

CANADIAN OCEAN SCIENCE NEWSLETTER LE BULLETIN CANADIEN DES SCIENCES DE L'OCÉAN

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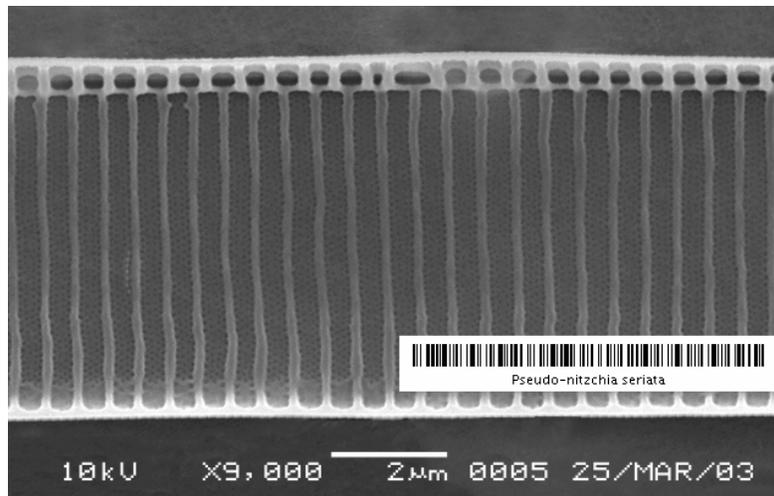
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Masters graduate student conducting research in DNA Barcodes of Harmful Diatoms

Review of applications will start February 1, 2006 and continue until the position is filled.



Applications are being sought for a Masters graduate student, at Mount Allison University, conducting research in DNA Barcodes of Harmful Diatoms. The successful candidate will evaluate nuclear and mitochondrial markers as a diagnostic barcode tool for native harmful diatom species, with emphasis on the genera *Pseudo-nitzschia*, *Chaetoceros* and/or *Nitzschia*. This work is a part of the greater Barcoding of Life program supported by Genome Canada. More information on the whole program may be found at: <http://www.bolnet.ca>)

Candidates must possess a B.Sc. in Biology with Honours or equivalent. Past experience in molecular methodology is desirable and willingness to gain experience in diatom taxonomy is critical. Experience with microbial cultures (preferably diatoms) would be an asset. The project will be supervised by Dr. Irena Kaczmarska, Mount Allison University, Sackville, New Brunswick, Canada. It will involve field collections on the Atlantic Coast of the Canadian Maritimes. To apply, please send a resume, transcript, abstract of Honours Thesis (if applicable) and contact information of three references to:

Dr. Irena Kaczmarska
Department of Biology
Mount Allison University
63B York Street
Sackville, N.B. E4L 1G7 Canada
e-mail address: iehrman@mta.ca.

Oceanic and Atmospheric Forcing of Sea Ice

Centre for Earth Observation Science (CEOS), University of Manitoba

The Centre for Earth Observation Science (CEOS) at the University of Manitoba is seeking qualified candidates for several positions focusing on research into oceanic and atmospheric forcing of sea ice in the northern hemisphere. These positions will work collaboratively within a Network of Centres of Excellence known as ArcticNet. For more information about ArcticNet, please go to: <http://www.arcticnet.ulaval.ca>

At least five candidates are sought to fill the following positions:

- Post doc or research associate in modelling of ocean-sea ice-atmosphere processes and biological coupling in the Canadian Arctic (region to be determined)
- Ph.D./M.Sc. studentships to work on oceanic and atmospheric forcing of sea ice growth and decay at a hemispheric scale (remote sensing and modelling)
- Ph.D./M.Sc. studentships to study contaminant and carbon cycling and physical biological coupling in arctic freshwater and marine aquatic ecosystems
- Ph.D. student to work on ocean surface gas exchanges from polar seas

For further information, please contact: David Barber at dbarber@cc.umanitoba.ca or go to: <http://www.umanitoba.ca/environment/ceos>

