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Vol 2 Issue 02

ARCTIC SIGnal ™

In This Issue

Arctic Science – Hopeful times

By Ann McMillan

The Canadian Meteorological and Oceanographic Society (CMOS, our parent organization, has experienced change as the Executive changed over in June (as usual) and the Executive Director left Canada for a position in Europe in September. Welcome to Martha Anderson, the new President, and Bruce Ramsay, the Interim Executive Director. CMOS is still looking for a permanent new Executive Director…if you are interested, please see the advertisement on the CMOS website.

Arctic SIG is also seeing its first change of leadership. Helen Joseph, who has been active with the group since its start, is taking over from Marty Taillefer who is now Vice President of CMOS nationally.

Congratulations to both Marty and Helen on their new roles!

The ArcticSIG has been asked to bring together a special edition of the CMOS Bulletin for December, 2015. If you have material that you would like to appear in the special Bulletin, please get in touch with me right away at mcmillan@storm.ca as deadlines are short.

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WORKING GROUP

The ArcticSIG working group for this issue has been:

- **Martin Taillefer – Ex-Chair**
- **Helen Joseph – Incoming Chair**
- **Andrew Bell/Bruce Ramsay – CMOS Executive Director – SIG Advisor**
- **David Fissel, Ann McMillan, Doug Bancroft - Members**

ARCTIC-SIG CHAIR - DEPARTING WORDS

It is with some sadness that I leave the position of ARCTIC-SIG Chair – yet I comforted that the SIG will be championed and lead by Helen Joseph whom many of you know to be very capable and well connected to direct the future endeavors of the Arctic-SIG. The idea of an Arctic-SIG started back in June 2011 where David Fissel, Ann McMillan and I formed an internal "Arctic-Awareness" Working group. This was a collaboration effort between ASL Environmental Sciences and Maritime Way. As one idea led to another we found ourselves pitching the working group idea to CMOS Council with the hope to leverage the societies' membership. Subsequently, at the Saskatoon Congress in 2013 the Arctic-SIG was officially formed.

Interestingly, almost 10 years earlier in September 2004, the CMOS Executive of the day determined that the "Special Interest Groups", once very active in CMOS, were no longer as active and that no new Special Interest Group had emerged in the previous ten years (from 1994 to 2004). They assessed that the existence of the group depended on the enthusiasm of the organizing chairperson. Once he or she departed from the scene the follow-up failed to carry the Group forward. Hence in 2004, CMOS Council recommended that the Special Interest Group activity within CMOS and their continued representation in the By-laws should be deleted.

Looking back even further, in 1946 The Canadian Joint Committee on Oceanography (JCO) was formed and renamed in 1959 as the Canadian Committee on Oceanography (CCO). Lead by J.P. Tully, the intent, at the time was to "…describe and predict the oceanographic state … and present its information, in suitable terms for fisheries, military and industrial use" (sic)[1]. What is important to note was in the very active years of the 1960s the CCO's influence in promoting Canadian oceanographic science was considerable. To address this growth the CCO branched out into numerous sub-committees that became pro-active cells of the parent organization. There was a Pacific Sub-Committee on Oceanography (PSCO), an Atlantic Sub Committee (ASCO) and an Arctic Sub-Committee (AcSCO), and many more. But by the late 1970's with the emergence of greater government involvement and the expansion of oceanographic laboratories – the CCO became functionless. It disappeared without being formerly dis-established in the early 1980s. One small remnant of the CCO was the PSCO that continued until 2001. The PSCO survived as an important collaboration link between DFO, the CCG, Industry, DND and universities of the British Columbia coast.

Why the history lessons on the CCO? It's easy - the history of pro-active sub-committees, like the PSCO, is an important lesson on what works well. Today, in 2015 and beyond, CMOS is struggling to show relevance to Canadian society. In the past 15 years CMOS has made only 10 position statements on a variety of meteorological or oceanographic science. How do we show relevance with only one(1) position statement per year – we can't. CMOS should have been publishing perhaps 100 (ten per year). By Standing up Special Interest Groups (like the Arctic-SIG) we can position ourselves with relevant expertise to address and make scientific statements that are relevant and important to Canadians. The Special Interest Groups are your voice within CMOS to articulate a position and a vision for future science and CMOS. We have to change to sustain and grow as a Society that showcases relevance - and the Special Interest Groups can achieve this.

