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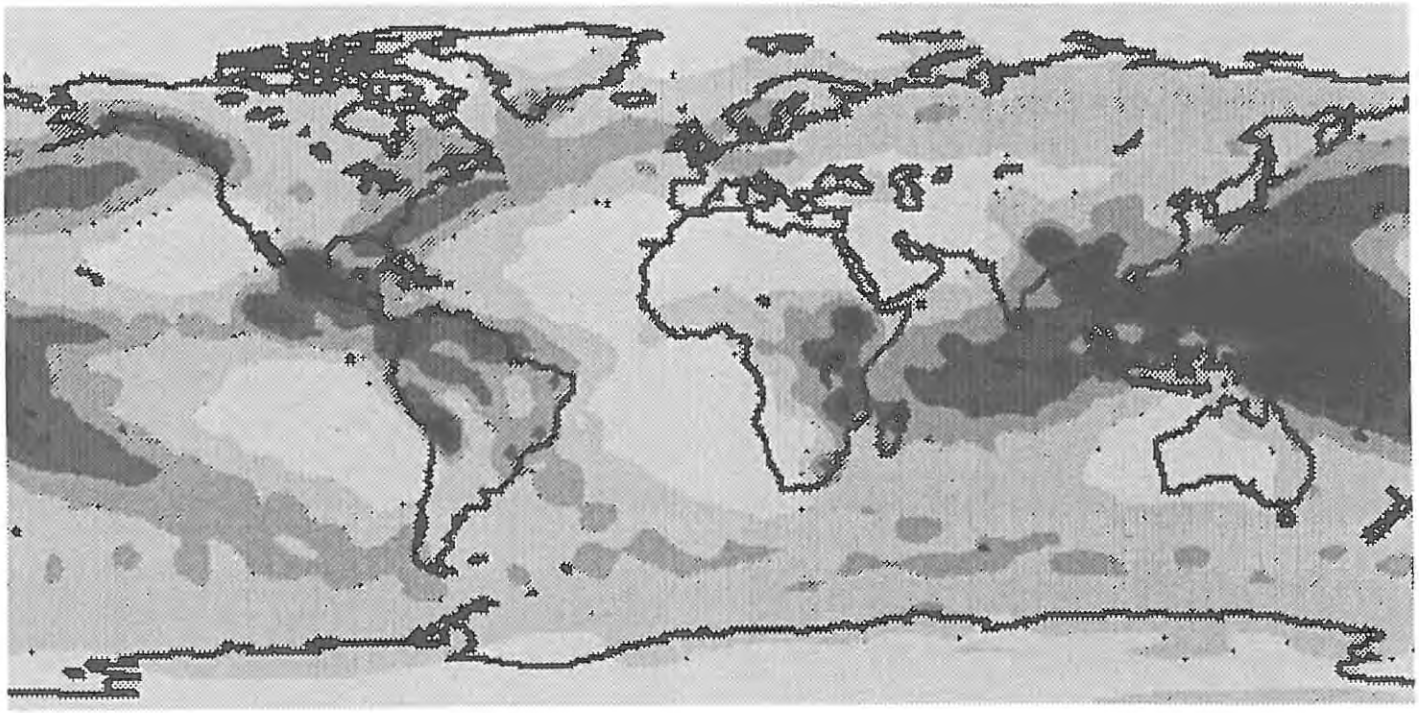
C.M.O.S. NEWSLETTER/NOUVELLES S.C.M.O.

Canadian Meteorological and Oceanographic Society

La Société canadienne de météorologie et d'océanographie

AUGUST/AOUT 1993 VOL. 21 NO. 4

Annual Mean Precipitation From the CCC 1x[CO_2] Model



Incorporating ocean processes with atmospheric models has become a major requirement for developing a new generation of climate models. This is one of the goals of some 25 researchers from the Atmospheric Environment Service of Environment Canada who will move to Victoria mainly by September 1993. For further information see the report on University of Victoria CEOR and SEOS activities on page 3 and the book review on page 12.

EDITOR'S COLUMN

The next issue of the CMOS Newsletter **21**(5), October 1993, will go to press on September 20th, 1993. 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 any DOS format (i.e. Word Perfect, flat ASCII, MS Word etc), however, I can now convert Macintosh files to DOS files. DFO contributors can send ASCII files to me over DFOnet to IOSCCS::HJFREE. Anyone with access to Omnet can send ASCII files to me at IOS.BC, attention Howard Freeland. ASCII files can also be sent to me via Internet to HJFREE@IOS.BC.CA. If you want to send graphics, then HPGL files can be sent as ASCII files over the networks, any other format will have to be sent on paper or on a floppy disc. It is recommended that whatever software prepares an HPGL file be configured for the HP7550 printer. If you have the option of selecting pen colours, please don't. If you send a file over the network, send a copy to yourself and examine the transmitted copy to check that it is all there.

Do you have an interesting photograph, say, an interesting meteorological or oceanographic phenomenon? If so, write a caption and send me a high contrast black and white version for publication in the CMOS Newsletter. Savonius Rotor is also looking for assistance from anyone who has an unusual point to make.

Howard J. Freeland, CMOS Newsletter Editor

WHAT'S GOING AROUND?
by Savonius Rotor

CMOS appears to have struck a chord (A major chord, perhaps) with the exchange of information regarding record wave heights. The following letter has been received from a colleague in Norway and takes the discussion in a whole new direction, downwards.

Dear Savonius,
First the West Coast, now the East Coast bragging about ever larger waves! Haven't you guys heard that smaller is better (or to be politically correct, that we have to learn to 'do more with less')? In this spirit I draw your attention to recent work by Dimitris Menemenlis at IOS who, among other things, detected surface gravity waves in the ice-water boundary layer north of Svalbard. These waves, which are described in Dimitris' Ph.D. thesis, had a period of 30s, resulted in currents of 0.5 mm/s, corresponding to an elevation of less than 1 mm, and came from 220°T, presumably having travelled approximately 1000 km from Fram Strait. His observations were independently corroborated with ice tilt detectors. The measurements were made with a 200m path length reciprocal travel time acoustic vorticity meter which attenuates smaller scale velocity fluctuations, allowing the wave signal to rise above background noise.

Any other challenges for the world's *smallest* wave?

Yours,
Zephyros Minimus

Letter to the Editor

Dear Dr. Freeland:

I read in the last issue that the Agricultural and forest meteorology SIG may be dissolved. As a former member of that SIG I am disappointed, but not surprised. Should the SIG be dissolved I would recommend that those with an interest in agricultural and forest meteorology consider joining the Canadian Society of Agrometeorology. I am a CMOS member and a CSAM member so I do not feel that I am "raiding" CMOS. However, CSAM does provide a forum for those interested in agmet, that the SIG in CMOS has unfortunately not been able to provide.

If anyone needs more information they can contact me:
Peter Dzikowski, P.Ag.
Alberta Agriculture, Food and Rural Development
#206, 7000-113 St., Edmonton, Alberta T6H 5T6
Phone 430-422-4385 Fax 403-422-0474
Internet pdzikows@ulysses.sis.ualberta.ca

Thank you

Peter Dzikowski

Lawrence Mysak President of RSC Academy of Science

In April 1993 Lawrence Mysak was elected to a three-year term as President of the 800-member Academy of Science, whcih is the largest of the 1400-member Royal Society of Canada. He formally took up the presidency of the Academy at the conclusion of the RSC-AGM in Montréal, 26-29 May, 1993. Lawrence Mysak is founding director of the McGill Centre for Climate and Global Change Research and is also Canada Steamship Lines Professor in the Department of Atmospheric and Oceanic Sciences. He was awarded the CMOS President's Prize in 1980 jointly with Paul LeBlond and has served terms as Associate Editor of Atmosphere-Ocean.

Newsletter Advertising Rates

Rates are based on black and white camera-ready copy. Sizes (inches) are full page (7.5 x 9.5), half-page single column (3.5 x 9.5), half-page two-column (7.5 x 4.5) and quarter page (3.5 x 4.5). Other charges will apply when typesetting, artwork or photography are required. **Material for inclusion in the CMOS Newsletter should be sent directly to the editor.** Distribution is to CMOS members, and therefore is approximately 1000 for each issue. There are six issues per year and appear in February, April, June, August, October and December.

