



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

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CMOS Edmonton Congress: Missing Abstracts?

The CMOS Congress reports “we have discovered a problem with our procedure for handling on-line abstract submissions, such that a few abstracts may not have been recorded on our web site, even if you have received an acknowledgement that it was. Since we have received almost 300 abstracts (second only to the Ottawa Congress), we do not think that this is a widespread problem. We ask therefore that you do a simple check that your abstract was recorded through a quick review of the list of abstracts (in alphabetical order by first author) at this site: <http://sumeria.eas.ualberta.ca/~cmos/>. This should take only a minute of your time. If you DO NOT SEE your abstract recorded here, then PLEASE CONTACT PAUL MYERS IMMEDIATELY, and forward your abstract to him by e-mail to pmyers@ualberta.ca. Our apologies if you receive this message more than once or for any other inconvenience that this problem may cause. Sincerely yours, Geoff Strong, Chair, CMOS Congress 2004 Science Program Committee”.

JOBS:

No contributions

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Canadian SOLAS Network

Report by Daniela Turk, neli@dal.ca

This is a brief summary of the 3rd C-SOLAS newsletter. Please contact Daniela Turk for additional details or if you wish to subscribe (free) to the C-SOLAS newsletter.

Fall cruise in the NW Atlantic. In October 2003, C-SOLAS returned from the third and final cruise in the North Atlantic. The expedition was a great success and extensive data was collected for both ocean and atmosphere scientists. The participants of the three Atlantic expeditions in the spring, summer and fall of 2003 will meet at the Atlantic workshop on May 11-12 in Montreal to discuss results and share ideas and data.

C-SOLAS Meetings. Special session on the “Response of the Upper Ocean to Mesoscale Iron Enrichment” was held at the ASLO/TOS meeting in February, Hawaii. The session was chaired by Maurice Levasseur, Atsushi Tsuda, Bill Miller, William Cochlan, and Richard Rivkin. There were ca. 30 presentations from the participants of C-SOLAS Subarctic Ecosystem experiment (SERIES) in NW Pacific in July 2002. SERIES participants will meet again at the Institute of Ocean Sciences, BC on April 1-3 to finalize plans for a special issue of *Deep Sea Research*.

The C-SOLAS Annual General Meeting is May 13-14, 2004 in Montreal. Project Leaders will present the status of their individual projects. Student’s posters session, summary reports from SERIES and Atlantic expeditions, News from the Secretariat, data issues, outreach and international collaboration will also be on the program. Peter Liss, chairman of International SOLAS, is planning to attend the meeting and present perspectives on International SOLAS and the UK SOLAS initiatives. In conjunction with the AGM there will be three other C-SOLAS meetings: the Atlantic workshop, the Science Advisory Committee, and the Board of Directors meeting. For further info for the C-SOLAS May meetings visit www.csolas.dal.ca and click on calendar and Annual General Meeting.

SOLAS Open Science Conference. The SOLAS Open Science conference will be held on October 13-16, 2004 at the Westin in Halifax. The conference web page is <http://www.uea.ac.uk/env/solas/ss04/>. The conference provides the opportunity for the presentation and discussion of the latest SOLAS results and aims to enable community building on both a national and international scale.

CFCAS award. A recent award from Canadian Foundation for Climate and Atmospheric Sciences (CFCAS) provides 50% funding for the International SOLAS Implementation group (IMP-2) dealing with Focus 2 scientific objective, “to develop quantitative understanding of processes responsible for air-sea exchange of mass, momentum and energy to permit accurate calculation of regional and global fluxes”. IMP-2, one of the three SOLAS Implementation groups, will be critical for the success of SOLAS. Its co-ordination will be co-located with C-SOLAS Secretariat.

C-SOLAS Secretariat Staff News. Bill Miller, the C-SOLAS Network project leader has moved to Georgia, US in December to take a position as the Associate Director of Marine Programs at University of Georgia Marine Institute and Director of the Marine Institute at Sapelo Island. Bill continues to have a strong involvement in C-SOLAS and the organization of the SOLAS Open Science conference. Maurice Lévassour assumed the position of C-SOLAS Project Leader in January. Daniela Turk, the Executive Director, is expecting a baby in April - Sylvie Roy, data manager/cruise coordinator, will assume her duties for the duration of Daniela's maternity leave. Caroline Rene-Alexander started in November 2003 as the new Executive assistant and editor of the Newsletter, while Leah Terry returned to her studies in the fall.

