



## Welcome

Congratulations to all those involved in successful SOFI research grant proposals: twelve projects will be supported as university-Oceans 2025 partnerships, with a total value of over £3m. Further details are given here (p4) together with information about STABLE III and the Dee estuary experiment and the NEMO ocean model; and items on various Oceans 2025 meetings and outreach activities that have either recently happened or that will occur shortly. I hope you find Issue 3 interesting and look forward to your feedback, as well as

articles, news and reports of meetings for Issue 4.

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### Annual Science Meeting (ASM)

This year's ASM will take place on 28-29 May at NOCS - and will showcase the productivity and vitality of the programme after a year of research. Ideally, everyone involved should be there; unfortunately that is impractical. Around 90 participants have been invited, including Centre representatives for all major programme activities, key collaborators and external advisors. Presentations will be on the ASM page of the website.

## Next generation marine research

### Policy News: The Marine Bill

The draft Bill published on 3 April includes creation of the Marine Management Organisation, marine planning, nature conservation, managing fisheries, and access to coastal land. Defra is seeking views on the proposals set out in the draft Bill and input to the supporting Impact Assessment. Deadline for responses is **26 June 2008**.

[www.defra.gov.uk/marine/legislation/index.htm](http://www.defra.gov.uk/marine/legislation/index.htm)

### Marine assessments

"Scotland's Seas: Towards Understanding their State" prepared for the Scottish Marine Bill involved input from SMRU, SAMS, MBA and NOCS. A workshop promoting UK-wide linkages between the communities involved in marine assessments is planned at the MBA, 10 - 11 June (contact Nova Mieszkowska, nova@mba.ac.uk).

[www.scotland.gov.uk/Publications/2008/04/03093608/0](http://www.scotland.gov.uk/Publications/2008/04/03093608/0)



### Oceans 2025 Programme Advisory Board

The Oceans 2025 Advisory Board will meet for the first time at the programme's ASM (see left). Members include academic, industrial and government stakeholders, under the chairmanship of Professor Peter Liss, FRS.

[www.oceans2025.org/aboutoceans2025.php](http://www.oceans2025.org/aboutoceans2025.php)

### Oceans 2025 Implementation Plan

The Implementation Plan, shortly available on the Oceans 2025 website, will provide a summary of the programme structure and its science.

A strategic marine science programme for NERC

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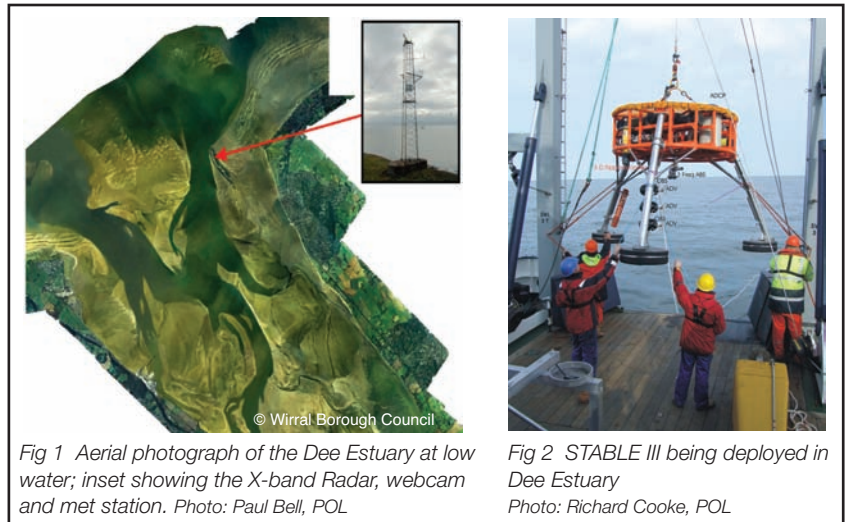
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# Oceans 2025 research reports

## STABLE III and the Dee experiments *Alejandro J. Souza, POL*

For Theme 3, the Proudman Oceanographic Laboratory is researching bottom boundary processes, suspended particulate material, transport and water column optics, coastal morphodynamics and bathymetric evolution. The team is carrying out process studies and recording bathymetric changes continuously in the Dee Estuary, a Site of Special Scientific Interest, special protection area and proposed special area of conservation.

