Canadian National Committee for SCOR
Comité national canadien pour SCOR

Scientific Committee on Oceanic Research

CANADIAN OCEAN SCIENCE NEWSLETTER
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OCEAN SCIENCE PROGRAMS

Do we need a Canadian Society for the Marine (and aquatic?) Sciences?

This question was asked – not for the first time – during the 2014 CMOS Congress at Rimouski, both by the CMOS executive, as well as at the meeting of the Canadian SCOR Committee (CNC/SCOR). After further discussion, the CMOS Executive tasked CNC/SCOR to investigate this issue. However, the members of CNC/SCOR did not feel that they could answer the question on behalf of the community without feedback, so we decided to ask what YOU think.

In the opinion of some, the Canadian Marine Science community is fragmented and homeless. It is fragmented in the sense that the community encompasses an unusually broad range of interconnected scientific disciplines, and it is homeless in the sense that none of the existing Canadian societies, in their present configuration, accommodate all these disciplines. As well, this work is carried out in three different sectors: academia, government as well as a growing private sector, that don't always work together in-sync. Thus, many of us have become resigned to present our work, and even meet our Canadian colleagues, at meetings in the US and Europe. This has its advantages and contributes to the high standing that Canadian marine science enjoys internationally. However, since we tend not to present our work at Canadian meetings, it can be argued that Canadian scientists in related fields are not exposed to the accomplishments of their marine science colleagues. Unfortunately, this lack of exposure has reduced our visibility at home and has weakened our ability to compete for resources.

The marine science community is of course "fragmented" only if one uses the values of the traditional disciplines as a measure. There are other measures for evaluating a scientific community, and by these measures, which include community dynamics, cohesion, multidisciplinarity, problem orientation, global vision, training students, etc., our community shines. Regrettably, in Canada, these measures are not always applied when the health and the strength of a scientific community are evaluated. Take NSERC as an example. At the end of three

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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.

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.

successive evaluations, the now infamous reallocation exercises, the Grant Selection committees that marine scientists depend on for research support (Environmental Earth Sciences and Ecology and Population Dynamics) have arrived on the bottom in the internal ranking system – pecking order if you like – on which NSERC's funding decisions are based. In the most recent description of the Strategic Grants Program, NSERC did not include Marine Science in its criteria for eligibility. There is no reason to believe that any of this is deliberate or ill intentioned; more likely it reflects the lack of visibility of Marine Science within the larger Canadian science community. For example during a panel on research funding at a recent meeting about links with the University Corporation for Atmospheric Research (UCAR) with Canada, the NSERC representative said they like when there is a known body to represent a scientific community, so that NSERC can easily learn what a community is thinking, what are its unique characteristics, needs, etc. Additionally, funding decisions that affect marine scientists in the service of the government, for example the Department of Fisheries and Oceans, are also made on the basis of visibility and perceived importance. There is much to be gained if we can improve the visibility and image of marine science in Canada.

As for marine scientists being homeless, sporadic attempts have been made by CMOS, which seems to work well for Canadian physical oceanographers, to bring the broader marine science community into the fold. Congresses with appropriate foci have held successful interdisciplinary sessions. Other attempts have been less successful. Successful or not, these events have been one-shot deals – forgotten by the time the next congress came around – and have prompted remarks that the "o" in CMOS should be written in lower case.

If you feel that Canadian marine scientists need a place they can call their own, then we can start thinking of ways to accomplish it. One possibility is to create a new society, complete with name, acronym, constitution, bylaws, officers, secretariat, meetings, award system, budget, etc. This would be a serious undertaking, so before embarking on this path we have to consider alternatives. One alternative is to make a home for ourselves within CMOS, in effect raising the lower case "o" to the upper case.

Can it be done? It may require fundamental changes in the structure of CMOS to ensure that marine science is always represented at the highest level of the organization, but it can be done if the will is there. One could, for example, propose to reorganize CMOS into sections, one for atmospheric sciences and one for marine sciences, that would represent and be responsible for the well being of their respective communities. They would share a secretariat and annual meetings. With strong support from their members, each section could speak for and make representations on behalf of their communities. The opportunities are endless.

The absence of a representative Canadian marine science organization has created a vacuum that has stifled the development of several worthy initiatives. In 1997, a NSERC funded meeting in St. John's, Newfoundland, produced a report on the State of Canadian Marine Science. The document contained a lucid statement of the needs and aspirations of the community and concluded with a set of recommendations that are as valid today as when they were written nearly ten years ago. Among them was a proposal to create a national infrastructure for marine science. The recommendations were never acted on because a mechanism for taking them to the highest level in government did not exist.

