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

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Canada-Wide Science Fair



The C.M.O.S., represented by John Fyfe, presented a special award in the amount of \$250 to Patrick Chain and Richard Marleau, both of North Bay, Ontario, at the Canada Wide Science Fair. The project title was: Deacidification and Species Richness, and the students summarized their project as follows:-

Purpose/Hypothesis: This project will try to answer 3 questions:

- 1) Has deacidification taken place over the last 17 years in the Sudbury, Ontario basin since Dr. Gary Sprules' study in 1973, and if so, have there been any changes in the zooplankton assemblages?
- 2) Do larger nets and multiple visits affect enumerated species richness?

- 3) Is sampling both the pelagic and littoral environments worthwhile when studying zooplankton species richness & community structure.

Outline/Procedure: We visited Killarney Provincial Park, in which most of the La Cloche Mountains are located, from August 15th to 19th. Our 9 study lakes were reached by either canoeing or backpacking. Pelagic sampling was carried out by hauling the Limno-Net vertically from the centre of the lake. The samples were concentrated and preserved in 70% denatured alcohol. The littoral sampling consisted of washing aquatic plants and sticks in the Limno-Net, as well as dumping buckets of near-shore water into the mouth of the Limno-Net. Horizontal hauls were also carried out in about 1 m of water either by snorkelling, wading or canoeing with the Limno-Net.

Results/Conclusions: Since 1973, eight of our study lakes (excluding Tear Drop that was not visited in 1973), have rebounded by an average of 1.2 pH units. The species richness loss that occurs during acidification (when crossing the pH 5.0 barrier) is a reversible process. Sampling with larger nets does pay off in finding more species. It is well worth adding a littoral component to the sampling effort while determining the species richness and zooplankton community structure. A skewed picture can easily result if the littoral zone is ignored and pelagic sampling effort is low. Our study found 24 previously unreported zooplankton species.

EDITOR'S COLUMN

The next issue of the CMOS Newsletter 19(6), December 1991, will go to press on November 25th, 1991. Contributions are welcome and should be sent to me at:-

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Sidney, B.C. V8L 4B2
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I prefer receiving contributions submitted on floppy disk in DOS WordPerfect format, however, I do have a program that translates between MS Word and WordPerfect documents.

Howard J. Freeland, CMOS Newsletter Editor

WHAT'S GOING AROUND? by Savonius Rotor

Recently I was browsing through EOS (Transactions of the American Geophysical Union) and in 72(32), August 6th 1991, page 338 the AGU is appealing for help in locating "Lost AGU Members". I wonder if we can be of assistance? If anyone knows the location of Lawrence A. Mysak, last heard of in Montréal, Canada, would they please contact AGU Customer Services, (202)-462-6900.

Over the past 5 years there has been quite a flurry of research on the subject of "crop circles", those mysterious patterns that appear occasionally across the British countryside. Various theories have been proposed such as "mowing devils", UFO's (Dalgado and Andrews, 1989) and atmospheric vortices (Meaden 1990; Lugt, 1989). However, during my recent travels in England I happened upon a new and intricate pattern of crop circles, see photograph below, that immediately puts to rest the meteorological theory. The



diagram shows a set of four "crop circles" (sic), photographed in late July 1991 near York in northern England, that clearly spell out the letters **apbo**. It strains the credulity to imagine atmospheric vortices that could etch out these letters with such startling clarity. Clearly

this is the work of an extraterrestrial advertising agency in league with a manufacturer of fertiliser.

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Lugt, H.J., 1989. Vortex breakdown in atmospheric columnar vortices. Bulletin of the American Met. Soc. 70, 1526-1537.
Meaden, T. 1990. Circles in the corn. New Scientist 23/6/90, 47-49.

C²GCR News by Lawrence A. Mysak, Director

The Centre for Climate and Global Change Research (C²GCR), created in March 1990, is an outgrowth of the Climate Research Group (CRG), which was established in 1987 by McGill's Department of Meteorology. The activities of the Centre have expanded from the original CRG focus of atmosphere-ocean modelling and data analysis to include studies pertinent to the recently established International Geosphere-Biosphere Program: A Study of Global Change (IGCP).

The two main objectives of the Centre are:

1. To promote research on the interactive physical, biological, chemical and socio-economic processes that regulate our global environment.
2. To provide a stimulating academic environment for graduate and postdoctoral students in the emerging fields of "earth system science" and climate and global change impacts.

To achieve these objectives, fourteen faculty members from the departments of Meteorology, Geography, Renewable Resources and Economics have been brought together in the Centre's formation. The research strengths of the Centre members are wide ranging and include:

air-sea interaction and ocean climate studies, especially at high latitudes; cloud-climate interactions; air-land and land-ocean interactions, including hydrological & biogeochemical cycles; and impacts of climate change & climate variability on biological and socio-economic systems.

To tackle the fundamental problems of climate and global change in a focused manner, the Centre faculty members have been grouped together into two teams, as follows:

- Global climate studies, biogeochemical cycles and impacts (Drs. G. Chmura, R. Davies, J. Derome, C. Green, C. Lin and T. Moore)
- Hydrological cycles and high latitude climate processes (Drs M. Dunbar, G. Ingram, J. Lewis, I. McKendry, L. Mysak, W. Pollard, P. Schuepp and A. Weaver.)

Associated with the Centre faculty are approximately 40 graduate and postdoctoral students.

The detailed operations of the Centre are administered by a 5-member Executive Committee, and annually the Centre reports to a broadly based Board of Directors. Financial support for the Centre is

received through McGill's Faculty of Graduate Studies and research, and Faculty of Science.

Other activities of the Centre include the publication of C²GCR Quarterly and a technical report series, and the sponsorship of Colloquium Series on climate and global change. The latter is designed (i) to bring in internationally renowned researchers to speak and interact with the graduate students and (ii) provide an opportunity for the Centre members to give overview seminars on

their research work. The Centre also hosts specialized workshops on climate and global change topics, and the annual "C²GCR Student Day".

Graduate student members of the Centre are registered in one of the four departments listed above and are encouraged to contact the departmental chairpersons to obtain details about their graduate programs.

ON CANADIAN SMALL BUSINESS IN THE ATMOSPHERIC SCIENCES

by R. Ambury Stuart, President
Private Sector Meteorology Association of Canada

In 1956 Louis St Laurent was the Prime Minister of Canada, and the Pipeline Debate was the political story of the year. Dr. Andrew Thompson was the Controller of the Meteorological Branch of the Department of Transport, a position he had held since 1946. The Canadian Meteorological Society did not exist as an independent Society, and was instead a Branch of the Royal Meteorological Society. Each year the Royal Meteorological Society selected papers of note to receive the Darton Prize. There was a "Home Award" and a separate "Canadian Award", which in 1956 was won by M. Kwizak and B.W. Boville for their paper "500-mb prediction by graphical techniques". In October of that year, the Second National Meeting of the Royal Meteorological Society (Canadian Branch) was held in Toronto, at which four papers were presented. The total membership in the Canadian Branch dropped in 1956 from 351 to 335, but the number of Fellows was greatly increased from 46 to 58.

