

Challenger Wave



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

NEWS

The EMOD-PACE Project: strengthening international ocean data through the EU's ocean diplomacy with China

On the 19th of February 2020, the EMOD-PACE project, 'EMODnet Partnership for China and Europe' kicked-off officially with a meeting at the headquarters of the European External Action Service (EC-EEAS) in Brussels. This project aims to support the EU's ocean diplomacy with China by fostering international collaboration between the European Marine Observation and Data Network (EMODnet) and the National Marine Data and Information System (NMDIS) in China.



The success of the project will be dependent on the effective cooperation, dialogue and exchange between experts from the EU and China. The project is an important support for the implementation of global commitments through improved accessibility of ocean marine data and data products. It is funded as part of the Foreign Policy Instrument (FPI) of the European Commission; www.emodnet.eu/emodnet-leading-implementation-emod-pace-ground-breaking-collaboration-between-eu-and-china-deal.

CIESM Guide to Marine Stations

The Mediterranean Science Commission, CIESM, are very pleased to introduce their latest product, the "CIESM Guide to Coastal Research Stations in the Mediterranean and Adjacent Waters". The guide is designed for easy consultation of key features of 116 coastal stations dedicated to marine research in the geographic perimeter of the Commission. "Once you load our interactive map on your screen, www.ciesm.org/online/institutes/CIESM_Institutes.php, we suggest that you click on a given country and proceed from there; it is very easy".



Please note that this online Guide merely reflects the quality of the feedback which is received from the diverse institutes. Some did fill in the CIESM questionnaire; but others did not. "So now it is your turn: we will be happy to receive comments from you" Loriane Mendez, lmendez@ciesm.org, "Or any editorial remark destined to improve the information provided on your own coastal station."

10th Annual Meeting of the NOC Association of Marine Science National Capability Beneficiaries (NOCA)

Members of the NOCA, www.noc.ac.uk/about-us/our-national-role/noc-association, are warmly invited to the 10th Annual Meeting which will be on **Tuesday 23rd June 2020** at a venue (to be confirmed) in London.

Provisional session topics include National Capability, sustainable management of marine resources, Early Career Researchers, the

BioGeoSCAPES initiative & accessing ship time. The event is free to attend and details are on the registration page, [www. eventbrite.co.uk/e/10th-annual-noc-association-meeting-2020-tickets-95340200105](http://www.eventbrite.co.uk/e/10th-annual-noc-association-meeting-2020-tickets-95340200105).

If members have colleagues who would like to attend, they are also welcome to register. For queries, please email NOCA Secretary, Jackie Pearson (jfpea@noc.ac.uk), at the National Oceanography Centre.

Oceanology International Postponed due to COVID-19

In case anyone missed it, on Thursday 5th March it was announced that the Oceanology International Exhibition & Conference would be postponed and will now take place from 1st - 3rd December 2020 at the ExCel, London, following the escalation of COVID-19 in Europe.

Speaking about the announcement, Jonathan Heastie, Portfolio Director at Reed Exhibitions, said: "The health and safety of our exhibitors, visitors and staff is of course our number one priority. We have been closely monitoring the situation and the notices issued by the World Health Organisation (WHO) as well as Public Health England and the authorities in London. We have also been in regular dialogue with many exhibitors, visitors and conference speakers to understand their views and to ensure we make the best decision - in such challenging circumstances - for the ocean communities we serve".

"This is not a decision we have taken lightly. We trust that postponing the show will enable us to ensure we deliver the true value of this world-leading event to participating organisations, as well as the greater marine community worldwide. We will be working closely with all our customers and partners over the coming weeks and look forward to returning to London ExCel in December 2020."

"We fully understand and appreciate the level of planning that is required to participate in an event like ours, and would like to thank our exhibitors, partners, suppliers and visitors for their continued support and patience during this challenging time."

VIEWS

Chelsea will showcase new fluorometers at Oceanology International 2020, later in the year

Chelsea Technologies, a Sonardyne Group Company, designs and manufactures ingenious environmental monitoring technology to make the world safer, cleaner and smarter. For over 50 years, Chelsea has applied its deep passion for science and innovation to solve customers' problems. Its fluorometers, sensors & systems have been used around the world to help customers understand the natural environment, improve water treatment processes, comply with ballast water and exhaust gas wash water monitoring regulations, monitor for pollution and contaminants in rivers and lakes, and support oceanographic & defence research.

On display at Oceanology International will be a range of Chelsea's sensors and systems for marine science, including multi-parameter and active fluorometers for Primary Productivity Estimation, In situ Algal Monitoring, Pollution Monitoring, Nutrient Stress Analysis, Climate Change Research and Monitoring of Hydrocarbons. A small selection of Chelsea's standard, OEM and custom acoustic hydrophones and projectors will also be on show. Throughout the week, Chelsea's technology and application experts will be on hand to offer advice so please drop by. To make an appointment ahead of the show, please email: ekeegan@sonardyne.com.

Sonardyne instruments to support pioneering tsunami research

High-accuracy, long-endurance underwater instrumentation from Sonardyne Inc. is set to play a major role in helping scientists across the US better understand and possibly predict earthquake and tsunami risk at a far greater scale than has been possible before.

Scripps Institution of Oceanography, through a US\$5.5 million grant from the US National Science Foundation (NSF), is procuring equipment to be used by the broader scientific community to study seafloor deformation. Comprising more than 50 Sonardyne Fetch subsea sensor logging nodes, this major new equipment pool will also include Sonardyne's

advanced acoustic positioning modules fitted to three Liquid Robotics Wave Gliders.