Much more recently, the Canadian Council of Academies chaired an expert panel on Canadian Ocean Science, and released in 2013 a report on Ocean Science in Canada. This report highlights the strengths of marine science

within Canada. But it also points out a number of issues, many of which come back to the idea of a unified community with a strong national vision. For example, the following comments were all made in the executive summary of the report:

- "Canada's dispersed network of clusters, however, can create challenges for certain kinds of collaboration, alignment of research strategies, and coordination and use of large-scale infrastructure investments."

- "Ocean science capacity in Canada is thus not only geographically dispersed, but also distributed across a variety of organizations with diverse mandates and priorities. This adds another dimension to the challenge of coordinating activities and scarce ocean science resources across the country."

- "The state of human capacity in ocean science cannot be determined because of data limitations. Due to its interdisciplinary character, ocean science draws on highly qualified personnel from many programs and departments, which makes human capacity one of the most challenging categories to assess. This is a particular concern, since human capacity determines the use and productivity of all other elements of ocean science capacity."

- **"The vision gap**: In contrast to other countries, or other disciplines in Canada, no comprehensive national strategy or vision currently exists for ocean science in Canada. This makes it difficult to prioritize needs and comprehensively plan investments for ocean science."

- **"The coordination gap**: Addressing the increasingly complex issues of ocean science requires enhanced collaboration at the local, regional, national, and international levels, and across disciplines and sectors. Despite the many instances of successful collaboration in Canada, coordination in key areas, such as ocean observation, is lacking, and support for research networks has often been constrained by temporary funding. More generally, there is no effective national-level mechanism to coordinate the allocation of resources and facilitate the sharing of infrastructure and knowledge among ocean scientists. This also hinders the sharing of resources and knowledge at the international level."

- **"The information gap**: Limitations in access to, and availability and comparability of, information made it difficult to assess several categories of ocean science capacity (e.g., the number of active researchers, comprehensive data on research spending, or inventories of large instruments relevant to ocean science). While many actors in ocean science maintain inventories for internal use, no existing mechanism or repository systematically collects and regularly updates information on key research activities, infrastructure, and other capacities in ocean science for the entire country."

The final paragraph from the executive summary of the Canadian Council of Academies report states "Ocean science in Canada is growing at a slower pace than other fields of science in Canada. Canada also has the lowest domestic growth index of the 25 leading countries in ocean science. This implies that ocean science is losing ground relative to other fields faster in Canada than in other countries, which could lead to a decline in Canada's position in research output and impact." This should be of concern to everyone working in marine sciences in Canada.

Our community has to be able to tackle challenges such as these, and a strong professional society could be an important step in the right direction. The Canadian SCOR committee is prepared to work on behalf of the community towards a representative Canadian professional organization for marine science, but only if YOU believe it needs to be done. We therefore solicit your opinion. You may let us know what you think in any way you like, from sending us a simple e-mail message saying AGREE or DISAGREE, to writing a letter for the Canadian Ocean Science Newsletter. We are eager to hear from you.

Please send your opinion to Michel Mitchell, Secretary of CNC/SCOR: michel.mitchell@dfo-mpo.gc.ca

Paul Myers	Rob MacDonald	Michel Mitchell
Chair	Past Chair	Secretary

CCORU Ocean Science Roundtable held in Ottawa, October 2014

Submitted by Helen Joseph, HCJ Consulting

In 2012 and 2013, the Canadian Consortium of Ocean Research Universities (CCORU) asked the Council of Canadian Academies (CCA) to undertake two assessments on ocean science in Canada. The first Assessment developed a listing of priority research questions, which were published in a report, entitled: *40 Priority Research Questions for Ocean Science in Canada*. The second Assessment, entitled: *Ocean Science in Canada: Meeting the Challenge, Seizing the Opportunity* examined Canada's needs and capacities with regard to the (previously identified) major research questions in ocean science.

The conclusion of the second Assessment, *Ocean Science in Canada,* identified the following three gaps in the coordination and alignment of ocean science in Canada, which are currently not being addressed:

- The vision gap: the report noted that in contrast to other countries, Canada currently lacks a comprehensive national strategy or vision for ocean science in Canada.
- The coordination gap: the report noted that addressing the 40 research questions requires enhanced collaboration at local, regional, national and international levels. While noting that there are examples of successful collaboration, there remain important challenges in coordination.
- The information gap: the report noted limitations in, and availability and comparability of, information on key research activities, infrastructure, and other ocean science capacities in Canada.

The CCA *Ocean Science in Canada* report further stated that addressing these gaps is necessary for Canada to meet the growing needs of ocean science with limited resources and to make the best possible use of existing capacities. The report recognized that "none of the current or emerging alignments, consortia, or networks can address these gaps singlehandedly, and that a national effort is required involving the entire community of ocean scientists in Canada, as well as the users of ocean science in government, the private sector and civil society".

