

# Challenger Wave



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

## Challenger Society Conference 2020/21

As most Challenger Society members will be aware by now, the local organising committee at Oban have regretfully decided to recommend cancelling the Challenger Society Conference that was planned for September 2021. They feel that any physical meeting would be hugely diminished compared with what it could have been, and that social and other events would be negatively impacted. It is very likely that social distancing will still be in place in September and that given the venues available, numbers of attendees would probably need to be reduced by around 50%. At least two of the parallel session venues probably couldn't be used and the scientific programme would have to be significantly curtailed. There could also be a problem with accommodation in Oban as the future of some of the hotels is still unclear. Furthermore, travel to Glasgow could still be significantly impacted in September, along with the train service to Oban.

An online event has been seriously considered, as it might have provided a forum for the presentation of fellowships and other Challenger awards and prizes. In the end, however, it was felt that a virtual Conference would not provide an environment in which the networking that forms such an important part of the usual Challenger Conference could take place very easily, and that given its relatively small size and limited resources, the Society would not be in a position to run the kind of virtual Conference that larger bodies could cope with.

### Alternative virtual Challenger Society events in 2021

The Challenger Society Council feels that, nevertheless, there should be some kind of Challenger get-together in 2021 to ensure a chance to share some science, along with networking opportunities with a focus on early-career researchers (ECRs). There will therefore be a series of short events to be held at approximately monthly intervals between September and December.

- ★ **9 September, 1.00–2.00** Awarding of Challenger Fellowships and short presentations by the new Fellows. This will be followed by a meeting of the Ocean Modelling Special Interest Group.
- ★ **Early October** Equality, Diversity and Inclusion 'town hall' meeting, to dovetail with the MASTS 2021 Annual Science Meeting on 5–7 October.
- ★ **18 November, 1.00–2.30** ECRs propose themes and issues to be developed as part of the Decade of the Ocean (see opposite), followed by discussion. An invitation for pitches will go out soon and will close mid-September. (Open to non-members)
- ★ **9 December, 1.00–2.30** Discussion on 'Finding the voice of the UK oceanographic community' with talks from representatives of academia, industry and Government. (Open to non-members)

### Challenger Society Conference 2022

Next year will be the 150th anniversary of the Challenger Expedition, and as a celebration the Challenger Society conference will be hosted by the Natural History Museum and some other London venues. This is intended to be a normal physical conference rather than a virtual one, and is scheduled for 5–9 September 2022. The London organising committee is currently seeking a suitable venue for the presentations as, given current restrictions, the first choice of venue cannot be guaranteed. More information about the conference will be available soon.

### Challenger Society Conference 2024

This will be in Oban, and the local organising committee are looking forward to hosting a great event.



*Reinold E. M. Behabey*

President of the Challenger Society

## Joint Copernicus Marine and EMODnet product portfolio

The first joint Copernicus Marine and EMODnet product portfolio is available on both Copernicus Marine and EMODnet Chemistry web portals. Read the news, [www.emodnet-chemistry.eu/promotion/news/A\\_CMEMS\\_EMODnet\\_catalogue\\_to\\_support\\_the\\_Marine\\_Strategy\\_Framework\\_Directive](http://www.emodnet-chemistry.eu/promotion/news/A_CMEMS_EMODnet_catalogue_to_support_the_Marine_Strategy_Framework_Directive), where you can also find the link to download the catalogue in pdf format.



Since 2020, EMODnet Chemistry and Mercator Ocean International have worked together, [www.emodnet-chemistry.eu/about/meetings/4th\\_Phase\\_EMODnet\\_and\\_CMEMS\\_shared\\_data\\_product\\_catalogue\\_meetings\\_Dec2020\\_May\\_2021](http://www.emodnet-chemistry.eu/about/meetings/4th_Phase_EMODnet_and_CMEMS_shared_data_product_catalogue_meetings_Dec2020_May_2021), to collect all the information from both EMODnet thematic portals and Copernicus Marine in order to build the data product portfolio, a catalogue gathering the available marine data, i.e. different marine parameters from different services and sources (in situ, satellite, models etc.), relevant for the implementation of the Marine Strategy Framework Directive.

