

**CANADIAN OCEAN SCIENCE NEWSLETTER
LE BULLETIN CANADIEN DES SCIENCES DE L'OCÉAN**

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OCEAN SCIENCE NEWS

The Ocean Frontier Institute

Marlon Lewis¹ and Paul Snelgrove²

1 Scientific Director, Dalhousie University

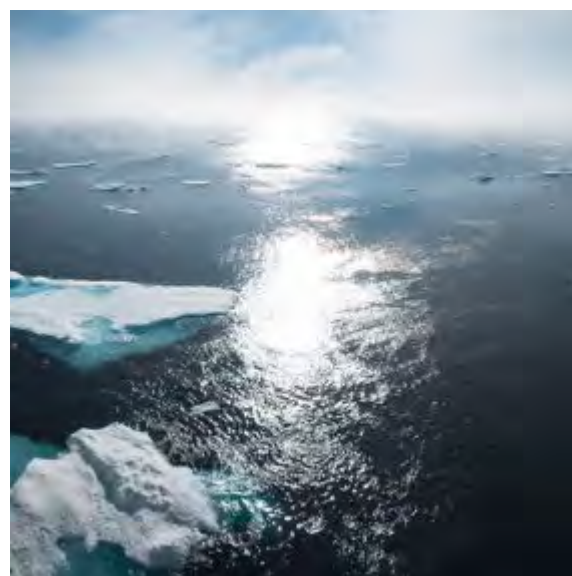
2 Associate Scientific Director, Memorial University of Newfoundland

Throughout history, the vastness, the unknown, and the resources of the ocean have drawn people to the planet's ocean frontier in search of knowledge and opportunity. This vital and long-standing relationship now clearly demonstrates that climate change and human activity are causing associated changes in the ocean. Understanding and responding effectively to these changes are crucial to ensuring ecosystem sustainability and responsible growth. It is against this backdrop that Dalhousie University, the Memorial University of Newfoundland and the University of Prince Edward Island have successfully launched a new trans-national Ocean Frontier Institute (OFI) to answer the question: How do we achieve safe and sustainable use of a rapidly changing ocean?



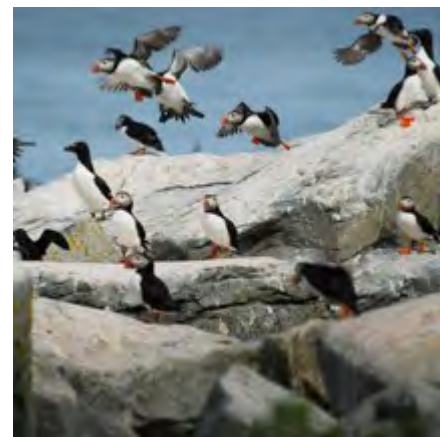
Canada is ideally positioned to benefit from answering this question because of its vast ocean resources, which are expected to expand considerably under its U.N. Convention on Law of the Sea (UNCLOS) claim. The OFI will propel Canada to global leadership in ocean sustainability by connecting and building on existing research excellence and by focusing international expertise on the Northwest Atlantic (NWA) and the adjacent Canadian Arctic Gateway (CAG) that lie off of Canada's east coast. The CAG includes the Labrador Sea and eastern portions of the straits of the Canadian Arctic Archipelago. The research program of the OFI is designed to complement Arctic research already underway in Baffin Bay led by Sentinel North at Laval University, with which close collaboration has developed.

The unique physical, chemical, and biological processes that characterize the NWA and CAG motivate the geographic focus of the OFI Research Program. The deep overturning circulation results in the most intense carbon sequestration on the planet, a highly productive marine ecosystem and air-sea interactions that modulate the weather and climate of both North America and Europe. Access to the environmentally sensitive Canadian Arctic occurs through this region, raising key sovereignty and security issues, which are compounded by increased shipping associated with diminishing ice cover. For these and other reasons, this sentinel area for change in the global ocean requires better observation and understanding of change, whether physical, geochemical, biological, or even human. The Canada-EU-USA Galway Research Alliance, which commits its signatories to prioritize marine research in the North Atlantic and Arctic



regions, formally recognizes the significance of the region.

