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CMOS
# BULLETIN
SCMO

Canadian Meteorological and Oceanographic Society

La Société canadienne de météorologie et d'océanographie

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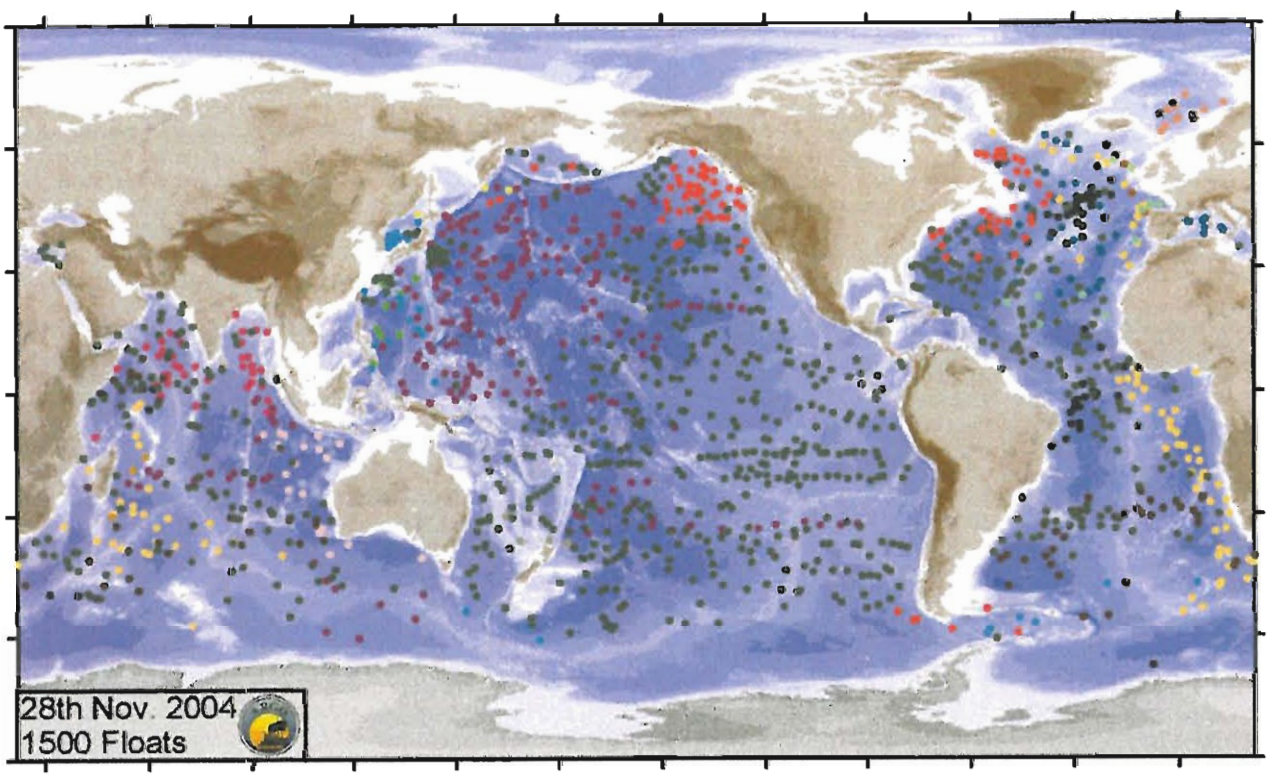
## Program Argo

## Programme Argo

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***CMOS Bulletin SCMO***
"at the service of its members
au service de ses membres"

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**Cover page:** The figure shown on the cover page includes a map showing the location of Argo floats, colour-coded by the country launching the floats, their positions appropriate as end of November 2004. The participants in program Argo aim to have a global array of 3000 robotic drifters in place by some time in 2006. In November 2004 Argo passed a significant milestone when the 1500th float was operating in the ocean thus taking the project past the 50% mark. To note the event the Argo Steering Team issued a press release which can be read on **page 172.**

**Page couverture:** L'image de la page couverture montre la position des bouées flottantes Argo codées avec des couleurs représentant les pays qui les ont déployées; les positions sont celles de fin novembre 2004. Les participants au programme Argo ont l'intention de déployer un réseau mondial de 3 000 profileurs dérivants qui seraient en place dans le courant de l'année 2006. En novembre 2004, le réseau du programme Argo a passé la marque de 1 500 flotteurs en opération dans les océans, soit la moitié du total visé par le projet. Afin de souligner cet événement, le Comité d'organisation a décidé d'émettre un communiqué de presse qui peut être lu en **page 173**.

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## Canadian Meteorological and Oceanographic Society (CMOS)

## Société canadienne de météorologie et d'océanographie (SCMO)

### Executive / Exécutif

**....from the President's Desk**

CMOS friends and colleagues:

As we approach the conclusion of 2004, CMOS activities are going full speed ahead. The following is a brief update on items that have been discussed at our recent Executive and Council meetings.

Jean-Guy Desmarais is now chairing the Prizes and Awards Committee and Louis Lefaivre is the new chair of the University and Professional Education Committee. We now have a full slate of committee chairs, and some committees have added new members. In particular the Prizes and Awards Committee is up to full strength, ready to review the many deserving candidates to be proposed in response to the current call for nominations. CMOS Prizes and Awards depend on members nominating worthy candidates. Please initiate and/or support your outstanding colleagues. You will find more information in this issue of the *CMOS Bulletin SCMO* at page 180.

There also has been considerable activity related to the CMOS External Relations Committee. In particular, input has been provided to the Partnership Group for Science and Engineering (PAGSE) which has sent its annual brief to the House of Commons Standing Committee on Finance (HCSCF). It argues for, among other things, increased funding for federal science departments.

Dr. Maurice Levasseur, Laval University, will be our CMOS 2005 Tour Speaker. Please watch for notices of his presentation in your local centre.

Richard Pawlowicz and his Vancouver organizers have been busy preparing for the 39th CMOS Annual Congress, May 31 – June 3, 2005 on the "***Sea to Sky***" theme. The Call for Papers can be read at page 189 (page 190 en français) in this issue of the *CMOS Bulletin SCMO*. The web site with science program and schedule is under development, including an exciting series of plenary and special sessions. The CMOS national office congress registration and abstract submission web modules are being tested and should be implemented by the end of December. This ongoing system will be a great benefit for Vancouver and all future congresses – finally there is a common system that will be refined rather than re-invented from year to year. Let's give the system a real challenge by flooding it with abstracts and registrations well ahead of the deadlines!

Continued on next page - Suite à la page suivante

**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.**

*Volume 32 No.6*
*December 2004 - décembre 2004*

**Inside / En Bref**



**Articles**



**Report / Rapport**



**Our regular sections / Nos chroniques régulières**



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Proposed amendments to our constitution and by-laws are posted on the bottom of our web page http://www.cmos.ca/conste.html. Comments are invited before our December 16 Council meeting at which time the amendments will be considered. Those approved by Council will be distributed in advance for consideration at our Vancouver Annual General Meeting.

So far this year, CMOS income has been slightly less than budgeted for. By now you have received your membership renewal notice. If you have not sent in your membership dues yet, please do so as soon as possible. Your membership fees and donations determine our Society's financial health.

Equally as important, your participation determines our Society's vitality. I hope you will continue to be involved both locally and nationally, and join us at the 2005 Annual Congress in Vancouver.

I wish you all a **happy and safe holiday season.**

*Harold Ritchie*
*President / Président*

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## Books in search of a Reviewer
## Livres en quête d'un critique

*Climate Change 2001, Synthesis Report, Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, by Robert T. Watson, Editor, April 2002, Cambridge University Press, Paperback Cover, 0-521-01507-3, US$40.00.

*The High-Latitude Ionosphere and its Effects on Radio Propagation*, by Robert Hunsucker and John Hargreaves, Cambridge University Press, Hardback Cover, 0-521-33083-1, US$140.00.

*Exploration of the Solar System by Infrared Remote Sensing*, by R.A. Hanel, B.J. Conrath, D.E. Jennings, R.E. Samuelson, Cambridge University Press, Hardback Cover, 0-521-81897-4, US$120.00.

*Coasts: Form, Process and Evolution*, by Colin D. Woodroffe, Cambridge University Press, Paperback Cover, 0-521-01183-3, US$50.00.

If you are interested in revlewing one of the above listed books, please contact the *CMOS Bulletin SCMO* Editor at bulletin@cmos.ca

Si vous êtes intéressés à faire la critique d'un livre listé ci-haut, prière de contacter le rédacteur du *CMOS Bulletin SCMO* à bulletin@scmo.ca

## Corrections

In the article *Why did a Category-2 Hurricane hit Nova Scotia? An explanation of the unusual intensity of Hurricane Juan* (CMOS Bulletin SCMO, Vol.32, No.2, p.41), Chris Fogarty discussed the sea surface temperature (SST) map around the Nova Scotia coast on September 28, 2003. Unfortunately, the map was not shown in the Bulletin. We are reproducing below the map as shown on the website. Please refer to the website address http://www.novaweather.net/Hurricane_Juan_files/juan_sst_track.jpg for viewing the colour map.

In the article *The Great Maritimes Blizzard of February 18-19, 2004* (CMOS Bulletin SCMO Vol.32, No.4, p.100) the correct affiliation for Chris Fogarty is the Meteorological Service of Canada.

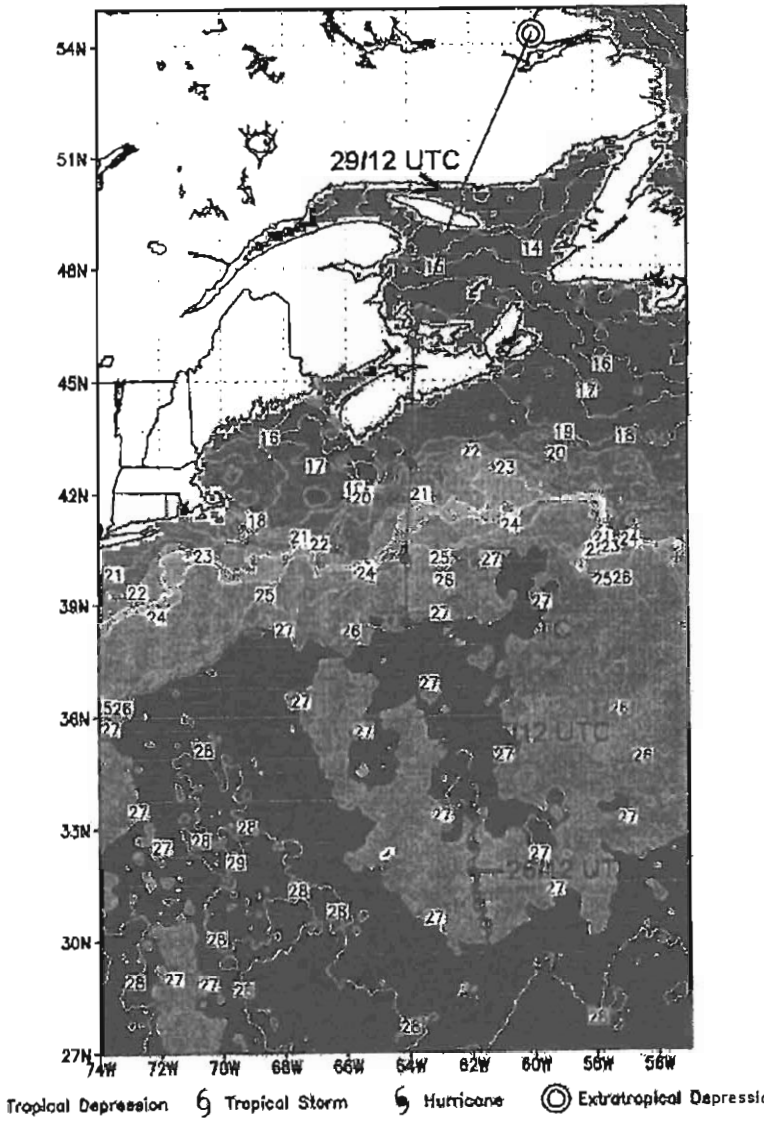


Figure: Map showing SST along Hurricane Huan track in September 2003 while approaching the Canadian Coast.

# Save Our Station – Save Our Island

by Zoe Lucas[1]

Résumé: (Traduit par la direction) L'avenir de la station de l'Île de Sable est maintenant compromis. Avec la réduction des ressources financières et les problèmes administratifs continus, la sauvegarde à long terme et l'aménagement de l'Île sont menacés, de sorte que celle-ci est en péril. Après 200 ans de présence humaine continue et de gérance sur l'Île de Sable, on discute de l'avenir de la station et le gouvernement canadien envisage l'option de la fermer.

The Government of Canada is presently considering the future of the Sable Island Station and closing or downsizing the facility are options being examined by senior managers.

Since 1801, when the Lifesaving Station was established, there has been a continuous government presence on Sable Island. During the last few decades, the role of the Sable Island Station has greatly expanded, and the Station now provides year-round stewardship for the Island, as well as infrastructure and expertise in support of a wide range of programs relevant to sovereignty, safety, cultural heritage, and environment and biodiversity. The Station ensures cost-effective and safe operations for the many university, government, industry and private researchers who work on the Island throughout the year, as well as for the numerous visiting media groups and artists, both from Canada and abroad.

If the Sable Island Station is closed, or if the Station's capacity and capability are lost through downsizing, there will be no effective long-term conservation and protection for the Island and the many critical programs supported by the facility would become prohibitively expensive and, in some cases, logistically impossible. The primary issues are:

**Sovereignty**: Sable Island is the most remote island in Canada, and its location extends the boundary of our 200 NM Exclusive Economic Zone (EEZ) further into the Northwest Atlantic, and provides an area of Canadian sovereignty (12 NM territorial sea) at the outer edge of the continental shelf. The extended sovereignty and EEZ jurisdiction enabled by Sable Island provide Canada with the means to extend control in issues relevant to coastal security, hydrocarbons and fishery resources, and control of oil, ballast and bilge water. A full-time human presence on Sable Island supports Canada's national security and sovereignty. The lack of a presence on the Island opens up opportunities for foreign individuals and interests to make landfall there.

The Sable Island Station - the air chemistry building is in the foreground.

**Search & Rescue:** The Sable Island Station provides security and infrastructure for helicopter refueling on the Island, thus increasing the range of Search & Rescue helicopters, as well as Coast Guard and industry helicopters. The Island also provides "safe haven" and a base of operations during marine disasters. This is a concern not only for the offshore energy industry, but also for all people who work at sea (e.g. personnel involved in military activities, shipping, fishing and tourism). The Station provides storage for emergency supplies (food, water, clothing) for up to 150 people for five days, and for oil spill clean-up materials.

**Platform for Monitoring and Research:** Sable Island's location makes it an invaluable platform for a number of monitoring and research programs relevant to understanding the dynamics, ecological parameters and health of the oceans and atmosphere of the Scotian Shelf region and the greater Northwest Atlantic area. Some of these monitoring programs represent long-term databases of global significance (e.g. measurements of atmospheric carbon dioxide). The Station also provides infrastructure and support for programs such as the geomagnetic observatory of the British Geological Survey. Sable Island is particularly important as a monitoring platform because it is adjacent to two significant marine concerns: offshore energy exploration and production activity, and the Gully Marine Protected Area, the first MPA in eastern Canada.

[1] Zoe Lucas is a biologist working on Sable Island.

**Island Conservation & Stewardship:** The year-round operation of the Sable Island Station provides a basic level of stewardship for the Island's natural values: vulnerable terrain, and flora and fauna including nesting and migrating birds; seals in the breeding colonies, and the Sable Island horses, including some rare and endemic taxa. Effective conservation and protection of biodiversity requires research and monitoring. The Station provides infrastructure supporting biological and geological research, and collection of meteorological data that are essential in any comprehensive environmental monitoring programs.

**Heritage and Culture:** The Island's long history of settlement, shipwrecks and horses is a significant component of Nova Scotia's and Canada's heritage and associated artefacts are of interest to historians, and to collectors. The Sable Island Station enables conservation of materials uncovered by storms and erosion, and protects them from collection by private interests. In providing support services for media and museum personnel, the Station plays a role in development of educational material and public information (news, documentaries, websites, museum collections). The Station has also enabled visits by Canadian print, performance and visual artists.