The release of the CCA's *Ocean Science in Canada* report generated considerable discussion across the Canadian ocean science community, with the next question being – how do we, as university, government and industry working together, address these gaps? In March 2014, a follow-up report was conducted by CCORU, *Investigating the Establishment of a Canadian Organization for the Coordination of Ocean Science Activities in Canada*, to examine what the next steps might be in working together.

As an immediate first step forward in improving the coordination and information sharing of ocean science activities in Canada, the March 2014 report recommended that CCORU host an "Ocean Science Roundtable". It recommended that the Roundtable bring scientists, science managers and science users together to identify ocean science initiatives that would address information and coordination gaps and would involve government, industry and university players.

CCORU accepted this recommendation and proceeded with an Ocean Science Roundtable meeting in October 2014 that brought together approximately fifty ocean scientists, science managers and ocean science users. The participants came from a range of ocean science areas, with many of them involved in the existing Networks from across the spectrum of universities, as well as government and industry.

The discussions over the two days were very productive with excellent engagement from all participants. The Roundtable identified two primary functions as key features for ocean science moving forward:

1. the need for an advocacy role on oceans; and
2. the need for coordination across the many sectors involved in ocean science (e.g. researchers; network leaders; science users for policy/innovation/ commercialization; industry; etc.).

The Roundtable developed a proposed vision, with supporting mission components, for ocean science in Canada. Three actions were also agreed upon as the next steps that should be taken to address the information and coordination gaps of ocean science in Canada. These actions are:

1. Continued Role of the Canadian Consortium of Ocean Research Universities (CCORU)
2. Expanded Canadian Galway Marine Working Group led by Fisheries and Oceans Canada
3. Emergence of a Canadian Consortium on Ocean Leadership organization

Roundtable discussions, results and actions are described in the CCORU Ocean Science Roundtable report that is being finalized at this time. A session is planned at the CMOS 2015 Congress to present the work to date coming from the Roundtable, and to engage with a broader ocean science community.

PERSONEL

Dr. Donald Forbes: 2014 Martin Bergmann Medal for Excellence in Arctic Leadership and Science

Dr. Forbes has contributed to the Arctic through dozens of studies and mapping projects, and advanced our knowledge of climate change through his own work and by championing interdisciplinary collaborations.

For his lifetime work in Arctic geography, and as a mentor and leader in community adaptation to climate change in coastal Arctic communities, Dr. Donald Forbes of Halifax, received The Martin Bergmann Medal.

Dr. Donald Forbes: médaille Martin Bergmann pour l'excellence en leadership et sciences dans l'Arctique

Dr Forbes a consacré sa carrière à l'Arctique; il a rédigé des douzaines d'études et de projets de cartographie. En outre, il a contribué à l'avancement des connaissances relatives au changement climatique grâce à ses propres travaux et en excellant dans ses collaborations interdisciplinaires.

En raison de l'ensemble de ses réalisations dans le champ de la géographie arctique, et en tant que mentor et leader en adaptation communautaire face au changement climatique au sein des communautés des zones côtières de l'Arctique, Dr Donald Forbes remporte la médaille Martin Bergmann.

Left to right: Paul Ruest, President of the Royal Canadian Geographical Society, Dr. Forbes, and His Excellency the Right Honourable David Johnston, Governor General of Canada and patron of the Royal Canadian Geographical Society. (Photo: Matt Zambonin/Canadian Geographic)

De gauche à droite : Paul Ruest, président de la Société géographique royale du Canada (SGRC), Dr Forbes et Son Excellence le très honorable David Johnston, gouverneur général du Canada et président d'honneur de la SGRC. (Photo : Matt Zambonin, Canadian Geographic.)

Dr. Robie Macdonald: 2014 Northern Science Award

The Canadian Polar Commission has awarded the 2014 Northern Science Award to Dr. Robie Macdonald, Scientist Emeritus at the Institute of Ocean Sciences in Sidney, BC. Governor General David Johnston presented the award in Ottawa on Nov. 19, 2014, at a ceremony prior to the Annual Dinner of the Fellows of the Royal Canadian Geographical Society.

The citations notes that Dr. Macdonald "*has won international respect for his innovative, rigorous, and groundbreaking research using geochemistry to understand earth and ocean processes*" and "*is one the world's leading marine geochemists. Honourable, unassuming, and humble, he is held in great esteem by his peers.*"

You can read the full citation here (click).

Dr Robie Macdonald: Prix de la recherche scientifique sur le Nord

La Commission canadienne des affaires polaires a décerné le Prix de la recherche scientifique sur le Nord de 2014 au Dr Robie Macdonald. Son Excellence le très honorable David Johnston, gouverneur général du Canada lui a présenté le prix lors d'une cérémonie précédant le dîner annuel des fellows de la Société géographique royale du Canada, le 19 novembre, à Ottawa.