Nutrient supply to coastal waters of the NE Pacific

Report by Frank Whitney, WhitneyF@pac.dfo-mpo.gc.ca

Nutrients are supplied to the coastal waters of the eastern Subarctic Pacific in large part by upwelling, tidal mixing and river discharge. Satellite imagery shows rich phytoplankton populations across the continental shelf throughout spring and summer in this area. Coastal waters appear to be adapted to high nutrient inputs in that the ecosystem is sloppy at retaining biomass in the surface layer. In open ocean, estimates suggest that 10% of primary productivity is lost to the intermediate ocean, whereas on the continental shelf, twice the rate of phytoplankton growth (compared with open ocean) results in 5 times the sedimentation of organic material. This results in a rapid loss of nutrients from the shallow coastal ocean.

A combination of upwelling and estuarine circulation provides an effective means of returning much of this waste nutrient to the surface. Across shelf regions, the general flow throughout summer is towards land at depth and offshore at the surface. In Hecate Strait, we have observed bottom waters travel up canyons at an average speed of 6 km d⁻¹ through the summer upwelling period. As they cross the shelf, these waters become richer in nutrients and depleted in oxygen as organic detritus from surface productivity is remineralized.

In the summer of 2002, a survey through one cross-shelf canyon showed that bottom waters were enriched in phosphate by ~50%, in silicate by ~100% and in nitrate by <10% over a distance of ~200 km. We expect silicate remineralization to occur nearer bottom since it only slowly dissolves as it sinks out of the water column. However, the low production of nitrate compared to phosphate suggests that some nitrogen is being lost due to denitrification (production of N₂ rather than NO₃ by bacteria in anoxic areas).

Eventually, the cross shelf deep water flow enters inlets where it is gradually mixed with fresh riverine inputs. As deep waters freshen they become part of the surface flow towards the ocean, producing a nutrient rich surface layer. By the time the surface layer has crossed the continental shelf in summer, phytoplankton have utilized most of the available nutrients. Thus the coastal ocean forms a circular system of nutrient transport. Perhaps because nutrient is not easily lost from shelf waters, the biological community can afford to be sloppy in its feeding.

The Census of Marine Life

Ron O'Dor, Senior Scientist, rodor@coreocean.org

The Census is an international program that represents “*a growing global network of researchers in more than 50 nations engaged in a ten-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans -- past, present, and future*” (<http://www.coml.org/coml.htm>). The Census of Marine Life became a SCOR Affiliated Program in September 2002. It has sponsored SCOR Working Group 118, New Technologies for Observing Marine Life, since 1999 and sponsored a symposium at the Moscow SCOR meeting in Moscow in 2003. CoML will participate in the SCOR “summit” of major cooperative international ocean field programs in Venice in September 2004.

The major themes of the Census include what **did** live in the oceans, what **lives** in the oceans, and what **will** live in the oceans? The program drew considerable attention with the release of its Baseline Report (http://www.coml.org/baseline/Baseline_Report_101603.pdf) in October 2003 (see Globe and Mail article, Oct. 25, 2003 “*Ain't no ocean deep enough*”). The Census Draft Research Plan (http://www.coml.org/baseline/CoMLResPlan_Oct03.pdf) identifies some 14 ocean 'realms' to be explored. The Census international Scientific Steering Committee guides and coordinates efforts worldwide to maximize the return on this initiative and create a truly integrated, global census.

Canadian scientists have played a significant role in this process from the beginning. The Senior Scientist is on leave from Dalhousie University, where CephBase became one of the first of the interactive databases in the Census' Ocean Biogeographic Information System (OBIS, <http://www.iobis.org/>), the practical core of the Census. The Huntsman Marine Science Centre hosted the OBIS Secretariat. Memorial University hosted an early conference of the History of Marine Animal Populations (<http://www.hmapcoml.org/>). The Centre for Marine Biodiversity in Halifax coordinated the first meeting to form a Census National Implementation Committee in 2002, which produced *Three Oceans of Biodiversity: Development of a Science Plan for Marine Biodiversity in Canada* (Canadian Technical Report of Fisheries and Aquatic Sciences No. 2432, <http://www.phys.ocean.dal.ca/ccffr/>). Halifax also hosts the Future of Marine Animal Populations (FMAP, <http://fmap.dal.ca/>), the modeling element of the Census.