These will, for the first time, make highly precise seabed monitoring capability – at scale – available to the entire US earth science community using a technique known as GNSS-A. GNSS-A combines GNSS-derived surface platform positions with acoustic ranging to seafloor sensors, enabling scientists to make centimetre-level and globally referenced measurements of movement across geological features such as subduction zones, which can cause potentially catastrophic earthquakes and tsunamis.

Unlike on land, where these observations are easily acquired using the GNSS network, this level and type of measurement has been either too costly or too impractical to acquire subsea. This has resulted in there being almost no seabed geodetic information, which has limited understanding of the geological mechanisms at work. “This lack of seabed geodetic data has been a real challenge for scientists,” says Geraint West, Global Business Manager Oceanographic, at Sonardyne. “With access to Wave Gliders, to make the highly accurate measurements to our Fetch sensors, the ability to link subsea measurements within a global reference frame is now practical and affordable. What’s more, we’re able to do this over long periods of time, taking the detailed measurements that are needed over decadal timescales.”



Sonardyne's Fetch long-life subsea sensor logging nodes enable subsea to surface data acquisition over periods of up to 10 years.

“To date only one prototype vehicle and approximately a dozen seafloor transponders have been available for the scientific community,” says David Chadwell, Research Geophysicist at the Marine Physics Laboratory at Scripps. “This project will add 51 additional seafloor instruments together with three new robotic platforms for making the required measurements. This will

approximately quintuple the equipment available to the research community to make these important measurements. Seafloor geodesy is poised to be transformative. It will allow for a broad community of existing and next-generation earth scientists to study active deformation on the seafloor. Improved access to these instruments will foster and communicate knowledge of the new methods and science outside of the current and very small marine community, to a much larger scientific community primarily consisting of highly-skilled land-based geodesists, and an inclusive next-generation scientific workforce.”

SALTS

Tackling Invasive species in the Great Lakes

Travelling recently to the Great Lakes, it's hard not to be struck by the amazing processes that have shaped them.

As glaciers advanced and retreated over thousands of years, ice sheets eroded the land, exposing the basins carved into its surface. The ice melted, filling the empty pockets and what remains today of a process that began 14,000 years ago is a lake system which accounts for over twenty per cent of the globe's available surface freshwater. With over 100 ports, it's no wonder that the Great Lakes have become a key driver for commercial shipping in North America, primarily for bulk cargo but also break bulk, containerised and project cargo.



Over the last 200 years, the Great Lakes have experienced significant changes to their ecosystems, following the invasion of over 180 alien species that have taken up residence across the region. The impact of this invasion is significant and widespread, causing millions of dollars in damage, not only affecting the local ecology, but also threatening human health and local industries including tourism, fisheries and agriculture. Invasive species can be very difficult to eradicate as they often lack natural predators.

The means by which non-native species are introduced, known as pathways of invasion, are more often than not a result of human activity in the region. The primary cause of aquatic invasion is firmly rooted in ballast water discharge, with statistics suggesting that up to 65% of invasive species have entered the Great Lakes via ballast tanks. Zebra mussels are particularly pervasive, having been transported from the Caspian and Black Sea region in the 1990s. This has caused a host of problems ever since, including clogging the water intakes of power generation plants and destroying native species' food sources.

Aiming to address environmental concerns in the region, the Federal Government introduced the Vessel Incidental Discharge Act (VIDA) in 2018. However, the act has presented considerable challenges to industry, with some vessel operators expressing concern over the undefined nature of the compliance testing methodology. Having already made significant investment in ballast water treatment systems in an attempt to comply with the overall aims of the legislation, these operators point out that the ability of their systems to comply with any future standards remains unclear. As a consequence, the operators who are yet to invest in a ballast water treatment system are looking for manufacturers that can demonstrate a robust solution that is most likely to future-proof their fleets against any emerging standard.

Chelsea Technologies was invited to take part in the Great Lakes Practicums to demonstrate the efficacy of our portable ballast water compliance monitor, FastBallast, alongside monitoring technologies from five other manufacturers. The Practicums were also an opportunity to introduce the FastBallast flow through unit, which can be installed on a ship for long-term ballast tank monitoring. Attendees included State and Federal authorities, shipowners and environmental organisations.

The primary objective was to demonstrate the usability and practicality of the different systems available. With this in mind, each participant was provided with five samples of lake water to test for viable organisms, with each sample in the series being more dilute than the previous. The samples were tested by each equipment manufacturer, who also demonstrated their methodology to the attendees and discussed the scientific merits behind the various analytical methods. The

organism counts recorded by the manufacturers were later compared with microscopy analysis of the samples. Due to sample size and experiment conditions, the collection of results was secondary to open discussion about the techniques and their applicability in the Great Lakes.

The Great Lakes present some unique challenges to ballast water monitoring equipment. For example, some regions contain high levels of dissolved tannins that stain the water brown and interfere with the detection of organisms. In addition, some species of phytoplankton within the Great Lakes form large colonies or chains. Counting individual cells within these structures is almost impossible without lengthy examination under a microscope. Because voyage times in the Great Lakes are often short, with ships hopping between ports only a few miles apart, rapid testing methods are essential. This requirement effectively rules out microscope-based testing and has, to a large extent, driven the development of methods based around alternative technologies.