One of these new Fellows was Morris Kestin, who had just returned from post-graduate studies at the University of California. While in California, Morris had concocted this crazy idea of leaving his steady, secure job in the Weather Service and setting up his own company. Upon his return to Canada, he and Gord Bassett formed Weather Consultants of Canada in Toronto just after Paul Denison and Bernard Powers had established Weather Engineering in Montreal. One of their first clients was the 7-Up Company who wanted specialized forecasts of hot, summer weather. Weather Consultants of Canada continues to provide specialized weather services to this day. When the Private Sector Meteorological Association (PSMA) was organized in 1986, it was only natural that Weather Consultants of Canada would become a charter member of this new organization, and that Morris Kestin would serve on its first Executive.

Despite the existence of private meteorological companies in Canada for the last 35 years, many meteorologists are still surprised to learn that commercial meteorology can be a successful business in this country. Surely, they assume, the provision of forecasts and professional expertise is the natural job of the federal government. Surely, these small business ventures are either the post-retirement hobbies of former AES employees or desperate attempts to earn a living by those who couldn't survive in the federal bureaucracy. Surely, when one's activities are confined by market competition and the drive to maximize profits, professional standards are bound to suffer. To start and run a business that is based on the

provision of scientific services, and to collect a fee for this service after bidding against others for the privilege to do so seems to many to be a distinctly unsavoury business, and certainly un-Canadian. Surely it is better and cheaper to let the government maintain a monopoly over these activities.

These and other myths have been held for as long as private meteorological companies have been in business, and are the cause of much misunderstanding within the profession. For many years these myths had considerable credibility. So long as expansionary government budgets were the order of the day, it was possible for governments to provide all the services that were demanded of them. Expanding a program depended only on finding enough qualified people to do the job; funding was never a problem. Under such circumstances, myths as to the inherent value of government monopolies could do no visible harm and the centralized coordination that was implicit in this arrangement was seen to be a good thing.

As everyone knows however, expansionary government budgets are no longer the order of the day, and haven't been so for the last several years. Under a long-term policy of government restraint, it is no longer prudent for any profession to depend exclusively upon tax-based resources to do research or to provide services and opportunities for employment. While we may all decry the loss of funds for our professional activities, it seems very clear that the wide-spread government cutbacks will continue to reduce the role of government in a large number of areas of Canadian life including meteorology. Perhaps the time has come to examine alternative methods for doing some of our activities. Perhaps the government monopoly model needs some revision.

Enter the "Private Sector" as we are referred to by government organizations. Private sector managers have two main tasks: first, they must provide high quality scientific services such as research or forecasting, and secondly, they must make enough money doing so that the activity can eventually sustain itself and perhaps even make a profit for the company. In Canada, this means choosing service areas that are not regarded by the AES as public services. During the expansionary period of the 60's and early 70's, private meteorology companies developed niches for themselves in service areas that the AES had decided to avoid, or simply had the AES as a client and worked directly under its supervision. As AES

budgets were reduced however, natural private sector niches have expanded, while the significance of the AES as a client has been greatly diminished. The natural press of market conditions has moved private companies into new areas for new clients. Powerful computer and communication technologies have become available at costs that are now within the easy grasp of small business. Consequently, small business science is now able to carry out activities that only a few years ago would only have been possible within much larger organizations. These developments, in addition to the discipline of the market, have produced small business entities that can survive and prosper in the difficult conditions posed by large government deficits and continued service cutbacks. As a result, the last ten years have seen a significant rise in the relative importance of private meteorology within the profession as a whole.

For its part, the AES recognized the growing importance of the private sector in two separate but related policy initiatives. First, the *Level of Services Policy* attempted to identify core services that AES would continue to do and other services that would be left to others. Its second initiative was the *Five Year Plan to Foster the Growth of Private Meteorology in Canada*, which was approved in 1987. While neither initiative seems to have had much impact on the budgetary allocation decisions of the AES, the process that was gone through by AES managers in the development of these ideas is extremely valuable to the ongoing relationship between them and their entrepreneurial counterparts. Given its size and the corresponding level of influence enjoyed by the AES in meteorology in Canada, it will come as no surprise that decisions within the AES continue to have considerable influence on the operations of private companies.

What of the next 35 years? Forecasting future economic conditions is certainly as difficult as forecasting the weather, but some large-scale patterns would seem to be well-established now, and able to persist for the next few years at least. Both private companies and governments need to identify these patterns and anticipate as much as possible the impacts that they will have on their respective organizations.

First, contrary to the recent experience in Ontario, it seems most likely that restraints in government spending will continue for the foreseeable future. AES managers will continue to be required to make difficult decisions on program cuts and reductions in levels of service. Given these constraints, it would seem reasonable that AES managers would want to develop a close relationship with one or more private companies that have some expertise in their specialization areas, and that have shown some capability of generating their own sources of income to support these activities. Investments in these companies now - even if it is at the expense of internal projects - would seem to be a sensible thing to do. Once companies have been able to establish an area of expertise, they are loath to give it up, and will seek out other sources of income if it is worthwhile to do so. Unfortunately, most government managers view the rise of other sources of expertise as threatening to their operations. If the private sector has the capability to carry out their activities, then they fear that the place at the head of the line for the next round of cuts will be reserved for them. Under these

circumstances, they conclude that it is better to keep the private sector at bay, and let one of their colleagues take the cuts instead. The difficulty with this argument is that when the inevitable cuts are made, the nation is worse off than would have been the case if a more cooperative attitude had existed.

The growing importance of environmental concerns within the public at large is a second pattern that will probably be with us for a long time. This means that increased demands for environmental services will occur in concert with decreased budgets for doing the job inside government departments. If government is unable to provide the environmental services demanded by the public, then these services will be provided by someone else. At the moment, government departments are the primary source of valuable expertise that will be necessary to carry out the public will. If the groups that have developed and which maintain this expertise are disbanded, then the costs incurred in rebuilding this expertise will be very great. It would seem to be in everyone's interest to develop the public sector-private sector relationships that would ensure that these costs will be avoided, but as already noted, the likelihood of this occurring does not seem very high at this time.

A third trend that seems to be well established is the globalization of national economies. The Free Trade Agreement between Canada and the United States is now being expanded to include Mexico. The European Economic Community will soon be a reality. International trade is becoming a more important part of every nation's economy. Since environmental problems are global, it would seem reasonable to assume that the environmental services to solve these problems will have a strong international flavour as well. Environmental services have a very high component of research and development, and they provide numerous high-technology job opportunities. If investment in such services is encouraged, then the future of the environmental service industry looks bright. Private investments in the atmospheric part of environmental services will not be an attractive alternative however, if the government department that now holds great sway over the industry is not amenable to a transfer of appropriate services to private companies. Without the necessary investments, the environmental services required by Canadians will be done by others - a unfortunate tradition of long standing in this country. Other countries have a more positive tradition of government and industry working together.