Advertisement type	Full Page	1/2 Page	1/4 Page
Commercial **	$300.00	$160.00	$100.00
Position vacancy	$200.00	$120.00	$80.00
Employment wanted	----- Free to members only -----		

** Corporate and sustaining members are charged at the position vacancy rate.

UNIVERSITY OF VICTORIA SEOS AND CEOR

The School of Earth and Ocean Sciences (SEOS) continues its expansion program. New faculty arriving in mid 1993 are Jim Bishop and Inez Fung. Jim Bishop is a chemical oceanographer from Lamont Doherty Geological Observatory N.Y. and Inez Fung has been modelling global CO_2 budgets while at the NASA Goddard Institute for Space Studies , N.Y.. Two more faculty positions were advertized early in 1993; final decisions will be made shortly with the new faculty starting in mid 1994. The undergraduate program in Earth Sciences was revised recently including additional elements of ocean and atmospheric science, additional mathematics, and the use of the CEOR research vessel to add marine geology and geophysics components to Field School. In collaboration with the Department of Physics and Astronomy new programs in Ocean Physics and in Geophysics are being developed.

SEOS has leased space in the Gonzales Observatory in which Michael Whiticar has recently installed his new tunable diode laser spectrometer. The Observatory is ideally located to allow comparison of generation of greenhouse gases in the Victoria urban plume with the more pristine atmosphere of the Strait of Juan de Fuca. The equipment is portable and a range of other projects are being designed, some in collaboration with West Coast Energy.

For the past three years, the Centre for Earth and Ocean Research (CEOR) has been working to attract to UVic the Canada Centre for Climate Modelling and Prediction (CCCMP). The initial phase was announced in late June by federal and provincial ministers. The first phase will see the establishment of an Ocean-Atmosphere Circulation Modelling node. Some 25 researchers from the Atmospheric Environment Service (AES) of Environment Canada (Canadian Climate Centre, Downsview, Ontario) will move to Victoria, mainly by September 1993. New space has been allocated to CEOR to accommodate this group together with additional research and lab space for SEOS faculty members. New computer equipment has been purchased by AES and a number of the 25 positions, mainly in ocean modelling, are new appointments. The group will work closely with researchers at SEOS, at the Institute of Ocean Sciences (DFO, Sidney), at UBC and with other groups, nationally and internationally. The second phase in the development of the CCCMP will initially require a detailed business plan, to be prepared within the next year. The CCCMP is envisaged as a government-university-industry cooperative venture, with a final staff complement in the range of 65-85 researchers.

Chris Garrett was honoured recently by election to Fellowship in the Royal Society and one of SEOS's most active adjunct professors, David Farmer (IOS/DFO), was elected to Fellowship in the Royal Society of Canada in May.

Chris Barnes

Kate Kranck 1937-1993

Dr. Kate Kranck of the Coastal Oceanography Division at the Bedford Institute of Oceanography died of cancer on March 30, 1993. An internationally acclaimed expert on sediment behaviour in aquatic systems, she pioneered much of the work on particle flocculation. Kate started work with the Geological Survey of Canada in Ottawa as a summer student while attending McGill University. She came to BIO in 1964 as a marine geologist with the Atlantic Geoscience Centre, where she mapped the surficial sediments of the Northumberland Strait. This study formed the basis for her doctorate degree, which she received from the University of Helsinki in 1974 and was still one of the major works she was often consulted on. In 1971 she transferred to Coastal Oceanography to pursue her studies on particle dynamics. A tireless and dedicated researcher, she constantly wondered about the behaviour of particles and their affect on grain size distributions. Often working alone, on a subject that few people understood, her efforts were finally being recognised as more and more researchers discovered that fine particle transport is a key to many of the environmental questions which we face today. Her expertise was in great demand within the international scientific community as well as in Canada and her particle studies took her to many diverse locations. From the high Arctic to the Amazon River, in Europe and in Asia, Kate was forever sampling outcrops and streams for material to bring home for particle size analysis. In 1989, she became a founding director of the International Institute for Environmental Studies and Disaster Management in Dhaka, Bangladesh, a country for which she developed a great love. Dr. Kranck was a leader in a scientific field, which until recently, few women entered. She actively encouraged women scientists to pursue a career in sediment dynamics and was an Honourary Adjunct Professor in the Department of Oceanography at Dalhousie University. She will be greatly missed by both friends and colleagues.

Editor's Note: Kate Kranck was to have been one of the invited speakers at the CMOS 27th Annual Congress in Fredericton this last June.

Scenes from the 27th Annual Congress in Fredericton

Dave Daugherty (Chairman of LAC) starts the congress

Welcome to Fredericton from Dave Krauel, CMOS President

Dr. Ralf Yorque (who looks a lot like someone else) giving advice on how to present papers.

How much am I bid for this antique document?

PRELIMINARY REPORT FROM THE 27TH CONGRESS

The 27th Annual CMOS Congress closed its sessions on June 11. Preliminary indications point to a successful Congress on the scientific side (258 Registrants, 218 presentations), and although all the bills are not in yet, it should turn out to be modestly successful on the financial side.

A breakdown of registration shows 100 CMOS members, 83 non-members, 52 students, and 23 non-member, day-registrants. It is encouraging to note that CMOS activities appear to generate significant interest among students and in the scientific community outside current membership.

A strict categorization of presentations is not possible because many crossed traditional boundaries, but according to the discipline most prominent in each, 50 percent were on meteorological topics, 29 percent in oceanography, 7 percent in hydrology and 14 percent interdisciplinary.

Both Scientific Program and Local Arrangements Committees wish to thank all those inside and outside of CMOS who came together to make the 27th Congress a success. Organizers of the 28th Congress were on hand in force and with enthusiasm giving evidence to a real treat next year.

David Daugherty

RAPPORT PRELIMINAIRE DU 27e CONGRES

Le 27e congrès annuel SCMO se termina le 11 juin. Les premières indications affirment un gros succès du point de vue scientifique, comptant 258 personnes inscrites et 218 présentations. Quoique toutes les factures ne sont pas encore rentrées, tout indique un modeste succès financier en plus.

Un relevé d'inscriptions démontre qu'il y avait 100 membres SCMO, 83 non-membres, 52 étudiant(e)s ainsi que 23 non-membres inscrites pour une journée seulement. Il est encourageant de noter que les activités SCMO suscitent beaucoup d'intérêt chez la population étudiante ainsi qu'auprès de la communauté scientifique non-membres.

Une catégorisation nette des présentations n'est pas possible à cause du grand nombre qui touchaient à plusieurs disciplines. De façon générale, 50 p.c. étaient de nature météorologique, 29 p.c. de nature océanographique, 7 p.c. en hydrologie et 14 p.c. de nature interdisciplinaire.

Le comité de programmes scientifiques ainsi que le comité organisateur désirent remercier tous ceux et celles à la fois membres SCMO et non-membres qui ont contribué au succès du congrès. Les membres du comité organisateur du 28e congrès étaient présents en grand nombre et leur enthousiasme nous indique un congrès fort intéressant l'an prochain.

David Daugherty

28th Annual CMOS Congress
Ottawa, Ontario
May 30 to June 3, 1994

Theme -- "Science: addressing the issues"

Scientific Program Committee		Local Arrangements Committee
Geoff Holland	Chair	Mike Hawkes
(613)-990-0298	Telephone	(613)-996-3661
(613)-990-5510	Fax.	(613)-995-4197

Please contact the Local Arrangements Committee regarding general enquiries and the Scientific Program Committee for special workshops etc. Exhibitors, please contact John Falkingham at (613)-996-4552 to reserve your prime floor space.

Enter the Ottawa Congress on your agenda, now. Abstracts must be submitted before January 31st, 1994.

28ième Congrès annuel de la SCMO
Ottawa, Ontario
Mai 30 à Juin 3, 1994

Thème -- "Les sciences: des solutions aux problèmes"

Comité du Programme scientifique		Comité local d'organisation
Geoff Holland	Président	Mike Hawkes
(613)-990-0298	Téléphone	(613)-996-3661
(613)-990-5510	Télécopieur	(613)-995-4197

Prière de contacter le Comité local d'organisation pour les renseignements d'ordre général et le Comité scientifique pour les sessions spéciales et les ateliers de travail, etc. Pour les exhibits, contactez John Falkingham à (613)-996-4552 pour réserver votre place de choix d'exposition.
Inscrivez dès aujourd'hui le congrès d'Ottawa à votre agenda. Les résumés doivent être soumis avant le 31 Janvier, 1994.

