



Canadian Meteorological
and Oceanographic
Society

La Société canadienne
de météorologie et
d'océanographie

C.M.O.S. NEWSLETTER/NOUVELLES S.C.M.O.

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VOL. 19 NO. 1

NEWS FROM HEADQUARTERS

During its January meeting the National Executive reviewed the Society's finances for 1990 and found them satisfactory. With the help of increased membership fees, the Society will be able to employ a part-time accountant to help with the GST and other financial matters, and to take, at last, steps to re-design and enlarge the CMOS Newsletter.

The re-designed Newsletter will contain, in addition to its usual contents of Society information, news from Centres, from Committees, from SIGs and from other activities such as WOCE and CASP, and also "Chinook" type articles. With Volume 11, No. 4, that publication, ably edited by Hans VanLeeuwen, has ceased to appear; we are inviting subscribers who are not yet members to join the Society so that they can continue reading articles of interest to them and participate in other Society activities.

Among these activities is the annual CMOS/AES/DFO lecture tour. This year's lecturer will be the well-known oceanographer Dr. Mohamed El-Sabh (University of Quebec in Rimouski) who will talk on a subject connected with the International Decade on Natural Disaster Reduction. He is the President of an International Society dealing with this matter.

The Executive Director

P.S. HAVE YOU RENEWED YOUR MEMBERSHIP? IF NOT, PLEASE DO SO AT ONCE OR YOU WILL CEASE RECEIVING YOUR NEWSLETTER. SHOULD YOU NOT HAVE RECEIVED OR MISLAID YOUR RENEWAL NOTICE, USE THE MEMBERSHIP APPLICATION FORM ON THE LAST INSIDE PAGE OF THIS NEWSLETTER, INDICATING ON IT "RENEWAL".

(see page 8)

NOUVELLES DU QUARTIER GÉNÉRAL

À la réunion de janvier, l'Exécutif national a révisé avec satisfaction les finances de la Société pour l'année 1990. À l'aide de l'augmentation des frais d'inscription, la Société sera en mesure de financer l'emploi à temps partiel d'un comptable qui s'occupera de la TPS et autres questions financières et d'élaborer enfin de nouvelles ébauches élargies du bulletin Nouvelles de la SCMO.

La nouvelle ébauche du bulletin Nouvelles contiendra des articles du même type paraissant actuellement dans le "Chinook" en plus de son contenu habituel d'information de la Société, des nouvelles de ses Centres, de ses comités, de ses groupes d'intérêts et d'autres activités tels que le WOCE et le CASP. Avec le Volume 11, No. 4, cette publication, éditée par le talentueux Hans VanLeeuwen, a cessé de paraître; nous invitons ses abonnés, qui ne sont pas déjà membres de la Société, à se joindre à nous pour continuer de lire les articles qui les intéressent et de participer aux autres activités de la Société.

Parmi ces activités, il y a les conférences annuelles tenues conjointement par la SCMO, le Service de l'Environnement Atmosphérique, et le Ministère des Pêches et Océans. Le conférencier de cette année est l'océanographe bien connu, le Dr. Mohammed El-Sabh (Université du Québec à Rimouski) qui nous parlera de sujets reliés à la Décennie internationale sur la réduction des désastres naturels. Il est le président de la société internationale qui s'occupe de ces problèmes.

Votre directeur exécutif

Avez-vous renouvelé votre inscription à la SCMO? Sinon, prière de le faire très bientôt car vous pourrez cesser de recevoir votre bulletin Nouvelles. Si vous n'avez pas reçu ou si avez égaré votre avis, utilisez le formulaire d'application qui se trouve à la dernière page intérieure de ce bulletin Nouvelles en y indiquant "RENOUVELLEMENT".

(voir page 8)

WOCE NEWS

THE WOCE SURFACE VELOCITY PROGRAM

by Paul H. LeBlond

The University of British Columbia, Vancouver, B.C.

The Canadian contribution to the WOCE Surface Velocity Program (SVP) consists in the deployment, tracking and analysis of the paths of satellite-tracked Algonkian drifters in the North Pacific ocean. The drifters used are of the design tested by P. Niiler (Scripps Institute of Oceanography, A030, La Jolla, CA 92093, USA) to avoid wind effects by maximizing the drag ratio. The drag elements are holey socks; the drifters are equipped with a temperature sensor and a submergence switch. The performance of the drifters has also been tested in heavy weather conditions. [Specific plans for their construction may be obtained from P. Niiler at Scripps or from the Canadian WOCE office: E. Traczynski, Department of Oceanography, University of British Columbia, Vancouver, B.C., V6T 1W5.]

In addition to contributing to mapping ocean surface velocity fields on a 500 km scale, Canadian drifter studies also intend to provide better documentation of the Alaskan Gyre, its variability and its eddies, as well as of the Alaskan Stream and its re-circulation. The program is led by Paul LeBlond (Univ. of B.C., Oceanography) in collaboration with Rick Thomson (Inst. Ocean Sciences, Sidney, B.C.), David Krauel (Royal Roads Military College, Victoria, B.C.), Gordon Swaters (Dept. Mathematics, Univ. Alberta, Edmonton) and Bill Large (NCAR, Boulder, Colorado).

Three deployments have already taken place. The first deployment, in August 1990, included 7 shallow (drogue centre at 15 m depth) and 2 deep-drogued (100 m) drifters, which were launched along the way to and near Station P (50°N, 145°W). A second deployment was arranged on a cruise of the Soviet vessel Akad. Vinogradov, returning to Vladivostok from Vancouver in early November 1990. Three shallow drifters were launched in the Kamtchaka current. The third set of drifters was put on the Alpha Helix during its refit in Tacoma and launched in the Alaskan Stream by Tom Royer during a cruise out of Seward in early December 1990. All drifters but one (which went aground in Hecate Strait) are reporting as of January 10, 1991. Positions and paths will be made available on a regular basis to Canadian and international WOCE investigators; some results will also be reported in this column.

CANADA/SOVIET OCEANOGRAPHERS AND MARINE

METEOROLOGISTS MEET IN ODESSA

by R. Allyn Clarke

Bedford Institute of Oceanography, Dartmouth, N.S.

Six Canadian oceanographers and meteorologists from the Bedford Institute of Oceanography, and from Dalhousie and Memorial universities travelled to Odessa and Moscow during

the week of November 19-23, 1990, to join their Soviet colleagues from both the State Oceanographic Institute and the Shirshov Institute of Oceanology in discussing possible joint work in the waters east of the Grand Banks in support of WOCE. Both nations have worked extensively, yet independently, in this region throughout the 1980s. The previous workshop in Halifax in April 1990 and this workshop in the Soviet Union had a principal goal of introducing each other to the results and the scientific ideas that resulted from that work in order to create a firm basis for joint work in the context of a WOCE Core Project 3 control volume experiment in the period 1993-1995.

The Soviets have been studying this region within their SECTIONS program because it is a region of large air-sea heat and moisture flux and also of large interannual changes. They believe that understanding these changes will help them make long-term predictions of climatic conditions in some of their principal agricultural regions. Their research has focused on describing the oceanic variability in this region and understanding how that variability might change atmospheric conditions over the Northwest Atlantic and hence the northern hemisphere.

A number of ocean currents come together, split and recirculate in this region. Here the Gulf Stream splits into a branch that recirculates to the south and one that continues northeastward as the North Atlantic Current. The Labrador Current also splits at the Tail of the Banks with the larger part turning offshore to feed into the North Atlantic Current and about 20% continuing westward along the edge of the Newfoundland shelves. Canadian research has focused on the processes controlling these splittings and hence the oceanographic variability seen in this region. It is because of this interaction between the subpolar and subtropical gyres of the North Atlantic that this region was chosen as one of the WOCE Core Project 3 Control Volume sites.

During the workshop, steps were taken to coordinate planned cruises by both Canadian and Soviet vessels in this region during 1991/92. In April/May, 1991, Hudson will meet the Soviet vessel Musson at sea for a 1-2 day period of simultaneous measurements in order to intercalibrate our measurement techniques. The State Oceanographic Institute is very interested in upgrading their observational techniques in order to achieve the accuracies required for WOCE. Hudson will be evaluating new deep sea CTD instruments in preparation for purchases in 1992; two Soviet technical experts have been invited to join the cruise to gain technical experience both from this evaluation and our normal deep sea CTD and tracer operations.

The two cruises will also provide a new look at the relationship between the splitting of the current systems off the Tail of the Banks and the larger scale circulation of the waters of the northwest Atlantic. The analysis of this data and that collected over the last decade will allow us to design a joint observing strategy for this region in the context of the planned WOCE North Atlantic Gyre Experiment scheduled for 1993-1995. In fact, planned

WOCE NEWS (Continued)

cruises by both the UK and USA also during the spring of 1991 will provide a mapping of the entire North Atlantic from 40 to 60°N at a station density not achieved since the ICES sponsored Polar Front Survey of 1958.