Dans la citation on note que le Dr Macdonald "*s'est gagné le respect de la collectivité internationale pour la rigueur et l'originalité de ses recherches où, faisant œuvre de pionnier, il a utilisé la géochimie pour comprendre les processus terrestres et océaniques*" et qu'il "*est l'un des plus grands biochimistes marins de notre planète. Honorable, modeste et humble, ses pairs le tiennent en très haute estime*."

Vous pouvez lire la citation complète ici (cliquer).

MEETINGS

The 2014 CNC-SCOR Eastern Lecture Tour / Le Tour de Conférence 2014 CNC-SCOR Est

The 2014 Eastern Lecture tour speaker is Dr. Debby Ianson from the Institute of Ocean Sciences. She will talk at Eastern Centres between the 21st and 28st of January 2015. The schedule is below and at cncscor.ca. Please try to attend the talk nearest you. For more information click here.

Dr Debby Ianson de l'Institut des sciences de la mer sera l'oratrice pour la tournée Est 2014. Elle parlera dans les centres de l'Est entre le 21 et le 28 de Janvier 2015. Le calendrier est ci-dessous et à cncscor.ca. Veuillez svp assister à la présentation la plus proche de vous. Cliquer ici pour plus de détails.

Title: Ocean Acidification on the Canada's west coast: what do we really know?
Schedule / Calendrier:

City / Ville	Date, Time/heure	Location / Lieu
Ottawa	21 Jan, 12:00	Rideau Canal Junior Ranks Mess, 4 Queen Elizabeth Drive, Side entrance, Harmony Room, 4th floor
Montréal	22 Jan, 12:00	McGill U., room 238, Frank Dawson Adams Building, Earth and Planetary Sciences
Québec	23 Jan, 11:00	U. Laval, Pavillon Vachon # 3068
Rimouski	23 Jan, 11:00	UQAR-ISMER, Salle Mohamed-El-Sabh (videoconference/vidéoconférence)
Dartmouth	26 Jan, 10:00	Bedford Institute of Oceanography, Needler Boardroom
Moncton	26 Jan, 10:00	DFO Gulf Fisheries Centre, room TBA (videoconference/vidéoconférence)
Halifax	27 Jan, 11:30	Dalhousie University, RM 3655, LSC - Oceanography Wing
St. John's	28 Jan, 13:00	MUN, Chemistry-Physics building, room C2045

2015 CMOS Congress Registration Now Open / Inscriptions pour le congrès SCMO 2015 maintenant ouvertes

The 49th CMOS Congress will be held in Whistler, BC, from May 31 to June 4, 2015. This congress will be held jointly with the 13th American Meteorological Society's Conference on Polar Meteorology and Oceanography. The theme of this joint conference is "*Tropics to Poles: Advancing Science in High Latitudes*".

Registration is now open and the deadline for early registration at a discounted price is **April 18**.

For general information about the congress, please consult the congress website (congress.cmos.ca) or email cmos2015@cmos.ca for further information.

Le 49ème congrès de la SCMO se tiendra du 31 mai au 4 juin 2015 à Whistler, C.-B. Le thème de cette conférence conjointe avec la 13ème conférence de l'AMS sur la météorologie et l'océanographie polaire est "*Des tropiques aux pôles: Faire progresser la science dans les hautes latitudes*".

Les inscriptions sont maintenant ouvertes et la date limite d' inscription hâtive est le **18 avril.**

Pour plus d'information consultez le site web du congrès: congress.cmos.ca/?language=fr_FR.

2015 International Ocean Colour Science Meeting

Abstract submission for the 2015 International Ocean Colour Science meeting is now open. The meeting will take place in San Francisco, California from 15 - 18 June 2015, and will be convened by the International Ocean Colour Coordinating Group (IOCCG) in partnership with, and thanks to sponsorship from NASA and NOAA, with additional sponsorship from EUMETSAT, ESA and CNES. You are invited to register, and to submit an abstract for a poster presentation (http://iocs.ioccg.org/).

If you have any questions about the conference please contact the IOCS-2015 meeting manager, Liz Gross, at egross@ioccg.org or call + 410-708-8889.

SCOR WG 139 Open Workshop and Symposium on Organic Ligands in the Ocean

SCOR WG 139 on Organic Ligands – A Key Control on Trace Metal Biogeochemistry in the Ocean is holding an Open Workshop and Symposium on 7-11 April 2015 in Sibenik, Croatia (see meeting Web site at https://www.confmanager.com/main.cfm?cid=2828). The hands-on workshop will be held on 7-8 April and is designed for individuals who would like to start doing ligand titrations as part of their research or have a PhD

student who would benefit from some expert advice on ligand titrations. Space in the workshop is limited, so those who are interested should register early. This will be the final event of WG 139 and the meeting will contribute to the final synthesis of the group and recommendations for future work.

