

# Challenger Wave



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

**ocean**  
**BUSINESS19**

The hands-on ocean  
technology exhibition  
and training forum  
Southampton, UK • 9-11 April



## NEWS

### Time-travelling deep sea scientists reveal historic plastics problem

Marine creatures living in the deepest parts of the ocean have been feeding on microplastic particles for at least four decades, a study has revealed. Researchers at the Scottish Association for Marine Science (SAMS) in Oban delved into the institute's archived samples from the Rockall Trough, an area of deep sea off the west coast of Scotland, to assess the extent of microplastic ingestion in the stomachs of bottom-dwelling starfish and brittle stars.

Traces of eight different plastics, including polyester and nylon, were found in the stomachs of specimens that lived more than 2,000 metres below the ocean surface between 1976 and 2015; and the levels of ingestion were similar throughout that period. Across the time series, scientists found that nearly half of the starfish and brittle stars sampled had ingested microplastics, defined as small pieces of plastic less than 5

millimetres in size. When ingested by sea creatures, microplastics may be retained in their bodies and passed up the food chain.



*An acrylic fibre isolated from a starfish sampled from the year 1980*

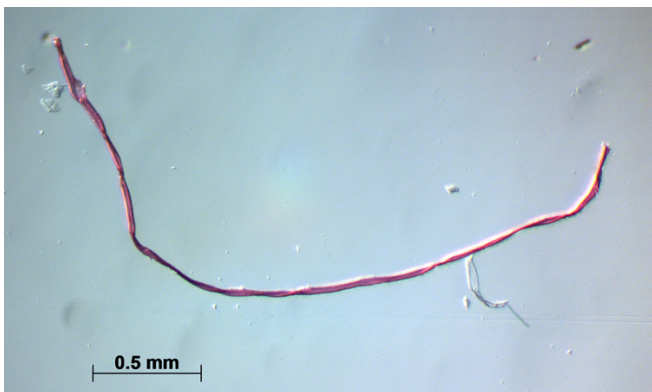
The study, published in Environmental Pollution [www.sciencedirect.com/science/article/pii/S0269749118330483?via=ihub](http://www.sciencedirect.com/science/article/pii/S0269749118330483?via=ihub), follows on from SAMS research in 2017, [www.sams.ac.uk/news/archive/archive-2017--sams/sams-news-deep-sea-microplastics.html](http://www.sams.ac.uk/news/archive/archive-2017--sams/sams-news-deep-sea-microplastics.html), which was the first to quantify the

levels of microplastic ingestion in marine creatures living at depths of 2,200 metres.



*A Hymenaster Seastar was one of the deep-sea creatures sampled*

Lead author Winnie Courtene-Jones, a University of the Highlands and Islands PhD student at SAMS, said: "Mass production of plastics only began in the 1940s and 1950s, so it would be reasonable to expect less plastic in our earlier samples, with a subsequent upward trend to the present day levels, but we haven't seen that. In fact, the level of microplastic ingestion is remarkably similar throughout the time series."



*A polyamide (nylon) fibre extracted from a starfish from the year 2013*

"This data shows, for the first time, the long-term prevalence of microplastic pollution in the deep sea and indicated that microplastics may have been present on the sea floor of the Rockall Trough prior to 1976. We were only able to gather this evidence by using archival specimen collections and I would encourage those with access to such repositories to consider using these in order to broaden our knowledge of historical plastic pollution, which will help us tackle our modern-day problem."

SAMS researchers had access to historical records collected from the annual Ellett Line scientific cruise, which began in 1975 and takes samples and observations at monitoring stations between Scotland and Iceland.

SAMS deep-sea ecologist Dr Bhavani Narayanaswamy, Winnie's lead supervisor and a co-author on the report, added: "To find such high levels of microplastic ingestion among deep sea creatures sampled more than 40 years ago shows that plastic pollution in our oceans is not a new problem. Previous studies have highlighted the current levels of plastic pollution, or given us a snapshot in time, but we need more long-term data like this if we are to find out the true extent of the problem."

### **Sonardyne acquires maritime and marine science technology company Chelsea Technologies Group**

Subsea technology developer Sonardyne International Ltd. has acquired maritime and marine science technology company Chelsea Technologies Group Ltd. The acquisition is part of a long-term growth strategy for Sonardyne, to diversify into markets where it sees an opportunity to build on its core technology base and expertise in underwater acoustic and optical communications, navigation and autonomous monitoring systems.