We also began to coordinate Soviet ship plans for the fall and winter of 1991/92 with Canadian plans to study storm development (CASP II), short-term sea ice movement, surface wind (ERS-1 scatterometer validation) and the variability of the Labrador Current on the Grand Banks. Soviet vessels have been requested to extend some of their oceanographic sections up onto the Grand Banks in order to tie the inshore and offshore conditions together. The Soviet vessels' more extensive meteorological measurements, including upper air soundings, will provide a better description of the atmosphere over the entire region and assist WOCE to estimate the atmospheric forcing field with greater confidence in this important region of the North Atlantic Circulation.

As the result of discussions carried out both within and outside of these two workshops, a number of joint analysis and modelling exercises have been initiated between Canadian and Soviet scientists on a variety of oceanographic and meteorological problems. Two Soviet scientists will be visiting BIO for two months in the spring of 1991 to work with us on the assimilation of physical oceanographic data using simple dynamical ocean models. We also have developed contacts that may bring Soviet students into Canadian university graduate programs in the coming years. This collaboration will continue with meetings at least annually either in the Soviet Union or in Canada and an eventual joint program in the Newfoundland Basin in 1993 to 1995.

NUMERICAL MODELLING

by William W. Hsieh

The University of British Columbia, Vancouver, B.C.

The development of a global ocean model based on the GFDL MOM (Modular Ocean Model, the latest version of the Brayn-Cox-Semtner model) is being undertaken by Warren Lee and William Hsieh in collaboration with scientists from George Boer's group at CCC (Canadian Climate Centre) and with Josef Cherniawsky and Greg Holloway at IOS. This 15-level primitive equation model with sea ice has a T32 horizontal grid identical to that used in the CCC AGCM (Atmospheric General Circulation Model), as future coupling of the two models for climate simulation is planned.

After having modified the CCC sea-ice model to include ice advection, Josef Cherniawsky incorporated the ice model in a simulation of the climatological seasonal cycle in the Bering and Okhotsk Seas using the NPAL (North Pacific Active Layer) Model developed earlier by Cherniawsky and Holloway. A preliminary experiment showed first an appearance of

sea-ice in the sea of Okhotsk towards the end of December, with maximum ice mass in the middle of January, then another maximum in the western Bering Sea in February.

Julie Pietrzak and William Hsieh have started on the assimilation of sea surface temperature (SST) data into numerical ocean models. This is a follow-up on the work by Anthony Weaver and W. Hsieh where SST from a reference model run was injected into an imperfect primitive equation ocean model. While the assimilation of SST did drive the imperfect model towards the reference model, there were numerous undesirable side-effects, such as an unrealistic deepening of the mixed layer, and a net cooling of the ocean model. A search for a better assimilation scheme with reduced side-effects is underway.

THE LABRADOR SEA LINE - July 1990

by John Lazier

Bedford Institute of Oceanography, Dartmouth, Nova Scotia

As reported in the previous issue of WOCE News, the WOCE Labrador Sea Line AR7W was completed for the first time between June 29 and July 11, 1990 from the Canadian Survey Ship Dawson. Figure 1 shows station positions.

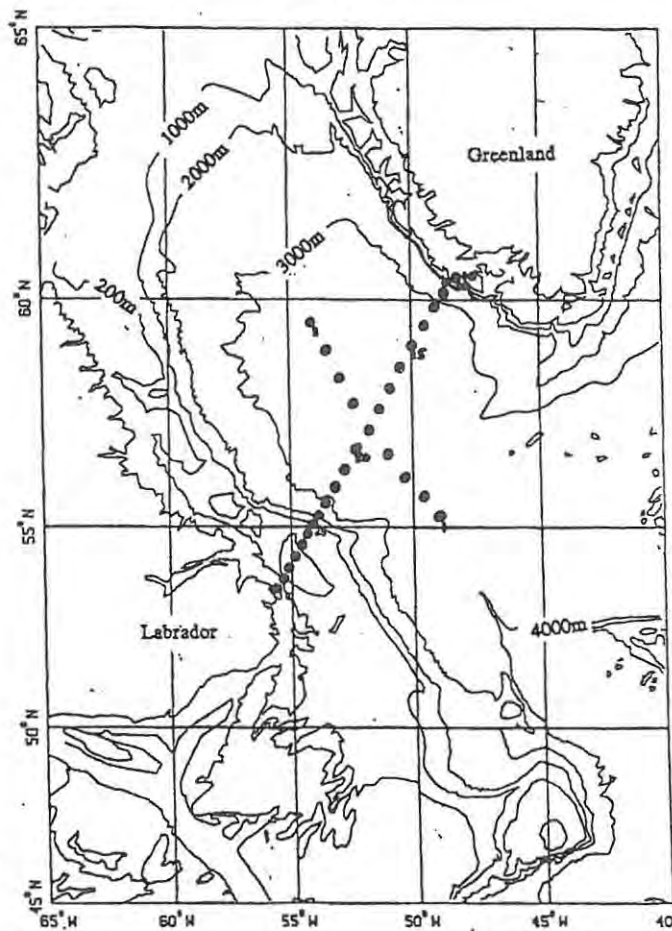


Figure 1: Positions of CTD stations occupied June 29 to July 11, 1990 (Stations 10 to 31 make up the WOCE AR7W line).

WOCE NEWS (Continued)

Initial analyses indicate that the temperature of the Denmark Strait Overflow Water (DSOW) has dropped back to the values observed between 1981 and 1985, while the chlorofluorocarbon (CFC) values throughout the water column appear to be about the same as observed in 1986, except for an increase of 0.5 to 1.0 pmol.kg^{-1} at $\sigma_\theta = 27.75$ to 27.77. Measurements of carbon tetrachloride (CCl_4) were obtained for the first time in the region. The DSOW flows along the bottom of the ocean from Denmark Strait, around Greenland and into the Labrador Sea. It has its greatest influence at σ_2 values between 37.08 and 37.16 kg.m^{-3} ($27.88 < \sigma_\theta < 27.92 \text{ kg.m}^{-3}$; $3300 < p < 3500 \text{ db}$) and, at the latter, the temperature is now back to the 1981-85 value of 1.3°C , down 0.15°C from the 1986-89 value. DSOW is distinguished from North Atlantic Deep Water (NADW), which lies above it, by lower temperatures and salinities. The available historical data in the western Labrador Sea indicates that the θ - S properties of these two water masses have changed between 1962 and 1986 but that the changes are much greater in the DSOW. An extension of this analysis for the $\sigma_2 = 37.16 \text{ kg.m}^{-3}$ surface (Figure 2) begins in 1962 when the temperature was 1.5°C . It rose through the 1960s to between 1.6 and 1.7°C then declined through the 1970s to its low of 1.32°C in 1981. This temperature remained more or less constant until 1985 when it suddenly rose to approximately 1.45°C in 1986 where it remained until this year's drop.

The causes of these fluctuations are most likely to be found in the surface waters north of Denmark Strait where the DSOW originates. Recent contact with the atmosphere in this region is suggested by the high oxygen and CFC values ($\text{O}_2 > 6.2 \text{ ml.l}^{-1}$, $\text{CCl}_3\text{F} > 3.0 \text{ pmol.kg}^{-1}$) and by the relatively high speed of the overflow water (0.2 m.s^{-1}), moving water from Denmark Strait to the western Labrador Sea in about 100 days.

The recent drop in temperature could reflect an increase in the heat loss in the Greenland or Norwegian Seas but because the density of the DSOW remains constant from year to year a decrease in temperature must be accompanied by a decrease in salinity. Salinity loss would result from an increase in the addition of fresh water through more precipitation or ice melt, or by changes in the composition of the source waters caused by shifts in the wind patterns. If such connections can be established, variations in the properties of the DSOW at the bottom of the Labrador Sea may prove to be an easily measured indicator of the variations in the meteorological conditions over the Greenland and Norwegian Seas.

Profiles of chlorofluorocarbons are shown in Figure 3. There is no indication of changes in CFC-11 concentrations in the deeper water masses between 1986 and 1990. This constancy contrasts with the changes in temperature and salinity observed in the DSOW and suggests that the rate of air-sea exchange of CFC-11 in the formation region is independent of temperature and salinity.

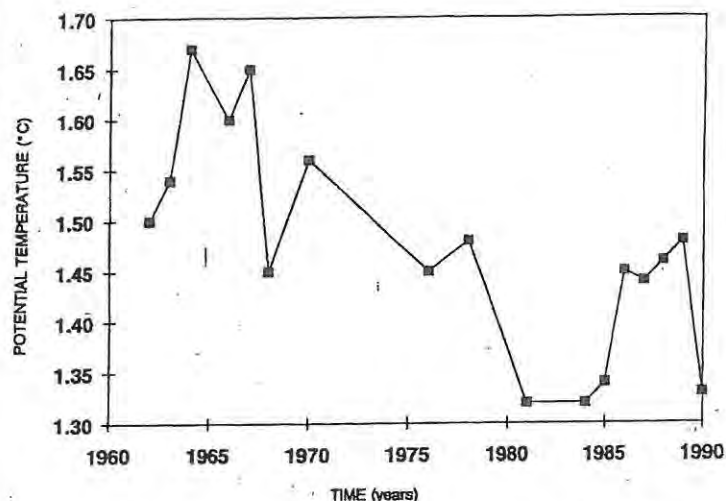


Figure 2: Potential temperature on the $\sigma_2 = 37.16 \text{ kg.m}^{-3}$ between 1962 and 1990. Data obtained in the western central Labrador Sea by various investigators with the final observation from the present cruise.