Assistant Professor, Fluid Dynamics

The Department of Mathematical and Statistical Sciences, at the University of Alberta, invites applications for a tenure-track Assistant Professor in the general area of fluid dynamics. We seek an individual who will complement the Department's existing expertise in turbulence, waves and shock theory, stratified fluids, hydrodynamic stability, physical oceanography, climatology and laboratory experiments. Candidates must hold a PhD degree. Additional postdoctoral experience showing a promising research record is preferred. As well as developing a strong research program, successful candidates will be expected to teach undergraduates and graduates in courses including mathematical fluid dynamics, numerical methods and advanced partial differential equations. Applicants are expected to possess excellent communication skills and leadership potential. Applicants should submit a curriculum vitae, a teaching profile outlining experience and/or interests, and at least three confidential letters of reference to:

Anthony To-Ming Lau, Chair
Department of Mathematical and Statistical Sciences University of Alberta
Edmonton, Alberta, Canada T6G 2G1

The closing date for applications is February 15, 2006, or until a suitable candidate is found. For more information about the Department and the University of Alberta, please see the Department's web page: <http://www.math.ualberta.ca>. For information about the Fluid Dynamics Group, see <http://www.math.ualberta.ca/~gfd/>

A unique Canadian component for the Global Ocean Observing System

Contribution by Ron O'Dor, Ron.O'Dor@dal.ca

The Census of Marine Life's Pacific Ocean Shelf Tracking project (www.postcoml.org) has just completed the second of its two-year demonstration phase, with 120 kms of 'listening curtains' stretching from the Columbia River to the top of the Alaska panhandle. The number of fish tagged almost tripled in 2005 – some 2,700 salmon from 19 US and Canadian stocks in 16 river systems, up from 1,050 fish tagged from 14 stocks in 8 river systems in 2004. The detection rate for individually tagged salmon migrating over the individual lines in the system increased from 91 to 96%, revealing substantial differences in the paths, speeds, distributions and survival of juvenile salmon after they leave their home rivers and swim out into the ocean. The system revealed unexpected insights into migrations of endangered sockeye and sturgeon, showing that even different stocks of the same species can have distinct migration pathways. The POST approach will become crucial to understand how animal behaviour changes as ocean waters warm because for the first time we are potentially able to measure survival directly in the ocean.

The key components in the POST system are tiny tags that can be surgically implanted in animals as small as 20 g, providing over a million unique codes, and VR2 receivers. Both are produced by the VEMCO Division of the Canadian manufacturer, AMIRIX Systems, Inc. VR2 receivers cost \$1000, last less than a year and must be physically recovered to acquire the records of the tags that pass a curtain. The 2005 season saw the first deployment of a complete curtain of VR3 receivers in a large-scale field test. VR3s cost \$5-7000, have sufficient power to last up to seven years, can upload data to the surface via an acoustic modem and can record and transmit data from physical sensors as well as tag codes. Phase 3 of POST will deploy VR3s exclusively, creating a key link between biological, chemical and physical data for GOOS. Modified versions can also host additional ocean sensors, thus potentially providing the backbone for an ocean observing system for ocean shelf and slope regions that can extend the length of continents.

Excitement over the POST deployment on the West Coast of North America generated an even larger scale expansion project called the Ocean Shelf Tracking and Physics Array (OSTAPA) that has been submitted to the Canadian Foundation for Innovation as an International Joint Venture Project. OSTAPA would put VR3 curtains in every ocean. Starting with a workshop at the Australian Marine Science Association meeting in Hobart in 2004, OSTAPA proponents have met in Halifax, Frankfurt and Catalina, formed consortia in Australia, South Africa and the Arctic, and are developing proposals for the Atlantic Salmon Federation, the European 7th Framework and the US Pacific Coast Ocean Observing System (PaCOOS). The workshops revealed that over 6000 VR2s are already in place around the world, tracking over 100 different species.

A key step for global collaboration in GOOS took place in Catalina in December 2005, where major coded tag users from around the world agreed to a new million code system that would avoid misinterpretation of codes issued locally and allow for data sharing from receivers globally. This also opened the way for longer-lived tags for large animals that last up to 20 years. The Canadian International Polar Year project, Global Warming and Arctic Marine Mammals (GWAMM) and the COML Tagging of Pacific Pelagics (TOPP) are both developing plans to double tag animals in the future. Satellite tags will continue to provide detailed movements and physical records in the short-term globally, but, if animals are tagged with acoustic-code tags as well, their seasonal migrations can be tracked at curtains on the decadal scale required to understand the impacts of global warming. With curtains in the Southern Ocean as well as the Arctic OSTAPA would be a major Canadian contribution to IPY's 'bipolar' theme.

