

# LIGHTHOUSE

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REVUE DE L'ASSOCIATION CANADIENNE D'HYDROGRAPHIE

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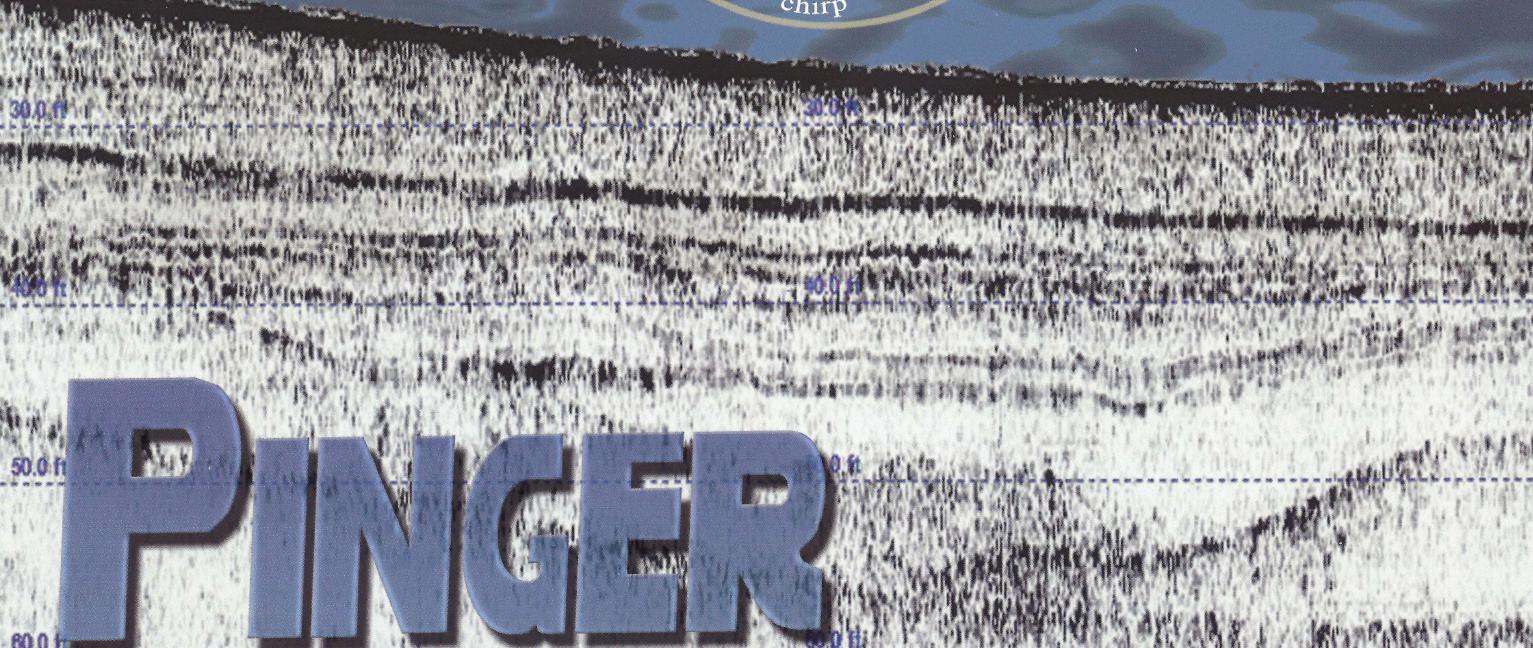
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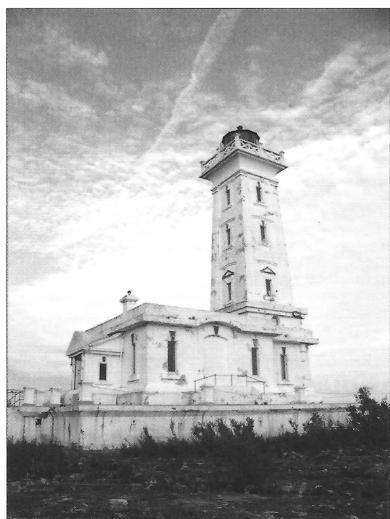
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## Point Abino

Photograph courtesy of Paul Kassay/Rick Doan, residents of Niagara Region, Canada. To see more of Paul Kassay's photographs go to: <http://www.redbubble.com/people/paulkassay>. Contact Rick Doan at [rdoan5@cogeco.ca](mailto:rdoan5@cogeco.ca)

### Point Abino Lighthouse

The Point Abino Lighthouse is located at the eastern end and on the rocky northern shore of Lake Erie. The lighthouse marks the shoals off Point Abino, an area that has claimed many ships in the past. Its construction in 1917/18 replaced what had been a series of manned Light Vessels, one which sank with a crew of six on board November 10, 1913 during 'The Great Storm of 1913'.

The Lighthouse was operational from 1918 to 1995, when it was eventually declared surplus. It sat neglected for several years, slowly deteriorating but still surviving what Lake Erie could throw at it.

Built in a Classical Revival style and housing a 3rd order Fresnel lens, the lighthouse is rather unique. Since 1995, it has had several designations: as a 'Classified' Heritage Building; a National Historic Site of Canada in 1998 [Search for 'Point Abino' at [www.historicplaces.ca](http://www.historicplaces.ca)]; and as a Classified Federal Building.

The Town of Fort Erie acquired the lighthouse from Public Works Canada in 2003. Since then by various groups have been trying to save/restore the lighthouse and grounds to their former glory. In 2011, an extensive restoration project for the lighthouse was begun.

Visits to the site are limited to summer and to certain hours and modes of transportation. Visit the Point Abino Lighthouse Preservation Society at [www.palps.ca](http://www.palps.ca) for details about the Point Abino Lighthouse.

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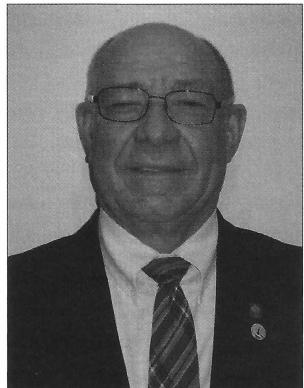
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# Message from the National President

## Mot du Président national



Since my last message, I have been extremely busy with affairs of the Canadian Hydrographic Association.

In the absence of a *Lighthouse* Editor, I have taken on the task of assisting our Layout Editor, Jim Weedon, in the preparation of this special issue, our Conference Edition. Once again, I must extend on behalf of all of us, our sincere thanks to the *Lighthouse* committee for their sterling efforts in the production of our journal, of which we are justly proud. It is no mean feat and it's only possible by the dedication and cooperation of all members of the committee. As you should all be aware by now, we are looking for a New Editor – folks, the line forms on the right. Step up please!

As president of the Host Organization for CHC 2012 – Our International Hydrographic Conference, I have also been busy with matters pertaining to the preparation of this bi-annual event. I would like to express our sincere gratitude to the Canadian Hydrographic Service (CHS), in particular to the Management and Staff of their Central and Arctic Region, for their sustained support of the organizing committee.

We also continue to foster our close relations with The Hydrographic Society of America (THSOA) and are happy to profile in this edition the bridge between their current administration and their past Executive. Thank you Pat and Jack. (Jack, by the way, is a long standing CHA Member and a tremendous supporter of our organization.)

Recently I have represented the CHA in Ottawa at the AGM of the Association of Ontario Land Surveyors (AOLS) and by the time you read this, will have as part of our international activities, attended the Annual World Bank Conference on Land and Poverty at the World Bank Headquarters in Washington DC, as well as headed the CIG delegation to the International Federation of Surveyors (FIG) Working Week in Rome, Italy.

As many of you may be aware, the CHA has had a long and mutually beneficial relationship with the Canadian Institute of Geomatics, (CIG) which nationally and internationally represent and promotes Canadian interests in Geomatics. Through our MOU we Chair their Hydrography committee, are represented at Council by the Technical Councillor for Hydrography, have provided the last two Chairs of the FIG Commission 4-Hydrography and are represented on their Certification Committee, with respect to the Certification of Hydrographers. This latter issue remains extremely sensitive and progress remains very slow. Recent discussions between the CIG, CHA and ACLS (The Association of Canada Lands Surveyors) were held with a view to moving this forward, but my personal belief is that to make real progress, we must have the full participation of the Dominion Hydrographer, representing the Canadian Hydrographic Service. To continue to foster our relationship with the CIG, we are introducing in this issue a new feature – CIG News.

Our National Student Award program continues to attract extremely well-qualified applicants from an ever widening list of Post Secondary Institutions and this year is no exception.

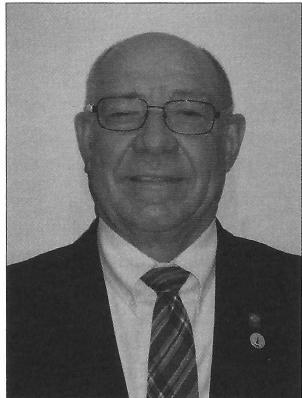
Finally, allow me to extend a personal invitation for you to attend our Annual General Meeting (AGM), which this year will take place during the CHS 2012 Conference – Wednesday, May 16, 2012 - Room 203 Scotiabank Convention Centre, 1200-1330 hours. Lunch will be served.

ALL ARE WELCOME! Welcome to Niagara Falls, Ontario, Canada – ENJOY!!!

George McFarlane, National President - CHA

# Message from the National President

## Mot du Président national



Depuis mon dernier message, j'ai été extrêmement occupé par les activités de l'Association canadienne d'hydrographie.

En l'absence d'un rédacteur en chef, j'ai pris l'engagement d'assister Jim Weedon pour la mise en page dans la préparation de notre édition spéciale pour la Conférence. Encore une fois au nom de nous tous, je remercie sincèrement le comité du Lighthouse pour ses efforts remarquables dans la production de notre journal, dont nous sommes fiers à juste titre. Ce n'est pas une mince affaire et il est seulement possible grâce au dévouement et à la coopération de tous les membres du comité. Vous devez vous douter que maintenant, nous sommes à la recherche d'un nouveau rédacteur en chef – qu'un volontaire se lève s'il vous plaît!

En tant que président de l'organisme d'accueil de la CHC 2012 - notre Conférence hydrographique internationale, j'ai également été très occupé par les affaires relatives à la préparation de cet événement biennuel. Je tiens à exprimer ma sincère gratitude au Service hydrographique du Canada (SHC), en particulier à la direction et au personnel de la Région centrale et de l'Arctique, pour leur appui soutenu au comité organisateur.

Nous continuons également à promouvoir nos relations étroites avec la Société hydrographique d'Amérique (THSOA) et nous sommes heureux de faire le pont dans cette édition entre leur administration actuelle et précédente. Merci à Pat et Jack. (Jack, en passant, est un membre de longue date de l'ACH et un formidable partisan de notre organisation.) Récemment, j'ai représenté l'ACH à Ottawa lors de l'AGA de l'Association des arpenteurs-géomètres de l'Ontario (AAO) et lorsque vous lirez ces lignes, j'aurai assisté, dans le cadre de nos activités internationales, à l'Annual World Bank Conference on Land and Poverty au siège social de la Banque mondiale à Washington DC, et aussi aurai présidé la délégation de l'ACSG à la Semaine de Travail de la Fédération internationale des géomètres (FIG) à Rome, Italie.

Comme plusieurs d'entre vous le savez déjà, l'ACH entretient depuis longtemps une relation mutuellement bénéfique avec l'Association canadienne des sciences géomatiques (ACSG), en représentant et en promouvant les intérêts canadiens en géomatique à l'échelle nationale et internationale. Grâce à notre protocole d'entente, nous prédisons leur comité d'hydrographie, nous sommes représentés au Conseil par le conseiller technique en hydrographie, nous avons fourni les deux derniers présidents de la FIG Commission 4-Hydrographie et nous sommes représentés sur leur comité de certification, quant la certification des hydrographes. Cette dernière question est extrêmement délicate et la progression est très lente. Des discussions récentes entre l'ACSG, l'ACH et AATC (Association des arpenteurs des terres du Canada) ont eu lieu afin de faire avancer ce dossier, mais ma conviction personnelle est que, pour faire de réels progrès, nous devons avoir la pleine participation de la directrice nationale du Service hydrographique du Canada. Pour continuer à favoriser notre relation avec l'ACSG, nous introduisons une nouvelle chronique dans ce numéro - Nouvelles de l'ACSG.

Notre programme national de bourse d'études continue d'attirer des candidats hautement qualifiés qui proviennent d'une liste toujours croissante d'établissements postsecondaires et cette année ne fait pas exception.

Enfin, permettez-moi de vous inviter à assister à notre assemblée générale annuelle (AGA), qui aura lieu cette année pendant la CHC2012 à la Salle 203 du Centre des congrès de la Banque Scotia – le mercredi 16 mai 2012 entre 12 h et 13 h 30. Un dîner sera servi.

**Bienvenue à tous!** Bienvenue à Niagara Falls, Ontario, Canada – **Passez un bon moment!!!**

George McFarlane, président national - ACH



Old Challenges,  
New Approaches

Vieux défis,  
nouvelles approches

May 15-17, 2012

Canadian Hydrographic Conference • Conférence hydrographique du Canada



## Welcome to CHC 2012

The Canadian Hydrographic Association is pleased to welcome you to the 2012 Canadian Hydrographic Conference, in Niagara Falls, Canada. The theme of this year's conference is "The Arctic – Old Challenges, New Approaches".

CHC 2012 will explore new approaches to the challenges of Arctic hydrography. Innovative ideas from industry, academia and national hydrographic offices, exploring different ways of utilizing existing technology and examining new and emerging technologies.

Climate change in the Arctic has resulted in reduced ice coverage and, consequently on the marine front, an extension of the shipping season. This has led to increased marine activity, not only in commercial deep draught shipping but also eco-tourism cruises. Increased

accessibility has also resulted in additional pressure to develop and exploit the Arctic's natural resources. Experts project that climate change will remain on course and marine traffic will experience exponential growth in the region.

Short Arctic summers, combined with immense geographic areas challenge traditional surveying methods that may not keep pace with the needs of shipping and resource development. Accordingly, this Canadian Hydrographic Conference will focus on innovation of hydrographic tools and methodologies to allow the hydrographic community to provide mariners with safe passage through the Arctic. Technical sessions, poster presentations and workshops will further allow for an exchange of ideas from all participants.

# Letter from THSOA President

By: Pat Sanders, President, The Hydrographic Society of America (THSOA)

On behalf of The Hydrographic Society of America, I would like to congratulate all those involved in organizing CHC 2012. For those of you who have never experienced the fun of dealing with hotels, caterers, exhibits, and attendees from multiple nations, I'd be happy to share with you some of the pitfalls that can happen.

