

# OES BEACON

Newsletter of the Oceanic Engineering Society



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Welcome to OCEANS 2020 Singapore

August 11-14, 2020

Marina Bay Sands Convention Center

***Don't miss the new schedule!***



The OES BEACON is published four times a year as a benefit to the membership of the IEEE Ocean Engineering Society. The OES Beacon is printed and distributed from IEEE headquarters in New York City, New York, USA.

**Editor-in-Chief:**

Harumi Sugimatsu—harumis@iis.u-tokyo.ac.jp

**Co-Editor-in-Chief:**

Robert L. Wernli—wernli@ieee.org

**Associate Editors:**

Masakazu Arima  
Kenichi Asakawa  
Toshihiro Maki  
Takumi Matsuda  
Katsunori Mizuno  
Takeshi Nakatani  
Hisashi Shiba  
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**Contributing Editors:**

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Japan—Blair Thornton  
Korea—Son Cheol Yu  
Scotland—John Watson  
Singapore—Venu Pallayil  
Taiwan—Jenhwa Guo  
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Members are encouraged to submit copy highlighting 1) Chapter Events, 2) People & Company News, 3) Student & Young Professional News, 4) Technology Updates, or 5) other material of broad interest to the OES. Please send to Beacon Editor-in-Chief, Harumi Sugimatsu <harumis@iis.u-tokyo.ac.jp>. Word format, 1-1/2 space; Photos (always encouraged): jpg, 300 dpi preferred. Material becomes property of IEEE-OES. Please send e-mail or physical address corrections or updates to the EIC.

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## Table of Contents

<i>Welcome to Singapore.....</i>	<i>Cover</i>
<i>Member Benefits—Did You Know?.....</i>	<i>3</i>
<i>From the OES BEACON Editors.....</i>	<i>4</i>
<i>From the President .....</i>	<i>5</i>
<i>VPTA Column .....</i>	<i>6</i>
<i>Call for OES DLs .....</i>	<i>6</i>
<i>VPPA Report .....</i>	<i>7</i>
<i>VPWS Report .....</i>	<i>8</i>
<i>From the EIC's Desk.....</i>	<i>11</i>
<i>NL History .....</i>	<i>12</i>
<i>Obituary on Fred Harold Maltz.....</i>	<i>16</i>
<i>Obituary on D. Richard “Dick” Blidberg .....</i>	<i>16</i>
<i>OES Society Awards—Presidential Award Ceremony.....</i>	<i>18</i>
<i>Awards for OES Members—Jerry C. Carroll .....</i>	<i>19</i>
<i>Request for Nomination for OES Awards .....</i>	<i>20</i>
<i>Chapter News .....</i>	<i>20</i>
<i>The Science We Need for the Ocean We Want.....</i>	<i>24</i>
<i>Sonar Performance Quantification: Report on Two DLs .....</i>	<i>27</i>
<i>Ad on Summer School 2020 .....</i>	<i>29</i>
<i>Workshop in Brest .....</i>	<i>29</i>
<i>Offshore Technology Conference .....</i>	<i>32</i>
<i>Ad on OTC Asia 2020.....</i>	<i>33</i>
<i>Call for Papers on COA 2020 .....</i>	<i>34</i>
<i>Ad on COA 2020.....</i>	<i>35</i>
<i>Ad on UComms’20 .....</i>	<i>36</i>
<i>Ad on UT21 .....</i>	<i>37</i>
<i>OCEANS Conferences Poster.....</i>	<i>38</i>
<i>Blast from the Past.....</i>	<i>39</i>
<i>OCEANS 2019 Singapore .....</i>	<i>40</i>
<i>Ad. on SAUVC 2020 Singapore.....</i>	<i>41</i>
<i>Ad. on OCEANS 2020 Gulf Coast .....</i>	<i>42</i>
<i>Ad. on OCANS 2021 San Diego .....</i>	<i>43</i>
<i>Who’s who in the OES .....</i>	<i>44</i>
<i>Member Highlights.....</i>	<i>45</i>
<i>Welcome New and Reinstated Members .....</i>	<i>46</i>
<i>Student Committee Activities-ESPOL-Ecuador Chapter.....</i>	<i>47</i>
<i>Christmas Science on the Outer Banks.....</i>	<i>47</i>
<i>Attention OES Students.....</i>	<i>49</i>
<i>OCEANS 2019 Singapore .....</i>	<i>Cover</i>

## Member Benefits—Did You Know?

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## From the OES BEACON Editors

***Harumi Sugimatsu and Robert Wernli***

Welcome to the March 2020 issue of the Beacon. The latest changes to all our committees and volunteers can be found on the inside of the front and back covers. More importantly, as pointed out by our President's article, that the CORVID-19 virus has had a significant impact on many international conferences. This includes the postponement to August for our OCEANS 2020 Singapore conference. Please refer to our website to find the latest on our society events.

Of particular interest in this issue is the report on the history of our society newsletter by our former society president, and our official photographer, Stan Chamberlain. It is certainly our honor to help continue the excellent history of this publication.

The Journal EIC again provides recently released papers that are available to our members and our VP for Technical Activities provides the latest on our technical committee activities. OES participation in the several OTC conferences is covered. We also have a call for Distinguished Lecturers (DLs) along with a report on two recent lectures. In addition, the latest is provided by our new VP for Professional Activities. And, there is a lot more going on than our two OCEANS conferences as documented by our VP for Workshops and Symposia, with his review of the 2019 events and info on this year's upcoming events.

There is plenty going on in our chapters as reported in the articles from Malaysia, Japan and Canadian Atlantic. We also have the WS report from India. Our student chapters are active and expanding as shown in the report from Ecuador. The benefits at the OCEANS conferences for our Young Professionals and students is highlighted in the latest Blast from the Past article. Get involved and supercharge your career.

We also take pride in our members. Be sure to see the latest articles on Member Highlights, Member Awards and "Who's



*Your Beacon editors "cutting a rug" at the Marseille gala.*

Who in the OES." And, in this issue is our call for nominations for this year's society awards. Also in this issue is an excellent article addressing how the problem of increasing marine debris is being addressed.

Unfortunately, we also report on those members who have been lost recently in the obituary section, which unfortunately includes our former Beacon Editor-in-Chief Fred Maltz and also AUV expert Dick Blidberg.

There is a wealth of other information and articles in this issue that we hope you enjoy. And, as always, we'll close by inviting you to participate in your society. Submit articles and material for the Beacon. Or . . . volunteer for other society activities as a participant or an elected officer. It's your society and it is here to help you reach your professional goals. Enjoy.





# From the President

*Christian de Moustier, OES President*



*Christian de Moustier*

Calendar year 2020 is a leap year. In our epoch, this means an extra day at the end of February and Summer Olympic Games [1]. Among other distinctions, 2020 has also been designated as the International Year of Sound by the International Commission for Acoustics [2], and the Year of the Nurse and the Midwife by the World Health Organization (WHO). However, on December 31, 2019, the WHO reported a novel coronavirus disease outbreak (COVID-19, [3]) that has since established worldwide preponderance.

The COVID-19 outbreak has had an immediate impact on our colleagues in China, Singapore, and Malaysia, forcing the postponement of events sponsored or co-sponsored by OES: China Ocean Acoustics 2020 [4] in Harbin, China, to July 27–30, OCEANS 2020 Singapore to August 11–14 and the associated Singapore AUV Challenge to August 14–17 [5], and OTC Asia 2020 [6] in Kuala Lumpur to August 17–19. We are all immensely indebted to the OES volunteers who serve on the local organizing committees of these conferences and who had to renegotiate and reschedule all aspects of a conference. For further updates, check the websites of these conferences and other events listed on the OES website ([ieeoes.org](http://ieeoes.org)).

While we strive to reschedule and/or relocate OES conferences, workshops, and symposia, we may question our motivations for attending these events in person instead of participating in teleconferences or using social media services for interactive exchanges of information and ideas with others who share our scientific and technical interests. For most of us, in person attendance is an opportunity to get

out of the office and open ourselves to different cultures while expanding our professional network and interests.

Our professional network starts at the local level. Although we may identify primarily as members of OES, our IEEE membership automatically ties us to the IEEE Section closest to our home and to the associated OES Chapter or joint Chapter, if it exists. In fact, the location of an OCEANS conference is usually predicated on the existence of a local Chapter or Section. One of the newest OES Chapters was created in Porto, Portugal, in support of OCEANS 2021 Porto.

Speaking of Sections, 2020 is also the year of the IEEE Section Congress (SC2020, [7]), an event held every 3 years that brings together all IEEE Sections (339 at last count [8]). SC2020 will be held in Ottawa, Canada, August 21–23. More importantly, OES will be represented by elected AdCom Member Christopher Whitt who serves on the SC2020 Steering Committee as Program Chair.

COVID-19 has already forced us to replace many in person meetings by teleconferences. This might be a positive step in today's yearning for a greener world, which makes air travel less desirable and provides an incentive to foster the creation of events comprising local gatherings linked via enhanced remote access and communications methods.

## References

- [1] <https://www.olympic.org/tokyo-2020>
- [2] <https://sound2020.org>
- [3] <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- [4] <http://www.chinaoceanacoustics.cn/COA2020>
- [5] <https://singapore20.oceansconference.org>, <https://sauvc.org/>
- [6] <http://2020.otcasia.org>
- [7] <https://sections-congress.ieee.org>
- [8] <https://www.ieee.org/about/today/at-a-glance.html>



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## VPTA Column: Carrying on...

**Malcolm Heron, OES Vice President for Technical Activities**



I started writing this column with Plan A in mind to say that the year was getting off to a smooth start with several workshops that have originated from Technology Committees and/or Chapters. These include the Offshore Energy and Storage Conference in Boston, USA in July (by the OSES Technology Committee), the Antarctic and Southern Oceans Forum in Hobart, Australia in August (Polar Oceans

Technology Committee), Breaking the Surface Symposium in Croatia (Autonomous Marine Systems Technology Committee) and the Underwater Systems Conference in Xian, China

(Malaysia Chapter) in August. But as I write, the COVID-19 virus has tentacles that cast a shadow over the whole outlook for the year, and I have moved to Plan B. Already international events are being postponed – pushed back into the second half of the year in the optimistic hope that normal conditions will resume by then. This means that the calendar is going to be pretty empty in the first part of the year and saturated (perhaps) in the second half.

The activities funding schemes for Technology Committees (TCAFS) and Chapters (CHAFS) are still funded and looking for applications. And remember that the funds are already allocated and the approval process is short and efficient. In the circumstances there are opportunities for regional events and activities that can proceed in spite of the virus turmoil. I urge you to be creative.

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## Call for OES Distinguished Lecturers Nominations for 2021–2023 Close July 31, 2020

**Malcolm Heron, OES Vice President for Technical Activities**

The IEEE Oceanic Engineering Society (OES) invites nominations for OES Distinguished Lecturers. The IEEE OES Distinguished Lecturers Program provides high quality speakers to the Oceanic Engineering Community, especially, OES Chapters, Student Branch Chapters, and Student Clubs. Appointment as an OES Distinguished Lecturer is a major Society recognition. The selected Distinguished Lecturers will be approved by the OES AdCom at their September Equinox Meeting, to commence on 1 January of the following year.

### Nominations

Distinguished Lecturers will have

- high technical proficiency in their area;
- demonstrated ability to make technical presentations that are inspiring to audiences of experts, as well as to general audiences;
- OES membership throughout the term of their appointment.

The DL nominee must be nominated by an OES member who does not have conflict with the selection process. Self-nominations are not accepted. If you are looking for a nominator we encourage you to contact the chair of the most relevant OES Technology

Committee. Nominations for a four-year term 2021–2023 close on 31 July 2020 with the Vice-President for Technical Activities. A nomination email should include a brief CV (1 page) of the nominee, contact details for the nominee, the nominator and endorsement by the relevant Technology Committee Chair.

The Distinguished Lecturer Committee will consider nominations, taking into account the diversity of topics and geographic spread of the pool of Distinguished Lecturers, as well as the criteria given above.

### Duties

The Distinguished Lecturers will start their three-year term in January. Each Lecturer should submit topics in his/her field of expertise that will be posted on the Society Website. The Distinguished Lectures should be readily available to travel within their geographical area upon contact by the Chapters or appropriate organizations, and will be expected to add small diversions to international travel to present lectures as opportunities arise. Reasonable travel expenses will be paid by the Distinguished Lecturers Program.

# New Year, New Member Opportunities

**Brandy Armstrong, VP of Professional Activities**

It's been a busy few months in my new role as VP of Professional Activities. Fortunately, I was able to attend the Executive Committee meeting held last December to get a head start on planning for this year. I've spent the first part of the year building my team, successfully conversing with motivated members who will continue or join roles in the standing professional activities committees.



## Membership Development Committee

In our Membership Development (MD) committee, Farheen Fauziya will continue on as the OES liaison to Women in Engineering (WIE) and Frederic Maussang will continue on as the OES liaison to Young Professionals (YP).

Many thanks to my predecessor, Jim Collins, for his years of service as the MD chair. Due to his recent resignation, I am seeking a motivated member to chair our Membership Development Committee, so please reach out to me if you are enthusiastic about supporting our members. I will happily fill this role until a suitable candidate is found.

Now in its third year, the Young Professionals (YP) Boost program is a resounding success! Several of our YP awardee alumni have already moved into the Administrative Committee and are taking on leadership roles in our standing committees. We can't wait to see everything that this year's awardees will do! YP and student memberships are increasing. In light of this success, we are working on developing a similar program to support OES Women in Engineering members.

## Student Activities Committee

Jeff Dusek is joining us as the new Student Activities Committee Chair, and as one of this year's YP Boost awardees. Jeff has some fresh ideas for how to engage and grow our student

membership and I am excited to work with him to help these ideas come to fruition.

The number of active OES Student Branch Chapters continues to grow. We are now able to sign up students on the spot at OCEANS and other events with two tablets set up to make the process easier.

Any opportunity to attend OCEANS continues to be the best way to energize student members. Our student chapters are taking advantage of the student branch chapter support available and sending delegates to OCEANS.



*Young Professionals lunch meeting at OCEANS 2019 Seattle.*

*Signing up new student members at OCEANS 2019 Seattle.*



## Promotion Committee

You may have noticed the redesigned OES website is ever improving thanks to Steve Holt's continued efforts as our Webmaster. If you haven't visited lately, please take a look and give us feedback on what you'd like to see.

Harumi Sugimatsu and Robert Wernli continue to do a great job with our Society newsletter the Beacon. The articles in html format available on the OES webpage make sharing opportunities and information with our members through social media a breeze!

Hari Vishnu (YP Boost 2019-2020), Editor in Chief (EIC) of Earthzine, is working hard with the Earthzine editorial team and collaborating with the Journal of Ocean Engineering (JOE) to bring a wider audience to the technical work the OES is doing. Rajat Mishra (YP Boost 2020-2021) continues to ensure the Earthzine site and submission portal are running smoothly and serving our members and editorial staff.

In its third year, our social media initiative continues to be an effective avenue to share information and opportunities with our members and to reach potential new members. Our online following continues to grow on Facebook, Twitter, LinkedIn and Instagram. Social Media announcements have helped increase participation in opportunities, particularly those aimed at students and YPs.

This year's initiative, with the help of a new social media coordinator, Manu Ignatius, is to focus on finding opportunities to collaborate with publications whose audiences share common interest and draw new eyes to watch OES for opportunities and technical expertise. As part of the social media coordinator position, Manu is taking over and moving forward with social media efforts to cover OCEANS, previously (and expertly) led by Stephanie Kemna (YP Boost 2019).



