February 2025

Challenger Wave

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

NEWS

The Ocean joins our board

The best ideas come when we step away from an issue. For me, taking a break outside, preferably near the coast, is my thinking place. On an early morning swim in the fresh, clear waters of the sea near the Slate Islands off the west coast of Scotland, I had one of my very best ideas. Even better, as Director of Scotland's oldest marine science research charity I can make it happen. That idea was to put "The Ocean" on our board. Last September, our Trustees agreed.

The Scottish Association for Marine Science (SAMS) is a 140-year-old marine science research charity, based near Oban in the Highlands, a jumping off point for ferries to the stunningly beautiful Isles of Mull, Iona and others beyond. We believe that electing the Ocean to be a Trustee of SAMS is one of the most important decisions in our history. It challenges outdated models of governance and champions a future where the ocean's voice is central to decision-making. That the Ocean should be represented in our governance might seem, at first blush, to be a gimmick, even whimsical. We are conscious that the move could be seen as trivial or greenwashing. After all, as a non-profit marine research organisation, surely SAMS always has the best interests of the Ocean in mind ? But after several months of careful discussion and debate, the Trustees are convinced that even with a strong empathy for ocean conservation and a well-informed understanding of marine environmental matters, our decision-making is essentially anthropocentric; human interests are given precedence, and concern is limited to the impact on the Ocean rather than the interests of the Ocean.

This approach is near universal. Take, for example, the major global research initiative proclaimed by the United Nations General Assembly in 2017: the UN Decade of Ocean Science for Sustainable Development (2021-2030). The "strapline" for this Ocean Decade reads "The Science we need for the Ocean we want"; the pronoun "we" is telling. The ten "Ocean Decade Challenges for collective impact" that make up the project are wholly worthy and ambitious, and no-one would argue with their content and sentiment. But going beyond the metaphor of the "Ocean on the Board", would the Ocean have constructed these Challenges in the same way ? Some have ocean-centric ambitions, at least in part, but the majority are clearly anthropocentric. No criticism of the UN Ocean Decade is implied, on the contrary it is a magnificent initiative that has mobilised the international marine science community in a way not seen before. However, it is typical of the focus of even the best-intentioned of ambitions in which human interests invariably have priority.

The Ocean is arguably the planet's most vital natural asset. Covering nearly 75% of Earth's surface (and more than 95% of the living space, when depth is considered), it regulates the climate, provides oxygen, sustains biodiversity, and underpins the livelihoods of millions of people. Yet, human activities have pushed it to the brink. Rising temperatures, acidification, plastic pollution, and unsustainable fishing practices have and continue to disrupt marine ecosystems at an alarming rate. These human activities are to a significant degree controlled by decisions taken in boardrooms, even in the most enlightened of which the drivers are anthropocentric and financial.

Although SAMS is a charity, with a deep concern for the health and well-being of the ocean, we are also a business with over 160 employees and around 200 students who rely on us. We

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must make our own financial way, just as any other company, and our Board has behaved rather like any other. However, we now wish to challenge the paradigm of the conventional boardroom by genuinely seeking a different way. A way where we formalise the idea that the Ocean is not merely a passive resource, but an entity deserving of advocacy, with a voice and with influence at the table, and where we can still balance the potentially conflicting commercial demands of running a business.

The Ocean is clearly a metaphor in this context and cannot represent itself in human terms. So, we are constructing the legal means by which its interests can be advocated by a designated individual or group: academics, conservationists, or experts specialising in oceanic issues and laws. This advocate will ensure that the Ocean's needs are given at least equal weight to all others in our decisions and strategies, especially in deciding from whom we will accept funding. We currently have an ethical policy that guides our decision-making, but this is based on conventional norms. We anticipate that taking an ocean-centric perspective will lead to different outcomes. We recognise that if followed genuinely this approach could result in poorer short-term financial performance. However, the commitment is to accept a balance between possible short-term sacrifice for longer-term benefit, but not necessarily financial. This balance will most likely lead to less certainty, with a need to reflect this in a changed business strategy. We are also examining changes required in our governing Articles of Association to ensure there are no conflicts of interest for the "Ocean trustee".

Electing an "Ocean trustee" is not merely a practical step; it is a philosophical statement. It challenges anthropocentric models of governance that prioritise human interests over the natural world. Instead, it recognises that humans are part of nature and not separate from it. Indeed, humanity's survival, including all its societal structures, are dependent on the health of the planet's ecosystems. This philosophy is deeply rooted in many indigenous cultures that have long-regarded nature as a partner, rather than a commodity. It mirrors legal innovations, such as the recognition that rivers and ecosystems have legal "personhood" in countries such as Ecuador and New Zealand. The Scottish company for natural household and beauty products, "Faith in Nature", has already taken the step of electing Nature to its Board. These developments represent a growing movement to redefine the relationship between human systems and the natural world.

