



Canadian Meteorological
and Oceanographic Society

La société canadienne
de météorologie et
d'océanographie

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Operation Irving Whale



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

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Cover page: Each month, several conferences are presented within the normal activities of CMOS, either within your Chapter or your local Centre. For the benefit of all CMOS members, it would be useful to present at the very least an elaborated abstract of such conferences without imposing too much on the lecturer. In this issue, we are presenting on page 67 the abstract of a conference given recently by Dr. Merv Fingas at the Ottawa Centre. On the cover page, we have reproduced the web page which illustrates very well the subject presented at this conference. In future issues of the Bulletin, we wish to continue this practice. Keep us informed of such activities taking place in your area.

Ref.: URL: <http://www.ns.ec.gc.ca/whale2/captures/1.jpg>.

Page couverture: Chaque mois, plusieurs conférences sont présentées dans le cadre des activités normales de la SCMO, soit au niveau de votre Chapitre ou de votre Centre. Pour faire profiter à tous les membres des idées présentées lors de ces conférences, il serait souhaitable de présenter à tout le moins un résumé assez élaboré de ces présentations, sans pour autant imposer un fardeau trop lourd au conférencier. Dans ce numéro, nous présentons en page 67 le résumé d'une conférence donnée récemment au Centre d'Ottawa par le Dr Merv Fingas. Nous avons reproduit en page couverture la page web (URL: <http://www.ns.ec.gc.ca/whale2/captures/1.jpg>) qui illustre très bien la conférence présentée. Nous désirons continuer cette pratique dans les prochains numéros du Bulletin. Tenez-nous au courant de ce genre d'activités qui se déroulent dans votre région.

Next Issue - Prochain numéro

The next issue of the *Bulletin 25 (4)*, August 1997, will go to press by mid-August. We always need your contributions, short articles, notes, presentations, chronicles, book reviews, etc. Forward them to me by early August. Don't miss your chance!

Le prochain numéro du *Bulletin 25 (4)*, août 1997 sera mis sous presse vers la mi-août. Vos contributions sont toujours les bienvenues. Veuillez bien me les faire parvenir d'ici le début du mois d'août. Ne manquez surtout pas votre coup!

Canadian Meteorological and Oceanographic Society (CMOS)

Aim of the Society

The Canadian Meteorological and Oceanographic Society (CMOS) was formed in 1967 as the Canadian Meteorological Society and was joined in 1977 by the oceanographers. It is a national society of individuals and organizations dedicated to advancing all aspects of atmospheric sciences, oceanography and related environmental disciplines in Canada.

Membership

The Society is composed of about 1,100 members and subscribers, and is open to all who share an interest in atmospheric sciences, oceanography and related sciences and their many applications. Membership is broadly based and includes students, corporations, institutions and representatives in education and communications, industry, the private sector and government.

Société canadienne de météorologie et d'océanographie (SCMO)

But de la Société

La Société canadienne de météorologie et d'océanographie (SCMO) a été formée en 1967 comme la Société canadienne de météorologie à laquelle se joignirent en 1977 les océanographes. C'est une organisation nationale regroupant des individus et des organismes voués à la promotion de la météorologie et de l'océanographie ainsi que des disciplines environnementales connexes sous tous leurs aspects au Canada.

Membres

La Société compte environ 1 100 membres et abonnés et accueille toute personne intéressée par les sciences atmosphériques, océanographiques ou les sciences connexes et leurs multiples applications. L'éventail des membres est vaste et inclut des étudiants, des corporations, des instituts, des responsables en éducation et communications, des représentants industriels du secteur privé ou public.

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Adresses électroniques de la SCMO

..... from the President's desk

It was perhaps somewhat ironic that the election of a new federal government on June 2nd coincided with the election by acclamation of a new Ottawa-based CMOS executive. Unlike the last government, we will do our best to avoid another CMOS election until the full term is completed!

The Year's Priorities

At the very successful Congress in Saskatoon, Council agreed on three priorities we shall be pursuing this year. The Society publications are fundamental. We will maintain *Atmosphere-Ocean* strong, and virtually self-supporting. Initiatives taken by the Director of Publications, Richard Asselin, have helped constrain costs and put the operation on a more business-like basis. We continue to rely on the solid work of our editors and associate editors to maintain quality. Secondly, we will seek to improve the *CMOS Bulletin SCMO*. The Bulletin is vital because it is the only benefit of membership shared by us all. Recent issues have seen an increase in the number of pages produced; 32 pages per issue is most economical, but it is sometimes a struggle to fill those last few pages. Full marks to André Bolduc as editor. In the next few months we will provide him the software to improve the layout of the Bulletin, hopefully through a corporate donation.

If we are to truly meet the aim of the Society - the advancement of meteorology and oceanography in Canada - we cannot do it just through services provided to members. We number 800 or so, a minuscule proportion of 30 million Canadians. But neither can we afford to fund work with the 30 million at the expense of the 800. Thus a third priority for the year, the development of an external services initiative comprising a variety of special services offered outside the Society on a user- or sponsor-pay basis. We will be working on this over the next few months. Look for more information in a coming issue of the Bulletin.

The Ottawa Scene

With the election of a new federal government we have written welcome letters to the newly appointed Ministers of Environment and of Fisheries and Oceans. Let me summarize these to indicate some of the concerns we shall be pursuing on your behalf in Ottawa.

In the letter to Minister Stewart of Environment Canada we started by emphasizing the role sound science must play in the decision making in her department. Although Environment Canada is renowned for the strength of its science; we pointed out that the strength needs continual renewal. Upgrading the skills of existing staff, ensuring an inflow of young graduate scientists, and maintaining a strong base of environmental science in Canadian

universities and the private sector to draw on, are all essential. We noted that CMOS is a partner in this by providing multiple opportunities for continuous learning and professional interaction. The Society initiatives to encourage the development of young scientists, through programs such as university postgraduate scholarships, and travel grants to our Annual Congress, were highlighted, and we regretfully informed the Minister that few young scientists are finding career opportunities in her department.

We welcomed the department's weather and related environmental services being the subject of an alternative service delivery (ASD) study. It is as an opportunity to address some fundamental policy questions about safety, economic efficiency, competition and the threat of climate change, commenting that as a vital public service it had been taken for granted for too long. We commented that the study reflects that times are changing in the weather business. CMOS will look to be an active partner in vetting proposals that emerge to ensure that high quality public good weather service is maintained, and if possible strengthened.

Finally, we commented that many issues in the portfolio are inherently international and must be dealt with by an international approach. International organizations are central to addressing them. We drew attention to technical organizations such as the World Meteorological Organization, the Intergovernmental Panel on Climate Change, and the InterAmerican Institution for Global Change Research which build the essential basis for international action on the global environment. We urged the Minister to support active involvement in the work of these organizations.

Our letter to Minister Anderson of Fisheries and Oceans also emphasized the importance of science and its renewal in his department, and of international collaboration. Examples and additional items were tailored to the situation of oceanography. We chose not to comment specifically on the recent controversy on fisheries science but acknowledged that policy decisions must consider social and economic sustainability together with science. We stressed that in the long run Canada is better off when the integrity of science advice is respected, even though it may appear to be politically and administratively easier not to have dissenting opinions from scientists. We also urged the Minister to establish open lines of communication between the DFO and university marine science communities.

John Reid

Irving Whale Recovery Project
Dr. Merv Fingas
Emergencies Science Division, Environment Canada¹

On September 7, 1970, the Irving Whale barge sank in 70 m of water in the Gulf of St. Lawrence north of Prince Edward Island, Canada. At the time of the sinking, the barge was carrying 4,200 tonnes of Bunker C fuel oil. Over the subsequent quarter century, some of the oil from the barge leaked out. As this area of the Gulf houses a valuable commercial fishery and tourism industry, there was much concern about protecting this important marine environment. The federal government monitored the condition of the barge throughout this time period with teams of divers and submersible vehicles. Attempts were made to control the slow leakage of oil from the vent pipes on the barge by placing containment bags over the openings of the pipes. While these measures were successful for the most part, there remained a concern that the integrity of the barge would eventually degrade and release the entire cargo of oil into the marine environment. A decision was made to raise the barge along with its cargo of Bunker C oil in the summer of 1995. During preparations for lifting the barge in 1995, it was revealed that the heating system on the Irving Whale contained several thousand litres of poly-chlorinated biphenyls (PCBs). Concerns were raised by several environmental groups about the possible release of the PCBs into the environment during a recovery project. These concerns were voiced in legal proceedings which led to a court injunction against the recovery project. Following the collection and analysis of water, oil and sediment samples taken from and around the barge, and extensive environmental studies, the court injunction was lifted and the lift project was rescheduled for the summer of 1996.

The luncheon talk, given to the Ottawa Centre of CMOS on April 16, 1997, briefly reviewed the recovery plan, identifying the lift and support vessels on scene, and reviewed some of the work leading up to the actual lift. For the most part, the talk reviewed the remote sensing flights conducted by the Emergencies Science Division employing the laser fluorosensor on board the DC-3, C-GRSB.

*Bill Pugsley,
Past-Chairman, Ottawa Centre*

The lift and recovery plan involved raising the Irving Whale with its cargo of Bunker C fuel intact to the surface of the Gulf of St. Lawrence. Once on the surface, the barge would be placed on the deck of a submersible barge and then transported to Halifax, Nova Scotia for cleaning and proper disposal of PCB-contaminated materials. One of the tasks outlined in the recovery plan was the monitoring by remote sensing of the lift procedure and transit of the barge to Halifax. The Emergencies Science Division (ESD) of Environment Canada was tasked with performing this role. ESD owns and operates a DC-3 aircraft which serves both as a platform for the testing of research and development oil spill remote sensing equipment, and as an operational response tool. The DC-3 houses a state-of-the-art laser fluorosensor known as the Laser Environmental Airborne Fluorosensor (LEAF), an RC-10 nine inch format reconnaissance camera and two down-looking colour video cameras.

Web page / Page Web

For more information on the Irving Whale recovery project, consult the following web page:

<http://www.ns.ec.gc.ca/whale2/>

Pour obtenir plus d'information sur la remise à flot de l'Irving Whale, consultez la page Web indiquée ci-haut.

RADARSAT surveillait tout!

Tôt dans la soirée du 31 juillet 1996, RADARSAT a obtenu une image de la région où se déroulait l'opération de remise à flot de la barge Irving Whale. Les données ont été transmises et transcrites à la station de réception de données du Centre Canadien de Télédétection de Gatineau et quelques heures plus tard, elles étaient disponibles et transmises.

RADARSAT saw it all!

Early on the evening of July 31, 1996, RADARSAT captured an image of the area where the Irving Whale recovery project was taking place. Data have been transmitted and transcribed to the receiving station of the Canada Centre for Remote Sensing in Gatineau where, a few hours later, they were made available and transmitted.

¹ 3439 River Road, Ottawa, Ontario K1A 0H3

Forecasting trajectory of would-be and actual oilspills during the 1996 Irving Whale Barge Salvage in the Gulf of St. Lawrence

D. Lefavre¹, F.J. Saucier¹, J. Chassé¹ and A. Gosselin¹

Résumé

Le renflouage de la barge Irving Whale en juillet 1996 s'avéra tout un défi pour ceux impliqués dans la prévision de la trajectoire de nappes d'huile. La difficulté provenait autant pour obtenir un bon estimé du courant de surface que d'acheminer la prévision de trajectoire au site pour utilisation. La région en question est dans le sud du golfe du Saint-Laurent à 60 milles nautiques à l'ouest des Iles-de-la-Madeleine. Des mesures effectuées l'année précédente en mai 1995, à l'aide d'un dériveur de surface (C-AST conçu à l'Institut Océanographique de Bedford et commercialisé par Seimac Ltée), démontrèrent que les courants inertiels entraînés par les coups de vents des jours précédents représentent le moteur principal du mouvement à la surface de l'eau, plus grand que l'effet du vent direct et que la marée. Cette observation nous força à réévaluer l'utilisation des modèles en vigueur de prévision de trajectoire de nappe de pétrole. Les modèles hydrodynamiques opérationnels tiennent compte de l'effet des marées et du vent, mais pas encore des courants inertiels. La solution évidente a été de mesurer en mer cette composante et d'assimiler à intervalle régulier, les valeurs obtenues d'amplitude et de phase dans le modèle de trajectoire. Ces nouvelles valeurs peuvent ensuite être utilisées et une prévision de trajectoire de nappe peut être émise. Pour que cette séquence d'actions puisse être faisable, nous nous sommes aperçu que nous faisons face à deux problèmes. Le premier consistait à l'assimilation proprement dite des données du dériveur de surface dans le modèle. Le second était un problème de transmission de données: Transmission du site de la position en fonction du temps du dériveur de surface et transmission au site de la prévision de trajectoire pour utilisation par le commandant sur place et des deux responsables des opérations, un aux Iles-de-la-Madeleine et un à l'Île-du-Prince-Édouard.

