March 2023

Challenger Wave

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

NEWS

PML leads the science on the world's first co-located seaweed and offshore wind farm

The PML (Plymouth Marine Laboratory), www.pml.ac.uk/, is to provide independent analysis for the Amazon-funded North Sea Farm 1 project. Scientists at Plymouth Marine Laboratory (PML) are investigating the potential climate change mitigation benefits of farming seaweed alongside offshore wind arrays.

Seaweed is known to absorb large quantities of CO_2 but the extent of its viability for carbon removal at industrial scale is yet to be determined. For 'blue carbon' ecosystems such as mangroves, seagrasses or salt marshes, carbon is sequestered into mud or sediment in the immediate environment – as the plants grow and die, their decomposing matter is absorbed into the ground below. Seaweeds, by contrast, grow in rocky and exposed areas, making the carbon sequestration process much more difficult to track as the seaweed detritus is constantly released into the ocean, sequestering at sites on the seafloor and at unknown locations in the deep ocean.

As part of an innovative €1.5 million project, funded through Amazon's Right Now Climate Fund, a team of scientists from PML is seeking to establish the role offshore seaweed farming could play in capturing and storing carbon in future. Delivered alongside North Sea Farmers (NSF), an international not-for-profit seaweed farming membership organization, North Sea Farm 1 is a first-of-its-kind seaweed farm located amongst offshore wind turbines. It is hoped the project, and the research it generates, will enable a far greater understanding of the natural processes involved in the seaweed carbon cycle and the ability to track detritus and locate where carbon may be stored for the long term, in the deep ocean and seafloor. Ultimately, North Sea Farm 1 could provide a blueprint for how such farms coupled with seafloor conservation measures could be used for larger-scale capture carbon in future.

Senior Marine and Climate Change Ecologist at PML Dr Ana Queirós is leading the research. She said, "I'm very excited about this project and the knowledge gap it seeks to address. The carbon dioxide removal potential of the seaweed industry remains unproven and the challenge is to understand how seaweed can be used for carbon sequestration over the long term. There is a lot of interest in the growth of the industry but we need to have the evidence to determine the genuine Blue Carbon value of these habitats. PML is at the forefront of science to understand the seaweed carbon cycle and I'm delighted to be working alongside North Sea Farmers who have one of the most advanced seaweed farming operations in the world."

Zak Watts, Director EU Sustainability at Amazon said, "Seaweed could be a key tool in removing carbon dioxide from the atmosphere, yet it's currently farmed at a relatively small scale in Europe. We're delighted to fund this project to help us reach a greater understanding of its ability to help fight climate change". During its first year of operation, Sea Farm 1 will focus on testing and improving the farm's production performance. The farm will make the most of the space between wind turbines and if successful it is thought this could be scaled across the North Sea, which has an estimated one million hectares of space available within existing wind farms.

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Eef Brouwers, Manager of Farming and Technology at North Sea Farmers said, “Potentially, up to 85,000 full-time jobs could be created in the European seaweed sector by replicating North Sea Farm 1 across the North Sea, re-purposing the space amongst wind farms. These jobs would not only be in the farming process but also in the production and sales of seaweed-based products”. Other partners involved in the project include: Deltares and Silvestrum Climate Associates, seaweed product manufacturers Algaia and maritime contractors Van Oord. For more information, please visit: https://pml.ac.uk/News/PML-leads-the-science-on-the-world%e2%80%99s-first-co-loca.

Departing remarks from the Director General of CIESM, The Mediterranean Science Commission

I shall step down next summer from the position of Director General of your Commission. That decision, known to close circles since 2020, had to be delayed somewhat due to the circumstances, as I was gently pressured to stay on-board a bit longer to try to 'manage' (poor word) the chaotic consequences of a devastating pandemic. By way of this message, I announce that the international search for a talented successor is now officially open: you will find here the profile of the job which will soon be published in Nature as well, ciesm.org/news/DG_vacancy.php. The selection process will be entirely managed by the international Advisory Board of the Commission, with due attention to scientific excellence and proven intercultural sensibility.

I am immensely grateful for the opportunity to have served as DG of this unique Organization for 30 years. It has been quite a journey. During this extended period the support of CIESM Member Governments never failed me, perhaps my proudest success considering that a number of countries do not even talk to each other. As I look back on my time as Director of the Commission, I am filled with a sense of accomplishment for what we have together achieved, ciesm.org/about/mission/index.htm. Note here that 'together' is not a mere stylistic formula. Firstly, as I lean on a tight group of collaborators at headquarters who constitute a team, highly skilled, of multi-task, exceptional individuals. Next, through our brainstorming Workshops, our Congresses, I have met original, brilliant intellectuals from all corners of the Mediterranean/ Black Sea region, called later to join our Science Council or a CIESM Program, where their creativity did wonders.

