

Challenger Wave



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

NEWS

Challenger Travel Awards January 2022 round

In the most recent round of applications for Challenger travel awards we are delighted to announce three successful applications - two for the European Geophysical Union (EGU) 2022 in Vienna and one for the *Prochlorococcus* and *Synechococcus* Fest decade 2020 in Cordoba. They were all very good applications and will be awarded the funds they requested. Our congratulations to recipients Kirsty Black (St Andrews) and Thiago Monteiro (Edinburgh) for travel to EGU, and Lukas Marx (Portsmouth) for travel to ProSyn Fest 2020.

The National Oceanography Centre (NOC) comments on first ever global map of whale migration

Did you know that whales have a role in fighting climate change? This week, the NOC's Dr Xiaoyan Wei featured in a Sky News online report, following the release of the world's first ever global map of whale migration patterns, highlighting the importance of protecting whales.



Photo credit: Shutterstock -Earth theater -WWF

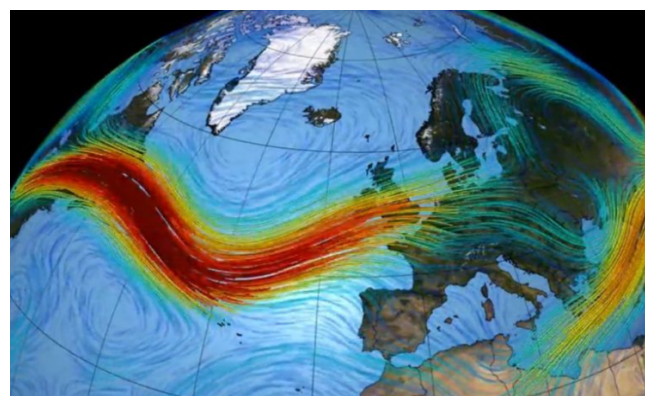
They are "helping us fight against climate change," said Dr Wei, because whales

themselves are huge storage units of climate-heating gas carbon dioxide. They accumulate more carbon over their lifetime than a thousand trees. Read the story on Sky News here, news.sky.com/story/revealed-first-ever-global-map-of-whale-migration-exposes-growing-dangers-along-superhighways-12543620.

Natural Environment Research council Advisory Network

NERC is seeking new members of its Advisory Network and applications are welcome until the 19th April. To apply visit nerc.ukri.org/about/organisation/boards/nan/nomination/, and for more information about the Network visit nerc.ukri.org/about/organisation/boards/nan/.

The jet stream is moving northwards; but not everywhere



The jet stream over the North Atlantic and UK. Image Credit: Crondallweather

New research led by the National Oceanography Centre (NOC) and the Maynooth University ICARUS Climate Research Centre in Ireland shows that the average winter northern hemisphere jet stream position over the North Atlantic and Eurasia has moved northwards by up to 330km. The research has also revealed that the mean winter jet speed has increased by 8% to 132mph, during the 141-year period from 1871-2011: for the full story visit, <https://noc.ac.uk/>

[news/jet-stream-moving-northwards...-not-everywhere.](#)

SCOR WG161 Mentoring scheme call

The Scientific Committee on Oceanic Research (SCOR) working group 161 [WG 161- Respiration in the Mesopelagic or ReMO] announces a capacity-building program to foster exchange of expertise and to establish international collaborations in the area of respiration in the mesopelagic ocean for early-career scientists. The mentoring program aims to enable participants to develop an original research project linked to mesopelagic microbial respiration, using either observations, experimentation, or modeling approaches. The program will further facilitate participants to start up new collaborations and strengthen their network in the field of mesopelagic respiration globally. The duration of the mentoring program will be limited to a maximum of 3 years until the end of the WG.



Mentoring Program
SCOR WG 161

ReMO aims to constrain respiration uncertainties and improve quantifications of organic matter flux and remineralisation rates in order to improve projections of the effects of global change on the decline of oxygen in the world's oceans.

Objectives
Foster exchange of expertise and establish international collaborations in the area of respiration in the mesopelagic ocean.

Who can apply?
Early career scientist, including:

- Postgraduate students.
- Postdoctoral researchers who completed their PhD in the last 7 years.

 Applications from developing countries and from regions with a lack in knowledge on mesopelagic respiration will be given priority.

Who are the mentors?
Members of the SCOR WG 161, with a wide experience in mesopelagic respiration, using observational, experimental and modeling approaches.

What does the mentorship offer?

- To develop an original research project in mesopelagic respiration.
- Technical guidance and scientific advice through regular virtual meetings with the mentor, with a duration of up to 3 years.
- Possibility to visit mentor's laboratory and to participate in the SCOR WG161 Training Course 2023 on respiration methodologies upon funding.

Steps to apply:

- Check research profiles of mentors on our website and select 1 or 2 you want to collaborate with.
- Select one of the proposed research projects listed on our website or, alternatively, suggest your own research project.
- Write a letter of motivation including your research interest and its relevance to mesopelagic respiration. Make sure to address Steps #1 and #2 here!
- Include an updated CV.
- Send your application by email to natalia.osma@imo-chile.cl before the deadline.

Further information:
 Email: natalia.osma@imo-chile.cl
 Website: <https://carolrobinson62.wixsite.com/remo161>
 Twitter: @ReMO_SCOR161

Deadline 10th April

Mentors will be members of the SCOR WG 161, whose research expertise is available on the SCOR WG webpage, carolrobinson62.wixsite.com/remo161/membership. They will provide technical guidance on experiments and study

design, supervision of data analysis, exchange of scientific articles, advice with writing proposals and/or manuscripts, etc. Information about capacity-building workshops, conferences, job opportunities, etc will also be provided by the mentors. Applicants can select a research project from the "list of research projects" suggested by the mentors or, alternatively, suggest their own research project based on their interests. In this latter case, the applicants should specify in the application which mentor they wish to collaborate with. Mentees will be responsible for leading all aspects of the research project, with the support of the mentors. The progress of the projects will be reviewed with monthly meetings between the mentor and the mentee.