- I remember a HYPACK Training Seminar where the main ballroom was sub-divided so that we shared it with a Polish music association. Attendees were serenaded with eight hours of continuous polka music while I tried to explain datum transformations....
- There was another conference where the attendees (not the organizers) kept asking the caterer to bring in more shrimp cocktail trays (at \$250 each).... and the caterer brought them. Four of them.....and guess who got the bill!
- In Las Vegas, at the end of the day, the hotel informed me that my 200 attendees drank 1,400 cans of soda (at \$2.50/can). Now, I know a couple of you really like your Diet Coke, but it's kind of hard to believe that everybody averaged 7 cans of soda. Well, I couldn't prove them wrong, and they had some REALLY big guys explaining my bill to me. That's the day I learned to count cans.....

- Exhibitors who reserve booth space, and then cancel the day before.....and then ask for a full refund.
- Guests who don't register for the conference and only want to 'Pop into the exhibit hall for a few minutes'. They then spend the next two days eating for free.

So, give a 'pat on the back' to the organizers and a word or two of thanks.....and offer to help on CHC 2014!

THSOA has just selected the Sheraton New Orleans to host our US HYDRO 2013 conference. We'll have training sessions beginning on Monday, 25 March 2013 along with technical sessions and exhibits from Tuesday 26 March 2013 thru Thursday 28 March 2013. We hope that you will consider making the trip!

Our best regards to all our friends,

Pat Sanders  
President  
The Hydrographic Society of America

## CALENDAR OF EVENTS

- Global Geospatial Conference, Québec City, Québec, May 15-17, 2012
- ACLS 8th National Surveyors Conference, Regina, Saskatchewan, Canada June 6-8, 2012 ([www.acls-aatc.ca/en/node/69](http://www.acls-aatc.ca/en/node/69))
- United Nations World Hydrography Day - June 21, 2012
- CARIS International Users Conference, Vancouver, Canada, June 25-28, 2012 ([www.caris.com/caris2012](http://www.caris.com/caris2012))
- XXII Congress of the International Society of Photogrammetry and Remote Sensing, Melbourne, Australia, August 25 - September 1, 2012 ([www.isprs2012.org](http://www.isprs2012.org))
- HYDRO '12 The Netherlands, November 13-15, 2012
- 8th FIG Regional Conference, Montevideo, Uruguay, November 26-29, 2012
- US HYDRO 2013 New Orleans, Louisiana, March 25-28, 2013 ([www.thsoa.org](http://www.thsoa.org))
- CIG-ISPRS Earth Observation on Global Change Conference - EOGC 2013, Toronto, Canada, May 15-17, 2013



The Canadian Institute of Geomatics (CIG) under the new direction of the President Mr Anthony Sani from *Sani International Technology Advisors Inc.* and *Spatial Geo-Link Ltd.*, is in the process of revitalising CIG Branches throughout Canada with particular emphasis on reaching out to Young Professionals. Through Branch activities, CIG has been a great supporter of GIS Days for several years now. CIG was present at both Toronto 2011 GIS Day events at York University and The University of Waterloo where Mr. Sani gave a speech to the students. CIG was also present at the Ottawa University GIS Day where the CIG booth was set up and Student Memberships were awarded as part of the day's activities.

CIG administers a number of Scholarship and Award programs that are oriented towards promoting the field of Geomatics and supporting college and university students enrolled in Geomatics related programs. One of such is The Hans Klinkenberg Memorial Scholarship which provides scholarships to students in the Geomatics sciences at technical institutes and community colleges in Canada. A list of awards can be found on the CIG website at <http://www.cig-acsg.ca/english/scholarship/main.php>.

On the international front, CIG is the Canadian association that represents the interests of all groups in the geomatics community and is the Canadian member to the International Federation of Surveyors (FIG), the International Society of Photogrammetry and remote Sensing (ISPRS) which presents the CIG Samuel Gamble Award, and the International Cartographic Association (ICA).

Having a Memorandum of understanding with the Canadian Hydrography Association (CHA) since 1997, both Associations were given a great opportunity to collaborate. A Joint CIG-CHA Hydrography Committee,

Chaired by Wendy Woodford, was created and it is working very well. One of these great opportunities in collaboration is an early Spring 2012 visit to the University of Calgary's hydrography class where the 33 graduating students will have a guest lecturer sponsored by both CIG and CHA. The goal of the lecture is to promote World Hydrography Day and for the students to learn about real-world experiences and the profession. In addition, the Hydrography Committee has developed a bilingual brochure promoting hydrography. This was first distributed during USHydro 2011 and has since been distributed at several other events, to businesses and to students. The Hydrography Committee will be present at the CHA booth at CHC 2012 in Niagara Falls.

CIG is supporting two conferences this year. The 2012 Canadian Hydrographic Conference, *Old Challenges, New Approches*, held May 15-17, 2012 at the Scotiabank Convention Centre, Niagara Falls, Ontario. As well as The Global Geospatial Conference 2012, held May 14 – 17, 2012, Québec City, Québec, where CIG's President will be one of the Keynote Speakers.

For those who are still unaware, we are extremely pleased to inform you that *Geomatica* is online and remains the official quarterly publication of CIG. It is the oldest surveying and mapping publication in Canada and was first published in 1922 as the Journal of the Dominion Land Surveyors' Association. *Geomatica* is dedicated to the dissemination of information on technical advances in the geomatics sciences. The internationally respected publication contains special features, notices of conferences, calendar of events, articles on personalities, review of current books, industry news and new products, all of which keep the publication lively and informative. It provides a useful mix of practical, professional, and academic articles with opinions and information from Canada and abroad.



# COMPETE FOR THE FUTURE

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- Over 100 years of technology change, combining the tradition of frontier mapping and surveying, with technology frontiers and revolutions which transform society
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- Use Career development opportunities and student networks
- Certification for professional and technical specialist
- Receive *Geomatica*, a quarterly world class scientific journal
- Significant discounts on registration fees at conferences, symposia, seminars and other events sponsored by CIG
- An opportunity to take advantage of the home and automobile insurance program offered by TD Insurance and the professional group insurance plan offered by Manulife Financial

**Full Member:** Individuals involved in the practice of geomatics or interested in the development and advancement of geomatics and associated sciences.

**Student Member:** Individuals enrolled as a full-time student in a geomatics related program at a recognized university, community college or technical institution. Proof of student status is required.

**Sustaining Member:** **PLATINUM** - anyone      **GOLD** - corporations/governments      **SILVER** - educational institutions or associations. Advantages include multiple individual memberships, advertising discounts, booth rental rate discounts and a list in each issue of **GEOMATICA**

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( ) Surveying	
( ) Remote Sensing	
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(Lighthouse-20120314)



L'Association canadienne des sciences géomatiques (ACSG), sous la direction du nouveau président M. Anthony Sani, de *Sani International Technology Advisors Inc.* et *Spatial Geo-Link Ltd.*, travail sur la revitalisation des Sections de l'ACSG à travers le Canada, avec un accent tout particulier sur un service d'approche auprès des jeunes professionnels. Depuis plusieurs années et grâce aux activités des Sections, l'ACSG a été un grand partisan des Journées SIG. L'ACSG était présente aux événements de la Journée SIG 2011 des Universités de York et Waterloo située dans la région de Toronto, où M. Sani a prononcé un discours auprès des étudiants. En plus, l'ACSG avec son kiosque, était également présente lors de la Journée SIG 2011 de l'Université d'Ottawa ou dans le cadre des activités de la journée, des adhésions de membre étudiant ont été attribués.

L'ACSG gère un certain nombre de programmes de bourses d'études et de prix qui sont conçus pour promouvoir le domaine de la géomatique et pour soutenir des étudiants aux niveaux collégial et universitaire inscrits dans des programmes d'études apparentés à la géomatique. Un de ceux-ci est la bourse commémorative Hans Klinkenberg qui prévoit des bourses d'études aux étudiants en sciences géomatiques aux établissements techniques et aux collèges communautaires du Canada. La liste se retrouve sur le site Web au ACSG au <http://www.cig-acsg.ca/francais/bourses/info-programme.php>

Sur le plan international, ACSG est l'association canadienne qui représente les intérêts de tous les groupes de la communauté géomatique et est le membre canadien de la Fédération internationale des géomètres (FIG), la Société internationale de photogrammétrie et de télédétection (SIPT) qui octroie le prix Samuel Gamble de l'ACSG, et l'Association cartographique internationale (ACI).

Avoir un protocole d'entente depuis 1997 avec l'Association canadienne d'hydrographie (ACH), a fourni aux deux associations une excellente occasion de collaborer. Un comité d'hydrographie mixte ACSG-ACH, présidé par Wendy Woodford, a été créé et celui-ci fonctionne très bien. L'une de ces grandes opportunités de collaboration

se tiendra au début du printemps 2012. Celle-ci consistera d'une visite auprès de la classe d'hydrographie de l'Université de Calgary, où les 33 étudiants diplômés auront un conférencier invité parrainé par l'ACSG et l'ACH. L'objectif de cette visite est de promouvoir la Journée mondiale de l'hydrographie et pour les étudiants d'en apprendre davantage sur les expériences du monde réel et de la profession. En plus, le Comité hydrographie a développé un pamphlet bilingue pour promouvoir l'hydrographie. Ce pamphlet fut d'abord distribué au cours du USHydro 2011 et a depuis été distribué à plusieurs autres événements, aux entreprises et aux étudiants. Le Comité d'hydrographie sera présent au kiosque de l'ACH lors de la conférence CHC 2012.

L'ACSG apporte son soutien à deux conférences pour l'année 2012. La conférence hydrographique du Canada CHC2012, *Vieux défis, nouvelles Approches*, qui se tiendra du 15 au 17 mai, 2012 au Centre de conférence Scotiabank, des Chutes du Niagara, en Ontario. Ainsi qu'au Congrès géospatial international 2012 qui se tiendra du 14 au 17 mai 2012 à Québec, Québec, où le président de l'ACSG sera l'un des conférenciers invités.

Pour ceux qui ne le savent toujours pas, nous sommes extrêmement heureux de vous informer que *Geomatica* est en ligne. Elle continue à être la publication officielle trimestrielle de l'ACSG. Elle est la plus vieille revue de levés et de cartographie au Canada. Sa première parution date de 1922 alors qu'elle était appelée le « Journal of the Dominion Land Surveyors' Association ». *Geomatica* est dédiée à la diffusion de l'information sur l'avancement technologique dans le domaine de la géomatique. Cette publication de renommée internationale contient des chroniques telles que des avis de conférence, un calendrier des événements, des articles sur des personnalités du domaine, des critiques de livres et de nouveaux produits et des nouvelles de l'industrie qui contribuent toutes à animer la revue. Elle fournit un utile mélange d'intérêts pratiques, professionnels et académiques ainsi que des opinions et de l'information en provenance du Canada et de l'étranger.



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- la possibilité de profiter du programme d'assurance-habitation et d'assurance automobile offert par la TD Assurance-habitation et assurance automobile ainsi que du régime d'assurance professionnelle de groupe offert par la Financière Manuvie
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**Membre de soutien** : **PLATINE** - toutes personnes **OR** - compagnies et organismes gouvernementaux **ARGENT** - établissements d'enseignement et les associations. Ceux-ci comprennent des adhésions individuelles multiples, des escomptes publicitaires, des rabais pour la location de stand d'information et une mention dans chaque numéro de GEOMATICA

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# The Hydrographic Academy

## Distance Learning with Plymouth University



The Hydrographic Academy project is being led by Plymouth University, in collaboration with Fugro, a major service provider and employer in the hydrographic survey and engineering industry, and the Royal Navy. This project is employing some of the latest concepts and technology in distance and online learning to develop a suite of transferable learning materials that will meet the education needs of the hydrographic surveying industry. The materials developed will allow employees to undertake university level professional development despite long periods offshore and changing working patterns. The modular course will also provide school leavers with a much needed work-based learning route into the industry.

Dr Richard Thain, Project Manager for Plymouth University, commented on the fantastic support the team have had from their industrial partners: "Early on in the project the Royal Navy provided us with the vessels and personnel to carry out filming sessions which will provide a valuable resource base for use within the learning environment". Fugro is the world's largest integrated suppliers of geoscience, survey and geotechnical related services, employing 13,500 staff in more than 50 countries and operating over 50 ships. Their involvement in the project gives the Hydrographic Academy direct access to personnel with a wealth of experience in the sector. Andy McNeill, Fugro's Global Learning and Development Manager commented: "Fugro's involvement is driven by the need not just to raise standards but to make education more accessible and broader reaching given the on-going shortage of supply of suitably qualified and experienced staff. It provides an educational and qualification route for us that is not currently available other than through full time study."

Distance e-learning is particularly suited to marine professionals seeking advancement of skills and qualifications without having to devote themselves to studying full time. Programmes will be available for both undergraduates and post-graduates, and either route may gain academic and appropriate professional qualifications. Hydrographic Academy's courses will be open to anyone, whatever their background or level of experience. Amongst the professional bodies, the Hydrographic Academy aims to achieve accreditation by the International Hydrographic Organisation at both Category B and Category A levels of professional practice, The Royal Institution of Chartered Surveyors (RICS), IMarEST and the Chartered Institution of Civil Engineering Surveyors (CICES).

Students will be provided with a variety of video presentations within a bespoke e-learning environment, which also enables sophisticated testing and assessment to be undertaken. A range of supporting materials will be provided on USB memory sticks issued to subscribing students; in addition they will have access to on-line student-tutor forums and interact directly with tutors via email as well as through other forms of electronic communication. At appropriate stages, all programmes will require students' attendance ashore for two weeks covering mathematics, practical surveying and examinations.

Following the successful "field test" of the learning materials through January and February 2012, the Hydrographic Academy will launch commercially to the market on the Marine Institute stand at Oceanology International in London, 13-15 March 2012.

<http://www.plymouth.ac.uk/hydro>

# Friends of Hydrography

A Canadian Volunteer Group

We invite you to the Friends of Hydrography Web Site '<http://www.canfoh.org>'

What is it and why does it exist? I was asked to write a little something about this small group and I struggled with how to explain what was often just referred to as "The Friends".

The Friends are a group of retired hydrographers, mostly former Canadian Hydrographic Service (CHS) employees, who would gather at 615 Booth Street every Tuesday for coffee and to capture and archive the history of hydrography. They combed through archival material including field reports, photos, conference proceedings and even an old publication called "Soundings" that was put out by the Dominion Hydrographer's office as a newsletter, capturing the work and social aspects of hydrography and the office. The volunteers spent hours formatting pictures of ships and launches for the website that was started long before the many prefab sites that are now available. These volunteers, who started in hydrography with pencil and paper, took on the steep learning curve of web development.

What drove these people to spend their time gathering information and recording it for the world to see? Over the years, some of the retirees had more difficulty coming in regularly and some sadly, passed away. There were a few who continued on, week after week. One volunteer, Sid van Dyck, explained that he joined the Friends because he loved his time with the Canadian Hydrographic Service and enjoyed the camaraderie of the Friends weekly work sessions. Long after the Friends numbers dwindled, Sid continued. His passion and persistence grew from one event in particular. He was researching a particular man who he remembered and wanted to include in the People section of the website. He asked someone in Human Resources if they had any information on his former colleague. Now this was long before the many privacy laws we have today, and so the HR person came back with the one bit of information on file. The man had written an exam and failed. This entire man's career in hydrography had been reduced to one remaining record of a failing grade. Sid knew the man had contributed much to the organization. He felt it was important to record the accomplishments of the people, and the organization; to record the history of the Canadian Hydrographic Service and hydrography in Canada.

