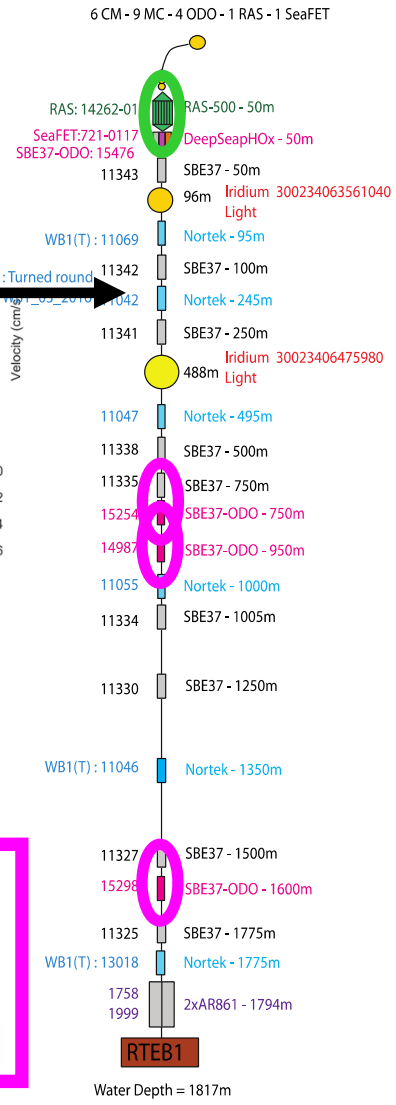
[1] Scottish Association for Marine Science, [2] National Oceanography Centre



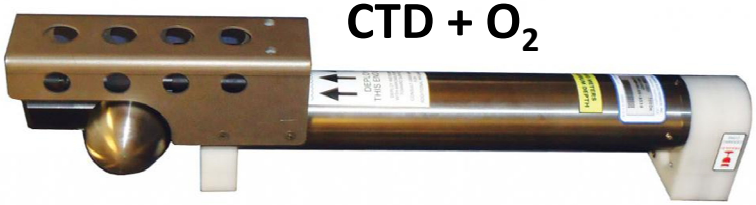
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 678760 (ATLAS). This output reflects only the author's view and the European Union cannot be held responsible for any use that may be made of the information contained therein.

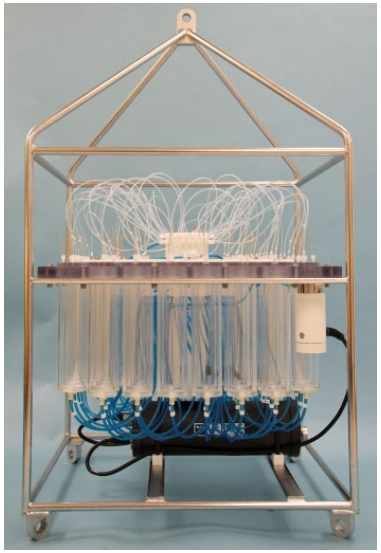
Ellett Array





Deployed 2014.
Chemical sensors added 2017.

