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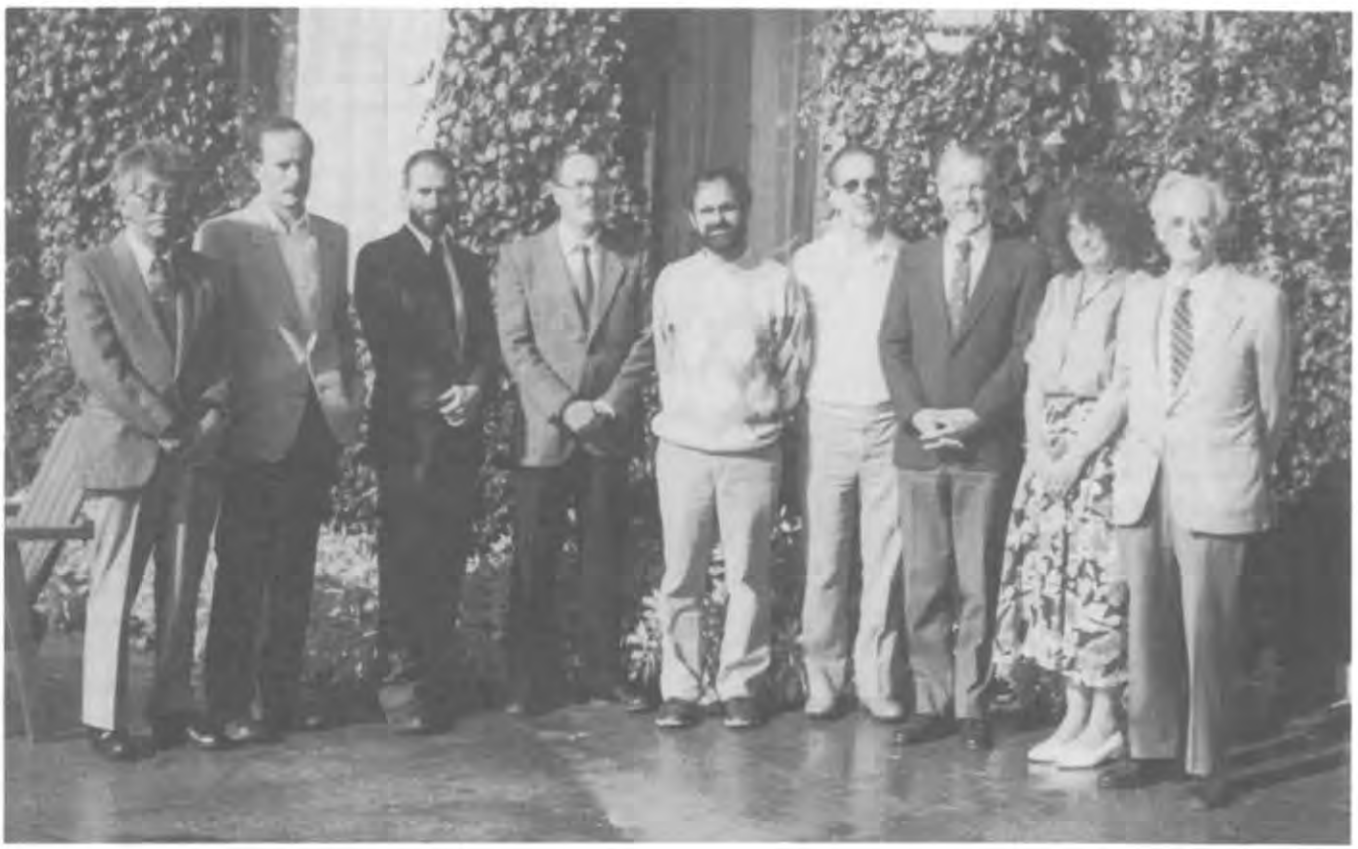
C.M.O.S. NEWSLETTER/NOUVELLES S.C.M.O.

Canadian Meteorological and Oceanographic Society

La Société canadienne de météorologie et d'océanographie

DECEMBER/DÉCEMBRE 1991 VOL. 19 NO. 6

Season's Greetings from CMOS Council
Joyeuses Fêtes du Conseil SCMO



Attending the CMOS Council meeting #1, 21st October 1991, at Royal Roads Military College were (left to right):-
Sus Tabata (CMOS Treasurer); Humfrey Melling (CMOS Recording Secretary); Doug Bancroft (CMOS Corresponding Secretary); Lou Hobson (CMOS President); Ken Denman (Chairman, CMOS Vancouver Island Centre); Howard Freeland (Newsletter Editor); Dave Krauel (CMOS Vice-President); Carol McCleod (CMOS Business Office) and last but not least Uri Schwartz (CMOS Executive Director).

EDITOR'S COLUMN

The next issue of the CMOS Newsletter 20(1), February 1992, will go to press on January 20th, 1992. Contributions are welcome and should be sent to me at:-

Institute of Ocean Sciences
P. O. Box 6000
Sidney, B.C. V8L 4B2
Tel. (604)-363-6590
FAX (604)-363-6746

I prefer receiving contributions submitted on floppy disk in DOS WordPerfect format, however, I do have a program that translates between MS Word and WordPerfect documents.

Do you have an interesting photograph, say, an interesting meteorological or oceanographic phenomenon? If so, write a caption and send it to me for publication in the CMOS Newsletter.

Howard J. Freeland, CMOS Newsletter Editor

WHAT'S GOING AROUND?
by Savonius Rotor

For some reason the above cartoon was sent to me by Willy Wave. I really don't know why. Anyway, I also received some fan mail which I will reproduce here, errata copied verbatim:-

Dear Savonius:

Where are you moored?
Me and my friends Sue Nami and Storm Serge have been looking for you..... We want to propagate all over you and pump your rotor!

Your devoted fan
Willy Wave

It certainly is gratifying to receive a response to my efforts but I really don't understand the comments about propagating all over me and pumping up my rotor. Could this be some obscure witticism concerning my personal monicker? In which case I am not amused.

AES/CMOS 1992 Tour Speaker

As in past years, CMOS and AES are arranging a tour speaker to the twelve CMOS centres. This year we are most fortunate to have Dr. Jean-Pierre Blanchet, of the University of Quebec at Montreal (UQAM), who will be speaking on the Canadian Climate Centre's Global Circulation Model.

The content of the presentation is not yet finalised, but will likely encompass past, present and future modelling efforts; including results obtained from experiments on CO_2 doubling.

Dr. Blanchet's recent research work at the Canadian Climate centre puts him in an authoritative position to make this tour. He is a dynamic speaker in both French and English and will have effective presentation graphics.

Timing details are still to be arranged, but, as in previous years, will span from January to April.

SUMMARY OF DISCUSSION

The 7th Session of the Canadian Climate Program Research Committee University of Toronto, October 10, 1991

The 7th meeting of the Research Committee took place at the University of Toronto on October 10, 1991. The agenda included discussion on:

- AES and DFO Green Plan Activities
- The Climate Change Detection Project (CCDP).
- The Global Climate Observing System (GCOS)
- Arctic issues.

With respect to the Green Plan the Committee was pleased that the government had acknowledged the potential seriousness of global warming and had embarked on a science plan to reduce the uncertainties in regards to predictions and impacts. The committee was also gratified at the general strategy that government departments would be following to deliver the initiatives.

Discussions on CCDP, GCOS and the reports of a task group on data systems within Canada clearly demonstrated a need to establish a mechanism to satisfy the data needs of researchers, possibly under a single group or forum. A further task group was struck to look into this matter.

The lack of cohesive Arctic climate research strategy, nationally and internationally, once again concerned the committee. A GCCP sponsored Arctic conference held in October in Ottawa and a meeting on the Arctic climate system (CGCP and IOS) in spring 1992 offer the hope of formulating a cohesive and coordinated Arctic Science Plan in collaboration with the U.S.A. The Chair of the Research Committee was requested to contact the CGCP secretariat to offer the sponsorship of the committee in the spring meeting.

In view of Green Plan funding projects such as GEWEX and BOREAS are assured of going ahead and their steady progress was noted. The committee strongly recommended that University groups and government departments hold discussions on approaches to developing proposals for submission to NSERC prior to any submissions being made for collaboration grants.

John Maybank
Made Life Member of C.M.O.S. at the Annual General Meeting, Winnipeg, June 1991

The 1991 Annual General Meeting of the C.M.O.S. unanimously approved a Council recommendation that Dr. John Maybank be granted a Life Membership for his significant services to the Society. As the following brief outline indicates John Maybank has been an active Society member for a long time, and we hope that he will remain active for many years to come. This recognition was indeed richly deserved.

John Maybank joined the Royal Meteorological Society (Canadian Branch) in 1960. In 1966 he attended the congress at which it was agreed to form the CMS, and he became a member of the new Canadian Society at its inception (but remained a Foreign Member of the RMS to present).

John became a member of the Meteorology Subcommittee of NRC's Associate Committee of Geodesy and Geophysics (ACGG) at the time of its re-establishment in 1962, under the chairmanship of Dr. Andrew Thomson. He was secretary of the Meteorology Subcommittee (later identified as SOMAS: Subcommittee on Meteorology and Atmospheric Physics) in the period 1967-70. He remained a member of it after it became the Scientific Committee of CMS in early 1970's. While on it John organized and took part in a three person subcommittee to write a definitive "position statement" for CMS regarding cloud seeding and weather modification (along with Dr. G. Goyer and Dr. E. Lozowski).

John helped establish a Saskatchewan chapter (later Centre) of CMS in early 1970's and was on the Program Committee for the 1975 Congress in Winnipeg (along with Hugh Fraser, chairman).