*Left to Right: Jeff Dusek (Student Activities Chair), Brandy Armstrong (VPPA), Farheen Fauziya (WIE Liaison), Roberto Petroccia (YP Boost 2019-2020), Hari Vishnu (Earthzine EIC, YP Boost 2019-2020), and Shyam Madhusudhana (YP Boost alumni, Administrative Committee, Technology Committee Chair) network at the OCEANS 2019 Seattle Ice Breaker Reception.*

## See You at OCEANS!

I am actively participating in the Local Organizing committee for OCEANS 2020 Gulf Coast, so I know there will be a lot of opportunities for student members as well as an entire day of sessions devoted to young professionals. There is also an extensive Women in Engineering program in the planning stages, including a breakfast panel and a number of special sessions. Please be sure to get involved at the fall OCEANS meeting and look for me at the Society booth!

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## From the Vice President for W&S

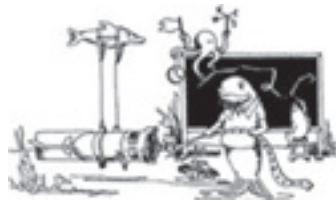
### *Philippe Courmontagne, Vice President for W&S*

By the way of loans to support the startup of a conference/workshop/symposium, or grants to support student participation or to bring keynote speakers, IEEE OES has been and is involved in several events as a co-sponsor.

Thus, during 2019, IEEE OES has been co-sponsor of 5 events taking place all over the world and allowing sharing knowledge about field of interest linked to the ocean understanding and exploration:

### **Currents, Waves, Turbulence Measurement and Applications Workshop (CWTMA)— March 10–13, 2019, San Diego, California**

Objectives of this 12th CWTMA Workshop were to provide the ocean community with a forum for technical information exchange and to promote coordination among those concerned with mea-



suring current, waves and turbulence. The goal was to ensure that the CWTMA Workshop remains the “go-to” forum for people who need to know how to measure ocean motions and how to translate those measurements into meaningful information.

The scopes of this workshop were: development of sensors for measuring currents, waves, turbulence; use of these sensors to study transport, coastal erosion, wave climate, and currents that affect marine operations. New technologies to make flow and wave observations such as radar remote sensing, correlation sonar, drifters, and satellite observation were also included.



## Underwater Technology (UT '19)—April 16–19, 2019, Kaohsiung, Taiwan



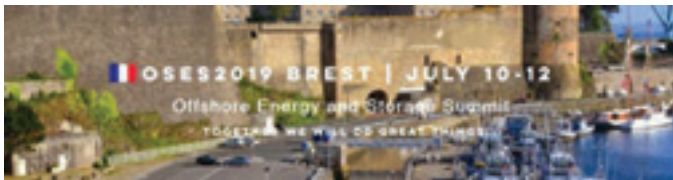
The IEEE OES international symposium on Underwater Technology 2019 (UT'19) organized by IEEE Oceanic Engineering Society (IEEE/OES), IEEE/OES Japan Chapter, IEEE/OES Taipei,

Taiwan Chapter, Taiwan Ocean Research Institute, and National Sun Yat-sen University, was held during 16-19 April 2019 at the International Building of National Sun Yat-sen University (NSYSU) in Kaohsiung.

There were 146 researchers, students and professionals from 18 countries coming for this important gathering for the underwater technology community.

The submitted abstracts were peer-reviewed, and 70 papers and 9 posters were selected by the technical committee for presentation in topics mainly dedicated to AUV: UUVs & ROVs, Observatories and Applications, Vehicle AI Control, Instrumentation and Sensors, AUV Design & Development, AUV Navigation, Sonar Signal Processing, AUV Control, Acoustic Signal Processing, AUV Application & Investigation, Vehicle Tracking & Path Planning

## Offshore Energy and Storage (OSES 2019)—July 10–12, 2019, Brest, France



For its 6th demonstration of leading innovation in offshore energy systems integration, OSES2019 was on the west coast of France, in Brest. Building on the legacy that snowballed from Windsor, to Edinburgh, Malta, Cape Cod, and most recently, Ningbo; the “OSES Effect” has continued to expand its global sphere of influence. The OSES Community is a warmly-linked, international group that is expanding at an accelerating rate.

OSES2019 drives a confluence of leading industrial, policy, and academic professionals to challenge convention. Offshore Energy Generation and Storage Technology, Environmental Integration, Policy, and Expanding Global Markets were tackled at this event. Over half the world lives near the coast. Its energy should too. OSES2019 has brought its contribution to make it possible.

## Arctic and Northern Ocean Forum (ANOF 2019)—September 2–4, 2019, Helsinki, Finland

A Forum, jointly organized by IEEE OES and IEEE GRSS, for fusing Engineering, Science and Technology to address the challenges of the changing Arctic and Northern Oceans.

The Initiative on North and South Pole, supported by IEEE Technical Activities since 2017 went first South in Australia in



2017 and 2018, for the Antarctic and Southern Ocean Forum. In 2019, it moved to Helsinki, Finland, as the Arctic is the place where all Continents that were kept apart by a sea of ice are now connected through waters that global warming is rendering navigable.

Several sessions around the following topics were proposed: Arctic Ecosystems under Change, Observation Technologies (including Autonomous Systems), Applied Data Science, Sustained Arctic Observations.

Also, a focus was made on technologies to help gather and analyze data concerning changes in marine productivity in support of the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean signed recently by nine countries and the European Union.

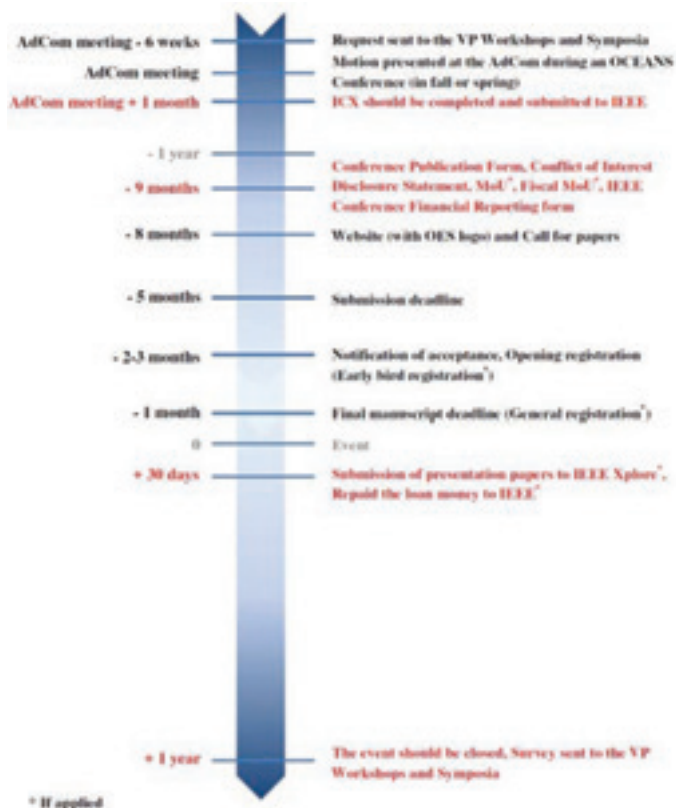
## Marine Debris Indicators: What's Next?—December 16–18, 2019, Brest, France



The workshop aimed to bring together a broad range of stakeholders from the Earth observation communities, research communities assessing the intermediate and long-term impacts of marine debris, United Nations and national agencies engaged in progress towards SDG 14, businesses that are aiming to tackle various aspects of the problem of marine debris, as well as experts working at the interfaces between these communities with the goal to ensure that knowledge required for policy making is created, accessible and useable.

More than 50 in-person and remote participants from twelve countries represented a wide range of stakeholders from all societal sectors.

For 2020, IEEE OES is involved in several upcoming events as a co-sponsor and is looking for new workshop/symposium topics and individuals to organize them. For those interested in organizing an OES sponsored workshop/symposium, it is necessary to get in touch with the VP Workshops and Symposia ([ieeeoes.workshop@gmail.com](mailto:ieeeoes.workshop@gmail.com)) and to respect the following schedule:



For 2020, 6 workshops will be co-sponsored.

## Marine Debris: a UN Perspective—End of May, 2020, Cascais, Portugal



Following the success of the workshop “Marine Debris Indicators: What’s Next?”, IEEE OES will be one of the organisers of a new workshop concerned with maritime pollution. This one will be linked with the first UN conference launching the UN Decade of Ocean Science for Sustainable Development, in Lisbon, Portugal (2–6 June). The workshop will be held in Cascais, Portugal, over the week-end preceding the conference, and run with the sponsoring of the Portuguese main and well-known Institutes.

More information concerning this event in the up-coming Beacon issues.

## IEEE/OES China Ocean Acoustics Symposium (COA 2020)—July 27–30, 2020, Harbin, China

COA 2020 is the second edition of the COA’s series. This event, sponsored by the IEEE Oceanic Engineering Society, has a goal to create in China an exchange platform for universities, research institutions and industries worldwide in one of the key fields of ocean science and engineering.

The aim is to create opportunities for high-level joint research in specific areas of common interest by facilitating the sharing of research achievements, experiences and new ideas on



hot topics. By actively participating in the symposium, postgraduate students and young researchers will have the opportunity to challenge their ideas, new approaches and developments of techniques and technologies. The organizers will invite widely recognized professors and experts to give tutorials and talks on underwater acoustics

fundamentals, new approaches and cutting-edge applications.

Deadline for abstract submission: March 31, 2020

Do not miss the opportunity to participate to this great event by visiting: [www.meetlist.org/COA2020/](http://www.meetlist.org/COA2020/)

## Ucomms—September 1–3 2020, Lerici, Italy



The mission of the UComms conference series is to promote the development of a deep understanding of the propagation of communication signals underwater and the performance of higher layer protocols with the objective of supporting the intelligent choice of network-

wide standards, as a foundation for interoperability.

UComms’20 is the fifth conference of the series organised by the NATO Centre for Maritime Research and Experimentation (CMRE) and is open to scientists and engineers involved in research, development, implementation and use of underwater communication systems.

The conference topics covers the full range of interests from physical understanding of the communication channels (acoustic optical, radio) through to network protocols and experimentation.

It is too late to submit an abstract, but it is not too late to register!

Visit <http://www.ucomms.net/>

## Autonomous Underwater Vehicle Symposium (AUV)—September 30–October 2, 2020, St John’s, Canada



Every two years the IEEE Oceanic Engineering Society (IEEE OES) sponsors a collaborative symposium to bring together those working in the field of autonomous underwater vehicles.

In 2020, this diverse group from around the world will meet in St John’s, NL, Canada, at Memorial University of Newfoundland for AUV 2020.

This symposium will cover topics from vehicles to extreme environments, exploring software development; multi-vehicle;



mission planning; navigation, localization and control; applications (mapping, oceanography ...).

All you have to know can be found here: <http://auv2020.org/>

### **GEO Blue Planet Symposium—October 28–30, 2020, Port Elizabeth, South Africa**



This 5th GEO Blue Planet Symposium will be co-organized by SAEON (South African Environmental Observation Network), and CSIR (Council for Scientific and Industrial Research) and the ACCESS programme (Alliance for Collaboration on Climate & Earth Systems Science). SAEON is well known for its work in the international ocean community for its contributions to ocean and coastal research and as an international participant with the JCOMM, the UNESCO/WMO Joint Commission on Oceans and Meteorology. The CSIR, is a world-class African research and development organisation and undertakes directed, multidisciplinary research and technological innovation that contributes to the improved quality of life of South Africans. The ACCESS programme is an earth systems science research consortium in South Africa representing several academic and research agencies and has a significant capacity building sub-programme.

More information will be available at the symposium's webpage: <https://symposium.geoblueplanet.org/>

### **IEEE USYS—December, 2020, Malaysia**



For its 9th edition, this International conference on Underwater System Technology: Theory and Applications will be held in Malaysia during December 2020.

This conference aims to provide a platform for researchers, scientists, engineers, academicians, as well as industrial professionals from all over the world to share, discuss and disseminate their current R & D activities and experiences related to the field of underwater system technology, including relevant theories as well as applications.

USYS 2020 focuses on exploring new technology and approach to utilizing the vast resources of the oceans, developing new engineering strategies for the preservation of the oceans eco-system, as well as providing a specialized forum for discussing the future of underwater system technology.

Deadline for abstract submission: July 30, 2020

Website: <http://oes.ieeemy.org/about-us/ieee-usys-2020/>



**Do not forget IEEE OES exists to serve you, but only your participation in events can allow the society to fulfill its mission!**

Editor's Note: Due to the effect of the COVID-19 virus, please visit the OES website for the latest on any possible date changes to these events.

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## **From the Journal Editor's Desk: IEEE Journal of Engineering Early Access Papers**

**Mandar Chitre, Journal Editor-in Chief**

Congratulations to the authors of our most recently approved papers for the IEEE JOE. The following papers were published as Early Access papers online on IEEE Xplore and will appear in regular issues soon. You'll find these papers now:

- D. P. Williams, "On the Use of Tiny Convolutional Neural Networks for Human-Expert-Level Classification Performance in Sonar Imagery".
- G. Yao; J. Xie; W. Huang, "HF Radar Ocean Surface Cross Section for the Case of Floating Platform Incorporating a Six-DOF Oscillation Motion Model."



- S. Alireza Nezamalhoseini; L. R. Chen, "Optimal Power Allocation for MIMO Underwater Wireless Optical Communication Systems Using Channel State Information at the Transmitter".
- X. Qin; F. Qu; Y. R. Zheng, "Bayesian Iterative Channel Estimation and Turbo Equalization for Multiple-Input Multiple-Output Underwater Acoustic Communications".
- J. Bonnel; S. P. Pecknold; P. C. Hines; N. R. Chapman, "An Experimental Benchmark for Geoacoustic Inversion Methods".



- C. R. Teeneti; T. T. Truscott; D. N. Beal; Z. Pantic, “Review of Wireless Charging Systems for Autonomous Underwater Vehicles”.
- S. Sun; X. Zhang; C. Zheng; J. Fu; C. Zhao, “Underwater Acoustical Localization of the Black Box Utilizing Single Autonomous Underwater Vehicle Based on the Second-Order Time Difference of Arrival”.
- Y. Song; B. He; P. Liu, “Real-Time Object Detection for AUVs Using Self-Cascaded Convolutional Neural Networks”.
- A. K. Sharma; S. K. Saha, “Simplified Drag Modeling for the Dynamics of an Underwater Manipulator”.
- M. N. Sangekar; B. Thornton; A. Bodenmann; T. Ura, “Autonomous Landing of Underwater Vehicles Using High-Resolution Bathymetry”.
- J. Tao; Y. Wu; X. Han; K. Pelekanakis, “Sparse Direct Adaptive Equalization for Single-Carrier MIMO Underwater Acoustic Communications”.

## The OES Newsletter—A Beacon Beaming the Activities of the Society for Fifty Years

**Stan Chamberlain (Initial OES President) and Fred Maltz (Longest Serving OESNL Editor)**



Stan Chamberlain



Fred Maltz

### The Early Years: 1970–1990

The newsletter (NL) of the Oceanic Engineering Society (OES) is one of only two activities of the OES that have existed over the full 50 years of the Society’s existence (the other being the OCEANS Conference). The NL began in simple form in 1970 without a designated continuing editor until 1973 when Donald Bolle from Brown University assumed that role. Professor Bolle continued as NL editor until 1978 when he relinquished it to become the founding Editor-in-chief (EIC) of the new IEEE Journal of Oceanic Engineering (JOE). At that point, the initial form of the OES was the Oceanography Coordinating Committee (OCC), an organizational form allowed by IEEE to sponsor conferences and have a newsletter but did not allow it to produce an archival journal. By 1973, The OCC had transitioned into the Council on Oceanic Engineering (COE), a form which was allowed by IEEE to have such a journal. The members of the COE were other IEEE societies, not individual IEEE members. With the need to organize OCEANS conferences at various locations, the desire for member individuals and local chapters was fulfilled by transitioning from a council to a society to become the Oceanic Engineering Society on January 1, 1983, with Stan Chamberlain as its initial President.