As this brief review clearly indicates, a continuously staffed Station on Sable Island supports a wide range of activities relevant to Canada's sovereignty, environment and culture. Some of these programs are of international significance. While Environment Canada and Fisheries & Oceans have the greatest investments and responsibilities on and for the Island, other federal agencies, including Transport Canada, Foreign Affairs, National Defence, and Heritage, also have mandates and/or interests regarding Sable Island.

On October 5th, about 250 people attended a public meeting held in Halifax - there was standing room only in the conference theatre. The large attendance and comments from the audience confirmed that there is strong public and professional support for the Sable Island Station and for the year-round stewardship and infrastructure it provides.

There is a growing consensus that the Government of Canada must provide long-term and reliable funding from Ottawa, and must ensure that the federal government maintains the central primary role in operating and managing the Island. Closing or downsizing the Sable Island Station would be a very serious and irreversible mistake. For more information, please consult: www.greenhorsesociety.com

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## A Demonstration of Support for the Sable Island Station (October 2004).

On the evening of October 5th 2004, a public meeting about Sable Island was held at the Sobey Conference Theatre, Saint Mary's University, Halifax. The event was co-hosted by the Sable Island Green Horse Society, the Ecology Action Centre, the Nova Scotian Institute of Science and the Environmental Studies Program of Saint Mary's University. The meeting consisted of a 45-minute slide presentation and talk by Zoe Lucas (about the roles of the Sable Island Station), followed by a short break, and then a panel discussion, moderated by Marc Lamoureux, with input and questions from the audience.

The six panel members were:

- Doug Bliss, Acting Regional Director, Environmental Conservation Branch, Environment Canada;
- Nancy Hurlburt, Director of Marine Programs, Canadian Coast Guard;
- Peter Underwood, Deputy Minister, Nova Scotia Department of Natural Resources;
- April Hennigar, Sable Island Preservation Trust;
- Bill Freedman, Chair, Biology Department, Dalhousie University;
- Zoe Lucas, Biologist, Sable Island.

Roughly 250 people attended the meeting and they represented the broad Sable Island community – including universities and research organizations, various departments in the federal and Nova Scotia governments, the offshore energy and marine services industries, the arts, nature and environmental organizations, and the public.

Both the attendance and the comments from the audience demonstrated a high level of public and professional interest in, and support for, the Sable Island Station. Hopefully the October 5th meeting will have sent a very clear message that the failure of the Sable Island Preservation Trust should not be interpreted as a lack of interest in Sable Island.

While the Sable Island Green Horse Society is a gathering of Sable Island friends, it has no official status and few resources. However, during the last six months the Ecology Action Centre (EAC), Halifax, has done a great deal to promote public awareness and concern about Sable Island and the crisis regarding the future of the Sable Island Station. Although Sable Island is only one of many issues addressed by EAC, the organization is committed and competent, and is providing very effective advocacy for the Island.

Persons who are concerned about the future of Sable Island and want to support efforts to ensure that the Sable Island Station continues to provide stewardship for the Island, should consider supporting the Ecology Action Centre www.ecologyaction.ca

# PNA Index Foreshadows Extremely Cold Summer

by Ray Garnett[2]

**Résumé:** (Traduit par la direction) La configuration PNA (Pacifique-Amérique du Nord) des courants atmosphériques, identifiée au départ par Wallace et Gutzler (1981), laisse voir une forte circulation zonale sur la région PNA entre les mois de septembre 2003 et avril 2004. Cette situation a favorisé des températures d'été froides et un risque accru de dommage causé par le gel pour les producteurs agricoles des Prairies.

**Abstract:** The PNA (Pacific North American) atmospheric flow pattern, as originally identified by Wallace and Gutzler (1981), revealed strong zonal flow over the PNA region between September 2003 and April 2004 This was conducive to cold summer temperatures, and an increased risk of frost damage for prairie agricultural producers.

## Introduction

The Pacific North American (PNA) flow pattern and the associated PNA index, originally defined by Wallace and Gutzler (1981) and Horel and Wallace (1981), is a measure of atmospheric response to a warm SST anomaly in the central equatorial Pacific. The PNA index is representative of four centres of action in the North American flow patterns, namely the north Pacific subtropical high, the Aleutian Low, northwestern North America and the Florida panhandle. Leathers *et. al* (1992) and Hansen *et. al* (1993) analyzed the impact of the PNA flow pattern and its monthly and seasonal variation on the temperature and precipitation patterns of the United States. In the early 1990s, Dr. M.L. Khandekar, formely with Environment Canada, recommended that this index be used for forecasting purposes over the Canadian prairies. The accumulation of a large-scale index provides a measure of sustained forcing of a preferred atmospheric flow pattern and is a meaningful measure of large-scale behaviour of atmospheric flow. The accumulated PNA technique can be interpreted as a "poor man's CCA technique" since the accumulated profile takes into account the linear impact of PNA over a number of months prior to the forecast time.

## Modulation of the PNA Pattern

Figure 1. from Garnett (2002) shows how El Niño and La Niña are of primary importance in modulating the PNA index, other possible influences being the strength and position of the Pacific High and North Pacific sea surface temperatures. In order to assess the influence of El Niño and La Niña on the flow pattern over the PNA region, nine years were classified as either El Niño, La Niña or normal. Years in which the warming rate of change in Niño-3 SSTAs between spring and summer exceeded 0.6°C were classified as El Niño year's, examples being: 1972, 1976 and 1991. Years in which the cooling rate of change at Niño-3 exceeded 0.6°C between the spring and summer were classified as La Niña year's, examples being: 1970, 1983 and 1988. Years in which sea surface temperatures (SSTAs) between the spring months (March, April, May) and summer months (June, July and August) deviated less than 0.1°C were classified as normal years, examples being: 1967, 1977 and 1978. Figure 1 reveals distinctly different profiles showing the typical response of the PNA index during El Niño, La Niña and normal years. When the SSTs warmed (cooled) by .6°C between the spring and summer months, the flow over the PNA region tends to be zonal (meridional). In other words El Niño (La Niña) conditions were generally conducive to zonal flow (meridional) flow. The PNA response was essentially neutral during years classified as normal.

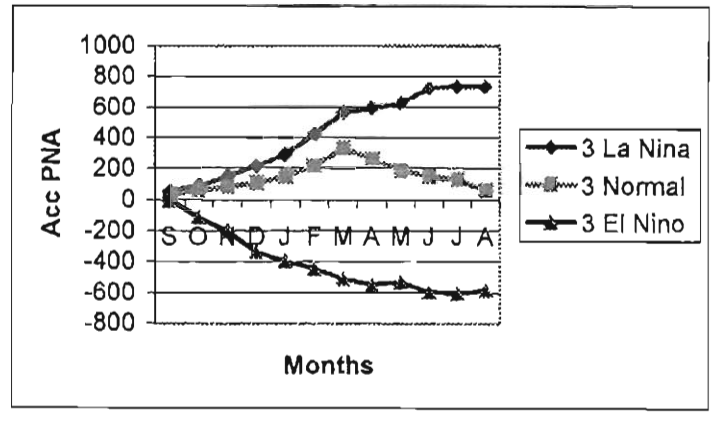


Figure 1: Accumulated PNA index in El Niño, La Niña and normal years

Garnett *et al.* (1998) indicate that during the hottest (coldest) June-July over the Canadian prairies between 1964 and 1996, flow over the PNA region was meridional (zonal). Figure 2 from Garnett (2002) shows a negative accumulation of PNA_81 values leading up to the critical June-July period in Saskatchewan in 2004 indicating strong zonal flow and a cold summer. The two coldest June-Julys in Saskatchewan between 1950 and 1998 were 1951 and 1993 while the two hottest were 1961 and 1988. In 2004 ENSO neutral-to-weak El Niño conditions prevailed in the Niño-3 region during spring and summer with no significant warming or cooling taking place in the Niño-3 region

[2] Consultant Agro-climatologist

between spring and summer. It appears the PNA index may have been forced by factors other than east equatorial sea surface temperatures, perhaps North Pacific sea surface temperatures.

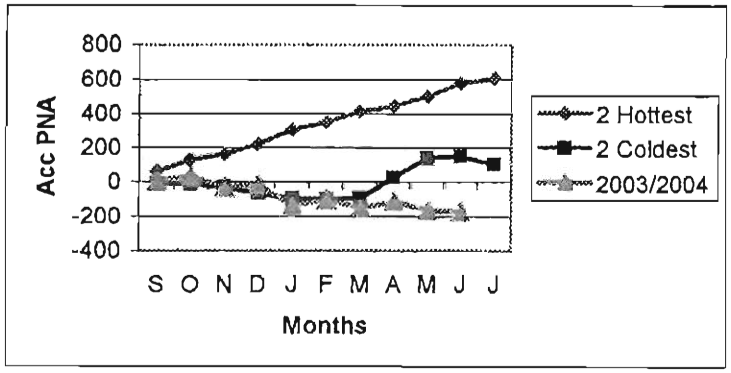


Figure 2: Accumulated PNA_81 values September to July

Stone *et al.* (1996) found there was a 60-70% probability of rainfall August through October in Saskatchewan exceeding median with a consistently negative Southern Oscillation Index (SOI) in June and July. The SOI was –1.3, -0.7 and -.8 in the June, July and August of 2004 suggestive of weak El Niño conditions. During August-September, precipitation in Saskatchewan was 101% of normal and Canadian prairie precipitation was 118% of normal meaning this prediction to date has been generally accurate. The SOI in June-July of 2004 behaved much like it did in 1992 when the quality of the Canadian spring wheat crop was very poor with low protein.

**Climatic Impact on Crops**

Based on 1998 Statistics Canada data, Saskatchewan produces 38% of Canada's total wheat production. Table 1.shows that Saskatchewan's mean temperature during June-July of 2004 was 2.1 °C colder than normal equalling the temperatures of 1952 and 1992. Only 1951 and 1993 were colder between 1950 and 2004. The coldest June-July in Saskatchewan was 1993 two years after the Pinatuba volcanic eruption in 1991. For the Canadian prairies as a whole it was the coldest June-July between 1950 and 2004. The extremely cool temperatures in 2004 delayed crop development by three to four weeks.

The precipitation data shown in Table 1 reveal that the summer was also wetter than normal with well above normal precipitation in Manitoba during May, August and October. The cold wet conditions supported spring wheat yields that were well above trend with low protein content. The wet August through October period caused harvest delays and a degradation in grain quality.

August 19-21 brought freezing temperatures along a line from North Battleford, Saskatchewan to Brandon, Manitoba. Most of Saskatchewan's grain belt and close to half of Manitoba's grain belt were affected. Frost typically occurs prior to August 31st in low-lying areas of eastern Saskatchewan, northwestern Alberta and southern Alberta with most areas of the Canadian prairies experiencing frost between September 10 and 20. The frost of August 19-21 came about three weeks earlier than normal affecting crops that were about three weeks later than normal. Initial estimates of frost damage were put at two-three million tonnes of canola and wheat. Agricore United has estimated the damage to quality and yield caused by frost and wet weather since August 1st at two billion dollars.

| Precipitation % of normal | Manitoba | Saskatchewan | Alberta | Prairies | Normal (mm) |
|---|---|---|---|---|---|
| May | 234 % | 133% | 93% | 145 % | 47.2 |
| June | 58 % | 96 % | 69 % | 75 % | 73.6 |
| July | 87 % | 106 % | 114 % | 106 % | 66.5 |
| August | 159 % | 129 % | 136 % | 127 % | 55.3 |
| Sept. | 116 % | 72 % | 130 % | 108 % | 41,4 |
| Oct. | 145 % | 72 % | 103 % | 105 % | 23,5 |
| **Temperatures DFN** | **Manitoba** | **Saskatchewan** | **Alberta** | **Prairies** | **Normal °C** |
| May | -1.9 °C | -2.4 °C | -3.1 °C | -2.7 °C | 10.8 °C |
| June | -1.9 °C | -2.7 °C | -2.2 °C | -2.5 °C | 15.4 °C |
| July | -1.4 °C | -1.4 °C | -1.1 °C | -1.4 °C | 18.0 °C |
| August | -7.9 °C | -7.6 °C | -6.8 °C | -7.4 °C | 17.0 °C |

Table 1. 2004 Precipitation percent (%) of normal and 2004 Temperatures DFN based on 2004 Farmzone data. DFN refers to the departure from normal. Normal is the monthly mean for over one hundred stations on the Canadian Prairies between 1950-1994.

**Conclusions**

In consulting work a regression equation was chosen over the abovementioned PNA index accumulation procedure to forecasting June-July temperatures over the Canadian prairies. The regression equation used was almost identical to the one used to produce the cross validation shown in Figure 2. from Garnett *et al.* 1998. The regression equation, which is probably missing a variable related to the Aleutian Low, greatly overestimated 2004 June-July temperatures over Saskatchewan and the Canadian prairies. Similarly, as mentioned by David Phillips on the Canadian Weather Channel, Environment Canada's seasonal temperature forecast for the summer of 2004 was a total bust. The PNA accumulation technique, however, provided excellent early warning of the cold summer and associated risk of frost damage that comes with low heat units and a late crop. Similarly the prediction method of Stone *et al.* (1996) has to date foreshadowed the wetter-

than-normal August-October period over the Canadian prairies.

**References**

Garnett, E.R., Khandekar, M.L. and Babb J.C. 1998. On the Utility of ENSO and PNA Indices for Long-Lead Forecasting of Summer Weather over the Crop-Growing Region of the Canadian Prairies, *Theoretical and Applied Climatology* 60: 37-45.

Garnett, E.R. 2002 Long-Lead Forecasting of Precipitation and Wheat yields in Saskatchewan Using Teleconnection Indices. Masters Thesis, Geography Department, University of Saskatchewan, Saskatoon, Saskatchewan.

Hansen, A.R., Pandolfo, J.P., Sutera, A.,1993: Midtropospheric flow regimes and persistent wintertime anomalies of surface-layer pressure and temperature. *J. Climate*, 6, 2136-2143.

Horel, J.D. and Wallace, J.M., 1981: Planetary scale atmospheric phenomena associated with the Southern Oscillation. *Mon.Wea. Rev.*, 109, 813-829.

Leathers, D.J., Yarnal, B., Palecki, M.A. 1992: The Pacific/North American teleconnection pattern and United States Climate. Part I: Regional temperature and precipitation association. *J. Climate,* 4, 517-528.

Stone. R.C., Hammer, G.L. and Marcussen, T. 1996. Prediction of Global Rainfall Probabilities Using Phases of the Southern Oscillation Index. *Nature* 384:252-255.

Wallace, J.M., and Gutzler, D.S. 1981. Teleconnections in the geopotential Height Field during the Northern Hemipshere Winter. *Monthly Weather Review* 109: 784-812.

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## Remembering Hurricane Hazel (1954 - 2004)

from the Canadian Hurricane Centre

Source – Environment Canada Website: http://www.atl.ec.gc.ca/weather/hurricane/hazel/en/index.html[3]

The Ocean Ranger Storm in 1982 was more intense (winds near 170 km/h). The August Hurricane of 1927 claimed more lives (at least 173). The Ice Storm of 1998 affected more people (over a million households lost power). The Edmonton tornado in 1987 was more sudden (less than an hour warning). Yet, no weather disaster has fixed itself more firmly in Canadian folklore than Hurricane Hazel's impact on Southern Ontario.

Hurricane Hazel struck Toronto on October 15, 1954, killing 81 people and leaving 1,896 families homeless. The record rainfall that the storm brought to Toronto - up to 225 mm - was unable to infiltrate the ground because the above-average rainfall in the preceding month had already filled the water table. Most of the rain simply ran off the surface into rivers and creeks, rapidly filling them to capacity and beyond. One estimate of runoff was that 90% of the precipitation ran off the land directly into rivers raising the water level by 6-8 metres. Water coursed through creeks where they had never before existed, derailed trains and washed out roads. Rampaging rivers tore houses from their foundations, picked up cars and mobile homes, and wrecked boats.

The Humber River Valley was the hardest hit. The bottom end of Raymore Drive was levelled, killing 35 people. Farther downstream on the Humber, five firemen who were dispatched to rescue people trapped in their cars by floodwaters were killed. The Holland Marsh, located north of Toronto, was turned into a lake, ruining houses and crops and forcing residents to flee. The marsh was pumped dry over several weeks before the levels of the dykes surrounding the marsh were raised and the drainage ditches deepened. The community of Long Branch, on the shores of Lake Ontario where Etobicoke Creek enters the lake, was also severely flooded and would be evacuated and eventually turned into a park. Damage was not isolated to these communities, but was felt throughout Southern Ontario as far away as Ottawa.

