

# Challenger Wave



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

## NEWS

### Long-endurance Canadian underwater drone to be fitted with full suite of Sonardyne tracking, communication and navigation technology

Integrated navigation, positioning and communications technology from Sonardyne Inc. will support a new, fuel cell-powered long-range unmanned underwater vehicle (UUV) being designed by subsea specialist Cellula Robotics Ltd. for the Canadian defence department. The UUV, called Solus-LR, is being designed to be able to travel up to 2,000 kilometres and stay submerged on multi-month missions, supported by an onboard fuel cell power pack. To help meet these demanding long-duration and long-distance navigational requirements, Cellula Robotics has ordered one of Sonardyne's high-performance SPRINT-Nav subsea navigation instruments for the Solus-LR.



Cellula Robotics' SolusLR UUV. Image from Cellula Robotics.

SPRINT-Nav, which combines a SPRINT INS sensor, Syrinx 600 kHz DVL and a high accuracy intelligent pressure sensor in a single housing, is one of the smallest and the highest performing combined inertial navigation instruments on the market. For tracking the vehicle from the surface, receiving data packets from it and sending mission commands to it, Cellula Robotics has also ordered a Micro-Ranger 2 Ultra-Short

BaseLine (USBL) system with optional Marine Robotics software feature pack, and an AvTrak 6 combined transponder and telemetry transceiver, which will be integrated into the UUV. Micro-Ranger 2 is Sonardyne's most compact underwater target tracking system, built around the company's 6G hardware and Wideband 2 digital acoustic technology platform which delivers perform consistently in any operational scenario.

Sea trials of the Solus-LR, which are expected to start in late 2019, running through to early 2020, will also be supported by the use of Sonardyne's Compatt 6 seabed transponders and the company's BlueComm-200 underwater optical communication instruments. BlueComm-200s are able to transmit high-bandwidth data, including video, at up to 150 metres. The trials will be held in the Indian Arm fjord, near Vancouver, British Columbia, close to Cellula's Robotics' headquarters.

Solus-LR is being built for the Canadian Department of National Defence's (DND) science and technology organization, Defence Research and Development Canada (DRDC), under the All Domain Situational Awareness (ADSA) Science & Technology (S&T) Program. The ADSA S&T program is supporting projects which could help to enhance domain awareness of air, maritime surface and sub-surface approaches to Canada, in particular those in the Arctic. Eric Jackson, President of Cellula, explains "This S&T program will showcase Cellula's advanced UUV research and development, combining traditional technologies with innovative power and anchoring solutions. With Solus-LR able to travel for thousands of kilometers, port to port missions will become a feasible lower-cost alternative to vessel-based operations."

**The changing Canadian Arctic workshop**  
NERC is convening a multidisciplinary workshop

on behalf of AHRC, EPSRC and ESRC, focused on the changing Canadian Arctic in London on Wednesday 19 June 2019, and invite applications to attend.

### **Workshop on Sea operations for Ocean Observatories**

EMSO ERIC proposes to bring together the major players in the field for a workshop in September 2019, in Toulon, France, focusing on means and methods for servicing fixed-point observing systems during their deployment, maintenance and recovery operations. Several sessions might interest the ocean observing community, including one dedicated to intervention procedures with divers on shallow water equipment. A call for abstracts is open for oral presentations or posters. All details on the workshop web site [www.ifremer.fr/rd\\_technologiques/Actualites/WorkShops/Workshop-On-Sea-Operations-EMSO](http://www.ifremer.fr/rd_technologiques/Actualites/WorkShops/Workshop-On-Sea-Operations-EMSO)

### **Save the date: February 16, 2020, in San Diego, CA**

The Ocean Obs Research Coordination Network (RCN) will host an OceanObs'19 Conference follow-up meeting on February 16, 2020, in San Diego, CA, immediately preceding the AGU/TOS Ocean Sciences Meeting (<https://www2.agu.org/ocean-sciences-meeting/>).

The OceanObs'19 Conference (Hawaii 16-21 September, 2019; <http://www.oceanobs19.net/>) will be the third conference of this series, held once every ten years. The Ocean Obs RCN annual meeting on 16 February 2020 will be dedicated to the synthesis of threads and recommendations emerging from the OceanObs'19 Conference. Of particular interest will be focusing the community on the planning for the implementation of initiatives emerging from OceanObs'19. The meeting will advance links between observation networks and operational users to facilitate the delivery of critical information to stakeholders, and to address critical policy issues that require multidisciplinary ocean observing systems.

