



# CMOS BULLETIN SCMO

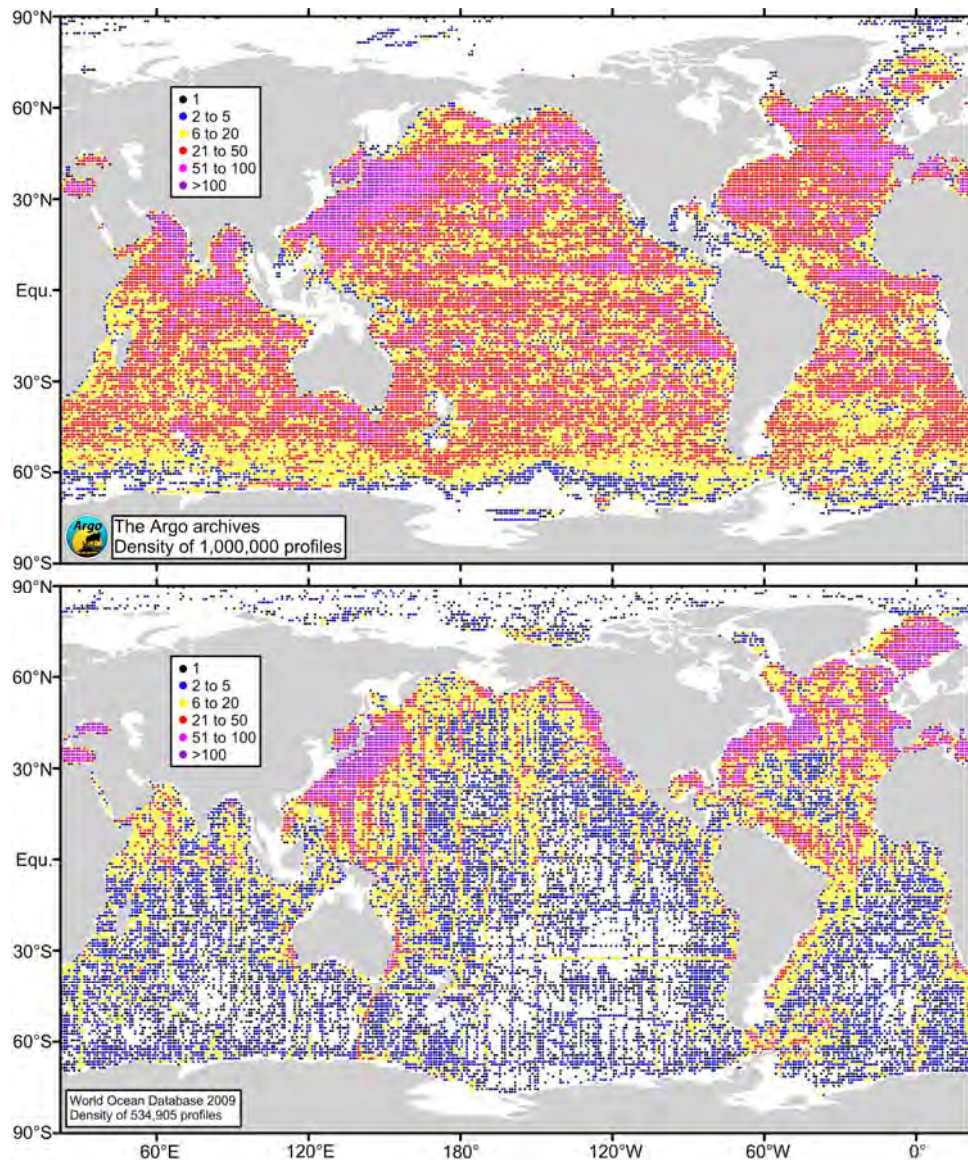
Canadian Meteorological  
and Oceanographic Society

La Société canadienne  
de météorologie et  
d'océanographie

December / décembre 2012

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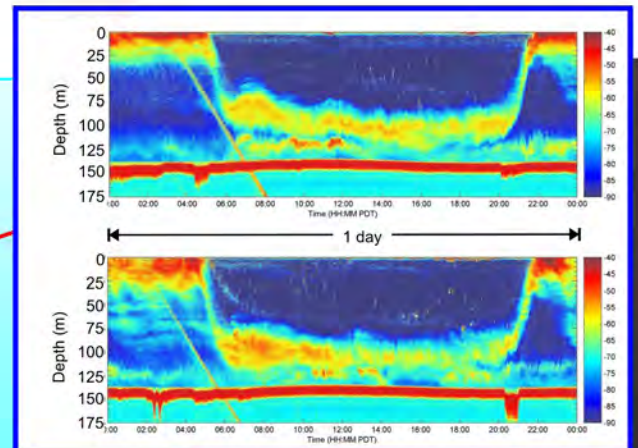
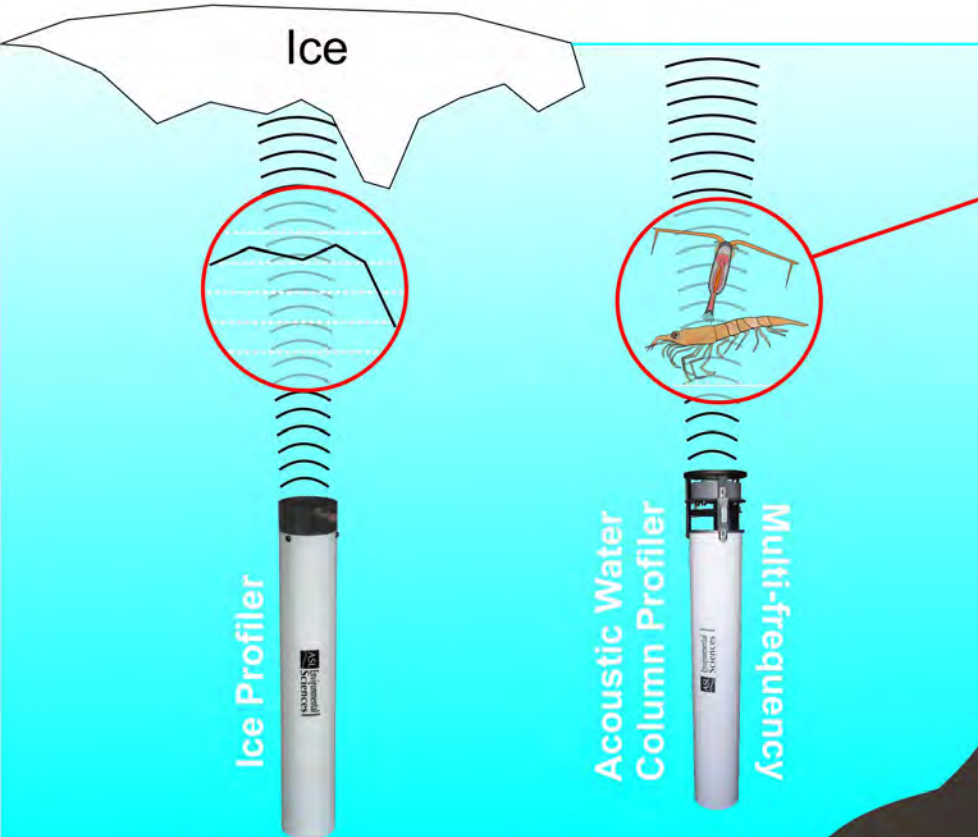
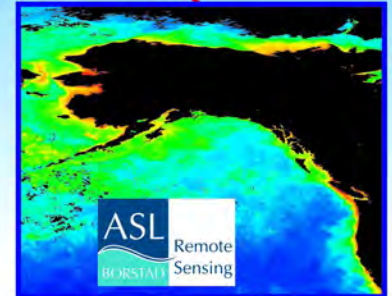
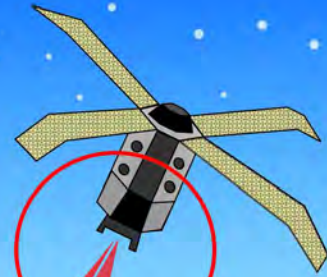
## Density of profiles: Argo & World Ocean Database



**Densité des profils : Argo & Banque mondiale des données**

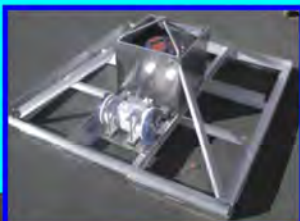


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## ...from the President's Desk / Allocution du président

Friends and colleagues:

Peter Bartello  
CMOS President  
Président de la SCMO

At this time of year many of us will soon take a well-deserved break from our normal routine and reflect upon the year that is about to close. It seems quite normal for me in this column to think out loud a bit about CMOS, what it has been through and where it is going. I have written several times that we have been through a rough patch as a science. Our federal government is clearly at odds with environmental activists of all kinds. It is my hope that CMOS

members will agree with me that CMOS is not about activism, but rather we are the authoritative voice on the hard sciences of meteorology and oceanography. Since these are at the very nucleus of climate science, I think it fair to say we are viewed as part of the problem by our federal political leaders. This is compounded by the fact that without some sort of scientific foundation, the activists are utterly without credibility. Our current government is very adept at controlling the flow of information and so we can easily imagine their tactics in this regard. Our colleagues who work directly under their control are very discouraged. They are declining to be involved with CMOS activities for the first time in the over four decades of our existence. Indeed CMOS would be a much smaller and less influential organisation without their enormous contribution over the years. Government scientists are starting to think of volunteer work with CMOS as a direct conflict with their responsibilities in their day jobs. They are unfortunately correct. One of CMOS' goals is to keep Canadian society informed of developments in our field that are of importance to them. It seems the current government's goals are the opposite.

The good news is that this can't last forever. As the effects of climate change become more obvious to more people, I am certain our science will be put back on track in this country. In the meantime, at the suggestion of many of our members, we are embarking upon a long-term media strategy to engage the public directly. Our goal is to inform them positively of the good work we do, why we do it and why it is important to them.

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**CMOS Bulletin SCMO**

"at the service of its members / au service de ses membres"

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**Cover page:** The international Argo program vastly improved open ocean sampling through the deployment of over 3000 robotic profiling floats in the world ocean. These freely drifting floats take profiles of temperature and salinity every 10 days from 2000 m depth to the surface. They provide oceanographers and meteorologists with real-time temperature and salinity data year-round and typically last 4 to 5 years. The cover page shows the count (or density) of Argo profiles in each 1° x 1° square (upper panel) and the same count for profiles in the World Ocean Database (lower panel). To learn more, please read the Argo team's article on **page 185**.

**Page couverture:** Le programme international Argo a grandement amélioré l'échantillonnage de l'océan hauturier par le déploiement de plus de 3000 flotteurs-profiling robotiques dans l'océan mondial. Ces flotteurs qui dérivent librement prennent des profils de température et de salinité tous les 10 jours de 2000 m de profondeur jusqu'à la surface. Ils fournissent aux océanographes et météorologues des données de température et salinité en temps réel pendant toute l'année et durent généralement de 4 à 5 ans. La page couverture montre le nombre (ou la densité) de profils Argo dans chaque carré de 1° x 1° (en haut) et la même chose pour des profils provenant de la base de données mondiale sur les océans (en bas). Pour en connaître plus, prière de lire l'article de l'équipe Argo en **page 185**.

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....from the President's Desk / Allocution du président  
(Continued / Suite)

In addition, they need to know that Canada's contribution to our science at the international level is at the very highest levels of quality and productivity. With this in mind the CMOS Council recently discussed a more active role for our Scientific Committee. It seems clear that, as part of our goal of informing the public, the Society needs to discuss the science behind issues of interest to the media and to formulate a consensus of the most knowledgeable of our members in those particular branches of our field. The idea would be to add significantly to the postings of CMOS position statements to our web site so that any of our members would be able to relay the consensus of Canada's top researchers to the media. I have written in a previous column of our relatively new links with the Science Media Centre of Canada, a non-profit organisation that helps journalists report on science issues, but it is my hope that individual members will also take the initiative with local media whenever possible. In my view this is one of the most important things we can do in the current circumstances to advance meteorology and oceanography in Canada. It is a job that no organisation can do better than CMOS.

CMOS is also extremely pleased to announce the creation of a Special Interest Group for the Arctic. This initiative was led by Martin Taillefer and recent CMOS President David Fissel. To quote from their proposal, it will "*serve as a focus for CMOS interests in the Arctic and Northern regions and act as an advisory body to the CMOS Council on matters related to the North. It will provide a forum for public, private, academic and even northern communities to work in support of Northern issues specifically related to meteorology, oceanography and the environment. The group will also be a forum to facilitate the publishing of materials and for the creation of a special track for the discussion of Northern environmental issues and the presentation of the results of scientific research at the Annual CMOS Congress*". CMOS bylaws require a minimum number of supporting members for the creation of a Special Interest Group and this was easily met in a very short time. As there is considerable interest in this important topic, we all look forward to following their activities in the years to come.

Special Interest Groups are perhaps an under-utilised way of concentrating our talents on particular issues within our science. We are over eight hundred members scattered mostly across Canada, but also in other countries. -->

**CMOS exists for the advancement of meteorology and oceanography in Canada.**

**Le but de la SCMO est de stimuler l'intérêt pour la météorologie et l'océanographie au Canada.**

What better way to coordinate efforts, organise workshops and Congress sessions, engage in public outreach and simply discuss results, theories and techniques with other like-minded professionals? They also provide an efficient mechanism for the Council to consult with groups of members on specific topics. I would encourage members to consider organising more of them.

As always, feedback is welcome.

Peter Bartello  
CMOS President / Président de la SCMO

### Next Issue CMOS Bulletin SCMO

Next issue of the *CMOS Bulletin SCMO* will be published in **February 2013**. Please send your articles, notes, workshop reports or news items before **January 4, 2013** to the address given on page 182. We have an URGENT need for your written contributions.

### Prochain numéro du CMOS Bulletin SCMO

Le prochain numéro du *CMOS Bulletin SCMO* paraîtra en **février 2013**. Prière de nous faire parvenir avant le **4 janvier 2013** vos articles, notes, rapports d'atelier ou nouvelles à l'adresse indiquée à la page 182. Nous avons un besoin URGENT de vos contributions écrites.

This publication is produced under the authority of the Canadian Meteorological and Oceanographic Society. Except where explicitly stated, opinions expressed in this publication are those of the authors and are not necessarily endorsed by the Society.

Cette publication est produite sous la responsabilité de la Société canadienne de météorologie et d'océanographie. À moins d'avis contraire, les opinions exprimées sont celles des auteurs et ne reflètent pas nécessairement celles de la Société.

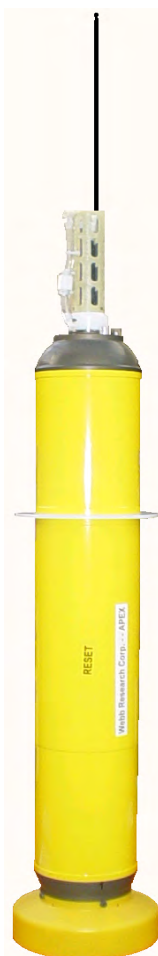
## News Flash

On Sunday, November 4<sup>th</sup>, the Argo float known by WMO ID 2901287 officially collected the one-millionth Argo profile. It was located in the Bay of Bengal, Indian Ocean. Launched by INCOIS (Indian National Centre for Ocean Information Services), it was the 147<sup>th</sup> profile supplied by this instrument, an APEX built by Teledyne Webb Research Corporation. The scientist responsible for the float is Muthalagu Ravichandran. Please read the full story on the following page.

## Dernière Heure!

Dimanche, le 4 novembre, le flotteur-profileur Argo WMO ID 2901287 a enregistré officiellement le millionième profil Argo. Il était à ce moment dans la baie de Bengal, océan Indien. Mis-à-l'eau par le INCOIS (Centre national indien pour les services d'information océanique), c'était le 147<sup>e</sup> profil océanographique fourni par cet instrument, un APEX construit par Teledyne Webb Research Corporation.

Muthalagu Ravichandran est le scientifique responsable pour ce profileur. Prière de lire l'article de l'équipe Argo à la page suivante.



A typical  
APEX Argo  
Float

## CMOS 2013 Photo Contest



All members with a photographic bent are invited to participate in the 2013 Photo Contest. Please submit your own original image files, either in colour or black and white, from scans of prints or digital capture of a meteorological or oceanographic subject, event, or phenomenon. Details on the photo contest can be found on the CMOS Web Page at:

<http://www.cmos.ca/photocontest.html>

## Meilleurs souhaits

C'est avec un grand plaisir que l'équipe éditoriale du *CMOS Bulletin SCMO* (Dorothy Neale, Qing Liao, Richard Asselin, Ian Rutherford et Paul-André Bolduc) complète ce dernier numéro du volume quarante (40) du *CMOS Bulletin SCMO*. Nous profitons également de l'occasion pour souhaiter à tous les membres de la SCMO de très joyeuses fêtes et une Bonne et Heureuse Année 2013.



## Best Wishes

It is with great pleasure that the *CMOS Bulletin SCMO* Editorial team (Dorothy Neale, Qing Liao, Richard Asselin, Ian Rutherford and Paul-André Bolduc) offers this last issue for Volume forty (40) of *CMOS Bulletin SCMO*. At the same time, we take this opportunity to wish all CMOS Members a joyous holiday season and a Happy New Year 2013.

## Concours photographique 2013 de la SCMO

Tous les membres qui ont une passion pour la photographie sont invités à participer au concours de photographie 2013 de la SCMO. Prière de soumettre vos photos numériques originales, soit en couleur, soit en noir et blanc, à partir de copie papier ou de fichier numérique portant sur des sujets ou phénomènes météorologiques ou océanographiques. Les détails du concours se trouvent sur le site web de la SCMO à l'adresse:



<http://www.cmos.ca/photocontest.html>

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**ARTICLES**

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**One million Argo float profiles**by the Canadian Argo Team<sup>1</sup>

**Abstract:** The Argo project has passed many thresholds starting with, in 2007, implementation of the original target of 3000 operating floats. The Argo armada remains fully operational and has moved well beyond the original target. Today it is gathering high-quality oceanographic profiles at the impressive rate of one every 4 minutes. In November of 2012 we will pass another of those notable numerical thresholds when the Argo array gathers its one millionth profile. This article summarises the current status of the Argo armada and, in particular, attempts a comparison with the view of the ocean offered by the World Ocean Database, at least, the part of the WOD that does not include Argo.