I wish Helen the best of luck in pushing the Arctic-SIG forward, while my support will not be far away.

Martin L. Taillefer, CD, M.Sc.
PAST ARCTIC SIG CHAIR

[1] Oceanographic History: The Pacific and Beyond by Keith Rodney Benson and Philip F. Rehbock.

MESSAGE FROM THE INCOMING CHAIR!

By Helen Joseph, HCJConsulting

I am delighted to be taking over the Chair of the Arctic Special Interest Group (SIG). Over my working career, I have had opportunities to work in Arctic ocean and climate sciences as well as had opportunities to travel to the northernmost reaches of Canada and other Arctic nations. This is an area of science that I am passionate about and I look forward to leading the Arctic SIG. The SIG has got off to a great start under the leadership of Martin Taillefer, Maritime Way, as the first ever Chair. I know that Marty has had some excellent guidance from colleagues like David Fissel, ASL Environment, Ann McMillan, Storm Consulting, and Doug Bancroft, EO DVC. As I lead the SIG in the coming years, I am counting on the continued advice from these individuals and others as well.

One initiative that I will be pursuing is the establishment of an Arctic "Advisory Group" that will be comprised of individuals who have worked or lived in the North. I am hopeful that their advice on the undertakings of the CMOS Arctic SIG will ensure that our activities are relevant and priority actions for Canada's north.

There are several science organizations in Canada that are working on various aspects of the Arctic science. I believe that it is important that the CMOS Arctic SIG should develop relationships with such organizations in Canada with interests and mandates in the North therein the interests of CMOS can be promoted and advanced. Examples include: the Canadian Networks of Centres of Excellence, for example, ArcticNet and MEOPAR; the Canadian Climate Forum; Polar Knowledge Canada and others.

If you were at the CMOS Congress in Whistler 2015, then I hope that you were able to attend the panel entitled "Two Ways of Knowing" that the Arctic SIG hosted. The following panelists did an excellent job at presenting their views on Arctic science – Bill Williams, DFO Sidney; Hal Ritchie, EC Dartmouth; Baba Pederson, Inuk Ranger, Kugluktuk, Nunavut and Frank Pokiak, Inuvialuit Game Council, Inuvik, NWT. (See attached photo of the panelists). We hope to build on the success of the 2015 panel by developing a similar exciting event for the 2016 CMOS Congress in Fredericton next year. Stay tuned for more details in the coming months!

Finally, I would like to acknowledge the great work of Ann McMillan as the editor of this Arctic SIG newsletter. It takes a lot of initiative on her behalf to find articles and the pull together the excellent features that we enjoy on aspects of Arctic ocean and meteorological science. I propose to work with the new Advisory Board and others to encourage the expanded distribution of the Arctic SIGnal as an excellent means of promoting knowledge and awareness of Arctic meteorological, oceanographic and environmental science issues.

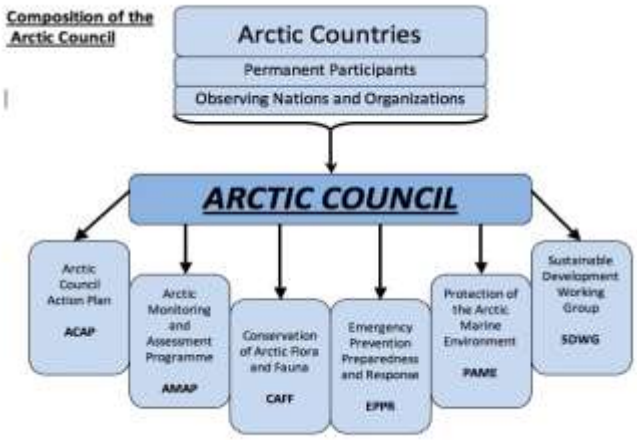
As the incoming Chair, I welcome your ideas and thoughts on what the Arctic SIG should be, what initiatives we should be considering, etc. Your input and assistance would be greatly appreciated!