John was re-appointed to the Scientific Committee in 1976 as chairman. Shortly after, CMS became CMOS and the Scientific Committee was re-structured to reflect this change. He then reviewed the history and mandate of the Scientific Committee for CMOS Executive 1977 when John Hay was president. While chairing the Scientific Committee he was also a member of NRC's Canadian National Committee for the IUGG, 1976-79. John retired from the Scientific Committee and was elected VP of CMOS for 1979-80 and then president in 1980-81.

John was the first chairman of CMOS's Accreditation Committee 1985-88 and helped review and approve the first 22 accredited consultants (including himself!). He was on the editorial committee for Chinook from 1984 to its demise in 1990, and several times chairman or other official of the Saskatchewan Centre CMOS.

John was also the AES-sponsored tour speaker in 1975-76.

The following are some personal details about John Maybank:-

- Born Winnipeg, Manitoba 1930
- Attended U of Manitoba 1948-52 B.Sc. (Hons) in Physics and mathematics
- UBC 1952-54, M.Sc. in Physics
- Imperial College, U of London 1956-59, Ph.D. in Cloud Physics

Long-time employee of Saskatchewan Research Council 1961-1989, first in Physics Division, then as Head of the Environment Division 1983-1988. Since then partly a private consultant (Agvironics Consulting) then to a term appointment in AES as a Senior Advisor for the Climate Services Program. Various publications over the years in Cloud Physics, air pollution and pesticide drift, agrometeorology and agroclimatology.

PHYSICAL OCEANOGRAPHY - NUMERICAL MODELLING

A postdoctoral or research associate position is available at McGill University. Available this fall or early winter, it requires experience in numerical modelling of coastal processes. Applicants must have a Ph.D. degree with a knowledge of physical oceanography. Priority for appointment at the research associate level will be given to citizens and permanent residents of Canada. If interested, please send curriculum vitae and names of three references to Dr. R. G. Ingram, Dept. of Meteorology, McGill University, 805 Sherbrooke Street West, Montreal, Quebec, H3A 2K6 Canada.

Tel: (514)-398-6071
FAX: (514)-398-6115
OMNET: G.INGRAM

Physical Oceanography and Atmospheric Science at Dalhousie University

Dalhousie's new Atmospheric Science program, funded through an NSERC Industrial Research Chair Initiative with AES as the partner, is now fully operational with four full-time faculty and thirteen graduate students. The Atmospheric Science program also offers an undergraduate diploma in meteorology for aspiring weather forecasters; fourteen students are currently enrolled. This group has already embarked on a diverse research program that covers the climate system and its dynamics, air-sea interaction, marine cyclones, cloud and aerosol physics, radiation in atmosphere and ocean, radar and satellite meteorology.

The physical oceanography group, which was established in the mid 1960's, will soon be filling the position created by Chris Garrett's departure to the University of Victoria. This will restore the group to three and one half full-time faculty, along with three research associates, three postdoctoral fellows and nine graduate students. In addition to participation in large collaborative programs such as WOCE (World Ocean Circulation Experiment), JGOFS (Joint Global Ocean Flux Study) and OPEN (Ocean Production Enhancement Network), the physical oceanography group maintains an active interest in "basic" research topics such as ocean mixing, deep convection and shear waves on beaches.

The establishment of an atmospheric science program at Dalhousie was strongly supported by the physical oceanographers and both groups now look forward to some strong air-sea interactions! A list of the full-time faculty, along with a brief outline of current research, is given below.

Tony Bowen (Physical Oceanography) Nearshore processes, benthic boundary layers and the dynamics of suspensions and turbidity currents. As part of the Canadian Coastal Sediment Transport Program, a major field experiment at Stanhope Lane, P.E.I., we investigated the hydrodynamic and sediment transport patterns on this multiple bar system. We were joined by Chris Vincent from the University of East Anglia and his acoustic Doppler system. This program is providing not only some of the best direct measurements of sediment suspension patterns ever made, but much ancillary data on waves and wave driven currents that allow us to investigate new concepts such as shear wave instability on longshore currents. 1990 has seen the beginning of OPEN and the major emphasis will be field measurements in support of the biological programs. Major programs are planned both offshore, on Western Bank, and nearshore, in Lunenburg Bay, NS and Terra Nova, NFLD, combining new technology with three-dimensional nonlinear numerical models. New equipment being developed at Dalhousie will play a major role in the field experiments for 1991. The autonomous bottom lander RASTRAN II will carry the whole suite of instruments we have been using for boundary layer research. These intensive measurements will be complemented by internally recording, instrument packages containing two electromagnetic flowmeters, 3 optical backscatter sensors, a pressure gauge and a thermistor.

Petr Chylek (Atmospheric Science) (1) Absorption and scattering of radiation by nonspherical particles: Using the anomalous diffraction approximation of Van de Hulst, expressions have been derived for the absorption and scattering cross-sections of nonspherical particles in a closed analytical form. Applications to the radiative properties of cirrus clouds and to the measurement of suspended mass of solid particles in the ocean are currently under investigation. (2) Absorption of solar radiation by dirty cloud droplets: Absorption of solar radiation by clouds is strongly affected by the presence of the absorbing material within the droplets as well as by the topological distribution of that material within droplets. The specific absorption of carbon or other absorbing material present can be increased up to a factor of ten as a function of position within a droplet. (3) Resonance structure of scattering by dirty droplets: An experimental investigation of the scattering features of composite micron sized droplets has been performed using individual droplets levitated by laser pressure. For concentrations up to 10^{-6}, the strongly absorbing material within the droplet does not significantly affect the resonance structure of the scattering. Consequently, the inner fields are not perturbed and enhanced absorption can occur. (4) The optical properties of a water-ice mixture have been investigated along with the effect of such mixtures on radar backscattering by hailstones. The topology of the water-ice mixture has a considerable effect on the backscattering; the distribution of ice and water must be taken into account in evaluating radar backscattering. (5) Physical and chemical analysis of ice core samples: We have obtained 42 ice core samples taken from the period 2,000 to 40,000 years before present and we are currently determining the concentrations of aerosols, graphitic carbon, total carbon, and other elements. Using these cores, we will examine indicators of global climate and the amount of forest fires and volcanic activity over the last 40,000 years.

Owen Hertzman (Atmospheric Science) Mesoscale structure and dynamics of mid-latitude cyclones. Measurements from the ERICA (Experiment on Rapidly Intensifying Cyclones over the Atlantic) field program, and in particular, from a storm that did not intensify as expected, are being analysed and used to test existing models of midlatitude storm intensification. The problem is being approached from both a potential vorticity budget and a precipitation analysis using airborne atmospheric soundings together with radar and flight level measurements. In our conceptual model of the storm, the role of mesoscale updrafts in tilting horizontal vorticity into the vertical appears to be important. I will also be participating in the Canadian Atlantic Storms Program II (a large atmosphere-ocean field program off Newfoundland, January to March 1992) and will focus on mesoscale storm dynamics and cloud physics near the ice-ocean interface. Other research includes a) comparisons of radar and satellite derived precipitation rates during ERICA and other field programs over the northwest Atlantic, b) development of algorithms for forecasting sea breezes, c) field studies of the atmospheric and oceanic boundary layer fluxes of carbon dioxide, and d) examination of the role of cyclonic storms in altered climate scenarios.

William Hyde (Atmospheric Science) Diffusive energy balance models (EBMs) apply statistics and simple thermodynamics to determine, at a useful level of approximation, the earth's temperature field without explicit computation of the highly nonlinear processes in the earth's climate system. It has been shown that on continetal spatial scales, and on time scales of a month or more, that EBMs can perform as well as General Circulation Models (GCMs) in simulating temperature

fields radically different from the current one. Thus when a new climate problem is presented a preliminary set of EBM experiments can and should be performed before considerable resources are committed in GCM experiments. It is now believed that the last glacial maximum, occurred 21,500, not 18,000 years ago. Thus the orbital elements used in earlier simulations were somewhat in error, as 3000 years is a significant portion of the obliquity and precession cycles. An EBM study may reveal whether there is a need for a GCM study at all, and should serve as a guide to the interpretation of a GCM study, when and if made. Other areas of paleoclimatic interest, for which it would nonetheless be difficult to acquire sufficient funding for a GCM study, include the problem of the ice sheets in Westphalian times, the presumed equable climates of Jurassic times, and the problem of climate-related extinction events. Finally, since these models to some degree duplicate the behaviour of more complex models, an investigation into their mathematical properties (solution space, attractors, chaotic behaviour) will aid in the understanding of more complex models and hence, of climate.

Dan Kelley (Physical Oceanography) Convective mixing. (1) What drives the dramatic interleaving observed in the region where the warm, saline Atlantic waters enter the Arctic ocean? A clue to the dynamics may be the angle at which the layers cross isopycnals and isobars. (2) Central issues in single-component convection relate to flux parameterization and the spatial coherence of convection elements. I have found that a simple boundary layer model collapses laboratory measurements of flux and velocity fields. (3) Laboratory studies of deep convection are being performed by research associate David Brickman. Initial experiments focus on scales and regimes of motion, and will shift to less traditional characteristics of convection that may facilitate comparison with oceanic observations. (4) Since the late 1960s Malmberg's criterion has been used to predict the inhibition of deep convection by low surface salinities. I think this criterion is based on incorrect assumptions about air-sea fluxes, and have formulated a new criterion. The difference between the two criteria is significant, the BRAVO data set in the Labrador Sea providing a case in point.