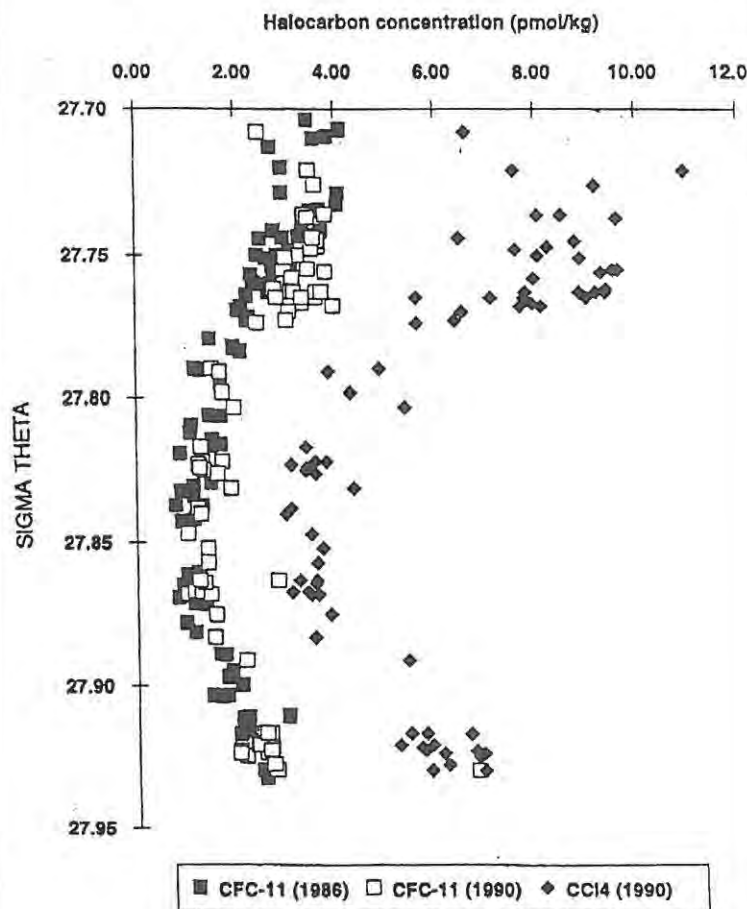


Figure 3: Observations of CFC-11 in 1986 and 1990 and CCl_4 in 1990 plotted against σ_θ .

CANADIAN COMMISSION FOR UNESCO

In May 1990, the Canadian Commission for Unesco formed a Programme Committee for Science whose job it is to advise the Canadian Commission (and the Canadian Delegation to the biennial Unesco General Conference) as to Canadian views on science in general and Unesco science initiatives in particular.

Unesco, in conjunction with other bodies, has either initiated or provides support for such organizations of programmes as the Man and the Biosphere programme (MAB), the Intergovernmental Oceanographic Commission (IOC), the International Geological Correlation Programme (IGCP) and the International Hydrological Programme (IHP). While these initiatives tend to focus on the applied rather than the basic aspects of science, at the Unesco General Conference in November 1989 there was a re-affirmation of the importance of Unesco's role in basic science, particularly in the field of education.

An important aspect of the committee's work will be to prepare the brief for the Canadian delegation to the Unesco General Conference in 1991. To do this, it is important that they receive input from as wide a cross-section of the scientific community in Canada as possible. Please direct any input that you may wish to have to:

Professor A.J. Naldrett,
Chairman, Natural Sciences Programme Committee
Department of Geology
University of Toronto
Toronto, Ontario M5S 1A1

Telephone (B): (416) 978-3030
Telephone (H): (416) 260-0631
Facsimile: (416) 978-3938

AWARDS FOR BUSINESS EXCELLENCE

OUTSTANDING ACHIEVEMENT is the theme of the 1991 Canada Awards for Business Excellence competition. Now in its eighth year, this awards program recognizes excellence in eight categories: Entrepreneurship, Environment, Industrial Design, Innovation, Invention, Marketing, Quality and Small Business. Each category is judged by a panel of private sector experts selected from the business, industry, or academic sectors. Their decisions are final. The awards will be presented at a prestigious banquet to be held in Ottawa, October 30. The award winners are the subject of a national advertising, public relations and media campaign.

Entries must be submitted no later than close of business April 12, 1991. To obtain your entry guide, contact: Canada Awards for Business Excellence, Industry, Science and Technology Canada, 235 Queen Street, Ottawa, Ontario K1A 0H5 (Tel: (613) 954-4079; Fax: (613) 954-4074).

Joint Global Ocean Flux Study

The Joint Global Ocean Flux Study (JGOFS), organized by the Scientific Committee on Oceanic Research (SCOR) under the auspices of the International Council of Scientific Unions (ICSU), will undertake a decade-long research program into ocean biogeochemical cycles in order to provide some of the basic knowledge required for understanding the role of the ocean in the global carbon cycle and climate change. An international scientific committee, with a Secretariat at the Institut für Meereskunde, Kiel, FRG, is responsible for formulating the principal goals and rationale of the program and for recommending the methodology to be adopted by the international participants.

There are currently three Canadian members of the committee (Steve Calvert (UBC)), Ken Denman (IOS, Sidney, BC) and Trevor Platt (BIO, Dartmouth, NS). Trevor Platt has become the new Chairman, with effect from January 1, 1991, replacing Bernt Zeitzschel from Kiel. There have so far been five annual meetings of the committee, the last one being in Washington, D.C. on November 29-30, 1990. The next meeting will be in the Fall, 1991, probably in U.K.

A SCOR Science Plan has recently been published (copies can be obtained from Elizabeth Tidmarsh, Executive Secretary of SCOR, Department of Oceanography, Dalhousie University, Halifax, NS B3H 4J1). The next major task is the preparation of an Implementation Plan, and a series of Task Teams has been created to carry this out.

A Canadian Committee for JGOFS was formed by CNC-SCOR in 1987 (Trevor Platt and Steve Calvert (Co-Chairmen), Ken Denman, Ken Mann (BIO), Alain Vézina (UQAR) and C.S. Wong (IOS)). A planning meeting was held at McGill University in October, 1989 (copies can be obtained from Steve Calvert, Dept. of Oceanography, UBC, Vancouver, BC V6T 1W5). A collaborative research proposal, containing detailed descriptions of the research programs presently underway by DFO scientists and those proposed by government and university scientists, has recently been submitted by NSERC for funding. This will provide support for the university participants in the cooperative Canadian program for an initial 5 years. It is proposed that a total of 67 researchers will work as teams on 26 topics concerned with gas exchange at the sea surface, transports and transformations of carbon in the ocean, and the burial of carbon on the sea floor.

NEW CMOS MEMBERS

These new members were approved January 11, 1991:

Mme Marie-France Geraud (regular)	Montreal
Mr. Roland Grosh (regular)	United States

These new members were approved February 8, 1991:

Mr. Dennis M. Nazarenko (regular)	Ottawa
Mr. William J. Laidlaw (regular)	Thunder Bay

XXV ANNUAL CMOS CONGRESS

25^e Congrès annuel de la SCMO

The 25th Congress of the Canadian Meteorological and Oceanographic Society (CMOS) will be held this year in Winnipeg, Manitoba, June 3-7, at the Delta Winnipeg hotel. This year's Congress theme is "Northern Meteorology and Oceanography". Speakers have been invited to present talks during the plenary sessions, in a number of areas relating to the Congress theme. The Scientific Program Committee, under the chairmanship of Rick Lawford of the National Hydrological Institute in Saskatoon, has invited Dr. V. Alexander, Dr. K. Aagaard, Dr. J. Walsh, Dr. E. Rasmusson, Dr. L. Mysak, Dr. T. Prowse and Dr. Jean-Pierre Blanchet. An invitation has been issued to Ms. E. Dowdeswell of the Atmospheric Environment Service to address the Congress. As well, an invitation has been issued to the Leningrad Arctic Research Institute to send a speaker.

Special Sessions

In addition to the theme sessions in meteorology and oceanography, the scientific committee has planned special sessions on Mesoscale Meteorology on the Canadian Prairies, Applications of Chaos Theory in Meteorology and Oceanography, WOCE, GEWEX, Ice, Hydrology of the North, Remote Sensing, Fisheries and Biological Oceanography, and Finite Element Modelling in Oceanography and Limnology.

