

# Challenger Wave



Monthly newsletter of the Challenger Society for Marine Science (CSMS)

## NEWS

### In Memory of Professor Alastair Dawson

It is with heavy hearts that we announce the death of Prof. Alastair Dawson who died peacefully surrounded by his family. Professor Dawson was a Scottish geographer and climate scientist renowned for his expertise in coastal geomorphology, Quaternary geology, and climate change. He served as a [Professor in the Department of Geography and Environment at the University of Aberdeen](#) and later became an



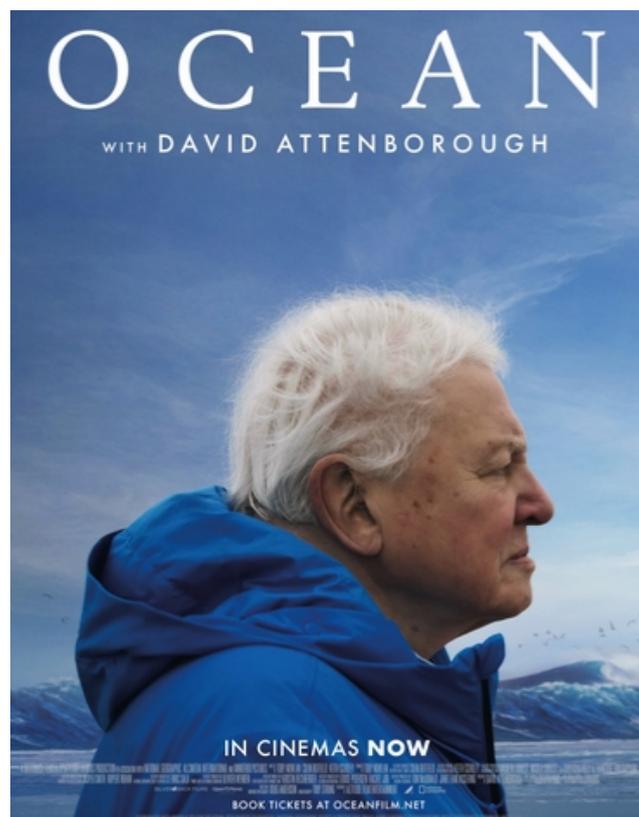
Honorary Professor at the University of Dundee. His research has significantly contributed to understanding sea-level changes, tsunami sedimentation, and the impacts of climate variability on coastal environments. Among his publications is the

book [So Foul and Fair a Day: A History of Scotland's Weather and Climate](#), which offers a comprehensive account of Scotland's climatic history. Prof. Dawson had recently been assisting MASTS to finalise the [Beaches of Scotland Image Archive](#) which is the result of a collaborative effort to preserve and make accessible a unique visual record of Scotland's coastline. Alastair will be very sadly missed, and our thoughts are with his family at this time.

### Ocean science takes centre stage at premiere of *Ocean with David Attenborough*

The National Oceanography Centre (NOC) is proud to have supported the World Premiere of *Ocean with Sir David Attenborough* at Southbank Centre Royal Festival Hall, London, on the 6th May. The landmark documentary film is Sir David's greatest message of hope for the Ocean.

Charting the story of ocean discovery, destruction and recovery, the film showcases the beauty and complexity of the marine world, and the urgent need to protect it.



As world-leading marine science and engineering experts, NOC supported the premiere through an exhibition, showcasing knowledge and expertise from decades of ocean exploration, climate research and marine monitoring. On show were cutting-edge science technologies used to explore our ocean, with NOC's underwater robot, known popularly as Boaty McBoatface, putting in a cameo appearance. NOC scientists and engineers, some of who also supported the making of the film with their scientific knowledge, also took leading roles, sharing their excitement for exploring the ocean, its role in the health of our planet and the exciting career opportunities

available in ocean science. Guests included more than 1,000 school children, who joined the Future Generations Premiere, and around 2,200 VIPs at the World Premiere, including Sir David and senior members of the Royal Family.



*Learning about life in the deep ocean at the Royal Festival Hall.*

NOC Chief Executive Dr John Siddorn said: "We're delighted to support this extraordinary film which is not just a celebration of the ocean's wonders, but a call to action, and one grounded in science and hope. It's a critical time for us all and this message is at the heart of everything we do at NOC. Our ocean covers more than 70% of the planet's surface and without it everything on Earth would be dramatically impacted, atmospheric carbon dioxide levels would be around 50% higher and global temperatures would be significantly higher than they are now. This is a precious resource, but it is under threat. The film's message that this could be the moment of change is a message we echo, with science, innovation and hope at the centre of a healthier ocean future."



Ocean with David Attenborough comes at a crucial moment, midway through the [UN Decade of Ocean Science](#). NOC's involvement reflects its status as a world leader in ocean science, dedicated to understanding the changing ocean and driving evidence-based solutions.

As part of the 33rd Session of the Intergovernmental Oceanographic Commission of the UNESCO Assembly, and in partnership with the Permanent Delegation of the Principality of Monaco to UNESCO, there will be a [special screening](#) at UNESCO Headquarters in Paris on

26th June 2025 at 18.30. The screening will be followed by a roundtable discussion featuring leading voices in ocean science.

### **NOC awarded £2.6 million to investigate expanding ocean desertification**

Scientists at the UK's National Oceanography Centre (NOC) are leading a new, five-year funded project to investigate the alarming expansion of ocean deserts vast regions of the ocean with little life or nutrients. The research, supported by a £2.6 million European Research Council (ERC) Consolidator Grant, will explore whether microscopic organisms called diazotrophs could slow or even reverse this trend.

Subtropical gyres, often referred to as "ocean deserts", cover more than 60% of the ocean's surface. These regions are expanding at an unprecedented rate of five million square kilometres per decade an area equivalent to the Amazon Rainforest or the entire European Union. As global temperatures rise, scientists are concerned about the long-term impact of this expansion on marine ecosystems and the Earth's climate, which would reduce ocean productivity, affecting marine food webs and the ocean's role as a carbon sink.

