June 2022

Challenger Wave

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

NEWS

New analysis of the subpolar North Atlantic reveals an increasingly strong role for the ocean in unusual year to year temperature changes

A fundamental study by scientists at the National Oceanography Centre (NOC) published on Wednesday 18th May, www.nature.com/articles/s43247-022-00433-6, has confirmed for the first time that the ocean is as important as the atmosphere in causing unusual temperature variations in the subpolar North Atlantic. Furthermore, it shows that the ocean's contribution has strengthened over the past 60 years at the expense of the atmosphere, pointing to the need for greater understanding of the ocean's role in setting North Atlantic and European climate variability.

The study by Simon Josey and Bablu Sinha, with UK Research and Innovation (UKRI) funding, employed observations of ocean temperature from the 1990's onwards and a cutting-edge climate simulation that includes the NOC high resolution NEMO ocean model. It has been discovered that year-to-year hot and cold irregularities in the amount of heat in the upper level of the ocean, called the mixed layer, are in fact caused about half of the time by changes in heat transported by ocean currents and mixing and not primarily by heat exchange with the atmosphere as previously thought.

To establish possible long-term variations in the role of ocean transports and surface heat exchange, the scientists then applied patterns revealed by the study to historic ship observation data, dating back as far as 1870. It was found that ocean transports have played a more dominant role in year-to-year variability of mixed layer heat content since around 1960, which could signify changes in the Atlantic climate system, however further research is needed to establish this.

Professor Simon Josey (left) and Dr Bablu Sinha (right)

Professor Simon Josey, leader of the study, commented: "The new results overturn the long-held view that year-to-year-variability in the temperature of the surface ocean is dominated by heat exchange with the atmosphere and establishes the strong role played by internal processes within the ocean itself. It is important to better understand why the surface temperature changes because an unusually warm or cold ocean can influence the atmosphere above and consequently both winter and summer weather over Europe. In addition, the changing role for the ocean that we have found since the 1960s is a potentially worrying sign of variations within the climate system; although further research is needed to establish whether it is natural in origin or due to the climate crisis."

Seaweed success at awards ceremony

SAMS celebrated further seaweed success at this year's Aquaculture Awards after the co-ordinator of the newly launched Seaweed Academy, www.seaweedacademy.co.uk/, picked up one of the top awards. Rhianna Rees, www.sams.ac.uk/people/consultancy-team/rees-rhianna/, was jointly awarded the Rising Star award at the ceremony in Aviemore on the 4th May alongside Andre Van of Kames Fish Farm. The award comes a week after the launch of the Seaweed Academy, the UK's first dedicated seaweed

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industry facility, using the research knowledge generated at SAMS to offer advice to start-ups, train workers and share the latest research to help businesses develop. The £400,000 funding for the project came from the UK Government's Community Renewal Fund.

Rhianna Rees was joint winner of the Rising Star category at this year's Aquaculture Awards

The success of the Seaweed Academy launch at SAMS, which attracted nearly 200 people and hundreds more virtual attendees, demonstrated the huge scope of interest in seaweed cultivation in the UK and Europe. As a precursor to the launch event on the 26th April, 200 primary school children visited SAMS to learn more about seaweed, its uses and its potential. Other invited guests had the chance to visit the SAMS seaweed farm and the seaweed nursery, where seed stock is grown and ready to be deployed on seaweed farms.

Rhianna said: "Words cannot describe how grateful, surprised, proud, and honoured I am to have been awarded Aquaculture UK Rising Star award. This was a win for seaweed, for SAMS, and everyone in the team who has worked so hard to achieve all the things we have, so far, as part of the Seaweed Academy."

Andrew Richardson of biotechnology company Innovafeed, an alumni of SAMS UHI's Aquaculture, Environment and Society (ACES+) Joint Masters Degree was also shortlisted in the Rising Star category. Head of SAMS Enterprise Mike Spain said: "This is a tremendous achievement for Rhianna, who has established an incredibly comprehensive and high-quality Seaweed Academy project in a short period of time. She brings energy, enthusiasm and expertise to the role of co-ordinator and thoroughly deserves this accolade. It has been an incredibly busy and rewarding few weeks for the SAMS Enterprise team but also for the developing seaweed farming industry as a whole. As the profile of seaweed cultivation grows, we move ever closer to a thriving new industry for the UK and Europe. SAMS Enterprise is helping to lead that movement."

Globally, the seaweed farming industry is estimated to be worth around $15billion per annum. However, the vast majority of this activity is in Asia and there is huge growth potential in Europe, with a growing demand for seaweed from gourmet restaurants to livestock feeds. Already used extensively in food ingredients, agriculture, cosmetics and pharmaceuticals, seaweed farming has a low carbon footprint, using no fresh water and with minimal land-based infrastructure.

Climate Linked Atlantic Sector Science, CLASS, project opportunities

Berths available on CLASS expeditions

The sustained observation expeditions have berths available for students and early career researchers (ECRs) to join them and make measurements or collect samples for projects in collaboration with CLASS researchers. Students and ECRs will receive support in collecting their data and samples at sea, gain experience in a range of seagoing activities and benefit from working closely with CLASS researchers.

ECRs can apply for a berth on a CLASS research cruise through one of three options:

a) A berth funded by the ECR's own project, to collect data and/or samples to carry out research that will enhance CLASS objectives.

b) A berth associated with a CLASS ECR Fellowship (see below) or a PhD with a CLASS Principal Investigator

c) A berth as a volunteer for the core science team. Some, but not all, CLASS cruises need volunteers for their core team of people who take samples and process data.

