

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



The hands-on ocean technology exhibition and training forum

NEWS

Award-winning wildlife film maker Doug Allen launches new EU project to support the cross-border management of Marine Protected Areas

On the 11th of December documentary filmmaker Doug Allan joined the launch event of a €6.4 million environment project to inform and improve management and monitoring of several Marine Protected Areas (MPAs) between Northern Ireland, the border region of Ireland, and Western Scotland. The event took place at the Whistledown Hotel in Warrenpoint, overlooking Carlingford Lough, one of the project sites. Doug Allan, about whom David Attenborough said '*wildlife cameramen don't come much more special than Doug*', provided an illustrated talk highlighting the beauty and connectedness of the marine environment that the project aims to conserve.

The Marine Protected Area Management and Monitoring 'MarPAMM' project is led and

coordinated by researchers from the Agri-Food and Biosciences Institute (AFBI) and involves another six leading marine research providers, forming a cross-border collaboration network developing tools to protect vulnerable marine habitats and species.



Feeding time for a sea scorpion (*Taurulus bubalis*)

MarPAMM is supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB). Match-

funding for this project has been provided by the Department of Agriculture, Environment and Rural Affairs in Northern Ireland and the Department of Housing, Planning and Local Government in Ireland. The investment will deliver seabird, benthic habitat, marine mammal and coastal processes models and culminate in the development of six MPA management plans, including four novel regional plans.

Project coordinator Dr Annika Clements from AFBI explained: "I am really excited to work alongside expert colleagues from statutory, academic and voluntary organisations and with a wide range of stakeholders to produce meaningful management plans for MPAs in Northern Ireland (Murlough Special Area of Conservation), in the cross-border region (County Down to County Louth; Carlingford Lough; North Coast – North Channel region) and in Scotland (Outer Hebrides and Argyll)."

Welcoming the official launch of the project Gina McIntyre, CEO of the SEUPB said: "Our shared marine environment, and the many different species which live within it, needs to be properly managed so that it can be protected for future generations to come. As nature does not respect any boundaries this work has the most impact when it is conducted on a cross-border basis by a multi-disciplinary team of highly trained scientists with the specific skill-sets needed to deliver long-term conservation. The MarPAMM project will deliver upon this vital work and in doing so help meet the environmental protection targets of the EU's INTERREG VA Programme across Northern Ireland, the Border Region of Ireland and Western Scotland."

Dr Stanley McDowell, CEO of AFBI, said: "The need to better protect and manage our marine environments has been increasingly recognized in recent years. I am particularly pleased that AFBI is leading on this hugely important project which brings together leading organisations and stakeholders to make a real difference for the marine environment and for society."

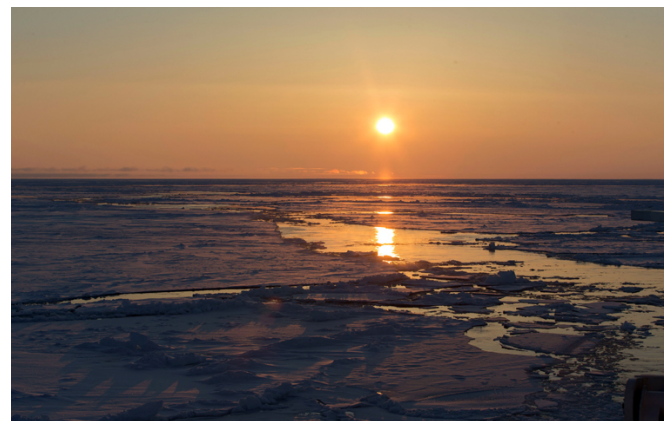
John Speers, Marine and Fisheries Director at the Department of Agriculture, Environment and Rural Affairs in Northern Ireland, said: "I am delighted to give my support to the MarPAMM project, which focusses on the evidence-based management of our local marine environment. It is an AFBI-led endeavour which will see

collaboration between multi-disciplinary scientists with the aim of generating lasting policies in the form of Marine Protected Area management plans. MarPAMM brings together experts across Northern Ireland, western Scotland and the border region of Ireland to study a wide range of marine species and habitats, from the seabed to seabirds. All the data will be used to produce plans supporting the conservation of those marine species, their habitats and the wider environment, helping to safeguard the health and sustainability of our marine ecosystem for future generations to enjoy."