The new project, called EXPAND, will focus on the Indian Ocean subtropical gyre, the least understood of these ocean deserts. It includes partners from France, USA, Canada and South Africa. Project lead and NOC senior scientist Dr Mar Benavides highlights the urgency of understanding what drives the expansion of ocean deserts, and whether biological nitrogen fixation can help counteract its effects. "This research will reveal how marine microorganisms support ocean health and global biogeochemical cycles," says Dr Benavides. "We aim to determine whether diazotrophs, microorganisms that convert atmospheric nitrogen into nutrients, can sustain marine productivity in these expanding deserts. By uncovering the links between nitrogen fixation and marine productivity, we will be able to refine climate change models and improve predictions of how marine ecosystems respond to environmental changes. Ultimately, this project could offer new insights into mitigating climate change's impact on our oceans."



As part of the project, researchers will conduct two expeditions aboard the R/V *Marion Dufresne*. These expeditions will bring together experts in biogeochemistry, microbiology, physical oceanography and ocean engineering to collect critical data from the Indian Ocean. The project will also involve the deployment of innovative, advanced automated ocean observing equipment developed by NOC to monitor diazotroph activity and diversity over an entire year, allowing scientists to gather continuous data, even when they are not at sea.



The R/V *Marion Dufresne*. Photo by dimidam. CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?curid=3245908>

The EXPAND project partners are the French National Centre for Scientific Research (CNRS), the French Institute of Research for Development, the Universities of California Santa Cruz and of Maryland (USA), India's Physical Research Laboratory, the University of La Réunion and the University of Cape Town (South Africa). EXPAND is an endorsed project of the Second International Indian Ocean Expedition (IIOE-2), the Integrated Marine Biosphere Research project (IMBeR), and the International Study of the Marine Biogeochemical Cycles of Trace Elements and Their Isotopes (GEOTRACES).

### New test uses oyster poo to track devastating parasite

A Heriot-Watt scientist has worked with colleagues at the University of Edinburgh's Roslin Institute to develop a groundbreaking method to detect a deadly oyster parasite without harming the shellfish. The European flat oyster (*Ostrea edulis*) has seen its numbers plummet over the past two centuries due to overfishing, habitat loss and disease. They are now rare and protected in the wild. Among their most

persistent threats is *Bonamia ostreae*, a microscopic parasite that causes a condition known as bonamiosis, which can devastate oyster populations but is harmless to humans.

Once widespread across Europe's coasts, the native flat oyster has become a conservation priority due to its ecological importance. Oyster reefs provide vital habitat, filter water, and stabilise marine sediments. But efforts to restore wild oyster populations and expand sustainable farming have been repeatedly thwarted by *Bonamia ostreae*. The parasite, which invades oyster immune cells, spreads silently and can wipe out populations.



Until now, detecting the presence of the parasite has involved dissecting a sample of oysters, an approach that is not only destructive but also impractical for monitoring rare or restoration-targeted populations. The Heriot-Watt and Roslin Institute team has pioneered a new method that uses oyster poo to screen for the parasite's DNA. By analysing the waste material left after holding oysters overnight in aerated seawater, scientists can determine whether any oysters are infected, without harming a single animal. Lead author Dr



Tim Bean from the University of Edinburgh's Roslin Institute says the technique is a step forward for oyster conservation and aquaculture biosecurity. Dr Bean said, "Oysters' poo contains traces of *Bonamia* DNA if they're infected. By sampling this material, we can screen large numbers of oysters at once without the need to sacrifice them."

The team tested the method at several sites across the UK, including *Bonamia*-positive waters in Essex and West Loch Tarbert in Scotland. They found the non-invasive method was at least as sensitive as traditional tissue

sampling and histology, and often more effective than water-based environmental DNA techniques. The method has already been validated in field and lab settings and is portable enough to be used on-site with mobile DNA testing kits. It also proved highly accurate in negative control sites, with no false positives detected. Unlike other DNA-based detection methods, which often rely on complex lab setups, the new approach uses a field-ready extraction and PCR system. According to the research team, it is scalable, cost-effective, and adaptable to other marine pathogens. Dr Bean said, “This is about giving restoration teams, oyster farmers and regulators the tools they need to respond quickly and effectively to disease threats, without compromising the very species they’re trying to protect.”

Professor Bill Sanderson from Heriot-Watt University, who leads several oyster restoration projects across Scotland, said, “This is excellent news for oyster restoration across Europe. Oyster restoration involves growing and then moving thousands of oysters from one site to another. We mustn’t take parasites or diseases with us, especially ones as deadly as *Bonamia ostreae*. This new tool gives us a way to quickly and cheaply monitor for infection while protecting precious oyster stocks. There are more than 50 restoration sites throughout Europe now, and this test could be a lifesaver for all those.”



The scientists are now working on refining the process further and exploring whether similar techniques could be used to detect other diseases or even invasive species. Their findings were published in the journal [Aquaculture](#) and supported by the UK Seafood Innovation Fund and the Sustainable Aquaculture Innovation Centre, with additional funding from the [Dornoch Environmental Enhancement Project](#), supported by The Glenmorangie Company.

### **Ocean robots exploring role of ‘marine snow’ in carbon storage**

A cutting-edge fleet of ocean robots and instruments has been deployed to explore the depths of the Labrador Sea as part of a groundbreaking year-long experiment led by scientists from the UK’s National Oceanography

Centre (NOC). The ReBELS project (Resolving Biological Carbon Export in the Labrador Sea) is investigating the biological carbon pump, a key ocean process that helps remove carbon dioxide from the atmosphere and store it in the deep sea and without which atmospheric CO<sub>2</sub> would be 50% higher. Using a combination of moored sensors, drifting profiling floats and autonomous underwater vehicles, the project seeks to understand how carbon-rich particles sink through the water column and how physical ocean processes, such as deep convection currents, might enhance carbon storage in this remote and understudied region. A key innovation in the project is the FluxCAM, a novel marine snow camera system designed to measure the sinking speeds of different-sized particles to reduce uncertainties in how much carbon the ocean absorbs from the atmosphere.