I would not have lasted so long in this 'exposed' position without the personal trust that two successive Princes of Monaco (the host country of the Commission) vested in me. Their support for the idea of an independent, non-aligned, science-based Commission never flinched. That was quite a novelty at the time, and it remains so today.

Years have passed. Things were never that easy in the face of a limited budget, the price of our independence, but the lessons were many. Not only did I learn a great deal, but I come out of this with a strong conviction: what we need in these troubled times is more humanity & more science in governments, and less bureaucracy & less government in science.

I have trust in CIESM bright future, warm wishes to you all, and many thanks for the journey, Frederic. ***- Frederic Briand, Director General, The Mediterranean Science Commission, CIESM***

Whale-spotting scientists chart blue whale behaviours

Video and photography have revealed tantalising glimpses into the lives of Antarctic blue whales and spurred the development of automated ways to detect these critically endangered ocean giants. The research, doi.org/10.3389/fmars.2023.1087967, led by scientists from SAMS, the Australian Antarctic Division and National Oceanic and Atmospheric Administration, measured the movement and behaviour of Antarctic blue whales in fine detail. This included dive times, blow rates, swim speeds and broadscale movements, using ‘photogrammetric’ (video-based) tracking and photo-identification.

The team, including SAMS Fellow Susannah Calderan, surveyed locations off East Antarctica,

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between the Dumont D'Urville Sea and the Ross Sea, during three voyages in 2013, 2015 and 2019. The 2013 voyage was the first time they had used passive acoustic instruments to find Antarctic blue whales by listening for their sounds. The instruments allowed the scientists to detect and track these rare and elusive animals from hundreds of kilometres away and get close enough to study them in fine detail. Once the team spotted a blue whale or a group of whales, their ship remained at a distance while they videoed the animals, typically for an hour at a time.

Dr Susannah Calderan deploys an acoustic instrument to track blue whales by listening for their sounds, during the 2015 Antarctic blue whale voyage. (Photo: Dave Allen)

Ms Calderan said: "We wanted to gain as much understanding as possible about the behaviour of the whales in their natural state, before we moved close enough to take photos for identification. By measuring them very precisely we're able to get an indication of whether animals are feeding or just moving through the area, and pick up patterns of movement and behaviour."

The video tracking data allowed the team to measure the precise location of the whales each time they surfaced, how often they took a breath (blow rates), how fast they swam and where they went. The whales' dive behaviour comprised a sequence of short dives averaging 17.6 seconds each, followed by a long dive of, on average, three minutes. Blow rates showed the animals breathe about 60 times an hour. The whales' average swimming speeds varied between about 3.2km/hr and 6.6 km/hr, with the fastest speed detected at almost 15 km/hr. These were considerably faster than speeds measured in other blue whale populations in New Zealand, Sri Lank and California.

The video dataset collected on the three voyages is now being used to develop artificial intelligence (AI) to detect whales at sea during noisy operations, such as offshore oil and gas surveys and wind-farm construction. The AI will reside within camera systems mounted on ships that can scan a 360-degree view of the ocean and detect blows from whales during the day and night. The research team said the study illustrates the benefits of applying technology in innovative ways, to learn more about an animal that has proved difficult to find and study using survey and sighting techniques that work well with other whales and species.

Experts assess ecological risks to UK overseas territories

A new study has for the first time predicted which invasive species could pose a future threat to the UK's ecologically unique Overseas Territories. The 14 Territories, many of them small, remote islands such as St Helena and Pitcairn, are home to species found nowhere else in the world. This makes them extremely vulnerable to biological invasions, in the oceans or on land, which could lead to the extinction of these endemic species or irrevocably change their unique ecosystems.

A team of experts led by the UK Centre for Ecology & Hydrology (UKCEH) and Durham University, which included Prof Elizabeth Cottier-Cook of SAMS (Scottish Association for Marine Science), worked in partnership with communities in the Overseas Territories and assessed thousands of potentially invasive non-native species. The team then predicted which species are most likely to arrive and impact these environments within the next 10 years. Prof Cottier-Cook led the marine working group, investigating non-native marine invasive species. The resulting research, published in the journal 'Conservation Letters', doi.org/10.1111/conl.12928, provides a reference for authorities, conservation ecologists and the public to guide them in preventing these invasive non-native species from becoming established and causing ecological and economic damage.