Details of CLASS cruises and deadlines for applications can be found in the Application Form on the CLASS website. ECRs considering applying for a berth on a CLASS cruise should contact the Principal Investigator (PI) to discuss their ideas and plans first. More information, including contact details for the PI, what you need to know, and where to send your form, is given in the Application Form, projects.noc.ac.uk/class-

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project/sites/class-project/files/documents/Application for berths on CLASS cruises Nov 21.docx. Applications can be submitted at any time.

CLASS Fellowships for Early Career Researchers
CLASS has an ECR Fellowship scheme to support extended visits by graduate students or postdocs to NOC and SAMS. The purpose of CLASS ECR Fellowships is to support the career development of ECRs by enabling collaborative working with CLASS researchers, as well as access to CLASS facilities, data sets, model output and tools, and berths on CLASS cruises.

The research carried out by the ECR during the Fellowship should enhance the CLASS objectives and build on the project's observations and/or modelling and/or technology development. Applications are invited for CLASS Fellowships at NOC and SAMS. The deadlines are given at projects.noc.ac.uk/class-project/academic-engagement.

Call for UN Ocean Decade Actions No. 03/2022 runs until August 2022
Coinciding with the International Year of Artisanal Fisheries and Aquaculture, the scope of the Call for Decade Actions No. 03/2022 for Decade Programmes is Challenge 3, Sustainable Blue Food, and Challenge 4, Sustainable Ocean Economy. Building on the impact of the Ocean Decade since its launch in January 2021, the call aims to continue addressing thematic and regional gaps and to encourage transformative science to achieve the outcomes identified for the next ten years.

The ocean is the foundation for future global economic development, human health and well-being, it provides food security and livelihoods for hundreds of millions of the world's poorest people. But to achieve the vision of a sustainable and productive ocean, knowledge and tools to support the recovery of wild fish stocks, and the deployment of sustainable fisheries management and aquaculture practices are needed. Innovation, technological developments and decision support tools to minimize risk, avoid lasting harm and optimize the contribution of economic sectors to the development of a sustainable ocean economy are essential. Providing governments and industrial decision-makers with tailored information and ocean management frameworks such as sustainable ocean planning that build resilience, recognize thresholds and avoid ecological tipping points, are required to guide the development of sustainable ocean economies and promote marine sectors.

The two selected Ocean Decade Challenges, www.oceandecade.org/challenges/, are closely interlinked. The term 'sustainable ocean economy' has numerous facets across different sectors, including elements related to energy, fisheries and aquaculture, shipping, tourism, etc. For the Call for Decade Actions No. 03/2022, now 17 endorsed Decade Programmes are also inviting Project submissions. These "umbrella" Decade Programmes include various thematic orientations, some focusing on marine life and ocean observations, others on regional action such as in the Mediterranean Sea. Among them, Marine Life 2030, https://oceandecade.us15.list-manage.com/track/click?u=75c69bf185fb2be069850f6ee&id=ce576e3164&e=7e66fb83d6, aims to establish a globally coordinated system to deliver actionable, transdisciplinary knowledge of ocean life to those who need it, promoting human well-being, sustainable development, and ocean conservation. Access the Call documentation and submit your Action on the Ocean Decade Global Stakeholder Forum, forum.oceandecade.org/page/call-for-decade-actions**.**

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From a regional perspective, the Call for Decade Action No. 03/2022 seeks to target Projects focused on Africa and Pacific Small Island Developing States (SIDS). To date, the Ocean Decade has worked hard to mobilise resources around the world, but these regions continue to be underfunded compared to regions such as Europe and North America.

Call for Papers deadline extended to 26th August 2022: DSR-II Special Issue on IMBeR West Pacific Symposium
The IMBeR West Pacific Symposium, 'Changing

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West Pacific Ocean: Science and Sustainability', was held between 22nd-25th November 2021 in Shanghai. This online event drew more than 900 participants and more than 160 presentations to provide new scientific observation results and perspectives on the changing marine biosphere in the West Pacific Ocean and its neighboring Indian and Southern oceans. It also brought many notable success stories about how scientific research activities empower us to cope with changing oceans due to global warming and harness the ocean's wealth sustainably. The symposium topics covered coastal blue carbon, coral reefs, dried small fish, ecosystem-social interactions in the coastal sea, marine biogeochemistry and biodiversity in the Indo-Pacific Region, marine-extreme events, oceanic top predators, tropical ocean ecosystem, and ocean interventions. It forged a camaraderie amongst the scientists and stakeholders interested in the West Pacific and its neighboring oceans from more than 70 countries.