Two FluxCAMs were installed on a deep-sea mooring in the Labrador Sea, between Newfoundland and Greenland, last year, along with a specially programmed drifting profiling float. The cameras were fixed at 100 and 300 m deep on a 3,300 m long mooring in the sea between Newfoundland and Greenland. The ReBELS float has been programmed to carry out more frequent and varied depth profiles than standard floats and is also equipped with advanced sensors, including an optical sediment trap to help us to understand the amount of sinking particles when the float is drifting at the same depth. Now, they have been joined by autonomous underwater gliders, which will measure ocean properties and carbon flux for five to six months. One of the gliders will stay near the mooring, while another one will follow a drifting profiling float, capturing detailed, high-resolution data on particle movement, ocean circulation and biological activity.

“The biological carbon pump plays a crucial role in regulating Earth’s climate,” says project lead Dr Filipa Carvalho at NOC.

“Microscopic marine plants, known as phytoplankton, absorb carbon dioxide from the atmosphere and convert it into organic material. This material is then consumed by marine organisms, with remnants eventually sinking as ‘marine snow’, tiny carbon-rich particles that settle in the deep ocean, where the carbon can



be stored for centuries. However, the rate at which these particles sink and how much carbon is ultimately locked away remain uncertain. The ReBELS project is using cutting-edge technology to answer these questions. This combination of fixed and mobile instruments will allow us to track how carbon is transported and transformed in the Labrador Sea over time.”



*Dr Louis Clement, ReBELS co-investigator with two underwater gliders before deployment.*

“This combination of moored sensors, drifting instruments and mobile gliders is designed to overcome the challenges of studying carbon flux in the ocean,” adds Dr Louis Clement, co-investigator and also at NOC. “While moored instruments provide long-term, fixed-location data, they do not capture the movement of water masses. The drifting float follows ocean currents, providing a dynamic perspective on sinking particles, while the gliders add another layer of insight, especially into small scale turbulence effects on the biological carbon pump. By integrating data from these platforms, we hope to build the most accurate picture yet of carbon transport and storage in the Labrador Sea.”

ReBELS is a four-year program funded by the Natural Environment Research Council (NERC) and builds on decades of research into ocean carbon storage. By deploying state-of-the-art robotic technology, the project is expected to provide new insights into one of the ocean’s most important climate-regulating mechanisms, improving our ability to predict and respond to global climate change. For more information visit: <https://noc.ac.uk/projects/rebels>.

### **October 2025 MEDIN Workshop: Marine Data Management, Governance and the MEDIN toolset**

The Marine Environmental Data and Information Network (MEDIN) are pleased to announce that

registration is now open for the next occurrence of our popular free online training workshop: ‘Marine Data Management, Governance and the MEDIN toolset’ on the 13th - 17th October 2025 on Ocean Teacher Global Academy. To self-enrol, go to the course page on [OceanTeacher Global Academy](#), create an account or log-in, and use the enrolment key: **MEDIN102025**.

This training course is suitable for anyone responsible for collecting or managing marine environmental data in the public sector, industry or for education or research. Familiarity with different marine data types, and how data is acquired and used, would be helpful but not essential. Prior knowledge or practical experience of data management is not required. This training course also helps to introduce the role of MEDIN, and improve the uptake, knowledge, and use of MEDIN Data Guidelines and the MEDIN Discovery Metadata Standard (and associated tools).

Be empowered as a data champion and consider best practices to improve organisational efficiency in data acquisition, analysis, curation, and sharing with colleagues at your organisation. If you have any questions, please don’t hesitate to ask [Roseanna Wright](#) or [Alice Rysiecki](#) More information on the MEDIN training workshop can be found on the [MEDIN website](#).

### **Call for Expert Input: Consultation on Biology and Ecosystems Essential Ocean Variables (EOVs)**

The Global Ocean Observing System (GOOS) Biology and Ecosystems Panel is launching an open consultation to seek expert input on the draft specification sheets for its Biology and Ecosystems Essential Ocean Variables. We invite ocean biology and ecosystem research community to contribute to this important review process.

EOVs are a minimum set of key variables identified by the GOOS community that are critical to understanding ocean change and guiding policy. They provide a common focus for observing system design and coordination. The GOOS Biology and Ecosystems Expert Panel has identified a set of Biology and Ecosystems (BioEco) EOVs using the *Drivers, Pressures, State, Impact, and Response (DPSIR)* framework, combined with feasibility and impact assessments. These BioEco EOVs represent the

core biology and ecosystems observations needed to inform our understanding of ocean health and to provide baselines against which the impacts of human pressures and climate change can be measured and reported.

There are currently 12 BioEco EOVs recognized by GOOS, from phytoplankton and marine microbes to seabirds and marine mammals. Each of them is described in a *specification sheet* that outlines its scientific relevance, observational requirements, and methodological guidance to support standardized, interoperable, and policy-relevant data collection. The information contained within the specification sheets is focused on basic observations that can be applicable globally.

The specification sheets for the BioEco EOVs are currently being updated to reflect scientific advances and evolving global priorities. Your feedback will help refine the definitions, clarify methodological recommendations, and ensure the specifications are both scientifically robust and practically useful. Each survey focuses on one BioEco EOV and takes around 30 minutes to complete. Surveys must be completed by 10th August 2025. Please select the survey for the EOV relevant to your expertise below.