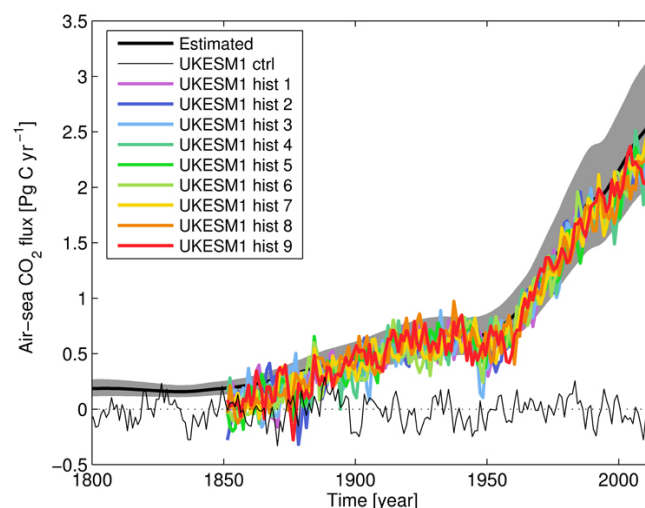
## New research from the UKESM project team released on World Oceans Day

New research from the UKESM (UK Earth System Modelling) project team released on World Oceans Day, evaluated performance of the ocean component of the UK's new Earth system model, UKESM1. Lead in the research, Dr Andrew Yool, said: "The ocean has a key role in the Earth's climate, acting as an important sink for

both the carbon dioxide (CO<sub>2</sub>) produced by human activities, and for the excess heat that this CO<sub>2</sub> has trapped in the atmosphere. This makes understanding how the ocean fits into the wider Earth system critical for the future projections of climate change we make with our computer models of the Earth. But an important step in this process is understanding how well these models represent the real ocean, and what biases occur in our simulations; for instance, where is it too warm or too cold."



Dr Yool continued to explain that "In this study, we looked at the ocean component of the UK's new Earth system model, UKESM1, to evaluate its physical, chemical and biological performance over the last few decades when we have the best observational data. While we found some discrepancies between UKESM1 and the real ocean, it generally captured most of the real geographical and seasonal patterns we observe, and performed well alongside other state-of-the-art climate models."



For more information visit, [gmd.copernicus.org/articles/14/3437/2021/gmd-14-3437-2021.html](http://gmd.copernicus.org/articles/14/3437/2021/gmd-14-3437-2021.html).

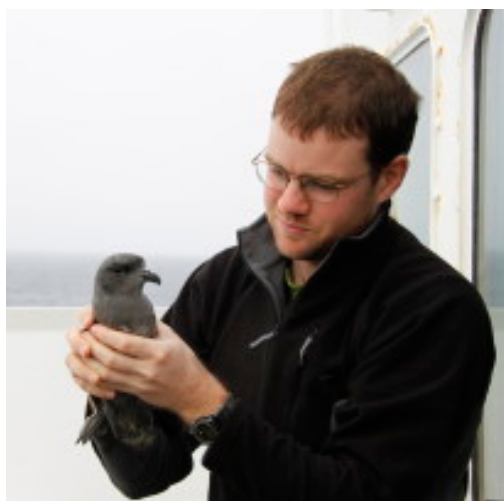


## Challenger Fellowships 2021

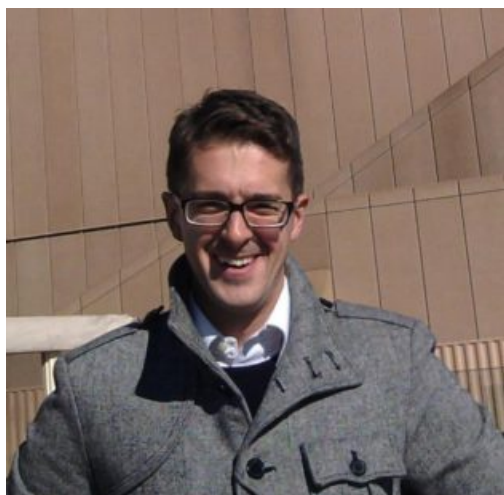
The Challenger Society is delighted to announce that the 2021 Challenger Fellows are,



