



Canadian Meteorological
and Oceanographic Society

La Société canadienne
de météorologie et
d'océanographie

CMOS **BULLETIN** SCMO

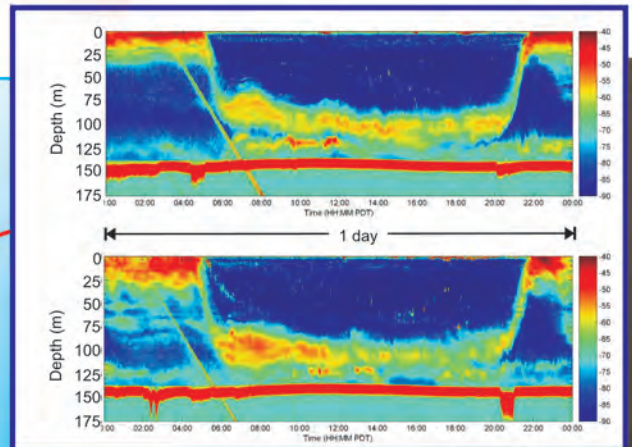
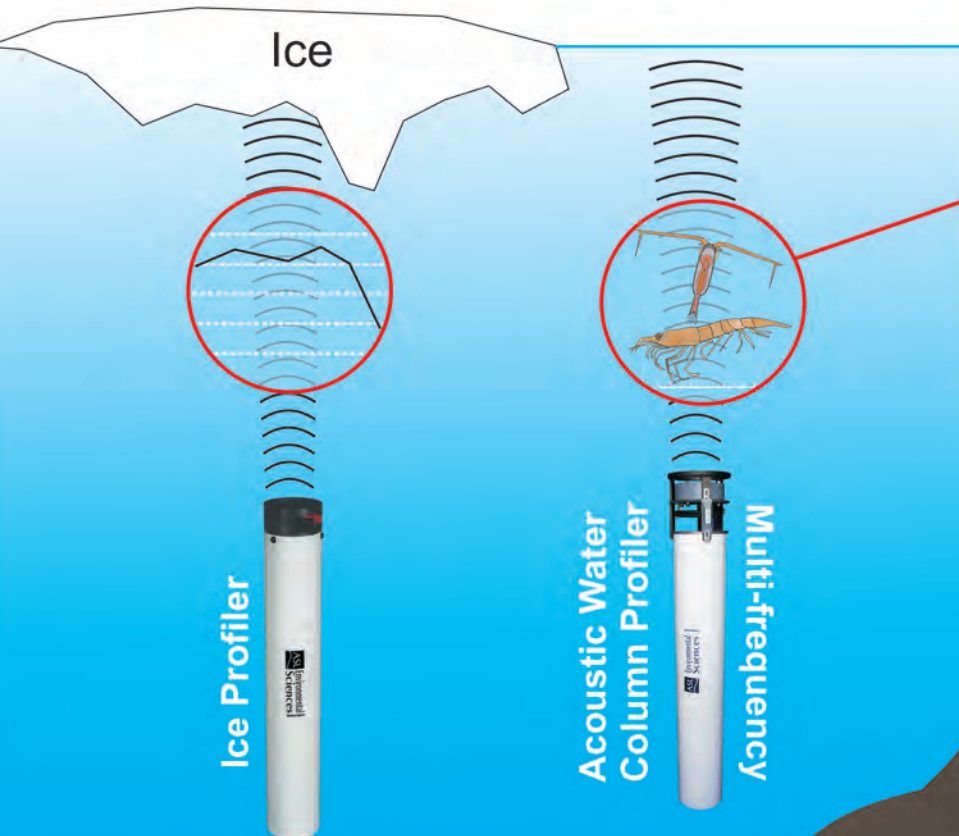
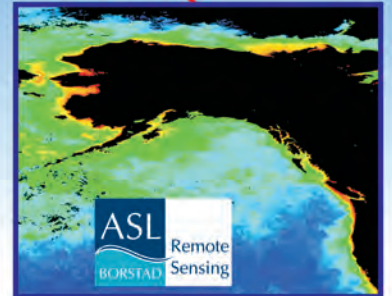
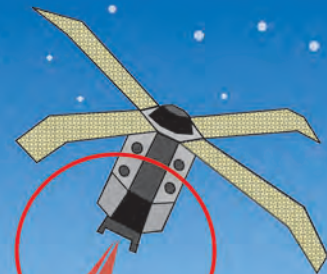
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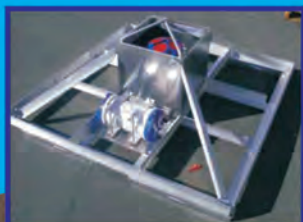
CMOS 4th Photo Contest / 4^e Concours photographique de la SCMO

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...from the President's Desk

Friends and colleagues:



David Fissel
CMOS President
Président de la SCMO

As I write this, the CMOS Congress in Ottawa has recently been completed in June. This year's 2010 Annual Congress, conducted as a joint meeting with the CGU, was a resounding success. Participation rates were very good in terms of conference registrations and scientific papers. Well over 900 people attended the

Congress.

The theme of the 2010 Congress was "Our Earth, Our Air, Our Water, OUR FUTURE" (*La Terre, l'air et l'eau, NOTRE AVENIR*). Within this theme, the Congress featured 794 papers presented. This total represented a healthy 4% increase from the last CMOS-CGU Joint Meeting with the CGU in St. John's NL in 2007.

The Congress also provided a forum for many important meetings, including the NSERC and Argo Townhall Meetings, and an important public lecture by Dr. Vincent Warwick of University Laval. The Congress also featured a well attended and successful Teachers' Day.

One of the highlights for me personally was the four scientific sessions, and a luncheon, on the occasion of the retirement of Professor Lawrence Mysak from McGill University, in celebration of his very distinguished career at McGill and before that, at the University of British Columbia. My first encounter with Lawrence was in the late 1960s, at UBC when I was a physics undergraduate student taking his third year math course. Professor Mysak sparked my interest in oceanography. Over the years he has worked with many outstanding students and colleagues, too numerous to mention, who represent a large part of his legacy to the Atmospheric and Ocean Sciences.

An important outcome of the Congress was the Statement of Concerns on Climate Change issued by scientists attending the meeting (as published elsewhere in this issue of the *CMOS Bulletin SCMO*). The Statement benefited from the timely scientific results provided in many papers presented at the Congress.

(Continued on page 123 / Suite à la page 123)

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CMOS Bulletin SCMO

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

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Cover page: Shown on the cover page are the three winning photos from the 4th CMOS Annual Photo Contest. Top, 1st prize: *Umbrella Graveyard* from Frédéric Fabry; bottom left: 2nd prize: *Mont Brome, Québec*, from Frédéric Fabry; bottom right: 3rd prize: *Little Storm on the Prairie* from David Sills. To learn more, please read the full report on **page 134**.

Page couverture: Les photos gagnantes du 4^e concours photographique annuel de la SCMO sont présentées sur la page couverture. Haut: 1^{er} prix: *Umbrella Graveyard* de Frédéric Fabry; en bas et à gauche: *Mont Brome, Québec*, de Frédéric Fabry; en bas et à droite: *Little Storm on the Prairie* de David Sills. Pour en savoir plus, veuillez lire le rapport en **page 134**.

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

I would personally like to thank the many dozens of volunteers who made this Congress so successful. In particular, the Local Arrangements Committee, chaired by John Falkingham, did an outstanding job of organizing and operating the conference. As already described, the Scientific Program Committee, headed by Dick Stoddart and Rod Blais, provided an excellent program of scientific papers. The names of all members of these committees, plus the many volunteers during the 2010 CMOS/CGU Meeting are given below. Thank you.

Next year, the CMOS Congress will be held in beautiful Victoria, British Columbia from June 5-9, 2011. Arrangements are already well under way under the leadership of Dr. Nathan Gillett, Chair of the Local Arrangements Committee, for what promises to be another important and productive scientific meeting. Please join us in Victoria.

During the 2010 joint meeting, Dr. Spiros Pagiatakis, President of the CGU along with the CGU Executive, met with us. It was agreed that the next joint CMOS/CGU Meeting will be held in Saskatoon on May 27-30, 2013.

On other CMOS matters, our membership numbers have been growing this year with the membership increases being largely in the student and retired membership categories. While the trend to increased membership numbers is encouraging, we need to continue in our efforts to offer more value to members.

We are seeking to improve our linkages between the national executive and office of CMOS with the fourteen CMOS Centres located across Canada. We urge all CMOS members to get involved in the activities of their local Centre and to participate in our Annual Congresses, whenever possible.

And finally, we have made some important decisions on improving the CMOS scientific journal, ATMOSPHERE-OCEAN. ATMOSPHERE-OCEAN will be published in collaboration with the international publishing firm, Taylor-Francis, as described elsewhere in this issue. This decision will place ATMOSPHERE-OCEAN on a sustainable path in which we can expand its contents over the years ahead.

David Fissel
CMOS President
Président de la SCMO

2010 Ottawa Congress Organization**Local Arrangements Committee (LAC)**

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Wayne Richardson - Treasurer
Isabel Ruddick - Registration
Erica Wilson / Bruce Ramsay - Facilities
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Elaine Moores - Volunteer Coordinator
Spiros Pagiatakis / Kathy Young - CGU Representatives
Denis Bourque - CMOS Ottawa Centre Chair
Sean Carey - at large

Scientific Program Committee (SPC)

Dick Stoddart and Rod Blais, Co-Chairs
Altaf Arain - McMaster University
Doug Whelpdale - EC/MSC (retired)
Gail Atkinson - University of Western Ontario
Howard Freeland - DFO/IOS
Ian D Rutherford - CMOS
Joe Henton - NRCAN
John Falkingham - Chair, 2010 Congress LAC
John Stone - EC/MSC (retired)
Leah Braithwaite - EC/Can Ice Service
Peter Taylor - York University
Sam Butler - University of Saskatchewan
Sean Carey - Carleton University
Spiros Pagiatakis - York University
Tim Aston - CFCAS

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Dave Henderson - John Hollins - Dave Huddleston
Sergio Ieropoli - Richard Jones - Peter Kimbell
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Colleen Mortimer - Inès Ng Kam Chan - Lidia Nikitina
Lynn Pogson - Sierra Pope - Jana Ramsay
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Shiliang Shan - Jennifer Smith - Margaret-Anne Stroh
Marty Taillefer - Colleen Turnbull - Anne-Marie Valton
Wesley Van Wychen - Adrienne White - Katherine Wilson
Amir Yadghar

Highlights of the May and June Executive and June (Congress) AGM and Council Meetings

The most significant decision made this year was to transfer ATMOSPHERE-OCEAN to another publisher. Following lengthy discussions at Executive, Council and Publishing Committee meetings, CMOS members at the Annual General Meeting on June 1st voted unanimously to authorize the Director of Publications to negotiate a publishing partnership with the company Taylor & Francis. Under this partnership, CMOS will retain copyright and editorial control of A-O, while Taylor & Francis will print and market the journal. The members chose a partnership with Taylor & Francis over an outright purchase of the journal by NRC Press. To attract more researchers to publish in A-O, page charges will be waived for the first paper published in ATMOSPHERE-OCEAN by a Canadian author.

The Ottawa Congress was successful, both scientifically and financially, and organizers expect to see a substantial surplus once the final report is complete. There were 990 registrants at the conference this year. The main challenge that the organizers faced was the limited space available for displays and posters. Participants were very appreciative of the assistance offered by the many volunteers at the conference. Next year's Congress will be held in Victoria, at the Conference Centre, with hotel rooms booked at the Empress Hotel and several other local hotels. Space will not be a problem in Victoria, but the Congress may not make such a large surplus, because the venues will be more expensive. Arrangements are proceeding well. The 2012 Congress will be held in Montreal, co-hosted by the American Meteorological Society, and in 2013, the Congress will be co-hosted by the Canadian Geophysical Union in Saskatoon.

This year's budget sheets include an accounting of the time spent by Ottawa Headquarters staff on various tasks. The exercise has shown that staff spend more time providing support for Congresses than was previously estimated, and this had led to an increase in the amount of Congress revenue that will go to support CMOS Headquarters in the future. Sixty-five (65) new members joined CMOS this year. The audited financial statement was published in the 2009 Annual Review, which is available online on the CMOS website.

Also on the front page of the website is a link to a statement of CMOS' position on climate change. A separate climate change statement by some participants at the Ottawa CMOS Congress is published in this issue of the *CMOS Bulletin SCMO* (on page 143).

A celebration for Uri Schwarz was held at his retirement home in Ottawa in May and was attended by 50-60 people, including family, friends and colleagues. At the AGM, members voted to change the name of the Development Fund to the "**Uri Schwarz Development Fund**" or "**Fonds de développement Uri-Schwarz**".

Sophia Johannessen,
Recording Secretary / Secrétaire d'assemblée

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.

Next Issue *CMOS Bulletin SCMO*

Next issue of the *CMOS Bulletin SCMO* will be published in **October 2010**. Please send your articles, notes, workshop reports or news items before **September 3, 2010** to the address given on page 122. We have an URGENT need for your written contributions.

Prochain numéro du *CMOS Bulletin SCMO*

Le prochain numéro du *CMOS Bulletin SCMO* paraîtra en **octobre 2010**. Prière de nous faire parvenir avant le **3 septembre 2010** vos articles, notes, rapports d'atelier ou nouvelles à l'adresse indiquée à la page 122. Nous avons un besoin URGENT de vos contributions écrites.

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.

ARTICLES

The Northeast Pacific during the winter of 2009/2010

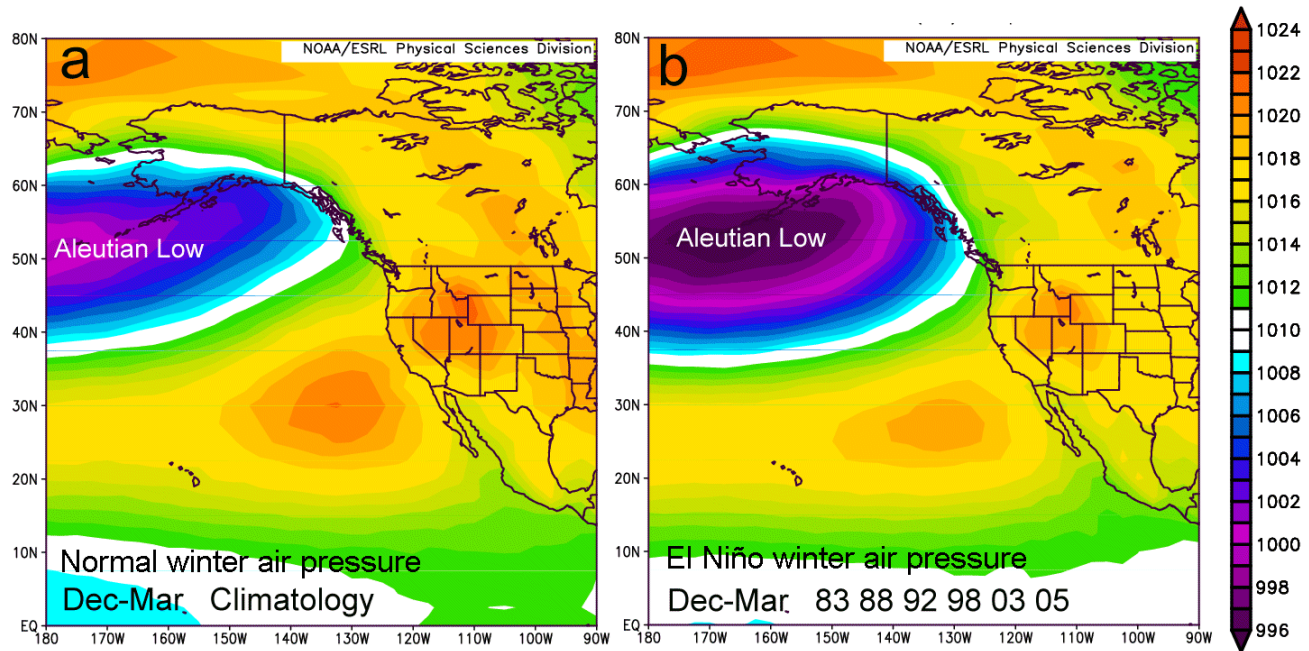
by Bill Crawford¹

Figure 1. Sea surface pressure average from December to March inclusive. (a) climatology from 1968-1996. (b) Dec-Mar of El Niño events in 1982/3, 1987/8, 1991/2, 1997/8, 2002/3, 2004/5. Air pressure is in millibars according to scale at right. Image provided by NOAA/ESRL Physical Sciences division. <http://www.esrl.noaa.gov/psd/cgi-bin/data/composites/printpage.pl>

Canadian west coast waters are generally cool when La Niña develops in the tropical Pacific Ocean, and then warm up with El Niño. This shift is attributed to stronger westerly winter winds of La Niña and more southerly winds of El Niño along the west coast. With the shift from La Niña to El Niño in spring of 2009 we expected local ocean temperatures to rise to above-normal temperature in autumn. This shift did indeed take place, but not until the very end of December 2009. Although this ENSO shift was late, the impact was severe in the Gulf of Alaska. Within a few weeks at the end of last year the storm tracks changed in the Gulf of Alaska; the Aleutian Low Pressure system deepened to new lows; and all through January and February 2010 the Gulf of Alaska coastal temperatures climbed quickly.

Fisheries and Oceans Canada sends its research vessel, the *CCGS John P. Tully*, into the Gulf of Alaska every February to monitor ocean conditions and conduct research into climate change impacts. In February 2010 the El Niño winter storms stopped the ship well before it arrived at Ocean Station Papa.

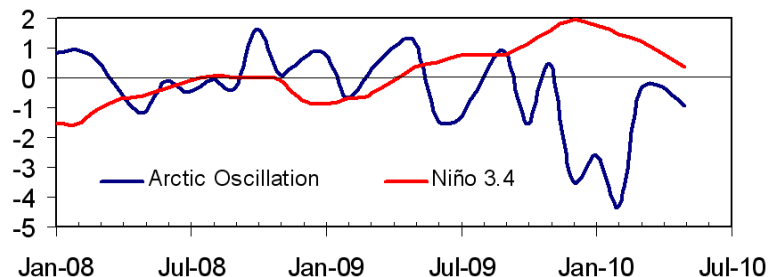


Figure 2. Time series of monthly values of the Arctic Oscillation and Niño 3.4 temperature anomalies.