Helen C Joseph
NEW ARCTIC SIG CHAIR
Helen@hcjconsulting.ca

THE ARCTIC COUNCIL: ROUND TWO

Difficult to say with certainty that the early advocates for a circumpolar forum knew exactly how the organization would evolve, but there are few who could have predicted the speed with which this regional body has changed. Like the unprecedented rate with which the summer sea ice is receding, this small multilateral forum has demonstrated an incredible transformation since the Ottawa Declaration was signed in 1996. Canada's recent Chairmanship marked the first time an Arctic Council State chaired for a second time. In international terms this is still a young organization.

International organizations normally take many years to establish. They are organized around a detailed set of procedures, are characterized by formality and protocol, dominated by state interests, and are typically slow to change. Critics of the Council often cite its informal nature and inability to take binding decisions. However the very qualities that are criticized are in fact the ones that have allowed this organization to respond to a region experiencing the most extreme social, political, environmental, and economic changes. Its unique structure has leant credibility to consensus decisions and products in which the indigenous people of the region have helped shape, and it continues to allow dialogue amongst states despite being a significant geopolitical hotspot.



The Council has delivered world class science that has directly influenced action by states, within and outside the region, and has spawned the negotiation of legal agreements for search and rescue, and spill preparedness and response. Impressive for an organization that is not a legal entity itself.

The Council did not follow a typical model and many, including within the Council, questioned its utility and degree of influence. We now see some of the greatest skeptics, picking up and running with the Council agenda.

Where to next for the Council? Given the degree of change to date it is unwise to try and predict too far into the future. It is safe to say that the attention on the region and the Council will only increase, and as such it is reasonable to assume in general there will be increased effort and commitment, hopefully resulting in pertinent and credible work. If we consider the upcoming agenda of the new Chair, there is not a shortage of ambition.

The US Chair of the Arctic Council is now Secretary of State John Kerry with the assistance of special representative for the arctic Admiral Papp, both men have a personal connection to oceans, as such it is not surprising that a main theme for the American Chairmanship is - Arctic Ocean Safety, Security and Stewardship. The US has also acknowledged the importance of data and observations, especially in dynamic environments.

Monitoring, assessing and forecasting the changes in the arctic have only become more central to the future of the region, the states and experts need to be ready to help make the right decisions.

Renée Sauvé
Chair of the Arctic Council working group for the Protection of the Arctic Marine Environment (PAME)

THE ARCTIC OBSERVING SUMMIT: Progress Towards an Integrated, Multipurpose, and International Arctic Observing System

Gabriela Ibarguchi[1], Maribeth S. Murray[1], Peter Schlosser[2], Vinay Rajdev[1] and Lize-Marie van der Watt[3]

[1]ISAC International Program Office, Arctic Institute of North America, University of Calgary, Canada
[2]Earth Institute, Columbia University, USA
[3]Arctic Research Centre, Umeå University, Sweden

The ISAC Program and the Arctic Observing Summit (AOS)

Rapid and unprecedented change in circumpolar regions now constitutes a system-scale transition that impacts communities, species, ecosystems, traditional ways of life, economies, and global circulation processes and feedbacks (Cohen, et al. 2014; Pearson, et al. 2013; Whiteman, et al. 2013). Climate and environmental changes are complex and have been attributed to anthropogenic activities and development around the world, resource extraction at high latitudes, and immigration into the North. International collaboration is an important tool to develop policies and strategies at the appropriate scale and scope to address complex issues, to mitigate potentially negative impacts, and to guide research and science planning (Chapin, et al. 2006; Murray, et al. 2010). In addition, a growing interest in aligning research agendas with society's needs for information is now facilitating discussion and the development of novel solutions, data accessibility, and knowledge translation and exchange (Murray, et al. 2010). National and international organizations, government agencies, and diverse programs have been providing a foundation to promote science-based discussion and decision-making, and including long-term planning strategies, with growing participation from Indigenous organizations, Arctic and non-Arctic nations, and improved inclusion of diverse sectors and disciplines. Some examples include the Arctic Council and its collaborative and international programs (http://www.arctic-council.org/), the International Arctic Science Committee (IASC, http://www.iasc.info/), and the International Study of Arctic Change (ISAC, http://www.arcticchange.org/).