Harold (Hal) Sabbagh was the NL editor from 1978 to 1990. In addition to including calls for papers for OCEANS and other conferences, the various activities of the COE, and the



Front cover of the September 1981 issue.

oceans-related activities of COE’s (society) members, the NL published technical articles of general interest to its readers. One such feature article was “An Overview of the U.S. OTEC (Ocean Thermal Energy Conversion) Development Program,” by Robert Cohen from the U.S. Department of Energy, in the March 1979 issue. The June 1982 issue included the full Technical Program for the OCEANS 82 Conference. The NL contained the “It’s A Puzzlement” series with puzzles to challenge



Front cover of the June 1983 issue.

readers. One such example (from the December 1981 issue) is the “Chinese Rug Puzzle”: A rug that is 10 ft by 10 ft is to be cut on a continuous line. The two parts are to be combined with a second rug that is 1 ft by 8 ft to form a single rug that is 9 ft by 12 ft. Show how to make the cut. Those of you who choose to test your skill can compare your answer to that in the March 1982 issue (linked from the OES website, Publications, OES Beacon Newsletter, Recent and Past Issues, Past Issues (pdf)). Hal Sabbagh had an entertaining sense of humor. In his last issue he said: “I am retiring as OES Newsletter editor, so it is my duty to reminisce. When I assumed this position in 1978, the Chicago Daily News had just ended publication, and this past year the Los Angeles Herald-Examiner went belly-up. Hence, of the three great American newspapers, only the OES Newsletter has survived the last dozen years. (Yes, I know that the OES Newsletter is a transnational publication, but calling it an American newsletter fits the context better, don’t you think?)” Given all the other newspapers that have hit the skids since then, I guess the staying power of the OES Newsletter is even more remarkable today, don’t you think?

The longest tenured OES NL editor was the late Fred Maltz, who served from 1990 to 2009 (See following Fred’s Obituary). To summarize the NL under his editorship, I’ll let him do the summarizing in the following unpublished article Fred produced in 2005 as background for the paper “The IEEE Oceanic Engineering Society at Forty: The Challenges of an Evolving Society,” JOE, January 2008, pp. 1–54.

## The Middle Years: 1990–2009 (by Fred Maltz)

Hal Sabbagh was the first, long standing, editor of the OES Newsletter (OESNL). He served in this capacity from 1978 to 1990. Fred Maltz became the new editor in 1990. The next year, the first IEEE produced OESNL appeared when Glen Williams was president of the OES. A paper by John J. Carey and Joseph R. Vadus, which described the role of NOAA in the development, utilization and conservation of the oceans and their resources was featured in the Summer 1992 issue of OESNL. The following year, Stan Chamberlain published a description of the OES Technology Committees in the Spring 1993 issue of OESNL. This was also a call for participation from the general membership and the beginning of a discourse in OESNL on Technology Committees activities.

In 1993, OESNL began the publishing of Winning Student Papers at OCEANS Conferences, coordinated by Norman Miller. Also, in 1994, OESNL included an interesting paper on the history of the Harvard Underwater Sound Laboratory in the early 40’s, thanks to Roger Dwyer. It was in 1994 under the OES President, Joe Czika, that OESNL began to publish Editorials from the Vice Presidents of the Society. There were two editorials in the Fall 1994 issue, one by Jim Collins, VP for Technical Activities and one by Norman Miller, VP for Professional Activities. Also, in 1994 OESNL began to report on Chapter Activities. This first report was from Ed Early, Chapter Coordinator and Jim Barbera, Washington/Northern Virginia Chapter Chairman.

It was in 1994 that OES held its first OCEANS Conference outside the North American Continent and the U.S. Subsequently there were three international news items carried in OESNL in 1995. The first was the editorial by Ferial El-Hawary, VP International, announcing the success of the first of the International OCEANS Conference Series, OCEANS’94/OSATES, which was held in Brest, France, during September, 1994. The second was a report on further details of the Brest conference by Glen Williams. The third international article was a reprint from the IEEE Instrumentation and Measurement Society Newsletter entitled “A Short History of French Trans-Atlantic Cables from the French Viewpoint” by Rene Salvador. This article was supplied by Tom Carver who was transitioning their newsletter to a magazine at the time. Tom lived on Cape Cod, MA, and noted that the U.S. terminus was in Orleans, MA, which is now a museum. This was the second part of an article, the first of which was published in the Winter 1994 OESNL, entitled “The French Cable Museum,” also courtesy of Tom Carver. Coincidentally, the French terminus was outside of Brest, France, in Deolen.

In the ensuing years, 1996 and 1997 OESNL began reporting on IEEE inter-society activities. This included the “Sharing Activities Letters” of Harold Goldberg who was Chair for the IEEE Technical Activities Board’s Public Relations Committee, and Norman Miller’s reporting on the Professional Activities Council for Engineers, which is part of the IEEE U.S. Activities Board. Also, in 1997, OESNL began the “Who’s Who In The OES” column originated by Ed Early. These years saw the transitioning of the OES leadership from the presidents Glen Williams and Joe Czika to Claude Brancart who previously



served as OES Secretary. The next stated goal envisioned by Claude was for the newsletter to improve graphical presentation and coverage of individual members within the OES. Since that time a more personal touch has been evolving in the newsletter.

In 1998, OESNL began to appear on the Web. The first two issues appeared in PDF form only, and after that in both PDF and HTML. This was also the year that the OCEANS conference returned to France. This time it was held in Nice, France. In the Fall '98 issue of OESNL, Rene Garelo, OCEANS'98 Technical Committee Co-chair and President of the IEEE/OES French Chapter, proclaimed that the conference was clearly a success. Throughout 1999, under the new leadership of Glen Williams who returned to serve another term as president, the OES explored various options for delivering the newsletter to its members. Finally, with such faithful advocates as Joseph Vadus, in early 2000 Glen announced "... for the foreseeable future, the OES will continue to publish the Newsletter in both hard copy form as well as the Web based electronic versions, with the hard copy version delivered to all the members ...". Also, in 2000, the EIC of OESNL, Fred Maltz, was awarded the Distinguished Service Award at the OCEANS conference in Providence, RI.

In the winter 2001 issue, John Irza initiated a regular column entitled "Soundings," which was designed to report on Ocean Engineering news as it appears in the mainstream media. Also, in 2001, color was introduced to the newsletter, and expanded coverage of people and events. A concerted effort was made in 2002 to provide the members with an upgraded, high quality print version of the newsletter with relevant and interesting content.

In 2003, the strategic management of the OES and plans for revitalization of the AdCom were communicated to the members by the then OES President, Tom Wiener, in a regular series of President's Messages. In addition, long term OCEANS Conference planning reports were initiated by Joseph Vadus, Vice President International and Life Fellow. The latter were



*From page 11 of the Fallwinter 1999, Former JOE EIC William M. Carey accepting the Distinguished Technical Achievement Award from President Glen Williams.*

in the form of editorials and included other non-OCEANS, symposia and workshops. Also, in 2003, increased coverage of non-North American events as UT '04 International Symposium in Taipei, Taiwan, and US-Baltic 2004 International Symposium in Klaipeda, Lithuania, were given more visibility. This trend will continue beyond 2004 with a Scientific Submarine Cable Workshop in Tokyo, Japan, reported on by Hisaaki Maeda and the symposia on Ocean Electronics in Cochin, India, brought to the attention of the OES by Jim Collins. These and the two-per-year conference plan for OCEANS Conferences, one of which is non-North American, has prompted a call by Tom Wiener, for two new Associate Newsletter Editors, one from Europe, and one from Asia-Pacific. A secondary purpose of this was to strengthen ties with local chapters. John Irza of the Boston chapter was appointed as an Associate Editor of OESNL earlier.

During 2004 and early 2005, the IEEE Newsletters Coordinator, Paul Doto, has been working with the EIC to further improve newsletter graphic presentation, with a distinctive appearance emerging in the Spring 2005 issue. Also, in 2005, work was started on the OESNL Web Archive to include an XML formatted version in addition to the PDF and HTML versions. The purpose of this is to gain experience with the forthcoming XHTML standard and to explore possibilities for more efficient newsletter material handling and new options for enhanced newsletter content delivery. This is in keeping with the future goals of partial automation of the newsletter production process and a richer viewing experience for the readers of the newsletter.

In the latter part of 2005, it was voted on by the AdCom to accept paid advertising in the newsletter. Also, in 2005, two newly appointed Associate Editors of OESNL, John Watson from the Aberdeen Scotland chapter and Sheng-Wen Cheng from the Taipei Taiwan chapter were welcomed aboard.



*From page 4 of Summer 2001 issue, one of the first color photos to appear in the NL, Tom Wiener, President of OES flanked by Gloria and Joe Vadus and Judy and Cliff McLain, at a Barbershop Quartet Concert directed by Tom Wiener.*

## The Later Years: 2009–2020

Jim Gant was the OESNL Editor from 2009 to 2014 and Fred Maltz continued on as Consulting Editor. Marinna Martini



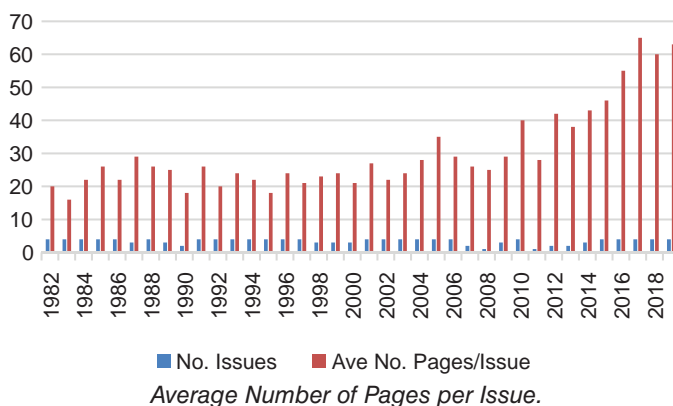
took on the position of editor of the newly created e-newsletter. The e-NL was created to provide for rapid distribution of time-critical items between the quarterly issues of the NL. Marinna passed the torch to Toshihiro Maki for the 2014-2015 years. As the OES activities increased in number and variety, the size of the OESNL expanded. Listings of names of new members joining OES during the previous 3-month period began to appear. Each issue following an OCEANS conference continued to contain photos and poster abstracts for each student in the Student Poster Competition, along with the full paper from the first-place student winner. On the 100th anniversary of the sinking of the Titanic (the July 2012 NL issue) an interesting article appeared by Joe Vadus on events onboard the Titanic leading up to its sinking. Memorable antidotes of deceased OES members appeared during Gant's editorship, including on Neil Brown, Albert Bradley, Rodney Coates, and Bill Carey. Student competitions were described, including International Submarine Races (U.S.), underwater autonomous vehicles (SAVe/India & SAUC-E/Europe), Underwater Robot Competition/Japan, and National Ocean Science Bowl (NOSB/USA). The increasing number of conferences, symposia and workshops sponsored by the OES were announced and reported, including UT/China'09, Japan'11, India'13; SYMPOL/India'09, '11, '13; Baltic'08, '10, '12, '14; AUV'12, '14 ; Chile-U.S.'08 Workshop, Techno-Ocean'12; OTC U.S., Brazil, Arctic; GEOSS; and others. In 2015, The OESNL was given a new name, The OES BEACON, Newsletter of the Oceanic Engineering Society.

An Interesting addition added by editor Jim Gant was a series of ocean-related poetry. These included works by Henry Larson (The Vagabond/July'10 issue), Henry Wadsworth Longfellow (The Phantom Ship, The Tides, The Tide Rises The Tide Falls, The Sound of the Seas/Dec'10, The Lighthouse/Jan'12, & The Secret of the Sea/Aug'13), Unknown (The Dreadnaught/Jul'12), Walter Mitchell (Reefing Topsails/Jan'13), Jose-Maria de Heredia (Les Conquerants (The Conquistadors, translated into English by Chris de Moustier)/Jun'14), and a traditional Newfoundland folk song (The Ryans and the Pittmans/Dec'14).

In 2015 the leadership of the OES Beacon was greatly expanded under the new transnational Co-Editor-in-Chiefs, Harumi Sugimatsu (Japan) and Bob Wernli (U.S.), with Kevin Hardy (U.S.) as Associate EIC. Their team included 7 (later expanded to 11) Contributing Editors from various countries across the globe. By this time the Beacon had taken on the form of a glossy magazine filled with high quality photos supporting articles and announcements of the voluminous world-wide activities of the OES. With this the number of pages per quarterly issue had about tripled compared to those of earlier decades (see Figure). A very disciplined process was instituted that has ensured that the issues appear on time. Our hats are off to those who continue to contribute to the Beacon and those



From cover of the September 2019 issue.



who do such an outstanding job of organizing and producing what is now such a high-quality OES Beacon, beaming forth the diverse and extensive activities of the Society.

### Enjoy Our Past NLs

You can enjoy the NL past issues from <https://ieeoes.org/publications/oes-beacon/> too!

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## Obituary on Fred Harold Maltz

With sadness, we again announce the passing of another of our long-time OES colleagues—Fred Maltz. Frederick (Fred) Harold Maltz of Mountain View, CA died on Sunday, March 31, 2019 at age 88.

Fred grew up in the Boyle Heights area of Los Angeles and attended Los Angeles High School. He received his B.S. degree from the University of California at Los Angeles in General Engineering and M.S. degree from Stanford University in Mathematical Statistics.

Fred's career spanned over 45 years of research and development in the fields of oceanic engineering, aerospace electronics, and communications engineering. Upon graduation from UCLA in 1953, he joined the Navy Research Lab to work on Long Range and High-Resolution Sonar. A couple years later, Fred took a commission with the U.S. Navy and served three years as an Airborne CIC Officer/Naval Air Observer Controller with radar picket duty flights over the North Atlantic. After finishing his M.S. degree at Stanford in 1962, Fred became a Research Scientist at the Lockheed Martin Advanced Systems Development Center in Palo Alto, CA. He received an award from NASA for his work on electromagnetic scattering and remote sensing in the early phases of SEASAT. In 1985, he joined Westinghouse as Principal Engineer for the development of sonar systems and acoustic signal processing for surface ship ASW combat systems. Fred rejoined Lockheed Martin in 1987 to lead an independent development project for the analysis of high-frequency sonar and acoustic signal processing onboard Autonomous Underwater Vehicles.

Fred was a Life Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) Oceanic Engineering Society (OES). He served as Editor of the Society's newsletter from 1988 to 2008 as well as six terms as an elected member of the Society's Administrative Committee (*See the article on the OES Newsletter history in this issue*). Fred was the IEEE Standards Coordinator for the Society for several years and chaired



*Frederick H. Maltz receives the Emeritus Award from OES president René Garelo at OCEANS 2016 Monterey.*

tutorial programs at AUV '96 and the OCEANS conferences in 1996, 1999, and 2000. He received the OES Distinguished Service Award in 2000 and the IEEE OES Emeritus Award in 2016 with appreciation and thanks for his long years of service as Editor of the Society Newsletter.

Fred loved sailing, photography (especially of boats), ballroom dancing, genealogy, and listening to classical music. He enjoyed both traveling the world with his beloved wife, Lucy, and hiking the nearby Stanford Dish. In addition to Fred's keen intelligence and many professional accomplishments, he will be remembered for his humility, kindness, gentle nature, and the mischievous glimmer in his eye that followed a witty comment.

