



UK's Climate Linked Atlantic Sector Science CLASS: 2018-2023

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world-leading long-term environmental science supporting
national and international strategic needs



projects.noc.ac.uk/class/




the ocean plays a vital role in sustaining life on planet Earth

*climate change is mainly controlled by the ocean, as
90% excess heat is taken up by the ocean*

*the ocean provides over a billion people with
their primary protein source*

need for global cooperation

An aerial photograph of a coastline. The land is a mix of green and brown, indicating vegetation and possibly some urban or agricultural areas. The ocean is a deep blue, but a large, swirling area of bright green is visible, extending from the shore into the water. This green area represents a significant algal bloom, likely a harmful algal bloom (HAB). The text is overlaid on the image, providing context for the CLASS project's focus on ocean management.

*CLASS will deliver the **knowledge** and **understanding** of the Atlantic Ocean system that society needs to make evidence-based decisions regarding ocean management*

observations & models → understanding → predictions → informed policy decisions

innovation & technology development → closing gaps, reducing costs

underpinning for high excellence ocean and climate research

UK contribution to international systems & networks

***sustained ocean observations** are research infrastructure used for process studies, operational assimilation, and environmental monitoring*

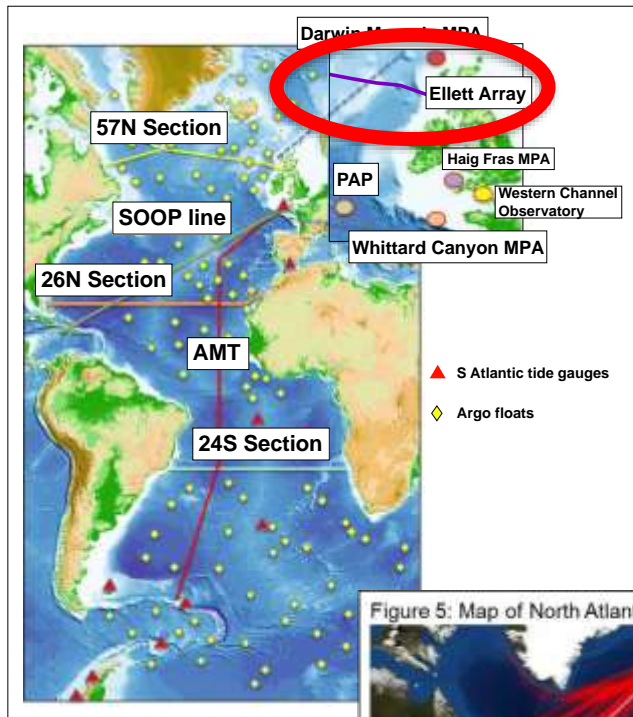


multi-decadal, coast to deep ocean, surface to seafloor

CLASS unifies long-standing projects with new technology

Essential Ocean and Biology Variables for our future





sustained ocean observations

- ✓ physical, biological and chemical data
- ✓ all data quality controlled and open access
- ✓ contribute data to international networks and systems
- ✓ traditional measurements married with new platforms and sensors

Figure 5: Map of North Atlantic CPR routes



case study 1: the Ellett Array

CLASS Ellett Array evolved from a ship-based hydrographic time series dating back to 1975

Moorings and new technology (pioneering use of continuous-presence gliders *for 10 years*)

Underpins international and EU programmes *OSNAP, AtlantOS, Blue Action, Atlas, iAtlantic*

OSNAP results: transforming a climate paradigm

Lozier et al., 2019, Science

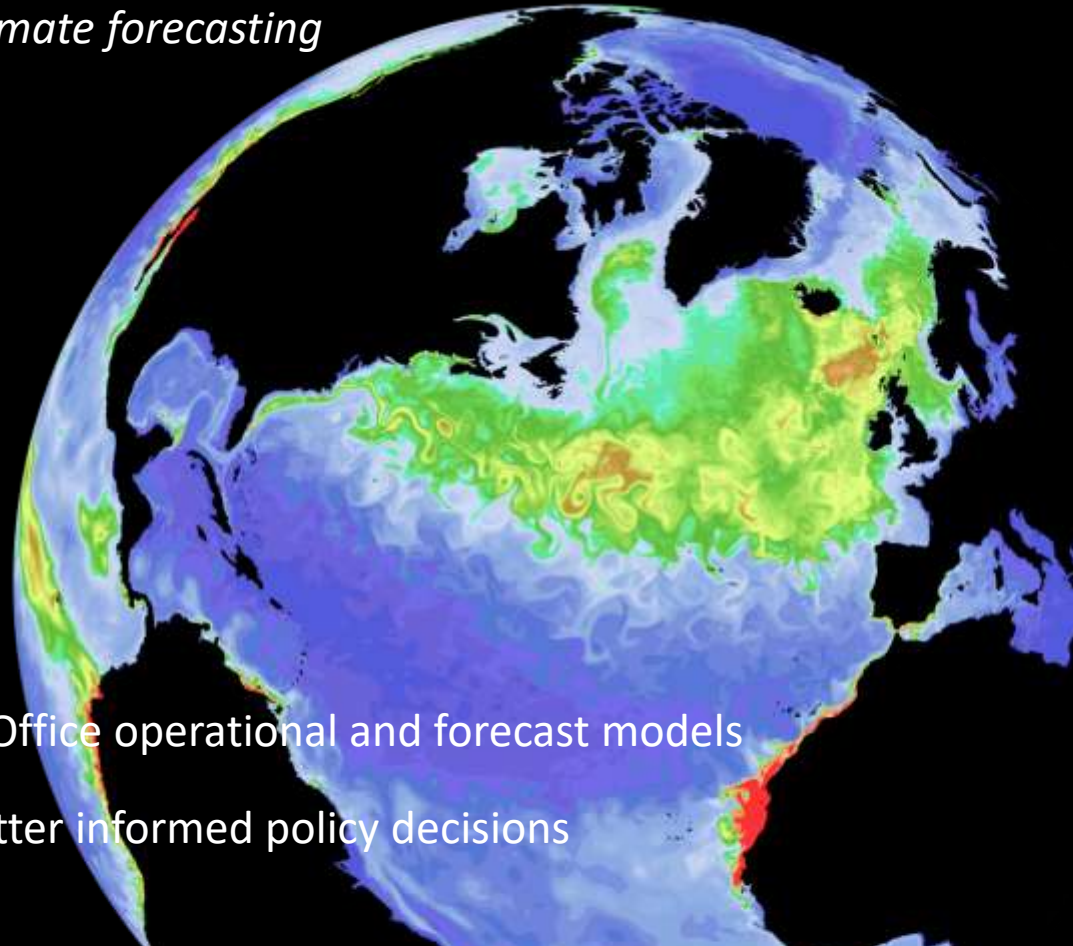
Changed focus for meridional overturning circulation research