The International Study of Arctic Change (ISAC) is a long-term, international, cross-disciplinary Arctic environmental change program established in 2003 by the International Arctic Science Committee (IASC) and the Arctic Ocean Science Board. The ultimate goal of ISAC is to provide timely, relevant and accessible scientific information for society for responding to Arctic change. The core components of ISAC include observing, understanding and responding to Arctic environmental change through research and monitoring, linking science and local knowledge, building partnerships and connections among programs, promoting knowledge-sharing and access to data, communicating results, and facilitating knowledge translation for action and mitigation.

ISAC leads the biennial Arctic Observing Summit (AOS, http://www.arcticobservingsummit.org/) in collaboration with IASC and other partners. The AOS is a workspace and forum for discussing and developing the design, implementation, coordination and sustained operation of an international, pan-Arctic observing system of systems. The AOS is a task of the Sustaining Arctic Observing Networks initiative (SAON, http://www.arcticobserving.org/) of the Arctic Council, IASC, the World Meteorological Organization (WMO), and the International Polar Year Programme. The AOS contributes to the SAON process through the synthesis of Arctic knowledge, planning and the development of an integrated Arctic observing system design, and in

the identification of gaps and priorities. The AOS initiative originated from the urgency to improve the coverage and coordination of pan-Arctic observing activities in the face of rapid environmental change, and from the need to enable efficient communication and data-sharing for solutions-based decision-making, management, and adaptation (Fig. 1).

The biennial AOS in held in conjunction with the Arctic Science Summit Week (ASSW) and other high-level international meetings to facilitate the participation and engagement of a wide range of sectors in cross-disciplinary dialogue. AOS is a key platform to address the observation needs of stakeholders, and to foster international communication, collaboration, and the coordination of long-term observations for improving understanding and responding to system-scale Arctic change (Fig. 1).

The inaugural AOS was held in April 2013 in Vancouver, B.C., Canada, and the second AOS in April 2014 was held in conjunction with the Arctic Science Summit Week (ASSW) in Helsinki, Finland. The Summits drew multidisciplinary participation from academic, government, public and private sectors. The third AOS is now in development and will be held March 15-18, 2016, in conjunction with ASSW, at the University of Alaska, Fairbanks (http://www.arcticobservingsummit.org/).

Foundation and community input: AOS 2013 (Vancouver), 2014 (Helsinki) and 2016 (Fairbanks) The inaugural AOS in 2013 established the initial foundation for dialogue on the status, priorities, opportunities and needs for a coordinated and comprehensive Arctic observing systems network. AOS 2013 focused on four initial themes: (1) the status of the current observing system including goals, objectives, capabilities, challenges, and sustainability; (2) observing system design and coordination (including inter-operability, integration and implementation); (3) stakeholder perspectives on observing system design and integration; and (4) mechanisms for coordination of support, implementation and operation of a sustained and relevant Arctic observing system. During the following AOS in 2014 (Helsinki, Finland), which was held in conjunction with ASSW at the University of Helsinki (Kumpula Campus) and the Finnish Meteorological Institute, the themes addressed the following topics in particular: (1) Stakeholder engagement; (2) Coordination; (3) Technology and innovation; (4) Remote sensing solutions; and (5) Data management, accessibility, and interoperability. The 2013 and 2014 Summits provided opportunities for community input (see below), and themes were selected based on such feedback and recommendations. Stemming from community input, the upcoming AOS 2016 will focus in depth on the following themes: (1) International and national strategies for sustained

support of long-term Arctic observing; (2) Technology and innovation; (3) Contributions of the Private Sector and Industry to sustained Arctic observations; (4) Actor and Stakeholder engagement and needs; (5) Arctic Observations in the context of Global Observing initiatives; and (6) Interfacing Traditional Knowledge,