We hope that our example will help to inspire a broader movement, perhaps first in the environmental charity sector. Given the pervasive impact of the decisions of corporate boards and policymaking bodies, embedding ecological considerations into the heart of these decisions could have a profound effect. In an era of ecological crisis, this bold move is not just symbolic, it is essential. By giving the Ocean a seat at the table, SAMS acknowledges its profound debt to this life-sustaining entity. More importantly, it signals a commitment to the Ocean not just for today, but for generations to come ***:- Professor Nick Owens, Director Scottish Association for Marine Science***

30th June 2025: Wind Waves Special Interest Group meeting

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) 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.

The Loch Ness Monastery: a Tale of Edwardian Scientists and Monks

The Challenger Society Special Interest Group on the History of Oceanography will be having its next zoom webinar on Wednesday 19th February at 17:00 UK time. The talk will be given by Prof. David Bowers of the University of Bangor. Some information about the talk is given below. You can join in using the link below (the link might be different for future talks so watch out for further

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updates) and feel free to give this message to colleagues:

https://ukri.zoom.us/j/95233294707pwd=pEaK511wDTEJbalcEZqGdFWmbl7Obb.1

For people who cannot join on that date, the talk will be recorded and will appear on the Challenger Society web site at some point. We already have a recording of the previous webinar (by Philip Pearson on 15th January) which will appear on the web site as soon as possible.

In 1903, a team of Scottish scientists led by Sir John Murray were making what they thought would be routine observations of the heat content of Loch Ness. They enlisted the help of some enthusiastic monks at the Benedictine monastery at Fort Augustus at the south eastern end of the loch. It soon became apparent that the job would not be a simple one, however. The temperature at mid-depth in the loch fluctuated by several degrees during the course of a day. These fluctuations could not be explained by heating and cooling at the surface, but they could be explained by a hitherto unexpected regular oscillation of the thermocline in the loch. This marked the discovery of what we would now call internal seiches.

SAMS to lead examination into Dark Oxygen discovery

Deep-sea scientists have announced the most detailed examination yet of our deep ocean which could provide clues to how life on Earth began, and even whether life can be sustained on other planets in and outside our solar system. The team, led by Professor Andrew Sweetman of SAMS (Scottish Association for Marine Science), a partner of UHI (University of the Highlands and Islands), will send purpose-built sensors to the deepest parts of the ocean to further probe their discovery last summer of so-called 'Dark Oxygen',. The new project has been made possible by a £2m support package from The Nippon Foundation.

Dark Oxygen can be produced in complete darkness on the deep ocean floor, where light cannot penetrate, challenging the previously held scientific consensus that oxygen is produced solely from light through photosynthesis. The discovery of a second source of oxygen last year was a major scientific breakthrough and called into question how life began on Earth. Prof. Sweetman said: "Our discovery of Dark Oxygen was a paradigm shift in our understanding of the deep sea and potentially life on Earth, but it threw up more questions than answers. This new research will enable us to probe some of these scientific questions. If we show that oxygen production is possible in the absence of photosynthesis, it changes the way we look at the possibility of life on other planets too. Indeed, we are already in conversation with experts at NASA who believe Dark Oxygen could reshape our understanding of how life might be sustained on other planets without direct sunlight."

Pictured, from left, at the funding announcement in London's Scotland House: SAMS scientist Prof. Andrew Sweetman; Chairman of The Nippon Foundation Yohei Sasakawa; and SAMS Director Prof Nick Owens. Photo - The Nippon Foundation

The research team also seeks to understand if Dark Oxygen production takes place in other deep-sea areas and will take various measurements and readings to help identify the source. The investigations will begin later this year. The support package from The Nippon Foundation will cover analysis costs for research in the central Pacific Ocean and the development of purpose-built and autonomous landers, or rigs, to carry specialist instrumentation to depths of 11,000 metres, where the pressure is more than one ton per square centimetre.

The three-year research programme will also investigate whether hydrogen is released, during the creation of Dark Oxygen, and whether it is used as an energy source for an unusually large community of microbes in parts of the deep ocean, as well as how climate change might impact biological activity in the deep sea. The project will be the first of its kind to directly

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explore these processes and will allow researchers to study the deep seafloor into the Hadal Zone as well, an area which reaches 6,000–11,000 metres depth and makes up around 45% of the entire ocean.

