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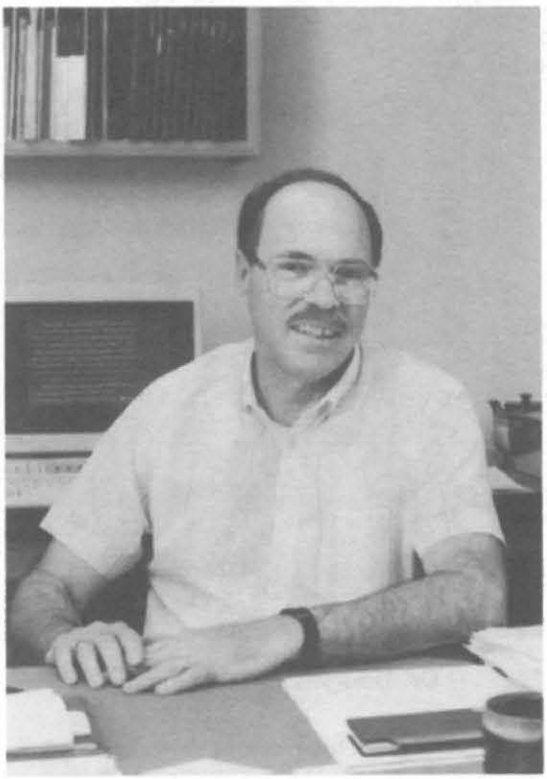
C.M.O.S. NEWSLETTER/NOUVELLES S.C.M.O.

Canadian Meteorological and Oceanographic Society

La Société canadienne de météorologie et d'océanographie

AUGUST/AOÛT 1991 VOL. 19 NO. 4

NEW PRESIDENT - NOUVEAU PRÉSIDENT



Prof. Louis A. Hobson

Dr. Louis A. Hobson received a B.Sc. degree in Fisheries Management and Zoology from Humboldt State University in 1959, and M.Sc. and Ph.D. degrees from the University of Washington, Department of Oceanography in 1963 and 1966, respectively, under the supervision of Drs. G.C. Anderson, F.A. Richards and K. Banse. For the two latter degrees I first examined the effects of buoyancy addition to the coastal region of the northeast Pacific Ocean by the Columbia River effluent on the character and distribution of marine phytoplankton, and then the production, chemical composition and transport of suspended particles by the geostrophic portion of the north Pacific drift in the eastern north Pacific Ocean. This work was continued in the Brazil, Benguela and Peru currents while Dr. Hobson was a Postdoctoral Fellow and Assistant Scientist at the Woods Hole Oceanographic Institution working with Drs. D.W. Menzel and J. Ryther. While at W.H.O.I. he also cultivated interests in the relationships between subsurface chlorophyll maxima and the density structure of the ocean and the metabolism of algal cells exposed to very low light levels. He pursued both of these research interests in the northeast Pacific Ocean and waters of the Strait of Georgia on joining the faculty of the University of Victoria, Department of Biology, in 1970. During the intervening years Dr. Hobson developed an interest in the impacts of the environment, particularly mixing conditions, nutrients and day-length, on the character of the neritic phytoplankton. Recently he, and graduate students, have begun to examine the ecology of marine zooplankton in the Strait of Georgia and are using the relatively new techniques of molecular biology to obtain information about zooplankton ecology.

During his tenure at the University of Victoria Dr. Hobson's principal teaching subjects have been introductory oceanography fro science majors and non-majors and algal physiology. Dr. Hobson was elected Chairman of the Department of Biology in 1988, a position which he continues to hold. Also he is a member of the Canadian National Committee of the Scientific Committee for Ocean Research, UNESCO, and participates on a Vancouver-based citizen's forum concerned with degradation of our environment.

EDITOR'S COLUMN

It has been pointed out to me by numerous people that there were a few editorial problems in my first try at the CMOS Newsletter. For example, in my first "Editor's Column" I gave my address, correctly as it happens, as: Institute of Ocean Sciences, P. O. Box 6000, Sidney, B.C. V8L 4B2, Tel. (604)-363-6590 and FAX (604)-363-6746. What I forgot to mention was who am "I", that is rectified at the bottom of this column. I also apologize for editorial errors to Savonius Rotor and Richard Greatbatch.

The next issue of the Newsletter will (I hope) go to press on October 1st 1991.

Howard J. Freeland

WHAT'S GOING AROUND?
by Savonius Rotor

I was quite distressed to see the editorial errata in the last issue of the C.M.O.S. Newsletter, in particular the doubling of the "t" in peta (the S.I. prefix denoting 10^{15}) was a most serious error. However, one correspondent pointed out to me that the doubling of the consonant does lead to some interesting new concepts, or as he described them "more colourful monikers", such as "terra" to be used exclusively by geophysicists, "decca" to be used by marine scientists (probably has something to do with navigation errors, and we note that 1 decca = 100 decci) and, of course, there is the "centi-petta" to be used when running out of digits while counting.

RUBE HORNSTEIN O.C.

Governor General Ramon Hnatyshyn announced in June that Rube Hornstein has been named to the Order of Canada. Mr. Reuben Aaron Hornstein is a life member of CMOS and a past winner of the AES Patterson Medal. In addition, the CMOS prize for operational meteorology is awarded each year in his name.

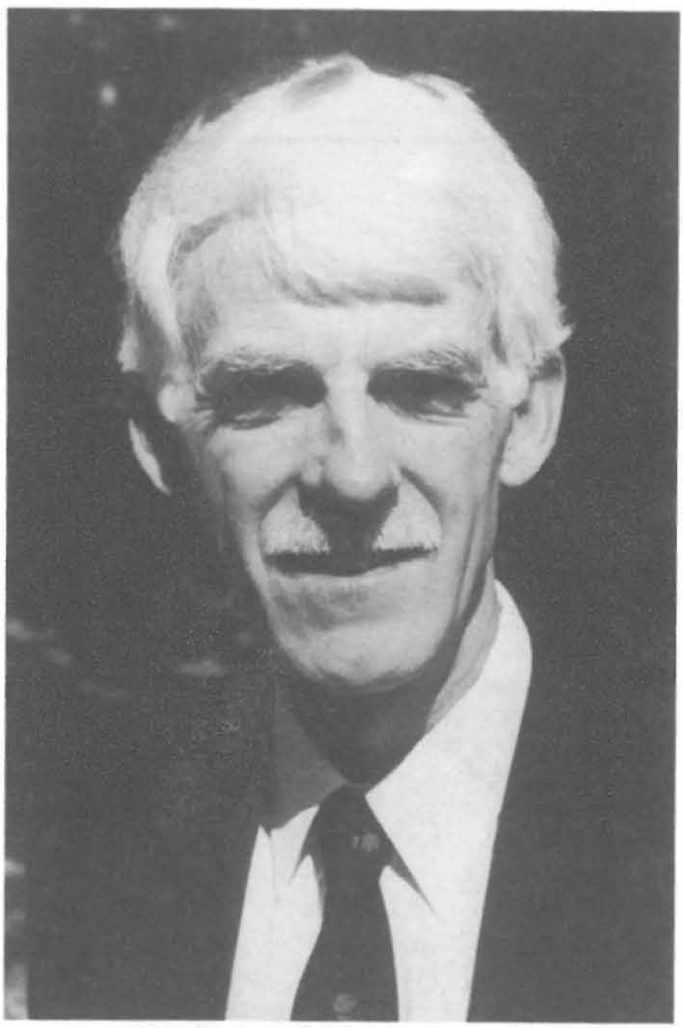
Mr. Hornstein received his B.A. from the University of Western Ontario in 1936 and his M.A. in physics (meteorology) from the University of Toronto in 1938. He was quickly swept up in the war effort, managing the Halifax Meteorological Office which provided forecast support for the north Atlantic patrol and convoy work. At the end of the war he was appointed a member of the British Empire in recognition of these services.

After the war, in charge of the Halifax Public Weather Office Mr. Hornstein began to make significant contributions as an interpreter of weather information to the Canadian public. Beginning in 1946, on the local radio in Halifax, his weekly radio talks were soon picked up by the Maritimes Network and later by the TransCanada network of the CBC. He published 4 books on popular weather topics and was known from coast to coast. With the advent of television he switched to that medium, and although his audience was limited to the Maritimes he became better known for his well-presented and understandable weather information. In time he also became a thoughtful, intelligent and effective interviewer on camera.

Mr. Hornstein retired from the federal meteorological service in 1972, but continued to do weather and other television work for another decade. In retirement he began reading books for the blind and visually impaired. He has read countless novels and textbooks on well over 1000 tapes and he is recognised as the most prolific narrator in the history of the Feguson Library at Saint Mary's University.

All of Rube's friends and colleagues from CMOS extend heart-felt congratulations on this most deserved of awards.

CMOS MEMBERS ELECTED FELLOWS OF THE R.S.C.



Dr. Douglas M. Whelpdale

Four members of C.M.O.S. have recently been elected Fellows of the Royal Society of Canada, in the last newsletter we presented the citations for Ann Gargett and for Tim Oke, in this issue we present the citations for the remaining two members.

Dr. Douglas M. Whelpdale

Douglas M. Whelpdale, Senior Scientist, Atmospheric Environment Service, Environment Canada, is an international authority on atmospheric chemistry. His fundamental work on transport and

deposition of atmospheric sulphur and nitrogen has played a major role in the development of Canadian and European acid rain research programs. His recent work has focused on large-scale cycling and budgets of atmospheric chemicals, leading to design and implementation of global atmospheric monitoring. Dr. Whelpdale chairs the influential Expert Panel on Atmospheric Chemistry and Environmental Pollution of the World Meteorological Organisation. In 1987 he was awarded the Patterson Medal for his contributions to Canadian Meteorology.

Dr. Peta J. Mudie (no picture available)
Dr. Peta Mudie is an outstanding palynologist making superb contributions to the solution of a wide range of geological oceanographic and climatological problems. She made the first modern palynological study of the oceans and sediments of the northwest Atlantic Ocean and its bordering lands and seas, and so she could make the first comprehensive synthesis of the events marking the onset of cooling and glaciation in high latitude regions of the northwestern Atlantic and the Arctic Oceans. She applied this foundation to solve many problems involving past climates and oceanographic conditions of the northern oceans and the Arctic using data teased from the geological record, data extracted under difficult conditions at sea and on the Arctic pack ice.