FastBallast is a rapid, onboard compliance monitor that incorporates Single Turnover Active Fluorometry (STAF) to provide an accurate assessment of living phytoplankton cells within a 20 mL ballast water sample. FastBallast generates a dataset of 480 fluorescence measurements over eight minutes as the sample is stirred. These data are analysed, in real time, using a patented method based on Poisson theory. Importantly, this method works with phytoplankton cells of any size to provide an accurate measure of phytoplankton cell density. For example, counts of organisms in Great Lakes waters works well over a wide range of cell sizes and organism densities. Critically, FastBallast measurements can be carried out quickly by crew members at any stage during ballast water treatment or discharge. Indeed, attendees commented on the attractive simplicity of operation and the rapid turnaround of results.

Having been selected by the Canadian government last year for a monitoring test pilot by the Great Lakes Laboratory for Fisheries and Aquatic Science, Chelsea Technologies continues to affirm its commitment to working closely with regulators, authorities and environmental experts in order to future-proof compliance with ballast regulations along with

protecting the environment from further damage from invasive species – **Emma Johnson**, *Maritime Manager, Chelsea Technologies*

CALENDAR

3rd - 8th May 2020: European Geophysical Union (EGU2020)

Vienna, Austria

The programme for EGU 2020 is now available at meetingorganizer.copernicus.org/EGU2020/provisionalprogramme.

ESS11.1 - Informatics in Oceanography and Ocean Science.

The session presents the **state of art information systems in oceanography** (metadata, vocabularies, ISO and OGC applications, data models), **interoperability** (Virtual Research Infrastructures, 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). The 2020 session should provide new ideas on the interoperability issues deriving from different sources of data.

Nearshore processes: fluid motions and sediment transport

The nearshore zone is one of the most dynamic places on earth. Here, the perpetual interaction between waves, tides, wind and the seabed drive the fluid motions that initiate sediment transport and, ultimately, shape the world's coastal areas. The magnitudes and spatiotemporal scales at which these processes act vary tremendously, and understanding the small-scale processes that underlie large-scale coastal dynamics remains a challenge.

This session welcomes contributions that focus on small scale (from turbulence to mean flow, sand grains to ripples) physical processes in the nearshore zone of wave-dominated coasts. Ranging from approximately 10 m water depth up to the shoreline, this region comprises the shoaling, surf and swash zones. Topics include cross-shore and alongshore wave field evolution, wave-breaking and turbulence, swash-zone processes, cross-shore and alongshore current

structures, extreme events, sediment mobilisation and transport, and biophysical interactions. This session will include abstracts describing field measurements, numerical and laboratory modelling, theoretical analysis, and model-data assimilation. We particularly welcome studies including innovative data collection approaches, or with a focus on uncertainties in measurements and predictions.

Further details of the session and the general assembly can be found at: <https://meetingorganizer.copernicus.org/EGU2020/session/36177>. With this session we hope to further raise the current coastal research profile at EGU. For those that are not familiar with EGU, but do know AGU: the annual General Assembly is similar to the AGU Fall meeting, hosting a wide range of interesting sessions that link to our field.

Co-conveners:

Timothy Price - Utrecht University, the Netherlands

Matthieu de Schipper - Delft University of Technology, the Netherlands

Nadia Sénéchal - University of Bordeaux, France

Àngels Fernández Mora - SOCIB Balearic Islands Coastal Observing and Forecasting System, Spain

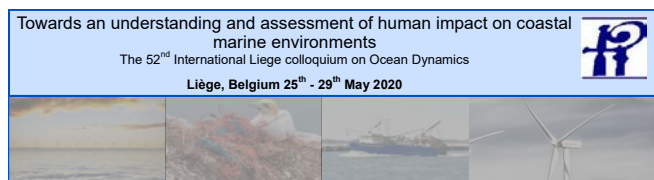
25th - 29th May 2020: 52nd International Liège colloquium on Ocean Dynamics: towards an understanding and assessment of human impact on coastal marine environments

Liège, Belgium

The coastal ocean is under increasing multiple (climate and non-climate) pressures that affect its functioning and health, and compromise the provision of services to society. The set-up of a scientifically underpinned ecosystem-based management scheme for the coastal ocean requires a thorough understanding of human impacts on the physics, biogeochemistry and biodiversity at large scale. Such a management scheme should be firmly embedded in the science-management-policy interface, taking account of selecting useful and communicable indicators for the ecosystem health, targeting ecosystem services and making use of novel analytical tools acknowledging the complexity of Drivers-Pressures-Stressors-Impacts-Responses (DPSIR) interactions.

The 52nd international colloquium will gather an interdisciplinary community of scientists to

overview the progress in our capabilities to understand, monitor and forecast the impact of human activities on coastal marine environments to guarantee a productive and healthy system as requested by the EU Marine Strategy Framework Directive and the UN Sustainable Development Goal 14.



Terms of reference

The coastal ocean is under increasing multiple (climate and not-climate) pressures that affect its functioning and health, and compromise the provision of services to the society. The set-up of a scientifically underpinned ecosystem-based management scheme for the coastal ocean requires a thorough understanding of human impacts on the physics, biogeochemistry and biodiversity at large scale. Such a management scheme should be firmly embedded in the science-management-policy interface, taking account of selecting useful and communicable indicators for ecosystem health, targeting ecosystem services and making use of novel analytical tools acknowledging the complexity of Drivers-Pressures-Stressors-Impacts-Responses (DPSIR) interactions.