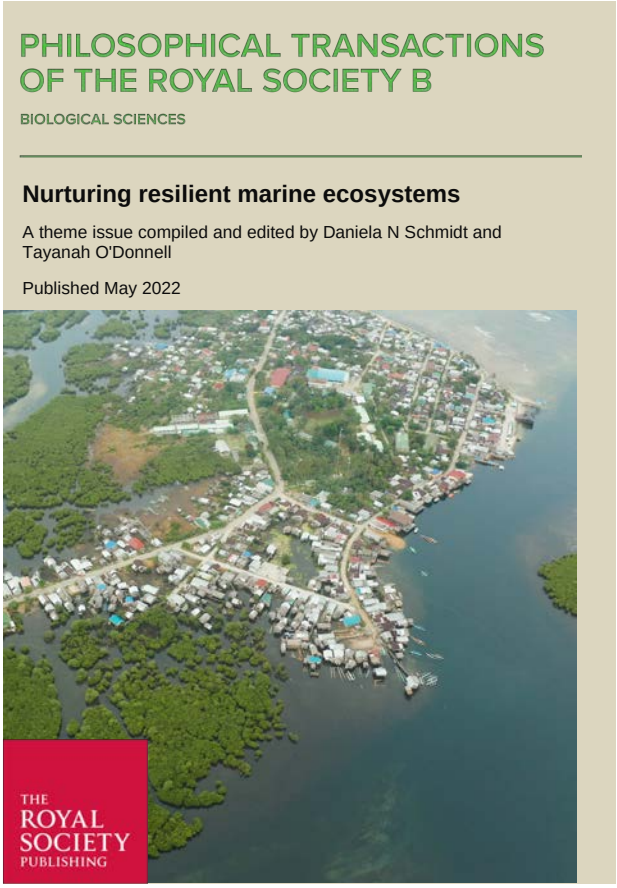
We are delighted to announce that the Deep-Sea Research II special issue, two volumes, stemming from the IMBeR West Pacific Symposium are under development. All presenters at the symposium are kindly entitled to submit manuscripts for the special issue. The manuscripts generated through/by/from/during the West Pacific Symposium are all welcomed according to the IMBeR publication policy. If you have developed manuscripts that fit into the Symposium over the course of time and are interested in submitting ones, please follow the submission guidelines here, imber.info/wp-content/uploads/2022/03/Special-Issue-guidelines-for-IMBeR-WPS-V2.pdf, or contact IMBeR IPO-China (imber@ecnu.edu.cn); new deadline 26th August 2022.

VIEWS

Royal Society Special Issue

Royal Society Publishing has recently published a special issue of *Philosophical Transactions B* entitled " Nurturing resilient marine ecosystems" compiled and edited by Daniela N Schmidt and Tayanah O'Donnelln; the articles can be accessed directly at www.bit.ly/PTB1854.

The issue is published as a result of the third Commonwealth Science Conference, in February 2021, co-organised by the Royal Society and the African Academy of Sciences. An associated theme issue on "Developing resilient energy systems" was published in *Philosophical Transactions A*., royalsocietypublishing.org/toc/rsta/2022/380/2221, and there is also a blog post at royalsociety.org/blog/2022/05/science-for-a-resilient-future/.



A print version is also available at the special price of £35.00 per issue from sales@royalsociety.org.

Challenger Society clothing store on Teemill

Please visit challengersociety.teemill.com/ where you can browse, and even purchase items if you like. Please feel free to provide feedback in the help section.

SALTS

Our cruise experiences to the Amundsen Sea

From January to March 2022, a group of interdisciplinary researchers and engineers set sail to the Amundsen Sea aboard the US

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icebreaker, *Nathaniel B. Palmer (NBP)*. The mission was part of the International Thwaites Glacier Collaboration (ITGC) and whilst the original mission plan was to survey Thwaites Ice Shelf, formidable sea ice in the region shifted these plans to the Dotson and Getz Ice Shelves. Scientists onboard represented ITGC projects TARSAN, THOR and associated project, ARTEMIS, all of which were UK-US collaborations. A large proportion of the team was made up of early career researchers and for a few, this was their first time partaking in a research cruise or in visiting the Southern Ocean. Some early career researchers representing the TARSAN project have shared their thoughts and experiences.

The RVIB Nathaniel B Palmer *at dock in Punta Arenas. Home to those in this article for 9 weeks. Photo by Philip Leadbitter.*

What happens on a research cruise in the Southern Ocean ?

The first hurdle I had to contend with once we had departed Punta Arenas was the dreaded Drake Passage. Despite a number of well-sailed crew members and fellow scientists telling me we got very lucky with the weather, I was still unaccounted for at meal times for a few days. However, once we crossed into Antarctic waters and the sights of icebergs got more frequent and the icebergs got larger, my days of sea-sickness were forgotten and replaced with an excitement of science to come.

As an interdisciplinary project, the research cruise included a number of different oceanographic disciplines and there was no lack of science to get on with. The mission incorporated a wide array of scientific aims, which used a combination of marine equipment. A primary aim of the research cruise was to survey underneath the ice shelf to further understand the mechanisms behind causing and modifying melt-water. This was done by using a Hugin robot from the University of Gothenburg and Autosub Long Range from the National Oceanography Centre. A fleet of Seagliders from the University of East Anglia were also deployed to understand more about the water column in this region.

A sunny day in front of the Dotson Ice Shelf. Photo by Daisy Pickup.

Shipboard activities ran 24 hours a day and included nearly 300 CTD casts, including trace metal sampling, with water samples taken by ARTEMIS team members for biogeochemical analyses. Sediment sampling was undertaken by the THOR team using a Kasten and Mega Corer. A specialised group of researchers from the University of St Andrews were involved in seal tagging on ice floes. I was lucky enough to get my hand in nearly all of the scientific activities taking place, learning an endless amount of skills that will benefit me throughout the rest of my career. ***- Daisy Pickup, PhD Student, University of East Anglia***

Deploying animal borne sensors in Antarctica

As an ECR studying the effects of climate change on marine mammals, the research cruise to the Amundsen Sea was a once in a lifetime experience. This was my first research cruise, and I was part of the team who were deploying sensors on Weddell seals to measure the ocean's heat content. The data collected is vital for understanding the melting rate of the floating part of the glacier. The seals live near the ice front of the glacier so are ideally positioned to provide information about these areas, which are hard for researchers to access. The data collected from these sensors also allow for further research into the behaviour of these marine mammals and how they could be impacted by future climate change.