This 'Save the Date' reminder will be followed up with an agenda after the OceanObs'19 Conference. The OceanObs RCN is an NSF-sponsored forum on all aspects of ocean observing. Discussions identify advances and challenges in ocean observing and may identify new technologies and promote their cost-effective

development, identify policy priorities, and highlight capacity building requirements for the next decade. This includes discussion of the Decade of Ocean Science for Sustainable Development (2021-2030) being organized by the IOC (<https://en.unesco.org/ocean-decade>), and balancing ocean observations, science, use, and conservation requirements.

### **Ambio IX: Biogeochemistry Across Boundaries, a celebration of Professor Tim Jickells**

AMBIO's 9<sup>th</sup> biennial meeting (24th - 27th June, see this month's calendar pages), will celebrate the immense contributions of Professor Tim Jickells. Tim's career has touched the full breadth of marine biogeochemistry, where he has personally pioneered transformative research and championed support for many of us in diverse roles of marine biogeochemical research, teaching and governance at local, national and international levels. A celebratory dinner will be held on Wednesday 26th of June, and an outline programme is available under the latest news at [www.challenger-society.org](http://www.challenger-society.org).

### **Sonardyne to host Marine Measurement Forum #63**

The Steering Group for the Marine Measurement Forum (MMF) series of twice yearly, one day networking seminars is delighted to announce details for the forthcoming MMF63. The event is scheduled for Wednesday 25th Sept 2019 and will be hosted by Sonardyne at their Yateley, Hampshire HQ. Detailed information on the day's proceedings, including a call for presentations and event registration, can be found at [www.eventbrite.co.uk/e/mmf-63-hosted-by-sonardyne-tickets-61858940757](http://www.eventbrite.co.uk/e/mmf-63-hosted-by-sonardyne-tickets-61858940757) - **Roger Scrivens, MMF Steering Group**

### **Ocean Teacher Global Academy (OTGA) Training Course: Ocean Currents Data Quality Control and Analysis Methods**

The period for applications for the Training Course on Ocean Currents Data Quality Control and Analysis Methods is open between 7th June and 7th July 2019. All information, including a course flyer, can be found following the UNESCO/IOC link [www.oceanexpert.net/event/2143](http://www.oceanexpert.net/event/2143).

The course provides students with both background reading assignments that cover the main course topics and hands-on exercises that

explore the essential elements of ocean currents data quality control and analysis methods. The course assists participants in developing specific technical skills and methods for using ocean currents data.

Aims and Objectives are:

- Build the fundamental knowledge of ocean currents dynamics
- Develop a great understanding of ocean currents observations and measurements
- Develop skills in managing ocean currents data

No tuition fee applies. Both full- and co-sponsoring are available for a limited number of participants. For detailed information on how to apply check the Ocean Teacher Global Academy website, [www.oceanteacher.org](http://www.oceanteacher.org). In case of questions please contact the OTGA Secretariat on [ioc.training@unesco.org](mailto:ioc.training@unesco.org) always indicating as subject: (OTGA) Training Course: Ocean Currents Data Quality Control and Analysis Methods, 16th – 20th September 2019, Oostende, Belgium.

## VIEWS

### Steering towards an industry-level response to marine plastic pollution

Following a round-table discussion hosted by the Institute of Marine Engineering, Science & Technology (IMarEST) together with the Centre for Environment, Fisheries and Aquaculture Science (Cefas), a report has been published on an industry-level response to marine plastic pollution. The discussion looked to gauge a wider industry perspective into the challenges, management practices and attitudes of professionals across the marine industry. The report is now available at [www.imarest.org/reports/1039-marine-plastics](http://www.imarest.org/reports/1039-marine-plastics) and gives an overview of the discussion and recommendations directly from industry on how the IMarEST can support education efforts targeted across marine sectors.

Marine activities, although proportionately lower contributors than other industries, do contribute to marine plastic litter and an estimated 5.2 trillion pieces of plastics are circulating in the oceans. By making their way into marine life, plastics are

responsible for the deaths of over 1 million seabirds and 100,000 marine mammals yearly, amongst a tidal wave of other environmental issues. The report seeks to investigate how the marine industry can reduce its environmental footprint when it comes to ocean plastics.