Transportation

The official airline of the Congress is Air Canada. They are offering a special Congress rate to registrants, amounting to 15 percent off the regular fare. We will also get one complimentary ticket for every 30 tickets bought. When making arrangements please ensure that your travel agent contacts Air Canada so that your ticket is registered under Event #CV9100578. Winnipeg International Airport is also served by other airlines; chief among which are Canadian Airlines and Northwest. From the airport it is about a \$12.00 cab fare to the Delta Winnipeg hotel. For those driving into Winnipeg, the Delta hotel has about 12 floors of parking within the building. This year the entire Congress will be held in this hotel, including special functions. The Delta Winnipeg is a relatively new 30 storey building in the centre of the city. It is connected through a network of all-weather walkways to other parts of the downtown core. For those so inclined, there are two major shopping centres that are connected by these walkways, along with numerous smaller facilities. These terminate in a concourse under the famed intersection of Portage and Main.

Student Assistance

Limited funds have been allocated within the budget to support student travel. Interested persons should indicate on registration form.

Le 25^e congrès annuel de la Société canadienne de météorologie et océanographie (SCMO) sera tenue cette année à Winnipeg, au Manitoba, du 3 au 7 juin à l'hôtel Delta. Le thème du congrès de cette année est: Météorologie et océanographie nordique. Des conférenciers ont été invités pour présenter des discussions, durant la session plénière, sur un nombre de sujets se référant au thème du congrès. Le comité des programmes scientifiques, sous la présidence de Rick Lawford de l'institut national d'hydrologie à Saskatoon, a invité les personnalités suivantes: Dr V. Alexander, Dr K. Aagaard, Dr J. Walsh, Dr E. Rasmusson, Dr L. Mysak, Dr T. Prowse et Dr Jean-Pierre Blanchet. Une invitation a été envoyée à Mme E. Dowdeswell de la Service de l'environnement atmosphérique pour prendre la parole au congrès. De plus, une invitation a été faite à l'Institut de Recherche nordique de Leningrad pour nous envoyer un conférencier.

Sessions spéciales

En plus du thème principal de météorologie et océanographie, le comité scientifique a planifié des sessions spéciales sur les thèmes suivants: la météorologie à méso-échelle des Prairies Canadiennes, les applications de la théorie du chaos en météorologie et océanographie, WOCE, GEWEX, la glace, l'hydrologie nordique, la télédétection, les pêches et l'océanographie biologique et l'application des modèles aux éléments finis en météorologie et en limnologie.

Transport

La ligne aérienne officielle du congrès est Air Canada. Cette compagnie offre présentement un rabais spécial pour le congrès. Le taux de réduction des billets est 15 pour cent. On aura aussi un billet gratuit pour chaque 30 billets achetés. Pour l'achat des billets, il est important que votre agent de voyage contacte Air Canada pour que votre billet soit enregistré sous le code #CV9100578. L'aéroport international de Winnipeg est aussi desservi par d'autres lignes aériennes principales comme Canadian International et Northwest Airlines. Il coûte environ 12.00\$ pour se rendre de l'aéroport à l'hôtel Delta par taxi. Pour ceux venant à Winnipeg par auto, l'hôtel Delta a un stationnement à 12 étages. Cette année tout le congrès sera tenu à l'hôtel Delta. Cet hôtel, dans le centre de Winnipeg, a 30 étages et est relativement nouveau. De l'hôtel on peut se rendre à d'autres édifices, au centre de la ville, par un réseau de passerelles surélevées à l'abri des intempéries. Pour ceux particulièrement intéressés, ce réseau connecte deux gros centres commerciaux avec d'autres plus petit magasins ou boutiques. Ce réseau mène au centre commercial principal à la célèbre intersection des avenues Portage et Main.

Aide aux étudiants

Des fonds supplémentaires ont été alloués dans le budget pour aider à défrayer le coût de voyage des étudiants. Ceux qui sont intéressés devront indiquer sur la demande d'inscription.

Social Events

Social Events have been planned for most evenings and spouses are encouraged to attend. The events include an Ice-Breaker on Monday evening, a Wine and Cheese on Tuesday evening, and the Annual Congress Banquet on Thursday evening. Tickets for these three events are included with the registration fees. A cash bar will be available for these events. A 25th Anniversary Luncheon will be held on Wednesday at noon with Mr. Morley Thomas as the guest speaker. Tickets will be available at the registration desk. Formal tours have not been planned, but brochures and information regarding attractions will be available at the desk and in the hotel lobby.

Registration

The pre-registration form is attached to this notice and must be received before 1 May 1991. Registration fees are \$110 for CMOS members before 1 May and \$130 after 1 May. The fees are \$55 for Emeritus members, \$50 for students, \$150 for non-members and \$600 for exhibitors.

Extra tickets for the banquet (\$40), Ice-Breaker (\$10) and Wine and Cheese (\$10) can be purchased at the registration desk.

Accommodation

We have reserved blocks of rooms at the Delta Hotel at the special rate of \$89.00 for this conference. We recommend that attendees stay here as there are benefits for CMOS and all the events are at the hotel. If the hotel should be fully booked there are other nearby hotels.

Commercial Exhibits

There will be space available for commercial exhibits during the Congress. Provision has been made to advertise in the abstract printing. We invite you to display your products or services and to sponsor coffee breaks or social events. Interested persons should contact Gerald Machnee at 204-983-8856 or Fax 204-983-0109 to request the application forms for exhibitors.

Special Meetings

All Committees, Special Interest Groups and Editorial Committees will hold their meetings on Monday 3 June 1991. Time and exact location of the meetings will be given in the Program to be distributed before the Congress. A meeting of Centre Chairpersons will also take place on the same day.

Notice to all Members

In accordance with By-Law 7(b), I am giving notice that the Annual General meeting of the Society will be held on

Événements sociaux

Des événements sociaux ont été planifiés pour occuper presque toutes les soirées. Les époux ou épouses sont invités. Le tout comprend une soirée d'introduction lundi soir, un vin et fromage mardi soir et le banquet annuel du congrès jeudi soir. Le prix des billets pour ces trois soirées est inclus avec les frais d'inscription. Un bar sera ouvert durant les trois soirées. Un dîner en l'honneur du 25^e anniversaire aura lieu mercredi midi. M. Morley Thomas sera l'orateur invité. Les billets seront disponibles au bureau d'inscription. Bien que des visites touristiques n'ont pas été organisées, des dépliants touristiques seront disponibles au bureau d'information et dans le hall de l'hôtel Delta.

Inscription

Le formulaire d'inscription de pré-enregistrement est fourni avec cette annonce et doit être reçu avant le 1^{er} mai 1991. Les frais d'inscription sont de 110.00 \$ pour les membres de la SCMO, si payés avant le 1^{er} mai 1991. Si non, les frais sont de 130.00 \$. Les frais sont de 55.00 \$ pour les membres honoraires, 50.00 \$ pour les étudiants, 150.00 \$ pour les non membres et 600.00 \$ pour les représentants de compagnies offrant des expositions. Des billets supplémentaires pour le banquet (40.00 \$), la soirée d'introduction (10.00 \$) et le vin et fromage (10.00 \$) peuvent être achetés au bureau d'inscription.

Logement

Nous avons réservé des groupes de chambres à l'hôtel Delta au taux spécial de 89.00 \$ pour le congrès. Nous recommandons que les invités logent à cet hôtel, vu que tout le congrès se déroulera là aussi. Dans l'éventualité qu'il n'y est plus de chambres disponibles, il y a d'autres hôtels près de l'hôtel Delta.

Expositions commerciales

Il y aura de la place disponible pour des expositions commerciales durant le congrès. Des dispositions ont été prises pour annoncer ces produits commerciaux dans le résumé du congrès. Nous vous invitons à exposer vos produits et services et à patronner les pauses café ou événements sociaux. Les personnes intéressées sont priées de contacter Gerald Machnee au numéro de téléphone (204)983-8856 ou par télécopie au (204)983-0109 pour obtenir des formulaires d'inscription pour les expositions commerciales.

Réunions spéciales

Tous les comités, groupes à intérêts spéciaux et comités éditoriaux tiendront des réunions le lundi 3 juin 1991. L'heure et le lieu des réunions seront donnés dans un programme diffusé avant le congrès. Les présidents d'organisation se réuniront le même jour.

Avis à tous les membres

Conformément au Règlement 7(b), je donne l'avis que l'Assemblée générale annuelle de la Société aura lieu au Delta Hotel à

Tuesday, June 4, 1991 at 8:00 p.m. at the Delta Hotel in Winnipeg, Manitoba. The meeting room will be posted at the registration desk. This meeting will include those items listed under By-Law 7(c):

1. To receive and consider the reports of Council, the auditor, the ballot counters, the Committees, the Centres, the Chapters, the Editorial Boards and the Special Interest Groups.
2. To approve the annual budget of the Society.
3. To establish the membership fees for the next calendar year.
4. To discuss and determine such other questions as may be proposed relating to the affairs of the Society.
5. To install new officers for the ensuing year.