Figure 1. *An ideal international and comprehensive Arctic observing systems network includes information on the physical, environmental, ecological and social dimensions of the Earth that may influence ecosystems and communities in polar regions and global feedbacks. A successful system should include iterative and adaptive components to accommodate emerging needs and flexibility, and should be based on sustained support and collaboration, open dialogue, and models based on co-development and co-management of the system. Accessibility to data and data products is imperative for responsive, accurate and timely decision-making, planning and preparedness.*

Community-based Monitoring and Scientific Methods for sustained Arctic observations.

Community input has been a key component in planning and development of the AOS. Activities to engage diverse stakeholders to improve dialogue on the needs, opportunities and capabilities of the scientific community, the private sector, Northern Peoples, government agencies, and other groups have included town

hall meetings, workshops, presentations, and article contributions through a white paper process.

For the first AOS 2013 in Canada, community members were invited to contribute white papers and short statements on relevant issues to Arctic observation; these contributions are available on the AOS website (http://www.arcticobservingsummit.org/aos-2013-white-papers). These white papers, and the synthesis documents stemming from those articles, served as the foundation for developing the themes for the 2013 Summit and in subsequent years, to highlight priorities, needs, gaps and opportunities, to showcase initiatives and novel approaches relevant for Arctic observing, and to provide recommendations and guidelines for the next steps. During the AOS 2014, these white papers continued to serve as a guideline for discussions and in some cases contributors of the articles provided updates on research and new initiatives. A subset of the updated AOS 2013 white papers (http://www.arcticobservingsummit.org/aos-2013-white-papers) were submitted to the journal ***Arctic*** for publication following AOS 2014, and a total twelve peer-reviewed articles and reports are part of a special open access AOS issue (*Arctic* vol. 68 [Suppl. 1], 2015: http://arctic.journalhosting.ucalgary.ca/arctic/index.php/arctic/issue/view/281). All articles are being published online and will be available in hardcopy format upon completion of copy-editing.

For the upcoming AOS 2016, white papers and short statements are being solicited for community input once again, and the call for papers is now open, with an anticipated deadline for submissions on October 18th, 2015 (http://www.arcticobservingsummit.org/community-white-papers-and-short-statements-submission-form). AOS 2016 will be hosting poster presentations also as part of discussions and community input on the 2016 themes, and the call for poster presentations will open in September 2015 (http://www.arcticobservingsummit.org/aos-2016-poster-abstracts-submission-form).

Results from AOS 2013 and 2014, and progress towards a comprehensive Arctic observing system

The critical groundwork for establishing an international Arctic observing network included the engagement of the international Arctic community to assess the most pressing needs and capabilities, and to include the input, expertise and diverse perspectives from scientists, managers, decision-makers, community members, government and not-for profit organizations, funding agencies, data managers, Arctic Peoples and members from Northern communities. A comprehensive report on the results and recommendations stemming from the Summits is being completed by the ISAC International Program Office and will be available on the AOS and ISAC websites for downloading. Some results and recommendations from the Summits are briefly summarised below.

More than 170 summit participants contributed to AOS 2013, from 17 different nations (Fig. 2). The participants came from a diverse array of backgrounds, representing funding agencies, northern residents, policy makers, industry and the private sector, science planners, and a variety of scientific disciplines including members working on the technology powering observing systems, data management and accessibility, biodiversity and natural systems, hydrology, climate, social sciences, community health, contaminants and many others. The AOS program balanced international and national level perspectives with the interests of northern residents and Indigenous Peoples, particularly from Alaska and Canadian Arctic. In addition to Arctic nations, there was strong representation from China, Japan, and South Korea, including several plenary presentations, highlighting the importance of Arctic observing programs for operational weather forecasts in eastern Asia as well as growing economic interests in the Arctic particularly with respect to resource development and shipping activities.