Dr. Steven Peteherych 1939-1991

Dr. Steven Peteherych died on 27th June 1991, one day before he would have celebrated his 52nd birthday, following a reoccurrence of the cancer he had so valiantly battled for several years.

Steve was born in Estevan, Saskatchewan and obtained his B. Eng.(1961), M.Sc.(1963) and Ph.D.(1973) from the University of Saskatchewan. From the time of his Master's thesis research Steve's main interest was remote sensing. From 1963 until 1965 he worked on rocket borne photometers and grating spectrometers at Kitt Peak National Observatory in Arizona. In 1965 he returned to the University of Saskatchewan to pursue his Ph. D. studies and lecture. He moved to Toronto in 1971 and for a short while worked at Spar Aerospace Products Ltd on a variety of infra-red and visible remote sensing instruments. After completing his Ph. D. studies he became a research associate at York University carrying out research on the use of LIDAR to investigate plumes from industrial smoke stacks.

After joining the Aerospace Meteorology Division of the Atmospheric Environment Service in 1975 he quickly realized the potential of micro-wave sensing to improve the accuracy of weather forecasts and he initiated a research programme in the area. Within a couple of years he had advanced the programme to the point where he was invited to become a member of the NASA sponsored sensor teams for both the SEASAT-A Scanning Multi-frequency Microwave Radiometer (SMMR) and the SEASAT-A Scatterometer (SASS). Over the years Steve's influence and recognition grew rapidly. He became a member of or chaired numerous international working groups in both Europe and North America and was frequently an invited speaker or member of a panel of experts at international colloquia.

Perhaps most people will remember him for his contribution to the joint JPL-UCLA-NASA-AES programme which resulted in a three-week global set of dealiased scatterometer winds from SEASAT-A. The data set was used by numerous investigators from the ECMWF, NASA, ESA and others. The same data set also resulted in the striking and colourful global sea-surface wind analyses which continue to appear in a wide range of publications.

But Steve not only worked in the forefront of international research on scatterometry, he was extremely interested in seeing scatterometer data used in day to day forecasting. To this end he worked closely with operational meteorologists, encouraging them to participate in both the research and publication of the results.

In 1983 Steve underwent surgery to remove a brain tumour. However he was determined to carry on with his research. In 1984 he not only returned to work but participated in the authorship of four journal articles and made four conference presentations. Steve continued to be a productive research scientist up until the fall of 1990 when he took a medical retirement.

During his career as a scientist Steve published over thirty journal papers, made more than twenty contributions to books and major reports and made over 40 conference presentations.

Steve did not spend all his time on science. He was a keen sportsman who loved fishing, gardening, art and travelling but perhaps it was his love of his family that will be remembered most by those who worked closely with him. He was a devoted husband and father who leaves behind his wife Virginia, his daughters Linda and Cheryl and his son Steven. They along with his many friends and colleagues will miss him.

Graeme Morrissey

1991 CMOS Prizes and Awards

At the 25th annual CMOS Congress the prizes and awards were as follows:-
President's Prize - Dr. Stephen Pond
J. P. Tully Medal in Oceanography - Dr. Paul LeBlond
Prize in Applied Oceanography - Dr. Mike Foreman
Prize in Applied Meteorology - Mr. David Phillips
Operational Meteorology - M. Denis Bachand

Graduate Student Prizes -
Ms. Tertia Hughes (oceanography)
M. Michel Desgagne (meteorology)

Excellence in reviewing -
Dr. R. Schemenauer (meteorology)
Dr. P. F. Cummins (oceanography)

Citation for outstanding television weather presentation -
Mr. Ian J. Miller

CMOS CONGRESS 25

CMOS Luncheon Talk, Morley Thomas, 5 June 1991

Twenty-five years ago, in 1967, the First Annual Congress of this Society was held at Carleton University in Ottawa. The entire nation was celebrating 100 years of Confederation and we had something extra; we were also celebrating the first year of our brand-new Canadian Meteorological Society. We had not yet begun to label Congresses with themes but there were two invited survey papers — one on "The Upper Atmosphere and Meteorology Today" and a second one on the "World Weather Watch" Twenty eight other papers were presented and an entire half day was devoted to the Annual General Meeting!

For the record, the 1967 Congress was not the first Congress of meteorology in Canada. The first one, organized by the Montreal-based National Executive of the Canadian Branch of the Royal Meteorological Society, was held in June 1960 at Queen's University in Kingston. So this Winnipeg Congress is not only the 25th of the CMOS but also the 31st consecutive Congress in Canada.

But, I must go back even further to properly delineate the history of our Congresses. More than 50 years ago, in the mid 1930s, there were increasing demands from aviation for flying weather forecasts. The director of the Meteorological Service, John Patterson, knew that, to prepare and issue meaningful aviation forecasts, he had to have forecasters trained in the new meteorological theories. So, he convinced the University of Toronto to sponsor an MA in Physics (Meteorology) program.

A few years later, the Service became the Meteorological Division of the new Department of Transport. The MA graduates from the meteorology courses were hired to staff the District Aviation Forecast Offices which were set up to service the new TransCanada Airlines at a few airports across the country. Then, just before war came, late in the summer of 1939, the Service hosted a joint Royal Meteorological Society/American Meteorological Society conference in Toronto. There it was announced that the RMS had issued a charter for the formation of a Canadian Branch.

There were only about 50 meteorologists in the country at that time (and even fewer oceanographers), but with the launching of the British Commonwealth Air Training Plan and its expansion over the next few years, nearly 400 more were hired as Meteorological Assistants Grade 3 and trained for service with the RCAF. From this group 120 were given advanced training to become Meteorologists Grade 1 to work at the rapidly expanding DAFOs.

By late in the war there were 16 main forecast offices and about 75 dependent offices at Home War RCAF stations throughout Canada. In the simple organization structure of that day every OIC reported directly to John Patterson, the Controller! After May 1945, more than half the wartime meteorologists departed and the Service, now led by Andrew Thomson, settled down to meet civilian needs. There were about 250 meteorologists in Canada and these people began to find time to participate in the activities of the Society.

The first Canadian Branch Executive, based in Toronto, had taken office in 1940 and a few meetings were held each year during wartime. After 1945, membership in the Society increased markedly. Attendance at the monthly meetings, usually held in the evening, became a "must" for Toronto-based meteorologists because the director of the Service was always there. Within a few years, sparked by the then president, Pat McTaggart-Cowan, the Society began to publish the papers given at these meetings in a *Canadian Branch Publications* series.

However, during the 1950s, the Society began to suffer from being "Toronto-bound" as just about all Society activities were held in that city. There were councillors-at-large throughout the country but it was rare that any one of them was able to attend an executive meeting. Then, the Montreal meteorologists volunteered to take over the National Executive. There were, at that time, two forecasts offices and the new CAO (now the Canadian Meteorological Centre) in that city along with a new academic program in meteorology at McGill University. There was plenty of talent in Montreal and the first Local Centre had already been organized there.

This move, in 1959, proved to be most beneficial to the health and strength of the Society. The new enthusiastic executive organized the first National Congress which was held the next year at Queen's University and in 1963, they brought out the first issue of *Atmosphere*. Over the next few years, with a nationalist Centennial fever sweeping the country, planning was begun to leave the Royal Meteorological Society and to form our own independent Canadian society.

After a postal ballot had indicated that 78% of the members approved, the 1966 Annual General Meeting at the University of Sherbrooke voted, almost unanimously, for the change. This separation from the RMS was done with the full cooperation of the parent society whose president, G.D. Robinson, was our guest at Sherbrooke. On January 1, 1967 (Centennial Year), the Canadian Meteorological Society came into being and the first Congress of the new Society was held in Ottawa.

The Society grew — the number of members reached 600 in 1969 and there were now 9 local centres. Corporate memberships were introduced, support was given to the National Science Fairs and a Society Development Committee was established. Sponsored by the Meteorological Branch, the first Speaking Tour was organized in 1969.

In other ways, though, the Society was becoming increasingly independent from the Service by taking over responsibility for printing, distribution, postage and considerable clerical and professional services which had been provided for free by the Service since the beginning. To help compensate for the Society's increased costs the Service began to provide an annual grant to the Society. The early 1970s saw much discussion over publishing policy for *Atmosphere* which led to a new format and style in 1971 and the inauguration of the *CMS Newsletter* in 1973.

Then, at the Halifax Congress in 1974, Dr. William Ford of the Bedford Institute of Oceanography was invited to give the keynote address and meteorologists and oceanographers began a new close relationship which was to lead to the Society of today. The next year, at Vancouver, an Oceanography Division was formed within the CMS and at the 1977 Annual General Meeting, the Canadian Meteorological and Oceanographic Society became a reality. The premier publication was renamed *Atmosphere-Ocean* and CMOS now boasted more than 700 members.

Also, during the 1970s, the Society decided to give scientists in cities other than Toronto and Montreal the opportunity to serve in key National Executive positions. The Executive was located at Vancouver in the late 1970s and this proved advantageous as the Society mounted a "Save Papa Campaign" when the initial moves were made by Environment Canada to discontinue the weathership program. Since then the Executive has been rotated through Alberta (with some help from Saskatchewan), Ottawa and Halifax before returning to Toronto and, in 1991, it will go back to the Pacific coast. This utilization of the executive talents of meteorologists and oceanographers from coast to coast has brought, every few years, fresh ideas and regional viewpoints which have been of great value in the development of the Society.

The late 1970s and early 1980s saw considerable spirited discussions on Standards for Meteorological Consulting in Canada which of course led to the current Accredited Consultants and Broadcaster Endorsement programs. Also, about a decade ago, the Society decided to have Specialist Groups, took over the *Climatological Bulletin* and *Chinook*, began to contract out many of the administration tasks and obtained an Executive Director in Ottawa.