Recognition that climate models must improve (IPCC)



ocean, climate and earth system models are crucial for process understanding, operational forecasting, decadal and climate forecasting

CLASS ocean models underpin UK Met Office operational and forecast models
improved models leads directly to better informed policy decisions



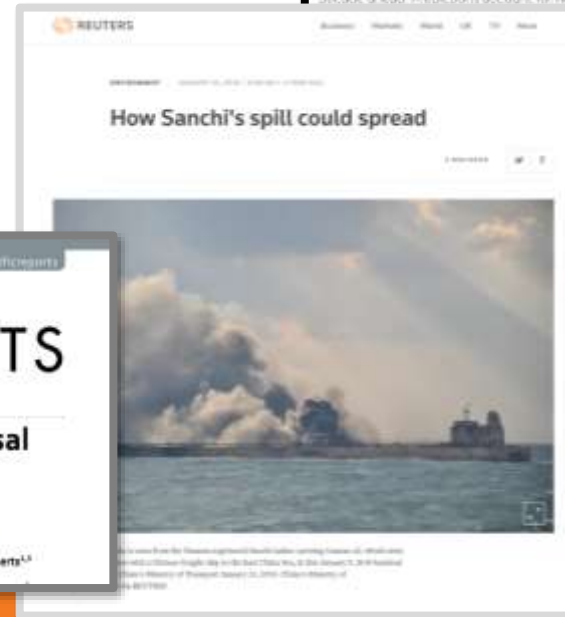
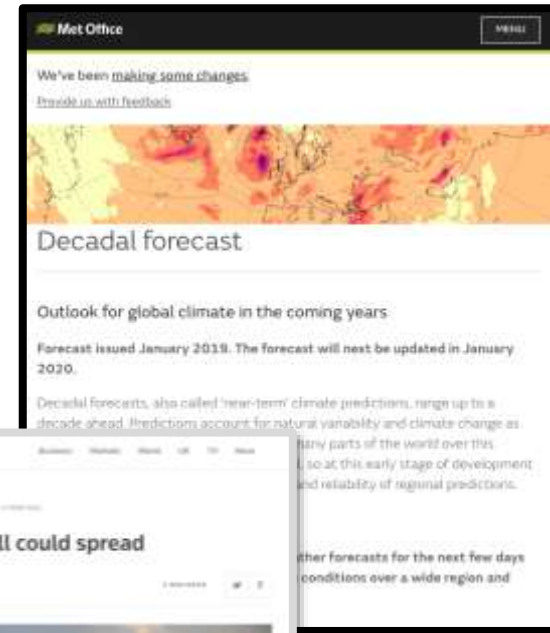
case study 2: improved skill in forecasting (days to decades)

CLASS ocean models used in UK Earth System and climate models

Improved skill in decadal prediction of precipitation and wind over land

Skill in predicting how oil spills spread

Understanding connectivity of deep sea ecosystems



platform and sensor development is required to transform our ability to measure Essential Ocean and Biology Variables where and when we need them



improved energy harvesting and communication

light-weight, low-power, novel sensors

lowering costs for wider use and cost-effective observing systems

case study 3: new sensors for carbon system chemistry



A large white research ship with a dark hull is docked at a concrete pier. To the left of the ship is a large, multi-story brick building with a prominent arched window and a sign that reads 'British Antarctic Survey'. A blue shipping container is visible in the foreground on the left. The sky is blue with scattered white clouds.

opening up national facilities to the community

funded CLASS Early Career Researchers fellowships (visits to centres)
filling 'spare' berths by inviting scientists to join our expeditions
sharing ship time with other UK agencies e.g. marine protection

we welcome collaboration so please get in touch



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