Amalgamation of *Climatological Bulletin* and *Newsletter*

Discussion of the Proposal Made by CMOS Council to the 27th Annual General Meeting

At the 1991 AGM, the decision was made to continue publication of the *Climatological Bulletin* until 1994, and to re-assess its future as this date approached. In May 1993, a review was undertaken by an *ad hoc* committee, consisting of Dr. Howard Freeland (*Newsletter* editor) and Dr. Ken Sato (CMOS Councillor-at-Large), chaired by Prof. Gordon McBean (CMOS Vice-President).

The *ad hoc* committee considered the following:

- Many CMOS members working in operational and non-research areas of the meteorological and oceanographic professions feel that CMOS has little to offer them;
- Over the past 2 years, the CMOS *Newsletter* has been enthusiastically welcomed by both the research and operational components within the Society;
- Only 13% of CMOS members subscribe to the *Climatological Bulletin*;
- Society and publication costs are increasing annually
- Over the past 4 years, *Climatological Bulletin* has lost an average of $3,780 annually, out of an annual budget of $11,837;
- Society income is decreasing;
- NSERC has judged *Climatological Bulletin* undeserving of a publication grant in 1993;

The *Ad-Hoc Committee* has recommended that:

- *Atmosphere-Ocean* be continued as the Society's technical scientific journal;
- Publication of *Climatological Bulletin* be discontinued;
- The *Newsletter* be significantly enhanced, incorporating aspects of the *Climatological Bulletin*, to provide a premier publication of interest to the broad membership of the Society;
- This enhanced publication be called the *CMOS Bulletin SCMO*, and include articles on meteorological and oceanographic applications, as well as on climatology to appeal to present subscribers to *Climatological Bulletin*;
- The new publication have its own editorial board consisting of at least an Editor, a co-Editor (climatology), a co-Editor (oceanography), a co-Editor (operational meteorology), and, as and when needed, a paid lay-out editor;
- This amalgamation take place effective January 1 1994;
- Appropriate scientific and technical articles in the *CMOS Bulletin SCMO* be refereed, and voluntary page charges be solicited.

Below are comments on this proposal which were recorded from discussion at CMOS Council Meeting #4 (92/93) and at the 27th Annual General Meeting, held during the Fredericton Congress in June. Attendance at these meetings was 18 and 45, respectively. CMOS membership is about 800.

- The proposed initiative is an interesting venture, particularly the intent to provide a publication which will appeal to the broad membership. I support it (Alec Paul, Editor, *Climatological Bulletin*).
- There is not enough readership for 2 atmospheric/oceanic science journals in Canada. The *Bulletin* and *Atmosphere-Ocean* will come into competition for manuscripts. All articles for formal review should be submitted to *Atmosphere-Ocean*, and no reviewed articles should appear in the *Bulletin* (Peter Smith, co-editor of *Atmosphere-Ocean*; views are shared by the A-O editorial board).
- The intent of the proposal is that the guidelines for review of manuscripts would differ between the two publications, since the *Bulletin* would be aimed at a different type of audience than is *Atmosphere-Ocean* (McBean).
- Clarification is required concerning the type of article acceptable to each publication (Stewart, Chair of Scientific Committee).
- The $18,000 currently budgeted for the *Newsletter* would be augmented by the approximately $6,000 annual subsidy currently paid out for C-B to produce sufficient working funds for the new publication (McBean).
- The proposal is a very sensible idea. However, the proposed name is not good enough to catch interest (Maybank).
- The proposed date of start-up (January 1994) seems too close (Freeland).
- The *CMOS Bulletin SCMO* will offer undesirable competition to *Atmosphere-Ocean* when manuscripts suitable for refereeing are sought. A counter-proposal would be to leave the *Newsletter* as it is (many think it is great), and rename *Atmosphere-Ocean* to *Atmosphere, Ocean and Climate* (Mysak).
- The *Atmosphere-Ocean* Editorial Board unanimously opposes combining the *Newsletter* and the *Climatological Bulletin* in this way. Peer-reviewed articles should be in *Atmosphere-Ocean*. The proposal appears to be an expensive way to promote CMOS. A cost-benefit analysis is appropriate before proceeding further (Smith).
- It is hoped that the *Bulletin* will be a magnet to attract new members, and to hold present members (Krauel, President CMOS).
- The *Bulletin* could be a forum for scientific correspondence, which *Atmosphere-Ocean* will not accept (Hertzman).
- A potential for financial losses in the early years of a new publication should not rule out the initiative. Also, the proposal does not address the comments of NSERC concerning the low scientific calibre of the *Climatological Bulletin* (Merilees).
- The new *Bulletin* will not strive to be an academic publication. It will serve a different purpose (McBean).
- CMOS members are happy with the *Newsletter* as it is. Why burden it with the legacy of the *Climatological Bulletin* (Wright).

Complete this ballot by indicating your choice with an **X**. *Place the ballot in an unmarked, sealed envelope. Place this envelope in a second sealed mailing envelope which bears your name. Return the ballot to:*

Dr. H. Melling, Recording Secretary CMOS,
c/o Institute of Ocean Sciences, P.O. Box 6000, Sidney, B.C., V8L 4B2, Canada.

THE DEADLINE FOR RECEIPT OF BALLOTS AT THIS ADDRESS IS 15 OCTOBER 1993

☐	I am **IN FAVOUR** of the proposed by-law amendments printed on the following page.
☐	I am **NOT IN FAVOUR** of the proposed by-law amendments printed on the following page.

- CMOS requires an outlet for less technical (not the same as low calibre) articles of general interest. We must not ignore the *other* members of CMOS (Anon.).
- I fully support the new *Bulletin* in its expansion to help attract new member to CMOS, to appeal to a different crowd (Lefebre).
- Let us maintain the present *Newsletter*, kill the *Climatological Bulletin*, and use surplus funds to expand *Atmosphere-Ocean* (Weaver).
- Perhaps the word *vetting* in reference to articles in the *Bulletin*, rather that *reviewing*, would have the right connotations. We do not want a 50/50 publication (Jones).
- Perhaps there is a semantic difficulty with the word *review* in this discussion (Freeland).
- I like the CMOS *Newsletter* in its present form. I prefer it to *Weather* and to the *AMS Bulletin*, which are publications which I see the proposed *CMOS Bulletin* attempting to emulate (Taylor).
- Members present at the AGM are not typical of CMOS membership. CMOS should provide something to the 70% of the membership who do not subscribe to *Atmosphere-Ocean*. A dramatic improvement of the *Newsletter* to the *Bulletin* is highly desirable (Welsh).
- I am in agreement. Do CMOS members at this AGM not want to improve the *Newsletter*. They should not forget the opmet types in the Society (Anon.).
- The *Newsletter* does need improvement. It is too Victoria-based (Freeland).
- The *Newsletter* needs also to be improved visually, so that it catches attention and interest (Schwarz, Executive Director).
- If CMOS truly wants a publication for opmets, than CMOS should do it properly (Lin, co-Editor *Atmosphere-Ocean*).
- There are CMOS members who value the *Climatological Bulletin*, and do not wish it to disappear. However, they might accept its folding into the new *Bulletin*. This is a compromise proposal (Anon.)!
- When this issue is put to a mail-in ballot, perhaps three different options should be presented, not one (Lawford).

Humfrey Melling — Recording Secretary

As a consequence, the Council at its 1st meeting of 1993/94 on July 12 proposed the following amendments to the CMOS By-Laws.

Proposed Amendment to By-Laws in Respect of *Climatological Bulletin* and *Newsletter*

Amend By-Law 3, paragraphs a) and b) to read:
a) The Society shall publish a bi-monthly *CMOS Bulletin SCMO* and an *Annual Review*. The former publication shall contain Society and other news in the fields of interest to Society members, as well as appropriate technical articles, particularly on climatological and operational meteorological and oceanographic subjects. These two publications shall be received by all members.
b) The Society shall also publish the journal *Atmosphere-Ocean* on a subscription basis.