Glen Lesins (Atmospheric Science) Global thermodynamics applies the first and second laws of thermodynamics to the atmosphere to predict characteristics of various circulations without solving the primitive equations of motion. In particular, the entropy carried by the infrared radiation leaving the Earth, which can be monitored with satellite measurements, is related to the distance the climate is from equilibrium. This provides a remote-sensing measure of the dynamical activity of the atmosphere using thermodynamic measurements. Data from the Earth Radiation Budget has been analyzed and it has been shown that the outgoing radiative entropy flux is an objective measure of disequilibrium in the atmosphere. In another technique called finite-time thermodynamics a power generation analysis of fluid trajectories is used to predict dissipation rates without solving explicitly for the velocity field. This technique has been applied to a range of atmospheric circulations such as thunderstorms, hurricanes, the Hadley cell and the global circulation. It has been found that the power generated in tropical convective clusters is not only sensitive to the sea surface temperature but also to the detrainment profile of the convective fluxes. Other research includes cloud modelling to explain how the wind field structure, thermodynamics fields and cloud microphysical processes affect the precipitation efficiency (ratio of precipitation to condensation) in storms. This is important in water budget studies, quantitative precipitation forecasts and precipitation data assimilation into numerical weather prediction models. It has been found that the precipitation efficiency varies from 0.1 to 0.9 in two dimensional flow fields. This large range helps explain the variability of the moistening and drying rates in the troposphere. Also radiation bands models are being used to determine how the initial formation of a thin cloud layer perturbs the radiative fluxes and to predict the diurnal surface temperature cycle.

Barry Ruddick (Physical Oceanography) Ocean mixing. (1) In 1992 the vertical eddy diffusivity will be measured in the North Atlantic Tracer Release Experiment (NATRE) as part of WOCE. An anthropogenic tracer will be released in the thermocline, and the vertical spread measured for a year. Neil Oakey and I will measure the turbulent microstructure, and test existing mixing models. (2) With Trevor McDougall and Jim Hamilton (BIO), we are investigating the difference between mixing driven by shear and salt fingers. Observations indicate that the mixing rate is sensitive to the ratio of the salinity and temperature gradients, a result inconsistent with mechanical turbulence and supportive of salt finger mixing. A model developed to interpret microstructure observations in such situations suggests that the vertical diffusivity may be doubled over that given by previous models. These models will be tested in NATRE. (3) Meddies are subsurface eddies of Mediterranean overflow water which drift in the Atlantic for years. Our observations of a Meddy over two years reveal that horizontal mixing was dominated by lateral exchange in 10 m thick interleaving layers. The slope of these intrusions suggests that double-diffusive fluxes are the driving mechanism. We hope that knowledge of the buoyancy forces driving the intrusions, combined with the observed erosion of the Meddy, will shed light on the intrusion dynamics.

Keith Thompson (Physical Oceanography) Shelf and ocean circulation. (1) Recently I have developed a data assimilation scheme, based on the adjoint of the shallow water equations, for inferring open boundary conditions from observations of current, sea level and drifter tracks. The goal is to provide short-term forecasts of shelf circulation similar to the weather forecasts provided by our meteorological colleagues. Some prototype models have been tested and will be used over the next couple of years in a larval tracking experiment on the Scotian Shelf. (2) Along with Dan Wright and John Lazier (BIO), I am looking at wind-forced fluctuations in the offshore branch of the Labrador Current which carries the southward return flow of the subpolar gyre. Our current and bottom pressure measurements across the Labrador Sea will allow us to test some of the (rarely checked) balances implied by the first-order theory of wind-forced circulation. (3) Having proposed that the Mediterranean is a good climate test basin, Chris Garrett and I are using this basin to examine the accuracy of the COADS heat flux data (with Bryan Marks). Other ongoing projects include parameterizing dispersion due to tidal flow over bottom topography (with Poppy Shen) and modelling hydrographic changes in the northwest Atlantic over the last 40 years (with Joseph Umoh).

Keith Thompson, Glen Lesins and Dan Kelley.

News from CMOS Council Executive and Headquarters

Your new Council and Executive have started on their tasks soon after being elected at the Winnipeg (June 1991) Congress. Their members are all located in and around Victoria, B.C. where the institutions mainly involved in providing officers are the University of Victoria (Dr. Hobson - President), Institute of Ocean Sciences (Drs. Melling, Tabata and Freeland - Recording Secretary, Treasurer and Newsletter Editor), Royal Roads Military College (Dr. Krauel - Vice President) and DND (D. Bancroft - Corresponding Secretary).

Among the first actions were those concerned with reviewing the preparations for the 1992 Congress in Québec City (Mesoscale Meteorology and Oceanography) which are going ahead well and promise to result in an interesting and stimulating Congress, and with the planning for the 1993 Congress in Fredericton, N.B.. The Council approved its Arrangements Committee Chairmen (Drs. Daugharty and Dickison, both of University of New Brunswick), as well as the Chairman of the Scientific Program Committee (Dr. Loder of Bedford Institute of Oceanography, Dartmouth, N.S.). The latter has already started to set up his Committee, and while no specific theme has yet emerged, it is already clear that, in addition to meteorology and oceanography, considerable attention will be paid to hydrology and relevant aspects of forestry.

The Council also appointed as Director, CMOS Publications, our old colleague and CMOS Life Member, Mr. Ed. Truhlar who recently retired from AES. Ed will do his best to help the lay-out and appearance, and increase readership. He will be glad to receive suggestions and comments which should, for the time being, sent to him at the following address: c/o CMOS Business Office, P.O. Box 334, Newmarket, Ont. L3Y 4X7 (Tel. 416-898-1040 and Fax 416-898-7937).

The CMOS Business Office has recently completed sending out membership renewals and replies have started to come in. Please make sure not to forget to renew for 1992 and in case you have not received a renewal form or know of a colleague who has not, please contact the Business Office at the above address or fill out the form at the end of this Newsletter, indicating in large letters on top of the form RENEWAL. There are many exciting CMOS activities planned for 1992, including an expanding Newsletter with increasing numbers of technical articles. Everyone is invited to contribute or make suggestions to the Editor concerning such articles.

Your Executive Director,
Uri Schwarz

Nouvelles du quartier général de la SCMO du Conseil et de l'Exécutif national

Votre nouveau Conseil et Exécutif ont commencé leur travail immédiatement après avoir été élus au Congrès de Winnipeg (Juin 1991). Les membres sont tous situés à ou autour de Victoria. C.B. Les officiers nous parviennent principalement des institutions suivantes: Université de Victoria (Dr. Hobson, président), Institut des Sciences de la mer (les docteurs Melling, Tabata et Freeland, respectivement secrétaire des minutes, trésorier et éditeur du bulletin Nouvelles), le Collège militaire de Royal Roads (Dr. Krauel, vice-président) et le ministère de la Défense Nationale (D. Bancroft, secrétaire de la correspondance).

Parmi les premières actions entreprises par l'Exécutif, on doit mentionner la révision des préparatifs pour le Congrès de 1992 à Québec (Météorologie méso-échelle et océanographie). Les préparatifs avancent rapidement et promettent comme résultat un congrès intéressant et stimulant. L'Exécutif s'est aussi préoccupé de la planification du congrès de 1993 à Frédéricton, N.B. Le Conseil a déjà approuvé l'endroit du congrès (Université du Nouveau Brunswick) et la nomination des présidents du comité conjoint pour les arrangements locaux (les docteurs Daugharty et Dickison, tous deux de l'Université du Nouveau Brunswick) et également du président du comité pour le programme scientifique (Dr. Loder de l'Institut océanographique de Bedford, Dartmouth, N.E.). Ce dernier a déjà commencé a formé son comité et, bien qu'aucun thème n'ait encore ressorti, il est déjà évident qu'en plus de la météorologie et de l'océanographie, une attention spéciale sera portée à l'hydrologie et aux aspects pertinents de la foresterie.

Le Conseil a également nommé comme Directeur des publications de la SCMO notre ancien collègue et membre à vie de la SCMO, M. Ed Truhlar, qui a récemment pris sa retraite du Service atmosphérique du Canada. Ed fera tout son possible pour aider les éditeurs de la SCMO pour produire des publications de hauts standards, pour améliorer si possible leur agencement et leur apparence et, enfin, leur facilité de lecture. Il sera heureux de recevoir des suggestions et des commentaires qui devront, pour l'instant lui parvenir à notre adresse d'affaires: Société Canadienne de Météorologie et d'Océanographie, C.P. Boite 334, Newmarket, Ont., L3Y 4X7 (téléphone: 416-898-1040 et Facsimilé: 416-898-7937).

Le bureau d'affaires de la Société a récemment terminé d'envoyer les renouvellements pour les abonnements et les réponses ont déjà commencé à nous arriver. Prière de ne pas oublier de renouveler votre abonnement pour 1992 et si vous n'avez pas reçu un formulaire ou si vous connaissez un collègue qui ne l'a pas reçu, veuillez contacter le bureau d'affaires à l'adresse ci-haut mentionnée, ou encore, remplissez le formulaire à la dernière page de ce bulletin de Nouvelles en indiquant en gros caractères au haut du formulaire RENOUVELLEMENT. Il y a plusieurs activités intéressantes de planifiées pour 1992 incluant l'expansion du bulletin de Nouvelles par l'inclusion d'articles techniques. Tous et chacun sont invités à participer ou à faire des suggestions à propos de tels articles à l'éditeur.

Votre directeur exécutif,
Uri Schwarz

WOCE NEWS

A Recent Canadian Contribution to the WOCE Hydrographic Program

by Ross Hendry
Bedford Institute of Oceanography, Dartmouth, N.S.

Physical and Chemical Sciences at the Bedford Institute of Oceanography continued the Canadian contribution to the WOCE Hydrographic Program (WHP) on recent April-June 1991 Cruises 91007 and 91015 of C.S.S. Hudson. An overview of the Hudson program was provided by LeBlond in WOCE News 19 (5). This note presents a rationale for the cruise plan and shows how the results can further our regional interests in addition to contributing to the international WOCE effort.