Recovery began immediately after the waters receded, with the aid of the militia, who searched the river valleys for flood victims, and relief organizations such as the Red Cross and Salvation Army. Relief organizations rushed to set up temporary shelters, find long-term housing for displaced people, collect food and clothing, and raise funds. The Hurricane Relief Fund was created to collect money from people around the city, province and world, and distribute funds to victims of the flood. The estimated cost of Hazel by a Royal Commission studying the effects was placed at $100,000,000, which in 2004 would be approximately $1 billion.

How government organizations handled the disaster was evaluated following Hazel. The weather office was both praised for their accuracy and emphatic warnings and denounced for not providing enough warning. The outcome of Hurricane Hazel was the recognition of the flood hazard

[3] Information reprinted with the permission of Environment Canada

in Southern Ontario and the development of plans to cope with the risk. Civil defence offices were created and trained with monies provided by the municipal, federal and provincial governments; conservation authorities were allowed more power to protect vulnerable land, and parklands were formed around the city.

Another significant outcome of Hazel was the formation of Toronto and Region Conservation Agency (TRCA) and the prioritization of flood control and flood warnings by the three levels of government. Conservation authorities were granted powers to buy and regulate floodplain land and, in cooperation among the three levels of government, helped create flood control and flood warning systems. Floodplains were bought from private property owners and returned to the river, and land-development was restricted. The debate on dams was reopened following Hazel and again when the TRCA presented their Plan for Flood Control and Water Conservation, which would only be partially completed.

If another storm were to follow the exact path and strength of Hazel, the city is now better prepared to cope: yet the risk has not been abolished. Developments remain in the city's floodplains and there is a lack of awareness of the risk; as 50 years have passed, local area residents' memory of the storm has faded.

**Acknowledgements**

This website, created to commemorate the 50th anniversary of Hurricane Hazel, was developed under the funding of two projects by the National Search and Rescue Secretariat's New Initiatives Fund: SARNIF # 2002016 (A Climatology of Hurricanes in Canada: Improving Our Awareness of the Threat) and SARNIF # 2003010 (Impacts of Hurricanes over the Canadian East Coast). It was also facilitated by collaboration with Toronto and Region Conservation who produced a commemorative website and produced a TV documentary and DVD on Hazel.

Project Manager and content editor - **Peter Bowyer**
Primary Researcher and content writer - **Rebecca Hanson**
Reviewer - **Tamara Gates-Hollingsworth**
Site design - **Lesley Carter**

**References**

Note The Toronto Star (TS) was the primary source of information unless otherwise noted.

- Boughner, C. C., 1955: Hurricane Hazel. Weather, Vol.10, No.6, June, 1955 pp. 200-205.
- Examiner, Barrie, Sept 16, 2003.
- Globe and Mail Newspaper (GM) 1954.
- Kennedy, Betty, 1979: Hurricane Hazel. MacMillan Toronto, Canada.
- Knox, John (1992) Hazel Revisited. Proceedings of the Warren Godson Symposium.
- Knox, J. L., 1955: The Storm "Hazel". Bulletin of the American Meteorological Society, Vol.36, No.6, June, 1955 pp. 239-246.
- Krueger, A. F., 1955: The Weather and Circulation of October 1954: Including a Discussion of Hurricane Hazel in Relation to the Large-scale Circulation. Monthly Weather Review, October 1954, pp. 296-300.
- MacLean's (1999) A Hurricane Called Hazel. 112 (26); 50-51.
- Mason, A. H., M. K. Thomas, and D. W. Boyd, 1955: "Hurricane Hazel" in Ontario. Technical Circular CIR-2606, TEC-210, Jan. 21, 1955. Meteorological Division, Department of Transport, Canada.
- Toronto Star Newspaper (TS) 1954-2004.
- Winnipeg Tribune October 20, 1954.

**Note from the Editor:** More information about Hurricane Hazel can be found by visiting the website mentioned above. Our readers are encouraged to visit this very interesting website full of additional information and photographs on this spectacular event.

***Hazel's Legacy,*** a hurricane that changed our landscape forever explores the path Hazel took and the devastation it had on our communities. It examines how our knowledge of hurricanes and their impact has evolved and subsequently the initiatives that have been taken since Hazel to lessen the impacts of future extreme weather events. Weather statistics show that a hurricane the size of Hazel will likely happen again. This timely film explores the importance of communities being prepared.

This 30-minute documentary will captivate viewers with personal accounts that have never been publicly recorded before. The film includes interviews with famed Canadians, Pierre Berton and Betty Kennedy. Experts from the Ministry of Natural Resources, the Canadian Hurricane Centre, Toronto and Region Conservation Agency and others in the field, communicate the future of flood control management.

***Hazel's Legacy*** is available for purchase on DVD and VHS exclusively through Toronto and Region Conservation at the Black Creek Pioneer Village and the Kortright Centre for Conservation gift shops as of October 19, 2004. Phone 416-661-6600. It may also be ordered from the website:

**http://www.hurricanehazel.ca/order_hazels_legacy**

# Program Argo

**Abstract:** The participants in Argo aim to have a global array of 3000 robotic drifters in place by some time in 2006. In November 2004 Argo passed a significant milestone when the 1500th float was operating in the ocean thus taking the project past the 50% mark. To note the event, the Argo Steering Team issued the following press release. Most of the text is being released simultaneously in all 20 nations presently contributing to Argo. For more information, please contact Howard Freeland at FreelandHj@pac.dfo-mpo.gc.ca

## Robotic ocean observations reach important milestone (Press Release)

In 1998 oceanographers dreamed of a global network of robotic instruments that would deliver information on the temperature and salinity of the upper half of the ocean and would help to give answers to a wide range of climate questions. Today that dream is a reality. Deployments started in 2000 and the array has now reached the half-way point. 1500 Argo floats now operate in the Atlantic, Indian, Pacific and Southern Oceans, and their data (55,000 profiles per year), are a mainstay of both climate and ocean researchers and of operational weather and climate centres around the world.

Many aspects of Argo and its data are unique and are a role-model for global observations.

- The data are freely available without restriction to anyone wanting to use them.
- The data are made available as soon as initial quality checks have been completed (most within 24 hrs).
- The data are free of seasonal bias (most ship-based observations are sparse in the winter at high latitudes where important climate processes occur).
- The data are distributed evenly throughout all ice free deep ocean areas.
- Argo floats measure salinity to an accuracy close to that achieved by research ships - salinity is important as a means of monitoring changes in precipitation over the oceans.
- Temperature measurements are accurate enough to detect subtle climate-related changes over years and decades.
- Argo floats are also uniquely able to measure subsurface currents that can be used to calculate global-scale heat transport by the oceans.

Argo is a collaborative effort by scientists in more than 20 countries who buy or build floats, deploy them and process their data. In 2004 over 800 floats will have been deployed. This is the number that will need to be deployed each year to maintain the mature array - floats have a design life of 4 years or more. The array should approach the 3000 float target in 2006.

**Examples of Argo data use:**

- Calculating heat storage by the ocean - important in verifying climate models of global warming.
- Studying salinity changes due to changing rainfall.
- In the prediction of El Niño events.
- A means of assessing impacts of ocean temperature, salinity and currents on fisheries and other aspects of regional ecosystems.
- Studying the interaction between atmosphere and ocean during monsoons.
- Monitoring how the oceans drive hurricanes and typhoons.

**Specific examples of relevance to Canada are:**

Using Argo data we are now able to monitor the changing circulation of the Gulf of Alaska and the changing stratification of the upper ocean which controls the supply of nutrients to the North Pacific ecosystems. We are also able to monitor deep convection in the Labrador Sea and the movement of water southwards from Nova Scotia towards the United States.

**For further information please contact :**

The Argo Information Centre at:-
http://w3.jcommops.org/cgi-bin/WebObjects/Argo
The Argo Project Office at:-
http://www.argo.ucsd.edu/
Canadian Argo at:-
http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/Argo/ArgoHome_e.html
or
http://www.pac.dfo-mpo.gc.ca/sci/osap/projects/argo/default_e.htm
or
FreelandHj@pac.dfo-mpo.gc.ca

# Le programme Argo

**Résumé:** (Traduit par la direction) Les participants au programme Argo ont l'intention de déployer un réseau mondial de 3 000 profileurs dérivants qui seraient opérationnels dans le courant de l'année 2006. En novembre 2004, le réseau du programme Argo a passé la marque de 1 500 flotteurs en opération dans les océans, soit la moitié du total visé par le projet. Afin de souligner l'événement, le Comité d'organisation du programme Argo a décidé d'émettre un communiqué de presse. Le texte sera diffusé presque simultanément dans 20 pays participants au programme Argo. Pour en savoir plus, prière de contacter Howard Freeland at FreelandHj@pac.dfo-mpo.gc.ca

## Un pas important dans l'exploration des océans par des robots autonomes

(Communiqué de presse)

A la fin du siècle dernier (1998) les océanographes ont imaginé un réseau mondial d'instruments autonomes, qui fourniraient automatiquement des informations sur la température et la salinité des océans, sur des profondeurs atteignant 2000 m. Aujourd'hui, ce rêve est en passe de devenir réalité. Les déploiements ont commencé en 2000 et le réseau vient de passer la marque de 1 500 engins en opération, soit la moitié du total visé de 3 000 instruments en opération permanente.

Le programme international Argo utilise des flotteurs conçus pour dériver à une profondeur de 1 000 m ; tous les dix jours ils plongent à 2 000 m pour remonter lentement vers la surface en enregistrant des profils de température et salinité, qui sont alors transmis par satellite vers des stations de réception à terre. Le flotteur replonge ensuite à sa profondeur de dérive pour entamer un nouveau cycle de mesures. Ces 1 500 flotteurs sont maintenant en opération dans les océans Atlantique, Pacifique, Indien et Austral, et leurs données (55 000 profils par an) sont un élément essentiel de l'étude du climat et des océans, tant pour les chercheurs que pour les Centres météorologiques et climatiques opérationnels de par le monde. Le réseau Argo constitue maintenant la première source d'information sur l'intérieur de l'océan.

Plusieurs aspects du programme Argo sont uniques et exemplaires pour les systèmes d'observation de l'océan :

- les données sont disponibles librement et sans restrictions à tous les utilisateurs;
- ces données sont disponibles avec un délai inférieur à 24 heures, après des contrôles de qualité préliminaires;
- les observations couvrent toutes les saisons, jusqu'aux hautes latitudes, contrairement à celles réalisées par des navires de recherche, qui sont rares en hiver dans les zones d'accès difficile;
- ces observations sont uniformément réparties sur la surface du globe, à l'exclusion des régions couvertes par les glaces de mer;
- la qualité et la précision des mesures permettent de détecter les variations subtiles liées au changement climatique;
- le déplacement des flotteurs dans leur phase d'immersion est une indication utile des courants en profondeur, permettant d'en déduire le transport de chaleur effectué par les océans à l'échelle globale.

Argo est un programme de collaboration de chercheurs et d'agences dans quelque 20 pays, qui fournissent et construisent les flotteurs, les déploient en mer, et traitent leurs données. En 2004 plus de 800 de ces instruments ont été mis à l'eau, ce qui représente le nombre nécessaire pour maintenir le réseau de 3 000 flotteurs actifs, compte tenu de leur durée de vie estimée à 4 ans. A ce rythme le nombre final devrait être atteint en 2006.

**Quelques exemples d'utilisation des données Argo:**

- calcul du rôle de l'océan dans l'équilibre thermique global : accumulation et transport de chaleur, échanges avec l'atmosphère;
- suivi du changement climatique et du réchauffement global;
- modifications de la salinité liée aux précipitations (surtout en zones tropicales) ou à la fonte des glaces de mer (régions arctiques et antarctiques);
- prévision du phénomène El Niño dans le Pacifique tropical;
- évaluation du rôle du milieu (courants, température) dans les fluctuations des écosystèmes et des ressources halieutiques;
- interactions océan - atmosphère pendant les moussons, et plus généralement prévision saisonnière;
- les rôles de l'océan dans l'évolution des ouragans et des typhons;
- les données Argo sont combinées avec d'autres

observations (par satellite, par exemple) pour déterminer les courants et améliorer les prévisions dans le domaine de la sécurité et du transport maritime, la prévision des états de mer, et les activités offshore.

**Voici quelques exemples pertinents pour le Canada :**

Avec l'utilisation des données, on peut maintenant surveiller la fluctuation des courants du golfe de l'Alaska et la fluctuation de la stratification de l'océan près de la surface qui contrôle les éléments nutritifs des écosystèmes du Pacifique Nord. On peut aussi surveiller la convection profonde dans la mer du Labrador et le mouvement des eaux vers le sud, de la Nouvelle-Écosse vers les États-Unis.

**Pour plus d'information, prière de contacter** :

Le Centre d'information Argo à: -
http://w3.jcommops.org/cgi-bin/WebObjects/Argo

Le Bureau de projet Argo à: -
http://www.argo.ucsd.edu/

Le Centre canadien Argo à: -
http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/Argo/ArgoHome_e.html

ou

http://www.pac.dfo-mpo.gc.ca/sci/osap/projects/argo/default_e.htm

ou encore

FreelandHj@pac.dfo-mpo.gc.ca

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## RAPPEL - RAPPEL - RAPPEL

COMMENT ACCÉDER AU SITE WEB POUR MEMBRES SEULEMENT

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MOT DE PASSE INITIAL: VOTRE NUMÉRO DE MEMBRE (sur votre étiquette postale)

En cas de difficulté, veuillez contacter Lise à affaires@scmo.ca (613) 991-4494.

## IOC/IODE
## Online Survey of Marine Experts

The "International Oceanographic Data and Information Exchange" (IODE)" programme (http://www.iode.org) of the "Intergovernmental Oceanographic Commission of UNESCO (IOC)" was established in 1961 to enhance marine research, exploitation and development by facilitating the exchange of oceanographic data and information between participating Member States and by meeting the needs of users for data and information products.

The IOC is now undertaking a review of the IODE programme in order to ensure that IODE effectively and efficiently addresses the needs of the ocean science and observation community. IOC has designed a short web-based survey addressed to marine experts. The survey can be found on the following URL: http://www.surveymonkey.com/s.asp?u=71514696388

Filling in this survey will take only 5 minutes. It is subdivided in five pages and has a total of thirty-five questions, most of which are answerable by picking from a list of options.

CMOS urges marine experts who read this notice to cooperate by visiting the web site and completing the survey. For any information on IODE or on this survey please contact Peter Pissierssens, Head Ocean Services IOC at:

p.pissierssens@unesco.org or
p.pissierssens@iode.org or
find out more about the IODE review on

http://ioc3.unesco.org/iode/categories.php?category_no=86

Please note that your email address will NOT be used for any non-official purpose unrelated to IOC. However if you do not wish to receive any other messages from IOC then please send a blank message to unsubscribe@iode.org and IOC will remove your address from their records.

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Canadian National Committee for SCOR
Comité national canadien pour SCOR

# Scientific Committee on Oceanic Research

## SCOR General Meeting, Venice, Italy

Report prepared by Dick Stoddart and Bjørn Sundby
Secretary and Chairman, Canadian National Committee for SCOR
www.cncscor.ca

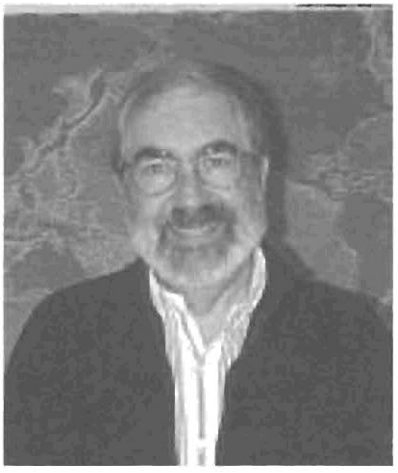
The 27th SCOR General Meeting was held in Venice, Italy on September 27-30, 2004. The meeting was attended by the SCOR executive, representatives from twenty-one national SCOR committees, and representatives from various SCOR committees, working groups, affiliated programs, international agencies and regional bodies. A number of reports from programs, committees, agencies, etc. were presented that were related directly to SCOR interests or programs. In due course the full report on the Venice meeting will be posted on the SCOR web site at: http://www.jhu.edu/~scor/.