We temporarily glued these sensors to the animals' fur, and they will fall off during the next

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moult. It was necessary to undertake safety training beforehand to ensure the safety of the team and every step of the fieldwork on the ice was carefully planned with each team member playing a vital role in collecting samples or assisting with the tag deployment. Good teamwork was essential, especially as we were working in a remote location, and we successfully deployed all the tags. This experience has given me renewed inspiration for my research now the cruise has finished, and I hope to be able to return to Antarctica soon. ***- Hannah Wyles, PhD Student, University of St Andrews***

Hannah Wyles and Dr Lars Boehme with a Weddell seal. Photo by Gui Bortolotto.

Life at sea during COVID-19

The last time I went to sea was before the pandemic that changed the world as we know it. Traditionally you'd hop on a plane to your port of departure, board the ship and set sail once mobilisation was finished. This time round we flew to the US to start our process of isolation. A week spent in San Francisco, a charter flight to Chile, followed by two weeks in Chile; all in individual isolation. This was then followed by a week of mobilisation on board the NBP when everyone was working together with masks on. We all had a PCR test just before leaving and then we were off. For the first time in two years, I was in close proximity with nearly 60 people, most of whom I didn't know well (although better by that point thanks to walks around the hotels), which was certainly a shock to the system. Then we spent 60 or so days together as if the world hadn't changed and living life as normal, well as normal as life is on a research icebreaker in the Southern Ocean with 24-hour daylight.

Eventually we had to come home. We docked up and within 2 days we were on a plane and 36 hours after that back in the UK, 97 days after we left. Given the amount of time we had to wait to get going, which when you are going through it felt much longer, leaving it felt like a crash landing back into the real world with the rapidity at which it all happened. Will this be the new norm for ocean going research ? Is it sustainable ?, I'm not sure, but I certainly don't want to be doing nearly 100 days away from home on a yearly (or even more) regular basis. ***- Philip Leadbitter, PhD Student, University of East Anglia***

Callum and Philip deploying a UEA Seaglider from a small boat during the early hours of the morning. Photo by Li Ling.

Combining data for everyone's use

During the cruise my main duties were deploying gliders and assisting with CTDs and Vertical Microstructure Profiler (VMP) surveys. This work was variable and left me with some free time, so I helped out with the sediment coring and seal tagging teams. Working with other research groups was a lot of fun. One thing I noticed was that we had several teams collecting datasets, with no easy way to collocate/compare them. While mobilising in port I had the idea to run a version of the UEA glider group web app (ueaglider.uea.ac.uk/mission64) on the ship so we could keep track of our gliders relative to the NBP while at sea. Seeing how other groups were collecting useful datasets, I decided to expand this app to show the locations and times of all the data we collected during the cruise. I wanted to enable any scientist to answer the question "what data were collected in this area around this time that I can compare with mine ?". It was a challenging task to pull in various near real time data streams, transmit data to the ship, make a map with temporal sub-setting, add sea ice

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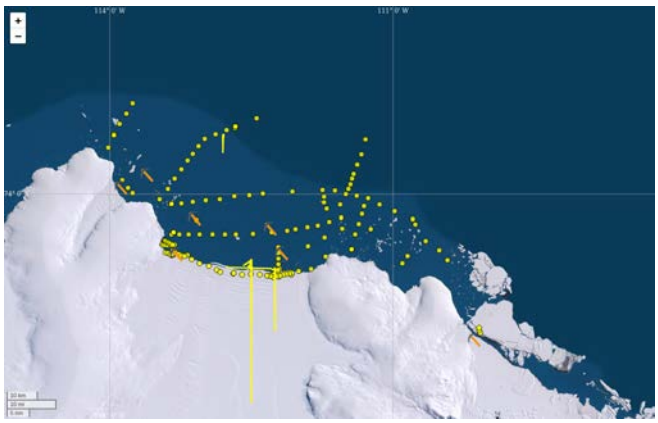
imagery for decision making, and keep the whole thing running on an old field laptop. Ultimately, this app was a success. Other scientists, particularly Li Ling from KTH, helped me solve some thorny coding issues and gave me great ideas for expanding the functionality. The app was well received, so I set it up on an open website once we got back to Punta Arenas. You can find the interactive map, as well as links to the source code, at nbp2202map.com. I hope this kind of data combination/exploration tool can be of use for future multidisciplinary cruises.



CTD stations, coring sites and ALR mission tracks displayed on Callum Rollo's NBP map.

Most of the science team onboard the NBP. Photo by Anna McBee.

Despite us all having different roles and experiences due to the interdisciplinary nature of the study, we enjoyed ourselves and gained valuable knowledge and skills. We each hope to be involved in more research cruises in the future. The research cruise overall was successful scientifically; providing important information about the region and aiding understanding of how we can utilise interdisciplinary data collection in remote locations. ***- Callum Rollo, Data Scientist, Voice of the Ocean Foundation***

CALENDAR

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

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)

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- 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 recordings will be accessible until August 1st at 12:00 (Canary Islands time). For more information see 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, and will bring together Governments, universities, research institutions, organizations, associations, companies and other partners. For more information, visit www.arcticcircle.org.