This is what the Friends of Hydrography is about. The passion for history and people, accomplishments and the stories that go with hydrography over the years is captured in every word on the website. The Friends of Hydrography now needs volunteers to carry on and add to the collection of information and expand upon it. The Friends needs people like you to contribute their stories and to contribute to website development. We are in need of a website overhaul to bring it up to modern standards and allow this information to continue to be available for years to come. Keeping our history alive is important and only you can do it, because the history lies within each of you reading this edition of Lighthouse. Each of you has a piece of the history of hydrography in the work you do. If you are interested in volunteering, please contact us. Anyone with information to add, and in particular anyone with website experience is needed to help us continue this work. Email: [CANFOH@cogeco.ca](mailto:CANFOH@cogeco.ca)

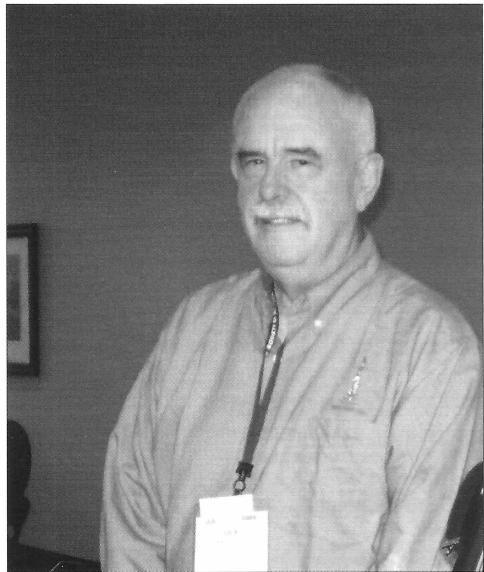
We thank our many volunteers past and present including our chief archivist, the late Sid van Dyck who dedicated almost every Tuesday for over ten years to our cause and our current communications coordinator, Earl Brown who has been a great asset and has been pivotal in answering your questions. We thank the Canadian Hydrographic Association for all their support. The association and its members have allowed our little website to go on and we couldn't have done it without them.

Stacey Kirkpatrick - Canadian Hydrographic Service - Ottawa

# Hydrographic Profiles

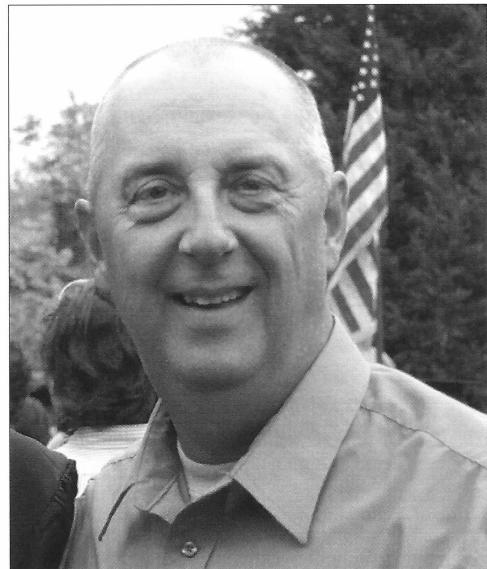
*This section is set aside to spotlight individuals who are making a difference in the field of hydrography. It is a chance for us to learn about them; their background, interests and passions.*

*Do you know of someone who should be profiled here? If so, please let us know*



## Jack Wallace

Jack is a New York native from the Long Island area. He attended the University of Michigan, graduating in 1965 with a BSc. degree in Civil Engineering -- Geodetic Option. Following graduation, he was commissioned as an ensign in the United States Coast and Geodetic Survey, one of the predecessor agencies of the National Oceanic and Atmospheric Administration (NOAA). Jack's initial sea tour was on the USC&GS Ship *Hydrographer*, which was fitted at that time with the first version of an automated hydrographic system. After his sea tour, Jack was assigned to the Pacific Marine Center where he helped develop systems for processing and quality assurance of automated hydrographic data. From there, he was assigned to the NOAA Ship *Whiting* where the prototype of the Hydroplot data acquisition and processing system was in use. Jack wrote much of the documentation for that system, which became the standard of NOAA hydrography for many years. After the *Whiting* tour, Jack worked in NOAA's Marine Data Systems Project where he procured and deployed computer systems for NOAA's hydrographic ships. In 1970, after an assignment aboard NOAA Ship *Mt. Mitchell* to implement the Hydroplot/Hydrolog system, Jack left the NOAA Corps and began work for NOAA as a civil servant, helping to manage the automated hydrographic systems in the NOAA fleet. Jack was a founding member of The Hydrographic Society of America when it was formed in 1980, and very shortly became the glue that held the society in place, taking on the volunteer role of managing the society's books and membership roles. In 1990, Jack became the Deputy Chief of NOAA's Hydrographic Surveys Division, where he served for 10 years, overseeing all of NOAA's hydrographic data acquisition and processing activities. Jack retired from NOAA in 2001, but continued serving The Hydrographic Society of America in the Executive Secretary/Executive Director role until the end of 2011. This year, Jack has passed his society management duties to the new officers and is busy spending quality time with his grandchildren.



## Pat Sanders

In January 2012, Pat Sanders returned for a 2nd tour of duty as President of The Hydrographic Society of America (THSOA). Pat had previously served as President from 1998 to 2000. During his tenure, THSOA took over responsibility for organizing the USA HYDRO conferences and completed the break from The Hydrographic Society, based out of the UK. Pat started his career as a hydrographer with the U.S. Naval Oceanographic Office. After returning to Carnegie-Mellon University for his MBA, he founded HYPACK, Inc in 1981.

In 1988, HYPACK first offered its PC-based hydrographic software package for sale. Pat currently serves as Director and manages the software development group at HYPACK. His outside interests include serving as Chairman for the Brakettes amateur women's softball team and struggling to break 90 on the golf course.

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# THE CANADIAN HYDROGRAPHIC ASSOCIATION AWARD LA BOURSE DE L'ASSOCIATION CANADIENNE D'HYDROGRAPHIE

(Established. 1992 / Établie en 1992)

## Deserving Student \$2,000 / 2000\$ Pour un étudiant méritant

### Application Criteria

1. The applicant must be a full time student in an accredited post secondary program in the field of Geomatics (the program must have a Hydrographic Survey or Ocean Science component) in a university or technological college anywhere in Canada. Other programs may be deemed eligible at the discretion of the Manager of this award.
2. The award will be available to undergraduate students in a degree or diploma program that conforms to the basic subject topic. The applicant will be required to submit a transcript of his/her most recent post secondary marks at the time of application. The marks must indicate an upper level standing in the class and under no condition less than 70%.
3. The award will be presented to an applicant who can demonstrate a bona fide financial need, coupled with an above average academic performance as stated above.
4. The applicant will be required to write a short paragraph explaining his/her financial need in a clear, concise manner on the application form or, if necessary, attached piece of paper. The importance of this aspect of the application is emphasized.
5. The award application will be submitted to the Canadian Hydrographic Association by June 30 each year and to the address in item 11 below.
6. The value of the award is \$2,000. There is one award only each calendar year. Only the winner will be notified.
7. The successful applicant will be issued with a special Hydrographic Association Certificate, duly framed, at the time the award is made. He/she will also receive a medallion with the Hydrographic Association Crest and have his/her name mounted on a perpetual winner's plaque. A picture of the plaque, duly inscribed will be mailed to the winner along with the \$2,000 cheque during the second week of July.
8. The applicant must submit one letter of reference from an official of the university or college where the applicant spent the previous year. This letter of reference must include the address and phone number of this official.
9. An individual student may receive the award once only.
10. The successful applicant's letter of appreciation will be published in the next issue of our professional journal "Lighthouse".
11. Application will be made on the form supplied or preferably down loaded from the official CHA web site at [www.hydrography.ca](http://www.hydrography.ca) and sent to:

### Critères d'admissibilité:

1. Le candidat ou la candidate doit être inscrit à plein temps à un programme reconnu en sciences géomatiques (ce programme doit inclure l'hydrographie ou un contenu en sciences de la mer) par une université ou un collège situé au Canada. D'autres programmes peuvent être jugés éligibles à la discrédition de l'administrateur de cette bourse.
2. La bourse s'adresse aux étudiants et étudiantes inscrits dans un programme menant à un diplôme collégial ou de premier cycle universitaire conforme aux disciplines de base. Le candidat doit soumettre une copie de son dernier relevé de notes post-secondaire avec sa demande. Les notes doivent être au-dessus de la moyenne de sa classe et être obligatoirement supérieures à 70 %.
3. La bourse sera remise au candidat ou à la candidate qui, de bonne foi, peut démontrer ses besoins financiers et qui respecte les exigences académiques mentionnées ci-haut.
4. Le candidat ou à la candidate devra écrire un court texte clair et concis, démontrant ses besoins financiers sur le formulaire de la demande ou, si nécessaire, sur une lettre jointe. Une grande importance est accordée à cet aspect de la demande.
5. La demande doit être soumise à l'Association canadienne d'hydrographie au plus tard le 30 juin de chaque année à l'adresse mentionnée à l'article 11 ci-bas.
6. La valeur de la bourse est de 2000 \$. Il n'y a qu'une seule bourse remise par année civile. Il n'y aura que le gagnant qui sera avisé.
7. Le récipiendaire recevra un certificat spécial de l'Association canadienne d'hydrographie, dûment encadré. Il ou elle recevra aussi un médaillon à l'effigie de l'Association canadienne d'hydrographie et verra son nom ajouté sur la plaque des gagnants. Une photo de la plaque, dûment gravée sera postée au gagnant avec un chèque de 2000 \$ au cours de la deuxième semaine de juillet.
8. Le candidat ou la candidate doit soumettre une lettre de référence d'un représentant de l'université ou du collège où il a suivi son cours l'année précédente. Cette lettre de référence doit inclure l'adresse et le numéro de téléphone de ce représentant
9. Un étudiant ne peut recevoir la bourse qu'une seule fois.
10. Une lettre d'appréciation du récipiendaire sera publiée dans l'édition suivante de notre revue professionnelle "Lighthouse".
11. La demande devra être faite en se servant du formulaire prescrit ou préféablement téléchargée à partir du site internet officiel de l'ACH « [www.hydrography.ca](http://www.hydrography.ca) » et envoyée à :

Manager / Administrateur

Canadian Hydrographic Association Award Program / Bourse de l'Association canadienne d'hydrographie  
6420 Edenwood Drive, Mississauga, ON L5N 3H3  
geomac66@sympatico.ca [www.hydrography.ca](http://www.hydrography.ca)



Go **F.I.G.**ure

*This regular feature provides information and current news from the International Federation of Surveyors (FIG) with emphasis on FIG Commission 4 (Hydrography).*

## **International Federation of Surveyors, Commission 4 Newsletter**

March 1, 2012

Dr. Michael Sutherland, Ph. D. (Canada)  
Chair of Commission 4 (2011-2014)  
Department of Surveying and Land Information  
University of the West Indies, St. Augustine Campus  
St. Augustine, Trinidad & Tabago, W.I.  
Permanent Email: [michael.d.sutherland@unb.ca](mailto:michael.d.sutherland@unb.ca)  
Website: <http://www.eng.uwi.tt/depts/survey/staff/msutherland/msutherland.htm>

Commission 4 finished the first year of the current four-year term (2011-2014) actively, with a focus on hydrography in Africa. The main event for the commission in 2012 is FIG2012 Working Week to be held in Rome in May but members of the commission continue to support hydrography and related events internationally. The commission has undergone a few changes to its structure and approved new officers in order to better align itself to chosen international hydrographic initiatives.

### **Hydrography Awareness Workshop, Lokoja, Nigeria**

The main story of this newsletter is about a Workshop on Hydrography Awareness organized by Mrs. Angela Etonovbe, Chair, Commission 4.5 (Hydrography in Africa). The workshop was held at the Confluence Beach Hotel, Lokoja, Nigeria between October 24<sup>th</sup> and 26<sup>th</sup> 2011 and was attended by participants from Nigeria, Ghana and Canada. The theme of the workshop was "Hydrography and National Development" and was primarily directed at government officials in order to increase awareness of the importance of hydrography and to begin to secure their political and financial support. Among the attendees were the Deputy Surveyor-General of Kogi State (representing the Governor) and the Managing Director, National

Inland Waterways Authority (representing the Minister of Transport). The President of Nigerian Institution of Surveyors and the President of the Surveyors Council of Nigeria were also present. The Nigerian Port Authority, Hydrographic Society of Nigeria and the Hydrographer of the Nigerian Navy sent goodwill messages. It was noted at the workshop that there is no institution in Africa offering Category A or Category B training in hydrography; that there are no strong institutional and legal frameworks that will enhance or facilitate the development of hydrographic practice in Africa; and that the few hydrographers in Africa work mostly in the oil Industry or the Navy. The workshop is an important beginning addressing these issues, and to ensure that the African continent is not ignored in hydrography-related deliberations and initiatives. The full report is published on the Commission 4 website (<http://www.fig.net/commission4/reports/reports.htm>).

### **Changes to Commission 4 Structure and Officers**

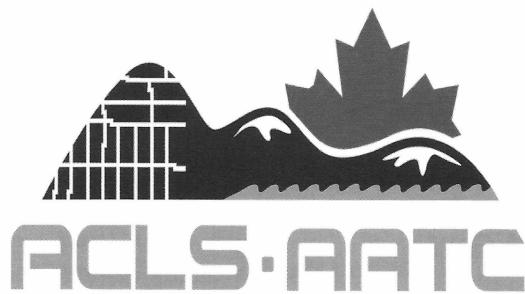
Professor Jonathan Li, Professor of Geomatics, Department of Geography & Environmental Management, University of Waterloo, Canada is now Chair, Working Group 4.4 (Maritime and Marine Spatial Information Management). Working Group 4.4 now has two study groups: Dr. Bheshem Ramlal, Head of Department, Geomatics Engineering and Land Management, University of the West Indies, St. Augustine, Trinidad and Tobago was approved as Chair of Study Group 4.4.1, Marine Spatial Data Infrastructure. Professor Li was approved as chair of Study Group 4.4.2, Remote Sensing of Coastal and Marine Waters. These changes will facilitate the commission's move to align itself with international hydrographic initiatives such as IHO's marine spatial data infrastructure working group, and as well facilitate more focused research chosen for the current four-year term.

### **Changes to IBSC**

Dr. Keith Miller, Senior Lecturer, Department of Geomatics Engineering and Land Management, University of the West Indies, St. Augustine, Trinidad and Tobago has been nominated to replace the late Dr. David Neale as one of FIG's four representatives on the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC). The other FIG members are Mr. Gordon Johnston (UK), Dr. Razali Mahmud (Malaysia), and Mr. Adam Greenland (New Zealand).