Amend By-Law 16, paragraph c) to read:
c) The editorial boards appointed by the Council are: *Atmosphere-Ocean* Editorial Board, and *CMOS Bulletin SCMO* Editorial Board. The former shall contain representation for meteorology and oceanography, while the latter shall contain co-editors for at least climatology and operational meteorology. The Editor of the *Annual Review* is appointed by the Council

Amend all other references to the *Newsletter* (*e.g.* By-Laws 9d and 10d) to read *CMOS Bulletin SCMO.*

Faisant suite aux discussions qui ont eu lieu lors de la 27e réunion générale annuelle, les amendements suivants sont proposés par le Conseil d'administration. Les discussions sont résumées ci-dessus et sont publiés en conformité au Règlement 5.

Proposition d'Amendements aux Règlements de la SCMO pour le *Bulletin Climatologique* et le *Bulletin de Nouvelles*

Amender le Règlement 3, paragraphes a) et b) pour lire:
a) La société entreprendra de publier un *CMOS Bulletin SCMO* à tous les deux mois et une *Revue Annuelle*. La première publication doit contenir des nouvelles de la Société et d'autres sujets intéressant les membres de la Société, ainsi que des articles techniques appropriés, particulièrement sur des sujets de météorologie et d'océanographie climatologique et opérationnelle. Ces deux publications devront être distribuées à tous les membres.
b) La Société entreprendra de publier le journal *Atmosphere-Ocean* aux membres qui en auront acquitté les frais d'abonnement.

Amender le Règlement 16, paragraphe c) pour lire:
c) Le conseil d'administration désigne les conseils de rédaction suivants: le conseil de rédaction d'*Atmosphere-Ocean* et le conseil du *CMOS Bulletin SCMO*. Les membres du premier conseil doivent être désignés de manière à représenter la météorologie et l'océanographie, alors que le deuxième conseil devra être composé de co-éditeurs venant soit de la climatologie ou de la météorologie opérationnelle. L'éditeur de la *Revue Annuelle* est désigné par le Conseil d'administration.

Amender toute autre référence au *Bulletin de Nouvelles* (par exemple, les Règlements 9d et 10d) pour lire *CMOS Bulletin SCMO*.

Complétez ce bulletin de vote en indiquant votre choix par un **X**. *Placez ce bulletin de vote dans une enveloppe vierge, scellée. Placez cette enveloppe dans une seconde enveloppe postale, scellée, en inscrivant bien votre nom sur cette seconde enveloppe. Retournez le bulletin de vote à:*
Dr. H. Melling, Secrétaire d'assemblé pour SCMO,
a/s Institut des Sciences de la Mer, B.P. 6000, Sidney, C.-B., V8L 4B2, Canada.

LA DATE LIMITE DE RECEPTION DES BULLETINS DE VOTE A CETTE ADRESSE EST LE 15 OCTOBRE 1993.

☐	Je suis **EN FAVEUR** des amendements aux Règlements proposés ci-dessus.
☐	Je **NE SUIS PAS EN FAVEUR** des amendements aux Règlements proposés ci-dessus.

C.M.O.S. STATEMENT ON NATURAL HAZARDS IN CANADA

To Canadians, disasters reported in the media often seem remote and Canada relatively immune. This is an illusion. Canada is vulnerable to major natural hazards as severe as those anywhere; much more frequent but minor natural hazards, cumulatively, may cause even greater suffering (for more details see Davenport et al. (1990).

Major Disasters
Earthquakes on the west coast are amongst the largest recorded; avalanches disrupt transportation and communications in the Rockies; few tornadoes have been more costly than that which caused half a billion dollars damage in Edmonton; floods in the Prairies have led to hundreds of millions of dollars of protective measures; forest fires in Manitoba and elsewhere have consumed record amounts of timber; hurricane Hazel reached Ontario and wreaked havoc; landslides in Quebec have obliterated entire communities; sea ice causes tremendous disruption to year-around navigation; and a major east coast storm saw 84 lives lost in the Ocean Ranger disaster.

Fortunately, regarding their impact, many types of natural hazards cause less damage now than in the past for, although we cannot stop the extreme natural event, we can limit the impact. For example, with improvements in safety systems, weather, ice forecasting and modern communications technology, ships now can avoid adverse conditions or prepare for them. Designers of bridges and buildings have a much better understanding of wind and ice loads and the behaviour of structures under extreme stress. Major disasters do still happen, particularly when there is limited experience to guide use. Continuous attention to disaster prevention, preparedness and relief is necessary.

Earthquake
What are the most threatening major disasters for Canada today? From the point of view of insurance coverage, our largest potential disaster is a megathrust earthquake (accompanied by liquefaction, landslides and a tsunami) in the B.C. lower mainland and Vancouver Island area. The damage estimate for an extreme event, insured costs only, is in excess of 16 billion dollars. The total damage could be 50 per cent higher. Most of the aspects of earthquakes are beyond the capabilities of the Canadian Meteorological and Oceanographic Society (CMOS). However, one result of earthquakes, tsunamis, are oceanographic.

Hurricane
The second most costly major natural disaster to be expected is from a Caribbean hurricane, moving up the east coast and landfalling in the Maritimes. The estimated damage for an extreme event is two billion dollars, considerably less than the fifteen to twenty billion dollars damage caused by Hurricane Andrew in Florida. Great improvements have been made in the credibility of today's hurricane forecasts. The relatively small number of casualties sustained by a hurricane like Andrew, is attributable to the greater confidence with which emergency preparedness agencies and the general public now view hurricane warnings. In Canada, hurricanes are less common and the level of emergency preparedness is lower. CMOS urges emergency preparedness agencies in the Atlantic Provinces to conduct simulation exercises to identify weaknesses in current preparedness.

Tornado and Severe Hail
The 500 million dollar Edmonton tornado type event is an illustration of the third most costly type of disaster likely. And although the Edmonton situation was extreme, major tornadoes have also struck Quebec, Ontario, and Saskatchewan since 1980. Modern technology is helping to lessen the tornado's impact. Weather radar, particularly Doppler Weather Radar, and new storm prediction techniques allow more warning of tornadoes with fewer false alarms. A recent Environment Canada study estimated that a network of twenty-two Doppler Weather Radars would be needed to provide warning services to the 82 per cent of Canadians most at risk. However, at the present rate of installation the network will not be complete until after the year 2000.

Communication channels have been improved so that people can get tornado warnings faster and have more time to take action. Some cable TV companies have experimented with weather warning crawlers appearing on every channel. In high hazard areas public awareness sessions are held at the start of the tornado season so that people know how to respond to a warning.

Common Natural Hazards
While it is the extreme disasters that get the headlines, in Canada much more common natural hazard events take the toll of human life and damage. Extremes of cold and heat, lightning and flooding are examples of the hazards that kill an average 150 Canadians annually.

In addition, each year, 500 Canadians die and 37,000 are injured in road accidents where poor weather is the major or a contributory factor, such as reduced visibilities in fog and blowing snow as well as icy roads. Also, a number of deaths occur due to accidents on water, during recreational activities and these are influenced by weather conditions such as gusty winds induced by thunderstorms.

Fatalism is often expressed regarding common natural hazards, but the fact is that the toll of human life and misery is largely avoidable. CMOS urges the Parliament of Canada, through hearings of the appropriate standing committee(s), to review how meteorological and oceanographic services can be improved to reduce this persistent problem.

Natural Hazards and Climate Change
Buildings and structures are constructed to withstand environmental extremes using design values prescribed by code writing bodies, such as the Canadian Standard Association, and deduced from the statistics of past conditions. For example, wind loads are typically estimated assuming that mean wind speeds and wind extremes to be expected in the future will be the same as in the past. Code writing bodies should ensure that adequate safety margins are included in their codes to account for climate change, and that codes are updated to take into account of improved understanding of likely changes.

International
In recent years there has been growing concern over the apparent increase in the number of serious catastrophes which have occurred worldwide - events which are of such a magnitude that the local population can no longer cope and outside assistance is required. The causes are found to be due to the increase in populations, the increase in the size and number of population centres, the siting of settlements in vulnerable areas such as low-lying coastal plains and earthquake fault lines, and the increase in the complexity of the urban infrastructures.

In response to this concern, the United Nations declared the

Natural Hazards Statement (cont.)

1990s as the International Decade for Natural Disaster Reduction (IDNDR). The purpose is to reduce the losses of lives and property sustained through rapid onset natural disasters such as windstorms (hurricanes and tornadoes), floods, earthquakes, volcanos and wildfires, particularly in developing countries.