The agenda for the Annual General Meeting will be published in the Annual Review which will be mailed to all members before the Annual General Meeting. In accordance with By-Law 10(e) of the Canadian Meteorological and Oceanographic Society, I am providing you with:

1. The list of members of the current Council.
2. A list of nominations for 1991/92 made by the Nominating Committee.
3. Notification that nominations for Council will be received in accordance with By-Law 10(d).

The Council for 1990/91 consists of:

President	Ms. N.B. Cutler
Vice-President	Dr. L.A. Hobson
Treasurer	Mr. B. de Lorenzis
Corresponding Secretary	Mr. H. Kagawa
Recording Secretary	Mr. W. Schertzer
Past President	Dr. Han-Ru Cho
Councillors-at-large	
Mr. B.D. Lawson, Dr. Kim Tai Tee, Mr. R. Leduc	

The nominations for Council for 1991/92 are:

President	Dr. L.A. Hobson
Vice-President	Mr. D. Krauel
Treasurer	Mr. S. Tabatha
Corresponding Secretary	Mr. D. Bancroft
Recording Secretary	Mr. H. Melling
Past President	Ms. N.B. Cutler

Howard Kagawa, Corresponding Secretary

NEWS FROM HEADQUARTERS

Other results of the January National Executive meeting:

- new invoicing procedures: in future, all invoices, bills (such as travel claims) as well as payments to CMOS should be sent to our Business Office (see address on back page);
- the CMOS Brochure is to be updated;
- the occasion of the 25th CMOS Congress is to be celebrated at a CMOS Luncheon during the Congress; the main speaker will be Morley Thomas, our Archivist.

Winnipeg, Manitoba, mardi, le 4 juin 1991 à 20:00 h. La salle de l'Assemblée sera affichée au kiosque d'inscription. Cette assemblée examinera les points contenus dans l'Article 7(c), qui sont:

1. L'acceptation et la prise de connaissance des rapports du conseil, des vérificateurs, des préposés au dénombrement des votes, des comités, des centres, des sections, des conseils de rédaction, et des groupes d'intérêts spéciaux.
2. L'acceptation du budget annuel de la Société.
3. La détermination des montants de la cotisation pour la prochaine année civile.
4. La discussion et la résolution de questions soulevées se rapportant aux affaires de la Société.
5. L'investiture des administrateurs pour la prochaine année.

L'ordre du jour pour l'Assemblée générale annuelle sera publié dans la Revue générale qui sera postée à tous les membres avant l'Assemblée générale annuelle. Selon les termes de l'Article 10(e) des Règlements de la Société canadienne de météorologie et d'océanographie, je vous fais parvenir:

1. La liste des membres du Conseil en cours.
2. La liste des mises en candidature pour 1991/92 telle que rédigée par le Comité des mises en candidature.
3. Notification que les mises en candidature pour le Conseil seront reçues selon les termes de l'Article 10(d).

Le Conseil pour 1990/91 se compose comme suit:

Président	Ms. N.B. Cutler
Vice-président	Dr. L.A. Hobson
Trésorier	Mr. B. de Lorenzis
Secrétaire-correspondant	Mr. H. Kagawa
Secrétaire d'assemblée	Mr. W. Schertzer
Président sortant	Dr. Han-Ru Cho
Conseillers	
Mr. B.D. Lawson, Dr. Kim Tai Tee, Mr. R. Leduc	

Mises en candidature pour le Conseil pour 1991/92:

Président	Dr. L.A. Hobson
Vice-président	M. D. Krauel
Trésorier	M. S. Tabatha
Secrétaire correspondant	M. D. Bancroft
Secrétaire d'assemblée	M. H. Melling
Président sortant	Ms. N.B. Cutler

Howard Kagawa, Secrétaire-correspondant

NOUVELLES DU QUARTIER GÉNÉRAL

Parmi les résultats de la réunion de l'Exécutif national de janvier:

- nouvelles procédures de facturation: à l'avenir, toutes factures, comptes (comme les réclamations de voyage) de même que les paiements à la SCMO doivent être envoyés à notre bureau d'affaires (voir l'adresse à la dernière page);
- la brochure de la SCMO doit être remise à jour;
- l'occasion du 25ième Congrès de la SCMO doit être célébrée à un dîner de la Société tenu durant le Congrès; le conférencier principal sera notre archiviste, Morley Thomas.

1991 CMOS Congress
June 3 - 7 1991
Winnipeg, Manitoba, Canada

Registration Form

Name: _____

Address: _____

City: _____

Province/State: _____

Country: _____ Postal Code/Zip: _____

Home Phone: _____ Business Phone: _____

FAX Phone: _____

Affiliation: _____

Please indicate the registration type below:

CMOS Member.....	\$110.00	[]
(late registration.....	\$130.00)	[]
Non-member.....	\$150.00	[]
Emeritus member.....	\$ 55.00	[]
Student.....	\$ 50.00	[]
One day pass.....	\$ 50.00	[]

Number of **extra** banquet tickets (\$40.00 per ticket) _____

Registration must be received by May 1, 1991

Make cheque payable to:

CMOS Congress 1991

Send to:
c/o Doris Quinn
471 Scotia Street
Winnipeg, MB
Canada
R2V 1X9

Congress Hotel:
The Delta Winnipeg
288 Portage Ave.
Winnipeg, MB
Canada
R3C 0B8
204-947-0410 FAX 204-947-1129
Rate: \$89.00 per night

NOTE: CMOS strongly encourages the participants to stay at The Delta Winnipeg as they are giving a special Conference rate to CMOS delegates.

Congrès de la SCMO 1991
Le 3 - 7 juin 1991
Winnipeg (Manitoba) Canada

Demande d'inscription

Nom: _____

Adresse: _____

Ville: _____

Province: _____

Pays: _____ Code postal: _____

Tél (maison): _____ Tél (bureau): _____

Télécopieur: _____

Affiliation: _____

Prière de détailler les activités désirées dans la liste suivante:

Membre du SCMO.....	110,00 \$	[]
(inscription tardive.....	130,00 \$	[]
Non-membre.....	150,00 \$	[]
Age d'or.....	55,00 \$	[]
Étudiant.....	50,00 \$	[]
Une journée.....	50,00 \$	[]

Billets supplémentaires pour banquet (40,00 \$ du billet) _____

Veuillez nous faire parvenir votre demande avant le 1er mai 1991.

Votre chèque doit être fait à l'ordre de:

Congrès de la SCMO 1991

Envoyer à:
a/s Doris Quinn
471, rue Scotia
Winnipeg (Manitoba)
Canada
R2V 1X9

L'hôtel du congrès:
Hôtel Delta
288, avenue Portage
Winnipeg (Manitoba)
Canada
R3C 0B8
204-947-0410 FAX: 204-947-1129
Taux: 89 \$ par jour

Note: La SCMO encourage fortement les membres du congrès de loger à l'hôtel Delta puisque un taux spécial leur est accordé.

**IMPORTANT NOTICE TO COMMITTEES,
SPECIAL INTEREST GROUPS, EDITORIAL
BOARDS, CENTRES AND CHAPTERS**

Reports on activities during 1990 were due February 15, 1991. If they have not yet been submitted they should be sent urgently to the Editor of the Annual Review, Mr. E. Truhlar, Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario (Tel: (416) 739-4713; Fax: (416) 739-4521) if possible in both English and French.

If Council approval of changes to Committee/Board memberships or terms of reference is required, they should be sent to the Corresponding Secretary at the same address, together with the names of candidates who have confirmed their willingness to serve.

1991 CMOS CONGRESS PRELIMINARY PROGRAM

This program for June 4-7, 1991, is highly tentative and intended to outline topics only.

Tuesday

Plenary Session: The Arctic and Its Climate (Long-Term & Short-Term Variability); The Hydrology of the North; Arctic Research in the USSR.

Concurrent Sessions: Fisheries/Biological Oceanography I; Ice in the Arctic Ocean; International Science Programs; International Science Programs; Finite Element Modelling in Oceanography and Limnology; ERICA.

Wednesday

Concurrent Sessions: Arctic Oceanography; Numerical Weather Prediction I; Remote Sensing Application I; Fisheries/Biological Oceanography II; Clouds and Radiation.

Oceanography Plenary: The Physical Features of Arctic Ocean; The Biology of the Arctic Ocean.

Concurrent Sessions: Numerical Weather Prediction II; Chaos and Fractals in Meteorology and Oceanography (after plenary only); Remote Sensing Applications II (after plenary only); Stratospheric Ozone; Fisheries/ Biological Oceanography III (after plenary only).

Thursday

Meteorology Plenary: Arctic Air Pollution; Polar Lows.