UKCEH ecologist Professor Helen Roy, who led the work, says, "these territories are exceptionally biodiverse. St Helena, for example, has over 400 invertebrates found nowhere else in world, it is simply unique. We hope that this study draws attention to these Overseas Territories and the inspiring people on them who

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are working so hard to protect their incredible wildlife and habitats."

To produce the list, experts from each UK Overseas Territory collaborated with the wider project team of experts from around the world to predict which invasive non-native species were likely to arrive, establish and impact on biodiversity, ecosystems, human health and the economy within the next 10 years. The report also examines how the species are most likely to arrive, with shipping containers identified as a key route for many animal species. Gibraltar and Saint Helena are threatened by biological invasion from the greatest number of species overall. St Helena is most at risk from a high number of plant species, while the Falkland Islands and Tristan da Cunha are threatened by the most marine invasive non-native species.

As a result of the work by Prof Cottier-Cook's marine team, two of the three highest risk non-native invasive species are ocean-based. The highest ranked, by threat level, is the green mussel (*Perna viridis*). It can 'hitchhike' around the world on ships and boats, and form dense colonies in places where it establishes, outcompeting other species by, for example, reducing levels of phytoplankton, a key component of aquatic ecosystems. Ranked third on the overall list is the Pacific oyster.

British Indian Ocean Territory was one of the locations assessed by the expert group

Prof Cottier-Cook said: "Leading the marine working working group and being able to work with people involved in the Overseas Territories was a real thrill and I hope our work will go on to make a real difference to marine planning in these parts of the world. The marine species identified were ranked overall as a considerable threat when we looked at biodiversity, the economy and health in these often isolated communities."

Ecologists and other experts on the UK Overseas Territories are aware of the challenges of invasive non-native species and in many cases have robust biosecurity measures in place, but Professor Roy hopes that the report will draw attention to their vital work. Professor Roy added, "Preventing the introduction of invasive non-native species is key, because management of species that have established and spread is often extremely expensive and in some cases there are no options available. We hope that this list will help inform action, including supporting biosecurity activities, to safeguard the wildlife in these precious places."

SAMS Director welcomes landmark ocean treaty

The Scottish Association for Marine Science's (SAMS) Director, Prof. Nicholas Owens, has welcomed a landmark international treaty designed to safeguard marine life in the international waters that lie outside of any country's jurisdiction. Known as the UN High Seas Treaty, the agreement has forged the framework necessary to set up protected areas to guard against risks from overfishing and potential deep sea mining.

Encompassing around 60% of the world's oceans, the so-called high seas are home to diverse ecosystems and marine life, much of which is yet to be discovered. However, as these regions are outwith any national jurisdiction, they have been largely unprotected from human exploitation and environmental impacts. The new treaty was agreed in New York on Sunday 5th March by 190 countries, after nearly two decades of diplomatic wrangling, but has still to be ratified.

Prof Owens, who is also chairman of the Partnership for the Observation of the Global Ocean (POGO), said: "This is a fantastic step forward for the future preservation of our ocean environment and I congratulate everyone who had a role to play in its development. "The real test now is to see how the treaty will be implemented. Can we take advantage of this great example of global citizenship and translate this agreement into action? We need to look around the world at globally important initiatives that have proven to be effective in bringing about progress. We can learn from these initiatives,

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such as the Antarctic Treaty. There is still much to do and to agree on. For example, if 30% of the world's ocean is not going to be fished, how is that policed? I am, however, optimistic that we are on track to address one of the most pressing issues in global environmental protection."

While the treaty heralds broad agreement in principle, there are still question marks over potential profits gained from marine resources, and where and how marine protected areas will be established. Find out more here, news.un.org/en/story/2023/03/1134157.

2024 UN Ocean Decade Conference

Three years after the start of the UN Decade of Ocean Science for Sustainable Development (2021-2030), oceandecade.org/, a global conference will bring together the Ocean Decade community and partners to celebrate achievements and set joint priorities for the future of the Decade. Hosted by Spain and co-organized with UNESCO's Intergovernmental Oceanographic Commission (IOC/UNESCO), the 2024 UN Ocean Decade Conference will take place on 10th-12th April 2024 in the coastal city of Barcelona. It will be a 3 day, in-person event co-led with a range of partners: Government of Catalonia and the Barcelona City Council through the Barcelona Capital Náutica Foundation, and the Spanish National Ocean Decade Committee, which is led by the Ministry of Science and Innovation through the Spanish Research Council (CSIC).