A family celebration of his life was held onboard a 50-foot sailboat in the San Francisco Bay on Saturday, October 19, 2019. RIP Fred.

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## Obituary on D. Richard “Dick” Blidberg

It is with sadness that we have recently lost another valuable member of our technical community with the passing of Dick Blidberg. Following is some background on Dick and personnel comments from some of our members.

### **D. Richard Blidberg: From the AUVAC: (Autonomous Undersea Vehicle Applications Center)**

D. Richard Blidberg received his B.S. in Electrical Engineering from the University of New Hampshire (UNH) in 1972.

He co-founded the Marine Systems Engineering Laboratory (MSEL) at UNH in 1976. In 1993 the laboratory moved from UNH to Northeastern University where he served as Director of MSEL. Since 1995 he has been Director of the Autonomous Undersea Systems Institute (AUSI) in Lee, NH, which he founded in 1993. He established AUV Associates, LLC in 2000 and continued as a managing partner. He recently founded the AUV Applications center which he directed. He has written several papers and reports on unmanned untethered submersible technology, as well as organized 17





*Dick Blidberg at the Gala party of AUV2016  
January 1, 1945–September 1 2019.*

international symposia on AUV technology. He has over 100 publications related to AUV technology and served on several science and engineering committees, consulted for a number of companies, and was involved in a number of international collaborations. He was an associate editor for the IEEE Journal of Oceanic Engineering for underwater vehicle systems for 15 years.

### **Dick, I Miss You!—Tamaki Ura**

When I started working in AUV R&D, in 1984, I learned that there are two great AUV pioneers in the world: George Russel from Heriot Watt University and Dick Blidberg from the University of New Hampshire. I met George in 1986, and then, in 1989, I met Dick at the UUST (Symposium on Unmanned Untethered Submersible). He showed me his “Eave East” and explained it in detail. Dick organized UUST every other year and I became a regular. Anthony Healey (Naval Postgraduate School) and Dana Yoerger (Woods Hole Oceanographic Institution) were also regulars. UUST was full of young people and was exciting with academic flavor. I am sure that many young people who participated in UUSTs are now working to develop the next generation of AUV technology and underwater engineering. This is a great achievement by Dick. I also brought to UUST many students from Japan. Some of them are now very active in Japanese AUV R&D.

Dick used “Drop your tether!” as a slogan of UUST and said the meeting should always be comfortable. He requested that everyone “Take off your tie!” at the beginning of UUST. Once, Dick beckoned a gentleman sitting nearby to come up, pinched his tie, and cut it with scissors. All of the attendees smiled, relaxed a bit and made themselves comfortable. Researchers should be free from any restriction, so . . . “Drop your tether!”

The lobster Party was always fun and we were accustomed to joking at the bar in the New England Center drinking sev-



*Three boy's chronicle.*

eral drams of Whiskey. The picture (Three boy's chronicle) shows three “drunkards” taken at the New England Center—Dick and me together with Dana in 1995. Ten years later, the middle one was taken at Genova in the same pose, and then, the bottom picture was taken during the 2016 AUV Symposium in Tokyo. I invited Dana, but he could not come, so Carl Kaiser is in the photo on behalf of Dana. The set of three pictures is a monument of the long history of our friendship.





*A demonstration of cutting the tie of Toshirho Maki (R).*

As an event in the middle of the Gala party of AUV 2016, Dick gave a lecture, followed by a demonstration of cutting the tie of Toshirho Maki. This was the last time I met Dick and we enjoyed the symposium together.

Dick, patiently wait with a drink of Whisky in heaven for me. I will not come for a while.

## Bill Kirkwood

To many Dick would seem a bit like a curmudgeon when it came to technical topics on autonomous vehicle systems. The reality was he was trying to pass along valuable lessons and knowledge, trying to prevent meetings from wandering off topic and doing his best to help the new (younger generation) make their way in the “business.” He gathered valuable information, volumes of proceedings from UUST and his famously successful web page that had the largest collection of AUV knowledge available in a single site with the Autonomous Underwater Vehicles Application Center <https://auvac.org/>.

Dick was always thoughtful in his remarks. Always careful to be exact. Always polite while making a point. Always focused on doing things better, going farther, and moving the field of autonomous robots ahead. He was supportive of the IEEE—OES AUV Symposia and all that went with that.

An international man with friends around the globe. We will miss you Dick, the world of autonomy has suffered a setback that will be hard to impossible to replace. RIP in Dick.

## The Special Session at the OCEANS 2020 Singapore

OCEANS 2020 Singapore will be holding a special session on Autonomous Underwater Vehicle in memory of Dick to acknowledge his numerous contributions to the field of Autonomous Marine Systems.

## OES Society Award—Mohd Rizal Arshad Received the 2019 Presidential Award

**Mohd Rizal Arshad** received the 2019 Presidential Award at the OES ExCom meeting in Singapore in December 2019. Congratulations!

Mohd Rizal Arshad organised USYS conf in 2006 (Penang), 2008 (Bali), 2010 (Cyberjaya), 2012 (Malacca),

2014 (Shah Alam), 2016 (Kuala Lumpur), 2017 (Penang) and 2018 (Wuhan) with his colleagues. For IEEE USYS2020 it will be organised in Xi'an, China. Rizal and his colleagues have also organised annual National Technical Seminar on Underwater System and Technology (NUSYS) since 2007



*Mohd Rizal Arshad received the 2019 Presidential Award from OES president Christian de Moustier.*



*With ExCom. and OCEANS 2020 Singapore LOC team.*

until now. This year NUSYS2020 will be held in Dec 2019. A number of ROV competitions were also organised with the Malaysian Ministry of Education for High School Students. For the past two years, they have initiated the Malaysian AUV (MAUV) Competitions among the undergraduate students. For the regional collaborations, he has worked

closely with friends in ITB, Bandung Indonesia and NUS, Singapore. The most recent one was to assist in the establishment of IEEE OES Wuhan Chapter and forging research cooperation with Indian counterparts. As it is, with his all ongoing activities, we are happy that his efforts have got OES recognition.

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## Awards for OES Members

**Contact the Editors with Your Submissions**



*Jerry C. Carroll (L) and Rear Admiral J.A. Okon, United States Navy Commander Naval Meteorology & Oceanography Command, (R) at the Award Ceremony (photo by Kaley Turfitt).*

### Jerry C. Carroll Inducted into Naval Oceanography Hall of Fame

Jerry C. Carroll, OES Senior Past President, was inducted into the Naval Meteorology and Oceanography Command (CNMOC) Hall of Fame during a ceremony held on Dec. 12, 2019, at STENNIS SPACE CENTER, Mississippi. He is the fourth person to receive the Hall of Fame award along with Rear Adm. (ret) James Koehr, Vice Adm. (ret) Paul Gaffney and Dr. Donald Durham. Congratulations!

The following article is copied from the official news release from the Public Affairs Office of the Naval Meteorology and Oceanography Command on Dec. 12, 2019.

“Naval Oceanography is the U.S. Navy’s leader in unmanned maritime systems operations by piloting a fleet of 150 ocean gliders, conducting daily autonomous underwater vehicle operations from six survey ships and collecting oceanographic and bathymetric observations across thousands of square miles across the world’s oceans since the 1990s. The enterprise can trace this enormous success directly to Mr. Jerry Carroll, who

was inducted into the Naval Oceanography Hall of Fame during a ceremony on Dec. 12, 2019.

“Mr. Carroll is a recognized and trusted expert in undersea warfare. And when you dig deep into what he built, it is truly inspiring,” said Commander, Naval Meteorology and Oceanography Command (CNMOC) Rear Adm. John Okon. “He provided leadership in operational decision-making for oceanographic technology, search and survey, data collection, international partnerships and product development.”

“Mr. Carroll graduated from Oklahoma State University with a degree in geophysics in 1958. He began working in Washington, D.C. at the Naval Oceanographic Office (NAVOCEANO) in support of the Fleet Ballistic Missile program.

“In 1963, he helped develop systems used to map the wreckage of the submarine U.S.S. Thresher and a major wreck off the Aleutian Islands that could possibly detonate a nuclear explosion.

“When NAVOCEANO moved from Washington, D.C. to the Mississippi Gulf Coast in 1978, Carroll moved to Picayune, MS. In 1981, he became Director of NAVOCEANO’s Oceanographic Department and later the Operations Directorate overseeing 650 civilians, 100 military personnel and a fleet of oceanographic ships and aircraft.

“Naval Oceanography leadership selected Mr. Carroll in recognition of his dedication to the U.S. Navy while serving as the Commander’s Special Adviser for Undersea Warfare from 1996 until 2008. For two decades, his profound leadership and technical expertise ensured the safety and security of present and future Theater Antisubmarine Warfare operations by leading the largest and most successful bilateral agreement for ocean survey mapping in the history of Naval Oceanography.

“Today he helps organize oceanographic conferences in South America, Asia and Europe. He also serves on the IEEE USA Energy Policy Committee in Washington, D.C., and the University of Mississippi Gas Hydrate Consortium as their advisory committee for Mineral Resources.

“On behalf of everyone here and the more than 2,500 naval oceanographers, sailors and civilians around the world who follow in your footsteps, I want to let you know your legacy lives on in us and we are humbled you are with us today,” said Rear Adm. Okon.

“Naval Oceanography consists of more than 2,500 globally-distributed military and civilian personnel who define and apply

the physical environment, from the depths of the oceans to the stars, to ensure the U.S. Navy has the freedom of action to deter aggression, maintain freedom of the seas, and win wars.”

Tags: Naval Oceanography, Naval Meteorology and Oceanography, Hall of Fame, Naval Oceanographic Office, It Starts With Us

191212-N-LS434-0004: Naval Oceanography inducted Jerry Carroll into its Hall of Fame during a ceremony held on Dec. 12, 2019, at Stennis Space Center, Miss.

191212-N-LS434-0010: Naval Oceanography inducted Jerry Carroll into its Hall of Fame during a ceremony held on Dec. 12, 2019, at Stennis Space Center, Miss. Naval Oceanography leadership selected Mr. Carroll in recognition of his dedication to the U.S. Navy while serving as the Commander’s Special Adviser for Undersea Warfare from 1996 until 2008.

191212-N-LS434-0013: Naval Oceanography inducted Jerry Carroll into its Hall of Fame during a ceremony held on Dec. 12, 2019, at Stennis Space Center, Miss.

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## Request for Nominations for OES Awards 2020

**René Garelo, Chair of IEEE/OES Nominations and Appointments Committees, Junior Past President**

Each year at the beginning of January, the Oceanic Engineering Society is proposing a call for four Awards, with a **closing date of June 30th**. A reminder call for nominations is issued mid-March. The Awards Committee requests the nominator to provide the listing of qualifications of the nominee relevant to the award criteria, and up to 5 references, by filling the Awards Nomination on-line form (<https://ieeoeos.org/menu/award-forms/oes-awards-nomination-form/>).

The Awards descriptions are given below.

### Request for Nominations for DTAA: The Distinguished Technical Achievement Award 2020

The Distinguished Technical Achievement Award is given to honor an outstanding technical contribution to oceanic engineering in either the fundamental or applied areas. The award recognizes either a single major invention or scientific contribution or a distinguished series of contributions over a long period of time.

### Request for Nominations for DSA: The Distinguished Service Award 2020

The Distinguished Service Award is given to honor an individual IEEE OES member for outstanding contributions towards furthering the objectives of the Oceanic Engineering Society.

### Company/Institution Award

The award will be presented to a corporation or institution that has significantly supported the activity and goals of OES through such areas as conference participation, patronage, technical innovation and technical or administrative participation.

### Emeritus Award

The award will be presented to an OES member having been particularly important for the Society and who is no longer in any position of Society governance.

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## Chapter News

**Submit Chapter News to Beacon Co-Editors and OES Chapter Coordinator**

### Japan Chapter—Workshop on Scientific Use of Submarine Cables & Related Technology

*Reported by Harumi Sugimatsu, OES-J Vice chair*

#### The SSC Workshop

We had the second domestic workshop on SSC (Scientific Use of Submarine Cables & Related Technology) on 22nd November 2019 at the convention hall of the Institute of Industrial Science, the University of Tokyo. Speakers and audiences, more than 160 attendees, were enjoying a variety of talks and

discussions about the potential use of the seafloor cable network system and its future vision. The discussed topics were as follows:

- N-net: the new seafloor network system for earthquakes and tsunamis along the Nankai Trough \*Keynote
- Submarine cable network system along the Suruga bay
- Tsunami early warning prediction on the Hamaoka nuclear power plant
- A new cable laying ship “KDDI Cable Infinity”
- Development of Ocean Bottom Cable (OBC) for seismic observation





Keynote talk by Masahiro Nakade (Ministry of Education, Culture, Sports, Science and Technology).



Closing address from the WS chair, Katsuyoshi Kawaguchi (OES-J Chair).



Caught it! The small gifts from the sponsor were distributed to the audience.



Panel discussion.

- Social implementation of the submarine cabled observatory—Joint project with a Scottish company
- Future prospects of seafloor crustal movement and earthquake observations using the submarine fiber optic cables
- Seafloor neutrinos detector to measure the deep earth data

- Effective utilization of the data measured by the Seafloor Observation Network for Earthquakes and Tsunamis along the Japan Trench (S-net)—Detection of Fin Whale songs recorded from the ocean bottom seismometers
- Submarine cabled observatory networks as “The Ocean Information Station”
- Panel discussion: How to expand the utilization of the submarine cable network system in future?

The next SSC workshop will be held in the summer of 2020. In addition, the special sessions will be organized at the OES sponsored international symposium on “UT21” in Tokyo. See you there!

UT21 URL: <http://www.ut2021.org>

### The Second IEEE OES Japan Chapter Youngster Robocon Support Program Award Ceremony

IEEE OES Japan Chapter has been offering the students travel support program to challenge the SAUVC since 2018. The second winner's award ceremony was held just after the workshop. The winner is the “HIT-Robotics” team from Hiroshima Institute of Technology. Jonghyun Ahn, a supervisor of the team, received the award from Katsuyoshi Kawaguchi (OES-J Chair) on behalf of the team members. Congratulations to all!

## A Sequel

The team has passed the qualifying round for the SAUVC 2020 which is held from 14-17 August, just after the OCEANS 2020 Singapore (<https://sauvc.org/#competition>). If you see them at the SAUVC 2020 in Singapore, cheer for them!



Jonghyun Ahn (L) and Katsuyoshi Kawaguchi (R).



Award speech.

## Canadian Atlantic Section (OES-CAS)

*Reported by Ferial El-Hawary, IEEE Life Fellow, Chapter Chair, and Dirk Werle, IEEE Senior Member, CAS Section Chair*

### Tidal Energy Presentation a Highlight at the 2019 Annual General Meeting of the IEEE Canadian Atlantic Section

The IEEE Canadian Atlantic Section held its Annual General Meeting on December 5, 2019, in Halifax. True to our maritime roots, the Chapter opted for a suitable venue by inviting our members to congregate at the well-established meeting



PHOTO CREDIT: F&M EL-HAWARY

Outgoing OES Chapter Chair Ferial El-Hawary.

facilities of the Royal Nova Scotia Yacht Squadron on the Northwest Arm.

We were delighted to welcome as keynote speakers at the AGM two prominent members of the ocean engineering community, **John Woods**, P. Eng., of Minas Energy and **Tony Wright** of the Fundy Ocean Research Center for Energy, FORCE. The title of their richly illustrated talk was “*Perspectives on Tidal Energy Development in Nova Scotia.*” In her capacity as outgoing OES

Chapter Chair, **Ferial El-Hawary** was instrumental in inviting the speakers to the meeting.