These attributes accentuate the urgent need to advance the research effort in this region. Recent data supports hypotheses of an ongoing slowdown in the Meridional Overturning circulation. Such a potential change has profound implications for the economy and social structure of Canada, and indeed much of the world.



The Ocean Frontier Institute focuses on both understanding the natural processes at play in the changing Northwest Atlantic, and on developing solutions to accommodate these changes. A funding base of \$93M from the Canada First Research Excellence Fund, and additional contributions from other private and government entities totalling \$127M (including the largest donation from a private individual to Dalhousie University), will support a common vision of a strong and balanced effort over the next 7 years.

The research program (Figure 1) organizes around two linked themes: 1) “Ocean Frontier Changes” addresses key aspects of ocean and ecosystem change, and 2) “Ocean Frontier Solutions” focuses on strategic and effective approaches to resource development that are globally competitive, societally acceptable, and resilient to change. The research program also contributes to, and capitalizes on, recent advances in ocean data science and technology that are making the ocean increasingly ‘transparent’ to investigation and surveillance.

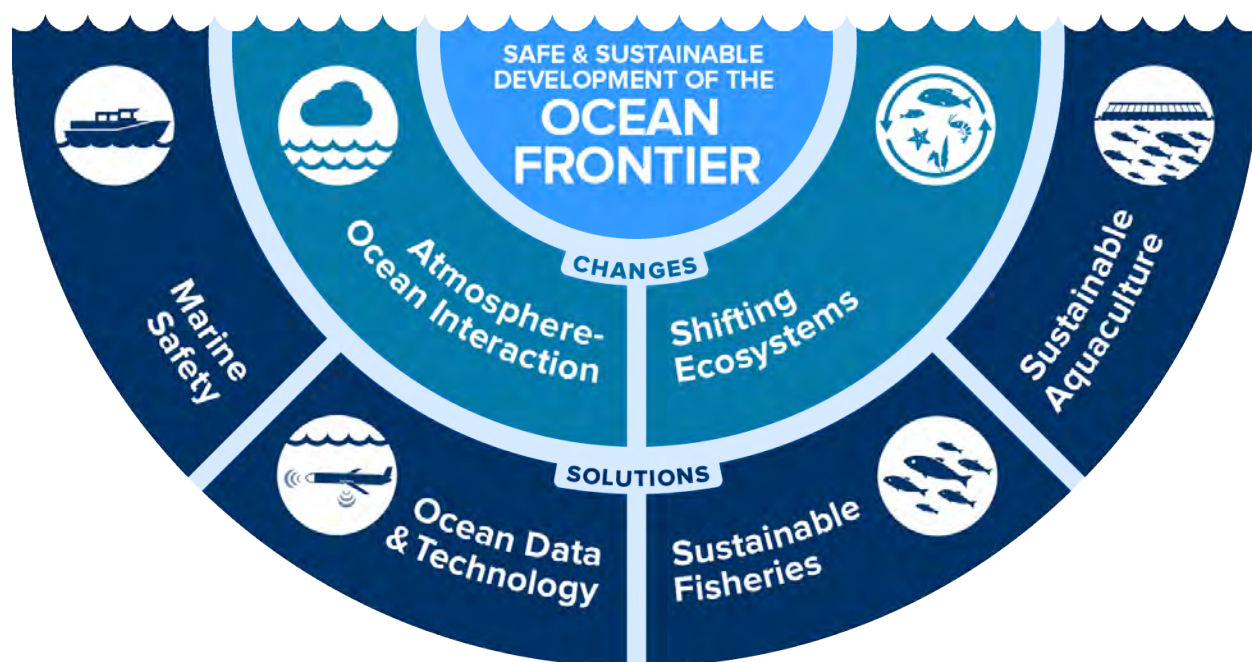


Figure 1

The NWA and CAG are vast, interconnected, and span multiple jurisdictions and research disciplines. Meeting the goals of the research program clearly requires globally competitive expertise, and the scale of the challenges require international cooperation. To this end, OFI depends on strong linkages to international partners. These comprise the Woods Hole Oceanographic Institute, and the Lamont-Doherty Earth Observatory in the United States, GEOMAR, AWI and the University of Kiel in Germany, LabexMER in France, the Irish Marine