The Minister for Science and Innovation, Diana Morant, welcomed the fact that this conference is taking place in Barcelona, "It strengthens Spain's commitment to the blue economy and sustainable development of the ocean and, furthermore, confirms our country's position in marine sciences."

"Catalonia has a long tradition as a centre of marine research and ocean science and as a maritime hub, with a strong commitment to sustainability. This synergy with the vision of the Ocean Decade makes Catalonia and Barcelona an ideal location for the first in-person convening of the global Ocean Decade community since its start in 2021," said Roger Torrent, Minister of Business and Labour at the Generalitat of Catalonia.

"It is an honour for the city of Barcelona to host a conference of such relevance for our planet. We are a city of the sea, and the sea is in our identity, culture and economy. Barcelona has adopted a Blue Economy strategy which promotes the creation of companies and quality jobs, in line with environmental sustainability," added Laia Bonet, Third Deputy Mayor of Barcelona.

The conference will be a key moment for governments, leaders, maritime sectors, philanthropy, universities, private sector, NGOs and more, to take stock of the achievements of the first three years of the Ocean Decade and define a collective vision for the coming years. Participants will benefit from concrete examples and best practices in ocean science to deliver "the science we need for the ocean we want".

A key outcome of the 2024 UN Ocean Decade Conference will be the publication of a set of white papers related to the 10 Decade Challenges, oceandecade.org/challenges/, that will identify future priorities for the Ocean Decade to generate the knowledge needed for science-based solutions related to global challenges, such as climate change, food security, biodiversity conservation, sustainable ocean economy, pollution and natural hazards.

A number of related high-level national and international events will take place before and

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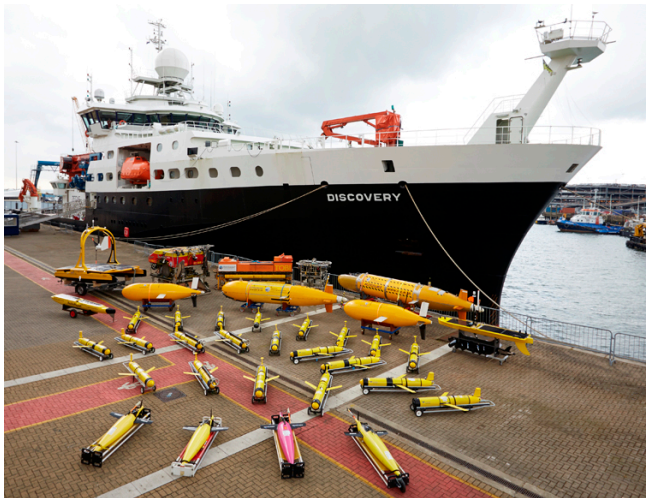
after the main conference and there will also be scope for partners to propose and lead side events, exhibitions and networking events relevant to the conference themes on the days before the conference and in the sidelines of the conference itself.

"We are very pleased to be working hand-in-hand with Spain to bring this important milestone of the Ocean Decade to life," said Vladimir Ryabinin, Executive Secretary of IOC/UNESCO. "The conference will be an incredible opportunity for actors from around the world to collectively reflect on the use of science and knowledge for the sustainable management of the ocean, and in turn pave the way for the future of the Decade". More details about the programme, registration process and calls for proposals for side events will be available soon. If you would like to receive updates, please sign up here, www.surveymonkey.com/r/OceanDecade24_updates.

New members appointed to the Marine Facilities Advisory Board (MFAB)

We are pleased to welcome the following five new members to the Marine Facilities Advisory Board: Dr Gaye Bayrakci, National Oceanography Centre, Dr Veronique Creach, Centre for Environment, Fisheries, and Aquaculture Science, Dr Stephen Jones, University of Birmingham, Dr Gabriele Stowasser, British Antarctic Survey and Dr Michelle Taylor, University of Essex.



We are grateful to Professor Mike Elliott, University of Hull, Professor Kerry Howell, University of Plymouth, Dr Clara Manno, British Antarctic Survey, Professor Mark Moore, University of Southampton and Professor Nick Wright from Newcastle University for their expertise, commitment, dedication, skill and guidance throughout their term. For more information and links to MFAB, noc.ac.uk/files/documents/about/ ispo/MFAB new membership 2023.pdf.

Call for applications for the IMBeR ClimEco8 Summer School

IMBeR ZRS IMECaN

ClimEco8

Sustaining the ocean we need for the future we want

19-24 June 2023
ZRS-Mediterranean Institute for Environmental Studies, Koper, Slovenia

Call for applications for the
IMBeR ClimEco8 Summer School

Integrated Marine Biosphere Research (IMBeR) and its Interdisciplinary Marine Early Career Network (IMECaN), together with the host institute, ZRS-Koper, are thrilled to invite Masters and PhD students, and early career researchers from any discipline of marine science, to apply to attend its 8th ClimEco summer school. The theme of ClimEco8 is *Sustaining the ocean we need for the future we want*.