Applicants to the scheme should be postgraduate students or postdoctoral researchers who completed their Ph.D. in the last 7 years. Applications should include a letter of motivation, including a description of the applicant's research interests and relevance to mesopelagic respiration, and a recent CV. The mentoring scheme is open to all early-career scientists involved in oceanographic work; however, applications from researchers from developing countries and from regions where there is a lack of knowledge/expertise in mesopelagic respiration will be given preference. Due to the unpredictability of the COVID-19 situation, the program will be conducted virtually. Unfortunately there is no specific funding available for this scheme, however, we encourage the mentee/mentor partnership to apply for external funding to enable a visit to the mentor's institution. This also applies to mentees interested in participating in the training course on model and observational approaches to derive mesopelagic respiration that will be held in 2023 as part of the WG activities.

All applications should be sent to natalia.osma@imo-chile.cl by the 10th of April 2022.

The National Oceanography Centre (NOC) contributes to the latest IPCC report

At the beginning of March, the Intergovernmental Panel on Climate Change (IPCC) released its next report, Climate Change 2022: Impacts, Adaptation and Vulnerability, www.ipcc.ch/report/ar6/wg2/. The report assesses the impacts of climate change, and reviews vulnerabilities,

including capacities and limits of the natural world and human societies to adapt to climate change.



Professor Stephanie Henson (left) and Dr Andrew Yool (right)

NOC scientists Professor Stephanie Henson and Dr Andrew Yool were contributing authors to Chapter 3 of the report, entitled 'Oceans and Coastal Ecosystems and their Services'. To read the full story visit, noc.ac.uk/news/noc-contributes-latest-ipcc-report-assessing-impacts-climate-change.

Launching a UK-wide citizen science plankton monitoring program

A team of four environmental scientists from the National Oceanography Centre (Dr BB Cael, Dr Alice Horton, Dr Elena García-Martín and Mr Will Major), 2 engineers from Stanford University (Dr Thibaut Pollina and Dr Adam G. Larson), and an enthusiastic group of 21 citizen scientists, volunteers of The Wildlife Trusts, have started a Citizen Science project with the objective of strengthening the observing capacity and data collection on aquatic environments. MAPPS, "Monitoring Anthropogenic Particles and Plankton using citizen Science", is a UK national-scale project, funded by NERC-UKRI and the Royal Society, with the main aim of increasing the observations on the abundance of anthropogenic particles and plankton composition and their spatial variability in different aquatic environments such as rivers, lakes and coastal waters. To achieve this goal, volunteers will use a "PlanktoScope", an ultra-low-cost microscopic imaging device.

The PlanktoScope is a modular image platform able to take good quality images of organisms larger than 20 μm in size. The device is composed of battery cells, couple of lenses, a camera and a peristaltic pump, all of them

controlled by a Raspberry Pi computer which can be operated from a personal mobile phone with an open-software. Dr T Pollina, the lead engineer of the imaging device, said "thanks to its low cost, accessibility, portability and easiness to use, PlanktoScope is the perfect technology device for this Citizen Science project".



The "PlanktoScope", an ultra-low-cost microscopic imaging device

As part of the project, the citizen scientists will be trained on the assembly of the PlanktoScope and its use. They will make observations of planktonic organisms, as well as anthropogenic particles. Images collected will be uploaded to EcoTaxa, a web application for taxonomic identification of plankton images, to verify and identify the diverse organisms. The close collaboration between environmental scientists and the citizen scientists is an excellent way to improve the spatial and temporal resolution of sampling aquatic environments and increase the monitoring of aquatic plankton abundance and anthropogenic particles (e.g. microplastics, modified natural fibres) at a scale that would be otherwise impossible to achieve. This will allow the citizen scientists as well as professional scientists to answer questions regarding temporal shifts in UK planktonic organisms, differences between aquatic ecosystems and to attempt to quantify the abundance of anthropogenic particles in different aquatic environments.

Dave Miller, one of the citizen scientists said "I am really excited to get involved with this project as we can find out more about our seas in a detail previously unattainable. This is a really fantastic opportunity to find out more about the foundation of the marine ecosystem, the assemblages and seasonal changes. The plankton, of course, feeds into the larger marine fauna which we experience and investigate already."

Dr BB Cael, Senior Research Scientist from the National Oceanography Centre, explains that “this exciting project highlights the tremendous value of combining citizen science, low cost equipment and scientific expertise to monitor aquatic environments”. The environmental impacts of MAPPS are very wide as the information gathered from the different sampling locations can help to better protect and manage aquatic systems. In addition, the engagement of people with nature will be beneficial for people’s health and wellbeing. The scientists involved in the project anticipate that the knowledge gained through the project will positively change people’s attitude and behaviour towards the microscopic organisms living in aquatic systems and their important role in the environment, in addition to opening up opportunities for long-term aquatic monitoring in a way that has not been accessible before.

More information about the use of PlanktoScope and how to be involved in this low-cost engaging community can be found in www.planktoscope.org/. For more information on the MAPPS project, please contact BB Cael at the National Oceanography Centre.