Institute and the Norwegian Institute of Marine Research. These partnerships will be instrumental in assuring access to the sea which will be critical to success.

As part of the OFI, Dalhousie is hiring 16 new faculty in ocean-related research areas and Memorial is hiring 11. Opportunities are in place to support international post-doctoral appointments where candidates will spend time at both Canadian and international partner institutions. International graduate programs and visiting fellows will complement the research effort and contribute to mobility of the ocean research community.

Un visiteur inhabituel dans une rivière du Nouveau-Brunswick

De [Infocéans Août-septembre 2017/volume 20/numéro 4](#)



Nous sommes au début du mois de juin. Le Maritime Marine Animal Response Network et le Réseau québécois d'urgences pour les mammifères marins reçoivent le signalement qu'un jeune béluga nage dans la rivière Népisiguit, proche de la ville de Bathurst au Nouveau-Brunswick. Rapidement, les équipes du Ministère sont contactées afin d'évaluer la situation et de déterminer les différentes actions à entreprendre.

L'animal a profité des niveaux d'eau élevés pour remonter la rivière et s'est retrouvé piégé en haut d'un rapide. Malgré plusieurs jours passés dans la rivière, le béluga semble vigoureux et en assez bonne santé. Cependant, l'augmentation de la température et la baisse du niveau de l'eau font craindre le pire aux experts. En effet, bien que ces animaux passent beaucoup de temps dans les estuaires des rivières, leur organisme n'est pas adapté pour y faire des séjours prolongés.



Des experts procèdent de façon sécuritaire à la capture du jeune béluga pris au piège dans la rivière Népisiguit.

Relocaliser l'animal dans son habitat traditionnel

Les experts décident alors de relocaliser l'animal dans son habitat traditionnel : l'estuaire du Saint-Laurent. Il faut savoir que le béluga du Saint-Laurent est une espèce inscrite à la liste des espèces en péril. En déclin depuis le début des années 2000, la population est estimée à moins de 900 individus. Dans ce contexte, la survie d'un individu pourrait avoir une influence sur le rétablissement de la population. Or, depuis 17 ans, c'est la deuxième fois seulement qu'une opération de relocalisation telle que celle envisagée est mise sur pied.

habitat traditionnel : l'estuaire du



Coordonnée par le Ministère, l'opération de sauvetage - qui inclut la capture, le transport et la remise à l'eau du béluga - nécessite la collaboration de nombreux intervenants. Trois équipes de vétérinaires en provenance de l'Université de Montréal et des aquariums de Vancouver et de Chicago viennent prêter main-forte aux agents

Le béluga est sorti de la rivière afin de pouvoir le relocaliser dans son habitat traditionnel, l'estuaire du Saint-Laurent

des pêches, aux scientifiques et aux équipes de bénévoles recrutés sur place. Le financement de l'opération est presque totalement assumé par des fonds privés.

Une opération réussie

Après plusieurs heures d'effort pour capturer l'animal de façon sécuritaire, celui-ci est transporté par camion à l'aéroport de Bathurst, puis placé dans un avion à destination de Rivière-du-Loup. Après 30 minutes de vol sous étroite surveillance médicale, le jeune béluga est relâché à la fin de l'après-midi, le 15 juin, au large de Cacouna.

À l'aide d'une balise satellite, les mouvements de l'animal ont pu être suivis pendant presque deux semaines après sa remise à l'eau. L'opération de sauvetage aura donc permis de valider qu'il est possible de retourner un jeune béluga solitaire à sa population. L'information recueillie et les tests effectués vont contribuer à la protection de cette population en voie de disparition.