**Résumé:** Le projet Argo a traversé plusieurs étapes, à commencer par le déploiement, en 2007, des 3000 flotteurs-profilingers opérationnels prévus dès le départ. Aujourd'hui, l'"armada" Argo demeure entièrement fonctionnelle et s'étend bien au-delà de l'objectif original. De plus, elle recueille des profils océanographiques de haute qualité au rythme considérable d'un profil toutes les 4 minutes. En novembre 2012, nous atteindrons une autre étape marquante, quand le réseau Argo enregistrera son millionième profil. Cet article résume la situation actuelle de la flotte Argo et tente notamment une comparaison entre le portrait de l'océan offert par les données d'Argo et celui que présente la World Ocean Database (base de données océanographiques mondiales), du moins, sans les profils provenant d'Argo.

In 1999 a small group of physical oceanographers presented a plan to the OceanObs '99 conference that outlined a plan to deploy a global array of profiling floats. We estimated that 3000 would be enough to provide an even and useful density of floats world-wide. The project did receive global support, and so started the modern era of operational oceanography.

The original prospectus stated an intermediate objective of having a global array of 3000 instruments in place by some time in 2007 and this target was achieved on schedule. We are now maintaining a global array of about 3500 floats, the largest the array has ever been. The reason for this was unexpected. The population of floats at any time is governed by the rate of addition of floats to the array and the rate at which floats fail; the latter has shown a significant decrease. When we first planned the array we assumed a typical lifetime for a float of 4 to 5 years. The most recent generation of floats suggests a lifetime closer to 7 years and plans exist to extend lifetimes even further.

At the time of writing, Argo floats are gathering profiles at the impressive rate of about 1 profile every 4 minutes, which translates to 360 profiles per day or 11,000 per month. Most of these profiles are of high quality and resolution, and all include temperature and salinity to a depth of about 2000 metres. A simple calculation indicates that, assuming there are no catastrophic changes to the existing array in the very near future, the Argo project will collect its millionth profile some time in late November. Our current best estimate suggests this might happen on November 25<sup>th</sup>, 2012.

The upper panel of Figure 1 shows the current distribution of almost 1 million Argo profiles. The lower panel was derived by searching the World Ocean Database (2009 version) for all profiles that include both temperature and salinity and extend to at least 1000 metres depth. That produces a total of 534,905 profiles starting with the Challenger expedition in the 1870s.

It is apparent from Figure 1 that Argo does vastly better at providing an even coverage of the oceans of the world, with the significant exception of the Arctic Ocean. To quantify the difference we created the density maps shown in Figure 2, on the outside front cover of this issue. To create Figure 2 we simply counted the number of profiles in each 1° latitude by 1° longitude rectangle using 1 million Argo profiles (upper panel) and 534,905 WOD-2009 profiles. This view shows that in a few parts of the world oceans, the Kuroshio region close to Japan and the northern North Atlantic as examples, Argo is in fact not yet supplying notably more data than the World Ocean Database. However, the difference in the rest of the world is dramatic with the overall dominance of Argo sampling being extremely clear.

Argo floats largely overcome the well-known seasonal bias in ocean sampling. Let us define the northern "summer" as the 6 month period April through September and "winter" as the 6 month period October through March and invert the definitions for the southern hemisphere. We find in the World Ocean database that the profiles divide 61% and 39% between summer and winter. In the Argo array the equivalent figures are 50.2% and 49.8%.

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<sup>1</sup> **The Argo Team:** Howard Freeland, Denis Gilbert, Mathieu Ouellet, Anh Tran and Igor Yashayaev

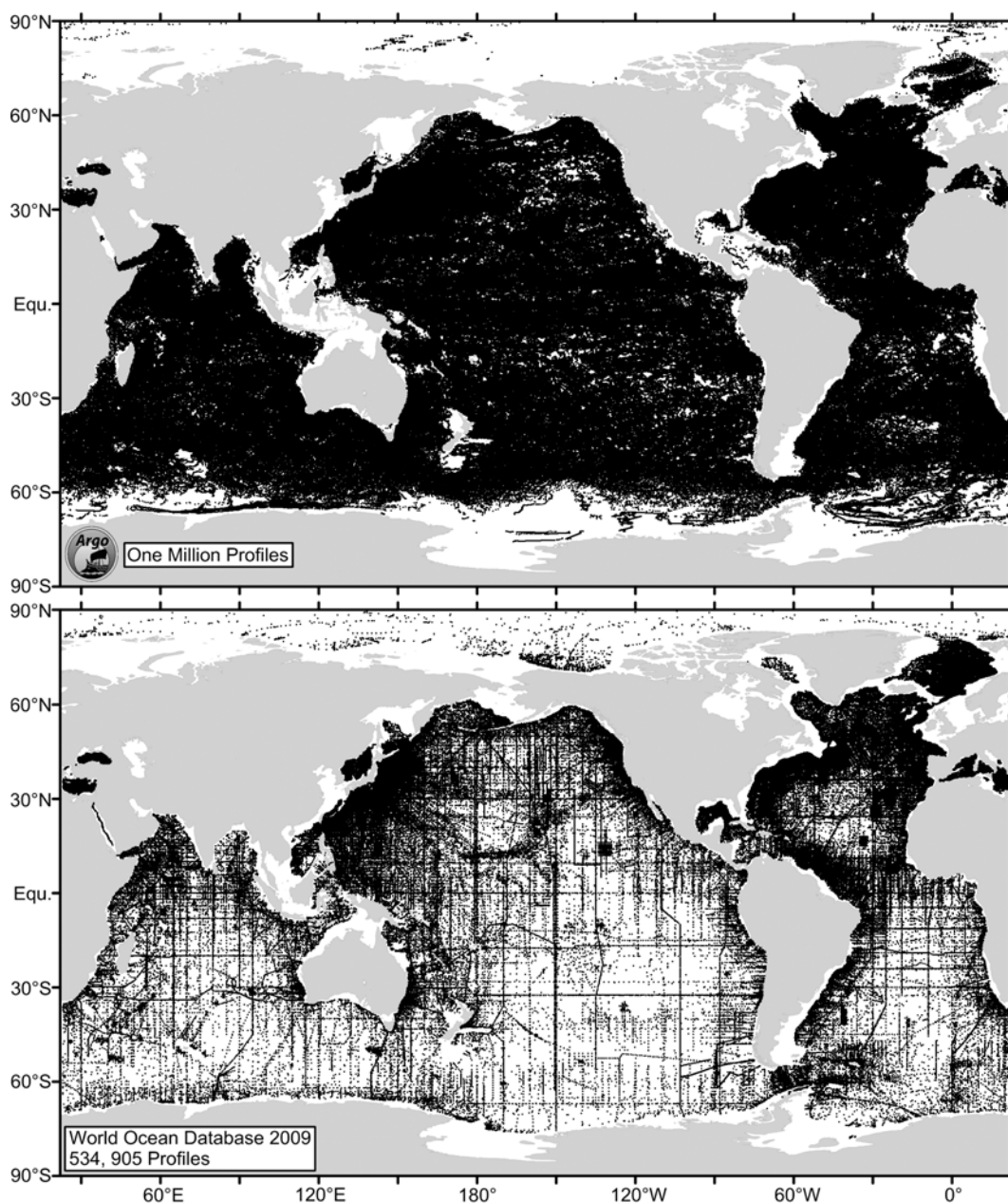


Figure 1: Upper panel shows 1 million (almost) Argo profiles and the lower panel shows 534,905 profiles from the World Ocean Database.

Note from the Editor: The one millionth profile was transmitted on November 4<sup>th</sup>. See the News Flash on page 184.

The improved coverage is made clearer in Figure 3 in which we count all of the profiles in Argo gathered south of 30°S and all of the WOD profiles which penetrate at least to 1000 decibars, include both temperature and salinity and were gathered south of 30°S.

The seasonal bias in the WOD is very clear with profiles per month varying between 7853 in February to 2001 in August, a ratio of almost 4:1. The Argo plot in contrast varies between 23397 and 18374 profiles, a ratio of 1.3:1. It is interesting that Argo has actually not succeeded in removing the seasonal bias completely, a low count in late austral winter persists though it is vastly better than the World Ocean Database. There are several reasons why a seasonal bias might persist. One explanation is that floats that get covered with ice may survive the ice season, but

will not return profiles. A second explanation is that floats still need to be deployed from vessels which themselves have a summer bias. Floats do have a high initial failure rate of perhaps 5%, with a small number supplying very few profiles. Few of these early failers will last into the winter months.

Argo data are now being used routinely for a wide range of oceanographic activities. Figure 4 shows the distribution of papers by year published in the refereed journals and that are predominantly dependant on Argo data or profiling float data; the count for 2012 is, of course, incomplete. But the story is a simple one, with the development of a global array that avoids seasonal biases and supplies vast quantities of free data, Argo has grown to dominate the world of physical oceanography.



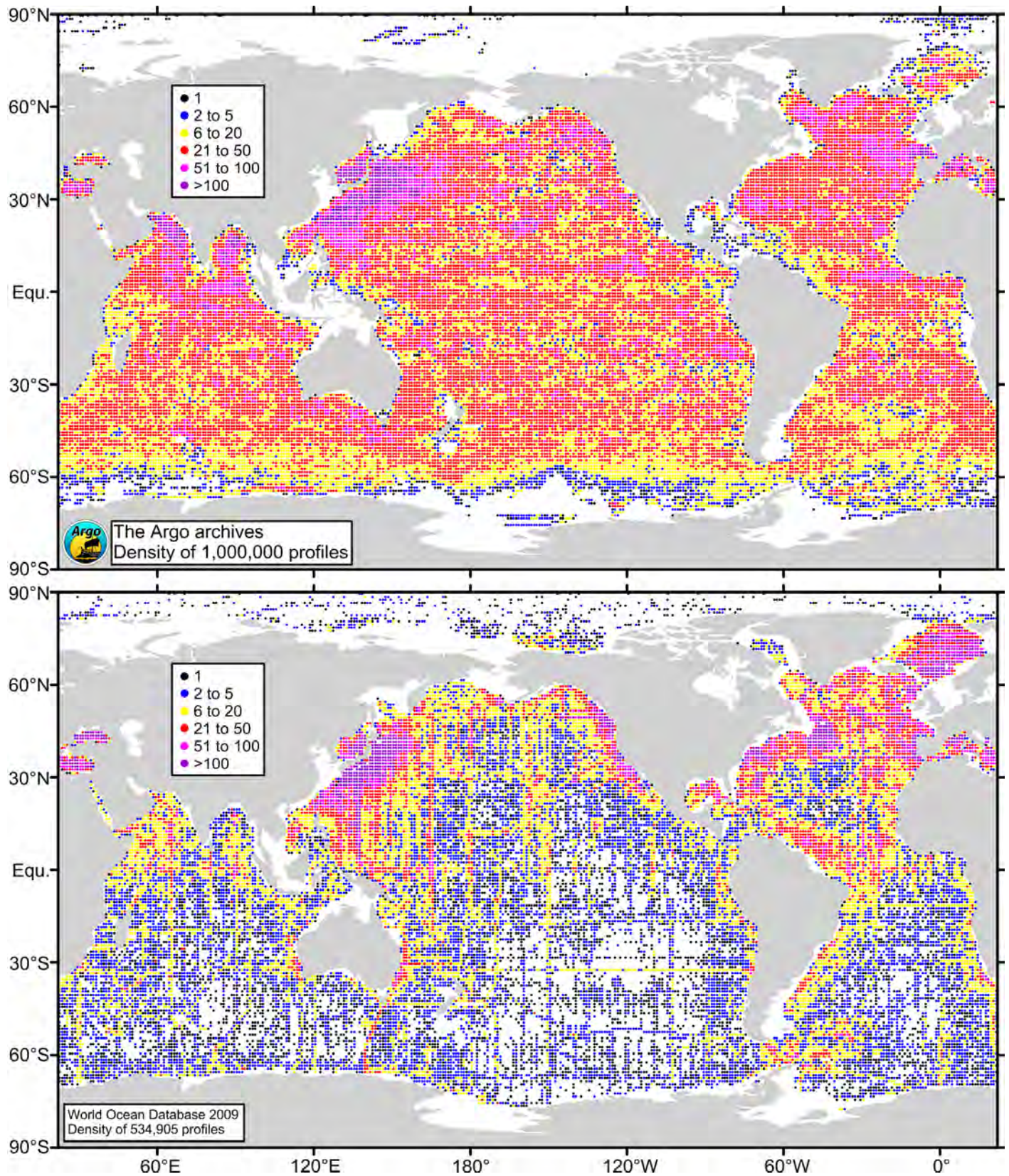


Figure 2: The upper panel shows the count of Argo profiles in each 1° square and the lower panel is the same count for profiles in the World Ocean Database. This figure is also shown in colour on the cover page.

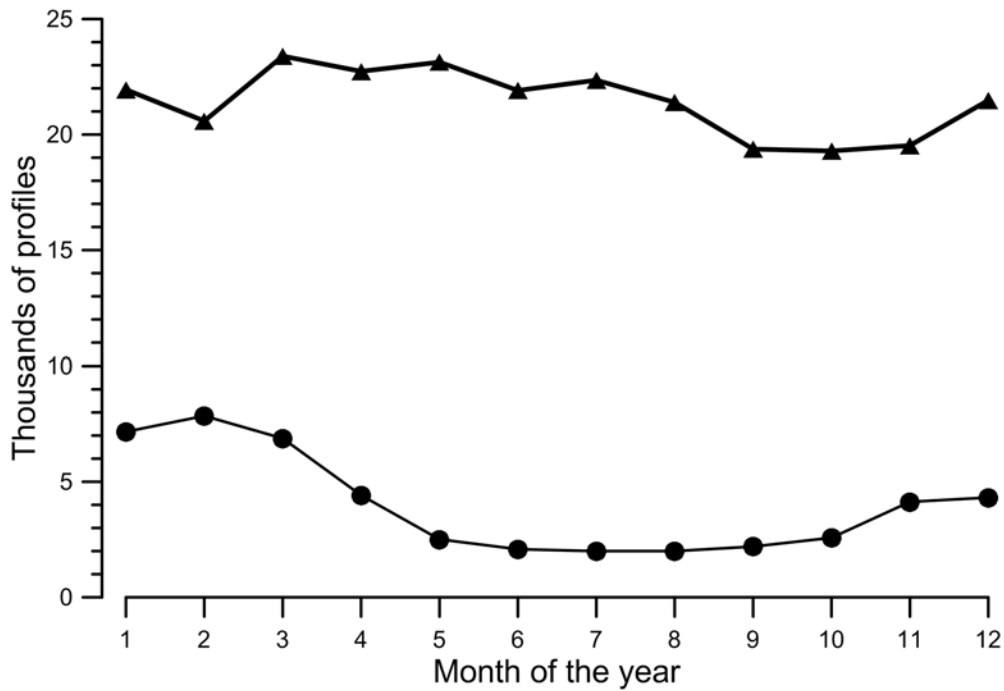


Figure 3: The number of Argo profiles (upper curve) and WOD profiles (lower curve) south of 30°S and sorted by month.

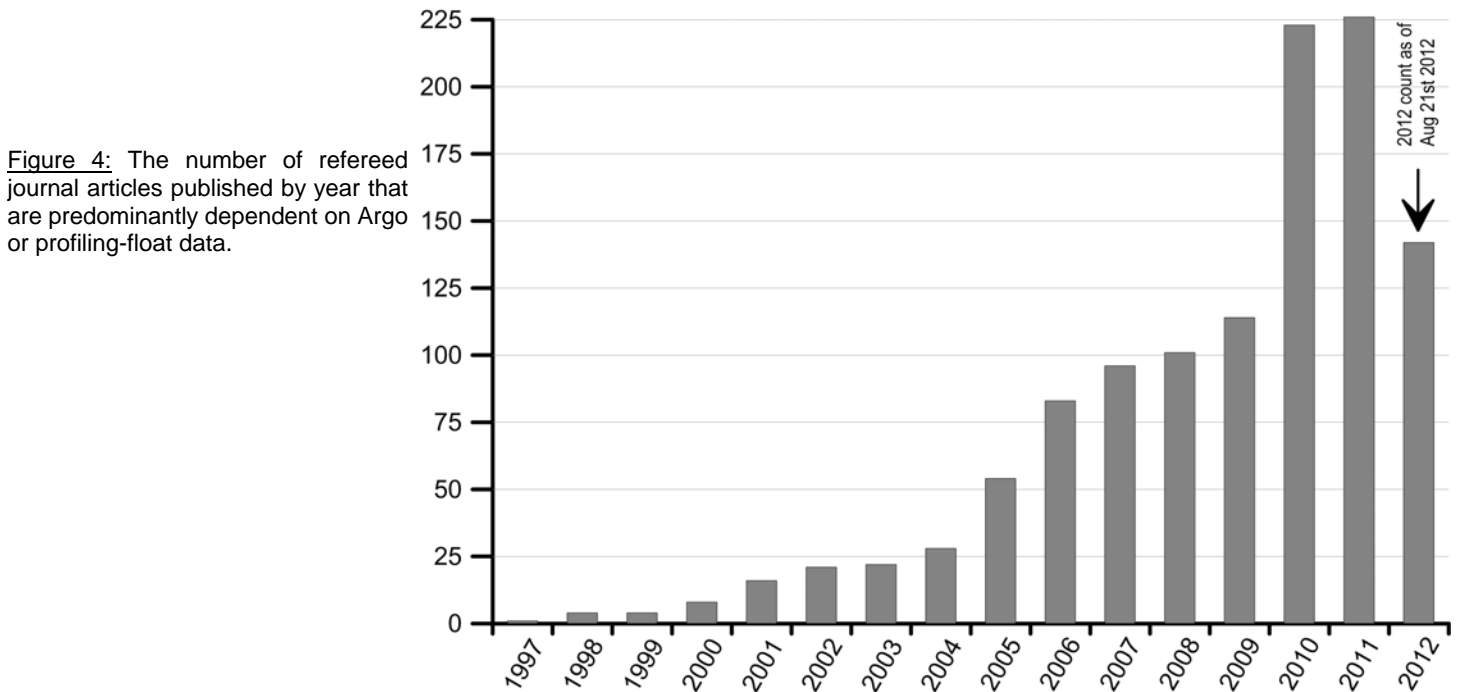


Figure 4: The number of refereed journal articles published by year that are predominantly dependent on Argo or profiling-float data.