Private sector companies are now enduring one of the worst recessions in recent years, and only the most stable and dedicated companies are prospering. The Green Plan comes at a most opportune time to permit the companies that survive the recession to grow to the extent that they can take over government environmental services that are eventually to be discontinued, and to establish international markets for these services. However, it will require an active and sustained initiative on the part of senior government officials and parliamentarians to ensure that this occurs. All government departments have suffered through the long period of cutbacks in recent years, and the first instinct of their managers will be to recover ground lost in this period. University department heads and influential academics, who have also experienced grievous cuts, will use whatever influence they have to direct resources to

their institutions and programs. While one must have sympathy for both academic and government petitioners, it must be remembered that Green Plan money only lasts for a short time, and once this money is gone then both academic and government programs, which continually require external sources of funds, will die. The Green Plan is a six year window of opportunity to develop expertise in the environmental sciences. It should not be used to make longer term commitments such as permanent government person-years, since these will require additional funding beyond the life of the Plan. Only those programs which generate their own investment capital can outlast their initial funding cycle and be self-sustaining. Only private companies are designed to operate in this way. Moreover, only private companies pay taxes and are able to generate significant international revenue from their operations.

In the past ten years, increased demands for environmental services combined with a decreased supply of publicly funded services, have resulted in a considerable growth of the private sector. At the same time, both governments and universities have seen their

budgets decline and their ability to add staff curtailed. Virtually all new jobs are being created in new, small business entities that are responding to the need for environmental expertise. Because of its size and corresponding influence in the industry, the AES will decide whether this expanding source of expertise will grow rapidly or slowly. Rapid growth would place these companies in a position to compete with companies in other countries for new business, while slow growth will make the Canadian industry vulnerable to the same international competition.

Private company managers are enthusiastic about the future. They continue to wrestle with the twin challenges of sustaining a business and doing good science. They are supported and encouraged by a growing cadre of public service managers who see the potential for achieving their mandate goals through the vehicle of private meteorology. What would Andrew Thompson have thought of this 35 years ago? Of course, we can never know the answer to that question, but when his grand-daughter finished her university program a few years ago, her first job was with a private company in the atmospheric sciences!

WOCE NEWS

FRACTAL DIMENSIONS OF DRIFTER TRACKS

by Paul H. LeBlond and Rick Thomson

At the IUGG in Vienna, in August 1991, Rick Thomson and Paul LeBlond presented results of an analysis of the fractal properties of shallow and deep satellite tracked drifters deployed in the North Pacific. The tracks analyzed to date included a 5.5 month segment for three shallow drifters deployed near the Kamchatka Peninsula and 3 to 12 month segments of deep drifters deployed in the Alaskan Gyre. Four analytical methods were explored: the scaling exponent method, the yardstick method, the box counting method, and a multi-track correlation method.

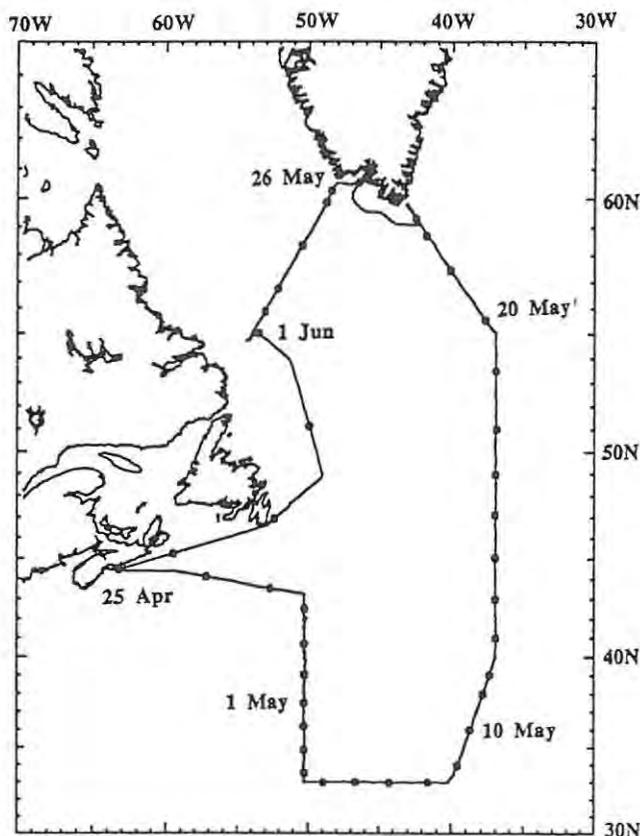
All techniques yielded a fractal dimension $D = 1.20 \pm 0.08$ for both shallow and deep drifters, a somewhat remarkable result given that the former are very strongly influenced by the wind while the latter are below the depth of direct wind influence. Fractal behaviour was found to be nearly isotropic, with the same value of fractal dimension for north-south as for east-west velocity fluctuations. The self-similarity implied by fractal behaviour prevailed for time scales ranging from the inertial period to about 10 days; in space, self-similarity scales ranged from 3 to 100 km. Drifters caught in the frequently occurring meso-scale eddies had the least fractal-like behaviour.

The complete analysis will include a comparison of the different methods and assessment of their usefulness. The effects of mean flow on fractal scale estimation will be explored and results compared with a more classical analysis of drifter motions (Thomson, LeBlond and Emery, 1990; *Atmosphere-Ocean*, 28, 409-443). There is also considerable interest in an assessment of the predictability of near-surface drifter tracks.

WOCE CRUISE IN THE N.E. ATLANTIC

by Paul H. LeBlond

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



C.S.S. Hudson sailed from the Bedford Institute, Dartmouth N.S. on April 24, 1991 to map the distribution of temperature, salinity and various chemical properties along selected sections as shown in Fig.

1. Ross Hendry was chief scientist; this summary report is extracted from his report to the WOCE Hydrographic Program Office. Measurements made during the cruise were also in support of the JGOFS program.

Temperature, salinity and oxygen measurements were made at all 130 stations. 2600 discrete water samples were collected by Rosette sampler using 8-litre sampling bottles were analyzed on board ship for salinity, dissolved oxygen, nutrients (phosphate, silicate, nitrate plus nitrite), alkalinity, total carbonate, chlorofluorocarbons (CFC-11, CFC-12, CFC-113), carbon tetrachloride, methyl chloride and bromoform. Station measurements of nutrients, chlorophyll and primary production in the upper 100 m were measured with a submersible pump system. Station measurements of light attenuation and fluorescence were made by a new design of profiling light meter. Underway measurements of near surface currents were obtained using an Ametek/Straza acoustic doppler current profiler. Underway measurements of near surface temperature, salinity and fluorescence were made using the ship's sea-water intake. Atmospheric particulates were collected by pumping air through filters for shore-based analysis.

Scientists from the Bedford Institute, from Dalhousie University and from the Odessa Branch of the USSR State Oceanographic Institute collaborated in the cruise. For additional information, contact Ross Hendry, Bedford Institute of Oceanography, Dartmouth, N.S. B2Y 4A2. OMNET: BEDFORD.INST.

Rotating Convection: Scales and Regimes

by Dave Brickman and Dan Kelley, Dalhousie University, Halifax, N.S.