Chelsea, based in West Molesey, Surrey, has a broad base in environmental sensing technology spanning markets in fresh and waste water, oceanography and a wide range of industrial applications. In addition to its optical engineering capability, it provides underwater acoustic products to both civilian and defence customers. In acquiring Chelsea (also known as CTG), Sonardyne believe it will both strengthen its presence in the maritime, marine and ocean science sectors and create new opportunities in the water environmental, defence and process control markets. Chelsea will gain access to Sonardyne's considerable research, production, testing, compliance and global distribution capabilities, allowing the company to access many more international territories.

Fuelled to no small degree by its involvement in the rapidly developing, maritime/green shipping markets, where it has introduced a number of new products, Chelsea has seen considerable expansion over recent years. Its new products are

helping maritime operators meet recently introduced stringent international regulations aimed at reducing the impact of global shipping operations on the environment.

Chelsea will remain an independent business, as part of the Sonardyne group of companies. Chelsea's Brian Phillips will become Executive Chairman of the company, while Stephen Fasham will move from a senior management role at Sonardyne to become Managing Director at Chelsea.

"Chelsea, like Sonardyne, is a UK-based, privately-owned, technology driven company with a deep understanding in software and sensor development," says Sonardyne Managing Director John Ramsden. "They have strong footholds in shipping, hydrographic and ocean science markets, which complement our capabilities. In addition, Chelsea operates in the water environmental, process control and defence markets. We believe there are exciting opportunities for us in these sectors, which will be part of our future growth."



(L-R) Chelsea's Brian Phillips and John Ramsden, Sonardyne.

Brian Phillips, Executive Chairman, Chelsea, says, "We will remain independent while greatly benefiting from the added, engineering and financial support offered by this acquisition, in addition to accessing a broadened international reach. Of particular strategic importance is the option we have to use Sonardyne's volume manufacturing capabilities to satisfy our burgeoning order book for maritime products."

## VIEWS

### World Ocean Circulation User Consultation Meeting

A World Ocean Circulation User Consultation Meeting will be held over the 21st-22nd February 2019 in ESA -ESRIN (Frascati, Italy). This event has been organized by the European Space Agency and is intended to prepare a roadmap for new initiatives on ocean circulation research and applications to be implemented in the ESA Earth Observation Science for society program element. If you are interested to contribute, you can find all details at: <http://woc2019.esa.int>. Please also forward this message to all colleagues potentially interested to the subject.

### EARTH Magazine digital edition now free to college and university students, faculty and staff

The American Geosciences Institute is turning 70. To celebrate the breadth and richness of the geoscience community it represents, AGI will now provide free subscriptions to the digital edition of EARTH Magazine to all faculty, students and staff of earth, atmospheric, ocean, and astronomy-related programs in higher education around the world.

The AGI encourages you to subscribe for free today, and to share the link with all of your students and colleagues. Subscriptions also include access to EARTH's complete archive.



To subscribe, go to <https://digital.earthmagazine.org>. There is no obligation and AGI will not sell or rent your personal information. EARTH is still available in print, and digital readers are invited to subscribe to the bimonthly print edition, which has all the same content as the digital edition, but with an added measure of the visual layout, tactile enjoyment and analog portability that print provides. If you have any questions or need any assistance, please email John Rasanen at [jr@earthmagazine.org](mailto:jr@earthmagazine.org).

# 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

## 19th-23rd November 2018: MICRO2018 - All you ever wanted to know about "Microplastics" in five days.

Arrecife, Lanzarote, Spain

The title for this year's conference is *"Fate and Impact of Microplastics: Knowledge, Actions and Solutions"*

The main topics include:

- Marine Ecosystems
- Freshwater bodies
- From Macro to Nano
- Social change and behaviour
- Human health
- Policy

So find out more and register for the event, <https://www.cearc.fr/content/micro-2018-fate-and-impact-microplastics-knowledge-actions-and-solutions>.