¹ Institute of Ocean Sciences, Department of Fisheries and Oceans Sidney, BC

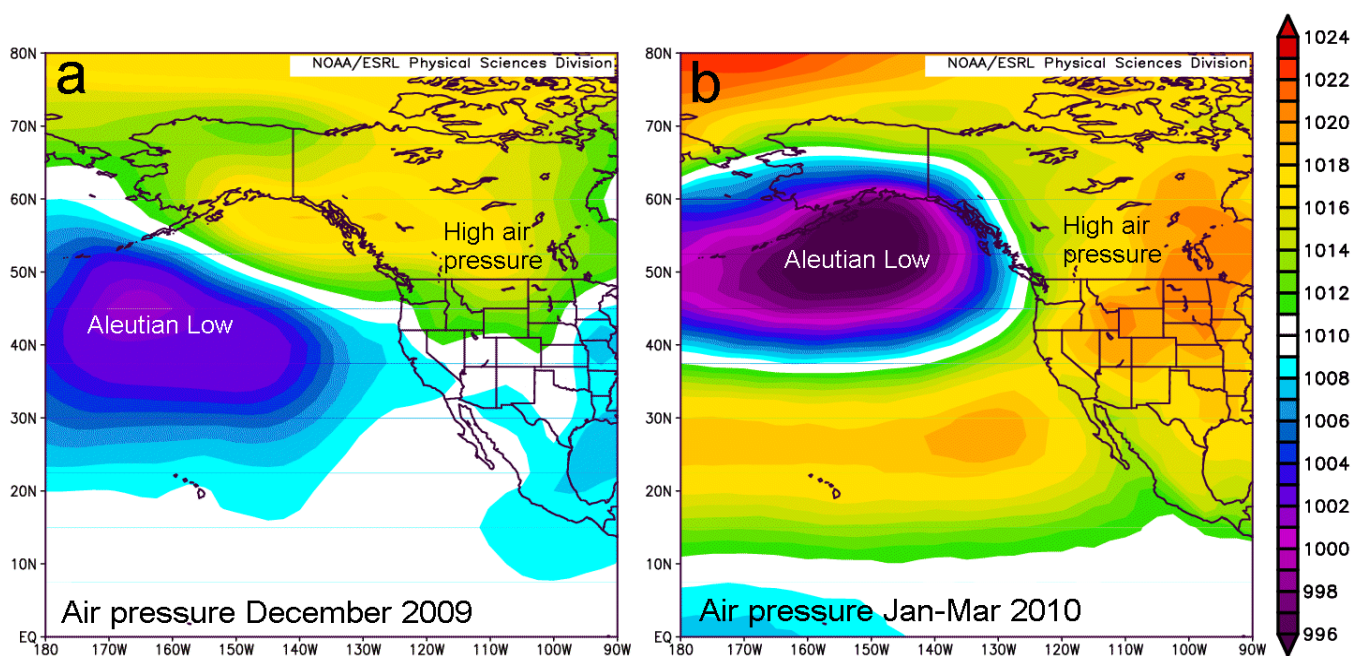


Figure 3. Sea surface pressure averages through winter 2009/10. Air pressure is in millibars according to scale at right. Image provided by NOAA/ESRL Physical Sciences division.

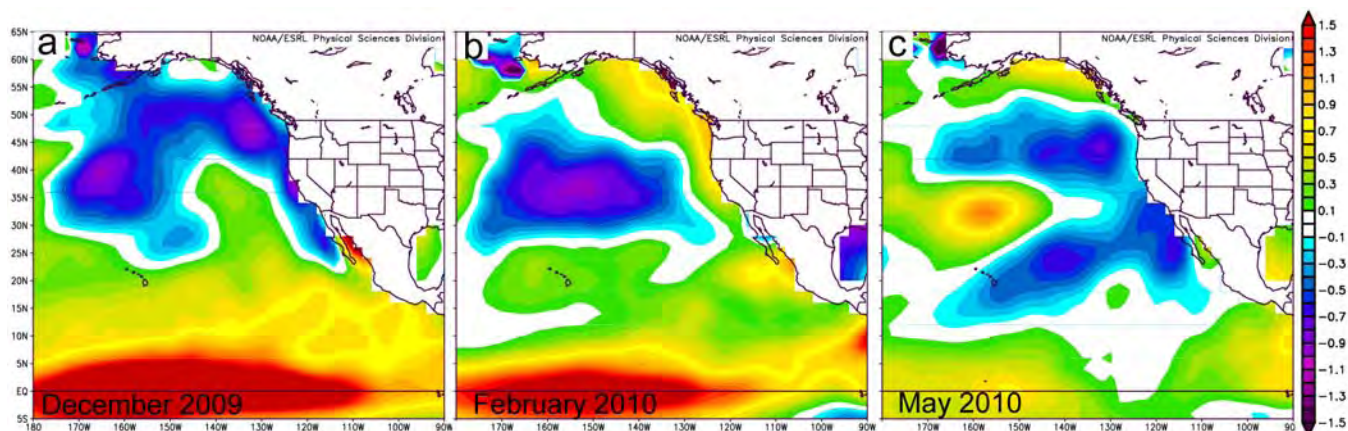


Figure 4. Sea surface temperature anomalies for (a) December 2009, (b) February 2010, (c) May 2010. Anomalies are in °C at intervals of 0.1 C, according to the scale at right. Image provided by NOAA/ESRL Physical Sciences division.

In a typical El Niño, the Aleutian Low pressure system in December to March drops in pressure and increases its area, as shown in the images below. The west coast North American from California to Alaska generally sees more southerly warm winds from Oregon to Alaska, and more storms in California during El Niño.

We blame the late arrival of warm winds in 2009-2010 on the Arctic Oscillation, which hit near-record negative values in December 2009 to February 2010. This oscillation is plotted below in Fig. 2, along with Niño 3.4 temperature anomalies. During negative Arctic Oscillation the high pressure regions of the Arctic spread to the south, as can be seen over western North America in Figure 3a.

The high pressure cell over western Canada and northwestern contiguous USA in December 2009 brought very cold air from the north. According to the Global Snow Lab of Rutgers University, more of North America was covered by snow than in any other December on record (going back to 1966). The ski runs of the Vancouver Olympics filled with snow, but it was not to last. If there was a contest between the high pressure of the Arctic Oscillation pushing south, and the Aleutian Low Pressure System of an El Niño winter pushing north, the Aleutian Low lost in December 2009, but dominated in January and February 2010. Figure 3b below reveals an Aleutian Low as intense as during the massive El Niño winters of 1982/3 and 1997/8. Its southerly winds carried warm air and water northwards along the North American west coast, and also downwelled

warm water at this coastline. These same winds quickly melted snow on the Olympic ski hills and only by importing snow did the Vancouver Olympic Games succeed in February.

Ocean temperature anomalies are plotted in Figure 4. El Niño appears as a warm region along the Equator. Note the cool waters in eastern Gulf of Alaska in December 2009, which had persisted for about two years. The intense Aleutian Low of January to February warmed the west coast in February 2010, but by May 2010 these warm surface temperatures were confined to Central American and Alaskan waters. Equatorial anomalies were close to zero in May, signalling the end of the 2009/10 El Niño. By early July the ENSO models even hinted at a possible return of La Niña to the Pacific Equator.

This article is based on the Ocean Status Research Document 2010/053, describing the Pacific Canadian ocean and its marine life, with input from 63 scientists:

<http://www.pac.dfo-mpo.gc.ca/science/psarc-ceesp/osrs/index-eng.htm>

Semi-annual reviews on the status of the NE Pacific, as well as on the status of the NW Pacific and Bering Sea are also published in *PICES Press* (http://www.pices.int/publications/pices_press/default.aspx).



Hottest March on Record

According to NOAA, the world's combined global land and ocean surface temperature made last month the warmest March on record, according to the National Oceanic and Atmospheric Administration (NOAA) of the United States of America, a WMO partner for global climate monitoring. Taken separately, average ocean temperatures were the warmest for any March and the global land surface was the fourth warmest for any March on record. Additionally, the planet has seen the fourth warmest January – March period on record.

The monthly National Climatic Data Center analysis, which is based on records going back to 1880, is part of the suite of climate services NOAA provides government, business and community leaders so they can make informed decisions.

Global Temperature Highlights – March 2010

The combined global land and ocean average surface temperature for March 2010 was the warmest on record at 56.3°F (13.5°C), which is 1.39°F (0.77°C) above the 20th century average of 54.9°F (12.7°C).

The worldwide ocean surface temperature was the highest for any March on record — 1.01°F (0.56°C) above the 20th century average of 60.7°F (15.9°C).

Separately, the global land surface temperature was 2.45°F (1.36°C) above the 20th century average of 40.8 °F (5.0°C) — the fourth warmest on record. Warmer-than-normal conditions dominated the globe, especially in northern Africa, South Asia and Canada. Cooler-than-normal regions included Mongolia and eastern Russia, northern and western Europe, Mexico, northern Australia, western Alaska and the southeastern United States.

El Niño weakened to moderate strength in March, but it contributed significantly to the warmth in the tropical belt and the overall ocean temperature. According to NOAA's Climate Prediction Center, El Niño is expected to continue its influence in the Northern Hemisphere at least through the spring.

For the year-to-date, the combined global land- and ocean-surface temperature of 55.3°F (13.0°C) was the fourth warmest for a January-March period. This value is 1.19°F (0.66°C) above the 20th century average.

According to the Beijing Climate Center, Tibet experienced its second warmest March since historical records began in 1951. Delhi, India also had its second warmest March since records began in 1901, according to the India Meteorological Department.

Other Highlights

Arctic sea ice covered an average of 5.8 million square miles (15.1 million square kilometres) during March. This is 4.1 percent below the 1979-2000 average expanse, and the fifth-smallest March coverage since records began in 1979. Ice coverage traditionally reaches its maximum in March, and this was the 17th consecutive March with below-average Arctic sea ice coverage. This year the Arctic sea ice reached its maximum size on March 31st, the latest date for the maximum Arctic sea ice extent since satellite records began in 1979.

Antarctic sea ice expanse in March was 6.9 percent below the 1979-2000 average, resulting in the eighth smallest March ice coverage on record.

In China, the Xinjiang province had its wettest March since records began in 1951, while Jilin and Shanghai had their second wettest March on record. Meanwhile, Guangxi and Hainan provinces in southern China experienced their driest March on record, according to the Beijing Climate Center.

Many locations across Ontario, Canada received no snow, or traces of snow, in March, which set new low snowfall records, according to Environment Canada.

For more information, visit <http://www.noaa.gov>.

National Oceanic and Atmospheric Administration *U.S. Department of Commerce*.

C M S TRILOGY

(With apologies to Gordon M. Lightfoot)

(The following poem was most likely typed on one of the upper case typewriters used in weather offices before computers were installed. It is a very clever adaptation of Gordon Lightfoot's *Canadian Railroad Trilogy*. The author, **G. Anna Zabolowski**, was a graduate of Meteorological Officer Course 24, see <http://www.cmos.ca/Metphotos/course24.html>. Her poem first appeared in Volume 31, Issue 2 of *The Forecaster* (June 1971), p. 10-12.

PART I (MODERATO):

THERE WAS A TIME IN THIS FAIR LAND WHEN THE
WEATHER WAS UNTAMED,
AND THE PROBLEM OF PREDICTING IT COULD DRIVE A
MAN INSANE,
LONG BEFORE THE CENTRALS AND BEFORE THE C.A.O.
WHEN THE PROVERBS IN THE ALMANAC WERE HANDY
THINGS TO KNOW.

BUT PEOPLE CAN'T BE SATISFIED, THEY WANT A
BETTER WAY
FOR THE SUNSET SKIES CONFUSED THEM WITH A
SHROUD OF SMOGGY GRAY
THE GROUNDHOG LOST AMBITION WHEN HE DIDN'T
LOSE HIS NERVE
AND THE OLD CHIEF FOLDED UP HIS TENT AND LEFT
FOR THE RESERVE.

BUT WHEN A FARMER'S FANCY WAS TURNING TO THE
SPRING
TOWARDS THOUGHTS OF EARLY PLANTING, STILL, THE
PROPHET WAS THE KING
AND THE WAILS OF COUNTLESS CHILDREN BROUGHT
INCREDIBLE DISMAY
TO THE TEACHER WHO POSTPONED THEIR JAUNTS
UNTIL A BRIGHTER DAY.

(ALLEGRO):

O THEY LOOKED IN THE FUTURE AND WHAT DID THEY
SEE?
JUST FRUSTRATION AND ANGUISH AND NO GUARANTEE
THAT THERE WAS TO BE SUNSHINE, THERE WAS TO BE
RAIN
AND A PROMISE RETRACTED WAS GIVEN IN VAIN.

"LOOK AWAY," SAID THEY,
"ACROSS THIS MIGHTY LAND
"SEE HOW MANY SCHEMES
"ARE ALL WEATHER-PLANNED:

(VIVACE):

"SO BUIILD US AN OFFICE, AND GIVE US THE
MEN
"TO FIND US THE ANSWERS, AGAIN AND AGAIN:
TO MAKE OUR DECISIONS, EMPLOYING THE
BEST
"OF TECHNICAL KNOWLEDGE, IN PLACE OF A
GUESS
"OF TECHNICAL KNOWLEDGE, IN PLACE OF A
GUESS"

(PART II: PIANISSIMO: STEADY RHYTHM, LIKE THE DRIP
OF PLOTTER'S INK):

WE ARE THE MET TECHS WHO SLAVE UP IN THE ARCTIC
ROASTING ALIVE IN THE HOT PRAIRIE SUN
TAKING THE OBS AND PLOTTING THE STRIP CHARTS
TO REST ON SHORT CHANGE WHEN OUR SHIFT WORK IS
DONE.

WE ARE THE PHONE CLERKS, THE FILERS OF TRAFFIC
TEARING OFF PAPERS AND ANSWERING CALLS
WE TYPE UP THE FORECAST AND SEND IT ON WIRE
AND STAPLE AMENDMENTS ALL OVER THE WALLS.

WE ARE THE MT'S WHO ISSUE THE FORECAST
WAITING FOR MAPS THAT WILL NEVER COME IN
FLIPPING OUR COINS ERE WE SPEND THEM ON COFFEE
AND GREETING RELIEF WITH A BLEARY-EYED GRIN.

PART III (ALLEGRO):

SO BOLSTERED BY GUIDANCE WE ISSUE OUR PROGS
WATCHING FOR FLURRIES, AND LEARY OF FOGS
CHECKING THE SEQUENCE FOR LATER REPORTS
WONDERING WHY ALL THE TIME IS SO SHORT:
SNATCHING AT SPECIALS AND WEIGHING OUR DOUBTS
WONDERING WHAT THE FX IS ABOUT
WRESTLING WITH TEPHIS AND SEARCHING FOR SHEARS
MAKING THE MOST OF WHATEVER APPEARS,
MAKING THE MOST OF WHATEVER APPEARS

(FORTE: ALL CIRCUITS RUNNING AT PEAK CAPACITY):

O AT LAST ALL THE FORECASTS HAVE BEEN DONE
AND THE BATTLE HAS BEEN WON
BY THE PRODUCT WE MUST STAND
WITH REVISIONS ON DEMAND
WE HAVE GIVEN ALL OUR BEST
AND WE FEEL WE'VE MET THE TEST

(REPRISE):

BUT MANY A TIME IN THIS FAIR LAND THE WEATHER
STAYS UNTAMED
AND THE PEOPLE YOU PREDICT IS FOR CAN DRIVE A
MAN INSANE
AND THE LAST STRAW IS THE WOMAN WHO WILL CALL
YOU UP AND SAY
"YES, I HEARD THE FORECAST, THANK YOUSHOULD I
DO MY WASH TODAY?"

(REFLECTIVO):

"YES, I HEARD THE FORECAST, THANK YOU SHOULD .
. . . I . . . DO . . . MY WASH TODAY?"

By Gawdara Anna Zabolowski (Regina)

2009 Patterson Medal Award Presentation

Ottawa, Ontario, June 2, 2010 – The Patterson Distinguished Service Medal, first presented in 1954, is considered the pre-eminent award recognizing outstanding work in meteorology by residents of Canada. This award is named in honour of Dr. John Patterson, a meteorologist who was Director and Controller of the Meteorological Service of Canada from 1929 to 1946, a crucial period in the development of Canada's weather service.

David Grimes, Assistant Deputy Minister, Meteorological Service of Canada, presented the medal to **Dr. Bruce Angle** with the following words:



Bruce Angle receiving the award from David Grimes. Photo courtesy of P.-A. Bolduc.

“Bruce Angle has made significant contributions to Canadian and International meteorology through his efforts not only to advance Canada's interests but also to influence the international community to improve societal benefits for the citizens of all countries by facilitating improved meteorological services. Bruce has been a leading member in International Meteorological Affairs.

He began his career when he joined the Meteorological Service of Canada in 1979 as a

Meteorological Technician. Bruce quickly moved through the ranks of the Meteorological Service of Canada to forecast operations in Newfoundland and Labrador, to training in Cornwall and to his current position as Senior Advisor, International Affairs in 1996. Bruce has been recognized for his efforts in international relations. In 2002, he was honored with a Citation of Excellence from Environment Canada and has been recognized from the Caribbean, the WMO, UK and Australia.

Throughout his career, Bruce has demonstrated very strong leadership skills as he has built and led Canadian negotiating teams that have been recognized as both ground-breaking and world-class in their accomplishments. He has built strong relationships with International Organizations, networked with academia and the private sector to advance our interests.

Congratulations Bruce!”

Remise de la médaille Patterson 2009

Ottawa (Ontario) le 2 juin 2010 – La médaille Patterson pour service méritoire, qui a été remise pour la première fois en 1954, est considérée comme un prestigieux prix visant à souligner le travail remarquable des Canadiens en météorologie. Ce prix a été nommé en l'honneur de M. John Patterson, Ph.D., météorologue qui a été directeur et contrôleur du Service météorologique du Canada de 1929 à 1946. Il s'agit d'une période cruciale dans le développement du service météorologique du Canada.