Rob Hall (University of East Anglia),



Hugh Venables (British Antarctic Survey)



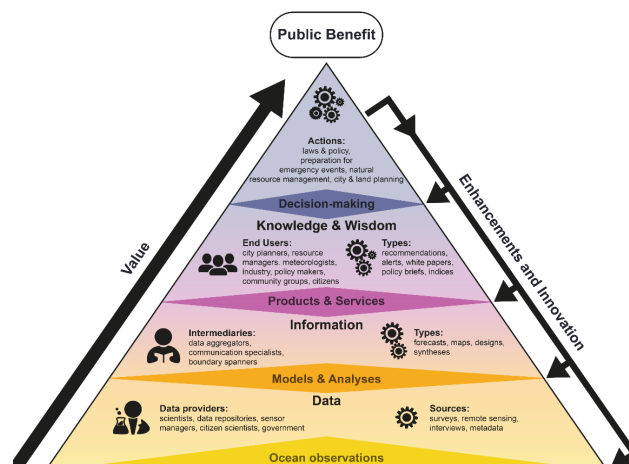
and Alex Brearley (British Antarctic Survey); and the Woodward Fellow is



Robyn Tuerena (Scottish Association for Marine Science).

## Sustaining in situ Ocean Observations in the Age of the Digital Ocean

On the 16th June, the European Marine Board (EMB) launched Policy Brief No. 9 on Sustaining in situ Ocean Observations in the Age of the Digital Ocean. The Policy Brief focuses on in situ Ocean observations and highlights their benefits, funding and governance challenges, and the investment needed for their transformation and sustainability. This document is the result of a Working Group, established by the EMB to address this topic, in light of the UN Decade of Ocean Science for Sustainable Development, and the start of Age of the Digital Ocean. EMB thank the external reviewers as well as the reviewers from the EMB Board Members for their input to this document which can be downloaded from [www.marineboard.eu/publications/sustaining-situ-ocean-observations-age-digital-ocean](http://www.marineboard.eu/publications/sustaining-situ-ocean-observations-age-digital-ocean).



The Ocean observation value chain. Adapted from Virapongse, et al., 2020. Ten Rules to Increase the Societal Value of Earth Observations. Earth Science

Considerable attention is now being given at the highest political levels to actions and solutions to reverse the cycle of degradation of the Ocean's health and productive capacity. But 'you cannot manage what you cannot measure' and timely Ocean information rooted in systematic sustained in situ Ocean observations will be integral to the design and evaluation of those actions and solutions. In addition, if the Ocean is to be integrated into the 'Internet of Things' then there will need to be a continuous presence of 'Things' in the Ocean.

The new EMB Policy Brief focuses on in situ Ocean observations and highlights their benefits, funding and governance challenges, and the investment needed for their transformation and sustainability. In situ Ocean observations are all Ocean, seas or coastal observations, and complement remote sensing observations (e.g. from satellites). This Policy Brief proposes the recognition of in situ Ocean observations as enabling infrastructure generating public-good data, which would deliver fit-for-purpose data and information supporting sustainable development, the 'Green Deal' ([ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)) and sustainable blue economy. It also recommends that a process should be established to review the costs and performance of the system and map its economic and environmental benefits. It should build on European and global coordination efforts, create partnerships with the private sector and civil society, and be integrated with satellite observations and models. For more information the EMB secretariat may be contacted via Twitter [@EMarineBoard](https://twitter.com/EMarineBoard) or email [info@marineboard.eu](mailto:info@marineboard.eu).

### Thank you for celebrating UN World Oceans Day

We are overwhelmed by the support and positive feedback from the 2021 United Nations World Ocean Day event. Over 260 thousand people from over 175 United Nations Member States around the world joined us in celebrating this year's theme, The Ocean: Life & Livelihoods. This year's programming featured over 75 speakers and performers and explored oceanic biodiversity, new underwater discoveries, innovative solutions for our changing ocean, and the economic opportunities that the ocean sustains.