Tony Wright’s presentation offered a FORCE-ful point-of-view on tidal power development and the challenge of “working in water that moves over 20 kilometers an hour.” Tony relayed his experience as general manager at FORCE, a public-private partnership studying the performance and interaction of tidal energy turbines in the Bay of Fundy. His professional background combines an MBA degree and an engineering degree. Prior to joining FORCE in 2012 he spent more than two decades as a career officer in the Royal Canadian Navy.

John Woods focused his talk on two of the FORCE berths from a developer’s perspective. They include a total of 21 x 420 MW units, connected in two arrays. He also highlighted issues of inter-connectivity. John presented his talk based on more than three decades of experience as an entrepreneurial engineer, as alderman of the City of Dartmouth, and as a manager to realize important energy opportunities. His professional competence and skill of a community leader have advanced innovative engineering designs and creative solutions to business and political issues related to energy development. John was very pleased to see the younger and aspiring members of the engineering profession in the audience since he has also mentored many Dalhousie engineering students as a lecturer on “Engineers in Society” over the past two decades.

In 2019, OES-CAS Chapter’s Secretary, Christopher Whitt, co-organized two additional lectures. Both events were very



PHOTO CREDIT: CALEB McDONALD

Keynote speakers and organizers at the IEEE-CAS Annual General Meeting on the Northwest Arm in December 2019.





*Members of the ocean engineering community during the networking and distinguished lecture event at the COVE in April 2019.*

well attended and deemed a success also for networking and highlighting OEC activities in the region. Here is a summary of the events.

On April 15, 2019, **Dr. Martin Siderius**, Professor of Electrical and Computer Engineering at Portland State University delivered a Distinguished Lecture on the topic of “*Underwater Communications: Challenges of the Acoustic Propagation Channel.*” The event was hosted in cooperation with Dalhousie Engineering at the Center for Ocean Ventures and Entrepreneurship, COVE, in Dartmouth, Nova Scotia.

On October 15, **Christopher Whitt** delivered a lecture on “*Passive Acoustics for Ocean Observations.*” Christopher is a project scientist at JASCO Applied Sciences and currently a member of the OES AdCom. His talk was the first in the Dalhousie Oceanography-Engineering Research Seminar (DOERS) series. It was a co-presentation between iMERIT, IEEE and the Department of Oceanography.

## Malaysia Chapter

### The 11th National Technical Seminar on Unmanned System Technology 2019 (NUSYS'19)

*Reported by Zainah Md. Zain & Khalid Isa*

On 2-3rd December 2019, the IEEE Ocean Engineering Society (OES) Malaysia Chapter organized The 11th National Technical



*Photo during NUSYS'19 parallel Session.*

Seminar on Unmanned System Technology 2019 (NUSYS'19) aimed at presenting current research being carried out in the listed area. The idea of the seminar is for the scientists, scholars, engineers, and students from Universities in Malaysia and the industry to present ongoing research activities, and hence to foster research relations between the Universities and industries. The seminar provides opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration. The seminar

offers a number of invited lectures from renowned speakers all over the country. NUSYS'19 is the premier interdisciplinary platform for the presentation of new advances and research results in the fields of Unmanned System Technology. The seminar brings together leading scientists, researchers, engineers, scholars, and students in the domain of interest from around the world.



*Photo Session with the participants during (NUSYS'19).*

### IEEE OES Malaysia Chapter Industrial Talk on Underwater Survey Operation

*Reported by Khalid Isa & Herdawatie Abdul Kadir*

Mr. Mohd Fairuz is currently Fugro's Project Manager, overseeing and responsible for the company's geophysics survey project in the Asia Pacific. Before joining Fugro, Mr. Fairuz had worked as Business Development Manager with a Malaysian survey company, where he was responsible for spearheading the effort in developing the Geophysical business line in line with technical expertise. Prior to this, he has previously worked as an Engineer, Senior Engineer & AUV Supervisor since 2007, with a career in the offshore geophysical survey spanning 11 years throughout the globe with several local and international companies. Mr. Mohd Fairuz is notably involved as one of Fugro's Lead Engineer for the largest underwater survey operation in the world, the MH370 search.





*Talk by Mr. Mohd Fairuz, Fugro's Project Manager.*



*Photo Session with Ms Emily Chiew, Assistant Sales Manager, Conventions & Conferences, KLCC.*

### **Collaboration Meeting with Kuala Lumpur Convention Centre**

*Reported by Herdawatie Abdul Kadir*

On Tuesday, Feb 11th, 2020, a collaboration meeting with Kuala Lumpur Convention Centre (KLCC) was held to bid for the 7th IEEE OES International Symposium on Underwater Technology (UT) 2023 and 11th Oceans' Asia Pacific 2026. The meeting was

held to explore collaboration opportunities. Early discussions identified possible ideas/benefits of the collaboration. There are many opportunities given by the Malaysia Convention & Exhibition Bureau (MyCEB) and KLCC. The KL Convention Centre works very closely with their strategic partner, Malaysia Convention & Exhibition Bureau (MyCEB), to provide financial and non-financial support to the national/international associations to bring their regional/international conferences to Malaysia.

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## **The Science We Need for the Ocean We Want**

**Regional Planning Workshop for the Northern/Central Indian Ocean Countries as well as ROPME Sea Area Towards the UN Decade of Ocean Science for Sustainable Development (2021–2030), 8–10, January, 2020, Chennai, India**

***M. A. Atmanand, Senior Member IEEE, Chair, IOC Regional Committee for the Central Indian Ocean (IOCINDIO), Member Executive Planning Group, UN Decade of Ocean Science for Sustainability & Director, National Institute of Ocean Technology, India***

### **1.0 Background**

The United Nations has proclaimed a **Decade of Ocean Science for Sustainable Development (2021–2030)** to support efforts to reverse the cycle of decline in ocean health and gather ocean stakeholders worldwide behind a common framework that will ensure ocean science can fully support countries in creating improved conditions for sustainable development of the Ocean. The term 'Sustainable Development of Oceans' actually refers to sustainable development of the ocean, seas and coasts. The main principle is that the Decade should utilize multidisciplinary understanding of ocean processes and solution-oriented research to generate new knowledge to support societal actors in reducing

pressures on the ocean, preserving and restoring ocean ecosystems and safeguarding ocean-related prosperity for generations to come. The identified six societal outcomes are:

- **A clean ocean** whereby sources of pollution are identified, quantified and reduced and pollutants removed from the ocean.
- **A healthy and resilient ocean** whereby marine ecosystems are mapped and protected, multiple impacts, including climate change, are measured and reduced, and provision of ocean ecosystem services is maintained.
- **A predicted ocean** whereby society has the capacity to understand current and future ocean conditions, forecast their change and impact on human wellbeing and livelihoods.



Figure 1. Inaugural Session.

- **A safe ocean** whereby human communities are protected from ocean hazards and where the safety of operations at sea and on the coast is ensured.
- **A sustainably harvested and productive ocean** ensuring the provision of food supply and alternative livelihoods.
- **A transparent and accessible ocean** whereby all nations, stakeholders and citizens have access to ocean data and information, technologies and have the capacities to inform their *decisions*.

The Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO) was tasked to coordinate the Decade's preparatory process (2018–2020). This involved inviting the global ocean community to jointly prepare an implementation plan for the Decade in ocean science and technology to deliver, together, the ocean we need for the future we want. This Implementation Plan will be submitted for approval to the 75th session of the UNGA in autumn 2020.

Global and regional consultative workshops are essential mechanisms in the Decade design process to achieve the objectives and to engage various communities through a multi-stakeholder process and structured dialogues. The first Global Planning Meeting held in Copenhagen, 13–15 May 2019, brought all key stakeholders with an interest in the Decade to the same level of information. Following this first global planning meeting, a series of regional workshops were planned to identify regional specific priorities and requirements as well as contributions to global objectives. It is in this connection the Regional Planning Workshop for the Northern/Central Indian Ocean countries as well as ROPME sea was held at NIOT during January 8–10, 2020.

## 2.0 Regional Planning Workshop for the Northern/Central Indian Ocean Countries as well as ROPME Sea Area

The Regional Planning Workshop for the Northern/Central Indian Ocean countries as well as ROPME sea area was conducted by Ministry of Earth Sciences, Govt of India in the National Institute of Ocean Technology, Chennai, located in southern part of India between 8th–10th January, 2020, to identify the region's specific priorities, requirements and contributions to the objectives of the UN decade of Ocean Sciences for sustainable Development. The agenda for the three day workshop had an inaugural session followed by well-structured panel discussions comprised of experts identified across six working groups followed by group discussions and a final wrap up with the summary and recommendation of each working group. As a prelude, an Intergovernmental Oceanographic Commission regional committee for The Central Indian Ocean (IOCINDIO) Leadership workshop on Developing the regional framework for coastal Vulnerability, was held from January 6–7, 2020.

## 3.0 Inaugural Session

Dr. M.A. Atmanand welcomed the delegates and gave a summary of the Global Planning meeting held at Copenhagen and on the activities of the National Institute of Technology. Dr. Justin Ahanhanzo, IOC, spoke on the genesis and overview of the UN Decade. Dr. Vladimir Ryabinin, Executive Secretary, IOC, talked about the importance of UN Decade and gave an overview of the various plans to be taken forward (video). Dr. Ariel Troisi, Chairperson, IOC, highlighted the importance of the Ocean



decade and gave an overall action plan. (video). Dr. M. Rajeevan, Secretary, MoES, reiterated the commitment of India for the various SDG goals and the UN decade action plan (video). Dr. Karen Evans, EPG, IOC, highlighted the draft science plan for UN Decade. She highlighted the cross cutting and inter-connections between the various science themes. Dr. Sateesh C. Sheno, Vice-Chair, IOC, gave the Keynote address. In his address, he highlighted six major issues viz. Climate Change – Sea Level Rise, de-oxygenated ocean (BoB, Arabian Sea), Ocean acidification, exploitation of living and non-living resources, marine biodiversity, marine pollution particularly plastics and risks. Dr. M.V. Ramana Murthy, Director, National Centre for Coastal Research (NCCR), gave the Vote of Thanks.

About 100 delegated from various **IOCINDIO** Member States including Australia, Bangladesh, France, India, Kuwait, Maldives, Saudi Arabia, UK participated; SACEP countries was represented by the Director General, SACEP; IOC-EPG members from Australia and Russia, NOAA-USA, IOC-Africa also participated in the three day workshop.

The participants were well represented from all concerned sectors including Government organisations, academia, research institutes, etc., and about 23% were women delegates.

#### 4.0 Working Groups

To steer the deliberations in the right direction, six working groups and panel members were identified and the detailed deliberations were held. The six working groups were:

- WG I: Clean Oceans
- WG II: Healthy and Resilient Ocean
- WG III: Predicted Oceans
- WG IV: Safe Oceans
- Work group V: A Sustainably Harvested and Productive Ocean
- Working Group VI: A Transparent and Accessible Ocean

#### Some of the Major Recommendations of Each Working Group are as Follows

WG I on Clean Oceans recommended for collection of litter before it enters the marine system, and recycling of plastic waste, awareness on usefulness of change in the public percep-

tions towards plastic use, developing and implementing a proper plan for disposal of the marine litter collected during the beach cleanup operations.

WG II on Healthy and Resilient Ocean have stressed the need to identify the boundary between healthy and unhealthy ecosystems and the drivers affecting the ecosystems health and environment including invasive species, biofouling and the restoration steps needed to improve the health and resilience of oceans. Involvement of local communities in resource conservation, use of local knowledge for protection and conservation of resources and promoting ecosystem value services have all been identified as priority areas for a healthy and resilient ocean.

WG III on Predicted Oceans have recommended for the establishment of a data hub for mid-eastern region under IOCINDIO platform. In addition, an ocean prediction science team to be formed and a regional forum established to address all the issues related to predictive ocean.

WG IV on Safe Oceans with major points that emerged during the discussions that included mitigation or elimination of risk by developing proper models for risk assessment for operations at sea and a comprehensive coastal vulnerability assessment and efforts to minimize or eliminate false alarms about a possible extreme event.

WG V on a Sustainably Harvested and Productive Ocean have identified the need to develop a working concept that brings together the modes and means to enhance economic benefits and coastal livelihoods by sustainably harnessing the marine resources through capture fisheries and through responsible mariculture.

WG VI on Transparent and Accessible Ocean major recommendations were that data and information goals should be user-driven and the ocean science community needs an accessible data system/portal to deliver data and info and should be coupled with an internationally developed and recognized data policy.

As part of IOCINDIO—IOCAFRICA collaboration initiation, interactions were held with participants from Cameroon and Ghana. A coastal vulnerability capacity building program is being initiated with IOCAFRICA through Kuwait, Bangladesh,

Saudi Arabia and India. Participants from Bangladesh and India are expected to participate at the regional UN Decade planning workshop to be held at Nairobi during month end. A session was organised by Dr. Jay Pearlman (over Skype) and Drs. Sidney Thurston and R. Venkatesan on Ocean best practices, which is to be taken care during all observations planned during the decade. A session by Early Career Ocean Professionals (ECOPS) involved an exclusive interaction with the student community and about 80 students participated actively and interacted with Scientists/mentors from various countries.



*Figure 2. Working Group deliberations in progress.*



## 5.0 Major Outcome and Recommendations

The major recommendations from this region for UN Decade for Ocean Science for Sustainability are:

- To develop a Regional Framework for Coastal Vulnerability towards the Safety, Security and Sustainable Development of Member States in the Indian Ocean.
- Monitoring and Management of Marine litter and research on micro plastics
- Tsunami Early Warning in the Indian Ocean.
- Inventory with knowledge gaps in existing programmes, studies and researches maximizing their wide and equitable usage towards the UN Decade success.

- Establishment of the Indian Ocean Youth Leadership Network of Ocean, Climate and Atmospheric Scientists and Professionals.
- Establishment of Indian Ocean Leadership Mentoring Network.
- Progress Review Follow up of the Recommendations at the IIOE-2-2020 Meeting in Goa, India, March 2020.

The Regional Planning Workshop for the Northern/Central Indian Ocean countries, as well as ROPME sea area, provided an excellent platform for bringing together experts and stakeholders related to various aspects of the coastal and Ocean science and technology to deliberate and identify the region specific priorities, requirements and contributions to the global ocean science needed to support the sustainable development of our shared ocean.



Figure 3. Delegates and Invitees to the Workshop.

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## Sonar Performance Quantification: Report on Two DLs

**Kenneth G. Foote, IEEE Fellow, Woods Hole Oceanographic Institution, Woods Hole, MA 02543 USA**

### Introduction

The author gave two seminars under the aegis of the OES Distinguished Lecturer Program in conjunction with the OCEANS Conference in Seattle, Washington, USA, which was held 27–30 October 2019. Each of these seminars was preceded by a short presentation on OES as an IEEE member society, with emphasis of these benefits of membership: networking, access to OCEANS Conference proceedings and JOE, and ready opportunity to pursue top-



ics such as sonar performance quantification through OES, noting its joint hosting of OCEANS Conferences; conduct of other meetings, symposia, and workshops; and the OES Standards Initiative, with Internet presence.

Information about the DLs is given in the following. The preambles were prepared specifically for the Beacon readership. They would have been understood implicitly by members of the audience with professional interest in the respective subject.

## First Distinguished Lecture

Title: Optical measurement of transducer vibration, including acousto-optic effect compensation

Time: 24 October 2019, 1500 PST

Place: Applied Physics Laboratory (APL), University of Washington, Seattle

Audience: The University of Washington, including especially APL scientists and engineers, and the public.