Canada was a co-sponsor of the UN resolution which established IDNDR, and has a good record of practical action over the years in support of natural disaster reduction in the developing world. Several individual Canadians are taking prominent roles in the decade. The federal governments needs to increase its practical support for the objectives of the decade, in line with the moral commitment it made in supporting its establishment.

Action

- CMOS as an organization undertakes to hold sessions on natural hazards at its Annual Congresses and to publish, in 1994, a special issue of its scientific journal, Atmosphere-Ocean, on natural disasters.
- Vis-a-vis the IDNDR, technology transfer of Canadian weather expertise to developing countries; for example forestry industry, weather warnings in remote regions, agriculture, warning of blizzards.
- CMOS recommends that its centres and chapters increase awareness amongst members and the public of how advances in meteorology and oceanography have improved the way society prepares to handle natural hazards, and the potential for further improvement.
- CMOS suggest to the media to inform the public about what they can do to protect themselves, their family and their property against natural hazards, and the electronic media to provide fast and accurate communication of severe weather warnings to their audiences.
- CMOS urges upon the code writing bodies to ensure that adequate safety margins are included in their codes to account for climate change, and that codes are updated to take account of improved understanding of likely changes.
- CMOS endorses the idea that all levels of government increase practical support for the objectives of the International Decade for Natural Disaster Reduction, and the federal government to publish its plan of action for IDNDR in line with the commitment it made in supporting its establishment.
- CMOS recommends that the federal government continue its development of deployment of Doppler Weather Radar across the country and to ensure that communications systems are established to maximise the lead time available for public warnings of all types of hazardous phenomena.

Reference

DAVENPORT, A.G., et al. (1990)
A report on the Canadian response to the IDNDR. Draft report, June 1990, prepared by the Joint Committee of the Royal Society of Canada and the Canadian Academy of Engineering.

School Mentor Program

Invitation to Participate

Scientists, engineers, technicians and technologists - we need you! If you would like to spend a small portion of your time helping kids learn about the scientific world using the Internet, please volunteer to be an "Electronic Innovator" for the SchoolNet initiative. Remember, too, that for elementary and high school students, science comprises more than chemistry, physics, biology, etc...it includes much of the social sciences, such as anthropology and psychology.

The aim of the SchoolNet initiative is to give schools across Canada access to the vast resources that are available through electronic communications and information technology. As a pilot for this project, 300 schools will be on-line this fall.

The students exploring this technology will benefit from electronic mentors who answer questions on science, mathematics, engineering and technology through electronic mail. These people, called "Electronic Innovators", should be working or studying in one of the aforementioned fields and accessible though Internet/CA*net. Although this is a Canadian initiative, we welcome volunteers from around the world.

If you would like more information on the SchoolNet initiative, and on how you can be an Electronic Innovator, please send a brief e-mail reply to the address below.

We welcome your participation in this exciting and rewarding project! Thank-you!

John D. Reid
aa327@freenet.carleton.ca
reidj@dots.doe.ca

SchoolNet Electronic Innovators
Volunteer Questionnaire and Information Sheet

Thank you for your interest in becoming an *Electronic Innovator* for the *SchoolNet Initiative*. Your time will be greatly appreciated by students and teachers alike.

Would you please supply the following information. This will be used to set up our database of *Electronic Innovators*.

1) Name:
2) E-Mail address:
3) Areas of Expertise:
4) Company or Affiliation:
5) Location (City, Prov. or State, Country):
6) Grade Section Desired (K-8, 9 and up):
7) Please tell us a bit about yourself:
   (Current research, special interests, hobbies etc.)
8) Frequency of E-Mail use (e.g. once a day, once a week):
9) In what capacity would you like to volunteer?
   i) School advisor for your field of expertise, i.e. advise teachers on subject matters relevant to your field.
   ii) Operate, in conjunction with professional colleagues, a BBS newsgroup on your field of expertise, i.e. answer questions posted by students and teachers.
10) Are you willing to do in-class visits?

Memorandum from NSERC to University Based Ship Users

As many of you will already know, the Department of Fisheries and Oceans (DFO) has introduced cost recovery on a number of its services as a means of coping with its severe budget restrictions. The most notable impact for NSERC and the university community is that ship time on DFO research vessels will no longer be allocated without cost.

Over the last year NSERC has held a number of discussions with DFO regarding university access to DFO research vessels. NSERC has agreed to reimburse DFO for the *incremental costs* associated with use of their vessels for NSERC supported research projects and programs. Although a formal Memorandum of Understanding has yet to be finalized, NSERC has assured DFO that it will be reimbursed for appropriate costs in 1993-94.

In late March DFO invoiced NSERC for *dedicated* ship days for NSERC funded university research in 1993-94. This invoice was carefully scrutinized to ensure that the days indicated were truly for dedicated missions. We have now reached consensus with DFO on the dedicated missions for 1993-94 and the daily rates; funds will be transferred once the payment mechanism has been worked out.

The short lead time for implementation of cost recovery in 1993-94 necessitated an *ad hoc* approach this year. In preparation for 1994-95 NSERC is developing a mechanism to evaluate ship time requests and establish priorities for access to DFO vessels across NSERC programs. This mechanism is being developed with the advice of our ad hoc Advisory Committee on Research Platforms.

There are important points that the community should consider when planning 1994-95 ship time requirements on DFO vessels.

Definition of the mission: The cost of ship time varies with the type of days requested.

Process: NSERC will create a **Ship Time Allocation Committee.** The committee will comprise a small group of experienced university based vessel users from the different areas of marine science.

Timing: Although we have not yet finalized the process for the Ship Time Allocation Committee, we expect that the Committee will meet once a year in the fall

If you have any questions, please contact me at (613)-995-5829

André Isabelle
Program Officer
Life and Earth Sciences

Note de Service de CRSNG aux Chercheurs Universitaires Utilisant du temps Navire

Comme nombre d'entre vous le savez déjà, le ministère des Pêches et Océans (MPO) a entrepris de recouvrir les coûts d'un certain nombre de ses services pour faire face aux compressions budgétaires. En conséquence le CRSNG et la communauté universitaire devront maintenant assumer une portion des dépenses relatives au temps passé à bord des navires de recherche du MPO.

Au cours de la dernière année, un certain nombre de discussions ont eu lieu entre le CRSNG et le MPO relativement à l'accès des universités aux navires de recherche du MPO. Le CRSNG a convenu de rembourser au MPO les *coûts supplémentaires* reliés à l'utilisation des navires dans le cadre des projets et programmes de recherche subventionnés pas le CRSNG. Bien qu'une lettre d'intention formelle reste à venir, le CRSNG a assuré le MPO qu'il sera remboursé pour les dépenses appropriées en 1993-94.

A la fin de mars le MPO a facturé le CRSNG pour les jours de navigation *dédiés* à la recherche universitaire subventionnée par le CRSNG en 1993-94. Une vérification minutieuse de cette facture confirme que les jours indiqués correspondent bien aux expéditions dédiées. Une entente a été conclue avec le MPO en ce qui a trait aux expéditions dédiées et aux tarifs pour 1993-94; nous allons transférer ces sommes une fois que le mécanisme de paiement sera déterminé.

Un échéancier serré en ce qui a trait à l'implantation du recouvrement des coûts pour l'année 1993-94 a nécessité la mise en oeuvre d'une approche ad hoc. Pour 1994-95 le CRSNG mettra sur pied un mécanisme d'évaluation des demandes de temps-navire et d'établissement des priorités d'accès aux navires du MPO. Ce mécanisme est élaboré en tenant compte des recommandations du Comité consultatif spécial sur les navires et les plate-formes de recherche.

Les chercheurs devraient tenir des principaux éléments lorsqu'ils planifieront leurs besoins en temps-navire pour 1994-95.

Définition de l'expédition: Les coûts de temps-navire varient selon le type de journées demandées.

Marche à suivre: Le CRSNG créera **le comité d'affectation du temps-navire.** Le comité sera formé d'un petit groupe qui utilise fréquemment les navires, groupe représentatif des différentes branches de l'océanologie.

Calendrier: Bien que nous n'ayons pas encore défini tout à fait le fonctionnement du comité d'affectation du temps-navire, on s'attend que le Comité se réunira une fois l'an à l'automne.