Over the next few years Argo will change. Funding appears to be sufficiently secure that we are sure there will not be any major declines in the Argo array in the foreseeable future. Argo profiles have so far excluded the deep oceans, below 2000 decibars but this is going to change. Several groups are deploying floats that can profile to 6000 decibars. We do not imagine that deep floats will ever dominate the Argo global array, but perhaps 5 years from

now we might see a significant fraction of floats being deployed being capable of sampling abyssal waters. The other significant developments will involve the addition of sensors to Argo floats aimed at addressing the needs of biogeochemistry and improved ability to profile and survive in ice-infested waters.



## Key Findings from International Polar Year 2007-2008 at Fisheries and Oceans Bringing Science to Policy and Programs

### Dedication

DFO is honoured to dedicate this work to the late Marty Bergmann, Director of the Polar Continental Shelf Program (PCSP) at Natural Resources Canada and, for many years, a public servant with Fisheries and Oceans Canada. Marty's contribution to Arctic science is inestimable, far exceeding any role he undertook. Working with the PCSP, Marty welcomed thousands of visiting scientists, students and media to Canada's Arctic during International Polar Year. His enthusiasm for the North was boundless. He was taken from the family, the work and the country he loved too soon and tragically, at age 55, on August 20, 2011 in a plane crash at Resolute Bay, Nunavut. (See *CMOS Bulletin SCMO*, Vol.39, No.5, p.192)



Marty Bergmann at the Polar Continental Shelf Program Office, Resolute Bay, Nunavut, July 2010. Photo credit: Oksana Schimnowski.

### Strategic Overview

Canada is a polar nation, the second largest in the world, with the Arctic comprising approximately 40% of the country's 15 million square kilometre land mass and continental shelf.<sup>1</sup> The Canadian Arctic is facing unprecedented social, political, economic, environmental and cultural changes. Models indicate that the Arctic is among the most sensitive regions to environmental change and it is likely the Arctic will experience more rapid and severe climate change than any other region on Earth.<sup>2</sup>

Fisheries and Oceans Canada (DFO) has extensive regulatory and legislative roles and responsibilities in this vast region, for both marine and freshwater environments. In broad strokes, these include: fisheries, oceans and habitat management and conservation; mapping, charting and navigational aids; marine search and rescue; environmental disaster response; and protection of endangered species.

International Polar Year (IPY) — the fourth since the late 1800s — offered an opportunity for scientists from around the world to collaborate and advance scientific knowledge. This cross-sectoral and international collaboration has been a hallmark of all IPY projects; it is also vital to Canada's role and leadership in both scientific and diplomatic forums with the potential to affect the Canadian Arctic.

Of the 52 Canadian IPY Program projects, DFO principal investigators led or co-led seven of the largest projects and participated in an additional seven all within the climate change theme. DFO's IPY research highlights the interactive physical environmental processes in the Arctic, and provides insight on the linkages and sensitivities within this ecosystem. Evidence gathered through these projects is contributing significantly to our understanding of the Arctic Ocean: how rapidly it is changing, the vital role it plays in regulating global climate and, in turn, how global climate change is affecting our own vulnerable Arctic ecosystems.

IPY early research results are directly relevant to all three DFO strategic outcomes<sup>3</sup> and will continue to contribute as further analysis and use is made of gathered data. Critical knowledge garnered through IPY research will support decision-making related to commercial fishery quotas and subsistence harvesting levels, as well as support other resource and habitat management decisions (both marine and freshwater). Results have already been used by Canadian trade negotiators in reaching a deal with China on seal products and are providing critical new data for predictive modelling, including severe weather scenarios, ecosystem sustainability, potential impacts of natural or man-made disasters and the effects of climate change.

Scientific research and inquiry often leads to the early identification of emerging issues or critical insights into a changing world. This "early warning" is helpful from a policy perspective, as it provides an opportunity to reflect on current and planned policy, as well as upcoming legislative or regulatory changes, to assess relevance and applicability now and into the future.

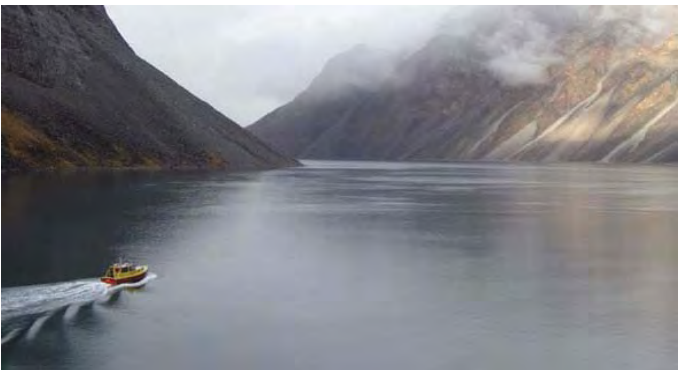
The interconnectivity and sensitivity of the entire Arctic environment means that small observable changes in climate produce cascading effects with real costs — economic, social and environmental. A warming Arctic does bring potential access to additional species (shifting north as a result of water temperature rises). However, this same change may also bring new diseases to existing species, introduce alien invasive species and increase the number of predators, all of which can quickly and easily disrupt the Arctic food web and affect critical food sources for Northerners.

**Note from the Editor:** The full article is available on DFO's website at: <http://dfo-mpo.gc.ca/science/publications/ipy-api/ipy-api-eng.html>





**Figure Caption:** The Fednav Group operates Umiak I, a 31,500-tonne icebreaking bulk carrier that makes 12 voyages each year to move 360,000 tonnes of nickel concentrates from Vale NL Ltd.'s Voisey's Bay mine in northern Labrador for processing at Vale smelters in Sudbury, Ontario and Thompson, Manitoba, and eventually its nickel refinery in Long Harbour, NL. There is no bulk carrier more powerful, and it is capable of breaking ice one and a half metres thick at a speed of three knots. Ships like this are designed, built and equipped to resist ice loads, and to handle Arctic weather and operating conditions. Arctic shipping in Canada is governed by legislation, including the Arctic Waters Pollution Prevention Act and its regulations, the Canada Shipping Act 2001, the Marine Liability Act, and the Marine Transportation Security Act, among other legislation. Ship owners and operators must ensure that they comply with all applicable Acts and regulations, such as the carriage of nautical charts from the Canadian Hydrographic Service. Canadian construction standards for ice class ships are found in the Arctic Shipping Pollution Prevention Regulations.



**Figure caption:** The Canadian Hydrographic Service works hard to survey and chart key channels in Canada's Arctic. Among its tools is the CSL Heron, a launch for hydrographic and geophysical surveying. To help understand coastal erosion and storm impacts, among other studies undertaken during International Polar Year, the CSL Heron was used to collect sediment samples and to acquire multibeam sonar data from coastal areas. It is seen here in Oliver Sound in the high Arctic, near the north end of Baffin Island. The remote, uninhabited waterway is part of Sirmilik National Park, and the nearest community is Pond Inlet, population 1500.

IPY modelling has revealed some surprises, including a future scenario in which current marine mammal populations in Hudson Bay will be replaced by temperate species as the climate continues to warm and sea ice is lost. Declines in seal abundance, for example, have already led to reductions in food sources for polar bears. At the same time, killer whales have now replaced humans as the top predator in Hudson Bay, leading to increased predation on traditional Inuit subsistence mammals. Further research will be essential given the potential impact on, for example, harvests and the potential implications for subsistence fishery resources available for local communities.

The potential use of the Northwest Passage as an international shipping route is a hotly debated topic as sea ice loss and thinning continue. Will it ever be economically viable? What are the risks, both human and environmental? What pressures will it place on DFO resources for icebreaking, search and rescue, and environmental response? More certain is the likelihood of increased resource exploration and development, and expanding ecotourism, both of which have potential in terms of economic development, but carry considerable environmental and disaster-response implications. IPY research results have strengthened the evidence base and are now validating and improving modelling systems that support decision-making and related risk-based planning by providing not only new data for modelling, but also greater understanding of the integration and interaction between the critical environmental factors, namely ocean, ice, wave and atmospheric systems.

The vastness of the Arctic region, its remoteness and the limited time in which most research can take place challenge our ability to ensure sufficient scientific research and analysis to support evidence-based decision-making. This emerging area of national focus must be balanced against the ongoing needs in "southern" Canadian coasts and inland waters. Balance must also be struck between science that supports economic development in this "new" frontier and science that supports conservation and sustainability of the fragile environment.

Focused injections of funding to support Arctic research, such as this most recent International Polar Year, make a significant contribution to global understanding of the North and the effects of climate change in particular. That said, as the results of the research continue to contribute to our understanding of the Arctic, as data are incorporated into modelling systems and research results are correlated and shared across projects and across nations, decision-makers will still not have all the information and scientific advice they need: demand has already outpaced supply. Baseline data and early warnings become truly useful as subsequent research establishes trends with more certainty; suspicions about habitat changes, and stock shifts and numbers are confirmed or refuted; and evidence — much of which is dependent on monitoring and access to ships — becomes

available that is solid enough on which to base decisions.



**Figure caption:** CCGS Henry Larsen, support vessel to the IPY CAT study, Petermann Fjord, 20 August 2009. The tiny waterfall is actually 200m high! The glacier is unnamed. This majestic fjord is more than 1100 m deep and bordered by cliffs rising sheer to 900m above sea level. It harbours a stream of ice that flows off the Greenland ice cap to form a floating ice shelf, 20 km wide and 70 km long. Since 90% of its original 600m thickness melts locally, the shelf contributes to fresh-water flow down Nares Strait, the central focus of CATs. Here the CATs' team completed surveys to find and sample the emerging melt water.

Photo credit: DFO.

There are some who look to the proposed Canadian High Arctic Research Station as a means to fill some of this knowledge need and, indeed, it is expected to help maintain a focus on Northern science. Nevertheless, DFO — and other federal departments — will need to consider what legacy will be built from IPY and how best to leverage the work done internationally, as well as domestically, to support a sustainable and economically prosperous Arctic.

#### End Notes:

1) Hik, David S.; Kraft Sloan, Karen. "Putting the Canadian Polar House in Order." *Arctic* 57 (2), 2004.

2) Arctic Council and International Arctic Science Committee (IASC). "Arctic Climate Impact Assessment." New York: Cambridge University Press, 2005.

3) DFO's three strategic outcomes are: Economically Prosperous Maritime Sectors and Fisheries; Sustainable Aquatic Ecosystems; and Safe and Secure Waters.

## Principaux résultats de l'Année polaire internationale 2007-2008 à Pêches et Océans Canada : les sciences au service des politiques et des programmes

### Dédicace

Le MPO a l'honneur de dédier le présent rapport à feu Marty Bergmann, directeur du Programme du plateau continental polaire (PPCP) à Ressources naturelles Canada et, pendant de nombreuses années, fonctionnaire au ministère des Pêches et des Océans. La contribution de Marty aux sciences arctiques est inestimable, bien au-delà des exigences des postes qu'il a occupés. Alors qu'il travaillait au PPCP, Marty a accueilli des milliers de chercheurs, étudiants et représentants des médias en visite dans l'Arctique canadien pendant l'Année polaire internationale. Il nourrissait un enthousiasme sans bornes pour le Nord. Il a péri tragiquement à l'âge de 55 ans dans l'accident d'avion survenu à Resolute Bay, au Nunavut, le 20 août 2011. Sa famille, ses collègues et ce pays qu'il aimait tant le pleurent. (Voir *CMOS Bulletin SCMO*, Vol.39, No.5, p.192).



Marty Bergmann au bureau du Programme du plateau continental polaire, à Resolute Bay, au Nunavut, en juillet 2010. Photo gracieuseté de Oksana Schimnowski.

### Aperçu stratégique

Le Canada est la deuxième plus grande nation polaire au monde, l'Arctique représentant environ 40 p. 100 de sa masse terrestre et de son plateau continental, d'une superficie de 15 millions de kilomètres carrés. L'Arctique canadien est en butte à des changements sans précédent sur le plan social, politique, économique, environnemental et culturel. Si l'on en croit les modèles, l'Arctique est l'une des régions du monde les plus vulnérables aux changements environnementaux et c'est probablement

l'Arctique plus que toute autre région de la planète qui sera touché plus rapidement et plus gravement par le changement climatique.

Le ministère des Pêches et des Océans (MPO) assume d'importants rôles et responsabilités réglementaires et législatifs dans cette vaste région, tant en ce qui concerne le milieu marin que le milieu dulcicole. Il s'occupe entre autres de la gestion et de la protection des pêches, des



océans et des habitats; de la cartographie, de l'établissement de cartes marines et des aides à la navigation; de la recherche et du sauvetage en mer; de l'intervention environnementale en cas de catastrophe écologique; et de la protection des espèces en voie de disparition.

L'Année polaire internationale (API) – la quatrième depuis la fin du XIX<sup>e</sup> siècle – a offert aux chercheurs des quatre coins du globe la possibilité de collaborer et de faire progresser les connaissances scientifiques. Cette collaboration intersectorielle et internationale est une caractéristique de tous les projets de l'API; elle est également essentielle au rôle et au leadership du Canada dans les tribunes scientifiques et diplomatiques susceptibles d'avoir des répercussions sur l'Arctique canadien.

Sur les 52 projets scientifiques de l'API financés sous l'égide du Programme de l'API, les chercheurs principaux du MPO en ont dirigé ou codirigé sept des plus grands et ont participé à sept autres, tous ces projets ayant pour thème le changement climatique. La recherche menée par le MPO dans le cadre de l'API met en évidence les processus interactifs du milieu physique dans l'Arctique et permet de comprendre les liens et les vulnérabilités dans cet écosystème. Les données scientifiques recueillies dans le cadre de ces projets nous aident beaucoup à comprendre l'océan Arctique, la rapidité avec laquelle il change, le rôle vital qu'il joue dans la régulation du climat mondial et, dès lors, la mesure dans laquelle les changements climatiques influent sur nos propres écosystèmes arctiques vulnérables.

Les résultats des premières recherches réalisées dans le cadre de l'API concernent directement les trois résultats stratégiques du MPO et continueront à y contribuer à mesure que l'on analyse et utilise les données recueillies. Les connaissances très importantes acquises dans le cadre de la recherche menée pendant l'API appuieront la prise de décisions relatives aux quotas de pêche commerciale et aux niveaux de pêche de subsistance, ainsi que d'autres décisions touchant la gestion des ressources et de l'habitat (marins et dulcicoles). Les négociateurs commerciaux canadiens ont déjà utilisé les résultats pour conclure une entente avec la Chine à propos des produits du phoque. Ces résultats fournissent également de nouvelles données cruciales en vue de la modélisation prédictive, y compris les scénarios de temps violent, la durabilité des écosystèmes, les répercussions éventuelles des catastrophes naturelles ou anthropiques et les effets du changement climatique. (La partie II du présent rapport renferme de l'information détaillée sur les principaux résultats et constatations des projets menés par le MPO dans le cadre de l'API.)

La recherche et les études scientifiques permettent souvent de déceler rapidement de nouveaux problèmes ou de bien comprendre le monde en évolution. Cette "alerte rapide" est utile du point de vue stratégique, car elle donne la

possibilité de réfléchir aux politiques en vigueur et aux politiques prévues, ainsi qu'aux prochains changements législatifs et réglementaires, pour évaluer la pertinence et l'applicabilité, maintenant et demain.



Légende: Le navire NGCC Henry Larsen, qui a appuyé l'Étude des eaux traversant l'archipel canadien, dans le cadre de l'API, dans le fjord Petermann, le 20 août 2009. La minuscule chute a en réalité 200 mètres de hauteur. Le glacier n'a pas de nom. Ce majestueux fjord, qui a plus de 1 100 mètres de profondeur, est bordé de falaises qui s'élèvent abruptement à 900 mètres au-dessus du niveau de la mer. Il abrite un fleuve de glace qui s'écoule du champ de glace du Groenland pour former une plateforme de glace flottante qui mesure 20 km de largeur sur 70 km de longueur. Comme cette plateforme perd 90 % de son épaisseur originale de 600 mètres en fondant sur place, elle contribue à l'apport eau douce dans le détroit de Nares, point névralgique de l'Étude. En ce lieu, l'équipe de l'Étude a effectué des relevés pour échantillonner l'eau de fonte. Photo gracieuseté du MPO

En raison de l'interconnectivité et de la sensibilité de tout le milieu arctique, les petits changements climatiques que l'on peut observer ont des effets d'entraînement sur les coûts réels – économiques, sociaux et environnementaux. Le réchauffement de l'Arctique permet à d'autres espèces (qui se déplacent vers le Nord en raison de l'augmentation de la température de l'eau) d'avoir accès à la région. Toutefois, ce même changement peut également apporter des nouvelles maladies aux espèces existantes, introduire des espèces exotiques envahissantes et accroître le nombre de prédateurs, qui peuvent tous rapidement et facilement perturber le réseau trophique de l'Arctique et toucher des sources de nourriture essentielles pour les habitants du Nord.

La modélisation de l'API a révélé des surprises, entre autres un scénario futur où les populations actuelles de mammifères marins de la baie d'Hudson seront remplacées par des espèces des zones tempérées à mesure que le climat continuera de se réchauffer et que la glace marine disparaîtra. Le déclin de l'abondance du phoque, par exemple, a déjà donné lieu à des réductions des sources de nourriture pour les ours polaires. Au même moment, l'épaulard a supplanté l'être humain comme principal



prédateur dans la baie d'Hudson, ce qui a fait augmenter la prédation visant les mammifères traditionnellement chassés par les Inuits à des fins de subsistance. D'autres recherches seront indispensables, compte tenu des répercussions possibles, par exemple, sur les prises et les ressources halieutiques pêchées par les collectivités locales à des fins de subsistance.