Figure 1 illustrates the difference between the existing POST curtains and those planned for OSTAPA. Figure 2 shows the locales where the OSTAPA consortia would operate. Although the curtains are shelf-limited by range, the satellite-linked VR3As are also being deployed from fixed and drifting fish aggregating devices (FADs).

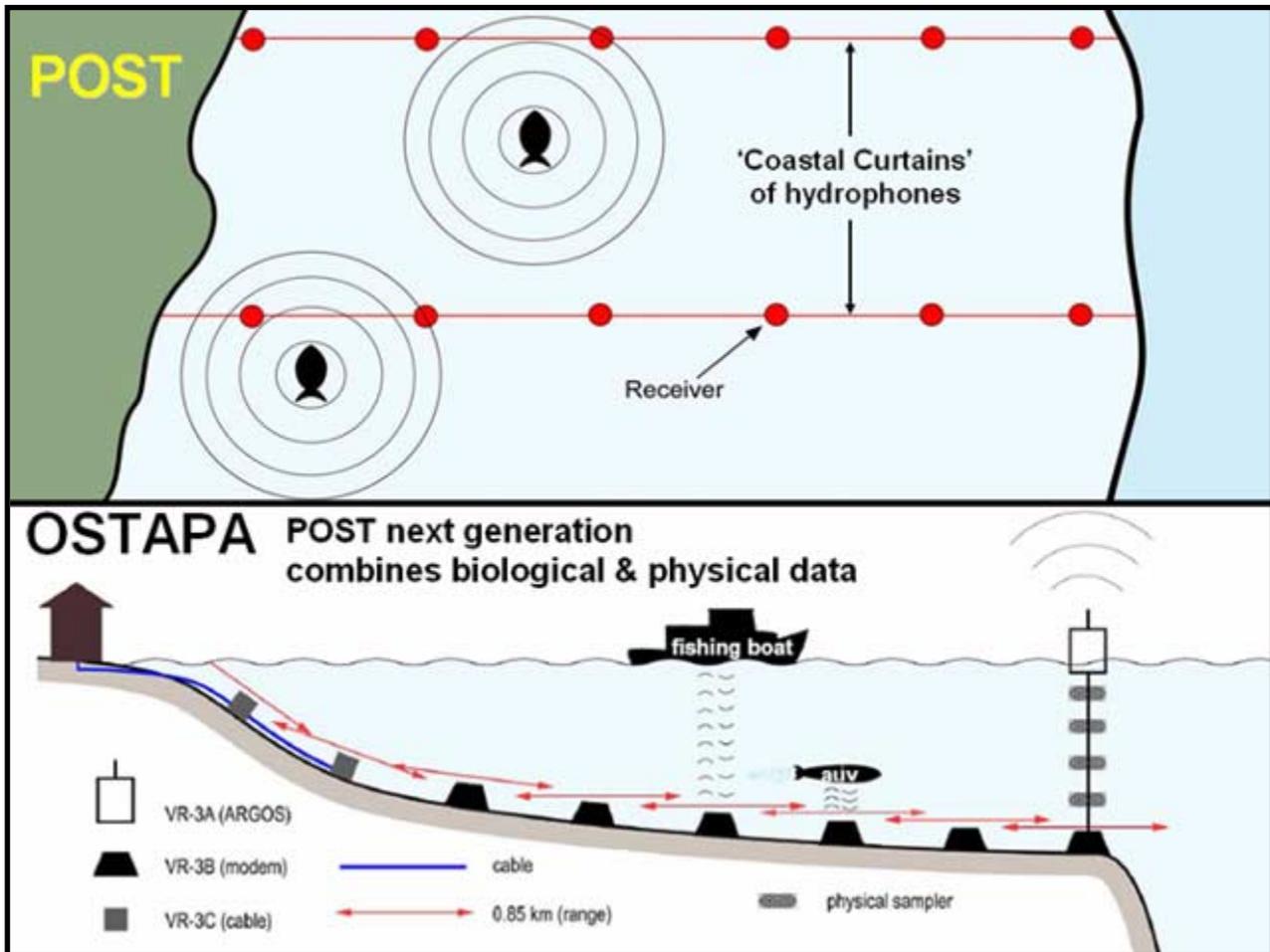


Figure 1. A range of acoustic tag receivers offers a flexible extension to ocean observatories. Each unit can record passing animals with coded tag as well as physical data. Receivers can communicate through existing cables, where available. Trawl-resistant bottom receivers with 5-7 year lives can collect, store and retransmit data from sensors as well. Profile data can be transmitted from suspended samplers to bottom receivers, or where real-time data