## 21st November 2018: From HMS Challenger to Argo and beyond.

NOC, Southampton, UK

A one day meeting focused on how our ability to collect, process, interpret and use temperature/salinity profile data has developed over 150 years. The meeting is co-sponsored by the History Special Interest Groups of the Royal Met. Soc. and the Challenger Society and has commercial sponsorship from OSIL (<http://osil.com/>) who produce and distribute standard seawater. It will focus on how our ability to collect ocean temperature and salinity profiles has developed from the era of the Challenger Expedition (1870s) to the present day when the Argo array of profiling floats now provides global coverage. It will also highlight the products

[www.challenger-society.org](http://www.challenger-society.org)

November 2018

derived from these data and will look towards future developments. The meeting will coincide with two Argo milestones this autumn; 4000 robotic floats now in operation and the collection of the 2 millionth temperature/salinity profile.

Registration and details of the meeting programme are available at <https://conference.noc.ac.uk/hms-challenger-argo-and-beyond>.

Student bursaries to cover UK travel costs and registration fees are available for this meeting.

**RMets**  
Royal Meteorological Society  
Promoting meteorology as a science,  
profession and interest

#RMetsMeet  


**NATIONAL MEETING**  
Organised by the RMets History Special Interest Group

## From HMS Challenger to Argo and Beyond

Ocean profile data, their history, uses and future prospects



Knowledge of the temperature and salinity of the oceans is fundamental to our understanding of their internal dynamics and is increasingly important to a wide range of ocean and climate applications.

This meeting will show how our ability to collect, process and collate these observations has developed up to the present day, with information from about 3,800 Argo profilers providing global-scale, high-quality information throughout the year.

We will explore the international data collection framework, the products and applications that use the data and look to future expansion and new observing systems.

We will see Argo floats being prepared for deployment, ocean gliders and other autonomous vehicles in the National Oceanography Centre's profiling fleet.

**21st November 2018, 11-5pm**  
**National Oceanography Centre**  
**University of Southampton, SO14 3ZH**

For more details and to register, please visit our website  
[www.rmets.org/events](http://www.rmets.org/events) - registration fees apply.

## 7th-8th December 2018: Arctic Circle Forum, Asia Meets the Arctic: Science, Connectivity and Partnership

Seoul, South Korea



Photo by Carlbs [CC BY-SA 4.0], from Wikimedia Commons

The Arctic Circle will co-host the forum together with the Korea Maritime Institute, the Korea Polar Research Institute and the Ministry of Foreign Affairs of the Republic of Korea. The Forum will take place at the Lotte Hotel in Seoul.

Participants will have the opportunity to attend a guided study visit to the Korea Polar Research Institute. The Forum will be held just prior to Arctic Partnership Week in Busan (December 10th-14th), which participants will be able to attend as well.

### **10th-11th December 2018: Eighth International Workshop on Marine Technology**

*Porto, Portugal*

Technological development deeply constrains our perception of marine environments and ecosystems. The main objective of the MARTECH Workshop is to share information and points of view on cutting-edge research in several fields of MARine TECHnology. MarTech is an internationally renewed venue for dissemination of marine technology research since 2008. MarTech 2018 will take place at Faculdade de Engenharia da Universidade do Porto, hosted by Laboratório de Sistemas e Tecnologias Subaquáticas.

A special session on Emodnet Physics Interoperability focused on Underwater Noise will take place during the workshop. Expected topics covered during the meeting are:

- Operational Oceanography
- Instrumentation, Metrology, Signal processing
- Remote sensing
- Seafloor observatories and sensor networks
- Marine Robotic perspectives: ROVs, AUVs, ASVs, Gliders, Crawlers.
- Underwater imaging and data communication
- Seafloor and Water Column characterization
- Coastal, regional, and offshore research vessels and platforms
- Technology for Marine Biology and Aquaculture
- Marine Geophysics technology and solutions
- Citizen Science applications and interfaces
- Marine Data Interoperability and data flow
- Marine Strategy Framework Directive

A full registration fee covers the publication of up to two accepted abstracts for the workshop proceedings (ISSN 1886-4864 DL B-32814-2006) and the attendance to the workshop. Further information about the MARTECH Workshop 2018

can be found on the conference web site: <http://www.martech-workshop.org>.

### **28th January-1st February 2019: Time series analysis and related aspects in environmental research: Join the training school and conference.**

*Tromsø, Norway*

It is our pleasure to announce the third training school and conference on "*Environmental Time series analysis*". Please have a look at the web page for more information and registration: [https://www.actris.eu/Events/Eventsdescriptions/T S3\\_2019.aspx](https://www.actris.eu/Events/Eventsdescriptions/T S3_2019.aspx).