David Grimes, sous-ministre adjoint, Service météorologique du Canada, a remis la médaille à **M. Bruce Angle, Ph.D.**, et voici l'hommage qu'il lui a rendu :

“Bruce Angle a contribué de façon importante dans le domaine de la météorologie à l'échelle canadienne et internationale. Non seulement ses efforts ont fait progresser les intérêts du Canada, mais ont influencé la communauté internationale en prodiguant des services météorologiques améliorés qui ont été bénéfiques à la société de plusieurs pays. Bruce a fait preuve de leadership aux affaires internationales en météorologie.

Sa carrière a débuté lorsqu'il a été embauché par le Service météorologique du Canada en 1979, comme technicien en météorologie. Avec le Service météorologique du Canada, il a gravi les échelons et a fait partie de la section des prévisions opérationnelles à Terre-Neuve-et-Labrador. Par la suite, il a reçu une formation à Cornwall, puis en 1996, il fut nommé conseiller sénior aux Affaires internationales. On a reconnu son travail pour ses efforts en relations internationales. En 2002, il a été honoré en recevant la mention d'excellence d'Environnement Canada. Les Caraïbes, le Royaume-Uni, l'Australie et l'OMM ont également reconnu sa valeur.

Au cours de sa carrière, Bruce a démontré beaucoup d'habiletés de leadership en développant et menant à bien des équipes de négociateurs canadiens, reconnus à la fois comme pionniers et de renommée mondiale dans leurs réalisations. Pour faire progresser les intérêts canadiens, il a développé de bonnes relations avec les organisations internationales, le milieu universitaire et le secteur privé.

Félicitations Bruce!”

Parsons 2010 Medal Award Presentation

On behalf of Siddika Mithani, Assistant Deputy Minister for Science of the Department of Fisheries and Oceans (DFO), Savithri Narayanan, Director General, Canadian Hydrographic Service, presented the Timothy R. Parsons Award to **Dr. Brian Petrie** from the Bedford Institute of Oceanography (BIO). The award was presented at the Canadian Meteorological and Oceanographic Society 2010 Congress in Ottawa, Ontario.

DFO established the Timothy R. Parsons Award in 2004 to pay tribute to excellence in Canadian ocean sciences and honour a scientist for either outstanding lifetime contributions to or for a recent exceptional achievement in multidisciplinary facets of ocean sciences, while working within a Canadian institution. The first award was presented to Dr. Parsons himself who was also a recipient of The Order of Canada.

Brian is noted for his extensive contributions to multidisciplinary ocean research with 35 years of service with



Dr. Brian Petrie receiving the Parsons' medal from Dr. Savi Narayanan.
Photo courtesy of P.-A. Bolduc.

Canada. Brian joined DFO in 1975 in the Marine Ecology Laboratory at the Bedford Institute of Oceanography. One of his first major services to the scientific community and province at large was his research associated with the Halifax Harbour Task Force. His model-based scenarios built on observations were the quantitative foundation for its recommendations and this body of research set a new standard for sewage modeling by incorporating a broad suite of variables beyond bacterial counts. Based on his unique blend of field and theoretical experience in physical oceanography and environmental monitoring, it was only natural that Brian was a key contributor in the design of DFO's Atlantic Zone Monitoring Program (AZMP).

Dr. Petrie has received numerous medals for his scientific contributions. These medals include the J.P. Tully Medal, awarded by the Canadian Meteorological and Oceanographic Society "for his collaborative, multidisciplinary research, and his sustained leadership to the description, understanding and implications of physical oceanographic variability in the Atlantic Canadian coastal ocean in 2004"; and the Deputy Minister's Prix d'Excellence on two separate occasions.

Dr. Petrie joins a distinguished group of scientists with the addition of the Timothy R Parsons Medal. Congratulations Dr Petrie!

Présentation de la médaille Parsons 2010

Au nom de Siddika Mithani, sous-ministre adjointe du secteur des Sciences du Ministère des Pêches et Océans (MPO), Savithri Narayanan, Directrice générale du Service Hydrographique du Canada, a présenté la médaille Timothy R. Parsons à **Brian Petrie, Ph.D.** La médaille fut présentée au congrès 2010 de la Société canadienne de météorologie et d'océanographie qui s'est tenu récemment à Ottawa, Ontario.

La médaille Timothy R. Parsons a été créée par le MPO en 2004 afin de reconnaître les réalisations hors du commun dans le domaine de la recherche sur les océans. Elle est décernée à un scientifique canadien qui s'est distingué par sa contribution remarquable dans un domaine multidisciplinaire lié à l'océanographie. Elle fut octroyée la première fois au Dr. Parsons lui-même qui est également récipiendaire de l'Ordre du Canada.

Brian est connu pour ses vastes contributions en recherche multidisciplinaire liée à l'océanographie et travaille à Pêches et Océans Canada depuis 35 ans. Il a rejoint les rangs du MPO en 1975 au Laboratoire d'écologie marine à l'Institut océanographique de Bedford où il travaille jusqu'à aujourd'hui.

Un des premiers principaux services qu'il a rendus à la communauté scientifique et à la province a été sa recherche menée avec le "Halifax Harbour Task Force". Ses scénarios fondés sur des modèles construits à la suite d'observations ont servi de fondement quantitatif aux recommandations formulées par la suite et cet ensemble de recherches a établi une nouvelle norme pour la modélisation des égouts en intégrant une vaste suite de variables au-delà du dénombrement des bactéries. Fort de son unique expérience autant théorique que pratique dans le domaine de la surveillance de l'océanographie physique et environnementale, Brian a naturellement contribué de manière importante au développement du programme de surveillance de la zone de l'Atlantique (PSZA) du MPO.

M. Petrie a reçu de nombreuses médailles pour souligner ces réalisations scientifiques, dont la médaille J. P. Tully de la Société canadienne de météorologie et d'océanographie : «pour sa recherche collaborative et multidisciplinaire ainsi que son leadership continu dans la description, la compréhension et les répercussions de la variabilité de l'océanographie physique dans les zones côtières de l'Atlantique canadien en 2004». Il a également été lauréat du Prix d'excellence de la sous-ministre deux fois.

M. Petrie s'est joint à un groupe distingué de scientifiques avec la médaille Timothy R. Parsons.

Félicitations M. Petrie!

CMOS Prizes and Awards announced at the 44th Annual Banquet

Crowne Plaza Hotel, Ottawa, Ontario
June 3rd, 2010

President's Prize

may be awarded each year to a member or members of the Society for a recent paper or book of special merit in the fields of meteorology or oceanography. The paper must have been accepted for publication in *ATMOSPHERE-OCEAN*, the *CMOS Bulletin SCMO* or another refereed journal.



Adam Monahan receiving his award from Bill Crawford

Awarded in 2009 to **Adam H. Monahan**, University of Victoria, for his pioneering work in developing a physical understanding of the probability distribution of surface winds, and in particular for his two recent papers dealing with the theoretical and practical construction, validation and interpretation of the probability distribution of

sea surface wind speeds over the ocean. His work has provided elegant and lucid examples of the application of stochastic differential equations to realistic atmospheric phenomena and improved our understanding of the stochastic dynamics of surface winds. A framework has been established for achieving significantly improved modelling and understanding of key processes that affect weather and climate as well as important technological applications such as wind power generation.

Tully Medal in Oceanography

may be awarded each year to a person whose scientific contributions have had a significant impact on Canadian oceanography.

Awarded in 2009 to **Eddy Carmack**, Institute of Ocean Sciences, for this major contributions in over 140 papers to all aspects of polar oceanography and limnology including water-mass formation, circulation, polar shelves and biogeophysical problems, as well as



Eddy Carmack receiving his medal from Bill Crawford

his tireless efforts to promote the study of the Arctic nationally and internationally.

Andrew Thomson Prize in Applied Meteorology

may be awarded to a member or members of the Society for an outstanding contribution to the application of meteorology in Canada.

Awarded to **John Richard Gyakum**, McGill University, for his leadership and many outstanding contributions to the understanding of weather systems over Canada, the development of forecasting techniques, and the training of meteorologists. His work has substantially



John Gyakum receiving his prize from Bill Crawford

advanced the ability of operational forecasters to warn the public and mariners of the threats due to major winter storms. He has also been one of the academic leaders in the Cooperative program on Operational Meteorological Education and Training, which teaches both Canadian and American forecasters cutting edge concepts in the context of weather forecasting.

The Prize in Applied Oceanography

may be awarded each year to a member or members of the Society for an outstanding contribution to the application of oceanography in Canada.



Michael Stacey receiving his prize from Bill Crawford

Awarded to **Michael W. Stacey**, Royal Military College, Kingston, for his numerical contributions to understanding the physical oceanography of fjords and turbidity currents. He has conducted observational and modelling work in Canadian fjords for over twenty-five years,

and has also made major contributions to turbidity current research, the parameterization of turbulent mixing in

numerical models, and wind-forced ocean circulation.

The Rube Hornstein Medal in Operational Meteorology may be awarded each year to an 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 duties. The work for which the medal is granted may be cumulative over a period of years or may be a single notable achievement.

Not awarded in 2009.

The Tertia M.C. Hughes Memorial Prize

may be awarded for contributions of special merit by graduate students registered at a Canadian university or by Canadian graduate students registered at a foreign university.

Awarded to **Oumarou Nikiema**, Université du Québec à Montréal, Montréal, for his Masters research on characterizing and understanding the sources of uncertainty in regional climate simulations, which represents a major scientific and technological accomplishment. As part of his research, Oumarou first derived, then applied the equation necessary for calculating a detailed budget for the time evolution and spatial distribution of inter-member variance in ensemble forecasts of the Canadian Regional Climate Model. His calculations succeeded in reproducing the episodes of high and low internal variability and the detailed analysis revealed which of the many terms contributed to the time tendency of internal variability.



Julie Thériault and Oumarou Nikiema receiving their awards from Bill Crawford

Also awarded in 2009 to **Julie Thériault**, McGill University, Montreal, for her Ph.D research on the formation of winter precipitation types with prescribed but varying atmospheric conditions. This has resulted in a much more comprehensive physically-based microphysics scheme that can account for phase changes and particle interactions

within a vertical column of the atmosphere. Dr. Thériault's study has resulted in significant advances in our ability to account for and better understand the formation of hazardous winter precipitation.

Roger Daley Postdoctoral Publication Award

Awarded each year to a candidate who, at the time of nomination, is working in Canada in a non-permanent position as a postdoctoral fellow or research associate, and is within five years of having received a doctoral degree. The award is to be based on the excellence of a publication in the fields of meteorology or oceanography that has appeared, or is in press, at the time of nomination.

Awarded in 2009 to **John Moores**, York University, for the publication entitled "*Atmospheric Dynamics at the Phoenix landing site, as seen by the Surface Stereo Imager*", published in the *Journal of Geophysical Research* (2010), which provides a



John Moores receiving his award from Bill Crawford

unique and important component of the wind knowledge base for Mars. Dr. Moores' initiative, diligence, creativity and hard work during the mission demonstrated his proven ability to envision a scientific program, to adeptly learn the components required to accomplish it, efficiently and determinedly implement it, analyze and understand the resulting data, and successfully publish the results for the scientific community to examine.

Neil J. Campbell Medal for Exceptional Volunteer Service

may be awarded each year to a member who has provided exceptional service to CMOS 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.



Neil Campbell presenting the award to Dick Stoddart

Richard Stoddart, CNC/SCOR Secretary, receives the medal in 2009 for this broad and effective service to and advocacy on behalf of both meteorological and oceanographic communities within the Canadian Meteorological and Oceanographic Society. He is recognized not only for his many volunteer activities as a committee member but also for his major contributions to the establishment of the Canadian Foundation for Climate and Atmospheric Science as an important supporter and facilitator of meteorological and oceanographic research in Canada. The medal was presented by Dr. Neil Campbell.

Citations

One or more Citations may be awarded each year to an individual, group or organization which has, in the previous year, made some outstanding contribution towards promoting public awareness of meteorology or oceanography in Canada.



Pascal Yiakovakis, weathercaster from Radio-Canada, receiving his award from Bill Crawford

The first citation is awarded to **Pascal Yiakovakis**, on-air meteorologist, Radio-Canada, Montréal, for his rigour and professionalism as presenter of weather forecasts on television and radio in both English and French. This includes the

countless hours spent keeping the public informed during the 1998 ice storm. Pascal combines in an exceptional way the two qualities necessary for any good weather presenter: a thorough knowledge of meteorology and the ability and desire to effectively communicate this knowledge.

The second citation is awarded to **Graham Thomson**, Columnist for *The Edmonton Journal*, Edmonton, Alberta, for his many excellent articles in *The Edmonton Journal*, as well as his public lectures on environmental issues. He has been particularly effective in bringing to light important issues related to Alberta politics, health and science, writing incisively with a critical eye. He undertakes extensive background research, and consults with the appropriate scientists in order to obtain the most up-to-date results on issues like global warming, recognizing that scientific issues cannot be assessed on the basis of popular opinion.

CMOS Fellow

may be awarded for exceptional long-term service and support to the Society and/or for outstanding contributions to the scientific, professional, educational, forecasting or broadcasting fields in atmospheric or ocean sciences in Canada.

Awarded to **William W. Hsieh**, University of British Columbia, for his internationally recognized leadership in the application of artificial neural networks to the advancement of our understanding of meteorological, oceanographic and climate variability.



Drs. Ronald Stewart and William Hsieh, new CMOS Fellows. Photo courtesy of P.-A. Bolduc

Also awarded in 2009 to **Ronald E. Stewart**, University of Manitoba, for his long-standing service to the meteorological community in teaching and research and for his outstanding organizational

and scientific leadership at both national and international levels.

The CMOS CNC/SCOR NSERC Scholarship Supplement provides a supplement of \$5000 to a holder of an NSERC Postgraduate Scholarship or Canada Graduate Scholarship. It is renewable for a second year provided the Scholarship continues to be held.

In 2009, the supplement was presented by Robie Macdonald to **Agathe Lisé-Pronovost**, Ph.D. student at Université du Québec à Rimouski. Her research objectives are to reconstitute the paleomagnetic vector from lake sediments in Patagonia and develop high resolution paleo tracers of changes in environmental conditions in order to better understand the relation of local to global climate changes.

The CMOS Weather Research House NSERC Scholarship Supplement

provides a supplement of \$5000 to a holder of an NSERC Postgraduate Scholarship or Canada Graduate Scholarship. It is renewable for a second year provided the Scholarship continues to be held.



Sarah Emily Collier receiving her prize from Bill Crawford

Awarded to **Sarah Emily Collier**, Ph. D. student, University of Alberta. Her research focuses on developing a coupled modelling system that includes a high-resolution regional climate model, a regional alpine glacier

model and a land surface hydrology model to investigate the interactions between the cryosphere, atmosphere and hydrosphere in alpine environments.

The CMOS Weather Network / Météomédia Scholarship offered to a Canadian female student enrolled in the 3rd or 4th year of an atmospheric science degree program at a Canadian university and with career aspirations as a forecast meteorologist, on-air meteorologist or meteorological briefer. It consists of a cheque for \$1500. The scholarship is funded by an annual donation from Pelmorex Inc., the parent company of The Weather Network and Météomédia.

Not awarded this year.

CMOS Undergraduate Scholarships

Provides \$500 for students in their penultimate year of studies to support their final year.

Awarded to **Jiselle Bakker**, University of Ottawa, 3rd year student in Earth Sciences preparing an honours thesis proposal to study the potential for creation of mercury methylation hotspots in benthic marine sediments from excess accumulation of organic matter from salmon aquaculture cages.



Derek Steinmoeller receiving his prize from Claude Labine of Campbell Scientific

Campbell Scientific Best Student Poster Prize

was presented by Claude Labine to **Derek Steinmoeller**, University of Waterloo, for his poster entitled "*High-order methods for weakly non-hydrostatic layered models*".

Photos credit: Except otherwise specified, all photographs shown in the above section are courtesy of Greg Teckles of Teckles Photo Inc., Ottawa, Ontario, the CMOS Ottawa Congress official photographer.

Fourth CMOS Annual Photo Contest

And the Winners are ...

1st Prize (\$100): *Umbrella Graveyard* by Frédéric Fabry;
2nd Prize (\$50): *Mont Brome, Quebec* by Frédéric Fabry;
3rd Prize (\$25): *Little Storm on the Prairie* by David Sills.

Prompted by participants to earlier photo contests, 12 members submitted 30 photos. Photos were displayed during the Ottawa Congress and on the web site. Voting was open from 15 May to 15 June. Twenty-six electronic ballots and twelve paper ballots were submitted.

As usual, there were non-member participants in the contest, both as entrants and voters. These were discarded, although for the first time this year the seven non-members who entered were given the opportunity to join CMOS by the close of voting. Two accepted that offer and their photos were entered.

A point system as for other years was used to determine the winning photos: three points for first choice; two points for second choice and one point for third choice.

Dorothy Neale helped with the vote-counting and tabulation.

Results

First prize, a clear winner with 37 points, is *Umbrella Graveyard*, taken by Frédéric Fabry at the corner of René-Lévesque and Drummond in Montréal on 16 May 2007. As can be seen, it was a very windy and rainy day!



1st Prize: *Umbrella Graveyard* by Frédéric Fabry

Second prize, with 29 points, also by Frédéric Fabry, was retitled *Mont Brome, Québec* for the contest. Frederic's original title was *Not Vancouver in 2010*. The photo was taken at night on 25 February 2010 from the top of Mont Brome, about 100 km east of Montreal, after a heavy

snow-storm. We felt the Vancouver title, while appropriate for the time of the Olympics, may have been misleading as to the location of the photo.



2nd Prize: *Mont Brome, Québec*, by Frédéric Fabry

Third prize, with 25 points, taken by David Sills on 18 July 2008 near Alask, Saskatchewan, was titled *Little Storm on the Prairie*. This was an excellent photo depicting cumulonimbus, virga, precipitation and rainbow against a perfect prairie background. David's clever naming of the photo may also have appealed to the voters.



3rd Prize: *Little Storm on the Prairie* by David Sills

About the Photographers

Frederic Fabry is the Director, Radar Observatory and Associate Professor of Atmospheric and Oceanic Sciences & School of Environment at McGill University, Montreal. Frederic is a first-time entrant to the CMOS Photo Contest, and to win two prizes at once is a special achievement.