United Kingdom SCOR committee: call for members

The Scientific Committee on Ocean Research (SCOR) was founded in 1957 to address interdisciplinary questions related to the ocean, with more than 2,300 individuals involved in SCOR activities to date. SCOR has had a specific focus on supporting ‘working groups’ of international scientists that are established in response to proposals from the scientific community. SCOR also sponsors international ocean science programmes, including GEOTRACES, IMBeR and SOLAS, as well as dedicating funds to support capacity building. For more details see www.scor-int.org.

The UK pays annual dues to SCOR, which are split between the Challenger Society for Marine Science (51%) and the Royal Society (49%). To date, Challenger Society has formed the effective UK SCOR committee. The role of SCOR national committees is two-fold: First, they provide a national opinion and review on the proposed working groups and represent the nation at the annual meeting. Second, they encourage national ocean science engagement with SCOR activities.

By number of individuals, UK scientists make the second largest contribution to SCOR science, but the Challenger Society would like to improve the ability of the UK SCOR committee to both represent and engage with the UK ocean science community. To do that, a stand-alone UK SCOR committee will be formed that reports to the Council of the Challenger Society. The UK SCOR committee will meet twice a year, once to review and rank working group proposals and once to discuss plans and priorities for UK ocean science engagement with SCOR. It is proposed that the committee would number 5 people, of which two must be early career scientists (www.challenger-society.org.uk/ecr_definition): a chair, co-chair and three ordinary members.

Participating in this committee would provide the opportunity to play a key role in international ocean science. Members will be able to engage at a high level with the key strategic issues facing scientists nationally and internationally, and develop leadership opportunities. The Challenger Society is working towards being a fully equitable and inclusive organisation (for EDI statement see: www.challenger-society.org.uk/EDI_Statement).

The Society strongly encourages marine scientists from historically underrepresented and/or diverse backgrounds to apply to join the UK SCOR committee. Currently, Alessandro Tagliabue (University of Liverpool) is the UK SCOR chair, with Kerry Howell (University of Plymouth) acting as vice-chair. Hence we seek applications for three positions to complete the committee. It is anticipated that the UK SCOR committee will appoint new chairs and vice-chairs from within the committee members to support emerging leaders.

The UK SCOR chair is responsible for reporting to the council of the Challenger Society at their regular meetings and the Global Environment Research Committee of the Royal Society. They also undertake the annual application to the Royal Society for their financial contribution to the SCOR dues. Finally, the chair organises the review of working group proposals, represents the UK national committee at the SCOR annual meeting and will chair the two UK SCOR meetings. For more information on the role of the UK in SCOR, see: www.challenger-society.org.uk/SCOR.

Application procedure

Please email your statement of interest to a.tagliabue@liverpool.ac.uk by 1700GMT on the 25th of April 2022

Evaluation criteria

It is essential that the candidate holds a PhD or equivalent experience in a relevant discipline and is enthusiastic about becoming engaged with the role of SCOR in UK marine science. Desirable characteristics would include experience of working on collaborative projects, multi-disciplinarity, science communication, or building networks. Experience with SCOR and its activities would be advantageous, but not essential.

A formalised rotation policy will be developed by the committee to ensure an appropriate degree and rate of turnover, but initially it is anticipated that posts will last two years, renewable once.

The next waves Special Interest Group meeting will take place on Monday 5th September 2022

The aims of the waves SIG are to promote research in ocean surface waves and collaborations with other disciplines, and discuss the future priorities for waves research in UK. We will use this meeting to develop connections in the UK waves research community, and introduce scientists and engineers to each other for networking. We also encourage early-career researchers in this field and encourage you to use this platform to present your work.

Ocean surface waves are an important phenomenon in many aspects of oceanography, while also crossing many disciplines, from meteorology to sediment transport, renewable energy, coastal morphology and coastal engineering. Waves have direct impact on safe navigation and coastal erosion, while also mediating ocean-atmosphere interactions with transfers of momentum, heat, water, carbon dioxide and other quantities. While often regarded as a topic separate from oceanography, ocean waves are included in global meteorological centre forecasts, and studies of other processes may neglect them at their peril, as they are often implicitly accounted for, while their variability may not be properly understood. The study of waves takes in many widely-varied skills, from in situ observations to satellite remote sensing, from statistics of extremes to long-term climatic trends, and from modelling of ocean waves on global scales down to details of wave-current

interactions or the bottom boundary layer in shallow water.

We meet the day before the Challenger Society conference and there will be a call for abstracts nearer the time. For now, please save the date, we look forward to seeing many of you there. More details about the SIG can be found at, https://challenger-society.org.uk/Ocean_Wind_Waves and <https://noc.ac.uk/windwavesSIG>.



IEWS

Sonardyne launch wireless seabed unexploded ordnance disposal capability

Marine technology company, Sonardyne, is aiming to improve the safety and efficiency of unexploded ordnance (UXO) clearance during offshore energy projects with the introduction of a secure, wireless underwater initiation capability. The company's new Initiation Transponder 6 (IT 6) is designed to be connected directly to a remotely deployed, non-electric mine neutralisation device, such as a Viper MDS from ECS Special Projects. This allows explosive ordnance disposal (EOD) teams to send a wireless, acoustic command from their vessel, safely initiating a shock tube detonator. Recent demonstrations were conducted over distances in excess of 1,000 m away.

IT 6 is based on Sonardyne's field-proven Wideband 2 digital signal technology, which offers a reliable and long-range underwater wireless communications link. The development of IT 6 means that technicians no longer need to wire UXO neutralisers up to signal relay buoys on the surface and are not restricted to good weather and daylight for setting up an initiation operation.

IT 6 is small, lightweight and designed to be placed by an ROV or diver for both high order detonation and low order deflagration. It features multiple layers of security to prevent unintended activation, including a hydrostatic switch, which only allows the unit to be armed when a pre-determined depth has been reached.