The 52nd international Liege colloquium will gather an interdisciplinary community of scientists to overview the progress in our capabilities to understand, monitor and forecast the impact of human activities on coastal marine environments to guarantee a productive and healthy system as requested by the EU Marine Strategy Framework Directive and the UN Sustainable Development Goal 14.

Regular sessions will be held on the following themes:

- Assessing the impact of sedimentary changes on the coastal ocean physics, biodiversity and biogeochemistry.
KEYNOTE : Martin Solan (University of Southampton, United Kingdom)
- Assessing the impact of marine structures on the coastal ocean physics, biodiversity and biogeochemistry.
KEYNOTE : Jennifer Dannheim (AWI and HIFMB, Germany)
- Assessing the impact of land-based pressures on the coastal environment, river-estuary-coastal ocean coupling.
KEYNOTE : Marjorie A.M. Friedrichs (Virginia Institute of Marine Science, USA)
- Multiple stressors, multi-use, cumulative effect assessment, including climate change.
KEYNOTE : Philip Boyd (University of Tasmania, Australia)
- Ecosystem services.
KEYNOTE : Tara Hooper (Plymouth Marine Laboratory, United Kingdom)
- Indicators definition for ocean health assessment in connection with SDG14 and GES assessment.
KEYNOTE : Angel Borja (AZTI, Spain)
- Science base for marine spatial planning.
KEYNOTE : Vanessa Stelzenmüller (Thünen Institute, Germany)

SIDE EVENT:

A special event gathering scientists, stakeholders and industries is foreseen for reviewing current knowledge and gaps on offshore wind farms impacts on biodiversity and biogeochemistry. The special event will set the scene for a follow-up discussion during a networking reception directly following the presentations.

Website: <http://labos.ulg.ac.be/gher/home/colloquium/>

Place of the Conference:

University of Liège - Place du 20-Août, 7 - 4000 Liège - Belgium

Organization Committee:

Ulrike Braeckman (UGent, BE)
Arthur Capel (ULiège, BE)
Steven Degraer (RBINS, BE)
Marilaine Grégoire (ULiège, BE)
Tom Moens (UGent, BE)
Karlina Soetaert (NIOZ, BE)
Jan Vanaverbeke (RBINS, BE)
Gert Van Hove (ILVO, BE)

Scientific Committee:

Tundi Agardy (Marine Conservation, US)
Salvatore Arico (IOC-Unesco)
Silvana Birchough (CEFAS, UK)
Angel Borja (AZTI, SP)
Denise Breitburg (Smithsonian, US)
Joop Coolen (Wageningen Marine Research, NE)
Valérie Cummins (University College Cork, Future Earth Coast, IE)
Farid Dahdouh-Guebas (ULB, BE)
Mihail Dăci (Xiamen University, CN)
Ghada El Seraly (Deltarec, NE)
Emmanuel Hanert (UCL, BE)
Stéphane Isard (IFREMER, FR)
Philippe Laleye (UAC, Benin)
Diego Macías (JRC, IT)
Patrick Meire (UA, BE)
Angélique Mélet (MOI, FR)
George Peliakos (EuroGOOS)
Pierre Pelegas (IFREMER, FR)
Nadia Pinardi (UB, IT)
Augustin Sanchez-Arcilla (Polytechnic University of Barcelona, SP)
Irene Schloss (University of Ushuaia, AR)
Emily Snail (NOAA, US)
Emil Staney (HZG, GE)
Adrian Stanica (GeoEcoMar, RO)
Vanessa Stelzenmüller (Thünen Institut, DE)
Michiel Van degehechute (VLIZ, BE)
Johan van der Molen (NIOZ, NE)



Regular sessions will be held on the following themes:

Assessing the impact of sedimentary changes on the coastal ocean physics, biodiversity and biogeochemistry.

KEYNOTE Speaker: Martin Solan (University of Southampton, United Kingdom)

Assessing the impact of hard substrate introduction on the coastal ocean physics, biodiversity and biogeochemistry.

KEYNOTE Speaker: Jennifer Dannheim (AWI and HIFMB, Germany)

Assessing the impact of land-based pressures on the coastal environment, river-estuary-coastal ocean coupling.

KEYNOTE Speaker: Marjorie A.M. Friedrichs (Virginia Institute of Marine Science, USA)

www.challenger-society.org

Multiple stressors, multi-use, cumulative effect assessment, including climate change.

KEYNOTE Speaker: Philip Boyd (University of Tasmania, Australia)

Ecosystem services.

KEYNOTE Speaker: Tara Hooper (Plymouth Marine Laboratory, United Kingdom)

Indicators definition for ocean health assessment in connection with SDG30 and GES assessment.

KEYNOTE Speaker: Angel Borja (AZTI, Spain)

Science base for marine spatial planning.

KEYNOTE Speaker: Vanessa Stelzenmüller (Thünen Institute, Germany)

SIDE EVENT: A special event gathering scientists, stakeholders and industries is foreseen on **Tuesday May 26th** afternoon for reviewing current knowledge and gaps on offshore wind farms impacts on biodiversity and biogeochemistry. The special event will set the scene for a follow-up discussion during a networking reception directly following the presentation.