David Sills is a severe weather scientist, Cloud Physics and Severe Weather Research Section, National Laboratory for Nowcasting and Remote Sensing Meteorology, Environment Canada, Toronto. David, is an avid photographer and has had winning photos in previous photo contests. He clearly has not lost his touch as he also took the honourable mention position of 4th place with 21 points for his 13 July 2008 photo of a shelf cloud near Carstairs Alberta.



Honourable mention:
Shelf Cloud near Carstairs, AB, by David Sills

Contributing Photographers

In addition to Frederic Fabry and David Sills who won the prizes, we wish to thank the following photographers for their excellent photos which were widely seen and appreciated during the contest period. They are: Chris Fogarty, Andrew Giles, John Hanesiak, Jason Noble, Peter Taylor, Yvonnick Le Clainche, Geoff Strong, Neil Taylor, Richard Verret and Tim Ashman.

Next Contest



Keep your cameras at the ready. Plans are under way for the 5th Annual Photo Contest to celebrate the artistic and creative talents of CMOS members.

Bob Jones
CMOS Webmaster
August 2010

CMOS - CGU Ottawa Joint Congress 2010

Ottawa, June 4, 2010. The CMOS-CGU joint congress wrapped up a successful week of meetings at Ottawa's Crowne Plaza hotel today. This was the 44th annual CMOS Congress and the third joint congress CMOS has held with the Canadian Geophysical Union (CGU). 990 delegates attended, including over 50 high school teachers who came for a special day on Thursday, June 3. It was the largest congress CMOS has ever held.



John Falkingham, Chair LAC Ottawa Congress

Many of the messages left by a series of impressive plenary speakers confirmed once again the results of climate change research which indicate that measurable warming is already under way. Climate warming was a main theme of plenary speakers on Arctic and Antarctic impacts especially

ice extent, glacier melting and shifts in traditional biosystems to new geographical areas. Another speaker exposed the issue of acidification of the oceans through chemical reactions with carbon dioxide and the possible extinction of shellfish whose shells will melt in the acidic water. Another speaker told the delegates that some lizards in Mexico are already extinct due to climate change in their habitats. Finally, the congress learned that weather forecasting models, using ever larger computers, now make nine-day forecasts possible with good accuracy, and that an additional day is added every decade. Over 700 oral and poster papers were presented in multiple sessions occupying every conference room in the hotel.

On Wednesday evening June 2, a public talk, titled *Our Melting Poles: Where Life on Earth is Changing*, was presented to about 300 people by Professor Warwick Vincent of Laval University. Members of the media attended, and there followed two excellent press reports about the congress in the local newspaper *Ottawa Citizen*.



Professor Warwick Vincent, Laval University. Photo courtesy of Bob Jones.

Many prizes and awards were announced during the Congress. Details of these awards for CMOS is published above. As well, at a special luncheon on June 2, the Environment Canada *Patterson Medal* was awarded to Bruce Angle, and the Fisheries and Oceans *Parsons Medal* was awarded to Dr. Brian Petrie. More details on these two awards with photos are published on page xxx.

Bob Jones, CMOS Webmaster

President's speech at CMOS Banquet

Thank you and good evening.



David Fissel on his Inaugural Speech

B o n s o i r
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b o n s o i r
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d ' o c é a n o g r a p h i e .

Comme certains d'entre vous le savent bien, je ne parle pas malheureusement très bien le français.

Par contre, je tiens à souligner que j'apprécie beaucoup les nombreuses contributions de nos collègues scientifiques francophones dans notre société SCMO. Par votre dynamisme, vous enrichissez beaucoup notre organisation.

Je vous offre mes sincères remerciements!

In my token French, I have acknowledged the importance of our French speaking colleagues in CMOS.

With over 800 members from all across Canada, CMOS is truly a national organization. Our membership is made up of meteorologists and oceanographers from the government, university and private sectors. Our membership numbers have grown over this past year, particularly in the student and retired member categories.

CMOS needs more growth in our regular membership category. Regular members represent the main practitioners of meteorology, oceanography and the related scientific disciplines. The vitality and ultimately the future of CMOS, depends on providing enhanced value to all our members: through our Annual Congress, our local Centre activities and our publications.

Our journal, ATMOSPHERE-OCEAN, has 43 years of outstanding contributions to the Canadian and international scientific communities. This week, CMOS took a major decision on the future of ATMOSPHERE-OCEAN in selecting the international publishing firm, Taylor and Francis, to partner with us in publishing ATMOSPHERE-OCEAN. This ensures that the publication of ATMOSPHERE-OCEAN is conducted on a sustainable basis for CMOS, with revenue sharing and an expanded international profile.

Choosing between Taylor and Francis, and the competing NRC Press, was a demanding year-long process. While NRC Press was compliant with our requirements, the decision to partner with Taylor and Francis was based on a very extensive comparative analysis, including ongoing consultation with the CMOS Executive and Council and our membership. Ultimately, the final decision was taken earlier this week at our well attended Annual General Meeting of CMOS.

I would like to thank our Chair of the Publications Committee, **Steven Lambert**, and particularly our Director of Publications, **Richard Asselin**, for their commitment in leading us through this demanding process. I would also like to introduce Ms. Lyndsey Dixon of Taylor and Francis. [Lyndsey's speech follows on page 140].

Like any scientific journal, ATMOSPHERE-OCEAN needs more high quality manuscript submissions. To this end, I would like to announce that ATMOSPHERE-OCEAN will waive page charges for the first publication by Canadian Authors. This initiative will encourage our growing student membership to publish and will provide a significant impetus to our ATMOSPHERE-OCEAN journal.

Under Bill Crawford's leadership, CMOS, along with four other Canadian Scientific Societies issued a public letter on climate change in November of last year, prior to the Copenhagen international summit. CMOS will continue to be a principled contributor to the public issues concerning climate change. Throughout this Congress we have seen the latest research results on climate change and its impacts. For example, at the Plenary Session of this morning, we learned of compelling research regarding climate change impacts on the Canadian Arctic and on increased ocean acidification.

In closing, I would like to thank all of you for participating in this Congress and for your support of CMOS.



Group photo of the LAC for the Ottawa 2010 Congress

Particular thanks are due to John Falkingham for his efforts as Chair of the Local Arrangements Committee, as well as to all of his volunteers.

Also, thanks to Dick Stoddart and Rod Blais, as co-Chairs of the Scientific Program Committee. Your efforts are very much appreciated.

Our annual congress this year is a joint scientific meeting of CMOS and the Canadian Geophysical Union. Accordingly, I would like to thank Dr. Spiros Pagiatakis, President of the CGU and his executive and volunteers for their efforts in making this Congress so successful.

As always, special acknowledgement is deserved for our National headquarters personnel (Richard Asselin, Paul-André Bolduc, Qing Liao, Bob Jones, Dorothy Neale and Sheila Bourque). In particular, I wish to thank our Executive Director, Ian Rutherford; it is not clear that any CMOS president could function effectively without Ian's guidance and wise counsel.

Also I would like to take this opportunity to introduce our new Vice- President, Dr. Norm McFarlane, a well known meteorologist and research scientist. Norm will join the Pacific Coast-based CMOS executive which also includes myself, Jane Eert and Sophie Johannessen of the Institute of Ocean Sciences, and Rich Pawlowicz of UBC as well as John Parker, Charles Lin and Kent Johnson, our three Councillors-at-Large. Dr. Bill Crawford of IOS now takes on the role of Past-President. Bill, I would like to thank you for your leadership, dedication and much hard work throughout this past year as our President. And our most sincere thanks to Andy Bush who leaves the Executive after three years as Vice-President, President and Past-President.

Merçi beaucoup pour votre attention. Thank you very much and enjoy the rest of your evening.

David Fissel
Incoming CMOS President

**The Honourable Gail Shea, P.C., M.P.
Minister of Fisheries and Oceans
Opening Remarks**

at the

The 3rd joint Canadian Meteorological and
Oceanographic Society (CMOS) – Canadian
Geophysical Union (CGU) 2010 Congress

Ottawa, June 1, 2010

Bienvenue! Good morning!

What a delight to help kick off this special joint Congress!



The Honourable Gail Shea, P.C., M.P.,
Minister of Fisheries and Oceans

I understand the Canadian Meteorological and Oceanographic Society (CMOS) and the Canadian Geophysical Union (CGU) last partnered for a joint congress just a few years ago in St. John's, and that it was a great success. I am not surprised. It is a little-known scientific fact that the Maritime climate brings out the best in people! And of course it does not hurt that your two organizations are so determined to share knowledge and build partnerships for the advancement of science.

Well, Ottawa is a long way from our oceans. But as someone who hails from Prince Edward Island, I have discovered the National Capital Region has many charms of its own. I hope that all of you, from wherever you have travelled, will make the most of your time here for what is certainly the leading conference on oceans in Canada.

For my part, I would like to talk about the role of Fisheries and Oceans Canada, particularly as it relates to your theme of "Our Earth, Our Air, Our Water, Our Future."

For me, this theme suggests a vision for science that reflects fundamental principles and values: collaboration, partnerships, and the sharing of science across disciplines...one that recognizes the essential role of science in policy development.



The audience at the Congress in the Crowne Plaza Hotel on opening day on June 1, 2010

I am sure you will understand, then, why I take particular pride that Dr. Bill Crawford, president of CMOS, is a scientist with my department...

Since my arrival at Fisheries and Oceans Canada, in fact, I have learned that the department's scientists, particularly in the regions, make enormous contributions to the field of oceanography and to CMOS.

For decades, they have been collecting and analysing data, and then sharing it with others, both within Canada and abroad. All to help expand our collective knowledge so we can better manage the ocean resources entrusted to us. Armed with scientific evidence, we can develop better policy, and ultimately, make better decisions.

Of course, like all good scientists, the people at Fisheries and Oceans Canada are always looking to improve their methods to achieve better results.

One of the most significant changes in recent years was the adoption of the ecosystem approach. As you know, this holistic approach recognizes that an ecosystem's physical, biological and human interactions are all connected. By better understanding and respecting the nature of these relationships, we can finally move away, once and for all, from the old "stovepipe science."

Let me tell you about how my department uses an ecosystems approach to get to the heart of priorities specific to different regions.

On the west coast, in the Strait of Georgia, we have 50 scientists looking at how the physical and biological conditions of the strait are influencing fish and marine mammal populations...and how a changing climate will affect them in the future.

Through the Climate Change Science Initiative, we are enhancing our understanding of the impact of global warming on aquatic ecosystems. This includes issues like ocean acidification, which threatens marine organisms with calcium-based shells. For shellfish harvesters and producers in my home province and the rest of coastal Canada, this threat to their livelihood is only now being understood for its gravity. Our investment in this science is helping us to identify and prepare for managing the socio-economic effects of a changing climate.

I will also mention a joint initiative with Environment Canada to improve the prediction of atmosphere, ocean and ice conditions in the Gulf of St. Lawrence — Canada's busiest maritime corridor. This project, in fact, also involves the Department of National Defence and other national partners. It is all part of the Canadian Operational Network of Coupled Environmental Prediction Systems, or CONCEPTS.

I mention this because partnerships are extremely vital in our work — not just among government players, but also with academic networks. Ocean Network Canada, the Ocean Tracking Network and ArcticNet are only three such examples.

We also work closely with international partners, including through Argo, the largest ocean research project in the world, and the Intergovernmental Oceanographic Commission (IOC), which — as you may know — is currently celebrating its golden anniversary with UNESCO.

I want to mention one international initiative that involves two of our neighbours. Over four years, we have invested nearly \$14 million to collect data in the North. Our goal is to help determine the limits of Canada's Arctic and Atlantic continental shelves that lie beyond the 200-nautical mile limit [economic exclusive zone]. In collaboration with the US and Denmark, we are presenting our findings to the UN Convention on the Law of the Sea by 2013.

This is a terrific example of how partners can work together to generate data that can lead to informed decisions.

We are never without challenges, but I think on the whole, this is a good time to be doing science in Canada, and I think the future for earth and environmental sciences is shaping up well.

We are just now seeing the findings emerge from the major burst of research for International Polar Year, which the

Government of Canada supported with significant funding. And just a couple of weeks ago, my colleague, Minister Tony Clement, announced the first group of Canada Excellence Research Chairs. In fact, several of the new chairs are directly related to your work.

We should all be proud that globally respected scholars will join Canada's leading researchers, students and postdoctoral fellows. These programs will surely lead to all kinds of new collaboration among government, academia and international partners. And, the knowledge generated will be reflected in policy and decisions, both within government and externally.

I want to end this morning with a few thoughts on how we can foster greater integration between science and policy.

The theme, "*Our Earth, Our Air, Our Water, Our Future,*" represents the coming together of the physical and biological sciences. But, in securing the future, we also need the input of our social sciences. This occurs at the crucial crossroad where policy and science intersect.

My department is working harder to bring policy and science together. For example, we have a new policy unit that brings together expertise from across sectors in the National Capital Region. By integrating the once separate sectors of science and oceans, we are [also] acknowledging the synergies that can be realized when science and policy work closely together and inform each other.

In closing, I leave you with this challenge. Reflect on how your work can influence public policy. Be willing to engage in the policy process. And, above all, recognize that Canada needs your collective knowledge to secure the future of our natural resources for generations to come.

On that note, I wish you a successful and fruitful Congress.

Thank you, Merci.

Gail Shea, P.C., M.P.
Minister of Fisheries and Oceans

Lindsey Dixon Remarks at CMOS Congress during Banquet



Ms. Lindsey Dixon from
Taylor & Francis

Taylor & Francis are delighted to be partnering with CMOS to publish *ATMOSPHERE-e3cdOCEAN*. It is an excellent journal which we will be proud to publish. We are privileged to work with such a

dedicated and passionate editorial team.

This is very much a partnership. In our role as stewards of A-O, we will work with you to best serve the interests of the research community. It is 70 years since the Royal Meteorological Society agreed to the establishment of a Canadian branch, setting in motion events which lead us all to be here today.

Over that period, there has never been a more important time to communicate research on oceanic and atmospheric change clearly and effectively to the global community.

And through T&F's online platform, through our global marketing campaigns and through our consortial sales deals we can provide *ATMOSPHERE-OCEAN* with the global presence it deserves. Through T&F over 1400 hundred additional institutions will be able to access A-O and by providing this greater visibility in combination with our online submission system we hope to encourage a greater number of submissions from within Canada and further afield.

I note that the inaugural CMS Congress – the precursor of CMOS – was held here in Ottawa, at Carleton University, in 1967. As an alumnus of Carleton myself, I see this as a very good omen! I, and the rest of the team at T&F, very much look forward to working with you. Thank you for choosing to partner with us.

Lindsey Dixon
Taylor & Francis

Prochain Congrès de la SCMO

Le prochain congrès de la SCMO se tiendra à Victoria, Colombie-Britannique, du 5 au 9 juin 2011. Le thème choisi est "Océan, atmosphère et le Pacifique en transition". Prière d'inscrire ces dates importantes à votre agenda pour 2011.

Thank you very much Neil

upon reception of the Neil J. Campbell Medal for exceptional voluntary service

I am so pleased and honoured to accept this very prestigious award. I have been mentored and counseled by Neil for well over 30 years. He hired me from Environment Canada back in 1978 and our working relationship and friendship has survived many ups and downs over the years. It was Neil who initiated me to volunteering through the CMOS National Executive, and subsequently on my retirement to the Canadian National Committee for the Scientific Committee on Oceanic Research (SCOR), and may other volunteer jobs in between.



Dick Stoddart, Co-Chair Scientific
Program Committee

No one could match the volunteer efforts that Neil has made has on behalf of CMOS over such a sustained period of time. It is truly an honour to be mentioned in the same breath as Neil Campbell.

It would not be possible to participate in these volunteer activities without partnerships with many other friends and colleagues. Thank you all. Finally, I would like to give particular thanks to my wife Jean for her unwavering support and understanding over the years for the time devoted to these volunteer efforts.

Thank you again.

Dick Stoddart
2009 Recipient of The Neil J. Campbell Medal for Exceptional Volunteer Service

Next CMOS Congress

The next CMOS Congress will be held in Victoria, British Columbia, June 5 - 9, 2011. The selected theme is "Ocean, Atmosphere and the Changing Pacific". Please book these important dates on your 2011 agenda.

Photos credit: Unless otherwise specified, all photographs shown in this section are courtesy of Greg Teckles of Teckles Photo Inc., Ottawa, Ontario, the CMOS Ottawa Congress official photographer.

Teachers' Day 2010

by Sheila Bourque¹ and Emily Bourque¹



Audience at the Teachers' Day

Teachers' Day 2010 took place on 3 June 2010 in the beautiful Panorama Room on the Penthouse level of the Crowne Plaza Hotel in Ottawa. The event was an outreach program of the 3rd joint Congress of CMOS and the Canadian Geophysical Union and was attended by 54 educators

representing 10 different boards, including 2 who came from Toronto specifically to attend Teachers' Day. This registration-only event is a no-cost professional opportunity for educators from many different levels of teaching.

The all-day event focussed on topics representing the interests and expertise of both Societies. There were speakers on meteorology/atmospheric science, oceans and the geosciences (earthquakes). Some speakers focussed on activities and resources that teachers could use immediately in their classrooms and others brought information on the current state of the science. Many of the educators were specifically interested in climate change topics due to a new climate change unit being part of the Ontario high school curriculum. Speakers came from academia, non-governmental organizations and the federal government.

The energy level in the room stayed high throughout the day, with interactive sessions and lots of questions from the teachers. The free registration included lunch and breaks, giving the teachers plenty of opportunity to share their excitement and ideas with their colleagues and interact with the speakers. During the breaks, many of the teachers visited the booths of the Congress sponsors located in the penthouse area.

Each teacher left with a comprehensive kit, all of which was generously donated by various organizations. The kit included posters donated by Natural Resources Canada, Environment Canada, the Department of Fisheries and Oceans and the Department of Earth Sciences, Carleton University. Lunch, as well as one of the breaks, was sponsored by Campbell Scientific, whose generous contribution enabled us to accommodate so many teachers. Throughout the day, there were draws for prizes that were also all generously donated.

¹ Environment Canada, Ottawa, ON

Overall, the day was a great success; most of the attendees indicated that the event had exceeded their expectations and many suggestions were given for additional presentation topics.