- [Coral cover and composition](#)
- [Seagrass cover and composition](#)
- [Macroalgae canopy cover and composition](#)
- [Mangrove cover and composition](#)
- [Microbe biomass and diversity](#)
- [Phytoplankton biomass and diversity](#)
- [Zooplankton biomass and diversity](#)
- [Benthic invertebrates abundance and distribution](#)
- [Fish abundance and distribution](#)
- [Sea turtles abundance and distribution](#)
- [Seabirds abundance and distribution](#)
- [Marine mammals abundance and distribution](#)
- [Ocean sound](#)

### Potential Availability of NERC Ship Time During the 2026/27 Programme Year

The forward-look availability of NERC marine facilities between 2024 and 2029 is published on the [NERC website](#). While the 2026/27 Marine Facilities Programme is still being shaped, there is currently available capacity in late autumn and winter 2026/2027 using the RRS James Cook or

RRS Discovery. Typically, NERC Marine Planning would require confirmation of funding by April 2025 for consideration of inclusion within the 2026/2027 programme year. However, we are still open to discussing opportunities to use this capacity during autumn/winter 2026/2027, noting that prospective usage would require funding through appropriate mechanisms. Please [see our website](#) and get in touch with us ([marineplanning@nerc.ukri.org](mailto:marineplanning@nerc.ukri.org)) to discuss the feasibility of accessing NERC marine facilities during this time or if you have any related questions.

## IEWS

### Factoring Biofouling into the Design of Floating Wind Farms

With floating wind farms set to be a major source of renewable energy, John Lewis from the Institute of Marine Engineering, Science & Technology (IMarEST) Biofouling Management Special Interest Group explains how their development could be compromised by marine organisms colonising their underwater components, a process known as biofouling. Fortunately, the shipping industry has spent decades tackling biofouling on ships' hulls and can offer valuable insights, as well as proven technologies that can be adapted to the floating wind sector at the design stage.

First, let's look at some biofouling basics. Biofouling begins within minutes of a surface being submerged in seawater, when organic and inorganic materials adsorb onto the surface. Over the following hours and days, a microbial community is established (known as microfouling), which comprises bacteria, microalgae, and protozoa. This is followed by the settlement of larger, visible organisms (known as macrofouling).

Initially, one can see small, fast-growing species, then larger, slower growing, and longer-lived species that displace or overgrow the primary colonisers. Depending on the environment, mature biofouling communities may include dense colonies of bivalves like mussels and oysters, long fronds of kelp, or hard coral. It's also worth noting that rates of accumulation, abundance and diversity of biofouling generally decrease with increasing distance from shore

and water depth. This is largely due to the distance from breeding populations and the limited survival time of algal spores and free-swimming larvae. Exceptions to this rule are the goose barnacles, which live close to the surface in the open ocean, and bottom dwelling fauna whose larvae are spread in bottom currents. However, although biofouling abundance may initially be lower on turbines distant from shore, once established, they can begin to self-propagate and increase biofouling rates.

So, what are the potential effects of biofouling on wind farms? Floating wind structures consist of the turbine tower fixed to a floating base. This means that the weight of biofouling becomes important, as does the hydrodynamic drag from currents and waves, and these need to be factored into the design to ensure the floating bases are stable. Soft biofouling, such as seaweeds and soft-bodied invertebrates, has a Specific Gravity (SG) close to that of water (~1.0), and therefore has little impact on buoyancy, whereas hard biofouling, like barnacles, molluscs, and corals, can significantly increase the load. These organisms build shells that are primarily made of calcite, which has an SG of around 2.2.

The impact of the added weight from hard biofouling depends on the size and design of the structure. While small buoys have been known to sink under excessive biofouling, larger platforms like Floating Production Storage and Offloading (FPSO) vessels remain unaffected. For floating wind farms, determining the tipping point between these extremes is essential during the design stage. Methods of biofouling management are mostly based on creating surfaces that prevent or deter the attachment of algal spores or invertebrate larvae. The most common method is the application of biocidal antifouling coatings that continuously release biocide through the coating surface. However, the life of these coatings is limited by the size of the initial biocide content of the coating when it is applied, and a chemical mechanism to enable the continuous release of this biocide.

The effective life of an antifouling coating on a ship can be from as little as 24 months and rarely surpass 90 months. The longest lives are achieved on continuously active and faster vessels, which helps deter the growth of organisms, but this performance is difficult to

achieve on static structures such as a floating wind turbine. This poses a challenge for static structures like floating wind turbines, which are designed for lifespans of 10–20 years.

A potential solution is to use foul release coatings, which contain little or no biocide, but have surfaces that deter or minimise the strength of adhesion of biofouling organisms. Organisms that do attach are dislodged by turbulent water flow across the surface, or when the weight of biofouling exceeds the adhesive strength of the basal organisms. These coatings may offer longer-lasting protection, but their effectiveness on floating wind platforms remains to be proven through further research and in-situ trials.

One thing is for sure, floating wind projects are moving closer to implementation, so now is the time to assess how biofouling could impact their performance. Early consideration of these factors will allow designers to incorporate effective mitigation strategies from the outset, bringing us one step closer to realising reliable, long-term offshore wind energy solutions. :- **John Lewis, Biofouling Management Special Interest Group, IMarEST**

#### Challenger History talks on youtube

The first five talks of the Challenger Society History of Oceanography special interest group are now on the society youtube channel, see [https://www.youtube.com/channel/UCABGwm9YiLHn1oD\\_vsLWxHA](https://www.youtube.com/channel/UCABGwm9YiLHn1oD_vsLWxHA).

I see they have had some views already. If you'd like to give a talk yourself in this series let me know. Have a nice summer :- **Philip Woodworth**

## SALTS

### New Coral Gardens and Hydrothermal Vents Found in the Icy Depths of the Remote South Sandwich Islands

An international team of scientists on a recent 35-day deep sea expedition to one of the most remote island chains in the world observed **thriving polar ecosystems**, discovered new hydrothermal vents, coral gardens and many suspected new species. The Ocean Census Flagship expedition aboard Schmidt Ocean Institute's research vessel **Falkor (too)** explored the South Sandwich Islands, including one of the

coldest and most isolated submarine trenches on the planet, and also found evidence of explosive volcanism. This was the same expedition that filmed the first confirmed sighting of a [juvenile colossal squid](#).