The purpose-built landers used to conduct the investigation will be the first UK-based assets with the capability of sampling below 6,000 metres depth. Yohei Sasakawa, Chairman of The Nippon Foundation, said: "The sea is vital to sustaining human life and biodiversity, but even today so much of the deep sea is unknown. We are passionate about innovating to achieve a better society, and we are proud to support Professor Sweetman's research into Dark Oxygen in the hope that we might learn more about the deep sea and the life which exists at the bottom of the ocean."

Prof. Nick Owens, Director of SAMS, added: "The discovery of Dark Oxygen last year was arguably the most significant in the history of SAMS, and has reinforced the UK's standing as a global leader in marine exploration. As an institution, we trace our roots back to the UK's Challenger Expedition of 1872-76. It is fitting that 150 years after that expedition gave us our first insights into the deep ocean, we are now uncovering some of its best-kept secrets." IOC UNESCO has endorsed the project as a UN Ocean Decade activity.

Marine Plastic Pollution: A breeding ground for pathogenic bacteria

A new study reveals for the first time that particle type affects colonization, enrichment and spread of both antimicrobial-resistant and pathogenic (disease-causing) bacteria. Microplastics (plastic particles under 5mm) are a widespread environmental pollutant, with more than 120 trillion estimated to have accumulated in the global ocean. Upon entering the environment, microplastics are rapidly colonized by diverse microbial communities, forming what is known as the 'Plastisphere'. The 'Plastisphere' is a term given to the novel microbial communities that live on discarded plastic in the environment, which is distinct from its surroundings, and has been suggested to serve as a pool of both pathogenic and antimicrobial-resistant (AMR) bacteria. Owing to the frequent omission of other appropriate materials, such as natural substrates, with which to compare in previous studies, there is a lack of scientific evidence supporting the unique risks posed by microplastics through the enrichment and spread of AMR pathogens.

This study, by scientists at Plymouth Marine Laboratory and the University of Exeter, investigated selective colonization by a sewage community on environmentally sampled microplastics, involving three different polymers, sources and morphologies, alongside a natural substrate (wood), inert substrate (glass) and free-living/planktonic community controls. The study showed that marine plastic substrates served as a platform for the selective growth of bacterial communities responsible for diseases in both humans and animals. Compared to controls, polystyrene and wood were found to enrich AMR bacteria, and bio-beads enriched strains of *Escherichia coli*, which can cause diarrheal illnesses.

Interestingly, under 'normal' circumstances, the community composition is largely driven by the external community and environment. Yet in this study all particles were exposed to the same environment, suggesting that the selective colonization observed is a result of substrate-specific drivers. Furthermore, given that there was no difference in the size of the particles used in this study, this suggests that there are specific differences in particle characteristics that affected the attachment of AMR or pathogenic bacteria. There are also reasons to suggest that the attachment of bacteria to plastics may make them more likely to become resistant to antimicrobial treatment, such as the dynamics of the microbial community that attaches to the material and previous exposure to plastic-associated chemicals. However, further research is required to fully understand whether plastics, specifically microplastics, pose a greater risk than natural debris in supporting these disease-causing or drug-resistant microbial communities.

Lead author of the study, Emily Stevenson, who is a PhD student with the University of Exeter and Plymouth Marine Laboratory, commented, "By identifying particles of greater concern for AMR risk, we can recommend improvements to waste management or sewage treatment, with the aim to reduce emissions of these materials into the environment. We would like to see policy

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recommendations that include proposed improvements to environmental monitoring of both microplastics and antimicrobial micropollutants. We also suggest that efforts to reduce the spill of bio-beads should be prioritized considering their effect on *E.coli* communities".

NOC Association (NOCA) AGM 2025

The 14th AGM of the NOC Association will be held on Thursday 15th and Friday 16th May 2025. This free, on-line event will take place on Zoom, across two consecutive mornings, each starting at 10:00 and ending at 12:30. Although discussion topics are being finalised, we will focus on national capability (NC) science, ships, and autonomous vehicles, and how the community can engage.

There will be an update on AtlantiS and on the new marine science scoping group. All are warmly welcome to participate; please complete your registration here and if you have any enquiries, please contact Jackie Pearson, Secretary to NOCA at jfpea@noc.ac.uk.

The Marine Facilities Advisory Board, can you help ?