29th August – 2nd September 2022: SWOT-AdAC & CLIVAR conference on submesoscale (fine scale) ocean dynamics
Paris, France, Providence, USA Hobart, Tasmania and Qingdao, China

The Earth system has complex dynamics, characterized by feedbacks among biophysical processes occurring at a wide range of spatiotemporal scales. Disentangling these complex feedbacks is at the core of our capacity to predict climate change scenarios at high accuracy. This knowledge forms also the base for planning effective adaptation and mitigation strategies, as well as sustainable environmental policies, in particular over the decadal timescale. Due to their size, the fine scales (i.e. mesoscale and smaller, spatial scales of 1–100 km) are not resolved in most Earth System Models and provide a major challenge for global observing systems. Nevertheless, they play a pivotal role in climate dynamics, by storing and directing the flow of energy across the ocean scales, and by strongly modulating the ocean biogeochemical cycles as well as air-sea and ice-sea interactions. The fine scales affect the distribution and behavior of marine biota, forming the skeleton of the open ocean seascape where major conservation programs are planned in the incoming years under international initiatives like “Biodiversity Beyond National Jurisdiction” and “High Ambition Coalition”. Understanding these dynamics is also critically important in the early phase of marine pollution accidents, during which the fate of the pollutants is controlled by horizontal stirring.

The workshop “From filaments to climate change: recent advancements and future challenges in finescale ocean dynamics” aims at understanding the role of fine scale ocean dynamics on feedbacks among biophysical processes, increasing accuracy of climate predictions, assisting in improving Earth System Models, and discussing how knowledge of the finescale can be integrated in management and conservation efforts. The workshop will bring together scientists from different disciplines in oceanography; geophysical fluid dynamics, biophysical interactions, model parameterization, observational oceanography, climate modelling, and societal applications. Special emphasis will be given to the synergies between models and observations, with a focus on emerging inversion/assimilation techniques, Lagrangian methods, and on the opportunities opened by next-generation in situ and remote sensing finescale platforms, like the forthcoming SWOT satellite mission. For more information, follow the workshop website at finescales2022.sciencesconf.org/.

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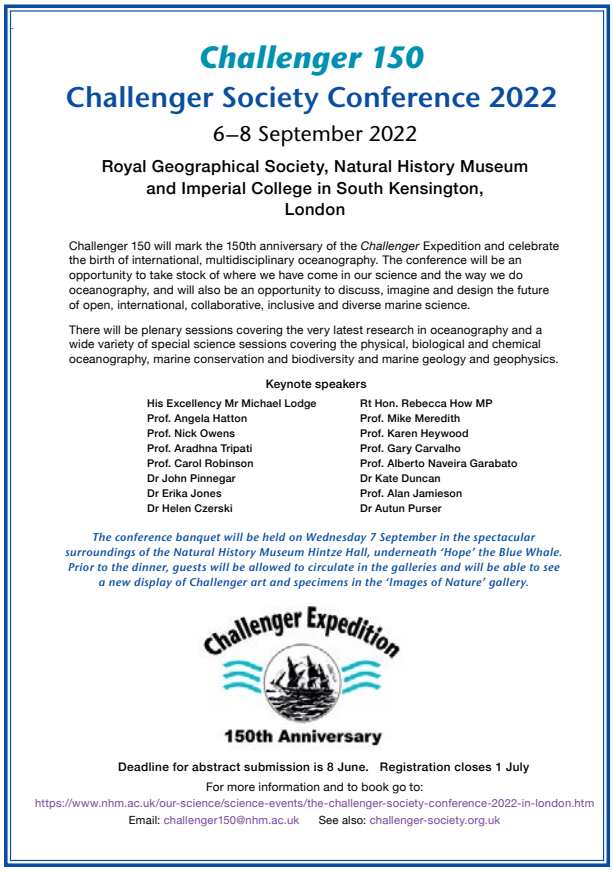
5th-8th September 2022: ECSA 59: Using the best scientific knowledge for the sustainable management of estuaries and coastal seas
San Sebastian, Spain
ECSA 59 will bring together a global multi-disciplinary community of researchers, educators and practitioners to address issues of outstanding importance in the science (both natural and social) and management of estuaries and coastal seas in this rapidly changing world. Main topics include:
Changing physical settings and processes
Biogeochemical processes and fluxes at the land sea interface
Shifting ecosystem structures and functions
The human dimension: impact, management, governance

Register by 24 June to claim your discount, www.estuarinecoastalconference.com/conference-register.asp. 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
The Challenger Society is delighted to announce that the Challenger 150 Conference 2022 registration and abstract submission is now open. This is a once in a lifetime opportunity to have dinner in the spectacular surroundings of the Natural History Museum Hintze Hall, underneath 'Hope' the Blue Whale. Guests will be allowed to circulate the galleries including a new display of Challenger art and specimens in the Images of Nature gallery prior to the dinner.

Conference: 6th-8th September 2022
Side events: 5th and 9th September 2022

Hosted by the Natural History Museum and Imperial College, London, UK, the Challenger Society Conference will mark the 150th anniversary of HMS Challenger setting off on her round the world voyage. The meeting will be held in person at the Royal Geographical Society, Natural History Museum and Imperial College in South Kensington, London.