A special Issue of Biogeosciences will be published with selected contributions from the Colloquium. Further details (scientific committee, submission, registration, deadlines, venue...) are available on the web site (<http://labos.ulg.ac.be/gher/home/colloquium/>). We are looking forward to welcoming you in Liège - **Organizing committee**

27th May 2020: Structures in the Marine Environment 2020

Glasgow, Scotland

The presence or removal of man-made structures such as Oil and Gas platforms, pipelines and renewable energy structures, impact our marine environment and related ecosystems, both positively and negatively. Following the inaugural and successful "Structures in the Marine Environment" (SIME) conference, we invite you to share environmental knowledge and evidence at the INSITE and MASTS SIME 2020 event taking place in Glasgow on 27th May 2020.

You are invited to submit abstracts for 15 minute presentation slots (12 minute talks + 3 minutes for questions) or a poster to one of four thematic areas:

- The role of man-made structures in conservation, management and restoration, in particular in the context of climate change and pressures on marine ecosystems.
- Increasing our understanding and modelling of ecosystem services (provisioning, supporting, regulating and cultural) in relation to structures in the marine environment.
- The role of man-made marine habitats in informing marine policy at local, national or international level.
- Innovative methods and technology to support our understanding and application of man-made structures as artificial reefs - including monitoring, collaborative working, data collection and reef design.

Presenters are encouraged not to solely focus on past and current research but reflect on gaps in knowledge and future research directions. Talks and posters should be accessible to other disciplines, by avoiding jargon and keeping technical details simple. Please submit your abstract according to the template, www.masts.ac.uk/media/36887/sime_2020_abstr_act_template.docx, and submit to masts@st-andrews.ac.uk before 16.00 on 27/03/2020. SIME registration will open in early March.



INSITE



Following the success of the first conference in 2019, at SIME 2020 our continued focus will be on the robust evidence base needed to support appropriate environmental management and policy / regulatory decision making. SIME 2020 will be held at the Technology and Innovation Centre, Glasgow, and we look forward to sharing further details in due course.

1st - 3rd June 2020: ESSAS Annual Science Meeting

Sapporo, Japan

ESSAS (Ecosystem Studies of Subarctic and Arctic Seas) will hold its annual science meeting in 2020 on "Linking past and present marine ecosystems to inform future fisheries and

aquaculture". The list of meeting sessions will be posted soon, stay tuned, essas.arc.hokudai.ac.jp/what_s_new/2020-essas-annual-science-meeting/.

15th - 17th June 2020: INCISE 2020 "Canyons: human connections to the deep sea"

Cork, Ireland

On behalf of the international and local organising committee we would like to announce early details for this event hosted at University College. The official INCISE 2020 website can be found at <https://www.incise2020.com/> where we will provide updates as the conference develops.

INCISE (International Network for Submarine Canyon Investigation and Scientific Exchange) is an annual forum bringing together scientists from around the world working on all aspects of submarine canyon research, and to stimulate discussions across disciplines. This cross-discipline approach allows scientists to collaborate and initiate a holistic approach to canyon research. The bi-annual conference brings together 80 - 100 geologists, biologists, engineers, oceanographers, ecologists and environmental managers. It provides a truly multidisciplinary and exciting forum for the exchange of knowledge and generation of ideas that underpin sustainable submarine canyon management.

At this early stage, we also welcome proposals and suggestions for pre-conference workshops to be hosted at INCISE 2020. For ideas, suggestions and proposals, please email: incise2020@gmail.com. We look forward to welcoming you to the City of Cork to experience our culture, engage in scientific discussion and discovery and enjoy the benefits that INCISE engagement offers. - **Prof Andy Wheeler and Dr Aaron Lim**

17th - 19th June 2020: 9th International Workshop on Marine Technology - MARTECH 2020

Vigo, Spain

The organising Campus de Excelencia Campus do Mar (University of Vigo, Spain) and the Universitat Politècnica de Catalunya (UPC, Spain) call for papers for MARTECH 2020, www.martech-workshop.org.

The main objective of the MARTECH Workshop is to show latest investigations and exchange of

information and points of view on current research in MARine TECHnology. The Program Committee cordially invites you to participate and submit your contribution in one of the proposed topics:

- Operational Oceanography
- Instrumentation, Metrology, Signal processing
- Seafloor observatories and sensor networks
- Observatories, remote sensing
- Marine Robotics: ROVs, AUVs, ASVs, Gliders
- Underwater imaging and communication
- Seafloor and Water Column characterization
- Technology for Marine Biology and Aquaculture
- Renewable energies
- Coastal, regional, and offshore research vessels and platforms
- Marine Geophysics technology and solutions
- Marine Data Interoperability and data flow
- Technologies for a sustainable dredging
- 2020 as a point between the past and the future



- Early Bird registration March 31th, 2020
- Martech 2020 June 17th- 19th, 2020

Yours sincerely, Dr. Ana Bernabeu, General Chair and Dr. Joaquin del Rio, Steering Committee Chair

21st - 25th June 2020: 6th International EcoSummit Congress, EcoSummit 2020 - Building a sustainable and desirable future: Adapting to a changing land and sea-scape, Gold Coast, Australia

This conference series was founded in 1996 in Copenhagen, as a forum for scientists, practitioners, and policy-makers working across disciplines to solve the integrated environmental, social, and economic problems facing the world today. Since 1996, EcoSummits have occurred around the world (Canada, China, USA and Europe), with EcoSummit 2016 hosting 1400 participants from 87 countries in Montpellier, France.