A series of convection experiments on a rotating table is being performed as part of the Canadian WOCE effort to understand deep convection in the ocean. We start with unstratified conditions and drive the convection by heating the bottom of the tank. We apply heat only over a localized region in the centre of the tank, our motivation being: (1) to simulate nonuniform conditions likely in the ocean (e.g. heat loss at an ice edge), (2) to allow comparison with recent numerical models (Madec et al., 1991) of response to localized forcing, and (3) to investigate coupling between various scales of motion. The heating plate is flat, and the water surface is free; thus no bathymetric effects are simulated yet. We illustrate here three stages of the convective response: first, and at smallest scales, the formation of tendril-like plumes over the heating region; second, the development of larger, more coherent convecting vortices over the heating region; and, finally, the creation of baroclinic eddies at the density front which develops between the heated area and the unheated area.

Governing Parameters

Because no predictive theory of rotating convection at high Rayleigh number has been worked out yet, much of what is known is based on scaling arguments (Kelley, 1987). Therefore the first step of our experimental program is to map out scales and regimes of motion. The goal is to determine appropriate scaling laws so that our laboratory results can be compared to the ocean. Several non-dimensional numbers are likely to be important in our experiments,

including the Rayleigh number of the boundary layer near the plate, the Taylor number, various aspect ratios, and the Prandtl number of the fluid. A central parameter expressing the competition between buoyancy forcing, which drives convection and rotation which inhibits it, is:

$$R = \frac{Q}{\nu f^2} \quad (1)$$

where Q (m^2s^{-3}) is the buoyancy flux and ν (m^2s^{-1}) is the viscosity and f (s^{-1}) is the Coriolis parameter. The parameter R is the ratio of the Ekman scale to the Kolmogorov scale (Tennekes and Lumley, 1972) based on the buoyancy flux instead of the dissipation rate, raised to the fourth power. In our experiments R ranged from 1 to 10. This roughly matches the ocean, where we estimated a canonical value $R \sim 100$, assuming a heat flux of $500 Wm^{-2}$ (Leaman and Schott, 1991) and $f \sim 10^{-4}s^{-1}$.

Scales and regimes of motion

Tendrils. The first stage of convective response to heating is the development of thin tendrils extending from the heating plate. Figure 1 shows a side view of this first stage of convection. The tank is illuminated with a 5 mm slit of light oriented in a vertical plane

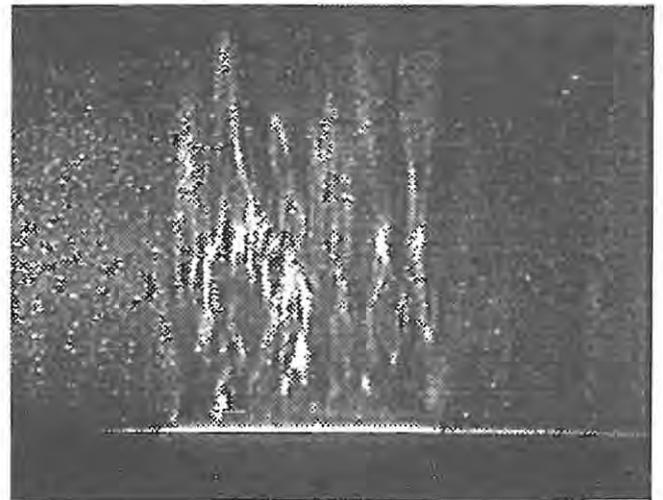


Figure 1: Side view showing the tendril phase of convection. The black area occupying the bottom eighth of the image is the bottom of the tank. Tendrils are visible extending upward into the water column above the heating plate, which takes up the middle third of the area. The visualization technique employs a powdered substance whose flake-like particles align themselves with shear in the fluid. Areas appear light when the particles reflect the illuminating light back to the video camera.

centred over the 15 cm heating plate. The heating rate is $Q = 6 \times 10^{-8}m^2s^{-3}$. The tendrils in this figure are 2-3 mm in radius. This scale is similar to two length scales we expect to see in this situation: (1) a scale $L = (Q/f^3)^{1/2}$ created by combining the buoyancy forcing parameter and the Coriolis parameter, and (2) the Ekman boundary layer scale $L_E = (2\nu/f)^{1/2}$. Each scale is likely to be relevant, and

more measurements will be required to determine which scale is appropriate; only then will we be able to scale the results safely up to the oceanic case.

Convecting vortices. Figure 2 shows an overhead view of the tank, with a horizontal illuminated slit of light 5 mm thick. The photograph was taken 100 s, or 17 rotation periods, after the heat was turned

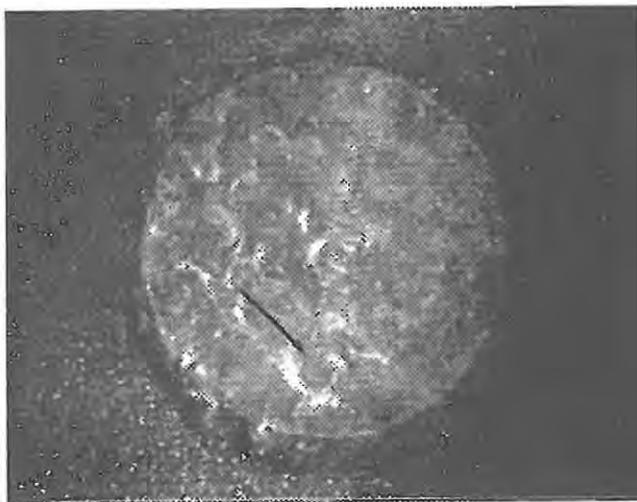


Figure 2: Overhead view showing convective vortices over the 15 cm heating plate. The arrow points to one of these vortices. (The vortices are difficult to locate in still images like this, but show up well in video.)

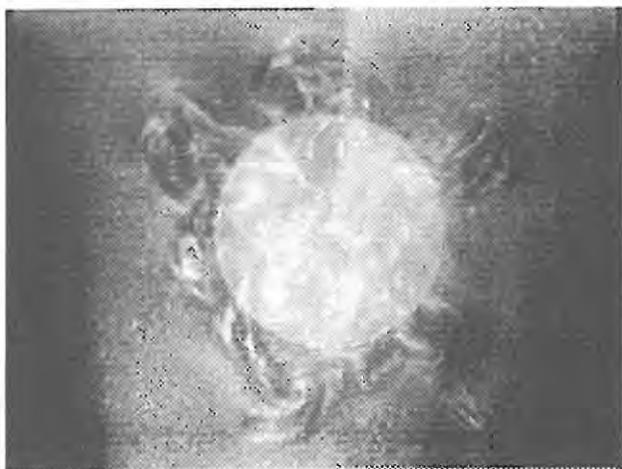


Figure 3: Overhead view showing the frontal vortices which develop at the edge of the heating region.

on. In this second phase of response, larger and more coherent motions are visible taking the form of cyclonic vortices. These vortices are located over the heating plate and do not drift away from it, which suggests that the vortices are actively convecting and are thus not fossil remains of previous convection elements. For an introduction to the motion fields in rotating convection see Chandrasekhar (1961) chapter 2.) In the run pictured in figure 2 the

vortex diameter is about 2.5 cm, which is comparable to measurements made by Chen et al. (1989) in similar experiments.