Concurrent Sessions: Snow and Northern Hydrology; Climate Change I; Upper Atmosphere Phenomena; Coastal and Estuarine Processes; Operational Meteorology; Large Scale Ocean Processes I; Climate Change II; Air Pollution and Boundary Layer Meteorology; Hudson Bay/James Bay Processes; Hydrology/Hydrometeorology.

Friday

Concurrent Sessions: Shelf Energy Project; Large Scale Ocean Processes II; Cloud Physics; Currents and Bottom Topography; Arctic Climatology; Radar Meteorology; Large Scale Ocean Process III.

**AVIS IMPORTANT AUX COMITÉS, GROUPES
D'INTÉRÊTS SPÉCIAUX, CONSEILS DE
RÉDACTION, CENTRES ET SECTIONS**

Les rapports sur les activités en 1990 étaient dus le 15 février 1991. S'ils ne sont pas encore soumis, il faut les envoyer immédiatement à l'éditeur de la Revue Annuelle. M. E. Truhlar, Service de l'Environnement atmosphérique, 4905 rue Dufferin, Downsview (Ontario) (Tél: (416) 739-4713; Fax: (416) 739-4521 si possible en anglais et en français.

S'il est nécessaire d'obtenir l'accord du Conseil concernant des changements de la composition des comités/conseil de rédaction ou des mandats, ces propositions doivent être envoyées au secrétaire-correspondant à la même adresse aussitôt que possible. Les propositions doivent inclure le nom des candidats qui ont consenti à servir.

CONFERENCE SPONSORSHIPS

In accordance with requests received, the following meetings will be co-sponsored by CMOS. Some dates are still tentative.

Canada/China International Mesoscale Workshop
June 8-11, 1991 Winnipeg, Manitoba

5th International Meeting on Statistical Climatology
June 22-26, 1991 Toronto, Ontario

5th International Conference on Precipitation Scavenging and Surface Exchange Processes
July 15-19, 1991 Richland, Washington

Canada/Japan Workshop on Fisheries Oceanography
Summer 1991 Vancouver, British Columbia

2nd WMO Operational Ice Remote Sensing Workshop
September 10-13, 1991 Ottawa, Ontario

Workshop on Oceanographic and Environmental Research on Howe Sound
October 1991 Vancouver, British Columbia

11th International Conference on Clouds and Precipitation
August 17-21, 1992 Montreal, Quebec

4th AES/CMOS Operational Meteorology Workshop
September 15-18, 1992 Whistler, British Columbia

3rd International Conference on School and Popular Meteorology and Oceanography Education
July 14-18, 1993 Toronto, Ontario

13th International Congress on Biometeorology
September 1993 Calgary, Alberta

EARTH AND OCEAN SCIENCES

University of Victoria, British Columbia

Applications are invited for at least two new faculty positions in a proposed School of Earth and Ocean Sciences. The research focus of the School will be on fundamental, transdisciplinary studies of earth system science; preference will be given to applicants with research interests in processes in modern and ancient earth systems, especially dealing with the lithosphere and hydrosphere. These appointments are part of a multi-year expansion program; rank of positions is open; starting date is July 1991. The School will combine existing faculty in earth/ocean science at UVic with new faculty and with adjuncts from nearby government and industry labs.

In accordance with Canadian Immigration and Employment regulations, this notice is directed in the first instance to Canadian citizens and permanent residents. The University of Victoria is committed to an employment equity program; women especially are encouraged to apply. Send inquiries or applications, with curriculum vitae and names of three referees to Dr. Chris R. Barnes, Director, Centre for Earth and Ocean Research, University of Victoria, P.O. Box 3055, Victoria, British Columbia V8W 3P6, Canada. Deadline for application is February 28, 1991, or until the positions are filled.

Graduate Assistantship Available

The Atmospheric Science Group of the Physics Department Université du Québec à Montréal is presently seeking qualified applicants to fill several graduate assistant positions. Students will pursue an MS or Ph.D. degree in micrometeorology/boundary layer research. Stipends are competitive and vary between \$8,000 to \$13,000 depending on standing in the graduate program and on the degree pursued. There are many possibilities of collaborative work within the Montreal meteorological community. Tuition fees are low and some out-of-province tuition waivers are available. The cost of living in Montreal is low. For further information contact:

Dr. M.Y. Leclerc
Department of Physics
Université du Québec à Montréal
P.O. Box 8888, Station "A"
Montreal, Quebec
CANADA H3C 3P8.

Weather Forecasters

Positions are open for Meteorologists / Weather Forecasters at Oceanroutes Canada. Successful candidates may be graduates of a specified program in meteorological studies at a recognized university or anyone having graduated in a related field who has completed a course of studies prescribed by a major national weather service. Familiarity with Atmospheric Environment Service core guidance and experience forecasting in the east coast marine environment is an asset. Salary is commensurate with qualifications and experience.

Please send your application and resume to:
Oceanroutes Canada Weather Office
271 Brownlow Avenue
Dartmouth, Nova Scotia, B3H 1W6
Fax (902) 468-3009



METEOROLOGICAL INSTRUMENTS

SINCE 1964



SENSORS TO MEASURE:

- Wind Speed, Peak Gusts
- Wind Direction, Variability
- Temperature, Delta T
- Dew Point, Relative Humidity
- Precipitation

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2801 AERO PARK DRIVE, TRAVERSE CITY, MI 49684, U.S.A.
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FAX 616-946-4772

CONFERENCES/CONFÉRENCES

Call for Papers

5th International Meeting on Statistical Climatology

The Fifth International Meeting on Statistical Climatology (5IMSC) will be held June 1992 in Toronto, Canada. 5IMSC is sponsored by the Steering Committee for International Meetings on Statistical Climatology (IMSC), the Atmospheric Environment Service of Canada, the World Meteorological Organization, the American Meteorological Society, the Bernoulli Society and the Statistical Society of Canada. The 5IMSC program is the responsibility of a Program Committee which consists of climatologists and statisticians and is chaired by Dr. Francis Zwiers of the Canadian Climate Centre. The IMSC series of meetings is sustained by a free standing Steering Committee of statistical climatologists chaired by Prof. Allan Murphy of Oregon State University. This meeting will be collocated with the 12th Conference on Probability and Statistics in Atmospheric Sciences (12PSAS) and sessions concerning topics of mutual interest will be organized jointly by the two groups. The joint theme is the detection of the enhanced greenhouse gas effect.

Papers are solicited on all aspects of statistical climatology and on all aspects of statistical methodology which pertain to climatology. Special emphasis will be placed on: a) papers which deal with methodology for describing, estimating and making inferences about climate change; and b) papers which describe observed and/or simulated climate change, trends in climate indices, developments pertaining to base line datasets, and other topics related to the observation and detection of anthropogenic and natural climate change. The acceptance of papers will be based on a 400- to 600-word reviewer's abstract. Authors or groups desiring to present more than one paper are urged to assign a priority to the abstracts submitted in case the volume of papers forces the Program Committee to limit the number of presentations.

Both oral and poster sessions are anticipated. Authors should indicate their preference when submitting abstracts. Every effort will be made to assign papers to sessions according to requested mode of presentation. Overhead and 35 mm slide projectors will be available at the meeting for oral presentations. Arrangements can be made for authors wishing to use other presentation equipment (such as a projection television) if they bring their own equipment or agree to pay the rental fees. Titles and reviewer's abstracts should be received by the Program Chairman no later than 20 December 1991. Authors will be notified in February 1992 regarding acceptance of their papers. A modest amount of support will be available for participants from developing countries who require assistance with travel and local expenses. Requests for support should be included with the reviewer's abstracts.

Instructions for the preparation of camera ready manuscripts will be furnished to the authors of accepted papers. Complete manuscripts of not more than eight pages in length (letter or A4 size), including diagrams and photographs, must be received by the Program Chairman no later than 15 April 1992. Attendees will receive a preprint volume at the time of registration.

Steering Committee for IMSC

Allan Murphy (Chair - Oregon State University)
George Gruza (Institute for Global Climate and Ecology - U.S.S.R.)
Neville Nicholls (Bureau of Meteorology Research Center - Australia)
Ignacio Rodríguez-Iturbe (Instituto Internacional de Estudios Avanzados - Venezuela)
Shyamvir Singh (Indian Institute of Tropical Meteorology)
Raymond Sneyers (Royal Meteorological Institute - Belgium)
Francis Zwiers (Canadian Climate Centre)

5IMSC Program Committee

Francis Zwiers (Chair - Canadian Climate Centre)
Peter Bloomfield (North Carolina State University)
David Brillinger (University of California - Berkeley)
Nicholas Fisher (CSIRO - Australia)
Robert Livezey (Climate Analysis Center - U.S.A.)
Roland Madden (NCAR - U.S.A.)
Paul Mielke (Colorado State University)
Allan Murphy (Oregon State University)
Nancy Reid (University of Toronto)
Benjamin Santor (Max Planck Institute for Meteorology - F.R.G.)
Raymond Sneyers (Royal Meteorological Institute - Belgium)
Andrew Solow (Woods Hole Oceanographic Institution - U.S.A.)
Hans von Storch (Max Planck Institute for Meteorology - F.R.G.)