By the late 1980s, there were more than a dozen Centres and Chapters, many committees and several special interest groups as Society activities increased markedly with membership approaching 1000. The Society appears to be in good financial health with assets at the astounding level of around $100,000. Many Annual Congresses have produced a profit and I understand that most Centres now have bank accounts! The Society and it's *(sic)* Annual Congresses appear to be in excellent health from a business viewpoint as well as a science one. So, Happy 25th Anniversary to the Congress program.

What about the next 25? Despite the political doom and gloom in much of the country, deficit spending and cutbacks in government research and services, there is unprecedented widespread concern over global change caused by man's activities. The atmosphere and the oceans are central to global change problems and a better understanding of them is essential to the solution. This, along with continued developments in automation and computerization will present great opportunities to scientists over the next decades. In the year 2016, when some of you gather to look back on 50 years of Congresses I believe you will see great advances in meteorology and oceanography and their applications, many more than we are so pleased to note for the past 25 years.

POSITIONS AVAILABLE

The Atmospheric Environment Service has two indeterminate positions open for research scientists to carry out research and development projects on data assimilation into numerical weather prediction models, with emphasis on assimilation of remote sensing data. The positions may be located in either Downsview, Ontario or Dorval, Quebec.

A Ph.D. with relevant specialization and post-doctoral research experience in meteorology or atmospheric science (preferably in data assimilation or satellite meteorology) are required. Positions in Downsview require knowledge of the English language; positions in Dorval require knowledge of either English or French and willingness to undergo training in the other official language.

Applications, including a curriculum vitae and the names of three referees, must be sent by 30 September 1991 to:

Mr. J.D.Steenbergen
Chief, Aerospace Meteorology Division
Atmospheric Environment Service
4905 Dufferin Street
Downsview, Ontario M3H 5T4

Please refer to competition number 91-DOE-AES-TOR-OC-178-179.

POSTES DISPONIBLES

Le Service de l'environnement atmosphérique annonce la disponibilité de deux postes indeterminés pour des chercheurs scientifiques qui realiseront des projets de recherche et de développement dans le domaine de l'assimilation de données dans les modèles de prévision numérique, portant une attention spéciale à l'assimilation de données télédétectées. Les postes peuvent se situer à Downsview, Ontario ou à Dorval, Québec.

Les postes exigent un doctorat avec spécialité pertinent et de l'expérience de la recherche post-doctorale en météorologie ou en physique atmosphérique (préférablement en assimilation de données dans les modèles numériques ou en météorologie satellitaire). Les postes à Downsview exigent une connaissance de l'anglais; les postes à Dorval exigent une connaissance du français ou de l'anglais avec preuve de bonne volonté d'entreprendre la formation dans l'autre langue officielle.

Les demandes, incluant un curriculum vitae et les noms de trois références, doivent être envoyées au plus tard le 30 septembre 1991 à:

M. J.D.Steenbergen
Chef, Division de la météorologie aérospatiale
Service de l'environnement atmosphérique
4905, rue Dufferin
Downsview (Ontario) M3H 5T4

Veuillez faire mention du numero de concours 91-DOE-AES-TOR-OC-178-179.

NEW C.M.O.S. MEMBERS

These new members were approved June 3rd 1991:-

Dr. Anthony Ciccione (regular)	Toronto
Mr. A. A. Warkentin (regular)	Winnipeg
Mr. André St.-Hilaire (regular)	Moncton
M. Robert Perron (regular)	Cornwall, Ont.

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 at the beginning of this notice.

POST-DOCTORAL FELLOWSHIPS

Positions are available with a growing group of Physical Oceanographers, on Canada's west coast, that collaborates with scientists at the nearby Institute of Ocean Sciences and with colleagues in other disciplines. Present interests include: ocean mixing processes; air-sea interaction and ocean circulation, with opportunities for field work, theory and modelling. While this advertisement is aimed primarily at physical oceanographers, we will consider applicants in other areas of ocean science that require interdisciplinary collaboration. Applications, with c.v.'s and the names of three referees, should be sent to Chris Garrett, Centre for Earth and Ocean Research, University of Victoria, Victoria B.C. V8W 3P6, Canada. Tel. (604)-721-7702, FAX (604)-721-7715.

R.W. STEWART

(From the preface to the R.W. Stewart issue of Atmosphere-Ocean **29**(2))

The development of physical oceanography in Canada, and to some extent in the international community, has been associated very closely with the career of Professor Robert W. Stewart. From his studies at Cambridge University of third-order correlation moments in wind-tunnel flows, to his present involvement in the global climate change program, Bob has been instrumental in the process of shaping the emerging disciplines of study. Bob has maintained a wide interest in physical mechanisms in oceanography, and has imparted his interest and deep insights to many people over the years. During his teaching days at the University of British Columbia he enabled the establishment of a world-leading Air-Sea Interaction Group, and students from that group are now pursuing their research in centres throughout North America and in other parts of the world. He was the first Director-General of the Institute of Ocean Sciences at Patricia Bay, near Sidney, B.C., and he led in the establishment there of a full range of multidisciplinary oceanographic programs devoted to research in the Northeast Pacific, including Arctic and satellite components. He has also been associated with the provincial governments of British Columbia and Alberta, in the former as a Deputy Minister and in the latter as President of the Alberta Research Council.

In June 1989, Bob retired from the Centre for Earth and Ocean Research at the University of Victoria where he had been interim Director since its inception in 1987. To mark the occasion, the R.W. Stewart Symposium was held on 25 and 26 May 1990, in Victoria, B.C., and the present publication is an outgrowth of the Symposium. A range of papers is presented in this issue, representing as much as possible the interests that Bob himself has displayed over the years, namely, acoustics, turbulence, ocean circulation, air-sea interaction, oceanographic remote sensing, diffusive processes and global ocean climate forecasts. As well, there is a paper (from the Alberta Research Council) on a technique for measuring rainfall rates by radar, with supporting measurements from the western prairies. All papers have been processed through the normal review procedure by the editors of ATMOSPHERE-OCEAN.

Unfortunately, there is no suitable contribution representing his career with the British Columbia Provincial Government. He was Assistant Deputy Minister and then Deputy Minister of Science, Education and Communications from 1979 to 1984. There is also no suitable contribution representing the many committees he has served on or chaired, nationally and internationally, such as SCOR-IOC, GARP, WCRP, CCCO, ICSU and UNESCO. Their presence must be inferred from the global orientation of some of the papers presented at the Symposium and contained in the present issue, including the acoustics research described by Walter Munk and the global ocean spinup modelling from researchers at McGill University.

This special issue is not a full proceedings of the Symposium. Some presentations were given in a colloquial style and are not readily transferable to the pages of this journal, and at least one paper had already been submitted for publication elsewhere when the decision was taken to prepare this special issue. The journal's readers will also miss a very powerful presentation by Francis Bretherton on Earth System Modelling, a paper that laid an integrating foundation and served as a touchstone for many of the specialist climate papers subsequently presented. They will miss a very creative presentation comparing humanity's exploration of the coastal ocean to an analogous imagined dolphin exploration of the geography and physical processes of the coastal land mass. They will also miss illuminating and humorous excerpts discussing the statistics of the productivity of scientists as a function of age (showing a decrease toward middle age but then an increase somewhat after that), and a personal testimony by Bob's namesake (presently from Texas A&M) who began his career feeling somewhat

overshadowed by Bob's existing reputation, but then more recently felt he was perhaps beginning to catch up a bit, only to discover now, on the basis of the previous statistics, that maybe he's in "deep trouble" again.

It was stressed several times at the banquet accompanying the Symposium that no one really expects Bob to completely retire. On the contrary, with less time now required by organizational activities on the local scene, perhaps (in accord with the statistics) he will have more time to devote to interesting research topics such as the question of sea-level rise, or to his continuing involvement in international activities such as UNESCO or ICSU. But, regardless of what his choices are for the future, we agree fully with the sentiments expressed by his friends and colleagues at the banquet: We wish him the very best for his endeavours in his present "retirement".

Blyth Hughes, Symposium Organising Committee

R.W. STEWART

(de la préface du numéro spécial R.W. Stewart d'Atmosphere-Ocean 29(2))

Le développement de l'océanographie physique au Canada, et à un certain point dans la communauté internationale, a été associé très étroitement à la carrière du professeur Robert W. Stewart. De ses études à l'université de Cambridge sur les moments de corrélation de troisième ordre de l'écoulement dans les souffleries aérodynamiques, jusqu'à sa participation présente dans le programme sur le changement du climat global, Bob a contribué au processus de formation des domaines d'études de pointe. Il a maintenu un vaste intérêt dans les processus physiques océanographiques et l'a partagé, ainsi que sa perspicacité, avec de nombreuses personnes au cours des ans. Pendant son professorat à l'université de Colombie-Britannique, il a rendu possible l'établissement d'un groupe mondial de premier plan sur l'interaction air-océan; des étudiants issus de ce groupe poursuivent maintenant leurs recherches à travers l'Amérique du Nord et le monde. Il fut le premier directeur général de l'Institut des sciences de la mer à Patricia Bay, près de Sidney C.-B Il institua un éventail complet de programmes océanographiques multidisciplinaires dévoués à la recherche dans le Pacifique du nord-est et l'Arctique et à l'observation satellitaire. Il fut aussi associé au gouvernement de la Columbie-Britannnique comme sous-ministre et à celui l'Alberta comme président du conseil de recherche de l'Alberta (ARC).

Directeur du Centre for Earth and Ocean Research à l'université de Victoria, depuis son ouverture en 1987, Bob se retira en juin 1989. Afin d'en marquer l'occasion, le symposium R.W. Stewart fut tenu les 25 et 26 mai 1990 à Victoria; cette publication y fait suite. La variété d'articles publiés représente autant que possible ses intérêts au cours des ans : acoustique, turbulence, circulation océanique, interaction air-océan, mesures océanographiques à distance, processus diffusifs et prévisions du climat global. En plus, on présente un article de l'ARC sur une technique de mesure de la pluviosité par radar supportée par des données complémentaires provenant de l'ouest des Prairies. Tous les articles ont suivi le cours normal de révision par les rédacteurs d'ATMOSPHERE-OCEAN.