Antoine Rivierre
Gestion des pêches

Hydrographie : une véritable révolution en perspective

De [Infocéans Août-septembre 2017/volume 20/numéro 4](#)



L'acquisition, au printemps 2017, de deux véhicules hydrographiques de surface autonomes par le Service hydrographique du Canada (SHC) pourrait bien constituer une véritable révolution. Ces bijoux de la technologie permettent en effet de concevoir l'hydrographie de demain... aujourd'hui même!

Un véhicule hydrographique de surface autonome, c'est quoi au juste?

Un véhicule hydrographique de surface est une embarcation utilisée pour faire des levés hydrographiques en vue d'obtenir des renseignements sur le fond marin, comme la bathymétrie (profondeur) et la nature des sédiments. Ces données sont ensuite analysées et incorporées dans divers produits, notamment dans les cartes marines qui permettent une navigation commerciale et de plaisance en toute sécurité.

Ce qui rend les deux nouveaux véhicules spéciaux, outre le fait que ce soit des catamarans, c'est leur autonomie. En effet, nul besoin d'équipage et d'hydrographes à bord. Ces embarcations de 2,5 mètres de longueur chacune peuvent atteindre une vitesse de 5 nœuds et se déplacent par elles-mêmes grâce à des logiciels programmés depuis la terre ferme. Il est aussi possible de les diriger à l'aide d'une télécommande. À bord de ces petits



De petite taille, chaque véhicule hydrographique de surface autonome se déplace par lui-même. Il est soit programmé, soit télécommandé.

catamarans 100 % électriques, on retrouve des instruments à la fine pointe de la technologie : échosondeur multifaisceaux, senseur de mouvements, profileur de son mis sur un treuil programmable ou accessible à distance, système anticollision et anti-échouement, caméra, traitement automatisé des données à bord. Toute cette technologie permet d'obtenir des données d'une précision comparable à celle acquise à bord d'embarcations conventionnelles.

Pourquoi des véhicules hydrographiques de surface autonomes?

Le Service hydrographique du Canada est un leader mondial en hydrographie, toujours à l'affût de nouvelles technologies susceptibles d'améliorer ses services. Les véhicules autonomes

récemment acquis sont considérés comme des outils qui permettront de révolutionner le travail des hydrographes. En effet, le faible tirant d'eau de ces appareils leur permet d'accéder à des secteurs qui étaient jusqu'alors impossibles à sonder avec des bateaux traditionnels, et ce, en toute sécurité. Le territoire sondé sera également augmenté grâce au déploiement des véhicules à partir d'une autre embarcation, comme dans l'Arctique. Ainsi, meilleure sera la couverture des eaux canadiennes, plus sûres seront ces dernières.

Et maintenant?

Pendant une semaine, au printemps dernier, des représentants de tous les bureaux du Service hydrographique du Canada se sont rencontrés à l'Institut Maurice-Lamontagne de Mont-Joli pour suivre une formation sur cette nouvelle technologie. Après une semaine bien remplie, les hydrographes sont retournés dans leurs bureaux respectifs avec la tête remplie d'idées et de projets réalisables à l'aide des deux nouveaux véhicules. Ce projet national a été mené par l'équipe du SHC à Mont-Joli. Des projets seront réalisés dès cette année dans la région afin de définir le mode opératoire et les limitations des véhicules. Ces derniers seront ensuite déployés à travers le pays pour réaliser le mandat du Service hydrographique du Canada. Voilà une belle occasion de découvrir l'hydrographie du futur dès aujourd'hui.



Ghislain Côté
Sciences

This section of your newsletter provides an opportunity to highlight your research programs to the Ocean Science Community.

*Your are invited to send contributions to
David Greenberg,
david.greenberg@dfo-mpo.gc.ca*

Mettez en valeur vos programmes de recherche en publiant un article dans cette première section de votre bulletin.