A l'aide d'un noeud central informatique accessible par FTP autant par voie terrestre que par satellite, les informations nécessaires ont pu être acheminées aux personnes concernées. Les données météorologiques utilisées comprenaient les observations faites à l'aide d'une bouée mouillée à un mille au nord-est du site et les prévisions journalières spécifiques pour la région. Les données de courant de surface ont été obtenues à l'aide des dériveurs de surface à enregistrement GPS interne et transmises par le système ARGOS. L'équipe de prévision de trajectoire avait accès à toutes ces informations pour premièrement reproduire la trajectoire observée du dériveur et ensuite calculer une prévision de trajectoire en utilisant les vents prévus. La trajectoire reproduite et la prévision étaient transmises au noeud central. Le commandant sur place avait accès en mer à ces informations grâce à une connexion M-Sat.

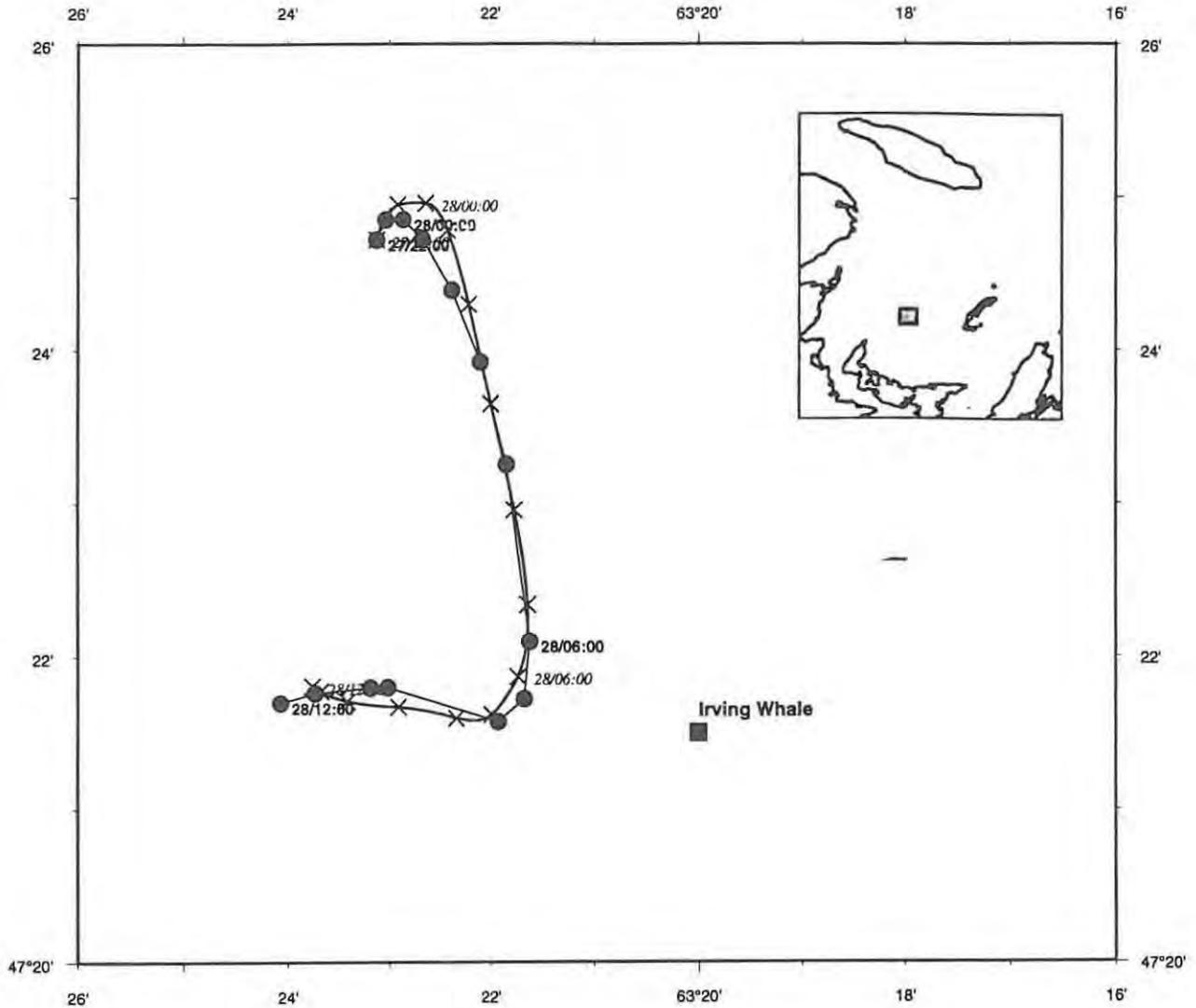
Introduction

The salvage of the Irving Whale barge in July 1996, proved to be a good challenge in forecasting oilspill trajectories because both the evaluation of the currents and the transmission of the forecast were tedious. The area is in the southern Gulf of St. Lawrence, 60 nautical miles west of the Magdalen Islands. Measurements made the previous year in May 1995, using a surface tracker (C-AST designed by DFO at Bedford Institute of Oceanography and commercialized by Seimac Ltd), showed that the inertial motion driven by past wind events was the greatest forcing, on the surface waters, more important than direct wind or tides. This observation necessitated a reevaluation of the use of current oil spill trajectory models. Operational hydrodynamical models usually include wind and tidal action, but none presently exists that considers inertial surface currents. The obvious solution was to measure this component at sea and

regularly assimilate its amplitude and phase into a trajectory model. Using this updated information, a forecast of the spill's trajectory could be issued. To make this a workable solution, we realized that we had in fact two problems to solve. The first one was the assimilation of drifter data into the model. The second one was data transmission: Transmission from the site, of the position as a function of time of the surface drifter, and transmission to the site, of the forecasted trajectory, to the on-scene commander and to the officers at the two operation centres (Magdalen Islands and Prince Edward Island).

¹ Maurice Lamontagne Institute, Dept. Fisheries and Oceans,
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EC/DFO Trajectory Modelling Group
WARNING: this is a sample forecast for an HYPOTHETICAL spill
Irving Whale Site, July 29, 1996 Hindcast

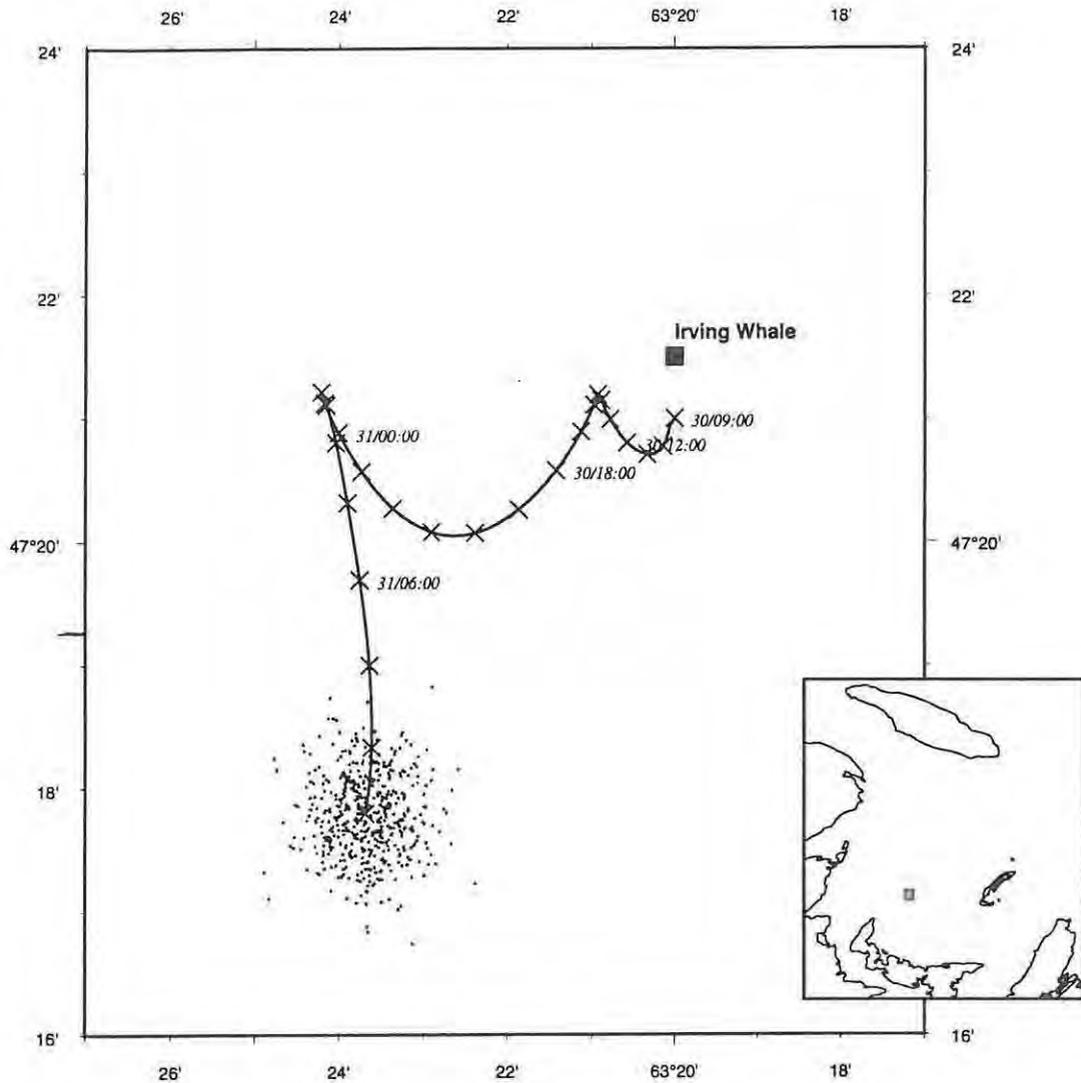


| Forecast Report | |
|-------------------------------------|-------------------------|
| Forecast issued at: | 11:30 ADT July 31, 1996 |
| Based on observations available at: | 12:00 ADT July 28, 1996 |
| Forecast period: | 14 hours |
| Starting date & time: | Jul 27, 1996 22:00 ADT |
| Ending date & time: | Jul 28, 1996 12:00 ADT |
| Start position: | 47°24.72' N 63°23.12' W |
| Mean end position: | 47°21.81' N 63°23.76' W |

This is the hindcast of the last portion of the trajectory of Buoy 21599 before its recovery.

Fig 1: Hindcast of the trajectory of a surface drifter

EC/DFO Trajectory Modelling Group
WARNING: this is a sample forecast for an HYPOTHETICAL spill
Irving Whale Site, July 30, 1996 Forecast



| Forecast Report | |
|-------------------------------------|-------------------------|
| Forecast issued at: | 11:00 ADT July 30, 1996 |
| Based on observations available at: | 09:00 ADT July 30, 1996 |
| Forecast period: | 24 hours |
| Starting date & time: | Jul 30, 1996 09:00 ADT |
| Ending date & time: | Jul 31, 1996 09:00 ADT |
| Start position: | 47°21.00' N 63°20.00' W |
| Mean end position: | 47°17.80' N 63°23.68' W |

The continuous line is the mean track of the spill. The patch indicates the size of the spill after 24 hours. This forecast uses the drifting buoy information.