Malheureusement, il n'y a aucune contribution appropriée évoquant sa carrière avec le gouvernement de la Columbie-Britannique, où il fut sous-ministre-adjoint puis sous-ministre des Sciences, éducation et communications de 1979 à 1984. Il n'y a aussi aucune mention des nombreux comités nationaux et internationaux sur lesquels il a servi comme membre ou président, tels que SCOR-COI, GARP, PMRC, CCCO, CIUS, UNESCO, etc. L'orientation générale de certains articles présentés au symposium et contenus dans la présente publication comme, par exemple, la recherche acoustique décrite par Walter Munk et le modelage océanique global des chercheurs de l'université McGill, nous permet de se faire une idée de ses activités.

Cette édition spéciale n'est pas un compte rendu complet du symposium. Quelques présentations furent faites dans un style familier et ne sont pas facilement publiables dans ce journal; au moins un article avait déjà été soumis à un autre journal quand on a décidé de l'édition spéciale. Les lecteurs sercnt aussi privés de la très importante présentation de Francis Bretherton sur le modelage du système terrestre intégrant les idées de fonds et servant de base à plusieurs des articles spécialisés sur le climat présentés subséquemment. Une présentation très créative, comparant l'exploration humaine des océans côtiers à une exploration similaire fictive par des dauphins, de la géographie et des processus physiques des zones côtiers terrestres, est aussi manquante. De même, on n'a pu publié les extraits humoristiques et éclairants sur les statistiques de productivité des scientifiques en fonction de l'âge (diminution vers l'âge moyen suivie d'une augmentation); et un témoignage personnel par un homonyme de Bob (présentement chez Texas A&M) qui débuta sa carrière en se sentant quelque peu dans l'ombre de la réputation de Bob, mais qui plus récemment senti qu'il commençait à le rattraper pour seulement découvrir maintenant, sur la base des statistiques, que peut-être est-il encore dans le « pétrin ».

Au banquet, on a mentionné à plusieurs reprises que personne ne s'attendait à ce que Bob se retire complètement. Au contraire, les activités organisationnelles locales demandant moins de temps, peut-être (selon les statistiques) qu'il en aura plus à consacrer à des recherches intéressantes telles que la question de l'augmentation du niveau de la mer, ou à son engagement dans des activités internationales comme l'UNESCO ou le CIUS. Mais, peu importe quels sont ses choix futurs, nous sommes totalement d'accord avec les sentiments exprimés par ses amis et collègues au banquet : nous lui souhaitons le succès pour ses projets durant sa présente « retraite ».

Blyth Hughes, Comité d'organisation du symposium

JULY 17, 1990 OTTAWA MICROBURST EVENT
RESULTS OF A FIELD SURVEY

Gilles Fournier, Aviation Meteorology Analyst
Marc Beauchemin, Meteorology student
Transport Canada, Air Navigation Technology and Environment
Place de Ville, Tower C, Ottawa, K1A 0N8

ABSTRACT This note presents the results of a field survey conducted shortly after an isolated severe storm producing strong winds and heavy rain hit an area of Ottawa on July 17, 1990. A number of elements support the thesis that the storm produced a microburst.

RÉSUMÉ Cette note présente les résultats d'une étude de champ effectuée juste après qu'un orage violent accompagné par des vents forts et de la pluie abondante ait frappé un quartier d'Ottawa le 17 juillet 1990. Un certain nombre d'éléments supportent l'hypothèse qu'une "microrafale" aurait été produite par l'orage.

1 BACKGROUND

A microburst is an intense downdraft from convective clouds which induces a divergent outburst of damaging winds on or near the ground, with horizontal wind velocity difference of at least 10 m/s over a distance of 4 km or less. The damaging winds may reach values of 75 m/s (Barnard, 1989). Therefore a microburst is characterized by its small size, its short lifespan of 10 minutes on average, the strength of its winds and the diverging pattern of the outburst and associated damage.

2 The July 17 Ottawa event

An isolated intense convective cell produced a microburst embedded in heavy rain which hit the east-end of Ottawa on July 17, 1990 at about 2010 UTC (16h10 EDT) and lasted about 10 minutes, producing a diverging pattern of wind damage on trees. Discussions with the Atmospheric Environment Service (AES) personnel from the "Centre Météorologique du Québec" (CMQ) confirmed that areas of trees damaged by strong winds from scattered storms were also sighted at St-Eustache and Laval (just north of Montréal) about the same time on that day. Unfortunately no resources were allocated for field surveys.

3 Meteorological conditions

As shown on a sequence of radar 1.5 km CAPPIs (not reproduced here) taken by the McGill weather radar located in Sainte-Anne-de-Bellevue (just west of Montréal), an isolated airmass type convective cell crossed the downtown Ottawa on Tuesday, July 17 at about 2000 UTC and the east end of Ottawa at about 2010 UTC. Rainfall rates of at least 32 mm/h were occurring at 2005 UTC in the Ottawa-Hull region. Maximum temperature recorded at the airport that day was 29.4°C with dew point about 18.0°C, and winds in the afternoon were from the southwest at 5 to 8 m/s with gusts up to 13 m/s. No measurable precipitation was recorded at the airport on that day.

4 Results of the field survey

A systematic field survey of damaged trees in an area of about 2 km in diameter was conducted, and feedback from local residents and witnesses was obtained.

The map presented in Fig. 1 shows that a total of 31 trees with diameters ranging from 10 to 90 cm fell due to strong winds. Of these, 18 had split or broken trunks and 13 had been uprooted. Eight of the uprooted trees were among the bigger trees of the area. All damaged trees were quite healthy except for 3 dead trees. Widespread branch damage was also noticed. The foliage cross sections of the trees to the winds played an important role since only deciduous trees were damaged while coniferous were available in the same area. Reproductions of photographs of some of the damaged trees are presented in Fig. 2 and Fig. 3.

It is apparent from Fig. 1 that the damaged trees present a diverging pattern except for the small area located just northwest of the corner of Carson and Montreal Road. Different factors may have played to affect the pattern. For instance the degree of asymmetry of the outburst, the effect of the prevailing winds, the local topography, the natural and human made obstacles to the winds, the density and preferred direction of growth of the trees, etc.., may have contributed in different degrees to the pattern of damage.

Other elements supporting the microburst thesis are: the trees were damaged by winds estimated at over 100 km/h; the small extent of the damage (about 1 km in diameter) and the short lifetime of the severe event (about 10 minutes) are characteristic of microbursts; interviewed witnesses confirmed that heavy precipitation was occurring at the time when trees were being split or uprooted by strong winds; and the damage was not caused by lightning strokes since no burned material was found on site.

5 Conclusion

The July 17th severe weather event analyzed in this note presents all microburst characteristics, including diverging outflow pattern as inferred from the survey of damaged trees.

Despite the fact that Canadian sites are not instrumented for detecting, tracking and forecasting small scale and transitory phenomena such as microbursts, the results of the field survey presented in this note show that microburst events can be inferred from damage patterns and information gathered from witnesses. In future it would help document microburst events in Canada if personnel from AES, Transport Canada or National Defence could systematically conduct thorough field surveys as early as possible after damage due to weather is reported, whatever the extent of the damage.

Acknowledgements

We thank individuals from the "Centre Météorologique du Québec" (CMQ), the Ontario Weather Centre (OWC) and the Ottawa Weather Office who were contacted and kindly accepted to discuss the case studied in this note. The city map was obtained from the Ministry of Natural Resources, Ontario.

Reference

Barnard I.C., Spar Aerospace Limited. 1989. Wind Shear Feasibility Study. Prepared for Transport Canada. TP 9658E.

Fig. 1 Map showing the results of the field survey.

The circles "o" are locations of uprooted "U" trees or split trunks; the arrows "→" indicate the direction of falls; the digits inside circles are estimated trunk diameters in decimeters; the dots "·" are locations of considerable branches damage; "d" was added when the affected tree was considered dead before it got hit; finally "X" indicates the location of an interviewed resident or witness.

Fig. 2 Uprooted 30 cm diameter maple tree.

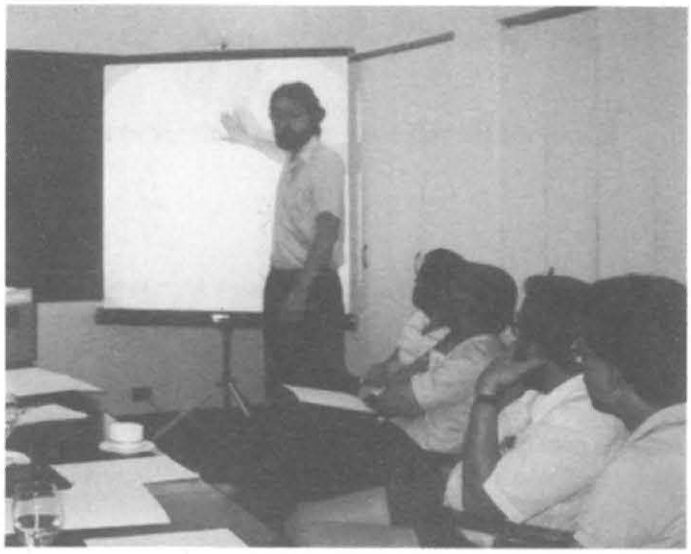
Fig. 3 Uprooted 90 cm diameter maple tree.

WOCE NEWS

Annual CNC-WOCE Meeting

by Paul H. LeBlond
University of British Columbia, Vancouver, B.C.

The annual CNC-WOCE meeting was held during the CMOS Congress in Winnipeg on June 3, 1991. It was opened by the Chairman for WOCE, Paul. H. LeBlond. Brief presentations on the progress and/or plans for their research were made by individual investigators R. Greatbatch, D. Kelley, K. Thompson (see photograph), W. Hsieh, C. Lin, P. LeBlond and B. Ruddick. H. Freeland also gave a short



presentation on recent observations of a benthic storm event in the North Pacific. Dario Stucchi disclosed the status of the Canadian WOCE brochure. The text is nearly ready and illustrations are being drafted.