is critical there is also an option for surface receivers that transmit to satellites, where surface exposure possible. Routinely, data can be harvested by acoustic modem from surface vessels or from programmed AUVs. Daisy-chaining between acoustic modem units is also possible, but is more power intensive, so must be traded off against increases in recovery rate and maintenance costs.

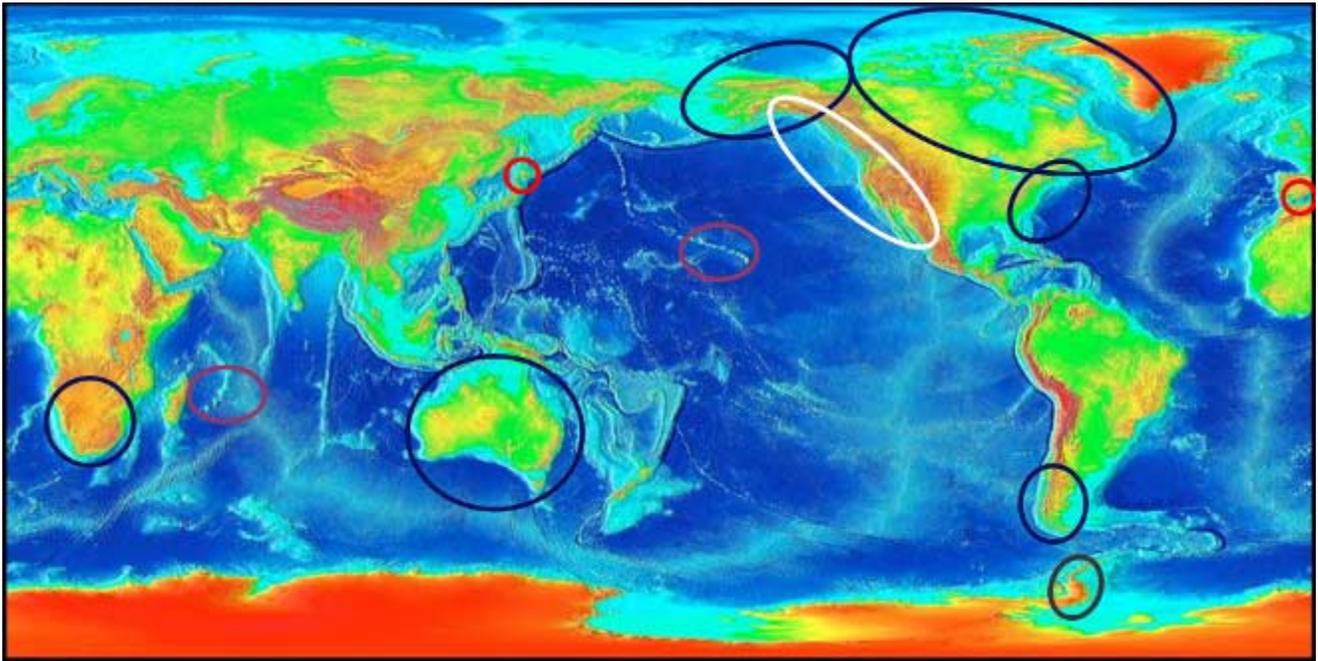


Figure 2. OSTAPA will reinforce consortia (black) in the Southern Ocean and Arctic to extend the POST system (white) to a global scale for GOOS and the International Polar Year. Key choke points (red) and existing FAD recorder systems (purple) will demonstrate this unique Canadian technology on a global scale. The Network for Oceanic Acoustic Code System (www.noacs.org) links the projects.