The concept of this event is to gather scientists from a large range of disciplines in Earth Sciences based on regular and constant in-situ measurements, and provide a discussion forum in the field of time series analysis and forecasting. There will be a 2½ day training school for students, followed by the conference. The program will be based on three different topics based on climate change:

- Atmospheric compositional change
- Ocean and marine environment, including connections with land and atmosphere
- Mathematical tools to understand climate change

Based on in-situ and remote data analysis and modelling, the conference will gather senior and young researchers (post-doctoral, doctoral and master students) to share their experience in time series interpretation across several scientific fields. The deadline for abstract submission is 31st December 2018.

You can find a link to the first conferences here ([http://wwwz.ifremer.fr/rd\\_technologiques/Projets/Time-series-analysis/Conference-2012](http://wwwz.ifremer.fr/rd_technologiques/Projets/Time-series-analysis/Conference-2012)) and to the

second conference here (<http://www.fixo3.eu/events/time-series-analysis-in-environmental-science-and-applications-to-climate-change>). We hope this will be of interest for many in the community.

On behalf of the coordination group, Benedicte Ferré (University of Tromsø), Cathrine Lund Myhre (NILU), Paolo Laj (UHEL/CNRS), and Ingrid Puillat (IFREMER).

**21st-22nd February 2019: World Ocean Circulation User Consultation Meeting**  
*Frascati, Italy*

Your attention is drawn to the forthcoming World Ocean Circulation User Consultation Meeting that will be held by the European Space Agency (ESA) -ESRIN. This event has been organized to prepare a roadmap for new initiatives on ocean circulation research and applications to be implemented in the ESA Earth Observation Science for society program element. If you are interested to contribute, you can find all details at: <http://woc2019.esa.int>. Please also forward this message to all colleagues potentially interested to the subject.

**25th-27th February 2019: Oi Americas 2019**  
*San Diego, California, USA*



The newly rebranded Oi Americas is returning to San Diego after a successful first event. Come and celebrate 50 years of delivering world leading ocean technology and marine science events. Now with brand new features for 2019.

Here are five reasons to attend Oi Americas in 2019:

1. Discover the latest technologies and innovations from 200 exhibiting companies displaying state of the art marine technologies and take the opportunity to explore a diverse range of solutions.

2. Experience live demos and hands on technology from global suppliers under one roof.
3. Collaborate and learn at our conferences: Technical Tracks, Ocean Futures Forum and Catch The Next Wave - [www.oceanologyinternationalamericas.com/Conference](http://www.oceanologyinternationalamericas.com/Conference).
4. Connect with your industry colleagues at one of our many OceanSocial events and through our digital tools
5. Discover future and disruptive technologies in our Future Tech Hub and Ocean ICT set to change the way ocean technology and marine science industries operate.



The ocean has always been a subject of wonder and mystery. Even after years of research, we still know little about the watery abode that covers more than 70% of our planet. However, thanks to some of the latest technologies and innovations in the marine industry, we're able to explore the ocean like never before. In our latest blog post, <http://inside.oceanologyinternational.com/2018/10/10/innovations-in-the-marine-industry/>, we're outlining some of the newest technologies that are part of that change.

Oceanology International Americas invites small organisations with less than 10 employees AND with a new product or innovation (launched since the first San Diego event in Feb 2017 or pending an upcoming launch) to exhibit in our Future Tech Hub at OiA19. If you are part of a small company, this could be the perfect opportunity for you to showcase products and technologies to be seen by the Marine Technology community.

You'll get:

- A centrally located booth
- Pre-show promotion with a special digital registration
- Two 20-minute presentation opportunities

View Future Tech Hub at: <http://www.oceanologyinternationalamericas.com/en/Exhibiting/Interested-in-Exhibiting-/Stand-build-options-/Future-Tech-Hub/>.

Don't miss this opportunity to create value for you and your business. For more information, visit: [www.oceanologyinternationalamericas.com](http://www.oceanologyinternationalamericas.com)

### 7th to 12th April 2019: 2019 EGU general assembly

*Vienna, Austria*

The conveners kindly invite you to submit your abstract to the following session: OS4.9, "Recent advances in physics and biogeochemistry from gliders and other autonomous underwater vehicles", <https://meetingorganizer.copernicus.org/EGU2019/session/30236>. This session provides an open forum for interdisciplinary discussions of the latest advances in oceanographic applications of autonomous underwater vehicles, including their use and complementarity in combination with other platforms. We welcome contributions on all aspects of the scientific analysis of data collected with such platforms on the coastal, regional, basin, or global scales.