It will be held at the ZRS-Mediterranean Institute for Environmental Studies, in the port city of Koper in Slovenia. The aim of ClimEco8 is to help develop new marine researchers who will be at the forefront of addressing ocean challenges. We have an extraordinary group of internationally recognised experts, who will guide participants during the summer school, to develop strong theoretical and applied understanding of different marine science disciplines, and how they can be integrated to help generate solutions to the grand challenges facing the world's oceans. In addition to lectures, each day will also include workshops and practical sessions in topics such as science communication and how to operate effectively at the science-policy-society interface, so as to influence decision-making processes and help secure the ocean we need, for the future we want. There will also be a field trip.

The summer school will be delivered in English and participants (attendees and all the lecturers) attend every session, every day for the duration of the summer school.

Participants will selected based on their marine science discipline, career status, and geographic distribution. Applications from underrepresented groups are especially welcome.

For more information about the summer school and to apply to be considered as a participant, please click here.

The deadline for applications is 10 April 2023,
so apply now!

VIEWS

Royal Netherlands Institute for Research acquires new Teledyne Gavia Osprey AUV

Teledyne Marine announces the acquisition of a new Gavia Osprey AUV by the Royal Netherlands Institute for Sea Research (NIOZ). NIOZ is the Netherlands' national oceanographic institute conducting multidisciplinary applied marine research to address major scientific questions about our oceans and seas. NIOZ acquired the Teledyne Gavia Osprey AUV to add

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to its ever-growing fleet to be used in scientific projects, like understanding the significant impacts of climate change on the seas and oceans, such as temperature increase and acidification. NIOZ studies the ocean's role in changing climate from equator to pole, from the continental shelf to the deep ocean, and from present to past.

Today, the ocean environment is changing rapidly due to external pressures, which will affect the diverse but poorly understood ocean processes that play an essential role in marine ecosystems and our future climate. The Osprey AUV is Teledyne's latest member of its underwater vehicle family and provides customers like NIOZ with longer endurance and greater payload capacity while maintaining true modularity.

The Osprey AUV builds on the Gavia product line of the world's first truly open and modular AUVs. The Osprey extends operational endurance to over 24 hours (configuration dependent) combined with high-performance payloads like Synthetic Aperture Sonar and Teledyne Reson SeaBat series multibeams, making it the perfect tool for collecting high-quality data with consistency and accuracy.

"We are really looking forward to field operations and being a part of new developments with this most recent addition to the Teledyne Gavia AUV family. The Osprey will be a real modular AUV with a flooded payload bay that will allow us to interface and use our new in-house developed sensors. The Teledyne Osprey also makes logistics effortless because it can easily be moved around in Pelican cases." Said Marck Smit, NIOZ Sea Research.

Voyis Imaging Inc. Chosen as the Camera Package for HII REMUS Vehicles

Huntington Ingalls Industries (HII), hii.com/, is a global engineering and defense technologies provider and recognized worldwide as America's largest shipbuilder. With a 135-year history of trusted partnerships in advancing U.S. national security, HII serves customers in more than 30 countries. HII provides design, autonomy, manufacturing, testing, operations and sustainment of unmanned systems, including unmanned underwater vehicles (UUVs) and unmanned surface vessels (USVs). With the goal of further improving the autonomous capabilities of its vehicles, HII has selected Voyis Imaging Systems as the standard camera option for all REMUS UUVs (REMUS 100/300/620 and 6000).

Voyis, www.voyis.com, has developed the Recon UUV module, consisting of a highly advanced 4K stills camera and extremely efficient, high output external light bar, that enhances all REMUS platforms imaging capabilities in any operational situation. The Recon camera module offers extremely crisp stills imagery with on-the-sensor data processing for real-time, highly optimized datasets that improve in-mission autonomy and analysis capabilities. These enhancements include improving image quality using image undistortion, true color correction, and image light leveling for consistent, actionable datasets available in-mission.

With Voyis cameras, navies are capable of completing the identification stage of MCM (mine countermeasure) operations, and improve target localization for neutralization/recovery completely submerged using REMUS platforms, improving operational covertness and efficiency. The high

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resolution imagery captured with Voyis' Recon module provides increased confidence in subsea missions, ensuring REMUS customers receive safe, reliable, and efficient operations. To learn more about Voyis' Recon UUV payload, visit voyis.com/recon-payloads/.