Frontal vortices Figure 3 shows another overhead view, taken 25 rotation periods after the start of heating, and illustrating the third and stage of flow. Prominent are large cyclonic eddies near the edge of the heating plate. These eddies are the result of a form of baroclinic instability at the front between the less dense water above the heating plate and the dense surrounding water. In this experimental run, the diameter of the eddies is 6 cm, which agrees favourably with the scale $5(H^2Q/\nu^3)^{1/3}$, H being the water depth, suggested by Maxworthy and Narimousa (1991) based on somewhat similar experiments. We are presently mapping out the length and time scales to a simple model of the baroclinic instability.

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Deployment of Satellite-Tracked Drifters along 158°W

by Richard Thomson

Institute of Ocean Sciences, Sidney, B.C.

With sufficient financing, the purchase and tracking of surface drifters is readily accomplished. There are several companies that build reliable oceanic drifters and Service Argos provides an ever improving network for positioning the platforms. Getting the drifters to required deployment sites is another story. The planned basin-scale meridional survey by Dr. David Musgrave of the University of Alaska scheduled for September 1991 has therefore provided an invaluable opportunity to increase the drifter coverage of the North Pacific Ocean. As part of the Canadian WOCE Surface Velocity Program (WOCE-SVP), twenty-two (22) near-surface drifters will be deployed from the University of Alaska vessel R/V Alpha Helix during an oceanic survey along 158°W longitude from Honolulu, Hawaii to Seward, Alaska. Both deep (120m) and shallow (15m) drogued buoy will be launched at strategic locations along the ship-track. Two types of deployments have been requested: (1) The release of deep

and shallow drifters along a "line source" spaced at 2° increments beginning at 38°N, with extra drifters in the Alaskan Stream south of Kodiak Island; and (2) the release of a group of 4 deep drifters at a single site within the Subtropical Gyre north of Hawaii to study

turbulent dispersion. The Canadian program will be complemented by drifter deployments south of 40°N for the US WOCE-SVP conducted by Professor Niiler's group at Scripps. Additional drifters are on order for deployment in the fall from Canadian and Russian research vessels.

COMMONWEALTH SECRETARIAT

Commonwealth Fund for Technical Co-operation

POST TITLE: Meteorological Adviser
DUTY STATION: Meteorological Services HQ, Gaborone, Botswana.
DURATION: Two Years
START DATE: As soon as possible.
RESPONSIBLE TO: Director, Meteorological Services

BACKGROUND: The Department of Meteorological Services is currently undergoing a major expansion which includes the commissioning of the Flight Information Region (FIR) and the establishment of the Central Forecast Office at the Sir Seretse Khama International Airport (SSKA). The new system will enable the government of Botswana to provide the necessary meteorological briefing to the national and international civil aviation; the Defence Force Air Wing as well as private operators.

The Director is overall in charge of the 6 divisions in the Department. These include the Climatology; Forecasting; Training and Research; and the Engineering Divisions headed by senior meteorological officers; the Station Management and Field Operations under the responsibility of a chief technical officer and the Administration Management Unit.

DUTIES: The expert is required to:-

- guide and assist the director in the technical administration of the various divisions of the department.
- guide the activities of the Central Forecast Office, SSKA, in particular assist in the establishment of a Meteorological Watch Office at the CFO in connection with the operation of the Gaborone Flight Information Region and conduct necessary training required including use of Doppler

Weather Radar, to forecast meteorologists.

- assist the climatological division in the provision of meteorological/climatological information and advice to various socio-economic sectors of the country, including contractors and consultants engaged by Government.
- provide on the job training to a local counterpart.
- undertake other related duties as may be assigned from time to time.

QUALIFICATIONS AND EXPERIENCE:

A masters degree in meteorology physics or mathematics with distinction from a recognized university, with several years experience in a senior capacity in a national meteorological service. Candidates should have wide experience of meteorology/climatology of the southern Africa subcontinent and several years experience conducting on-the-job training to Class-I and Class-II forecasting meteorologists.

An excellent working knowledge of English is essential and also a sound knowledge of environmental problems including the ozone layer depletion issue and the global warming issue. Interest in the activities of the World Climate Programme of the WMO and the Inter-Governmental Panel on Climate Change (IPCC) will be an advantage.

Contact:-

Attn. Mrs. Rose-Marie Odiachi
Commonwealth Fund for Technical Co-operation
Commonwealth Secretariat
Marlborough House
Pall Mall, London SW1Y 5HX, England

CONFERENCES/CONFÉRENCES

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 held 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

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.

For additional information contact the program chairman, or consult the C.M.O.S. Newsletter 29(4), August 1991.

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

**The Impacts of Climate Change on Resource
Management of the North**

Whitehorse, Yukon Territory
May 12-14th, 1992

VENUE: Goldrush Inn, Whitehorse.

PRINCIPAL SPONSORS:

Atmospheric Environment Service, Environment Canada.
National Oceanic and Atmospheric Administration, U.S.A.
Indian and Northern Affairs, Canada.

PURPOSE:

- To provide information to the people of the Arctic regions of N. America about current issues in climate and climate change.
- To promote dialogue between the Federal Governments, scientific research community and local groups about various aspects of the climate problem important to northern people.
- To discuss and formulate recommendations regarding the management of northern resources that might be affected by global warming and associated regional climate change.

FORUM:

A combination of plenary sessions for information exchange and working groups to address terrestrial, freshwater and marine resource management issues in the context of climate change. There will also be two evening sessions organized for the general public.

CONTACTS:

Canada -	United States -
Al Maninauskas	William Bolhofer
Canadian Climate Centre	NCPO/NOAA
Environment Canada	Universal Building, Suite 518
4905 Dufferin Street	1825 Connecticut Avenue
Downsview, Ont. M3H 5T4	Washington, D.C. 20235
Tel. (416)-739-4431	Tel. (202)-606-4360
Fax (416)-739-4380	Fax (202)-606-4355

Canadian Applied Mathematics Society

Wave Phenomena II: Modern Theory and Applications
June 15-18, 1992

The University of Alberta, Edmonton, Alberta

Theme topics and principal speakers include:-

WAVES AND STABILITY

D. J. Benney (M.I.T.), A.D. Craik (St. Andrews), P.G. Drazin (Bristol)
J.E. Marsden (Berkeley), S.A. Maslowe (McGill)

WAVES IN THE OCEAN AND ATMOSPHERE

R. Grimshaw (New S. Wales), W.R. Peltier (Toronto)

HYPERBOLIC WAVES AND SHOCKS

D. Crighton (Cambridge), J.K. Hunter (Davis), A. Jeffrey (Newcastle)
J.B. Keller (Stanford), A. Majda (Princeton), B.R. Seymour (U.B.C.)
F.T. Smith (U.C. London), J. Smoller (Michigan).