Produced by the Division for Ocean Affairs and the Law of the Sea of the Office of Legal Affairs of the United Nations (DOALOS), in partnership with non-profit organization Oceanic Global, and presented by Blancpain supported by La Mer, in case you missed it, follow [@unworldoceansday](https://www.instagram.com/unworldoceansday) on Instagram for speaker highlights all month. You can also watch the full livestream now and individual speaker segments are coming soon: [unworldoceansday.org/un-world-oceans-day-2021/](https://unworldoceansday.org/un-world-oceans-day-2021/).

### Developments in the Science and History of Tides

A preface for the Copernicus special issue on tides, to mark the 100th anniversary of the Liverpool Tidal Institute, can be found at [doi.org/10.5194/os-17-809-2021](https://doi.org/10.5194/os-17-809-2021). The preface, led by Phil Woodworth, has some history and a summary of each paper in the issue. There are 26 papers in all (plus the preface) which reflects the continuing wide-ranging interest in tides.

### The Ocean Decade Advisory Board: call for expert members nominations

The Decade Advisory Board will be a multi-stakeholder advisory body that will assist the Secretariat of the Intergovernmental Oceanographic Commission (IOC) of UNESCO in performing its function as coordinator of the UN Decade of Ocean Science for Sustainable Development, 2021-2030 (the 'Ocean Decade').

The Board will report both to the IOC Governing Bodies and the IOC Executive Secretary. The Board's advice to the IOC Governing Bodies will concern strategic elements of the Decade implementation, such as reviews of the Decade progress in moving towards the Decade societal outcomes and on the research work in the domains of Decade challenges, identifying gaps and opportunities, advising on data stewardship strategies, the development of resource mobilisation strategies, and supporting the

development of a monitoring and evaluation framework of the Decade. The Board will also provide advice and operational support to the IOC Executive Secretary to facilitate the endorsement process of Decade Actions, specifically at the programme level.

The Decade Advisory Board will comprise up to 15 expert members drawn from government, private sector, philanthropy, civil society, and the scientific community. They will serve in their individual capacity. Five representatives of United Nations entities will also sit on the Board. The 15 expert members of the Board will be nominated through an open Call for Nominations. The full Terms of Reference for the Board, the eligibility criteria for expert members, and information on how to apply can be found in the Circular Letter, [oceanexpert.org/document/28656](https://oceanexpert.org/document/28656), and should be consulted before submitting a nomination. The nominations form can be found at [www.surveymonkey.co.uk/r/5PLY6PT](https://www.surveymonkey.co.uk/r/5PLY6PT). For more information, please contact the IOC Secretariat via [oceandecade@unesco.org](mailto:oceandecade@unesco.org), including "Nomination for Decade Advisory Board" in the subject line.

## VIEWS

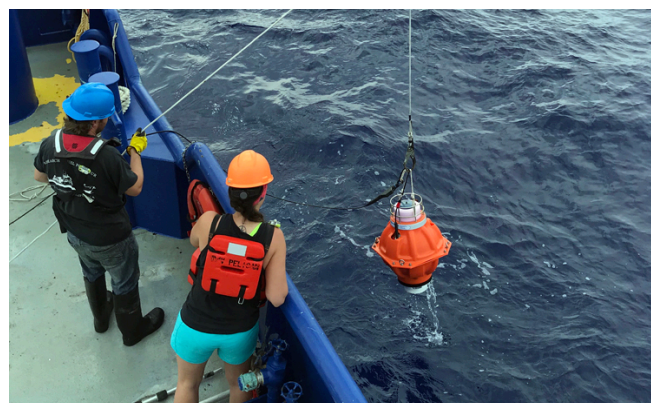
### Major Gulf Loop Current study using Sonardyne's PIES completes

Oceanographic instrumentation, developed by Sonardyne to monitor ocean currents, has been acquired by the University of Rhode Island following its successful use in a US\$2 million project in the US Gulf of Mexico. The project, led by the University of Rhode Island (URI), saw an array of specialist sensors, including Sonardyne's Pressure Inverted Echo Sounders (PIES), deployed for two years, to monitor the hugely disruptive Gulf Loop Current.