**Canadian Elected SCOR President.** Bjørn Sundby, Professor at Université du Québec à Rimouski (UQAR) and Adjunct Professor, Earth and Planetary Sciences at McGill University, has been elected President of SCOR for the next four years. This is the first time in SCOR's history, which dates back to 1957, that a Canadian has been elected SCOR President. Professor Sundby earned a Ph.D. from the University of Bergen (Norway) and a Dr. Philos from the University of Bergen in 1987. His career in oceanography began in 1972 as a postdoctoral fellow at the Bedford Institute of Oceanography. He has been Professor of Oceanography at UQAR, Head of the Department of Chemical Oceanography and Marine Pollution at the Netherlands Institute of Oceanography, and Director of Physical and Chemical Sciences at the Maurice Lamontagne Institute, Canada. Since 1999, Prof. Sundby has been Professor of Oceanography at the Institut des Sciences de la Mer de Rimouski and Adjunct Professor at McGill University. Prof. Sundby's research focuses on redox chemistry, but is relevant to any element whose distribution in sediments is in some way related to the carbon cycle. His recent and ongoing projects include the use of a solid state voltammetric microelectrode to measure redox species directly in sediment porewater; recent changes in sediment chemistry in the deep Arctic Ocean basins as a result of global warming; hypoxia in the St. Lawrence estuary; the cycle of lead in the root zone of salt marsh sediments; the coupled geochemistry of manganese, nitrogen, and iodine in sediments; and geochemistry of cadmium, molybdenum, uranium, and rhenium in view of their use as tracers of redox conditions in paleo-sediments.

**SCOR Working Group Reports.** The meeting reviewed all active SCOR working groups: six (6) were disbanded as they had completed their terms of reference, ten (10) ongoing groups presented progress reports, and two (2) new proposals were reviewed and accepted (pending clarifications).

### Disbanded Working Groups

*WG 93 on Pelagic Biogeography.* The English version of biogeography terms is now available on the SCOR Web site (http://www.jhu.edu/scor/Biogeography.doc). It includes English definitions, with Spanish translations of the terms and a Spanish cross-reference list of terms.



Dr. Bjørn Sundby, newly elected Chairman of SCOR

*WG 107 on Improved Global Bathymetry.* The group's report was published in the IOC Manuals and Guides series in 2002 and the group was disbanded. Ron Macnab, NRCan/GSC, was a WG member from Canada.

*WG 112 on the Magnitude of Submarine Groundwater Discharge and its Influence on Coastal Oceanographic Processes.* The product of this working group included a special issue of the journal Biogeochemistry (published in 2003) and a chapter in the synthesis book for the Land-Ocean Interactions in the Coastal Zone (LOICZ) project (still in progress). Leslie Smith (UBC) was the Canadian Associate Member on this group.

*WG 113 on the Evolution of the Asian Monsoon in Marine Records: Comparison between Indian and East Asian Subsystems.* Marine Geology published a special volume of the papers contributed to the working group's second workshop in 2003. A review paper was prepared based on the results of the first and third workshops, to be published in Quaternary Science Reviews.

*WG 114 on Transport and Reaction in Permeable Marine Sediments.* A Gordon Research Conference on this topic was the prime result of the working group. Bernie Boudreau (Dalhousie) was the WG Co-Chair, and Bjørn Sundby (UQAR, McGill) was an Associate Member.

*WG 118 on New Technologies for Observing Marine Life.* The Web site for the group was re-designed (see http://www.coml.org/scor/scor.htm) as a resource for the new panel on the topic.

**Current Working Groups**

*WG 109 on Biogeochemistry of Iron in Seawater.* The group produced a book in 2001. A subgroup on iron standards was set up at the Amsterdam General Meeting (1998) and met at the 2000 Ocean Sciences Meeting in San Antonio, Texas; an intercalibration of standards was undertaken in 2000. The subgroup met in late 2002 to discuss the results of the intercomparison. The results of this intercomparison resulted in a grant from NSF for a larger intercomparison cruise.

*WG 111 on Coupling Winds, Waves and Currents in Coastal Models.* The group is developing a book tentatively entitled Coupled Coastal Wind-Wave-Current Dynamics, which will be published by Cambridge University Press in mid-2005. Peter Craig (Australia) is leading the editorial work for the book.

*WG 115 on Standards for the Survey and Analysis of Plankton.* The working group met for the second time in Concepción, Chile in November 2003. Erika Head (DFO/BIO) is an Associate Member of the WG. The group plans to meet for its third and final time in early 2005.

*WG 116 on Sediment Traps and $^{234}Th$ Methods for Carbon Export Flux Determination.* The group met in Nov. 2003 to construct the outline for a book on their topic and will hold a meeting in 2004 to coincide with a larger meeting on this topic in the United States.

*WG 119 on Quantitative Ecosystems Indicators for Fisheries Management.* The working group convened a large symposium at UNESCO in Paris on March 31-April 3, 2004. A special issue of the ICES Journal of Marine Science will be produced from the symposium. The WG will continue for one more year until its publication is complete. Villy Christensen (UBC) is Co-Chair of the WG. Associate Members include Daniel Pauly (UBC), Tony Pitcher (UBC), Jake Rice (DFO/HQ) and Kees Zwanenburg (DFO/BIO).

*WG 120 on Marine Phytoplankton and Global Climate Regulation: The Phaeocystis Species Cluster As Model.* The working group's second meeting was held in Savannah, Georgia, USA in December 2003. The group would like to convene a Gordon Conference-type meeting in 2005 to gather information for their final product, which would be a proceedings.

*WG 121 on Ocean Mixing.* SCOR and IAPSO are funding the group's symposium scheduled for October 2004 in Victoria, B. C., Canada. Chris Garrett (UVic) is a Member of the WG, and Barry Ruddick (Dalhousie) is an Associate Member.

*WG 122 on Estuarine Sediment Dynamics.* The group held its first meeting in Faro, Portugal in September 2004. The group would like to hold its second meeting in September 2005 in Bahia Blanca, Argentina. Ray Cranston (NRCan/GSC) is an Associate Member of the WG.

*WG 123 on Reconstruction of Past Ocean Circulation (PACE).* Several group members held an opportunistic meeting in conjunction with the EGU meeting in April 2004. They are proposing to hold a conference on their topic in Atlanta, Georgia, USA in March 2005, bringing together physical oceanographers and paleoceanographers. Andrew Weaver (UVic) is an Associate Member of the WG.

*WG 124 on Analyzing the Links Between Present Oceanic Processes and Paleo-records (LINKS).* The group held a planning meeting in conjunction with the 8th International Conference on Paleoceanography in September 2004 in Biarritz, France.

**New Working Group Proposals**

Two new Working Group proposals were approved, subject to some clarifications identified at the Venice SCOR meeting.

1) *Working Group on Global Comparisons of Zooplankton Time Series*

This new SCOR Working Group will undertake a global-scale comparison of low frequency variability of marine zooplankton communities. This idea grew out of a workshop convened by Ian Perry (DFO/PBS) and Hal Batchelder during the recent "3rd International Zooplankton Production Symposium" (May 2003 in Gijon, Spain, co-sponsored by GLOBEC, PICES, ICES and the Spanish government). A summary paper from that workshop (Perry et al., In press) includes preliminary but provocative evidence for temporal coherence of zooplankton and climate variability in both the North Atlantic and the North Pacific. There was a strong consensus at the Gijon workshop that a more detailed and more global comparison of zooplankton time series would be timely, technically feasible, and extremely useful. Such an analysis must be an international cooperative effort – the relevant data sets are in many places and have been collected by many independent nations and agencies.

Expected activities and products include:

■ Year 1: Summarize and evaluate methods, results, and questions arising from the zooplankton time series analyses that have been completed to date. For the proposed new comparative analyses, select and prioritize the set of regional time series, and the suite of variables from each time series that will be compared (e. g. total zooplankton biomass, major-group and/or species-level zooplankton taxonomic composition, phenology, and physical and biological environmental indices). Identify obstacles to pooled analyses (e. g. incomplete processing, differences in formatting, differences in resolution). Develop recommendations for data-exchange, and feasible enhancements of sample processing.

■ Year 2: Begin comparative analyses. Evaluate sensitivity and specificity of data analysis (statistical) tools, and improve their availability and "user-friendliness". Identify time scales and date intervals of particular interest. Post selected tools and data on a web or ftp site.

■ Year 3: Complete comparative analyses of zooplankton and environmental time series, incorporating any new data that have become available during years 1-3. Identify synchronies (if any) in timing of fluctuations, and quantify correlation time and space scales. Prepare interpretive paper(s) for symposium presentation and publication. Prepare recommendations for "best practice" sampling and analysis methodologies.

The Working Group will be Co-Chaired by David Mackas (Canada, DFO/IOS) and Hans Verheye (South Africa, Benguela).

2) *Working Group to Investigate the Role of Viruses in Marine Ecosystems*

Understanding the role of viruses in oceanic carbon and nutrient cycling, food web processes and diversity is pivotal for assessing the stability of marine systems and their biogeochemical significance. This understanding is not only of scientific interest; it will also increase the predictability of the effects of global change on biogeochemical processes in the ocean. Moreover, quantitative data on the consequences of viral lysis are necessary to better understand the functioning of marine food webs. This will also facilitate the inclusion of viral effects into oceanic carbon models.

This working group will study the role of viruses in marine ecosystems over a period of four years, culminating in a final report that: (1) summarize past results on virus-mediated mortality of eukaryotic plankton and prokaryotes and its impact on oceanic carbon and nutrient cycling; (2) coordinate data and international collaboration on the role of viruses in different water masses in particular in the open ocean and deep sea; and (3) assess the current methodological limitations and develop recommendations for techniques to quantify virus-mediated mortality of microorganisms (eukaryotes and prokaryotes), their impact on carbon and nutrient cycling, and methods for assessing diversity in viral communities. An important aspect of the working group will be to stimulate research to investigate viruses and viral-mediated processes in different water masses, since this promises a better understanding of the effect of viruses on biogeochemical cycles. The working group will also establish and maintain a Web site as forum that can be used by the 'viral community' for exchanging data, ideas and future plans. The SCOR effort will culminate with an International Symposium that could include a published proceeding such as a special issue of Limnology and Oceanography or Deep-Sea Research.

Curtis Suttle (UBC) is a proposed Member of the Working Group.

**Large Scale Scientific Programs.**

■ **SCOR/IGBP Joint Global Ocean Flux Study (JGOFS).** The JGOFS Executive Committee met for the final time in September 2003 to finish its business. Project files were shipped to the Woods Hole Oceanographic Institution Library for archiving. JGOFS decided to try to write an article on the history of JGOFS. The JGOFS IPO closed on 31 December 2003 and distributed the final version of its Web site on CDs. It is also still on-line at the University of Bergen.

■ **SCOR/IGBP/IOC Global Ocean Ecosystems Dynamics (GLOBEC).** Canadians on the SSC include Ian Perry (DFO/PBS) and Rosemary Ommer (UVic). GLOBEC held its 2004 SSC meeting in Swakopmund, Namibia, to make it possible to meet in conjunction with the annual meeting of BENEFIT, one of GLOBEC's regional contributing activities (from South Africa, Namibia, and Angola). The GLOBEC SSC continued planning its synthesis activities and planning for joint activities with IMBER, and reviewed draft science plans for two new regional activities, one in the sub-arctic seas and the other for high-trophic level fish in tropical regions. GLOBEC and IMBER have agreed to work together on studies related to end-to-end food webs.

■ **SCOR/IOC Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB).** The Canadian member on the SSC is Allan Cembella (NRC). GEOHAB's Implementation Plan was approved after the 2003 Executive Committee meeting. GEOHAB has embarked on a series of focused open science meetings to create research plans for its four Core Research Projects. Two have been held so far: (1) HABs in Upwelling Systems (in Lisbon, Portugal) and (2) HABs in Fjords and Coastal Embayments (in Viña del Mar, Chile). The plan from the Upwelling was published by IOC, and the plan for the Fjords and Coastal Embayments meeting is in progress. The final two open science meetings will be held on HABs in Eutrophied Systems (March 2005 in Baltimore, Maryland, USA) and HABs in Stratified Systems (in mid-2005).

■ **SCOR/IGBP/WCRP/CACGP Surface Ocean-Lower Atmosphere (SOLAS).** The Canadian member on the SSC is Ken Denman (EC/CCCma and DFO/IOS). The SOLAS International Project Office has been established in the United Kingdom and SOLAS is seeking support for its focus activities. SOLAS held its first open science meeting as an official project in Halifax, Nova Scotia in October 2004, just after the SCOR General Meeting. SCOR contributed US$15,000 NSF funding for the conference, plus an additional $7,500 for the participation of developing country scientists in the meeting. SOLAS and IMBER have agreed to create a cooperative research activity related to ocean carbon.

■ **SCOR/IGBP Integrated Marine Biogeochemistry and Ecosystem Research (IMBER).** Jay Cullen (UVic) is the Canadian member on the SSC. The IMBER Science Plan and Implementation Strategy was reviewed by SCOR and IGBP and approved, in principle, by both co-sponsors, in 2004. SCOR and IGBP also approved the IMBER SSC membership in 2004. The IMBER SSC met on 9-12 August 2004 in Plymouth, UK to discuss how to revise the Science Plan and Implementation Strategy to respond to reviewers' comments and to begin planning implementation activities.

■ **GEOTRACES Planning Committee.** The GEOTRACES Planning Committee met for the first time in Oxford, UK in June 2004, to begin creating their science plan. Kristin Orians (UBC) is an Associate Member on the planning committee. The primary objectives of a GEOTRACES study would be: (1) to determine global distributions of selected trace elements and isotopic tracers in the ocean, and (2) to evaluate the oceanic sources, sinks, and internal cycling of these elements and thereby characterize more completely their global biogeochemical cycles. Four national GEOTRACES communities (in France, Germany, the United Kingdom and the United States) held scientific meetings to specify their particular interests in GEOTRACES, which will contribute to the international GEOTRACES science plan. New funding has been secured from NSF for GEOTRACES to continue its planning. These funds will be used for an editorial meeting and meetings of subcommittees for data management, and for standards and intercomparison experiments.

■ **Land Interactions in the Coastal Zone (LOICZ).** The 2002 SCOR General Meeting agreed to co-sponsor the elements of LOICZ related to coastal ocean science, pending development of financial support for LOICZ. SCOR has not yet been able to develop funds to assist LOICZ.

**SCOR/IOC Advisory Panel on Ocean Carbon Dioxide.** The terms of panel members expired at the end of 2003. Much discussion has taken place on how to reform the Panel, its new terms of reference, and how it would relate to (1) the International Ocean Carbon Coordination Project (IOCCP), which it co-sponsored and which has continued its activities, and to (2) SOLAS and IMBER.

**SCOR-IOC International Symposium on "The Ocean in a High-$CO_2$ World".** The symposium was held at UNESCO in Paris, France in May 2004. It was mentioned in an article in the New York Times weekly Science section, as well as in other printed and on-line newspapers. Papers from the symposium will be published in a special issue of the Journal of Geophysical Research-Oceans. These papers will be produced in time to contribute to the IPCC Special Report on Carbon Dioxide Capture and Storage. In addition, a summary of research priorities from the discussion sessions was prepared and distributed to research agencies worldwide. A meeting summary was published in EOS. The new Panel that will replace the SCOR/IOC Advisory Panel on Ocean $CO_2$ will be responsible for continuing follow-up activities related to ocean carbon sequestration science.

**SCOR/IOC Activity on Extending Ecosystem Models to the Basin Scale.** The Intergovernmental Oceanographic Commission (IOC) requested that SCOR and IOC bring together a group of scientists who have been active in ecosystem modelling (particularly in the North Atlantic region), to write a paper to describe the status of ecosystem models and how they could be extended to the basin scale. This group was chaired by Brad de Young (Memorial). It met twice to write an article for Science. This activity resulted from a GLOBEC focus group, but also included individuals from JGOFS, IMBER, and PICES.

**The Global Iron Cycle.** SCOR was a supporting applicant for a proposal from IGBP to ICSU for an IGBP "fast-track" activity on the global iron cycle, which brought together experts on oceanic, atmospheric, and terrestrial aspects of the global iron cycle to document our current state of knowledge about the iron cycle. The activity will result in one synthesis paper for Science or Nature and several other more-focused papers in Global Biogeochemical Cycles.