### **FIG Working Week 2012**

FIG Working Week 2012 is set to be held in Rome, Italy between May 6<sup>th</sup> and 11<sup>th</sup>. Commission activities will include technical sessions, Commission meetings, social events, and possibly a hydrography-related technical tour. Details of this event are published on the conference's official website (<http://www.fig.net/fig2012/>).



## **GeoEd Canada**

GeoEd Canada (Geomatics Education for Professionals) has a new home and new content! [www.geoed.ca](http://www.geoed.ca) is where you can find a variety of online courses to view at your leisure. Currently available through GeoEd:

- Free 30 minute course that focuses on How to do Business with the Federal Government
- Getting it Right
- 3 out of 10 seminars on Offshore Property Rights

GeoEd recently launched the first of many paid live trainings. A one hour course on the principles of GNSS positioning was presented by Dr. Robert Radovanovic to 85 participants. A satisfaction survey afterwards showed an overwhelming percentage found the course to be very worthwhile and informative.

Some upcoming courses that will be available soon are: Introduction on how to make comprehensive Field Notes, and How to Prepare to be an Expert Witness.

## **National Surveyors' Conference 2012**

The eighth National Surveyor's Conference will be held from June 6th to 8th 2012 in Regina, Saskatchewan in conjunction with the Saskatchewan Land Surveyors Association AGM. The venue will be the Hotel Saskatchewan Radisson Plaza.

Seminar topics include: Getting it Right (second module), Risk Management (presented by ENCON), Plan Processing in Saskatchewan, How Social Media Can Help Your Business, and Geodetic Surveys.

An exciting accompanying persons program will have such things as: tours of local Regina attractions such as the RCMP Heritage Center, Life Sciences, Earth Sciences, First Nation Galleries, and Northwest Territories Government house as well as excursions to Moose Jaw and Lajord Hutterite colony.

For more information please see our Web site. Go to: <http://www.acls-aatc.ca/en/node/69>

## **New CLSs**

The following individuals were awarded CLS Commissions as a result of passing their last exam at the October 2011 exam sitting or passing the on-line, on demand, professional examination: Adam James Barvir, Calgary, AB; David Batten, Fort St. John, BC; Gavin Lawrence, Toronto, ON; Roger G. Luard, Edmonton, AB; Jacob McAstocker, Victoria, BC; Henry Dean Reiter, Okotoks, AB; Robert Seymour, Victoria, BC; Jason R. Shortt, Vernon, BC; Sara Spence, Calgary, AB; Michael Thompson, Lethbridge, AB; Vincent Villeneuve, Laval, QC; and Zeng Zhiqing, Toronto, ON.

Welcome!  
Jean-Claude Tétreault  
ACLS Executive Director



## **GeoEd Canada**

GeoEd Canada (Éducation géomatique pour les professionnels) possède un nouveau site et un contenu renouvelé ! À [www.geoed.ca](http://www.geoed.ca) vous pourrez trouver une gamme de cours en ligne que vous pourrez consulter à loisir. Actuellement disponibles sur GeoEd :

- Un cours de 60 minutes gratuit sur comment faire affaire avec le gouvernement fédéral.
- Getting it Right
- Les séminaires sur les droits de propriété en zone extracôtière

GeoEd a récemment lancé le premier d'une série de cours payants en direct. Un cours d'une heure sur les principes de positionnement GNSS a été présenté par le Dr Robert Radovanovic à 85 participants. Un sondage a révélé que la majorité des participants avaient trouvé le cours informatif et digne d'intérêt.

Parmi les cours qui seront offerts bientôt on compte : comment rédiger des notes d'arpentage complètes – une introduction, et comment se préparer pour le rôle de témoin expert.

## **Conférence nationale des arpenteurs-géomètres 2012**

La huitième Conférence nationale des arpenteurs-géomètres aura lieu du 6 au 8 juin 2012 à Regina, Saskatchewan conjointement avec l'assemblée générale annuelle de la Saskatchewan Land Surveyors Association. L'événement aura lieu à l'Hôtel Saskatchewan Radisson Plaza.

Parmi les sujets abordés on compte : Getting it Right (deuxième module), Gestion des risques (présenté par ENCON), Processus de traitement des plans en Saskatchewan, comment les médias sociaux peuvent aider votre entreprise, et les levés géodésiques.

Un programme intéressant pour les personnes accompagnatrices a été mis sur pied avec, entre autres : visite des sites touristiques de Regina tel les Centre du patrimoine de la GRC, Sciences de la terre, Sciences de la vie, galeries des Premières Nations, ainsi que la maison du gouvernement des Territoires du Nord-Ouest et des excursions à Moose Jaw et à la colonie Hutterite de Lajord.

Pour obtenir plus de renseignements, veuillez consulter notre site Web : <http://www.acls-aatc.ca/en/node/69>

## **Nouveaux arpenteurs des terres du Canada**

Les personnes suivantes ont reçu des brevets d'ATC après avoir passé leur dernier examen lors de la session du mois d'octobre 2011 ou un examen en ligne sur demande (mobilité de la main-d'œuvre): Adam James Barvir, Calgary, AB; David Batten, Fort St. John, C.-B.; Gavin Lawrence, Toronto, ON; Roger G. Luard, Edmonton, AB; Jacob McAstocker, Victoria, C.-B.; Henry Dean Reiter, Okotoks, AB; Robert Seymour, Victoria, C.-B.; Jason R. Shortt, Vernon, C.-B.; Sara Spence, Calgary, AB; Michael Thompson, Lethbridge, AB; Vincent Villeneuve, Laval, QC; et Zeng Zhiqing, Toronto, ON.

Nos félicitations!

Jean-Claude Tétreault  
Directeur exécutif

# Remote Processing of Ship Based Hydrographic Multibeam Data

By: Rob Hare, Canadian Hydrographic Service, Pacific Region  
Derrick R. Peyton and John Conyon, IIC Technologies, Inc.

**[Publication Note:** This paper was previously submitted to HYDRO 2011, Perth, Australia, November 7-10<sup>th</sup>, 2011.]

Collection and processing of multibeam data has traditionally taken place onboard larger survey vessels during hydrographic operations. The goals being; to have a nearly completed product ready within a short timeframe after survey operations end; and to conduct quality control on the data before departing the survey area. A major component of the survey cost is related to the number of data processors that are onboard the survey vessel during a survey. This coupled with potential skilled workforce shortages for offshore operations has lead to increased challenges to deliver an effective and viable survey program.

Processing hydrographic data by logging onto a centralized server from a shore-based remote location has proven to be a viable technique in hydrographic data processing [Peyton et al, 2010]. Taking this concept one step further, the Canadian Hydrographic Service (CHS) conducted a trial survey whereby a Citrix-enabled central server was installed on a survey vessel and multibeam data was cleaned and processed from a remote shore-based facility.

This paper describes the survey setup, system configuration and processing results using the above methodology during a demonstration survey on board a 22-foot survey launch.

## Background

Competitive pricing, ease of use, and market preferences have made multibeam echo sounding surveys a mainstream tool for hydrographic surveys. At the same time efficiency of use has become an important component of all surveys. The primary reasons being to keep costs down, to acquire final results as near real-time as possible and to have a more effective use of human resources and assets.

Processing hydrographic data by logging onto a ship-based centralized server from a shore-based remote location has proven to be a viable technique in hydrographic data processing [ibid.]. The approach involves the concept of “desktop virtualization,” which is an approach whereby just about any computing device can be turned into a fully functional desktop without completely sacrificing IT security rules. Citrix and Wyse Technologies, for example, have extended Windows desktops to the Apple iPad.

The Citrix-enabled central server and remote clients exchange a small amount data. This highly optimized data stream consists of: compressed screen data, keyboard keystrokes and mouse movement instructions only resulting in small bandwidth requirements ([www.citrix.com](http://www.citrix.com)). In effect, the remote machine is a dumb terminal and “sees” the screen of the central server “being controlled” where all data processing actually takes place.

One of the main benefits of Citrix is the elimination of the need to transfer enormous quantities of data (either physically or via the Internet), which in turn reduces the latency and expense associated with moving data, while also making data management and data security much simpler. A related benefit is better utilization and version control of software packages used to process data. Using Citrix enhances data security over traditional approaches as no data actually resides outside of the central server.

Taking this approach one step further, the Canadian Hydrographic Service (CHS) conducted a shallow-water survey in British Columbia, Canada using the CHS vessel *Shoal Seeker* (Figure 1). The *Shoal Seeker* was an ideal candidate for this test in that it fit the profile of a typical modern survey launch with limited space aboard for equipment and personnel. Consequently the ship-board data acquisition system was separated from the shore-based data processing. This has necessarily meant the quality control of the collected data is only finalized well after the survey acquisition has been completed. This can often lead to missed lines, bad data and a need to return to the survey area to complete the job. In essence, this is not a cost effective or efficient use of the available hydrographic assets. This made it an ideal candidate for testing the concept of real time remote multibeam data processing.



Figure 1: Shoal Seeker - 22 foot survey launch



Figure 3: Citrix-enabled central server aboard Shoal Seeker (initial Set-up)

## Set-up and Survey Site

In order to test the concept of remote processing of multibeam data for near real-time QA/QC, a demonstration survey within predicted 3G cellular coverage (Figure 2) was devised. The laptop computer (Figure 3) aboard the *Shoal Seeker* was configured with a Telus Mobility wireless mobile Internet stick for Internet access.

The idea was to process the collected data aboard the vessel in near real time using remote access software (**GoToMyPC** from Citrix) by a shore-based data processor (Figure 4). We note that the distance between the survey site and the shore-based processor is approximately 4000km (Victoria, British Columbia to Toronto, Ontario, Canada).



Figure 4: Remote HIPS processing in Toronto, Ontario, Canada

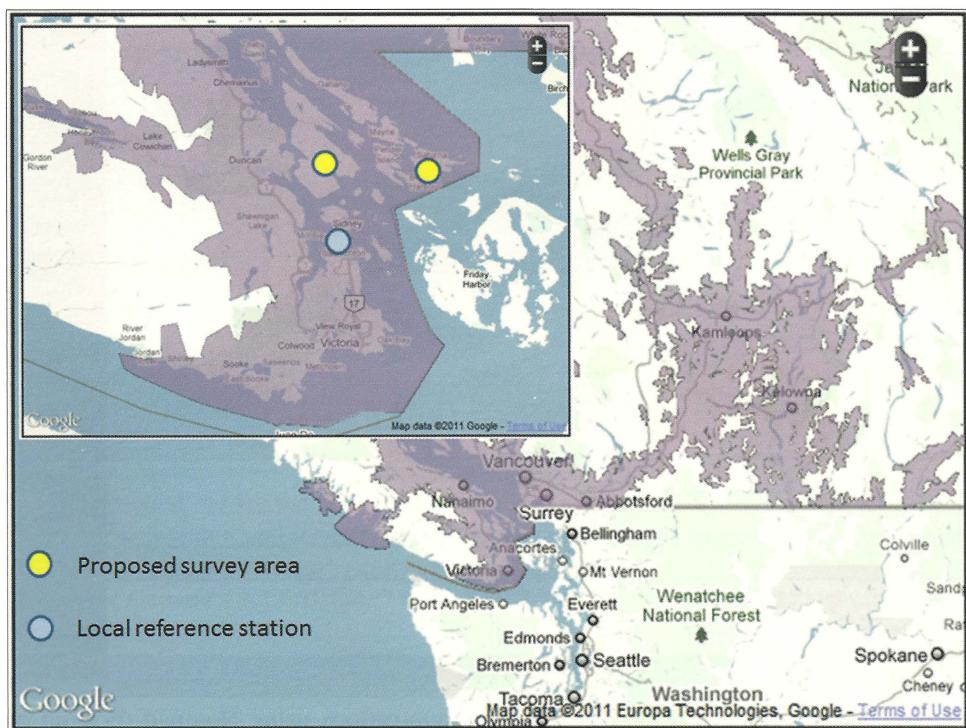


Figure 2: Predicted 3G cell phone coverage, British Columbia, Canada

Initially, Fulford Harbour (Number 1 in Figure 5) was selected as a good candidate site for the demonstration survey, believed to be not only in good 3G coverage, but also covered by local RTK service (local reference station near Number 3 in Figure 5). While the latter service proved to be available at Fulford Harbour, the former coverage did not. Consequently, a second candidate survey area was chosen – Lyall Harbour (Number 2 in Figure 5). Lyall Harbour did have good 3G coverage, but sadly was not covered by the RTK service – so predicted tides would be required for sounding reduction.

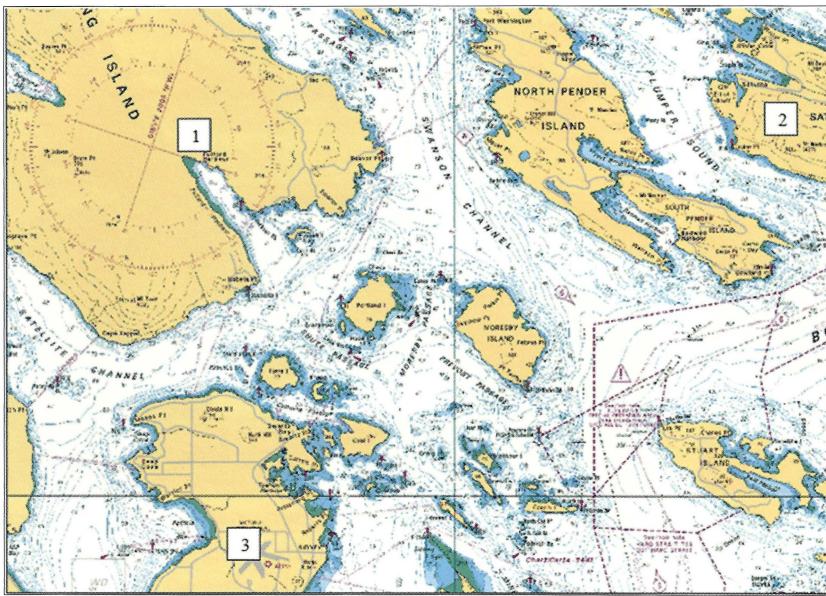


Figure 5: Project areas (southern British Columbia)

## Methodology

IIC Technologies, Inc. configured a laptop computer with Citrix software and a CARIS HIPS licence, which would act as the central server. This laptop was then attached to the *Shoal Seeker*'s on-board network, which allowed connection to the data acquisition computer RAID drives, where all the raw sonar files, tide files, sound speed profiles, etc. are stored. The ship-board configuration process took less than 1 hour.

With the vessel alongside at Institute of Ocean Sciences (IOS) (near Number 3 in Figure 5) and the laptop having Internet connectivity via the Telus stick, an IIC Technologies, Inc. bathymetry processor in Toronto with a pre-configured user account was able to connect via Citrix remote access software (**GoToMyPC**) directly to the processing laptop. She was able to open a CARIS HIPS session, grab logged sonar files from the RAID drives over the on-board network, open them in HIPS and start processing. To someone onboard the vessel, the speed at which this happened made it appear as though the data processor was aboard the boat.