L'utilisation possible du passage du Nord-Ouest comme route de navigation internationale suscite de vifs débats publics à mesure que la glace marine s'amincit et disparaît. Sera-t-il jamais rentable? Quels sont les risques, tant humains qu'environnementaux? Quelles pressions exercera-t-il sur les ressources du MPO pour ce qui est du déglacement, de la recherche et du sauvetage et de l'intervention environnementale? Il est par contre plus probable que l'exploration et l'exploitation des ressources s'intensifient et que l'écotourisme prenne de l'expansion, ce qui, dans les deux cas, stimule le développement économique, mais a d'importantes répercussions sur le plan de l'environnement et de l'intervention en cas de catastrophe. Les résultats de la recherche menée dans le cadre de l'API ont enrichi la base de données scientifiques et valident et améliorent maintenant les systèmes de modélisation qui appuient la prise de décisions et la planification connexe axée sur les risques non seulement en fournissant de nouvelles données pour la modélisation, mais en permettant aussi de mieux comprendre l'intégration et l'interaction des facteurs environnementaux critiques, à savoir l'océan, la glace, les vagues et les systèmes atmosphériques.



**Légende:** La vedette Heron dans la baie *Oliver*. Le Service hydrographique du Canada (SHC) travaille fort pour lever et cartographier les principaux chenaux dans l'Arctique canadien. Entre autres outils, il utilise la vedette CSL Heron, employée pour les levés hydrographiques et géophysiques. Pour mieux comprendre les répercussions de l'érosion côtière et des tempêtes, qui ont fait l'objet d'études menées durant l'Année polaire internationale, le SHC a utilisé le CSL Heron pour prélever des échantillons de sédiments et recueillir des données sur les zones côtières à l'aide de l'échosondeur multifaisceaux. On voit la vedette ici dans la baie Oliver dans le Haut-Arctique, près de l'extrémité nord de l'île de Baffin. Cette voie navigable inhabitée et éloignée fait partie du parc national Sirmilik, et la collectivité la plus proche est Pond Inlet, qui compte 1 500 habitants. Photo gracieuseté du Service hydrographique du Canada.

L'immensité de la région arctique, son éloignement, et le calendrier de recherche souvent restreint pendant lequel la plupart des recherches peuvent être effectuées entravent notre capacité à effectuer des recherches et analyses scientifiques suffisantes pour appuyer la prise de décisions reposant sur des données scientifiques. Il faut trouver un compromis entre cette nouvelle priorité nationale et les besoins continus à l'égard des côtes et eaux intérieures "méridionales" du Canada. Il faut également concilier les activités scientifiques qui appuient le développement économique dans cette "nouvelle" terre en friche et les activités scientifiques qui appuient la protection et la durabilité de ce milieu fragile.

L'investissement ciblé à l'appui de la recherche arctique, comme cette toute récente Année polaire internationale, contribue grandement à la compréhension générale du Nord et des effets du changement climatique en particulier. Par ailleurs, comme les résultats de la recherche nous permettent encore de mieux comprendre l'Arctique, étant donné que les données sont incorporées dans les systèmes de modélisation et que les résultats de la recherche sont mis en corrélation et communiqués entre les projets et entre les nations, les décideurs n'auront pas encore toute l'information et les opinions scientifiques dont ils ont besoin : la demande a déjà dépassé l'offre. Les données de base et les alertes rapides deviennent vraiment utiles à mesure que la recherche subséquente établit les tendances avec plus de certitude, que l'on confirme ou réfute les chiffres et les soupçons concernant les changements touchant l'habitat et les déplacements des stocks, et que les données scientifiques – dont bon nombre dépendent de la surveillance et de l'accès aux navires – deviennent disponibles et sont suffisamment solides pour que l'on y fonde les décisions. Certains considèrent le projet de Station de recherche du Canada dans l'Extrême-Arctique comme un moyen de combler en partie ces besoins en connaissances et, en fait, il devrait continuer à privilégier la recherche scientifique sur le Nord. Néanmoins, le MPO – et d'autres ministres fédéraux – devront se demander quel sera l'héritage de l'API et quelle est la meilleure façon de tirer parti des travaux menés au pays et à l'échelle internationale, à l'appui d'un Arctique durable et prospère sur le plan économique.

#### Notes:

- 1) Hik, David S. et Karen Kraft Sloan. « Putting the Canadian Polar House in Order », dans *Arctic*, vol. 57, n° 2, 2004.
- 2) Conseil de l'Arctique et International Arctic Science Committee (IASC). *Arctic Climate Impact Assessment*, Cambridge University Press, New York, 2005.
- 3) Les trois résultats stratégiques du MPO sont : prospérité économique des secteurs maritimes et des pêches; écosystèmes aquatiques durables; et eaux sécuritaires et protégées.

**Note du Rédacteur:** Cet article en entier est disponible sur le site web du MPO à: <http://dfo-mpo.gc.ca/science/publications/ipy-api/ipy-api-fra.html>

**ATMOSPHERE-OCEAN @ 50<sup>1</sup>**by John D. Reid<sup>2</sup>

This preface was published in Volume 50, a milestone for *Atmosphere-Ocean* and an opportunity to reflect on achievements, acknowledge those who made them happen, take stock and look ahead to where the ambitions of the editors, the Canadian Meteorological and Oceanographic Society (CMOS) and publisher Taylor & Francis are taking the journal.

**Past**

Publications by Canada's atmospheric scientists long had to find a place in specialist foreign journals such as the Quarterly Journal of the Royal Meteorological Society (QJRMS) or the Journal of Meteorology. In Canada a few were published in the generic Transactions and Proceedings of the Royal Society of Canada. That changed in 1950. The Canadian Branch of the Royal Meteorological Society began publishing occasional papers, and there were compilations of conference proceedings. All of the scientific articles published by the Canadian Branch are now available on the CMOS web site.

By 1963 membership of the Branch had grown to the point where there was an expectation that a regular publication could be sustained. The first issue of *Atmosphere* appeared in a 6 by 9 inch format. It was not a scientific journal but a "*Bulletin of Canadian Meteorology*." The first article was "*Arctic Winter*" by Branch president Byron W. Boville, with Svenn Orvig the first editor, both of McGill University. Each of the first four volumes had three issues with a gradually increasing page count.

Jim McCulloch assumed the editorial role upon formation of the Canadian Meteorological Society in 1967. Members would no longer be receiving the QJRMS which had been a benefit of Canadian Branch membership, and *Atmosphere* was tasked with picking up some of that role. It was also hoped it could develop a broader appeal beyond the Society membership. There was a new cover, logo, larger format and a switch to quarterly publication.

Ed Truhlar took over as editor for volume 7 (1969), introducing a new format and a cover in a graduated shade of blue, the inspiration for the current cover, with volume 9. A society newsletter instituted in 1972, forerunner of the *CMOS Bulletin SCMO*, reduced the need to carry Society news in *Atmosphere*. Ed Truhlar retired from the role of editor in 1974 while continuing as technical editor until 1994

becoming the longest serving member of the editorial team.

Ian Rutherford took over as editor from volume 12 and instituted full peer review. Jacques Derome edited three issues. Finding quality content for the early volumes was a struggle; credibility grew gradually. A paper in volume 14 "*The distinction between canopy and boundary-layer urban heat islands*" by Tim Oke is still one of the most requested from the journal.

In 1977 atmospheric and oceanographic scientists joined forces to form CMOS. Physical oceanographers could now publish in the Society journal and were no longer limited to foreign journals, such as *Limnology and Oceanography*. *Atmosphere* was renamed *Atmosphere-Ocean* with a modified cover design to include the ocean. Tim Oke as editor guided the transformation starting with the final issue of volume 15.

Leaders from the membership continued to build the journal. Henry Leighton was editor from volume 18(3) after which coeditors for meteorology and oceanography were appointed: Phil Merilees and Fred Dobson from volume 21(3); Gordon McBean and Howard Freeland from 24(4); Roger Daley and William Crawford from 27(3). Colour figures made an early appearance in volume 28(1).

Starting with volume 30(3), when Charles Lin and Peter Smith became co-editors, terms have been somewhat staggered. Peter Bartello replaced Lin with volume 33(3); Dan Wright served from volume 34(1); Rick Marsden from 36(1); Steven Lambert from 36(3). With volume 39 the journal switched to the present 8½ by 11 inch format.

Patrick Cummins replaced Marsden as of volume 41(3); Andrew Bush replaced Lambert for 43(4) and Denis Gilbert replaced Cummins for 46(1) and was in turn replaced by Guoqi Han for 48(2). William Hsieh replaced Bush for 48(3). With increasing activity a third editor position, for climate science, was created and taken by Hsieh as of volume 50(3) when Douw Steyn was appointed for meteorology and hydrology.

Associate editors and reviewers play a vital role in the journal's success, but space does not permit naming all those who have filled these roles. Two long-serving members of the publications team, still at work, merit

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<sup>1</sup> John D. Reid (2012): *ATMOSPHERE-OCEAN @ 50*, *Atmosphere-Ocean*, DOI:10.1080/07055900.2012.737180

<sup>2</sup> Past-President, CMOS (1997–98)





**ATMOSPHERE-OCEAN @ 50<sup>3</sup>**par John D. Reid<sup>4</sup>

La préface de ce numéro conclut le volume 50, une étape importante pour *Atmosphere-Ocean* et représente l'occasion de réfléchir sur les réalisations, de reconnaître ceux qui les ont rendues possibles, de faire le point et de déterminer la direction qu'emprunteront les rédacteurs en chef, la Société canadienne de météorologie et d'océanographie (SCMO) et le diffuseur Taylor & Francis pour la revue.

**Passé**

Les publications des experts en sciences atmosphériques du Canada avaient longtemps cherché à faire leur place dans les revues spécialisées étrangères comme le *Quarterly Journal of the Royal Meteorological Society* (QJRMS) ou le *Journal of Meteorology*. Au Canada, quelques-unes sont parues dans Mémoires et délibérations de la Société royale du Canada. Cette situation a changé en 1950. La Branche canadienne de la Royal Meteorological Society a commencé à publier occasionnellement des articles et des résumés de conférences. Tous les articles scientifiques publiés par la Branche canadienne sont maintenant offerts sur le site Web de la SCMO.

En 1963, le nombre de membres de la Branche avait augmenté au point où ceux-ci s'attendaient à ce que des parutions régulières puissent être assurées. Le premier numéro d'*Atmosphere* est paru dans un format de 6 po par 9 po. Il ne s'agissait pas d'une revue scientifique, mais d'un "Bulletin de la météorologie au Canada". Le premier article était intitulé "Arctic Weather" et était signé par le président de la Branche, Byron W. Boville, avec Svenn Orvig comme rédacteur en chef, les deux provenant de l'Université McGill. Les quatre premiers volumes étaient composés de 3 numéros dont le nombre de pages a progressivement augmenté.

Jim McCulloch assumait la fonction de rédacteur en chef lors de la création de la Société canadienne de météorologie en 1967. Les membres n'allaient plus recevoir le QJRMS, qui avait constitué un avantage de l'adhésion à la Branche canadienne, et *Atmosphere* fut chargée de reprendre en partie ce rôle. On espérait également réussir à atteindre un public plus large que les seuls membres de la Société. La couverture, le logo et le format de la revue furent modifiés et la publication allait maintenant s'effectuer sur une base trimestrielle.

Ed Truhlar prit la relève à titre de rédacteur en chef pour le volume 7 (1969), et il procéda à l'introduction d'un nouveau format et d'une nouvelle couverture comportant une gradation de bleu, l'inspiration derrière la couverture actuelle, avec le volume 9. Une lettre de nouvelles de la société, mise en oeuvre en 1972 et précurseur du *CMOS Bulletin SCMO*, a minimisé le besoin de publier les nouvelles sur la société dans *Atmosphere*. Ed Truhlar a quitté son poste de rédacteur en chef en 1974, mais il a continué à travailler comme rédacteur technique jusqu'en 1994, devenant ainsi le membre de l'équipe éditoriale ayant servi le plus longtemps.

Ian Rutherford est ensuite arrivé comme rédacteur en chef dès le volume 12 et il a introduit l'examen complet par les pairs. Jacques Derome a édité trois publications. Trouver du contenu de qualité pour les premiers volumes représentait un défi important, cependant la crédibilité de la revue a progressivement augmenté. Un article paru dans le volume 14, "*The distinction between canopy and boundary layer urban heat islands*" par Tim Oke, demeure un des articles de la revue les plus consultés à ce jour.

En 1977, les intéressés en sciences atmosphériques et en sciences océanographiques ont uni leurs forces pour former la SCMO. Les océanographes physiciens pouvaient maintenant publier dans la revue de la société et n'allaient plus être limités à publier dans les revues étrangères, comme *Limnology and Oceanography*. *Atmosphere* fut rebaptisée *Atmosphere-Ocean* et la couverture modifiée pour y inclure l'océan. En tant que rédacteur en chef, Tim Oke a mené à bien la transformation dès le dernier numéro du volume 15.

Les chefs de file des membres ont continué à développer la revue. Henry Leighton a été nommé rédacteur en chef à partir du volume 18(3), puis deux corédacteurs en chef ont été nommés pour la météorologie et l'océanographie: Phil Merilees et Fred Dobson à partir du volume 21(3); Gordon McBean et Howard Freeland à partir de 24(4); Roger Daley et William Crawford à partir de 27(3). Les images en couleurs sont apparues dès le volume 28(1).

À partir du volume 30(3), où Charles Lin et Peter Smith sont devenus corédacteurs, la durée des mandats a été légèrement décalée. Peter Bartello a remplacé Lin pour le volume 33(3); Dan Wright à partir du volume 34(1); Rick

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<sup>3</sup> John D. Reid (2012): *ATMOSPHERE-OCEAN @ 50*, *Atmosphere-Ocean*, DOI:10.1080/07055900.2012.737180.

<sup>4</sup> Ex-Président, SCMO (1997–98)



## REPORTS / RAPPORTS

### New Special Interest Group on the Arctic (Arctic SIG)

Under the leadership of **David Fissel**, ASL Environmental Sciences Inc and **Martin Taillefer**, Maritime Way Scientific Inc, a new Special Interest Group (SIG) has been proposed and approved by CMOS Council last September. **Vera Reifenstein**, Maritime Way Scientific Inc, and **Ann MacMillan**, Storm Consulting Services, are the Arctic SIG Managers. At the time of submission, more than forty members have expressed their interest in this new SIG.

#### Terms of Reference

1. In accordance with CMOS Bylaw #5 dealing with Special Interest Groups and recognizing that Canada's North is emerging as an important area for applications of meteorological, oceanographic and related knowledge and data, a special interest group on the Arctic (Arctic SIG) will serve as a focus for CMOS interests in the North.

#### 2. Objectives of the group include

i) Handling of CMOS interests related to the Arctic in a consistent and transparent manner.

ii) Acting as an advisory group to the National Executive Council and membership in discussions between CMOS and others on matters related to Canada's Arctic and Northern Regions.

iii) Developing awareness of the importance of meteorology, oceanography and related science to Northern development and Arctic environmental changes and issues.

iv) The engagement and communication with Northern groups and communities about Arctic meteorological, oceanographic and environmental issues, data and scientific studies.

v) Create a neutral forum by which parties from public, private, academic and local communities both Canadian and foreign entities can work in support of Arctic meteorological, oceanographic, environmental issues, data and scientific studies.

vi) Provide a networking environment in order to bring together all interested groups both public and private in order to further the study of Arctic meteorological, oceanographic and environmental issues, data and scientific studies addressing issues such as climate change

vii) Facilitate the publishing of specialized material in *Atmosphere-Ocean* and elsewhere tied to Arctic and Northern focused research and publications.

#### 3. Mode of Operation

The group will normally work and meet by e-mail but will explore the use of technologies to facilitate national scope meetings and discussions. It may appoint ad hoc working and study groups as required. The need for a face-to-face workshop will be assessed.

i) Monthly or quarterly working meetings

ii) Potential for specialized sessions at the CMOS Congress Reporting of activities on a quarterly basis to the CMOS National Executive.

iii) Sponsoring of a special track at the annual CMOS conference related to Arctic meteorological, oceanographic, environmental issues, data and scientific studies

#### 4. Core Activities

i) To represent the interests of CMOS, to develop positions related to Arctic issues and present these to other groups or bodies.

ii) To act as an advisory group on discussion with the CMOS membership and on matters related to Canadian Arctic meteorology, oceanography and related matters.

iii) To engage Northerners in discussion related to meteorology, oceanography and related matters in the Arctic.

iv) Reporting, Budget and fees: A business plan outlining a targeted set of activities will be created that includes any potential fees and expenditures. This will be reported to the CMOS executive as per other committees reporting on an annual basis at the annual general meeting.

#### 5. Arctic SIG Mandate & TOR review

On an annual basis, the SIG Executives will convene a meeting to review and assess the SIG's mandate and terms of reference to ensure that they meet the intent and mandate of the group and CMOS.

#### 6. Why is an Arctic SIG needed?

Canada's North is truly the last frontier, it is distant, relatively undeveloped, sparsely populated and rich in resources and culture.

The North is deeply dependent on Meteorological and Oceanographic Services for success today and tomorrow.



Northerners are increasingly taking an active role in their own government, their own monitoring and science and their own education. Existing collaborative mechanisms are scarce and sometimes ineffective. A lot of northern science has been done through, for example, International Polar Year (IPY) involving southern scientists as well as northerners.

In spite of the importance of the North, key activities such as IPY have wound down leaving a gap in coordination mechanisms for northern science and interaction with local communities.

### 7. Why Now?

Arctic SIG should be initiated now to take advantage of other related events:

- i) Special issue of Atmosphere-Ocean already planned on the Arctic;
- ii) Scientific interest raised by International Polar Year etc. has produced results that still require implementation. Some of this could be accommodated through a special session at the next CMOS Congress.