Sonardyne's PIES were installed in waters down to 3,500 m depth early in 2019, to help better understand the current. Following successful wireless acoustic data harvesting campaigns from the instruments in 2019 and 2020, their deployment was extended to the end of May, this year. Funding for the project, from the US National Academy of Sciences (NAS), was also extended, allowing URI to purchase the Sonardyne PIES used on the project outright, as well as a Dunker 6 telemetry transceiver, for

wireless data harvesting from the instruments when they are on the seafloor. This will allow URI to use the instruments on its future projects.

The Gulf Loop Current system is a highly energetic ocean circulation feature that influences all ocean processes in the Gulf and is characterised by disruptive Loop Eddy events that have serious impacts on a wide range of human and natural activities, from oil exploration to coastal eco-systems. However, knowledge of its underlying dynamics has been limited, leading to this study, led by Kathleen Donohue, Project Director and Professor of Oceanography at URI.



*Recovering Sonardyne's PIES, from 3,500 m water depth to the back deck of the RV Pelican, after a successful deployment in the US Gulf of Mexico. Photo by Maureen Kennelly, Marine Research Specialist at URI's Graduate School of Oceanography.*

PIES work by transmitting an acoustic pulse from an instrument on the seabed upwards. The pulse is reflected off the water-air boundary at the sea surface and returns back down to the seabed where it is detected again by the PIES. This enables an exact measurement of the two way signal travel time to be calculated. At the same instant, an accurate measurement of depth is made using highly precise internal pressure sensors. Combining data from an array of PIES instruments and near bottom current meters with historic water profile data can be used to calculate currents throughout the full water column over an extended area, in this case totalling over 50,000 sq km. For this project, Sonardyne enhanced the instruments with an integrated single point current meter, tethered above the units, leading to a modified designation as CPIES.

Randy Watts, Professor of Oceanography at URI, says, "The ability to receive the full time series of measurements plus engineering-performance



checks via acoustic telemetry in 2019 and 2020 shows that the data are of high quality. The impressively low battery drain meant we could leave the CPIES untouched on the sea floor for the duration of our experiment. With the additional funding, we were also able to extend our observational window to nearly two years. This is important because each Loop Current Eddy formation is unique.”

“The Loop Current encounters different pre-existing eddies and different bottom topography in different locations with different inflow from the Caribbean and different wind fields,” says Professor Donohue. “These events inside the ocean are dynamically analogous to ‘weather’ and ‘storms’ in the atmosphere, and every bit as varied. Observing these many events and observing the full water column is highly valuable information to guide the forecast models.”

“Looking to the future, the telemetry capabilities of Sonardyne’s CPIES offer us an established way to collect the data at more frequent time intervals using an uncrewed surface vehicle (USV) and report it ashore to enable real-time forecasting of the entire Gulf of Mexico Loop Current System,” adds Professor Watts.

Geraint West, Business Development Manager – Oceanographic, at Sonardyne, says, “URI have long been recognised as a leading proponent of using PIES to undertake large scale studies of ocean currents. Our collaboration with them has consequently taken our PIES technology to a new level, which we’re pleased to see being used in this important study. We look forward to continuing our close relationship with URI, including supporting more autonomous harvesting of their data.”

URI’s LCS study is being funded by the US National Academies of Sciences, Engineering and Medicine’s Gulf Research Programme, which was founded in 2013, as part of the legal settlements with companies involved in the 2010 Deepwater Horizon oil spill. The long-term objective is to improve forecasts of the Loop Current in order to increase the safety of operations in the Gulf.

### Seafood industry survey to assess impact of Covid-19

UK seafood businesses are invited to share their experiences on coping with the Covid-19

pandemic, as a team of researchers seeks to find out how resilient the sector will be to future challenges. The so-called ‘double shock’ of Brexit and the COVID-19 pandemic has heavily impacted the sector and has changed the way many seafood businesses operate.



*RiseUp project researcher George Charalambides, SAMS, is pictured at the Railway Pier in Oban, one of many UK towns that benefits from a thriving seafood sector. Credit: SAMS*

The Rise-Up project, [www.sams.ac.uk/science/projects/riseup/](http://www.sams.ac.uk/science/projects/riseup/), led by the Oban-based Scottish Association for Marine Science (SAMS), is calling on businesses to support its research by generating key data through a questionnaire. The project findings will generate policy recommendations and advice for government. The project team has already conducted interviews with representatives from the UK seafood sector, ranging from farmers and fishers, through to processing and logistics operations within the supply chain and supermarkets, fishmongers and restaurants.