The Marine Facilities Advisory Board (MFAB) advises the National Oceanography Centre on marine facilities and services, including the Natural Environment Research Council's National Marine Equipment Pool (NMEP), the British Oceanographic Data Centre and the British Ocean Sediment Core Research Facility. MFAB is now seeking a new chair and five new members to join a small team from the UK's marine science community and the National Marine Facilities, to respond to requirements for the NMEP. These voluntary positions, Marine Facilities Advisory Board call for chair 2025 and Marine Facilities Advisory Board call for members 2025, starting this summer, offer exciting opportunities to gain experience of working on a technology board, and to learn about the challenges to enhance understanding of the ocean. For an informal chat about the MFAB or the vacancies, please email Jackie Pearson, secretary to MFAB: jfpea@noc.ac.uk.

Scientists to "break waves" in climate modelling

Breaking waves on the world's coastlines can be a magnet for surfers and a headache for coastal defences. Now, leading UK and French scientists want to find out more about the impacts of coastal wave breaking on our climate system to plug a gap in current climate models. Through an ambitious project led by scientists at University College London (UCL), the National Oceanography Centre (NOC) and the École Normale Supérieure (ENS) Paris-Saclay in France, scientists will use novel observations of coastal wave breaking with advanced modelling and machine learning to work out the importance of this notoriously complex and hard to measure phenomenon.

Waves crashing against a shore, by Ray Bilcliff

Specifically, the project, called WAVECLIM, will look to fill a gap in understanding about the role these often-dramatic coastal processes play in global climate modelling. "It is well known that ocean wave breaking at the coast plays a big role in air-sea exchanges, sediment transport and coastal erosion", explains Professor Christine Gommenginger, who leads the project at NOC. "But these complex coastal processes are largely absent from current climate models."

This innovative project is one of the first opportunity seeds in the UK's Advanced Research and Invention Agency's (ARIA) Scoping Our Planet opportunity space, announced in October last year. ARIA's seed funding supports ambitious research that can challenge assumptions, open up new research paths and provide steps towards new capabilities

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"While waves in the open ocean are starting to be included in some climate models, coastal wave breaking is still disregarded", adds Frederic Dias from ENS Paris-Saclay. "This is a critical gap in our understanding of how coastal seas influence and impact the global climate system." The WAVECLIM project will change this using advanced sensor technology and machine learning to capture and integrate coastal wave-breaking dynamics into predictive models.

State-of-the-art monitoring equipment, including LIDAR, drones and stereoscopic cameras, will be deployed to provide unprecedented data on coastal wave breaking under diverse conditions. Machine learning models trained on these observations will be integrated into climate models, addressing biases and enhancing the accuracy of future climate predictions. "This pioneering approach builds on recent successes in embedding machine learning into climate modelling, promising more realistic projections at a fraction of the computational cost," says Serge Guillas, principal investigator for WAVECLIM, from UCL. "The work is expected to yield transformative insights into how coastal processes influence global climate systems, especially in the face of rising sea levels and increased storm activity."

Through this collaboration, the partners hope to address critical knowledge gaps, paving the way for improved representation of coastal seas complexities in the next generation of climate models.

Climate change reshuffling species 'like a deck of cards'

A new study by an international team of researchers has found that rapid temperature changes due to climate change will have a doubly detrimental impact: destabilising animal and plant populations both on land and in aquatic environments. In the *study, in Nature*, the researchers found that changing temperatures, either warming or cooling, drive changes in the composition of species in an ecosystem. The results also suggest that behavioural adaptation and changing species interactions are not enough to preserve species composition in the face of higher rates of temperature fluctuations.

An intertidal species assemblage in Unst, Shetland, UK. Species are being rapidly replaced in assemblages like this as temperatures change around the world. Photo: Michael Burrows/SAMS

Prof. Michael Burrows of the Scottish Association for Marine Science (SAMS) in Oban, one of the report authors, said there were now very clear warning signals about the effects of climate change on the natural environment and urged global leaders to take note. "How the composition of communities of animals and plants changes with temperature is really important to allow us to better plan conservation and adaptation strategies in the face of rapid climate change," said Prof Burrows. "This study shows that, despite the complexity of the natural world, a clear signal of the effects of warming is evident, and shouldn't be ignored."