### 8. How it will work?

Although national in scope, the first executive is likely to be Ottawa-based.

Meetings will need to utilize new web-based technologies in order to gather constituents.

The "agenda" will be formed by the members and it is anticipated that activities could include meteorological, climatological, air quality or oceanographic issues and research support.

### 9. Examples where CMOS professionals could have a voice in the Arctic through SIG

As Arctic sea ice melts and resources are discovered, ships are navigating the Arctic with rapidly increasing frequency. However, less than 10% of Arctic waters are charted to modern standards. In addition, the melting sea ice leads to safety issues for those leading a traditional Northern life and hunting on the ice.

Canada has one of the most automated weather forecasting systems in the world; however, the observations and science necessary to expand this system to the far North are not yet in place.

In the south, increased frequency of storm surges is causing damage to small craft harbours and other coastal infrastructure. In the North such infrastructure will need to be designed and built to withstand such change.

Northern air is thought of as pristine, but pollutants from the orient are increasingly finding their way into the Northern air and from there into biota used for food.

Along the southern border between Canada and the US, the International Joint Commission oversees fresh water systems shared by the two countries. In the North the huge Yukon river system, which originates in Northern British Columbia, crosses the border from the Yukon Territory to Alaska and does not have such oversight.

While Canada has been a leading participant in IPY, since that time Northern science, especially done by the federal government, has been severely cut back and world leading facilities such as PEARL are closing.

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## **Report from National Snow & Ice Data Center**

Arctic sea ice shatters previous low records;  
Antarctic sea ice edges to record high.

This September, sea ice covering the Arctic Ocean fell to the lowest extent in the satellite record, which began in 1979. Satellite data analyzed by NSIDC scientists showed that the sea ice cover reached its lowest extent on September 16. Sea ice extent averaged for the month of September was also the lowest in the satellite record.

The near-record ice melt occurred without the unusual weather conditions that contributed to the extreme melt of 2007. In 2007, winds and weather patterns helped melt large expanses of ice. "*Atmospheric and oceanic conditions were not as conducive to ice loss this year, but the melt still reached a new record low,*" said NSIDC scientist Walt Meier. "*This probably reflects loss of multi-year ice in the Arctic, as well as other factors that are making the ice more vulnerable*". Multi-year ice is ice that has survived more than one melt season and is thicker than first-year ice.

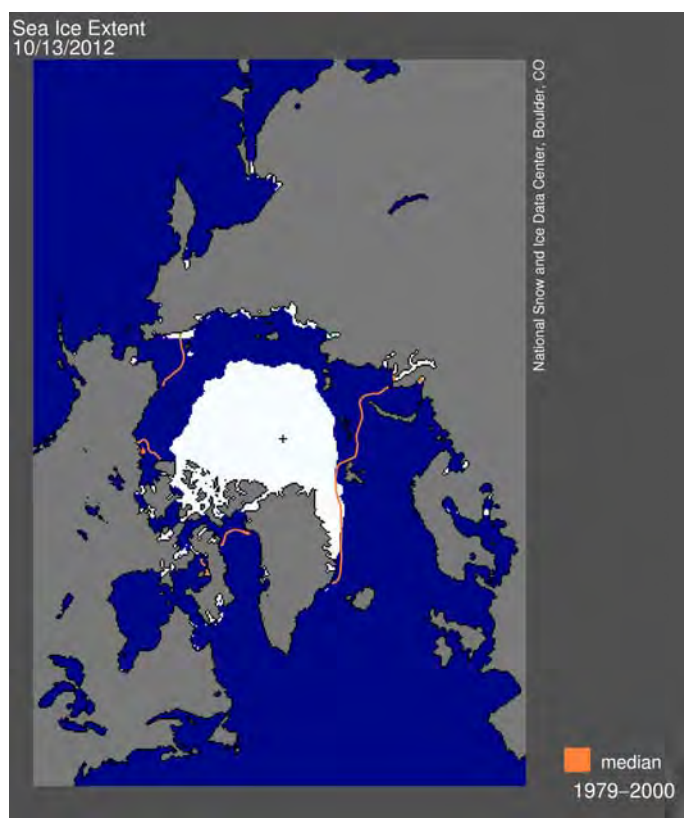
NSIDC Director Mark Serreze said, "*It looks like the spring ice cover is so thin now that large areas melt out in summer, even without persistent extreme weather patterns.*" A storm that tracked through the Arctic in August helped break up the weakened ice pack.

Arctic sea ice extent reached its lowest point this year on September 16, 2012 when sea ice extent dropped to 3.41 million square kilometres (1.32 million square miles). Averaged over the month of September, ice extent was 3.61 million square kilometres (1.39 million square miles). This places 2012 as the lowest ice extent both for the daily minimum extent and the monthly average. Ice extent was 3.29 million square kilometres (1.27 million square miles) below the 1979 to 2000 average.

The Arctic ice cap grows each winter as the sun sets for several months and shrinks each summer as the sun rises

higher in the northern sky. Each year the Arctic sea ice reaches its annual minimum extent in September. It hit its previous record low in 2007. This summer's low ice extent continued the downward trend seen over the last 33 years. Scientists attribute this trend in large part to warming temperatures caused by climate change. Since 1979, September Arctic sea ice extent has declined by 13 percent per decade. Summer sea ice extent is important because, among other things, it reflects sunlight, keeping the Arctic region cool and moderating global climate.

In addition to the decline in sea ice extent, a two-dimensional measure of the ice cover reveals the ice cover has grown thinner and less resistant to summer melt. Recent data on the age of sea ice, which scientists use to estimate the thickness of the ice cover, shows that the youngest, thinnest ice, which has survived only one or two melt seasons, now makes up the large majority of the ice cover.



**Figure caption:** Arctic sea ice extent for September 2012 was 3.61 million square kilometres (1.39 million square miles). The magenta line shows the 1979 to 2000 median extent for that month. The black cross indicates the geographic North Pole. — Credit: NSIDC.

Climate models have suggested that the Arctic could lose almost all of its summer ice cover by 2100, but in recent years, ice extent has declined faster than the models predicted. Serreze said, "The big summer ice loss in 2011 set us up for another big melt year in 2012. We may be

looking at an Arctic Ocean essentially free of summer ice only a few decades from now." NSIDC scientist Julienne Stroeve recently spent three weeks in the Arctic Ocean on an icebreaker ship, and was surprised by how thin the ice was and how much open water existed between the individual ice floes. "According to the satellite data, I expected to be in nearly 90% ice cover, but instead the ice concentrations were typically below 50%," she said.

As the Arctic was experiencing a record low minimum extent, the Antarctic sea ice was reaching record high levels, culminating in a Southern Hemisphere winter maximum extent of 19.44 million square kilometres (7.51 million square miles) on September 26. The September 2012 monthly average was also a record high, at 19.39 million square kilometres (7.49 million square miles) slightly higher than the previous record in 2006. Temperatures over Antarctica were near average this austral winter. Scientists largely attribute the increase in Antarctic sea ice extent to stronger circumpolar winds, which blow the sea ice outward, increasing extent.

NSIDC scientist Ted Scambos said, "*Antarctica's changes — in winter, in the sea ice — are due more to wind than to warmth, because the warming does not take much of the sea ice area above the freezing point during winter. Instead, the winds that blow around the continent, the "westerlies," have gotten stronger in response to a stubbornly cold continent, and the warming ocean and land to the north.*"

### Information and graphics

For a full analysis of the summer melt season and additional images, please see Arctic Sea Ice News and Analysis.

An NSIDC animation of the Arctic melt season is available at: <http://youtu.be/AztEry44A9A>

An NSIDC animation of the Antarctic melt season is available at <http://youtu.be/CBD8hWbiFMI>

The National Snow and Ice Data Center (NSIDC) is part of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado Boulder. NSIDC scientists provide Arctic Sea Ice News & Analysis content, with partial support from NASA.

For more information and visualizations of thinning sea ice, see the NOAA Climate Watch article, "Arctic Sea Ice Getting Thinner, Younger."

#### Website

[http://nsidc.org/news/press/20121002\\_MinimumPR.html](http://nsidc.org/news/press/20121002_MinimumPR.html)

Visited on October 13, 2012.

## The CMOS Awards, Prizes, Recognition and Scholarship Programs – A Review

by Denis A Bourque

CMOS has a rich history of recognizing the past accomplishments of its members (Section 1) and of other contributors to the advancement of meteorology and oceanography in Canada (Section 2, 3 and 4). The Society is also concerned for the future: it supports students through undergraduate and graduate scholarships (Section 5).

In total, CMOS spends nearly \$32,000 each year on its Awards, Prizes, Recognition and Scholarship Programs

### Awards to Society Members

#### 1) The President's Prize

First awarded in 1967 (for accomplishments in the previous year, i.e., the President's Prize for 1966), this is the first of three awards that have existed since the creation of the Society. This award recognizes a member or members for a "*recent paper or book of special merit in the fields of meteorology or oceanography*". This prize has been granted in 44 of the Society's 46 years to a total of 49 members (twice to Dr. André J. Robert).

The award consists of a plaque. Funding for the production of the plaque comes from the CMOS Operations Fund.

#### 2) Dr. Andrew Thomson Prize in Applied Meteorology

First awarded in 1967 (for accomplishments in the previous year, i.e., the Andrew Thompson Prize in Applied Meteorology for 1966), this is the second of three awards that have existed since the creation of the Society. This award recognizes a member or members "*for an outstanding contribution to the application of meteorology in Canada.*" This prize has been awarded in 41 of the Society's 46 years to a total of 46 members (twice to Mr. Morley K. Thomas).

The award consists of a plaque. Funding for the production of the plaque comes from the CMOS Operations Fund.

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<sup>1</sup> Prior to 1977 when the Society expanded to include oceanography, the award was granted for a "Recent paper or book in the field of meteorology".

#### 3) François J. Saucier Prize in Applied Oceanography<sup>2</sup>

First awarded in 1982 (for accomplishments in the previous year, i.e., the CMOS Prize in Applied Oceanography for 1981), this is the longest standing Society award specific to oceanography<sup>3</sup>. This award recognizes a member or members "*for an outstanding contribution to the application of oceanography in Canada.*" The Prize has been awarded in 22 years of its 31-year history to a total of 39 members. Dr Saucier, after whom the prize was renamed in 2009, was himself a recipient in 2002.

The award consists of a plaque. Funding for the production of the plaque comes from the CMOS Operations Fund.

#### 4) Neil J. Campbell Award for Exceptional Volunteer Service

First awarded in 2005 (for accomplishments up to 2004, i.e. the Neil J. Campbell Award for Exceptional Volunteer Service for 2004), this award recognizes a member "*who has provided exceptional service to the society as a volunteer. The award may be made for an exceptional contribution in a single year or for contributions over an extended period. The contribution should have resulted in an important advancement for CMOS and/or its aims, nationally or locally.*" The Award has been awarded in all eight years of its existence. Dr. Campbell was its first recipient.

The award consists of a medal. Funding for the production of the medal comes from CMOS Operations Fund.

### Open Awards (not restricted to Society Members)

#### 1) Rube Hornstein Medal in Operational Meteorology

First awarded in 1976 (for accomplishments in 1975, i.e. the Rube Hornstein Prize<sup>4</sup> in Operational Meteorology), this medal is awarded to any individual "*for providing outstanding operational meteorological service in its broadest sense, but excluding the publication of research papers as a factor, unless that research has already been incorporated into the day-to-day performance of operational*

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<sup>2</sup> The prize was known as the 'CMOS Prize in Applied Oceanography' from 1982 until 2008 when it was renamed the 'François J. Saucier Prize in Applied Oceanography' in memory of member Dr. Saucier who died in 2008.

<sup>3</sup> The President's Prize has a longer history, has included oceanography since the introduction of oceanography in the Society in 1977. It is, however, awarded to both meteorology and oceanography.

<sup>4</sup> The name of the award was changed from "Prize" to "Medal" in 1997.



*duties. The work for which the medal is granted may be cumulative over a period of years or may be a single notable achievement.*" The award has been granted 32 times during its 37-year existence to 32 recipients. Mr. Hornstein was the first recipient of the award as a medal in 1998.

The award consists of a medal. Funding for the production of the medal comes from the CMOS Operations Fund.

#### 2) J.P. Tully Medal in Oceanography

First awarded in 1984 (for accomplishments up to 1983, i.e. the J.P. Tully Medal in Oceanography for 1983), this award recognizes any person "*whose scientific contributions have had a significant impact on Canadian oceanography.*" The award has been granted 26 times in its 29-year history to 26 recipients. Dr. Tully was the first recipient in 1983.

The award consists of a medal. Funding for the production of the medal comes from the CMOS Operations Fund.<sup>5</sup>

#### 3) Tertia MC Hughes Memorial Graduate Student Prizes<sup>6</sup> (and formerly the Graduate Student Prize)

The Graduate Student Prize has a long history in the Society. It is the third of three awards that have existed since the creation of the Society. In the early years, it was awarded for work in meteorology (1966-1976), then for work in meteorology or oceanography (1977-2007). The Tertia MC Hughes Memorial Graduate Student Prizes were first awarded in 2000 (for accomplishments in 1999, i.e., Tertia MC Hughes Memorial Graduate Student Prizes for 1999). In 2008, the Graduate Student Prize was merged with the Tertia MC Hughes prizes.

The awards are granted to graduate students registered at a Canadian university or Canadian graduate students registered at a foreign university for "contributions of special merit. It is emphasized that the awards are for work already accomplished. This is not a scholarship for future work. Over the 45 years of their existence, graduate student prizes have been awarded 43 times to 51 recipients.

The awards are a prize of \$500 for each recipient. Funding for the prizes comes from the Scholarship Fund.<sup>7</sup>

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<sup>5</sup> The original J.P.Tully Fund was merged with the Scholarship Fund in 2006.

<sup>6</sup> Ms Hughes passed away in 1998.

<sup>7</sup> Between 2000 and 2006, this award was funded by the CMOS Tertia Hughes Fund established in 2000 from donations received upon the death of Ms Hughes. That Fund was merged with the Scholarship Fund in 2006.

#### 4) The Roger Daley Post-Doctoral Publication Award

First awarded in 2005 (for accomplishments in 2004, i.e. the Roger Daley Post-Doctoral Publication Award for 2004), this award recognizes a candidate who, at the time of nomination, is working in Canada in a non-permanent position as a post-doctoral fellow or research associate and is within 5 years of having received a doctoral degree. The award is granted for "*excellence of a publication in the fields of meteorology or oceanography that has appeared, or is in press, at the time of nomination.*"

The award has been granted in 6 of the 8 years of its existence. The award is a prize of \$2,000.

Following the wishes of his widow, funding for the prize comes from the Roger Daley Fund established with a \$20,000 bequest upon the death of Dr. Daley in 2001. The prize will continue as long as there remain sufficient funds from the original bequest, augmented by annual donations..

#### 5) CMOS Citations

Ever since 1974, CMOS has been recognizing the contribution of any individuals, groups or organizations "*which have, in the previous year, made some outstanding contribution towards promoting public awareness of meteorology or oceanography in Canada.*" This recognition is accomplished in the form of a citation presented as a certificate.

In 32 of these 39 years, Citations were awarded to 49 individuals, 5 organizations and 5 companies.

The award consists of a certificate.

### **Congress Poster Awards**

Each year during the CMOS Annual Congress, CMOS offers prizes for Posters presented in the Poster sessions. There are currently three awards.

#### 1) CMOS Best Poster Prize

This prize is for the best poster in any subject by students and non-students alike.

This award was first awarded in 2011 during the Congress in Victoria. The prize is a cash award of \$1,000. Funding for this prize comes from the CMOS Operations Fund.

2) Campbell Scientific Best Student Poster Prize in Meteorology<sup>8</sup>

This prize, first awarded at the CMOS Annual Congress in 2001, focuses on posters on atmospheric topics presented by students.

The prize is a cash award of \$1,000. Funding for this prize comes entirely from a donation from Campbell Scientific (Canada) Corporation.

3) ASL Environmental Sciences Best Student Poster Prize in Oceanography

This award was first awarded at the CMOS Annual Congress in 2011. Its focus is posters on oceanographic topics presented by students.

The prize is a cash award of \$1,000. Funding for this prize comes entirely from a donation from ASL Environmental Sciences.

**Other Awards**1) 'Project Atmosphere' Summer Workshop for Pre-College Teachers

Each year, CMOS offers an opportunity for a teacher to attend 'Project Atmosphere', a two-week summer workshop on atmospheric science sponsored by the American Meteorological Society (AMS) and the USA National Oceanic and Atmospheric Administration (NOAA) at the National Weather Service Training Center in Kansas City, Missouri. Except for travel, *all other expenses* (e.g., accommodation, meals, etc...) are paid by the AMS/NOAA who receive a contribution of US\$650 from CMOS and of US\$650 from its partner the Canadian Council for Geographic Education (CCGE). CMOS and CCGE each also provide travel grants of CDN\$300 to the selected teacher.

First given in 1994, this prize has been awarded in 17 of the 19 years of its existence.

The prize is an all-expenses paid two-week workshop in Kansas City Missouri, except for travel costs for which CMOS provides a \$300 grant matched by the CCGE. Funding for the award is shared with the Canadian Society for Geographic Education and the CMOS portion comes from CMOS Operations Fund.

2) 'Project Maury' Summer Workshop for Pre-College


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<sup>8</sup> From 2001 to 2010, this award was the only Poster prize and was titled the *Campbell Scientific Canada Corporation - Best Student Poster Prize*. The new name and criterion were introduced upon the creation of the other two Poster awards.

Teachers

Each year, CMOS offers an opportunity for a teacher to attend 'Project Maury', a two-week summer workshop on oceanographic science sponsored by the American Meteorological Society (AMS) and the US Naval Academy at the US Naval Academy in Annapolis, Maryland. Except for travel, *all other expenses* (e.g., accommodation, meals, etc...) are paid by the AMS who receive a contribution of US\$650 from CMOS and of US\$650 from its partner the Canadian National Committee/Committee on Oceanic Research (CNC/SCOR). CMOS and CNC/SCOR each also provide travel grants of CDN\$300 to the selected teacher. This prize was awarded in 1995 as a single prize, but was restored as a regular prize in 2010. This prize was awarded in all three years since then to 4 recipients.