Preamble: A transducer is a device that converts energy from one form to another. An acoustic transducer converts a mechanical vibration, e.g., pressure fluctuation, to an electrical signal, e.g., voltage, and vice versa. The effectiveness of this conversion process is critical to many applications of transducers. Examples of applications include the biological: finding and quantifying fish in the water column; the hydrographic: bathymetric mapping; the industrial: chemical processes stimulated by sound; the medical: diagnostic imaging and diverse therapies using ultrasound; the military: detecting and locating mines on the seafloor; the offshore oil and gas industry: surveying applications to floating, standing, and bottom structures, including pipelines and pipeline routes. All of these applications are addressed by acoustic instruments, which presume a particular standard of transducer operation. How do we know that the transducer is operating as it should? What happens when things go wrong? Sometimes the answer involves detailed measurement of transducer vibration. This is casually believed to be straightforward, but a figurative wrinkle - namely the acousto-optic effect - has upset, precluded, or complicated measurement results since the beginning of optical interferometric measurement of vibration, at least as early as 1974. The DL addresses this matter.

Abstract: The connection of transducer vibrations and acoustic radiation is well known, but are the transducer vibrations themselves known? Optical measurement methods based on laser interferometry are described. These include homodyne and heterodyne laser interferometers, and laser Doppler velocimeters, whose operating principles are reviewed. Use of a pellicle, defined as a very thin, optically reflecting and acoustically transmitting membrane, which is suspended in the radiation field, is presumed. This enables convenient measurement configurations, sometimes allowing direct measurement of acoustic vibrations. In general, however, the acoustic field is unknown, especially in the transducer nearfield. This impacts the optical measurement, for the acoustic wave changes the local index of refraction along the path of the transiting laser beam. This acousto-optic effect is treated generally by solving the governing integral equation. In this way, acoustic vibrations can be measured without regard to the proximity of pellicle and transducer.

Follow-up reading: K. G. Foote and P. D. Theobald, "Acousto-optic effect compensation for optical determination of the normal velocity distribution associated with acoustic transducer radiation," *J. Acoust. Soc. Am.*, 138, 1627-1636 (2015); doi 10.1121/1.4929372

## Second Distinguished Lecture

Title: Acoustic quantification of water-column scatterers

Time: 1 November 2019, 1400 PST

Place: School of Aquatic and Fishery Science, University of Washington, Seattle

Audience: Scientists and engineers at the University of Washington, NOAA Northwest Fisheries Science Center including an Oregon laboratory by video link, NOAA Alaska Fisheries Science Center, sonar manufacturers, other institutions, and the public.

Preamble: Acoustic quantification of fish has been practiced for a half-century. Improvements have been pursued vigorously throughout this period. An operation that is essential to the quantification process is sonar calibration. The DL addresses this subject through the simplest, most accurate and rapid, hence cost-effective, method: that of the standard target.

Abstract: The two traditional methods of acoustic quantification of water-column scatterers, e.g., fish, namely echo counting and echo integration, are briefly reviewed. Both involve the acoustic sampling volume. This stochastic quantity is defined operationally. Echo integration additionally involves the scattering cross section. This is also defined operationally. The standard-target sonar-calibration method is then described and applied to measurement of the volume scattering coefficient in both the energy and spectral domains. The method is indeed robust, treating the sonar and its transducers, whether monostatic or bistatic, as a black box. The claim is supported by reference both to obsolete sonars whose output once consisted of markings on a strip-chart recorder, and some current sonars whose output is essentially an image. It is further bolstered by reference to a method that enables a calibration performed under a particular set of environmental conditions to be extended to the generally different environmental conditions of application.

Follow-up reading: K. G. Foote, "Standard-target calibration of active sonars used to measure scattering: Principles and illustrative protocols," *IEEE J. Oceanic Eng.* 43, 749-763 (2018); doi 10.1109/JOE.2017.2713538 [Date of Publication: 14 July 2017]

## Concluding Remarks

Process: As a matter of process, these steps were followed in seeking support under the OES DL Program: preliminary inquiries to potential hosts, preliminary inquiry with attached abstracts to the VPTA on the possibility of qualifying for DL support, preparation and submission of a budget to the VPTA. After VPTA approval, the DLs were confirmed with the identified hosts. It can be imagined that there is a lead time to be observed. This is necessary both for OES processing and to find mutually agreeable dates close to the those of the principal event.

Acknowledgement: The VPTA, Dr. Malcolm Heron, is thanked for supporting the lectures described here.

SUMMER SCHOOL

# 6-15 July 2020

Department of  
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## Marine Debris Indicators: What's Next?—Workshop Summary Report

An IEEE OES Event 16–18 December 2019-Brest, France

*René Garelo, OES Junior Past President*

*This workshop was sponsored by:*



### The Workshop

The workshop on “Marine Debris Indicators: What is Next?” was held on December 16-18, 2019, in Brest, France. Building on a first workshop held in November 2018, also in Brest, on “Technologies for Observing and Monitoring Plastics in the Oceans,” this second workshop aimed to strengthen the link between observation, extracted information, and decision and policy making. The workshop also provided a platform for the further development of a community focusing on the monitoring and measuring of marine debris.

More information is available at: [https://www.gstss.org/2019\\_Brest/index.php](https://www.gstss.org/2019_Brest/index.php)

Recognizing the UN targets for ocean plastic and related indicators, the second Marine Litter workshop brought together experts on observations and monitoring of marine debris and plastics with decision and policy makers in need of comprehensive information on this challenge. Focusing on targets and performance indicators, the goal was to converge towards common best practices and potential standards. Bringing in relevant stakeholders, the workshop also fostered collaborative networks to ensure that evidence-based decisions and policy-making are possible.

### Workshop Background, Objectives, and Scope

#### The Challenge

Marine debris is of growing global concern. Increasing material consumption and plastic production contribute to more marine litter and have resulted in estimates that over 8 million tonnes of plastic leak into the ocean each year. While quantitative information on production and use of plastics is to a large extent available, the fate of plastics discarded or leaked into the environment is highly uncertain. In particular, knowledge of how much plastic at different scales, down to micro and nano levels, reaches the ocean and the trajectories of the plastic in the ocean remain poorly known.

The Earth observation community so far has not managed to establish a global tracking and information system that would provide quantitative information on where and how plastics move in the ocean and allow the identification of the points where marine plastic pollution could be reduced most effectively. A necessary first step in addressing marine litter includes establishing a knowledge base for the amount of marine litter that has entered the ocean. In order to establish this knowledge base, the right actors need to be involved and they require a global platform to coordinate monitoring marine litter and informing action.

#### Pre-Workshop Activities

The goal of the November 2018 workshop on “Technologies for Observing and Monitoring Plastics in the Oceans” was to identify future technology initiatives able to address the





*Participants to the workshop at one coffee break, under the Christmas tree.*



*Collaborative work in progress.*

mounting global marine debris with particular focus on plastics in the ocean. The workshop addressed the interest of the UN Environment Program in finding support for their efforts to develop the methodology for monitoring marine debris indicators, in particular the Indicator 14.1.1 “Index of coastal eutrophication and floating plastic debris density” of the Sustainable Development Goal (SDG) 14 “Conserve and sustainably use the oceans, seas and marine resources for sustainable development.” The major outcome of this workshop was a draft road map with a set of activities and goals for six months, two years and 5 years, which provided an initial road map (see R. Garelo et al., “Technologies for Observing and Monitoring Plastics in the Oceans”, IEEE/MTS OCEANS 2019 Marseille, June 2019).

At a Town Hall meeting at the OCEANS 2019 conference in Seattle on October 29, 2019, the challenge of marine debris, in particular plastics, was presented and approaches to monitoring

indicators were considered. The discussion touched upon a wide range of topics including the societal challenge of reducing the use of plastics in an economy that has developed a high dependency on plastics, detecting and monitoring plastics in the environment and in the oceans, understanding the impacts of plastics on the biosphere including humans, and approaches to a better linking of science and policy making.

Both events provided valuable input for working out the scope and objectives of the second workshop program and the development of the program.

### **Workshop Scope and Objectives**

Building on the recommendations and draft road map of the 2018 Workshop, the main goals for the workshop were to further develop a community of stakeholders around marine debris and to further detail the road map towards a joint goal. The overarching goal for this community is to achieve a comprehensive description of observation means (underwater, satellite-borne, in situ, crowd sourcing, Big Data analyses) and assess their technological readiness, as well as their availability for relevant indicators, including the SDG Indicator 14.1.1, and to ensure that a range of emerging efforts to address the global challenge of marine debris can be based on sufficient observational evidence.

The workshop explored the potential for a platform linking the data to actions and develop an implementation strategy for observing networks

and modeling platforms to support co-creation of knowledge needed by those addressing all aspects of marine debris.

### **Participation**

The workshop brought together a broad range of stakeholders from Earth observation communities, research communities assessing the intermediate and long-term impacts of marine debris, United Nations and national agencies engaged in making progress towards SDG 14, businesses tackling various aspects of the problem of marine debris, as well as experts working at the interfaces between these communities with the goal to ensure that knowledge required for policy making is created, accessible and usable.

More than 50 in-person and remote participants from twelve countries represented a wide range of stakeholders from all societal sectors.

## Workshop Approach and Format

The first part of the workshop included several sessions with invited presentations and brief discussions. This part aimed at reviewing the current state in monitoring marine debris and relevant modeling, and aimed at an overview of the knowledge needs for societal decision making on mitigating the threat marine debris poses to the ocean and human beings. (See the next section for more details.)

The second part took a participatory approach in which the participants worked together to improve the draft road map that resulted from the first workshop in 2018. Initially, several groups collected sets of relevant terms and developed graphics of their vision for the next five years. Then the plenary agreed on a common vision, which provided a basis for the work on elements of the road map with a particular focus on the elements to be implemented during the six months leading up to the next workshop in June 2020 in Lisbon, Portugal. During the final session, input for a case study on “Reducing Plastics in the Ocean within a Growing Global Economy: Understanding the Information Needs to Support Interventions” was collected in a participatory effort.

## Workshop Program and Conclusions

The workshop was divided into sessions dispatched all along the 4 half-days of the meeting:

- Session 1: Speed Meeting
- Session 2: State of the Art and Emerging
- Session 3: Monitoring: From Sensors to Indicators and Policy
- Session 4: Observations and Models for Marine Debris Indicators
- Session 5: Posters
- Session 6: Connecting Data to Actions
- Session 7: Road Map
- Session 8: Working Groups - Road Map
- Session 9: Wrap Up – Conclusions

## Preliminary Outcomes

A representative of the DG Research & Innovation, Directorate C Healthy Planet, was an invited speaker and discussed the EU policy and actions on reducing marine litters, including plastic debris, and he emphasized that there are many relevant policies and initiatives, including among others the efforts to make progress towards a circular economy. With respect to plastics, the “European Strategy for Plastics in a Circular Economy” provides focused international actions, aims to improve reuse and recycling, as well as curbing marine litter, and promotes investigations of circular solutions. He outlined many funding opportunities and

pilot actions for the removal of marine litter. Importantly, there is an ongoing effort to achieve a common European framework that harmonizes procedures for plastic pollution monitoring. The participants worked collaboratively on the further development of a road map. And the main focus was on the next six months, with a plan for actions to be developed prior to the third workshop to be held in June 2020 in Lisbon, Portugal, at the “United Nations Decade of Ocean Science for Sustainable Development first meeting,” the “2020 UN OCEAN CONFERENCE,” <https://www.un.org/en/conferences/ocean2020>).

- Community building and organization:
  - How to benefit from it?
  - Identify and connect scientific communities;
  - Governance.
- Finance:
  - Donors funding;
  - Budgeting;
  - A project to commit time.
- Strategy:
  - Scoping of targets;
  - Connecting knowledge and action.
- External stakeholders:
  - Identify stakeholders;
  - Synergies;
  - Understand stakeholder needs.
- Content:
  - Monitoring;
  - Mitigation;
  - Value added;
  - Problem identification;

One session was devoted to a further development of the draft road map. A first step in this process is to agree on a common goal. For that, four groups were asked each to develop a graphical vision for 2025. The groups presented their visions to the plenary and an open voting was used to determine the vision with the largest support.



Vision graphics developed by four groups. The vision on the upper right was accepted as the guiding vision by the participants.



# Offshore Technology Conference

**Jerry C. Carroll, Senior Past President, OTC Board of Directors**



Founded in 1969, the Offshore Technology Conference (OTC) organizes the world's foremost events for the development of offshore resources in the fields of drilling, exploration, productions, and environmental protection. The flagship OTC is held annually in Houston, Texas, U.S.A. OTC has expanded technically and globally with the Arctic Technology Conference, OTC Brazil, and OTC Asia.

## OTC Asia

The Offshore Technology Conference Asia-OTC ASIA 2020 will be held in Kuala Lumpur, Malaysia, 24–27 March. The first OTC ASIA was held in 2014 and has consistently been a very successful conference. We expect to have over 20,000 energy professionals in attendance with over 150 exhibitors from 70 Countries and over 400 thought and expert leaders.

The venue will be at the Kuala Lumpur Convention Center and we hope to see you there! The Conference will feature the spotlight on New Technology Awards; Distinguished Achievement Awards; the Next Wave, a program for young energy professionals; and the University R&D Showcase & Challenge, a special program for high school students on STEM.

OTC ASIA 2020 will continue to feature in-depth and relevant country briefings as part of the conference program. These country sessions will provide in-depth coverage of the latest industry developments taking place in Asia and beyond. Discussions will cover market outlooks, investment climates and opportunities, while highlighting industry and technological advancements in recent and on-going major projects.

The sessions incorporate both presentation and panel discussions led by representatives from government and regulatory bodies, national and independent oil companies, and various energy players active in the featured countries.



*OTC Asia relevant countries.*

## OTC Houston

The annual offshore Technology Conference 2020 will be held at the NAG Park, Houston, Texas, 4–7 May 2020 and will feature a full technical program and exhibits. Attendance normally exceeds 50,000 and includes programs for young professionals. This year's program will feature a number of sessions and talks on renewable energy.

## OTC Brazil

Our OTC Brazil 2019 was held 29–31 October 2019 at the SulAmerica Convention Center in Rio de Janeiro, Brazil. This year's Conference had over 20,000 attendees and was a great success. The conference was located in the central part of the city and turned out to be a very popular location. I helped co-chair several technical sessions and was very pleased with the attendance of a number of professionals who also made excellent presentations. This conference was also well represented by female professionals in the industry. The next OTC Brazil will be in 2021.

For more information on the all OTC conferences, visit [www.otcnet.org](http://www.otcnet.org).



*IEEE/OES booth at OTC Houston.*





**NEW DATES!!!**

**17-19 August, 2020**

### **DISCOVER OTC ASIA**

The biennial Offshore Technology Conference Asia (OTC Asia) is where energy professionals meet to exchange ideas and opinions to advance scientific and technical knowledge for offshore resources and environmental matters.

The first OTC Asia was held in 2014. OTC Asia's vision and goal is to fulfil OTC's mission to promote and further the advance of scientific and technical knowledge of offshore resources and environmental matters.

### **OTC Asia aims to:**

- Meet the demand for technical information to support the growth of the offshore energy industry in Asia.
- Provide opportunities for industry professionals and their employers to share their applied technologies and best practices with other producing areas in the world.
- To create opportunities to institute and strengthen intersociety collaboration and cooperation with member societies based in Asia.