CANADIAN JOBS and TRAINING

No Canadian employment opportunities have been offered or located. You may find international oceanographic opportunities posted on the CMOS web site.

Looking for work? Try the CMOS site (click)	*Vous recherchez un emploi? Visitez le site SCMO (click)*

GENERAL

Dr. Bob Fournier - Key Note Speaker at the Book Launch: 'Voyage of Discovery'

The BIO-Oceans Association hosted a ceremony at the Bedford Institute of Oceanography on 20 November 2014 to celebrate the launch of the book ***'Voyage of Discovery- Fifty Years of Marine Research at Canada's Bedford Institute of Oceanography***'. Dr. Bob Fournier of Dalhousie University was a key note speaker at the event. Below is a transcript of his remarks.

A Voyage of Discovery

Good Morning. I would like to begin by congratulating my colleagues here at the Bedford Institute for seizing the opportunity to celebrate BIO's first 50 years. The volume *"Voyage of Discovery"* provides an important perspective on ocean research but it also reflects the growth of oceanography in Canada. At the risk of appearing presumptuous I assume that another individual, not here today, would also be pleased - Dr. William Van Steenburgh, a major driver in the creation of BIO.

Attempting to understand Dr. Van Steenburgh's motivation, after all these years, could be a fool's errand. However, sufficient information exists to allow a rudimentary placement of that individual in his proper temporal context – the mid to late 1950s. That was a time not so long after World War II when Canadians were flushed with pride and a can-do attitude following unqualified success in that conflict. Keep in mind that World War II was the first amphibious war, with landings in the Atlantic, Pacific and Mediterranean. The use of the oceans as a launching platform led to increased awareness as to our shortcomings regarding knowledge of the oceans, as well as the realization that Canada was surrounded by three oceans and possessed the longest coastline in the world.

All of these considerations eventually led to a national imperative, widely accepted in many circles, that Canada should become a major player in a comprehensive approach to the study of oceans. This would be an approach securely grounded on the excellent studies carried out by marine scientists in the then Fisheries Research Board of Canada. The plan was to extend those studies beyond fisheries - to cover the full range of oceanographic pursuits.

A further presumption is to suggest that Van Steenburgh's vision emerged from those times and was viewed as moving Canada into its rightful place among nations. From that vision emerged the BIO, 50 years of research,

this celebratory event and, of course, the *Voyage of Discovery.* My personal view is that BIO contributed to Canada's maturation as an S&T nation – despite the fact that the 1880s saw Nova Scotia as the Clipper Ship Capitol of the world. The implication of that fact is that such a title presumes a high degree of innovation and understanding of a vast array of technologies. One can only presume that Nova Scotian skills were present but quiescent for the early part of the 20th century.

As mentioned earlier the *Voyage of Discovery* vindicated the original vision promulgated in the late 1950s and early 1960s. However, we might ask if Van Steenburgh would be pleased with a similar volume – a mirror image of the current book – 50 years in the future? I believe that the answer to that question would be a resounding No! The times are quite different! Canada's needs are different! And most of all, the oceans are different!

I think that he would agree that the present volume would be the correct starting point but the next volume should reflect a different national imperative. This is no longer about Canada's self-realization, and without being overly dramatic, this is about survival. Since the early 1960s the global population has more than doubled. In fact, during my lifetime it has tripled. Phrases such as Climate Change, Greenhouse Effect and Global Warming had not yet entered into common usage.

Over the past 50 years – since the Bedford Institute came into existence – the oceans have become warmer, storms are more threatening, there is greater acidification, lower biodiversity, higher sea level and more pollution. In addition, the ocean's ability to provide services has greatly diminished. For example, 50% of the oxygen we breathe is provided by small plants at the ocean surface, the oceans regulate temperature and moisture in the atmosphere, as well as sequester carbon dioxide and provide genetic resources. The Intergovernmental Panel on Climate Change (IPCC) - a UN organization that utilizes between 1000 and 2000 scientists – has been in existence for nearly 30 years. During that time the IPCC has produced a series of reports, and most recently the fifth offering in the form of three volumes on the subject of Climate Change. Just a couple of weeks ago it produced the fifth synthesis report – a summation of the previous three - in which it offered a dire warning of impending change. One commentator went so far as to declare that "this was a slow train wreck about to happen".