The prize is an all-expenses paid two-week workshop in Annapolis, Maryland, except for travel costs for which CMOS provides a \$300 grant matched by CNC/SCOR.

Funding for the award is shared with the Canadian National Committee on Oceanic Research (CNC/SCOR) and the CMOS portion comes from the CMOS Operations Fund.

**Scholarships****A: CMOS Undergraduate Scholarship Program**1) The CMOS Undergraduate Scholarships

Two CMOS undergraduate scholarships (\$500) can be offered annually to successful student applicants planning a career in atmospheric, hydrological, oceanographic or limnological sciences. These scholarships are tenable at any Canadian university. Applicants must be Canadian citizens or have landed immigrant/permanent resident status and be in their penultimate undergraduate year; the scholarships are to support the students' final university year. To be qualified, students should be taking four or more half courses in one or more of the following areas in their final year: meteorology, physical or chemical oceanography or limnology, hydrology or climatology.

This Scholarship was created and first awarded in 2001. 18 students have received these scholarship in the 12 years of the program.

The scholarship consists of a cash award of \$500. It is funded by the CMOS Scholarship Fund.

2) The CMOS Daniel G. Wright Undergraduate Scholarship<sup>9</sup>

This scholarship (\$1000) may be awarded to a Canadian undergraduate student entering final year of a B.Sc.

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<sup>9</sup> Dr. Wright, a Society member, passed away in 2010.

Honours program in Mathematics and/or Physics, or a related discipline, at a Canadian university. The successful candidate will be selected on the basis of: academic standing; a written commitment to pursue graduate studies in physical oceanography or a related field; and the ability and interest to communicate and share their knowledge with others, as indicated in his/her resume and letters of reference.

This Scholarship was first awarded in 2012. One scholarship has been awarded to date. It is funded by the CMOS Scholarship Fund.

### 3) The CMOS - The Weather Network/Météomédia Scholarship

This scholarship (\$1500) is offered to a female student in her penultimate year of an atmospheric science program at a Canadian university who intends to pursue a career in the fields of meteorology or atmospheric science.

This Scholarship was created and first awarded in 2004. It has been awarded to 8 recipients in its 9 years.

It is entirely funded by an annual donation of \$1,500 from Pelmorex Media Inc, the owners of The Weather Network and MétéoMédia.

### **B: CMOS Post-Graduate Scholarship Program**

Each year CMOS sponsors post-graduate scholarships in the form of supplements to NSERC scholarships.

These are meant to foster graduate research in atmospheric and oceanographic sciences in Canada.

At the time of applying for these scholarship supplements, the applicant must be studying or planning to study atmospheric or oceanic sciences in a recognized postgraduate program. In the atmospheric sciences, all branches, including hydrology, are acceptable. In the oceanic and limnological sciences, biological research is not accepted, unless it is as an indicator of physical/dynamical/chemical processes.

These supplements provide support to high-calibre students working towards a master's or doctoral degree in atmospheric or oceanic sciences. CMOS grants one new award each year in both supplements. The applicant must be holding either an **NSERC Postgraduate Scholarship (PGS)** or an **NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS)** to qualify for either of these supplements. There are two supplements:

#### 1) The CMOS - Weather Research House NSERC Scholarship Supplement in atmospheric or ocean sciences

This Scholarship Supplement was initiated by Weather Research House Inc. in 1998 when it was first awarded. 15

graduate students have received the award.

The award is worth up to \$10,000, consisting of \$5,000 per year over two years, as long as the student meets the NSERC criterion.

The first year of the award (\$5,000) is funded entirely by Weather Research House, Inc.<sup>10</sup> whereas the second year (\$5,000) is funded through the CMOS Scholarship Fund.

#### 2) The CMOS - CNC/SCOR NSERC Scholarship Supplement in Ocean Sciences

This Scholarship Supplement was initiated by the Canadian National Committee for the Scientific Committee on Oceanic Research (CNC-SCOR) in 2006 when it was first awarded. Seven graduate students have received the award.

The award is worth up to \$10,000, consisting of \$5,000 per year over two years, as long as the student meets the NSERC criterion.

The award is funded entirely by the Canadian National Committee for the Scientific Committee on Oceanic Research (CNC-SCOR).

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## **Description des programmes de distinctions, de prix, de reconnaissance et de bourses d'études de la SCMO**

par Denis A. Bourque

La SCMO a un riche passé en ce qui a trait à la reconnaissance des réalisations de ses membres (section 1) et d'autres contributeurs participant à l'avancement de la météorologie et de l'océanographie au Canada (sections 2, 3 et 4). La Société regarde aussi vers l'avenir et offre un soutien aux étudiants par l'entremise de bourses d'études touchant tous les cycles universitaires (section 5).

En tout, la SCMO octroie près de 32 000 \$ par année dans le cadre de ses programmes de distinctions, de prix, de reconnaissance et de bourses d'études.

### **Récompenses réservées aux membres de la Société**

#### 1) Le Prix du président

Décerné pour la première fois en 1967 (pour des travaux réalisés l'année précédente, donc le Prix du président de 1966), ce prix représente la première de trois distinctions qui existent depuis la création de la Société. Cette distinction souligne l'apport d'un ou plusieurs membres à

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<sup>10</sup> For a total contribution to date of \$75,000.



une « *excellente communication ou à un livre de grande valeur traitant de météorologie ou d'océanographie.* »<sup>11</sup> Ce prix a été attribué 44 fois (dont deux fois à André J. Robert, Ph. D.) au cours des 46 années d'existence de la SCMO, pour un total de 49 membres récompensés.

Ce prix consiste en une plaque. Le fonds général de fonctionnement de la SCMO couvre le coût de la plaque.

## 2) Le prix Andrew-Thomson en météorologie appliquée

Décerné pour la première fois en 1967 (pour des travaux réalisés l'année précédente, donc le prix Andrew-Thomson en météorologie appliquée de 1966), ce prix représente la deuxième de trois distinctions qui existent depuis la création de la Société. Cette récompense souligne la participation d'un ou plusieurs membres à « *un travail exceptionnel dans le domaine de la météorologie appliquée au Canada.* » Ce prix a été attribué 41 fois (dont deux fois à Morley K. Thomas) au cours des 46 années d'existence de la Société, pour un total de 46 membres récompensés.

Ce prix consiste en une plaque. Le fonds général de fonctionnement de la SCMO couvre le coût de la plaque.

## Le prix François-J.-Saucier en océanographie appliquée<sup>12</sup>

Décerné pour la première fois en 1982 (pour des travaux réalisés l'année précédente, donc le prix de la SCMO en océanographie appliquée de 1981), ce prix représente la plus ancienne récompense destinée au domaine de l'océanographie au sein de la Société.<sup>13</sup> Cette distinction souligne la participation d'un ou plusieurs membres à « *un travail exceptionnel dans le domaine de l'océanographie appliquée au Canada.* » Ce prix a été remis 22 fois au cours de ses 31 années d'existence, pour un total de 39 membres récompensés. Monsieur Saucier, dont le prix porte le nom depuis 2009, a lui-même reçu cette distinction en 2002.

Ce prix consiste en une plaque. Le fonds général de

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<sup>11</sup> Avant 1977, année où la Société s'est élargie pour inclure l'océanographie, le prix était attribué à une « *excellente communication ou à un livre de grande valeur traitant de météorologie.* »

<sup>12</sup> Ce prix a porté le nom de « prix de la SCMO en océanographie appliquée » de 1982 à 2008. Il a été renommé « prix François-J.-Saucier en océanographie appliquée » en mémoire de F.-J. Saucier (Ph. D.), membre de la SCMO, décédé en 2008.

<sup>13</sup> Le Prix du président, inauguré bien avant, a récompensé les travaux en océanographie depuis l'introduction de cette discipline à la Société en 1977. Il est cependant octroyé à la fois pour des travaux en météorologie et en océanographie.

fonctionnement de la SCMO couvre le coût de la plaque.

## 4) La médaille Neil-J.-Campbell pour service bénévole exceptionnel

Décernée pour la première fois en 2005 (pour des réalisations effectuées jusqu'en 2004, donc la médaille Neil-J.-Campbell pour service bénévole exceptionnel de 2004), cette récompense souligne la participation d'un membre qui a fourni « *un service exceptionnel en tant que bénévole à la SCMO. La médaille peut être décernée pour une contribution exceptionnelle dans une seule année ou pour des contributions sur plusieurs années. La contribution devrait avoir fait progresser d'une façon importante la SCMO ou ses buts, au niveau national ou local.* » Cette distinction a été attribuée chaque année depuis sa création. N. J. Campbell (Ph. D.) en a été le premier récipiendaire.

Ce prix consiste en une médaille. Le fonds général de fonctionnement de la SCMO couvre le coût de la médaille.

## **Récompenses générales (non réservées aux membres de la Société)**

### 1) La médaille Rube-Hornstein en météorologie opérationnelle

Décernée pour la première fois en 1976 (pour des travaux réalisés l'année précédente, donc la médaille Rube-Hornstein<sup>14</sup> en météorologie opérationnelle de 1975), cette médaille souligne « *un travail exceptionnel dans l'exploitation des services météorologiques, au sens large du terme. Ceci exclut cependant comme critère d'évaluation les publications scientifiques, à moins que leurs résultats ne soient déjà utilisés pour améliorer la performance quotidienne des services d'exploitation. Le travail pour lequel la médaille est donnée peut avoir été réalisé sur plusieurs années précédant l'année en cours ou encore, en récompense d'un accomplissement exceptionnel.* » Cette distinction a été octroyée 32 fois au cours de ses 37 années d'existence, à un total de 32 récipiendaires. Monsieur Hornstein a été le premier à recevoir cette médaille en 1998.

Cette distinction consiste en une médaille. Le fonds général de fonctionnement de la SCMO couvre le coût de la médaille.

### 2) La médaille J.-P.-Tully en Océanographie

Décernée pour la première fois en 1984 (pour des travaux réalisés jusqu'en 1983, donc la médaille J.-P.-Tully de 1983), cette distinction honore toute personne « *dont la contribution scientifique dans le domaine de l'océanographie canadienne a été jugée exceptionnelle.* »

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<sup>14</sup> En 1997, « médaille » a remplacé « prix » dans le nom de la récompense.

Cette distinction a été octroyée 26 fois au cours de ses 29 années d'existence, à un total de 26 récipiendaires. J. P. Tully a été le premier à la recevoir en 1983.

Ce prix consiste en une médaille. Le fonds général de fonctionnement de la SCMO couvre le coût de la médaille.<sup>15</sup>

### 3) Les prix Tertia-M.-C.-Hughes pour étudiants diplômés<sup>16</sup> (anciennement le Prix des étudiants diplômés)

Le Prix des étudiants diplômés a une longue histoire au sein de la Société. Il représente la troisième distinction existant depuis la création de la SCMO. Tout au début, il était octroyé pour des travaux en météorologie (1966 à 1976), puis pour des travaux en météorologie ou en océanographie (1977 à 2007). Les prix Tertia-M.-C.-Hughes pour étudiants diplômés ont été attribués pour la première fois en l'an 2000 (pour des travaux réalisés l'année précédente, donc les prix Tertia-M.-C.-Hughes pour étudiants diplômés de 1999). En 2008, le Prix des étudiants diplômés a été fusionné aux prix Tertia-M.-C.-Hughes.

Les prix sont octroyés aux étudiants des cycles supérieurs inscrits à une université canadienne ou aux diplômés canadiens inscrits à une université étrangère et ayant déjà "*accompli un travail exceptionnel*". Il faut préciser que cette récompense souligne un travail déjà réalisé. Il ne s'agit pas d'une bourse d'études appuyant des travaux futurs. Au cours de leur 45 années existence, les prix destinés aux étudiants des 2<sup>e</sup> et 3<sup>e</sup> cycles ont été décernés 43 fois, à un total de 51 récipiendaires.

Les étudiants reçoivent chacun 500 \$ de récompense. Les prix sont financés par le Fonds des bourses d'études.<sup>17</sup>

### 4) Le prix Roger-Daley de publication postdoctorale

Décernée pour la première fois en 2005 (pour des travaux réalisés l'année précédente, donc le prix Roger-Daley de publication postdoctorale de 2004), cette distinction souligne l'apport d'un candidat qui, au moment de sa nomination, travaille au Canada au titre d'un poste non permanent de boursier postdoctoral ou d'associé de recherche, et qui a reçu son doctorat il y a moins de 5 ans. Ce prix est attribué pour "*l'excellence d'une publication, dans les domaines de la météorologie ou de*

*l'océanographie, déjà publiée ou en voie de l'être au moment de la mise en candidature*".

Cette distinction a été attribuée 6 fois au cours de ses 8 années d'existence. Ce prix s'accompagne d'une récompense de 2000 \$.

Conformément au souhait de la veuve de R. Daley, le financement de ce prix provient du fonds Roger-Daley créé avec un legs de 20 000 \$ consenti à la mort de monsieur Daley en 2001. Le prix sera remis aussi longtemps qu'il restera des fonds provenant du legs initial, suppléé par des dons annuels.

### 5) Citations de la SCMO

Depuis 1974, la SCMO souligne la contribution de toute personne, tout groupe ou toute organisation "*qui a contribué d'une façon exceptionnelle à éveiller l'intérêt du public au Canada en météorologie ou en océanographie durant l'année précédente*". Cet honneur est présenté sous la forme d'une citation attestée par un certificat.

Au cours de 32 années sur 39, des citations ont été remises à 49 personnes, 5 organismes et 5 entreprises.

Ce prix consiste en un certificat.

### **Prix pour les affiches du Congrès**

Tous les ans, durant le Congrès annuel de la SCMO, la Société offre des prix pour les travaux exposés à la séance de présentation par affiche. Trois récompenses existent actuellement.

#### 1) Le prix SCMO de la meilleure affiche

Ce prix récompense la meilleure affiche, tous sujets confondus, présentés par un étudiant ou un scientifique.

Il a été décerné pour la première fois en 2011, au Congrès de Victoria. Le prix s'accompagne d'une somme de 1000 \$. Le fonds général de fonctionnement de la SCMO finance ce prix.

#### 2) Le prix Campbell Scientifique de la meilleure affiche d'étudiant(e) en météorologie<sup>18</sup>

Ce prix, décerné pour la première fois lors du Congrès annuel de la SCMO en 2001, vise les affiches portant sur des sujets présentés par des étudiants.

<sup>15</sup> Le fonds J.-P.-Tully original a été incorporé au Fonds pour les bourses d'études en 2006.

<sup>16</sup> Madame Hughes est décédée en 1998.

<sup>17</sup> Entre 2000 et 2006, cette récompense était financée par le Fonds Tertia-Hughes de la SCMO, créé en 2000 sur la base de dons reçus lors du décès de madame Hughes. Ce fonds a été incorporé au Fonds pour les bourses d'études en 2006.

<sup>18</sup> De 2001 à 2010, seul ce prix récompensait les présentations par affiche et il se nommait le prix Corporation Campbell Scientific Canada de la meilleure affiche d'étudiants(es). Le nom actuel de ce prix et de nouveaux critères ont été instaurés lors de la création de deux autres récompenses pour affiches.

Le prix s'accompagne d'une somme de 1000 \$. Un don provenant de Campbell Scientific (Canada) Corporation couvre entièrement le financement de ce prix.

### 3) Le prix ASL Environmental Science de la meilleure affiche d'étudiant(e) en océanographie

Ce prix a été décerné pour la première fois en 2011, au Congrès de Victoria. Il vise les affiches qui portent sur l'océanographie et qui sont présentées par des étudiants.

Le prix s'accompagne d'une somme de 1000 \$. Un don provenant d'ASL Environmental Sciences couvre entièrement le financement de ce prix.

### **Autres récompenses**

#### 1) Atelier d'été pour les enseignants de niveau précollégial - *Projet Atmosphère*

Chaque année, la SCMO offre à un enseignant la possibilité de participer au projet Atmosphère, un atelier estival de deux semaines, qui porte sur les sciences atmosphériques et que financent l'American Meteorological Society (AMS) et la National Oceanic and Atmospheric Administration (NOAA) des États-Unis, au National Weather Service Training Center de Kansas City (Missouri). À part les frais de déplacement, *toutes les autres dépenses* (l'hébergement, les repas, etc.) sont prises en charge par l'AMS et la NOAA, qui reçoivent une somme de 650 dollars américains de la part de la SCMO et tout autant du Conseil canadien de l'enseignement de la géographie (CCEG). En outre, la SCMO et le CCEG fournissent chacun à l'enseignant sélectionné une subvention de 300 dollars canadiens, applicable aux frais de voyage.

Décerné pour la première fois en 1994, ce prix a été attribué 17 fois au cours de ses 19 années d'existence.

Le prix consiste en un atelier de deux semaines à Kansas City (Missouri), toutes dépenses payées, sauf pour le déplacement, que subventionnent en parts égales la SCMO et le CCEG, pour un total de 600 \$.

Le financement de ce prix provient à la fois du Conseil canadien de l'enseignement de la géographie et du fonds général de fonctionnement de la SCMO.

#### 2) Atelier d'été pour les enseignants de niveau précollégial - *Projet Maury*

Chaque année, la SCMO offre à un enseignant la possibilité de participer au projet Maury, un atelier de deux semaines, qui porte sur les sciences de l'océan et que financent l'American Meteorological Society (AMS) et la US Naval Academy, située à Annapolis (Maryland). À part les frais de déplacement, *toutes les autres dépenses* (l'hébergement, les repas, etc.) sont prises en charge par l'AMS, qui reçoit une somme de 650 dollars américains de la part de la

SCMO et tout autant du Comité national canadien du Comité scientifique pour les recherches océaniques (CNC du SCOR). En outre, la SCMO et le CNC du SCOR fournissent chacun à l'enseignant sélectionné une subvention de 300 dollars canadiens, applicable aux frais de voyage. Ce prix, une initiative ponctuelle, avait été octroyé en 1995, mais il a été réinstauré en 2010 et est maintenant attribué régulièrement. Au cours des trois dernières années, cette récompense a été remise à quatre enseignants.