A close-up of a siphonophore, focussing on its Nectophores, structures that are specialised for swimming. Credit: Schmidt Ocean Institute

The expedition was part of the [Nippon Foundation–Nekton Ocean Census programme](#), the world's largest initiative to accelerate the discovery of ocean life. The Ocean Census scientists led the species discovery efforts, uncovering a wide range of potentially newly discovered marine life including corals, sponges, snails, sea urchins, benthic ctenophores, and sea stars. The exact number of new species will be announced later this year following an Ocean Census workshop, where taxonomic experts will formally assess and catalogue the findings. The GoSouth team, a collaboration between the [University of Plymouth \(UK\)](#), [GEOMAR \(Germany\)](#), and the [British Antarctic Survey \(UK\)](#), investigated the effects of geohazards, including tsunamis, volcanoes, and earthquakes.

“This expedition has given us a glimpse into one of the most remote and biologically rich parts of our ocean. This is exactly why the Ocean Census exists, to accelerate our understanding



of ocean life before it's too late,” said Dr. Michelle Taylor, head of science and expedition principal investigator at the Ocean Census, and senior lecturer at the University of Essex. “The 35 days at sea were an

exciting rollercoaster of scientific discovery; the implications of which will be felt for many years to come as discoveries filter into management action.” “Mother Nature threw everything she had

at the expedition,” said Taylor, “including a subsea earthquake, tropical storm force winds with hurricane-level gusts, eight-metre (26-foot) waves, and icebergs to navigate.” :- **Ahayward, Ocean Business**

### **NOC expedition marks 40 years of world's longest abyssal science project**

A major scientific expedition led by the UK's National Oceanography Centre (NOC) is marking an incredible four decades of cutting-edge science at one of the world's most unique deep ocean scientific research sites this summer. The expedition left Southampton on the 30th May, onboard the Royal Research Ship (RRS) *James Cook*. The intensive, 25-day expedition is focused on the [Porcupine Abyssal Plain Sustained Observatory \(PAP-SO\)](#), 800 km from Land's End in the Northeast Atlantic Ocean.

Started in 1985, at 4,850 m depth, it is the world's longest running time series of life on an abyssal plain, areas of flat seabed at 4,000-6,000 m deep, and one of the world's longest deep-ocean observatories of critical ocean data, from seabed to the surface. This year's expedition (JC278), underpinned by UK [National Environment Research Council \(NERC\)](#) funding, through the [AtlantiS](#) programme, will include testing new, cutting-edge autonomous technologies alongside well established observational methods. These will add to the crucial long-term multidisciplinary observations at the site, which provide a unique and important window into long-term changes in the health of the deep ocean, from the impacts of climate change to its role as a carbon sink.



PAP expedition chief Dr Andrew Gates with Mike Thurston, the scientist who led the first PAP expedition in 1985 on the RRS Challenger.

“Science undertaken at PAP-SO has significantly advanced knowledge of the remote deep-ocean realm and beyond,” says Dr Andrew Gates, the principal scientist at NOC who is leading the expedition. “Early insights at PAP revealed that the deep-sea floor, thought to be a very stable, constant environment, is in fact subject to seasonal change. More recently, the work at this unique multi-decadal research site has helped understand how long-term environmental change and human activity affect deep-ocean environments and what the longer-term impacts of that could then be to the wider ocean.”

New advanced autonomous technologies being tested on this 41st ship-based expedition to the PAP-SO include the deployment of new sensors and sampling technologies for autonomous observation. These were developed as part of a major on-going Horizon Europe funded project to advance technology for high quality ocean observations, called **GEORGE** (Next Generation Multiplatform Ocean Observing Technologies for Research Infrastructures). GEORGE is using two underwater autonomous robots called gliders to deploy new miniaturised sensors and samplers, and an uncrewed surface vessel (USV) that will expand on and support ship-borne data, paving the way for new frontiers in ocean science.

Dr Socratis Loucaides, NOC’s lead GEORGE scientist said, “this is an important opportunity to deploy our new technology at an open ocean site where we have long term data to compare with the new measurements and make sure they meet the requirements for future ocean observation capability. Additionally, for the first time, sets of underwater hydrophones will be deployed to allow scientists to “listen” to the deep ocean at the PAP-SO and another site that the RRS *James Cook* will visit during the expedition, Whittard Canyon, for a full year.



Scientists hope the sounds captured could provide insights into everything from elusive whales and dolphins to submarine canyon landslides at Whittard Canyon and also unlock the mysteries of the soundscape of a site like the PAP-SO, nearly 5 km down. A time-lapse camera system, Bathysnap, that has been sitting on the seafloor taking images every few hours for

the past year will also be recovered and replaced, with scientists excited to see what creatures it has caught a glimpse of.



*Creatures found at the seabed at PAP include sea cucumbers, including this Psychropotes buglossa, one of the most iconic animals from the abyssal plain, captured with the Bathysnap camera.*

A newly acquired specialised camera system able to take images of single cell organisms from seawater samples taken every 30 minutes from the ship on its route will also be used, with plans to use artificial intelligence to enable the imaged organisms to be identified in real time in the future.

The team will also replace a **Met Office** monitoring buoy that supports weather forecasting and ocean monitoring at the site, including measuring carbon dioxide in the atmosphere and upper ocean. The expedition will also do its more routine work recovering and deploying a wide range of scientific instrumentation to collect water and sediment samplers, physical and chemical sensors for the highest quality data. Ecological observations will be collected using baited experiments and remote seafloor imaging systems, all of which make testing new technologies possible as well as extending the crucial time series.

“The PAP-SO is more than a research site it’s a testbed for new technologies that advance ocean science,” adds Dr Gates. “The data gathered here not only enhances our knowledge of the deep ocean but also drives the development of new tools and techniques that will help address the challenges of climate change.”

# CALENDAR

## 23rd-24th June 2025: Advances in Marine Biogeochemistry (AMBIO) conference

*Edinburgh, UK*

The MASTS Marine Biogeochemistry Forum are delighted to be partnering with the Challenger Society to host the next Advances in Marine Biogeochemistry (AMBIO) conference. AMBIO provides a technical forum for students, educators, researchers, and governmental and industrial partners with shared interests in marine biogeochemistry. The MASTS Marine Biogeochemistry Forum Steering Group would like to know more about you and your marine biogeochemistry research interests! Please help by completing their [community survey](#) before the end of May.