In the Marine Affairs Program at Dalhousie where I am currently the Interim Director, when addressing the changing role of the Oceans we often refer to a quote by E.O. Wilson who wrote in his 1998 book "Consilience" that

"We are drowning in information while starving for wisdom. The world henceforth will be run by synthesizers, people able to put together the right information at the right time, think critically about it and make important choices wisely"

That comment suggests to me that the balance between basic and applied research has shifted, even though the need for basic research continues. Consider for the moment the Curiosity Rover currently on Mars. The long-term goal of the program within which the Rover operates is to place a human on Mars. However, a great deal of energy has been expended to gain a basic understanding of the atmosphere, soil and potential for water. I view this as a perfect example of an altered balance between basic and applied research. According to E.O. Wilson sufficient knowledge exists for us to begin the process of implementing our current knowledge. In other words we need to apply what we already know.

I would suggest that the role of all marine scientists over the next 50 years will be to embrace the challenge that faces us all, which is that "The oceans – they are us"! In other words we are inextricably linked to the oceans through all the myriad systems that control the habitability of this planet, and are mediated through the oceans.

When I was a graduate student 50 years ago I was told that the research cycle was not complete until publication had taken place. This is no longer true. The new end point comes in the form of a much larger responsibility – to influence human behavior - through public policy, governance and management. That is not to say that marine scientists should become lawyers, political scientists or policy wonks. But it does suggest that we should find new ways to achieve this new end point – perhaps through collaboration or cooperation.

In closing I believe that Dr. Van Steenburgh would be very proud of BIO and what it has become. It almost certainly reflects his expectations and the *Voyage of Discovery* underlines the accomplishments of the past 50 years. Today the times are different. They are no longer about Canada's self-realization or its proper place among nations – since both of those goals have long since been realized. We have a global responsibility to protect the oceans and should soon begin the gradual process of moving toward the second volume of the *Voyage of Discovery.*

Bob Fournier, Interim Director of Marine Affairs
And Professor (Emeritus) of Oceanography
Dalhousie University
Key note speaker at the launch of "Voyage of Discovery"
Bedford Institute of Oceanography, 20 November 2014

The centenary of the Canadian Fisheries Expedition (1914/15): an important milestone in the history of North American marine research

Submitted by Dr. Michael M. Sinclair

Jennifer Hubbard, a history professor at Ryerson University, provides an excellent synthesis of the Canadian Fisheries Expedition; including the influence of the Norwegian expedition leader (Johan Hjort) on the development within Canada and the United States of America of an ecological and oceanographic approach to fisheries issues (Hubbard, 2014). Also Vera Schwach (at the Nordic Institute for Studies in Innovation, Research and Education in Oslo, Norway), in the same volume, provides a synthesis of Hjort's brilliance as a scientist and leader (Schwach 2014). The report on the expedition, which was published by the Department of the Naval Service, Ottawa, is still a great read (Hjort 1919). Due to the fortunate timing of this two year study a century ago, the approach to addressing the fisheries issues of the day could be considered revolutionary.

The expedition followed closely Hjort's synthesis (published in 1914) of the *Migration Committee* work carried out under the guidance of the International Council for the Exploration of the Seas (ICES). The mandate of the committee, which was established at the initiation of ICES in 1902, was to solve the reasons for the decadal scale fluctuations in the landings of the *Great Fisheries of Northern Europe* (in particular those directed on for cod and herring). In the 18th and 19th century during the good years for fishing (with abundant landings) the economies of Northern Europe were robust, whereas during the poor years society at large suffered. The issue being addressed by ICES was high profile within several northern European countries adjacent to the North Sea and

the North Atlantic waters, and thus the stakes for the continuation of ICES beyond the first few years of initial funding were high.

The extant hypothesis (based on the *Polar Migration* concept developed in 1746 by Johann Anderson, the mayor of Hamburg at that time) interpreted that the local fluctuations were caused by variable migration patterns of relatively constant abundance levels of the diverse commercially important groundfish and small pelagic species (Wegner 1993). In essence the fluctuations in any particular area were considered to be due to an edge effect caused by climate variability (the overall abundance levels of the species were considered to be invariable, whereas local abundance varied due to migration patterns of the species). The scale required to address the issue under "migration thinking" was large (i.e. the northeast Atlantic as a whole). The title of this inaugural ICES Committee (the *Migration Committee*) reflected the current hypothesis of the day, an elaboration of the ideas of the Hamburg mayor from the mid-18th century.

The radical new interpretation by Hjort (1914) could be termed a paradigm shift, in the true sense of Kuhn (1962). Under this new thinking being developed within ICES, fish species were considered to be comprised of populations (or in the language of the early 20th century, "races"). Some species like herring and salmon are characterized by many populations, whereas other species such as mackerel and tuna have only a few. At the extreme end of the scale of richness one species, the European eel, was hypothesized to be panmictic (i.e. there is a single population for the species). Thus population richness (and their diverse spawning areas) was considered to be a species specific trait, which needed to be described and interpreted. Furthermore the abundance levels of the populations/"races" of the diverse species were concluded to be variable on decadal time scales due to year-class variability. The observed variability in year-classes was considered to be caused by oceanographic processes. In addition, the spatial scale of the problem of the fluctuations of landings under population thinking, in contrast to species thinking, shrunk to some degree for some commercial species. A detailed analysis of the shifts in perspective on research strategies with respect to fisheries issues at the time of the Canadian Fisheries Expedition was provided by Sinclair and Smith (2002) on the occasion of centenary of the founding of ICES.