Fig 2: Forecast of the trajectory of a hypothetical oilspill

Assimilation of Drifter Data

To hindcast the observed trajectory of the surface tracker, four forcings were identified, two known and two to be assimilated. The two known forcings are the observed wind and the tidal current, the latter calculated from a hydrodynamical model. The two other forcings are the inertial and the residual current. A best fit was performed over the observed trajectory to evaluate the last two forcings. For the inertial component, the parameters used were the diameter of the circular motion and its phase, which is the initial geographical angle at the beginning of the trajectory. The period of rotation of 16.25 hours and its clockwise motion are determined by the latitude. The residual current is the result of non-local fresh-water runoff into the system as well as tidal rectification driven by the local topography. One result of such a fit is shown in Fig. 1, where the dots are the transmitted position of the surface drifter while the trajectory with crosses is the hindcasted one. Such calculations were performed daily. As shown in Fig. 2, a forecast of the trajectory a spill would follow could now be issued using the values of the inertial (amplitude and phase) and residual (velocity and direction) currents from the hindcast. The forecasted winds were obtained from the Atmospheric Environment Branch (AEB) of Environment Canada and the forecasted tides were obtained from the results of a hydrodynamical model.

Transmission of Information for Decision Making

The southern Gulf of St. Lawrence is a particularly remote area. Being at sea implies no land communications, moreover, the cellular phones are unreliable at that distance, more than 60 nautical miles from the closest antenna. All data transfer had to be done through a satellite link. The main preoccupation at that stage was to minimize the number of data transfers from one agency to the other, due to costs and access limitations. The set-up of a centralized node to collect information was the result of brainstorming among all the REET (Regional Environmental Emergencies Team) members and is shown in Fig. 3. It was organized on one of the AEB - Bedford machines, and the internet site would be accessible through a standard FTP connection for all the agencies involved. As shown in Fig. 3, the basic information flow starts on the left with the observation, proceeds to the forecast, and concludes on the right with the choices made by the on-scene commander for recovery at sea or coastline protection. This centralized method of operation made information available and updated simultaneously for all individuals involved.

Operations during the Irving Whale Salvage

For meteorology, observations and forecast were involved. A meteorological buoy was moored for the summer of 1996, one nautical mile northeast of the site. This buoy transmitted hourly meteorological observations

through the regular ARGOS satellite system. These observations, along with a specific AEB weather forecast for the next few days were set in files on the central node (AEB-FTP Site on Fig. 3). Sea-surface currents were monitored using surface drifters with internal recordings of GPS positions. Their positions were also transmitted through the ARGOS system. The trajectory modelling team would access the central node for these observations to hindcast the observed trajectory of the drifting buoy and calculate a forecast using the forecasted winds. Both the hindcasted and forecasted trajectories were then put back on the same central node. The on-scene commander for the salvage would then access the node at sea using an M-Sat connection. This sequence of observation, hindcast, and forecast was done daily from July 2 until the end of the lift on August 2, 1996. On the salvage day, July 31, an aircraft overflight by the Emergencies Science Division (ESD) of DOE mapped the oil targets in the area. A forecasted trajectory of the observed spills was issued and put on the site. The on-scene commander received the information on the same day and knew that no coastline was threatened. The majority of the oil released during the recovery operation was recovered using equipment already on the recovery site. The remainder dispersed naturally over the following days. The central node also channelled some pieces of the above information on the internet WEB for public diffusion.

Acknowledgments

We would like to acknowledge the work of S. Beauchamp, AEB, for setting up the central node and channelling the observed and forecasted weather, D. Lawrence, DFO, for supervising the operations of the surface drifters, Capt. W. Dancer CCG-DFO, on-scene commander, for his unrelenting support throughout the planning and the operation stage, and finally, all the REET members of this operation for their positive comments and support.

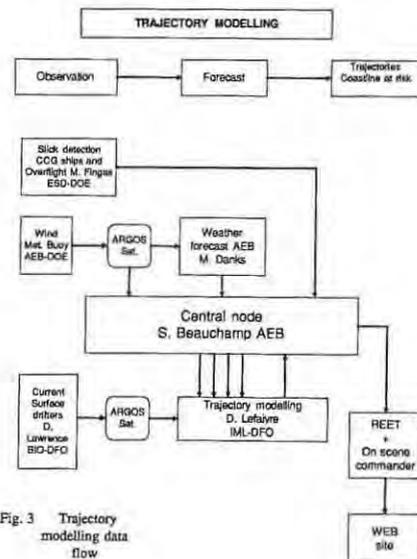


Fig. 3 Trajectory modelling data flow

The Canadian Regional Climate Modelling Project and its 1997 Workshop

by René Laprise¹ and Daniel Caya¹

1) The Canadian Regional Climate Modelling project

Global atmospheric General Circulation Models (GCMs), coupled with land-surface, ocean and sea-ice modules, are the most sophisticated tools for understanding the physical processes responsible for the maintenance of the climate system, its natural variability and anticipated changes. Such mathematical models of the climate components are very demanding on computer resources. For this reason, GCMs are limited to coarse computational meshes; typical horizontal resolutions are seldom better than about 500 km, and the reliable scales of such models are even larger than this. Most environmental, societal and economic impacts resulting from anticipated climate changes, however, are associated with processes operating on much finer scales. There thus exists a demonstrated need for "downscaling" GCM results. The only realistic approach to produce climate projections at spatial scales of a few tens of kilometres is to limit the domain over which high resolution is required. The concept of Regional Climate Models (RCMs) consists in applying to climate simulations a time-honoured numerical weather prediction technique of "nesting" a limited-area, high-resolution regional model within a global, coarse-mesh GCM.

The Canadian RCM (CRCM) is based on the highly efficient fluid dynamics kernel of the MC2 (Mesoscale Compressible Community) model, developed by the late André Robert and colleagues of the Cooperative Centre for Research in Mesometeorology (CCRM). This kernel is coupled with detailed physical parameterisation packages developed at the Canadian Centre for Climate Modelling and Analysis (CCCma). The latest version of CRCM includes the state-of-the-art land-surface scheme CLASS developed at the Atmospheric Environment Service (AES). An extensive suite of diagnostic tools has also been designed to analyze the vast amount of simulated regional climate data, following the modular approach used at CCCma for the global model.

Two 5-year integrations of the CRCM nested with Canadian GCM simulations corresponding to current and doubled greenhouse-gas concentrations have recently been completed and analyzed. These simulations were

performed over a region covering western Canada on a 45-km grid mesh using a 15 min time step. It is noteworthy that such a long time step makes the CRCM 3 to 5 times faster compared to other RCMs. Preliminary analysis of these high-resolution simulations reveals a much more realistic distribution of precipitation over complex topography in British Columbia (paper by Laprise et al. submitted to *Atmosphere-Ocean*).

The CRCM is undergoing the following developments and improvements: Coupled mixed-layer ocean and thermodynamic sea-ice modules are being adapted for use within RCM.

A coupled dynamical regional ocean model is also currently being tested in order to study complex air-sea interactions in the Gulf of St-Lawrence. Tropospheric chemistry modules have been implemented in the CRCM in order to study tropospheric ozone episodes in the Windsor-Québec City corridor. The transport and size segregation of aerosols is being developed for the study of climate feedbacks between aerosols and radiation in the Arctic as part of the Northern Aerosols Regional Climate Modelling (NARCM) project. The CRCM is also used to study the energy and water budgets over the Mackenzie River basin as part of the Canadian GEWEX MAGS project. The CRCM serves as driver for studying energy and mass exchanges between the atmosphere and land surface within the context of the CLASS project.

RCMs can also serve as "intelligent interpolator". From the prescription of the time evolution of a small set of coarse-grain atmospheric variables (winds, temperature, pressure and atmospheric water vapour) at the perimeter of its regional domain, RCMs generate a set of coherent fine-grain atmospheric and surface fields, as well as fluxes within its domain. RCMs can thus generate difficult (or impossible) to observe fields, such as precipitation amounts in data-sparse regions. This tool can serve to create synthetic or surrogate data bases to feed environmental impact, adaptation and management models.

The CRCM project is now entering the model validation phase. This validation of regional simulations constitutes an important aspect of the project since the model's success at reproducing a variety of atmospheric

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phenomena lends confidence in its ability to correctly simulate altered climate conditions. In this validation phase, the CRCM will be tested over a wide range of situations. The CRCM has successfully simulated tropical easterly waves, the types of disturbances that occasionally develop into hurricanes. A version of CRCM extending into the middle atmosphere is being tested to study gravity wave production, vertical propagation and momentum deposition which is so important for the understanding of dynamics where the ozone layer is located. Composite satellite measurements of Earth's surface parameters are used to validate surface processes in CRCM. Archived radar data are also being used in order to compare precipitation statistics with those derived from CRCM simulations. Progress along these lines has been reviewed at the latest RCM Workshop described below.

The development and validation effort of the CRCM is carried out collaboratively within AES, CCCma, Forestry Canada and in Canadian Universities, including Victoria, Toronto, York, Sherbrooke, McGill and UQAM. The CRCM project has been financed by Environment Canada, the Canadian Climate Research Network (CCRN) through the Canadian Institute for Climate Studies (CICS), the NSERC Strategic Grant programme, the Québec FCAR programme and through internal grants of UQAM.

2) Summary of the Fifth annual Canadian RCM Workshop

On February 27 and 28 1997 the Canadian RCM group hosted its annual workshop at UQAM. With over sixty participants, this workshop brought together from Canada and abroad a number of students and experts on regional climate modelling and applications to impact and adaptation studies.

The two-day workshop consisted of some 14 oral presentations including 3 key-note lectures by guest speakers, 13 posters and 4 working group sessions. (Numbers beside participants' names refer to their institution, as listed below). The invited talks were the following:

- Regional climate modelling in BALTEX, by D. Jacob (8)
- Nested model studies of elevation and lake effects on the surface climate change signal, by F. Giorgi (9)
- Observational evidence of climate changes in Switzerland, by M. Beniston (7)

A wide range of topics was also covered in the other oral presentations:

- Hydrological cycle in Mackenzie River basin, by M. MacKay (1)

- A Canadian RCM/CLASS simulation over the HAPEX-MOBILHY area, by E. Chan (1)
- Coupled mixed-layer and sea-ice modelling with the Canadian RCM, by S. Goyette (2)
- The influence of land surface fluxes on the atmospheric response of a RCM over Alaska, by A. H. Lynch (3)
- The Northern Aerosols Regional Climate Modelling (NARCM) project, by L. Barrie (1)
- Sea-salt modelling in the NARCM project, by S.-L. Gong (1)
- Modelling of tropospheric chemistry, by D. Plummer (5)
- Climate scenario simulations over western Canada with the Canadian RCM, by R. Laprise (11)
- Ecological modelling in climate models, by B. Bass (1)
- Report on Workshop held at NCAR on Model Data Users needs, by C. Hakkarinen (6)

Two posters sessions were held during extended lunch periods to allow participants to interact with Graduate Students, Research Assistants and Faculty Members involved in research activities using the CRCM. The following posters were presented:

- Adjustment following a prescribed diabatic heating, by A. Caya, P. Zwack and René Laprise (11)
- Sensitivities of the one-dimensional Kain-Fritsch convection scheme, by D. Paquin and R. Laprise (11)
- The influence of lateral boundary conditions on the fine-scale features developed in CRCM simulations, by D. Caya, S. Biner and R. Laprise (11)
- Regional Scale Variability of the climate in RCM Model Simulations, by H. Côté, R. Laprise, M. Giguère and G. Bergeron (11)
- Sensibility experiment on the influence of different sea ice conditions in Hudson Bay on the atmosphere, by P. Gachon and P. Zwack (11)
- Forest Fire Indexes Climatology with RCM: 1xCO₂ and 2xCO₂, by A. Arif and J.-P. Blanchet (11)
- A simulation of the effects of Gulf of Mexico sea surface temperature anomalies using the Canadian Regional Climate Model, by Y. Shao, C. Lin (4) and R. Laprise (11)
- A physical based numerical model to study the potential release of greenhouse gases by hydroelectric reservoirs, N. Barrette, R. Laprise and M. Lucotte (11)
- Towards the application of the CRCM to tropospheric ozone climatology, by V. Bouchet, E. Torlaschi, R. Laprise (11) and J. McConnell (5)
- Simulation of a radiatively active tracer: Kuwait oil fire case, by J. S. Fontecilla and J.-P. Blanchet (11)
- Lamb disturbances in the RCM-MC2 model: explicit resolution Vs parameterization, by C. Thurre and R. Laprise (11)
- Fine-scale modelling of air flow and tracer dispersion over Mexico City, by L. Spacek and M. Giguère (11)
- Water budget: explicit Vs diagnostic methods, by G. Bergeron, A. Frigon and R. Laprise (11)

Four parallel working group sessions were held to discuss specific topics in restricted groups under the lead of a chair:

- Sensitivity of RCM to lateral boundary conditions, chaired by D. Jacob (8)
- Data needs for impacts studies, chaired by M. Beniston (7)
- Hydrological Applications/Processes for RCM, chaired by M. MacKay (1)
- Data and strategies for RCM validation, chaired G. Morneau (10)

This year's Workshop attracted a lot of interest with a participation exceeding previous years' attendance. Next year it is planned to hold a joint workshop with modellers and applications and impact researchers, possibly in early April 1998. Those interested in receiving information about the Canadian RCM project or forthcoming workshops should contact Prof. René Laprise, principal investigator, Canadian RCM project (laprise.rene@uqam.ca).