EcoSummit 2020 will have a focus on coastal and marine ecosystems including adjacent terrestrial ecosystems and all habitats that are integrated within those ecosystems, including river networks,

wetlands and catchments. We expect all aspects of environmental modelling, engineering, science, and policy to be covered under the focus of climate adaptation and the need for developing socio- economic and environmental resilience and sustainable prosperity around the world. Further focus will be placed on fragile systems that are more likely to suffer the consequences of climate change and anthropogenic pressure such as islands, coastal communities and arid landscapes.

The Scientific Committee is developing a program that will highlight the advances and research made to address the current environmental problems facing our changing world. A focus will be on the sustainable solutions to the most pressing problems of our time.

In the current context of an increasing world population, in particular in coastal regions, it is evident that building sustainable cities and using resources sustainably is inevitable. It is envisaged that the Summit will produce a declaration encompassing its vision and policy recommendations. We welcome your participation and look forward to seeing you at EcoSummit 2020.

Early-bird registration rates are available until 27 March 2020, www.ecosummitcongress.com/conference-register.asp.

Side events will also take place during EcoSummit 2020. If you wish to participate in a side event, please contact the organiser by email beforehand, as the number of places is limited in each event. There is no abstract submission to side events. Still time to submit a symposium or side event proposal: www.ecosummitcongress.com/participation-events.asp. For more general information Visit the EcoSummit 2020 website: ecosummitcongress.com.

EcoSummit 2020 Co-Chairs:

Robert Costanza, Crawford School of Public Policy at Australian National University, Australia.

Bai-Lian (Larry) Li, University of California, Riverside, USA.

Jan-Olaf Meynecke, Griffith University, Australia

7th - 11th September 2020: Challenger Society Biennial Meeting

Oban, Scotland

The biennial Challenger conference attracts around 300 leading UK marine scientists, science

managers and early career scientists. As well as showcasing cutting edge marine science and technology, the conference is noted for its training of young scientists and networking events, including a public lecture by an eminent authority on relevant societal marine issues.



The range of sponsorship opportunities are listed below. The conference organiser is Professor Nick Owens, and commercial exhibition organiser Terry Sloane will be happy to discuss any requirements that you may have.

Terry Sloane by email: terry@planet-ocean.co.uk or phone 01276 427 971

www.challenger2020.co.uk

www.challenger-society.org.uk

❖ Sponsorship Packages

Headline sponsor of conference (one only):

- 3m x 2m exhibition stand in prime location with 2 delegate passes
- Prominent name and logo on the conference website and abstract book acknowledging **MAIN SPONSOR**
- leaflet in delegates bag,
- Full page advert on inside front cover of abstract book
- Free "Gold upgrade"

£1600

Individual sponsorship opportunities:

Sponsors of individual elements of the event will be acknowledged in the lecture theatres, abstract book, on the conference website and on posters. Those sponsors with manned exhibition stands are able to upgrade to the **Gold package**, where they will have the opportunity to have a 5 minute speaking slot at the start of the plenary sessions.

- | | |
|--|------|
| • Manned exhibition stand 3m x 2m with 2 delegate passes | £600 |
| • "Gold Upgrade" (only five slots available) | £100 |
| • Co-sponsorship of conference dinner | £750 |
| • Co-sponsorship of ice breaker reception | £700 |
| • Co-sponsorship of poster session | £500 |
| • Co-Sponsorship of public lecture | £500 |
| • Sponsorship of keynote speaker | £550 |
| • Exhibition banner unmanned | £200 |
| • Brochure in delegates bag | £200 |
| • ¼ Page advert in conference handbook | £150 |
| • ½ Page advert in conference handbook | £300 |
| • One A4 leaflet in delegates bag | £100 |

Corporate society members benefit from a 15% discount

Once again the call is out for sponsors and exhibitors wishing to participate in next year's conference. The conference is a great place to be if you are recruiting marine science graduates.



For the only the third time, the conference will be held at SAMS (Scottish Association for Marine Science) in beautiful OBAN. SAMS hosted the first post war conference back in 1946 and since then only once more since in 2006.

22nd - 25th September 2020: EMODnet 2nd Open Conference and Jamboree

Oostende, Belgium

Five years after the first edition, we are delighted to announce the organisation of the second EMODnet Open Conference (22-23 September 2020) and Jamboree (23-25 September 2020). During the event, EMODnet partners, communicators and data providers/users will take stock of EMODnet achievements over the past 10 years, connect across stakeholder communities and set goals for the future.



To start the week, the EMODnet Open Conference will focus on use cases and ocean data and observation requirements to develop essential open marine data services for blue economy actors, public sector, civil society and researchers: www.emodnet.eu/conference2020.

7th - 9th October 2020: Marine Alliance for Science and Technology for Scotland 10th Annual Science Meeting (ASM)

Glasgow, Scotland

Join us at the Technology and Innovation Centre, Glasgow. We will look back at the significant progress made by our partners and collaborators, and look forward to 2021, which sees the start of the decade of ocean science for sustainable development. We will examine the modern challenges that face our marine waters, and identify ways and means to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

This cross-disciplinary meeting brings together members of the marine science community, with the aim of promoting and communicating research excellence and forging new scientific collaborations. The cross-disciplinary nature of the event as well as the high calibre of the selected talks means that scientists can broaden their knowledge in marine science as well as benefit from expertise and ideas gained in a range of fields other than their own. Science presentations and e-poster sessions will take place on the first two days, together with Plenary Speakers and opportunities to network.