In essence the *Migration Committee*, during about a decade of international multi-disciplinary ecological and oceanographic studies, redefined the very nature of the societal issue of "*fluctuations in the great fisheries*" of northern Europe. Thus the timing of the Canadian Expedition was very fortunate. The questions asked by Hjort and his colleagues were ecological and oceanographic, rather than being focused on the search for biogeographical laws in the tradition of Darwin and Wallace, and as carried out in the oceans in respectively the *Challenger* (1872-1876) and *Michael Sars* (1910) expeditions. The Canadian expedition initiated modern oceanographic and marine ecological research in North America. We owe a great intellectual debt to ICES, and in particular to the Scandinavian scientific leaders who participated in the Expedition a century ago.

In October 2014, ICES organized a symposium in Bergen, Norway (the *Johan Hjort Symposium on Recruitment Dynamics and Stock Variability*) to celebrate the centenary of the publication of the classic paper by Hjort (1914). Canada was very well represented at the gathering, illustrating that the seeds of marine science planted by Johan Hjort and his team a century ago have born considerable fruit. Furthermore, in 2015, the *Canadian Journal for Fisheries and Aquatic Sciences* will publish a volume on the proceedings of the symposium. This year

is a time for us to celebrate the magnificent contribution by the mostly Scandinavian team of scientists who initiated our field of marine research in support of management of ocean uses.

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Enhancing the Argo float array density in the Gulf Stream system and its extension

DFO's Bedford Institute of Oceanography (BIO) recently made an important contribution to one of the targeted regions of intended denser Argo float coverage: the Gulf Stream system and its extension. In April 2014, BIO personnel deployed four Canadian floats in the Gulf Stream's northern recirculation gyre. This was followed, in September 2014, by another BIO ship survey during which four U.S Argo floats and five German Argo floats were also deployed in the Gulf Stream's northern recirculation gyre.

It is expected that shorter than average residence time of floats in the Gulf Stream system will require frequent re-seeding of Argo floats in this region. But on the plus side, drift-away floats will contribute to the Argo array in other parts of the North Atlantic that will then require fewer direct float deployments. Our German colleagues and U.S. colleagues from Woods Hole Oceanographic Institute expressed their interest to continue in future years this collaboration that takes advantage of a regular BIO ship survey for opportunistic deployment of Argo floats.

A set of maps displaying the status of the global Argo array as of November 2014 can be viewed through the following URL: http://argo.jcommops.org/maps.html.

IOCCP and JAMSTEC announce the 4th Intercalibration Exercise for Nutrients

IOCCP and Japan Agency for Marine-Earth Science and Technology (JAMSTEC) have invited more than 80 laboratories worldwide to participate in the 2014 inter-comparison study designed to test the global comparability of nutrient measurements and to promote the use of CRM of nutrients in seawater.

The oceanographic community has continued to improve comparability of nutrient data from the world's oceans in many ways, including through 3 international inter-laboratory comparison studies since 2003 and the development of nutrient reference materials (RMs). However, adequate comparability and traceability of nutrient data have not yet been achieved.

Certified reference materials, CRMs, of nutrients in seawater that cover wide range of nutrients concentration became available in 2014. IOCCP and JAMSTEC decided to continue and expand the intercomparison study using both RMs and newly arrived CRMs. Invited laboratories will have confirm their participation by 30 November 2014 to allow for sample shipment by the end of the year. Reporting deadline for analyses' results was set to 28 February 2015 and we hope to be able to report integrated findings in mid-2015.

For more information visit our Nutrients page at http://www.ioccp.org/nutrients.

Weather and Climate Impacts in the Atlantic Coastal Zone

The Canadian Climate Forum (CCF) has recently released an issue paper on weather and climate impacts in the Atlantic coastal zone. By 2100, sea levels in Atlantic Canada are expected to be between 20 cm and one metre higher than today's levels. In *Forecasting a Sea of Change,* the CCF highlights the stakes involved and the importance of considering the more extreme scenarios of sea level rise. The document is available for download here: CCF Issues-SeaOfChange_3.

Les impacts du climat sur la zone côtière atlantique.