Si vous avez des questions au sujet de l'approche proposée, vous pouvez me rejoindre au (613)-995-5829.

André Isabelle
Administrateur
Sciences de la vie et de la Terre

Review/Critique

Review off "Climate System Modelling" by Kevin E. Trenberth (ed.), Cambridge University Press, 1992, 788 pp., ISBN 0 521 43231 6

Geophysically, we are living in an exciting time. Through the unintentional perturbation of our environment, we are performing an unprecedented global experiment. This experiment has given us a valuable scientific opportunity to increase our understanding dramatically of the workings of our environment on the global scale. This scientific challenge has been taken up by the earth science communities through initiations of various international collaborative programs, such as the International Geosphere-Biosphere Program (IGBP) of ICSU (International Council of Scientific Unions). This and other programs are based on the recognition of the fact that in order to achieve a fuller understanding of the climatic environment in which we live, we need to know how individual components of the climate system interact with each other. We need to go beyond the traditional reductionist approach, and to look at the whole of climate in an holistic sense. On the whole, **Climate System Modelling** succeeds in doing this. The book encompasses, between its two hard covers, the basic spirit and philosophy of such scientific programs as IGBP, that sense of the interdisciplinary nature of our earth sciences.

The book is almost 800 pages long, with contributed articles from 27 authors (10 from the National Center for Atmospheric Research in Boulder, Colorado). Six parts of the book are composed of 23 chapters. Part 1 (Introduction) is made up of 2 chapters. Some basic climate modelling concepts are introduced here by Stephen Schneider, while major anthropogenic activities perturbing the climate system are described clearly and concisely by Michael Glantz and Jerrold Krenz.

Part 2 (The Science: Subsystems and Processes) is composed of Chapters 3 to 8, and describes the basic science of each of the major components (atmosphere, ocean, land surface, terrestrial ecosystems, atmospheric chemistry and marine biogeochemistry) of the climate system and processes which connect these components. Important uncertainties are identified. The editor states in the Preface that each chapter focuses on "those elements of each subsystem as they relate to climate." Chapter 3 on the atmosphere, however, seems to deviate somewhat from this intent. The chapter reads like a condensed version of all the books published on atmospheric physics and dynamics.

Part 3 (Modelling and Parameterization) contains 8 chapters (Chapters 9 to 16). The intent of this section is to describe how some of the important physical, dynamical, chemical and biological processes identified in Part 2 have been and can be modeled. Part 3 opens up with a simple and brief introduction to the basic numerical and computational concepts, followed by chapters describing models of the atmosphere, the oceans, sea and land ice, land surface processes, atmospheric chemistry and oceanic biogeochemistry. Parts 2 and 3 "interact" very well through frequent cross references made by authors of the chapters in these two sections.

Part 4 (Couplings and Interactions) has only 2 chapters (Chapter 17 and 18). This section introduces the reader to concepts and strategies of coupling by describing globally coupled models of the atmosphere, the ocean, and sea ice. An example of detailed atmosphere-ocean coupling is given in Chapter 18 to highlight those aspects of coupling that may be very important in any climate system modelling effort.

Part 5 (Sensitivity Experiments and Applications) contains 4 relatively short chapters giving results of the applications of the models described in Parts 3 and 4. The section begins with a description of the capability of the simply coupled general circulation models to simulate natural variability and change in the climate system. Against this background, the remaining 3 chapters describe various model responses to increasing greenhouse gases in the atmosphere, land-use changes, and past geological and astronomical forcing. The book ends with a chapter (Part 6) on the possible future directions in the climate system modelling.

This is a very good book for students and scientists who are interested in understanding and obtaining an appreciation for the complexity of the interactive processes among various components of the climate system. But as a textbook focused on graduate students who might be persuaded to pursue climate system modelling as a research activity, the book can be a double-edged sword. On one hand, the book can easily be perceived as presenting an overwhelming amount of information, thereby "turning off" the reader. On the other hand, however, the book does bring out the excitement of the interdisciplinary nature of the climate system research. The level of difficulty, unlike many other edited books, does not vary too much from chapter to chapter, making the reading relatively smooth and enjoyable.

Many parts of the book are interrelated and cross-referenced. However, there are some parts which seem to be independent of much of the book. For example, there are no substantial references made to Chapter 2 on human components of the climate system by other parts of the book, and vice versa. By the time the reader is well into Parts 2 and 3, Chapter 2 is basically forgotten. Similarly, the short discussion on the computer hardware can be deleted without compromising the objectives of the book. Furthermore, instead of being more selective and focused on those elements relevant to the modelling of the climate system, some chapters, such as the one on the atmosphere (Chapter 3), try to cram too much into a very limited space. One additional aspect of the book I have found very irritating is the colour Plate 1, which shows a conceptual model of the earth system processes. This figure is simply illegible because of the small print.

Excepting these minor blemishes and a few typographical errors, such as "Irabarne and Godson" (should be "Iribarne and Godson"), the book is well written and edited. **Climate System Modelling** succeeds in bringing together in an interactive fashion the various components of the climate system, and presents them in a clear and rational way. The book should be used as a main textbook for any course on climate system. Finally, this type of book has been long overdue.

K. Higuchi
Atmospheric Environment Service
Toronto, Ontario

World Ocean Circulation Experiment - News

What is WOCE?

At the CMOS Annual General Meeting John Maybank was looking at a recent copy of the CMOS Newsletter and asked, "What is a WOCE, or a JGOFS anyway?" This article attempts to give a thumbnail sketch of the World Ocean Circulation Experiment (a.k.a. WOCE) and the participation of Canadian Scientists in this project. Some of the material in this note is abstracted from a brochure entitled Canada's Contribution to: **WOCE** and may be ordered from:-

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The Sun warms the Earth; it does so most effectively in the tropics. The ocean shares with the atmosphere the task of redistributing heat polewards. On a long-term average, an equilibrium is reached: the Earth's surface temperature adjusts itself to send back out to space as much heat as it receives from the Sun.

Meteorologists have by now documented the wind systems which carry heat towards the poles. Computer models of the General Atmospheric Circulation are in daily use for weather forecasting; predictions are stretched over decades to arrive at climate forecasts.

The oceans, however, are still poorly explored. Their role in moderating coastal climate has of course long been recognized. More recently however, oceanographers have discovered that ocean currents recirculate about as much heat as the atmosphere does, but in a more complicated way. Furthermore, because of their great heat capacity and of the nature of their deep circulation, oceans can take centuries to adapt to climate change!

Climate modellers have identified their lack of ability to model ocean circulation and processes as one of the greatest barriers to improving their ability to predict climate change and variability. Canadian scientists and others around the world have joined together to plan and carry out the World Ocean Circulation Experiment (WOCE): the first global ocean programme focused on the development and the validation of ocean models useful for climate prediction.

WOCE is an international program, 10 years in preparation and involving more than 40 nations. It will observe, analyse and model the global ocean to obtain a working, quantitative understanding of its role in the Earth's climate system. Scheduled to run 10 years (1990-2000), the first half of its life span will concentrate on an intensive observational program.

WOCE is sponsored by UNESCO's Intergovernmental Oceanographic Commission, the World Meteorological Organization's World Climate Research Program, the International Council of Scientific Unions and its Scientific Committee on Oceanic Research.

WOCE Objectives
The ocean has many processes, many scales of variability and motion that are neither well described observationally nor well understood. As a first step in the planning process, the WOCE Scientific Steering Group established a formal set of goals and objectives for the experiment as a whole. These guide WOCE planners when they are deciding what type of work must be included and what can be excluded. These goals and objectives are:

Goal 1: *To develop models useful for predicting climate change and to collect the data necessary to test them.*

Goal 2: *To determine the representativeness of the specific WOCE data sets for the long-term behaviour of the ocean and to find methods for determining long-term changes in the ocean circulation.*

WOCE's Core Projects
The WOCE field program is coordinated scientifically within three core projects.

Project I, The Global Description will measure the momentum, heat and water flux between atmosphere and ocean; the seasonal response of the upper ocean to that forcing; the three-dimensional mean circulation; and the distribution of eddy energy. The project relies heavily on satellite measurements of wind, temperature and sea level, coupled through computer models with scattered, high-quality measurements at sea to produce global estimates. It encompasses the Atlantic Ocean from Greenland to the tip of South America and the entire Pacific and Indian oceans.