It is important to note that the reason for this performance is that all the data remains aboard the vessel, so a broadband Internet connection is not required and

the costs associated with moving huge amounts of data over the Internet are avoided. The data and the processing horsepower needed are on the on-board computers; only the command keystrokes/mouse clicks and an optimised replica of the computer screen are passed across the Internet link, requiring far less bandwidth. Both the remote processor and the data acquisition hydrographer aboard the vessel can view the processing in action and can stay in constant communications using, e.g. Notepad (Figure 6), a text-based conversation.

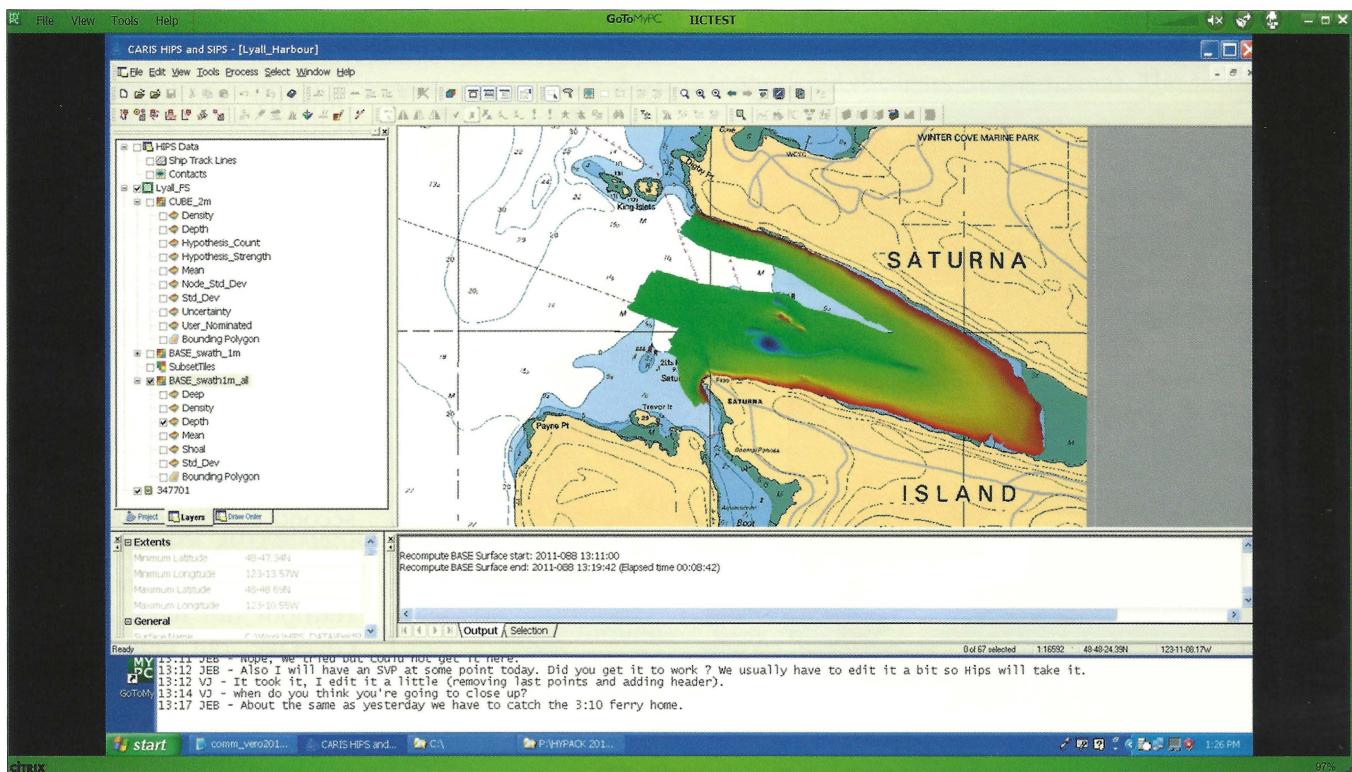


Figure 6: Example of processor (VJ) and acquisition hydrographer (JEB) communications using Notepad (bottom of image)

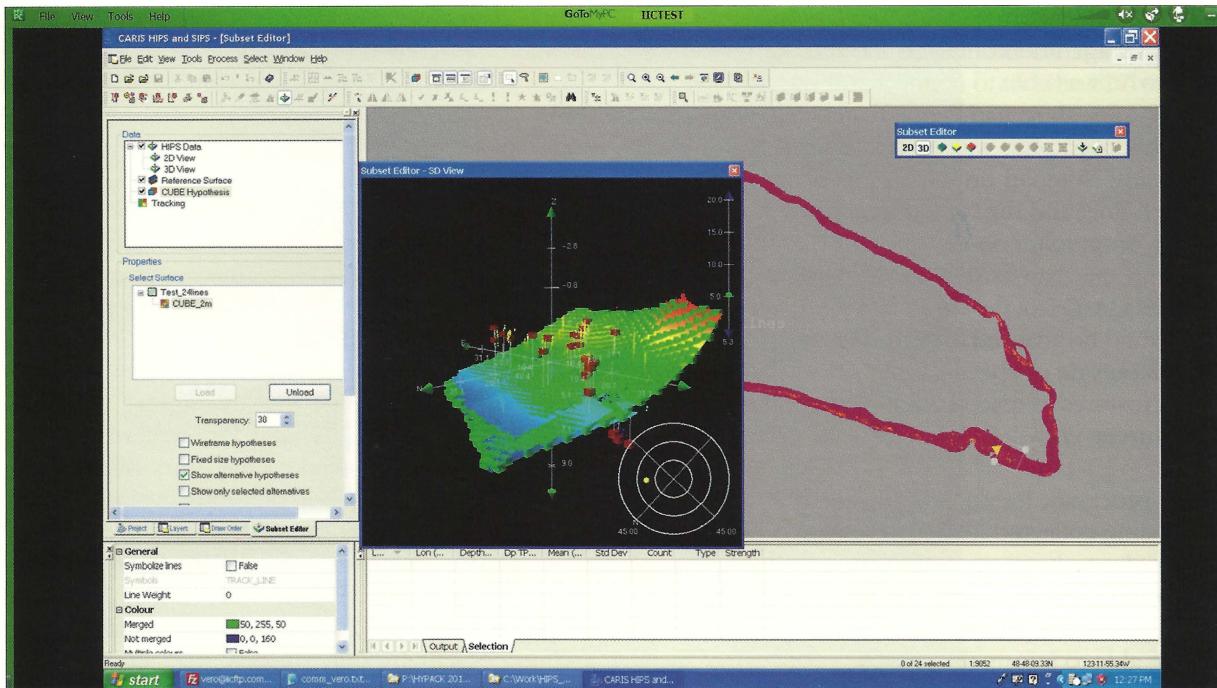


Figure 7: Remote processing: CUBE hypotheses

## Results

After the initial configuration and remote connection test at IOS had proved successful, a test survey was planned for nearby Fulford Harbour, thought to be well within Telus 3G coverage and RTK range from the local reference station. A BSB chart backdrop, adjacent BASE surface and predicted tides were provided to the remote processor, who uploaded them to the processing PC. In addition, the vessel configuration file, including TPU values was also provided. As it turned out, local topography on Saltspring Island prevents cell phones from working in Fulford Harbour. Several attempts at connection failed.

The hydrographer on the *Shoal Seeker* phoned from a land line to confirm that his cell phone was not getting coverage.

Plan B – Lyall Harbour. Lyall Harbour, while further away from local cell phone towers, proved to be in excellent 3G coverage, although not within range of the local RTK signal. Predicted tides and a different BSB chart backdrop were made available to the remote data processor. Unfortunately, no adjacent BASE surface was available for this area.

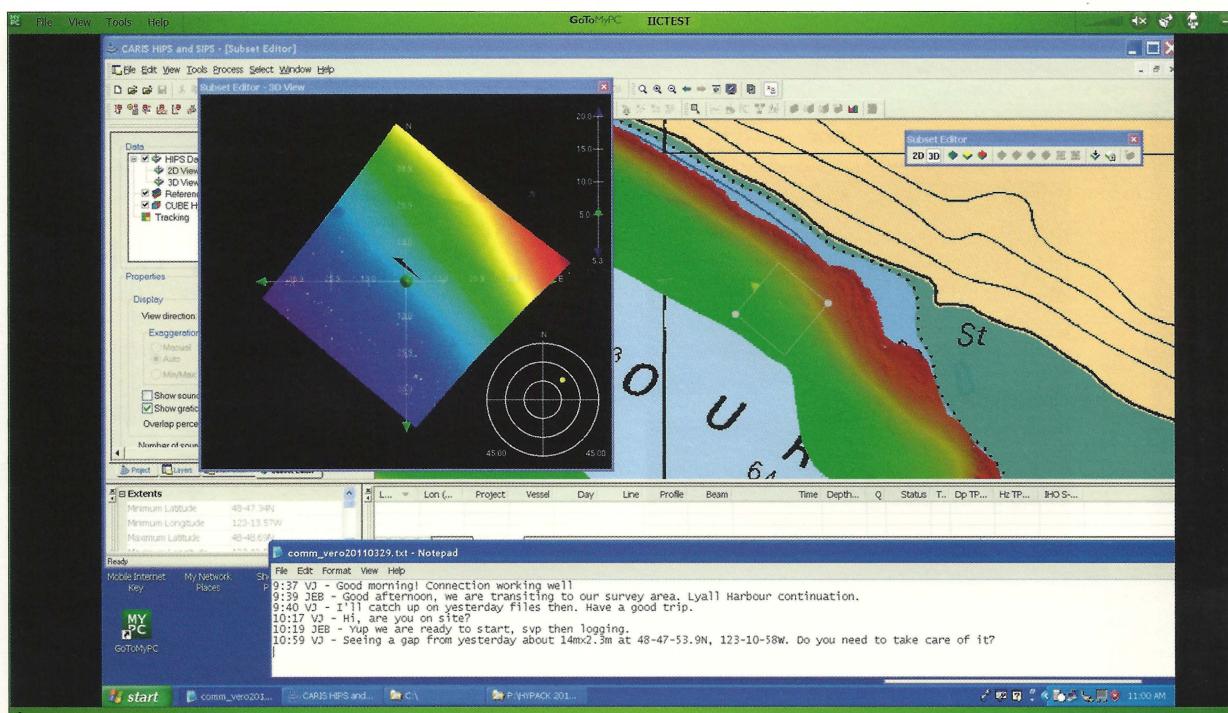


Figure 8: Remote processing: identifying an acquisition data gap

On March 28, 2011, the crew of the *Shoal Seeker* confirmed good cell coverage and contacted the remote processor in Toronto, who was able to connect and start processing lines shortly after they had been completed. The data acquisition hydrographer was able to inform the remote processor using Notepad on the laptop computer of the status of each line, and the remote processor was able to advise the hydrographer on-board of problems (Figure 7; Figure 8) with the data as they arose. Most importantly, near real-time QA/QC of the data was being performed so the survey could be adapted to correct defects (data gaps, uncertainties outside of specifications, more data needed over certain features to resolve multiple hypotheses, etc.) before the survey crew left the project area (Figure 9).

The remote processor found that the speed at which the lines were being collected lead to an adapted processing strategy in order to keep up with near real-time QC and feedback to the crew on-board the vessel. Time did not permit a fully detailed processing strategy to be applied. Still, she was able to inform the crew of a data gap, which was resolved by running an additional line. Also, more detailed information above a wreck was required to aid in deconfliction of multiple hypotheses on the wreck's superstructure (Figure 10). At the end of the day March 29, 2011, the project was completed (Figure 11); including preliminary processing sufficient to identify and correct all the data acquisition defects before the vessel left the project area.

## Discussion

The Lyall Harbour phase of the project worked very well and showed the many benefits of utilizing remote access to a survey vessel to conduct data processing and QA/QC procedures. For example, instances occurred where the

remote data processor identified data gaps that needed to be filled and guided the survey team to a more detailed wreck investigation. In essence, communications between the survey crew and the remote processor were simplistic and reliable.

In addition to the use of CARIS HIPS for checking the internal consistency of the newly-collected data, it was quite conceivable to also check the external consistency of the data by comparison to a validated overlapping BASE surface using CARIS BASE Editor.

On March 30, 2011 the survey project area changed from Lyall Harbour to Whaler Bay, where limited to no 3G coverage was available, final processing of the Lyall Harbour project was not possible. A strategy may be required to download the data to a shore-based server with reliable Internet connection after each project completes. This would allow final processing and QC of the project. This would also ensure the project data (raw and processed) are fully backed up.

The time zone of the acquisition was Pacific Standard Time; the time zone of the remote processor was Eastern Standard Time – a 3 hour difference. For the processor, this meant a late start and late end of working hours each day. While this did not appear to be a big problem, one does need to consider strategies to ensure that acquisition and processing remotely stay in synchronization. The processor was able to begin working on the project as soon as Internet connection was established, often while the vessel was in transit to/from the work area. This allowed time for catching up on work from the previous day.