Given the plethora of environmental risks and consequences for marine services, the report suggests that a robust review of common practices and of the infrastructure to support proper disposal and management of plastics is required – one that considers the needs of different marine sectors and the drivers for plastic generation in order to identify new solutions.

The discussion included representatives from the following organisations:

- Bernhard Schulte Ship management
- British High Commission
- Centre for Environment, Fisheries and Aquaculture Science (CEFAS)
- Centre for International Law, National University of Singapore (NUS)
- The China Navigation Company
- The Economist Intelligence Unit
- Institute of Marine Engineering, Science and Technology (IMarEST)
- Institute of Chemical Engineers and Advancing World Partners Pte Ltd
- INTERTANKO Singapore Branch Office
- London Offshore Consultants Pte Ltd
- Nanyang Technological University (NTU)
- National Parks Board (NParks)
- Newcastle University
- Ocean Wise, Canada
- Sembcorp Marine
- SGS Testing and Control
- Singapore Institute of Manufacturing Technology (SIMTech), A\*Star
- Singapore-ETH Centre
- Western Shipping Pte Ltd

## 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

### 13th - 14th June 2019: **BLUEMED Mediterranean Research Infrastructures Stakeholders Conference**

Paris, France

Participants will split into different small working groups to focus on key challenges that need to be solved in the Mediterranean Sea through development and synergies of research & innovation infrastructures. An efficient and coordinated use of RIs will enable to address these challenges, while at the same time, it will contribute to the implementation of BLUEMED SRIA priorities.



- SAVE THE DATE! -

**blue<sub>med</sub>**

Mediterranean Research Infrastructures Stakeholders Conference

13th and 14th June 2019  
PARIS

TOTEM / Complex Systems Institute of Paris (ISC-PIF)  
11 Place Nationale  
75013 Paris

CNRS

Research infrastructures in the Mediterranean are key to implement at best BLUEMED Strategic Research and Innovation Agenda priorities. This two-day event will be the opportunity for BLUEMED community, Mediterranean research infrastructures experts and key stakeholders involved in blue economy to elaborate recommendations to encourage policy-makers to further strengthen marine and research innovation and cooperation in the basin.

REGISTRATION

Supported by BLUEMED Coordination and Support Action (GA 727453) funded by the European Commission – DG Research and Innovation.

These discussions will be conducted in two phases:

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

- *First session*: brainstorming on the challenge raised within the working group. Participants think about projects they wish to put in place both to tackle key research infrastructures gaps/needs and Mediterranean Sea's challenges. These first proposals will aim at enhancing cooperation between countries and between different Mediterranean communities.

- *Second session*: proposal of common and concrete follow-up actions that would enable to face Mediterranean Sea's challenges in link with the implementation of BLUEMED SRIA key priorities.

Each working group will designate a rapporteur who will present actions proposals and recommendations to policy makers and governments' representatives during the final plenary. These concrete proposals will also feed the BLUEMED RI Roadmap and contribute to the implementation of BLUEMED Strategic Research and Innovation Agenda.

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

Brest, France



Open Science Conference

**IMBeR**  
**FUTURE OCEANS<sub>2</sub>**

Ocean sustainability for the benefit of society:  
Understanding, challenges and solutions

Brest, France 17-21 June 2019

@FutureOceans2

The 2nd IMBeR Open Science Conference.  
<http://www.imber.info/en/events/osc--imber-open-science-conference/osc-2019/2019-imber-open-science-conference>