IT 6 is used with Sonardyne's new IP67-rated, touch-screen Deck Topside case and cabled dunker, which can be used without any need for an external power source. Photo from Sonardyne.

Operations using IT 6 transponders are controlled using Sonardyne's new rugged Deck Topside case and cabled dunker. Environmentally rated to IP67, the case features a daylight readable interactive 7-inch resistive touch screen and rechargeable battery, for when operating on small boats with no external power. The user interface was designed in close co-operation with EOD technicians and enables operating parameters to be set and multiple IT 6 transponders to be configured prior to deployment. During a live operation, two physical buttons provide an additional layer of security, requiring users to hold one button to arm, then simultaneously press the other to initiate.



With IT 6, mine clearances operations can be performed wirelessly and remotely, making site preparation work safer and more efficient. Artist's illustration.

The dunker, which is supplied with 10 m of cable, provides a secure two-way communications link between the surface and IT 6, and is simply lowered over the side of a vessel. John Houlder, Product Manager at Sonardyne said; "European waters are littered with unexploded ordnance (UXO), the result of past military conflicts, training exercises, weapons development and dumping activities at sea. During the construction phases of wind farms, for example, the risk to personnel, assets and project timescales are significant. When disposal rather than avoidance is deemed necessary for turbine or cable route placement, our new IT 6 and topside will help those involved with the hazardous task operate entirely wirelessly and in any weather, day or night. Underwater acoustic command and control is a core Sonardyne capability, so IT 6 can be considered as reliable and as secure as traditional methods involving shock tubes and a lot safer than electrical detonation lines."

MSubs and Sonardyne to collaborate on advancing autonomous naval platform capabilities

Submersible manufacturer MSubs and marine robotics technology company Sonardyne have signed a strategic partnership to advance the capabilities of long endurance, autonomous underwater platforms for the UK defence sector. The Memorandum of Understanding (MOU) will see the two companies working to integrate and evaluate Sonardyne's commercial-off-the-shelf navigation, communications and imaging payloads into MSubs 9 m long extra-large uncrewed underwater vehicle (XLUUV) to provide naval forces with enhanced situational awareness across the underwater battlespace.

From Plymouth, south-west England, where both companies have research, trials and manufacturing facilities, Sonardyne will supply and support a suite of its technologies to MSubs. These will include SPRINT Nav X, a hybrid inertial - Doppler navigation sensor that's suitable for GNSS denied environments; AvTrak 6, a long-range tracking, command and control instrument; and Vigilant, a forward-looking obstacle avoidance sonar (FLS) jointly developed by Sonardyne and sister company Wavefront Systems.

MSubs' XLUUV has been selected by the UK's Royal Navy to help it understand the future roles for XLUUVs for surveillance, reconnaissance and

anti-submarine warfare (ASW) missions, and deliver new capabilities to the organisation years earlier than otherwise be possible.



The MOU announced on the 8th March will see MSubs and Sonardyne working closely to enhance the operational capability of XLUUVs for the UK's underwater defence sector

In 2021, MSubs and Sonardyne took part in the first phase of the UK's Defence and Security Accelerator (DASA) Uncrewed Underwater Vehicle Testbed, Opportunity to Integrate competition, run jointly with the Royal Navy and the Defence Science and Technology Laboratory (Dstl). As part of the demonstration, MSubs' XLUUV used bathymetric data gathered by its Vigilant FLS to navigate in open waters off Plymouth.

This announcement builds on this success, with the two companies targeting further emerging opportunities from the UK's Ministry of Defence, such as Project CETUS. This will see the design and build of an extra-large autonomous underwater vehicle (AUV), which may one day work alongside the Astute-class attack submarines.

Brett Phaneuf, Managing Director of MSubs said: "The integration of Sonardyne equipment on our extra-large AUV is a key factor for our continued success, helping us to move the state of the art forward swiftly. The operator-centric approach to engineering from Sonardyne and MSubs makes it easy to enhance our vehicle performance and reliability through applied research, bringing much needed capability to the underwater domain and greatly reduced timelines and budgets."

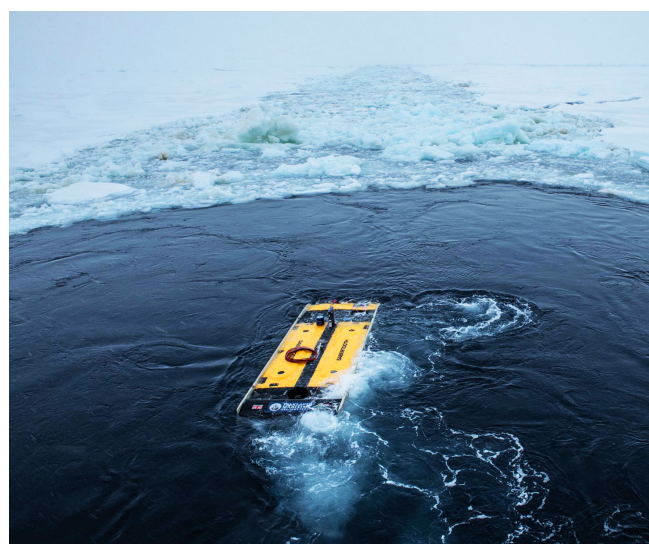
Ioseba Tena, Head of Defence at Sonardyne, added: "Our two companies are at the forefront of the development of unmanned platforms and payloads that are reshaping the underwater battlespace playbook; delivering tactical edge to navies and governments facing new and increasingly capable underwater adversaries."