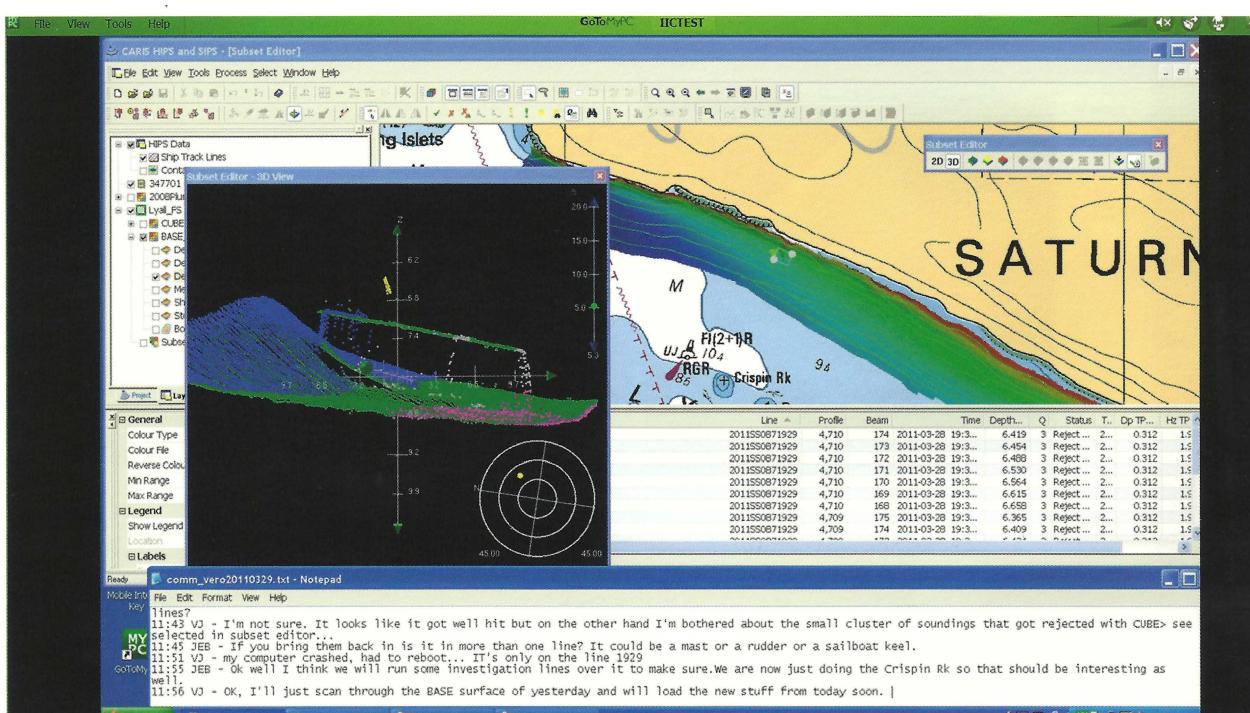


Figure 9: Remote processing: identifying problem soundings above a wreck

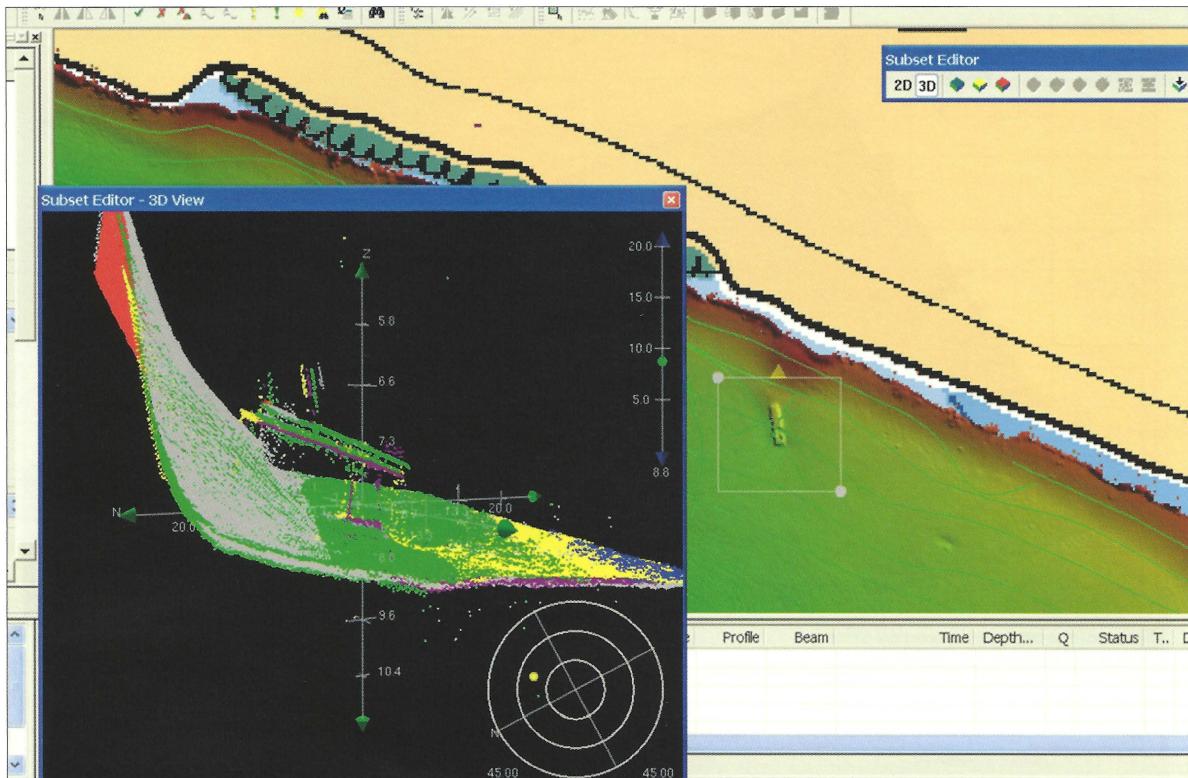


Figure 10: Remote processing: unsubstantiated hypothesis over wreck resolved after additional lines run

## Start-up costs

For the most part, project costs were primarily on the survey vessel side. The remote processing side used the existing Internet and existing hardware. No special purpose set-up costs were necessary.

- PC box: (~\$1000) small form factor (e.g. Shuttle PC) or any industrial/marine PC if desired; launch power supply and space on-board might be considerations;
- Standard IT software: (OS, antivirus, text editor, ftp client etc.) site licensing and/or open source so the cost is small (~\$100);
- Wireless mobile Internet stick: ~\$150 on a month to month plan (or free on a 3-year contract);
- Specialized software: CARIS HIPS, BASE Editor, Fledermaus, etc. – pricing dependent on individual vendor agreements;
- Two to three days if IT support to set it all up and test it.

## Ongoing costs

- Citrix **GoToMyPC** remote access @ \$25/month/station – (PC-grade option from Citrix); other options (some free) are also available;
- Mobile data plan @ ~\$50/month; or flexible plan \$35/month first 500MB + \$5 for each additional 500MB; daily usage is about 100MB/day; one might need to be wary of roaming charges in areas close to an international boundary;
- Ongoing IT support and system maintenance.

## Summary

A demonstration (proof-of-concept) survey of Lyall Harbour successfully showed that remote processing of high-density bathymetry can be of benefit for real-time QA/QC. The hardware, software and ongoing costs are reasonably affordable and can make more effective use of hydrographic assets (small vessels, hydrographic expertise).

There were some start-up glitches encountered, however, and one must take caution in believing 3G coverage maps produced by the service providers – these may be over-generalized and not show potential small outage areas. Processing of the data is only possible while the vessel is within good 3G coverage, unless other strategies are worked out for daily transfer and back-up of raw and processed data from the vessel to a network with more reliable Internet (or internal network) connection. It might be possible to set-up one's own local wireless network to service small areas or use a WIMAX system configuration to cover wider areas. Another alternative to 3G is to explore satellite internet services (i.e. Galaxy Broadband).

## Future directions

For follow-on projects, the CHS will seek a more permanent installation on the *Shoal Seeker* – one that is a little more robust, space-conserving and ergonomic. The laptop worked fine for a temporary survey in calm waters. We need to test that the remote connection will work from within government networks through our security firewalls; it worked fine from an outside connection.

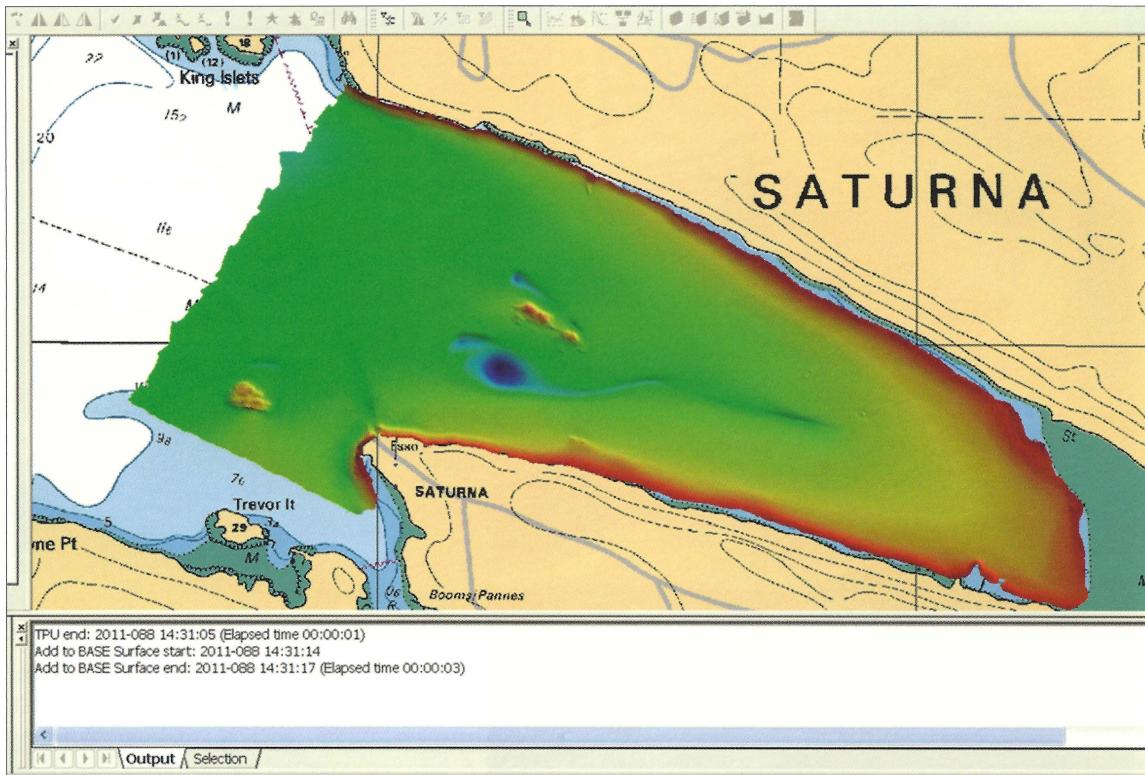


Figure 11: Remote processing: final BASE surface for Lyall Harbour

In addition, for future projects we plan to have a full suite of processing and QC tools (e.g. CARIS BASE Manager, Fledermaus) on the processing machine so that external consistency of the data can be confirmed in near real-time. This would require that we work in areas where existing validated BASE surfaces are available.

Lastly, we plan to conduct another trial using a Citrix client in the field to connect to CARIS HPD on a Citrix server in the office, create a scratch layer and do chart revisions directly in the HPD database instead of on a stand-alone HOB file in CARIS Notebook as has traditionally been done. 

## References

Peyton, D., J. Conyon and D. Wardle. 2010. New Concepts in Bathymetric Source Data Storage and Manipulation in Proceedings, HYDRO2010, Rostock, Germany. 18 slides., accessed 2011-05-16 at: [http://www.dhyg.de/hydro2010/HYDRO2010\\_PPT\\_PDF/PDF\\_Presentations\\_2010-11-03/Data\\_Processing\\_Evaluation\\_Management/Peyton\\_et\\_al.pdf](http://www.dhyg.de/hydro2010/HYDRO2010_PPT_PDF/PDF_Presentations_2010-11-03/Data_Processing_Evaluation_Management/Peyton_et_al.pdf).

## Biographical Notes and Contact Information

**Rob Hare** is a Manager with the Canadian Hydrographic Service. He has worked as a hydrographer and geomatics engineer with CHS since 1982. He is author of numerous papers and reports on hydrographic uncertainty and is Canada's representative on the IHO working group on Standards for Hydrographic Surveys (S-44) and on the IHO Data Quality Working Group (DQWG). He is a Professional Engineer in British Columbia and a Canada Lands Surveyor.



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**John Conyon** has over twenty years of experience in digital chart production as well as the technologies and workflows involved, from both a technical and managerial perspective. During this time he has worked in partnership with over two dozen hydrographic offices on projects related to S-57, digital paper chart production, product maintenance, and geospatial databases. Mr. Conyon is employed by IIC Technologies Inc in Vancouver BC as Director, Hydrographic Operations.



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**Derrick R. Peyton** has over three decades of experience in geomatics covering surveying and civil engineering technologies, oceanography and hydrography, offshore oil and gas, UNCLOS and defense. He holds a Diploma in Surveying Technology, a BSc and MSc in Geodesy and Geomatics Engineering, and an MBA. He is a Professional Engineer (Nova Scotia) and has a Canadian Lands Surveyor (CLS) certification. He also has an IHO Category "A" recognition. Derrick is presently the CEO of IIC Technologies and the Governing Council Chairman for the IIC Academy.



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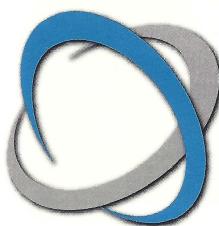
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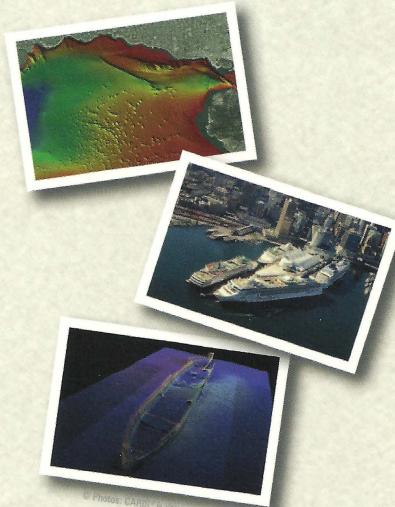


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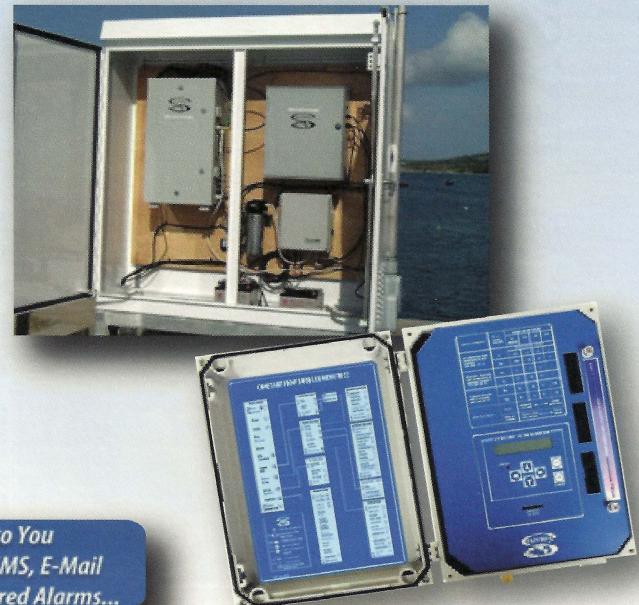