*Faites parvenir vos contributions à
David Greenberg,
david.greenberg@dfo-mpo.gc.ca*

MEETINGS

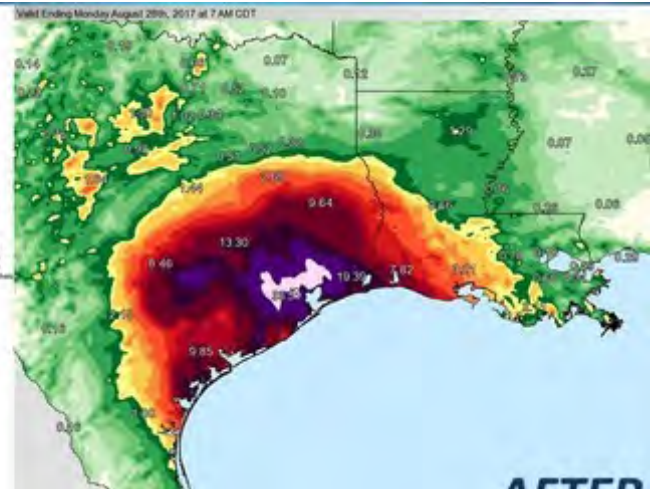
AGU Fall Meeting

New Orleans, Louisiana, USA,
December 11-15, 2017



The AGU Fall Meeting is the largest worldwide conference in the geophysical sciences, attracting more than 22,000 Earth and space scientists, educators, students, and other leaders. Fall Meeting continues to bring together the entire Earth and space science community from across the globe for discussions of emerging trends and the latest research. The technical program includes presentations on new and cutting-edge science, much of which has not yet been published, meaning you'll return to work with knowledge you can't get anywhere else.

The closing date for abstracts has passed, but there are four [late-breaking sessions](#) for which abstracts are still being accepted. These are: Hurricanes Harvey and Irma, South East Asian Flooding 2017, North Korean 2017 Nuclear test, and Climate Solutions.



Deadline for late-breaking session [abstract submission](#): October 31.

Deadline for early [registration](#): November 3.

Student Competition at Marine Renewables Canada 2017

Ottawa, Ontario
November 8-9, 2017

As investment in clean energy begins to outpace fossil fuels and governments develop policies to facilitate that energy transition, new opportunities are emerging for the marine renewable energy sector. This year's [Marine Renewables Canada Annual Conference](#) will explore the path forward for marine renewable energy. It will examine



marine
renewables
canada

what the strategy going forward could look like and how the growing focus and priority on renewables and cleantech by society, investors, and governments will play a role.



OERA are excited to invite students to attend the Conference and bring poster presentations and videos highlighting their energy-related research to share with conference delegates. The poster

competition is limited to 20 students. Students presenting posters will not be charged a registration fee; however, you do not need to attend the conference to participate. There are two categories: - Marine Renewable Energy and Environment. Two \$500 prizes will be awarded, one for best poster and one for best video. There are important details given on the [website](#).

Deadline for poster abstracts - October 13, 2017.

Deadline for videos - October 25th, 2017 at 5:00 pm ADT.

Biennial Conference on the Biology of Marine Mammals

Halifax, Nova Scotia
22 - 27 October 2017

Given the challenges these amazing animals face in our oceans, our conference theme: "2017: A Marine Mammal Odyssey, Eh!" is about reflecting on the journey that marine mammals and the people who study them have taken together over the years, and the voyage that still lies ahead.



We are anticipating over 1500 scientists, managers, policy makers and student delegates will come to this meeting from 65 countries to discuss cutting edge marine mammal science and conservation strategies from around the world.

Visit the conference website at <http://www.smmconference.org> to register and find out more! (Members: Be sure you are signed in to the <http://marinemammalscience.org> website before you register to receive your member's registration discount.)

See also [Post Conference Workshops](#).