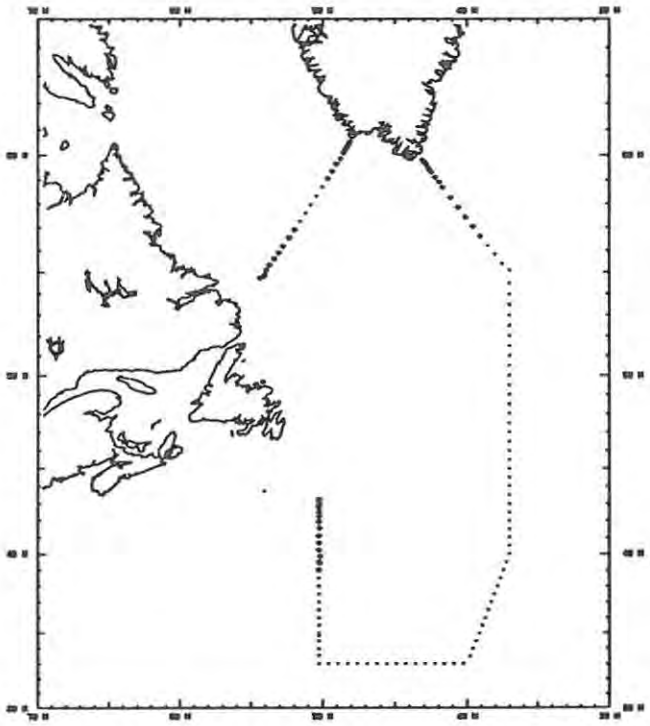


Figure 1: CTD station positions from Hudson cruises 91007/91015. Stations making up the sections shown in Figures 2 (a-d) are emphasized.

The station positions are shown in Figure 1. The CTD survey began in the shallow waters on the Grand Banks, and ended on the outer limits of Hamilton Bank off Labrador. The six survey segments and the coastal boundaries define a closed region in the western North Atlantic. All of the segments lie along WOCE lines. Since none of the lines provide ocean-wide zonal or meridional coverage, our contribution is officially classified as part of the WOCE repeat hydrography program rather then the one-time global survey. With the notable exception of the Labrador Sea line, there are no current Canadian plans to reoccupy the lines visited on the 1991 Hudson cruise.

The segment along the 50°W meridian is designated WHP A20N, or the northern part of one-time survey line A20. This line crossed the Labrador Current and the Gulf Stream, and at deeper depths sampled the westward flowing Deep Western Boundary Current (DWBC).

The zonal segment along 33°N at the southern extreme of the survey is deemed WHP line A4C, a central part of one-time WHP section A4.

The three segments running generally northward from 33°N to the southern tip of Greenland comprise WHP line AR5. This section crossed the North Atlantic Current near 51°N. It ended in 50 percent ice-covered waters on the Greenland shelf south of Cape Farewell after sampling the DWBC at the base of the continental rise and crossing the shallow East Greenland Current.

The final survey segment WHP line AR7W crossed the Labrador Sea from the Greenland continental shelf to Hamilton Bank off southern Labrador. AR7W was also occupied in 1990 [Lazier, WOCE News 19(1)], and we have a commitment to WOCE for further annual realizations of this Labrador Sea line. Fresh coastal currents characterize both ends of AR7W: the northward flowing West Greenland Current on the eastern side and the southward flowing Labrador Current on the western side. The DWBC that flows to the north along the west Greenland slope and returns to the south along the Labrador slope was also sampled on both ends of the line in the 1991 survey.

The hydrographic and tracer measurements obtained on the cruise will help initialize and constrain circulation models aimed at better understanding the oceanic transports and air-sea exchanges of heat and fresh water in the thermodynamically active region bounded by the cruise track. Because the segments completely enclose the region, a local inverse calculation should produce interesting results. The measurements of the Labrador Current will make a useful contribution to local studies seeking to understand the covariability between Canadian coastal ocean climate and biology. The DWBC that was sampled four times on the cruise provides a route for relatively fast communication between surface waters in the Norwegian-Greenland Seas and the deep interior of North Atlantic. This pathway is thought to be potentially important in the partitioning of the global store of carbon dioxide between the atmosphere and the ocean. The cruise data should contribute to a better understanding of this deep current system.

The data from the cruise are at an early stage and are being worked on by a number of investigators. We can use a provisional version of the discrete oxygen data set from rosette samples to highlight the four crossings of the DWBC and provide a semi-quantitative illustration of the interconnections suggested above. High values of dissolved oxygen provide a distinctive label for the waters cooled in contact with the atmosphere in the Norwegian-Greenland Seas and subsequently spilled over the sill at Denmark Strait to form the DWBC. Mixing and biological activity would both contribute to reduced DWBC oxygen concentrations further from its source region.

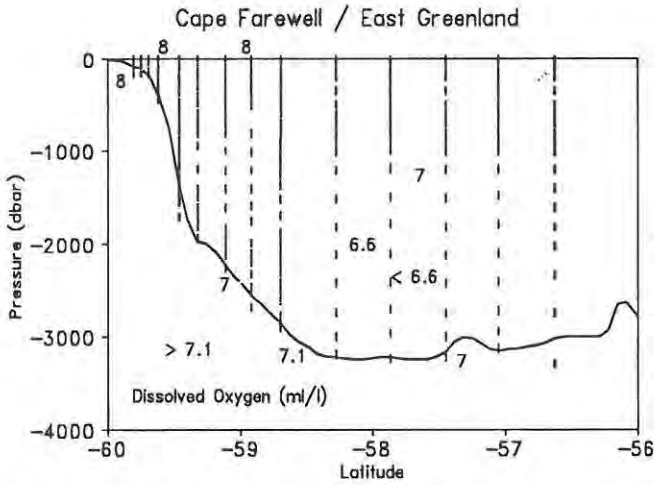


Figure 2a. Dissolved oxygen concentration (ml/l) along a transect of the east Greenland slope and rise, showing a deep maximum associated with the Deep Western Boundary Current (DWBC)

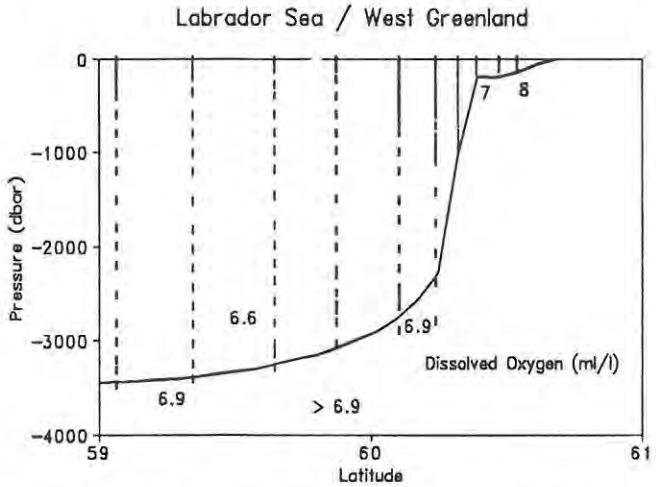


Figure 2b: Oxygen section from the west Greenland slope and rise.

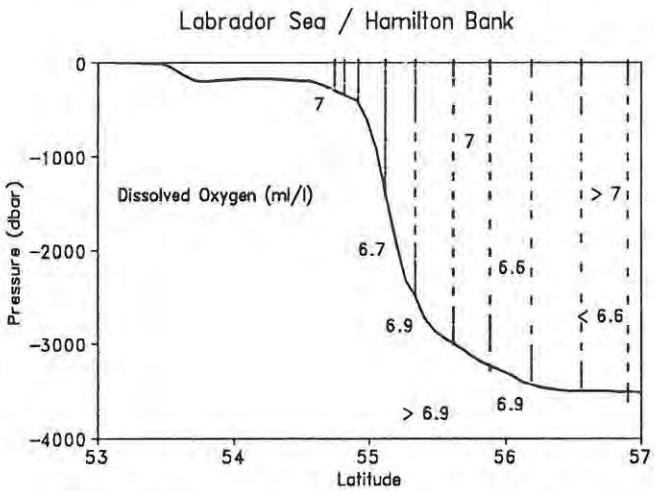


Figure 2c: Oxygen section from the Labrador slope and rise.

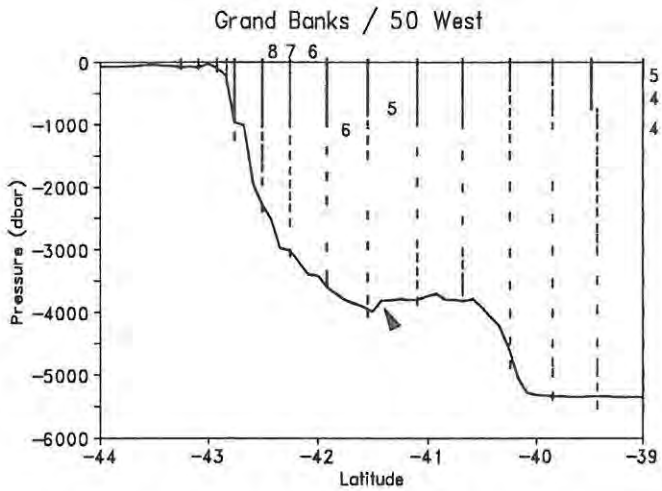


Figure 2d: Oxygen section along 50°W on the southeast Newfoundland Rise leading up to the Grand Banks.