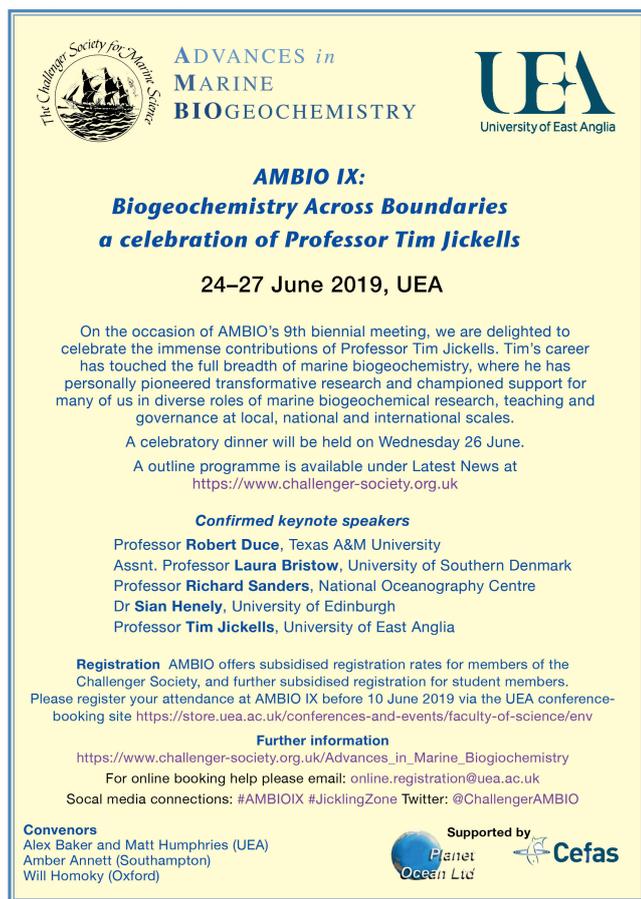
**19th June 2019: The changing Canadian Arctic workshop**

London, UK

The UK Natural Environment Research Council (NERC) is convening a multidisciplinary workshop on behalf of AHRC, EPSRC and ESRC, focused on the changing Canadian Arctic in London on Wednesday 19 June 2019, and would like to invite applications to attend: [nerc.ukri.org/latest/events/list/cca-workshop/](http://nerc.ukri.org/latest/events/list/cca-workshop/).

**24th – 27th June 2019: Ambio IX: Biogeochemistry Across Boundaries, a celebration of Professor Tim Jickells**

UEA, Norwich, UK



The poster for AMBIO IX: Biogeochemistry Across Boundaries, a celebration of Professor Tim Jickells, held from 24-27 June 2019 at UEA. It features logos for the Challenger Society for Marine Science, Advances in Marine Biogeochemistry, and the University of East Anglia (UEA). The text includes details about the event, keynote speakers (Robert Duce, Laura Bristow, Richard Sanders, Sian Henely, and Tim Jickells), registration information, and contact details for convenors and sponsors.

**AMBIO IX:  
Biogeochemistry Across Boundaries  
a celebration of Professor Tim Jickells**

24–27 June 2019, UEA

On the occasion of AMBIO's 9th biennial meeting, we are delighted to celebrate the immense contributions of Professor Tim Jickells. Tim's career has touched the full breadth of marine biogeochemistry, where he has personally pioneered transformative research and championed support for many of us in diverse roles of marine biogeochemical research, teaching and governance at local, national and international scales.

A celebratory dinner will be held on Wednesday 26 June.  
 A outline programme is available under Latest News at <https://www.challenger-society.org.uk>

**Confirmed keynote speakers**

Professor **Robert Duce**, Texas A&M University  
 Assnt. Professor **Laura Bristow**, University of Southern Denmark  
 Professor **Richard Sanders**, National Oceanography Centre  
 Dr **Sian Henely**, University of Edinburgh  
 Professor **Tim Jickells**, University of East Anglia

**Registration** AMBIO offers subsidised registration rates for members of the Challenger Society, and further subsidised registration for student members. Please register your attendance at AMBIO IX before 10 June 2019 via the UEA conference-booking site <https://store.uea.ac.uk/conferences-and-events/faculty-of-science/env>

**Further information**  
[https://www.challenger-society.org.uk/Advances\\_in\\_Marine\\_Biogeochemistry](https://www.challenger-society.org.uk/Advances_in_Marine_Biogeochemistry)  
 For online booking help please email: [online.registration@uea.ac.uk](mailto:online.registration@uea.ac.uk)  
 Social media connections: #AMBIOIX #JicklingZone Twitter: @ChallengerAMBIO

**Convenors**  
 Alex Baker and Matt Humphries (UEA)  
 Amber Annett (Southampton)  
 Will Homoky (Oxford)

**Supported by**  
 Planet Ocean Ltd  
 Cefas

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

Montreal, Canada

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>.

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

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).

**17th – 19th September 2019: IOCCP meeting, OceanObs '19**

Honolulu, Hawaii, USA

For more details of the IOCCP OceanObs'19 meeting, please go to <http://www.oceanobs19.net/breakout-sessions/>.