Challenger 150

Challenger Society Conference 2022

6–8 September 2022

Royal Geographical Society, Natural History Museum and Imperial College in South Kensington, London

Challenger 150 will mark the 150th anniversary of the *Challenger* Expedition and celebrate the birth of international, multidisciplinary oceanography. The conference will be an opportunity to take stock of where we have come in our science and the way we do oceanography, and will also be an opportunity to discuss, imagine and design the future of open, international, collaborative, inclusive and diverse marine science.

There will be plenary sessions covering the very latest research in oceanography and a wide variety of special science sessions covering the physical, biological and chemical oceanography, marine conservation and biodiversity and marine geology and geophysics.

Keynote speakers

His Excellency Mr Michael Lodge	Rt Hon. Rebecca How MP
Prof. Angela Hatton	Prof. Mike Meredith
Prof. Nick Owens	Prof. Karen Heywood
Prof. Aradhna Tripati	Prof. Gary Carvalho
Prof. Carol Robinson	Prof. Alberto Naveira Garabato
Dr John Pinnegar	Dr Kate Duncan
Dr Erika Jones	Prof. Alan Jamieson
Dr Helen Czerski	Dr Autun Purser

The conference banquet will be held on Wednesday 7 September in the spectacular surroundings of the Natural History Museum Hintze Hall, underneath 'Hope' the Blue Whale. Prior to the dinner, guests will be allowed to circulate in the galleries and will be able to see a new display of Challenger art and specimens in the 'Images of Nature' gallery.

Challenger Expedition

150th Anniversary

Deadline for abstract submission is 8 June. Registration closes 1 July

For more information and to book go to:
https://www.nhm.ac.uk/our-science/science-events/the-challenger-society-conference-2022-in-london.htm
Email: challenger150@nhm.ac.uk See also: challenger-society.org.uk

Challenger members are eligible for reduced registration rates by providing their membership number and membership type. You can login to your account at, www.challenger-society.org.uk/Members, to check this information prior to registering. If you encounter any issues regarding your Challenger membership please email chelsey.baker@noc. ac.uk. After registering for the conference, you will receive an email and form to submit an abstract.

Registration closes 1st July

Don't forget to start taking your pictures for the Photo Competition, to be judged at the Challenger Society Conference. This time, the subject is to be 'Ocean Challenges': more details coming soon.

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The Conference web site is, www.nhm.ac.uk/our-science/science-events/the-challenger-society-conference-2022-in-london.html. If you have any questions regarding the conference please email challenger150@nhm.ac.uk.

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/.

25th September-2nd October 2022: Ramon Margalef Colloquium 2022, Past, present and future of a living ocean
Barcelona. Spain
A workshop hosted by the Institut de Ciències del Mar (ICM-CSIC). We have a limited understanding of the long physicochemical and biological evolution of the ocean. In a context of climate change, it is crucial to better understand the paleo-ocean and how it has evolved into the present ocean. That information would allow us to generate better predictions of the future ocean.

Thus, the main aim of this workshop is to bring together scientists from different disciplines, paleoceanographers, biogeochemists, conservation biologists, microbial ecologists, ecosystem modellers, geologists and physical oceanographers, in order to develop improved perspectives on the future ocean, based on knowledge from the past and present.

The RMSC2022 will promote synergies and dialogues between different disciplines as well as networking and knowledge exchange between senior, junior and next-generation researchers from different disciplines. Registration is now open and all information can be found at ramonmargalefcolloquia.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/1FAIpQLSc5MEiuWVNa5JXah47qoIdhKrDopmcY2bEzBcVu2MLrAATHJQ/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

11th-13th October 2022: 7th Argo Science Workshop
Brussels, Belgium

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We are pleased to announce that the call for abstracts is open for the 7th Argo Science Workshop.

This international workshop is hosted by Euro-Argo and will take place in the Royal Belgian Institute of Natural Sciences, Brussels, as a hybrid event with in-person and virtual attendance options. You will find further information on the workshop webpage, www.euro-argo.eu/News-Meetings/Meetings/ Others/7th-Argo-Science-Workshop-October-2022.

13th-16th October 2022: Arctic Circle Assembly
Reykjavik, Iceland
Arctic Circle, www.arcticcircle.org, provides an open, democratic platform for discussion and cooperation on Arctic Affairs, for Governments, universities, research institutions, organizations, associations, companies and other partners.

Attended by more than 2000 participants from over 60 countries, the Assembly is the largest international gathering on the Arctic. Every year, participants can attend over 150 Sessions, receptions, art exhibitions, film screenings and more with various networking opportunities provided throughout the Assembly days.

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.

27th–30th November 2022: 2nd Springer MedGU Annual Meeting 2022
Marrakech, Morocco
The Mediterranean Geosciences Union, association.medgu.org/, in collaboration with Springer and Ibn Tofail University (Morocco) organizes the 2nd MedGU. Visit our website (www.medgu.org) to learn more about the event.

MedGU Mediterranean Geosciences Union
Annual Meeting | Marrakech , 27–30 November 2022
Springer SPRINGER NATURE

On this occasion, we are pleased to invite you to take part in the conference (in-person or virtually) and share/discuss your latest research findings. The MedGU Annual Meeting is one of the largest international geoscience meetings (200 attended in-person the MedGU-21 in Istanbul and 250 online). The MedGU Annual Meeting aims to provide a forum where geoscientists, especially early career researchers, can present and discuss their findings with experts in all fields of geosciences. It will feature talks and panels covering a diverse range of geoscience and geoscience-society topics. **** Abstract submission date extended until the 20th June 2022.