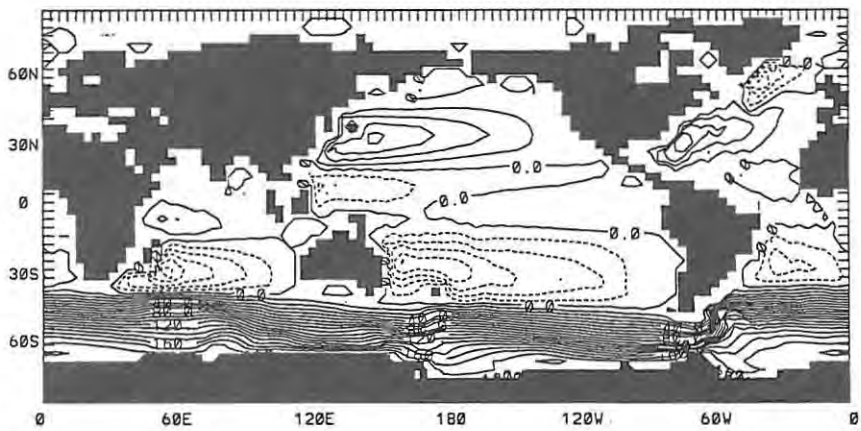
The Cape Farewell section is the most upstream section from the point of view of the DWBC. The DWBC is marked by oxygen readings greater than 7.1 ml/l near the 3000 m depth contour (Figure 2a). Moving approximately 450 km around the southern tip of Greenland to the Labrador Sea, a similar DWBC oxygen signature shows maximum deep readings of just over 6.9 ml/l (Figure 2b). The DWBC oxygen maximum is also seen on the western side of the Labrador Sea (Figure 2c) with deep oxygen concentrations greater than 6.9 ml/l. The deep oxygen maximum on the Labrador side is about 450 km away from the west Greenland maximum as the crow flies, but the DWBC has traversed approximately 2000 km around the northern perimeter of the Labrador Sea before reaching the section offshore of Hamilton Bank . Finally, the DWBC oxygen maximum is seen near 3500 m depth over the Southeast Newfoundland Ridge south of the Grand Banks on 50°W (Figure 2d). The DWBC has traversed approximately 1500 km from the western Labrador section, and the maximum concentrations are reduced to just over 6.4 ml/l. The net path length between the east Greenland crossing and the 50 W crossing is on the order of 4000 km. A nominal mean speed of 0.05 m/s gives a transit time of about 2.5 years.

The goal of the WHP is to create a data base of observations like those obtained on the Hudson cruise to verify models of ocean circulation that can contribute to an improved understanding of climate and climate variability. Regional studies in many parts of the world ocean will also benefit from the WHP efforts.

A Global Ocean Model for Coupling to the CCC AGCM

by Warren G. Lee and William W. Hsieh
University of British Columbia, Vancouver, B.C.

A 15-level global ocean general circulation model (based on the Modular Ocean Model, the latest version of the Bryan-Cox primitive-equation ocean model from the Geophysical Fluid Dynamics Lab, Princeton) has been set up to match the CCC (Canadian Climate Centre) Atmospheric General Circulation Model (AGCM) with the T32 horizontal grid (corresponding roughly to 3.75 degree horizontal resolution). Driven by the climatological annual mean wind stress, and with surface temperature and salinity relaxed to the Levitus (1982) data, the depth-integrated transport streamfunction is shown



above after 2000 years of spinup. The streamfunction contour interval is 10 Sv, with solid contours indicating clockwise circulation, and dashed contours, counterclockwise circulation. Transports of 42, 47 and 190 Sv were obtained for the Kuroshio, the Gulf Stream and the Antarctic Circumpolar Current. The deep waters are presently too warm, due to inadequate bottom water formation. Implementation of seasonal forcing (hence intense winter cooling) and the addition of a sea ice model (hence brine rejection) should improve bottom water formation in the model. Coupling of this model with the CCC AGCM is expected to begin in early 1992.

CANADIAN OCEAN MODELLING WORKSHOP

A special workshop on Ocean Circulation Modelling was held at the Institute of Ocean Sciences, Sidney, B.C. on Oct 24-25 1991. The workshop addressed problems of science and structure in planning for a Canadian Network on Global Climate Modelling. Many of the Canadian participants in the ocean modelling aspects of WOCE (names underlined below) presented papers during the first day.

Morning presentations included the following: Andrew Weaver, of McGill University (Montreal) talked about "Stability and variability of the thermocline circulation". Richard Greatbatch (Memorial University, St.John's, Newfoundland) presented recent modelling studies of the North Atlantic. Josef Cherniawsky (Institute of Ocean Sciences, Sidney, B.C.) presented initial experiments with an "Isopycnal Ocean Global Climate Model" for climate studies. William Hsieh (University of British Columbia, Vancouver, B.C.) gave a talk entitled: "The influence of global warming on ocean upwelling and a Global Ocean Model for future coupling to the Atmospheric General Circulation Model of the Canadian Climate Centre."

Afternoon papers were by: Lawrence Mysak (McGill University), on "Century-scale climate variability in an ocean circulation model"; Ann Gargett (Institute of Ocean Sciences) on "Sensitivity of the GFDL ocean model to different diffusivities for heat and salt; Michael Eby (Institute of Ocean Sciences) on "Representation of the Arctic in a global ocean model; Keith Thompson (Dalhousie University, Halifax, N.S.) presented an overview of physical oceanographic research at Dalhousie University in relation to Ocean Circulation Modelling. Chris Garrett (University of Victoria, Victoria, B.C.) talked about "The Mediterranean as a climate test basin: the need to combine monitoring, modelling and process studies; Allyn Clarke (Bedford Institute of Oceanography, Dartmouth, N.S.) closed the session with his talk on "The interannual variability of the North Atlantic - is it predictable?"

After dinner, Richard Peltier (University of Toronto) presented an overview of the Canadian Global Change Program, which is an umbrella planning and steering group under the leadership of the Royal Society of Canada for work falling under the International Geosphere-Biosphere Program as well as associated climate change programs (WOCE, JGOFS, BOREAS, etc...)

The second day of the workshop was devoted to presentation of interests by Canadian government departments (Environment, Fisheries & Oceans) in climate modelling, and of the recently launched "Green Plan" environmental initiative. Plans to develop an global ocean-atmosphere modelling centre were discussed in that context.

More information on the scientific presentations as well as on discussion towards the modelling centre may be sought from the WOCE Canada office (Ms Elsa Traczynski, Dept. Oceanography, University of British Columbia, Vancouver, B.C. Canada, V6T 1Z4)

COUNCIL GUIDELINES FOR COMMISSIONING AND ISSUING POSITION STATEMENTSON BEHALF OF THE CANADIAN METEOROLOGICAL AND OCEANOGRAPHIC SOCIETY (CMOS)

PREAMBLE CMOS is a society of persons and organizations having an interest in meteorology and/or oceanography. The society exists for the purpose of advancing oceanography and meteorology in Canada and shares a sense of responsibility to ensure that advances in these sciences are made available to benefit us all.

The Society encourages its members to exercise their individual sense of responsibility in addressing political and social issues. Should they choose to act collectively on such issues other organizations exist for such purposes. CMOS, as a society, should preserve its unique position as an objective source of analysis and commentary on the full spectrum of oceanographical and meteorological science.

AUTHORITY AND PROCEDURES The council of CMOS may choose to issue, in the name of the Society, authoritative statements on issues of public concern within the range of its competence which council has decided enjoy the broad support of the Society membership. Furthermore, Council has established a Scientific Committee, which *inter alia* is especially concerned with policy statements on various scientific issues, funding policies in atmospheric and ocean sciences and the state of atmospheric and oceanographic science in Canada.

Requests for position statements on scientific issues are normally referred to the Chairman of the Scientific Committee. The Scientific Committee shall appoint a subcommittee of the Scientific Committee consisting of at least the chairman of the Scientific Committee, the initiator of the request and three persons who have recognized scientific expertise and experience concerning the issue at hand. These persons have to be members of the Society.As necessary, other committees (e.g., Educational, Professionalism) are also consulted.

The Council and the membership will be informed, by means of a notice in the Newsletter, that the subcommittee is working on the issue and that comments are welcome.The subcommittee will prepare a draft statement for circulation to the Council.

Members of Council will be asked to vote or to comment on the proposed statement. The function of Council is to endorse the respectability and expertise of the subcommittee and the importance of the subject of the statement. This vote is to be taken at regularly scheduled meetings, except where timeliness is critical. Concurrence of two thirds of Council Members voting is required for adoption.

The members of the subcommittee preparing the statement should be prominently identified as the authors.

In cases of great urgency, the Council may have to abbreviate this process.

Statements shall be distributed to appropriate news media, to those in a position to take or influence needed actions, and to the Society at large through the Newsletter.

SUBJECT MATTER CMOS has assumed a responsibility to society as a whole and to its members to adopt, from time to time, positions on scientific matters concerned with the atmosphere or oceans. To the extent that the understanding and application of meteorological and ocean science is relevant to public policy, CMOS as a responsible scientific association should make relevant information available to all interested parties. As a scientific society, CMOS should not take or advance public positions on judgmental issues that extend beyond the range of available data or recognised norms of legitimate debate. Public positions adopted by CMOS and statements issued on its behalf must be based on sound scientific principles and should reflect the interests of society as a whole.