SALTS

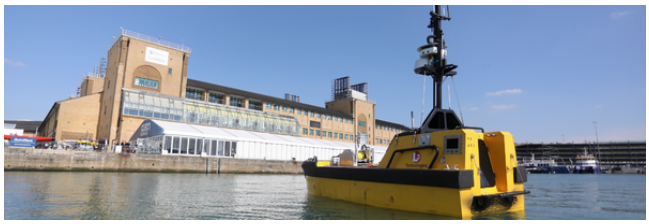
No news from sea this month I'm afraid

I know that this is a favourite section for many readers, where we get the inside information about life at sea, its thrills and spills. So please the next time you are at sea or carrying out any fieldwork, please remember that a simple paragraph or two will get you published here. – ***Ed***

CALENDAR

18th-20th April 2023: Ocean Business 2023

Ocean Business returns to the National Oceanography Centre, Southampton UK. Register for your free ticket, www.oceanbusiness.com/, to see, in person, the scientific and technological developments from the industry. Connect with thousands of the industry's brightest minds, and share ideas to help define the future of ocean technology.



Who will you meet at Ocean Business ? Are you looking for new ocean surveying equipment ?, or do you want to see the newest developments from an existing supplier ? A visit to Ocean Business can save you hours of research. Discover solutions from 300+ world leading manufacturers and service providers. You'll meet the teams behind the latest innovations in marine science, ocean sensors, geophysics, autonomous technologies, positioning & navigation solutions and many more.

Take a look at the full exhibitor list, exhibitor manual.oceanbusiness.com/, and start planning your visit to Ocean Business, www.oceanbusiness.com/, today. See the full demo programme here, www.oceanbusiness.com/training-and-demonstrations-programme-day-1/. It's free to attend so register for your ticket, we can't wait to see you in April.

23rd-28th April 2023: EGU General Assembly 2023

Vienna, Austria

The EGU General Assembly 2023 will bring back many of the features the EGU community enjoyed before the pandemic, including: orals, posters, and, PICO sessions, in a new hybrid format, as well as a wide variety of networking opportunities. At the same time, we are very keen to improve the experience for our virtual attendees, and are working hard to connect the virtual and on-site experiences as much as possible. Learn more about the planned format for EGU23 on our website, egu23.eu/about/meeting_format.html.

16th – 18th May 2023: 2023 Sustainable Management of UK Marine Resources (SMMR) Conference

Bristol, United Kingdom

Building on the success of our inaugural conference in 2022, this year's event will feature presentations, discussions, and workshops exploring the varied work underway in the SMMR programme, both from our funded project teams and across the SMMR Network. We invite you to register for the conference here, hopin.com/events/smmr-conference-2023. In-person and online tickets are available, with early bird options available until the end of March. Further details about the conference, including an agenda, will be published in due course.

4th-9th June 2023: ASLO Aquatic Sciences Meeting 2023, Resilience and Recovery in Aquatic Systems

Palma de Mallorca, Spain

Concepts of resilience and recovery do not only apply to aquatic ecosystems but also to societies when faced with disruptions and crises. Past events have shown that adaptability and decisiveness are important keys to resilience and recovery. Disruptions are opportune moments for setting up strategies for management and recovery. Faced with the COVID-19 pandemic, ASLO meetings have adapted by transforming the ASM 2021 Palma meeting to virtual with a positive attitude that in 2023 we will recover and

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meet in-person. Positivity is also an important factor. We do not dwell on problems, but we try to look for solutions and get united for whatever crisis we face.

We will incorporate the theme of resilience and recovery in aquatic systems into the plenary sessions. We look forward to having a dynamic meeting. This will be an in-person meeting, beginning on Sunday with an opening plenary and reception, then conclude on Friday, with the scientific program scheduled Monday through Friday. There will be a small virtual component for those unable to travel to Spain. The programme is available at www.aslo.org/palma-2023/.

26th–30th June 2023: MARE Conference People & the Sea XII, Blue Fear, navigating ecological, social and existential anxieties during the Anthropocene

Amsterdam, Netherlands

In addition to regular paper-based panels, we have encouraged panel proposals with innovative formats that stimulate interaction and dynamism. These include formats such as roundtables, workshops, brainstorm sessions, debates, artistic interventions, exhibition (virtual excursion), documentary film (photo essay/story) screenings with discussion, meet the author sessions, book presentations etcetera.