Sustainable Ocean Summit 2017

Halifax, Nova Scotia
November 29 - December 1, 2017

The SOS 2017 theme is "The Ocean Sustainable Development Goal (SDG 14): Business Leadership and Business Opportunities". It is a unique gathering of the world's ocean industries focused on the sustainable development, science and stewardship of the global ocean. The focus is on ocean business community leadership in achieving the U.N. "Ocean" Sustainable Development Goal (SDG) 14 and business growth and investment opportunities of ocean sustainable development.



[Website](#)

Deadline for early [registration](#): October 1 2017.

*Please send meeting announcements to
David Greenberg,
david.greenberg@dfo-mpo.gc.ca*

*SVP faites parvenir vos annonces de réunion à
David Greenberg,
david.greenberg@dfo-mpo.gc.ca*

POSITIONS AVAILABLE

Assistant Professor in Analytical Chemistry, Tenure Track, UBC

The Department of Chemistry at the University of British Columbia is seeking an outstanding new investigator for a full time tenure-track faculty position, at the rank of Assistant Professor. We are seeking candidates of exceptional scientific talent who have demonstrated success in analytical chemistry working at the interface of one or more other areas of science including, but not limited to, biological chemistry, data science, environmental chemistry, materials chemistry, and radiochemistry.



The position requires a Ph.D. degree in Chemistry or a related discipline, postdoctoral experience, and an outstanding research track record. Relevant postdoctoral experience is highly desirable. The successful candidate will develop and maintain an internationally recognized research program. As a faculty member in the Department of Chemistry, the successful applicant will be expected to effectively supervise graduate students, collaborate with other faculty members, obtain external funding, teach undergraduate and graduate Chemistry courses, and actively participate in departmental activities. Leading candidates will complement and strengthen the Department and University's expertise in research and education.

[Details](#)

Deadline Nov 1 2017

PNNL Two Post Docs and a Post Masters



The Pacific Northwest National Laboratory (PNNL) in Seattle Washington is hiring three people for different programs. They are looking for [one post doc](#) to conduct coastal hydrodynamic and biogeochemical modeling using advanced unstructured-grid coastal ocean models. A [second post doc](#) is required for work in coastal hydrodynamics, biogeochemical modeling, and sediment/contaminant fate and transport. A [post masters](#) is needed to support modeling projects in wave and tidal energy and storm surge modeling.

Deadlines are not given on the web pages, so check out the links soon.

Tenure Track Assistant Professor University of Victoria

The [School of Earth and Ocean Sciences \(SEOS\)](#) at the University of Victoria invites applications for a Tenure Track Assistant Professor position in Physical Climate Science, to commence as early as July 2018. The ideal candidate will collaborate with SEOS faculty through overlapping interests in, for example, ocean circulation and mixing, biogeochemical cycles, paleoclimate, or natural climate variability. Excellent opportunities also exist for collaborative research with scientists associated with the Canadian Centre for Climate Modelling and Analysis, the Pacific Climate Impacts Consortium, and the Pacific Institute for Climate Solutions, which are located on campus, and the nearby Institute of Ocean Sciences. SEOS emphasizes an Earth Systems Science approach, and the ideal candidate will be able to interact broadly with faculty who specialize in solid-earth, earth-surface, ocean and atmosphere processes.



Review of applications **will begin on October 1, 2017**, and will continue until a suitable candidate is identified.

[Details](#)

Vice President Research and Scientific Director, Ocean Frontier Institute, Dalhousie University

Dalhousie University invites applications, expressions of interest and nominations for the position of Associate Vice President Research (AVPR) and Scientific Director of the [Ocean Frontier Institute \(OFI\)](#). This is an outstanding opportunity to lead one of Dalhousie's priority research areas, and to drive the development of a long-term research strategy



for the world's first truly transnational institute for interdisciplinary science at the ocean frontier. This leadership role will provide the successful candidate an opportunity to help fundamentally change the landscape of ocean sciences in Canada and internationally.