Gordon McBean, Chair, Canadian National Committee for SCOR

The Canadian National Committee (CNC) for SCOR is pleased to confirm that effective January 1, 2006 Gordon McBean became its new Chair, replacing Bjorn Sundby at the completion of his three-year term. Dr. Sundby will continue to serve as a member of CNC/SCOR as past-Chair, and he continues to serve as President of international SCOR for an additional three years.



Dr. McBean is a Professor at the University of Western Ontario, and Chair for Policy in the Institute for Catastrophic Loss Reduction. He is also presently the Chair of the Board of Trustees of the Canadian Foundation for Climate and Atmospheric Sciences (CFCAS). Previously Gordon was the Assistant Deputy Minister, Meteorological Service of Canada (MSC); Professor and Head, Department of Oceanography, University of British Columbia; Professor and Chairman, Atmospheric Science Programme, University of British Columbia, and; Senior Scientist, Canadian Climate Centre, MSC, located at the Institute of Ocean Sciences.

Gordon’s early career spanned a wide variety of interests in MSC, including boundary layer research, hydrometeorology and environmental impact research, and weather forecasting. Gordon has received many distinguished awards (MSC Patterson Medal, CMOS President’s Prize, EC Jim Bruce Award) and has been elected a Fellow of the Royal Society of Canada, the Canadian Meteorological and Oceanographic Society and the American Meteorological Society.

Gordon has Chaired and been a Member of enumerable national and international scientific committees, including Chair of the International Scientific Committee for the World Climate Research Programme, and he has published extensively. Gordon received his Ph.D. in Physics and Oceanography from the University of British Columbia. Gordon may be reached at: gmcbear@uwo.ca

Lawrence Mysak awarded the Alfred Wegener Medal

Lawrence Mysak has recently been awarded the highly-prestigious Alfred Wegener Medal & Honorary Membership in the EGU for 2006. The Alfred Wegener Medal & Honorary Membership of the EGU, form one of the three equally-ranked most prestigious awards made by the Union, and they are reserved for scientists who have achieved exceptional international standing in atmospheric, hydrological or ocean sciences, defined in their widest senses, for their merit and their scientific achievements. Details may be found at:

http://www.copernicus.org/EGU/awards/alfred_wegener_overview.html

Grant Ingram: Canadian delegate to the International Arctic Science Committee (IASC)

Dr. Grant Ingram has recently been designated as the Canadian delegate to the International Arctic Science Committee (IASC) for a term of two years. Dr. Ingram is replacing the former delegate Peter Johnson, geographer and former chair of the Canadian Polar Commission. IASC is a non-governmental organization and an international associate of the International Council for Science (ICSU). The aim of IASC is to encourage and facilitate cooperation in all aspects of arctic research, in all countries engaged in arctic research and in all areas of the arctic region. The main activities include identifying international scientific priorities and developing research projects for which circumarctic or international cooperation is required.

Dr. Ingram is Professor, Department of Earth & Ocean Sciences at the University of British Columbia and an arctic oceanographer with a long history of national and international collaborations in arctic science. Dr. Ingram was previously a professor at McGill for a number of years and a member of Groupe Interuniversitaire de Recherche Océanographiques du Québec (GIROQ), the organisation that brought together the oceanographic interests of Laval, Montréal and McGill University. His current interests include physical processes in Arctic coastal waters, the impact of sea ice cover on transport processes, and the influence of climate change on biological-physical interactions in northern waters.

This appointment represents a great opportunity for the academic and government marine science community to further Arctic Ocean sciences, and to promote arctic ocean science program planning with our international partners, including Canada's program for International Polar Year.

The Second Conference on Arctic Research Planning, ICARP II, Copenhagen November 10-12, 2005

Report by Geoff Holland, hollandg@shaw.ca

This successful international Conference was attended by over sixty Canadian scientists and stakeholders. In a total participation of over 450, the turnout was impressive, but compatible with the size of the Canadian northern territories and related Arctic interests. There were a large number of Arctic related meetings arranged in Copenhagen to take advantage of the presence of

the arctic research community, for example senior level meetings of the IPY and CLiC. Many of the Canadian attendees were involved directly in the Conference agenda. Michel Beland gave an update on the IPY planning to plenary and other plenary sessions were chaired by the two Canadian ICARP Steering Group members, Barry Goodison and Geoff Holland.