CMOS takes its role in educating our future scientists very seriously and by supporting outreach activities for educators we reach today's students. Many of the comments on the evaluations indicated that the teachers planned to share what they had learned, not only with their students but also with their colleagues so many more educators will benefit from the presentations.

A selection of comments received:

- I wish this would happen each year in Ottawa.
- I wish others from my school and board would have taken advantage of this excellent conference and workshops. Well done in all aspects. Collegiality, exchange of ideas at a professional level with professionals in "the outside world" is beneficial and informative.
- Overall, I truly enjoyed the day because I felt the presenters had true respect for teachers as partners in education. I felt that they value the contribution we may make to their field of expertise via the interactions we have with our students. Many thanks for a good day.



Claude Labine

Speakers and Topics
Weather, Climate & Climate Change: Monitoring in a School Environment by Claude Labine, Chief Scientific Officer, Campbell Scientific.

eCards - eLearning on our Changing Climate by Gordon Harrison,

Director, GreenLearning Canada.

Moving Day in Canada - Earthquake Science and Human Impact by Stella Heenan, POLARIS.

Environmental Video Conferencing by René Brunet, Distance Learning & Videoconference Coordinator / Facilitator.

La Biosphère, Environnement Canada.

Weather - Everywhere and Everyday by Phil Chadwick, Meteorologist, Environment Canada.

Climate Change: Are You Confused? by Dr. John Stone, Research Professor, Dept. of Geography and Environmental Studies, Carleton University.

What's Really Happening to Arctic Sea Ice? by Leah Braithwaite, A/Director, Canadian Ice Service, Environment Canada.

44TH CMOS Congress Photo Memories Souvenirs photographiques du 44^e Congrès de la SCMO



Photos legend (from left to right, top to bottom). 1. Ms. **Qing Liao** (CMOS Office Manager) at CMOS Banquet on Thursday night. 2. **David Fissel**, **Richard Asselin** and **Lindsey Dixon** just before Banquet. 3. Poster session under the tent on the terrace; 4. **Dr. Neil Campbell**, **Karen Grimes**, **Ian Black**, weathercaster from CBC, Ottawa and **Dorothy Neale** at the Patterson-Parsons Luncheon on Wednesday noon. 5. **Howard Freeland** and **Helen Joseph** proudly waving the IOC 50th anniversary flag. 6. **Howard Freeland** and **Bill Crawford** with a profiling float, one of the types used in Argo. 7. Part of the audience at the Public Lecture on Wednesday night. 8. Passing the buck, **Bill Crawford** (Past-President on left) and **David Fissel** (Incoming President on right). 9. Happy oceanographic team, **Dick Stoddart** (Co-Chair, Scientific Program Committee) and **Savi Narayanan**, (Director General, Canadian Hydrographic Service).

Above photos are courtesy of the Editor, *CMOS Bulletin SCMO*, June 2010.

CLIMATE CHANGE / CHANGEMENT CLIMATIQUE

It has been proposed that *CMOS Bulletin SCMO* print a regular bi-monthly section devoted to Climate Change. The purpose would be to keep members informed on recent results and related information on climate change, especially on the hot topic of global warming. These could be volunteered or solicited, and would be mostly short snippets, but with occasional longer articles. Please forward your thoughts, suggestions, or better still, your articles on this to the Bulletin editor, bulletin@cmos.ca.

Il a été suggéré que le *CMOS Bulletin SCMO* publie régulièrement une section bimensuelle concernant le changement climatique. Le but serait d'informer les membres sur les plus récents résultats et les sujets reliés au changement climatique, en particulier sur les sujets d'actualité comme le réchauffement climatique. Ces informations pourraient être fournies sur une base volontaire ou sur demande. Elles prendraient la forme de courts articles et occasionnellement les articles pourraient être plus longs. Nous vous invitons à faire parvenir vos idées, suggestions ou, mieux encore, vos articles sur le sujet au rédacteur du Bulletin, bulletin@scmo.ca.

Climate Change

A Statement of Concern by Scientists

Note: Following the Ottawa Congress held at the Crowne Plaza Hotel, May 31st - June 4th 2010, several delegates met to discuss the implications for climate change research presented at this congress. They issued the following statement.

Ottawa, Ontario, June 4, 2010 - We, the undersigned, have been participating in discussions of the latest scientific results on our changing climate. We are increasingly concerned about the rate of climate change and the impacts on our planet, now and in the future. We feel that an urgent message must be brought to the attention of all Canadians.

Some key messages, presented this week at scientific meetings of the Canadian Meteorological and Oceanographic Society and the Canadian Geophysical Union in Ottawa, include:

- **Current warming will continue and get worse.** Human-made warming, occurring due to increases in carbon dioxide concentrations, will likely be irreversible for more than 1,000 years after emissions stop.

- **Sixty percent of sea-level rise is due to ocean warming.** Argo, a Canadian-led global network of 3,300 devices, already provides striking measurements of oceanic warming and sea-level rise.

- **Life will continue to change rapidly in our melting polar regions; we must adapt.** Projections show significant changes within this century. Increased rates of permafrost degradation are resulting in new conditions to which northern communities and industries will have to adapt.

- **Acidification of the oceans, particularly in coastal waters, will change marine ecosystems significantly.** Due to industrial and agricultural activities over the past 200 years, atmospheric CO₂ concentrations are now at their highest in the last 800,000 years and oceans are absorbing 30% of this carbon leading to acidification.

- **Proposed geoengineering actions are questionable and may have dangerous unknown side effects.** Science questions some key assumptions underpinning strategies, such as those to inject sulphate aerosols into the stratosphere to offset global warming.

- **Water supplies in the Prairies are dwindling and will continue to do so.** The Canadian Prairies are susceptible to droughts, which are among the most costly natural disasters in Canada in terms of socio-economic impact.

On 26 November 2009¹, the Canadian Meteorological and Oceanographic Society (CMOS), Canadian Geophysical Union (CGU), Canadian Association of Physicists (CAP), Canadian Society of Soil Science (CSSS) and Canadian Society of Zoologists (CSZ) jointly issued a statement reflecting their concerns about climate change. They noted that rigorous international research reveals that greenhouse gases resulting from human activities contribute to the warming of the atmosphere and the oceans and constitute a serious risk to the health and safety of our society, as well as having an impact on all life.

¹: http://www.cmos.ca/ClimateChangeLetter_26Nov09.pdf

Carbon Dioxide has Played Leading Role in Dictating Global Climate Patterns

CO₂ levels explain why temperatures in tropical and arctic waters have risen and fallen together for the past 2.7 million years.

Increasingly, the Earth's climate appears to be more connected than anyone would have imagined. El Niño, the weather pattern that originates in a patch of the equatorial Pacific, can spawn heat waves and droughts as far away as Africa.

Now, a research team led by Brown University has established that the climate in the tropics over at least the last 2.7 million years changed in lockstep with the cyclical spread and retreat of ice sheets thousands of miles away in the Northern Hemisphere. The findings appear to cement the link between the recent Ice Ages and temperature changes in tropical oceans. Based on that new link, the scientists conclude that carbon dioxide has played the lead role in dictating global climate patterns, beginning with the Ice Ages and continuing today.

"We think we have the simplest explanation for the link between the Ice Ages and the tropics over that time and the apparent role of carbon dioxide in the intensification of Ice Ages and corresponding changes in the tropics," said Timothy Herbert of Brown University and the lead author of the paper in *Science*. Herbert added, *"but we don't know why. The answer lies in the ocean, we're pretty sure."*

Candace Major of the National Science Foundation agrees: *"This research certainly supports the idea of global sensitivity of climate to carbon dioxide as the first order of control on global temperature patterns,"* she says. *"It also points to a strong sensitivity of global temperature to the levels of greenhouse gases on very long timescales, and shows that resulting climatic impacts are felt from the tropics to the poles."*

The research team, including scientists from Luther College in Iowa, Lafayette College in Pennsylvania, and the University of Hong Kong, analyzed cores taken from the seabed at four locations in the tropical oceans: the Arabian Sea, the South China Sea, the eastern Pacific and the equatorial Atlantic Ocean.

The cores tell the story. Sedimentary cores taken from the ocean floor in four locations show that climate patterns in the tropics have mirrored Ice Age cycles for the last 2.7 million years and that carbon dioxide has played the leading role in determining global climate patterns. The researchers zeroed in on tropical ocean surface temperatures because these vast bodies, which make up roughly half of the world's oceans, in large measure orchestrate the amount of water in the atmosphere and thus rainfall patterns worldwide, as well as the concentration of water vapour, the most

prevalent greenhouse gas.

Looking at the chemical remains of tiny marine organisms that lived in the sunlit zone of the ocean, the scientists were able to extract the surface temperature for the oceans for the last 3.5 million years, well before the beginning of the Ice Ages. Beginning about 2.7 million years ago, the geologists found that tropical ocean surface temperatures dropped by 1 to 3 degrees C (1.8 to 5.4 F) during each Ice Age, when ice sheets spread in the Northern Hemisphere and significantly cooled oceans in the northern latitudes. Even more compelling, the tropics also changed when Ice Age cycles switched from roughly 41,000-year to 100,000-year intervals.

"The tropics are reproducing this pattern both in the cooling that accompanies the glaciation in the Northern Hemisphere and the timing of those changes," Herbert said. *"The biggest surprise to us was how similar the patterns looked all across the tropics since about 2.7 million years ago. We didn't expect such similarity."*

Climate scientists have a record of carbon dioxide levels for the last 800,000 years--spanning the last seven Ice Ages--from ice cores taken in Antarctica. They have deduced that carbon dioxide levels in the atmosphere fell by about 30 percent during each cycle, and that most of that carbon dioxide was absorbed by high-latitude oceans such as the North Atlantic and the Southern Ocean. According to the new findings, this pattern began 2.7 million years ago, and the amount of atmospheric carbon dioxide absorbed by the oceans has intensified with each successive Ice Age. Geologists know the Ice Ages have gotten progressively colder--leading to larger ice sheets--because they have found debris on the seabed of the North Atlantic and North Pacific left by icebergs that broke from the land-bound sheets.

"It seems likely that changes in carbon dioxide were the most important reason why tropical temperatures changed, along with the water vapour feedback," Herbert said.

Herbert acknowledges that the team's findings leave important questions. One is why carbon dioxide began to play a major role when the Ice Ages began 2.7 million years ago. Also left unanswered is why carbon dioxide appears to have magnified the intensity of successive Ice Ages from the beginning of the cycles to the present. The researchers do not understand why the timing of the Ice Age cycles shifted from roughly 41,000-year to 100,000-year intervals. Contributing authors are Laura Cleaveland Peterson at Luther College, Kira Lawrence at Lafayette College and Zhonghui Liu at the University of Hong Kong. The U.S. National Science Foundation and the Evolving Earth Foundation funded the research. The cores came from the Ocean Drilling Program, sponsored by the NSF, and the Integrated Ocean Drilling Program.

Source: NSF-PR 10-103. The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In fiscal year (FY) 2010, its budget is about \$6.9 billion. NSF funds reach all 50 states through grants to nearly 2,000 universities and institutions. Each year, NSF receives over 45,000 competitive requests for funding, and makes over 11,500 new funding awards. NSF also awards over \$400 million in professional and service contracts yearly.

Tenure-Track Faculty Position in Mesoscale Meteorology

The Department of Atmospheric and Oceanic Sciences at McGill University is seeking outstanding applicants for a tenure-track Assistant Professor position in the area of Mesoscale Meteorology. The successful applicant will be expected to develop an active research program, supervise graduate students, and teach a variety of undergraduate and graduate courses.

The preferred areas of research are fairly broad, but should include a strong modelling component addressing one or more of a range of topics. These include, but are not limited to, the dynamics and physics of precipitating weather systems, the development of physical parameterizations and data assimilation to improve mesoscale weather prediction. A Ph. D. in atmospheric science or a closely-related field is required.

McGill University is an English-speaking university located in Montreal, one of North America's most cosmopolitan cities. For more information about McGill University and the Department of Atmospheric and Oceanic Sciences please see <http://www.mcgill.ca/meteo>

Qualified candidates are invited to submit an application, including a curriculum vitae, a statement of research interests, and a teaching statement to:

**Dr. John R. Gyakum, Chair,
Department of Atmospheric and Oceanic Sciences
McGill University
805 Sherbrooke Street West, Montreal, QC
H3A 2K6, Canada
Telephone: 514-398-3760; Fax: 514-398-6115**

Or by e-mail with pdf format application to: mesoscale@meteo.mcgill.ca.

The candidate should also provide three names, with contact information, of referees with their application. After preliminary screening, the search committee will request reference letters from the list of names that candidates have provided.

The preferred starting date for this position is September 2011.

Review of the applications will begin on October 15, 2010, and continue until the position is filled.

McGill University is committed to equity in employment and diversity. It welcomes applications from indigenous peoples, visible minorities, ethnic minorities, persons with disabilities, women, persons of minority sexual orientations and gender identities and others who may contribute to further diversification. All qualified applicants are encouraged to apply; however, in accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.

Want to know about climate science? Ask climate scientists

by Dan Gardner

The Ottawa Citizen, June 4, 2010¹

So you follow the news, maybe not as closely as you'd like, but you try to stay informed about major issues. And the latest buzz on climate change is unmistakable. The science is breaking up. There is no consensus. Climatologists were caught cooking the books. Forecasts of dire consequences have been exposed as nonsense. It seems that so much of what we heard over the past decade was hype and hysteria.

Climate change is starting to smell like the next Y2K.

Is that true? The people who are best informed about the state of climate science are climate scientists, and, as luck would have it, the joint annual congress of the **Canadian Geophysical Union and the Canadian Meteorological and Oceanographic Society** was held in Ottawa this week. So I attended a reception with hundreds of leading scientists and asked whoever I bumped into how they saw things.

What I heard is easy to sum up.

No, they said, the theory of anthropogenic climate change is not getting shakier. It is getting stronger. And no, orthodox scientists -- in contrast to many environmental activists -- did not hype the threat. If anything, they underestimated the pace and extent of change observed so far. Everyone I spoke to agreed that some legitimate scientists do not accept that human activity is warming the planet, but several guesstimated that at least nine out of 10 scientists in that room accepted that man-made climate change is all too real.

So it's not unanimous. But it is a consensus. And that's significant because, contrary to those who seem to think scientific claims become scientific facts when the immaculate hands of God chisel them into marble, there is no Higher Authority that settles things. There are only scientists arguing among themselves, and when most scientists decide there is enough evidence to consider a theory to be true, it is. That's how science works. There's nothing more to it.

Admittedly, casual conversation at a cocktail party is not a rigorous methodology for determining the state of scientific

opinion. But I am confident that what I heard that night reflects what scientists think for the simple reason that it is pretty much what the research arm of the United States National Academy of Sciences -- the most prestigious scientific institution in the world -- said in a report issued just two weeks ago. And what every major national science academy said in joint statements issued in 2005, 2008, and 2009.

I find this expert opinion impressive and persuasive because, as the reader may be aware, I am not a climate scientist. Indeed, when I try to read scientific papers discussing, say, "*absorption coefficients for CO₂ in the Schumann-Runge continuum*," my head hurts.

As Socrates said, the admission of ignorance is the beginning of wisdom, and I admit I do not have anywhere near the knowledge and training necessary to make sense of the vast scientific literature on climate. I respect and rely on those who do. Similarly, I would not attempt to determine what causes cancer, whether I have it, and how it should be treated. I would ask the appropriate scientific specialists and, if they collectively agreed something is true, I would consider it true. It may not be. Scientists sometimes turn out to be wrong, even when most of them agree, but we fallible humans have no better way of determining truth. Only a fool would play amateur oncologist.

But plenty of fools play amateur climatologist. They send me e-mails every time I write a column about climate change. After assuring me that they know what they are talking about because they studied science in undergrad, or they have a master's degree in engineering, they insist that, if I would read the attached three-page presentation, I would realize that the theory of anthropogenic climate change is complete nonsense. The atmosphere isn't warming. Or if it is, it's sun spots that are responsible. Or the ozone hole. Or Al Gore.

I occasionally respond to these people by saying I am unqualified to conduct an independent assessment of the science and so I rely on the views of those who are, a category which does not include my correspondent. This has been known to induce conniption fits. One man furiously denounced me for having an opinion on the subject that is not based on my own reading of the evidence; I chastised him for allowing oncologists to determine if he has cancer. He did not respond.

These people define themselves as brave, critical thinkers. Skeptics, in others words. But, as Michael Shermer, a true skeptic, pointed out recently in the *New Scientist*, they are nothing of the kind. They are dogmatists who scan scientific papers they do not fully understand for factoids that support their firmly held beliefs. They accumulate these factoids like starlings building a nest.

¹ Article reprinted with the express permission of: "Ottawa Citizen Group Inc.", a CanWest Partnership.

Naturally, the dogmatists' beliefs are threatened by the fact most serious scientists support the theory of climate change, and so they deny this fact. Or they insist scientists think the way they do because they ignore contrary evidence, don't consider alternative hypotheses, and shut out critics. Some insist scientists are pushing a hidden agenda and even major scientific institutions like the NAS are fellow-travellers of Gore and the environmentalists; one man accused me of dishonestly failing to tell readers the president of the NAS is a climatologist, which apparently demolishes the NAS's credibility on climate science for reasons I cannot seem to fathom.

But, as fun and wacky as these folks are, I want to emphasize, again, science-based criticism of climate-change theory, as distinct from what the fun and wacky folks do, is very much in the spirit of science and should be welcomed by any scientist worth the name. And it is. Granted, a few scientists have occasionally allowed their passion for action on climate change to get the better of them, but remember the reception I attended was peppered with scientists who doubt the theory of anthropogenic climate change. Their far-more-numerous colleagues did not throw buns, shout and drive them from the room. They chatted and drank wine.

It was an amazing contrast with the public debate, which tends to be dominated by the loudest, most extreme, and most unyielding voices. It's Mad Malthusians versus Crazy Cornucopians. Either climate change is the end of the world or it's a total fraud: Whose side are you on?

Reality is a bit more complicated than that. Which is why I will continue to respect and rely on scientists.