Topics for this session include physical (e.g. hydrology, hydrodynamics, acoustic, optic), geochemical (e.g. nutrients) and biological (e.g. primary and secondary production, biomasses) variability of the ocean, ocean processes at different spatial and temporal scales (from ocean turbulence to basin-wide circulation), and interactions between the ocean, atmosphere and land. We also invite contributions on AUV data management and on their operational use (e.g. in Operational forecasting systems) and on the development/implementation of new instrumentation and sensors.

Following its success last year, we propose again the PICO formula that is highly suitable for the session topic. Looking forward to seeing you in Vienna, the conveners, Antonio Olita, Bàrbara Barceló-Llull, Louise Biddle, Federica Pessini and Simón Ruiz.

The conveners encourage you to submit an abstract to the following session on the "The realm of (sub)mesoscale dynamics: variability, impact, and new challenges". It is listed in the programme group Ocean Sciences (OS) as OS4.5/NP6.9: <https://meetingorganizer.copernicus.org/EGU2019/session/30232>.

Mesoscale and submesoscale structures such as fronts, meanders, eddies, and filaments are found worldwide, from the global ocean to marginal seas. During recent years it has been shown that

these features play a key role in the advection of heat, salt, biogeochemical properties, and in the enhancement of biological activity across all trophic levels. Due to their typical spatial and temporal scales, direct observations of these features remain currently an open challenge and their study requires a joint multi-platform effort combining in situ and remote sensing observations with theory and numerical models.

This session will provide a forum to properly address the new scientific advances associated with:

- Variability of (sub)mesoscale structures through observations (in situ and remote sensing), theory, and numerical simulations.
- 3D dynamics related to (sub)mesoscale features.
- Temporal and spatial interactions between different structures.
- Impact on mixing and transport of hydrographic properties.
- Physical and biogeochemical interactions.
- Limitations and improvements of the observational platforms and numerical simulations.
- A particular emphasis is put on challenges associated with the observation and numerical representation of subsurface (sub)mesoscale eddies.

We are looking forward to meeting you in Vienna, the conveners, Bàrbara Barceló-Llull (IMEDEA (UIB-CSIC)), Angel Amores (IMEDEA (UIB-CSIC)) and Bruno Buongiorno Nardelli (CNR).

The deadline for abstract submission is 10th January 2019, 13:00 CET. Detailed information on how to submit an abstract can be found at [https://egu2019.eu/abstracts\\_and\\_programme/how\\_to\\_submit\\_an\\_abstract.html](https://egu2019.eu/abstracts_and_programme/how_to_submit_an_abstract.html). If you would like to apply for a Roland Schlich travel grant to attend the meeting, please submit your abstract no later than 1st December 2018, [https://egu2019.eu/about\\_and\\_support/roland\\_schlich\\_travel\\_support.html](https://egu2019.eu/about_and_support/roland_schlich_travel_support.html). If you enjoyed a session this year at EGU, why not propose something similar for next year and perhaps offer to convene it. If you thought something was missing this year, why not propose it. If your session was successful, please propose it again. Note that no sessions are carried over now. You can do this at: <https://meetingorganizer.copernicus.org/EGU2019/provisionalprogramme>. Please use this opportunity to suggest sessions with conveners

and descriptions.

### 9th to 11th April 2019: Ocean Business 2019 Southampton, UK

As one of the most unmissable events in the ocean technology calendar, exhibit space at Ocean Business is already over 80% sold. With still 5 months until the show is due to take place at the National Oceanography Centre. The organisers have been overwhelmed by how quickly re-bookings have been flooding in; "Never before have we had such an incredible response to re-booking exhibition space. Exhibitors see Ocean Business as the perfect platform to seek out new opportunities for a relatively low cost. Such a rapid and positive response has been astounding!" exclaimed Cheri Arvonio, event manager.



Conference focused on the technology, operations and business issues in the global field of offshore surveying

9 - 10 April 2019 Southampton UK

[Submit an Abstract](#)



#### Offshore Survey 2019 Call for Abstracts - Deadline 14 December 2018

We are delighted to announce that Offshore Survey 2019, will once again be held alongside the Ocean Business event, from 9 – 10 April 2019 in Southampton, UK.