Two existing ocean realm field projects focus on Canadian waters, the Pacific Ocean Shelf Tracking (POST, <http://www.postcoml.org/>) project and the Gulf of Maine Census (GoMA, <http://www.usm.maine.edu/gulfofmaine-census/>), and Canada participated in workshop for the Arctic 'ice realm', moving quickly toward project status, to complete the 'three oceans' (<http://www.sfos.uaf.edu/research/arcdiv/>). POST uses Canadian technology to track animals

from 10 grams to 100 tons with coded acoustic tags and receiver arrays. GoMA is closely linked with the Gulf of Maine Ocean Observation System and its Gulf of Maine Biogeographic Information System integrates fisheries and physical data from the Department of Fisheries and Oceans and the National Marine Fisheries Service. Canadians also participate in the Natural Geography in Shore Areas (NaGISA), Tagging of Pacific Pelagics (TOPP) and Chemosynthetic Ecosystems (ChEss) projects. The Census' protocol for using very short DNA sequences to identify or "barcode" (<http://www.barcodinglife.com/>) marine species originated in Canada.

The Census expects to invest a billion dollars in exploration, research and digital infrastructure by 2010 and to be a major contributor to the Global Marine Assessment recently called for by the UN General Assembly. Census technology should contribute substantially to the development of the biological aspects of the Global Ocean Observing System. Current global commitments approach \$100 million, and we hope that Canada and SCOR will continue as major supporters.

Landfast Ice Movement

Contact: Chris Elmer, chriselmer@fsmail.net

Arctic drilling is a challenging affair, and when drilling is undertaken from landfast ice in coastal areas, ice movement becomes a potentially important operational variable. Devon Canada Corporation recently asked B. Wright & Associates of Calgary, Alberta to investigate landfast ice movements in its Beaufort Sea lease areas. As part of the ensuing study, ASL Environmental Sciences of Sidney, B.C. was contracted to provide a number of GPS/Argos ice beacons for on-ice deployment as well as an analysis of the resultant data.

These data showed evidence of ice movements with amplitudes as large as a few meters and sometimes more. Comparison with data acquired from both satellite imagery and ASL Ice Profilers deployed further offshore in the mobile pack ice zone showed close relationships between landfast ice displacements and large-scale movements of the pack ice in the Beaufort Sea. Recognition of these relationships may lead to future capabilities for prediction of landfast ice movement, as an important input to on-ice operations. For more information about ASL see www.aslenv.com

ASL Provides Lease Instruments for Canoe-Borne Oceanography

Contact: Chris Elmer, chriselmer@fsmail.net

ASL Environmental Sciences of Sidney, BC Canada, operator of Canada's largest oceanographic instrument leasing pool is used to unusual situations, but came across a new one with a recent request for a number of instruments from Interives Ltee., a company engaged in met-ocean studies based in Laval, Quebec.

Jean-Pierre Savard of Interives needed a range of instruments (CTD, wave and current profilers, tide gauge and a weather station) for gathering data to be used for harbor development in several Inuit villages on Hudson Bay and Ungava Bay in Northern Quebec. While this was not unusual, the deployment method certainly was. This part of the world has few if any marine charts and

the only safe way of deploying this equipment is from a canoe! Jean-Pierre, long used to this environment, has developed a number of techniques for instrument deployment from a canoe, and has been successfully doing so for many years. For this project, ASL is processing the data as well as providing the instrumentation from its lease pool.

New SCOR Working Groups

Information on recent new SCOR Working Groups established has now been posted on the international SCOR web site at: <http://www.jhu.edu/~scor/wkgroups.htm> Highlights include:

IAPSO/SCOR WG 121 on Ocean Mixing; Chair: Robin Muench (USA); Full Member from Canada, Chris Garrett; Associate Member from Canada, Barry Ruddick; Terms of Reference:

- Summarize past results, including analyses of historical field data, concerning the sources for, and geographical distribution of, mixing in the deep-ocean basins. In light of recent results, tidally driven mixing mechanisms will be emphasized.
- Assess, within the established observational and theoretical context, those difficulties involved with parameterization of mixing in numerical ocean GCMs.
- Assess what more should be done by further observational programs or improved observational techniques to fill gaps in understanding essential to provide useful information for modeling the effects of deep-ocean mixing, including the potential to detect deep-ocean mixing through remote sensing and tracer techniques.
- Produce a comprehensive, published final report incorporating appropriate results from the above topics.