Project 2, The Southern Ocean, will measure similar quantities as in Project I but in the Southern Ocean, concentrating on the exchange of waters among the Atlantic, Indian and Pacific oceans and the formation and spreading of its dense intermediate and deep waters.

Project 3, The Gyre Dynamics Experiment, will focus on specific processes which must be better understood and modelled to improve our climate prediction capabilities. These process experiments are located primarily in the Atlantic Ocean (between 30°S and 60°N) and when combined with an enhanced set of Core Project 1 measurements will provide a North Atlantic data set more suitable for gyre-scale ocean model development and testing.

Canada's contribution to the WOCE field program will be in Projects I and 3, in both the Atlantic and Pacific oceans.

So what exactly are Canadian scientists doing to contribute to the World Ocean Circulation Experiment? The federal government (Dept. of Fisheries and Oceans) oceanographic laboratories in Dartmouth, N.S. and in Sidney B.C. have made very substantial commitments to support the WOCE Hydrographic Program. This is the backbone of core project I listed above. The international WOCE community has drawn up a list of surveys that need to be completed some time during a 5 year window to complete a one-time survey of the state of the world ocean. Figure 1 shows a view of the Earth with some of the survey lines included. The bold lines are Canadian commitments. The Canadian commitment is substantial, but there are actually remarkably few countries in the world that can execute the surveys measuring temperature, salinity, dissolved oxygen, nutrients and several tracer chemicals, such as freons to the accuracy required by WOCE. So a substantial Canadian commitment is needed. Like the atmosphere, the ocean is subject to variability, and

World Ocean Circulation Expt. (cont.)

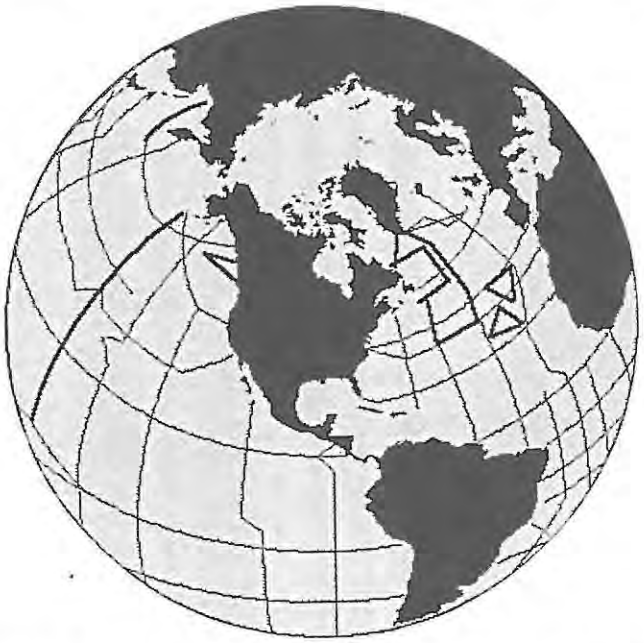

Figure 1: Survey tracks in the WOCE Hydrographic Program.

to understand how much variability exists in the data set several lines have been designated as 'repeat hydrography lines'. After all five years is a rather long exposure for a 'snapshot' of the state of the world ocean. Most experimental work is being done from within D.F.O., but not all. One major university program, the surface drifter program in the north Pacific Ocean, was highlighted in the June 1993 issue of the CMOS Newsletter.

Another experimental program that falls within WOCE and has both D.F.O. and University participation is a project known as NATRE, or North Atlantic Tracer Release Experiment. This centred around the deliberate release of a few kilograms of sulphur hexafluoride in the N. Atlantic. This exotic chemical can be detected in extremely minute quantities. The initial distribution was mapped, and that was repeated a month later. Finally the distribution of SF_6 was mapped 12 months after the initial release, and at the same time observations were made of the turbulent mixing velocities. Analysis of the results of this very successful experiment will provide a thorough description of turbulent mixing in the ocean.

Numerical modelling and data assimilation studies are being carried out under the WOCE umbrella at both federal government laboratories and within the Canadian university community.

Finally one should mention that WOCE has launched its own satellite, TOPEX/Poseidon which, among other things, is measuring the height of the sea-surface globally. This will supply oceanographers with the near surface pressure field in the ocean, an important parameter not available to ship based observing systems. The satellite was launched from French Guiana in August 1992 and is already producing spectacular results. Notably, it has produced detailed maps of the equatorial Kelvin waves associated with the 1993 El Niño.

CMOS Prizes and Awards

Thursday night was banquet night at this year's CMOS Congress. Once again the evening featured the presentation of the 1993 CMOS Prizes and Awards.

The President's Prize was awarded to Dr. Kevin Hamilton for his work on modelling the stratospheric quasi-biennial oscillation in Global Circulation Models, presented at the 1990 Congress and recently published.

The John P. Tully medal was presented to Dr. Fred Dobson for his extensive contributions to the study of air-sea interactions.

The Dr. Andrew Thomson Prize in Applied Meteorology was shared by Drs. Herschel Mitchell and Harold Ritchie in recognition of their exceptional work in the design of the CMC global analysis and forecast system.

The Prize in Applied Oceanography was awarded to Dr. R. Grant Ingram for his extensive contributions to Applied Oceanography and especially for his work as Federal Commissioner for the Review of the Great Whale River hydroelectric project.

The Rube Hornstein Prize in Operational Meteorology was awarded to John Luckett for his work in the west coast marine programme, and especially for his contributions to the marine data buoy and ASAP programme.

Co-winners of the graduate student prize were Dr. Greg McFarquhar (University of Toronto) for his thesis and publications in cloud physics, and Dr. Charles Hannah (University of British Columbia) for his thesis and publications on wind driven flow in Hecate Strait, B.C.

Environmental Citations were awarded to Dr. Bob Schemenauer and Pilar Cereceda (Catholic University of Chile) for their work in developing a practical technology for the collection of fog water in the semi-arid regions of northern Chile.

Citations for Outstanding Radio and TV Weather Presentations were awarded to Jay Campbell of CFPL-London and Mike Roberts of CHBC-Kelowna.

Dr. T. A. Black (meteorology) and Dr. Daniel G. Wright (oceanography) were selected as reviewers of the year.

Congratulations to all winners for their well deserved recognition.

ACID REIGN '95?

The 5th International Conference on acidic deposition is to be held 26-30th June 1995 in Gothenburg, Sweden, under the patronage of His Majesty Carl XVI Gustaf.

The conference will focus on the acidification problem, but will cover the regional air pollution problems in the broadest sense. It will give opportunities for presentations of scientific results and their implications for national and international policies.

For further information contact the secretariat Acid Reign'95?:-

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GLOBAL ECOSYSTEM DYNAMICS

National Meeting of GLOBEC

The Canadian GLOBEC program held a national planning meeting 5-7 June 1993 in Fredericton, N.B. The meeting was convened to obtain input from the marine science community on the scope and scientific content for this program. Recommendations will form the basis for a C-GLOBE Initial Science Plan to be developed in late 1993. The meeting was sponsored by CNC-SCOR and funded jointly by NSERC and Fisheries and Oceans. The total attendance of over 40 included scientists from the International and US GLOBEC programs and US marine science institutions.

GLOBEC is a developing international and national program to study the response of marine ecosystems to environmental variability (including climate change). Special emphasis is placed on physical-biological linkages, on a process-oriented approach (vs "black-box" correlations of time series), and on integration of new measurement and modelling techniques.

The Fredericton workshop consisted of:

- Plenary session background presentations on GLOBEC and activities of related international and national programs and organizations such as JGOFS, ICES, PICES, USCoOP, OPEN, La Pérouse and Northern Cod.
- Thematic working groups to consider important physical and biological processes and linkages operating within different time and space scale bands.
- Geographically-based working groups to identify potential study sites, and their primary process and target species emphasis.
- Additional plenary discussion of working group recommendations, and between-region commonality of content and method among study sites.
- National scientific steering committee selection, and scheduling for the report and science plan preparation and circulation.
- National scientific steering committee selection, and scheduling for the report and science plan preparation and circulation.

The meeting recommended programs to study three advectively coupled continental margin regions: Labrador and Newfoundland shelves; the Gulf of St. Lawrence, Scotian Shelf, Georges Bank and Gulf of Maine system; and the Pacific outer coast as coupled to the open North Pacific and the Georgia Basin. These regions are distinguished by important differences in bathymetry, physical inputs controlling current patterns, and ecologically/socially important target species. These regional ecosystems were chosen to cover the range of biological and fisheries problems and physical-biological linkages in Canadian national waters.