Program Chairman

Dr. Francis W. Zwiers
Numerical Modelling Division, Canadian Climate Centre
4905 Dufferin St.
Downsview, Ontario, CANADA M3H 5T4

Phone: (416) 739-4415; Fax: (416) 739-4521
E-mail: acrnrfz@cid.aes.doe.ca

American Meteorological Society

The 12th Conference on Probability in the Atmospheric Sciences (12PSAS) will be held June 22-26, 1992, in Toronto, Canada. It will emphasize climate change and, particularly, the detection of the enhanced greenhouse-gas effect. Information: Prof. Paul Mielke, Department of Statistics, Colorado State University, Fort Collins, Colorado, 80523, U.S.A. (Tel: (303) 491-6465; Fax: (303) 491-7895).

CONFERENCES/CONFÉRENCES

Atmospheric Environment Service
Meteorological Administration of Peoples Republic of China
Canadian Meteorological & Oceanographic Society

The Canada-China International Mesoscale Workshop will be held June 8-11, 1991, in Winnipeg, Manitoba. Information: Louis Legal, Workshop Coordinator, Atmospheric Environment Service, 9th Floor, 266 Graham Avenue, Winnipeg, Manitoba, Canada R3C 3V4 (Tel: (204) 983-2079; Fax: (204) 983-0109).

International Association on Wind Engineering

The 8th International Conference on Wind Engineering will be held July 8-12, 1991, in London, Ontario. The Conference will be hosted by the Boundary Layer Wind Tunnel Laboratory (University of Western Ontario). Information: Dr. A.G. Davenport, Director, Boundary Layer Wind Tunnel Laboratory, University of Western Ontario, London, Ontario, Canada N6A 5B9 (Tel: (519) 661-3338; Fax: (519) 661-3339).

Expert Committee on Agrometeorology
Canadian Society of Agrometeorology

An interdisciplinary workshop/symposium on "Changing Climate in Relation to Sustainable Agriculture", will be held July 29-30, 1991, in Fredericton, New Brunswick. The impact of climate on the Canadian agricultural industry is an important and growing concern. The workshop sessions will focus on:

1. developing feasible ways to assess the effect of climate on agriculture as a basis for developing strategies to maintain and foster an internationally competitive and sustainable industry in Canada; and
2. identifying what research is needed to increase our understanding of the effect of climate on agriculture.

For information, please contact Peter Dzikowski, Alberta Agriculture, Room 206, 7000-113 Street, Edmonton, Alberta, T6H 5T6 (Tel: (403) 422-4385; Fax: (403) 422-0474).

Canadian Society of Agrometeorology (CSAM)

Papers are invited for a technical session sponsored by CSAM to be held July 31, 1991, at the Agricultural Institute of Canada annual conference in Fredericton, N. B. The theme of the plenary session will be "Agriculture and Climatic Change". To submit a title, contact Bob Dickson, Atlantic Weather & Environmental Consultants Ltd., 112 Bloor Street, Fredericton, N.B., Canada E3A 2K4 (Tel: (506) 450-8802).

Service de l'environnement atmosphérique
Agence météorologique de la République populaire de Chine
La Société canadienne de météorologie et d'océanographie

L'atelier internationale mésoéchelle Canada-Chine sera tenue du 8 au 11 juin 1991 à Winnipeg, Manitoba. Renseignements: Louis Legal, Coordonnateur de l'atelier, Service de l'environnement atmosphérique, 266 Graham Avenue, Winnipeg, Manitoba, Canada R3C 3V4 (Tel: (204) 983-2079; Fax: (204) 983-0109).

World Meteorological Organization
Atmospheric Environment Service
Institute for Space and Terrestrial Science
Canadian Meteorological and Oceanography Society

The 2nd WMO Operational Ice Remote Sensing Workshop will be held September 10-13, 1991, in Ottawa, Ontario. The theme will be the operational applications of remotely-sensed ice information to ice forecasting. For information, see insert with this Newsletter.

European Centre for Pollution Research

The International Conference on Environmental Pollution will be held April 15-19, 1991, in Lisbon, Spain. It will provide a forum for the discussion of the state-of-the-art in all scientific and policy-making aspects of environmental pollution. For information, please contact the ICEP Conference Office, ICTR Secretariat, 11-12 Pall Mall, London SW1Y 5LU, U.K. (Tel: (01) 930-6825; Fax: (01) 976-1587).

International Hazards Society

The Symposium on Geophysical Hazards in Developing Countries and Their Environmental Impacts will be held April 21-27, 1991, in Cairo, Egypt. For more information, please contact Professor M.I. El-Sabh, Chair, Organizing Committee, HAZARDS-91, Département d'Océanographie, Université du Québec à Rimouski, 300 Allée des Ursulines, Rimouski, Québec, Canada G5L 3A1 (Tel: (418) 724-1707; Fax: (418) 723-7234).

EDITOR'S COLUMN

The Editor would like to see articles on meetings, global projects, special interest groups or any topic of interest to our membership. Black and white photographs or diagrams are welcomed. Authors who wish to submit by computer disk, please contact the Editor for acceptable wordprocessing formats. Newsletter items should be sent to Malcolm Still, Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario M3H 5T4 (Tel: (416) 739-4127; Fax: (416) 739-4287). The deadline for next issue is April 1, 1991.

Chinook

Spring / Printemps 1989 Vol. 11 No. 2

FROM THE EDITOR'S DESK	23
THE LAW OF THE ATMOSPHERE <i>By Hans Martin</i>	24
WINTER 1988-89 IN REVIEW <i>By Aaron Gerye</i>	26
DOPPLER RADAR LOOKS FOR THE ILL WINDS <i>By Thomas Nichols and Clifford Crozier</i>	33
ARCTIC EASTER BUNNY VISITS ATLANTIC CANADA Weather Map Series, March 25 to 27, 1989 <i>By Hans VanLeeuwen</i>	43

Chinook

Summer / Été 1989 Vol. 11 No. 3

FROM THE EDITOR'S DESK	47
THE CHANGING ATMOSPHERE	48
IN CONVERSATION	51
SAFEGUARDING THE GLOBAL ATMOSPHERE	53
OUR COMMON FUTURE - A CLIMATE FOR CHANGE <i>By The Honourable Gro Harlem Brundtland</i>	56
THE ROLE OF CITIZENS IN SUSTAINABLE DEVELOPMENT <i>By Sister Aida Velasquez, OSB</i>	60
THE GLOBAL GREENHOUSE EFFECT <i>By F. Kenneth Hare</i>	62
FORESTS AND ATMOSPHERIC CHANGE <i>By J.S. Maini</i>	67
CONFERENCE STATEMENT	74

Chinook

Fall / Automne 1989 Vol. 11 No. 4

FROM THE EDITOR'S DESK	79
LETTER FROM THE CMOS PRESIDENT	80
WIND.BAS <i>By Anton Jopko</i>	81
SEA BREEZES AND ANABATIC WINDS IN THE MOUNTAINS <i>By Bill Pike</i>	82
FOGGY, CLOUDY AND DRIZZLY DAYS Weather Map Series, April 5 and 6, 1989 <i>By Hans VanLeeuwen</i>	84
LETTERS	84
ONE HUNDRED AND FIFTY YEARS AGO: FOUNDING THE TORONTO OBSERVATORY <i>By Morley Thomas</i>	89

Climatological Bulletin Bulletin climatologique

Vol. 24, No. 2, August/aout 1990

66 FOREWORD / AVANT-PROPOS

ARTICLES

- 67 Some Observations on the Effect of Chinooks on Field Microclimates and Soil Moisture Status in Southern Alberta
B. Grace
- 84 Integration of Automated Station Data into Objective Mapping of Temperatures for an Arctic Region
J.D. Jacobs
- 97 Temporal Relationships Among Multiple Drought Types During an Average Drought
P.T. Soule

NOTE

- 109 Geographical Patterns of Nocturnal Precipitation on the Canadian Prairies During the Growing Season
A.K. Chakravarti

ATMOSPHERE-OCEAN

Contents / Table des matières

A Finite-Element Tidal Model for the Southwest Coast of Vancouver Island M.G.G. FOREMAN and R.A. WALTERS	281-287
The Flow of a Coastal Current Past a Blunt Headland HOWARD J. FREELAND	288-302
Modelling the Behaviour of Oil Spills in Ice-Infested Waters S. VENKATESH, H. EL-TAHAN, G. COMFORT and R. ABDELNOUR	303-329
Estimating the Propagation Velocity of Atmospheric Fronts From Surface Wind Observations CARL ANDERSON	330-344
Expériences numériques lagrangiennes à partir de modèles eulériens NAJET ZOUARI et ARMANDO BABIANO	345-364
An Efficient Optimum Interpolation Analysis Scheme M. TANGUAY and A. ROBERT	365-377