To present a paper in the MARE conference, the participant must be physically present in Amsterdam. Online participants can observe all conference sessions, but will not be able to present themselves. Please, regularly visit this page, https://marecentre.nl/, for updates and important information about the 12th MARE People and the Sea conference.

9th-14th July 2023: Goldschmidt Conference

Lyon, France

Let's Talk about #DEI @goldschmidt2023. Tell us about obstacles that contribute to the under-representation of marginalized groups in geochemistry, conf.goldschmidt.info/goldschmidt/2023/cfp.cgi.

10th-12th April 2024: UN Ocean Decade Conference

Barcelona, Spain

Three years after the start of the UN Decade of Ocean Science for Sustainable Development (2021-2030), oceandecade.org/, a global conference will bring together the Ocean Decade community and partners to celebrate achievements and set joint priorities for the future of the Decade. Hosted by Spain and co-organized with UNESCO's Intergovernmental Oceanographic Commission (IOC/UNESCO), it will be a 3 day, in-person event co-led with a range of partners: Government of Catalonia and the Barcelona City Council through the Barcelona Capital Náutica Foundation, and the Spanish National Ocean Decade Committee, which is led by the Ministry of Science and Innovation through the Spanish Research Council (CSIC).

The conference will be a key moment for governments, leaders, maritime sectors, philanthropy, universities, private sector, NGOs and more, to take stock of the achievements of the first three years of the Ocean Decade and define a collective vision for the coming years. Participants will benefit from concrete examples and best practices in ocean science to deliver "the science we need for the ocean we want". A key outcome of the 2024 UN Ocean Decade Conference will be the publication of a set of white papers related to the 10 Decade Challenges, oceandecade.org/challenges/, that will identify future priorities for the Ocean Decade to generate the knowledge needed for science-based solutions related to global challenges, such as climate change, food security, biodiversity conservation, sustainable ocean economy, pollution and natural hazards.

A number of related high-level national and international events will take place before and after the main conference and there will also be scope for partners to propose and lead side events, exhibitions and networking events relevant to the conference themes on the days before the conference and in the sidelines of the conference itself. More details about the programme, registration process and calls for

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proposals for side events will be available soon. If you would like to receive updates, please sign up here, www.surveymonkey.com/r/OceanDecade24_updates.

The CSMS email address is challenger.society@gmail.com. Contributions for next month's edition of Challenger Wave should be sent to: john@vectisenvironmental.com by the 31st March.

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JOBS and OPPORTUNITIES

Researcher in Physical Oceanography
Centre for Ocean and Atmospheric Sciences, School of Environmental Sciences, University of East Anglia, Norwich

Applications are invited for the post of Researcher in Physical Oceanography to undertake research into ocean processes in the Amundsen Sea, Antarctica. You will work with Professor Karen Heywood and Dr Rob Hall on the ERC-funded COMPASS project and the NSF-NERC-funded TARSAN project, a joint project between oceanographers and glaciologists to understand the behaviours of ice shelves, as part of the International Thwaites Glacier Collaboration (ITGC). You will investigate the oceanographic drivers of the basal melting of the Thwaites, Dotson and Getz ice shelves in the southern Amundsen Sea. Depending on your research interests, your analyses might exploit any or all of the following unique and exciting data sets collected during COMPASS and TARSAN:

1 Surveys of hydrographic properties, current velocity and turbulent mixing obtained under Dotson ice shelf from Autosub Long Range.
2 Ocean glider and ship-based hydrographic surveys across the Amundsen Sea and in front of Dotson and Getz ice shelves.
3 Moored time series beneath Thwaites ice shelf and in the Amundsen Sea.
4 Three years of seasonal hydrography from tagged seals in the Amundsen Sea.

You will collaborate with TARSAN and COMPASS colleagues in various US and UK institutions, and the University of Gothenburg. You will also collaborate with a biogeochemical counterpart to TARSAN, the ARTEMIS project. These international collaborations, together with the networking and early career scientist support provided by ITGC, offer an excellent opportunity to further develop your career. Although the data collection phases of TARSAN and COMPASS are now nearing completion, you will have the option to join UEA's ocean glider group and gain skills in operating and piloting the UEA Seaglider fleet.