SCOR/LOICZ/IAPSO WG 122 on Mechanisms of Sediment Retention in Estuaries; Co-Chair: Björn Kjerfve (USA), Co-Chair: Gerardo Perillo (Argentina); Associate Member from Canada, Ray Cranston; Terms of Reference:

- Collect and analyze global data on sediment retention in estuaries versus export to the coastal ocean, based on climate, hydrologic, physical, geological, chemical, and biological, and human processes, and including estuarine systems of different types, from tropical to subpolar.
- Evaluate available models of estuarine sediment retention.
- Identify research, observation (including standard measurement procedures), and modeling activities needed to improve predictions of sediment retention in estuaries.
- Conduct the above three TORs through WG meetings and an international workshop of interested scientists.
- Document the work of the WG and the workshop through a Web-based database of river/estuary sediment characteristics and trapping efficiencies, a special issue of a peer-reviewed journal, and a short article written for research managers and policymakers.

SCOR/IMAGES WG 123 on Reconstruction of Past Ocean Circulation (PACE); Chair: Jean Lynch-Stieglitz (USA); Vice-Chair: Catherine Kissel (France); Associate Member from Canada, Andrew Weaver; Terms of Reference:

- Assess the existing paleoceanographic methods for reconstructing the history of ocean circulation over the past 120,000 years. Are the existing methods sufficient for a robust reconstruction of past ocean circulation? Are existing chronological tools sufficient to reconstruct distinct ocean circulation states? If not, what developments are necessary?
- Assess the available paleoceanographic data for reconstructing the history of ocean circulation over the past 120,000 years. Can robust conclusions on past ocean circulation be drawn from existing data? For what time periods and locations?
- Develop recommendations for future approaches to quantitatively assess the hypothesised changes in ocean circulation over the same time scale.
- Identify a minimum array of global locations and data types that would help to constrain uncertainties concerning changes in ocean circulation linked to major climate changes, bearing in mind the potential for collecting appropriate geological material as well as the size of the expected circulation signal relative to uncertainties in the methods. Through international co-operation within the IMAGES and ODP, existing cores would be identified and plans for new coring to meet these objectives would be discussed.

SCOR/IMAGES WG 124 on Analyzing the Links Between Present Oceanic Processes and Paleo-Records (LINKS); Co-Chairs: Karin Lochte (Germany) and Marie-Alexandrine Sicre (France); No Members from Canada; Terms of Reference:

- Use the new insights gained from contemporary ocean biogeochemical studies to identify or refine our understanding of key oceanic processes and develop or improve proxies for these processes for subsequent use in paleoceanographic studies.
- Refine established proxies, provide mechanistic understanding and foster the development of new proxies within integrated multidisciplinary process studies in the modern ocean.
- Use proxy evidence from the sedimentary records to test hypotheses of the oceanic response to climate change.

Arctic and Subarctic Oceans Variability. Session at the 2004 EGU General Assembly, April 25-30, Nice, France. Contacts: Jean-Claude Gascard, gascard@lodyc.jussieu.fr, Igor Yashayaev, yashayaevi@mar.dfo-mpo.gc.ca, Wieslaw Maslowski, maslowsk@nps.navy.mil

The 2004 EGU session OS9 will deal with the observed and modelled variability of the Arctic Ocean, the Nordic Seas and the subpolar basins. The session will include experts in polar and subpolar oceanography and climate studies in 40 presentations contributing to OS9.

The oral section (**Wednesday, April 28**) of the OS9 session is split into three blocks. Following the session introduction, the first oral block will be dedicated to the Arctic Ocean. The second oral block will be dedicated to the Nordic Seas and exchanges with the Arctic Ocean and the North Atlantic and the third to the subpolar basins of the North Atlantic and Pacific Oceans, followed by concluding remarks.

Main discussions are expected during the OS9 poster section scheduled on **Thursday, April 29** (the day following the OS9 oral session). The posters will extend and complement practically all themes brought in during the oral presentations and in particular:

1. The exchanges (fluxes) of mass, heat and salt (fresh water) between the Arctic, the Nordic Seas and the North Atlantic.
2. The role of the Arctic and subarctic oceans in the global thermohaline circulation at long time scales (decadal to centennial) and the changes in the ocean heat and fresh water budget.
3. The long term Pan-Arctic variability from a perspective of the large scale atmospheric weather patterns.
4. New definitions and methods of monitoring of marine environmental changes in the Arctic and subarctic regions.