CMOS CONGRESS 1993 PROGRAMME COMMITTEE

The 1993 CMOS Congress will be held at the University of New Brunswick (UNB), Fredericton, N.B. from June 7-11. The Scientific Programme Committee for the Congress is considering topics for the Congress theme and/or theme sessions, and potential invited speakers. The membership is invited to pass suggestions to the Committee:

Dr. John Loder (Chairman; shelf oceanography), Bedford Institute (BIO) (902/426-4960; FAX:902/426-7827; INTERNET:jloder@sable.bio.ns.ca)

Mr. Dave Daugharty (LAC Liaison; hydrology), UNB (506/453-4501; FAX:506/453-3528)

Mr. R.B.B. Dickison (LAC Liaison; forest meteorology), UNB (506/450-8802; FAX:506/453-3528)

Dr. Fred Dobson (Air-sea interact., ocean climate, satellite ocean.), BIO (902/426-3584; FAX:902/426-7827; INTERNET:F_DOBSON@bionet.bio.ns.ca)

Dr. Owen Hertzman (Synoptic meteorology), Dalhousie Univ. (902/494-3683; FAX:902/494-3877)

Dr. Peter Jones (Chemical oceanography), BIO (902/426-3869; FAX:902/426-7827; OMNET:BEDFORD.INST)

Mr. Ken MacDonald (Operational meteorology), AES Bedford (902/426-9200; FAX:902/426-4873)

Dr. Fred Page (Fisheries oceanography), St. Andrews Biological Stn. (506/529-8859; FAX:506/529-4274; INTERNET:fpage@sable.bio.ns.ca)

SCMO

26e congrès annuel

UNIVERSITÉ LAVAL, QUÉBEC

8 au 12 juin 1992

MÉTÉOROLOGIE ET OCÉANOGRAPHIE À LA MÉSOÉCHELLE

FORMULAIRE D'INSCRIPTION AU CONGRÈS

TARIFS

Membre de la SCMO	
avant le 1er mai 1992	120,00$
après le 1er mai 1992	140,00$
Non membre	160,00$
Membre honoraire	50,00$
Etudiant	50,00$

Nom ..... Prénom .....

Adresse .....

.....

Code postal .....

Tél: .....

TOTAL

Catégorie:	membre SCMO avant le 1er mai	.....$
	membre SCMO après le 1er mai	.....$
	non membre de la SCMO	.....$
	membre honoraire	.....$
	étudiant	.....$
	TOTAL	.....$

COMPLÉTER ET FAITES PARVENIR À L'ADRESSE CI-DESSOUS EN INCLUANT UN CHÈQUE FAIT À L'ORDRE DU **CONGRÈS SCMO 1992**

CONGRÈS SCMO 1992
a/s M. Paul Lamb
2360 chemin Ste-Foy, 2e étage
Ste-Foy, QC, Canada
G1V 4H2

téléphone: (418) 643-7880
télécopieur: (418) 643-9591

CMOS

26th Annual Congress

UNIVERSITÉ LAVAL, QUÉBEC

June 8-12, 1992

MESOSCALE METEOROLOGY AND OCEANOGRAPHY

REGISTRATION FORM

RATES

CMOS member

before May 1 1992	120,00$
after May 1 1992	140,00$
Non member	160,00$
Honorary member	50,00$
Student	50,00$

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Address .....

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Postal Code .....

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		TOTAL
Category :	CMOS member before May 1 1992	.....$
	CMOS member after May 1 1992	.....$
	non member	.....$
	honorary member	.....$
	student	.....$
	TOTAL	.....$

FILL IN AND SEND WITH CHEQUE PAYABLE TO: **CMOS CONGRESS 1992**

CONGRÈS SCMO 1992
a/s M. Paul Lamb
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Ste-Foy, QC, Canada
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FAX: 418-643-9591

SCMO 26e congrès annuel
UNIVERSITÉ LAVAL, QUÉBEC
8 au 12 juin 1992
MÉTÉOROLOGIE ET OCÉANOGRAPHIE À LA MÉSOÉCHELLE
INFORMATIONS POUR L'HEBERGEMENT

Les participants doivent prendre eux-mêmes tous les arrangements nécessaires pour réserver leur chambre.

Lieu	Taux	Téléphone	Date limite
Université *	32$	418-656-2921	1 mai
Motel Universel	58$	418-653-5250	1 mars
Holiday Inn	90$	418-653-4901	1 mai
Hilton	110$	418-647-6508	17 mai

* comprend le petit déjeuner

Le nombre de chambres est limité. Les participants ont donc avantage à réserver le plus tôt possible.

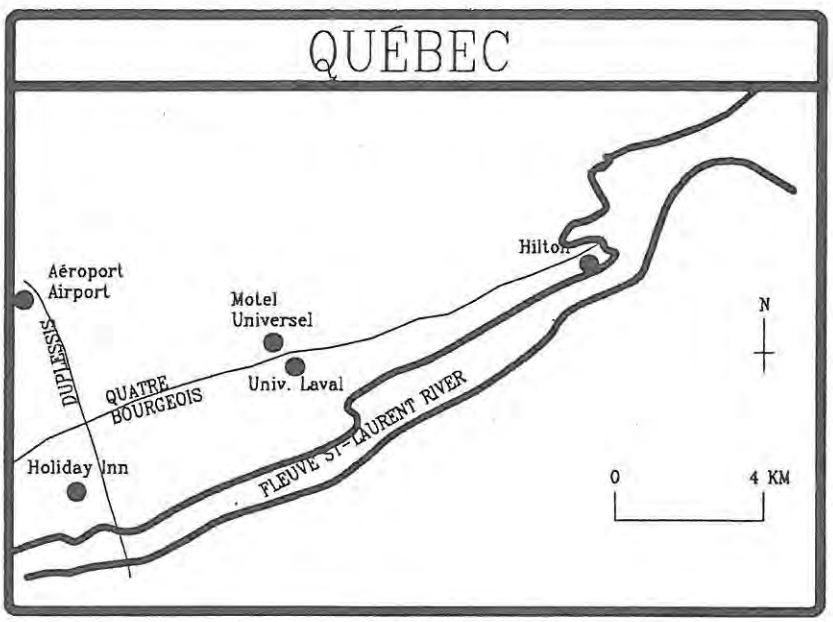
CMOS 26th Annual Congress
UNIVERSITÉ LAVAL, QUÉBEC
June 8-12, 1992
MESOSCALE METEOROLOGY AND OCEANOGRAPHY
INFORMATION FOR ACCOMODATION

All participants must make their own arrangements and reservations.

Place	Rate	Telephone	Deadline
University*	32$	418-656-2921	1 May
Motel Universel	58$	418-653-5250	1 March
Holiday Inn	90$	418-653-4901	1 May
Hilton	110$	418-647-6508	17 May

* includes breakfast

At each place the number of rooms is limited. Reservations must thus be made as soon as possible.



Le logiciel PAPYRUS

ABSTRACT This text gives an overview of PAPYRUS, a software design to manage bibliographical references. It appears that PAPYRUS is a very powerful and flexible tool which has the advantage of being compatible with popular word processors and Current Contents on Diskette at a very reasonable price. A demo diskette is available.

RÉSUMÉ Ce texte donne un aperçu de PAPYRUS, un logiciel de gestion des références bibliographiques. PAPYRUS est un outil très puissant et très flexible qui a l'avantage d'être compatible avec les traitements de texte populaires et les Current Contents on Diskette, le tout à un prix très raisonnable.

Dans le domaine scientifique, il est totalement impossible de travailler sans documentation à jour. Ceci est aussi vrai dans de nombreuses activités professionnelles. Que ce soit des articles de revues, des comptes-rendus de conférences, des livres de référence ou d'enseignement, des rapports, etc, nous sommes tous en devoir de consulter une vaste source d'information afin de demeurer à date et bien informé. Pour plusieurs, ces informations doivent être conservées pour référence future. Cependant, vient un moment où un système de classement qui puisse organiser cette masse d'information est rendu nécessaire. Le logiciel PAPYRUS est justement conçu pour aider à mieux gérer les innombrables références dont on a besoin.

L'objectif de ce texte est de présenter au lecteur un court aperçu du logiciel PAPYRUS afin que ce dernier puisse juger de sa pertinence pour ses propres besoins.

1. Fonction de PAPYRUS La fonction de PAPYRUS est d'aider l'utilisateur à classer puis à traiter ses références au moyen de divers outils de gestion. PAPYRUS permet l'échange des informations, soit vers PAPYRUS (à partir d'autres sources) soit hors de PAPYRUS (par exemple en interface avec un traitement de texte).

2. Les éléments PAPYRUS vous permet de classer des articles de revues (scientifique ou autre), des livres, des chapitres de livre (ou par exemple une communication dans un compte-rendu de conférence), des thèses, des cartes, des patentes, des citations et autres. Ce logiciel peut gérer 2 millions de références par base de références.

Pour chaque référence, on donne le nom du ou des auteurs (jusqu'à un maximum de 99 par article), l'année, le nom du journal, le volume, le numéro, les pages et les mots-clés. Chaque référence peut se voir attribuer jusqu'à 100 mots-clés que l'on peut classer selon deux catégories (majeurs et mineurs). De plus, à chaque item, on peut joindre un commentaire pouvant contenir jusqu'à 10 000 caractères (par exemple un résumé des points d'intérêt de cette référence).

Les mots-clés sont contenus dans une banque de mots-clés que l'on peut accéder en tout temps lors de la saisie des informations. PAPYRUS simplifie énormément la tâche au moment de la saisie. Par exemple, il n'est pas nécessaire d'écrire à chaque fois le nom complet de la revue dans laquelle se trouve un article. On peut donner une abréviation ou un code (deux lettres par exemple) à chaque journal et l'inscrire au moment de la saisie; PAPYRUS remplace alors cette abréviation par l'abréviation officielle du journal (que vous devez donner la première fois qu'un nouveau journal est mentionné). La même chose se produit pour les chapitres d'un livre: de l'un à l'autre PAPYRUS se souvient du titre du volume.

3. Le travail Les items peuvent évidemment être édités et listés (de manière brute) en totalité. Une liste peut se faire selon un ordre numérique ou alphabétique, selon les mots-clés, les auteurs, l'année, etc. Cette liste peut être affichée à l'écran ou imprimée ou encore envoyée dans un fichier; ce fichier peut être formaté de manière à être lu par un traitement de texte tel MS-WORD ou WORD-PERFECT. La liste des mots-clés et des journaux peut aussi être éditée et sauvegardée dans un fichier.

