

SY33D-2378

Wednesday 11th  
December

13:40 - 17:30



# An Agile Model for Policy Driven Science: Application to Offshore Geological Carbon Storage.

Joseph Asplet, Anna Rufas Blanco, Tom Kettlety, Millicent Sutton, Jimmy Moneron, Malini Kallingal, Dania Albini, Heather A. Bouman, Joe A Cartwright, Rosalind E M Rickaby, Hasan Muslemeni, Michelle Jackson, Myles Robert Allen, Steve Smith and J Michael Kendall.  
joseph.asplet@earth.ox.ac.uk



## The Agile Initiative

The Agile Initiative is a five-year (2022-2027) UK Natural Environmental Research Council (NERC) funded project to experiment with models for producing research required by policymakers in a timely manner. This aims to facilitate **science-informed policymaking**.

**The Challenge:** Effective policy and world-class science are required to prevent catastrophic environmental degradation on a global scale, yet science and policy often operate in **different worlds** and to **different timescales**.

### Proposed solutions:

1. Deliver solution oriented science through a new model of interdisciplinary research: **"Research Sprints"**
2. Create a cohort of interdisciplinary researchers to build capacity for interdisciplinary research that **meets the needs of decision makers**.
3. Contribute to a research culture shift that enables and values this form of solutions-focused research.

Thus far the Agile Initiative has funded 12 Research Sprints in subjects such as geological carbon storage, scaling up nature based solutions, and accounting for biodiversity.

## The Research Sprint Model

Research Sprints are 12-15 month projects designed to rapidly produce research in response to an urgent policy challenge or opportunity.

The core of each Research Sprint is the identified **Policy Pull** and **Research Timeliness**:

**Policy Pull.** A clear policy and/or environmental challenge which requires research to identify a solution. Co-created with stakeholders.

**Example:** For current UK Net Zero targets geological storage of CO<sub>2</sub> is 'a necessity not an option' (UK Climate Change Committee, 2019). All CO<sub>2</sub> storage licenses issued thus far are on the UK continental shelf (i.e., offshore). Research is required to develop cost-effective passive seismic (i.e., earthquake) monitoring, assess the potential impact of CO<sub>2</sub> storage (and *potential* leakage) on carbon present in seafloor sediments (blue carbon) and the marine ecosystem, and to identify regulatory gaps.

**Timeliness.** Does the research required within a defined period, with clear plans for outcomes and impact?

**Example:** Injection at the UK's first mover project, Endurance, was scheduled for 2027 (initially mid-2025). Ahead of injection, and as other projects ramp-up there great interest from the North Sea Transition Authority (the UK regulator), the Department of Energy Security and Net Zero, the center for Environment, Fisheries and Aquaculture, and operators in assessing risks of offshore CO<sub>2</sub> storage and developing science-informed regulation.

## Want to learn more?



Agile Initiative  
Website



@AGU24!! S51A-03.  
Using onshore arrays to monitor offshore seismicity.  
Friday 8:55am 209 A-C



CO<sub>2</sub> Storage  
Sprint Report



Recently published  
offshore CO<sub>2</sub> storage  
policy brief

## Other Sprints

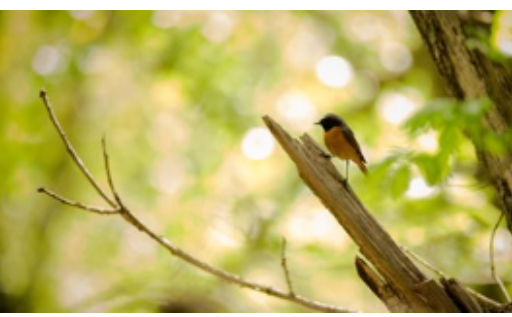
How can maritime shipping transition to green ammonia as fuel?



How do we scale up Nature-based solutions?



How do we account for biodiversity?



Can we turn waste into fertilizer?



How can Brazil reach Net Zero?