To stimulate productive discussions at the 2004 EGU General Assembly, climate scientists and oceanographers interested and involved in polar and subpolar research, are kindly invited to participate and to exchange ideas during OS9 oral and poster presentations and other related polar research sessions. We are thankful to the EGU planning committee for proposing an attractive schedule, especially concerning sessions dealing with polar research, including OS9, OS8 and CL5.

We hope that the session on the Arctic and Subarctic Oceans Variability will become a valuable complement to ongoing arctic research activities (e.g. ASOF, SEARCH...) aimed at better understanding of the ocean circulation and climate change in Arctic and subarctic regions.

The Timothy R. Parsons Medal

The Department of Fisheries and Oceans (DFO) has established an award aimed at recognizing excellence in Canadian ocean sciences. The Timothy R. Parsons medal will be awarded to residents of Canada for distinguished accomplishments in multidisciplinary facets of ocean sciences either during their lifetime or for a recent outstanding achievement.

The first award will be presented to Dr. Timothy R. Parsons at the Canadian Meteorological and Oceanographic Society (CMOS) Congress in June 2004 in Edmonton. Subsequent awards will be presented each year at the CMOS Congress provided the selection committee has identified a worthy recipient.

The award is being named in honour of Dr. Tim Parsons. Dr. Parsons has had a distinguished career in Canadian and international oceanography. Presently he is a Professor Emeritus at the University of British Columbia and an Honorary Research Scientist at the Institute of Ocean Sciences in Sidney, British Columbia. His lifetime work has been to establish a new ecosystem approach for the management of fisheries using oceanographic information.

Throughout his research career, Dr. Parsons has devoted himself to obtaining a holistic understanding of ecology, and in particular understanding how pelagic organisms are interconnected in the oceanic food-web. He has made major contributions to the development of Biological Oceanography and is personally responsible for many of the standard analysis methods used in his field. Dr. Parsons' goal has been to present an alternative method for the management of fisheries based on the measurement of dynamic relationships between fish and their physical, chemical and biological backgrounds.

Dr. Parsons has always been disturbed about the independent development of fisheries science and of oceanography, with very little exchange between the two disciplines. In most countries of the world oceanography and fisheries research are funded independently of each other and Dr. Parsons has repeatedly pointed out how the ever-changing environment of the oceans impacts the fisheries. Tim was also the founding editor of the journal "Fisheries Oceanography"

Dr. Parsons has also worked to encourage a holistic approach to the evaluation of human impacts on the environment using his experience in biological oceanography. As such he has contributed to understanding the impacts of the construction of the Aswan High Dam, the impacts of large oil spills and has advised industry on countless occasions. On April 27th, 2001, Dr Tim Parsons was the recipient of the 17th Japan Prize, awarded by the Emperor of Japan.

A.G. Huntsman Award 2003

The A.G. Huntsman Foundation is pleased to announce that the winner of the 2003 A.G. Huntsman Award is Dr. Lynne D. Talley, Professor at the Scripps Institution of Oceanography in La Jolla, California. The award was presented by Dr. Garry Rempel of the Royal Society of Canada at a special ceremony at the Bedford Institute of Oceanography on Wednesday, 5 November 2003. Dr. Talley is honoured for her outstanding contributions to the understanding of the circulation and ventilation of the global ocean. Throughout her career, she has illuminated the overturning circulation of the oceans through her assembly and synthesis of large datasets. In addition, she has published significant analytical studies of oceanic processes such as barotropic instabilities, ventilated thermocline theory, and mixing and convection. She has led oceanographic expeditions in all of the major ocean basins other than the Arctic and has chaired national and international scientific steering committees for major ocean climate programs such as the World Ocean Circulation Experiment.