You should have, or soon to be awarded, a PhD in physical oceanography (or equivalent independent research experience) and have led publications in scientific journals. You should have excellent communication skills and have presented results at conferences. This full-time post is available from 1st May 2023 or as soon as possible thereafter, for a fixed term period up to 32 months, it must end on 31st December 2025. UEA offers a variety of flexible working options and although this role is advertised on a full-time basis, we encourage applications from individuals who would prefer a flexible working pattern including annualised hours, compressed working hours, part time, job share, term-time only and/or hybrid working. Details of preferred hours should be stated in the personal statement and will be discussed further at interview. **Closing Date: Monday 3 April 2023**

Benefits include:
- 44 days **annual leave** inclusive of Bank Holidays and University Customary days (pro rata for part-time).
- **Family and Work-life balance policies** including hybrid working and considerable maternity, paternity, shared parental leave and adoptionleave.
- Generous **pension scheme** with life cover for dependents, plus incapacity cover.
- **Health and Wellbeing**: discounted access to sportspark facilities, relaxation rooms, 320 acres of rolling parkland, wellbeing walks, medical centre, Occupational Health and a 24/7 Employee Assistance Programme.
- **Campus Facilities**: sportspark, library, nursery, supermarket, post office, bars and catering outlets.
- Exclusive shopping **discounts** to help cut the cost of household bills, childcare salary sacrifice scheme, Cycle to Work scheme and public transport discounts.
- **Personal Development**: unlimited access to LinkedIn Learning courses, specialist advice and training from our Organisational Development and Professional Learning Team.

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There are jobs on the IMBER web site

http://www.imber.info

IMBeR Integrated Marine Biosphere Research

Jobs and opportunities

New

- Postdoc: Biology and trophic ecology, IFREMER, Brest, France. Apply by **13 March**
- Senior Lecturer: Fisheries Sciences, University of Namibia, Henties Bay, Namibia. Apply by **15 March**
- ICES Journal of Marine Science mentorship programme: Scientific writing. Apply by **17 March**
- PhD: Arctic Ocean Primary Production, University of Southern Denmark, Denmark, Apply by **17 March**
- ReMO Training course: Spain. 21-27 May. Apply by **20 March**
- Senior Fisheries Officer, Blue Ventures, Madagascar, Mozambique, Kenya or Tanzania. Apply by **26 March**
- Senior Fisheries Officer, Blue Ventures Timor-Leste. Apply by **26 March**
- Activities coordinator, Anthropocene Laboratory, Stockholm, Sweden. Apply by **31 March**
- Research assistant: Anthropocene Laboratory, Stockholm, Sweden. Apply by **31 March**
- Postdoc: "The intertwined biosphere" Anthropocene Laboratory, Stockholm, Sweden. Apply by **31 March**
- Postdoc: "The empirics of hope" Anthropocene Laboratory, Stockholm, Sweden. Apply by **31 March**
- Postdoc: Physical Oceanography and Biogeochemical Modelling, New York University, Abu Dhabi, United Arab Emirates. Apply by **31 March**
- Oppenheimer Scholarship: MSc in Global Sustainability Solutions, University of Exeter, Streatham, UK. Apply by **3 April**
- Call for applications: Simons Pivot Fellowships: Apply by **15 May**
- Postdoc: Development of decision-support tools for socio-ecological systems. AZTI, San Sebastian, Spain. Apply **now**
- Postdoc: Particle flux processes. Marine Biological Lab, Woods Hole, MA, USA. Apply **now**. Applications reviewed as submitted
- Assistant Prof – Tenure Track: Evolutionary processes in the ocean and feedbacks on Earth Systems. Rutgers University-New Brunswick, NJ, USA. Apply **now**
- Climate Science Coordinator, Ocean Conservancy, Washington DC, USA. Apply **now**

In case you missed it...

- 2023 Open call: NF-POGO Visiting fellowships for shipboard training. 3 February - 30 November. Apply **now**
- PhD/Postdoc: Ocean coupled physical-biogeochemical modelling. Liège University, Belgium. Apply **now** – open until filled
- PhD/Postdoc: Suspended particulate matter modelling. Liège University, Belgium. Apply **now** – open until filled
- Climate & Ecosystems Coordinator: NERACOOS, Portsmouth, NH,USA. Apply **now**. Open until filled
- Postdoc: Biogeochemical Oceanography, Princeton University, NJ, USA. Apply **now**. Open until filled
- Call for Proposals: International Teams in Space and Earth Sciences. Submit by **16 March**
- PhD: Predictive modelling for management. University of Tasmania, Hobart, Tasmania, Australia. Apply by **27 March**
- Science Director: International Science Council (ISC), Paris, France. Apply by **31 March**
- Associate/Assistant/Full Researcher: Oceans and Atmosphere, Scripps , California, USA. Apply by **1 May**
- 2023 Call for SCOR Working Group proposals. Submit by **12 May**
- Call for Nominations: Bina Agarwal Prize for Young Scholars in Ecological Economics. Submit by **15 May**

imber@imr.no

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