Le prix consiste en un atelier de deux semaines à Annapolis (Maryland), toutes dépenses payées, sauf pour le déplacement que subventionnent en parts égales la SCMO et le CNC du SCOR, pour un total de 600 \$.

Le financement de ce prix provient à la fois du Comité national canadien du Comité scientifique pour les recherches océaniques et du fonds général de fonctionnement de la SCMO.

### **Bourses d'études**

#### **A: Programme de bourses d'études de premier cycle de la SCMO**

##### 1) Bourses d'études de premier cycle de la SCMO

Deux bourses d'études de premier cycle de la SCMO (500 \$) sont offertes annuellement aux candidats méritants qui étudient en vue d'une carrière en sciences atmosphériques, hydrologiques, océanographiques ou limnologiques. Ces bourses sont valables pour toute université canadienne. Le candidat doit être citoyen canadien ou résident permanent, et en être à son avant-dernière année d'étude de premier cycle; la bourse sert à financer la dernière année d'études universitaires du candidat. Pour être admissible, l'étudiant devrait être inscrit à quatre cours ou plus dans au moins un des domaines suivants au cours de sa dernière année : météorologie, limnologie ou océanographie physique ou chimique, hydrologie ou climatologie.

Cette bourse d'études a été créée et décernée pour la première fois en 2001. Au cours des 12 années d'existence du programme, 18 étudiants ont bénéficié de cette bourse.

La bourse d'études consiste en une somme de 500 \$. Elle est financée par le Fonds pour les bourses d'études de la SCMO.

##### 2) Bourse d'études de premier cycle Daniel-G.-Wright de la SCMO<sup>19</sup>

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<sup>19</sup> D. G. Wright (Ph. D.), un membre de la Société, est décédé en 2010.



Cette bourse d'études (1000 \$) peut être octroyée à un étudiant canadien de premier cycle, entamant sa dernière année de baccalauréat spécialisé en sciences, dans un programme de mathématiques, de physique ou de sciences connexes au sein d'une université canadienne. Le candidat gagnant sera choisi sur la base de ses résultats scolaires; d'un engagement écrit attestant sa volonté de poursuivre des études supérieures en océanographie physique ou dans un domaine connexe; de son aptitude et de son intérêt pour la communication et le partage des connaissances, comme le démontreront son curriculum vitae et ses lettres de recommandation.

Cette bourse d'études a été décernée pour la première fois en 2012. Elle n'a donc été remise qu'une seule fois jusqu'à maintenant. Elle est financée par le Fonds pour les bourses d'études de la SCMO.

### 3) Bourse d'études The Weather Network/Météomédia de la SCMO

Cette bourse (1500 \$) est offerte à une étudiante qui est inscrite à son avant-dernière année d'études au sein d'un programme de sciences atmosphériques d'une université canadienne et qui compte poursuivre une carrière dans le domaine de la météorologie ou des sciences atmosphériques.

Cette bourse d'études a été créée et décernée pour la première fois en 2004. Elle a été décernée à 8 personnes en 9 ans.

La somme remise provient en totalité d'un don de 1500 \$ consenti par Pelmorex Média Inc., propriétaire des chaînes The Weather Network et MétéoMédia.

### **B: Programme de bourses d'études supérieures de la SCMO**

Chaque année, la SCMO subventionne des bourses d'études supérieures sous forme de suppléments aux bourses du CRSNG.

Elles visent à favoriser la recherche au niveau de la maîtrise et du doctorat en sciences atmosphériques et océanographiques au Canada.

Au moment de poser sa candidature relativement au supplément à la bourse, l'étudiant doit être inscrit ou planifier son inscription en sciences atmosphériques ou océanographiques au sein d'un programme d'études supérieures reconnu. En ce qui concerne les sciences atmosphériques, y compris l'hydrologie, toutes les branches sont admissibles. Quant aux sciences océaniques et limnologiques, elles excluent les études en biologie, à moins que celles-ci ne portent sur des indicateurs de processus physiques, dynamiques ou chimiques.

Ces suppléments offrent un financement aux étudiants de haut calibre poursuivant des études de maîtrise ou de doctorat en sciences atmosphériques ou océaniques. La SCMO remet un nouveau prix chaque année pour les deux suppléments. Le candidat doit détenir soit une **bourse d'études supérieures du CRSNG** ou une **bourse d'études supérieures du Canada Alexander-Graham-Bell** pour être admissible à l'un de ces suppléments. Il existe deux suppléments :

#### 1) Le supplément SCMO - Weather Research House à la bourse du CRSNG pour les sciences de l'atmosphère ou de l'océan

Ce supplément aux bourses du CRSNG a été instauré par la Weather Research House Inc., en 1998, et décerné cette même année. Quinze étudiants des cycles supérieurs ont reçu cette subvention.

Ce prix a une valeur maximale de 10 000 \$ et consiste en une somme de 5000 \$ par année pendant deux ans, tant que l'étudiant est boursier du CRSNG.

La première année, la Weather Research House Inc. couvre entièrement la subvention (5000 \$)<sup>20</sup>, tandis que la deuxième année (5000 \$) est financée par le Fonds pour les bourses d'études de la SCMO.

#### 2) Le supplément SCMO - CNC du SCOR à la bourse du CRSNG en sciences de l'océan

Le Comité national canadien du Comité scientifique pour les recherches océaniques (CNC du SCOR) a instauré ce supplément aux bourses d'études en 2006 et l'a décerné cette même année. Sept étudiants des cycles supérieurs ont reçu cette subvention.

Le prix a une valeur maximale de 10 000 \$ et consiste en une somme de 5000 \$ par année pendant deux ans, tant que l'étudiant est boursier du CRSNG.

Le Comité national canadien du Comité scientifique pour les recherches océaniques (CNC du SCOR) finance entièrement ce supplément.

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<sup>20</sup> Jusqu'à maintenant, la contribution totale s'élève à 75 000 \$.

**CMOS BUSINESS / AFFAIRES DE LA SCMO**

Prrière de noter que les versions françaises suivent.

**Summer Meteorology Workshop  
Project Atmosphere 2013**Call for Applications by K-12 Teachers

As in previous years, the Canadian Meteorological and Oceanographic Society (CMOS) has been invited to select a Canadian teacher to participate in PROJECT ATMOSPHERE. This is a summer workshop for K-12 teachers of atmospheric science topics sponsored by the American Meteorological Society (AMS) and the National Oceanic and Atmospheric Administration (NOAA). It will take place from **14 to 26 July 2013** at the National Weather Training Center, Kansas City, Missouri.

Expenses during the workshop for the participating teacher (excluding personal expenses) are covered by AMS/NOAA, CMOS and Canadian Geographic, Education (CGE). A total travel subsidy of \$600 is provided to the selected Canadian teacher by CMOS (Can\$300) and CGE (Can\$300).

Previous Canadian participants have found their attendance a very rewarding and significant learning experience. Presentations are made at the workshop by some of the most respected US scientists in the field of atmospheric science. Field trips are included in the program, usually including time at a weather office. Participants return with a wealth of classroom-ready material, resources and teaching modules.

Interested teachers can obtain more information on the workshop and an application form on the CMOS website ([www.cmos.ca/ProjectAtmosphere.html](http://www.cmos.ca/ProjectAtmosphere.html)). Reports from previous participants can also be found on the CMOS website.

The successful candidate will provide CMOS with a short report on his/her summer experience to be published in the CMOS Bulletin SCMO.

Completed application forms can be mailed or faxed to the address below no later than **8 March 2013**. Applicants are encouraged to submit their forms as soon as possible.

CMOS - Project Atmosphere Workshop  
P.O. Box 3211, Station D  
Ottawa, ON K1P 6H7  
Telephone: (613) 990-0300 / Fax: (613) 990-1617  
e-mail: [education@cmos.ca](mailto:education@cmos.ca)

**Summer Oceanography Workshop  
Maury Project 2013**Call for Applications by K-12 Teachers

The Canadian Meteorological and Oceanographic Society (CMOS) has been invited to select a Canadian teacher to participate in THE MAURY PROJECT. This is a summer workshop for K-12 teachers of oceanographic science topics sponsored by the American Meteorological Society (AMS), the National Oceanic and Atmospheric Administration (NOAA) and the US Naval Academy. This year's workshop takes place from **7 to 19 July 2013** at the US Naval Academy, Annapolis, Maryland.

Expenses during the workshop for the participating teacher (excluding personal expenses) are covered by AMS/NOAA, CMOS and the Canadian National Committee/Scientific Committee on Oceanic Research (CNC/SCOR). A total travel subsidy of \$600 is provided to the selected Canadian teacher by CMOS (Can\$300) and CNC/SCOR (Can\$300).

Presenters at the workshop are some of the most respected American scientists in the field of oceanographic sciences. Field trips are included in the program, usually including time spent on a research vessel. Participants return with classroom-ready material, resources and teaching modules.

Interested teachers can obtain more information on the workshop and an application form on the CMOS website (<http://www.cmos.ca/ProjectMaury.html>). Reports from previous participants can also be found on the CMOS website.

The successful candidate will provide CMOS with a short report on his/her summer experience to be published in the CMOS Bulletin SCMO.

Completed application forms can be mailed or faxed to the address below no later than **8 March 2013**. Applicants are encouraged to submit their forms as soon as possible.

CMOS - The Maury Project Workshop  
P.O. Box 3211, Station D  
Ottawa, ON K1P 6H7  
Telephone: (613) 990-0300 / Fax: (613) 990-1617  
e-mail: [education@cmos.ca](mailto:education@cmos.ca)

Please note that you cannot save a completed copy of this form on your computer, but you can fill it on-screen and print copies afterward.

Please note that the English versions precede.

## Atelier d'été en météorologie Projet Atmosphère 2013

### Demande de candidats enseignants de niveau pré-collégial

Comme par les années passées, la Société canadienne de météorologie et d'océanographie (SCMO) a été invitée à choisir un enseignant canadien qui participera au PROJET ATMOSPHERE. Il s'agit d'un atelier d'été à l'intention des enseignant(e)s de niveau pré-collégial spécialistes en sciences atmosphériques; cet atelier est parrainé par l'American Meteorological Society (AMS) et la National Oceanic and Atmospheric Administration (NOAA) américaine. Il aura lieu du **14 au 26 juillet 2013** au centre de formation du National Weather Service à Kansas City au Missouri.

Les dépenses de l'enseignant(e) choisi(e) (à l'exclusion des dépenses personnelles) seront assumées par l'AMS et la NOAA, avec une contribution financière de la SCMO et du Conseil canadien pour l'enseignement de la géographie (CCEG). Une bourse totale de 600 \$ sera versée à l'enseignant(e) choisi(e) par la SCMO (300 \$ Can) et le CCEG (300 \$ Can).

Les ancien(ne)s participant(e)s du Canada ont trouvé leur expérience très enrichissante et stimulante. Les exposés de l'atelier sont présentés en anglais par des experts américains les plus réputés dans les sciences atmosphériques et 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. Le candidat choisi devra écrire un court rapport pour la SCMO de son expérience estivale, rapport qui pourra être publié dans le Bulletin de la SCMO.

Les enseignant(e)s intéressé(e)s peuvent obtenir plus d'information en visitant le site de la SCMO sur la toile à [www.scmo.ca/ProjectAtmosphere.html](http://www.scmo.ca/ProjectAtmosphere.html) où ils peuvent obtenir un formulaire d'application. Les rapports des années précédentes sont également publiés sur le site web de la SCMO.

Les formulaires dûment remplis doivent être envoyés par courrier ou télécopieur à l'adresse ci-dessous au plus tard le **8 mars 2013**. Les candidat(e)s sont encouragé(e)s à soumettre leur formulaire dès que possible.

SCMO - Atelier Projet Atmosphère  
Casier postal 3211, Station D  
Ottawa, ON K1P 6H7  
Téléphone: (613) 990-0300 / Télécopie: (613) 990-1617  
courriel: [education@scmo.ca](mailto:education@scmo.ca)

## Atelier d'été en océanographie Projet Maury 2013

### Demande de candidats enseignants de niveau pré-collégial

Comme par les années passées, la Société canadienne de météorologie et d'océanographie (SCMO) a été invitée à choisir un enseignant canadien qui participera au PROJET MAURY. Il s'agit d'un atelier d'été à l'intention des enseignant(e)s de niveau pré-collégial spécialistes en sciences océanographiques; cet atelier est parrainé par l'American Meteorological Society (AMS) et le US Naval Academy. Il aura lieu du **7 au 19 juillet 2013** au US Naval Academy à Annapolis au Maryland.

Les dépenses de l'enseignant(e) choisi(e) (à l'exclusion des dépenses personnelles) seront assumées par l'AMS, qui recevra aussi une contribution de la SCMO et du Comité national canadien / Comité scientifique de la recherche océanographique (CNC/SCOR) à cette fin. Une bourse totale de 600 \$ sera versée à l'enseignant(e) choisi(e) par la SCMO (300 \$ Can) et le CNC/SCOR (300 \$ Can).

Les ancien(ne)s participant(e)s du Canada ont trouvé leur expérience très enrichissante et stimulante. Les exposés de l'atelier sont présentés en anglais par des experts américains les plus réputés dans les sciences atmosphériques et 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.

Le lauréat devra écrire un court rapport pour la SCMO de son expérience estivale qui pourra être publié dans le Bulletin de la SCMO.

Les enseignant(e)s intéressé(e)s peuvent obtenir plus d'information en visitant le site web <http://www.cmos.ca/ProjectMaury.html>. Si vous êtes intéressés, vous devez télécharger le formulaire de candidature (en format pdf) et, une fois rempli, le poster ou le télécopier à l'adresse donnée ci-bas avant le **8 mars 2013**. Les candidat(e)s sont encouragé(e)s à soumettre leur formulaire dès que possible.

SCMO - Atelier Projet Maury  
Casier postal 3211, Station D  
Ottawa, ON K1P 6H7  
Téléphone: (613) 990-0300 / Télécopie: (613) 990-1617  
courriel: [education@cmos.ca](mailto:education@cmos.ca)

Prière de noter que vous ne pouvez pas enregistrer votre formulaire rempli sur votre ordinateur mais vous pouvez le compléter sur l'écran et imprimer des copies par la suite.





## New developments for the Atmosphere-Ocean journal site

Taylor & Francis, CMOS' publishing partner, are adding more and more information content and user friendliness to their online journal platform, including for *Atmosphere-Ocean*. Since this summer, the number of online views is captured and displayed in real time for each article, revealing a very large amount of interest that had been generally hidden up to now. Authors who sometimes wish that their article would receive more formal citations may be comforted by knowing the number of people who are interested in their paper.

Citation counts, currently based solely on the CrossRef database are also being updated more frequently and soon will include information accumulated in other databases, such as Scopus, Web of Science, Google Scholar and Microsoft Academic. Authors who follow closely the fate of their papers should develop the habit of frequently consulting the A-O web site at <http://informaworld.com/tato>. Another new development is the addition of several links to source the referenced documents, thus providing more options for free access to the full text, depending on the library's subscriptions.

Although most authors can access the A-O site through their institution library, all CMOS members should be aware that they have full access to their journal through the CMOS member services site <https://www1.cmos.ca> (username and password required).

*Atmosphere-Ocean* is intending to publish a fifth issue by the very end of the year, a first in its 50 year history.

Please consider *Atmosphere-Ocean* for your next article.

## Du nouveau sur le site Web de la revue Atmosphere-Ocean

Taylor & Francis, l'éditeur partenaire de la SCMO, ajoute de plus en plus de contenu à sa plateforme d'édition de revues en ligne et en augmente la convivialité, y compris pour *Atmosphere-Ocean*. Depuis cet été, le nombre de consultations est enregistré et affiché en temps réel pour chaque article, révélant ainsi un très grand intérêt, qui demeurait jusqu'à tout récemment impossible à estimer. Les

auteurs qui souhaitent parfois que leur article fasse l'objet de plus de citations officielles peuvent se reconforter en connaissant le nombre de personnes que l'article intéresse.

Le nombre de citations, actuellement fondé exclusivement sur la base de données CrossRef est aussi mis à jour plus fréquemment qu'avant et inclura bientôt l'information accumulée dans d'autres bases de données, comme Scopus, Web of Science, Google Scholar et Microsoft Academic. Les auteurs qui suivent de près la destinée de leurs articles prendront l'habitude de consulter fréquemment le site Web d'A-O à l'adresse <http://informaworld.com/tato>. Autre fait nouveau, l'ajout de plusieurs liens pour se procurer les documents cités, fournissant des options supplémentaires pour un accès gratuit aux textes intégraux, selon les abonnements de la bibliothèque.

Bien que la plupart des auteurs puissent accéder au site d'A-O par l'entremise de la bibliothèque de leur établissement, tous les membres de la SCMO devraient savoir qu'ils bénéficient d'un accès illimité à la revue en passant par la page de services aux membres du site Web de la Société : <https://www1.cmos.ca> (nom d'utilisateur et mot de passe requis).

Un 5<sup>e</sup> numéro d'*Atmosphere-Ocean* devrait paraître avant la fin de l'année, une première en 50 ans de publication.

Pensez à *Atmosphere-Ocean* pour la diffusion de votre prochain article!



## Atmosphere-Ocean 50-4 Paper Order

### Applied Research / Recherche appliquée

#### **AO-2011-0064**

Extreme Waves and Wave Run-up in Halifax Harbour under Climate Change Scenarios, by Fumin Xu and William Perrie.

#### **AO-2011-0077**

The 1977 Global Regime Shift: A Discussion of its Dynamics and Impacts in the Eastern Pacific Ecosystem by Alfred M. Powell, Jr. and Jianjun Xu.

#### **AO-2011-0084**

Iceberg Detection Using Compact Polarimetric SAR by Michael Denbina and Michael J. Collins.

Fundamental Research / Recherche fondamentale**AO-2011-0081**

Modelling oxygen isotopes in the University of Victoria Earth System Climate Model for preindustrial and Last Glacial Maximum conditions by C. E. Brennan, A. J. Weaver, M. Eby and K. J. Meissner.