Minister for the Natural Environment in the Scottish Government, Mairi Gougeon, said: "I am delighted that Marine Scotland and Scottish Natural Heritage will be partners in the MarPAMM project, working with other organisations across Scotland, Ireland and Northern Ireland. This project will improve the marine evidence base particularly in relation to seabirds and provide the platform for stakeholder engagement in development of long-term regional MPA management plans."

Life in the slow lane: Polar plankton march to their own beat

The world's largest daily commute happens in our oceans, as fish and zooplankton, key components in the food web, travel up and down in the water column in response to the sun as it sets and rises. But marine scientists have now discovered that zooplankton at the most northerly point of the globe prefer life in the slow lane, rising and falling in apparently random patterns and responding to changes in light that happen just twice a year at the North Pole.



Midnight sun in the Arctic

Zooplankton are the primary food source for many species of fish and are therefore important

in sustaining life in our ocean, but we know relatively little about their movements. Arctic researchers from the Scottish Association for Marine Science (SAMS), the University of Strathclyde, and UiT The Arctic University of Norway, studied zooplankton populations collected at the North Pole. This part of the world experiences two seasons: one long summer, in constant light, and one long winter in complete darkness. These periods are known as the midnight sun and the polar night.

Using acoustic sensors, scientists discovered that the normal daily commuting pattern, known as diel vertical migration (DVM), did not apply. Instead of using the daily light cycle to dictate their movements, these rebellious North-Pole dwellers appear to enjoy the freedom that comes with just one day and one night in any given year. The findings have been published, www.int-res.com/articles/meps_oa/m605p061.pdf, in the journal, Marine Ecology Progress Series, and suggest that at some point between 81 and 89 degrees north, zooplankton stop moving in unison to the daily solar cycle as they do elsewhere in the world.



The zooplankton Calanus finmarchicus can be found throughout the northern hemisphere

Lead author Dr Laura Hobbs of SAMS and the University of Strathclyde said: "While their more southerly colleagues commit to a gruelling daily commute of all rising towards the surface to eat during the night and diving to hundreds of metres at sunrise to avoid predators, the North Pole zooplankton seem to have escaped the rat race

altogether. Whilst zooplankton here continue to migrate, they do so in an unsynchronised fashion." The only evidence of a mass migration in the high Arctic is in late February and August each year when the 'midnight sun' and the 'polar night' periods begin. "In the high Arctic, the best time to feed is August; there is plenty of food available, and the sun is approaching the horizon ready to set, so we generally see zooplankton sitting higher in the water column," said Dr Hobbs. "In late February, as the north pole enters its spring equinox and the midnight sun starts there is a general movement downwards."

Marine scientists have previously observed this unsynchronised migration at lower latitudes for the few weeks a year that the midnight sun lasts. However, this is the first time that such a high latitude has been studied in this way. Prof Jørgen Berge of UiT The Arctic University of Norway added: "Everywhere we have looked for these migrations in the oceans, we have found them at some point during the year. We think that this might be the one place on the planet that synchronised daily migrations in the ocean don't exist. But then again, why should it? In a place where each year is just one long night and one long day, it makes little sense to keep up the hectic life that fish and zooplankton further south lead!"

In memory of John Harvey

It is with sadness that we bring news of the passing of John Harvey. John was a physical oceanographer at UEA for several decades, teaching generations of students as well as research.

John was an expert in the North Atlantic circulation, and in particular in water mass analysis, with strong collaborations with French oceanographers amongst others. In many ways he was ahead of his time; I remember that in the 1980s his T/S diagrams seemed very old-school as we were all into fronts, eddies and remote sensing at the time. Then along came WOCE a decade later; and there we were all doing T/S diagrams and talking about water mass formation!

John would have been in his element, such a shame that he did not benefit from this renaissance, but we built upon his foundations.

John took early retirement in 1989 and started a second career running adventure holidays in Scotland with his wife Chris. After many years he

returned to Norfolk to be closer to their grandchildren. - **Professor Karen J. Heywood**

January 2019

VIEWS

Launch of the European Atlas of Marine Life
EMODnet Biology is proud to unveil a new and innovative showcase of key marine biology data products.