Announce du Lauréat, Prix A.G. Huntsman 2003

La Fondation A.G. Huntsman est heureuse d'annoncer que le lauréat du Prix A.G. Huntsman en 2003 est Lynne Talley, professeur à l'institut Scripps d'océanographie, à La Jolla, Californie. Le prix a été remis par Dr. Garry Rempel, de la Société royale du Canada, lors d'une cérémonie spéciale tenue à l'institut océanographique de Bedford, à Dartmouth (Nouvelle-Écosse), le mercredi 5 novembre 2003. Dr. Talley est honorée pour ses contributions exceptionnelles à la compréhension de la circulation et de la ventilation de l'océan global. Pendant sa carrière, elle a rassemblé et synthétisé de grandes bases de données pour jeter un éclairage nouveau sur la

circulation thermohaline des océans. De plus, elle a publié des analyses importantes de processus océaniques tel que les instabilités barotropiques, la théorie de la ventilation de la thermocline, et le mélange et la convection. Elle a mené des expéditions océanographiques dans tous les principaux bassins océaniques autres que l'Arctique, et elle a dirigé les comités scientifiques directeurs de programme majeurs sur le climat océanique, tel que le World Ocean Circulation Experiment. Elle a reçu le prix Rosenstiel en 2001 et une bourse pour les jeunes chercheurs de la U.S. National Science Foundation en 1987, et elle est membre de l'American Academy of Arts and Sciences.

A.G. Huntsman Awards, Call for Nominations – Silver Jubilee

The **A.G. Huntsman Award** was created in 1980 to recognize excellence in marine sciences. To mark its **25th Anniversary**, a 2-day jubilee is planned for the fall of 2005, hosted by the Bedford Institute of Oceanography and Dalhousie University. Awards will be presented in each of the following categories:

- Biological/Fisheries Oceanography
- Marine Geosciences
- Physical/Chemical Oceanography
- Interdisciplinary Marine Science

The latter category is intended to recognize exceptional contributions across two or more marine science disciplines, at the interface between the oceans and other natural systems, or in the expansion of marine sciences into new fields.

Nominations for outstanding individuals in the above categories are encouraged. The deadline for their receipt is **30 June 2004**. More information on the Huntsman Award and on the nomination procedure can be found on the Huntsman website at <http://www.bio.gc.ca/huntsman/huntsman-e.html>. For further information, please contact John Loder (Chair, Huntsman Selection Committee) at loderj@mar.dfo-mpo.gc.ca.

Prix A.G. Huntsman, Appel de Candidatures – 25^{ème} Anniversaire

Le prix A.G. Huntsman a été créé en 1980 pour reconnaître l'excellence dans les sciences marines. Une présentation spéciale de deux jours est planifiée pour l'automne 2005 pour souligner le 25^{ème} anniversaire de la médaille Huntsman. Tenue par l'institut océanographique de Bedford et l'université Dalhousie, cette cérémonie verra la présentation de médailles dans chacune des catégories suivantes:

- géosciences marines
- océanographie physique et chimique
- océanographie biologique et des pêches
- interdisciplinaire en sciences de la mer

L'intention de cette dernière catégorie est de reconnaître les contributions exceptionnelles qui chevauchent deux disciplines ou plus, qui se situent à l'interface entre les océans et d'autres systèmes naturels, ou qui ont mené à l'expansion des sciences de la mer dans de nouveaux domaines de recherche.

Vous êtes encouragés à soumettre des candidatures pour des individus exceptionnels dans les catégories décrites plus haut. La date limite pour recevoir les candidatures est **le 30 juin 2004**. Consultez le site web Huntsman à <http://www.bio.gc.ca/huntsman/huntsman-f.html> pour plus d'information sur la médaille Huntsman et sur les procédures de mise en candidature. Pour d'autres informations, veuillez contacter John Loder (Président, Comité de Sélection Huntsman) à loderj@mar.dfo-mpo.gc.ca.

ACZISC COASTAL UPDATE - MARCH 2004 & APRIL 2004

The ACZISC Update for March 2004 is now available. This and previous Updates are available at <http://www.dal.ca/aczisc/new>. The March issue contains contributions on: upcoming ACZISC meetings; watershed management on PEI: it's where we live; Geomatics Atlantic 2004; 23rd Annual Submerged Lands Management Conference; using topographic LIDAR to map flood risk from storm-surge events; C-CIARN workshop reports; Marine Cadastre Issues: workshop report; addressing the depletion of the Atlantic salmon in Maine; a paper on frameworks and indicators for assessing progress in integrated coastal management initiatives; public consultations: Species at Risk Act; climate change leading to the decline of fish stocks; a geospatial framework for the US coastal zone; lingering oil injury from the Exxon Valdez; CoPraNet: the EU coastal practice network; draft US National Coastal Condition Report II; marine protected areas technology needs assessment in the USA; upcoming deadlines and upcoming conferences and other events.

The ACZISC April 2004 Update is also now available at the site indicated above.

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.

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