3) Affiliations and acronyms:

- (1) AES: Climate Processes and Earth Observation Division, Atmospheric Environment Service, Downsview (Ontario) Canada.
- (2) CCCma: Canadian Centre for Climate modelling and analysis, Victoria (British Columbia) Canada.
- (3) CIRES: Cooperative Institute for Research in Environmental Sciences, Boulder (Colorado) USA.
- (4) Department of Atmospheric and Oceanic Sciences, McGill University, Montréal (Québec) Canada.
- (5) Department of Earth and Space Sciences, York University, North York (Ontario) Canada.
- (6) EPRI: Electric Power Research Institute, Palo Alto (California) USA.
- (7) Institute of Geography, University of Fribourg, Perolles, Switzerland.
- (8) MPI: Max-Planck Institut für Meteorologie, Hamburg, Germany.
- (9) NCAR: National Center for Atmospheric Research (NCAR), Boulder (Colorado) USA.
- (10) SEA: Division des services scientifiques, Service de l'Environnement Atmosphérique, Ville Saint-Laurent (Québec) Canada.
- (11) UQAM: Département des sciences de la terre, Université du Québec à Montréal, Montréal (Québec) Canada.

CMOS Exhibits at the AMS Annual Meeting

CMOS has entered a new era as a first time exhibitor at an AMS Annual Meeting. The 77th Annual Meeting of the American Meteorological Society was held in Long Beach, California, February 2-7, 1997. It included 11 conferences and symposia, commercial exhibits and a number of special sessions and events. Nearly 2,000 registrants and 600 exhibit personnel attended the meeting.

Attendees, who visited the CMOS booth, were exposed to a variety of CMOS scientific publication and information materials. The CMOS exhibit featured complimentary copies of the CMOS Bulletin; Atmosphere-Ocean; CMOS educational poster; information package about the forthcoming CMOS Congress at the University of Saskatchewan, Saskatoon, June 2-6, 1997; information package offering advertising opportunities in the CMOS Bulletin; poster on a special issue of Atmosphere-Ocean dedicated to the memory of Dr. André Robert; brochure on GEWEX (Global Energy and Water Cycle Experiment); and CMOS membership application forms.

The CMOS exhibit was made possible through an exchange of display space between CMOS and AMS. It was located in the AMS Book-Store and CD-ROM exhibit area which received heavy traffic from numerous registrants and exhibitors. The booth was staffed by Oscar Koren with occasional assistance from Geoff Strong. Of note was a large Canadian contingent of attendees and a beautifully designed Environment Canada booth located in the main commercial exhibit area.

Discussions with numerous visitors to the CMOS booth revealed that CMOS was not well known among the meteorological and oceanographic community of the US. Many visitors commented that they had never heard about CMOS, and after being presented with information, expressed interest in attending a CMOS Congress and visiting Canada at the same time. Judging from the large number of attendees that visited the CMOS booth, picked up information, and asked questions about CMOS, it is concluded that the CMOS exhibit at the AMS 77th Annual Meeting was a success. Special thanks go to Evelyn Mazur, Monica Tolson and Yale Schiffman of AMS, for their hospitality and excellent logistics support.

Oscar Koren, CMOS-97 Exhibits Convenor

Quotes from the wise weatherperson

"Isotherms and isobars are even more important than their names sound."

"Clouds just keep circling the earth around and around. And around. There is not much else to do."

LETTERS - CORRESPONDANCE

Canadian Meteorological and Oceanographic
Society / La Société canadienne de météorologie
et d'océanographie
Suite 112, McDonald Building,
University of Ottawa, 150 Louis-Pasteur Ave.
Ottawa, Ontario, K1N 6N5

4 March, 1997

Dear Phil:

On this day, when AES is celebrating your achievements on the occasion of your retirement from the Federal Public Service, CMOS would like to share some perspectives from outside government.

You have been a member and continuing supporter of CMOS, since before it was CMOS, in the days of the Canadian Meteorological Society. We served together on the CMS Executive and Council, including your year as President in 1975-76. As a member of the Council you helped bring about the expansion of the Society to include oceanography in 1977. You also served on committees, including the Editorial Committee for Atmosphere (and Atmosphere-Ocean); continue to be a Society Accredited Consultant and, since 1989, have been a Life Member of the Society.

In addition to your own research achievements in atmospheric dynamics, particularly the so-called pseudo-spectral model and predictability, you have had a profound influence on Canadian meteorology. Your time on the faculty and as Chair of the Department of Meteorology at McGill University gave you an insight that one can accomplish as much or more through management than one's own research. It was surely at McGill that you began to appreciate the potential to advance Canadian meteorology by promoting the strength of the universities.

On your return to AES from McGill you spearheaded a series of initiatives to build national atmospheric science strength, particularly since becoming Director-General. You increased AES science subvention funding to universities and then talked NSERC into matching the AES funds for several years. Through your initiative AES was recognized as equivalent to an industry for the purposes of the NSERC Industrial Research Chair program.

More recently under program review, when others were making massive resource cuts in externally directed funding, you took the long view and so leave Canadian atmospheric science in a much healthier condition than it would otherwise be. The dividends being realized through the Climate Research Network are just one example of how this is paying off for AES and Canada.

But I confess there is one aspect of your career I find a bit mysterious. Many of your colleagues may not be aware of the credit given, somewhat cryptically, to you by Ed Lorenz in his book *"The Essence of Chaos"* for turning a seagull into a butterfly. It has something to do with Brazil and Texas. I hope to hear the whole story someday.

Now with your retirement from AES, and your departure from the country, Canada is losing a science leader of the first order. On behalf of all members of CMOS I'd like to thank you for your contributions, and wish you and Micheline all the very best for the new phase of your lives soon to begin in Monterey.

Sincerely,

*Peter Zwack,
President*

Avis du Rédacteur

Lorsque Phil Merilees a dernièrement prit sa retraite, le Président Peter Zwack l'a remercié de sa contribution exemplaire pour la météorologie au Canada en général et pour la SCMO en particulier. Nous publions ici la lettre de remerciement expédiée par notre président à Phil.

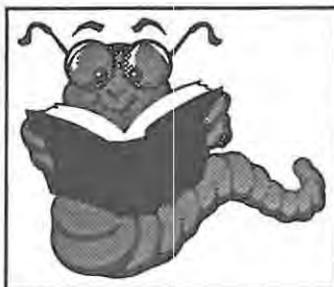
Note from the Editor

When Phil Merilees retired, the President, Peter Zwack, thanked him for his exceptional contribution to meteorology in Canada in general and more specifically to CMOS. We are publishing here the letter sent by our President to Phil.

The Oceans and Climate Change
by Grant R. Bigg
Cambridge University Press

Hardback ISBN 0-521-45212-0 \$US 49.90
Paperback ISBN 0-521-58268-7 \$US 27.95

Book Reviewed by Ken Mann
Bedford Institute of Oceanography, Dartmouth,
Nova Scotia.



In this consideration of climate change, the author rightly points out that if climatic boundaries shift appreciably and quickly, our political system of nation states, with populations historically attached to their borders and identities, is likely to lead to conflicts over

resources. He goes on to say (p.240) "Modern climatologists may be on the verge of providing advice crucial for world peace and sustainable development in the twenty-first century". In this context, he has produced a textbook intended for undergraduates studying subjects such as earth and environmental sciences, oceanography, meteorology and climatology, designed to make them familiar with the basic mechanisms by which the oceans interact with the atmosphere to influence climate change. This is no easy task, for the subject crosses the traditional boundaries of physics, chemistry and biology and in almost every area there is uncertainty about what is really going on. The book went to press before the Intergovernmental Panel on Climate Change announced that the majority of scientists now believe that the recent changes in global temperature are unlikely to be entirely natural and are at least in part the result of anthropogenic emission. The author's position is more cautious than this.

After an introduction to the climate system, there are chapters on physical and chemical aspects of ocean-atmosphere interactions, and one about biochemical interactions. The latter contains brief introductions to phytoplankton, zooplankton and detritus, and their biochemical interactions with sea water. There are references to the use of colour scanners for estimating phytoplankton biomass, and to the production of dimethyl sulphide by phytoplankton. The next chapter is on large-scale air-sea interactions and gives a particularly full and clear account of ENSO.

The introductory material is then pulled together in two chapters, one about natural climate variability and the other about climatic change with particular attention to anthropogenic forcing. The former begins with a geological perspective and finally focuses on marine climate change during the 20th century. The second brings together the underlying causes of present climate change, both natural and anthropogenic. The author does an excellent job of reviewing the evidence without drawing unjustified conclusions. He lists the shortcomings of current models and does not conceal the fact that many processes have chaotic underpinnings that may be fundamentally unpredictable.

Suggestions for further reading are given at the end of each chapter, with the full references collected together in a bibliography at the end of the book. In a field that is changing rapidly, this is an excellent review of the forces at work and a snapshot of the state of understanding as of 1995. I would recommend it warmly to undergraduates. Professionals in related fields would find it a useful digest.

La turbulence
de Marcel Lesieur

Publié aux Presses universitaires de Grenoble
1994.

Livre présenté par André April, M.Sc.
Département des Sciences de la terre
Direction Science de l'atmosphère
Université du Québec à Montréal

Cet ouvrage peut être considéré comme une promenade de détente le long des écoulements turbulents. De nature qualitative, cet ouvrage décrit les principales phases tourbillonnaires; il traite de la formation de ceux-ci, de leurs interactions et enfin de leurs déclin. C'est l'étude de la prévision de l'imprévisibilité.

Après une présentation sommaire de la mécanique des fluides, de la modélisation et de la simulation numérique, l'auteur fait une approche plus approfondie des instabilités, de la turbulence développée, de la turbulence aérodynamique et enfin de la turbulence de l'environnement. Ces sujets ont pour but de faire réfléchir le lecteur sur ces différents aspects de la turbulence.

Plusieurs graphiques en couleurs présentent des simulations numériques provenant du groupe de recherche en modélisation numérique de Grenoble. Personnellement, je crois que l'étude de l'appariement des tourbillons est intéressante puisqu'elle permet de faire une analogie avec le comportement des tourbillons à l'échelle atmosphérique.