The Conference covered both natural and social sciences and involved breakout sessions that specifically looked at the arctic science plans that had been developed by experts working over the past two years. Each breakout session involved an independent panel that included youth, experience and indigenous knowledge. Needless to say, there were also many Canadians involved in the discussions as Session Chairs, WG Chairs, panel members and rapporteurs. Finally there were over 100 poster presentations and again Canadian scientists were well represented.

The Conference Proceedings will be finalized in time for presentation at the Arctic Science Summit Week in Potsdam, March, 2006. The amended science plans will also be published and available for the guidance of scientists and research managers shortly thereafter.

Time Series of the Northeast Pacific: A symposium to mark the 50th anniversary of Line-P

The symposium "Time Series of the Northeast Pacific: A symposium to mark the 50th anniversary of Line-P" will take place in Victoria, British Columbia, Canada from July 5-8, 2006. Abstract submission closes on **March 15, 2006** and pre-registration closes on **June 4, 2006**. For details and abstract submission lease visit:
http://www.pices.int/meetings/international_symposia/2006_symposia/Line-P/Background.aspx

2006 CMOS Congress, May 29 – June 1, 2006

The 2006 CMOS Congress will be taking place in Toronto at the Downtown Sheraton Hotel from May 29 to June 1, 2006. You can find more details about the congress, including the call for papers, at http://www_cmos2006.ca. Science sessions will highlight international research contributions to meteorology, oceanography, atmospheric chemistry and pollution, remote sensing, climate modelling, and weather and climate forecasting. Other activities of interest include an evening general-interest lecture on the theme of climate change; and outreach sessions that focus on education, on communicating our research results to the media, on policy implications, and on career opportunities for young scientists. The electronic abstract submission website of the 2006 CMOS Congress has opened. The abstract submission deadline is February 1, 2006. The early registration deadline is April 15, 2006.

ASLO Summer Meeting, Global Challenges Facing Oceanography and Limnology

The program of the ASLO meeting of June 4-9, 2006, at Victoria, British Columbia may be found at: <http://aslo.org/meetings/victoria2006/>. Sessions include:

Challenges for Understanding Climate Change

- Physical/Biological Interactions in the Tropical Pacific: Implications for Understanding Potential Effects of Climate Change
- Climate Effects on Planktonic Organisms
- Integrated Approaches to Assessing the Effects of Global Change and Other Drivers of Change on Freshwater Ecosystems

- Experimental and Theoretical Approaches to Understand the Aquatic Food Webs in a Changing Climate
- Climate Change Effects Using Experimental Approaches: What Have We Learned So Far?
- Forecasting Biogeographic Responses to Climate Change in Coastal Ecosystems
- Interactions of UV Radiation With Biotic and Abiotic Components in a Changing Environment
- Rapid Environmental Changes at High Latitudes – Evidence From Limnology, Oceanography, and Historical Sediment Records
- Aquatic Microbial Communities as Sources and Sinks of Climate-active Gases

Challenges for understanding ecosystem function and change

- Zooplankton Behavior and Sensory Perception
- The Role of Genetic Diversity in Changing Environments
- Ecosystem Functions of Large Lowland Rivers – Natural Potential and Anthropogenic Impacts
- The Changing Strait of Georgia
- Dynamics and Interchange Between Rivers and Marine Environment in Arid Zones
- Pathways Through the Plankton: An Integration of Plankton Ecology
- Challenges and Progress in the study of Phosphorus Biogeochemistry - Cycling, Bioavailability, and Stoichiometric Relationships
- Linking the Nutrient Physiology of Marine Phytoplankton to Regional and Global Biogeochemistry
- Physical Processes in the Ocean and Their Impact on the Marine Ecosystem: Combining Measurements and Models
- Application of New Sensors for the Study of Chemical Biological Processes in Marine Waters
- Importance of Terrestrial and Oceanic Nutrient Sources in Coastal Oceans: Bottom-up Energy Flow
- Crabs as Ecological Filters Working Across Aquatic-terrestrial Gradients in Marine and Freshwater Ecosystems
- Non-indigenous Aquatic Species – An Integrated Approach
- Anthropogenic Acidification of the Ocean: Implications for Marine Ecosystems, Carbon Cycling and Climate
- Consequences of Multiple Trophic Levels in Plankton Communities
- Aquatic Ecology in the Age of Dispersal: Approaches, Patterns and Challenges
- Ecology, Physiology and Molecular Biology of Cyanobacteria Along the Freshwater-marine Continuum
- Alternate States in Shallow Lakes: The Role of Climate, Water Level, Fish and Nitrogen
- Do Viruses Control Microbial Ecosystems?
- Transient Diagenesis: Reconstructing the Past and Predicting the Future