The MedGU-22 encourages submissions of research works from all regions of the world. The MedGU-22 Proceedings will be published in Springer ASTI Series (indexed in Scopus & SCImago). Contact us, if you need more information, contact@medgu.org.

4th – 6th November 2023: Arctic Circle Japan Forum
Tokyo, Japan
The Arctic Circle is collaborating with the Sasakawa Peace Foundation in organizing the Forum. Governments, universities, companies, research institutions, organizations, associations and other partners were invited to submit proposals for Sessions. For more information visit www.arcticcircle.org/forums/arctic-circle-japan-forum.

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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 30th June.

JOBS and OPPORTUNITIES

POSTDOCTORAL POSITION IN PHYSICAL OCEANOGRAPHY, IMEDEA (CSIC-UIB)

The Oceanography and Climate Change department at IMEDEA (CSIC-UIB), Mallorca, is seeking a Postdoctoral Investigator. This is a full-time position. The initial appointment will be for one year with the possibility of an extension for an additional year based on satisfactory performance.

JOB SUMMARY:

The successful candidate will work on the characterization of the horizontal and vertical motion associated with ocean fronts in the Balearic Sea using observations from different platforms (CTD, ADCP, thermosalinograph, underway-CTD, gliders, and drifters), and the evaluation of different artificial intelligence approaches for diagnosing vertical velocity using model simulations. The appointee will be based at IMEDEA and will carry out research in collaboration with other international groups participating in the Departmental Research Initiative CALYPSO, which is funded by ONR. The project offers scope to investigate ocean submesoscale dynamics and understand the pathways for subduction from the upper ocean to the interior. The postdoctoral investigator will have an opportunity to participate in educational and outreach activities associated with the project.

EDUCATION & EXPERIENCE DESIRED:

1 PhD in Physical Oceanography.
2 Strong computer and programming skills, data analysis and visualization.
3 Demonstrated ability to communicate effectively and work collaboratively.

IMEDEA is a joint research center of the Consejo Superior de Investigaciones Científicas (CSIC) and the Universitat de les Illes Balears (UIB) located in Mallorca, Balearic Island (Spain). One of the objectives of the Oceanography and Global Change department is to study the physical mechanisms that explain the dynamics of the ocean system in the context of global change. The variability of scales involved, from metres to thousands of kilometres and from seconds to years, and their nonlinear interactions, make understanding these mechanisms a real internationally established challenge. We address this challenge by combining, a physical and mathematical background, theoretical, observational (in situ and remote), and numerical modeling approaches, particularly (but not exclusively) on the Mediterranean Sea, which becomes an ocean laboratory on a small scale, ideal to understand physical processes, to try new ideas and to support various activities in the maritime environment. It is an interdisciplinary group with significant external relationships with other groups, organizations, and companies.

APPLICATION INSTRUCTIONS:

Please, send a cv (resume) that includes the names and contacts of at least 3 references, a statement describing research interests and career goals, and up to three relevant publications (or preprints). Please, send your applications to Simón Ruiz (simon.ruiz@imedea.uib-csic.es) and Ananda Pascual (ananda.pascual@imedea.uib-csic.es). Applications will be reviewed as received until the position is filled. Applicants should not have previously held a postdoc position for more than three years to be eligible for this position. Please contact Simón Ruiz (simon.ruiz@imedea.uib-csic.es) or Ananda Pascual (ananda.pascual@imedea.uib-csic.es) with any questions about the position.

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Postdoctoral Scholar, Ocean Time-Series Group at Scripps Institution of Oceanography

Uwe Send's Ocean Time-Series Group at Scripps Institution of Oceanography (http://mooring.ucsd.edu) collects mooring-based observational data of the ocean. Their primary interest is physical oceanography (e.g., ocean circulation), with an additional focus on interdisciplinary studies that collect biogeochemical/ecosystem data and examine topics like ocean acidification and bio-physical interactions. The group typically has a portfolio of 5-10 funded projects which, in their entirety, range from the nearshore to basin-scale and span all three major oceans. Currently a postdoctoral scholar is sought to actively participate in the projects and produce scientific results from the data collected. The group's observational research topics include:

- Large-scale ocean circulation, such as the Atlantic meridional overturning circulation and studies of the Loop Current in the Gulf of Mexico
- Boundary current circulation at multiple additional sites, incl. off the western US, in the Solomon Sea, and near Sri Lanka
- Technology development for long-term time series observations with oceanographic moorings, including hardware, software, real-time data connectivity, and data management aspects
- Regional circulation in the California Current system and coastal circulation off California, including phenomena of upwelling and marine heat waves
- Ocean acidification and hypoxia
- Variability of nutrient and plankton concentrations and interpretation of the signals w.r.t. circulation and biogeochemical or ecosystem processes

To be considered for this job opportunity, a candidate should:

- have a doctoral degree at the time when this appointment begins, either in the discipline of physical oceanography or a related discipline;
- not have previous appointments as postdoctoral scholar of a cumulative duration in excess of five years; be willing and able to participate in field work on oceanographic research vessels up to several times per year;
- be willing and able to travel occasionally to scientific conferences and similar meetings;
- be fluent in the English language, both spoken and written, to a level appropriate for discussion and publication of scientific results;
- have computer software and analysis skills commensurate with independent research in the field of oceanography;
- have a demonstrated scientific interest in topics that broadly overlap with the group's interests;
- not be barred from obtaining necessary permits or visas to work in the US, as appropriate for the candidate's citizenship status.