Review of candidates will begin immediately and will continue until the position is filled. The new AVPR and OFI Scientific Director is expected to take office in July 2018, or sooner if possible.

[Details](#)

Looking for work? Try the CMOS site ([click](#)).

Vous recherchez un emploi? Visitez le site SCMO ([click](#)).

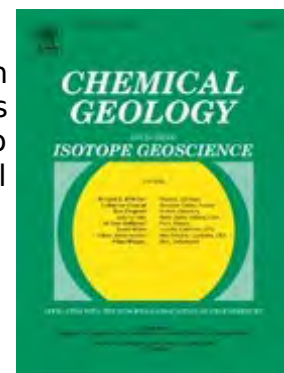
GENERAL

Virtual Special Edition: state of ocean (biogeo)chemistry

After a successful [Intermediate Data Product launch](#) and GEOTRACES session at Goldschmidt in Paris, *Chemical Geology* have approached the conveners with the idea of a virtual special edition based around the session, but also including research papers from non-attendees, to highlight the international state of the field in ocean chemistry.

The special edition is proposing to:

- highlight the international state of the full field in ocean (biogeo)chemistry
- encourage original research + review + synthesis articles
- include submissions from Goldschmidt Session 10i presenters & attendees
- submissions also encouraged from the wider geochemistry & GEOTRACES community



Details

- Requires commitment of ~10+ proposed paper titles for a proposal to go forward by mid-Sept
- Normal peer-review process with Journal Chief Editor and Guest Editors (session convenors)
- Colour figure fees waived for review articles, for 3 figures in research articles
- Likely submission period Oct 2017 - Jan 2018.
- Papers published online as soon as accepted



Contact Tim Conway (tmconway@usf.edu) with titles and for more details

Marine Debris Monitoring Toolkit for Educators

The Marine Debris Monitoring Toolkit for Educators was created through a collaboration between the NOAA Marine Debris Program (MDP) and the [Office of National Marine Sanctuaries](#). This toolkit provides many useful marine debris resources and adapts the MDP's [Marine Debris Monitoring and Assessment Project](#), a robust citizen science monitoring initiative, for classroom use. The Toolkit is designed to assist teachers in educating their students about marine debris and involving them in marine debris research and outreach. Using the Toolkit, students conduct marine debris surveys, which can help to provide valuable information on where, when, and what kind of debris is showing up. Students can enter their data into a national database, analyze monitoring results, and become involved in marine debris stewardship within their communities.

Download the toolkit [here](#), along with the associated presentation to help teach your students about marine debris!



Three New SCOR Working Groups Approved



SCOR held its 2017 Annual Meeting last week in Cape Town, South Africa, celebrating the 60th anniversary of SCOR. An important feature of every SCOR annual meeting is consideration of proposals for new SCOR working groups. The proposals are reviewed by national SCOR committees, partner organizations, and others before the annual meeting and a significant portion of time at the meeting is devoted to discussing the proposals.

Five proposals were received. Three were considered timely, relevant to SCOR and achievable using a SCOR working group approach, and were provisionally approved by SCOR:

[Integration of Plankton-Observing Sensor Systems to Existing Global Sampling Programs \(P-OBS\)](#)
[Eastern boundary upwelling systems \(EBUS\): diversity, coupled dynamics and sensitivity to climate change](#)

[Floating Litter and its Oceanic Transport Analysis and Modelling \(FLOTSAM\)](#)

SCOR will work with the proponents of each group over the coming weeks to agree to the final memberships and terms of reference of each group.

Nova Scotia Student Research Travel Program

The objective of the OERA Student Research Travel program is to cultivate collaborations between Nova Scotia student researchers and international research facilities or laboratories that will contribute to advancing the offshore energy sector here in Nova Scotia and in building research capacity for the province. It is open to full-time senior honours and graduate students attending a Nova Scotia university or the Nova Scotia Community College (NSCC), who are conducting research in marine renewables, marine geosciences or seismic & marine sound. Funding for post-doctoral fellows may be considered on a case by case basis. The program has been designed to support student travel to/from relevant field schools, relevant courses and other learning opportunities as approved by OERA management. Workshops, conferences and other types of meetings are not eligible under this program.