Challenges for understanding linkages among aquatic, terrestrial and atmospheric systems

- Microbial Ecology Across the Landscape
- DOC Increases in Surface Waters - Multiple Mechanisms for a Major Perturbation?
- Use of Remote Sensing to Interpret Air-land-water Interactions
- Landscape Limnology: Interactions Among Land, Water, and Humans at Multiple Spatial Scales
- Carbon Budgets in Reservoirs

- Marine and Continental Sedimentary Organic Geochemical Profiles as Records of Past Environmental Conditions
- Global Role of Inland Water Systems
- Nutrient Transformations Within and Across Ecosystem Boundaries: Analytical and Methodological Approaches
- Trace Elements and Isotopes in the Marine Environment

Challenges for achieving or maintaining healthy water

- Use of Microscopic Imaging and Flow Cytometry for Detecting and Enumerating Plankton
- The Challenge of Cyanobacterial Blooms
- Cyanobacterial Blooms and Cyanotoxins: Scaling Up from Individual to Ecosystem Level Effects
- Land-use Impacts on Water Quality: Search For Science Supporting Beneficial Management Practices for Sustainable Clean and Healthy Water
- Parasitism in a Changing World
- Assessing the Environmental Quality Status in Estuarine and Coastal Systems: Comparing Methodologies and Indices
- Environmental Reactivity of Dissolved Organic Matter

Challenges for managing aquatic resources

- Recent Advances in Fisheries Oceanography and Larval Fish Ecology
- Climate Impacts and Implications for Fish and Fisheries
- Detection and Forecasting of Harmful Algal Blooms
- Distribution of Commercially Important Fish, and Its Influence on Stock Assessment and Sustainable Harvest
- Freshwater and Marine Processes Regulating Salmon Productivity
- Conservation Challenges in Marine Pelagic Fisheries
- Applications of Remote Sensing Data in Coastal Waters
- Coral Reef Ecosystem Research and Management Objectives
- Research to Management Emerging Tools for the 21st Century

Challenges for communication, education, and outreach

- Science Education and Outreach
- An Ocean Literate Public: How Do We Overcome the Challenge of Making Ocean Science Relevant to All?
- Communication Science: Telling Your Story
- Broadening Impact by Bringing Research Into The Classroom
- Limnologists and Oceanographers with Disabilities

Emerging challenges in Oceanography and Limnology

- Human and Climate Impacts: Predicting the Future of Coastal Wetland Environments
- Ecology and Trophic Relationships of Plankton and Benthos of the Eastern Tropical Pacific
- Emerging Challenges in Cross-boundary Aquatic Research
- “Genomics” Without a Genome

The Sangster Award

The Canadian National Committee for the ICSU Committee On Data For Science And Technology (CODATA), CNC/CODATA, is accepting applications for The Sangster Award; the application deadline is March 31, 2006. This award will enable a graduate student enrolled in a Canadian university, or recent graduate (within 3 years of graduation), to attend and present his or her work at the 20th International CODATA Conference, Scientific Data and Knowledge within the Information Society, 23-25 October 2006, Beijing, China. Details of the award and the application procedure may be obtained at: <http://www.codata.org/canada/sangster>

Timothy R. Parsons Medal: Call for Nominations

It is time to send in nominations for the next Timothy R. Parsons Medal, Canada's prestigious new award for distinguished accomplishments in multidisciplinary facets of ocean sciences. The Department of Fisheries and Oceans (DFO) established the award in 2004 and the next award will be presented at the Canadian Meteorological and Oceanographic Society (CMOS) Congress in May 2006 in Toronto.