Unlike marine species, those on land can often move short distances to find new locations that better suit their temperature needs. Though this can help mitigate the effects of temperature change, this research finds that terrestrial creatures are still susceptible to destabilisation and replacement due to temperature change. In their paper, the researchers focus on the rates of species replacement which refers to the loss and gain of species over time. While this happens naturally, they found that the rate of replacement is increasing due to faster temperature changes. If that trend continues, species could be lost and ecosystems could begin to break down, the study concludes. The most effective ways to avoid these outcomes are to avoid further global

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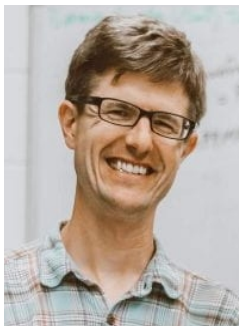
warming, preserve landscapes with a diversity of temperatures, and reduce the alteration of natural environments. Benefits could include more abundant wildlife, clean water, and clean air.

"It's like shuffling a deck of cards, and temperature change now is shuffling that deck faster and faster," said the study's lead author Malin Pinsky, Associate Professor at UC Santa Cruz. "The worry is that eventually you start to lose some cards. Temperature affects everything from how fast the heart beats to how flexible and porous our cell membranes are; from how much food animals eat to how fast plants grow. Temperature is in many ways the metronome for life."



The researchers also found that species in ecosystems with less-varied habitats were more sensitive to temperature change than those with more diverse temperatures nearby, such as taking shade from the sun in a forest. Living near these temperature escapes allows organisms to move nearby for relief, rather than going extinct or being replaced entirely. Understanding the differing needs of species living in more or less varied environments can help society identify which ecosystems need the most attention and protection, the study concludes.

Importantly, the researchers found that human impacts like land use, pollution, and introduction of invasive species exacerbate the impacts of temperature change on species replacement. This is possibly due to human activity reducing the diversity of landscapes and increasing stress on species that are already near their temperature limits. Main funders for the study, "Warming and cooling catalyse widespread temporal turnover in biodiversity," include the National Science Foundation, iDiv, and the Helmholtz Institute for Functional Marine Biodiversity.

VIEWS

Sonardyne launches SPRINT-Nav DP; revolutionising shallow water dynamic positioning technology

Sonardyne, a leading provider of pioneering marine technology, today announced the launch of its new shallow water dynamic positioning (DP) reference system. Building on the company's decade-long expertise in hybrid acoustic-inertial navigation systems, SPRINT-Nav DP integrates high-grade inertial navigation with doppler velocity log (DVL) technology in a single, pre-calibrated unit. The system joins Sonardyne's renowned SPRINT-Nav family, which has become the standard for underwater vehicle navigation worldwide.

Developed in response to SPRINT-Nav customer's requests and an increasing demand for shallow water DP operations from the offshore wind farm sector, SPRINT-Nav DP has undergone extensive trials and validation tests to ensure it maintains the mandatory class requirements as an alternative position reference into a vessel's DP system. SPRINT-Nav DP provides accurate and reliable positioning without the need for a GNSS signal. This makes it ideal for a wide range of shallow water operations, including offshore renewable energy and nearshore work where GNSS signals are often spoofed, blocked or distorted by nearby structures.

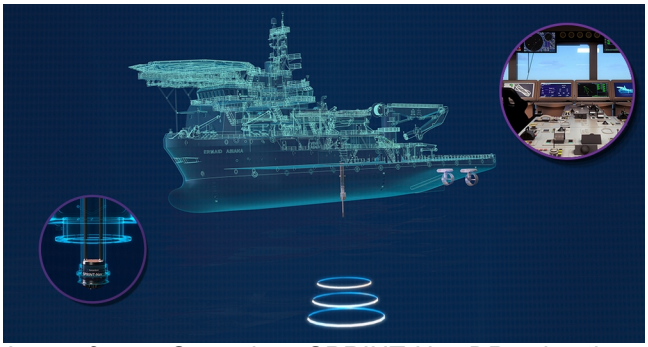


Image from a Sonardyne SPRINT-Nav DP animation

This latest addition to the SPRINT-Nav family also saves DP vessel operators both time and money. The DVL bottom-lock technology, effective up to 230m depth, means there is no need to deploy sensors or other equipment as the seabed itself is used as the positioning reference. Factory pre-calibration means that SPRINT-Nav DP is operational as soon as the

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vessel arrives on site. "SPRINT-Nav DP represents a leap forward in shallow water vessel positioning," said Duncan Rigg, Business Development Manager, Vessel Systems, at Sonardyne. "By removing GNSS dependencies, we're enabling operators to work more efficiently and dependably in challenging environments. Many existing customers had asked about using their SPRINT-Nav's for dynamic positioning and we are delighted to introduce SPRINT-Nav DP to enhance their operations."