Le Forum canadien du climat (www.forumduclimat.ca) a publié un document thématique sur les impacts du climat sur la zone côtière atlantique. En 2100, les niveaux de la mer prévus dans le Canada atlantique devraient être de 20 cm à 1m plus élevés que maintenant. Dans le document intitulé *Prévisions pour une mer en changement*, le Forum met en lumière les enjeux et souligne l'importance de prendre en considération les pires scénarios d'élévation du niveau de la mer. Le document est disponible ici: Previsions pour une mer en changement.

Project Maury: Teacher Summer Workshops/Projet Maury: Ateliers d'été pour enseignants

CNC-SCOR and CMOS are inviting applications from Canadian teachers (K-12) to attend a physical oceanography education workshop to be held at the US Naval Academy, Annapolis, Maryland, 12-24 July, 2015.

This is a summer workshop for pre-college teachers of oceanographic science topics

CNC-SCOR et CMOS invite les enseignants de la maternelle au secondaire à faire application au projet Maury.

Il s'agit d'un atelier estival à l'intention des enseignant(e)s de niveau pré-collégial spécialistes en sciences océanographiques qui aura lieu au US Naval Academy à Annapolis au Maryland du 12 au

sponsored by the American Meteorological Society (AMS) and the US Naval Academy of the United States. Presentations at the workshop are made by some of the most respected American scientists in the field of oceanographic sciences. Participants have returned with material, resources and teaching modules readily adaptable to classroom presentations.

The essential expenses for the selected teacher are all paid by AMS/NOAA, with contributions from CMOS and CNC/SCOR.

The deadline for applications is **8 March 2015**. Please forward this information to any eligible teacher that you think might be interested.

For more information on the workshops, including subsidies details and the application forms, visit the web site (click here). If you have questions, please send an email to education@cmos.ca.

24 juillet 2015. Cet atelier est parrainé par l'American Meteorological Society (AMS) et la National Oceanic and le US Naval Academy américains. Les exposés de l'atelier sont présentés par des experts américains les plus réputés dans les sciences océanographiques. Les enseignant(e)s sont revenu(e)s avec du matériel, des ressources et des modules didactiques qu'ils peuvent facilement adapter dans leurs cours. ***Notez que cet atelier est disponible seulement en anglais***.

Les dépenses de l'enseignant choisi seront assumées par l'AMS, qui reçoit des contributions de la SCMO et du CNC/SCOR.

La date limite pour les applications est le **8 mars 2015**. SVP, partager ce message avec les enseignant(e)s qui pourraient y être intéressé(e)s.

Pour de plus amples détails et pour le formulaire d'application visiter le site web (cliquer ici) ou communiquer à education@cmos.ca.

CMOS AWARDS Nominations Deadline: Feb 15.

The 15 February deadline for nominations for the CMOS Prizes and Awards is fast approaching. Please take a moment to visit the CMOS awards site for a list of the eight awards, for instructions on how to make a nomination and then submit something on behalf of one of your colleagues or students. CMOS has a rich history recognizing deserving persons (members and non-members) through its awards programs. But regrettably, there are many deserving candidates who go unrewarded each year because we were too busy to work up a nomination. It is not too late - do it now!

Date limite pour les nominations envers les Prix de la SCMO: 15 février.

La date limite, le 15 février, pour la soumission des mises en candidature pour les prix et honneurs de la SCMO s'approche vite. Veuillez prendre quelques secondes pour consulter (cliquer ici) la liste des huit prix et pour lire les instructions, puis prendre le temps de soumettre la nomination d'un de vos collègues ou étudiants. La SCMO a une histoire qui souligne les personnes méritantes (membres et non-membres) par ses programmes de reconnaissance. Malheureusement, il y a beaucoup de personnes qui méritent d'être nommées qui ne le sont pas, parce qu'on est trop occupé. Ce n'est pas trop tard; faites-le maintenant!

CMOS Scholarships / Bourses d'étude de la SCMO

Through the generosity of members and sponsors, CMOS is able to offer several undergraduate and graduate scholarships. The deadline for the undergraduate scholarships is March 15th, and April 20th for the graduate scholarship. Please visit the CMOS web site for more information.

Grace à la générosité des membres et de sponsors, la SCMO peut offrir plusieurs bourses d'étude de premier cycle de même que de deuxième et troisième cycle. La date limite sont respectivement le 15 mars et le 20 avril.
Vous retrouverez les détails pour chaque bourse, ainsi que les informations décrivant la procédure de soumission, en cliquant ici.

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

Previous newsletters may be found on the CNC/SCOR web site.

Newsletter #81 will be distributed in March 2015.
Please send contributions to Michel Mitchell, michel.mitchell@dfo-mpo.gc.ca

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Veuillez faire parvenir vos contributions à Michel Mitchell, michel.mitchell@dfo-mpo.gc.ca

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