**25th September 2019: Sonardyne to host Marine Measurement Forum #63**

*Yateley, UK*

The Steering Group for the Marine Measurement Forum (MMF) series of twice yearly, one day networking seminars is delighted to announce details for the forthcoming MMF63. The event will be hosted by Sonardyne at their Yateley, Hampshire HQ. Detailed information on the day's proceedings, including a call for presentations and event registration, can be found at [www.eventbrite.co.uk/e/mmf-63-hosted-by-sonardyne-tickets-61858940757](http://www.eventbrite.co.uk/e/mmf-63-hosted-by-sonardyne-tickets-61858940757).

**25th – 26th September 2019: Workshop on Sea operations for Ocean Observatories**

*Toulon, France*

EMSO ERIC proposes to bring together the major players in the field for a workshop focusing on means and methods for servicing fixed-point observing systems during their deployment, maintenance and recovery operations. Several sessions might interest the ocean observing community, including one dedicated to intervention procedures with divers on shallow water equipment. A call for abstracts is open for oral presentations or posters. All details on the workshop web site [www.ifremer.fr/rd\\_technologiques/Actualites/WorkShops/Workshop-On-Sea-Operations-EMSO](http://www.ifremer.fr/rd_technologiques/Actualites/WorkShops/Workshop-On-Sea-Operations-EMSO).

**1st – 5th October 2019: Ecological Modelling Global Conference**

*Salzburg, Austria*



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

**2nd - 4th October 2019: MASTS ninth Annual Science Meeting (ASM)**

*Glasgow, Scotland, UK*

The 9th ASM, will take place at the Technology and Innovation Centre, and will examine the science we need to meet the modern challenges that face our marine waters and seas. 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 (Wednesday 2nd and Thursday 3rd October), together with Plenary Speakers and opportunities to network. On the third day the venue will host a number of meetings and workshops.

Please get in touch if you would be interested in:

- running a special session on the 2<sup>nd</sup> or 3<sup>rd</sup>
- hosting a workshop on the 4<sup>th</sup>
- exhibiting at the event

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

*Cascais, Portugal*

Come and join our 42nd CIESM International Congress in the second week of October. A Congress conceived and designed to compare the approaches, findings and perspectives of Atlantic and Mediterranean researchers on a great number of common issues. So come to Cascais (Portugal) and meet hundreds of marine scientists from the Atlantic and Mediterranean shores. This will allow you, inter alia, to:

- actively participate in a number of debates (40 in total) covering all marine disciplines, and listen to four cross-disciplinary panels. See program sessions, [ciesm.org/marine/congresses/sessions\\_cascais.php](http://ciesm.org/marine/congresses/sessions_cascais.php);
- engage discussions with all authors in three Plenary Poster sessions, and with friendly moderators, [ciesm.org/marine/congresses/mosaic\\_cascais.php](http://ciesm.org/marine/congresses/mosaic_cascais.php);
- enjoy the various, informal receptions and the free visit and guided tour of the world-famous Lisbon Aquarium mid-week.

June 2019

meetings on Sunday morning. Pre-Events will consequently be on Wednesdays.



Programs from previous Assemblies, which list all past Breakout Sessions, may be found at [www.arcticcircle.org](http://www.arcticcircle.org). The Arctic Circle provides an open, democratic forum for discussion and cooperation on Arctic Affairs.

**16th February 2020: Ocean Obs Research Coordination Network (RCN) OceanObs'19 Conference follow-up meeting**

*San Diego, USA*

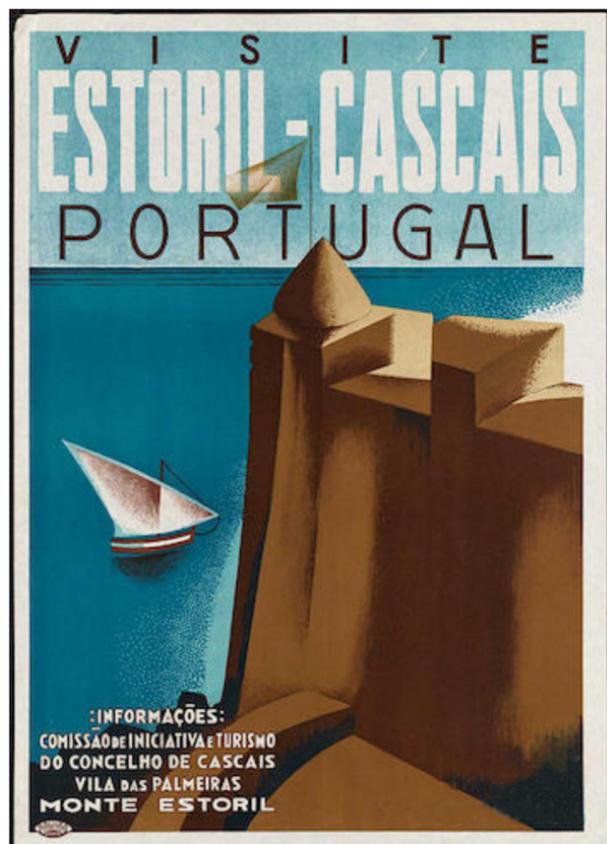
The Ocean Obs RCN will host an OceanObs'19 Conference follow-up meeting immediately preceding the AGU/TOS Ocean Sciences Meeting (<https://www2.agu.org/ocean-sciences-meeting/>).