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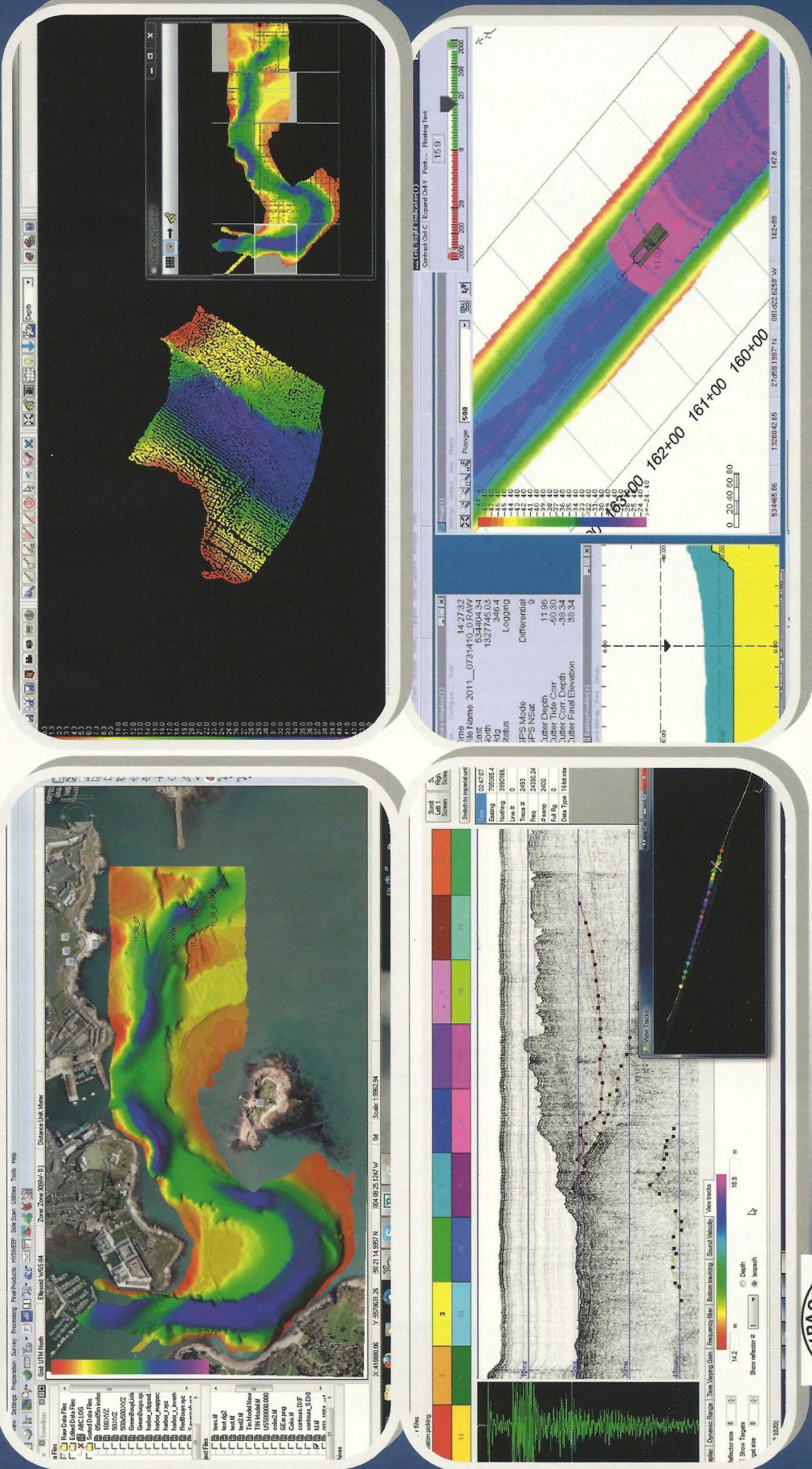


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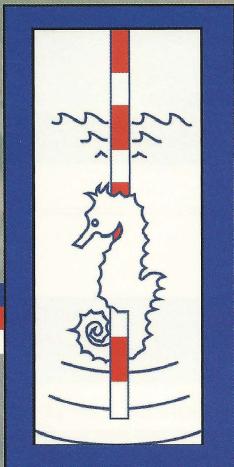


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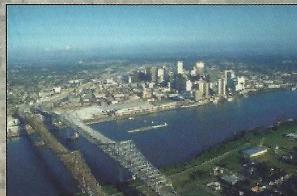
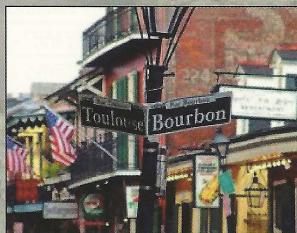
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15-17 May, 2012

Niagara Falls, CANADA

15-17 mai, 2012

**Sunday, May 13, 2012**

18:00 - 21:00	CONFERENCE EARLY REGISTRATION	Marriott Gateway Lobby
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**Monday, May 14, 2012**

TIME	ACTIVITIES	WHERE
12:00 - 20:00	Exhibitor Load-In	Scotiabank Convention Centre
09:30 - 17:00	Optional Niagara River Exploration Tour (Niagara Falls & Niagara-on-the-Lake)	All Conference Hotels
07:30 - 17:00	CONFERENCE EARLY REGISTRATION/HELP DESK	Scotiabank Centre Foyer
08:30 - 12:00	Optional Morning Workshops	Scotiabank Convention Centre
08:30 - 12:00	CARIS - Bathy DataBase	Room 201
08:30 - 12:00	Chesapeake Technology Inc. - Intro to Sidescan and Sub-bottom Post Processing using SonarWiz 5	Room 202
08:30 - 12:00	Triton Imaging Inc. - Integrated Data Processing & Interpretation - New Prospective Software	Room 206
09:15 - 12:10	iXBlue - Live demo of HYDRINS multibeam survey navigation system with DELPH INS software	Room 204
13:00 - 16:30	Optional Afternoon Workshops	
13:00 - 16:30	International Discussion Group Meeting on Uncertainty Management in Hydrography	Room 202
13:50 - 16:30	iXBlue - Icecap AUV Positioning with iXBlue GAPS Acoustic Positioning System/Integrated INS	Room 204
13:00 - 16:30	Fugro Pelagos - Planning Considerations for Bathymetric Lidar Surveys	Room 206
13:00 - 16:30	ESRI and QPS - The Modern Hydrographic Workflow with QINSy and ArcGIS	Room 205
08:30 - 16:30	Optional All-Day Workshops	
08:30 - 16:30	Hypack - Multibeam Data Collection and Processing using Hypack 2012	Room 203
18:30 - 21:30	Icebreaker Reception	R-5/Fallsview Casino

**Tuesday, May 15, 2012**

TIME	ACTIVITIES	WHERE
07:00 - 21:30	Exhibitor Load-In	Scotiabank Convention Centre
07:30 - 17:00	CONFERENCE REGISTRATION/HELP DESK	Scotiabank Centre Foyer
08:30 - 10:00	Opening Ceremonies	Junior Ballroom
10:00 - 10:30	Break	Peller Ballroom
10:00 - 17:00	Exhibition	Peller Ballroom
10:30 - 12:00	Session 1 - Coastal Zone and Continental Shelf	Junior Ballroom
12:00 - 13:30	Lunch	Peller Ballroom
13:00 - 17:00	Shuttles to/from the On-Water Exhibits	Scotiabank Centre Foyer
13:30 - 15:00	Session 2 - Marine Spatial Data Infrastructure and Management I	Junior Ballroom
15:00 - 15:30	Break	Peller Ballroom
15:30 - 17:00	Session 3 - Marine Spatial Data Infrastructure and Management II	Junior Ballroom
17:30 - 20:30	Exhibitors Evening	Peller Ballroom

\* subject to change





15-17 May, 2012

Niagara Falls, CANADA

15-17 mai, 2012

**Wednesday, May 16, 2012**

TIME	ACTIVITIES	WHERE
07:30 - 17:00	<b>CONFERENCE REGISTRATION/HELP DESK</b>	Scotiabank Centre Foyer
08:00 - 12:00	Shuttles to/from the On-Water Exhibits	Scotiabank Centre Foyer
08:30 - 17:00	Exhibition	Peller Ballroom
08:30 - 10:00	<b>Session 4 - New &amp; Emerging Technology I</b>	Junior Ballroom
10:00 - 10:30	Break	Peller Ballroom
10:30 - 12:00	<b>Session 5 - Training and Professional Development</b>	Junior Ballroom
12:00 - 13:30	Lunch	Peller Ballroom
12:00 - 13:30	CHA Annual General Meeting (lunch provided)	Room 203
13:00 - 17:00	Shuttles to/from the On-Water Exhibits	Scotiabank Centre Foyer
13:30 - 15:00	<b>Session 6 - New &amp; Emerging Technology II</b>	Junior Ballroom
15:00 - 15:30	Break	Peller Ballroom
15:30 - 17:00	<b>Session 7 - Vertical Reference Frame and Datum Issues</b>	Junior Ballroom
17:30 - 18:00	<b>Buses to Cocktails/Conference Dinner</b>	All Conference Hotels
18:00 - 19:00	<b>Cocktail Reception</b>	Table Rock Centre Elements Foyer
19:00 - 22:00	<b>Conference Dinner</b>	Table Rock Centre Elements Restaurant

**Thursday, May 17, 2012**

TIME	ACTIVITIES	WHERE
07:30 - 17:00	<b>CONFERENCE REGISTRATION/HELP DESK</b>	Scotiabank Centre Foyer
08:00 - 12:00	Shuttles to/from the On-Water Exhibits	Scotiabank Centre Foyer
08:30 - 15:30	Exhibition	Peller Ballroom
08:30 - 10:00	<b>Session 8 - Tides, Currents, and Water Levels</b>	Junior Ballroom
10:00 - 10:30	Break	Peller Ballroom
10:30 - 12:00	<b>Session 9 - Nautical Cartography</b>	Junior Ballroom
12:00 - 13:30	Lunch	Peller Ballroom
13:30 - 15:00	<b>Session 10 - Opportunities for Collaborative Approaches</b>	Junior Ballroom
15:00 - 15:30	Break	Peller Ballroom
15:30	Exhibition Hall Closes	Peller Ballroom
15:30 - 17:00	<b>Closing Ceremonies</b>	Junior Ballroom



## Dimanche 13 mai 2012

18:00 - 21:00	INSCRIPTION HÂTIVE À LA CONFÉRENCE	Marriott Gateway Lobby
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## Lundi 14 mai 2012

HEURE	ACTIVITÉS	ENDROIT
12:00 - 20:00	Installation des exposants	Scotiabank Convention Centre
09:30 - 17:00	Visite guidée optionnelle de la rivière Niagara (Niagara Falls et Niagara-on-the-Lake)	Tous les hôtels de la conférence
07:30 - 17:00	INSCRIPTION HÂTIVE À LA CONFÉRENCE/BUREAU D'AIDE	Scotiabank Centre Foyer
08:30 - 12:00	Ateliers optionnels du matin	Scotiabank Convention Centre
08:30 - 12:00	CARIS - Bathy DataBase	Salle 201
08:30 - 12:00	Chesapeake Technology Inc. - Introduction au post-traitement des données de sonar latéral et de sous-sol de fond à l'aide du SonarWiz 5	Salle 202
08:30 - 12:00	Triton Imaging Inc. - Interprétation et traitement de données intégrés - nouveau logiciel Perspective	Salle 206
09:15 - 12:10	iXBlue - Démonstration en temps réel du système de navigation cartographique multifaisceau HYDRINS avec le logiciel de post-traitement DELPH INS	Salle 204
13:00 - 16:30	Ateliers optionnels de l'après-midi	
13:00 - 16:30	Réunion du groupe de discussion international sur la gestion de l'incertitude en hydrographie	Salle 202
13:50 - 16:30	iXBlue - Localisation des champs de glace par VSA avec le système de positionnement acoustique IXBLUE GAPS et le INS intégré	Salle 204
13:00 - 16:30	Fugro Pelagos - Facteurs liés à la planification des relevés bathymétriques Lidar	Salle 206
13:00 - 16:30	ESRI et QPS - Le flux de travail hydrographique moderne avec QINSy et ArcGIS	Salle 205
08:30 - 16:30	Ateliers d'une journée complète optionnels	
08:30 - 16:30	Hypack - Collecte et traitement de données à faisceaux multiples à l'aide du HYPACK 2012	Salle 203
18:30 - 21:30	Réception d'accueil	R-5/Fallsview Casino

## Mardi 15 mai 2012

HEURE	ACTIVITÉS	ENDROIT
07:00 - 21:30	Installation des exposants	Scotiabank Convention Centre
07:30 - 17:00	INSCRIPTION À LA CONFÉRENCE/BUREAU D'AIDE	Scotiabank Centre Foyer
08:30 - 10:00	Cérémonies d'ouverture	Junior Ballroom
10:00 - 10:30	Pause	Peller Ballroom
10:00 - 17:00	Exposition	Peller Ballroom
10:30 - 12:00	Séance 1 - Les zones côtières et le plateau continental	Junior Ballroom
12:00 - 13:30	Dîner	Peller Ballroom
13:00 - 17:00	Navettes aller-retour vers les expositions sur l'eau	Scotiabank Centre Foyer
13:30 - 15:00	Séance 2 - Infrastructure et gestion des données spatiales marines I	Junior Ballroom
15:00 - 15:30	Pause	Peller Ballroom
15:30 - 17:00	Séance 3 - Infrastructure et gestion des données spatiales marines II	Junior Ballroom
17:00 - 20:00	Expositions en soirée	Peller Ballroom

\* susceptibles d'être modifiées





15-17 May, 2012

Niagara Falls, CANADA

15-17 mai, 2012

### Mercredi 16 mai 2012

HEURE	ACTIVITÉS	ENDROIT
07:30 - 17:00	<b>INSCRIPTION À LA CONFÉRENCE/BUREAU D'AIDE</b>	Scotiabank Centre Foyer
08:00 - 12:00	Navettes aller-retour vers les expositions sur l'eau	Scotiabank Centre Foyer
08:30 - 17:00	Exposition	Peller Ballroom
08:30 - 10:00	<b>Séance 4 - Technologies nouvelles et émergentes I</b>	Junior Ballroom
10:00 - 10:30	Pause	Peller Ballroom
10:30 - 12:00	<b>Séance 5 -Formation et perfectionnement professionnel</b>	Junior Ballroom
12:00 - 13:30	Dîner	Peller Ballroom
12:00 - 13:30	Assemblée générale annuelle de l'ACH (Dîner offert)	Salle 203
13:00 - 17:00	Navettes aller-retour vers les expositions sur l'eau	Scotiabank Centre Foyer
13:30 - 15:00	<b>Séance 6 - Technologies nouvelles et émergentes II</b>	Junior Ballroom
15:00 - 15:30	Pause	Peller Ballroom
15:30 - 17:00	<b>Séance 7 - Cadre de référence altimétrique et problèmes référentiels</b>	Junior Ballroom
17:30 - 18:00	<b>Bus vers le cocktail/souper de conférence</b>	Tous les hôtels de la conférence
18:00 - 19:00	<b>Cocktail Reception</b>	Table Rock Centre Elements Foyer
19:00 - 22:00	<b>Souper conférence</b>	Table Rock Centre Elements Restaurant

### Jeudi 17 mai 2012

HEURE	ACTIVITÉS	ENDROIT
07:30 - 17:00	<b>INSCRIPTION À LA CONFÉRENCE/BUREAU D'AIDE</b>	Scotiabank Centre Foyer
08:00 - 12:00	Navettes aller-retour vers les expositions sur l'eau	Scotiabank Centre Foyer
08:30 - 15:30	Exposition	Peller Ballroom
08:30 - 10:00	<b>Séance 8 - Marées, courants et niveaux d'eau</b>	Junior Ballroom
10:00 - 10:30	Pause	Peller Ballroom
10:30 - 12:00	<b>Séance 9 - Cartographie nautique</b>	Junior Ballroom
12:00 - 13:30	Dîner	Peller Ballroom
13:30 - 15:00	<b>Séance 10 - Des ouvertures pour l'adoption d'une approche collaborative</b>	Junior Ballroom
15:00 - 15:30	Pause	Peller Ballroom
15:30	Fermeture du hall d'exposition	Peller Ballroom
15:30 - 17:00	<b>Cérémonies de clôture</b>	Junior Ballroom



# The Clock is Ticking - The Journey for Canada's Submission to the United Nations Commission on the Limits of the Continental Shelf

By: Stephen Forbes, Canadian Hydrographic Service, Department Fisheries & Oceans, Canada  
Jacob Verhoef, Geological Survey of Canada, Natural Resources Canada, Canada  
David Mosher, Geological Survey of Canada, Natural Resources Canada, Canada

In 2003 Canada ratified the Law of the Sea (LOS) Convention. Given the timeline for Extended Continental Shelf (ECS) submissions to the United Nations Commission on the Limits of the Continental Shelf (CLCS), Canada's submission is due December 2013.