Eligible scientists are those working for Canadian institutions for the benefit of Canadian science, and the nomination can be for a lifetime's body of work or for a recent outstanding achievement. Please use the on-line form at http://www.dfo-mpo.gc.ca/science/Awards/Persons_e.htm, or send nominations to:

Timothy R. Parsons Medal Committee
Strategic Science Outreach
Rm. 8W144 - 200 Kent Street
Ottawa, Ontario, K1A 0E6
Tel: (613) 991-1021
FAX: (613) 990-5113
ssopss@dfo-mpo.gc.ca

Appel de candidatures pour la prestigieuse médaille dans le domaine des sciences de la mer

Il est maintenant temps de soumettre les candidatures pour la prochaine remise de la médaille Timothy R. Parsons, le nouveau prestigieux prix du Canada décerné aux scientifiques s'étant distingués dans un domaine multidisciplinaire lié aux sciences de la mer. Ce prix a été créé par le ministère des Pêches et des Océans (MPO) en 2004 et la prochaine médaille sera remise lors du congrès de la Société canadienne de météorologie et d'océanographie (SCMO) à Toronto en mai 2006.

Les scientifiques qui sont admissibles doivent oeuvrer au sein d'une institution canadienne dans l'intérêt de la science. Les candidatures peuvent avoir pour but de faire reconnaître l'ensemble d'une carrière ou une réalisation exceptionnelle récente. Veuillez utiliser le formulaire en ligne http://www.dfo-mpo.gc.ca/science/awards/persons_f.htm à : ou faites parvenir les candidatures à l'adresse suivante :

Comité de la médaille Timothy R. Parsons
Bureau de la promotion stratégique des sciences
200, rue Kent, bureau 8W144
Ottawa (Ontario) K1A 0E6
Téléphone : (613) 991-1021
Télécopieur : (613) 990-5113
Courriel : ssopss@dfo-mpo.gc.ca

CMOS Awards

It is time to think about nominations for oceanographers for selected CMOS awards; the deadline is February 15, 2006. See <http://www.cmos.ca/prizese.html> for details on the various awards and the “call” for nominations for this year. In some years CMOS awards, for eligible ocean scientists, have not had any nominations; e.g. the Tully Medal, and the Prize in Applied Oceanography. A list of past winners is listed on the aforementioned web site. Oceanographic nominations are also encouraged for The President's Prize. The ocean science community should consider appropriate nominations for this year. Peer recognition is very much appreciated, and a little competition for such awards is very healthy. Any such submissions should be made by the nominator, directly to CMOS; e.g. not via CNC/SCOR.

Committee on International Capacity Building for the Protection and Sustainable Use of Oceans and Coasts

The Ocean Studies Board of the US National Research Council is soliciting nominations of individuals to serve on its Committee on International Capacity Building for the Protection and Sustainable Use of Oceans and Coasts. The committee will examine current and past efforts to build the scientific, technological and institutional capacities required for countries to develop and implement effective coastal and marine resource policies. The committee will recommend ways in which the United States, working in partnership with governments, international bodies and stakeholders, can help strengthen the marine protection and management capacity of other countries. This will include recommendations on how capacity building activities can be translated into sustainable environmental and economic programs.

The committee will be comprised of 12 individuals with expertise in the following areas: ecology, oceanography, geology, environmental toxicology, environmental engineering, public policy, and coastal and ocean resource management. Some individuals may be able to fill more than one category. Nominations of non-U.S. scientists, engineers, and managers are particularly encouraged.

If you would like to nominate someone to serve on this committee, please send his/her name, institution, area of expertise, contact information, and any other comments concerning their suitability for participation no later than February 15, 2006. A nominations form may be obtained from

Jodi (Bachim) Bostrom
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Ocean Studies Board
National Research Council
National Academy of Sciences
The National Academies
500 Fifth Street, NW, Room 709
Washington, DC 20001
(202) 334-2628
(202) 334-2885 Fax
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**CANADIAN OCEAN SCIENCE NEWSLETTER
LE BULLETIN CANADIEN DES SCIENCES DE L'OCÉAN**

Previous newsletters may be found on the CNC/SCOR web site.
Les bulletins antérieurs se retrouvent sur le site web du CNC/SCOR.

Newsletter #21 will be distributed on March 16, 2006. Please send contributions to dick.stoddart@sympatico.ca
Bulletin #21 sera distribué le 16 mars 2006. Veuillez faire parvenir vos contributions à dick.stoddart@sympatico.ca

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