At least six important scientific themes emerged:
1. Advective coupling among mesoscale sub-regions;

2. Role of physics in setting the distribution, availability, and rate of food-energy transfer into and between zooplankton and predator (fish) trophic levels;

La Réunion Nationale de GLOBEC

La première réunion nationale du projet GLOBEC Canadien s'est déroulée du 5 au 7 juin 1993 à Fredericton, N.B. Le but de cette réunion était d'estimer l'envergure des connaissances scientifiques disponibles pour ce programme. Cette réunion servira de base à l'élaboration du plan scientifique qui sera développé dans le courant de l'année. Cette séance de travail a été sponsorisée par le CNC-SCOR et subventionnée par le CNRS et le Département des Pêches et Océans. Ont participé à cette réunion de travail, de nombreux scientifiques canadiens (de diverses universités et de le Département des Pêches et Océans), des représentants des institutions océanographiques américaines ainsi que des délégués des projets US GLOBEC et International GLOBEC.

GLOBEC qui comprend un programme national et international a pour but d'étudier la réponse de l'écosystème marin aux modifications de l'environnement (intégrant les changements climatiques). Une attention particulière sera portée sur les relations entre les processus physiques et biologiques des systèmes marins, sur l'étude détaillée des processus (rejet de la notion de boites noires) ainsi que l'intégration des moyens de mesures aux techniques de modélisation.

La réunion de Fredericton s'est déroulée en plusieurs étapes, reprises ci-dessous:

- Session générale sur le contexte du programme GLOBEC et sur les activités d'autres programmes internationaux tels que JGOFS, WOCE, ICES, PICES, US CoOP, OPEN La Pérouse, et Northern Cod.
- Travail de groupes afin d'identifier les différents thèmes, de déterminer l'importance des processus physiques et biologiques ainsi que leurs influences mutuelles à différentes échelles.
- Travail de groupes afin de localiser les sites potentiels d'études et mesurer leurs importances.
- Discussion générale sur les conclusions des différents groupes de travail, ainsi que sur les méthodes et moyens utilisés dans les différents sites étudiés.
- Mise en place d'un comité scientifique national de sélection, et planification de la préparation des études, des rapports scientifiques ainsi que de l'appel d'offre.

La réunion a insisté sur la nécessité de programmes portant sur les trois régions continentales qui présentent une circulation advective: Labrador et Terre-Neuve; Le Golf du Saint Laurent, le plateau continental de Nouvelle Ecosse, Le Georges Bank et le Gulf of Maine; et le talus continental de la côte Pacifique relié au Pacifique Nord et au Bassin de Georgia. Ces régions se différencient par leur bathymétrie, par les paramètres physiques contrôlant les courant marins ainsi que par leur importance sur le plan écologique. Ces régions ont été choisies afin de comprendre les phénomènes biologiques, les problèmes de pêche et les interactions physiques-biologie dans les eaux côtières canadiennes.

Emergent de cette réunion, plusieurs thèmes dont:
1. Couplage des processus à méso-échelles contrôlées par l'advection;

2. Rôle des paramètres physiques sur la distribution, la disponibilité et le taux de transfert d'énergie et de matière au sein des communautés zooplanctoniques et entre les niveaux "zooplancton" et prédateurs (poissons) de la chaîne trophique;

GLOBAL ECOSYSTEM DYNAMICS (Cont.)

3. Potential importance of climatic variability in amount and seasonal phasing of freshwater input;
4. Timing match between critical physical and biological events (reproduction, migration);
5. Importance of designing GLOBEC studies so that they will be able to interpret longer time scale signals and observation programs;
6. Philosophy for the design and use of numerical models.

Several of these (2,4 and 5) are also core themes of the International GLOBEC program. Others (1,3 and 6) reflect the scientific perspective and priorities of Canadian scientists.

At the close of the meeting, a national scientific steering committee was formed. Members are B. deYoung and D. Mackas (co-chairs), D. Deibel, W. Leggett, I. Perry, J. Runge, M. Sinclair, and K. R. Thompson.

A meeting report will be completed by late summer. For copies contact either Brad de Young (Department of Physics, Memorial University, St. John's, Newfoundland, A1B 3X7, bdeyoung@kean.ucs.mun.ca (Internet)) or David Mackas (Institute of Ocean Sciences, P.O. Box 6000, Sidney, B.C., V8L 4B2,d.mackas (OMNET)). The initial Science Plan will be published in early 1994.

3. Importance qualitative et temporelle des changements climatiques en terme d'apport d'eau douce;
4. Corrélation temporelle entre les processus physiques et biologiques (tels que reproduction, migration);
5. Précision dans le développement du projet GLOBEC afin d'intégrer l'étude des processus à grande échelle; et
6. Compréhension de la structure et de l'utilisation des modèles numériques.

Les points (2,4,5) sont des thèmes repris également dans le programme international GLOBEC. Les autres buts (1,3,6) sont spécifiques aux études et aux priorités canadiennes.

A la fin de la réunion, un comité national scientifique s'est constitué regroupant B. deYoung (président), D. Mackas (président), D. Deibel, W. Leggett, I. Perry, J. Runge, M. Sinclair et K. R. Thompson.

Le rapport final de la réunion sera mis à jour dans les prochains mois. Des copies de ce rapport seront disponibles auprès de B. deYoung (Physics Department, Memorial University of Newfoundland, St. John's, Newfoundland, Canada, A1B3X7, bdeyoung@kean.ucs.mun.ca (Internet)) ou de David Mackas (Institute of Ocean Sciences, P.O. Box 6000, Sidney, B.C., V8L 4B2, d.mackas(OMNET)). Le plan initial du projet CGLOBEC sera publié dès le début de l'année 1994.

What's coming up in the journals?

Volume 27 No 1 April 1993 avril

Climatological Bulletin
Bulletin Climatologique

The biologically important thermal character of the eastern prairie climate.
G.H.B. Ash, C.F. Shaykewich and R.L. Raddatz

Weather and climate impacts in 1992 in Canada.
Malcolm East and Andrej Saulesleja

Volume 31 No 3 September 1993 Septembre

ATMOSPHERE-OCEAN

Intercomparsison of an acoustic Doppler current profiler with cyclesondes in Knight Inlet, British Columbia.
K.C. Greenwood, R.F. Marsden and J.R. Buckley

Coupled ice-ocean variability in the Greenland Sea.
A.T. Roach, K. Aagaard and F. Carsey

A particle-in-cell sea-ice model.
Gregory M. Flato

A comparison of conventional and passive microwave sea-ice data sets for Hudson Bay.
D.A. Etkin and Rene O. Ramseier.

A slantwise Showalter Index based on moist symmetric instability: Results for central Alberta.
Gerhard W. Reuter and Nacim Aktary

ACCREDITED CONSULTANTS/EXPERTS-CONSEIL ACCREDITES

Entries on the following pages are restricted to CMOS Accredited Consultants. The accreditation process started 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 specialised training:

   (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:

(1) L'applicant doit possèder un degré universitaire de premier cycle approprié d'une institution reconnue.

(2) L'applicant doit posséder au moins un des types suivants de formation spécialisée.

   (i) degré de deuxième ou troisième cycle d'une universitaire reconnue en météorologie ou océanographie;

   (ii) dégré de deuxième ou troisième cycle d'une universitaire reconnue en sciences naturelles ou appliquées ou en mathématiques avec spécialisation dans 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 formation complétées, l'applicant doit avoir au moins deux années de travail, avec performance satisfaisante, dans un champ de spécialisation mentionné dans ce document. Une certaine expérience d'expert-conseil est nécessaire.

ACCREDITED CONSULTANTS/EXPERTS-CONSEILS ACCRÉDITÉS

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For records only: if student, please indicate institution and year studies will be completed.

Pour dossiers seulement: l'étudiant(e) doit inscrire le nom de son institution et l'année où il (elle) finira ses études.

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(Indicate group if interested - Indiquez si vous avez des intérêts dans un des groupes.)

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Floating Ice / Glace flottant ☐
Mesoscale Meteorology / Météorologie à la mésoéchelle ☐
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