Volume 28 No 4 December 1990 Décembre

ATMOSPHERE-OCEAN

Contents / Table des matières

Measurements of Arctic Total Ozone During the Polar Winter J.B. KERR, C.T. MCELROY, D.L. WARDLE and V. DOROKHOV	383-392
On the Growth of Marine Iceicles K.K. CHUNG and E.P. LOZOWSKI	393-408
Analysis of Deep-drogued Satellite-tracked Drifter Measurements in the Northeast Pacific RICHARD E. THOMSON, PAUL H. LEBLOND and WILLIAM J. EMERY	409-443
Patch Diffusion Computed From Lagrangian Data. With Application to the Atlantic Equatorial Undercurrent BRIAN G. SANDERSON and BADAL K. PAL	444-465
Research Note Validation Experiments for a Nested Grid-Point Regional Forecast Model E. YAKIMIW and A. ROBERT	466-472

Climatological Bulletin Bulletin climatologique

Vol. 24, No. 3, December/décembre 1990

122 FOREWORD / AVANT-PROPOS

ARTICLES

- 123 Relationships Between Weather and Road Safety: Past and Future Research Directions
Jean Andrey and Richard Olley
- 138 Etude du phénomène des vagues de froid au Québec en tant que catastrophe naturelle
Jacinthe Lacroix et Daniel J. Boivin

NOTES

- 158 Precipitation Trends at Victoria, British Columbia
Stanton E. Tuller
- 168 Change in Frost Season Characteristics in Winnipeg, 1872-1988
W.F. Rennie

ACCREDITED CONSULTANTS/EXPERTS-CONSEILS ACCRÉDITÉS

Entries on the following pages are restricted to CMOS Accredited Consultants. The accreditation process commenced in December, 1986. A complete list of CMOS accredited consultants can be obtained from the CMOS Business Office. Individuals interested in applying for accreditation may contact the CMOS Business Office at the Society's Newmarket address for a copy of the Guidelines and an application form.

As set out in the document "CMOS Guidelines for Accreditation," the criteria are:

- (1) The applicant must possess an appropriate undergraduate degree from a recognized university.
- (2) The applicant must possess at least one of the following types of specialized training:
 - (i) post-graduate degree from a recognized university in meteorology or oceanography;
 - (ii) post-graduate degree from a recognized university in the natural or applied sciences or mathematics, specializing in one or more branches of meteorology or oceanography; or
 - (iii) three years of on-the-job meteorological or oceanographic experience.
- (3) Upon completion of the above educational and training requirements, the applicant must have spent at least two years of satisfactory performance, at the working level, in the field of specialization included in this document. This should include at least some consulting experience.

Les entrées sur les pages suivantes sont réservées aux experts- conseils accrédités. Le processus d'accréditation a débuté en décembre 1986. Une liste complète des expert-conseils accrédités peut être obtenue du Directeur du Bureau. Les personnes désirant l'accréditation doivent contracter le Directeur du Bureau de la CMOS à l'adresse de la Société à Newmarket afin de recevoir une copie des Règlements et un formulaire d'application.

Le document "Règlements de la SMC0 pour l'accréditation" liste les critères demandés:

- (1) L'applicant doit posséder un degré universitaire approprié d'une université reconnue.
- (2) L'applicant doit posséder au moins l'un des types suivants de formation spécialisée:
 - (i) degré d'une université reconnue, en météorologie ou océanographie;
 - (ii) degré d'une université reconnue en sciences naturelles ou appliquées ou en mathématiques, spécialisé dans au moins l'une des branches de la météorologie ou de l'océanographie; ou
 - (iii) trois années d'expérience de travail en météorologie ou en océanographie.
- (3) Une fois les exigences d'éducation et de formation complétées, l'applicant doit avoir au moins 2 années de performances satisfaisantes, au niveau de travail, dans un champ de spécialisation mentionné dans ce document. Une certaine expérience d'expert-conseil est nécessaire.

Noel Boston, P.Eng., Ph.D.

CMOS Accredited Consultant

Physical Oceanography, Boundary Layer Meteorology,
Training

The Environment Centre

Suite 200 - 1130 West Pender Street

Vancouver, British Columbia V6E 4A4 Canada

Tel: (604) 681-8828

Fax: (604) 681-6825

David R. Hudak, Ph.D.

CMOS Accredited Consultant

Cloud Physics, Synoptic Meteorology,
Weather Modification

KelResearch Corporation

850-A Alness Street, Suite 9

Downsview, Ontario M3J 2H5 Canada

Tel: (416) 736-0521

ACCREDITED CONSULTANTS/EXPERTS-CONSEILS ACCRÉDITÉS

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Swire House, 271 Brownlow Avenue
Dartmouth, Nova Scotia B3B 1W6 Canada
Tel: (902) 468-3008 Fax: (902) 468-3009

Tom B. Low, Ph.D., P.Eng.

CMOS Accredited Consultant
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Downsview, Ontario M3J 2H5 Canada
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Ian J. Miller, M.Sc.

CMOS Accredited Consultant
Marine Meteorology and Climatology, Applied Meteorology
and Climatology, Storms, Waves, Operational Meteorology

MacLaren Plansearch Limited
Suite 701, Purdy's Wharf Tower
1959 Upper Water Street
Halifax, Nova Scotia B3J 3N2 Canada
Tel: (902) 421-3200 Telex: 019-22718

Prof. T.R. Oke, B.Sc., M.A., Ph.D.

CMOS Accredited Consultant
Urban Meteorology & Climatology
Boundary-Layer, Applied Climatology

3776 West 39th Avenue
Vancouver, British Columbia V6N 3A7 Canada
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Douw G. Steyn, Ph.D.

CMOS Accredited Consultant
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Meso-Scale Meteorology

3650 Carnarvon Street
Vancouver, British Columbia V6L 3E4 Canada
Tel: (604) 228-6407 Home: (604) 733-1255

Brian Wannamaker

CMOS Accredited Consultant
Remote Sensing, Instrumentation (oceanography),
Physical Oceanography, Sea Ice/Icebergs

Sea Scan
R.R. 3,
Caledon East, Ontario L0N 1E0 Canada
Tel: (416) 880-0528

Bassem M. Eid, P.Eng., Ph.D

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Air-Sea Interaction, Marine Meteorology

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Terry J. Gillespie, Ph.D.

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Agricultural Meteorology & Land Planning,
Agrometeorological Training

51 Applewood Crescent
Guelph, Ontario N1H 6B3 Canada
Tel: (519) 824-4120 Ext 2645 or (519) 824-9504

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Mory Hirt

CMOS Accredited Consultant

Applied, Aviation & Operational Meteorology,
Research & Development, General Project Management

World Weatherwatch
7050 Woodbine Avenue, Suite 100
Markham, Ontario L3R 4G8 Canada
Tel: (416) 477-4120 Telex: 06-966599(MEP MKHM)

T.W. (Terry) Krauss, Ph.D.

CMOS Accredited Consultant

Cloud Physics, Radar, Weather Modification,
Storms, Research & Development

INTERA Technologies Ltd.
2500, 101-6th Avenue S.W.
Calgary, Alberta T2P 3P4 Canada
Tel: (403) 266-0900

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Agrometeorology, Hydrometeorology, Forest Meteorology

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Fredericton, New Brunswick E3A 2K4 Canada
Tel: (506) 450-8802

Richard J. Kolomeychuk, M.Sc.

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Applied Meteorology and Climatology
Hydrometeorology

The Environmental Applications Group Ltd.
Suite 1006, P.O. Box 2041, 20 Eglinton Ave. W.
Toronto, Ontario M4R 1K8
Tel: (416) 322-5701 Fax: (416) 322-5706

Mike Lepage, M.S.

CMOS Accredited Consultant

Wind Engineering, Climatic Data Management,
Air Pollution Meteorology, Climate Research

Rowan Williams Davies & Irwin Inc.
650 Woodlawn Road West
Guelph, Ontario N1K 1B8 Canada
Tel: (519) 823-1311 Fax: (519) 823-1316

John E. Letkeman

CMOS Accredited Consultant

Air Quality Meteorology

Radian Corporation
8501 MoPac Blvd.
Austin, Texas, USA 78720-1088
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Warren McCormick, M.A.Sc., P.Eng

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Andrew H. Gillam, Ph.D.

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Environmental Audit, Assessment and Monitoring

CBR International
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Sidney, British Columbia V8L 3S3 Canada
Tel: (604) 655-1944 Fax: (604) 655-7131

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Hydrologie

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Other (specify)

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Please enroll me as a member of the Society. I attach a cheque for \$ _____ payable to the Canadian Meteorological and Oceanographic Society for the membership fee and/or publication subscriptions. I also include a tax-deductible donation of \$ _____ for (check one):

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Faire parvenir à la SCMO la demande d'adhésion complétée à l'adresse au dessus.