Marine Science and Technology Business Person of the Year Award 2025

Every other year at Ocean Business the Marine Science and Technology Group Council (MSTG) hand out their MSTG Business Person of the Year award. Therefore, nominations are now invited for the 2025 Award to be received no later than 28th February 2025. The Business Person of the Year Award recognises individuals who demonstrate outstanding entrepreneurial spirit, strategic business thinking and are regarded as leaders in their field. This Award also acknowledges and celebrates the personal and generous contributions by a Business Person and the difference their involvement makes to the Marine Science & Technology (MST) community overall. Individuals entering into this category can be self-employed or employed by a business.

Previous winners of the award have been Versha Carter (Intelligent Exhibitions), John Partridge (Sonardyne International), Matthew Quartley (Valeport), Ralph Rayner (BMT Group), Brendan Hyland (WFS Technologies), Keith Birch (National Oceanography Centre), Roger Scrivens (RS Aqua), Dan Hook (ASV), Claire Cardy (Nortek), Terry Sloane (Planet Ocean) and Geraint West (Sonardyne). All of whom have exemplified the spirit of this award through their flair, innovation and business acumen. The SMI MSTG Council will review all nominations and will consider:

- The nature and extent of the personal contribution by the nominee to the MST business community
- The nature and extent of the personal contribution by the nominee to the MST community at large
- Their demonstrated ability to overcome challenges, drive business growth and foster innovation

The award will be presented on 8th April at Ocean Business 2025.Please use this form to nominate a candidate for the award.

SALTS

Expedition Opportunity to the Pitcairn Islands

In September 2025, the MV *Silver Supporter* will be travelling from Pitcairn Island to the outer island(s), Henderson Island (first priority) and Oeno Island (second priority). The Blue Belt Programme will be looking to undertake a range of scientific research projects in these remote and untouched waters. The location will be dependent on sea and weather conditions at the time of the expedition and applications should be flexible to accommodate either or both destination(s), where feasible.

We currently have three berths available on the vessel which we would like to offer out to universities both in the UK and New Zealand. The Government of the Pitcairn Islands also have three research grants of £10,000 each to support travel costs and the analysis of the data collected during the expedition.

The Pitcairn Islands Marine Protected Area (MPA) is one of the largest and continuous no-take MPAs in the world. The four islands within the group are some of the best examples of untouched subtropical coral atolls with healthy and diverse coral reefs within the shallows. The exceptional water clarity around the islands also means that these corals grow to depths unseen throughout much of the world (over 100 m deep). The waters are home to numerous species of sharks, turtles, corals, and reef fish. Read more about this opportunity here.***:- Marine Alliance for Science and Technology Scotland (MASTS)***

Potential Availability of NERC Ship Time During the 25/26 Programme Year

The NERC Marine Facilities Programme for 2025/2026 for the RRS *Discovery* and the RRS *James Cook* has been published on the Marine Facilities Planning website. The RRS *Discovery* programme currently contains a 79 day alongside slot between the 2nd of November 2025 and the 19th of January 2026, which is available for science delivery if funded science projects can make use of this time. Due to the

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location of the vessel, the ship is most likely to be able to deliver fieldwork in the North and East Atlantic regions. Some support for science capability within the National Marine Equipment Pool is potentially available, although there is no capacity for use of autonomous vehicles or remotely operated vehicles. Any fieldwork within Exclusive Economic Zones (EEZs) will need the appropriate diplomatic clearance submitted to coastal states at least 6 months in advance, and to NMF with sufficient lead time for processing via the FCDO. If interested in making use of this ship time, please contact NERC Marine Planning (marineplanning@nerc.ukri.org) ASAP to start discussions.

CALENDAR

26th-27th February 2025: The first OCEAN DECADE International Coastal Cities Conference

Qingdao, China

Coastal cities are among the fastest-growing human settlements in the world. They are on the frontline to benefit from the growth of a sustainable ocean economy, but also to face escalating threats from climate change, ocean pollution, and other environmental risks. The Ocean Decade presents a unique opportunity to harness ocean science and knowledge to address these challenges, enhance the resilience of coastal cities to global change, and improve the living conditions and well-being of their inhabitants. Happening ahead of the 2025 United Nations Ocean Conference, this event will accelerate the co-design of ocean science for the sustainable development of coastal cities. Join us to build a better ocean for better cities.