The meeting will be held in Edinburgh at the Edinburgh Climate Change Institute <https://edinburghcentre.org/>. The event is limited to 60 attendees only, so don't delay. Registration costs will cover attendance to the conference, including lunch both days, tea and coffee and a poster drinks reception on Monday 23rd (1630-1800). Please feel free to share

## 23rd-24th June 2025: Structures in the Marine Environment (SIME) 2025 conference

*Edinburgh, UK*

Call for presentation and poster abstracts. The INSITE Programme and OCF are pleased to announce SIME conference will be held once again at the National Museum of Scotland. The main sessions will cover:

- Long-term environmental impacts of contaminants & breakdown materials;
- Estimating biomass associated with structures;
- Social Attitudes to Marine Artificial Structures;
- Monitoring, Evidence and Innovation surrounding Marine Artificial
- Structures and Decommissioning.

## 23rd-25th June 2025: Turbulence Grey Zone Workshop

*Exeter, UK*

Highlighting the opportunity to attend or participate in a workshop about advances in turbulence modelling/parametrisations, which is taking place at the University of Exeter next summer. Turbulence parametrisation is a common challenge in the modelling of fluids, including Earth's ocean and atmosphere, so the conference aims to take an interdisciplinary approach.

## 24th-25th June 2025: Machine Learning for Ocean Modelling workshop

*Reading, UK*

Announcing a new workshop taking place at the University of Reading; this will be an in-person event with the option to attend remotely for some of the sessions. The workshop, organised by colleagues from NCAS, NOC, BAS, and the Met Office, will take place over two full days. There will be keynote talks, short talks, and posters presented across some important themes, such as hybrid modelling and benchmarking.

As many of you will be aware, the space surrounding machine learning is fast evolving, so it is important that we come together as a community to identify current challenges and opportunities, particularly within the UK. For now, please save the date in your calendar if you are interested in taking part in this new workshop. We will be in touch soon to provide more concrete details and open the registration.

## 30th June 2025: Wind Waves Special Interest Group meeting

*Liverpool, UK*

The 2025 meeting of the Challenger Society Special Interest Group (SIG) on Wind Waves will take place at the National Oceanography Centre in Liverpool. The SIG aims to promote research in ocean surface waves and of their interactions with oceanographic, atmospheric and climatic processes. We provide a forum for cross-disciplinary exchange of information, and to encourage early-career researchers in this field by providing an informal platform for presentations and interactions. If you want to receive information about future events, please contact Dr Lucy Bricheno ([luic@noc.ac.uk](mailto:luic@noc.ac.uk)) to be added to the mailing list.

More details of our special interest group here: <https://projects.noc.ac.uk/windwavesSIG/>, and details of previous meetings can be found here: <https://projects.noc.ac.uk/windwavesSIG/meetings>.

### **1st-3rd July 2025: 2nd UK Coastal Research Conference**

*Liverpool, UK*

Coastal zones are of high ecological and societal value, but as the dynamic interface between land, sea, and air, they are heavily impacted by a combination of climate-driven environmental change and human interventions. Approaches to sustainably manage the coastal zone increasingly seek to provide co-benefits such as risk mitigation, climate regulation, biodiversity gain, and supporting coastal community resilience. These require working across sectors and disciplines to better manage the UK coast in a changing climate.

The second UK Coastal Research Conference welcomes all those with an interest in UK coastal science, including academia, policy makers, practitioners and industry professionals. Our aim is for the conference to promote conversations around national coastal research strategies and coastal knowledge, connecting researchers with those involved in managing our coasts, and thereby inform sustainable future management of our coast.

Following on the first UK Coastal Research Conference, the programme will include one day with optional site visit / training course / workshops and two days for the conference including keynote, oral and poster presentations. Social activities are planned to include an icebreaker drink reception and a conference dinner. For further information click [HERE](#).

### **15th-16th July 2025: Deep-Sea Ecosystems Special Interest Group meeting**

*Newcastle, UK*

The 2025 meeting of the Deep-Sea Ecosystems SIG will be hosted by Will Reid at Dove Marine Lab on the outskirts of Newcastle. This year, the SIG is pleased to announce they've been given some funds from the Challenger Soc. This is going to be split to cover some of the food and drink, and to provide a travel bursary for an ECR to attend the meeting. [More Information](#) for the

2025 DSE-SIG meeting and as with previous years, we will look to provide remote attendance for people who are unable to attend in person.

### **11th-15th August 2025: Aquatic Stressors Forum**

*York, UK*

This Forum would like to highlight an opportunity for PhD students and Early Career Researchers (ECRs), interested in ecotoxicology, to present their work in a friendly and supportive environment as well as network with like minded individuals. The University of York will be hosting SETAC's (Society of Environmental Toxicology and Chemistry) Young Environmental Scientist (YES) conference this August. Find out more [here](#).

### **4th-5th September 2025: Centre for Port and Maritime History Annual Conference, Environment and the Sea**

*Liverpool, UK*

The [Centre for Port and Maritime History](#) (CPMH) encourages submissions to its 2025 Annual Conference on the theme of Environment and the Sea. The 2025 Conference theme draws upon the rich vein of scholarship across the arts, humanities, and the social and environmental sciences which have approached the 'ocean' as a social and a natural environment. This work has fostered new knowledge of maritime environments as diverse, multi-species spaces which challenge many traditional disciplinary boundaries. The scope of this research is necessarily broad, from: studies of environmental and climate change in particular oceanic contexts; explorations of the roles animals play in sustaining ecological and social systems (e.g. as ships mascots); intersections between maritime art and the environment; historical studies of the environmental and other natural sciences, to name only a few. Through this conference theme, we seek to explore how understanding the histories of oceanic and marine environments are crucial to the past and our future.

The CPMH has a well-established reputation as a supportive and collegial arena for postgraduate and early-career submissions and presentations, and we welcome submissions from independent scholars. Previous CPMH conferences have led to publication in the CPMH Book Series, which we would be keen to explore if suitable content emerges from the 2025 submissions.