This will be the sixth Offshore Survey conference and all interested parties are invited to submit an abstract online by **14 December 2018**. Each abstract will be peer-reviewed and a final programme will be announced in January 2019.

The offshore survey community are encouraged to come forward with papers suitable for sessions on the following:

- Subsea Positioning
- Hydrographic and Seabed Survey Systems
- Survey Operations
- Data Processing and Visualisation
- Industry and Professional Issues

The 2019 event will see the same winning formula as in previous years with an international exhibition, three-day programme of hands-on training and demonstration sessions, a cutting edge conference (abstract deadline **14th**

**December 2018**), various associated meetings, Ocean Careers and an amazing line of up social events keeping exhibitors and visitors networking around the clock.

The organisers have now opened up the last few remaining stands to new companies wishing to exhibit. Interested parties are encouraged to be quick as every show to date has been a sell out and for a number of years there has been a long waiting list. Space won't be available for long. For further information on exhibiting at Ocean Business, visit [www.oceanbusiness.com/exhibition/why-exhibit/](http://www.oceanbusiness.com/exhibition/why-exhibit/).

### 6th – 10th May 2019: GODAE OceanView Symposium, Ocean Predict '19

Halifax, Canada

The next GOV Symposium invites ocean scientists, ocean observation specialists, industry representatives, service providers and users of ocean data and products from across the local, national and international operational oceanography community to engage in science sessions, booth exhibitions and discussions to explore and define the direction of future operational oceanography.

GODAE OceanView continues to provide coordination and leadership in consolidating and improving global and regional ocean analysis and forecasting systems. The Symposium objectives include:

- Getting a common picture of future development in all aspects of Operational Oceanography
- Motivating integrated international community projects to further advance science and benefits of Operational Oceanography
- Enhancing end-user awareness of present capacity and providing collaborative output of future in operational oceanography and end-user engagement

The call for abstracts opened in **October 2018**. The symposium is built around **six major themes** covering all aspects of Operational Oceanography. Abstracts will be invited to contribute to plenary, splinter and poster sessions. Especially welcome are representatives from the service provider and end-user community, to exhibit their work and products, and to engage with the science community.

Further information about the symposium,

themes and description of sessions is now available from the OceanPredict '19 website: <http://www.oceanpredict19.org>. We are looking forward to your participation; Fraser Davidson, Eric Chassignet, PN Vinayachandran and Kirsten Wilmer-Becker on behalf of the OceanPredict '19 Symposium Organising Committee. The Symposium is sponsored and supported by MEOPAR, DFO and other members of the GODAE OceanView Patrons Group.

**11th May 2019: Tides and the port of Liverpool**  
*Liverpool, UK*

The Merseyside Maritime Museum is hosting a one day meeting on Tides and the port of Liverpool. This meeting marks the 100<sup>th</sup> anniversary of the world-famous Liverpool Tidal Institute. Founded at Liverpool University in 1919, before moving to Bidston Observatory on the Wirral, this was the precursor of the Proudman Oceanographic Laboratory and the National Oceanography Centre. It also marks the start of teaching and research in Oceanography at Liverpool University, the first oceanography department in the UK.

This meeting is organised by the National Oceanography Centre and the University of Liverpool, in association with the Centre for Port and Maritime History (University of Liverpool, Liverpool John Moores University and Merseyside Maritime Museum) and the Liverpool Institute for Sustainable Coasts and Oceans (National Oceanography Centre, University of Liverpool and Liverpool John Moores University).

The meeting will run from 10 am to 2 pm with free registration and free refreshments. For a list of speakers and to sign up, please go to: <https://conference.noc.ac.uk/ocean-tide-and-port-liverpool> and download a ticket. The National Oceanography Centre building in Liverpool will also be open that day for you to see the machines which made tidal predictions before the days of digital computers; see the above web site for information on that also. Please sign up yourself and spread the word to your friends, schools etc.

**17th – 21st June 2019: IMBER 2nd Open Science Conference**  
*Brest, France*

We are now accepting abstracts and registration for Future Oceans<sub>2</sub> – the 2nd IMBeR Open Science Conference.