*Fishmongers are at the end of the supply chain and therefore rely on processing as well as fishing to supply their products. Credit: Seafish*

Project leader Dr Sofia Franco, [www.sams.ac.uk/people/researchers/franco-dr-sofia/](http://www.sams.ac.uk/people/researchers/franco-dr-sofia/), said: "Seafood businesses had to adapt quickly to the pandemic and, while doing so, had to prepare for Brexit when so much was unknown. This double-shock has affected businesses in different ways, so we want to hear from a variety of sub-sectors and operators. How did businesses cope this past year? How well do businesses anticipate changes? Are they preparing for a 'third wave' of Covid infections? What could help their business survive or do better? These are some of the questions we ask in our survey, which will give us the data we need to produce a comprehensive report on the sector. We also hope to learn from the businesses who coped well or less well, so we can better understand what makes resilient businesses and which external changes could be 'game changers' to improve business competitiveness."

Dr Franco said the UK seafood industry was under unprecedented pressure to deliver on national food security during the pandemic, while trying to adapt to remain viable in a fast-changing sector. "Many livelihoods depend on the industry, whether that is people working within fishing and aquaculture sectors, supply chain companies and high street businesses," she said. "The location of many of these jobs, many in coastal and rural communities, is also significant in these local economies."

The Rise-Up project, funded by the Economic and Social Research Council (ESRC) as part of the UK Research and Innovation's rapid response to COVID-19, involves the University of Manchester and will create resilience models and identify adaptations that support future-proofing of the sector. The project is also benefitting from Seafish information and analytical input. The project questionnaire can be accessed here: [uhi.onlinesurveys.ac.uk/riseup](http://uhi.onlinesurveys.ac.uk/riseup).

### **AGU announces Geochemistry, Geophysics, Geosystems to become open access**

AGU is excited to announce that their journal Geochemistry, Geophysics, Geosystems, publishing research on the chemistry, physics, geology and biology of Earth and planetary processes will be open access from 1st January 2022. As a part of their mission, AGU is focused on making science available to the widest possible audience. By making G-Cubed open access, AGU will ensure that researchers

worldwide have access to the important research it publishes.

AGU is also pleased to announce that from the 9th July 2021, they have eliminated excess page fees for all open access journals and for authors who purchase an open access license in their other journals. Article publication charges for open access will be increased slightly to cover all costs, but there will now be one flat fee for open access, removing the need for a second invoice during article production. AGU have provided additional details about the G-Cubed move to open access and the elimination of excess page fees for open access journals in a 'From the Prow' blog post, [fromtheprow.agu.org/agus-geochemistry-geophysics-geosystems-g-cubed-journal-to-become-open-access/](https://fromtheprow.agu.org/agus-geochemistry-geophysics-geosystems-g-cubed-journal-to-become-open-access/).

## SALTS

### **No news from sea this month I'm afraid**

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

## CALENDAR

**9th – 13th August 2021: IMBeR ClimEco7 summer school**  
Vancouver, Canada



### **IMBeR ClimEco7 summer school postponed to 2021**

Unfortunately, due to the restrictions that we are currently all dealing with, and the uncertainty as to how things will be in August when we were planning to hold ClimEco7, IMBeR has taken the decision to postpone the summer school for a year.

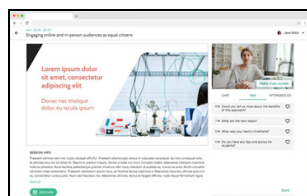
All the applications that we received for ClimEco7 this year will be carried over to 2021. Results of the selection process will be made known during March 2021.

**6th - 9th September 2021: Estuaries and coastal seas in the Anthropocene**  
Hull, England

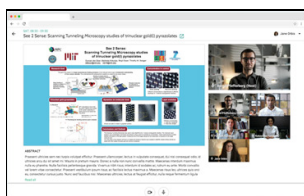


Same great content will now take place online as a live-streamed and interactive event. The conference will bring together our expert invited speakers, contributed talks and e-posters showcasing the latest research and addressing key topics from our cancelled in-person meeting. You will be able to participate in a live interactive conference experience direct from your desktop or mobile device.