**AO-2011-0071**

Effect of Realistic Soil Moisture Initialization on the Canadian CanCM3 Seasonal Forecast model by Gordon Drewitt, Aaron A. Berg, William J. Merryfield and W.S. Lee.

**AO-2011-0080**

Upper Water Column Nitrous Oxide Distributions in the Northeast Subarctic Pacific Ocean by Damian S. Grundle, Roxane Maranger and S. Kim Juniper.

**AO-2011-0078**

Simulating the Carbon Cycling of Northern Peatlands Using a Land Surface Scheme Coupled to a Wetland Carbon Model (CLASS3W-MWM) by Jianghua Wu, Nigel T. Roulet, Mats Nilsson, Peter Lafleur and Elyn Humphreys.

Review / Synthèse**AO-2012-0027**

Streamflow Modelling: A Primer on Applications, Approaches and Challenges by Dominique R. Bourdin, Sean W. Fleming and Roland B. Stull.



**Atmosphere-Ocean**  
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**Atmosphere-Ocean Argo-China Paper Order**Special Issue / Numéro spécial

Argo-China / Argo-Chine

Guest Editor / Rédacteur invité : Dake Chen

Preface / Préface

Dake Chen

**AO-2011-0015**

Typhoon-Induced Variability of Oceanic Surface Mixed Layer Observed by Argo Floats in the Western North Pacific Ocean by Qiaoyan Wu and Dake Chen.

**AO-2011-0005**

Ocean Responses to Typhoon Namtheun Explored with Argo Floats and Multiplatform Satellites by Liang Sun,

Yuan-Jian Yang, Tao Xian, Yu Wang and Yun-Fei Fu.

**AO-2011-0016**

Currents in Luzon Strait as Evidenced by CTD and Argo Observations and a Diagnostic Model in October 2008 by Yaochu Yuan, Guanghong Liao, Chenghao Yang, Zenghong Liu and Hong Chen.

**AO-2011-0033**

Circulation Around Luzon Strait in September as Inferred from CTD, Argos and Argo Measurements and a Generalized Topography-Following Ocean Model, by Huiqun Wang, Yaochu Yuan, Weibing Guan, Chenghao Yang, Guang-hong Liao and Zhenyi Cao.

**AO-2011-0048**

Current Observations of Internal Tides and Parametric Subharmonic Instability in Luzon Strait, by Guanghong Liao, Yaochu Yuan, Chenghao Yang, Hong Chen, Huiqun Wang and Weigen Huang.

**AO-2011-0013**

Assessing the Application of Argo Profiling Float Data to the Study of the Seasonal Variation of the Hydrological Parameters and the Current Field East of Luzon Strait by Jianling He, Yinghui He and Shuqun Cai.

**AO-2011-0014**

Observations of Freshening in the Northwest Pacific Subtropical Gyre near Luzon Strait by Youfang Yan, Dazhi Xu, Yiquan Qi and Zijun Gan.

**AO-2011-0022**

Variation Features of the Mindanao Eddy from Argo Data by Qilong Zhang, Hongwei Liu, Hui Zhou and Dongmei Zheng.

**AO-2011-0036**

Reconstruction of Three-Dimensional Pacific Temperatures with Argo and Satellite Observations by Huizan Wang, Guihua Wang, Dake Chen and Ren Zhang.

**AO-2011-0034**

A Time-Averaged Covariance Method in the EnKF for Argo Data Assimilation by Ziwang Deng, Youmin Tang Dake Chen, Guihua Wang.

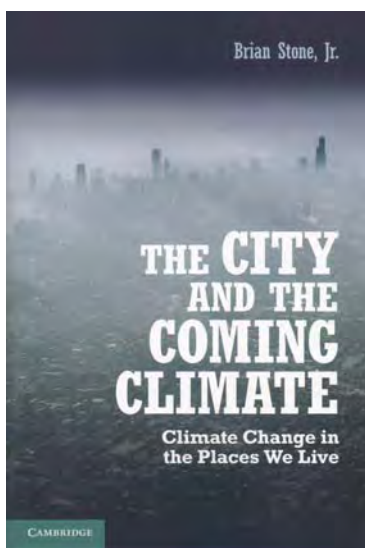
**Remember!**

For the next CMOS Congress in Saskatoon, please submit your abstracts electronically between **13 January and 16 February 2013**. See the Congress website for submitting your abstracts or for more information:

<http://www.cmos.ca/congress2013/inex.htm>

**BOOK REVIEWS / REVUES de LITTÉRATURE****The City and the Coming Climate - Climate Change in the Places We Live**

by Brian Stone Jr.

Cambridge University Press, 2011  
ISBN 978-1-107-60258-8, 187 pages, Paperback, US\$30Book reviewed by John Stone<sup>1</sup>

A few months ago I was invited to brief the Ottawa City's Environment Committee on the threat of climate change. I had prepared some notes on the crucial nexus between development and climate change. The main items on the agenda were the state of the local storm and waste water systems (following the collapse of a section of a city street - a "sink hole" - that swallowed a car) and a report on sustainable development in the region. The first item really

engaged the councillors in an interesting exchange with local construction companies. Significantly though, there was no mention of the need to plan for the potential of more extreme precipitation events that might overwhelm the existing infrastructure. This should have been a signal for me. When all but two of the councillors left at the beginning of the sustainable development item I knew I was going to have a tough sell to convince the City Council to take climate change seriously. It was, therefore, with some positive anticipation that I accepted to review the book: *The City and the Coming Climate - Climate Change in the Places We Live*.

The book was written by Brian Stone Jr. (no relation to the reviewer) who is a professor in the School of City and Regional Planning at the Georgia Institute of Technology. He has absorbed the rudiments of the science (Chapter 1) as well as the international negotiations of the climate change (Chapter 5) issue and concluded that insufficient

attention has been given to the thermal impacts of urban design. He argues that the primary driver of warming in cities is not climate change as it is normally understood but rather what is colloquially referred to as the "urban heat island" effect. This is the main focus of this book. It will thus disappoint the reader who is looking for a comprehensive discussion of the impacts of climate change on cities that includes not just heat-waves but increased heavy rain events, stronger winds from hurricanes and (for coastal communities) sea-level rise. This is not to make light of the several prolonged heat-waves that we have seen recently which have caused the additional deaths of several thousand people. The enhanced effect on older people was the subject of a conference in Vancouver earlier this year entitled: *Climate Change and Aging* - to which one wag noted they were both bad.

Not only is the content of the book disappointing but the style does not make for easy reading. The use of degrees measured on the Fahrenheit scale and examples limited to US cities makes the book less accessible to a non-American reader. Scientists hoping for new insights will wish for more references of the peer-reviewed literature and for some estimates of uncertainties. The author also introduces (and sometimes confusingly) a range of new terms such as "climate management" and "adaptive mitigation".

But what I found most annoying was the author's tendency to boldly criticize the efforts of climate scientists and climate change negotiators in a manner that suggests he has some privileged perspective. He unjustifiably criticizes climate modellers for not including the effects of land-use changes and negotiators for limiting climate change to the carbon cycle. Occasionally the author does modulate his criticisms (and alarmist tones) in subsequent elaborations of some of the subtleties involved but the overall tone is a distraction.

While the author accepts that the urban heat island effect is well recognized he argues that corrections for it in temperature records give a misleading impression of the increase in heat stress experienced by the majority of people who now live in cities. Indeed, his preoccupation is that by regarding climate change as a global carbon issue we have decoupled the potential for greater efforts at the local level where the impacts are felt most acutely and the resources often most readily available. This is to discount the broad recognition of many policy-makers of the ancillary benefits of tackling climate change such as the provision of ecosystem services; and that by framing the issue as more than one of controlling emissions we should be able to enlist a broader coalition of actors.

His policy prescriptions for broadening climate change actions to include land changes are not particularly new although his vision, such as the greening of the Sahara and the capture of heat from city roads, may seem more the

<sup>1</sup> Retired Meteorologist and Adjunct Research Professor in the Department of Geography and Environmental Studies at Carleton University, Ottawa, Ontario, Canada



stuff of science fiction. They include: broadening the definition of climate change used in the Framework Convention on Climate Change to encompass land-surface drivers (bringing it closer to the Intergovernmental Panel on Climate Change (IPCC) definition); adopting a more regional scale focus for the assessment of climate change (of a smaller scale than that now used by the IPCC); establishing incentives for reforestation (such as is now being discussed in the international negotiations under the Reducing Emissions from Deforestation and Forest Degradation (REDD)); and adopting a series of what are geo-engineering technologies to change the albedo of cities and capture waste heat. Indeed, these solutions which are discussed in Chapter 4 are almost a "how to" guide for city planners.

The author's main thesis, that urban design can exacerbate warming due to the greenhouse effect, and conversely, if properly executed, can reduce the thermal stress in cities, does seem to be one worth making. However, it is not a new one and ignores considerable discussion on the potential benefits of land use change and forestry in tackling both mitigation and adaptation to climate change.

As a text for graduate students this book lacks sufficient rigour and discipline; as a handbook for city planners it is unlikely to stimulate a change of paradigm and as a summer read (as it was for me) there are better things to while away an afternoon. Sorry.

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## Books in search of a Reviewer (Partial list) Livres en quête d'un critique (Liste partielle)

### Latest Books received / Derniers livres reçus



**2011-20)** *Atmospheric Dynamics*, by Mankin Mak, Cambridge University Press, Hardback, ISBN 978-0-521-19573-7, 2011, 486 pages, US\$80.

**2011-21)** *Fluid Mechanics, A Short Course for Physicists*, by Gregory Falkovich, Cambridge

University Press, Hardback, ISBN 978-1-107-00575-4, 2011, 167pages, US\$60.

**2011-34)** *Modeling Methods for Marine Science*, David M. Glover, William J. Jenkins and Scott C. Doney, Cambridge University Press, Hardback, 571pages, US\$85.

**2011-36)** *Ocean Dynamics and the Carbon Cycle, Principles and Mechanisms*, Richard G. Williams, Michael J. Follows, Cambridge University Press, ISBN 978-0-521-84369-0, Hardback, 404 pages, US\$73.

**2011-42)** *Physics and Chemistry of Clouds*, Dennis Lamb and Johannes Verlinde, Cambridge University Press, ISBN 978-0-521-89910-9, Hardback, 584pages, US\$85.

**2012-03)** *Ocean Dynamics and the Carbon Cycle, Principles and Mechanisms*, by Richard G. Williams and Michael J. Follows, Cambridge University Press, ISBN 978-0-521-84369-0, Hardback, 404 pages, US\$ 73.

**2012-08)** *Dryland Climatology*, by Sharon E. Nicholson, Cambridge University Press, ISBN 978-0-521-51649-5, Hardback, 516 pages, US\$150.

**2012-10)** *Phytoplankton Pigments, Characterization, Chemotaxonomy and Applications in Oceanography*, Edited by Suzanne Roy, Carole A. Llewellyn, Einar Skarstad Egeland and Geir Johnsen, 2011, Cambridge University Press, ISBN 978-1-107-00066-7, Hardback, 845 pages, US\$140.

**2012-12)** *Buoyancy-Driven Flows*, Edited by Eric P. Chassignet, Claudia Cenedese and Jacques Verron, 2012, Cambridge University Press, ISBN 978-1-107-00887-8, Hardback, 436 pages, US\$120.

**2012-15)** *Introduction to the Physical and Biological Oceanography of Shelf Seas*, by John H. Simpson and Jonathan Sharples, Cambridge University Press, ISBN 978-052-1701488, Paperback, 424 pages. US\$65.95.

**2012-17)** *The Continental Drift Controversy, Volume III: Introduction of Seafloor Spreading*, by Henry F. Frankel, Cambridge University Press, ISBN 978-0-521-87506-6, Hardback, 476 pages, CDN\$132.95.

**2012-18)** *Chemistry and the Environment*, by Sven E. Harnung and Matthew S. Johnson, Cambridge University Press, ISBN 978-110-768257-3, Paperback, 427 pages. CDN\$76.95.

**2012-19)** *Understanding the Earth System, Global Change Science for Application*, Edited by Sarah E. Cornell, I. Colin Prentice, Joanna I. House and Catherine J. Downy, Cambridge University Press, ISBN 978-1-107-00936-3, Hardback, 267 pages, CDN\$81.95.

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## Canadian Weather Quiz

What city in Canada can brag about having the greatest number of cold days below freezing in an average year?

- 1) Yellowknife, NT
- 2) Thompson, MB
- 3) Prince Albert, SK
- 4) Timmins, ON
- 5) Fort McMurray, AB

Answer on last page. Source: *The 2012 Canadian Weather Trivia Calendar* by David Phillips.



**IN MEMORIAM****Dr. Joseph Clodman****1917-2012**

Dr. Joseph (Joe) Clodman, first Director of the Meteorological Services Research Branch (MSRB) until his retirement in 1977, passed away on 2 October 2012 in his 96<sup>th</sup> year.



Joe Clodman was a weather forecaster near the end of and just after the World War 2, serving with distinction in several locations in Quebec and Atlantic Canada. From 1953 onward, as a member of the research division in Toronto, he did research on various weather phenomena and forecast methods. His Ph.D. work and thesis at New York

University was on clear air turbulence (ref. Joseph Clodman, Griffith M. Morgan, John T. Ball, "*High Level Turbulence*", Air Weather Service, United States Air Force, 1961, 84pp.)

He became the first Director of MSRB in the early '70s under the Research Directorate within the Atmospheric Environment Service, within the newly formed Department of the Environment. He fostered and directed the work of research divisions devoted to satellite meteorology, numerical weather prediction (NWP) and the use of mini computers to support regional weather centres through the generation of automated weather forecasts using numerical model guidance and statistical methods. Most of his staff were in Toronto (Downsview) but the NWP work was carried out by Recherche en Prévision Numérique (RPN) in Montreal.

Dr. Joe Clodman will be remembered as a leader in the development of forecast methods, including the computerization of the weather forecasting process.

Note from the Editor: With the kind assistance of Stephen Clodman, son of Joe, and Ian Rutherford, Executive Director, CMOS.

**Dr. David Paul Krauel****1944-2012**

It is with deep sorrow that we announce David Paul Krauel's passing. With his family by his side, David slipped away peacefully at home after a brave and stoic 15-year battle with Myelodysplastic Synrome, followed by an 18-month battle with Acute Myeloid Leukemia and subsequently Acute Lymphoblastic Leukemia. Predeceased by his loving wife Jill, David leaves behind to mourn, his daughters Sara and Val, his grandchildren Ava and Zachary, sisters, brothers and many close friends.



Born in Waterloo, Ontario, to Joye and Paul Krauel, David met Jill while working on his master's degree in Halifax. Married in 1969, David and Jill spent three years in Liverpool while David completed his PhD in Physical Oceanography. His supervisor was Kenneth Bowden and the title of his thesis was Dye Diffusion Studies in the Irish Sea. Returning to Canada in 1972, the couple settled first in Halifax where he worked at BIO, before moving to Victoria in 1974, where they raised their family.

David spent twenty-one years with Royal Roads Military College (RRMC), starting as a professor of Physics, and ending as Dean of Graduate Studies. David started the undergraduate programme in oceanography at RRMC in 1974, and was instrumental in the development of the graduate programme in Acoustics and Oceanography which began in 1987 and continued until the closing of the College in 1995. David continued on with Royal Roads University, as Director of Information Systems, until his retirement in 2002.

David was the President of CMOS in 1992.

David was passionate about boating and enjoyed many years racing sailboats, and spent many summers with Jill cruising and exploring the islands.

Note from the Editor: With the valuable assistance of Michael W. Stacey, Royal Military College of Canada, Kingston, Ontario, and staff of Royal Roads University, Victoria, B.C.

**NEXT CONGRESS NEWS / NOUVELLES du PROCHAIN CONGRÈS****Mitacs**

Mitacs supports national innovation by coordinating collaborative industry-university research projects with human capital development at their core. Since 1999, Mitacs has been promoting academic-industrial R&D while supporting the development of future innovation leaders. Mitacs has developed a proactive and successful approach to supporting innovation, both directly through collaborative R&D and indirectly through long-term development of skilled human capital.

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Look for a Mitacs presentation at the upcoming CMOS-CGU-CWRA congress and for more information see [www.mitacs.ca](http://www.mitacs.ca).

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**Gamal Eldin Omer Elhag Idris, C.Chem., MCIC**

Chemical Oceanography,  
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*"We want our children to live in an America that isn't burdened by debt, that isn't weakened up by inequality, that isn't threatened by the destructive power of a warming planet".* President Obama's Election Night Victory Speech very early on Wednesday morning in Chicago. Source: <http://www.nytimes.com/interactive/2012/11/06/us/politics/06-obama-election-night-speech.html>

**Mitacs**

Mitacs appuie l'innovation à l'échelle nationale en coordonnant des projets de recherche collaboratifs, qui mettent en rapport les secteurs industriel et universitaire, et qui visent à la base le développement du capital humain. Depuis 1999, Mitacs favorise la recherche et le développement (R.-D.) universitaires-industriels, en tablant sur le développement des futurs leaders en matière d'innovation. Mitacs a créé un mécanisme proactif qui a fait ses preuves pour le soutien direct et indirect de l'innovation : la R.-D. collaborative et le développement à long terme d'un capital humain compétent.

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- Construire des réseaux internationaux de recherche, créant ainsi des chefs de file innovateurs au Canada et à l'étranger;
- Fournir une formation professionnelle et entrepreneuriale aux étudiants diplômés, pour leur donner les outils nécessaires, afin de répondre aux besoins émergents en matière d'innovation.

Ne manquez pas la présentation de Mitacs au Congrès SCMO-UGC-ACRH. Pour de plus amples renseignements, consultez le site [www.mitacs.ca/fr](http://www.mitacs.ca/fr).

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**Douw G. Steyn**

Air Pollution Meteorology  
Boundary Layer & Meso-Scale Meteorology

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Email: [dsteyn@eos.ubc.ca](mailto:dsteyn@eos.ubc.ca)

### **Answer to Canadian Weather Quiz**

2) Thompson, MB



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