AOS 2014 included over 340 registered participants (double the registered members from 2013), a wider representation of countries (30 in 2014 versus 17 in 2013; Fig. 2) and greater diversity in the stakeholder areas of expertise (now expanding into other fields including Education and Outreach, Economics, Geography and Space Science, and expansions within Health, Engineering, and other Natural Sciences). Within-country and within-region participation improved by hosting AOS in Finland in 2014, now including representatives from additional nations, regions and Indigenous Peoples. The location of AOS was important to balance the participation across the circumpolar North (e.g. American sector in 2013; improved representation from Europe and Asia in 2014). Participation often included a diversity of groups, organisations and institutions, from both Arctic nations and non-Arctic countries such as Germany and Japan, and increasingly, from nations with a growing interest in polar regions (Fig. 2).

Recommendations stemming from AOS 2013 and 2014 were obtained from working groups by theme, by Summit participants during panel discussions, by contributors of white papers, from reviewers, and through participation in consultations prior, during and following the Summits. Over 100 comments and recommendations have been received by the ISAC Program Office since AOS 2013. Progress has been made on identifying Arctic observing needs, capacity, priorities, and on building international consensus and strengthening partnerships. Recommendations stemming from AOS Summits can be summarised as follows: (1) Create a body to coordinate and support cyber-infrastructure, data accessibility and products, interoperability among systems, policy, funding, and communication; (2) Improve international site accessibility and data collection; address coverage and continuity of programs, avoiding temporal/spatial gaps; improve extent and type of coverage, improve inclusion and participation of Eurasian sector; (3) Improve the diversity of participants, stakeholders, and of observing systems (e.g. Fig. 1); (4) Link efforts, standards, methods, variables and indicators in use (e.g. Arctic Council, SAON, WMO, GEO [Group on Earth Observations], etc.); (5) Engage stakeholders at all stages and from the beginning, from assessing needs to the creation of solutions-based, useful products; and (6) Incorporate technology for real-time data capture and accessibility, and invest in data rescue and baselines. Other recommendations include novel proposals for systems design, the use of new technology, practical issues related to international policy and cooperation, creative solutions to address specific local or global needs, and others.

The ISAC Program Office and the AOS Executive Committee continue welcoming feedback and continue working towards building representative participation from Arctic and non-Arctic nations, and all sectors (e.g. Figs. 1 and 2). The AOS 2016 is already providing further opportunities for dialogue and for making tangible progress on building an international network of Arctic observing systems for timely and relevant planning, forecasting, management and mitigation for Arctic environmental change.

Support the Arctic SIGnal….send in your thoughts and articles today (or tomorrow!)