26th-28th February 2025: 4th annual Socio-oceanography Workshop

Southampton, UK

The National Oceanography Centre (NOC) is calling on scientists and researchers to participate in its fourth annual Socio-Oceanography Workshop, hosted in collaboration with the Marine Social Science Network. This international event will gather experts across natural and social sciences to tackle the pressing issues linking people and the changing ocean.

This year's workshop will focus on four key themes, including the impact of climate change-driven shifts in marine species distribution and how these changes will affect the way the UK marine environment is perceived, valued, and managed. Other topics include integrating digital humans into environmental digital twins, addressing biases in research related to marine carbon dioxide removal, and exploring how local communities can engage in participatory environmental monitoring.

The workshop is limited to 50 people, with social sciences participants, in particular, being encouraged to apply, to help grow the number of specialists from this discipline engaging with socio-oceanography. Outputs from the workshop include research papers and funding proposals to help address the learnings, identified gaps and further knowledge.

Outputs from this year's workshop, held in March, continue with a recent publication addressing marine heatwaves, particularly in the UK where there is currently little awareness of their potential impacts, ecologically and societally. Find out more here.

25th-27th March 2025: The 4th Ocean Visions Biennial Summit.

Vancouver, Canada

We're thrilled to announce that the 4th Ocean Visions Biennial Summit 2025 will be held in March in Vancouver, Canada. This action-oriented event will bring together scientists, policymakers, innovators, funders, students, and others to explore solutions and strengthen partnerships to help restore our ocean and stabilize the climate. We invite you to be part of the movement. Join a multidisciplinary community focused on advancing solutions to the ocean's most pressing challenge, climate disruption.

Programming will be highly interactive and include ample opportunities for collaboration. Participants can look forward to:

- ***Sharing & Learning****:* Gain insights from inspiring keynote speakers and panel discussions on the forefront of ocean-climate research and innovation.
- ***Workshops****:* Dive deeper with fellow attendees on challenges and issues of mutual concern.
- ***Networking****:* Connect with leading experts, industry pioneers, and decision-

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makers shaping the future of ocean-climate health through time devoted to building and strengthening relationships.
- ***Collaborating****:* Forge partnerships and collaborations to accelerate the impact of your work in ocean-based climate solutions through interactive, action-oriented sessions and activities.

We're excited to announce that registration for the Ocean Visions Biennial Summit 2025 is now open. The Summit is designed to be highly interactive. A diverse set of session types and events will engage scientists, policymakers, innovators, funders, students, and others around innovative approaches and solutions to restore our ocean and stabilize the climate. The Summit will also help build and strengthen the multisector partnerships that are needed to make complex solutions real**.** Register Now and contribute to the Program.

The Summit is designed to welcome and engage a multidisciplinary community. The event will feature a mix of session types as well as ample opportunities to collaborate. Summit participants will share and discuss cutting-edge advancements in ocean sciences, engineering, policy, governance, and economics, and coordinate action on key priorities to advance innovative solutions for ocean-climate restoration. We invite you to be part of the movement. Help us advance solutions to the ocean's most pressing challenge, climate disruption.

8th-10th April 2025: Ocean Business 2025.
Southampton, UK
Countdown for Ocean Business as registration opens. The global ocean technology community will gather again at the National Oceanography Centre in Southampton. Over 5,000 visitors are expected from around the world for the must attend Ocean Business 2025. Discover the newest innovations in marine autonomous systems and find solutions to transform your business in 2025. Connect with thousands of the industry's brightest minds and share ideas to help define the future of ocean technology. Explore the full Exhibitor List and start planning what stands you don't want to miss.

The Ocean Business Training & Demonstration programme has launched. This year's line up is bigger than ever. Experience 180-plus hours of new technologies demonstrated in the dockside waters, onboard vessels, in a purpose built test tank, and in the classroom.
- Observe cutting edge sensor technology close up
- Meet the top industry innovators displaying the latest in underwater monitoring
- Discover the next generation ROVs in action
- See ground-breaking advances in navigation technology

27th April - 2nd May 2025: European Geophysical Union General Assembly.
Vienna, Austria
The EGU General Assembly 2025 brings together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary, and space sciences. The EGU aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geoscience.

The Provisional Programme is online. Prepare your calendar with all the EGU25 important dates by checking our Deadlines and Milestones page. Curious about who organizes the EGU25 General Assembly? Meet the Programme Committee.

13th-16th May 2025: IMBeR future Oceans 3
Shanghai, China
IMBeR (Integrated Marine Biosphere Research) approaches the conclusion of its transformative journey (2016–2025) and is excited to host the IMBeR Synthesis and Future Planning Conference (Future Oceans3, FO3). This pivotal event will bring together IMBeR's diverse science teams, representatives from international organizations, policymakers, and early career researchers to reflect on the past decade-long achievements, share rich collaborative experiences, and shape the future of marine biosphere research.