The European Atlas of Marine Life presents a range of products, including abundance maps and trends for Atlantic Copepods, fish, birds, mammals, zooplankton and phytoplankton species, traits-based maps of macrobenthic and fish functional groups, an analysis of thermal niches occupied by marine species groups, and maps showing the occurrence of marine invasive species in European waters, along with many more. This gallery of products will continue to grow, as new analyses are done by EMODnet Biology partners and the wider community. The atlas is available at www.emodnet-biology.eu/about-atlas.

The Success of the Arctic Circle Korea Forum: Asia and the Arctic

About 250 participants from more than 30 countries attended the Arctic Circle Korea Forum, which was held at the Lotte Hotel Seoul, December 7-8, 2018.

In his opening speech, former UN Secretary General Ban Ki-moon recalled receiving the Arctic Circle Prize in recognition of his contributions to the success of the Paris Agreement. "Looking back," he reflected, "I think, unfortunately, I was too quick to declare victory," and urged the United States in particular to recommit itself to international climate cooperation.

Gao Feng, Park Heung-kyeong and Eiji Yamamoto, representing China, the Republic of

Korea and Japan respectively, presented their governments' policies and visions for the region, committing to continued trilateral consultations on the Arctic. Meetings between the Arctic Council's three East Asian Observer States and the Member States were suggested in the session "The Future of the Arctic: Asian Perspectives," as were East Asian contributions to marine plastic pollution mitigation in the Arctic Ocean.

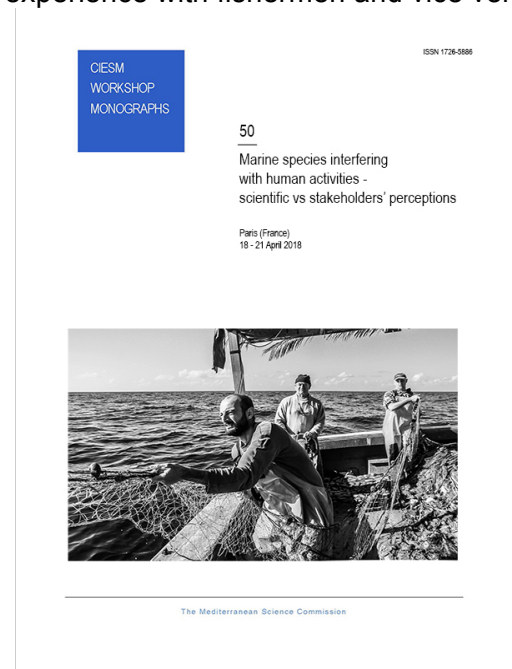


The Arctic Ambassadors of China, Japan and Korea shake hands over their commitments to trilateral consultation on the Arctic.

The Forum concluded with a visit to the Korea Polar Research Institute (KOPRI). More videos and photos will be available soon on the webpage, www.arcticcircle.org.

Latest issue of CIESM Monographs breaks new ground

Marine researchers could learn a lot by sharing their experience with fishermen and vice versa.



Forging such new alliances yields different perspectives on marine "socio-ecosystems" and can provide effective responses in the co-management of a number of major issues. See an overview of our latest CIESM Monograph on this exciting subject, www.researchgate.net/publication/329810761_Engaging_marine_scientists_and_fishers_to_share_knowledge_and_perceptions_-_An_overview.

This is no. 50 of our CIESM Monograph Series. Details on our full collection are here, www.ciesm.org/online/monographs/index.htm.

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

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.

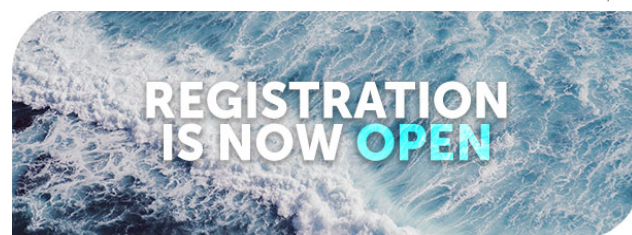
25th-27th February 2019: Oi Americas 2019 San Diego, California, USA

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.

Oi oceanology
international
AMERICAS

25TH-27TH
FEB 2019
SAN DIEGO CONVENTION CENTRE, CA



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.
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.

CALLING ALL TECHNOLOGY
INNOVATORS

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 out-

lining 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

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

Vienna, Austria

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.

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.