It was concluded that the scientific progress for the first year has been satisfactory. Intentions were stated to enhance collaboration between the various groups and also possibly to fund unexpected and innovative extensions.

Co-chairman R.A. Clarke and member E. Carmack are retiring this year. H. Freeland of IOS, Sidney, and D. Wright of Bedford Institute, Halifax, have been invited and accepted to serve as new members.

Where are they now?

by Paul H. LeBlond
University of British Columbia, Vancouver, B.C.

As part of the Canadian contribution to the WOCE Surface Velocity Program, satellite-tracked drifting buoys were released in three areas in 1990. The first deployment, in late August- early September, took place in the vicinity of Station P (50°N, 145°W) and included 7 shallow (15 m) and two deep (100 m) drogues. Fig. 1 shows how the latter diverged from the former, heading north while surface waters flowed eastwards.

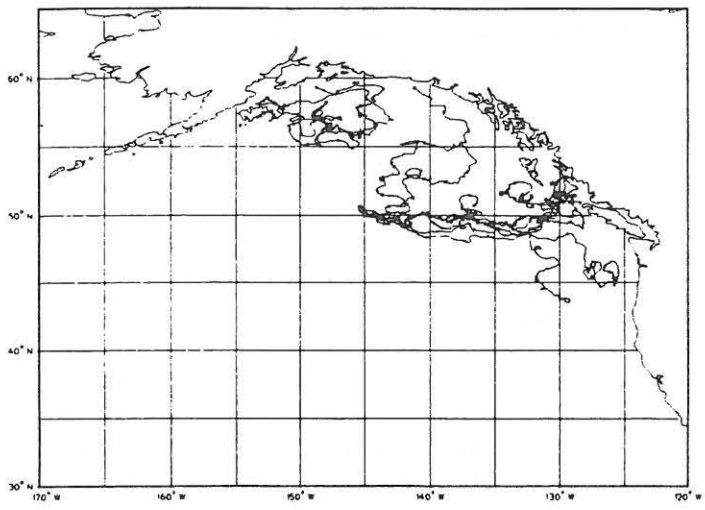


Figure 1

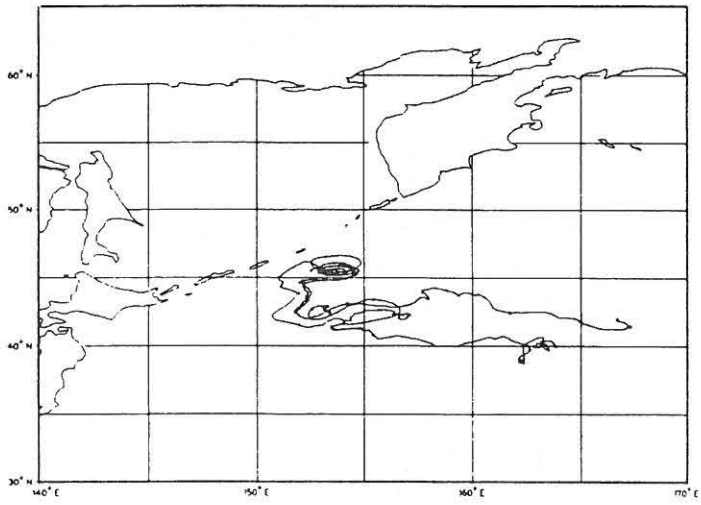


Figure 2

In collaboration with the Pacific Oceanological Institute of Vladivostok, three shallow drifters were released from the Akad. Vinogradov off the Kurile Islands in October 1990. They spent about a month-and-a-half within an anti-cyclonic gyre and are now proceeding eastwards across the Pacific (Fig. 2).

The third deployment, of five drifters, was made from the Alpha Helix thanks to Tom Royer of the University of Alaska. The intention was to seed the source area of the Alaskan Stream with deep-drogued drifters and to observe their progress downstream. Contrary to expectations, all five drogues turned back shorewards; two have already stranded on the eastern side of Kodiak Island (Fig.1).

Of the nine drifters released during the first deployment, one went ashore after 78 days and all but one of the others were still functioning well, with their drogue in place, at the beginning of July 1991. One of the deep drifters launched at Station P in August 1990 is now moving southwards through Shelikof Strait, Alaska. Drifter performance has been superb: only one has died at sea so far.

A Global Coordinate Rotation Utility

by Michael Eby
Institute of Ocean Sciences, Sidney, B.C.

A limitation in using the GFDL Modular Ocean Model (MOM) for world ocean circulation studies arises from the use of spherical coordinates in the finite difference scheme. Convergence of lines of longitude at high latitudes aggravates instabilities such as noted by Killworth in relation to steep topographic gradients. A utility (World Axis Rotation Program - WARP) has been devised to provide an arbitrary rotation of the spherical grid to optimize model performance in any limited region such as a marginal sea. Tilting the Warp grid one can maximize efficiency by reducing the number of land points and provide more flexibility in defining boundary conditions. Penalties are that data must be interpolated onto a transformed grid, and the Coriolis parameter varies with longitude as well as latitude. The Arctic is a region of particular interest for the application of a WARPed MOM. Although the Arctic is not officially a "WOCE ocean", the intent is to supply WOCE global modelling with interactive boundary conditions along an open North Atlantic sector.

WOCE in the News

We would like to point out that a short article has appeared in the Geowatch section of the June/July '91 issue of the Canadian Geographic Magazine describing the role of Canadian WOCE in the research of the oceans' effect on weather.

WOCE MOORING OBSERVATIONS IN THE NORTH PACIFIC

Howard Freeland, Inst. of Ocean Sciences

As part of Canada's WOCE contribution from the Institute of Ocean Sciences a mooring has been maintained off the west coast since June 1989, and this mooring was expanded to a small array in August 1990. At the present time data are available only from the single site (QEP-1) that started in 1989. The location of that single mooring is shown in the above map Figure 1. It is in deep water (3980 metres) on line P and carries current meters at depths of 200m, 600m, 1500m, 2200m and 3000m. The stick diagrams of the data acquired so far are shown in figure 2.

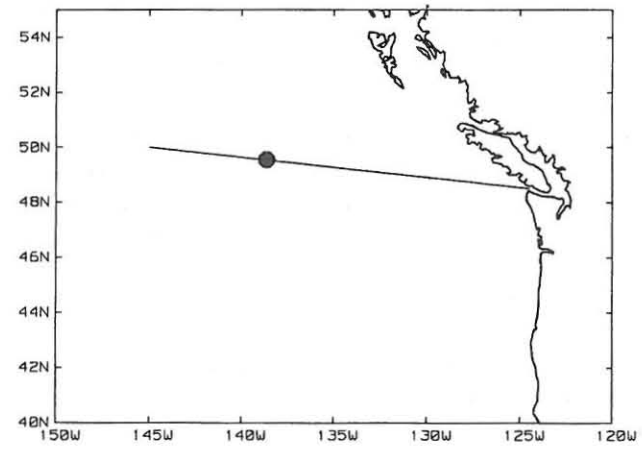


Figure 1

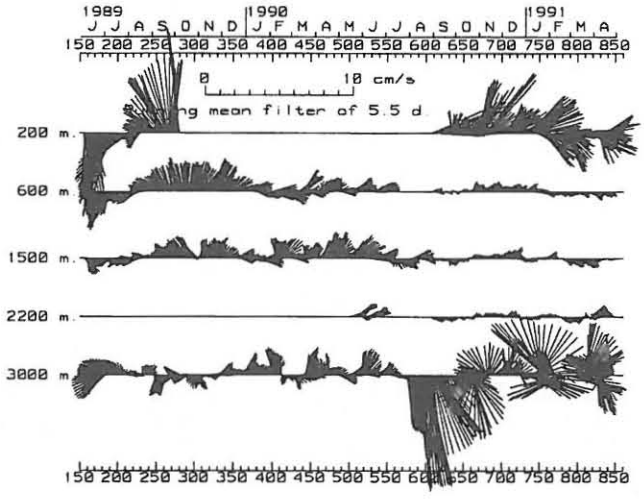


Figure 2

All time series were intially filtered with a Lanczos-Cosine filter to remove tides, and then, for the purposes of this display, operated upon with a running mean filter of length 5½ days. All time series are shown to the same scale, the total time duration of the data displayed is just under two years.

We were very surprised to see the obvious non-stationarity in the time series. At 600 m. and at 1500 m. the r.m.s. speed for the first year of data is about 3 times that for the last 8 months. However, particularly striking is the sudden burst of current speed in late August of 1990 at a depth of 3000m. This appears to have been the sudden onset of a "deep ocean storm" that continued for at least the next 8 months. The mooring was serviced on day #606, just after the most intense burst of speed at the deep current meter and the instrument that continued that time series was a different one. Thus we are confident that this is not a result of a faulty instrument. The current speeds observed at 3000 metres are really very high, the peak speed, after removal of the tides, is about 10.1 cm/sec. For comparison the largest speed observed at 200 metres so far is only 8.4 cm/sec.

The central mooring of the array will continue operation until summer of 1992, the remaining components of the array will be recovered in October 1991.