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Appui financier au Consortium Ouranos et sauvegarde du Centre ESCER de l'UQAM

Montréal, le 12 juillet 2010 - Le ministre du Développement économique, de l'Innovation et de l'Exportation, M. Clément Gignac, et la ministre du Développement durable, de l'Environnement et des Parcs, M^{me} Line Beauchamp, annoncent un appui financier de 14,4 \$ à la recherche en sciences du climat auprès du consortium Ouranos et du centre ESCER de l'UQAM. De ce montant, 12 M\$ serviront à la reconduction du soutien du gouvernement du Québec au financement de base du consortium Ouranos pour les quatre prochaines années; 1,5 M\$ seront versés sur trois années au Centre pour l'étude et la simulation du climat à l'échelle régionale (ESCER) de l'Université du Québec à Montréal (UQAM); et 900 000 \$ serviront à la réalisation de projets par des chercheurs dont l'expertise est reconnue dans le domaine des sciences du climat.

“Le consortium Ouranos représente une collaboration interinstitutionnelle intéressante qui réunit plusieurs universités, huit ministères québécois, Hydro-Québec et Environnement Canada. Le consortium Ouranos constitue une formule de partenariat unique qui nous permettra d'atteindre nos objectifs de développement durable. De plus, grâce à l'investissement annoncé, le centre ESCER de l'UQAM dirigé par le Dr. René Laprise pourra continuer son travail de calibre international sur la modélisation du climat régional”, a mentionné le ministre Clément Gignac.

Le consortium Ouranos a été créé en 2001 avec l'objectif d'aider la société à faire face aux changements climatiques. Sa mission consiste à acquérir et à développer des connaissances sur les répercussions socioéconomiques et environnementales de ces changements. Les connaissances développées par le consortium servent à informer les décideurs sur l'évolution du climat et à les conseiller en vue de cibler, d'évaluer et de mettre en œuvre des stratégies d'adaptation locales et régionales. Le consortium contribue aussi au soutien du développement de modèles climatiques, notamment par la production et la validation de projections climatiques pour le Québec et d'autres régions du Canada, ainsi que pour l'Amérique du Nord.

“L'appui financier du gouvernement au consortium Ouranos et au Centre ESCER s'inscrit dans la foulée des actions entreprises par le gouvernement du Québec dans le cadre de son Plan d'action 2006-2012 sur les changements climatiques. Les résultats de leurs travaux permettront d'améliorer notre compréhension des impacts attendus du changement du climat afin de développer les outils d'adaptation les plus pertinents pour le Québec”, a affirmé la ministre Line Beauchamp.

“L'appui du gouvernement du Québec permettra au consortium Ouranos et au Centre ESCER de poursuivre le développement de l'expertise acquise depuis une vingtaine d'années dans le domaine de la science du climat. Ce travail a d'ailleurs donné lieu à des collaborations majeures, notamment au sein du Groupe d'experts intergouvernemental sur l'évolution du climat (GIEC) de même qu'à l'échelle internationale”, a souligné le directeur général du consortium Ouranos, M. André Musy.

“Le financement du gouvernement du Québec permettra le maintien du Centre ESCER dans l'attente d'un changement de politique du financement de la recherche en climat au fédéral. Le Centre ESCER pourra ainsi poursuivre ses recherches de calibre international et la formation de personnel hautement qualifié dans un domaine stratégique pour le Québec. Notons que l'UQAM est la seule université à offrir une formation en langue française dans les domaines de la météorologie et de la physique du climat au Québec”, a déclaré le directeur du Centre ESCER, le Dr René Laprise.

CMOS BUSINESS / AFFAIRES DE LA SCMO***Big news!*****ATMOSPHERE-OCEAN****■ AGM SELECTS TAYLOR & FRANCIS AS THE NEW PUBLISHER****■ CMOS PRESIDENT WAIVES PAGE CHARGES FOR NEW CANADIAN AUTHORS**

On 1 June 2010, the Annual General Assembly of CMOS voted in favour of Taylor & Francis as the new publisher for ATMOSPHERE-OCEAN. This will be a partnership, whereby CMOS will retain full editorial control and will be completely responsible for provision of the scientific content while T&F will look after publishing in print and on-line, marketing, sales, distribution and all administration. In the next few months, the contract will be signed and the process of transfer will be initiated. The new arrangements will become effective on 1 January 2011.

As explained in a [background document](#) posted on the web and printed in the 2009 Annual Review, CMOS can no longer publish A-O by itself because of the complexity of marketing a scientific journal internationally. The membership survey yielded 184 replies, including 25 with comments, indicating a high degree of interest from the membership. The preference was 99 in favour of NRC Research Press and 81 for Taylor & Francis. Several persons contacted during the congress also indicated their interest in this question, but felt insufficiently knowledgeable to express a clear preference. The Publications Committee analyzed all comments and interviewed a representative from each company, concluding that either company would be acceptable. Council considered the advice of the Publications Committee and all available information and opted 13-1 in favour of T&F. They also proposed this choice to the AGM, which later voted unanimously in favour of Taylor & Francis, after more than one hour of animated but friendly discussion.

In the end, the arguments that seem to have carried the vote were: 1) A scientific society needs to have control of its journal and 2) NRC Research Press is a new private company, with no track record as a non-governmental entity.

At the Banquet on 3 June, the representative from T&F (Lyndsey Dixon, Publisher for the Environment and Agriculture group of journals) indicated that her company considered ATMOSPHERE-OCEAN as an excellent journal and promised to promote it strongly. In particular, she indicated that at least 1,400 new libraries would immediately gain access to our journal through the publications package to which they already subscribe.

The partnership with T&F will not only deliver a greatly increased readership: it will also assist the editorial process with its online manuscript submission and review system (Scholar One), will provide royalties to CMOS estimated at \$25 000 per year and support the editors with another \$7 500 per year. What T & F will not do directly is recruit more submissions, which is our own responsibility.

Following this announcement, David Fissel, the incoming President, remarked that the partnership with Taylor & Francis was a momentous decision for the Society, an opportunity to step forward and initiate a new life for ATMOSPHERE-OCEAN. He also noted that many papers presented at this congress could be the subject of publication in A-O. In order to facilitate the recruitment of more manuscripts, he then made his first decision by announcing that:

Page charges will be waived for Canadian authors publishing for the first time in ATMOSPHERE-OCEAN.

For the purpose of administering this decision, the following definitions have since been approved by the CMOS Executive:

A Canadian author is one who has conducted the reported research while working or studying full time in a Canadian institution or company, or who is currently working or studying full time in Canada.

A paper will qualify for waiving of page charges if the qualifying author: 1) is listed as the first author and 2) is the corresponding author and 3) has not been listed as the first author of another paper published in A-O (he may have been a secondary author).

The Publications Page Charge form will be modified so that the author must request the subsidy and claim qualification as Canadian author of a first paper in A-O.

Grande nouvelle!

ATMOSPHERE-OCEAN

■ L'AGA CHOISIT TAYLOR & FRANCIS COMME NOUVEL ÉDITEUR

■ LE PRÉSIDENT DE LA SCMO SUPPRIME LES FRAIS PAR PAGE POUR LES NOUVEAUX AUTEURS CANADIENS

Le 1^{er} juin 2010, l'assemblée générale annuelle de la SCMO a voté la nomination de Taylor & Francis comme nouvel éditeur pour ATMOSPHERE-OCEAN. Cela sera un partenariat par lequel la SCMO conservera le plein contrôle de la rédaction et sera pleinement responsable de fournir le contenu scientifique alors que T & F s'occupera de l'édition imprimée et en ligne, du marketing, des ventes, de la distribution et de toute l'administration. Dans les prochains mois, le contrat sera signé et le processus de transfert sera lancé. Les nouveaux arrangements entreront en vigueur le 1^{er} janvier 2011.

Comme il est expliqué dans un [document d'information](#) publié sur le Web et inclus dans la Revue annuelle 2009, la SCMO ne peut plus publier A-O par elle-même, du fait de la complexité de la commercialisation internationale d'une revue scientifique. Le sondage effectué auprès des membres a produit 184 réponses, dont 25 avec des commentaires, indiquant un niveau d'intérêt élevé de la part des membres. La préférence était de 99 pour NRC Research Press contre 81 pour Taylor & Francis. Plusieurs personnes interrogées pendant le congrès ont également indiqué leur intérêt pour cette question, mais sentaient qu'elles ne disposaient pas des connaissances suffisantes pour exprimer une préférence claire. Le Comité des publications a analysé tous les commentaires et s'est entretenu avec un représentant de chaque entreprise, concluant que les deux entreprises étaient acceptables. Le conseil d'administration a pris en compte l'avis du Comité des publications ainsi que tous les renseignements disponibles, et il a opté pour T & F à 13 contre 1. Il a également proposé ce choix à l'AGA, qui, plus tard, a voté à l'unanimité pour Taylor & Francis, après plus d'une heure de discussion animée, mais amicale.

Finalement, les arguments qui ont semblé influencer le vote étaient : 1) une société scientifique a besoin d'avoir le contrôle de sa revue et 2) NRC Research Press est une nouvelle entreprise privée, sans antécédents en tant qu'entité non gouvernementale.

Lors du banquet du 3 juin, la représentante de T & F (Lyndsey Dixon, éditrice pour le groupe de journaux sur l'environnement et l'agriculture) a indiqué que son entreprise considérait ATMOSPHERE-OCEAN comme une excellente revue et a promis d'en faire une solide promotion. En particulier, elle a indiqué qu'au moins 1 400 nouvelles bibliothèques obtiendront immédiatement l'accès à notre revue par le biais de l'ensemble de publications auxquelles elles sont déjà abonnées.

Le partenariat avec T & F n'offrira pas seulement un nombre fortement accru de lecteurs, mais il aidera également au processus d'édition avec son système de soumission et d'examen des manuscrits en ligne (Scholar One), fournira à la SCMO des redevances estimées à 25 000 \$ par année et appuiera les éditeurs avec un montant supplémentaire de 7 500 \$ par année. Ce que T & F ne fera pas directement est de solliciter d'autres soumissions; cela est de notre responsabilité.

À la suite de cette annonce, David Fissel, le nouveau président, a fait remarquer que le partenariat avec Taylor & Francis était une décision capitale pour la société, une occasion d'aller de l'avant et d'apporter une nouvelle vie à ATMOSPHERE-OCEAN. Il a également noté que de nombreux articles présentés à ce congrès pourraient être publiés dans A-O. Afin de faciliter la soumission d'un nombre plus important de manuscrits, il a ensuite pris sa première décision en annonçant que :

Les frais par page seront supprimés pour les auteurs canadiens publiant pour la première fois dans ATMOSPHERE-OCEAN.

Pour l'administration de cette décision, les définitions suivantes ont été depuis approuvées par le conseil de direction de la SCMO :

Un auteur canadien est un auteur qui a effectué la recherche en question tout en travaillant ou en étudiant à plein temps dans une institution ou une entreprise canadienne, ou qui travaille ou étudie actuellement à plein temps au Canada.

Un article sera admissible à une exonération des frais par page si l'auteur admissible : 1) figure comme auteur principal et 2) est l'auteur-ressource et 3) ne figure pas comme auteur principal d'un autre article publié dans A-O (il a pu être un auteur secondaire).

Le formulaire de frais de publication sera modifié afin que l'auteur puisse demander le subside et revendiquer sa qualification en tant qu'auteur canadien d'un premier article dans A-O.

A-O Abstracts Preview

Avant Première des résumés de A-O

The following abstracts will soon be published in your next *ATMOSPHERE-OCEAN* publication.

Les résumés qui suivent paraîtront sous peu dans votre prochaine revue *ATMOSPHERE-OCEAN*.

Spatiotemporal Mapping of ENSO and PDO Surface Meteorological Signals in British Columbia, Yukon and Southeast Alaska

by SEAN W. FLEMING and PAUL H. WHITFIELD

Abstract

We assessed the impacts of some key Pacific ocean-atmosphere circulation patterns on annual cycles of temperature and precipitation across British Columbia, Yukon, and southeast Alaska. The El Niño-Southern Oscillation (ENSO), the Pacific Decadal Oscillation (PDO), and ENSO conditional on PDO states were considered in composite analyses of 71 long, high-quality datasets from surface meteorological stations. Month-by-month, station-by-station Monte Carlo bootstrap tests were employed to assess statistical significance. The results trace precipitation and temperature responses as a function of location, season and climate mode. In summary, temperature responses were relatively uniform, with higher (lower) temperatures during the warm (cool) phases of these circulation patterns. Nevertheless, strength and seasonal persistence varied considerably with location and climate mode. Impacts were generally most consistent in winter and spring but could extend through most of the year. Overall spatiotemporal patterns in precipitation response were decoupled from those in temperature and were far more heterogeneous. Complexities in precipitation signals included north-south inverse teleconnectivity along the Pacific coast, with a zero-response hinge point in the approximate vicinity of northern Vancouver Island; seasonally opposite anomalies in several interior regions, which might conceivably reflect contrasting effects of Pacific climate modes on wintertime frontal storms versus summertime convective storms; and a consistent lack of substantial response in northwestern British Columbia and possibly southwestern Yukon, conjectured to reflect complications associated with the Icefield Ranges. The product is intended primarily as a basic-level set of climate response maps for hydrologists, biologists, foresters, and others who require empirical assessments of relatively local-scale, year-round ENSO and PDO effects across this broad region.

Résumé

Nous avons évalué les répercussions de certaines configurations de circulation océan Pacifique-atmosphère clés sur les cycles annuels de température et de précipitations en Colombie-Britannique, au Yukon et dans le sud-est de l'Alaska. Nous avons examiné l'El Niño-oscillation australe (ENSO), l'Oscillation décennale du Pacifique (ODP) et la sensibilité de l'ENSO à l'égard des états de l'ODP dans des analyses composites de 71 ensembles de données longs et de bonne qualité de stations météorologiques de surface. Nous avons employé des tests d'amorçage de Monte Carlo mois par mois, station par station, pour mesurer la signification statistique. Les résultats tracent les réponses des précipitations et de la température en fonction de l'endroit, de la saison et du mode climatique. En résumé, les réponses de la température étaient relativement uniformes, avec les températures les plus élevées (basses) durant les phases chaudes (froides) de ces configurations de circulation. Néanmoins, la force et la persistance saisonnière variaient considérablement selon l'endroit et le mode climatique. Les répercussions étaient généralement plus cohérentes en hiver et au printemps mais pouvaient se faire sentir durant la majeure partie de l'année. Généralement, les configurations spatiotemporelles générales dans la réponse des précipitations étaient dissociées de celles de la température et étaient beaucoup plus hétérogènes. Les complexités dans les signaux de précipitations comprenaient une téléconnexion nord-sud inverse le long de la côte du Pacifique, avec un point charnière de réponse nulle dans le voisinage approximatif du nord de l'île de Vancouver; des anomalies saisonnièrement opposées dans plusieurs régions intérieures, qui pourraient refléter des effets contrastants de modes climatiques du Pacifique sur les tempêtes frontales hivernales par rapport aux tempêtes convectives estivales; et un manque constant de réponse marquée dans le nord-ouest de la Colombie-Britannique et possiblement le sud-ouest du Yukon, que l'on croit attribuables aux complications liées aux chaînons des Glaciers. Le produit est principalement destiné à servir d'ensemble de base de cartes de réponse climatique pour les hydrologistes, les biologistes, les forestiers, etc. qui ont besoin d'évaluations empiriques des effets de l'ENSO et de l'ODP à une échelle assez locale, toute l'année, dans cette grande région.

The Semi-Diurnal Tide in Hudson Strait as a Resonant Channel Oscillation

by PATRICK F. CUMMINS, RICHARD H. KARSTEN and BRIAN K. ARBIC

Abstract

Tidal studies have shown that there exists a resonance of the semi-diurnal tide in the Hudson Bay-Hudson Strait system. The resonant response is particularly strong within Hudson Strait and Ungava Bay. It is shown here that the semi-diurnal tide in Hudson Strait has characteristics that are similar to those of a half-wavelength open channel resonance. A simple analytical model is developed to account for the salient aspects of the semi-diurnal response in the strait. Non-dimensional parameters that govern the response are identified and evaluated based on the physical dimensions of the region and results from a numerical tidal model. Taking account of the mechanical impedance presented to the channel by Hudson Bay, the results suggest that a channel mode is resonant near semi-diurnal periodicities, in general agreement with observations and more complex tidal models of the region. The possibility that Ungava Bay may have a separate quarter-wavelength resonance driven at the entrance to the shelf is also briefly explored.

Résumé

Des études sur les marées ont montré qu'il existe une résonance de la marée semi-diurne dans le système baie d'Hudson – détroit d'Hudson. La réponse résonante est particulièrement forte dans le détroit d'Hudson et la baie d'Ungava. Nous démontrons ici que la marée semi-diurne dans le détroit d'Hudson a des caractéristiques semblables à celles d'une résonance de demi-longueur d'onde dans un canal à écoulement libre. Nous proposons un modèle analytique simple reproduisant les principaux aspects de la réponse semi-diurne dans le détroit. Nous identifions et évaluons les paramètres non dimensionnels auxquels la réponse est liée d'après les dimensions physiques de la région et les résultats d'un modèle numérique de marée. En prenant en compte l'impédance mécanique produite par la baie d'Hudson dans le canal, les résultats suggèrent qu'il existe un mode de canal présentant une résonance proche des périodicités semi-diurnes, ce qui s'accorde approximativement avec les observations et les modèles de marées plus complexes de la région. Nous explorons rapidement, aussi, la possibilité qu'il existe dans la baie d'Ungava une résonance distincte de quart de longueur d'onde générée à l'entrée de la plate-forme.