Looking forward to seeing you in Vienna, the conveners, Antonio Olita, Bàrbara Barceló-Llull, Louise Biddle, Federica Pessini and Simón Ruiz.

OS4.5/NP6.9, "The realm of (sub)mesoscale dynamics: variability, impact, and new challenges", <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).

OS4.11, 'Copernicus Marine Environment Monitoring Service. This CMEMS session will focus on:

- research activities that are required to maintain CMEMS systems at the state of the art and prepare their long-term evolution, including (but not limited to):
 - for models: physical and biogeochemical modeling, coupling with coastal systems; coupling with sea-ice, atmosphere &

waves; data assimilation both for physics (ocean, sea-ice, wave) and biogeochemistry; progress in short-term forecasts and assessment of forecasting skills.

- for observations: impact of existing and future in situ and satellite observations for estimates of the ocean state; processing and analysis of remote and in-situ observations of the ocean; use of Sentinel products.
- for long-term evolutions: seasonal to multidecadal regional projections for the coastal ocean and marine ecosystems, ocean model forcing from river discharge of freshwater and nutrients.
- verification, validation and uncertainty estimates of CMEMS products, forecasting skills,
- ocean monitoring and long-term assessment of the ocean physical and biogeochemical states,
- the use of CMEMS products for downstream applications.

Please note that presentations have not been limited to research teams directly involved in CMEMS; the convenors: Angélique Melet (Mercator Ocean, France, angelique.melet@mercator-ocean.fr), Stefano Ciavatta (PML, UK, s.ciavatta@pml.ac.uk), Emanuela Clementi (CMCC, Italy, emanuela.clementi@cmcc.it), Ananda Pascual (IMEDEA, Spain, ananda.pascual@imedea.uib-csic.es).

OS4.35, “Informatics in Oceanography and Ocean Science session”. The session presents the state of art information systems in oceanography (metadata, vocabularies, ISO and OGC applications, data models), interoperability (Interoperability forms, Web services, Quality of Services, Open standards), data circulation and services (quality assurance / quality control, preservation, network services) and Education in ocean science (Education and Research, Internet tools for education).

This 2019 session should provide new ideas on the interoperability issues deriving from different sources of data and new data streams. ISO standards introduce the necessary elements in the abstract process aiming to assess ‘how’ and ‘how much’ data meets applicable regulatory requirements and aims to enhance user needs. Data management infrastructures should include

an evaluation of data by assuring relevance, reliability and fitness-for-purposes / fitness-for-use, adequacy, comparability and compatibility. The session aims also to create a link to the important initiatives on ocean literacy. Presenters are strongly encouraged to demonstrate how their efforts will benefit their user communities, facilitate collaborative knowledge building, decision making and knowledge management in general, intended as a range of strategies and practices to identify, create, represent and distribute data, products and information.

OS2.5, “Advances in Understanding of the Multi-Disciplinary Dynamics of the Southern European Seas”. This session will overview recent developments and understanding, by observations and modelling, of the Southern European Seas (SES) general circulation, physical processes, biogeochemical interactions and their ecosystems.

Themes of particular interest are:

- Interaction of scales and processes in the SES: hydrodynamic and ecosystem interactions at multiple temporal and spatial scales (down to submesoscale), coastal processes and shelf-to-open sea interactions, straits dynamics, ocean response to atmospheric forcing, impact of environmental conditions on ecosystem functions from local to regional scales.

- Assessing, understanding and predicting the potential impact of climate change in the SES: long term trends, occurrence of extreme events, development of downscaled models at basin and regional scales, novel approaches to model marine ecosystems, ecosystem functions and biodiversity.

- Integrated Observing System in the SES: development of new sensors, scale of interests, development of advanced methodologies for upscaling local information, new satellite products, processes that need to be monitored, identification of data gaps (eg. observing system experiments).

- Science-based Integrated management of the SES: support to Marine Spatial Planning and deployment of Marine Protected Areas , scenario studies, mapping of anthropogenic pressures, habitat and ecosystem services, potential support for nature-based solutions and/or sustainable exploitation of marine resource.

Looking forward to meeting you in Vienna. Gianmaria Sannino, Emil Stanev, Katrin Schroeder, Arthur Capet, and Alexander Mikaelyan

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

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

The organisers have 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/.