**SCOR/IGBP Meeting on Data Management in International Marine Reearch Projects.** SCOR obtained funding from NSF to convene a meeting (with help from IGBP) to bring together project scientists and data managers to recommend to projects what should form the key elements of their data policies. The meeting was chaired by Roy Lowry of the British Oceanographic Data Centre. SCOR convened this meeting because of the need of SOLAS, IMBER, and GEOHAB for such a policy. The policy was distributed to all the projects that participated in the meeting. All of the above projects, plus GEOTRACES, have considered the recommendations at their meetings.

**SCOR Meeting on Coordination of International Marine Research Projects.** SCOR obtained funding from the Alfred P. Sloan Foundation to convene a meeting of representatives of the major large-scale ocean research projects, both SCOR-sponsored and others. The meeting occurred in Venice during the week before the 2004 General Meeting and was co-chaired by John Field and Laurent Labeyrie. The purpose of the meeting was to bring together representatives of the major international ocean

research and observation projects and programs to discuss common opportunities, issues and problems. The topics for discussion were an update on results from the data coordination meeting, a discussion of project-GOOS cooperation, a discussion of project collaboration on Southern Ocean research, project needs for time-series stations, project input to global assessments, and other topics of interest to the participants.

**Panel on New Technologies for Observing Marine Life.** The 2003 SCOR Executive Committee meeting approved the transformation of *WG 118 on New Technologies for Observing Marine Life* to a panel of the same name. Elgar de Sa (India) was approved as the Panel chair and terms of reference were approved for the Panel. The Sloan Foundation approved a three-year grant ($140,000) for the Panel's activities. The panel membership is now under development. The first meeting of the panel will be held in Goa, India in late 2004.

**Capacity Building Activities.** SCOR participates in a number of initiatives in developing nations that are aimed at increasing scientific capacities in ocean science, including: developing regional graduate schools of oceanography and marine environmental sciences; supporting POGO-IOC-SCOR visiting fellowships for oceanographic observations; awarding, through SCOR, NSF travel support for developing country scientists; providing SCOR reports, such as books emanating from SCOR working groups, to developing country libraries; and, interacting with the Third World Academy of Sciences (TWAS) which represents developing nations that do not have their own science academies.

**SCOR Affiliated Programs.** SCOR's role in relation to Affiliated Programs is one of advice and occasional review. SCOR will not usually sponsor an Affiliated Program for more than 10 years.

■ **Census of Marine Life (CoML)** CoML became a SCOR affiliated program in 2002. Ron O'Dor (Dalhousie) provided an excellent overview and update on the Census of Marine Life (CoML) program. This decade-long program will promote and fund research assessing and explaining the diversity, distribution and abundance of species throughout the world's oceans. Dr. O'Dor summarized recent CoML activities, including: the Scientific Steering Committee, education and outreach, Ocean Biogeographic Information System (OBIS), History of Marine Animal Populations (HMAP), Future of Marine Animal Populations, Gulf of Maine Program (GoMA), Mid-Atlantic Ridge (MAR-ECO), Chemosynthetic Ecosystems (ChEss), Tagging of Pacific Pelagics (TOPP), Salmon/Coastal Tracking (POST), Latitudinal/Longitudinal Gradients in Near-Shore Biodiversity (NaGISA) protocols, Abyssal Sediments (CeDAMar), and Arctic Ocean Census of Marine Life (ArcCoML). The Census of Marine Life Canada will hold a workshop at the end of October 2004 in Ottawa, organized by Paul Snelgrove (Memorial) and Mike Sinclair (DFO/BIO). The CoML program description may be found at http://www.coml.org/coml.htm

■ **iAnZone – International Antarctic Zone.** Accorded status as a SCOR Affiliated Program in1996, the primary goal of the international Antarctic Zone (iAnZone) program is to advance our quantitative knowledge and modelling capability of the seasonal cycle and interannual variability of the ocean and its sea ice cover, with emphasis on climate-relevant fluxes that couple the Antarctic Zone to the atmosphere and to the global ocean. The iAnZone group has been involved in the development and coordination of three large Antarctic zone projects and also organizes meetings intended to inform others of national research and field programs for the purpose of "value-added" linkages among the participants. For detailed information on iAnZone's scientific programs, see their Web site at http://www.ldeo.columbia.edu/physocean/ianzone/

■ **IMAGES – International Marine Global Change Study.** Claude Hillaire-Marcel (UQAM) is the Canadian member on the IMAGES consortium. Affiliated with SCOR in 1995, IMAGES is a program of Past Global Changes (PAGES), a core project of the International Geosphere-Biosphere Programme (IGBP). IMAGES was initiated to respond to the challenge of understanding the mechanisms and consequences of climatic changes using oceanic sedimentary records. The overriding IMAGES science issue is to quantify climate and chemical variability of the ocean on time scales of oceanic and cryospheric processes; to determine its sensitivity to identified internal and external forcings, and to determine its role in controlling atmospheric $CO_2$. In order to achieve these scientific objectives, IMAGES proposes to coordinate a global program to collect and study marine sediment records to address three fundamental questions: 1. How have changes in surface ocean properties controlled the evolution of global heat transfer through the deep and surface ocean and thereby modified climate? 2. How have changes in ocean circulation, ocean chemistry, and biological activity interacted to generate the observed record of atmospheric $pCO_2$ over the past 300 kyr? 3. How closely has continental climate linked to ocean surface and deep-water properties? The IMAGES program is outlined in detail at http://www.images-pages.org/start.html

■ **InterRidge – International, Interdisciplinary Ridge Studies.** Steven Scott (U. of Toronto) is the Canadian member of the InterRidge Steering Committee. InterRidge became a SCOR affiliated program in 1995. The scientific purpose of InterRidge is to discover and quantify the inter-relationships among the various manifestations of the ridge system and to integrate growing understanding of ridge dynamics with knowledge about the functioning of the Earth as a whole. These goals concern many subjects, from seismology to bacteriology, and require a variety of approaches at many different scales. To acquire global-scale data on the entire mid-ocean ridge system, international cooperation and planning is a necessity. InterRidge plays a vital role to facilitate international cooperation and thereby pool resources and expertise to address complex scientific ridge-related questions. A full description of InterRidge's makeup and activities may be

found at http://interridge.org/

■ **IOCCG – International Ocean Colour Coordinating Group.** Trevor Platt (DFO/BIO) is the Chair of the IOCCG Committee. Venetia Stuart (Dalhousie) provided an excellent detailed account of this SCOR affiliated (in 1997) program. A major focus of the IOCCG has been the formation of specialized working groups to investigate various aspects of ocean-colour technology and its applications. The end product of these working groups is usually the publication of a scientific report, which can be used to provide appropriate advice to Space Agencies, scientists and managers. To date, three of these working groups have completed their tasks and reports of their findings have been published by the IOCCG. Currently, seven other IOCCG-commissioned working groups are active and in various stages of progress. A full description of the program may be found at http://ioccg.org/

**Relations with Intergovernmental Organization.** Updates were provided on a number of SCOR interactions, including with: (i) the Intergovernmental Oceanographic Commission and related to programs of GESAMP, the proposed SCAR-SCOR-IOC Southern Ocean research coordination activity, the follow-up for the WG 119 symposium, the Coastal Ocean Advanced Science and Technology Studies (COASTS) Meeting, the Global Ocean Observing System (GOOS), and (ii) related programs of the North Pacific Marine Science Organization (PICES).

**Relations with Non-Governmental Organizations**

■ **International Council for Science (ICSU).** As part of the ICSU strategy development the ICSU Committee on Scientific Planning and Review (CSPR) commissioned three Priority Area Assessments. The first of these reports, environment in relation to sustainable development, is available and may be found on the ICSU web site at: http://www.icsu.org/. The portion of the ICSU report that refers to SCOR was very complimentary to SCOR.

■ **International Geosphere-Biosphere Program (IGBP).** IGBP and SCOR have worked since early 2003 on an "Ocean Vision" for the ocean projects that are part of IGBP.

■ **World Climate Research Programme (WCRP).** WCRP is co-sponsoring the SOLAS project and SCOR projects are working well with CLIVAR, the part of WCRP most relevant to SCOR. SCOR provided funds for the CLIVAR Open Science Meeting in Baltimore for travel of developing country scientists and is providing funds to the CLIVAR IPO to help revise the WOCE hydrographic manual in terms of carbon measurements.

■ **Scientific Committee on Antarctic Research (SCAR).** SCAR has proposed SCOR involvement to work cooperatively in Southern Ocean research coordination and are discussing a variety of other cooperative activities. For example, the two organizations will co-sponsor a special session at the IAPSO/IABO meeting in Cairns, Australia, on the topic of integrated biological and physical oceanography in the Southern Ocean.

■ **Scientific Committee on Problems of the Environment (SCOPE).** SCOR was a supporting applicant to a SCOPE proposal to ICSU for an activity called Physics and Chemistry as the Key to Marine Ecosystem Dynamics and Structure (PACKMEDS). IAPSO was also a supporting applicant. SCOPE is planning to attempt to conduct the project even though support has not been received from ICSU.

**Future SCOR Meetings**

The 2005 Executive Committee Meeting will be held at Cairns, Australia, August 29 to September 1, following the IAG/IAPSO/IABO meeting. The 2006 General Meeting will be held in Concepción, Chile.

**2004 Election of SCOR Officers**

The SCOR Executive Committee for 2004-2006 is as follows:

- President, Bjørn Sundby (Canada)
- Secretary, Julie A. Hall (New Zealand)
- Past President, Robert Duce (USA)
- Vice-President, Akira Taniguchi (Japan)
- Vice-President, Laurent Labeyrie (France)
- Vice-President, Victor Akulichev (Russia)
- Ex-Officio Member, IABO President, Annelies Pierrot-Bults (Netherlands)
- Ex-Officio Member, IAMAS President, Mike McCracken (USA)
- Ex-Officio Member, IAPSO President, Shiro Imawaki (Japan)
- Co-Opted Member, Ilana Wainer (Brazil).

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## REMINDER - REMINDER - REMINDER

HOW TO ACCESS THE MEMBERS ONLY WEB SITE

GO TO BOTTOM OF PAGE WWW.CMOS.CA

USER NAME: THE FIRST SIX CHARACTERS OF YOUR FAMILY NAME (or less if shorter) FOLLOWED BY YOUR MEMBERSHIP NUMBER, without spaces

INITIAL PASSWORD: YOUR MEMBERSHIP NUMBER (on your address label)

In case of difficulty, please contact Lise at accounts@cmos.ca (613) 991-4494

## Brian Patrick Murphy

## 1958 – 2004

On June 30th of this year, the meteorological community lost one of its finest members with the passing of Brian Murphy in his home town of Windsor, Ontario.

Brian was born in 1958 and developed "the weather bug" at a very early age. As early as grade four, Brian was known to have been perusing weather-related books. Brian also developed a number of other talents, including musical abilities. He played trombone in the Scarlet Brigade, a marching and concert band that travelled across the region. He also led a jazz band while in high school.

Brian pursued studies in music for two years at the University of Windsor before switching majors to mathematics. He completed his BSc in 1982 then headed off to the University of Toronto to earn his Diploma in Meteorology. He was subsequently hired by Environment Canada.

After completing the Meteorologist Operational Course (MOC 5), Brian was posted to Gander, Newfoundland in 1984. His love of severe Ontario storms brought him to the Ontario Weather Centre in Toronto in 1986. His last posting as a forecaster was at the Regional Centre in Thunder Bay from 1995 to 1999. He spent the rest of his career working as a research meteorologist at Environment Canada offices in Guelph and Burlington.

Brian was an expert in the prediction of both summer and winter severe weather and he authored and co-authored a number of articles in meteorological publications. His insights into tornadoes, snowsqualls and, more recently, heavy precipitation events have contributed significantly to operational knowledge in these areas. He was also well known for his excellent teaching skills and served as a presenter for the US/Canada COMET program on winter severe weather forecasting.

Brian was instrumental in the creation of The Great Lakes Operational Meteorology Workshop, now heading into its 14th year. To recognize this contribution, one talk at each workshop will now be known as the "Brian Murphy Operational Forecaster Presentation."

One of Brian's greatest achievements was his forecast of significant tornadoes over southern Ontario and the State of New York for which he received a U.S. National Weather Service Commendation in 1990. He was also awarded an AES Ontario Region Award of Excellence and was listed in the book *Canadian Who's Who*.

Outside of work, Brian was an avid baseball fan and, being a Windsor native, he always cheered for Detroit (How 'bout those Tigers?). He also took great pleasure in coaching his son Brendan's baseball team.

Brian is fondly remembered by his friends and colleagues as caring, humble and passionate. He never failed to inspire or make us laugh. His presence will be sorely missed among us.

Anyone wishing to send condolences or make a donation to the Windsor Regional Cancer Centre should go to the following website: http://www.familiesfirst.net. In addition, an educational fund has been set up for Brendan. Anyone wanting to contribute can contact me at David.Sills@ec.gc.ca.

*Dave Sills*
*Meteorological Service of Canada*
*Toronto, ON*

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**RAPPEL - RAPPEL - RAPPEL**

COMMENT ACCÉDER AU SITE WEB POUR MEMBRES SEULEMENT

ALLEZ AU BAS DE LA PAGE WWW.SCMO.CA

NOM D'UTILISATEUR: LES SIX PREMIERS CARACTÈRES DE VOTRE NOM DE FAMILLE (ou moins s'il est plus court) SUIVIS DE VOTRE NUMÉRO DE MEMBRE, sans espaces.

MOT DE PASSE INITIAL: VOTRE NUMÉRO DE MEMBRE (sur votre étiquette postale)

En cas de difficulté, veuillez contacter Lise à affaires@scmo.ca (613) 991-4494.

## Atelier d'été en météorologie
## Projet Atmosphère 2005

Demande de candidats professeurs de niveau pré-collégial

Comme par les années passées, la Société canadienne de météorologie et d'océanographie (SCMO) a été invitée à choisir un enseignant canadien qui participera au PROJET ATMOSPHÈRE en 2005. Il s'agit d'un atelier d'été à l'intention des enseignants de niveau pré-collégial spécialistes en sciences atmosphériques; cet atelier est parrainé par l'American Meteorological Society (AMS) et la National Oceanic and Atmospheric Administration (NOAA) américaine. Il aura lieu du 18 au 29 juillet 2005 au centre de formation du National Weather Service à Kansas City au Missouri.

Les dépenses de l'enseignant choisi seront assumées par l'AMS et la NOAA, avec une contribution financière de la SCMO et du Conseil canadien pour l'enseignement de la géographie (CCEG). Ceci n'inclus pas les déplacements à destination et au retour de Kansas City pour lesquels la SCMO et le CCEG offrent chacun 300 $ (canadiens), soit un total de 600 $ au participant canadien choisi.

Les anciens participants du Canada ont trouvé leur expérience très enrichissante et stimulante. Les exposés de l'atelier sont présentés par des experts américains les plus réputés dans les sciences atmosphériques et océanographiques. Les enseignants sont revenus avec du matériel, des ressources et des modules didactiques qu'ils peuvent facilement adapter dans leurs cours.

Les enseignants intéressés peuvent obtenir plus d'information en visitant le site de la SCMO sur la toile à www.scmo.ca/hsworkshop.html où ils peuvent obtenir un formulaire d'application. Ils peuvent également obtenir un formulaire en le demandant le plus tôt possible à l'adresse suivante:

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

Ces demandes doivent être soumises au bureau ci-haut mentionné au plus tard le **1er avril 2005**.

## Summer Meteorology Workshop
## Project Atmosphere 2005

Call for Applications by Pre-College Teachers

As in previous years, the Canadian Meteorological and Oceanographic Society (CMOS) has been invited to select a Canadian teacher to participate in PROJECT ATMOSPHERE in 2005. This is a summer workshop for pre-college teachers of Atmospheric Science topics sponsored by the American Meteorological Society (AMS) and the National Oceanic and Atmospheric Administration (NOAA) of the United States. It will take place July 18-29, 2005 at the National Weather Training Center, Kansas City, Missouri.

The expenses for the participating teacher are paid by AMS/NOAA with a financial contribution from CMOS and the Canadian Council for Geographic Education (CCGE). This does not include the travel to and from Kansas City for which CMOS and CCGE provide $300 (Canadian) each (total of $600) to the selected Canadian participant.