PAPYRUS peut faire de la recherche sur votre base de données de plusieurs manières et selon plusieurs critères: auteur, éditeur, année, mots-clés, titre, etc; on peut aussi employer des opérateurs tels =, >, <, ou, et, etc.

PAPYRUS peut lire un manuscrit et, grâce à un code simple, rechercher dans votre base de références celles qui sont mentionnées dans votre texte et les ajouter à votre liste de références. PAPYRUS produira votre liste de références selon des critères propres à certaines revues par exemple ou selon vos propres spécifications. Il est aussi très simple d'échanger des informations avec une autre base de références crée par PAPYRUS et aussi très simple d'importer des éléments provenant des CURRENT CONTENTS ON DISKETTE; toute l'information est parfaitement conservée dans le transfert.

Malgré la puissance de ce logiciel, le travail de saisie, de recherche, de liste, etc est très rapide; les commandes sont intuitivement simples. L'apprentissage est très facile; au début, il est préférable de bien lire les quelques sections du guide qui sont recommandées par le fabricant.

4. Spécifications PAPYRUS fonctionne sur PC-Compatible préférablement avec disque rigide; il occupe environ 2,5 Megs de mémoire plus l'espace requis pour la base de références (environ 1 Meg pour 1500 références) . On peut créer autant de base de données que l'on désire simplement en copiant 2 fichiers sur d'autres sous-répertoires. On peut aussi configurer le logiciel selon ses préférences quant au choix de couleurs, ce qui peut faciliter la saisie des informations. La souris est active dans le champ des commentaires.

Le manuel de l'utilisateur est suffisamment documenté (une version ASCII est fournie avec le logiciel). Notons que contrairement à ce qu'on y indique, on peut employer les caractères accentués sans devoir y référer selon leur code ASCII grâce à un programme

deconfiguration de clavier courant (comme celui de MS-WORD par exemple).

Si vous vous procurez le logiciel directement du fabricant, ce dernier vous donne une garantie de remplacement sans condition si vous n'êtes pas entièrement satisfait.

5. Conclusion PAPYRUS constitue un excellent outil de travail qui est très efficace et parfaitement à la hauteur de ce qu'on en attend. Compte tenu de son prix qui n'est que d'environ 120$ (disponible chez MICRO-SOLUTIONS), c'est sans contredit un investissement de choix. Une licence multi-usager est disponible.

Ceux qui le désirent peuvent obtenir une disquette de démonstration (fournie avec le logiciel) en contactant Richard Leduc au 418-643-7880 ou encore par FAX au 418-643-9591.

L'adresse du fabricant est la suivante: Research Software Design, 2718 SW Kelly Street, Suite 181, Portland, Oregon, USA 97201, tél:503-796-1368, FAX:503-241-4260.

par Richard Leduc, Ph.D.
Division de la qualité de l'air 2360 chemin Ste-Foy, 2ième étage
Ste-Foy, QC, G1V 4H2

Atmospheric Data Analysis.

By Roger Daley, Cambridge University Press, 1991, 457 + xiv pp.

During the coming decade there will be an enormous increase in the quantity and types of global atmospheric data acquired through satellite remote sensing, ground based remote sensing, and in-situ measurements by aircraft. As one example, the recently launched Upper Atmosphere Research satellite (UARS) will provide stratospheric and mesospheric observations of temperature, wind, water-vapour, ozone and many other trace constituents. Satellite instrumentation planned as part of the Earth Observing System (EOS) will observe these and many other atmospheric, oceanic and surface parameters thought to be significant for global climate change. Satellite data, which are highly asynoptic in nature, must be combined with conventional synoptic data and data from ground based remote sensors (which may operate continuously) if optimal use is to be made of the total anticipated data resource for either operational forecasting or climate research purposes.

Fortunately, during the last couple of decades, research efforts by scientists concerned with analysis of the atmospheric state for initialization of forecast models have led to major advances in the science of objective analysis of atmospheric data. These are now beginning to be utilized not only in operational weather forecasting models, but also in analysis of fields of interest in global change research, such as the stratospheric ozone distribution. Until now, however, there has been no comprehensive text covering the many techniques of atmospheric analysis. This void in the literature has now been filled by Dr. Daley's important and timely work.

The title *Atmospheric Data Analysis* perhaps suggests a broader area than is addressed in Daley's text. For example, techniques of time series analysis and expansion of fields in series of orthogonal functions, which are widely used in the study of atmospheric low-frequency variability, are not discussed at all. Rather the emphasis is on methods of objective analysis techniques in both forecasting and research.

The text itself is sufficiently self-contained so that it can be successfully used by students with little background in meteorology. Although the publisher indicates that the book may be used by senior level students taking courses in numerical weather prediction or dynamic meteorology, a solid grounding in the fundamentals of linear algebra and advanced calculus is clearly a prerequisite for the understanding of many of the analytic developments in the book. Thus, I anticipate that the primary uses will be as a text in graduate level courses in objective analysis and numerical weather prediction, and as a reference source for researchers who need to apply the methods of objective analysis. The value of the book as a text is enhanced by the inclusion of exercises for the student at the end of each chapter.

Chapter 1 is an introduction that nicely describes the general subject of the text. Chapters 2-5 discuss function fitting, the method of successive corrections, and univariate and multivariate statistical interpolation. These chapters demonstrate how to utilize observations and background values to produce representations of the spatial distribution of a given field at a specified time. As is well known, objectively analyzed fields produced by such techniques are not generally suitable as initial fields for weather prediction models since they do not utilize dynamical information on the balance between the velocity and mass fields, and thus tend to produce spurious high frequency oscillations in forecast fields. This problem can be solved by suitably modifying the objectively analyzed fields. This process, which is called data initialization, is the primary subject of Chapters 6-11. These chapters provide a thorough treatment of a number of approaches to the initialization problem. An appealing aspect is the use of the shallow water model on an f-plane as a prototype. Owing to the simplicity of this model, analytic solutions can often be obtained. These clearly illustrate the physical constraints inherent in each of the methods, and provide the reader with concrete examples.

More general problems of data assimilation are considered in the final two chapters. These include assimilation of asynoptic satellite data, and data assimilation for the oceans. The book ends with a number of useful appendices which expand on various mathematical points treated more briefly in the main text.

Daley's book is well organized, pedagogically sound, and attractively printed. It is a welcome addition to the meteorological literature and is likely to become the standard reference in its field.

James R. Holton
University of Washington.

Volume 29 No 4 December 1991 Décembre

ATMOSPHERE-OCEAN

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Volume 30 No 1 March 1992 Mars

ATMOSPHERE-OCEAN

Contents/Table des matières

Volume 25 No 3 December 1991 Décembre

Climatological Bulletin
Bulletin climatologique

as of Oct 1st 1991/en date du 1 Oct. 1991

University of Victoria
School of Earth and Ocean Sciences

The new School of Earth and Ocean Sciences was formally established in July 1991 through an amalgamation of geologists, geophysicists and oceanographers in three other departments. The School will expand with new faculty appointments over the next few years. Two appointments were made in the summer: Dr. Paul Hoffman (Precambrian tectonic processes; Geological Survey of Canada) and Dr. Andrew Weaver (ocean-atmosphere modelling; McGill University) and a third position is still under review. Drs. Hoffman and Weaver will join SEOS in mid-1992. Two further positions for next year are currently being advertised. The establishment of the School has also required new technical and administrative staff and a move by some into expanded quarters.

A new undergraduate program in Earth Sciences and the M.Sc. and Ph.D. programs in earth and ocean sciences were also launched this Fall. Many new graduate students were enrolled. There are several post-doctoral fellows in the School and a new Research Associate, Dr. Hidekatsu Yamazaki, who is conducting a research program in physical oceanography specifically addressing near ocean surface physical/biological interactions.

The University of Victoria has been selected as the IBM Western Canada Centre for Environmental Modelling and several faculty in SEOS, as well as the growing group in GIS and remote sensing in Geography, will benefit from this initiative. The intention is to build strong ties with the established IBM Scientific Centre in Bergen, Norway.

Considerable activity occurred in September with the arrival of the ocean drilling project vessel JOIDES Resolution, and several faculty were involved in the organisation of the port-call festivities, panel meetings, scientific symposia and in organising public tours of the ship. On a more modest scale, U. Vic. approved a mid-life refit of its research vessel the MSSV John Strickland. The work will be fully complete by December and will allow a more ambitious program in marine science.

Chris Barnes

New CMOS Members

The following new members were approved at the CMOS Executive Meeting 22nd July, 1991:

Dr. Lok Yan (regular)	Calgary
Mr. Zuchao Cao (student)	Toronto

The following new member was approved at the CMOS Executive meeting 21st October, 1991:

Sylvain de Margerie (regular)	Halifax

Note to Centres and Chapters:
It is important that you make contact as soon as possible with any new members in your area to verify their mailing address and to begin distribution of local Society material. National mailings and publications begin once approved new members are entered in the office computer. This follows the date of the executive or Council meeting shown in this notice.

International Symposium on CLIMATE CHANGE AND NORTHERN FISH POPULATIONS

October 13-16, 1992, Victoria B.C., Canada

FIRST ANNOUNCEMENT AND CALL FOR PAPERS

OBJECTIVE:
This symposium will promote an exchange of information relating to the effect of climate change on fisheries in aquatic ecosystems in northern latitudes.

TOPICS:
- Evidence for changes in climate and the resulting effects in freshwater and marine environments.
- Effects of climate on fish populations.
- Economic impacts of climate change on fisheries
- Preparing for climate change.

PUBLICATION:
Proceedings will be published in the Special Publication series of the Canadian Journal of Fisheries and Aquatic Sciences.