We're excited to be opening a new chapter of collaboration with the MSubs team, and where better for that collaboration to be centred than Plymouth, the UK's marine autonomy city."

Sonardyne navigation and positioning technology helps locate Shackleton's historic Endurance

After more than 100 years lost more than 3,000 m underneath sea ice in the Antarctic's Weddell Sea, the almost fully intact wreck of Ernest Shackleton's Endurance has been found, supported with underwater navigation and positioning technology from Sonardyne.

The pioneering search, launched in February this year, saw the Endurance22 team deploy Saab Seaeye Sabertooth hybrid autonomous underwater vehicles (AUVs) from the icebreaking polar supply and research ship S.A. Agulhas II. During their hunt of the seabed, close to where the 1914-1917 expedition came to its end, these underwater robots used Sonardyne's SPRINT-Nav hybrid acoustic-inertial navigation system (INS) technology to navigate their search routes. They also used Sonardyne's AvTrak 6 tracking and telemetry transceiver, to send commands and position updates from a Ranger 2 Ultra-Short BaseLine (USBL) system, also from Sonardyne, onboard the S.A. Agulhas II.



One of the Endurance22's two Saab Seaeye Sabertooths, showing the blue cap of Sonardyne's AvTrak instrument near the front of the vehicle. Photo by Esther Horvath / Falklands Maritime Heritage Trust.

"It is amazing what the team have achieved, given the extreme depths and under ice conditions they were working in," says Geraint

West, Head of Science at Sonardyne, who has himself been involved in hunting for wrecks in the Antarctic. "The stunning condition of the Endurance as it rests on the seabed, like it's been frozen in time, really is astounding and beyond our wildest hopes. We're thrilled that it was our positioning and navigation technology and expertise that were chosen to support this what can only be called extreme science mission and we congratulate the Endurance22 team on their historic discovery. I'm sure this is also just the start of the story, as we begin to learn more about remains of this historic ship."

For ease of deployment, the Ranger 2 was configured with a Gyro USBL transceiver. This comes with inbuilt attitude, heading and reference sensor (AHRS) and is pre-calibrated, making it easy to deploy on vessels of opportunity. A second Ranger 2 Gyro USBL system was also on hand, ready to be deployed from the surface of the ice, if the S.A. Agulhas was unable to get through the Weddell Sea's sea-ice. Both were LMF systems, enabling tracking at ranges beyond 7,000 m, to meet the Endurance22 team's potential under-ice tracking requirements.

Sonardyne's sister company, Voyis, also had equipment on the project. Its Insight Pro and Observer stills camera were integrated into the Saab Sabertooth to generate 3D models and capture high-resolution true colour images of the wreck, all geolocated by Sonardyne navigation data.

SALTS

Microplastics researcher to make transatlantic voyage on inherited yacht

A marine scientist who inherited a yacht from her seafaring mentor is sailing it from the Caribbean to her home in Glencoe while measuring the extent of microplastic pollution, from the deep sea to Scottish rivers.

Saz Reed, from the Scottish Association for Marine Science (SAMS), will sail from Carriacou Island, Grenada from mid-March in a Sadler 34 yacht called *Cariad*. From Carriacou she will head to the Azores and then up to Scotland, via Ireland, swapping some crew along the way. While the voyage will be a challenge in itself, Saz has taken the opportunity to fit various

microplastic monitoring tools to *Cariad* in an effort to collect data along the way.

The yacht was left to her by the late Tony Meakin, a friend of her father who taught her to sail and helped inspire her love of the ocean. She said: "My dad was friends with Tony for years and when I was about seven they bought a yacht together so they could build towards their Royal Yachting Association instructor's ticket. Tony decided to go sailing around the world, so bought the yacht outright, but I did a lot of sailing with him on *Cariad* before he settled in the Caribbean. I think those early years of sailing and adventures at sea really forged my love of the ocean. Tony died two years ago and I was shocked to find out that he had left me *Cariad* in his will."

Saz hails from Wales, where the word 'Cariad' is used as a term of affection. Having delayed the transatlantic voyage for two years because of the Covid-19 pandemic, Saz and her partner Al Docherty will refit the yacht in Carriacou before sailing it back to Scotland from mid-March to mid-May. Saz left Scotland for Carriacou on Friday, February 18th. You can follow Saz's transatlantic voyage at the following link: https://forecast.predictwind.com/tracking/display/SV_Cariad/.



Saz Reed and her partner Al Docherty preparing for their transatlantic voyage

The marine environment campaigning group Weswimwild has donated the sampling tools required to collect microplastic samples during the voyage. Microplastics are man-made plastic particles and fibres less than five millimetres in size. Marine scientists are investigating the extent of microplastics in the ocean environment and how they may be affecting the food web, as small creatures can feed on these particles.

"I can't go across the Atlantic without measuring something scientific," says Saz. "Fortunately, I sampled microplastics in the River Coe for Weswimwild last year, so by bringing Cariad back from the Caribbean to Glencoe we are going from sea to source. Saz will also be noting down sightings of marine debris and any marine mammals she encounters on her way. The data will hopefully help us build a picture about the extent of microplastic pollution and allow us to examine the interactions between our coastal rivers and the open sea," she said.



Marine scientist Saz Reed is investigating the extent of microplastic pollution around Scotland's coastline and in the Atlantic Ocean.

Meanwhile, Saz has also been working on a citizen science project with the Scottish Coastal Rowing Association project to sample microplastics in Scottish waters. This project was supported by Year of Coasts and Waters 2020/21, Event Scotland, the Field Studies Council in Millport, High Water Sails and Nature Scot. The association's RowAround Scotland event, https://www.rowaround.scot/virtual_legs/microplastics/, saw the 70 member clubs row in a relay around the Scottish coastline. Most of the clubs towed a microplastics trawl to sample the waters in their local area. The trawl rig was constructed especially for RowAround Scotland

2020/21 by the Field Studies Council in Millport, Cumbrae.