Previous Canadian participants have found their attendance a very rewarding and significant experience. Presentations are made at the Workshop by some of the most respected American Scientists in the fields of atmospheric and oceanographic sciences. Participants have returned with material, resources and teaching modules readily adaptable to classroom presentations.

Interested teachers can obtain more information on the workshop from the CMOS website www.cmos.ca/hsworkshop.html from where they can also download an application form. They can also request an application form by writing, as soon as possible, to the following address:

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

These requests should be submitted to the above office not later than **April 1, 2005**.

## Call for Nominations for CMOS Prizes and Awards

Background:

The Prizes and Awards Committee is anxious to receive nominations for CMOS awards and offers the following background information for potential nominators. The Committee is made up of meteorological and oceanographic researchers and managers from academia, government and non-government agencies.

1) The Committee requires a nominating letter that should include an up-to-date CV and a summary of the candidate's work that is to be considered for an award. Note that the President's Prize and the Roger Daley Postdoctoral Publication Award pertain to a specified scientific paper, book or other major publication.

2) Letters of support are essential and should indicate the extent of influence of the candidate's work.

3) The Committee prefers that nominations and supporting documentation be submitted in electronic format; however, hard-copy material will be accepted if electronic material is not available.

All Society members are encouraged to consider nominating individuals of the meteorological or oceanographic community who have made significant contributions to their fields. The award categories are:

**a) The 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.

**b) The J.P. Tully Medal in Oceanography**
May be awarded each year to a person whose scientific contributions have had a significant impact on Canadian oceanography.

**c) The Dr. Andrew Thomson Prize in Applied Meteorology**
May be awarded each year to a member or members of the Society for an outstanding contribution to the application of meteorology in Canada.

**d) 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.

## Appel de mises en candidature pour les Prix et Honneurs de la SCMO

Préambule:

Le Comité des prix et honneurs de la SCMO attend avec impatience les mises en candidature pour les prix de la SCMO et désire donner l'information pertinente suivante aux personnes faisant des nominations. Le Comité est constitué de chercheurs et gestionnaires en météorologie et océanographie du monde universitaire, du gouvernement et des agences non-gouvernementales.

1) Le Comité demande une lettre de nomination dans laquelle on devrait trouver un curriculum vitae mis-à-jour et un sommaire du travail du candidat qui devrait être considéré pour l'attribution d'un prix. Prière de prendre note que le Prix du Président et le Prix de publication postdoctoral Roger Daley s'adressent spécifiquement à une communication scientifique, un livre ou une publication d'importance.

2) Des lettres supportant la candidature sont essentielles et devraient indiquer l'étendue de l'influence du travail du candidat.

3) Le Comité préfère recevoir les nominations et les documents les supportant sous forme électronique; par contre, des copies papier seront acceptées en l'absence de document électronique.

Tous les membres de la société sont encouragés à présenter des nominations de personnes considérées comme ayant contribué de façon significative dans leur sphère d'activités tant en océanographie qu'en météorologie. Les catégories de prix sont:

**a) Prix du président**
Peut-être décerné chaque année à l'un ou plusieurs des membres de la Société pour une excellente communication ou un livre de grande valeur traitant de météorologie ou d'océanographie. La communication doit être acceptée pour publication dans Atmosphère-Océan ou tout autre périodique avec comité de lecture.

**b) Médaille de J.P. Tully en océanographie**
Peut-être décernée à un individu dont la contribution scientifique dans le domaine de l'océanographie canadienne a été jugée exceptionnelle.

**c) Prix du Dr. Andrew Thomson en météorologie appliquée**
Peut-être décerné chaque année à l'un ou plusieurs des membres de la Société pour un travail exceptionnel dans le domaine de la météorologie appliquée au Canada.

**d) Prix en océanographie appliquée**
Peut-être décerné chaque année à l'un ou plusieurs des membres de la Société pour un travail exceptionnel dans le domaine de l'océanographie appliquée au Canada.

**e) 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.

**f) The Graduate Student Prizes**
One or more prizes may be awarded each year for contributions of special merit by graduate students registered at a Canadian university or by Canadian graduate students registered at a foreign university. One of these prizes shall be named the **Tertia M. C. Hughes Memorial Prize.**

**g) Roger Daley Postdoctoral Publication Award ($2000)**
May be awarded 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 5 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.

**h) Environmental Citations**
May be awarded to individuals or groups who have made some outstanding contribution in helping to alleviate pollution problems, in promoting environmental improvement, stewardship or awareness, or in developing environmental ethics.

**i) Citation for Outstanding Radio and Television Weather Presentation**
Only Canadian weather products or programs will be considered. Nominations can be made for high standards of performance over a period of time or the media outlet's response to a particular event. Normally, submissions include audio tapes of three consecutive radio broadcasts or VHS recordings of three consecutive telecasts along with the date and time of the programs, and the names and addresses of the presenter and station. However, letters of support can also be provided by either Centres or individual Society members. Nominations will be judged on the quality of information, the educational value, the appeal to the audience, and the level of technical and professional presentation.

Additional Information
1. Some prize categories require that a nominee be a member of CMOS.
2. Receipt of submissions by the Secretary will not be

**e) Médaille de Rube Hornstein en météorologie opérationnelle**
Peut-être décerné chaque année à un individu pour un travail exceptionnel dans l'exploitation des services météorologiques, au sens large du terme. Ceci exclut cependant comme critère d'évaluation les publications scientifiques, à moins que leurs résultats ne soient déjà utilisés pour améliorer la performance quotidienne des services d'exploitation. Le travail pour lequel la médaille est donné peut avoir été réalisé sur plusieurs années précédant l'année en cours ou encore, en récompense d'un accomplissement exceptionnel.

**f) Les Prix pour étudiants diplômés**
Un ou plusieurs prix pour étudiants diplômés peuvent être décernés aux étudiants diplômés, inscrits à une université canadienne ou aux étudiants canadiens inscrits à une université étrangère, ayant accompli un travail exceptionnel. Un de ces prix devrait être dénommé le **prix commémoratif Tertia M. C. Hughes.**

**g) Le prix de publication postdoctoral Roger Daley (2 000$)**
Peut-être décerné chaque année à un(e) candidat(e) qui, au moment de la mise en candidature travaille au Canada dans un poste non-permanent à titre de boursier (ère) de recherche postdoctoral ou d'assistant(e) à la recherche et a obtenu son doctorat dans les cinq dernières années. Le prix sera remis en fonction de l'excellence d'une publication, dans les domaines de la météorologie ou de l'océanographie, déjà publiée ou en voie de l'être au moment de la mise en candidature.

**h) Citations environnementales**
Peuvent être décernées à des individus ou groupes ayant apporté une contribution importante aux problèmes de la pollution, en promouvant une meilleure qualité environnementale ou en développant un code d'éthique environnemental.

**i) Citation pour l'excellence en présentation des prévisions météorologiques à la radio ou à la télévision**
Seules les productions canadiennes sont éligibles. La nomination peut être basée sur un standard élevé et soutenu de communications ou sur la reconnaissance des médias sur un événement particulier. Une bande audio de trois émissions radiophoniques consécutives ou un enregistrement VHS de trois émissions télévisées consécutives est requis. La date et l'heure des émissions, le nom du présentateur et la station doivent être indiqués. Toutefois, si désiré, une telle justification peut accompagner la bande afin d'aider le comité de sélection. Les extraits soumis seront jugés pour leur valeur informative et/ou éducative, leur attrait pour le public, et pour le niveau de présentation technique et professionnel.

Information supplémentaire
1. Certaines catégories de prix sont réservées aux membres de la SCMO.
2. Aucun accusé de réception pour les candidatures ne sera

acknowledged unless requested. Acknowledgement when requested will be by telephone.
3. The current title, full address and phone number of the nominee must accompany the submission.

4. Nominees (who have not received awards) in previous years may be re-nominated. All criteria provided above apply to re-nominations. The Committee has recently adopted a policy of considering nominations (kept on file) submitted in the two preceding years. Nominators are encouraged to re-affirm and/or update these nominations.

Nominations should be received by 18 February 2005 by:

Executive Director
Canadian Meteorological and Oceanographic Society
P. O. Box 3211, Station D
Ottawa, ON K1P 6H7
Tel: (613) 990-0300;
Fax: (613) 990-1617
email: cmos@cmos.ca

envoyé par le Secrétaire à moins d'une demande formelle. S'il est requis, l'accusé de réception se fera par téléphone.
3. Le titre actuel de chaque candidat, ainsi que son adresse complète et numéro de téléphone, doivent être envoyés avec la mise en candidature.
4. Les candidats des années précédentes, qui n'ont pas reçu de prix, peuvent être reconsidérés. Les critères énoncés ci-dessus s'appliquent également à ces nominations. Le comité considérera désormais les nominations antérieures et conservées durant les deux dernières années. Nous encourageons les personnes qui ont fait ces nominations à les réitérer ou à les préciser.

Les soumissions doivent être reçues au plus tard le 18 février 2005 par le :

Directeur Exécutif
Société canadienne de météorologie et d'océanographie
C. P. 3211, Station D
Ottawa, ON K1P 6H7
tél.: 613-990-0300;
téléc.: 613-990-1617
courriel: cmos@cmos.ca

Notes: l'utilisation du genre masculin dans le texte français n'a pour but que d'alléger le texte.

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**Canadian Meteorological and Oceanographic Society (CMOS)**

**Background Information on CMOS Privacy Policy**
The Personal Information Protection and Electronic Documents Act (PIPED Act), passed in 2000 sets out ground rules for how private sector organizations can collect, use or disclose personal information in the course of commercial activities. It balances an individual's right to privacy with the need of organizations to collect, use or disclose personal information for legitimate business purposes.

The PIPED Act has been coming into effect in stages. As of January 2001, the Act has applied to personal information about customers or employees in the federally-regulated sector in the course of commercial activities. It also applies to information sold across provincial and territorial boundaries. Since January 1, 2004, the PIPED Act applies right across the board — to all personal information collected, used or disclosed in the course of commercial activities by all private sector organizations.

If a business wants to collect, use or disclose personal information about people, it needs their consent, except in a few specific and limited circumstances. A business can use or disclose people's personal information only for the

**Société canadienne de météorologie et d'océanographie (SCMO)**

**Préambule sur la politique de la SCMO sur la protection des renseignements personnels**
La Loi sur la protection des renseignements personnels et les documents électroniques (LPRPDÉ), en force depuis 2000, expose les règles fondamentales de la collecte, de l'utilisation ou de la communication de renseignements personnels auxquelles les organisations du secteur privé doivent se soumettre dans le cadre de leurs activités commerciales. Elle crée un équilibre entre le droit d'une personne à la vie privée et le besoin des entreprises de recueillir, d'utiliser ou de communiquer des renseignements personnels à des fins lucratives légitimes

L'entrée en vigueur de la LPRPDÉ s'est faite par étape. D'abord, à compter de janvier 2001, la Loi s'est appliquée à la collecte, à l'utilisation et à la communication de renseignements personnels concernant des clients et des employé(e)s par des organisations de compétence fédérale dans le cadre de leurs activités commerciales. Elle visait également les renseignements vendus au-delà des frontières provinciales et territoriales. À compter du 1er janvier 2004, l'application de la LPRPDÉ est de portée générale — c'est-à-dire que la Loi vise tous les renseignements recueillis, utilisés ou communiqués

Si une entreprise veut recueillir, utiliser ou communiquer des renseignements personnels, elle devrait obtenir le consentement de la personne concernée, sauf dans quelques circonstances précises et limitées. Une entreprise

purpose for which they gave consent. Even with consent, organisatlons have to limit collection, use and disclosure to purposes that a reasonable person would consider appropriate under the circumstances. Individuals have a right to see the personal information that a business holds about them, and to correct any inaccuracies. There's oversight, through the Privacy Commissioner of Canada, to ensure that the law is respected, and redress if people's rights are violated.

CMOS came under the Act on 1 January 2004. Although our practices have always been in line with the Act we did not have a public statement of the principles we follow and we did not have a designated privacy officer as the first point of redress. The Privacy Policy published for the first time in this issue is that statement. A CMOS Privacy Officer will be appointed by Council in December 2004.

*Ian D. Rutherford*
*Executive Director*

ne peut utiliser ou communiquer des renseignements personnels qu'aux fins pour lesquelles la personne concernée a donné son consentement. Même en obtenant le consentement de la personne concernée, organisations doivent restreindre la collecte, l'utilisation et la communication de renseignements personnels à des fins qu'une personne raisonnable estimerait acceptable dans les circonstances. Chaque personne a droit de voir les renseignements personnels que votre entreprise possède à son sujet et de corriger toute donnée inexacte. Une surveillance est assurée par la Commissaire à la protection de la vie privée du Canada, qui veille à ce que la loi soit respectée, et à ce que les personnes lésées dans leurs droits aient des recours.

La SCMO est assujetti aux provisions de la Loi depuis le premier janvier 2004. Même si nous avons toujours agi en conformité avec la Loi, nous n'avions pas d'énoncée de principes que nous devons suivre et pas d'officier désigné pour la protection des renseignements personnels. La politique publiée dans ce numéro est l'énoncé exigé par la Loi. Un officier pour la protection des renseignements personnels sera nommé par le Conseil au mois de décembre 2004.

*Ian D. Rutherford*
*Directeur exécutif*

## CMOS Privacy Policy

**Commitment to Privacy**
CMOS recognises the importance of privacy and is committed to maintaining the accuracy, confidentiality and security of the personal information that it collects about its members, subscribers, conference attendees, suppliers, clients and other contacts as outlined in this policy statement.

**What is Personal Information?**
Personal information is any personally identifiable information such as your name, residential and e-mail addresses, telephone and fax numbers, membership, subscription and conference information, credit information and billing records, service records, recorded complaints, opinions and preferences.

Publicly available information such as the name, address, telephone and fax numbers of a business are not considered personal information.

**Collection and Use of Personal Information**
CMOS collects and uses personal information only for the purposes of providing membership, conference or subscription services, for receiving necessary products and

## Politique de la protection des renseignements personnels de la SCMO

**Engagement envers la protection des renseignements personnels**
La SCMO reconnaît l'importance de la vie privée et s'engage à maintenir l'exactitude, la confidentialité et la sécurité des renseignements personnels qu'elle recueille au sujet de ses membres, de ses abonnés, des participants aux congrès, des fournisseurs, des clients et d'autres contacts, tels que décrit dans cet énoncé de politique.

**Que sont des renseignements personnels?**
Les renseignements personnels consistent en tout renseignement personnel identifiable, comme votre nom, adresse de résidence ou de courriel, numéros de téléphone et de télécopieur, renseignements sur votre adhésion, vos abonnements et le congrès, renseignements relatifs au crédit et dossiers de facturation, les états de service, les plaintes, opinions et préférences enregistrées.

Les renseignements accessibles au public, comme la dénomination, l'adresse et les numéros de téléphone et de télécopieur d'une entreprise ne sont pas considérés comme étant des renseignements personnels.

**Collecte et usage de renseignements personnels**
La SCMO collecte et utilise des renseignements personnels dans le seul but d'offrir des services relatifs aux membres, aux congrès ou aux abonnements, de recevoir les produits

services and to communicate with members, subscribers, conference registrants, suppliers and other contacts about their accounts or about CMOS business. All contacts may at any time specify their preferred (default) method of communication with CMOS. They may opt out of all communications not directly connected with their membership, subscription or business with CMOS.

**Prior Consent**

CMOS will seek consent prior to the collection, use and disclosure of personal information as required by the Personal Information Protection and Electronic Documents Act (PIPEDA) and other applicable privacy legislation. Subject to legal and contractual requirements, anyone can at any time refuse consent to the collection, use and disclosure of personal information by giving reasonable notice. If the Society's intended use or disclosure of personal information changes, CMOS will provide advance notification.

**Limitation of Use and Disclosure**

CMOS offers a membership directory that is accessible on the Internet to members only. Only the names of members are published in the directory, unless members explicitly and individually permit the publication of their default postal or e-mail address, telephone or fax number.

Contact information for selected groups of members will be provided to CMOS Officers, Committee Chairs, and Centre Executive members to enable them to provide membership services at national and centre levels. They will be instructed to not pass on this information and to discard it when their CMOS role is concluded.