Send to: mcmillan@storm.ca

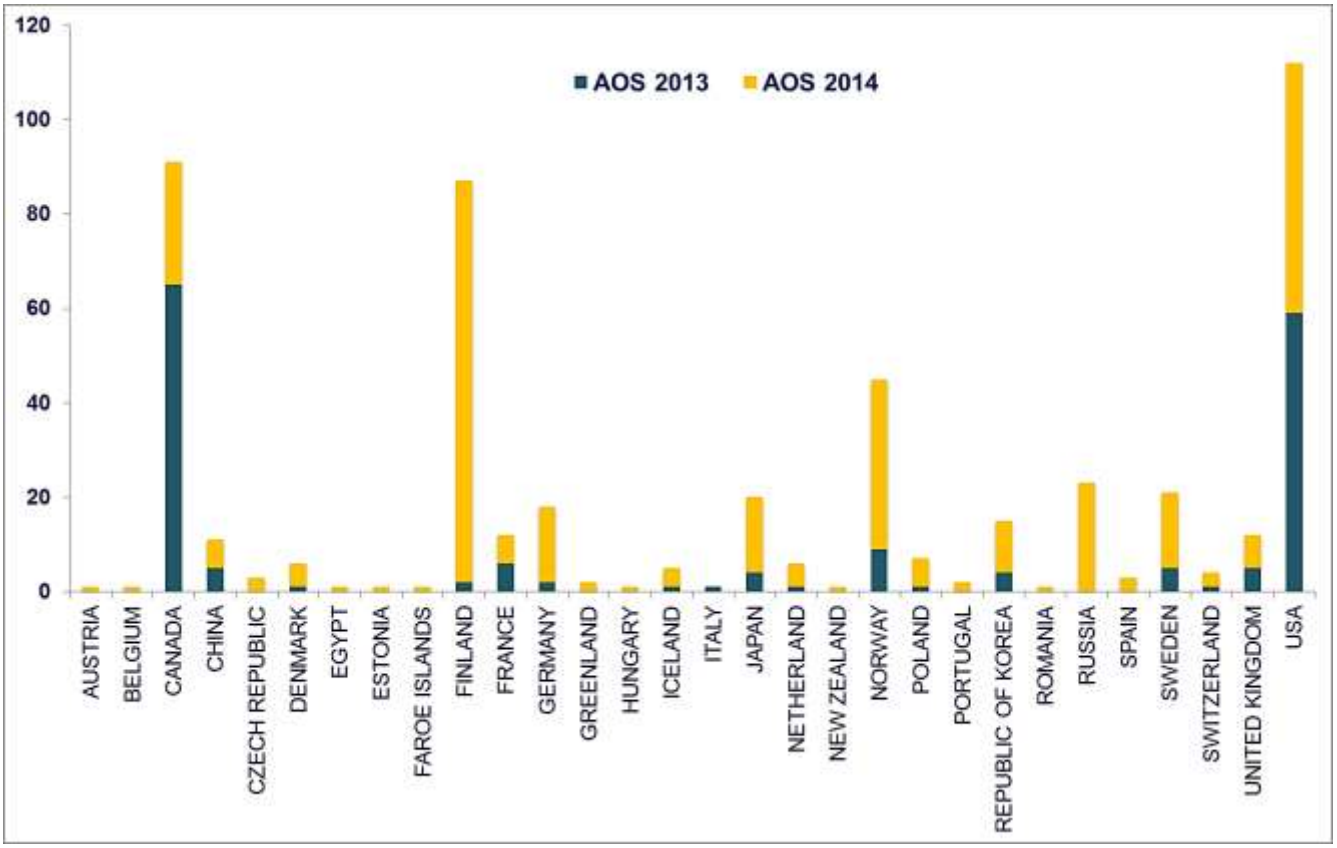


Figure 2. *Total numbers of participants in AOS 2013 (Vancouver, Canada, n= 172) and AOS 2014 (Helsinki, Finland, n= 342), grouped by their country or major territory of origin.*

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WHAT IS POLAR KNOWLEDGE CANADA?

by Katherine Wilson

The mission of Polar Knowledge Canada is to conduct world-class cutting edge Arctic research.

Polar Knowledge Canada is responsible for advancing Canada's knowledge of the Arctic and strengthening Canadian leadership in polar science and technology.

Polar Knowledge Canada was created by the *Canadian High Arctic Research Act* and came into force by Order in Council on June 1, 2015. It combines the mandates, resources, and knowledge of the Canadian Polar Commission (CPC) and the Canadian High Arctic Research Station initiative at Aboriginal Affairs and Northern Development Canada into a single federal organization.

Polar Knowledge Canada serves as Canada's primary point of contact with the circumpolar knowledge community, and is Canada's adhering body to the International Arctic Science Committee and the Scientific Committee for Antarctic Research. Polar Knowledge Canada also liaises with research organizations and institutes throughout the circumpolar world, providing guidance for multilateral scientific projects relevant to Canadian interests.

Polar Knowledge Canada consists of a pan-northern science and technology program, a knowledge management and mobilization function and the research station being built in Cambridge Bay, Nunavut.

Science & Technology Plan 2014-2019 Priorities are:

- Baseline information preparedness for development;
- Alternative and renewable energy;
- Underwater situational awareness;
- Predicting the impacts of changing ice, permafrost, and snow on shipping, infrastructure and communities;
- Infrastructure for development.

Cross-cutting activities:

- Monitoring and reporting;
- Science and technology mobilization; and
- Logistics.