Saz is analysing these samples to assess microplastic abundance in waterways around the coast of Scotland, as there are too few research publications on the topic. The country's coastal waters are important breeding and foraging areas for a wide range of marine species and scientists are keen to learn more about microplastic distribution in the waters around Scotland.

CALENDAR

15th–17th March 2022: Oceanology International (OI)

London, UK

Oceanology International (OI) is the leading global event connecting industry, academia and government with the ocean technology community. It has a 50 year legacy as market leader in the oceanographic sector. A Truly global event with 8,000 attendees from 90 countries representing 15 diverse end-user sectors. It is the largest exhibition/trade show in this sector, with 480+ exhibiting companies.

Oceanology International London 2022 will connect you with 7,500 buyers and influencers from more than 80+ countries looking for innovative solutions to improve strategies for exploring, monitoring, developing and protecting the world's oceans. For 50 years, no other event has provided such a perfect global platform to showcase your solutions, from technical to strategic professionals from academia, government and over 15+ key industries, all unified by their use of ocean technology.

Demonstrate and promote your company's capabilities, generate qualified leads and strengthen and develop your networks both face-to-face in London, and digitally throughout the year. For more information and register, please visit www.oceanologyinternational.com/london/en-gb.html.

9th–12th May 2022: Fourth ICES PICES Early Career Scientist Conference

St. John's, Newfoundland, Canada

Hosted by Fisheries and Oceans Canada (DFO), www.dfo-mpo.gc.ca/index-eng.html, The International Council for the Exploration of the

Sea (ICES), www.ices.dk/about-ICES/Pages/default.aspx, and North Pacific Marine Science Organization (PICES), meetings.pices.int, welcome you the fourth conference of this series, where early career scientists will have the opportunity to meet colleagues from around the globe who share similar interests and an enthusiasm to improve equality and diversity in marine science. The conference aims to foster the development of contacts, collaborations, and associations among early career scientists that will persist for decades and to establish personal and institutional networks that will help to advance our understanding of the marine environment.

The scientific sessions will be organized around the following themes:

Ecosystem and ocean processes

1. Biodiversity and ecosystem functions
2. Understanding food webs and biogeochemical cycles
3. Developments in taxonomy and systematics
4. Connecting biological, oceanic, and atmospheric processes of different scales

Inclusive, interdisciplinary, and transparent ocean sciences

1. Human–ocean interactions
2. Science, management, and policy for a sustainable and productive Blue Economy
3. Science communication, inspiration, and engagement

Emerging technologies and techniques for ocean science

1. Using remote and *in situ* technologies to inform marine science
2. Advances in techniques and technologies: from 'omics to gear modifications to data analysis
3. Towards open-source science: freely available methods and data in the marine research

Visit the ECSC4 website, www.ices.dk/events/symposia/ecsc4/Pages/default.aspx, to read more about the conference and the theme sessions and stay up-to-date by following us on Twitter @ECSC_4 for announcements of keynote speakers, the programme, and important dates. Registration and call for abstracts will open in.

16th–20th May 2022: 53rd International Liège colloquium on Ocean Dynamics, and GO2NE oxygen conference

Liège, Belgium

Oxygen is critical to the health of the planet. It affects the cycles of carbon, nitrogen and other key elements, and is a fundamental requirement for marine life from the seashore to the greatest depths of the ocean. Nevertheless, de-oxygenation is increasing in the coastal and open ocean. This is mainly the result of human activities that are increasing global temperatures (CO₂-induced warming) and increasing loads of nutrients from agriculture, sewage, and industrial waste, including pollution stemming from power generation using fossil fuels and biomass.



The 53rd Liège colloquium will investigate new developments and insights related to de-oxygenation in open and coastal waters. It is jointly organized with the Global Ocean Oxygen Network (GO2NE) and is a contribution to the Global Ocean Oxygen Decade (GOOD) program endorsed by IOC-UNESCO. The following sessions are considered:

- De-oxygenation: understanding causes and attributing changes
- Assessing open ocean and coastal de-oxygenation variability and trends
- De-oxygenation: observing and modelling
- De-oxygenation and ocean life
- De-oxygenation and co-stressors: understanding, monitoring and mitigating deoxygenation in the context of multiple stressors
- Ocean De-oxygenation - how the past can inform the future?

- Microbial Communities and their controls on biogeochemical feedbacks and interactions
- De-oxygenation, water quality and the climate system: understanding processes and feedbacks and developing actionable indicators
- De-oxygenation: ecosystem services, economic and societal consequences.
- Confronting de-oxygenation and its impacts: translating science to management and policy

Further details (scientific committee, registration, deadlines, venue etc...) are available on the web site <https://www.ocean-colloquium.uliege.be/>.

23rd–27th May 2022: The General Assembly 2022 of the European Geosciences Union (EGU)

Vienna, Austria

The EGU General Assembly 2022 will bring together geoscientists from all over the world in one meeting covering all disciplines of the Earth, planetary, and space sciences. The EGU aims to provide a forum where scientists, especially early career scientists, can present their work and discuss their ideas with experts in all fields of geoscience.

In view of increasing event restrictions in Austria, currently limiting events to 2000 people, that we anticipate will be relaxed later in the year and attendee concerns over the high infection rates in Europe, the EGU has had to make some important changes to our plans for this year's General Assembly. Firstly, we have had to move the date of the meeting to May. Moving the meeting back closer to summer months means that infection rates are likely to be lower and the Austrian rules around large events will be more flexible.