The policy of CMOS is not to distribute or sell its membership list to anyone. However, CMOS occasionally agrees to distribute information to members on behalf of a client if it is judged to be useful to members. Members can select at any time not to receive such distributions.

The policy of CMOS is that *all* national communication with the general membership will be done through the national office.

**Security**

CMOS is committed to protecting the security of the personal information that it collects. Security measures such as restricted access to the CMOS office, locked cabinets for paper files, firewall-restricted access to the electronic database and the use of passwords on computers have been adopted. These measures are in place in order to protect personal information against loss or theft, as well as against unauthorised access, copying, disclosure, use or modification. Access to this information is restricted to

et services requis et de communiquer avec les membres, abonnés, congressistes, fournisseurs et autres contacts au sujet de leur compte ou des affaires commerciales de la SCMO. Tous les contacts peuvent à tout moment indiquer à la SCMO le moyen de communication qu'ils préfèrent (par défaut). Ils peuvent choisir de ne recevoir aucunes des communications qui ne sont pas directement liées à leur adhésion, leur abonnement ou leurs affaires avec la SCMO.

**Consentement préalable**

La SCMO obtiendra le consentement préalable avant la collecte, l'usage et la divulgation de renseignements personnels, tels que requis par la Loi sur la protection des renseignements personnels et les documents électroniques et d'autre législation relative à la protection de la vie privée. Sous réserve d'exigences juridiques et contractuelles, toute personne peut en tout temps refuser de consentir à la collecte, à l'usage et à la divulgation de renseignements personnels en donnant un préavis raisonnable. Si l'usage prévu ou la divulgation des renseignements personnels de la Société change, la SCMO devra envoyer un avis au préalable.

**Restriction de l'usage et divulgation**

La SCMO offre un répertoire des membres qui est accessible via l'Internet aux membres seulement. Seuls les noms des membres sont publiés dans le répertoire, à moins que le membre donne la permission explicite et individuelle qu'y soient inscrits par défaut ses adresses postales ou courriels, ou ses numéros de téléphone ou de télécopieur. Des renseignements sur des groupes sélectionnés de membres seront fournis aux administrateurs, aux présidents de comité, ainsi qu'aux membres de l'Exécutif des centres de la SCMO afin de leur permettre d'offrir des services aux membres aux niveaux national et des centres. Ils seront avisés de ne pas transmettre ces renseignements et de s'en débarrasser lorsque leur mandat dans la SCMO sera terminé.

L'énoncé de la SCMO est qu'elle ne distribuera ni ne vendra sa liste de membres à personne. Toutefois, la SCMO consent parfois à distribuer des renseignements aux membres au nom d'un client s'ils sont jugés utiles aux membres. Les membres peuvent opter en tout temps de ne pas faire partie de cette liste de distribution.

L'énoncé de la SCMO est que toutes les communications à l'échelle nationale avec les membres en général se feront par le biais du bureau national.

**Sécurité**

La SCMO s'engage à protéger la sécurité des renseignements personnels qu'elle recueille. Des mesures de sécurité ont été adoptées telles que l'accès restreint au bureau de la SCMO, le verrouillage des classeurs, l'accès restreint par coupe-feu aux bases de données électroniques et l'utilisation de mots de passe pour les ordinateurs. Ces mesures sont en place afin de protéger les renseignements personnels contre la perte ou le vol, ainsi que l'accès, la reproduction, la divulgation, l'usage ou la modification non

CMOS office personnel who have been trained to respect the privacy of personal information held by CMOS, in accordance with this policy, PIPEDA and all applicable laws.

**Openess and Availability**
This policy is published on the CMOS website at www.cmos.ca. To obtain a copy of, or the answer to any question about, this policy, or its application, please contact the CMOS Privacy Officer at privacy@cmos.ca.

**Individual Access**
Anyone wishing to ascertain what personal information CMOS may have on file about them, to access that information, to receive a copy, to correct or amend it, to know the source, to find out how it may have been used, etc., may contact the CMOS Privacy Officer at privacy@cmos.ca.

CMOS will not refuse an individual access to their own personal information, except in circumstances permitted by the applicable privacy legislation. If access is refused, CMOS will provide the reason(s) for such refusal. These reasons may include the fact that the information refers to other individuals, that it is subject to legal, commercial, or solicitor-client privilege or that it bears on a matter before litigation.

**Accountability and Recourse**
For any questions or concerns about personal information held by CMOS please contact the CMOS Privacy Officer at privacy@cmos.ca.

If you are not satisfied with the response within 30 days of making an enquiry or complaint, or within 60 days if an extension has been obtained, then you should contact the federal Privacy Commissioner or your provincial Privacy Commissioner for redress.

Approved by CMOS Council 23 September 2004.

autorisés. L'accès à ces renseignements est restreint au personnel de bureau de la SCMO qui a été formé à respecter le caractère privé des renseignements personnels de la SCMO, conformément avec cet énoncé de politique, la Loi sur la protection des renseignements personnels et les documents électroniques et toute autre législation applicable.

**Transparence et disponibilité**
Cette politique est publiée sur le site Web de la SCMO au www.scmo.ca. Pour en obtenir un exemplaire ou pour obtenir réponse à toute question concernant cet énoncé de politique ou son application, veuillez communiquer avec l'agent chargé de la protection des renseignements personnels de la SCMO à vieprivee@scmo.ca.

**Accès individuel**
Toute personne souhaitant connaître les renseignements personnels dans son dossier à la SCMO, avoir accès à ces renseignements, en recevoir une copie, les corriger ou les modifier, pour en connaître la source, pour savoir comment ils ont pu être utilisés, etc., peut communiquer avec l'agent chargé de la protection des renseignements personnels de la SCMO à vieprivee@scmo.ca.

La SCMO ne refusera pas à un individu l'accès à ses propres renseignements personnels, à l'exception de circonstances permises par la législation applicable relative à la protection de la vie privée. Si l'accès est refusé, la SCMO fournira la(les) raison(s) du refus. Ces raisons peuvent être que les renseignements portent sur d'autres personnes, qu'ils sont régis par des privilèges juridiques, commerciaux ou par le secret professionnel ou qu'ils portent sur un sujet en litige.

**Imputabilité et recours**
Pour toute question ou tout commentaire au sujet des renseignements personnels fichés à la SCMO, veuillez communiquer avec l'agent chargé de la protection des renseignements personnels de la SCMO à vieprivee@scmo.ca

Si vous n'êtes pas satisfait de la réponse obtenue dans les 30 jours suivant le dépôt d'une requête ou d'une plainte, ou dans les 60 jours si une prolongation a été accordée, vous devriez communiquer avec le commissaire à la protection de la vie privée du Canada ou le commissaire à la protection de la vie privé de votre province en recours.

Approuvé par la Conseil de la SCMO le 23 septembre 2004.

## Changes to the CMOS Constitution and By-Laws passed at the AGM, Edmonton, May 2004

A list of proposed changes to the CMOS Constitution and By-laws was published in the February 2004 *CMOS Bulletin SCMO* (Vol.32, No.1, pp.29-30) for consideration at the Annual General Meeting in May. At the meeting, held in

## Modifications à la constitution et aux règlements de la SCMO présentées à l'AGA d'Edmonton en mai 2004

Une liste des changements proposés à la constitution et aux règlements de la SCMO a été publiée dans le numéro de février 2004 du *CMOS Bulletin SCMO*, (Vol.32, No.1, pp.30-31) pour être présentée à l'Assemblée générale

Edmonton on 31 May, there was no copy of these proposals readily available so some of them did not get discussed. The amendments that were discussed and passed were Amendments 1, 2, 3, 6, 7 and 8.

In brief, the effect of amendments 1, 2 and 3 is to eliminate the distinction between Centres and Chapters and use only the term Centre, renaming existing Chapters to Centres. The number of members required to form a Centre was reduced from 10 to 4. Proposed Amendment 4, to eliminate the term Significant Interest Group (SIG) was not passed,. Amendment 5 and Amendment 9 were not discussed and they will be re-visited at the 2005 AGM in Vancouver. Amendment 6 revises the list of Committees appointed by Council. This is important because the Chairs of these committees become members of Council if not members already. Amendments 7 and 8 have to do with adding the Roger Daley Postdoctoral Publication Award to the list of Prizes and Awards. Nominations can now be solicited for the first award in 2005.

All of the changes approved at the Edmonton AGM 2004 have now been incorporated into the Constitution and By-Laws in both official languages. The revised documents can be perused on the CMOS web site.

*Ian D. Rutherford*
*Executive Director*

annuelle en mai. À la réunion tenue à Edmonton le 31 mai, il n'y avait pas de copie de ces changements disponibles sur place de sorte que quelques-uns ne furent pas discutés. Les amendements qui furent discutés et adoptés furent les amendements 1, 2, 3, 6, 7 et 8.

En bref, les amendements 1, 2 et 3 éliminent la distinction entre Centres et Chapitres et utilisent uniquement le terme Centre, tout en renommant les Chapitres existants Centres. Le nombre de membres requis pour constituer un Centre a été réduit de 10 à 4. L'amendement proposé 4, l'élimination du terme Groupes d'intérêts, ne fut pas adopté. Les amendements 5 et 9 ne furent pas discutés et ils seront considérés de nouveau à l'AGA de 2005 à Vancouver. L'amendement 6 considère la liste des comités nommés par le Conseil. Ceci est important parce que les présidents de ces comités deviennent membres du Conseil s'ils n'en sont pas déjà membres. Les amendements 7 et 8 proposent l'addition du prix pour publication post-doctorale Roger Daley à la liste des prix et récompenses. Les nominations peuvent maintenant être sollicitées pour la première attribution du prix en 2005.

Tous les changements approuvés à l'AGA d'Edmonton de 2004 ont maintenant été incorporés à la Constitution et Règlements dans les deux langues officielles. Les documents modifiés peuvent être consultés sur la toile de la SCMO.

*Ian D. Rutherford*
*Directeur exécutif*

## Private Sector Committee News

**1. Human Resources Study**

CMOS members and other meteorological practitioners should be aware of an important upcoming study which is intended to provide an improved understanding of the meteorological private sector's skill requirements and forecasted labour market requirements, and will allow for an assessment of the need for national occupational standards and certification programs. The study will target firms and their employees and individual meteorological practitioners but the views of meteorologists in government and academia will be sought as well.

The study is being carried out by the Canadian Council on Human Resources in the Environment Industry (CCHREI, www.cchrei.ca)[1] with the collaboration of CMOS and with assistance with surveys being provided by SPR Associates Inc. (Toronto, Ottawa, www.spr.ca). Funding for the study is provided by Human Resources Skills Development Canada (HRSDC). The study will focus mainly on the private sector (including non-governmental agencies such as universities), and will include surveys of both employers and individual meteorological practitioners. The surveys are now planned from December through January and will be conducted with full recognition of privacy legislation and complete confidentiality of all data collected.

We request cooperation with the survey by all Canada based CMOS members, as a good response rate will be important to a valid survey result. This study offers great opportunities to enhance the visibility of meteorological practitioners in Canada and internationally, and opportunities to improve resources for training and professional development.

You can log on www.cchrei.ca/meteorology/ to review the survey.

**2. Technology Transfer**

The CMOS Private Sector Committee has established a Technology Transfer Subcommittee. Chaired by Dr. Harinder Ahluwalia of Info-Electronic Systems, this committee hosted a very successful one-day workshop on Oct. 18, 2004 in Ottawa. Participants included

[1]CCHREI is one of 26 sector councils for human resources development, funded by Humans Resources Skills Development Canada. CCHREI has recently completed a major study of the environmental sector as a whole. The current study focuses on the meteorological part of that sector.

representatives from government science departments, funding agencies and private sector companies. Presentations and the report from the meeting can be found at: http://www.cmos.ca/Privatesector/techtransfere.html

**3. Referrals to CMOS Private Sector Directory – Success Stories**

CMOS Private Sector Directory now boasts 53 members! To find out more about the meteorological and oceanographic private sector in Canada, go to http://www.cmos.ca/Privatesector/directory.html

Early this fall, Environment Canada (MSC Atlantic Region), offered the opportunity for companies to bid on the final year of their contract for the provision of Road Weather Services to the Nova Scotia Department of Transportation. The successful bidder was a directory member, Scotia Weather Services, a company run by Mac MacLeod in Dartmouth, Nova Scotia. This is an excellent demonstration of MSC's withdrawal from commercial services in favour of private sector companies.

In the summer, the ExxonMobil Business Support Centre was referred to us by Environment Canada's Ontario Region. The client was looking for temperature data for 161 different temperature regions. The winning directory subscriber was The Weather Network Commercial Services Division.

We are now receiving requests for services through the web site on a routine basis. Either the client sends an email directly to a company or group of companies or the request is sent to the CMOS private sector email address (psc@cmos.ca) for processing. Clients are finding consultants and companies which are meeting their needs. One client wrote, "*I have responses already from 6 companies – great service!*" We urge you to subscribe today so that you don't miss any business opportunities.

*Susan Woodbury,*
*Vice-President, CMOS*

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## Celebration in Canada of the International Year of Physics 2005

In 2005 Canada, together with many other nations around the world, will be celebrating the **World Year of Physics** (WYP2005) which was declared as such by the International Union of Pure and Applied Physics (IUPAP). In June 2004, the UN endorsed 2005 as the International Year of Physics, so it can be referred to by both names. Each country is arranging its own events to mark this year, chosen to celebrate the 100th Anniversary of Albert Einstein's three famous publications in physics on the theory of relativity, quantum theory, and Brownian motion.

The Canadian Association of Physicists (CAP) represents Canada on the international steering committee. CMOS and other "Friends of CAP" belong to a group charged with organising celebratory activities in Canada. The general thrust is outreach to the wider community at the local level. It was also decided that the theme in Canada should be "100 years of Canadian physics". There should be opportunities here for CMOS to publicise developments in atmospheric or oceanic physics. Please send your ideas to the CMOS office.

As CAP will be celebrating its 60th anniversary in 2005, special events will be held in conjunction with the CAP 2005 Congress at the University of British Columbia. This falls during the week following the CMOS Congress in Richmond, BC. The CAP website (www.cap.ca) will act as the central information centre for events being co-ordinated within Canada. Here is a sample of things planned so far.

**National Events:**

1. A special WYP2005 poster calendar to be distributed to high schools.

2. National Museum of Science and Technology in Ottawa will prepare and host hands-on displays demonstrating Einstein's discoveries.

3. (In June) Special CAP congress to mark 60th anniversary at UBC.

4. National Lecture Tour by a speaker who will talk about work in Einstein's area.

5. Special articles in Physics in Canada throughout the year and a special issue on physics education.

6. A special review article with Canadian authors to appear in each issue of Can J. Phys. throughout 2005.

7. A request has been submitted to Canada Post to publish a special postage stamp (or series) honouring Einstein (and physics) in 2005.

**Provincial Events:**

1. Special displays at the provincial museums of Science and Technology, e.g., Ontario Science Centre and Science North in Sudbury, Ontario

2. Upgraded CAP lecture tour with emphasis on speakers working in fields related to Einstein's work.

**Regional Events:**

1. The CAP's Division of Physics Education will organize, in June 2005, a teachers' workshop in conjunction with the CAP's Annual Congress in Vancouver, BC. This might be an opportunity for CMOS to get involved with demonstrations of atmospheric or oceanic physics.

2. Place science teachers in University and Government Laboratories for a few days for hands-on experience, modelled on the existing program run by TRIUMF.

**Local Events:**
1. Each university/college physics department chair and national laboratory is to organise a local event.

2. Special prizes for physics posters at local science fairs.

*Ian D. Rutherford,*
*Executive Director, CMOS*

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## CMOS External Relations Activities

CMOS belongs to a couple of umbrella groups that attempt to influence government policy on matters related to Science, Technology, Research and Development.

One of these, the Partnership Group on Science and Engineering (PAGSE) unites CMOS with about 20 similar societies to promote partnerships among universities, government and industry in order to maximize the benefits of science and engineering to Canadians. PAGSE organises breakfast sessions on Parliament Hill and hosts an annual meeting between parliamentarians and leading scientists. These meetings attempt to highlight some of the exciting science being done in this country and raise the understanding of parliamentarians on its importance for Canada's future prosperity. A brief is presented annually to the House of Commons Standing Committee on Finance (HCSCF). The brief for 2004 is presented elsewhere in this issue.