FELLOWS ET FELLOWS HONORAIRES CATÉGORIE NOUVELLE DE MEMBRES DE LA SCMO PROPOSÉE PAR LE CONSEIL

S'il a été proposé de créer une catégorie «Fellow» et «Fellow honoraire» à la SCMO, c'est pour, notamment, essayer de stimuler davantage d'intérêt et de participation vis-à-vis des affaires de la Société.

La Société fait face à une diminution du nombre de ses membres et des abonnements à *Atmosphère-Océan* et à un malaise général qui se traduit par un manque d'intérêt pour le *CMOS Bulletin SCMO*, à en juger d'après le peu de nombre d'articles et de lettres à la rédaction que nous recevons. Plusieurs centres sont loin d'être actifs et, dans certains cas, il manque même des titulaires à certains postes de dirigeants.

Si la Société doit survivre et accomplir ce qu'elle doit, les membres devront s'impliquer davantage d'une façon ou d'une autre. Un des moyens de susciter l'intérêt des membres consisterait à les mettre directement en contact avec les affaires de la Société tout en reconnaissant leurs réalisations et contributions personnelles dans l'accomplissement des objectifs de la Société. La présente proposition vise à ce que l'on reconnaisse nos collègues pour leur travail en leur accordant le titre de «Fellow». Beaucoup de sociétés savantes, comme l'AMS, l'AAAS et l'IEEE, honorent leurs membres de cette façon. C'est le moyen utilisé pour les faire participer aux activités de leurs associations respectives.

Voici quelques éléments à considérer éventuellement:

Pour devenir Fellow de la SCMO

Pour devenir Fellow de la SCMO (FSCMO), le membre doit être reconnu pour son apport dans le monde scientifique, professionnel, académique et météorologique des sciences atmosphérique et océanographique au Canada.

Les compétences et les critères relatifs à la mise en candidature ou à l'élection d'une personne comme Fellow comprennent notamment:

- a) l'apport et les réalisations du membre dans sa vie professionnelle;
- b) la contribution que le membre est censé faire à la Société;

Au nombre des autres considérations, citons:

- a) les recommandations des personnes qui proposent sa candidature;
- b) le nombre des Fellows à la Société;
- c) la représentation au niveau des régions, de la langue ou d'autres éléments de diversité.

MISE EN CANDIDATURE, ÉLECTION ET MANDAT DES FELLOWS

Les Fellows sont élus à une réunion annuelle ou à une réunion générale spéciale des membres de la Société.

Comité des candidatures au titre de Fellow: Le Conseil nommera un Comité (des candidatures au titre de Fellow) chargé de la mise en candidature de membres au titre de Fellow; il sera composé du président sortant de la Société, du président du Comité scientifique, du président du Comité d'accréditation et d'un autre membre dont le statut reste à déterminer.

Le président du Comité devrait normalement être le président sortant de la Société.

Procédure de mise en candidature et d'élection: Le Comité doit solliciter des candidatures auprès des membres. Un formulaire de mise en candidature devra être préparé à cette fin. L'information utile doit être organisée et, une fois prête, être signée par deux membres en règle.

Le Comité des candidatures au titre de Fellow se chargera de revoir toutes les candidatures et dressera une liste de celles qu'il aura décidé de retenir. Toutes les candidatures seront conservées dans un dossier actif pendant une période de deux ans suivant l'année de la mise en candidature.

En approuvant la candidature d'un membre au titre de Fellow, le Comité tiendra compte des critères susmentionnés.

Les recommandations du Comité des candidatures au titre de Fellow seront présentées au Conseil qui, à son tour, annoncera l'élection à la réunion annuelle ou réunion générale spéciale suivante.

Les Fellows peuvent démissionner ou être radiés du Forum pour un motif valable sur décision prise à la majorité des deux tiers des membres présents et votants à une assemblée générale annuelle.

Note du Rédacteur

Tel que promis dans le dernier numéro du CMOS Bulletin SCMO, Vol. 25, No.2, nous reproduisons ici en français l'article qui a paru en page xx et que nous n'avons pu publier à ce moment à cause de problèmes techniques. Nous vous remercions de votre compréhension.

Fellows honoraires

Dans une recommandation distincte, le Comité des candidatures au titre de Fellow peut aussi présenter le nom de membres dont on estime qu'ils ont dispensé des services remarquables dans leur domaine professionnel et à la Société. Ces personnes peuvent être élues Fellows honoraires de la Société par l'assemblée générale annuelle.

Les membres à vie nommés avant l'adoption du présent règlement continueront d'être reconnus comme tels.

Les Fellows honoraires sont habituellement élus à vie, mais peuvent démissionner ou être radiés du Forum pour un motif valable sur décision prise à la majorité des deux tiers des membres présents et votants à une assemblée générale annuelle.

Les Fellows honoraires recevront un avis et peuvent participer aux réunions annuelles et assemblées générales du Forum des Fellows de la Société.

Le Fellow honoraire doit être un membre en règle de la Société.

LE FORUM DES FELLOWS

Lorsque le quart des Fellows aura été nommé, ceux-ci se constitueront en «Forum».

Rôle du Forum: Le Forum, à toute réunion annuelle ou réunion générale spéciale convoquée en bonne et due forme, sera appelé à examiner notamment:

- i) le rapport du Comité des candidatures au titre de Fellow, et à recommander des candidats comme Fellows ou Fellows honoraires;
- ii) les questions et les préoccupations intéressant la Société, et à recommander des mesures appropriées pour le Conseil et la Société.

Droits et devoirs

Le Fellow est un membre en règle. Le Fellow peut siéger au Conseil et aux divers comités. Le Fellow est censé promouvoir les objectifs de la Société et faire partie du Forum des Fellows.

Le Fellow de la Société canadienne de météorologie et d'océanographie peut s'identifier comme tel au moyen du titre FSCMO.

Le Fellow peut démissionner ou être radié du Forum pour un motif valable sur décision prise à la majorité des deux tiers des membres présents et votants à une assemblée générale annuelle.

Le Conseil.

El Nino Alert by the UBC Climate Prediction Group

On May 20, 1997, the UBC Climate Prediction Group issued a forecast for an El Nino event, based on tropical wind data up to the end of April, 1997. This prediction was based on two very different models, a neural network model and a simpler POP (Principal Oscillation Pattern) model. With wind data up to the end of March, neither model forecasted an El Nino, but when April wind data became available, both predicted an El Nino, suggesting a significant warming of the tropical Pacific by the fall of 1997. Through atmospheric teleconnection, western Canada tends to be warmer and slightly drier during an El Nino winter. Details of the UBC model forecasts are freely available via the World Wide Web (<http://www.ocgy.ubc.ca/projects/clim.pred/index.html>).

*William Hsieh
University of British Columbia*

Long-Range Weather and Crop Forecasting Working Group Meeting

A third working group meeting is being proposed on Long-Range Weather and Crop Forecasting in October 1997 at the Canadian Meteorological Centre (CMC) in Dorval, Québec. The CMC is the nerve centre of the Canadian numerical weather prediction facility and has recently embarked upon operational implementation of long-range (1 to 3 months) forecasts for Canada, based on dynamical and statistical techniques.

No specific theme for the meeting is being proposed at this time, but we welcome any suggestions from any of you. Please fill in the following survey form to provide suggestions and ideas. The impact of Sea Surface Temperatures (SST) distribution and anomalies of the North American climate and agriculture will still be similar to that of the previous meetings with a number of short presentations followed by working group discussions.

This invitation is being sent to all previous participants as well as to others who are presently involved in long-range weather and crop forecasting over North America. It would be appreciated if you could fill in the following form (shown on next page) and mail or fax it to the address given below preferably by August 31, 1997.

Louis R. Lefavre, CMC, Dorval, Local Organizer;
E.Ray Garnett, Canadian Wheat Board, Winnipeg;
Madhav L. Khandekar, Environment Canada, Downsview.

SURVEY FORM
Long-Range Weather and Crop Forecasting Working Group Meeting

Name:

Organization:

Field of Study:

Will you be attending the meeting: Yes No

Anyone else in your organization interested in attending? If yes, please provide their names.

Will you be making a presentation at this October workshop? Yes No

Tentative title of your presentation:

Suggestions for any other activities during the meeting?

Please mail or fax before August 31, 1997 to:

Louis Lefaiivre
Canadian Meteorological Centre
2121, Trans-Canada Highway
Dorval, Québec H9P 1J3 Canada
Fax: (514) 421-4657; e-mail: louis.lefaiivre@ec.gc.ca

New Co-Editor for Atmosphere-Ocean

Dr. Rick Marsden is the new Co-Editor (Oceans) for Atmosphere-Ocean. He received his BSc from the Royal Military College of Canada (RMC) in 1972 and served as an artillery officer in the Canadian Armed Forces until 1976. He then attended graduate school in physics at the University of British Columbia. After completion of his PhD in physical oceanography in 1980, he worked as a post-doctoral fellow at Dalhousie University. In August 1982, he took a faculty position at Royal Roads Military College (RRMC) in Victoria, B.C. With the closure of RRMC in 1995, he transferred to RMC where he has been involved with their space science program and the establishment of a post-graduate program in acoustics and physical oceanography.

Rick Marsden was the chairman of the local arrangements committee for the 1990 CMOS Congress held at RRMC. In this capacity, he served as a member-at-large on the CMOS executive during 1989-1990.

Dr. Marsden's research interests include the study of internal tides, super-tidal internal waves, surface gravity waves and air-sea interaction as well the use of acoustic Doppler current profilers in detecting ocean structures. He has maintained close ties with researchers at McGill University and INRS in Rimouski. In recent years, he has organized a number of his own field programs, including an ADCP study of Knight Inlet, B.C. and Resolute, N.W.T. He has also participated in several co-operative international field programs, including the SARES project, a joint-Canadian-Japanese investigation of ice-algal growth in the Arctic as well as the CST-7 and STD EIGER sea trials, air-sea interaction studies in conjunction with the Johns Hopkins University. He is presently a principal investigator of the North Water Project, a study of the North Water Polynya that will take place in 1998.

We express to Dr. Marsden our best wishes in this new and challenging endeavour.

NUMERICAL METHODS IN ATMOSPHERIC AND OCEANIC MODELLING
The **André J. Robert** Memorial Volume

The Canadian Meteorological and Oceanographic Society announce the publication of the special issue of Atmosphere-Ocean dedicated to the memory of Dr. André Robert who has contributed to the the first integration of a global spectral primitive equation model, to the development of the Robert-Asselin time filter and has pioneered studies in the use of the semi-implicit and semi-Lagrangian methods.

La Société canadienne de météorologie et d'océanographie annonce la publication d'un numéro spécial d'Atmosphère-Océan dédié à la mémoire d'André Robert qui a contribué à l'intégration d'un modèle spectral global utilisant les équations primitives, au développement du filtre temporel Robert-Asselin ainsi qu'à des études fondamentales sur l'usage des méthodes semi-implicites et semi-lagrangiennes.

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**Prestation des services environnementaux
au Canada
Étude des alternatives -
Commentaires demandés**

Environnement Canada et le Secrétariat du conseil du trésor ont entrepris une étude des alternatives de prestation des services du Programme de l'environnement atmosphérique dans le cadre d'une vaste réforme du rôle du gouvernement dans la prestation des services. L'objectif est d'identifier la forme d'organisation gouvernementale ainsi que les méthodes de prestation qui feront en sorte que les services soient livrés d'une manière flexible, financièrement efficace et innovatrice. Sont inclus non seulement les services météorologiques conventionnels, mais aussi les services des glaces et hydrologiques et, du moins conceptuellement, toute une étendue d'autres services basés sur la physique et qui impliquent la prévision environnementale sur une gamme d'échelles temporelles. Le gouvernement désire atteindre une décision sur la forme d'organisation vers la fin de l'automne 1997, et procéder à toute implantation requise aussi prestement que possible, compte tenu de l'ampleur des changements.