Polar Knowledge Canada will operate out of the Canadian High Arctic Research Station (CHARS), which is currently under construction in Cambridge Bay, Nunavut. The CHARS campus encompasses a main research building, a field and maintenance building and triplex accommodation units for visiting researchers and scientists.

Polar Knowledge Canada's Canadian High Arctic Research Station will provide a world-class hub for science and technology in Canada's North that complements and anchors the diverse network of facilities across the North, including the members of the Canadian Network of Northern Research Operators.

Once operational, CHARS will attract international scientists to work on science and technology issues in Canada's North and will provide a technology development centre, traditional knowledge centre and advanced laboratories.

Once the facility is operational, 50 full-time scientists and support staff will be based in Cambridge Bay.

Website: http://www.canada.ca/en/polar-knowledge/ (English)
http://www.canada.ca/fr/savoir-polaire/index.html (Français)

Twitter: @POLARCanada
@POLAIRECanada

Facebook: Polar Knowledge Canada - https://www.facebook.com/PolarKnowledge?fref=ts
Savoir Polaire Canada - https://www.facebook.com/Savoirpolaire?fref=ts

ArcticNet

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- Dr. Tom Pedersen Chair, Canadian Climate Forum
- Sergio Marchi President, Canadian Electricity Association

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- Geraldine Van Bibber Chancellor, Yukon College • Member of the Gwich'in First Nations
- Dr. Karin Wittenberg Dean, Faculty of Agricultural and Food Sciences, University of Manitoba
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More Announcements

21st Northern Contaminants Program Results Workshop

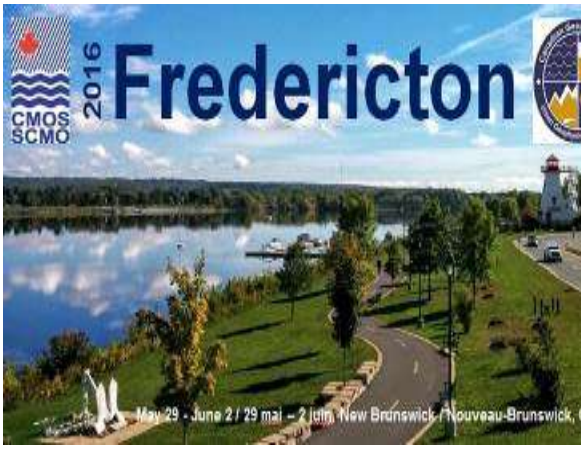
Co-located with ArcticNet Annual Scientific Meeting!

The 21st Northern Contaminants Program (NCP) Results Workshop will be held December 7-8, 2015 at the Westin Bayshore in Vancouver BC. The NCP Results Workshop, held every other year, is the main venue for Canadian scientists, Northerners and policy-makers to focus attention on the breadth of issues related to contaminants from long-range sources in Canada's North, to learn about and discuss the latest results, current state of knowledge and policy implications, and to plan for future initiatives.

This year's NCP Results Workshop is co-located with the ArcticNet Annual Scientific Meeting and we will be integrating our programs on Tuesday afternoon (December 8th) beginning with the ArcticNet opening plenary session and culminating in a joint NCP/ArcticNet session on contaminants.

For more information (agenda, registration, etc.), please contact the NCP Secretariat at PLCN-NCP@aadnc-aandc.gc.ca.

Sarah Kalhok



50th CMOS Congress & joint CGU Annual Meeting

Monitoring of and Adapting to Extreme Events and Long-Term Variations

May 29 - June 2, 2016

Welcome to the Canadian Meteorological and Oceanographic Society's 50th Congress and joint annual Canadian Geophysical Union meeting. The joint-congress will be held from 29 May to 2 June, 2016 at the Fredericton Convention Centre, Fredericton, NB, Canada. The theme of the congress is "Monitoring of and Adapting to Extreme Events and Long-Term Variations". The congress will bring together a wide range of scientists and other professionals from across Canada and other countries with a focus on topics in atmospheric, ocean and earth sciences.

Call for Congress 2016 Session Proposals (deadline Nov 13)