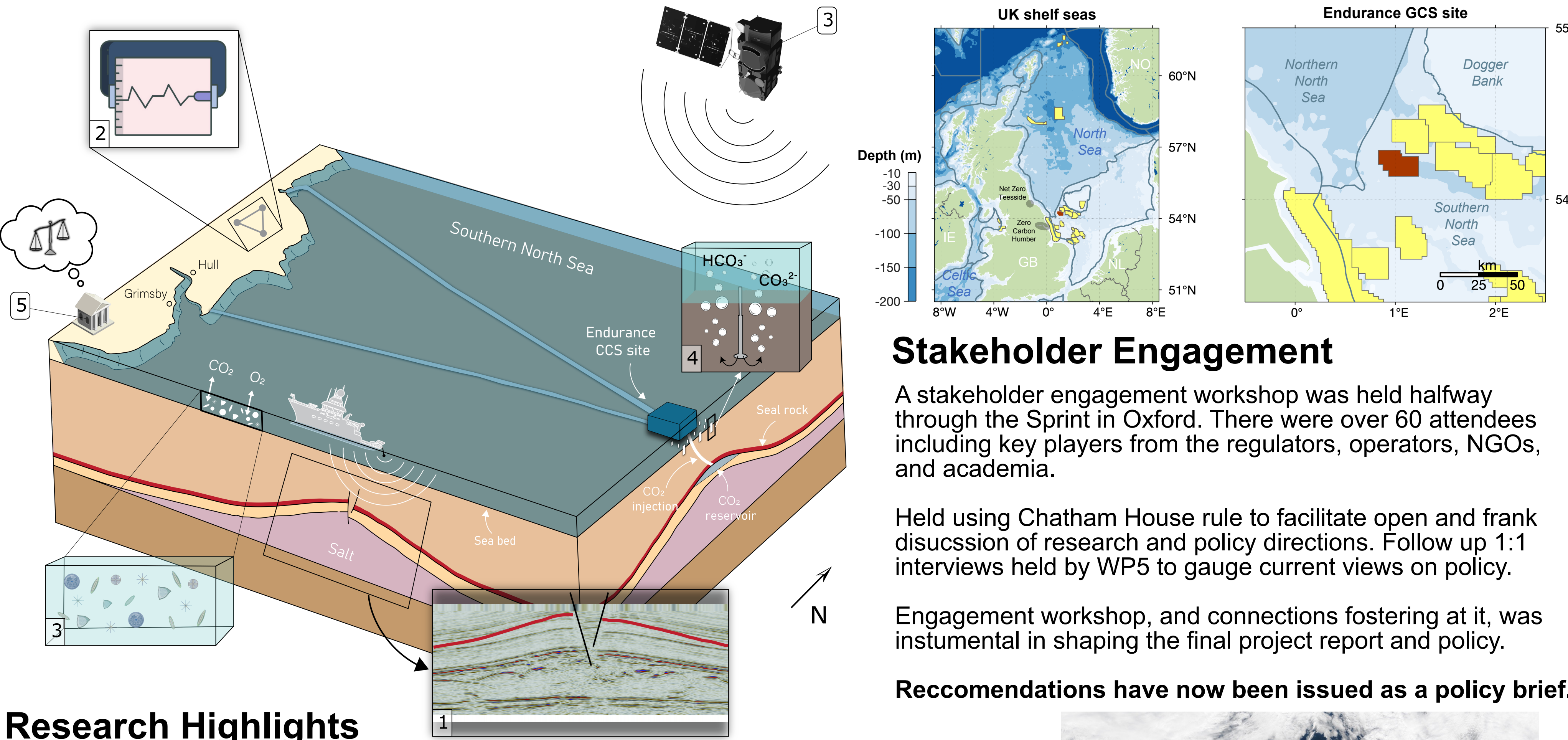
How can the UK implement the Global Biodiversity Framework's finance goals?



## Research Sprint Example: "What do we need to know to safely store CO<sub>2</sub> beneath out shelf seas?"

This Research Sprint ran from April 2023 to June 2024 and brought together an interdisciplinary team of geologists, geophysicists, geochemists, marine biologists, lawyers, and policy experts to answer the question: "What do we need to know to safely store CO<sub>2</sub> beneath our shelf seas?".