Potential Topics include (but are not limited to):

- Environmental Histories of Littoral, Sea and Ocean Spaces
- Histories of Science and Technology at Sea (including biographical approaches)
- Environmental and Climate Change at Sea (including ship-logs and other archival sources of past climate)
- More-than-human histories of the ocean
- Art, history and ocean environments
- Terraqueous and/or archipelagic histories which challenge the distinction between land and ocean
- Activist histories of/on/around sea or ocean environments
- Indigenous knowledges of the seas and oceans

We also welcome ideas/proposals for presentations in alternative formats to traditional academic papers (e.g. exhibitions, videos, artistic pieces), please discuss your ideas with the Conference Organiser, Dr Andy Davies, who can advise about what is possible.

The Conference will take place at the University of Liverpool. There is a Conference Registration Fee of £20 to cover Conference Catering for waged/funded conference attendees. This will be waived for unwaged or unfunded attendees. The Conference will allow for remote/hybrid presentation, but in order to foster a collegial and supportive atmosphere, as well as provide the best opportunity for discussion and networking, we encourage and recommend in-person attendance in Liverpool. Please submit an abstract to Dr Andy Davies ([addavies@liverpool.ac.uk](mailto:addavies@liverpool.ac.uk)) by Wednesday, July the 30th 2025.

**15th-18th September 2025: The ICES 2025 Annual Science Conference**

*Klaipeda, Lithuania*

The ICES (International Council for the Exploration of the Sea) **2025 Annual Science Conference (ASC)** taking place at Klaipeda University in Lithuania. The ASC will bring together marine scientists from around the world to share innovative research, ideas, and build lasting collaborations. The conference will feature a dynamic programme, covering key areas of ICES Science, including ecosystem science, human impacts, emerging technologies, and conservation.

**23rd-25th September 2025: 8th Euro-Argo Science Meeting**

*Crete, Greece*

More information is available on the Meeting webpage: <https://www.euro-argo.eu/News-Meetings/Meetings/Euro-Argo-Users-Meetings/8th-Euro-Argo-Science-Meeting>



**9th October 2025: 6th Maritime Transport Efficiency Conference (MTE Conference)**

*Geneva, Switzerland*

To take place at the Hotel President Wilson, Geneva. Held annually, the **MTE Conference** uniquely bridges the maritime and commodity trading sectors, addressing the shared challenges and opportunities of decarbonising the global shipping industry. Focusing on the commercial and operational aspects of decarbonisation and offering actionable strategies to reduce emissions across the maritime value chain, the event caters to shipowners, cargo owners, charterers, operators, fuel suppliers, regulatory bodies, and technology innovators.

This diverse mix of stakeholders ensures comprehensive discussions on navigating the evolving regulatory landscape, adopting sustainable procurement practices, and embracing emerging technologies, while promoting cross-industry collaborative efforts to decarbonise.

**13th - 17th October 2025: MEDIN Workshop: Marine Data Management, Governance and the MEDIN toolset**

*Online*

The Marine Environmental Data and Information Network (MEDIN) are pleased to announce that registration is now open for the next occurrence of our popular free online training workshop: 'Marine Data Management, Governance and the MEDIN toolset' on Ocean Teacher Global Academy. To self-enrol, go to the course page on [OceanTeacher Global Academy](https://oceanteacher.academy), create an

account or log-in, and use the enrolment key: **MEDIN102025**.

This training course is suitable for anyone responsible for collecting or managing marine environmental data in the public sector, industry or for education or research. Familiarity with different marine data types, and how data is acquired and used, would be helpful but not essential. Prior knowledge or practical experience of data management is not required. This training course also helps to introduce the role of MEDIN, and improve the uptake, knowledge, and use of MEDIN Data Guidelines and the MEDIN Discovery Metadata Standard (and associated tools).

Be empowered as a data champion and consider best practices to improve organisational efficiency in data acquisition, analysis, curation, and sharing with colleagues at your organisation. If you have any questions, please don't hesitate to ask [Roseanna Wright](#) or [Alice Rysiecki](#). More information on the MEDIN training workshop can be found on the [MEDIN website](#).

### **16th-18th October 2025: Arctic Circle Assembly 2025**

*Reykjavik, Iceland*

The [Arctic Circle Assembly](#) will be held in the Harpa Concert Hall and Conference Centre, and registration will open in early June. The annual Arctic Circle Assembly brings together governments, organizations, corporations, universities, think tanks, environmental associations, Indigenous communities, citizens and others for a comprehensive and democratic Arctic dialogue. The Assembly is the largest gathering on Arctic affairs. It is a place for international engagement, cooperation, and celebration.

The [Polar Dialogue](#) will return in October. It consists of a series of sessions, consultative meetings, workshops and high-level Plenary Sessions taking place during the Assembly. The initiative aims to facilitate science and research cooperation in the Arctic, Antarctica and Himalaya-Third Pole region, as well as other ice-covered areas of the world. Chaired by H.E. Katrín Jakobsdóttir, Prime Minister of Iceland 2017-2024, the Polar Dialogue unites global experts and policymakers to address scientific challenges and foster collaboration.

The [Business Forum](#) will take place again during the 2025 Assembly at the Reykjavik Edition Hotel (located within the Assembly Area). It consists of a series of Sessions, consultative meetings, workshops and high-level Plenary Sessions. The Business Forum will delve further into areas of interest including tourism, the blue economy, infrastructure, innovation and more. Additionally, the assembly program has Business Forum Sessions that are open to all participants.

In addition, the [Frederik Paulsen Arctic Academic Action Awards](#) will be awarded for the fifth time at the 2025 Arctic Circle Assembly.

### **10th-13th November 2025: Mediterranean Geosciences Union 5th Annual Meeting**

*Athens, Greece*

Following the remarkable success of the [2024 MedGU Annual Meeting](#) in Barcelona, which drew 750 attendees in person and online from 65 countries, the National and Kapodistrian University of Athens in Greece will host the [2025 MedGU Annual Meeting](#). We warmly invite you to participate and share your most recent research contributions with us; the abstract submission deadline is the 30th June 2025.