Secondly, we have had to change the format of the meeting, so that all presentations will now be 'short orals' (egu22.eu/about/provisional_meeting_format.html), that can be delivered and viewed either online or in person. This change is a result of restrictions on having a large number of non-seated people in an enclosed space, like a poster hall, which has meant that we can no longer offer the poster or vPICO options in 2022. We are also creating opportunities for both online and in-person audience participation with this format, that we hope will maintain the accessibility

that we were aiming to achieve with this, our first step towards a fully hybrid meeting.

For more information about the changes to the General Assembly please read the full news announcement ([//www.egu.eu/news/886/important-update-egu22-change-of-date-and-format/](https://www.egu.eu/news/886/important-update-egu22-change-of-date-and-format/)) or the updated FAQ egu22.eu/about/egu22_faqs.html.

The assembly is open to the scientists of all nations. The entire congress centre is fully accessible by wheelchairs. For more information regarding the programme and registration please visit egu22.eu/.

19th–22nd June 2022: Ecosystem Studies of the Subarctic and Arctic Seas (ESSAS) 2022 Annual Science Meeting

Washington, Seattle, USA



Integrated Marine Biosphere Research

Ecosystem Studies of the Subarctic and Arctic Seas (ESSAS) 2022 Annual Science Meeting

Bridging the past and present to manage the future of northern fisheries and ecosystems



19-22 June 2022

Fisheries Auditorium, University of Washington

Seattle, WA, USA

Hybrid in-person/online

High-latitude marine ecosystems are undergoing rapid changes due to increasing anthropogenic carbon emissions, with potentially important impacts on living marine resources and on the people dependent on these resources. These systems, particularly the gateways to the Arctic, have undergone large changes in the past between periods of cooler and warmer conditions, as evident in the paleo-ecological record. The 2022 ESSAS Annual Meeting aims to bridge perspectives from paleo-ecology, contemporary ecology, and human-environment interactions to inform the future management of fisheries and other living marine resources. The meeting will encompass a shared session with the [Oceans Past Initiative](#).

Sessions include:

- Interdisciplinary collaboration across the marine sciences and humanities: Past, present and future
- The past, present and future of codfish population in the subarctic and Arctic
- Building on the past to predict the future: scenarios, models and interdisciplinary approaches to predicting future marine conditions and fisheries

Submit your abstract by 1 March!

[Learn more](#)













imber@dal.ca

4th–8th July 2022: Viii International Symposium on Marine Sciences

Las Palmas de Gran Canaria, Spain

A number of Conferences will take place under the umbrella of the Marine Sciences Week in Las Palmas de Gran Canaria, these are:

- International Symposium on Marine Sciences (ISMS 2022)
- International Symposium on Artisanal and Recreational Fishing in Islands Systems (ISARFIS)
- Expanding Ocean Frontiers (EOF)
- Maritime Spatial Planning (MAPSIS22)
- Iberian Seminar on Marine Chemistry (SIQUIMAR)
- Marine Litter (BAMAR)
- International Conference on Modern and Fossil Dinoflagellates (DINO12)



The ISMS 2022 will be a face to face event and online event. All sessions will also be available online 48 hours after they take place. The access to the recordings will be accessible until August 1st at 12:00 (Canary Islands time). The abstracts submission is already open. You can download the templates and submit your abstracts through the abstract form on the web page, isms-canarias.com/.

27th–29th August 2022: Arctic Circle Greenland Forum

Nuuk, Greenland

Greenland in the global Arctic, climate and prosperity, geopolitics and progress, organised in association with Naalakkersuisut, the Government of Greenland.

The Forum will be held at the Katuaq Cultural Centre in Nuuk. Governments, universities, research institutions, organizations, associations, companies and other partners are invited to submit proposals for Sessions to the Arctic Circle Secretariat. Submit your proposal before the 1st June by visiting www.arcticcircle.org/proposal-guidelines-for-the-greenland-forum. For more information, visit www.arcticcircle.org.

www.challenger-society.org



5th-8th September 2022: ECSA 59: Using the best scientific knowledge for the sustainable management of estuaries and coastal seas

San Sebastian, Spain

ECSA 59 will bring together a global multi-disciplinary community of researchers, educators and practitioners to address issues of outstanding importance in the science (both natural and social) and management of estuaries and coastal seas in this rapidly changing world.

The abstract submission deadline is the 1st April 2022. For our full list of topics and special sessions please visit the website at www.estuarinecoastalconference.com/submit-abstract.asp.

5th-9th September 2022: Challenger Society Biennial Meeting – celebrating the 150th anniversary of the Challenger Expedition

London, UK

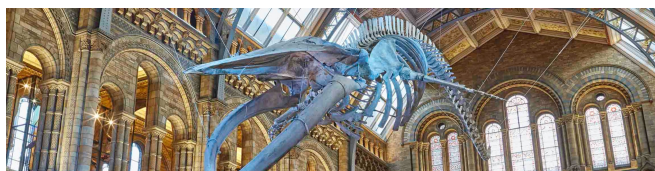
Challenger Society for Marine Science Biennial Conference



Learning from 150 years of scientific progress to become the pioneers of tomorrow

5 – 9 September 2022
Natural History Museum &
Imperial College, London





Full details online:



Imperial College
London

19th-23rd September 2022: Open Science Conference on Eastern Boundary Upwelling Systems (EBUS): Past, Present and Future and the Second International Conference on the Humboldt Current System

Lima, Peru



The meeting will bring together PhD students, early career scientists and world experts to understand, review, and synthesize what is known about dynamics, sensitivity, vulnerability and resilience of Eastern Boundary Upwelling Systems and their living resources to climate variability, change and extreme events. For more information, visit www.ebus-lima2022.com/.