ATMOSPHERE-OCEAN 48-2 Paper Order

Climate Trends at Eureka in the Canadian High Arctic
by G. LESINS, T. J. DUCK and J. R. DRUMMOND

Measurements of Drifting and Blowing Snow at Iqaluit, Nunavut, Canada during the STAR Project
by MARK GORDON, SUMITA BISWAS, PETER A. TAYLOR, JOHN HANESIAK, MARNA ALBARRAN-MELZER and SHANNON FARGEY

Simulating Wind Channelling over Frobisher Bay and its Interaction with Downslope Winds during the 7-8 November 2006 Wind Event
by DANIEL DEACU, AYRTON ZADRA and JOHN HANESIAK

Spatiotemporal Mapping of ENSO and PDO Surface Meteorological Signals in British Columbia, Yukon, and Southeast Alaska
by SEAN W. FLEMING and PAUL H. WHITFIELD

Modelling Stratification and Baroclinic Flow in the Estuarine Transition Zone of the St. Lawrence Estuary
by RACHEL D. SIMONS, STEPHEN G. MONISMITH, FRANÇOIS J. SAUCIER, LADD E. JOHNSON and GESCHE WINKLER

New Co-Editor (Meteorology) for A-O

Dr. William Hsieh
University of British Columbia



Dr. William Hsieh

William Hsieh obtained from the University of British Columbia his B.Sc. degree in combined honours mathematics and physics (1976), an M.Sc. in physics (1978), and a Ph.D. degree in oceanography and physics (1981). He did postdoctoral work at Cambridge University and at the University of New South Wales, before returning to the University of British Columbia, where he is now Professor Emeritus at the

Department of Earth and Ocean Sciences and at the Department of Physics and Astronomy. He is best known for his pioneering work in developing and applying machine learning methods in environmental sciences. He has over 90 refereed publications covering areas of climate variability and prediction, neural network modeling, atmospheric science, oceanography, hydrology and agricultural science. His graduate-level book *Machine Learning Methods in the Environmental Sciences* (2009) was published by Cambridge University Press. He was awarded the CMOS President's Prize in 1999 and was elected a CMOS Fellow in 2010.

New Co-Editor (Oceanography) for A-O

Dr. Guoqi Han
Northwest Atlantic Fisheries Centre
Department of Fisheries and Oceans

Dr. Guoqi Han is a Research Scientist of Fisheries and Oceans Canada, at the Northwest Atlantic Fisheries Centre. His main research interests are physical oceanographic,



Dr. Guoqi Han

climatic, and ecosystem issues in coastal and shelf seas and in sub-polar regions, using satellite remote sensing, numerical models, and oceanographic observations. In particular, he has made significant efforts and achievements in advancing coastal and shelf applications

of satellite altimetry and in applying unstructured grid ocean models for oceanographic and ecosystem-science issues in the past two decades. He has published over 50 refereed papers in scientific journals and written chapters in books, encyclopaedia and science bulletins, covering fields of oceanography, climate, ecosystem science, hydrodynamics and hydraulic engineering.

Dr. Han currently serves as the Co-Editor for ATMOSPHERE-OCEAN. He is the Vice Chair for Scientific Commission A (Space Studies on the Earth's Surface, Meteorology and Climate) of Committee on Space Research. He is an Adjunct Professor at Memorial University of Newfoundland, Canada and at a few other universities and institutions. Dr. Han co-chaired the Science Program Committee for the CMOS (Canadian Meteorological and Oceanographic Society)-CGU (Canadian Geophysical Union)-AMS (American Meteorological Society) 2007 Congress. He has served on advisory/organizing committees of international symposia and conferences.

Dr. Han, together with a team of his colleagues, was awarded the Prize in Applied Oceanography for the year 1998 by the Canadian Meteorological and Oceanographic Society. He, together with the Local Organizing Committee of the 2007 CMOS-CGU-AMS Congress, received the Admiral Award from the City of St. John's in 2008.

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

2009-04) *Principles of Snow Hydrology*, by David R. DeWalle and Albert Rango, Cambridge University Press, Hardback, 2009, ISBN 978-0-521-82362-3, pp.410, US\$150.

2009-16) *Waves and Mean Flows*, by Oliver Bühler, Cambridge Monographs on Mechanics, Cambridge University Press, Hardback, 2009, ISBN 978-0-521-86636-1, pp.341, US\$99.

2009-22) *Cloud and Precipitation Microphysics, Principles and Parameterizations*, Jerry, M. Straka, Cambridge University Press, Hardback, 2009, ISBN 978-0-521-88338-2, pp.392, US\$130.

2010-01) *Remote Sensing for Biodiversity and Wildlife Management, Synthesis and Applications*, Steven E Franklin, McGraw-Hill, Hardback, 2010, ISBN 978-0-07-162247-9, pp. 346.

2010-04) *Challenged by Carbon, The Oil Industry and Climate Change*, Bryan Lovell, Cambridge University Press, Paperback, 2009, ISBN 978-0 521-14559-6, pp.212, US\$30.

2010-05) *Measuring Global Temperatures, Their Analysis and Interpretation*, Ian Strangeways, Cambridge University Press, Hardback, 2009, ISBN 978-0 521-89848-5, pp.233, US\$115.

2010-09) *Climate Change and Small Pelagic Fish*, Edited by Dave Checkley, Jürgen Alheit, Yoshiaki Oozeki and Claude Roy, Cambridge University Press, Hardback, 2009, ISBN 978-0 521-88482-2, pp.372, US\$155.

2010-13) *Water Resources and Environmental Issues, Introduction*, Karrie Lynn Pennington and Thomas C. Cech, Cambridge University Press, Hardback, 2010, ISBN 978-0-521-86988-1, pp.457, US\$65.

2010-17) *Introduction to Coastal Processes and Geomorphology*, Robin Davidson-Arnott, Cambridge University Press, Hardback, 2010, ISBN 978-0-521-87445-8, pp.442, US\$125.

2010-19) *Stochastic Physics and Climate Modelling*, Edited by Tim Palmer and Paul Willimas, Cambridge University Press, Hardback, 2010, ISBN 978-0-521-76105-5, pp.480, US\$150.

2010-20) *Beyond Smoke and Mirrors, Climate Change and Energy in the 21st Century*, by Burton Richter, Cambridge University Press, Paperback, 2010, ISBN 978-0-521-74781-3, pp.226, US\$30.

ANNOUNCEMENT**COMMUNIQUÉ****CMOS Congress 2011****Congrès 2011 de la SCMO****Welcome**

Empress Hotel

The 45th Annual Congress of the Canadian Meteorological and Oceanographic Society will be held June 5th-9th 2011 at the Victoria Conference Centre, Victoria, BC. The Victoria Conference Centre has excellent facilities and is attached to the historic Empress Hotel, which is our main conference hotel, located in the heart of downtown Victoria. As many of you will know, Victoria is a great city to visit, surrounded by beautiful coastal and mountain scenery, and there is much to explore on Vancouver Island and the

surrounding Pacific coast should you choose to extend your stay. The Local Arrangements Committee and Scientific Program Committee are already hard at work planning the 2011 Congress, and we look forward to welcoming you here.

Congress Theme and Scientific Program

The theme of next year's Congress, "***Atmosphere, Ocean and the Changing Pacific***", encompasses how changes in this great ocean, both natural and human-induced, are affecting the planetary environment and its ecosystems. As we attempt to predict such changes and their many consequences across a broad range of time scales and to unravel the causes of such changes in the past, understanding the interconnections between the components of the earth system has become increasingly important; therefore, this theme will have a very broad reach. The Congress theme is, of course, only one facet of the meeting, and contributions in all areas will be sought and welcomed.

The scientific program for the 2011 Congress is taking shape and will feature an exciting slate of plenary and public lectures. A **Call for Session Proposals** will be circulated in early September via email and the Congress web site <http://www.cmos.ca/congress2011>, with submissions accepted until **September 30, 2010**. Workshops, business meetings and the icebreaker reception will be scheduled for June 5, and the Congress program will commence June 6. Those wishing to discuss or provide input to the program can contact the Scientific Program Committee at cccma_cmos2011@ec.gc.ca.

Bienvenue

Plage typique de la côte Ouest sur l'île Vancouver

Le 45^e congrès annuel de la Société canadienne de météorologie et d'océanographie se tiendra du 5 au 9 juin 2011 au Victoria Conference Centre, à Victoria, en Colombie-Britannique. Le Victoria Conference Centre possède d'excellentes

installations, et il fait partie de l'historique Empress Hotel, qui est notre principal hôtel pour le congrès, situé au cœur du centre-ville de Victoria. Comme plusieurs d'entre vous le savent, Victoria est une très belle ville à visiter, entourée de paysages côtiers et montagneux, et il y a beaucoup de choses à explorer sur l'île de Vancouver et la côte du Pacifique si vous décidez de prolonger votre séjour. Le Comité national organisateur et le Comité des programmes scientifiques travaillent déjà à planifier le congrès 2011, et nous avons hâte de vous accueillir ici.

Thème du congrès et programme scientifique

Le thème du congrès de l'année prochaine "***Atmosphère, Océan et le Pacifique en transition***", comprend le sujet des changements dans ce grand océan, naturels et causés par l'homme, qui affectent l'environnement planétaire et ses écosystèmes. Alors que nous tentons de prédire de tels changements et leurs nombreuses conséquences sur une large gamme d'échelles chronologiques et de démêler les causes de tels changements dans le passé, le fait de comprendre les interconnexions entre les composantes du système terrestre est devenu de plus en plus important. Par conséquent, ce thème aura une très large portée. Le thème du congrès n'est bien sûr qu'une seule facette de la rencontre, et les contributions sont recherchées et bienvenues.

Le programme scientifique pour le congrès 2011 prend forme et présentera une liste intéressante de conférences plénières et publiques. Un **appel de propositions de sessions** circulera au début septembre par courriel et sur le site Internet du congrès au <http://www.cmos.ca/congress2011>, et les soumissions seront acceptées jusqu'au **30 septembre 2010**. Des ateliers, des réunions d'affaires, et une réception brise-glace se dérouleront le 5 juin, et le programme du congrès commencera le 6 juin. Les personnes qui veulent discuter du programme ou y apporter des suggestions peuvent communiquer avec le Comité du programme scientifique à cccma_cmos2011@ec.gc.ca.

SHORT NEWS / NOUVELLES BRÈVES

Oceans Research gets a Boost

by Ryan McNutt



Dr. Douglas Wallace, new Dalhousie University Chair, CERC in Ocean Science and Technology.
Photo credit: Danny Abriel.

From the spectacular view of the Northwest Arm to the more than 100 faculty across campus involved in marine research, Dalhousie has a special relationship with the ocean. That relationship is about to be taken to the next level with a groundbreaking new research chair.

On Monday [May 17, 2010], the Government of Canada awarded Dalhousie a new Canada Excellence Research Chair (CERC) in Ocean Science and Technology, bringing renowned chemical oceanographer Douglas Wallace to the university to lead a multidisciplinary team of oceans researchers.

"This is truly an exciting day for Dalhousie and the whole Atlantic Region," said Scott Armstrong, Member of Parliament for Cumberland-Colchester-Musquodoboit Valley, who made the announcement at an event in the Milligen Room of the Life Sciences Centre.

The chair, one of nineteen CERCs awarded across Canada, will receive \$10 million over seven years from the Government of Canada to support its research into how CO₂ and other greenhouse gases are exchanged between the ocean and the atmosphere. Dalhousie will match that with a further \$24 million to put together a CERC Research Unit, consisting of seven new hires and several researchers at Dalhousie presently engaged in work related to the CERC focus. Between researchers, post-docs, students and support, the chair will add over 40 positions to the

university's research capacity.

"As we welcome Dr. Wallace to Dalhousie, we are also welcoming a new team of oceans researchers," said President Tom Traves, thanking the CERC program for making the chair possible. *"I think it's a tremendously far-sighted initiative on the part of the Government of Canada."*

Dr. Wallace, who comes to Dalhousie from the Leibniz Institute of Marine Sciences and the University of Kiel in Germany, plans to study the rapid changes in the North Atlantic as a result of human intervention.

"Many of the changes going on in the ocean are human influenced," he said. *"The recent disaster in the Gulf is just the latest example. These pressures are now global and growing deeper and deeper... what happens in a very distant part of the ocean -- or atmosphere, for that matter -- can affect Canada very directly."*

It's a sort of homecoming for Dr. Wallace, who graduated from Dalhousie with his PhD in 1985. Julie LaRoche, his wife, also earned her PhD from Dalhousie; the two met while studying in Halifax. A marine microbiologist, she will be joining her husband at Dalhousie as part of the CERC Research Unit.

The process of earning the chair was an intense one -- a multi-stage proposal process that required a cross-departmental team led by Keith Thompson, professor with the Departments of Mathematics & Statistics and Oceanography.

"This was really made possible by a spirit of teamwork across departments and disciplines and between faculty and administration," said Dr. Wallace. He noted that having pulled together to earn the funding in a competitive process, now it was up to the university and his new research team to deliver on the promise of their research.

"Now it's up to me to show that you made the right choice."

Source: Dalhousie University Web Site, DALNEWS.DAI.CA, visited on May 20, 2010. Reproduced here with authorization. Credit to Ryan McNutt, Danny Abriel and Dal News.

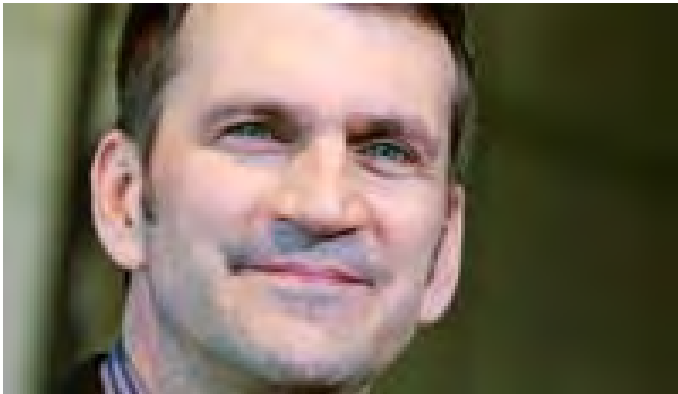
**Canada Excellence Research Chair in
Remote Sensing of Canada's
New Arctic Frontier**

Marcel Babin

Université Laval

High-Tech Explorer of Canada's New Arctic Frontier

Coupled with climate change, the growing exploitation of natural resources is transforming the ecosystems of the Canadian Arctic. To ensure the sustainable development of Arctic resources, ecosystem management and the adaptation of northern communities to their rapidly changing environment, we need to understand what underlies these transformations, and what impacts they will have. This is the goal of Dr. Marcel Babin, Canada Excellence Research Chair in Remote Sensing of Canada's New Arctic Frontier.



Dr. Marcel Babin, Université Laval

Babin and his research team will apply the most recent advances in satellite remote sensing to track how Arctic ecosystems respond to climate change. To do so, they will develop new observing technologies, advanced computer models of Arctic ecosystems, and powerful new tools to archive and analyze the vast stream of data made available by the rapid expansion in northern research currently under way in Canada. The results of their research will help stakeholders in government, industry and northern communities make effective decisions.

To observe the Arctic environment, Dr. Babin will, in particular, adapt state-of-the-art technologies used in various oceans, such as free-drifting profiling floats, underwater gliders, and unmanned submarines equipped with hi-tech sensors that measure key processes in marine ecosystems. Combined with laboratory experiments and biodiversity analysis using advanced molecular and biochemical techniques, this will allow a better understanding of Arctic aquatic ecosystems and, ultimately, their diagnostic and predictive modeling. Finally, Babin will develop an intelligent archiving and analyzing system for

Arctic data that organizes scientific observations from the multiple platforms and models, offering stakeholders from the public, academic and industrial sectors a better understanding of the socio-economic consequences of climate change on Arctic ecosystems.

Babin's research program establishes a partnership between Canadian Arctic scientists and the Centre national de la recherche scientifique of France in the form of a Joint International Centre for Arctic Ecosystem Surveillance and Modelling. Partnerships will also extend to other organizations, such as Canadian, American, French and European space agencies, the United Kingdom's Arctic Office and the Plymouth Marine Laboratory. To conduct their research, Babin and his team will also involve the Québec-Océan oceanographic research group, the Centre for Northern Studies, as well as ArcticNet and GEOIDE—two Canadian Centres of Excellence.

Dr. Marcel Babin's work will revolutionize the way the world sees the Arctic, and will help position Canada as a leader in northern research, namely, with regard to the way ecosystems react to climate change.

**Chaire d'excellence en recherche du Canada
sur la télédétection de la nouvelle frontière
arctique du Canada**

Marcel Babin

Université Laval

Explorateur high-tech des nouvelles frontières de
l'Arctique canadien

Couplée aux changements climatiques, l'exploitation grandissante des ressources naturelles transforme les écosystèmes de l'Arctique canadien. Pour assurer l'exploitation durable des ressources de cette région, la gestion de ses écosystèmes et l'adaptation des communautés du Nord aux transformations rapides que subit leur environnement, il est nécessaire de comprendre les changements qui se produisent ainsi que leur impact. Voilà l'objectif de Marcel Babin, titulaire de la Chaire d'excellence en recherche du Canada sur la télédétection de la nouvelle frontière arctique du Canada.

En s'appuyant sur les plus récentes avancées en télédétection spatiale afin d'étudier comment les écosystèmes marins arctiques réagissent aux changements climatiques, M. Babin et son équipe de recherche mettront au point de nouvelles technologies d'observation, de meilleurs modèles numériques des écosystèmes arctiques et de puissants outils d'archivage et d'analyse des nombreuses données issues de la recherche menée dans le Nord – une recherche actuellement en essor au Canada.

Leurs résultats de recherche aideront les représentants du gouvernement, de l'industrie et des communautés du Nord à prendre des décisions plus judicieuses.

Marcel Babin compte notamment adapter des technologies de pointe utilisées dans différents océans pour observer le milieu arctique. Ainsi, à l'aide de flotteurs-profileurs dérivants, de planeurs sous-marins et de sous-marins autonomes équipés de capteurs de pointe, il mesurera les variables les plus pertinentes des écosystèmes arctiques. De plus, grâce à des expériences en laboratoire et à des études sur la biodiversité effectuées au moyen de techniques moléculaires très modernes, ses observations permettront de mieux comprendre les écosystèmes arctiques et, en bout de ligne, de mettre au point des modèles diagnostiques et prévisionnels fiables. Enfin, M. Babin élaborera un système intelligent pour l'archivage et l'analyse de données – système qui aura la capacité de regrouper et d'organiser les données provenant de multiples plateformes et modèles. Ainsi, les intervenants des secteurs public, universitaire et industriel pourront se fonder sur des renseignements pertinents pour cerner les enjeux socio-économiques liés aux changements climatiques et à leur impact sur les écosystèmes arctiques.

Le programme de recherche de M. Babin consistera en un partenariat entre les chercheurs canadiens travaillant dans l'Arctique et le Centre national de la recherche scientifique de la France. Ce tout nouveau partenariat se présentera sous la forme d'un centre international de surveillance et de modélisation des écosystèmes arctiques qui collaborera avec d'autres organismes, comme les agences spatiales canadienne, française, américaine et européenne, le United Kingdom's Arctic Office et le Plymouth Marine Laboratory. En outre, pour réaliser leurs travaux, M. Babin et son équipe se joindront au groupe de recherche océanographique Québec-Océan, au Centre d'études nordiques ainsi qu'à ArcticNet et à GEOIDE, deux réseaux de centres d'excellence du Canada.