For more info., please visit the URL: <http://2020.otcasia.org/welcome>

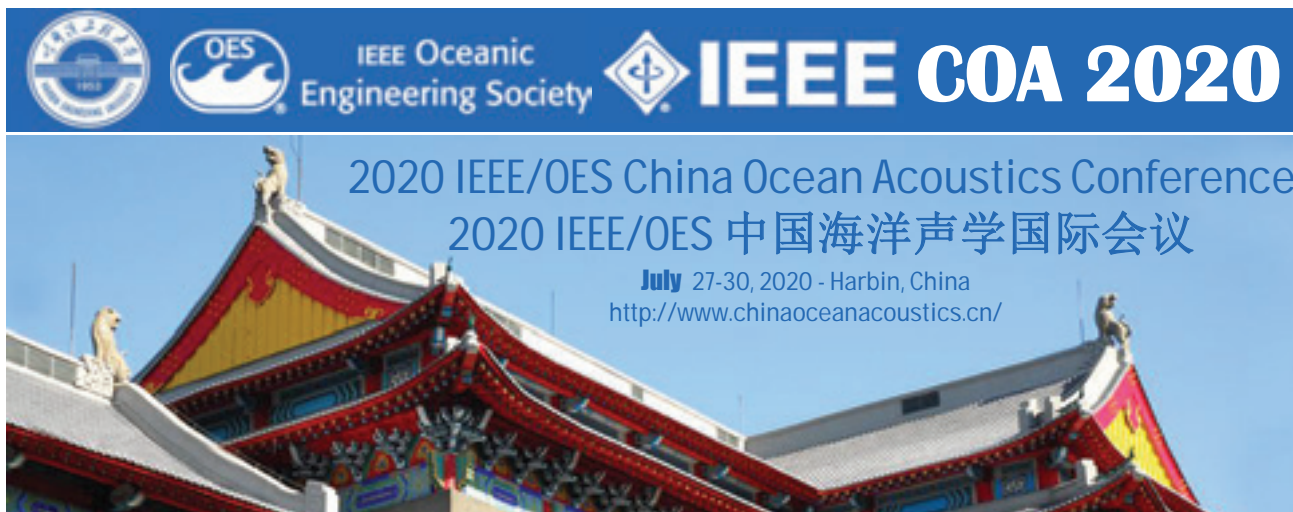
### **General Enquiries**

**T: +60.3.2182.3000**

**F: +60.3.2182.3030**

**E: [otcasia@otcnet.org](mailto:otcasia@otcnet.org)**





## Welcome to COA 2020!

### **2nd IEEE/OES China Ocean Acoustics Conference—COA 2020, Harbin, China, 27–30 July 2020 \*Updated**

The 2016 IEEE/OES China Ocean Acoustics Symposium (COA2016), initiated by Professor Yang Desen (Harbin Engineering University) and Professor Jean-Pierre Hermand (Université Libre de Bruxelles) was a great success and established a high-level platform for international cooperation and scientific exchange. COA2016 attracted extensive attention from academic circles in the mainland and abroad.

Continuing this tradition, second IEEE/OES China Ocean Acoustics Conference (COA 2020) will be held from 27th July to 30th July, 2020 at Harbin, China. Conference chair, Professor Yang Desen, welcomes all colleagues in marine acoustics and related fields to submit latest research in the up-coming conference. COA 2020 will focus on discussing, exchanging and sharing the cutting-edge research topics, by well-known scholars worldwide, creating new opportunities for cooperation. The conference will present the latest research in marine and underwater acoustics through invited and contributed papers.

All accepted and presented full-papers will be submitted for publication in the IEEE Xplore and full-text will be search by EI Compendex. Selected papers will be recommended for review and publication in IEEE journal. Scholars and students are welcome to submit contributions and participate in the conference to exchange new ideas, new technologies and new methods.

The conference program will also include tutorials by well-known experts on topics relevant to marine acoustics research. A technology exhibition will also be held during the conference to show-case advanced marine and underwater acoustic instruments, equipment and systems from Chinese and international manufacturers.

### **Conference Dates: July 27–30, 2020**

Registration: 27th July 2020  
 Technical Sessions: 28–29 July 2020  
 Tutorials: 30th July 2020  
**VENUE:** Harbin, China

### **Organizing Committee**

Honorary chair: YANG Shi-e  
 Co-Chairmen: YANG Desen  
 Technical Committee Chair: YIN Jingwei, QIAO Gang, Suleman Mazhar  
 Finance Chair: HU Bo  
 Secretary: WU Yingzi  
 Treasurer: FENG Xuan  
 Local Coordinator: LIU Songzuo  
 Student Affairs Chair: WANG Jianan  
 Publication Chair: ZHOU Tian  
 Social events Chair: MENG Yu

### **Important Dates \*Updated**

Abstract submission date: 31 March 2020  
 Full paper submission date: 29 April 2020  
 Notification of acceptance date: 15 March 2020  
 Final paper submission date: 20 June 2020

Please submit extended abstract (in English) online. The abstract should consist of minimum 500 words and can be up to 2 pages including necessary diagrams or tables. Final paper requires 4-6 pages.

**CONTACT:** Wu Yingzi, 18846070800 (Harbin Engineering University)

**EMAIL:** COA2020@hrbeu.edu.cn, wuyingzi@hrbeu.edu.cn



IEEE Oceanic  
Engineering Society



IEEE COA 2020

## 2020 IEEE/OES China Ocean Acoustics Conference 2020 IEEE/OES 中国海洋声学国际会议

July 27-30, 2020 - Harbin, China

<http://www.chinaoceanacoustics.cn/>

### Organizing Committee

**Honorary chair:** YANG Shi-e

**Chairmen:** YANG Desen

**Technical Program Chairs:**

YIN Jingwei,

QIAO Gang,

Suleman Mazhar

**Finance Chair:** HU Bo

**Treasure:** FENG Xuan

**Secretary:** WU Yingzi

**Local Coordinator:** LIU Songzuo

**Student Affairs Chair:** WANG Jianan

**Publication Chair:** ZHOU Tian

**Social events Chair:** MENG Yu

### Important Date

**Abstract submission date**-31 Mar. 2020

**Full paper submission date**-29 Apr. 2020

**Notification of acceptance date**-15 May 2020

**Final paper submission date**-20 Jun. 2020

Please submit extended English abstract on line.  
The abstract is more than 500 words and up to 2  
pages including necessary diagrams. The final  
paper requires 4-6 pages.

### Contacts

Yingzi Wu, Harbin Engineering University

Email: [coa\\_2020@163.com](mailto:coa_2020@163.com)

[COA2020@hrbeu.edu.cn](mailto:COA2020@hrbeu.edu.cn)

[wuyingzi@hrbeu.edu.cn](mailto:wuyingzi@hrbeu.edu.cn)

Tel: +86-18846070800

The long-awaited 2nd IEEE / OES China Ocean Acoustics Conference (COA 2020) Second China Ocean Acoustics Symposium will be held from July 27 to 30, 2020 in Harbin, China. Academician Yang Desen of Harbin Engineering University is chairman. Welcome your colleagues in marine acoustics and related fields. The conference website is under construction.

The 2016 IEEE / OES China Ocean Acoustics Symposium (COA2016) was initiated by Professor Yang Desen of Harbin Engineering University and Professor Jean-Pierre Hermand of Université Libre de Bruxelles (ULB). The conference was a great success and established a high-level international the cooperation and exchange platform. COA2016 has attracted extensive attention from academic circles at mainland and abroad.

COA 2020 will focus on discuss, exchange and share the cutting-edge research hotspots, research progress and research results of well-known scholars worldwide, and create new opportunities for cooperation. The conference will show the latest research results in marine and underwater acoustics through invited reports and session papers.

The proceedings of the COA2020 conference will be included in IEEE Xplore and full-text search by EI Compendex. Excellent papers will be recommended for review and publication in an IEEE journal. Scholars and graduate students are welcome to actively submit contributions and participate in the conference to exchange new theories, new ideas, new technologies and new methods.

The conference will invite well-known experts and professors to provide tutorial session for young scholars and students on research topics such as marine acoustics and underwater acoustics for one day.

An equipment exhibition will also be held during the conference to showcase advanced marine and underwater acoustic instruments, equipment and systems from Chinese and international manufacturers.

Meeting time: July 27-30, 2020, registration on the 27th, meeting on the 28th and 29th, return on the 30th. Venue: Harbin, China

### Call for Papers

**I. Underwater acoustics and acoustical oceanography**

**II. Ocean acoustic observatories and ocean**

**III. Ocean sound propagation modeling and experiments**

**IV. Marine sediment acoustics**

**V. Ocean noise and reverberation**

**VI. Underwater acoustic communication and networking**

**VII. Signal processing: Sonar modeling, signal detection and estimation, target tracking and recognition**

**VIII. Design, development, testing and calibrations for acoustical sensor and array**

**IX. Polar acoustics and under-ice propagation**

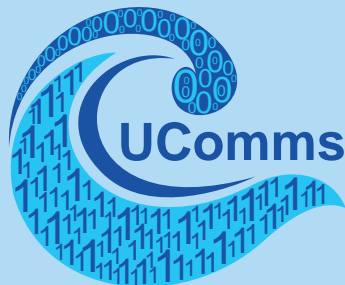
**X. Underwater non-acoustic detection and communication**

**XI. Underwater acoustics in extreme and special environments: discovery, observation and application**





# FIFTH UNDERWATER COMMUNICATIONS AND NETWORKING CONFERENCE



## UComms'20

Organised by the NATO STO Centre for Maritime  
Research and Experimentation (CMRE)

Lerici, Italy • 1-3 September 2020

Deadline for submissions: 16 March 2020

Supported by:



IEEE Oceanic  
Engineering Society



ATLAS ELEKTRONIK

Conference secretariat:  
[secretariat@ucomms.net](mailto:secretariat@ucomms.net)

For more information please visit:  
[www.ucomms.net](http://www.ucomms.net)





## International Symposium on Underwater Technology 2021

March 1 - 4, 2021

IIS Conference Hall "Haricot", Tokyo, Japan

**Advanced Underwater Technology for the Ocean**

The University of Tokyo is delighted to welcome international experts for the International Symposium on Underwater Technology (UT21). One of the most pleasant months in Japan will host the highly successful symposium, which is organized by the IEEE OES, IEEE OES Japan Chapter, the University of Tokyo's Institute of Industrial Science (IIS), and Earthquake Research Institute (ERI). The symposium will provide you with a thematic umbrella under which attendees will discuss the problems and potential long term solutions that concern not only the Pacific Rim countries, but the world in general.

### TOPICS

The symposium consists of keynote talks, double-track technical sessions, a student poster session and a technical tour on the first day.

It will feature advanced underwater technology and scientific use of submarine cables & related technologies. Suggested topics are listed below.

1. Environmental Monitoring
2. Marine Robotics
3. Marine Mineral Resources
4. Renewable Energy
5. Marine Construction
6. Observatory and Disaster Mitigation
7. Fishery Engineering
8. Acoustics and Communications
9. Sensors

### CONFERENCE OFFICERS

#### General Co-Chairs

Robert L Wernli, First Centurion Enterprises  
Katsuyoshi Kawaguchi, Japan Agency for Marine-Earth Science and Technology (JAMSTEC)  
Chang-Kyu Rheem, IIS, The University of Tokyo  
Masanao Shinohara, ERI, The University of Tokyo

#### Technical Committee Co-Chairs:

Weilin Hou, United States Naval Research Laboratory  
Toshihiro Maki, IIS, The University of Tokyo  
Blair Thornton, IIS, The University of Tokyo /University of Southampton

#### Secretariat

Harumi Sugimatsu, IIS, The University of Tokyo

### ABSTRACT SUBMISSION

On-line submission page will be available in March 2020. Please bookmark the conference website and check for updates: <http://www.ut2021.org>

### IMPORTANT DATES

Deadline for Abstract Submission: **September 18, 2020**

Notification of Acceptance: **October 16, 2020**

Deadline for Paper Submission: **December 11, 2020**

Deadline for Early Registration: **January 21, 2021**

Symposium Dates: **March 1 - 4, 2021**

### FOR INQUIRIES

Contact: [info@ut2021.org](mailto:info@ut2021.org)

<http://www.ut2021.org>



**OCEANS**  
CONFERENCE & EXPOSITION



**SAVE THE  
DATE**

## **OCEANS 2020 Singapore**

August 11 - 14, 2020

[singapore20.oceansconference.org](http://singapore20.oceansconference.org)



## **OCEANS 2020 Gulf Coast**

October 19 - 22, 2020

[gulfcoast20.oceansconference.org](http://gulfcoast20.oceansconference.org)

## **OCEANS 2021 Portugal**

May 24 - 27, 2021



## **OCEANS 2021 San Diego**

September 20 - 23, 2021

[sandiego21.oceansconference.org](http://sandiego21.oceansconference.org)



## A Blast from the Past! . . . And a Look at Our Future

**Bob Wernli—Beacon Co-Editor-in-Chief, photos by Stan Chamberlain**

Many of our OES members are, how shall I say it . . . “very experienced.” So, what are we doing to plan for the future and maintain our membership until, one day, our new members will also become “very experienced?” OES has eyes on the future and actively works to bring in our new members via our Student Poster Competition,

First Flight High School support, Student Receptions, Women in Engineering and Young Professional BOOST programs. Many of those involved in these programs have already become actively involved in the society to include becoming members on the AdCom. Welcome aboard to our future as shown below.



*OCEANS 2017 Anchorage—Student Reception.*



*OCEANS 2019 Seattle—Student Poster Competition.*



*OCEANS 2019 Marseille—Student Poster Competition.*



*OCEANS 2013 San Diego Student Reception.*



*OCEANS 2013 San Diego WIE Reception.*



OCEANS 2012 Hampton Roads, FFHS, Benjamin Lam.



Celebrating 50 years of OCEANS

NEW DATES!!!!

June 15, 2020 | Early-bird Registration Closes

June 30, 2020 | Papers/Posters Due



 **OCEANS 2020**  
Singapore

11-14 Aug 2020

Green Ports: In harmony with the Oceans

<https://singapore20.oceansconference.org/>

Sponsored by:







# SAUVC 2020

**Design** to compete.

**Destined** to explore.

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**August 14 -17 @ Singapore Polytechnic**

MENTORS . GUEST SPEAKERS . COMMUNITY . COMPETITION

**7 years**

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**93 AUVs**

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Visit [sauvc.org](http://sauvc.org) for more details about the  
Asia's Largest AUV Competition





# OCEANS

CONFERENCE & EXPOSITION



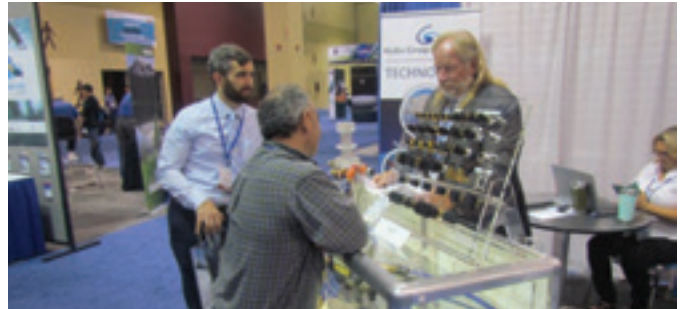
Time is fast approaching for the upcoming OCEANS 2020 conference hosted in Gulf Coast Mississippi. We expect more than 2,000 attendees and will feature experiential content tracks as well as exciting opportunities to engage with attendees in the interactive exhibit hall and/or thru unique sponsorships.

**You're invited to join us:  
OCEANS Gulf Coast 2020  
October 19-22**

The conference will be held at the renovated [Mississippi Coast Convention Center](#) and the famous [Beau Rivage Resort & Casino](#) will be the host hotel.

**For more information in booking your company's activation or information on the next steps for getting involved visit [OceansConference.org](https://OceansConference.org) or contact**

Jay Blankenship | Phone: 410-584-1932  
Email: [Jay.blankenship@mci-group.com](mailto:Jay.blankenship@mci-group.com)



# OCEANS 2021 SAN DIEGO EXHIBITS NOW ON SALE

<https://sandiego21.oceansconference.org/>



The OCEANS 2021 San Diego committee invites you to beautiful San Diego to participate in the world's most prestigious, comprehensive, and diverse conference and exposition regarding our most critical resource—the oceans. Coordinated with the kickoff of the United Nations “Decade of Ocean Science (2021-2030), this will be the 8th time the OCEANS conference has come to San Diego, a venue that has consistently provided the largest and most successful OCEANS conferences ever.