Live-stream presentations, ask questions to the speakers and poster presenters and chat with other attendees via a dedicated conference platform. Plus, enjoy more flexibility with on-demand access to recorded sessions for 12 months after the event. Visit [www.estuarinecoastalconference.com](http://www.estuarinecoastalconference.com), for more information and registration (deadline 3rd September).



Engage with speakers



Participate in poster sessions

We do hope that you will be able to participate in this exciting event, Conference Chairs:

*Mike Elliott*, University of Hull, and International Estuarine & Coastal Specialists Ltd

*Tim Jennerjahn*, Leibniz Centre for Tropical Marine Research, Bremen, Germany

*Masataka Watanabe*, Chuo University, Japan

**20th - 22nd September 2021: Oceanology International Middle East**

*Abu Dhabi, UAE*

Whilst it is hugely disappointing to postpone the launch, and not a decision we have taken lightly, we believe it is the best course of action for all involved. In the last couple of months, we have been speaking to customers, partners and supporters to understand their views and to ensure we make the best decision, in such

challenging circumstances, for the ocean communities we serve.

If you require any further clarification or information regarding this situation, please feel free to email us at [info@oceanologyinternationalmiddleeast.com](mailto:info@oceanologyinternationalmiddleeast.com).

**20th-24th September 2021: Fifth OBPS Community Workshop, An Ocean of Values**

Early Information and pre-registration are available at: [workshop5.oceanbestpractices.org/](http://workshop5.oceanbestpractices.org/). All members of the ocean community, including educators, scientists, citizens, artists, conservationists, cultural ambassadors, policy makers, and ocean explorers, are invited to co-develop this workshop by proposing sessions, tracks, or other contributions by the end of June: [workshop5.oceanbestpractices.org/contribute](http://workshop5.oceanbestpractices.org/contribute).



As an overarching theme, participants will be asked to help understand how to better represent and safely archive the methods, policies, guides, or standard specifications that bring value to their communities. The workshop will be facilitating value mapping activities across all groups, so we can better connect "how" things are done to "why" they are done as well as why they matter: [workshop5.oceanbestpractices.org/mapping-value](http://workshop5.oceanbestpractices.org/mapping-value).

For more information, stay tuned to the OBPS newsletter and Twitter channel ([@OceanPractices](https://twitter.com/OceanPractices)) for updates.

**14th - 17th October 2021: The Arctic Circle Assembly**

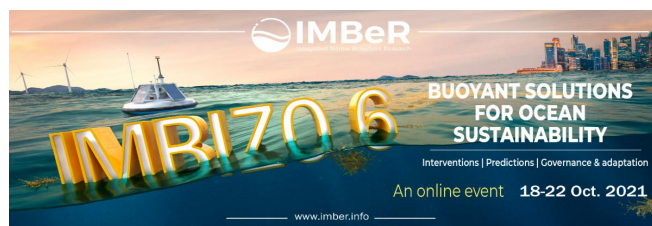
*Reykjavik, Iceland*

The 2021 Arctic Circle Assembly will be held in the traditional way as an in-person event. Registration will open in August. More information will be published soon, [www.arcticcircle.org](http://www.arcticcircle.org). You can also follow Arctic Circle on social media to stay updated.

**18th - 22nd October 2021: IMBeR sixth IMBIZO (the Zulu word for a gathering) virtual meeting**



IMBeR aims to promote and enable interdisciplinary marine research and governance to achieve improved prediction of, adaptation to and mitigation of global change towards ocean sustainability. Topics addressed during IMBIZO6 will showcase positive, 'buoyant' solutions for ocean sustainability currently being discussed and implemented around the world.



We will follow the usual IMBIZO format of three distinct but interacting workshops. To optimize discussions, the number of IMBIZO6 participants will be limited to about 120 people (around 40 per workshop). The workshop topics are:

1. Exploring potential marine options for climate intervention
2. Lighting the 'grey zone': how can we integrate human dimensions in decadal-scale prediction systems?
3. Ocean governance and climate adaptation: comparing responses, charting future courses.