We are delighted that IMarEST is sponsoring the student prizes for the 2020 ASM. Best Presentation - £200 first prize and a £100 second prize and Best Poster - £130 first prize and a £70 second prize. Winners of the Best Presentation and Poster will be invited to attend the IMarEST Scottish Branch evening lecture to obtain their certificate and prize (travel cost to be reimbursed by IMarEST). You must be a student member of IMarEST to be eligible for these prizes, www.imarest.org/membership/membership-registration/upgrade-your-membership/student-member-simarest. The E-poster submission deadline is 16.00 on Monday **28th September 2020**.

On the third day the venue will host a number of meetings and workshops: If you are interested in hosting one of these, or if you are interested in **exhibiting** at the 2020 event, or anyone wishing to showcase or demonstrate a piece of kit/equipment please email Dr Emma Defew, ecd2@st-andrews.ac.uk. For further general information, please visit, www.masts.ac.uk/annual-science-meeting/.

8th – 11th October 2020: Eighth Arctic Circle Assembly

Reykjavík, Iceland

Proposals are now being accepted for Sessions, which will now run for either 55 or 60 minutes. Sessions at the Arctic Circle Assembly are held in auditoriums, lecture halls, board rooms, and open spaces throughout Harpa and nearby venues.



Sessions are organized by governments, institutions, organizations, universities, think tanks, companies and others. In addition the Arctic Circle itself organizes Plenary Sessions at the Assemblies. SUBMISSION DEADLINE: MAY 1st, 2020. For Information, visit www.arcticcircle.org/assemblies/2020/proposals.

www.challenger-society.org

21st – 23rd November 2020: Arctic Circle Japan Forum

Tokyo, Japan

The Forum will be organized in coordination with the Third Arctic Science Ministerial Meeting, which is co-hosted by the Icelandic Ministry of Education, Science and Culture, and the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT). The Arctic Circle is collaborating with the Sasakawa Peace Foundation in organizing the Forum.



Governments, universities, companies, research institutions, organizations, associations and other partners are invited to submit proposals for Sessions to the Arctic Circle Secretariat. Guidelines will be published soon.

30th November – 2nd December 2020: Evolving and Sustaining Ocean Best Practices Workshop IV

Maryland, USA

We are pleased to inform you that this annual OBP event will be held in suburban Maryland. The agenda and more details will be circulated next month. We look forward to you joining us for another productive workshop. Please mark the dates on your calendar.

If you have any questions, please email jay.pearlman@ieee.org. On behalf of the Steering Group for the Ocean Best Practices System, Jay Pearlman and Johannes Karstensen, SG Co-Chairs. Submit your Best Practices in Ocean Observing for peer-review: www.frontiersin.org/research-topics/7173/best-practices-in-ocean-observing

1st – 3rd December 2020: Oceanology International

London, UK

Celebrate the world's largest ocean technology exhibition and conference. Oceanology International is turning 50, and you are invited to the celebration. The event brings the industry together, from businesses to government and

thought leaders from different sectors, to offer the latest information and technology that are moving our oceans.



Dramatic progress in ocean surveying is unlocking previously unimaginable opportunity across the ocean tech community. The 50th Anniversary Oi expo looks ahead to the next half century of surveying and services, bringing together 500 companies in 17,000 m² of exhibition space designed to inspire. Survey and services are key dimensions of the current ocean tech revolution, enabling new kinds of insight into the ocean floor, aquatic life and ongoing change in our oceans.

Progress in automation is unlocking previously unimaginable opportunity across the ocean tech community. It's a unique chance to meet the teams behind the innovations and see the technology in action. From subsea controls to autonomous survey boats, aerial drones to independent sample collectors, unmanned systems will streamline operations and deliver new depth in detail and data.

This is a unique chance to find out what's possible, meet the teams and see the technology in action. Register online now to attend Oi 2020: www.oceanologyinternational.com/.

Visit the show to:

- Have access to a free and interactive educational programme that will inspire and inform you on key industry topics.
- Meet experts and do business – the show offers more than 500 exhibitors, global suppliers of cutting-edge technology.
- Stay up to date with regulations and policies to make more effective decisions for your business and projects.
- Explore features such as the Ocean ICT Zone, focused on marine and ocean IT, communications, satellite and data solutions.

Here are some of the exciting developments for 2020:

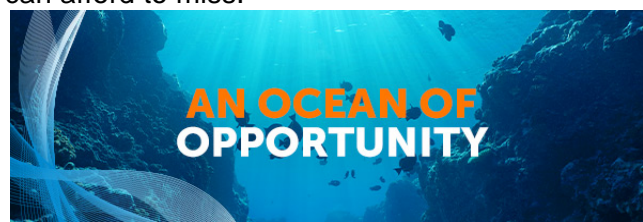
- Expanded Dockside Demonstrations - we doubled the number of companies demonstrating technology at the dockside so you have even more options for an immersive experience.
- New tracks at this year's conference - Asset Integrity and Monitoring, Coastal Zone and Shallow Water, Data Interpretation and AI, and much more. Full programme coming soon.
- Expanded Ocean ICT Zone – More exhibitors and technology at the area dedicated to the latest IT and Communication Technologies for the Ocean Space.

To succeed in your future ocean strategies, you need to be where the people shaping them are. Register now to Oceanology International 2020 and celebrate our 50th anniversary where the industry is.