Ocean Business dinner tickets are now on sale, but be quick as they are expected to sell out fast. The famous Ocean Business dinner has returned, but this time at the luxury Southampton Harbour Hotel. Located in Ocean Village, Southampton, it features a stunning contemporary design. Guests can catch up with friends old and new whilst taking in the views across the marina. The evening will take place on Wednesday 10th April

www.challenger-society.org

and will start with pre-dinner drinks, followed by a three course meal, promising a night to remember. Tickets are £85 +VAT per person, to purchase your ticket, email Apinya Wright awright@divcom.co.uk.

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 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 100th 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.

20th May 2019: Institute of Aquaculture Students' Association Careers Fair for Postgraduate Students

Stirling, UK

We would like to draw your attention to the event Aquaculture Careers 2019 organized by the Aquaculture Students' Association (ASA) at the Institute of Aquaculture, University of Stirling. This year the event is taking place a month later than usual, and will run from 09:15 – 16:00.

In the past the event has hosted some stands free-of-charge. However this year the students have decided to apply a nominal charge of £50 for a stand. This charge will contribute toward the sole significant overhead of the event, which is catering. Would this be of interest to any of your companies? In the last two years the event

attracted 150 – 200 students of MSc/PhD level with a keen interest in Aquaculture. If this would be of interest, please could you contact Carolina Fernandez carolina.fernandez@stir.ac.uk who is President of the ASA.

20th – 24th May 2019: 8th EGO Meeting and International Glider Workshop

Rutgers University, New Jersey, USA

Save the dates, express your interest at docs.google.com/forms/d/e/1FAIpQLSeEksxZdaYLtQc0Em9NMCsUaBWY6NEfZkY2ISu55i9CkkacUA/viewform.

SAVE THE DATE
 20th - 24th May 2019
 Rutgers University
 New Jersey, USA

UG²/EGO

Present the **8th EGO Meeting and International Glider Workshop**

Goal: To strengthen international collaboration, exchange information, share experiences, promote dialogue, and develop best practices

This meeting will be 3-4 days and offer a mix of presentations, panels, breakout groups, poster sessions, and open community dialog.

Planned topic areas include:

- Harmonizing glider efforts: International data management, leveraging partnerships, documenting best practices, and international collaboration
- Promoting new developments: Sensors, emerging requirements, novel glider applications
- Exploring extreme environments: Sea ice, currents, severe weather conditions
- Refining operational activities: Reliability, sampling strategies, sustained monitoring
- Preparing for OceanObs'19: Strategy for the next decade of regional, national, and global ocean observing using glider technologies

Input, either through an oral or poster presentation, as well as, suggested discussion topics are welcomed!

Fill out the expression of interest if you'd like to participate.

Supported by:

17th – 21st June 2019: IMBER 2nd Open Science Conference

Brest, France

The deadline has been extended for abstract submission for Future Oceans2, The 2nd IMBeR Open Science Conference. DEADLINE is now 15 JANUARY 2019. 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>.



8th – 18th July 2019: 27th IUGG General Assembly

Montreal, Canada

This is to inform you that until February 18th 2019 it is possible to submit your abstract to the IAPSO Symposium P02. Details of the P02 symposium, Physics and Biogeochemistry of Semi-Enclosed, Shelf Seas, and Coastal Zones can be found below and at this link <http://iugg2019montreal.com/p.html>.

This interdisciplinary symposium provides a joint forum for oceanographers whose research focuses on physical, chemical, and biological processes in coastal zones, semi-enclosed and shelf seas of the World, as well as their responses to climate change and anthropogenic impacts. These areas are often characterized by complex interactions between land, ocean, and atmosphere, they exhibit rich dynamics driven by a variety of feedbacks and forcing mechanisms. Marginal seas and coastal areas are particularly vulnerable to climate change effects and anthropogenic stressors. Given their limited geographical extension and their sometimes constricted connection to the open ocean, these environments often exhibit shorter timescales in their responses to external forcing: this is why they are widely recognized as natural “laboratories” for studying oceanic processes and interactions between the physical, biogeochemical and climatic spheres. They also play an exceptionally important role in ecosystem services and socio-economic issues and require careful governance measures to avoid or mitigate environmental deterioration.