D'autres pays, tels l'Angleterre et la Nouvelle Zélande, ont déjà apporté des changements importants à leurs services météorologiques nationaux, mais il a été déterminé que ceux-ci ne sont pas appropriés pour le Canada. L'étude sur les alternatives de prestation est à la recherche d'une solution "faite au Canada". On peut obtenir plus de renseignements sur cette étude en communiquant directement avec le groupe d'étude à: ASD-Questions@ec.gc.ca

La SCMO est reconnue comme parti intéressé et a reçu un breffage sur cette initiative lors du récent congrès. Nous avons été invités à présenter nos vues en tant que Société. Étant donnée l'importance du Programme de l'environnement atmosphérique pour la SCMO et ses membres, le Conseil aimerait apporter sa collaboration afin que les vues du groupe soient transmises à ceux qui exécutent l'étude. On s'attend à ce qu'il y ait une occasion de commenter sur des options précises plus tard cet été, mais, comme premier pas, la Société voudrait conseiller le groupe d'étude sur l'étendue d'une nouvelle organisation, ainsi que sur les critères nécessaires et désirables pour garantir la satisfaction des besoins nationaux. Par exemple, serait-il désirable que le mandat de l'organisation soit confiné aux services météorologiques pour le bien commun? Ou devrait-il couvrir une vaste étendue de composantes environnementales, ou encore chercher à fournir des services à valeur ajoutée payés par les usagers? Quel devrait être le rôle de la nouvelle organisation en ce qui a trait à la recherche, la surveillance à long terme, le maintien et le développement d'une compétence nationale

de base en science environnementale? Est-ce que le but de l'organisation devrait être de rechercher des arrangements plus étroits, ou même la co-gestion avec les provinces, municipalités or autres partenaires? Comment s'assurer des besoins de la sécurité nationale et des ententes de gouvernement à gouvernement pour l'échange des données? Ceci ne sont que des exemples.

Lorsque l'étude aura identifié quelques options spécifiques, la SCMO tentera de les publiciser, de solliciter vos vues et de préparer un bref. En attendant, la SCMO sollicite les vues des membres sur les critères nécessaires et désirables à considérer dans le développement d'options organisationnelles. Veuillez envoyer vos commentaires à Bill Pugsley, vice-président de la SCMO, à: bb185@freenet.carleton.ca dès que possible.

**Delivery of Environmental Services in
Canada
Alternative Service Delivery Study -
Comments Requested**

Environment Canada and the Treasury Board Secretariat are undertaking an "Alternative Service Delivery Study" of the Atmospheric Environment Program as part of a broad reform of the service delivery role of government. The aim is to identify the organizational form within government and the means of delivery which will ensure that services are provided in a flexible, cost effective and innovative manner. The services comprise not only traditional weather services, but include ice and hydrological services and, at least conceptually, a whole range of other physically-based services that involve environmental prediction on a range of time scales. The government intends to reach a decision on the organizational form in the late Fall of 1997, and to proceed, as swiftly as possible given the magnitude of the change, with any necessary implementation.

Some other countries, such as UK and New Zealand, have already made substantial changes to their national weather service systems, but it has been determined that these are not appropriate for Canada. A "made in Canada" solution is being sought through the ASD study. Additional information on the study can be obtained directly from the ASD Study Team at ASD-Questions@ec.gc.ca.

CMOS is recognized as a stakeholder and a briefing was given on the initiative at the recent Congress. We have been invited to submit our views as a Society. Considering the importance of the Atmospheric Environment Program to CMOS and its members, Council would like to cooperate to ensure that the community view is available to those conducting the study. There is expected to be an opportunity to comment on some

specific options later in the summer, but as a first step the Society would like to provide advice to the study on the scope of any new organization, and the necessary and desirable criteria that would ensure it meets national needs. For example, is it desirable to have the mandate of the organization constrained to public good weather services? Or should it encompass a broader range of environmental components, or seek to deliver value added services on a user pay basis? What role should the new organization have in research, long-term monitoring, the maintenance and development of a core national environmental science competence? Should it be the objective that the organization seek a closer, or even a co-management arrangement with provinces, municipalities or other partners? How can national security needs, and government-to-government arrangements for international exchange of data be ensured? These are only examples.

When the ASD study has identified some specific options CMOS will attempt to publicize them, solicit your views and provide a Society brief. In the meantime CMOS invites members' input on the necessary and desirable criteria that should be considered in developing the new organization options. Comments can be sent to Bill Pugsley, CMOS Vice-president at bb185@freenet.carleton.ca as soon as possible.

Selected Candidate for the Summer Meteorology Workshop

The April 1997 issue of the CMOS Bulletin SCMO called for pre-college teachers of Atmospheric Science topics to apply for selection as Canadian participant in an American Workshop in Atmospheric Meteorology ("Project Atmosphere"). The workshop is sponsored by the American Meteorological Society (AMS) together with the National Oceanic and Atmospheric Administration (NOAA) of the United States. CMOS has been invited for some years to send a Canadian teacher to participate in this annual event.

As in previous years, CMOS has collaborated in this selection with the Canadian Council for Geographic Education, each providing funding to assist the chosen teacher to defray the cost of his/her journey to Kansas City, Missouri, where the Workshop is taking place this year.

This year, the selected teacher from the numerous high class applicants received is Ms. Helen R. McWilliams, who teaches Physical Geography, Sector and Global Geography in Sackville High School, in Nova Scotia. Upon her return, we look forward to publishing in a future issue of this Bulletin a short report to acquaint our readers with the highlights of this year's workshop.

Uri Schwarz

1996 Prizes and Awards Prix et bourses pour 1996

The Prizes and Awards for 1996 were distributed by the Committee as follows:

Les prix et bourses pour 1996 ont été octroyés par le comité de la manière suivante:

President's Prize / Prix du président:

To/À: **Dr. Stuart Smith** - Citation for the CMOS President's Prize.

The President's Prize of the Canadian Meteorological and Oceanographic Society is awarded to Stuart Smith for his contributions to the fields of meteorology and oceanography. Over many years, his meticulous field work and careful analysis directed at determining the variations with wind speed in the transfer coefficients for momentum, heat and water vapour have served to improve our understanding of the exchange process across the air-sea interface.

The Dr. Andrew Thomson Prize in Applied Meteorology / Le prix Andrew Thomson en Météorologie appliquée:

To/À: The consensus of the Committee was NOT to award the Dr. Andrew Thomson Prize in Applied Meteorology for this year.

Prize in Applied Oceanography / Prix en océanographie appliquée:

To/À: The consensus of the Committee was NOT to award the Prize for Applied Oceanography for this year.

The Rube Hornstein Prize in Operational Meteorology / Le prix Rube Hornstein en Météorologie opérationnelle:

To/À: **Jim Van Os** - Citation for the Rube Hornstein Prize

The Rube Hornstein Prize is awarded to Jim Van Os in recognition of his work in graphical manipulation of meteorological data so that they can be used quickly and effectively. His radar work on composites and his grads software displaying meteorological fields derived or otherwise via colour gradients in addition to lines has greatly facilitated the analysis of meteorological fields by focusing attention on the problem of the day in real time. His work has been perceived by NAVCAN and other national and regional clients of weather as being essential to their operations. For Ontario Region, ENSOs across the country and in some national projects, his knowledge, work and skills are essential and highly respected throughout.

The 1996 Prizes and Awards Committee Members were the following: / Les membres du comité des prix et bourses étaient les suivants pour 1996:

Dr. Jean Coté, Dr. Alex Hay,
Dr. Chris Garrett, Dr. Kent Moore - Chairman
Dave Phillips - Secretary

The J.P. Tully Medal in Oceanography /
La médaille J.P. Tully en Océanographie:

To/À: **John Lazier** - Citation for the J. P. Tully Medal

The J. P. Tully Medal is awarded to John Lazier for his dedicated and outstanding long-term field studies of the Labrador Sea and Labrador Current, frequently under adverse conditions. His documentation of the wintertime changes and interannual variability of this important region has provided a foundation for investigations of climate change. His gentlemanly and generous collaboration with colleagues in Canada and abroad has also enhanced the quality and international reputation of Canadian oceanography.

Graduate Student Prizes / Prix étudiant(e)s gradué(e)s:

To/À: **Michael Dowd** - Citation for the Graduate Student Prize

The graduate student prize has been awarded to Michael Dowd for showing what can be learned from the thoughtful combination of simple dynamical models and innovative inverse methods. For example, Mike's research has helped confirm the existence of a newly-discovered gyre on the outer Scotian Shelf. His ideas on inverse modeling have also been used in the development of an operational forecasting scheme for the circulation off the east coast of Canada.

Environmental Citation / Citation environnementale:

1) To/À: **CFAX Radio Station** - Storm of 96 - Environmental Citation

The Environmental Citation is awarded to CFX Radio Victoria for their outstanding work of independently organizing communications and volunteer support during Victoria's December 96 snow storm - referred to as the "Storm of the century". CFX stayed on the air for many days relaying information on people's needs and making

their facilities available to emergency organizations for communications.

2) **RDI** - Saguenay River Flood 1996 - Environmental Citation

An environmental citation is awarded to the Réseau de l'information (RDI) for its coverage of undoubtedly the most catastrophic event in Canada this year, namely the flooding and mud slides following sustained heavy precipitation over the Saguenay in July 96. The network, and in particular the work of reporter, Mr. Louis Lemieux, provided a continuous and extensive coverage of the event in difficult conditions.

Une citation environnementale est accordée au Réseau de l'information (RDI) pour sa couverture de l'événement sans contredit le plus catastrophique de l'année au Canada, c'est-à-dire les inondations et les glissements de terrain suite aux pluies diluviennes qui se sont abattues sur le Saguenay en juillet 96. Le Réseau de l'information, et plus particulièrement le travail du journaliste Louis Lemieux, a assuré une couverture continue et extensive de l'événement dans des conditions difficiles.

Congratulations to all recipients!
Félicitations à tous les récipiendaires!

D. J. Phillips
Secretary, CMOS Prizes and Awards Committee

Contents of Atmosphere-Ocean 35-3

SHEN and THOMPSON

Periodic Flow of a Homogeneous Fluid over an Isolated Topographic Feature

KONG and YAU

An Explicit Approach to Microphysics in MC2

BEAGLEY, de GRANDPRÉ, KOSHYK, McFARLANE and SHEPHERD

Radiative-Dynamical Climatology of the First-Generation Canadian Middle Atmosphere Model

SLONOSKY, MYSAK and DEROME

Linking Arctic Sea-Ice and Atmospheric Circulation Anomalies on Interannual Decadal Timescales

BARNSTON, CHELLIAH and GOLDENBERG

Documentation of a Highly ENSO-Related SST Region in the Equatorial Pacific (Research Note)

Proposed CMOS Publication Policy

1. Mandate

An important objective of CMOS is to publish informative, high-quality periodicals and monographs on meteorological and oceanographic topics, in a timely and cost-effective manner.

2. Scope of Application

This Policy concerns specifically *Atmosphere-Ocean*, but is also generally applicable to all other publications of the Society.

3. General

The research journal (*Atmosphere-Ocean*) and the monographs published by CMOS provide meteorologists and oceanographers in Canada and elsewhere with a means to communicate with their peers in the international research community.

A-O publishes only original research and survey articles as well as notes or comments on published papers. Monographs document work produced by Canadians or in which Canadians have made a major contribution.

The *CMOS Bulletin SCMO* is the main information vehicle for all members of the Society. It contains non-refereed articles, news, notes, book reviews and advertisements.

The *CMOS Homepage* is an additional communications means, for up-to-date information to members, as well as general information to interested persons around the world.

4. Rationale

CMOS has maintained reasonably consistent standards in the past, mainly because of the efforts of Ed Truhlar, Editor (in chief) for many years. It is important that CMOS follow the best current practices, and where possible, improve on them. This document records and formalizes the editorial, production, and related policies and defines a set of ethical guidelines. Adherence to these policies will protect the integrity and the reputation of the Society as a publisher.

5. Responsibilities

a) Authors

1. Authors have an obligation to present an accurate account of the research performed and are responsible for complete reporting of the observations made and data collected.