IMBeR organizes the FO3 around three major themes:
- Looking Inward: Reflecting on IMBeR's scientific achievements over the past decade (2016-2025).
- Looking Outward: Reviewing IMBeR's interactions with relevant scientific projects, programs, organizations, and initiatives.

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- Looking Forward: Envisioning the future of marine biosphere research post-IMBeR.

IMBeR Synthesis and Future Planning Conference (Future Oceans 3) is an endorsed United Nations Decade of Ocean Science for Sustainable Development activity. IMBeR invites prospective participants to submit abstracts for the following sessions. The organizing committee will select submissions for oral or poster presentations within the available time and space. Plenary sessions and poster presentations will enable participants to engage with broader themes and network with colleagues beyond your selected session. Visit the web site, choose a session and submit an abstract by 20th March 2025.

28th-29th May 2025: The MARTECH Workshop 2025
Pasaia, Spain
The Martech Workshop 2025 is an excellent platform for showcasing innovations and collaborating with marine technology experts. MARTECH 2025 is organized by the Marine Technologies team of AZTI located at the Pasaia AZTI Headquarters and the Universitat Politècnica de Catalunya (UPC – SARTI). Further details about the workshop are available on their website: http://www.martech-workshop.org/.

4th-6th June 2025: The One Ocean Science Congress
Nice, France
The One Ocean Science Congress will feature a mix of plenary sessions, including opening and keynote speeches, alongside parallel oral and poster presentations. The One Ocean Science Congress is organised by CNRS and IFREMER and it is a special event of the 3rd United Nations Conference on the Ocean Endorsed by the United Nations Decade of Ocean Science for Sustainable Development. Please see more information on their website: https://one-ocean-science-2025.org/home.html

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.

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) 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,

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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. Abstract submission now open. For further information and submission form 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 in person (remote attendance TBC), hosted by Will Reid at Dove Marine Lab on the outskirts of Newcastle. More information about the meeting will be circulated in the New Year.

15th-18th September 2025: The ICES 2025 Annual Science Conference
Klaipeda, Lithuania
The ICES (International Council for the Exploration of the Sea) have released a call for abstracts for their 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. The call for abstracts closes on 17th March 2025 and is accepting oral, poster, and pre-recorded presentations.

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. Take advantage of the Early-Bird rate, register by April 1st and save 300 CHF.

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.

Governments, universities, companies, research institutions, organizations, associations and others are invited to submit Session proposals for the 2025 Arctic Circle Assembly. The deadline for submitting proposals is 23:59 on May 1st, 2025, Alaska Standard Time (AKST).

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, Antarctic and

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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.

The CSMS email address is challenger.society@gmail.com. Contributions for next month's edition of Challenger Wave should be sent to: john@myocean.co.uk by the 28th February.

JOBS and OPPORTUNITIES

Opportunities at SAMS (Scottish Association for Marine Science)

MRes Marine Science

New Masters by Research programme | Details

ACES-STAR

Erasmus Mundus Joint Master Degree in Aquaculture, Environment and Society- STAR | Details

Finance Business Analyst Manager

Open-ended | Closing date 25/02/2025 | Details

Vessel Skipper

Open ended | Closing date 21/02/2025 | Details

Senior PDRA in Marine Social Science

Fixed term - until 13/02/2028 | Closing date 14/03/2025 | Details

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There are jobs in the MASTS newsletter

New vacancies:

Visit our Vacancy Webpage to find all the positions listed below.

- Post-doctoral fellowship – Interdisciplinary School for the Blue Planet (ISblue) – 31/03/25
- Senior/Principal Marine Mammal Consultant – Royal HaskoningDHV – 28/02/25
- Finance Business Analyst Manager – Scottish Association For Marine Science – 25/02/25
- Deputy Director of Natural Resources -Falkland Islands Government – 16/02/25

Still open vacancies:

- Senior Marine Bioacoustician – Scottish Government's Marine Directorate – 16/02/25
- Vessel Skipper – Scottish Association for Marine Science – 21/02/25
- High Seas Alliance MPA Coordinator – High Seas Alliance – 21/02/25

PhD Opportunities:

- Bridging the divide between distant water fleets and coastal communities in the biggest unregulated fishery in the world. University of St. Andrews & Newcastle University PhD Opportunity. More here.

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