Gathering experts from different regions, the symposium will give a global perspective of the topic through comparison and elucidation of similarities and differences. Contributions on different regions are invited, related to themes such as innovative observational, theoretical, experimental and modeling studies of the hydrodynamics, marine biogeochemistry (e.g., nutrient dynamics, primary production, acidification, algae blooms) and the influence these regional seas and coastal zones exert on the adjacent basins/oceans and on the global scale. Studies of past, present and future climate variability are welcome, as well as interdisciplinary studies on the bio-physical interactions in semi-enclosed and shelf seas. The convenor and co-convenors of this session are: Peter Zavialov (Russia), Jianping Gan (China), Osmar Moller Jr (Brazil), Katrin Schroeder (Italy).

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, 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 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.

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

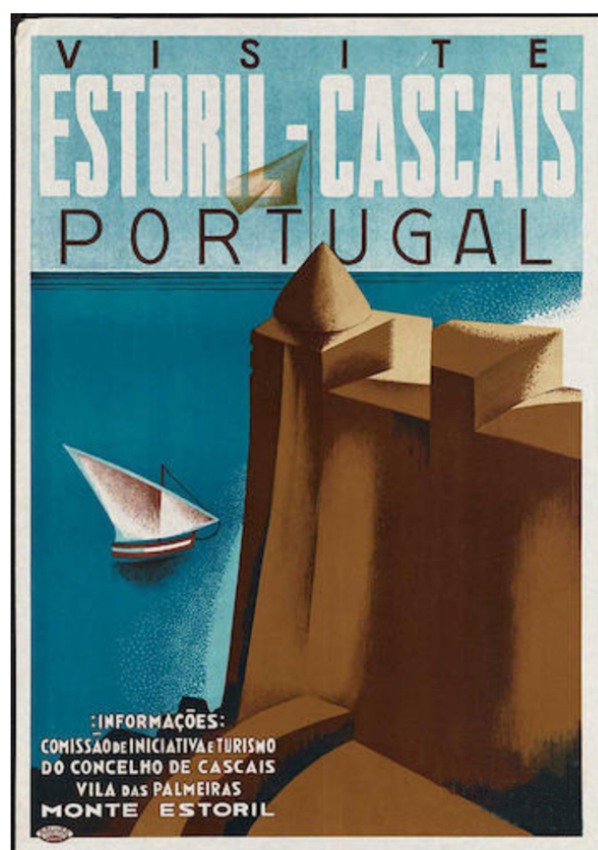
7th – 11th October 2019: 42nd CIESM Congress

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. Some 1000 scientists will be there to share and debate their findings and their views on marine issues.

If your research matches one of our 76 Congress themes, we encourage you to submit a paper online as soon as 15th January. Do not wait much longer: Cascais is a picturesque town, highly popular with tourists and so hotels and pensions in the vicinity will fill up quickly. Besides, by registering before 15 February you will enjoy a significant 40% reduction in your fee. Have a close look at the Congress themes selected by our Science Council for the occasion, www.ciesm.org/. Please make a note that the period to submit your one-page illustrated paper

online will run from 15th January to 5th April 2019. - **Cordially, The CIESM Congress Team**



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

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, as soon as possible

JOBS


Marine Earth Observation Scientist Plymouth Marine Laboratory

advanced.advorto.com/PML/VacancyInformation.aspx?VId=21006-.XCx4nfZ2vug

Closing date 28/1/19

There are jobs on the IMBER web site

<http://www.imber.info>

**IMBeR**

Integrated Marine Biosphere Research

Jobs and opportunities

- Assistant Prof: Large-scale ocean dynamics and climate, University of Toronto, Canada. Apply by 31 Jan
- Junior (tenure track) or Senior Scientist: Marine Chemical Oceanography, Royal NIOZ, The Netherlands. Apply by 28 Jan
- Junior (tenure track) or Senior Scientist: Physical Oceanography, Royal NIOZ, The Netherlands. Apply by 21 Jan
- PhD Research Assistantship, University of Vermont, USA. Review of applications starts 18 Jan
- EURASTIP exchange programme: Aquaculture education, industry and research. Apply by 27 Jan
- JPI Oceans Call for joint research proposals on microplastics in the oceans. Proposals by 28 Feb
- Two Phds: Coral Climatology, ZMT, Germany. Apply by 31 Jan

Visit the IMBeR Website

imber@imr.no