Note: The following draft policy was presented at the last CMOS Annual Congress in Saskatoon. It is reproduced here for the benefit of all our members before being officially accepted. If you have any comments regarding this policy on CMOS Publications, please provide your comments as soon as possible to Richard Asselin at CMOS Office. Once adapted, this policy will be re-publish in both official languages.

L'ébauche de cette présente politique a été présentée au dernier Congrès de la SCMO à Saskatoon. Elle est reproduite ici, en anglais seulement, pour le bénéfice de nos lecteurs avant de devenir officiellement acceptée. Si vous avez des commentaires à propos de la politique des publications de la SCMO, prière de les faire parvenir à Richard Asselin, Bureau de la SCMO. Une fois adoptée, cette politique sera publiée de nouveau dans les deux langues officielles.

e-mail / courriel

cmos@ottmed.meds.dfo.ca

2. Authors must relate their work to that of others and provide complete and accurate citations so that the readers can objectively evaluate the paper.

3. The authors should be prepared to defend their adherence to both formal and informal standards of ethical conduct of research.

4. It is the responsibility of authors to ensure that manuscripts accepted for publication are free of any kind of prejudice, especially gender and racial stereotyping.

5. Co-authors of a paper should be limited to those who have made significant scientific contributions to the work reported. All authors of a paper should be able to take public responsibility for its content. All additional contributions should be indicated in a footnote or in the Acknowledgements section.

6. Authors should avoid fragmentation of research reports or submission of trivial reports, as this consumes excessive journal space and burdens the review process unnecessarily.

7. The corresponding author must give assurance that all co-authors have read and approved the manuscript as submitted. When dealing with manuscripts with more than one author, the Editor assumes that the corresponding author is responsible on behalf of the group.

8. Authors are responsible for obtaining any formal or informal approval or clearance of the paper from their institution or company before it is forwarded to CMOS.

9. Authors must identify the sources of all information quoted and material obtained privately.

10. When a manuscript contains material (tables, figures, charts, etc.) that is protected by copyright, it is the obligation of the author to secure written permission from the holder of the copyright. Letters of permission must be sent to the editor before final acceptance of the manuscript.

11. Authors are responsible for disclosing any information that may affect the acceptance or rejection of the paper. This includes indicating if the work has been previously presented in any format (conference proceedings, abstract publication, etc.) and submitting a list of related manuscripts that the author has in press or under consideration by another journal. The paper will be considered for publication only with the understanding that it has not already been submitted to, accepted by, or published in another journal.

b) Editors (including co-editors, as appropriate)

1. The Editor is responsible for the scientific calibre of the contents of the publication.

2. CMOS Council appoints an editorial board for the journal, upon recommendation by the Editor. It is usually composed of Associate Editors, who assist the Editor in assessing articles submitted for publication and act as an advisory group for the Editor as required.

3. Editors are appointed by Council for a fixed renewable term, normally 5 years.

4. The Editor may appoint one or more Assistant Editors, to assume editorial responsibilities during an absence.

5. It is the responsibility of the Editor to ensure that manuscripts accepted for publication meet the guidelines established for authors.

6. The Editor is responsible for ensuring that proper review procedures are followed and for making the final decision on acceptance or rejection of a manuscript. The Editor may delegate some duties to Associate Editors, or to a temporary Editor appointed to oversee a special issue or section, but the final responsibility remains with the Editor.

7. The peer review process is carried out under the direction of the Editor. When a manuscript is deemed appropriate for consideration for publication, arrangements are made for it to be reviewed by at least two referees.

8. Referees are advisory to the Editor and do not make decisions on acceptance or rejection of a manuscript. The name of a referee will only be conveyed to an author with the explicit consent of the referee.

9. The Editor must ensure that submitted papers are dealt with in a timely manner. The Editor will endeavour to notify the corresponding author of the receipt of the manuscript. The Editor will ensure that the corresponding author is notified of any changes in status of the manuscript and all decisions that follow.

10. The Editor is responsible for ensuring that the contents of an author's paper are not divulged to anyone other than persons necessarily involved in reading the paper or reviewing it for the Editor or persons assisting in these functions.

11. The Editor should give unbiased consideration to all manuscripts and should declare any potential conflict of interest, in which case the Editor should delegate the consideration of the manuscript to another Editor or to a member of the Editorial Board.

12. All files regarding an individual manuscript are the property of CMOS and are to be retained by the Editor or disposed of in consultation with the Director of Publications.

13. When notified of errors in facts or conclusions in a paper subsequent to its publication, the Editor, after notifying the corresponding author, is responsible for initiating publication of an erratum or a report pointing out the changes.

14. If the Editor receives convincing evidence of plagiarism, duplicate publication, or falsification of data, the Editor must initiate publication of a retraction. The Editor must notify the Director of Publications as soon as possible of any serious breaches of ethical behaviour.

c) Technical editor

1. The technical editor is responsible for the quality of the language, style and adherence to agreed standards of the publication.

2. A translator/assistant technical editor is available for abstracts and articles in the French language.

3. The technical editor is responsible for all correspondence with authors after acceptance of the paper, except for financial matters, which are dealt with by the CMOS Business Office.

4. The technical editor is responsible for correspondence with the printers for all aspects of production.

d) Referees

1. Referees are advisors to the Editor and should serve only in their areas of expertise. A referee who feels inadequately qualified to evaluate a manuscript should return it promptly to the Editor.
2. A referee who cannot give an unbiased opinion about a manuscript should declare this bias or conflict of interest to the Editor and return the manuscript promptly.
3. Referees must treat the paper as a confidential communication. If a referee wishes to seek expert advice from an associate, he/she should consult the appropriate Editor or Associate Editor before proceeding. The Associate must also honour the confidentiality of the document.
4. A referee who is unable to complete the review of a manuscript in an appropriate time-frame should return it to the Editor promptly.
5. All statements made by the referee must be adequately supported so that the Editor may make a well-informed decision regarding the manuscript.
6. The referee should call to the attention of the Editor any failure by an author to cite relevant work by other scientists.
7. Unpublished information, arguments, or interpretations disclosed in a submitted manuscript should not be used for the referee's own research except with the consent of the author.

e) Director of Publications

1. The Director of Publications is responsible for arranging and negotiating all contracts and business matters for CMOS publications.
2. The Director of Publications has general responsibility for the quality and editorial integrity of the periodicals and monographs published by the CMOS.
3. Questions regarding the scientific quality and competitiveness of the publications, as well as ethical questions (e.g., reporting of fraudulent data, duplicate publication, submission of inappropriate material), may be referred to the Director of Publications.
4. In cases where an Editor is not fulfilling obligations as outlined in this policy, the Director of Publications has the responsibility to recommend to Council termination of the appointment.
5. The Director of Publications has the right of access to all files maintained by the Editors of CMOS publications.

The Director of Publications may exercise this right when necessary to ensure that the policies and procedures in application conform to the requirements outlined in this Publication Policy.

f) Publisher

1. CMOS is the Publisher, represented by the Director of Publications. It is responsible for setting policies, procedures, and guidelines and for production of the publications, through technical editors or other appointees as appropriate.
2. All persons involved in CMOS publications must ensure that confidentiality of the manuscripts is maintained at all stages of the pre-publishing process. Information must not be given to persons unauthorized by the author (reporters for the news media or employees of investment firms, for example) prior to the appearance of the paper in print.
3. After a manuscript has been accepted for publication, the Editor or technical editor may make editorial changes as required but must not make substantive changes in the content of a paper without consultation with the author and the Editor.
4. The technical editor must alert the Editor concerning any substantive changes requested by an author after acceptance of the manuscript, including changes in authorship or deletion or insertion of substantial amounts of material.
5. The Publisher accepts no responsibility for statements or opinions expressed by a contributor, and a statement to this effect will appear in all publications.

6. Publishing Policy

a) Copyright

Once an author's paper is accepted for publication, the author transfers copyright to the CMOS. As the holder of copyright on all original material published in its publications, CMOS (through the Director of Publications) exercises the right to grant permission to copy or republish articles or portions thereof, provided that the source of such material is fully acknowledged. This is normally free of charge, provided the intended use is mainly scientific. If the address of the author of the copied article is known, a copy of the permission is sent to him/her.

CMOS reserves the right to charge for all forms of copying or publishing, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

b) Publishing in Both Official Languages

An article is published in English or French according to the author's choice. Some material of general interest may be translated by CMOS. A-O articles are always preceded by an informative abstract in both English and French. Material relating to membership and other communications from the CMOS Council or Executive will be in both official languages.

c) Standard Units

In A-O, metric units are used or the metric equivalents given, and the use of SI units is encouraged, as outlined in the Canadian Metric Practice Guide (CAN/CSA - Z234.1-89).

d) Spelling

English spelling and practice are as per the Oxford dictionary and UK style. French spelling and grammar is according to Office de la langue française du Québec. Translation of scientific words and expressions is according to the Termium of Secretariat of State of Canada. The WMO and the Villeneuve dictionaries will be secondary sources.

e) Advertising in CMOS publications

Advertising is accepted in CMOS publications subject to approval by the Director of Publications. All advertising must be consistent with the editorial policy of the publication. Generally, advertising will be directed to the Bulletin or the homepage, which are published more frequently, and in order not to distract from the scholarly orientation of A-O.

The following types of advertising are accepted:

- i) Advertisements submitted by other organisations may be accepted free of charge where benefit is expected for CMOS publications in exchange.
- ii) Advertisements announcing upcoming conferences and symposia may be accepted free of charge, subject only to approval by the Editor of the publication concerned. Such advertisements will only be accepted when the event is of interest to a significant proportion of the readers served by that publication. The event need not take place in Canada.
- iii) Paid advertisements may be accepted providing they are consistent with the editorial policy of the publication. No advertising that implies endorsement of a product or service by CMOS will be accepted. Loose inserts are considered to be advertisements. Advertising fees will be published occasionally in the Bulletin.

f) List rental

CMOS does not rent its complete membership or subscription lists. Partial lists may be rented, comprising only authorized names.

g) Page charges for A-O

- i) Page charges are set occasionally by CMOS Council, upon recommendation by the A-O Editorial Board;
- ii) It is the responsibility of the Editor to inform the author of the applicable page charges, as a condition for acceptance;
- iii) The Director of Publications may agree to reduce charges in cases where authors cannot afford to pay, e.g. if the author has no applicable research grant or funding. Authors should not be expected to pay from their personal purse.
- iv) The corresponding author is expected to pay the charges, but CMOS will bill individual co-authors if the corresponding author negotiates a cost sharing arrangement with them;
- v) 50 free offprints will be provided by CMOS; this benefit may be eliminated if page charges are not paid in full.

h) Inventory of back copies

CMOS maintains a varying number of copies of all publications, for sale and for archive purposes. A detailed policy on this question is attached.

Richard Asselin
Director of Publications, CMOS.

Ocean Circulation and Climate

The Conference of the World Ocean Circulation Experiment

Halifax, Nova Scotia, Canada
24 - 29 May 1998

WOCE is a component of the World Climate Research Programme investigating the role played by the ocean circulation in the earth's climate system. Its aim is to develop improved ocean circulation models for use in climate research. Planning started in the early 1980s to take advantage of new earth observing satellites and of the advances in computer power to model the global ocean.

The WOCE observational phase from 1990-1997 has used satellites and *in-situ* physical and chemical measurements to produce a data set of unprecedented scope and precision. It has resulted in the development of new observational techniques that have changed our view of the oceans. None of this would have been possible without the wholehearted co-operation of scientists in the over 20 countries involved.

WOCE is now entering its phase of Analysis, Interpretation, Modelling and Synthesis (AIMS) which will continue until 2002. The reconciliation of model results and observations, and ultimately the assimilation of ocean data into models, presents the ocean science community with a novel set of challenges. The results from WOCE are having a profound influence on understanding the physics, chemistry and biology of the world's oceans and their interaction with the atmosphere.

Science Organizing Committee

Prof Gerold Siedler, Chair, Germany;
Dr Trevor McDougall, Australia;
Dr Bernard Barnier, France;
Prof Carl Wunsch, USA;
Dr Nobuo Sugimoto, Japan;
Dr Allyn Clarke, Canada;
Dr John Gould, WOCE/IPO, UK;
Dr Andrea Frische, WOCE/IPO, Germany.