Possession of the following qualifications will be evaluated favourably:

- Scientific publications authored by the candidate about a topic that overlaps with the group's research areas
- Prior experience with deploying oceanographic equipment from research vessels, especially those that clearly relate to the group's instrumentation (oceanographic moorings, sensors for seawater temperature, salinity, currents, oxygen and nutrient concentrations, pH, phytoplankton)
- Advanced knowledge of relevant software, such as MatLab or Python, as well as familiarity with use of the Linux operating system
- Demonstrated experience with processing of observational oceanographic data from a "raw" status into a final product that has undergone calibration, validation, and quality control procedures, and familiarity with NetCDF data formats as well as common metadata standards

Please email usend@ucsd.edu with a detailed CV (including education, training, positions held, experience, and expertises), a statement of interest, and names of three persons who may be contacted for references. Applications will be reviewed on an ongoing basis until the position is filled.

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Recruiting at Planet Ocean

Planet Ocean ecoSUB Robotics Division are seeking two talented individuals to join our small team to develop our capabilities at this next crucial growth phase of the technology. Our ecoSUB Division is based within the Marine Robotics Innovation Centre within the National Oceanography Centre Southampton. ecoSUB Autonomous Underwater Vehicles (AUVs) are robotic platforms at the leading edge of subsea technology development. They are affordable, intelligently designed and extremely disruptive to the market, markedly increasing accessibility to a wide range of users in research, offshore energy, and defence markets. Following the release of production systems, the ecoSUB division is in the process of growing a strong team of talented engineers to advance the system and achieve the growth plan.

Senior Robotics & Embedded Software Engineer
This position will primarily be responsible for software development for the ecoSUB AUV. The embedded software is very much at the heart of the AUV system and as such is the lead engineering role. This role involves working closely with mechanical and electronics development to ensure complete system functionality and cohesive operation. The role is primarily R&D focused with aspects of existing system support. The Senior Robotics & Embedded Software Engineer role will involve supporting colleagues and will benefit from career development opportunities and excellent compensation. The role will involve fieldwork and travel, with time spent at sea guaranteed. Required offshore training will be provided.

Production, Procurement & Test Manager
ecoSUB AUVs are self-contained electro-mechanical systems produced in small batches. The Production, Procurement & Test Manager role is responsible for production and testing of the ecoSUB AUV and associated products. This role involves working closely with R&D engineers across software, mechanical and electronics to ensure complete system functionality and cohesive operation. The role is primarily associated with the procurement of materials, system build and testing, liaison with sub-contractors and suppliers, documentation, and quality control. This is a new role within the ecoSUB team and requires the successful candidate to grow the ecoSUB teams' capability to efficiently build and deliver production systems as well as supporting R&D's test requirements. The role will involve future recruitment and development of a wider team to deliver the capacity and services required by the division. The role will involve fieldwork and travel, with time spent at sea guaranteed. Required offshore training will be provided.

Please contact carole@planet-ocean.co.uk for further information and visit www.ecosub.uk.

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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

- PhD: Resilience of Mediterranean low-lying coastal landscapes under climate change scenarios, Technological Centre of Catalonia (Eurecat), Barcelona, Spain. No deadline given; **apply now**
- 2 PhD positions, Mediterranean Institute of Oceanography, Marseille, France. September start; **apply now**
- Postdoc/Senior Researcher: Ocean physics and biogeochemistry, Princeton University, Princeton NJ, USA. Open until filled; **apply now**
- Marie Sklodowska-Curie Actions Postdoc Fellowships: Institute of Marine Research (IIM-CSIC), Spain. **Apply now**
- Earth Scientist: Berkeley Lab, CA, USA. Open until filled; **apply now**
- Program Officer: Ocean for Builders Initiative, San Diego, Chicago or Boston, USA. No deadline given; **apply now**
- Dean, School of Ocean and earth Science and Technology, University of Hawai'i, USA. Apply by **21 June**
- Wave Modeler, NIWA, Hamilton, New Zealand. Apply by **26 June**
- Marine Conservation Fellows Program, REEF Campus, Key Largo, Florida, USA. Apply by **5 July**
- Senior Marine Population Dynamicist, CSIRO, Brisbane, Australia. Apply by **5 July**
- Funding opportunity: Integrated Approaches to Human Migration/Mobility in an Era of Rapid Global Change, Belmont Forum. Apply by **29 July**
- Seafood Industry Climate Award: Innovations to lower the C footprint of the seafood industry and increase the leadership role of women and minority communities. Apply by **10 August**
- Funding opportunity: Community-centred coastal research, St. Mary's University, Halifax NS, Canada. Apply by **31 October**

In case you missed it...

- Environmental Assessment/Referrals Coordinator Prince Rupert, BC, Canada. Open until filled; **apply now**
- Short-term contractual support to the SCAR Executive Director. No deadline given; **apply now**
- PhD: Ecotoxicology, FAOESO. Apply by **20 June**
- Scholarship: Exceptional call for SCOR project and working groups scholars. Apply by **15 July**

imber@imr.no

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