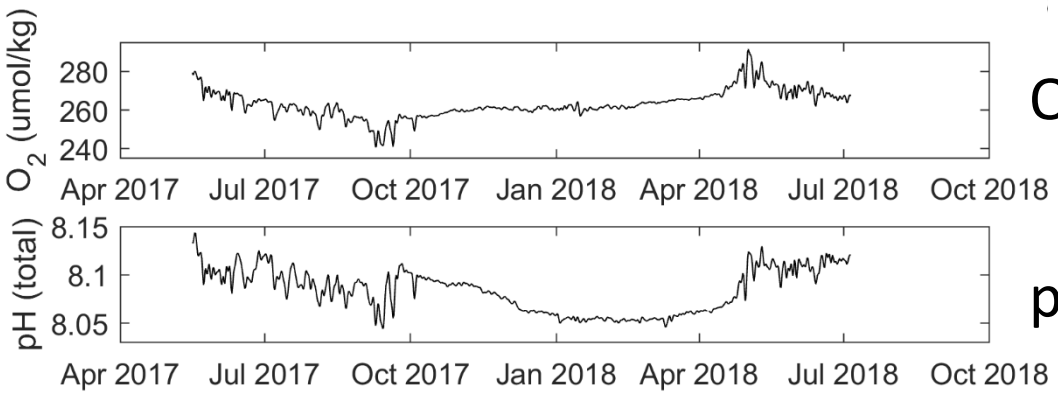




water sampler

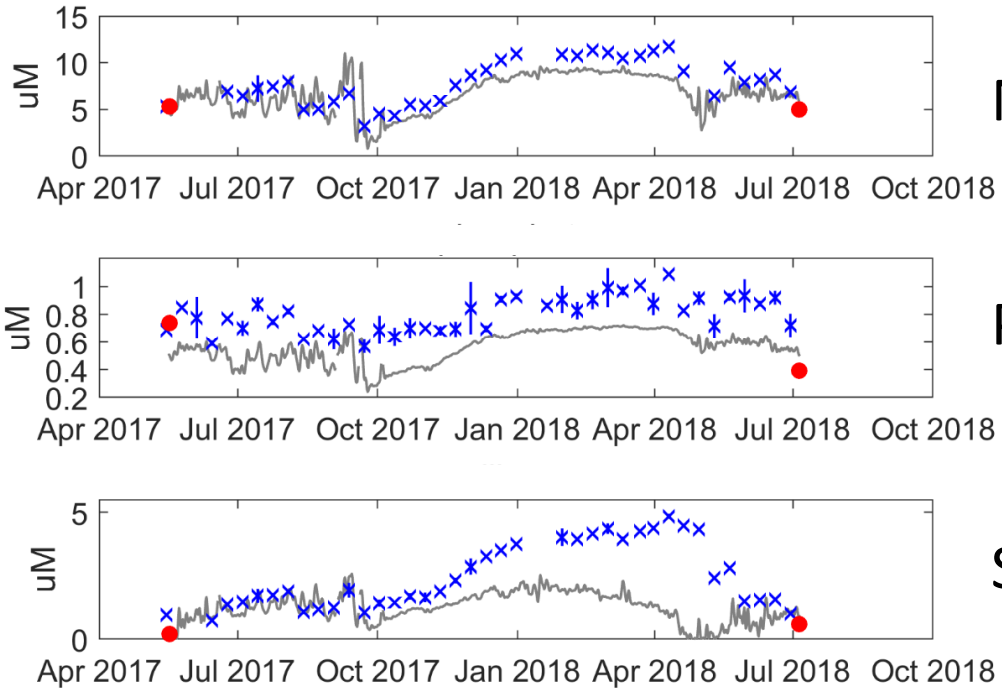
CTD + O_2 + pH

Results – data from 50 m



O_2

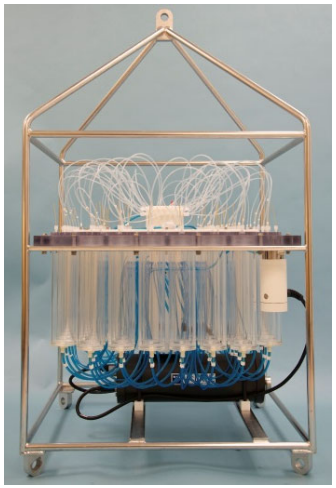
pH



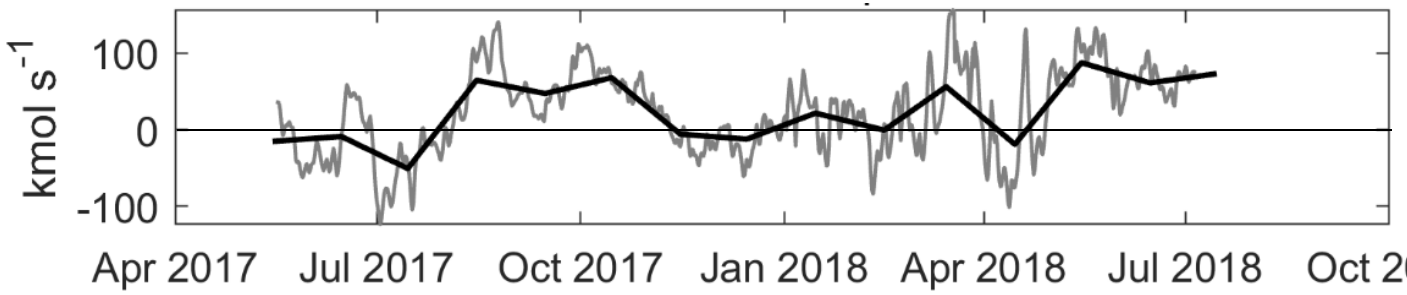
Nitrate

Phosphate

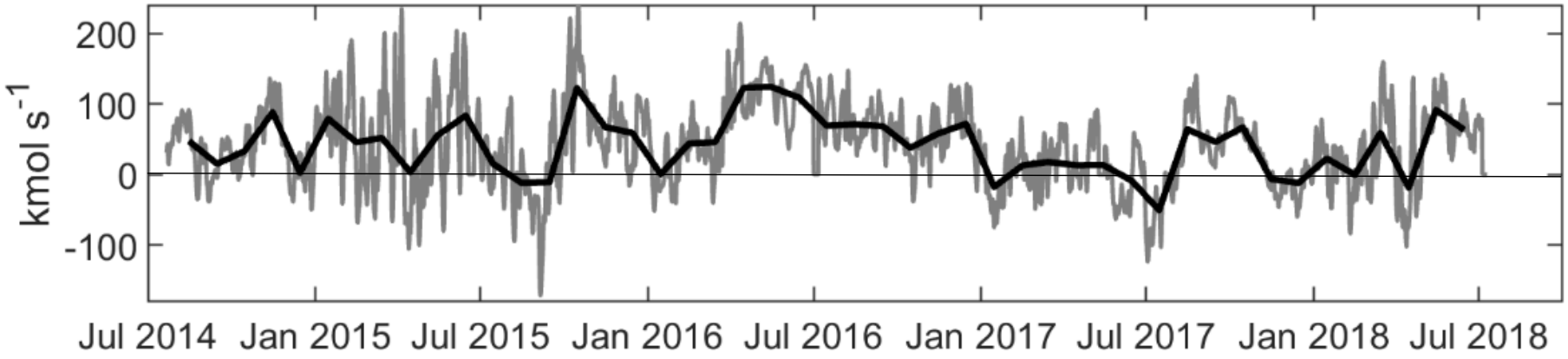
Silicate



Results – nutrient and carbon transports



Nitrate



Nitrate	41.4 ± 41.5 kmol s^{-1}
Phosphate	2.7 ± 2.7 kmol s^{-1}
Silicate	12.9 ± 17.6 kmol s^{-1}

DIC	9.0 ± 6.9 Mmol s^{-1}
TA	8.6 ± 7.4 Mmol s^{-1}

Conclusion and future steps

The new integrated physical and ecosystem flux array has:

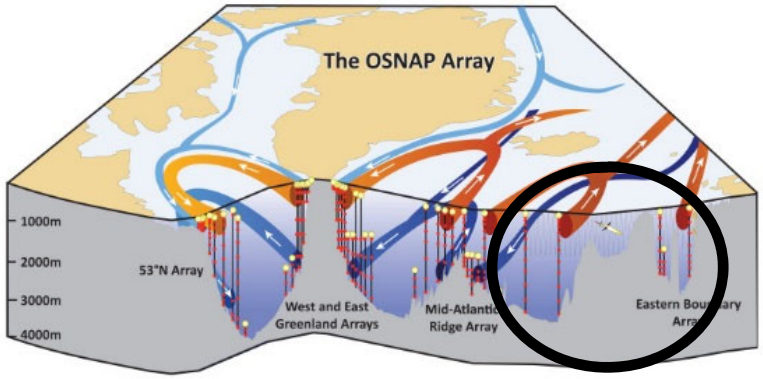
(1) enabled us to look at intra-annual and seasonal variability for the first time

(2) provided the first long-term transport measurements of nutrients and carbon in one branch of the North Atlantic Current

In August 2020 going to:

(1) turnaround the Ellett Array

(2) add additional chemical sensors in the Iceland basin so measuring two branches of the NAC



Future extensions of work:

(1) calculate transports of anthropogenic carbon

(2) combine with data from hydrographic cruises to extend analysis between Greenland and Scotland

(3) combine with data from OVIDE and RAPID to provide North Atlantic budget.