We welcome abstracts for oral and poster presentations. Abstracts should be submitted for specific sessions or workshops, and so it is advised to consult the session and workshop details prior to submission. Please submit abstracts through the abstract submission portal <http://www.imber.info/en/events/osc--imber-open-science-conference/osc-2019/2019-imber-open-science-conference/abstract-submission>.

**1st – 5th October 2019: 42nd CIESM Congress**  
*Salzburg, Austria*



Invites participants of The International Society for Ecological Modelling Global Conference 2019 to organise symposiums at the conference. Possible symposium topics, which include marine ecology and fisheries, are listed on our website, [www.elsevier.com/events/conferences/international-society-for-ecological-modelling-global-conference](http://www.elsevier.com/events/conferences/international-society-for-ecological-modelling-global-conference), and we also welcome other topic suggestions. To submit your symposium proposal please click [www.elsevier.com/events/conferences/international-society-for-ecological-modelling-global-conference/about/symposiums](http://www.elsevier.com/events/conferences/international-society-for-ecological-modelling-global-conference/about/symposiums) and submit before the 22nd February 2019.

The deadline to submit your abstracts is the 8th April 2019, [www.elsevier.com/events/conferences/international-society-for-ecological-modelling-global-conference/submit-abstract](http://www.elsevier.com/events/conferences/international-society-for-ecological-modelling-global-conference/submit-abstract).

This global conference, to be held at the Salzburg Congress Centre, is the 22nd biennial conference

of The International Society for Ecological Modelling (ISEM) and will bring together scientists from all professions and applications that deal with the use of ecological models and systems ecology.

The Conference Chairs are:

*Gudrun Wallentin*, Department of Geoinformatics,  
University of Salzburg

*Tarzan Legović*, Ruđer Bošković Institute

*Brian Fath*, Department of Biological Sciences,  
Towson University

**7th – 11th October 2019: 42nd CIESM  
Congress**

*Cascais, Portugal*



We hope to see as many of you as possible next October in Cascais, where our Congress will zoom in on the Atlantic/ Mediterranean interface.

If you wish to be part of the program, have a close look at the [75 Congress themes](#) selected by our Science Council for the occasion. If any one of them matches your research, please make a note that the period to submit your one-page illustrated paper online will run from 25th January to 5th April 2019. - **Cordially, The CIESM Congress Team**

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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 November.

*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

**There are jobs on the IMBER web site**

<http://www.imber.info>


**IMBeR**

Integrated Marine Biosphere Research

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### Jobs and opportunities

- 2019 SCOR Visiting Scholars Program to teach in a developing country for two weeks or more. Apply by 15 Dec
- MSc and PhD positions, Ocean Frontier Institute, Halifax, Canada. Apply by 31 Jan
- Proposals are being solicited for OCB workshops, synthesis, intercomparison or training activities in 2019. Submit by 3 Dec
- Associate Research Scientist: Paleodata assimilation to understand hydroclimate variability. Lamont-Doherty Earth Observatory, Palisades, New York
- Call for 2019 MarineGEO Postdoc proposals: Understanding changes in biodiversity, structure and function of coastal marine systems. Submit by 15 Dec
- Staff associate: Climate assessment specialist, Lamont-Doherty Earth Observatory, Palisades, New York
- PhD scholarships for 2019-2020, Imperial College, London, UK
- PhD: Marine Biogeochemistry, Bergen, Norway. Apply by 15 Nov
- SESYNC funding opportunity: Towards Understanding the Ecology Behind the Societal Benefits of Ecosystems
- Associate Prof/Prof: Marine and Aquatic Research, Åbo, Finland. Apply by 30 Nov
- Expression of interest for Collaborative marine science aboard R/V Falkor. Submit by 28 Dec
- Senior Research Scientist, Bigelow Laboratory for Ocean Sciences, East Boothbay, Maine, USA. Application deadline: 30 Nov 2018
- Postdoc: MarineGEO Fellowship Program, The Smithsonian. Proposal submission deadline: 15 Dec 2018
- Assistant/Associate Prof: Marine Resource Economics (modelling commercial or recreational fisheries or aquaculture), UC Davis, California, USA. Apply by 26 Nov 2018
- Regius Professorship of Ocean Sciences, University of Southampton, UK. Apply by 31 Dec
- Expressions of interest: Oceanographic technology research and development. Apply by 28 Dec

Visit the IMBeR Website

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