SOLITONS AND COHERENT STRUCTURES

M. Ablowitz (Boulder), T.B. Benjamin (Oxford), J. Bona (Penn. State)
J.C. Eilbeck (Heriot-Watt), Y. Kodama (Ohio State),
A.C. Newell (Tucson), C. Rogers (Loughborough)

WAVES IN SOLIDS

M. McCarthy (Galway), D. Parker (Edinburgh), A.C. Pipkin (Brown)

Organizers: T. Bryant Moodie and Gordon Swaters.

Information: CAMS Conference
Applied Mathematics Institute
University of Alberta
Edmonton, Alberta
Canada T6G 2G1
FAX: (403)-492-6826

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 sur la météorologie opérationnelle, parrainé par le Service 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.

Volume 29 No 4 December 1991 Décembre

ATMOSPHERE-OCEAN

Contents/Table des matières

A comparison of different methods of estimating energy-limited evapotranspiration in the Peace River region of British Columbia. Karim Abbaspour.

The linear steady response of a stratified baroclinic atmosphere to elevated diabatic forcing. Alain Robichaud and Charles A. Lin.

Initialization and diagnostic application of operational analyses. Steve Lambert.

An example of attenuation by wet snow on a radar dome. Norman Donaldson

Sensitivity of ADOM dry deposition velocities to input parameters: A comparison with measurements for SO₂ and NO₂ over three land use types. J. Padro and G. C. Edwards.

Eurasian snow cover, Indian monsoon and El Niño/Southern Oscillation - A synthesis. M. L. Khandekar.

Wind-driven depth-averaged circulation in Queen Charlotte Sound and Hecate Strait. Charles G. Hannah, Paul H. LeBlond, William R. Crawford and W. Paul Budgell.

An upper ocean general circulation model for the North Pacific: Preliminary experiments. Josef Cherniawsky and Greg Holloway.

Volume 30 No 1 March 1992 Mars

ATMOSPHERE-OCEAN

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

Importance of bottom topography in the seasonal cycle of the North Pacific Sub-Arctic gyre. Warren Lee, Greg Holloway & William Hsieh.

Tidal model studies of particle trajectories around a shallow coastal bank. M.G.G. Foreman, A.M. Baptista & R.A. Walters.

Temperature and salinity variability on the eastern Newfoundland shelf: The residual field. B. Petrie, J. Loder, S. Akenhead & J. Lazier.

Residual currents in the central Strait of Georgia, B.C. S.G. Marinone and J. Fyfe.

.....more to come

Volume 25 No 2 August 1991 Août

Climatological Bulletin

Bulletin climatologique

Contents/Table des matières

An assessment of the 27 year record of measured precipitation at Ocean Weather Station P in the Northeast Pacific Ocean. J.L. Knox.

Greenland Sea ice and salinity anomalies and interdecadal climate variability. L.A. Mysak and S.B. Power.

Étude du phénomène de vents violents au Québec en tant que catastrophe naturelle. J. Lacroix et D. J. Boivin.

The sensitivity of soil moisture reserves to changes in precipitation amount and frequency. J.A. Dyer.

Mean daily temperature normals from 1901-30 to 1961-90 on the eastern Canadian prairies. R.L. Raddatz, J. Maybank and G.B. Atkinson.

Volume 25 No 3 December 1991 Décembre

Climatological Bulletin

Bulletin climatologique

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

Comparison of rainfall distribution during dry spells using radar images and gauge networks. T. Sribimawati, D.M. Brown, W.D. Hogg.

Étude du phénomène des tempêtes de neige: effets socio-économiques. J. Lacroix and D. Boivin.

ENVIRONMENTAL PROFESSIONALS

The **AXYS GROUP** is expanding its **Environmental Consulting Division**. AXYS has career opportunities in the following disciplines:

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The **AXYS GROUP** provides services in environmental consulting, GIS applications and trace organic analyses. AXYS also manufactures environmental instrumentation, ultra-pure acids, and optoelectronic devices; and has developed a PC-based Geographic Information System software package. The Company was established in 1974 and has over 100 employees. The positions are available at the Company's offices in Vancouver and Victoria.

Please send resumes, in confidence, to:

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2045 Mills Road, P.O. Box 2219
Sidney, B.C., Canada V8L 3S1

 **AXYS GROUP**

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CMOS Prizes and Awards - Prix et Bourses de la SCMO

Maritimes Weather Centre
1496 Bedford Highway
Bedford, Nova Scotia
B4A 1E5

27 September 1991

The Canadian Meteorological and Oceanographic Society established the Prizes and Awards Committee to focus attention on the achievements of its members and their influence on the sciences of meteorology and oceanography in Canada.

Nominations are now being solicited for the various award and prize categories in our society. Your involvement in identifying and nominating appropriate individuals is an significant aspect of your contribution to our Society.

The awards program is important to CMOS as it brings credit and recognition to those who deserve it. Outstanding achievers in the sciences of oceanography or meteorology, or in the field of radio or television presentation of meteorological forecasts should be recognized by their CMOS peers as well as members of the Canadian community. Both media and Society attention is focussed on the recipients, thereby highlighting important work and Canadian contributions to specific science programs.

A list of the various awards is attached. Please note the approved and necessary criteria for each award or prize. It is essential that your written recommendation for a particular award be supported by complete documentation, illustrating that the candidate has met all the category's requirements.

The deadline for receipt of all nomination and documentation packages is Friday 24 January 1992. Please send all packages to the Secretary, Mr. John Merrick at the above address. Nominations may be submitted by mail, or, if of a reasonable length by fax. For the current fax number please contact the Committee Secretary, John Merrick at (902)-426-9180.

Thank you for your participation,

Dr. Peter Taylor
Chairman, Prizes and Awards Committee

Centre météorologique des Maritimes
1496 Bedford Highway, sixième étage
Bedford, Nova Scotia
B4A 1E5

le 27 septembre 1991

La Société Canadienne de Météorologie et d'Océanographie (SCMO) a réuni un comité qui a pour mandat de décerner des prix et récompenses aux membres qui ont apporté une contribution importante dans les domaines de la météorologie et de l'océanographie au Canada.

Les personnes ayant contribué d'une façon significative dans les domaines de la météorologie et de l'océanographie, ou encore dans la diffusion des prévisions météorologiques à la radio ou à la télévision doivent être reconnus par les membres de la SCMO en particulier et la population canadienne en général. Ce programme de prix et récompenses est important pour la SCMO pour mettre en évidence et récompenser ses membres. Il permet aussi de mieux faire connaître les récipiendaires et leurs contributions dans les programmes scientifiques canadiens.

Nous procédons présentement à la mise en candidature dans les diverses catégories de prix et de récompenses. Nous demandons aux membres de collaborer à cette mise en candidature en proposant des candidats.

Vous trouverez ci-joint une liste des divers prix et récompenses. Veuillez porter attention aux critères établis, approuvés et requis pour chacun des prix et des récompenses. Il est essentiel que chaque proposition soit appuyée d'une documentation complète montrant l'éligibilité du candidat.