Using marine X-Band radar at the mouth of the estuary on Hilbre Island (Fig 1) to measure bathymetry at hourly intervals, the study is applying a wave inversion technique, developed in-house. Near-bed turbulence and sediment processes are measured using NERC-funded and POL-developed STABLE III (Sediment Transport And Bottom Layer Equipment, Fig 2). This gear disturbs water flow only minimally and measures all terms in the turbulence equation and near-bed sediment transport components, bed shape, near-bed hydrodynamics and suspended sediment.



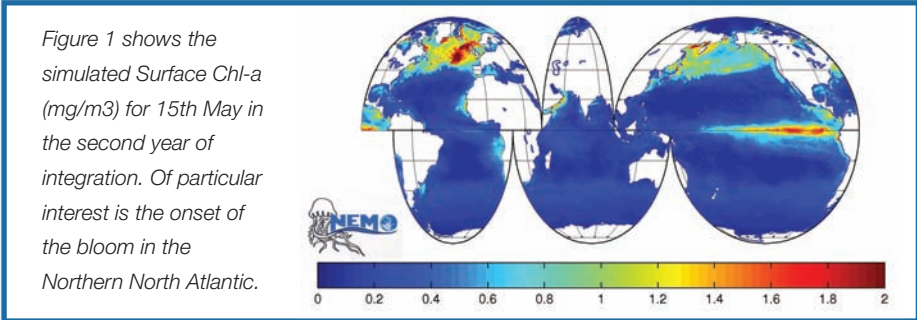
*Fig 1 Aerial photograph of the Dee Estuary at low water; inset showing the X-band Radar, webcam and met station. Photo: Paul Bell, POL*

*Fig 2 STABLE III being deployed in Dee Estuary Photo: Richard Cooke, POL*

The study involves the Universities of Plymouth and Bangor amongst others and has won two SOFI studentships. Within the FORMOST (Field Observation and Modelling of the Sediment Triad) project in collaboration with Bangor, POL has secured NERC funding to get local processes into regional sediment transport models. The project is revealing how tides control the balance between the main channel and sandbanks and uncovering the dynamics of freshwater exchange and stratification - different to that in nearby Liverpool Bay.

## An update from NEMO *Andrew Coward, NOCS*

Oceans 2025 Theme 9 requires an ambitious modelling capability based around the NEMO ocean model. To enable some of the required model development, NOCS has just installed a 768 core SGI Altix cluster. This High Performance Computing facility, named "nautilus", has already been used to develop and run short integrations of a 1/4 degree global ocean model (NEMO ORCA025) coupled with a brand new, 10 compartment ecosystem model (MEDUSA). MEDUSA has been developed especially for Oceans 2025 by Dr. Ekaterina Popova at NOCS.



*Figure 1 shows the simulated Surface Chl-a (mg/m3) for 15th May in the second year of integration. Of particular interest is the onset of the bloom in the Northern North Atlantic.*

## The Environmental eScience Revolution, at the Royal Society *Phil Williamson*

Elephant seal behaviour and state-of-the-art ocean modelling featured in the Oceans 2025 demonstrations at the Royal Society-NERC eScience discussion meeting on 7 and 8 April. Whilst these topics may not seem to have much in common, both are critically dependent on modern computing and information technology.

And there is a more direct link: seals, tagged by the Sea Mammal Research Unit and their international colleagues, have now provided over 30,000 salinity/temperature profiles from various parts of the global ocean, many of which are rarely or never reached by research ships or autonomous floats, and yet are of high climatic importance. In particular, it is crucial that ocean models can simulate present-day conditions in polar regions to give confidence in their future scenarios. The seal-delivered data therefore provide an essential complement to other tools for ocean observation.

The ocean modelling displays comprised a 'magic planet' presentation of the OCCAM 1/12° model, developed by the National Oceanography Centre Southampton, and work in progress on unstructured grid modelling, to be further supported at Imperial College London through a SOFI award.

## Sailing over changing seas

A project team involving NERC, Oceans 2025 partners and BGS is developing an exhibition, "Sailing over changing seas" for the 2008 Tall Ships event in Liverpool, 18 – 21 July. Highlighting key marine issues along the route of the Tall Ships race to Den Helder, the exhibit promises to be interactive and colourful. Over a million visitors are expected.