The Conference

The 1998 WOCE Conference "Ocean Circulation and Climate" marks the end of the observational phase and looks towards the challenges of WOCE AIMS. It will be WOCE's first global meeting since the 1987 Planning Conference in Paris.



It will provide an opportunity for scientists who have been involved in the observational and modelling activities to display the progress made towards the programme's objectives and to highlight the intellectual challenges that remain to derive maximum benefit from the

enormous investment already made in WOCE.

It is planned to issue the first set of WOCE data CD-ROMs to conference participants.

The conference is sponsored through the WCRP by the World Meteorological Organization, the Intergovernmental Oceanographic Commission, the International Council for Scientific Unions and the Scientific Committee on Oceanic Research. It will be organized in association with the Canadian Meteorological and Oceanographic Society and the Department of Fisheries and Oceans.

Conference Structure

Registration will commence on Sunday, 24th May 1998. In order to provide the greatest opportunity for interaction between the scientists with varying interest there will be no parallel sessions. Each day will have a particular theme relating to the overall objectives of WOCE:

- WOCE Overview - its Origins, Technologies and Issues;
- The Large-Scale Heat, Freshwater, Carbon and Momentum Fluxes;
- The Global Flow Field;
- Formation and Circulation of Water Masses;
- The Future.

A series of invited plenary lectures will be given in the mornings. Afternoons will be dedicated to posters. Posters will, as far as possible, be related to the daily themes and will be available for viewing throughout each day. The list of plenary session speakers will be published in the second announcement to be issued in August 1997.

Poster submissions

The call for poster presentations will be made in August 1997 with a submission deadline of February 1998. A book of poster abstracts will be produced prior to the meeting.

Venue

The Conference will be held in the Halifax World Trade and Convention Centre located in the centre of Halifax, the capital of Nova Scotia. It is within easy reach of hotels, shops, restaurants and local transportation. It is close to various historical sites and to the Halifax waterfront.

Accommodation

A block of rooms is being held in three business class hotels linked to the Conference Centre by enclosed pedways. Other accommodation options will range from luxury hotels to university dormitories.

Registration

Completion of the registration form found on the WOCE Conference WWW Page

<http://www.soc.soton.ac.uk/OTHERS/woceipo/wconf>

will ensure that you receive the second circular (to be issued in August 1997) containing details of the plenary lectures, poster submission and accommodation options.

Travel Support

Limited funding will be available to support the participation of students presently or planning to be involved in WOCE research and to scientists from countries with emerging economies. An indication of whether you may require support should be made at the time of initial registration.

Sponsorship

The organizers welcome financial sponsorship of the conference. This could be in the form of sponsorship of specific events such as receptions and coffee breaks or could be used to reduce the planned conference registration fee or to fund travel grants. The Director of the WOCE Project Office would be happy to discuss any offers of sponsorship.

News from CMOS 1998 Annual Congress

The LAC for the 1998 congress has been looking at potential sites. The choice for a University was restricted as St Mary's was unavailable because of their building program and Dalhousie University is not recommended by recent users - this leaves Mount St. Vincent.

The LAC prefers the facilities at the more centrally located Holiday Inn/Convention Centre in Dartmouth (near the old bridge to Halifax). The attached information sheet

compares the two sites. The rooms at the Inn are \$89 - but up to four persons per room. We need to use 100 rooms to get a good price on the convention centre. Does anyone foresee problem with room cost that might make the use of the Mount more appropriate? Please provide your comments to:

Clive Mason
Bedford Institute of Oceanography
c_mason@bionet.bio.dfo.ca

Don Lawrence.
Bedford Institute of Oceanography

Summary of estimated cost (no tax included)

| CMOS Costs in \$ | Inn | Mount |
|---------------------------------|--------------------|--------------------|
| Rooms | 89.00 | 24.00 |
| Parking | 0.00 | 4.00 |
| Meeting (4 day cost) | 2,000 ¹ | 4,156 ¹ |
| AV (5 rooms) | 2,340 | 1,140 |
| Approx. Totals | 4,340 | 5,296 |
| Buffet Lunch | 10.95 | 10.15 |
| Formal Lunch | 14.95 | 9.90 |
| Banquet | 23.95 | 21.45 |
| Coffee | 1.50 | 1.00 |

1: Cost includes Exhibit, Lounge, rooms for AGM + committees;
Also note that both sites are licenced for alcohol.

Notes: Majority of Mount rooms will be singles, corridor pay phone, shared lavatory, 5 minute walk to meeting area. Nearby motels are available but taxi or car required to get to convention site. Inn rooms have phone, attached lavatory, twin or single beds. If delegates wish to share a room cost will be \$45 each - better value than Mount (\$24 each). Three students can share a room for \$30 each. Rooms, meals and convention centre are all in the same building. Inn provides one free room for each 50 rooms rented; for 100 rooms we also get a hospitality suite (30 people). Buses to Halifax from Inn are frequent; at Mount every hour in the evening. Inn is about 15 minute walk from Halifax ferry. Management of conference facilities will be better at the Inn - more experienced and better equipped.

**ANNOUNCEMENT of the OCEANS'97
CONFERENCE
WORLD TRADE and CONVENTION
CENTRE
HALIFAX, NOVA SCOTIA, CANADA**

6th - 9th October 1997

Oceans'97 is an international conference sponsored by IEEE/MTS. The emphasis in the technical program is on ocean applications of technology. The conference is being held from Oct. 6th - 9th at the World Trade and Convention Centre In Halifax, Nova Scotia, Canada, and the abstract deadline is fast approaching.

Abstracts are still being accepted in all topic areas, many of which are of direct interest to InterRidge participants. Extra emphasis is currently given for abstracts on technologies related to:

1. Air/Sea Interaction
2. Oceanographic Instrumentation
Sediment Measurement
Novel Instruments/Sensors
Optical Instruments General
3. Polar and Severe Environments Instrumentation
4. Satellite/Airborne Remote Sensing
SAR Ocean Observations
Radar Modelling, Analysis and Simulation
HF Radar Observations: Currents & Winds
Satellite Scatterometer Measurement of Sea Surface Winds
Optical Observations of Marine Ecology and Constituents
5. Active/Passive Remote Sensing
6. Water Current Measurements
State of Current Measurement Systems
Performance of ADCP's
Turbulence/Bottom Sensors
New Developments
Surface Drifters
7. Wave and Tide Sensors
8. Real Time Observations
9. Geophysical Monitoring
10. In-situ Measurement
11. Data from Refurbished Sensors

If you wish to submit an abstract in any of these topics, please send it as quickly as possible to:

d_mckeown@bionet.bio.ns.ca
<http://www.seimac.com/oceans97/>

CALL for PAPERS

**First International Conference on Fog and
Fog Collection**

The First International Conference on Fog and Fog Collection will be held at the Westin Bayshore Hotel in Vancouver, Canada, 19-24 July 1998. The conference will examine the role of fog in science (physics, chemistry, meteorology), sustainable forestry and development.

Papers are invited on the physics and chemistry of fog, the capture and use of fog water by vegetation, the importance of fog water to ground water supplies, the forecasting of fog, the managed use of fog water in fog collection projects and the role of international institutions in developing the use of fog as a water supply for the next century. The conference will also include a special one-day symposium on a European Union sponsored fog collection project, which is focussed on the reforestation of the coastal desert of southern Peru.

Short abstracts of papers must be received by the Conference Secretariat by 1 September 1997 at the address given below. They should be a maximum of 300 words, on 8 ½" x 11" paper, double spaced, with 1" margins. The short abstracts will be peer reviewed and the authors notified of acceptance by 1 November 1997. The abstracts should have a title in bold, followed by the author's name and affiliation. Further details can be found on the conference homepage:

<http://www.tor.ec.gc.ca/armp/Events/html>

Extended abstract due 1 March 1998.

Please see the homepage address given above for answers to most queries and for electronic copies of the First and Second Conference Announcements. You may also write to:

Dr. Robert S. Schemenauer
Conference on Fog and Fog Collection
P.O. Box 81541, 1057 Steeles Avenue West, North York,
Ontario M2R 2X1, Canada
Fax : (416) 739-4211
e-mail: robert.schemenauer@ec.gc.ca

HEAR YE! HEAR YE! HEAR YE!

To celebrate its 25th anniversary, the *CMOS Bulletin SCMO* will produce a special issue in December 1997. The selected theme is **Climate Change**. The "1995 Intergovernmental Panel on Climate Change final report" concluded that the balance of evidence indicates that there is a discernible human interference on global climate. Therefore, this theme has been selected because of its popularity in today's scientific debate and its fame in various discussions among scientists and the general public. In Canada, climate change could have an impact on:

- 1) Agriculture;
- 2) Coastal Sea Levels and Flooding;
- 3) Energy Supply;
- 4) Forests;
- 5) Fresh Water Resource Supply;
- 6) Marine Fisheries;
- 7) Recreation & tourism (Socio-economic);
- 8) Snow and Ice.

The *CMOS Bulletin SCMO* Editorial Board will accept articles (non-referee) on **Climate Change** and on its potential impacts to be included in its next December issue. Send your contribution to the Editor at the earliest. Be part of the celebration!

Paul-André Bolduc
CMOS Bulletin SCMO Editor

Order of Canada for Jim Bruce

As this issue of the Bulletin goes to press we have just learned that our member Jim Bruce has been appointed an Officer of the Order of Canada. This honour comes soon after he was named as a specially appointed member of the Royal Society of Canada. Congratulations again Jim from all CMOS members.

OYEZ! OYEZ! OYEZ!

Pour célébrer son 25^{ième} anniversaire, le *CMOS Bulletin SCMO* publiera un numéro spécial en décembre 1997. Le thème choisi est le **Changement climatique**. Le "rapport final de 1995 du Panel intergouvernemental sur le changement climatique" a conclu qu'ils y avaient des évidences de l'influence humaine sur le changement climatique. C'est pourquoi ce thème a été choisi à cause de sa popularité dans le débat scientifique et sa renommée dans les discussions entre les scientifiques et le public en général. Au Canada, le changement climatique peut avoir des impacts sur:

- 1) Agriculture;
- 2) Approvisionnement en eau douce;
- 3) Approvisionnement en énergie;
- 4) Forêts;
- 5) Neige et glace;
- 6) Niveaux de la mer et inondation des côtes;
- 7) Pêcheries maritimes;
- 8) Récréation et tourisme (Socio-économique).

Le comité éditorial du *CMOS Bulletin SCMO* acceptera des articles (sans révision) sur le **changement climatique** et ses impacts potentiels pour être inclus dans le prochain numéro du mois de décembre. Faites parvenir votre contribution au Rédacteur le plus tôt possible. Soyez de la fête!

Paul-André Bolduc,
Editor / Rédacteur, CMOS Bulletin SCMO
Marine Environmental Data Service
1202-200 Kent Street
Ottawa, Ontario Canada K1A 0E6
Tel: (613) 990-0231; Fax: (613) 993-4658
e-mail: bolduc@ottmed.meds.dfo.ca

Our apologies

John Walmsley, AES, Downsview, ON and Theodore Fathauer, Fairbanks, Alaska, US, should have been listed as Corporate and Sustaining Members in the last issue of the CMOS Annual Review. Both, have been sustaining members for many years and CMOS is thankful for their valuable contributions to our Society.

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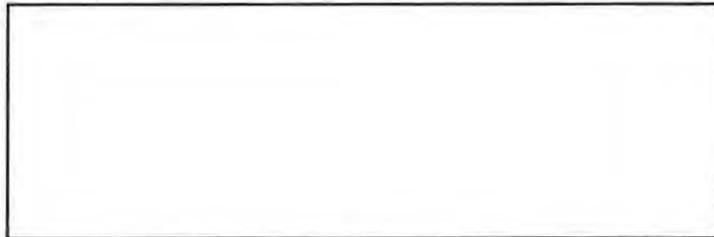


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