Plenary keynote presentations and poster sessions will enable you to learn about the work of participants in other workshops. More information about IMBIZO6 and each of the workshops is available here, [imber.info/events/imbizo/](http://imber.info/events/imbizo/). There will also be an opportunity to attend a bonus workshop on 14th and 15th October. This is organised by the Interdisciplinary Marine Early Career Network (IMECaN) and will look at Equity, Diversity and Inclusion in Marine Science

Attendees will be selected on the relevance of their abstracts to the workshop topic. So, choose a workshop and submit an abstract by the recently extended deadline of the 16th August, [imber.ceotr.ca/machform/view.php?id=59222](http://imber.ceotr.ca/machform/view.php?id=59222).

### 9th-11th November 2021: Marine Autonomy Technology Showcase (MATS 2021)

Southampton, UK

MATS 2021 will welcome guests and exhibitors for a packed three days of insightful presentations and networking opportunities. This year's

showcase will primarily focus on new developments and innovations, and will also look forward to where marine autonomous technology and ocean exploration is heading in the next five years. Abstract submission is now open and will close on 14th July 2021. For more information, visit [noc-events.co.uk/mats-2021](http://noc-events.co.uk/mats-2021).

### 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](http://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](http://www.ices.dk/about-ICES/Pages/default.aspx), and North Pacific Marine Science Organization (PICES), [meetings.pices.int](http://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](http://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](https://twitter.com/ECSC_4) for announcements of keynote

speakers, the programme, and important dates. Registration and call for abstracts will open in October 2021.

**5th - 9th September 2022: Challenger Society Biennial Meeting – celebrating the 150<sup>th</sup> anniversary of the Challenger Expedition**

*London, UK*

To be hosted by the National History Museum, just a 'date for the diary', stay tuned.

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

*We continue to send printed copies of Challenger Wave to members of the CSMS without email addresses. However it is in everybody's interest to send your email address to Jennifer Jones, [jxj@noc.ac.uk](mailto:jxj@noc.ac.uk), as soon as possible*

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# ***JOBS and OPPORTUNITIES***

There are jobs on the IMBER web site

<http://www.imber.info>



Integrated Marine Biosphere Research

## **Jobs and opportunities**

### **New**

- Laboratory technician specialized in inorganic trace analysis, State Key Laboratory of Estuarine and Coastal Research (SKLEC), East China Normal University (ECNU), Shanghai, China. Open until filled; contact rczp@sklec.ecnu.edu.cn to apply!
- Postdoc Heat and OA stress on corals: University of Arizona, Tucson, AZ USA. **Apply now**
- Postdoc: Statistical Modeling and Analysis, Nanyang Technological University, Singapore. Review of Application: Starts on 1 July and continues until filled; **apply now**
- PhD: the constructive role of environmental stochasticity in ecological systems, University of Pisa. Apply by **16 July**
- Senior Science Officer: Future Earth, Paris, France. Apply by **16 July**
- Research Group Leader: Ocean Systems, CSIR, Rosebank, Cape Town. Apply by **17 July**
- Postdoc: Plankton Imaging and Ocean Biogeochemical Modeling, Princeton University, New Jersey, USA. Apply by **30 July**
- Six Postdocs: Institute of Marine Research, Spain. Apply by **1 August**
- Oceanography Lecturer, University of Cape Town. Apply by **2 August**
- Research Fellow: JAMSTEC Young Research Fellow 2022, Japan. Apply by **16 August**
- Future For Nature Award 2022. Apply by **1 September**
- Blue Climate Initiative: US\$1 million Ocean Innovation Prize. Apply by **15 September**

### **In case you missed it...**

- Marine Education Specialist, University of Southern Mississippi, USA. Open until filled; **apply now**
- Partnerships Manager Global Ghost Gear Initiative, Ocean Conservancy. Washing, DC, Santa Cruz, CA, or Portland, OR. No deadline given; **apply now**
- PhD Scholarship (fully funded): Climate Change in the Deep Oceans, University of Western Australia. No deadline given, **apply now**

Visit the IMBeR Website

[imber@imr.no](mailto:imber@imr.no)