La date limite pour recevoir les candidatures, ainsi que la documentation, est le vendredi 24 janvier 1992. Veuillez envoyer vos propositions ainsi que la documentation montrant l'éligibilité de vos candidats au secrétaire du comité, M. John Merrick à l'adresse suivante. La documentation peut être envoyée par la poste ou par fax. Veuillez contacter M. John Merrick à (902)-426-9180 pour le numéro de facsimilé.

Merci de votre participation.

Dr. Peter Taylor
Président, Comité des prix et récompenses de la SCMO

Prizes and Awards Criteria

The criteria listed below are extracted from Appendix I of the Society's bylaws.

1. The deadline for submissions is rigidly observed due to other Committee deadlines and the high volume of copying required. Complete submissions must be in the hands of the Secretary by that date.

Allow sufficient time for mail or courier. Some couriers may not offer overnight service to Halifax from all regions of Canada. Also, first class mail from Vancouver (for example), still on occasion may take several days to reach Halifax. If desired, submissions may be faxed to the Secretary of the Prizes and Awards Committee. Please contact the Secretary for the current phone number.

Critères d'éligibilité.

Les critères d'éligibilité énumérés ci-dessous originent de l'appendice I des règles établies par la société.

1. La date limite doit être respectée étant donné les échéances des autres comités ainsi que la grande quantité de photocopies requises. Les candidatures doivent être entre les mains du secrétaire avant la date limite.

Il faut allouer suffisamment de temps pour le transport du courrier. Certaines compagnies de courrier n'offrent pas un service de nuit à Halifax pour toutes les régions du Canada. Aussi par exemple, le service postal de première classe venant de Vancouver peut mettre plusieurs jours pour arriver à Halifax. Si vous le désirez, le secrétaire du comité des prix et bourses peut recevoir des facsimilés. Vous pouvez obtenir le numéro de téléphone pour envoyer un facsimilé en communiquant avec le secrétaire du comité.

2. Some prize categories specify that a nominee must be a member of CMOS. Nominees in these categories who are not members of CMOS on the date which nominations close will be disqualified and their nominations will not be considered. Membership status will be confirmed by phone through the office of the Executive Director of CMOS.

3. Receipt of submissions by the Secretary will not be acknowledged unless requested. Acknowledgement when requested, will be by telephone or fax.

4. The current title, full address and phone number of the nominee MUST accompany the submission.

5. Nominees from previous years, who have not received awards may be re-nominated. All criteria provided above apply to re-nominations. All re-nominations must be complete with justification since nomination material is not retained from year to year.

a) **PRESIDENT'S PRIZE**

May be awarded each year to one or members for a recent paper, book or contribution of special merit in the field of either meteorology or oceanography. Nominees **MUST** be members of the Society. The paper or work;

1. **MUST** have been accepted for publication in Atmosphere-Ocean, Climate Bulletin or another refereed journal, or;

2. **MUST** have been presented to the Society membership at a national or local meeting.

b) **THE J. P. TULLY MEDAL IN OCEANOGRAPHY**

May be awarded each year to a person whose scientific contributions have had a significant impact on Canadian Oceanography.

c) **THE DR. ANDREW THOMSON PRIZE IN APPLIED METEOROLOGY**

May be awarded each year to a member or members of CMOS for an outstanding contribution to the application of meteorology in Canada. Nominees **MUST** be members of the Society.

d) **PRIZE IN APPLIED OCEANOGRAPHY**

May be awarded each year for a significant contribution to the application of oceanography in Canada. Nominees **MUST** be members of the Society.

e) **THE RUBE HORNSTEIN PRIZE IN OPERATIONAL METEOROLOGY**

May be awarded each year to an individual for providing outstanding operational meteorological service in its broadest sense, but excluding the publication of research papers as a factor, unless that research is already incorporated as an aid in the day-to-day performance of operational duties. The work for which the prize is granted may be cumulative over a period of years or may be a single notable achievement.

f) **GRADUATE STUDENT PRIZES**

One or more prizes may be awarded in this category each year for contributions of special merit in the fields of meteorology or oceanography by graduate students. Such students must be;

2. Certaines catégories de prix sont réservées aux membres de la SCMO. Les candidats de ces catégories qui ne sont pas membres lors de l'échéance des nominations seront disqualifiés. Le statut de membre des candidats sera confirmé par le bureau de la direction de la SCMO par téléphone.

3. La réception des candidatures par le secrétaire ne sera pas confirmée par un avis de réception, sauf si vous le demandez. Dans ce cas la confirmation sera faite par téléphone ou par fax.

4. Le titre actuel de chaque candidat, son adresse complète, ainsi que son numéro de téléphone doivent être envoyés avec la mise en candidature.

5. Les candidats des années précédentes, qui n'ont pas reçu de prix, peuvent être reconsidérés comme candidats. Ces derniers doivent suivre les mêmes critères cités ci-haut. Les informations relatives au candidat doivent être complètes, puisque les documents de l'année précédente ne sont pas conservés.

a) **PRIX DU PRESIDENT**

Peut être décerné à un ou plusieurs membres pour une publication récente, un livre ou une contribution importante dans les domaines de la météorologie ou de l'océanographie. Les candidats doivent être membres de la SCMO. L'article ou la contribution;

1. doit avoir été accepté pour être publié dans Atmosphere-Océan, Bulletin de Climatologie ou un autre journal arbitré, ou;

2. doit avoir été présenté aux membres de la société lors d'une assemblée nationale ou locale.

b) **MEDAILLE J. P. TULLY EN OCEANOGRAPHIE**

Peut être décernée chaque année à une personne à laquelle ses contributions scientifiques ont eu un impact significatif en océanographie au Canada.

c) **PRIX DR. ANDREW THOMSON EN METEOROLOGIE APPLIQUEE**

Peut être décerné chaque année pour une contribution remarquable en météorologie appliquée au Canada. Le récipiendaire doit être membre de la société.

d) **PRIX EN OCEANOGRAPHIE APPLIQUEE**

Peut être décerné chaque année pour une contribution significative en océanographie appliquée au Canada. Le récipiendaire doit être membre de la Société.

e) **PRIX RUBE HORNSTEIN EN METEOROLOGIE OPERATIONNELLE**

Peut être décerné chaque année à une personne ayant procuré un service exceptionnel en météorologie dans son sens le plus large. Par contre la publication des papiers de recherche sera exclue, à moins que cette recherche soit déjà incorporée comme aide quotidienne dans le travail opérationnel. Le travail pour lequel le prix est accordé peut être cummulatif sur une période de plusieurs années, ou peut être un seul accomplissement remarquable.

f) **PRIX ETUDIANT GRADUE**

Un ou plusieurs prix peuvent être décernés chaque année aux étudiants gradués ayant apporté une contribution notable en météorologie et/ou en océanographie. Le ou les étudiants doivent être;

1. inscrits dans un programme de météorologie ou d'océanographie d'une université canadienne reconnue, ou;

2. doivent être canadiens inscrits dans un programme

1. registered in oceanography or meteorology at a recognised Canadian University, or;

2. Canadian graduate students registered at a recognised foreign university in meteorology and/or oceanography programs.

g) ENVIRONMENTAL CITATION

One or more citations may be awarded each year to individuals or groups who have in the previous year, made some outstanding contribution in helping to alleviate pollution problems, in promoting environmental improvements, or in developing environmental ethics.

h) CITATION FOR OUTSTANDING RADIO AND TELEVISION WEATHER PRESENTATION

May be awarded each year to a regular on-going Canadian weather program or regularly appearing weather presentation personality. Audio tapes of three consecutive radio broadcasts or VCR recordings (VHS format) of three consecutive telecasts are required, along with the date and time of the programs, the name of the presenter, station, city, etc.