OCEANS 2021 San Diego will expand significantly in scope, bringing together key international industry and government stakeholders, focusing on investment plans/strategies during the upcoming five years as well as emerging technologies, new science and research initiatives, and the latest in commercial products.

The theme for OCEANS 2021 San Diego is **“Sustaining our Oceans . . . Sustaining our Future,”** reflecting on the critical nature and importance of our industry and its sustaining technologies. New Technical tracks will include Artificial Intelligence (AI), the great challenge of Data Management, Arctic and Antarctic exploration, and will present emerging technologies for ocean stewardship, food supply production and management, national defense, energy production, and overall management of the oceans and waterways. Assuring a successful conference will be committee members from the highly successful 2013 and 2003 San Diego OCEANS conferences along with new, influential and highly capable technical, academic and business leaders. Your OCEANS committee is working diligently to bring together influential buyers, investors, stakeholders, industry experts, and innovators from government agencies, industry, and academia.

We look forward to welcoming you to San Diego.



Alan Kenny  
Conference Chair



Robert Wernli  
Conference Co-Chair



# Who's who in the OES

**Christopher Whitt, OES AdCom. Member**



*Figure 1. Preparing an ice drifting acoustic array for deployment in Svalbard.*

I have been around the ocean my whole life. I was born in St. John's, Newfoundland and Labrador, Canada, and in 2003, I settled in Halifax, Nova Scotia, Canada. Since 2007, I have worked for JASCO Applied Sciences, an international consulting company that specializes in measuring sound in the ocean.

In my 13 years with JASCO, I have worked on many aspects of passive acoustic monitoring. First, with deploying sound recorders in oceans around the world and developing our in-house instrumentation. I then helped develop automated processing of sound recordings, as well as the procedures for our ISO9001 quality system. Recently, I've been training JASCO's field staff and managing projects.

Music and acoustics have been common threads in my life. I learned to play bass guitar in junior high school. I played in various bands and church groups through high school and university, and then expanded a little to double bass. I was a member of the Newfoundland Symphony Youth Orchestra and the Memorial University Jazz Ensemble, and briefly played with the Newfoundland Symphony Orchestra.

My parents gave me a love of travel from a young age. We lived for four years in Liberia, West Africa, when I was a child. Later, I lived for a year in Doha, Qatar. Between work, family trips, and now IEEE, I have visited many countries, including a lot of unusual places like Alaska, Greenland, and Svalbard. When I'm not traveling or playing frisbee, I'm usually found at home spending time with my family and our three dogs.

My involvement with music eventually led to volunteering. After starting to play music, I also learned to operate sound and lighting systems and then started training others to do the same. During my undergraduate studies in Electrical Engineering at Memorial University of Newfoundland, I joined IEEE and soon became vice-chair and eventually chair of the Student Branch. After moving to Halifax, I became involved in the sport of Ultimate Frisbee. For several years, I was chair of the Halifax Ultimate community. I became active with the IEEE Canadian Atlantic Section and was Section Chair in 2016. After that, I was Area East Chair for Region 7.



*Figure 2. My dogs Piper, Brooklyn, and Shenzi (L to R).*



*Figure 3. Deploying a real-time acoustic buoy in western Canada.*

In addition to serving on OES AdCom, I am currently the IEEE Canada (Region 7) Secretary as well as the Program Chair for Sections Congress 2020. I enjoyed working with many of my fellow OES members on the OceanObs19 Community White Paper *Future Vision for Autonomous Ocean Observations*. Following that experience, I've participated in several meetings to plan for the UN Decade of Ocean Science for Sustainable Development ([oceandecade.org](http://oceandecade.org)). The Ocean Decade is a framework for professionals across many fields to identify priorities and coordinate ocean research for the next decade. Engineering and technology will be essential to transforming ocean observations needed to better understand and manage our oceans, which are so important for life on this planet. OES is planning various activities to support the Ocean Decade. Look for more information at OCEANS conferences, in *The Beacon* and in *Earthzine*.

I look forward to many more years of connecting work, personal interests and volunteering with the ocean. Please contact me or any other society volunteer if you would like to get involved in OES activities.



## Member Highlights

**Contact the Editors if You Have Items of Interest for the Society**

### **Doraemon Museum with a New OES Member's Family in Japan**

**Harumi Sugimatsu, BEACON newsletter Editor in Chief**

Do you know “Doraemon,” a Japanese manga series by Fujiko F. Fujio (Hiroshi Fujimoto)? The series started in 1969 and still continued until today, even though the author had passed away in 1996.

In the story, Doraemon, a cat type home robot travels back from the 22nd century to support the boy “Nobita Nobi” (Doraemon lives with his descendant family in a future world).

Doraemon has a four-dimensional pocket on his tummy, in which are unexpected tools developed by future technology that can save Nobita from his crisis, such as an escape from a bully or so. Bamboo-Copter, a small piece of headgear that can make us fly into the sky, and Anywhere Door, a pink-colored door that can make us travel anywhere we want to visit, are the well-known tools.

Fujiko F. Fujio Museum, so called Doraemon Museum, was established in commemoration of the author in his living area on outskirts of Tokyo in 2011 (<http://fujiko-museum.com/english/>).

With a new OES member Zonghua Liu of IIS, U-Tokyo, and his wife Faye and their baby boy James, we visited the museum on 8 February 2020.

We can learn how the Doraemon series and his unique tools are created there.

When you have a chance to visit Japan, please visit the museum where you can meet the seeds and needs of future technologies like “Back to the Future.”



*Having fun with a new OES member's family. Zonghua Liu, his wife Faye and James and Harumi (L to R). Nobita and Doraemon are in our back.*



*Doraemon Statue at the museum.*



*Anywhere Door (Dokodemo-Door) at the Museum.*

---

## Welcome New and Reinstated Members

### Australia

Perri Quattrociocchi  
Andrew E Sayers  
C J Skinner

### Brazil

J Coriolano

### Canada

Chris Bayley  
Xinwei Chen  
Jasper Dupuis  
James Leo Hanlon  
Franz Heubach  
Anna Wailand

### China

Yuhan Dong  
Le Gao  
Xiao Han  
Wei Huang  
Yan Li  
Lixin Liu  
Yingjie Liu  
Feng Lyu  
Hongde Qin  
Yibin Ren  
Chong Wang  
Tao Wang  
Bin Zhang  
Xudong Zhang

### Croatia

Nikola Filip Fijan

### Ecuador

Luigi Styven Purizaga

### France

Nicolas Gartner  
Barbara Nicolas

### Germany

Martin Gade  
Karsten Hilbich

### Hong Kong

Yu Hin Chan  
Leo Clement Chiu-Leung

Ching Tung Lui  
Leon Ng

### India

Avik Kumar Das  
Shailesh Vijay Khanolkar  
Uma Shanker Sahu  
Kurian Thomas

### Israel

Roe Diamant

### Italy

Lorenzo Bartalucci  
Lorenzo Bazzarello  
Matteo Bresciani  
Chiara Brogi  
Alessandro Bucci  
Riccardo Costanzi  
Samantha Dugelay  
Federica Guerrini  
Piero Pareti Abetoni  
Giovanni Peralta  
Alessandro Ridolfi  
Francesco Ruscio  
Alberto Topini  
Edoardo Topini  
Leonardo Zacchini

### Japan

Zonghua Liu  
Hanako Ogasawara  
Tomorou Yamada  
Yuichi Yokoi

### Lebanon

Elie A Shammas

### Malaysia

Nurul Adilah Abdul Latiff

### Mexico

Juan Francisco Barcenas  
Grael

### Norway

Claudio Paliotta  
Beatrice Tomasi

### Poland

Radoslaw Jez

### Russia

Aleksandr Nikolaevich  
Grekov

### Singapore

Veerajagadheswar  
Prabakaran

### Slovenia

Ales Zamuda

### South Africa

Daniel J Versfeld

### Sri Lanka

Tharindu Sankalpana  
Weerakoon

### Tunisia

Nizar Rokbani

### United Kingdom

Gita Marina Ahadyanti  
Saptarshi Das  
Siti Fariya  
Jack Farley  
Angus Gray-Stephens  
Miltiadis K. Kalikatzarakis  
Roberto Ravenna  
Momchil Terziev  
Moritz Troll

### USA

Elizabeth Alvanas  
Michael A Anuta  
Steven Calton Ates  
P Morgan Baker  
Kristin Beem  
Mark Bourassa  
M. Breyfogle  
Donald P Brutzman  
Sydni Nicole Crain  
Elisabeth Deeb  
Paul Andrew Elmore  
Mehdi Farrokhrooz  
Robert J Fleming

### J C Garstka

Kandice Gunning  
Michael Habisohn  
Nathanael Hammond-Kunke  
Sam D Herbert  
Lisa J Herman  
Rick Hernandez  
Robert Luke Jackson  
Harpreet Kaur  
Donna M Kocak  
Stanley J Labak  
Stephen Lash  
John J Lester  
Ryan Austin McGill  
Carrie Miller  
Ron Murdock  
James D Nickila  
Corey Adam Nilges  
David M Orr  
Bethany Pertain  
Victoria Preston  
Yuan Qiao  
Sarah Raney  
Alex Richetta  
Irene Rodriguez-Alegre  
Michael Rudolph  
Kevin Rychert  
Daniel Sada  
Allison Marie Savoie  
Willem Scholten  
Richard A Smith  
Peter So  
Lauren Ann Sommers  
Shashank Swaminathan  
Mark A Talbott-Williams  
Gordon Cullen Thomas  
Stephen Thompson  
Erik Valeur  
Harry Vine  
Robert Watson  
Glenn Andrew Wilson



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## Student Committee Activities IEEE OES—Escuela Superior Politecnica Del Litoral

**Aguirre—Rojas Karen Elizabeth, ESPOL-Ecuador Chapter Chair**



*The new members and the Chair Karen. People in the photo from the front to back; Karen Aguirre, Jacqueline Rivas, Karen Miraba Nicole Sanunga, Angelica Bustos, Jessica Palate, Yomaira Mera, Maria Jose Garcia and Nicole Macas.*

This month (18/12/2019), we had the pleasure of welcoming 8 new members of IEEE OES, all of them women. It is a real honor for us to motivate and promote the inclusion of women in engineering in our Student Branch Chapter. During the meeting we discussed issues about benefits and future activities of the SBC.

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## Christmas Science on the Outer Banks

**Todd Morrison, Senior Ocean Engineer, Woods Hole Group**

Just before Christmas, 2019, OES mentors Drs. Hilary and Todd Morrison ventured once again onto the Outer Banks of North Carolina to work with a new generation of First Flight High School Phyto-Finders. OES has sponsored these student citizen scientists since 2010 and the Phyto-Finders of FFHS have so far authored nine research papers, which they have presented in technical sessions at OCEANS and which were published in the Conference Proceedings. Expect more results from this new generation of students at OCEANS 2022 in Hampton Roads.

During the December trip, students collected phytoplankton samples from two piers jutting out into the Atlantic Ocean. Each sample was examined, by multiple students using microscopes, to identify target species, with more experienced students teaching new members. Potentially toxic species are immediately reported to NOAA. The beginning of a possible bloom of *Pseudo nitzschia* was detected in the samples shown here and, after a phone call directly from the science classroom, samples were sent overnight to the NOAA Toxin Lab in Charleston, SC.



*Figure 1. Phyto-Finders display a tow net sample on Jennette's Pier, Nags Head, NC.*





*Figure 2. Student teams examine the samples with microscopes, looking for target species and recording their observations.*

During the trip the students were also taught how to extract DNA from the samples. The extracted DNA will be sequenced in Hilary's lab at the Marine Biological Laboratory in Woods Hole. Comparison to sequence libraries identifies, with extremely high sensitivity, the distribution of species at multiple trophic levels. Look for a longer article, authored by one of the students, about this trip and the ongoing work of the Phyto-Finders in the next edition of the Beacon.



*Figure 3. Students quickly mastered the detailed steps of a DNA extraction protocol.*



*Deploying the tow frame. The development and testing of the frame, christened "Bagel", was described by FFHS students in a paper presented at OCEANS '18 in Charleston, SC.*



*Tow frame and net in the water off the pier in Duck, NC.*

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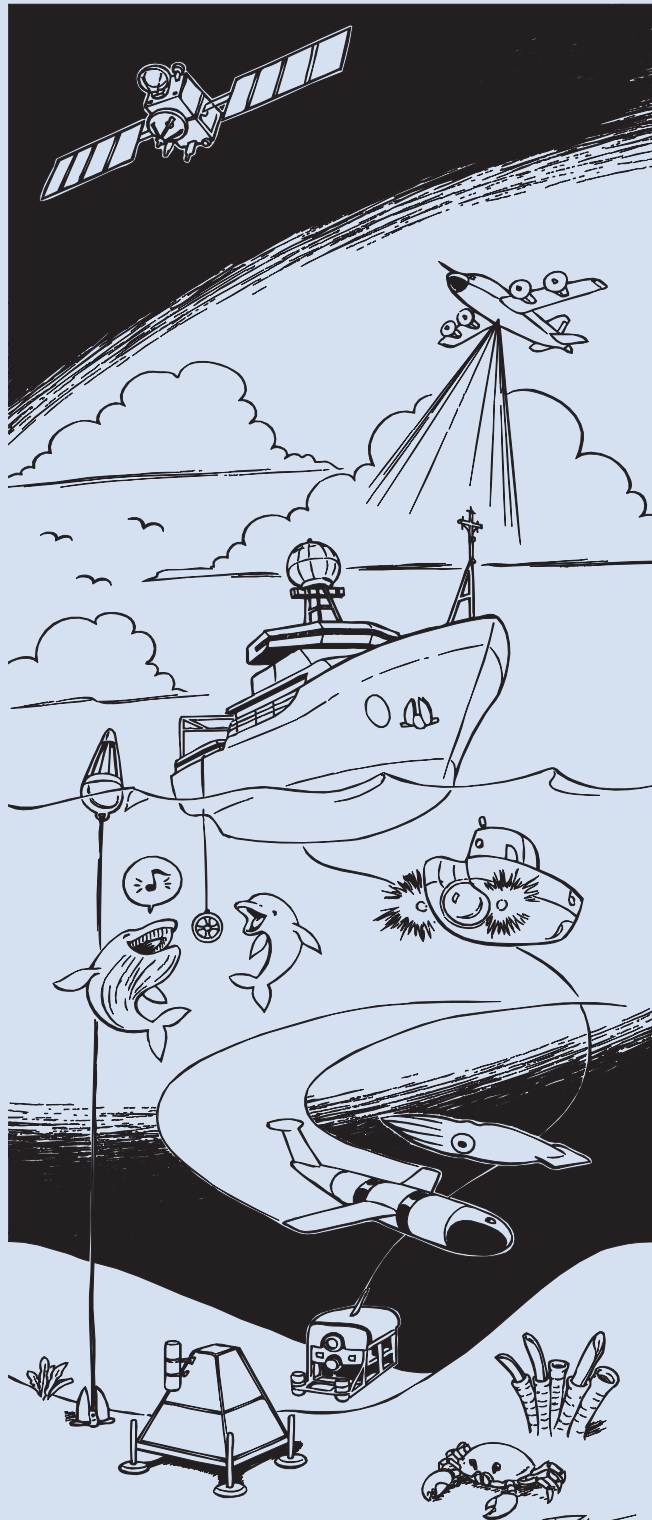
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