Another group, the Canadian Consortium for Research (CCR), has a similar but somewhat broader membership that includes social science societies and groups such as the Association of Universities and Colleges of Canada and the Canadian Federation of Students. CCR focuses on funding for research and lobbies actively every year through meetings with key ministers and parliamentary committees. The CCR brief to the HCSCF was still under development at the time this article was written. However, the measures it will promote are quite similar. This year both briefs argue for, amongst other things, increased funding for government science departments such as Environment and Fisherires and Oceans and for the kind of national science infrastructure that only the federal government can afford.

Both groups will be seeking a meeting with Canada's new National Science Advisor, Dr Arthur Carty, and both groups will be seeking to assist in the formation of the recently announced Canadian Academies of Science (CAS). The CAS is expected to be *"a source of expert advice on scientific aspects of important domestic and international issues"*.

*Ian D. Rutherford,*
*Executive Director, CMOS*

## REMINDER - REMINDER - REMINDER

HOW TO ACCESS THE MEMBERS ONLY WEB SITE

GO TO BOTTOM OF PAGE WWW.CMOS.CA

USER NAME: THE FIRST SIX CHARACTERS OF YOUR FAMILY NAME (or less if shorter) FOLLOWED BY YOUR MEMBERSHIP NUMBER, without spaces

INITIAL PASSWORD: YOUR MEMBERSHIP NUMBER (on your address label)

In case of difficulty, please contact Lise at accounts@cmos.ca (613) 991-4494

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## RAPPEL - RAPPEL - RAPPEL

COMMENT ACCÉDER AU SITE WEB POUR MEMBRES SEULEMENT

ALLEZ AU BAS DE LA PAGE WWW.SCMO.CA

NOM D'UTILISATEUR: LES SIX PREMIERS CARACTÈRES DE VOTRE NOM DE FAMILLE (ou moins s'il est plus court) SUIVIS DE VOTRE NUMÉRO DE MEMBRE, sans espaces.

MOT DE PASSE INITIAL: VOTRE NUMÉRO DE MEMBRE (sur votre étiquette postale)

En cas de difficulté, veuillez contacter Lise à affaires@scmo.ca (613) 991-4494.

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## Book Review / Revue de Littérature

Our regular section on Book Review will be back in the next issue of the *CMOS Bulletin SCMO*. Don't miss reading this very popular section!

Notre section régulière sur la Revue de littérature sera de retour dans le prochain numéro du *CMOS Bulletin SCMO*. Ne manquez pas de lire cette section très populaire!

## Call for Papers

## 39th Annual CMOS Congress
## May 31- June 3, 2005
## Vancouver, British Columbia, Canada

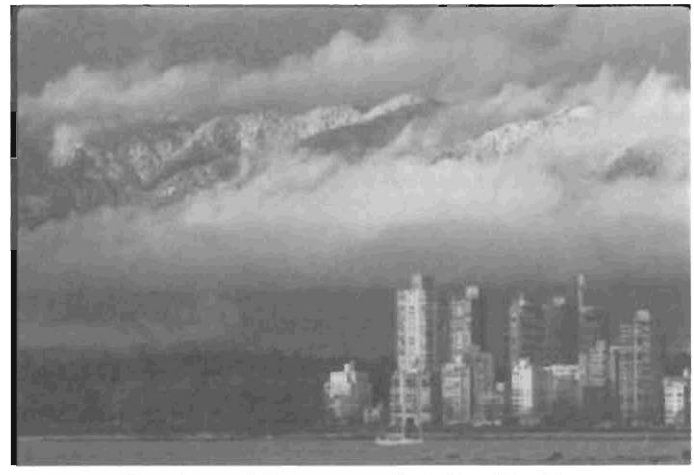
**Abstract Submission Deadline: Feb 18 2005. Early Registration Deadline: April 15 2005.**

Members of the Canadian Meteorological and Oceanographic Society and other interested persons are invited to submit abstracts for oral and poster presentation at the CMOS "***Sea to Sky***" Congress to be held near beautiful Vancouver, British Columbia, Canada. The Annual CMOS Congress is the foremost venue in Canada for the oceanographic and meteorological community in government, academia and private industry.

Contributions are sought on theoretical, observational, and technical aspects of oceanography and meteorology at all scales. We anticipate papers related to remote sensing of the oceans, atmosphere, and land, current meteorological and oceanographic observational programs, biological/physical coupling, regional and coastal oceanography, laboratory and numerical modeling of geophysical fluids, urban and biometeorology, climate modeling, prediction, and impacts, and weather forecasting issues.

In addition to contributed papers there will be plenary speakers on a range of topics, a commercial exhibitors' gallery, social events including an Icebreaker, the annual Awards Luncheon, the CMOS banquet, a partners program, and a daily weather briefing for aficionados. The following special sessions are currently planned:

- Health Issues in Weather and Climate
- Chemical Composition of the Troposphere
- GPS Atmospheric Moisture Retrieval and Applications
- Atmospheric Community Modeling
- Statistics in Oceanography and Meteorology
- Ocean/Cyclone Interactions
- Air Quality Forecasting
- Decision Support Systems for Forecasting
- Broadcast Meteorology
- Ocean Observatories
- The 2007 International Polar Year and the Future of Polar Science
- Canadian Arctic Shelf Exchange Study (CASES) and Related Research
- Physical impacts on Ocean Ecosystems
- Ocean-Atmosphere Interactions and their Influence on Ocean Biogeochemistry
- Advances in Private Sector Meteorology and Oceanography
- Offshore Environmental Factors for Oil and Gas Development



Courtesy of Vancouver Tourism Bureau

- The Role of Terrestrial and Oceanic Biogeochemical Cycles in the Climate System
- Lawrence Mysak Session on Ocean and Climate Dynamics
- Norman McFarlane Session on Physical and Numerical Aspects of Climate Modeling

Special sessions will feature at least one invited introductory or overview talk. It is anticipated that these sessions will form about one third of the program. Papers not designated for special sessions will be grouped with others of similar technical content. Multiple same first-author submissions are discouraged in order to limit the number of parallel sessions. Late submissions will be accepted ONLY if space permits. An expanded program of posters will foster more personal interactions.

Student CMOS members are welcomed and encouraged to apply for a Student Travel Bursary when submitting an abstract.

For conference details including plenary speakers and descriptions of the special sessions, instructions on electronic abstract submittal and presentation format, registration, hotel, travel and exhibitor information please see the conference web site www.cmos2005.ubc.ca or contact the program organizers at congress2005@cmos.ca

# Demande de Communications

## 39ième Congrès annuel de la SCMO
## 31 mai – 3 juin 2005
## Vancouver, Colombie-Britannique, Canada

**Date limite de soumission des résumés : 18 février 2005. Date limite de pré-inscription : 15 avril 2005.**

Les membres de la Société Canadienne de Météorologie et d'Océanographie et autres personnes intéressées sont invités à soumettre des résumés de communications qui seront présentés oralement et sous forme d'affiche au Congrès de la SCMO "***Entre Ciel et Mer***" qui aura lieu près de Vancouver, Colombie-Britannique, Canada. Le Congrès annuel de la SCMO est le lieu de rencontre privilégié au Canada des communautés météorologiques et océanographiques du gouvernement, du milieu universitaire et de l'industrie privée.

On recherche des communications sur les aspects théoriques, observationnels et techniques de l'océanographie et de la météorologie pour toutes les échelles. On s'attend à des communications sur la télédétection des océans, de l'atmosphère et de la terre, les programmes observationnels météorologiques et océanographiques, le couplage biologique/physique, l'océanographie régionale et côtière, la modélisation en laboratoire et numérique des fluides géophysiques, la météorologie urbaine et la biométéorologie, la modélisation du climat, la prédiction, et les impacts, et les problèmes associés à la prévision du temps.

En plus des présentations, il y aura des conférenciers pléniers sur une variété de sujets, une galerie d'exposants commerciaux, des activités sociales incluant un cocktail de bienvenue, le Déjeuner annuel de remise des Honneurs, le banquet de la SCMO, un programme d'activités pour les conjoints, et une présentation quotidienne des conditions météorologiques. Les sessions spéciales suivantes sont présentement prévues :

- Problèmes de santé associés au temps et au climat;
- Composition chimique de la troposphère;
- Extraction de données d'humidité par GPS et ses applications;
- Modélisation atmosphérique communautaire;
- Statistiques en océanographie et en météorologie;
- Interactions océan/cyclone;
- Prévision de la qualité de l'air;
- Systèmes d'aide à la décision pour la prévision;
- Présentation de la météorologie;
- Observatoires océaniques;
- Année internationale polaire de 2007 et le futur de la science polaire;
- Étude du plateau continental arctique canadien (CASES) et la recherche connexe;
- Impacts physiques sur les écosystèmes marins;
- Interactions océan-atmosphère et leur influence sur la biogéochimie de l'océan;
- Progrès dans la météorologie et l'océanographie du secteur privé;
- Facteurs environnementaux marins affectant la recherche et l'exploration pétrolière;
- Rôle des cycles biogéochimiques terrestres et océaniques dans le système climatique;
- Session de Lawrence Mysak sur la dynamique des océans et du climat;
- Session de Norman McFarlane sur les aspects physiques et numériques de la modélisation du climat.

Gracieuseté du Bureau de tourisme de Vancouver

Les sessions spéciales incluront au moins une présentation invitée orale d'introduction ou un exposé général. On s'attend à ce que ces sessions occupent environ le tiers du programme. Les communications qui ne seront pas assignées aux sessions spéciales seront regroupées avec des communications semblables. On décourage les soumissions multiples ayant le même premier auteur afin de limiter le nombre de sessions concurrentes. Les soumissions en retard ne seront acceptées que si l'espace le permet. Un programme augmenté d'affiches encouragera plus d'échanges personnels.

Les membres de catégorie étudiant de la SCMO sont bienvenus et sont encouragés à soumettre une demande de Bourse de Voyage pour Etudiant lors de la soumission de leur résumé de communications.

Pour plus d'information sur la conférence incluant les conférenciers pléniers et les descriptions des sessions spéciales, les instructions pour la soumission des résumés de communications sous forme électronique et le format des présentations, l'inscription, l'hôtel, information de voyage et information pour les exposants, veuillez consulter le site internet de la conférence www,cmos2005.ubc.ca ou communiquer avec les organisateurs du programme à congress2005@cmos.ca.

## Western Canada Weather Workshop

The 8th annual Western Canada Weather Workshop on operational forecasting was held at UBC on 14 Oct 2004. It brings together industry, government, and academia to discuss current issues, weather events, and advances in regional weather prediction. It was co-organized by Laurie Neil (EC) and Bruce Thomson (UBC), and was sponsored by the Lower Mainland BC chapter of CMOS.

This year, thirteen speakers presented talks on the following themes: Major weather events of 2003 and 2004, the new EC Coastal and Mountain Meteorology Lab, weather support for the 2010 Winter Olympics, air-quality modeling, data assimilation, and new ensemble mesoscale NWP products. Invited speaker Peter Jackson from UNBC discussed pressing research topics for western Canada. The copies of the presentations are available online at http://weather.eos.ubc.ca/events/WCWW.html.

The audience of about sixty people included representatives from the western EC regions, two universities, many provincial and local government agencies, hydroelectric and other industries, media meteorologists, and university students and researchers.

*Roland Stull*
*BC Lower Mainland Centre*

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## New Publications & Reports

1) The US Commission on Ocean Policy delivered its final report, "An Ocean Blueprint for the 21st Century", on 20 September 2004. The report calls for a new governance framework, more investment in marine science and a new stewardship ethic by all Americans - all within the context of an ecosystem-based management approach - to halt the decline of the nation's oceans and coasts. The Commission put forward 212 recommendations for a new national ocean policy in the 610-page report available at http://www.oceancommission.gov/. An executive summary is also available.

2) The paper "Scientific and Technical Aspects of Climate Change, including impacts and adaptation and associated costs" is available at http://www.defra.gov.uk/environment/climatechange/07.htm. Recently published by the UK Department for Environment, Food and Rural Affairs (Defra), it reviews the evidence for climate change, its human causes, projections for future climate change, its likely impacts and related adaptation issues, and the scientific issues surrounding stabilisation of greenhouse gases in the atmosphere.

3) The report entitled "Canada's Ocean Industries: Contribution to the Economy 1988-2000" provides estimates of the direct impact of each industry segment of the ocean sector on the national, Atlantic, Pacific, and Arctic regional gross domestic product (GDP). It is available at http://www.dfo-mpo.gc.ca/communic/statistics/oceans/economy/contribution/index_e.htm.

Two earlier reports, published by DFO, provided ocean industry data for the period between 1988 and 1998.

4) The report entitled "Energy from Waves and Tidal Currents: Towards 20yy ?" presents an overview of the main developments in ocean energy from waves and currents and a proposal for the development of an Ocean Energy Technology Network in Canada. The report describes ocean energy harnessing systems; transfer of power systems; ocean power economics and R&D programmes. To obtain a copy (either digital or hard-copy), email Geoff Lewis, Industry Canada at lewis.geoff@ic.gc.ca

5) According to research presented at a symposium organized by UNESCO's Intergovernmental Oceanographic Commission and the International Council for Science's Committee on Oceanic Research (SCOR), the world's oceans are absorbing an unprecedented amount of carbon dioxide ($CO_2$), that is increasing their acidity and possibly threatening the long-term survival of many marine species. This in turn could disrupt marine food chains and alter ocean biogeochemistry in ways that are not yet understood or predictable. For information, access http://portal.unesco.org/en/ev.php-URL_ID=21758&URL_DO=DO_TOPIC&URL_SECTION=201.html

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## Prochain numéro du *CMOS Bulletin SCMO*

Le prochain numéro du *CMOS Bulletin SCMO* paraîtra en **février 2005**. Prière de nous faire parvenir avant le **14 janvier 2005** vos articles, notes, rapports d'atelier ou nouvelles à l'adresse indiquée à la page ii. Nous avons un besoin **URGENT** d'articles.

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## Next Issue *CMOS Bulletin SCMO*

Next issue of the *CMOS Bulletin SCMO* will be published in **February 2005**. Please send your articles, notes, workshop reports or news items before **January 14, 2005** to the address given on page ii. We have an **URGENT** need for your articles.

## Fin d'installation du réseau canadien de radars météorologiques

L'installation de la dernière station de radars météorologiques a été complétée fin septembre 2004 dans le nord-est de l'Ontario. Ce réseau comprend maintenant 31 radars Doppler. Le parachèvement des radars Doppler constitue une étape importante dans la modernisation des prévisions météorologiques. Plus de 98% de la population canadienne peut maintenant recevoir des avertissements météorologiques plus précis et plus rapides. Le dernier radar météorologique Doppler étant complété, Environnement Canada a atteint l'objectif qu'il visait d'un réseau de radars Doppler assure une couverture presque complète de toutes les régions peuplées du pays les plus exposées aux phénomènes météorologiques violents. Ce projet d'une valeur de près de 35 millions $ a commencé en 1997 mais les chercheurs du SMC ont déjà entrepris l'élaboration et l'essai d'un système radar encore plus avancé aux installations radars de King City. Cette amélioration technologique appelée double polarisation devrait aboutir à un bien meilleur niveau de détection des phénomènes météorologiques de fort impact, permettant de distinguer la pluie de la grêle et de divers autres types de précipitation au sein des tempêtes hivernales, et aussi de produire des estimations quantitatives de précipitations plus fiables.

Source: Environnement Canada

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## Completion of Canada's National Doppler Radar Project

The final addition to the Doppler Radar facility has been completed at the end of September 2004 in the Northeast Ontario facility. There are now 31 Doppler Radars included in the Canadian network. The Doppler Radar network's completion is an important step in the modernization of weather forecasting. More than 98% of the Canadian population will receive more accurate and timely weather warnings. With the completion of the final Canadian Doppler Radar, Environment Canada has met its goal of a Doppler Radar network providing coverage over all major populated areas in Canada and areas with significant potential for severe weather. The close to $35 million project began in 1997 but MSC researchers have already embarked on the development and piloting of a more sophisticated radar system at the King City installation. This next technological enhancement, called dual polarization, is expected to result in far better detection of high impact weather, such as the discrimination of rain from hail and of the various precipitation types in winter storms, and quantitative precipitation estimates that are more reliable.

Source: Environment Canada.

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