ADDENDUM

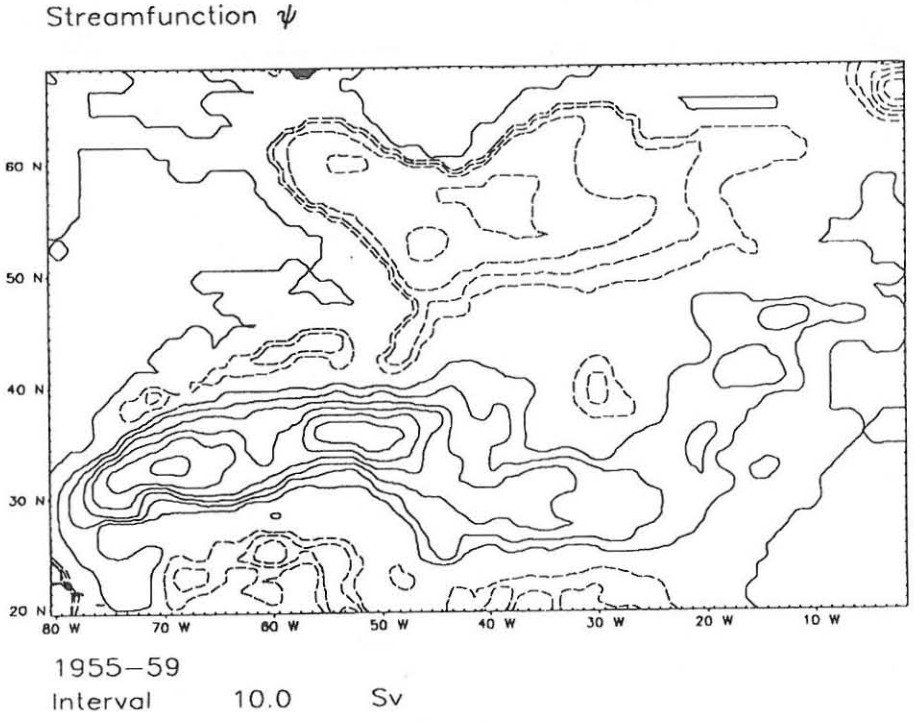


Figure 1.

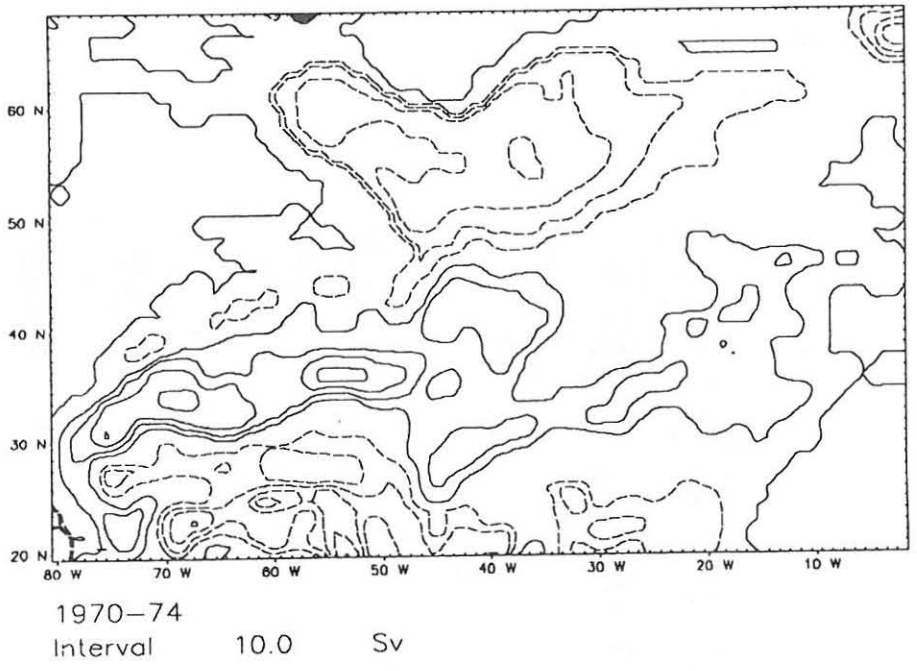


Figure 2.

In our previous issue, Richard Greatbatch, of Memorial University of Newfoundland, described calculations of the transport stream function in a two layer model of the North Atlantic for currents driven by COADS wind stresses in a Levitus density field during two five-year periods (pentads): 1954-59 and 1970-74. Since only one of the contour plots was presented it was not possible to compare the two pentads. Both figures are shown here Fig. 1 and 2. We note that the subtropical gyre is substantially weaker during the later pentad, with the transport of the Gulf Stream dropping from 80 Sv to about 50 Sv. Nearly all this change is attributed to the JEBAR term in the vicinity of the mid-Atlantic Ridge. Three-dimensional modelling will be required for a careful examination of such changes.

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Dynamics in Atmospheric Physics.

by Richard S. Lindzen, Cambridge University Press, 310 pp.

This book is a reproduction of lecture notes for an introductory course in atmospheric dynamics given at Harvard and M.I.T. The students enrolled in the course are expected to have a solid grounding in undergraduate physics and mathematics. While the presentation of the material in the book does not require especially advanced mathematical skills, many of the topics are dealt with at a relatively advanced level. Each chapter begins with a list of references to supplementary reading material. The student who is not already familiar to some extent with the subject matter of a particular chapter is well advised to study the supplementary reading material. The book is not intended as a text or reference book. This point is emphasized in Dr. Lindzen's preface to the book and used as justification for omission of an index. There is, however, a bibliography which includes complete references for the suggested supplementary reading and additional useful reference material.

The book contains fourteen chapters and an appendix devoted to presentation of a simple linear numerical model for the vertical structure of gravity waves forced from below. The choice of material reflects to some extent Dr. Lindzen's own research interests over the last 25 years. Some of the topics discussed are not usually dealt with in textbooks on atmospheric dynamics. For example, there are chapters on energy balance climate models, atmospheric tides, and symmetric circulation models. On the other hand, the book does not deal with such more traditional topics as the planetary boundary layer, and elementary aspects of numerical weather prediction. Such omissions, while not detracting from the usefulness of the book, do emphasize the fact that it is more in the nature of a collection of essays on dynamical processes than a textbook.

The order in which topics are treated in the book is rather unorthodox. The first subject discussed (in the second chapter) is elementary energy balance models. This topic is treated in a manner that is typical of the book as a whole. After listing supplementary reading material, the subject is introduced rather abruptly with two paragraphs that briefly outline the basic features of such models. This is followed by a statement that such models have the mathematical form C dT/dt = incoming solar radiation - infrared cooling - divergence of heat flux. Here C is identified as representing some effective heat capacity for the atmosphere-ocean system. However, in a rather confusing choice of notation, it is also stated that the heat flux divergence term is often used in the (Budyko, 1969) form: C ($\bar{T}$ - T). Unfortunately, it is not mentioned that the quantity C in this term is not the effective heat capacity. Most of the discussion in this chapter is on the ice/snow albedo feed-back mechanism, using the Budyko formulation for an energy balance climate model. This model is introduced with very little discussion of its derivation. Here, as is typical in many of the later chapters, it is expected that the student will have obtained this information from the supplemental reading suggested at the beginning of the chapter. The discussion of ice-albedo feedback is, however, presented in a clear and enlightening manner.

The chapter on energy balance models is followed by two short chapters, the first of which deals with constituent equations (and includes an elementary derivation of the equation of mass continuity). The second, on "statics" of a rotating system, deals with hydrostatic and geostrophic balance and the thermal wind relationship. These matters are dealt with before the equations of motion are formally introduced (this is delayed to the sixth chapter). Some justification for this rather illogical ordering of topics is given in the preface and introductory chapter. The arguments for it are rather weak however. A more rational choice would have been to present the material in chapter 6 as the third chapter of the book. In fact the topics of hydrostaticity and geostrophy are discussed again in short sections at the end of chapter 6. The derivation of the equations of motion in chapter 6 is given in terms of an elegant but rather advanced approach attributed to Serrin.

The fifth chapter is a longer one dealing with observed atmospheric structures. The discussion in this chapter is supported by several pages of maps (depicting sea level pressure and geopotential height fields at several levels in the troposphere and stratosphere) and zonal cross-sections. A number of topics are discussed in the chapter in a descriptive rather than quantitative manner. Some of these are taken up again in later chapters where they are dealt with in a more quantitative way.

The chapters following chapter 6 contain some of the more interesting parts of the book. These include an interesting chapter on symmetrical circulation models that outlines some of the more recent work on this topic, including contributions of Lindzen and his students. There is also a chapter on atmospheric tides that contains an interesting account of the history of the subject, again including Lindzen's own contributions.

The two chapters on internal gravity waves include a derivation of the Eliasen-Palm theorems, a discussion of the use of the WJBK method in analysis of the vertical structure of internal waves in the atmosphere, a discussion of the Booker and Bretherton theory dealing with wave absorption at critical levels, and a brief discussion of the role of damping in the dynamics of internal waves and its relevance to momentum deposition. The importance of this process is illustrated in a brief discussion of the quasi-biennial oscillation of the zonally averaged flow in the tropical stratosphere. These chapters deal predominantly with linear theory. There is a short section dealing with the approach to nonlinearity in the vicinity of a critical level. However, the discussion of this topic is so brief as to offer little more than a tantalizing suggestion that non-linear effects may be important in such regions.

The last third of the book contains chapters dealing with Rossby waves, vorticity and quasi-geostrophy, instability theory and energetics. The chapter on Rossby waves includes brief but clear discussions of the linear dynamics of free and forced Rossby waves in the atmosphere, including the analogy of these to waves in a shallow rotating homogeneous fluid. In interesting feature if this chapter is that a discussion of Stommel's theory on the western intensification of ocean circulations is also included. The chapter closes with a brief discussion of the basic dynamics of Kelvin waves.

The chapter on quasi-geostrophy gives a rather traditional derivation of the quasi-geostrophic equations as the leading approximations in a Rossby number expansion wherein it is assumed that the relevant time scales are long enough to exclude inertio-gravity waves.

A fairly broad range of topics is covered in the last two chapters which deal with instability theory, it's implications for the presence of "eddies" in the atmosphere including their effect on the structure of the mean flow. There are sections on buoyant convection, Rayleigh-Benard instability, gravity wave breaking, Kelvin-Helmholtz instability, baroclinic and barotropic instability including a discussion of the venerable 2-level model. The discussion of large-scale atmospheric energetics is predominantly in terms of quasi-geostrophic theory but does contain a brief outline of the Lorenz (1955) analysis of available potential energy. The book closes with some remarks, based on the work of Lindzen and Farrel(1980), concerning the implications of baroclinic instability for the time and zonally averaged thermal structure of the troposphere. All of the topics in these chapters are dealt with in a brief manner designed to emphasize the basic dynamics of the relevant processes.