Research broken into 5 concurrent work packages focussing on: (1) Characterising potential geological leakage pathways for CO<sub>2</sub>; (2) Monitoring offshore microseismicity; (3) Impact of CO<sub>2</sub> leakage as a phytoplankton stressor and remote sensing as a monitoring tool; (4) Impact of CO<sub>2</sub> leakage on sedimentary blue carbon; (5) the Governance Environment of CO<sub>2</sub> storage



### Stakeholder Engagement

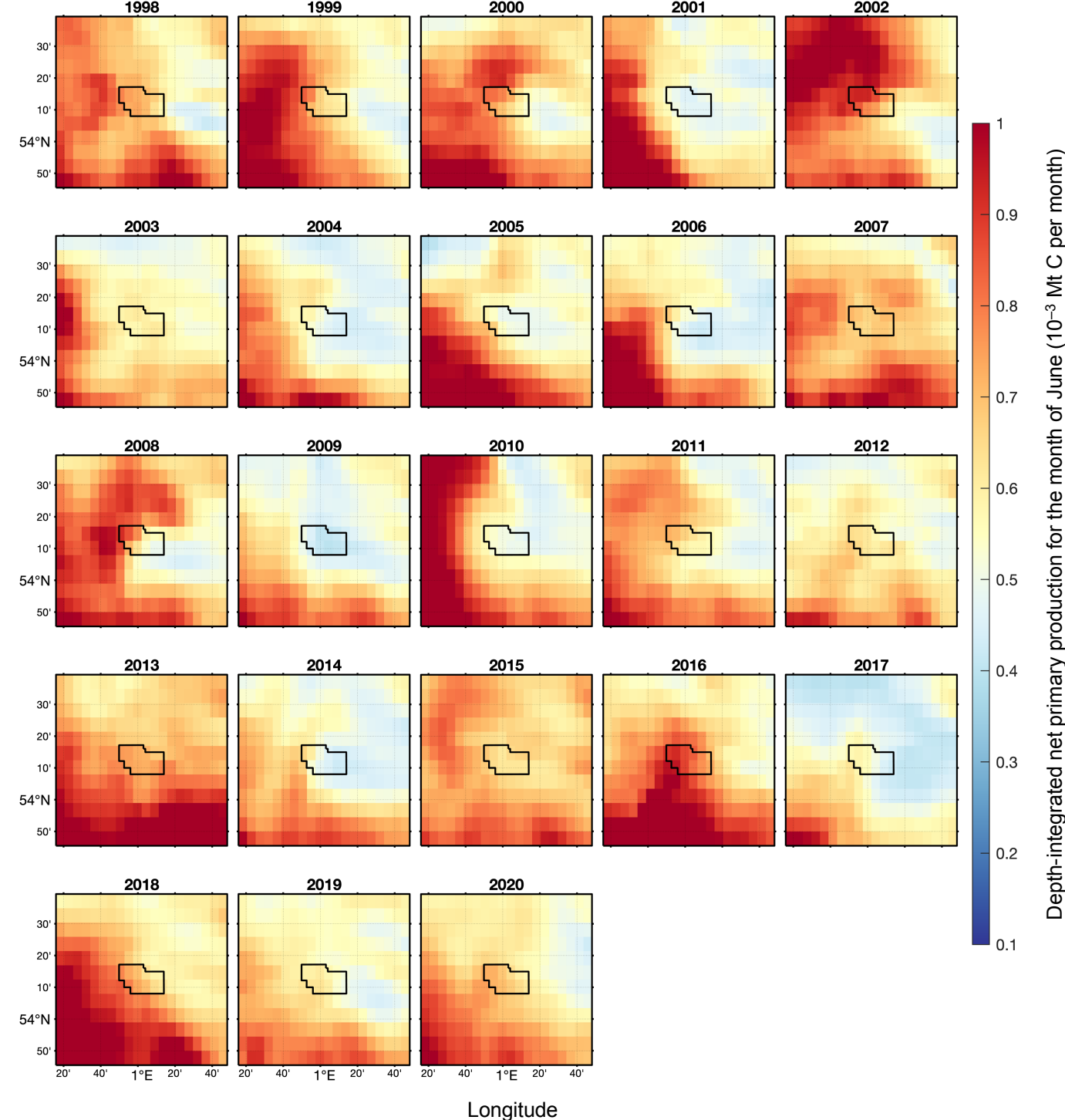
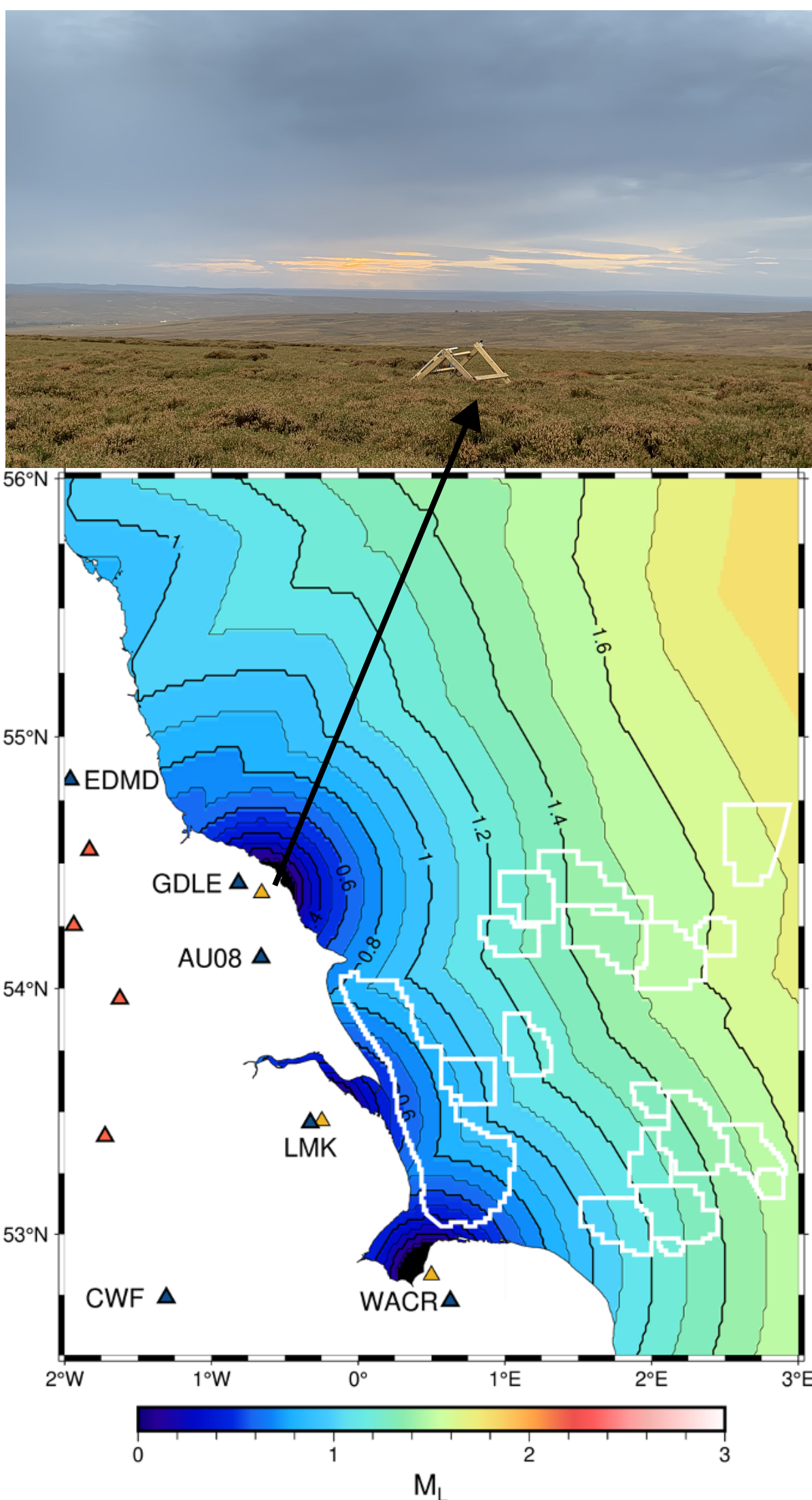
A stakeholder engagement workshop was held halfway through the Sprint in Oxford. There were over 60 attendees including key players from the regulators, operators, NGOs, and academia.