5th-19th October 2022: Ocean Best Practices System (OBPS) Workshop VI

Virtual

The OBPS announces that the Ocean Practices Workshop VI will take place virtually with

plenaries on the 5th (opening plenary 1A), 6th (opening plenary 1B), and 19th (closing plenary) of October 2022 (each three hours long). Working Group sessions will meet in between, at times of their own choosing.

The Workshop will cover a broad range of topics proposed and selected by session leads and the workshop coordinators. For the plenaries, there are two general themes: 1) Guiding technology evolution and use, and 2) Capacity development and sharing, with an emphasis on developing countries. Let us know if you are interested in participating, or in proposing a theme or session for a Working Group, by filling out the Interest to Participate short form at docs.google.com/forms/d/e/1FAIpQLSc5MEiuWVNa5JXah47qoldhKrDopmcY2bEzBcVu2MLrAATHJQ/viewform.

Please circulate this invitation to colleagues who may be interested in focused discussions; those who may want to learn more about developing, curating and sharing Ocean Practices; and to help plan the next three to five years of OBPS and its Ocean Decade programme: "OceanPractices". Should you have any questions, please e-mail us at info@oceanbestpractices.org. We look forward to hearing from you, Frank Muller-Karger, Chair, OBPS Workshop VI; On Behalf of the Ocean Best Practices System Steering Group

8th-10th November 2022: 12th MASTS Annual Science Meeting

Scotland

Save the date for the Marine Alliance for Science and Technology Scotland (MASTS), more details soon.

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

JOBS and OPPORTUNITIES

Available at Mercator Ocean International :

Permanent position for an Oceanographer/Expert in marine biogeochemistry and biology
(Ref: 2022- 03/00/OEBBM)

Job opportunities - Mercator Ocean, www.mercator-ocean.eu/en/job-opportunities/

Cover letter and a detailed CV with the following reference 2022- 03/00/OEBBM should be sent to recruitment@mercator-ocean.fr

Closing date: 31/03/2022

There are jobs on the IMBER web site

<http://www.imber.info>



Integrated Marine Biosphere Research

Jobs and opportunities

New

- POGO 2022 Open call for shipboard Fellowships
- Internships at Oceana, Washington, DC, USA. No deadline given; **apply now**
 - Policy Intern
 - Science and Strategy Intern
- Research Assistant I/II; Ecosystems Centre, Marine Biological Laboratory, University of Chicago, Woods hole, MA, USA. No deadline given; **apply now**
- Postdoc: Transdisciplinary research into interventions and tools for community-level adaptation to global change, University of Cape Town, South Africa. Review begins immediately; **apply now**
- Postdoc: Marine system-based stakeholder processes, University of Cape Town, South Africa. Review begins immediately; **apply now**
- Postdoc: Integrated marine ecosystem assessment, University of Cape Town, South Africa. Review begins immediately; **apply now**
- Postdoc: Ocean acidification and anthropogenic carbon cycling, MIT, Cambridge MA, USA. No deadline given; **apply now**
- Oceanographic Research Analyst; Nutrient chemist, The Bermuda Institute of Ocean Sciences, Bermuda. Review begins immediately; **apply now**

- Director of Special Project- Public Service Coordinator, The Department of Marine Resources, Augusta, Maine, USA. Apply by **22 March**
- Lecturer/Senior Lecturer: Environmental studies (sustainability science, environmental social science), National University of Singapore, Kent Ridge, Singapore. Apply by **25 March**
- MSc opportunity at Rhodes University, Grahamstown, South Africa. Apply by **31 March**
- Postdoc: Marine biogeochemical modelling of the Black Sea, CNR-ISMAR, Italy. **31 March**
- Postdoc: Understanding spatial interactions across ocean-use sectors in a changing climate, Seattle, USA. Apply by **1 April**
- Mentoring opportunity, SCOR working group 161 - respiration in the Mesopelagic. Apply by **10 April**
- PhD Fellowships: OWSD supports women from eligible countries(see below) to do a PhD in another Global South country. Apply by **15 April**
 - OWSD eligible countries
- Simons Postdoctoral Fellowships in Marine Microbial Ecology. Apply by **13 May**

In case you missed it...

- PhD and Postdoctoral Positions: Western Indian Ocean Numerical Modelling, University of Cape Town. Open until filled; **apply now**
- Senior Marine Biologist, Shark and Marine Research Institute, Gansbaai, Western Cape. No deadline given; **apply now**
- Researcher: Seal population surveys, Institute of Marine Research, Tromsø, Norway. No deadline given; **apply now**
- Funding opportunity for Biodiversity related synthesis projects. Apply by **22 March**
- Graduate student opportunities: AGU Bridge Program. Apply by **31 March**
- PhD: Community Ownership of Green and Blue Spaces to Reduce Health Inequalities - Queen's University Belfast, Ireland. Apply by **31 March**
- Postdoc: Modeling marine ecosystem tipping points, Princeton University, New Jersey, USA. Apply by **31 March**
- Interdisciplinary School for the Blue Planet (ISblue) launches international fellowship program. Apply by **30 April**
- MSc (full scholarship): Fisheries science, Memorial University of Newfoundland, Canada. Apply by **30 April**
- Multiple opportunities at AquabioTech Group. Apply by **15 May**:
 - Department Manager - Senior Fisheries/Marine Consultant
 - Aquaculture shrimp trial Coordinator
 - Aquatic Zebra Technician
 - Senior Fisheries Biologist

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