[www.tallshipsliverpool.co.uk](http://www.tallshipsliverpool.co.uk)



*The team on a chilly site visit to Wellington Dock.*



## Next generation UK marine research - flying the flag at Oi08!

At Oceanology International 2008 (Oi08, 11 – 13 March, London), NERC-

supported marine centres were for the first time co-located and easy to find in the vast hall under a banner promoting 'next generation UK marine research', a broad theme which helped promote Oceans 2025. The co-location and branding magnified the impact made by individual stands against strong international competition. The collaboration was jointly supported by the NERC Communications team and the National Marine Coordination Office. Teams from the National Oceanography Centre Southampton, the Plymouth Marine Science Partnership, the Proudman

Oceanographic Laboratory, the British Oceanographic Data Centre, the Scottish Association for Marine Science, the British Geological Survey and the Inter-Agency Committee for Marine Science and Technology presented a range of ocean technology equipment, animations, policy developments and footage of science and technology highlights.

Oceanology International brings together the worldwide marine science and ocean technology communities for product demonstrations, displays, training events and conference sessions. Oi08 involved 533 exhibitors from 32 countries, and attracted 8,700 visitors, with more than 40% from outside the UK. For information: <http://www.oceanologyinternational.com>

## Strategic Ocean Funding Initiative (SOFI)

SOFI awards totalling £3.2m have been made for three small grants and nine standard grants, following international peer review and assessment by a NERC Moderating Panel. A very wide range of topics are covered, including molecular and genetic studies, land movements affecting relative sea level rise, and fault detection in autonomous underwater vehicles.

What all awards have in common is that they involve partnerships between university researchers and Oceans 2025 centres, adding value to the programme. Whilst several of the linkages are new, others build on existing collaborations. Examples of the latter include novel ocean modelling approaches (using unstructured grids) and an ambitious biogeochemical measurement programme for Oceans 2025 research cruises.

The following projects will be supported:

- The creation of a map of current vertical land movements in the UK based on an optimal combination of absolute gravity and continuous GPS (Richard Bingley, Nottingham, with POL)
- Extending the scale of marine biodiversity research: spatial models of the European macrobenthos (Thomas Webb, Sheffield, with PML)
- Impact of Arctic sea-ice retreat on zooplankton foraging behaviour and vertical carbon flux (Andrew Brierley, St Andrews, with SAMS and BAS)
- Modelling of the Wyville Thomson Ridge overflow (Peter Davies, Dundee, with SAMS)
- Response of *Emiliana huxleyi* to a high CO<sub>2</sub> world: assessing the extent of genetic diversity in the pattern of gene expression (David Suggett, Essex, with MBA)
- A carbon and transient tracer measurement programme in the Atlantic and Southern Ocean under Oceans 2025 (Andrew Watson, UEA, with NOCS and PML)
- Consistent multi-technique geodetic estimates of present-day contributions to regional sea level change (Peter Clarke, Newcastle, with POL)
- Automated diagnosis for fault detection, identification and recovery in Autosub6000 (Richard Dearden, Birmingham, with NOCS)
- Molecular and ecological investigations into the infection process of *Eurychasma dicksonii* on brown algae (Pieter van West, Aberdeen, with SAMS)
- Twilight zone to deep-ocean floor. Developing an understanding of particle dynamics and trophic interactions using a molecular experimental approach (George Wolff, Liverpool, with NOCS)
- Global ocean modelling with adaptive unstructured grid methods (Chris Pain, Imperial College, with NOCS)
- Carbon mineralization of shelf and coastal sediments: A holistic approach using state of the art lander technology and the eddy-correlation technique (Ronnie Glud, SAMS, with Aberdeen)

## SOFI workshop awards

It is not envisaged that there will be any further SOFI funding rounds for research grants (or studentships). Nevertheless, NERC funds will be available throughout the lifetime of the Oceans 2025 programme to assist in widening engagement through workshops and other meetings. Details of this scheme can be found at [www.oceans2025.org/funding.php](http://www.oceans2025.org/funding.php) To date, two awards have been agreed by the Oceans 2025 Executive Board.

- Co-support for Symposium on Algal Culture Collections 2008, to enhance UK awareness and use of CCAP as a National Facility at SAMS; 8 – 11 June 2008.
- Co-support for Summer school in modern methods for ecosystem modeling, at SAMS, 30 June – 10 July 2008.

Information on these workshops will be available on: [www.oceans2025.org/events.php](http://www.oceans2025.org/events.php)

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