Tapes need not be accompanied by written justifications, but justifications would assist the Committee. Submissions may be made by either Centres or individual members.

Submissions should be based on informative and educational value, effective communication of material, appeal to the public, a high level of technical and professional presentation, etc.

i) Reviewers of the Year; Meteorology and Oceanography

May be awarded each year in each category. A recommendation in each category may be made by the senior editor of Atmosphere-Ocean and will be forwarded by the deadline to the Secretary of the Prizes and Awards Committee for inclusion in the committee's annual awards recommendation to Council.

d'océanographie d'une université étrangère reconnue.

g) CITATIONS ENVIRONNEMENTALES

Un ou plusieurs prix peuvent être attribués à des individus ou groupes ayant, durant l'année précédente, apporté une contribution importante au problème de la pollution, ou ayant favorisé une meilleure qualité ou éthique environnementale.

h) CITATION POUR L'EXCELLENCE EN PRESENTATION DES PREVISIONS METEOROLOGIQUES A LA RADIO OU A LA TELEVISION

Seules les productions canadiennes sont éligibles. N'importe quelle série régulière de diffusion météorologique peut être considérée. Une bande audio de trois émissions radiophoniques consécutives ou un enregistrement VHS de trois émissions télévisées est requis. La date, le temps des émissions, le nom du présentateur, la station, la ville, etc, peuvent être accompagnés d'une justification écrite pour aider le comité de sélection.

Les extraits soumis doivent l'être sur la base d'émissions d'informations et/ou de valeurs éducatives, attrayantes pour le public et avec un haut niveau de présentation technique et professionnelle, etc.

Les centres de prévisions sont fortement encouragés à participer à la revue des émissions de radio et/ou de télévision dans leur région. Les centres qui jugent qu'une émission rencontre tous les critères mentionnés sont invités à proposer la candidature de l'émission au comité de sélection. (Les centres pour lesquels leurs candidatures n'auront pas été sélectionnées pour un prix national peuvent, s'ils le désirent, élire un gagnant parmi leurs candidats dans leur région.)

i) CRITIQUE DE L'ANNEE; METEOROLOGIE ET OCEANOGRAPHIE

La mise en candidature pour chacune des catégories sera normalement faite par les éditeurs de Atmosphere-Océan. Une recommandation dans chaque catégorie sera faite par l'éditeur en chef de AO, qui sera envoyé au comité des prix et bourses pour être inclu parmi leurs recommandations annuelles au conseil.



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Head, Ocean Chemistry

\$56,665 to \$83,351
Department of Fisheries and Oceans
Institute of Ocean Sciences
Sidney, British Columbia

A scientific leader is sought for this small research group (14 members) which focuses on factors controlling the distribution of compounds in the ocean with emphasis on North Pacific coastal waters. Good laboratory and vessel facilities are available. Excellent opportunities for collaborative research are provided by other groups within IOS and at nearby university and government laboratories. Senior management is committed to scientific excellence.

Your Challenge

You will be accountable for planning and directing the chemical oceanography and contaminants research program at the Institute to ensure that comprehensive and up-to-date information and advice on questions of national and regional concern are available to the government and people of Canada. You will also be expected to maintain an active personal research program.

Your Credentials

You must possess a doctoral degree from a recognized university in chemical oceanography, chemistry or a related field or a lesser degree with evidence of research experience and productivity equivalent to that of a doctoral degree. You must be a highly motivated individual with extensive knowledge of current scientific problems in chemical oceanography and marine contaminants research and a background in research. You must have leadership skills in motivating a small research group and experience in the planning and management of research involving several scientists. You must have well-developed communication skills. Proficiency in English is essential. Preference in appointment will be given to Canadian citizens.

Please forward your résumé and/or application form, before October 31, 1991, quoting reference number S-91-31-5709-47JG (199), to: **Joan Girling, Public Service Commission of Canada, 171 Slater Street, Ottawa, Ontario K1A 0M7.**

We are committed to Employment Equity.

Chef, chimie marine

56,665 \$ to 83 351 \$
Pêches et Océans Canada
Institut des sciences marines
Sidney (Colombie-Britannique)

Pêches et Océans Canada recherche une personne compétente pour assumer la direction scientifique d'une petite équipe de recherche (14 personnes) travaillant à comprendre les facteurs de distribution des composés dans l'océan, plus particulièrement dans les eaux côtières du Pacifique Nord. L'équipe a à sa disposition d'excellentes installations embarquées et de laboratoire. De plus, ce travail offre d'excellentes occasions de mener les recherches en collaboration avec d'autres équipes au sein de l'Institut et des laboratoires gouvernementaux et universitaires situés à proximité. La direction supérieure est entièrement vouée à l'excellence scientifique.

Votre défi

Vous serez responsable de la planification et de la direction du programme de recherche sur la chimie océanographique et les contaminants au sein de l'Institut en vue d'assurer que le Gouvernement et les citoyens du Canada disposent d'informations et d'avis complets et à jour sur les questions d'intérêt national et régional. Vous aurez également à soutenir un programme de recherche personnel.

Vos compétences

Vous devez détenir un doctorat d'une université reconnue en chimie océanographique, en chimie ou dans une discipline connexe, ou un diplôme universitaire de pair avec une expérience de recherche et des publications équivalentes au niveau doctoral. Une personne hautement motivée, vous possédez une connaissance étendue de la problématique scientifique actuelle dans les domaines de la chimie océanographique et de la recherche portant sur les contaminants marins de même que des antécédents en recherche. Vous devez de plus faire preuve de leadership et être capable de motiver une petite équipe de recherche. En outre, vous avez de l'expérience dans la planification et la gestion de la recherche menée par plusieurs scientifiques. Enfin, vous devez démontrer d'excellentes aptitudes pour la communication en anglais. La préférence sera accordée aux citoyens canadiens.

Veillez acheminer votre demande d'emploi et (ou) votre curriculum vitae avant le 31 octobre 1991, en prenant soin d'indiquer le numéro de référence S-91-31-5709-47JG (199), à **Joan Girling, Commission de la fonction publique, 171, rue Slater, Ottawa (Ontario) K1A 0M7.**

Nous souscrivons au principe de l'équité en matière d'emploi.



Public Service Commission
of Canada

Commission de la fonction publique
du Canada

Canada

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-EHELLE"; 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:

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CALL FOR PAPERS
26th ANNUAL CONGRESS OF THE
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.

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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 posséder 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) degré 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.

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

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See over/au verso

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