An attractive feature of this book is that sets of exercises are included in all but one of the chapters (chapter 6 has none). The most obvious defect of the book is that a number of the processes that are mentioned are discussed so briefly that the reader acquires little more than the information that such matters are of interest and relevant to the general topic under discussion. The reference material is also rather biased in favour of Lindzen's own work. An example of this is the section in chapter 7 entitled "Remarks on cumulus convection" which simply states three of the larger scale effects of cumulus convection in the tropics and refers the reader to a relatively recent (1988) paper by Lindzen for further details on cumulus convection and it's parameterization. The sophisticated student would, it is hoped, eventually discover that there is a large literature on this subject and that modern methods of cumulus parameterization have their origins in the much earlier work of Arakawa and his students. Despite such shortcomings the book is an interesting and useful addition to the instructional literature on atmospheric dynamics.

Norman McFarlane
Numerical Modelling Division
Canadian Climate Centre

Spectral Analysis of Physical Oceanographic Data.

by K. V Konyaev.

This little book (200 pp.) should make interesting reading for those already experienced in spectral analysis of oceanographic data.

The author offers discussion, comment and advice on topics ranging from elementary Fourier transformation through various sources of error in spectral estimation, confidence, autoregressive methods, and coherence. Discussion reflects also some of the historical developments of methods. Specific examples are given from oceanographic experiments and a number of comments are directed toward deployment of actual oceanographic instruments. One shortcoming is that fields are simply assumed to be "random", i.e. joint normally distributed, without consideration for possible departures from normality.

Although this book will interest those already acquainted with the subject, it may not serve to introduce the subject. The author states various properties and results without giving the derivation. It can be difficult to see whether a stated property is meant as a mathematical consequence or as an observation from practice. In some cases, it seemed to me that a property was stated as a mathematical consequence when in fact I think it is only typically observed to be so. (E.g., that monotonic decay of correlation function implies monotonic decay of the spectrum.) In other cases the author "advises" one to do something which is, in fact, mathematically required. The author depends heavily (sometimes a bit repetitively) on prose, which may suffer ambiguity or error in translation. A reader may be uncertain as to precisely what is meant, especially to see what is mathematically implied or only advised. Mathematical typography also suffers in places, as when $\mathrm{sinc}^2 \pi fT$ is rendered as $\sin c^2 \pi fT$. I think the text might not be so useful as primary reading for student instruction,but may provide interesting supplemental reading.

Throughout, the author uses clearly presented, nicely labelled figures. Translation quality is about as good as one might expect, with some differences of idiom which help to keep the reader's interest. A reasonably detailed table of contents offsets the absence of an index.

Greg Holloway
Ocean Physics Division
Institute of Ocean Sciences

INVITATION A PRESENTER UNE COMMUNICATION AU

26ième CONGRES ANNUEL

SOCIETE CANADIENNE DE METEOROLOGIE ET D'OCEANOGRAPHIE

UNIVERSITE LAVAL, QUEBEC, 8-12 JUIN 1992

Vous êtes invités à présenter une communication au 26ième Congrès annuel de la Société canadienne de météorologie et d'océanographie qui se tiendra à Québec du 8 au 12 juin 1992. L'Université Laval est l'hôte du Congrès; les activités du Congrès auront lieu à l'Université Laval.

Le thème du Congrès est "LA METEOROLOGIE ET L'OCEANOGRAPHIE A LA MESO-ECHELLE"; les communications ou présentations sous forme d'affichage sont les bienvenues. D'autres sessions reliées à la météorologie, à l'océanographie et à la climatologie seront aussi organisées lors du Congrès et toute communication sur ces sujets est aussi la bienvenue.

La date limite pour la réception des résumés est le 1 mars 1992. Les auteurs sont priés de remettre une copie imprimée de leur résumé de même qu'une copie sur disquette sur un fichier format ASCII.

POUR INFORMATIONS:

Dr Richard Leduc
Comité organisateur
MENVIQ
2360 chemin Ste-Foy, 2ième étage
Ste-Foy, QC G1V 4H2
tél: 418-643-7880
fax: 418-643-9591

Ghyslain Jacques
Programme scientifique
MENVIQ
2360 chemin Ste-Foy, 2ième étage
Ste-Foy, QC G1V 4H2
tél: 418-644-3482
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CANADIAN METEOROLOGICAL AND OCEANOGRAPHIC SOCIETY

LAVAL UNIVERSITY, QUEBEC CITY, JUNE 8-12 1992

You are invited to submit a paper for the 26th Annual Congress of the CMOS which will be held in Québec City June 8 to 12 1992. Laval University is the official host of the Congress where all the activities will be held.

Congress theme is "MESO-SCALE METEOROLOGY AND OCEANOGRAPHY". Papers or posters related to this theme are most welcome. Other sessions related to the various fields of meteorology, oceanography and climatology will also be held and papers or posters are also invited.

The deadline for abstracts is March 1st 1992. Authors are requested to submit a hardcopy of their abstract as well as on a diskette in an ASCII format file.

FOR INFORMATION:

Dr Richard Leduc
Organising committee
MENVIQ
2360 chemin Ste-Foy, 2ième étage
Ste-Foy, QC G1V 4H2
tél: 418-643-7880
fax: 418-643-9591

Ghyslain Jacques
Scientific programme
MENVIQ
2360 chemin Ste-Foy, 2ième étage
Ste-Foy, QC G1V 4H2
tél: 418-644-3482
fax: 418-643-9591

FIRST NOTICE AND CALL FOR PAPERS
3RD INTERNATIONAL WORKSHOP ON WAVE HINDCASTING AND FORECASTING

MONTREAL, QUEBEC MAY 19-22, 1992

An international workshop on wave hindcasting and forecasting, sponsored by the federal Panel on Energy Research and Development (PERD) and the Atmospheric Environment Service, will be held in Montréal, Québec from May 19-22, 1992.

The objectives of the workshop are:-

-to provide a forum for the exchange of ideas and information related to wave hindcasting and forecasting.

-to discuss priorities for future research and development.

Papers are solicited on both the research and operational aspects of wave hindcasting and forecasting. Papers dealing with the following topics are particularly welcome:

-operational forecasting
-regional hindcasts
-data collection/instrumentation
-data assimiliation into numerical models
-wave/current interaction
-wave/ice interaction
-shallow water and nearshore effects
-wind fields for wave hindcasting/forecasting
-extremal analysis
-case studies

The program will consist of both presentation and poster sessions; authors should indicate their preference.

Those wishing to present a paper should submit a title and abstract (100-300 words) to the address shown below. Each abstract should contain the author's name, mailing address and telephone number. The deadline for receipt of abstracts is November 30, 1991. Full papers will be required by April 1, 1992.

To receive further notices contact:

V. R. Swail
Atmospheric Environment Service
4905 Dufferin Street
Downsview, Ontario M3H 5T4
Canada
Telephone (416)-739-4347 FAX: (416)-739-4297

PRELIMINARY ANNOUNCEMENT

The Canadian Institute for Research in Climatic Chemistry (CIRAC) and the Ontario Section of the Air and Waste Management Association (AWMA-OS) are please to announce the first:-

CIRAC/AWMA INTERNATIONAL MEETING ON
ATMOSPHERIC CHEMISTRY

to be helf in Toronto on January 26-28, 1992. The meeting is titled:-

THE ROLE OF MODELS IN UNDERSTANDING
ATMOSPHERIC CHEMISTRY

and will have sessions on "Successful (?) Model Applications" and whether or not assumptions made are correct. A unique "Kids Meet Scientists and Engineers Session" will start the meeting on Sunday night with our guest speaker being "Johnny Biosphere".

For more information contact:

Ann McMillan, Conference Chair 739-4867
Jim Young, Program Chair 764-9380

CALL FOR POSTERS

Associated with the above conference there will be a poster session. If you are interested in displaying a poster on a 3 foot by 4 foot display, please contact:

Tony van der Vooren, Poster Session Chair 756-3866

Alfred Wegener Foundation for the Promotion of the Geosciences

The International Trade Fair and Congress for Geosciences and Technology will be held September 18-21, 1991, in Cologne, Germany. The theme will be "Preserving the Earth - a Challenge to Science and Technology."

Session topics will be: The Geobiosphere in the Process of Change - condition of the earth's ecosystem and its development in the past and in the future; Data registration and Exploration of the Earth's System - data processing and methods of recording, measuring, depicting and illustrating information; Exploitation of the Geobiosphere - strain on Earth, water and air, with perspectives on utilization of natural resources; and Adaptation of the Results for Environmental Protection - objectives and strategies, measures and standards to preserve the geobiosphere.

For information, please contact Mr. U. Schneider, Cologne Congress Management, Postfach 180 180, 5000 Köln 1, Germany (Tel: 221 236413; Fax: 221 249447).

Joint United States/Canada Symposium

A Symposium on the Implications of Climate Change for Pacific Northwest Forest Management will be held October 23-25, 1991, in Seattle, Washington. Focusing on the Pacific Northwest, it will define issues/sensitivity of the forest sector to climate change, and identify potential management responses. Contact: Dr. Richard Silversides, Pacific Forestry Centre, 506 West Burnside Road, Victoria, B.C., V6Z 1M5 (Tel: (604) 363-0727).

European Geophysical Society

The XVII General Assembly will be held April 6-10, 1992, in Edinburgh, Scotland. The deadline for receipt of abstracts for the 1992 General Assembly is January 15, 1992. The meetings are open to all scientists. For information, please contact the EGS Office, Postfach 49, 3411 Katlenburg-Lindau, Germany (Tel: (49) 5556-1440; Fax: (49) 5556-4709).

5th International Meeting on Statistical Climatology

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

For additional information contact the Program Chairman, or consult the C.M.O.S. Newsletter 29(3) June 1991.

Program Chairman

Dr. Francis W. Zwiers, Numerical Modelling Division, Canadian Climate Centre, 4905 Dufferin St., Downsview, Ontario, CANADA M3H 5T4 (Tel: (416) 739-4415; Fax: (416) 739-4521; E-mail: acrnrfz@cid.aes.doe.ca).