Held using Chatham House rule to facilitate open and frank discussion of research and policy directions. Follow up 1:1 interviews held by WP5 to gauge current views on policy.

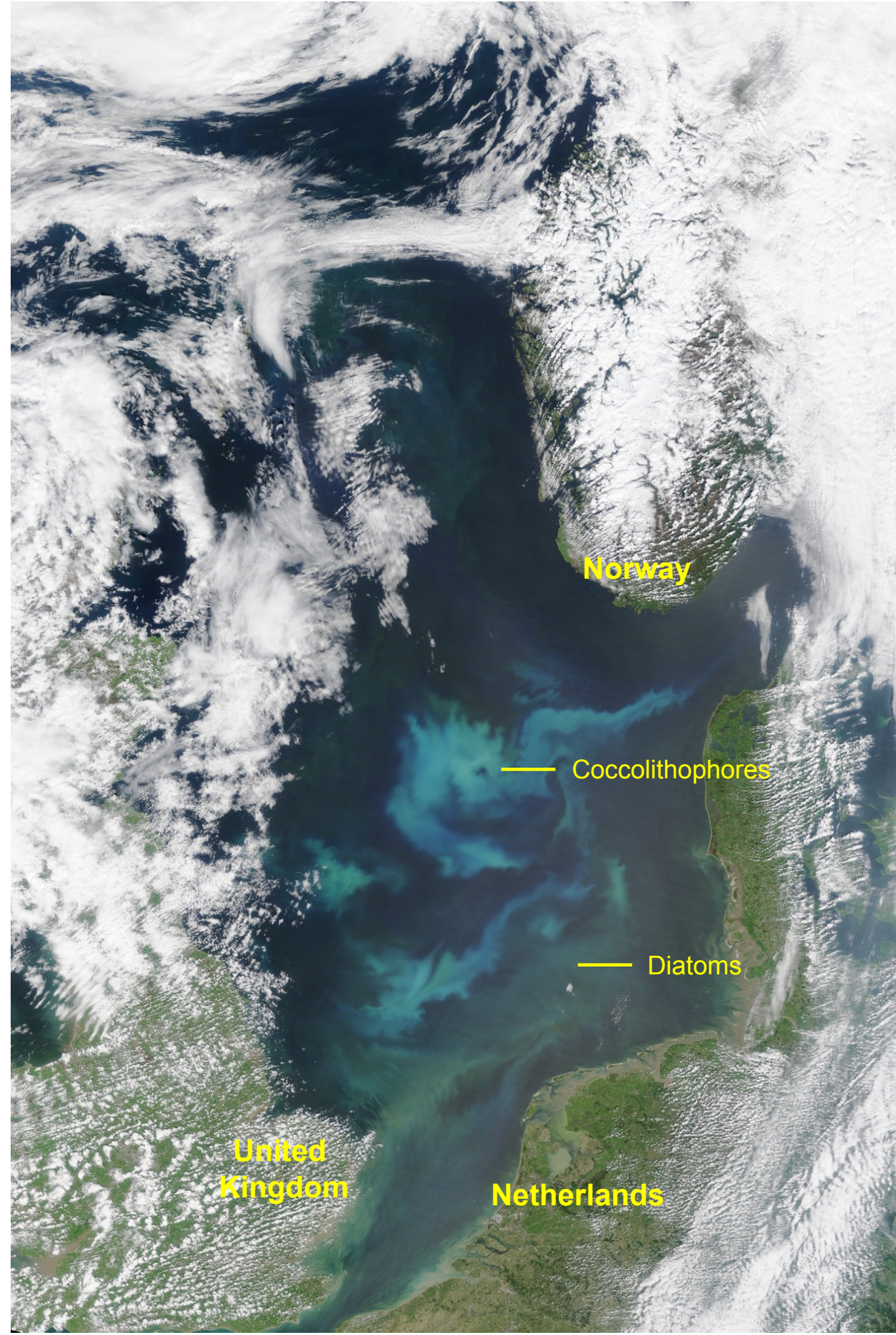
Engagement workshop, and connections fostering at it, was instrumental in shaping the final project report and policy.

Recommendations have now been issued as a policy brief.

### Research Highlights



**Above:** Spatial variations in the monthly standing stocks of water column blue carbon (in megatonnes of carbon per month) for June from 1998 to 2020 derived from satellite imagery. The assessment area covers 100 x 100 km<sup>2</sup> around the Endurance site (black polygon). Created using data from the ESA Biological Pump and Carbon Export Processes (BICEP) project's dataset of monthly marine phytoplankton net primary production. We estimate that phytoplankton fix ca. 1.6 Mt CO<sub>2</sub> per annum in this region.



True colour satellite image of a phytoplankton bloom composed of coccolithophores in June 2015 in the North Sea. Image credit: Jesse Allen, NASA Earth Observatory, using MODIS data on NASA's Terra satellite