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Please circulate this 'Save the Date' reminder widely. We will follow up with an agenda after the OceanObs'19 Conference. Best wishes, on behalf of the organizing committee (Frank Muller-Karger, Jay Pearlman, Linwood Pendleton and Dawn Wright)

PS:

The OceanObs RCN is an NSF-sponsored forum



Take advantage of our special, low fee (half-week or whole week) by registering online, [ciesm.org/marine/congresses/registering.htm](http://ciesm.org/marine/congresses/registering.htm), before 30 June. 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. Have a close look at the Congress web-page, [www.ciesm.org/](http://www.ciesm.org/). - **Cordially, The CIESM Congress Team**

**10th – 13th October 2019: Seventh Arctic Circle Assembly**

*Reykjavik, Iceland*

Following consultations with Arctic Circle partners and participants, it has been decided to open the Arctic Circle Assemblies ONE day earlier, on Thursdays. Plenary Sessions will end on Saturdays and the party for all participants will take place on the Saturday evening. On Sunday, thematic Excursions and Tours devoted to areas of interest to Arctic Circle participants will be offered.

Breakout Sessions will begin on Thursday morning and the Opening Session will be held after lunch on that day. In addition opportunities will be created for those who so desire to hold Breakout Sessions, working or networking

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

on all aspects of ocean observing. Discussions identify advances and challenges in ocean observing and may identify new technologies and promote their cost-effective development, identify policy priorities, and highlight capacity building requirements for the next decade. This includes discussion of Decade of Ocean Science for Sustainable Development (2021-2030) being organized by the IOC (<https://en.unesco.org/ocean-decade>), and balancing ocean observations, science, use, and conservation requirements.

Jay Pearlman, Ph.D. Fellow IEEE, IEEE France, Director, Four Bridges [jay.pearlman@ieee.org](mailto:jay.pearlman@ieee.org).  
"Submit your Best Practices in Ocean Observing for peer-review: <https://www.frontiersin.org/research-topics/7173/best-practices-in-ocean-observing>

**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.

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

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

Visit the EcoSummit 2020 website: [ecosummitcongress.com](http://ecosummitcongress.com)

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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 28th June.

*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

## Full-time postdoctoral Research Associate, Cape Eleuthera Institute (The Bahamas)

The Cape Eleuthera Institute (The Bahamas), is seeking a full-time postdoctoral Research Associate to carry out activities related to marine science. The candidate will be primarily responsible for participating in the operations of underwater gliders to measure a suite of important oceanographic variables to improve hurricane prediction models. This project will be conducted in close collaboration with scientists at the Co-operative Institute of Marine and Atmospheric Sciences (CIMAS) of the University of Miami and the Atlantic Oceanographic and Meteorological Laboratory (AOML) of the US National Oceanic and Atmospheric Administration. For more information please see: [ceis.bamboohr.com/jobs/view.php?id=39](http://ceis.bamboohr.com/jobs/view.php?id=39)

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There are jobs on the IMBER web site

<http://www.imber.info>



Integrated Marine Biosphere Research

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**Jobs and opportunities**

- Postdoc: Role of microbes in shaping ocean processes. Apply by 14 June
- JPI Oceans and JPI Climate call for proposals: Joint transnational next generation climate science for oceans in Europe. Submit proposals by 14 June
- PICES: Executive Secretary, Sidney, BC, Canada. Apply by 15 June
- Postdoc: Fisheries biology/conservation, UWA, Australia. No deadline given

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Visit the IMBeR Website

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