Our technical sessions unpack the latest developments and insights on essential topics, including:

- offshore energy development
- asset monitoring
- navigation and positioning
- hydrography, geophysics and geotechnics
- environmental stressors
- data interpretation and AI

It's shaping up to be a sensational show and an occasion no one in the Ocean tech community can afford to miss.



In its 50 years, Oi has consistently advanced with the community involved in exploring, monitoring, developing or protecting the world's oceans by providing networking across different sectors, knowledge exchange from various disciplines and valuable business opportunities. That reflects on the developments of the show programme year by year and the new benefits for attendees.

11th – 14th January 2021: The Fifth Xiamen Symposium on Marine Environmental Sciences

Xiamen, China

The State Key Lab of Marine Environmental Science (MEL), Xiamen University and the Earth Science Division of the National Natural Science Foundation of China (NSFC) are going to hold the fifth bi-annual meeting XMAS-V. The theme of XMAS-V is **Multidisciplinary Sciences Serving a Sustainable and Healthy Ocean**. More information about the meeting can be found at <http://melmeeting.xmu.edu.cn/xmas5/>.

Background

To promote interdisciplinary studies in marine environmental science and to foster the next generation of ocean scientists, the State Key Laboratory of Marine Environmental Science (MEL, <http://mel.xmu.edu.cn/en/>), Xiamen University initiated the Xiamen Symposium on Marine Environmental Sciences (XMAS) in 2014, with the overarching theme **The Changing Ocean Environment: From a Multidisciplinary Perspective**. XMAS has grown to be one of Asia's largest conferences in marine sciences and acts as a hot spot to exchange research interests in global and regional oceans.

Its fifth iteration, XMAS-V (<http://melmeeting.xmu.edu.cn/xmas5/>) will be held in Xiamen from **January 11th to 14th, 2021**. XMAS-V will focus on how **Multidisciplinary Sciences Can Serve a Sustainable and Healthy Ocean**. It will be one of the important hallmarks of Xiamen University's centenary celebrations. The symposium will consist of different, interconnected sessions covering physical oceanography, marine biogeochemistry, biological oceanography, and marine ecotoxicology along

with workshops for emerging topics in marine environmental sciences such as how to achieve the goals outlined in the United Nations Decade of Ocean Science for Sustainable Development (2021-2030).

MEL was established in 2005 under sponsorship from the Ministry of Science and Technology of China (MOST). It has been awarded The Excellent State Key Laboratory twice in two recent official reviews by MOST. MEL is dedicated to interdisciplinary cutting-edge research in marine environmental sciences, with particular strengths in marine biogeochemistry and ecosystem studies.

Originally known as Amoy, Xiamen is an island renowned for rich cultural relics, a pleasant climate, and beautiful natural scenery. It is located on the southeast coast of China and has a long history of international commerce. It has a monsoonal humid subtropical climate characterized by mild and dry winters (average January temperature around 15 °C /59 °F).



Important Dates

January 1, 2020: Call for Session/Workshop Proposals Begins
April 30, 2020: Call for Session/Workshop Proposals Ends
May 15, 2020: Decision of Proposals Sent
June 1, 2020: Abstract Submission Begins
August 31, 2020: Abstract Submission Closes
September 30, 2020: Authors Notified of Acceptation
October 1-31, 2020: Registration
November 15, 2020: Scientific Program Posted

Chair of XMAS-V

Minhan Dai, Xiamen University

Local Organizing Committee

Yawei Luo
Zhimian Cao, Yongxiang Huang, Xing Jian, Xin Lin, Jian Ma,
Dalin Shi, Shanlin Wang, Siqi Wu and Wei Zhuang

Organizers

State Key Laboratory of Marine Environmental Science, Xiamen University
Department of Earth Sciences, National Natural Science Foundation of China

Contact

Ying Huang
xmas@xmu.edu.cn +86-592-2181571

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

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


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

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

There are jobs on the IMBER web site

<http://www.imber.info>



Integrated Marine Biosphere Research

Jobs and opportunities

- Research Associate: Physical Oceanographer (Southern Ocean Circulation), UTAS, Tasmania, Australia. Apply by 22 March
- Newton International Fellowships for non-UK early career researchers to do research in the UK. Apply by 26 March
- Assistant Prof: Big data oceanographer, Baton Rouge, Louisiana, USA. No deadline given - apply soon
- Senior Manager: Climate Program, Ocean Conservancy, Washington DC, USA. Apply soon, no deadline given
- Marine Scientist, Oceana, Juneau, AL, USA. No deadline given - apply soon
- Lecturer: Environmental Studies and GIS. UCF, Orlando, FL, USA. Open until filled
- Postdoc: Mollusc aquaculture, University of Bologna, Ravenna, Italy. Apply by 31 Mar
- Postdoc: Biogeochemical modelling, ZMT, Bremen, Germany. Apply by 31 Mar
- Two PhDs in benthic nitrogen isotope biogeochemistry, Basel, Switzerland. Apply by 15 April
- Postdoc: Nitrogen isotope biogeochemistry, Basel University, Switzerland. Apply by 15 April
- Four Postdocs: Marine Sciences, IsBlue Labs, Brest, France. Apply by 23 April
- MSc: Fisheries science (2 years funding), MUN, St John's, Canada. Apply by 15 May
- PhD: Fisheries science (4 years funding), MUN, St John's, Canada. Apply by 15 May

[Visit the IMBeR Website](#)

imber@imr.no