American Meteorological Society

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

Atmospheric Environment Service of Canada
Université du Québec à Montréal
McGill University

The 11th International Conference on Clouds and Precipitation, organized by the International Commission on Clouds and Precipitation (ICCP) of the International Association of Meteorology and Atmospheric Physics, will be held on the campus of McGill University in Montreal, Canada, on August 17-21, 1992.
The ICCP has recently broadened its mandate to include all aspects of clouds and precipitation. Accordingly, papers are invited in the following technical areas: cloud microphysics, precipitation physics, instrumentation, the remote sensing of clouds and precipitation (including satellite observations), the mesoscale structure of precipitation systems, radiative effects of clouds, cloud and precipitation chemistry, the effects of clouds on global climate and air quality, and clouds and precipitation in relation to the hydrological cycle.

Single-page abstracts, including author's address and telephone number, should be sent to Professor Peter V. Hobbs, Atmospheric Sciences AK-40, University of Washington, Seattle, WA 98195, USA. Indicate whether the paper is submitted for oral presentation or for a poster session. **The abstract deadline is November 1, 1991.** To be considered for the conference, abstracts must reach Professor Hobbs by no later than this date. Authors will receive notifications of acceptance by January 31, 1992. The deadline for completed manuscripts to be included in the conference proceedings will be April 30, 1992.

For further information about the conference, please contact 11th ICCP, Conference Office, McGill University, 3450 University Street, Montreal, Canada H3A 2A7 (Tel: (514) 398-3770; Fax (514) 398-4854). Questions about the scientific program should be directed to Professor Peter V. Hobbs, Atmospheric Sciences AK-40, University of Washington, Seattle, WA 98195, USA (Tel: (206) 543-6027; Fax (206) 543-0308).

Canadian Meteorological and Oceanographic Society

Fourth Workshop on Operational Meteorology
September 15th-18th, 1992
Whistler, B.C., Canada

The Fourth Workshop on Operational Meteorology, sponsored by the Atmospheric Environment Service of Environment Canada and the Canadian Meteorological and Oceanographic Society, will be held September 15th-18th, 1992 at the Whistler Conference Centre. The principal theme of this workshop will be "Forecasting in the Nineties".

For additional information contact either Neil McLennan (Tel. (604)-664-9073, FAX (604)-664-9066) or Gérard Neault (Tel. (604)-664-9052) or see C.M.O.S. Newsletter 29(3) June 1991.

La Société Canadienne de Météorologie et d'Océanographie

Quatrième atelier de travail sur la météorologie opérationnelle
15-18 septembre, 1992
Whistler, C.B., Canada

Le quatrième atelier de travail su la météorologie opérationnelle, parrainé par le Sevice de l'environnement atmosphérique d'environnement Canada et la Société Canadienne de Météorologie et d'Océanographie, aura lieu du 15 au 18 septembre, 1992, au Centre de Conférence de Whistler. Le thème de l'atelier sera "La prévision du temps durant les années 90".

Pour des renseignements supplémentaires veuillez contacter Neil McLennan (Tel. (604)-664-9073, FAX (604)-664-9066) ou Gérard Neault (Tel. (604)-664-9052) et voir les Nouvelles S.C.M.O. 29(3) juin 1991.

ACCREDITED CONSULTANTS/EXPERTS-CONSEIL ACCRÉDITÉS

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

Susan K. Lally
CMOS Accredited Consultant
General Meteorology, Marine Meteorology

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

Tom B. Low, Ph.D., P. Eng.
CMOS Accredited Consultant
Research and Development Meteorology

KelResearch Corporation
850-A Alness Street, Suite 9
Downsview, Ontario M3J 2H5 Canada
Tel: (416) 736-0521

Ian J. Miller, M.Sc.
CMOS Accredited Consultant
Marine Meteorology and Climatology, Applied Meteorology and Climatology, Storms, Waves, Operational Meteorology

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

Prof. T.R. Oke, B.Sc., M.A., Ph.D.
CMOS Accredited Consultant
Urban Meteorology & Climatology
Boundary-Layer, Applied Climatology

3776 West 39th Avenue
Vancouver, British Columbia V6N 3A7 Canada
Tel: (604) 228-2900 Res: (604) 263-7394

Douw G. Steyn
CMOS Accredited Consultant
Air Pollution Meteorology,
Boundary Layer Meteorology,
Meso-Scale Meteorology

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

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

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

Bassem M. Eid, P.Eng., Ph.D.
CMOS Accredited Consultant
Coastal Circulation, Waves/Tides/Surges
Air-Sea Interaction, Marine Meteorology

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

Terry J. Gillespie, Ph.D.
CMOS Accredited Consultant
Agricultural Meteorology & Land Planning
Agrometeorological Training

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

ACCREDITED CONSULTANTS/EXPERTS-CONSEILS ACCRÉDITÉS

Mory Hirt

CMOS Accredited Consultant
Applied Aviation & Operational Meteorology
Research & Development, General Project Management

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

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

CMOS Accredited Consultant
Cloud Physics, Radar, Weather Modification,
Storms, Research & Development

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

R.B.B. Dickison

CMOS Accredited Consultant
Boundary Layer Meteorology, Synoptic Meteorology
Agrometeorology, Hydrometeorology, Forest Meteorology

Atlantic Weather & Environmental Consultants Ltd.
112 Bloor Street
Fredericton, New Brunswick E3A 2K4 Canada
Tel: (506) 450-8802

Richard J. Kolomeychuk, M.Sc. Ph.D.

CMOS Accredited Consultant
Applied Meteorology and Climatology
Hydrometeorology

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

Mike Lepage, M.S.

CMOS Accredited Consultant
Wind Engineering, Climate Data Management
Air Pollution Meteorology, Climate Research

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

John E. Letkeman

CMOS Accredited Consultant
Air Quality Meteorology

Radian Corporation
8501 MoPac Blvd.
Austin, Texas, U.S.A. 78720-1088
Tel: (512) 454-4797

Warren McCormick, M.A.Sc., P. Eng.

CMOS Accredited Consultant

Waste Management Branch
Ministry of the Environment
Plaza 400, 1011 Fourth Avenue
Prince George, British Columbia V2L 3H9 Canada
Tel: (604) 565-7104

Andrew H. Gillam, Ph.D.

CMOS Accredited Consultant
Marine Chemistry
Environmental Audit, Assessment and Monitoring

CBR International
Suite 101, 9865 W. Saanich Road
Sidney, British Columbia V8L 3S3 Canada
Tel: (604) 655-1944 Fax: (604)-655-7131

1991 MEMBERSHIP APPLICATION FORM-DEMANDE D'ADHÉSION 1991

(Please print in block letters - Lettres moulées s.v.p.)

Title Dr___ Mr___ Mrs___ Miss___ Ms___
M ___ Mme___ Mlle___

MEMBERSHIP CATEGORY-CATÉGORIE DE MEMBRE
ANNUAL FEES - COTISATION ANNUELLES
(Please check one - cochez un s.v.p.)

Name/Nom _____

Address/Adresse _____

_____

_____

Telephone/Téléphone res./maison_____ bus./travail_____

Occupation/Emploi _____

Regular Régulier	☐	$40.00
Student Étudiant	☐	$20.00
Sustaining Soutien	☐	$150.00 (minimum)
Corporate Corporation	☐	$200.00 (minimum)

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

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

PUBLICATION SUBSCRIPTIONS - ABONNEMENT AUX PERIODIQUES

ANNUAL RATES - ABONNEMENTS ANNUELS

		Members Membres	Non-Members Non-Membres	Institutions Institutions
ATMOSPHERE-OCEAN ATMOSPHERE-OCEAN	☐	$25.00	$35.00	$65.00
CLIMATOLOGICAL-BULLETIN BULLETIN-CLIMATOLOGIQUE	☐	$15.00	$20.00	$25.00
Annual Congress Program & Abstracts Congrès Annuel Programme et Résumés	☐	$ 0.00	$15.00	$15.00

Note: Students receive one society publication in their annual fee and must indicate free publication desired. All regular Society publications are sent to Corporate and Sustaining Members. Members resident in Canada please add 7% GST to annual rate.

Note: Les membres étudiant reçoivent une des publications SCMO et doivent indiquer la publication gratuite désirée. Tous les périodiques sont envoyés aux membres corporatifs et soutiens. Les membres qui résident au Canada veuillez ajouter 7% (TPS) à l'abonnement annuel.

PRIMARY FIELD OF INTEREST - SPHERE D'INTÉRÊT PRINCIPAL

Meteorology / Météorologie ☐ Oceanography / Océanographie ☐

SPECIAL INTEREST GROUP - GROUPE D'INTÉRÊT SPÉCIAL

(Indicate group if interested - Indiquez si vous avez des intérêts dans une groupe)

Hydrology / Hydrologie ☐ Air pollution / Pollution de l'air ☐ Agriculture & Forest / Agricole et Forêt ☐

Operational Meteorology / Météorologie d'exploitation ☐ Floating Ice / Glace dérivant ☐ Mesoscale Meteorology / Météorologie de l'échelle meso ☐

Fisheries Oceanography / Océanographie des pêches ☐ Other (specify)_____ / Autre (stipulez)_____ ☐

See over/au verso

CMOS-SCMO
P.O.Box/C.P. 334
Newmarket, Ontario
L3Y 4X7
Canada

W1028 1
Mr. M.K. Thomas
15 Lewes Cres.
TORONTO ON
M4N 3J1

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

☐ The Society's Development Fund

☐ Other (specify) _____

_____ _____
(Signature) (Date)

If applying for student membership, please obtain signature of one of your professors.

_____ _____
(Signature) (Date)

Mail completed form to CMOS at the address above.

Je désire devenir membre de la Société. J'inclus un chéque au montant de $ _____ payable à la Société Canadienne de Météorologie et d'Océanographie pour la cotisation de membre et/ou des abonnements aux périodiques. J'inclus aussi un don déductible d'impôts de $ _____ pour (indiquez):

☐ Le fonds de développement de la Société

☐ Autre (stipulez) _____

_____ _____
(Signature) (Date)

Si vous désirez devenir membre-étudiant, veuillez obtenir la signature d'un de vos professeurs.

_____ _____
(Signature) (Date)

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