CALL FOR PAPERS:
All interested persons are invited to provide summaries of their papers, not to exceed 250 words, to the Symposium Secretary (address below) by **January 15, 1992.** The Organizing Committee will select papers for oral presentation and for a poster session.

For additional information, please contact the Symposium Secretary, Department of Fisheries and Oceans, Pacific Biological Station, Nanaimo, B.C., Canada V9R 5K6 or members of the Coordinating Committee.

Telephone: (604)-756-7260
Rapidfax : (604)-756-7053

RMS Calendar for 1992

The CMOS Executive Director has received a sample copy of the Royal Meteorological Society 1992 Calendar. As usual, the calendar has exquisite colour photographs of weather elated subjects. The calendar also includes information on monthly averaged data for UK locations and accounts of outstanding weather occurrences in the past year. The calendar is available from:

The Royal Meteorological Society
104 Oxford Road
Reading, Berks RG1 7LJ
Tel. (0734)-568500
Fax. (0734)-568571

The price is £3.80 each or £16.50 for 5 copies including postage and handling.

Computer Bulletin Board for the ERS-1 Satellite

A computer bulletin board designed to improve corodination among participants of the international research program Earth Observing System (EOS) has been set up on the Omnet/ScienceNet information exchange. The European management arm of SCIENCEnet, Omnet Europe, based in Killaloe, County Clare, Ireland, worked to set up the bulletin board.

For more information on Omnet/SCIENCEnet and the ERS1.NEWS bulletin board, contact Omnet Europe, Killaloe, Co. Clare, Ireland. Telephone: 353-061-23407.

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Workshop on Cloud Microphysics and Applications to Global Change
Toronto 10-14 August 1992

A Workshop on Cloud Microphysics and Applications to Global Change is being planned for 10th-14th August 1992 in Toronto. It will be held at the same hotel and in the same time period as the Third International Cloud Modelling Workshop, and just before the 11th International Conference on Clouds and Precipitation being planned for Montréal, 17th-21st August, 1992. This workshop is being organised by the WMO Panel of Experts/CAS Working Group on the Physics and Chemistry of Clouds and Weather Modification Research. The Canadian Meteorological and Oceanographic Society, and the American Meteorological Society are co-sponsors.

It is known that clouds play an important role in controlling the Earth's climate. The main purpose of the workshop will be to collect together measurements made around the world relating to cloud microphysics and its impact on global change. The measurements will be presented in a format useful to those attempting to predict global change. The workshop will consist of two parts. First, a series of papers will be presented summarizing various measurement campaigns and demonstrating the relationship between cloud microphysics and global change. Second, measurements from around the world will be summarized using information obtained from a detailed questionnaire completed by participants. Third, panel discussions will be held to discuss such things as gaps in our knowledge and capabilities relating to instrumentation, measurements and modelling. There will be a workshop report consisting of the workshop papers, the data summaries and the recommendations of the panel(s).

Some review or summary-type papers are solicited on 1) the theory and observations of how clouds affect climate, 2) microphysical measurements made in different regions or cloud types, 3) aircraft instrumentation, 4) remote sensing instrumentation, and 5) cloud microphysical modelling. There will be no concurrent sessions and papers will be given adequate time for discussion. Consequently, only a few papers will be accepted for presentation. Papers need not present original results; summaries from the author(s) work are encouraged. Single page abstracts, including author's address and telephone numbers, should be sent no later than 1st february, 1992, to the Program Chairman at the following address.

Dr. G. A. Isaac
Cloud Physics Research Division
Atmospheric Environment Service
4905 Dufferin Street
DOWNSVIEW, Ontario M3H 5T4, Canada

Tel. (416)-739-4605
FAX (416)-739-4211
Email: (OMNET) G.ISAAC

Authors will be notified by April 1st, 1992, if their papers have been accepted, and manuscripts will be required by the time of the Workshop. Those interested in participating in the workshop, presenting a paper, or contributing to the data summary are also invited to inform Dr. G. A. Isaac.

Third International Cloud Modelling Workshop
Toronto 10th-14th August, 1992

The International Commission on Clouds and Precipitation of the IUGG is planning to conduct the Third International Cloud Modelling Workshop in Toronto, Canada during 10th-14th August, 1992. The workshop is being cosponsored by the World Meteorological Organization, the American Meteorological Society and the Canadian Meteorological and Oceanographic Society.

The purpose of the workshop is to stimulate co-operative efforts among theoreticians and observers who seek to understand the mechanisms of cloud and precipitation evolution in both natural and cloud seeded situations. The broad goal of the workshop is to promote work that will increase the utility of numerical models in cloud physics, weather modification, cloud chemistry, climate, forecasting and other areas of meteorology that require accurate representation of cloud processes. The primary focus of the Third International Cloud Modelling Workshop will be on the simulation of precipitation processes in cloud scale and mesoscale systems.

Participation in the workshop will involve two phases. First, participants will carry out numerical experimentation at their home institutions using data sets provided by the workshop organizers. Second, participants will meet at the workshop itself to compare model results against observations and against other modelling efforts. Participants will be encouraged to provide papers describing their results for use at the workshop and for publication in the report of the workshop.

The following data sets will be available for distribution by the end of September, 1991:

(a) All liquid microphysical processes.
(b) Mixed phase (both liquid and ice) processes for winter-time orographic and spring/summer-time convective clouds.
(c) Frontal cloud conditions.
(d) Maritime boundary layer cloud conditions.

In addition to data sets from natural clouds, some data from seeded clouds are also available.

Those interested in participating in the workshop are invited to obtain data sets and other information by writing to:- Dr. Harold Orville, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, 501 E. St. Joseph Street, Rapid City, South Dakota 57701-3995, U.S.A., Tel. (605)-394-2291, FAX (605)-394-6061, Omnet: H.ORVILLE.

All expenses incurred in connection with the workshop (travel and computer costs) will have to be borne by the participants. Plans are being made to request NSF support for a travel grant to help support a limited number of scientists from the United States to attend this workshop, the Cloud Microphysics and Applications to Global Change Workshop, and the 11th International Conference on Clouds and Precipitation Physics, held one week later in Montréal.

Special Session on the Interactions Between Synoptic and Mesoscale Weather Systems

Montréal, Québec 12th-15th May 1992

A special session on the interactions between synoptic and mesoscale weather systems will be held during 10-12 May 1992 in Montreal as a part of the 1992 joint spring meeting of the American and Canadian Geophysical Unions and the Mineralogical Society of America. Detailed programs have been published in the November 5th 1991 issue of EOS.

The purpose of the symposium is to provide a forum for researchers to exchange their current understanding of the dynamical processes taking place in midlatitude weather systems at scales from 10 to 1000 km. Papers are solicited on both observational and modelling aspects of the scale interactions in atmospheric weather systems. Papers in the following areas are particularly welcome.

- mesoscale weather systems and their effects on synoptic scale dynamics;
- surface features and their effects on meso- and larger scale dynamics;
- synoptic forcing and the determination of meso-scale features;
- tropospheric processes coupled with meso- and synoptic scale disturbances;
- case studies from recent field experiments; and
- unique Canadian mesoscale and synoptic scale phenomena.

Those wishing to present a paper should submit a title and abstract (200 words) to AGU Meetings, 2000 Florida Avenue, N.W., Washington, D.C., 20009, U.S.A., no later than 20th February 1992. Please consult the November 5th issue of EOS for more details.

Session co-convenors: Dr. R. E. Stewart, Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario, M3H 5T4, Tel. (416)-739-4608, and Da-Lin Zhang, Department of Meteorology, McGill University, Montréal, Québec, H3A 2K6, Tel. (514)-398-8075.

Special Session on Arctic Physical Oceanography

Montréal, Québec 12th-15th May 1992

A special session (004 Ocean Sciences) on the above topic will be held in Montréal as part of the 1992 spring AGU meeting of the American and Canadian Geophysical Unions and the Mineralogical Society of America.

Recent studies have suggested that the dynamics of the North Atlantic Ocean may be strongly influenced by its interactions with the Arctic Ocean by the mass, heat and salinity fluxes through the Fram Strait into the Greenland Sea. If these interactions affect the rate of deep water formation through a modification of the convection taking place in the North Atlantic, the entire thermohaline circulation (THC) could be altered with a likely strong influence on the Earth's climate. Papers are invited on observational, theoretical and modelling aspects of Arctic oceanography with special emphasis on northern Atlantic-Arctic ocean/ice interactions. Related papers on air/ice/ocean interactions are also welcome for consideration.

Those wishing to present a paper should submit a title and abstract (200 words) to AGU meetings, 2000 Florida Avenue N.W., Washington, D.C. 20009, U.S.A., no later than 20th February, 1992. Please consult the November 5th issue of EOS for details on abstract format.

Session Convenors: Dr. Lawrence A. Mysak, Dept. of Meteorology, McGill University, 805 Sherbrooke St. West, Montréal, Québec H3A 2K6. Tel: 514-398-3759; Fax: 514-398-6115 and Dr. Kirk Bryan, Geophysical Fluid Dynamics Laboratory, Princeton University, Princeton, N.J. 08540, U.S.A. Fax 609-987-5063.

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

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  (i) post-graduate degree from a recognised university in meteorology or oceanography.

  (ii) post-graduate degree from a recognised 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 specialisation included in this document. This should include at least some consulting experience.

Les entrées sur les pages suivantes sont réservées aux experts-conseil accrédités de la SCMO. Le processus d'accréditation a débuté en décembre 1986. Une liste complète des experts-conseil accrédités de la SCMO peut être obtenue du bureau d'affaires. Les personnes désirant l'accréditation doivent entrer en contact avec la Société à Newmarket afin de recevoir une copie de règlements et un formulaire d'application.

Le document "Règlements de la SCMO pour l'accréditation" liste les critères suivants:

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