Your participation, whether in person or virtually, will help MedGU achieve its goals of promoting scientific cooperation and creating opportunities for new and fruitful partnerships between geoscientists on both sides of the Mediterranean and from around the globe. [MedGU-25](#) is looking forward to cordially welcoming you in Athens. Your participation will support MedGU's mission of ensuring a sustainable future for humanity in the region and for the planet.

### **18th-20th November 2025: 15th MASTS Annual Science Meeting**

*Glasgow, Scotland*

The Marine Alliance for Science and Technology Scotland (MASTS) Annual Science Meeting (ASM) is a cross-disciplinary event that brings together members of the marine science community, with the aim of promoting and communicating research excellence and forging new scientific collaborations. The MASTS ASM will take place at the Technology & Innovation Centre (TIC), University of Strathclyde, Glasgow.

The first two days will bring together expert plenary speakers and contributed talks, panel sessions and e-posters outlining the latest

research and management practices that address key topics related to marine science and management in the face of global climate change and a biodiversity crisis. Alongside our general science sessions, the event will include special topic sessions, and plenty of opportunities to network. The third day is devoted to workshops.

ASM Workshops:

- Thurs 20th Nov - Introduction to Open-Source GIS (QGIS). This course will introduce postgraduates, early career researchers, and anyone new to Geographical Information Systems, to the use of GIS, and specifically the Open Source QGIS program.
- Thurs 20th Nov - State-space modelling and model-based inference for animal-tracking datasets with pater. This workshop will introduce state-space modelling and model-based inference for animal-tracking data. The workshop will focus on the pater R package as a tool for model-based inference. Participants will gain the knowledge and expertise required to understand (a) where the pater sits within the animal-tracking ecosystem, (b) when to reach for the package and (c) how to apply the package with their own datasets.

Contact us now if you would be interested in:

1. Organising a workshop
2. Exhibiting at the event
3. Sponsoring the event

We look forward to hearing from you, [masts@st-andrews.ac.uk](mailto:masts@st-andrews.ac.uk).

## 22nd-27th February 2026: Ocean Sciences Meeting 2026

*Glasgow, Scotland*

The OSM is the flagship conference for the ocean sciences and the larger ocean connected community. Every two years, the Ocean Sciences Meeting unifies the oceans community to share findings, connect scientists from around the world, and advance the impact of science. The Ocean Sciences Meeting 2026 is co-sponsored by the American Geophysical Union (AGU), the Association for the Sciences of Limnology and Oceanography (ASLO), and The

Oceanography Society (TOS). This time we look forward to seeing you in Glasgow, Scotland in February 2026. Visit the [Ocean Science Meeting website](#) for up to date information.

## 2nd-4th March 2026: BIO-Carbon international data workshop on the role of marine life in storing carbon in the ocean

As part of the UK NERC BIO-Carbon research programme, and with the support of the MASTS [Marine Biogeochemistry Forum](#), we are delighted to announce an international data workshop on the role of biology in helping the ocean store carbon, March 2nd-4th 2026. The hands-on workshop will bring together scientists from around the world, to pool data on key processes and to determine how we should go about capturing those processes in the next generation of climate models. A major aim of the workshop is to bring modellers, observationalists and experimentalists together to co-design roadmaps for how this should happen.

The workshop will focus on the following 10 themes, identified as key gaps in our understanding:

- calcification and the rain ratio
- plankton community structure
- phytoplankton growth and micronutrients
- the microbial loop and solubilization
- plankton respiration
- zooplankton processes
- ✓ particle characteristics & ballasting
- particle fragmentation & aggregation
- the active flux
- the physical circulation

Applications will follow later this year. However, we would already welcome expressions of interest to attend, It is not necessary to have registered an expression of interest to apply to attend the workshop though: <https://forms.office.com/e/JizgtqVweJ>

## 8th-10th September 2026: Challenger Society for Marine Science Conference

*Bangor, UK*

Save the dates for the next biennial Challenger conference, which will be in Bangor, 42 years on from the first modern Challenger conference which was also held in Bangor; then organised by John Simpson, Paul Linden, Steve Thorpe and Roy Chester, and run by amongst others a very junior Ed Hill and Bill Turrell.

The CSMS email address is [challenger.society@gmail.com](mailto:challenger.society@gmail.com). Contributions for next month's edition of Challenger Wave should be sent to: [john@myocean.co.uk](mailto:john@myocean.co.uk) by the 30th June.

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## ***JOBS and OPPORTUNITIES***

**There are jobs in the MASTS newsletter**

### ***New vacancies:***

[Visit our Vacancy Webpage to find all the positions listed below.](#)

- ✓ Marine Environmental Consultant - Intertek - closing 30/6/25
  - ✓ Marine Support Officer - JNCC - closing 26/6/25
  - ✓ Marine Consents Manager - SSEN - 24/6/25
  - ✓ Research Fellow in Biofilm Engineering - University of Southampton - closing 2/7/25
  - ✓ Tenure-Track Professor/Associate Professor/Assistant Professor in Ecology & Biodiversity - University of Hong Kong - closing 30/6/25
  - ✓ Senior Environmental Consultant (Marine Surveys) - Natural Power – closing 29/6/25
  - ✓ Principal Research Engineer / Principal Research Scientist - NOC - closing 5/7/25
  - ✓ Head of Offshore Oil & Gas Decommissioning - DESNZ - closing 22/6/25
  - ✓ Post-doctoral Research Associate in Oceanography/ Glaciology - University of St Andrews - closing 30/6/25
  - ✓ Postdoctoral Researcher to join BLUESHORES project - University College Cork - closing 10/7/25
  - ✓ Research Scientist, Compound Coastal Hazards – University of Reading - closing 2/7/25
  - ✓ Post-Doctoral Research Opportunity: Assessing the socio- economic benefits of Nature Networks - CXC - Closing 18/7/25
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