Les réalisations de M. Babin révolutionneront la perception générale de l'Arctique et permettront de solidifier la place de chef de file qu'occupe le Canada dans le domaine de la recherche menée dans le Nord, notamment en ce qui concerne la manière dont les écosystèmes réagissent aux changements climatiques.

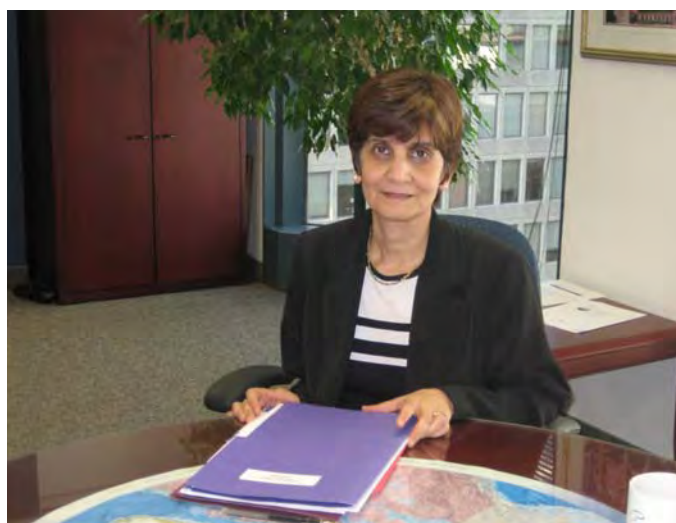
Conference on Advances in the Atmospheric and Oceanic Sciences

This notice is for the attention of alumnae, associates and current students of the McGill University Department of Atmospheric and Oceanic Sciences (formerly Meteorology). The Department will be holding a one-day conference and dinner on Friday, September 24, 2010 to celebrate the Department's **50th anniversary**. The conference will consist of invited presentations by former faculty, students and associates. To round out the celebration there will be an excursion to some Eastern Townships wineries and an apple cider producer on the following day, Saturday, September 25. Please visit our web site mcgill50@meteo.mcgill.ca for more details and registration information.

New DFO Assistant Deputy Minister Siddika Mithani

Dr. Siddika Mithani has been appointed the Assistant Deputy Minister, Oceans and Sciences, for Fisheries and Oceans Canada. Dr. Mithani previously held the position of Associate ADM, Health Products and Food Branch at Health Canada. She brings to DFO her experience in leadership and managing science, policy and regulatory initiatives at the national and international levels. She brings knowledge and expertise in the areas of safety, efficacy, quality and risk management principles in the health and industry sectors as well as risk management in complex regulatory science programs.

Dr. Mithani is a recipient of the Queen's Medal for her work in the area of developing and implementing regulations for clinical drug trials in Canada, and has been extensively involved in difficult food and nutrition files. She holds a Bachelor of Science degree in Pharmacy and a Ph.D. in Psychopharmacology from the University of Aston in Birmingham, England.



Dr. Siddika Mithani, ADM Science / SMA Science
Department of Fisheries and Oceans
Ministère des Pêches et Océans

Nouvelle Sous-ministre adjointe au MPO Siddika Mithani

La Dre Siddika Mithani a été nommée au poste de sous-ministre adjointe, Océans et Sciences à Pêches et Océans Canada. La Dre Mithani a occupé le poste de SMA associée, Direction générale des Produits de santé et des Aliments à Santé Canada. Elle apporte au MPO son expérience en leadership et gestion dans le cadre des sciences, des projets en matière de politiques et de règlements, tant au niveau national qu'international. Elle apporte comme bagage des connaissances et expertises dans le domaine des principes de gestion de la sécurité, de l'efficacité, de la qualité et des risques dans les secteurs de la santé et de l'industrie, ainsi que dans la gestion des risques des programmes réglementaires des sciences.

La Dre Mithani a obtenu la Médaille de la Reine pour ses travaux sur l'établissement et la mise en place de règlements pour les essais de médicaments au Canada et elle a participé à plusieurs dossiers difficiles d'alimentation et de nutrition. Elle détient un diplôme de bachelier ès sciences en pharmacie et un doctorat en psychopharmacologie, obtenu à l'université d'Aston (Birmingham, Royaume-Uni).

Trent Professor Honoured by American Society of Limnology and Oceanography

Peterborough, Ontario, Monday, June 14, 2010. In recognition of his pioneering research in chemical limnology, **Dr. Peter Dillon**, Chemistry and Environmental and Resource Studies professor at Trent University, has been awarded the prestigious G. Evelyn Hutchinson Award from the American Society of Limnology and Oceanography (ASLO).

Dr. Dillon has been a professor at Trent University since the early 1980s. A renowned researcher in the field of environmental biogeochemistry, he is also the director of the Worsfold Water Quality Centre, a world-class analytical chemistry facility at the University. Previously, he held the position of Industrial Research Chair in Watershed Biogeochemistry at Trent. His research explores the chemistry of lakes, rivers and watersheds and how pollutants and stresses like acid rain and climate change affect the environment.

The ASLO award, named in honour of limnologist G. Evelyn Hutchinson, has been presented annually since 1982 to recognize excellence in the fields of limnology (the study of inland waters) or oceanography. Dr. Dillon was presented with the award at the 2010 ASLO Summer Meeting held from June 6 to 11 in Santa Fe, New Mexico for his innovative research on eutrophication in lakes (the response of lakes to excessive nutrient inputs, usually from sewage or agriculture) and for his long-term studies that have significantly advanced the understanding of how lakes and wetlands respond to acid deposition and climate change.

The G. Evelyn Hutchinson Award is the most recent in a long list of honours presented to Dr. Dillon over the years. In 2003, he was awarded the Miroslaw Romanowski Medal from the Royal Society of Canada for making significant contributions in the field of environmental science. Other awards and honours include: Trent University's Distinguished Research Award, F. H. Rigler Memorial Award, Society of Canadian Limnologists, and the Ontario Ministry of Environment (First) Excellence in Research Award. Dr. Dillon is also a fellow of the Royal Society of Canada and the Rawson Academy of Aquatic Science.

News from Woods Hole

1) Revolutionary Communications System Promises New Generation of Untethered, Undersea Vehicles

Woods Hole Oceanographic Institution (WHOI) engineers and scientists are employing a combination of new undersea technologies to redefine how we think of tethered, remotely operated vehicles.

Using the 11,000 meter-rated Nereus hybrid remotely operated vehicle (HROV) as a test platform, engineers at WHOI recently demonstrated a new system that integrates acoustics with optics. This achievement, they say, opens the way to new opportunities in communications between untethered remotely operated vehicles (UTROVs) and their human operators — literally "**cutting the cord**" for undersea exploration.

Traditional deep-water ROV operations with long, heavy tether cables result in high operating costs, driven by their need for ships with specialized positioning systems, large A-frames and winch systems. In addition, such vehicles often are limited by their tethering systems.

Redefining what it means to be tethered promises to lower the cost of underwater robotic vehicles and significantly change how they are used. Because it enables communications without the heavy tether-handling equipment, the optical/acoustic system would require smaller, less-expensive ships and fewer personnel to perform undersea missions, said WHOI Senior Engineer Norman E. Farr, the team leader in developing the novel communications system.

Ongoing advances in control systems and energy storage will only serve to add momentum to a new class of underwater vehicle actively being developed at WHOI, says Andy Bowen, a research specialist and lead investigator of the WHOI UTROV team.

Bowen, Farr and their colleagues successfully tested an underwater optical modem, which allows instant data transfer and real-time video from battery-powered untethered ROVs outfitted with sensors, cameras and manipulators to surface ships.

The first deep-water test of the optical communications system was performed on the human occupied vehicle (HOV) Alvin submersible in August 2008. Data were transmitted from a seafloor package to a receiver mounted on submersible's light bar facing forward. Alvin was moved to a series of stations and error rate data were collected. The system demonstrated error-free transmissions at 1 megabit per second (MBPS) at a range of more than 100 metres, the researchers reported.

A follow-up test was performed at the WHOI dock using Nereus. The demonstration successfully showed that the optical link enabled real-time control of the vehicle by transferring high-rate video, including direct human control while performing complex, unstructured manipulations under water.

"The recent development and successful testing of the HROV Nereus paves the way for a derivative vehicle-type, able to perform a variety of useful tasks such as rapid event response, deployment from ships of opportunity, time-series ocean observatory maintenance, and exploration at increasingly high latitudes, including beneath Polar ice," says Bowen.

The test results clearly demonstrate that next-generation, battery-powered vehicles like Nereus, are capable of replacing conventional, tethered vehicles in performing an increasing range of tasks, the researchers say. *"The unique, integrated combination of advancements in both acoustic and optical communications, coupled with the successful realization of a battery powered ROV, positions Woods Hole Oceanographic scientists and engineers to make broad and important contributions to the evolution of undersea robotic vehicles in the years to come,"* says Bowen.

Farr likens optical/acoustic system possibilities to the world opened up by "your household wi-fi." His co-investigator on optical communications, Dr. Maurice Tivey of WHOI, adds that "underwater optical communications are akin to the cell phone revolution...The ability to transfer information and data underwater without wires or plugging cables in is a tremendous capability allowing vehicles or ships to communicate with sensors on the seafloor."

This July, WHOI plans the first large-scale deployment of the system at the Juan de Fuca Ridge off shore of the Northwestern United States. The WHOI team will employ Alvin to deploy the optical system on a sub-sea data concentrator to collect and transmit geophysical data from wellheads situated at the undersea ridge.

Ultimately, Farr says, the system will *"allow us to have vehicles [at specific undersea locations] waiting to respond to an event. It's a game-changer."*

2) WHOI Scientist Takes Comprehensive Look at Human Impacts on Ocean Chemistry

Numerous studies are documenting the growing effects of climate change, carbon dioxide, pollution and other human-related phenomena on the world's oceans. But most of those have studied single, isolated sources of pollution and other influences.

Now, a marine geochemist at the Woods Hole Oceanographic Institution (WHOI) has published a report in the latest issue of the journal *Science* that evaluates the

total impact of such factors on the ocean and considers what the future might hold.

"What we do on land- agriculture, fossil fuel combustion and pollution- can have a profound impact on the chemistry of the sea," says Scott C. Doney, a senior scientist at WHOI and author of the *Science* report. *"A whole range of these factors have been studied in isolation but have not been put in a single venue"*.

Doney's paper represents a meticulous compilation of the work of others as well as his own research in this area, which includes ocean acidification, climate change, and the global carbon cycle.

He concludes that climate change, rising atmospheric carbon dioxide, excess nutrient inputs, and the many forms of pollution are *"altering fundamentally the...ocean, often on a global scale and, in some cases, at rates greatly exceeding those in the historical and recent geological record"*.

The research documents several major trends, which include a shift in the acid-based chemistry of seawater, reduced subsurface oxygen, both in coastal waters and the open ocean, rising coastal nitrogen levels, and a widespread increase in mercury and other pollutants.

"Human impacts are not isolated to coastal waters," Doney says. They *"are seen around the globe"*.

Moreover, he says, *"many of these changes in climate and ocean chemistry can compound each other, making the problem considerably worse for marine life"*. For example, warming and nutrient runoff both can trigger a decline in oxygen levels off the coast, according to Doney. And acidification, he says, may exacerbate coral bleaching.

Among Doney's findings:

- Global ocean pH and chemical saturation states are changing at an *"unprecedented"* rate, 30 to 100 times faster than temporal changes in the recent geological past, *"and the perturbations will last many centuries to millennia"*.
- *"Ocean acidification will likely reduce shell and skeleton growth by many marine calcifying species, including corals and mollusks"*.
- *"Ocean acidification may also reduce the tolerance of some species to thermal stress... Polar ecosystems may be particularly susceptible..."*.
- Fertilizer runoff and nitrogen from fossil fuels are increasing the severity and duration of coastal hypoxia, or decreased oxygen.

Doney was part of an international consortium of scientists

that reported recently that carbon dioxide emissions from fossil fuels have increased by almost a third over the last decade, rendering the Earth's future uncertain unless "CO₂ emissions [are] drastically reduced".

They attributed the rise to increasing production and trade of manufactured products, particularly from emerging economies, the gradual shift from oil to coal, and the planet's waning capacity to absorb CO₂.

Doney led a team that developed ocean-model simulations for estimating the historical variations in air-sea CO₂ fluxes. "Over the last decade, CO₂ emissions have continued to climb despite efforts to control emissions," Doney said. "Preliminary evidence suggests that the land and ocean may be becoming less effective at removing CO₂ from the atmosphere, which could accelerate future climate change".

In his Science paper, Doney calls for "a deeper understanding of human impacts on ocean biogeochemistry...Although some progress has been made on a nascent ocean observing system for CO₂, the marine environment remains woefully undersampled for most compounds. The oceanographic community needs to develop a coordinated observational plan...".

More detailed studies are needed, in particular, to look at the responses of cells and organisms to biochemical intruders to their undersea environment. "Lastly, Doney says, "targeted research is needed on the impacts on marine resources and fisheries, potential adaptation strategies, and the consequences for human and social economic systems".

The work was funded by W. Van Alan Clark, Sr. Chair for Excellence in Oceanography from WHOI, and the Center for Microbial Oceanography, Research and Education.

The Woods Hole Oceanographic Institution is a private, independent organization in Falmouth, Mass., dedicated to marine research, engineering, and higher education. Established in 1930 on a recommendation from the National Academy of Sciences, its primary mission is to understand the oceans and their interaction with the Earth as a whole, and to communicate a basic understanding of the oceans' role in the changing global environment.

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MeteoWorld, Shanghai World Expo 2010



The pavilion "MeteoWorld" on the theme "for the safety and well-being of the people" is operated by the World Meteorological Organization (WMO) and China Meteorological Administration (CMA), in partnership with the Intergovernmental Panel on Climate Change, the Group on Earth Observations, the European Organization for the Exploitation of Meteorological Satellites, and the Association of Hydro-Meteorological Equipment. The pavilion covers 1 500 m² and has the form of a white cloud with surrounding mist. Visitors are able to see a rainbow when the angle of the sunshine is below 42 degrees, as well as simulations of climatic extremes. "MeteoWorld" is adjacent to the United Nations pavilion, in which WMO participates as the UN Specialized Agency for meteorology (weather and climate), operational hydrology and related geophysical sciences.

In the morning of 21 June 2010, Miss Hu Xi, a Shanghai student who just finished her college entrance examination, became the 200,000th visitor to the MeteoWorld. As of 23 June, the total number of visitors to the MeteoWorld reached 214,205. During the exhibition, MeteoWorld is organizing events on five major themes, namely: New Energy, Better City (13 June – 4 July); City Life and Meteorological Risks (10 - 31 July); "Eyes" on Weather (1-22 August); Meteorological Service for Your Splendid Life (1-30 September); Weather Forecasts Take Care of You Every Day (11-30 October). In addition, Weather China (<http://www.weather.com.cn>) launched a programme called 'Imagine Meteorological Life in the Future' (<http://tq121.weather.com.cn/futurelife/html/index.html>) during the period from June to September 2010. The winners will be awarded free tickets for World Expo 2010 Shanghai.

In Memoriam**Dr. Daniel G. Wright**

Colleagues and friends across Canada and around the world have been shocked and deeply saddened to learn of the sudden passing of Dr. Daniel (Dan) Gordon Wright on Thursday, July 8, 2010. Dan was a highly-regarded scientist with the Ocean Sciences Division (OSD) of Fisheries and Oceans Canada at the Bedford Institute of Oceanography (BIO).

Dan obtained his B.Sc. in Mathematics from Laurentian University in 1975, and his Ph.D. in Applied Mathematics and Oceanography from the University of British Columbia in 1978 under the mentorship of Professor Lawrence Mysak. He was then a Postdoctoral Fellow at the Woods Hole Oceanographic Institution (1978-1979) with Dr. Harry Bryden, and a Research Associate at Dalhousie University (1979-1981) with Professor Chris Garrett.

In late 1981 Dan accepted a Research Scientist position in the Ocean Circulation Section of BIO where, until his passing, he was a highly productive, generous and respected scientist, and an advisor, colleague and friend to many in the oceanographic and atmospheric research communities. In 2008 Dan was promoted to the Government of Canada's highest Research Scientist level, recognizing his outstanding scientific and other contributions both nationally and internationally. Dan was also a long-time Adjunct Professor in the Department of Oceanography at Dalhousie University where he cherished the opportunity to interact with students and young scientists.

Dan used his elite mathematical skills and clear thinking to advance our understanding of a very broad range of physical oceanographic phenomena and their role in the broader Earth system, building on both theory and observations. He made major contributions on topics ranging from the thermodynamics of sea water to the role of the ocean in climate dynamics, including baroclinic instability, tidal rectification and other continental shelf dynamics, regional- to global-scale ocean circulation, physical-biogeochemical interactions, the development of innovative circulation models, and the oceanography of the Northwest Atlantic. He co-authored over 70 papers in international scientific journals, and many other reports and communications. His scientific excellence and impact were recognized by the Canadian Meteorological and Oceanographic Society through his receipt of its President's Prize in 1992, and by his selection as a CNC-SCOR Tour

Speaker. Further elaboration on his many scientific contributions will be provided elsewhere; suffice it to say that he was one of Canada's leading physical oceanographers whose impacts on the national and international scientific and related communities, and on future scientists, will be widespread and long-lasting.

Above all, Dan Wright was a very decent human being - being gifted yet generous and humble, rigorous yet compassionate, motivated yet fair and honest, and devoted to his profession yet also very devoted to his family. He will be greatly missed. His friends and colleagues will be looking at ways to honour him.

Private condolences to the family can be sent to Mrs. Donna Wright, c/o Atlantic Funeral Home, 125 Sackville Drive, Lower Sackville, NS, B4C 2R3.

The family has indicated that donations in Dan's memory can be made to the **Scholarship Fund of the Canadian Meteorological and Oceanographic Society (CMOS)**. A donation form can be found on the CMOS website (www.cmos.ca).

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