Details can be found on the [OERA website](#).

Deadline for [applications](#) is October 31, 2017.

SCOR Visiting Scholars Program

The Scientific Committee on Oceanic Research (SCOR) has sent 26 SCOR Visiting Scholars to 15 developing countries to teach and mentor since 2009. SCOR will be supporting five Visiting Scholars in 2018.

SCOR began a program in 2009 to enlist the services of ocean scientists, from both developed countries and developing countries, to teach short courses and to provide more extended on-site education and mentorship at developing country institutions.

This program is open to any scientists who have time available to spend teaching and mentoring in a developing country for two weeks or more. The scholarships are not intended to conduct joint research, although such research may develop as an outcome of a visit.

Please see the application information at: http://www.scor-int.org/SCOR_Visiting_Scholars.htm

Applications for the 2018 SCOR Visiting Scholars Program should be sent to Ed.Urban@scor-int.org by **15 November 2017**.



ASLO Award Nominations

ASLO awards provide opportunities to recognize outstanding individual performance and to highlight accomplishments of the aquatic science research community. Please take the time to nominate your colleagues for these awards.

ASLO also offers two awards to students: Student Travel Awards, and Student Poster Awards.

All nominations must be submitted as a single Adobe PDF file.

Details can be found on the [ASLO awards web page](#).

The deadline for receipt of nominations is 18 October 2017.



Austral Summer Institute XVIII



The Department of Oceanography and Center COPAS Sur-Austral of the University of Concepcion, Chile, are pleased to announce the Austral Summer Institute XVIII (ASI XVIII).

ASI XVIII will be held in January 2018 and is comprised of 5 courses on the themes "Numerical modeling tools to understand physical and biological processes in mid- and high-latitude marine ecosystems" and "Ecology and Diversity of Marine Microorganisms" (ECODIM X).



[More information](#)

[Application](#) deadline: **November 15, 2017**.

Canadian Ocean Science Newsletter Le Bulletin Canadien des Sciences de l'Océan

Previous newsletters may be found on the [CNC/SCOR](#) web site.

Newsletter #97 will be distributed in **November 2017**.

Please send contributions to David Greenberg
david.greenberg@dfo-mpo.gc.ca

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SIGNOFF OCEAN-NEWSLETTER

Les [bulletins](#) antérieurs se retrouvent sur le site web du [CNC/SCOR](#).

Le Bulletin #97 sera distribué en **novembre** 2017.

Veillez faire parvenir vos contributions à David Greenberg, david.greenberg@dfo-mpo.gc.ca

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CNC-SCOR

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Rob Macdonald - Past Chair (DFO-IOS)
David Greenberg - Secretary (DFO-BIO)
Markus Kienast (Dalhousie)
Marty Taillefer (Maritime Way)
Ian Perry (DFO-PBS)
Paul Snelgrove (Memorial)
Stephanie Waterman (UBC)
Kimberley Davies (Dalhousie)

Le Comité national canadien du Comité scientifique de la recherche océanographique (SCOR) favorise et facilite la coopération internationale. Il reflète la nature multidisciplinaire de la science océanique et de la technologie marine.

Members Ex-Officio/ Membres d'office

Jody Klymak (IAPSO)
Keith Lennon (DFO-HQ)
Wayne Richardson (President CMOS)
Gordon Griffith (Executive Director CMOS)
Michael Scarratt (SOLAS)
Jean-Éric Tremblay (Québec-Océan)
David Beauchesne (Québec-Océan étudiants)
Laura Gillard (CMOS students)

The Canadian National Committee of the Scientific Committee for Oceanic Research (CNC-SCOR) fosters and facilitates international cooperation. It is a non-governmental body that reflects the multi-disciplinary nature of ocean science and marine technology.

WWW.CNCSCOR.CA