Several years prior to ratification, Canada was preparing for the ECS submission to determine the current scientific data holdings, the regions requiring surveys and plan surveys to collect the additional scientific data necessary to support the submission. The submission will delineate the outer limits of the continental shelf using criteria determined by the United Nations Convention on the Law of the Sea (UNCLOS), Article 76. Post ratification in 2003, three Federal Government departments were assigned the responsibility to prepare Canada's submission. The Department of Foreign Affairs and International Trade (DFAIT) is the lead department responsible for the preparation and presentation of the submission, Fisheries and Oceans Canada and Natural Resources Canada are tasked with the collection, analysis and presentation of the scientific data necessary to support the submission under Article 76.

## 1. Introduction

The data acquisition in the Arctic and Atlantic regions will be described and the use of innovative techniques and technology to acquire the scientific data in difficult and inhospitable regions will be presented. The collaboration among Canada's Federal Departments and Agencies and the international cooperation with Arctic and Atlantic coastal states are also described. Canada's submission status and what needs to be addressed to "beat the clock" before December 2013 will be discussed.

## 2. Background

Canada was a British colony prior to Confederation in 1867. Up to this time, personnel of the British Royal Navy (British Admiralty) were the primary explorers and map makers for these holdings including the Arctic Regions. The Admiralty explorers were instructed to take possession in the name of the Crown of any newly discovered islands and territories. The Dominion of Canada was established by the British North America Act signed by the British monarch, Queen Victoria in 1867.

In 1870, the British proposed the transfer of the Arctic Islands to Canada and in 1880 an Imperial Order-in-Council was signed in London stating that "after September 1, 1880 all British territories and possessions and all islands adjacent to any such territories or possessions shall become and be annexed to and form part of the

Dominion of Canada; and become and be subject to the laws for the time being in force in the said Dominion". As a result of this transfer, Canada has the longest coastline in the world and is endowed with continental shelves in the Arctic, Atlantic and Pacific regions.

The United Nations Convention on the Law of the Sea, in more than 350 articles established, the shared governance of the world's oceans by all nations and also defines the principles and guidelines for the coastal states delimitation of sovereignty, jurisdiction and associated rights.

Canada became a signatory to UNCLOS in 1982. The convention currently has 162 states parties and is one of the most widely accepted world treaties. Every coastal state has a right to a 200 nm continental shelf and under certain circumstances an ECS. In November 2003, Canada ratified the convention and by ratifying, Canada made the commitment to the United Nations (UN) to provide a submission that delimited its ECS 10 years after ratification i.e. December 2013.

The following discussion will outline Canada's progress in acquiring, analyzing, presenting data and preparing the submission for the Arctic and Atlantic regions. As the December 2013 approaches the "ticking clock" is becoming louder.

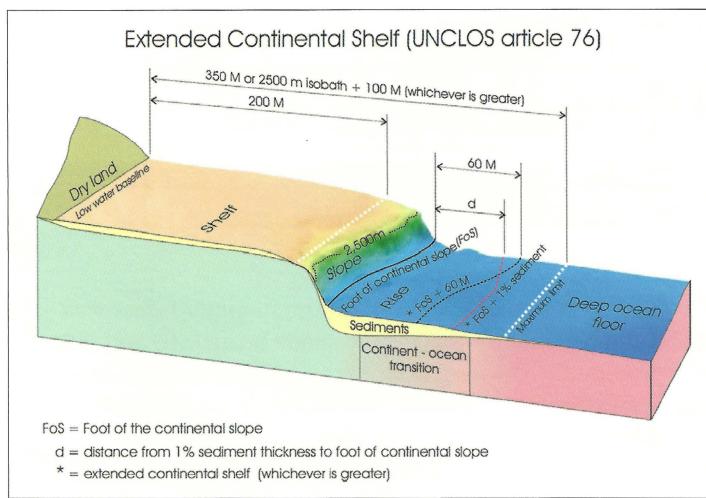


Figure 1: Foot of the Slope and Outer Limit

### 3. UNCLOS and Article 76

UNCLOS is frequently called the ‘constitution for the oceans’ since it provides a framework for the governance of the world’s oceans by dividing them into zones of national and international jurisdiction. The convention recognizes a coastal state’s rights to the water column and seabed up to 200 nm and to the seabed beyond 200 nm under special conditions as defined under Article 76.

Within its 200 nm wide Exclusive Economic Zone (EEZ) a state has exclusive sovereign rights over the seabed and the water column. For a continental shelf beyond 200 nm a state is required to delineate with precision the area over which it can exercise its sovereign rights. The state has exclusive rights over the natural resources on and under the seabed. However it does not include rights to the water column or migratory species therein beyond the 200 nm EEZ.

Article 76 utilizing scientific and legal terms defines the juridical continental shelf (Figure 1).

The definition of the continental shelf is: ...the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical mile ... (paragraph 1). The continental margin is defined as: ...the submerged prolongation of the land mass of the coastal State, and consists of the seabed and subsoil of the shelf, the slope and the rise. It does not include the deep ocean floor with its oceanic ridges or the subsoil thereof (paragraph 3).

A coastal state must demonstrate that it meets the criteria of Article 76 for an ECS and must collect the hydrographic, geomorphological and geological information necessary to define its ECS. To delineate the ECS, Article 76 describes the formulae for measuring the continental shelf seaward (Figure 1). Determining the ‘foot of the continental slope’ (FOS) is the first step in this process. It is defined as the point of maximum change in the gradient at its base. The outer limit can now be established as a distance of 60 nm from the FOS, or the distance to a point where

the thickness of the sedimentary layer is at least 1% of the shortest distance from this defined point to the FOS (the line that is used to connect these two points is called the Gardiner line). The maximum extent of the continental shelf under Article 76 is constrained by two conditions. Firstly, the outer limit shall not exceed 350 nm from the baselines of the coastal state and the second constraint states it cannot extend beyond 100 nm from the 2500 m isobath. The coastal state is at liberty to use any combination of the above constraints to delineate its outer limits but the distance between points defining this limit can not exceed 60 nm.

## 4. UNCLOS Preparation

Canada began to prepare for the ratification of the Law of the Sea in the mid to late 1980’s. Based on the requirement outlined in Article 76 for delimiting an ECS, it was prudent to determine the hydrographic, geomorphologic, seismic and geologic information that was currently available. Given this information it was possible to determine regions where additional data and analysis was needed to support Canada’s ECS submission. All relevant literature in published research papers for the Atlantic, Arctic and Pacific were obtained and catalogued as supporting documents for the submission.

The Pacific Coast to date has had a lower priority because of its narrow continental shelf but a Pacific ECS submission has not been ruled out.

### 4.1 The Early Years

The planning of the surveys to acquire the scientific data necessary for the submission was pioneered by hydrographers and geomorphologists from the Canadian Hydrographic Service (CHS), Department of Fisheries and Oceans and geologists, geomorphologists and support staff from the Geological Survey of Canada (GSC) Department of Natural Resources (NRCan). The inventory of data and information created the foundation for determining resource requirements, priorities and infrastructure needed to augment data holdings, in support of Canada’s submission. The early effort during this period was critical for preparing the financial and human resources documentation necessary to perform data acquisition and the substantial work required to prepare Canada’s submission. This accelerated the processes for securing the funding and resources to support the UNCLOS project.

### 4.2 The Project

As noted in the summary the UNCLOS project is the responsibility of three federal departments.

### 4.3 Governance

Governance and oversight for the project is provided by the Assistant Deputy Minister’s Steering Committee. The committee membership includes the ADM Earth Sciences Sector (ESS) NRCan, ADM DFO and the DFAIT Legal Advisor. Also included are the Director UNCLOS Project, NRCan, the Director LOS Project, DFO and a Director

Region	Year	Joint	Bathymetry	Type	Multi-Channel Seismic	Type	Other Data
Grand Banks	2006		18 545 km	MB			
Scotian Margin	2007		12 100 km	SB	6900 km	Reflection	
Labrador Margin	2009		4500 km	MB	3825 km	Reflection	
Labrador Sea	2009	Denmark			900 km	Reflection	

Table I :Atlantic Data Collection 2006-2009

and Deputy Director, Continental Shelf Division, DFAIT. The committee generally meets twice a year and reviews the project status and progress through the performance reports and background material provided.

In addition a detailed evaluation audit of the project is performed twice during the project's duration i.e. 2003 to 2013. The evaluation is provided to the ADMs and the recommendation(s) are documented in the Management Review and Action Plan (MRAP) for implementation.

## 5. Atlantic Data

The inventory of data in the Atlantic from the Labrador Sea to the maritime boundary with the US indicated that potential field data, seismic data and bathymetry were systematically collected during the 1960's and 1970's. However the data coverage frequently did not reach the abyssal plain and therefore by itself was not sufficient

for the ECS submission. Although the quality of data was good, the bathymetry was mostly single beam (SB) and did not provide the detailed bottom topography necessary to highlight slope processes and additional geomorphological evidence on and beyond the shelf.

To address this shortcoming, contract surveys were conducted for the Grand Banks in 2006, the Scotian Margin in 2007 and the Labrador Sea in 2009. These surveys extended the seismic and multi-beam sonar coverage further seaward to support Canada's submission. The seismic data collected in the Labrador Sea in 2009 were used to tie in existing seismic reflection and refraction data.

The data collected from 2006 – 2009 in the Atlantic are summarized in Table I.

The additional multi-beam bathymetry and seismic data (red) in the Atlantic acquired post 2006 is shown in Figure 2. The data holdings prior to 2006 are portrayed in black.

The Atlantic Region portion of the submission will be a combination of the FOS plus 60 nm, 2500 m contour plus a 100 nm and sediment thickness (Gardiner) to maximize and delimit Canada's ECS outer limits.

## 6. Arctic Data

The Arctic presented a different challenge. Not only were existing seismic and bathymetric data sparse, the area has an inhospitable climate, short survey season, ice cover and is remote and largely unpopulated. These factors alone made it a costly and a high risk region to collect data.

### 6.1 Eastern Arctic

The Arctic in the region of the Lomonosov Ridge, Alpha Ridge and Sever Spur has historically been an area with heavy multi-year ice that prevented surveys being conducted by icebreakers. The approach in these areas was to construct ice camps for the scientific and technical staff and to support data collection using helicopters and fixed wing aircraft.

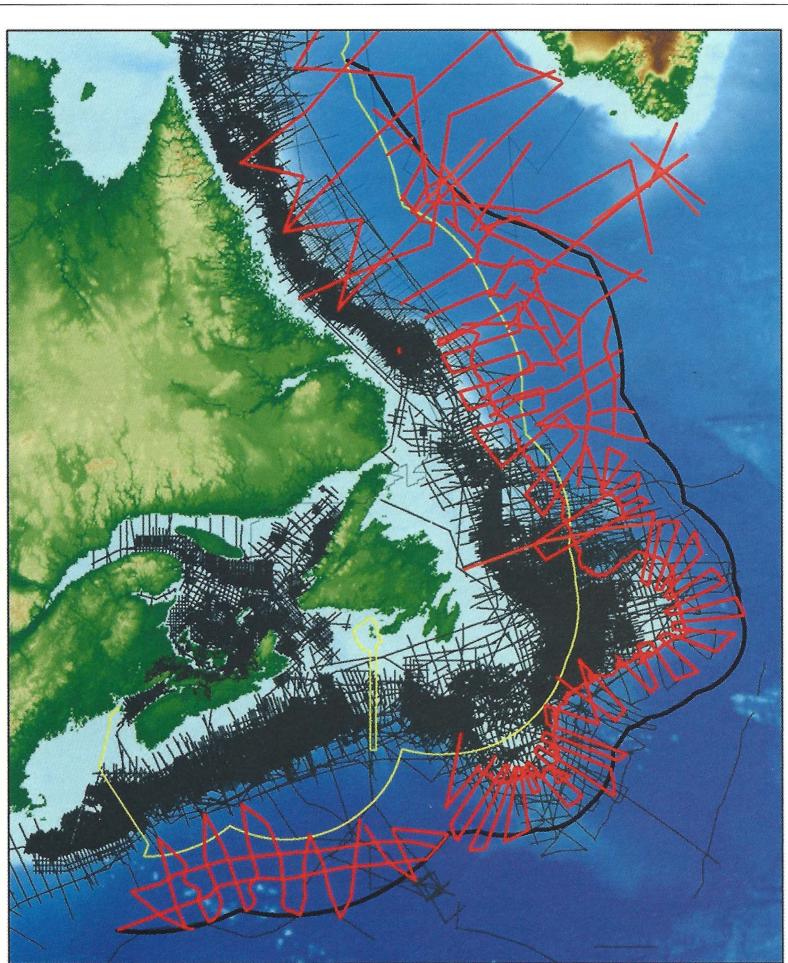


Figure 2 : Multi-beam bathymetry and seismic data collected 2006-2009

Region	Year	Joint	Bathymetry	Type	Multi-Channel Seismic	Type	Other Data
LORITA Lomonosov Ridge	2006	Denmark	100 km	Spot 2 km spacing	540 km	Refraction	
ARTA	2008		678 km	Spot 1-5 km Spacing	525 km	Refraction	250 gravity readings
Ward Hunt	2009	Denmark	1850 km	Spot			
Aero-Survey	2009	Denmark					75 000 km gravity & magnetics
Icebreaker Oden	2009	Denmark	320 km	MB	45 km	Reflection	
Borden Island	2010		326 km	Spot 2-5 km Spacing			60 gravity readings
Borden Island	2010		500 km	AUV			

Table II : Eastern Arctic Data Collection 2006 - 2010

Bathymetric measurements were obtained using an echo sounder and transducer coupled to the ice surface to obtain the depth. These measurements were made by a hydrographer to collect the position, time and depth information using a helicopter to transit from station to station.

Seismic information was obtained using seismic recorders in contact with the ice. The sound source for seismic measurements was pentolite explosive that was placed in holes drilled through the ice and detonated.

Potential field data i.e. gravity, were collected on the ice surface using gravity meters in specialized containers designed to provide power and maintain a consistent temperature.

The data acquired in the Eastern Arctic from 2006 to 2010 are summarized in Table II. Figures 3, 4 and 5 illustrate an ice camp and data collection in the Arctic.

## 6.2 Western Arctic

In 2007, the CCGS *Louis S. St-Laurent* conducted a hydrographic and seismic survey in the Western Arctic. Given the ice coverage and the necessity to collect data the following year in higher latitudes it was deemed too risky to survey with one icebreaker.

A Memorandum of Understanding was developed between the US and Canada that established a protocol for conducting joint survey) and data sharing in the Arctic that was mutually beneficial to both nations.

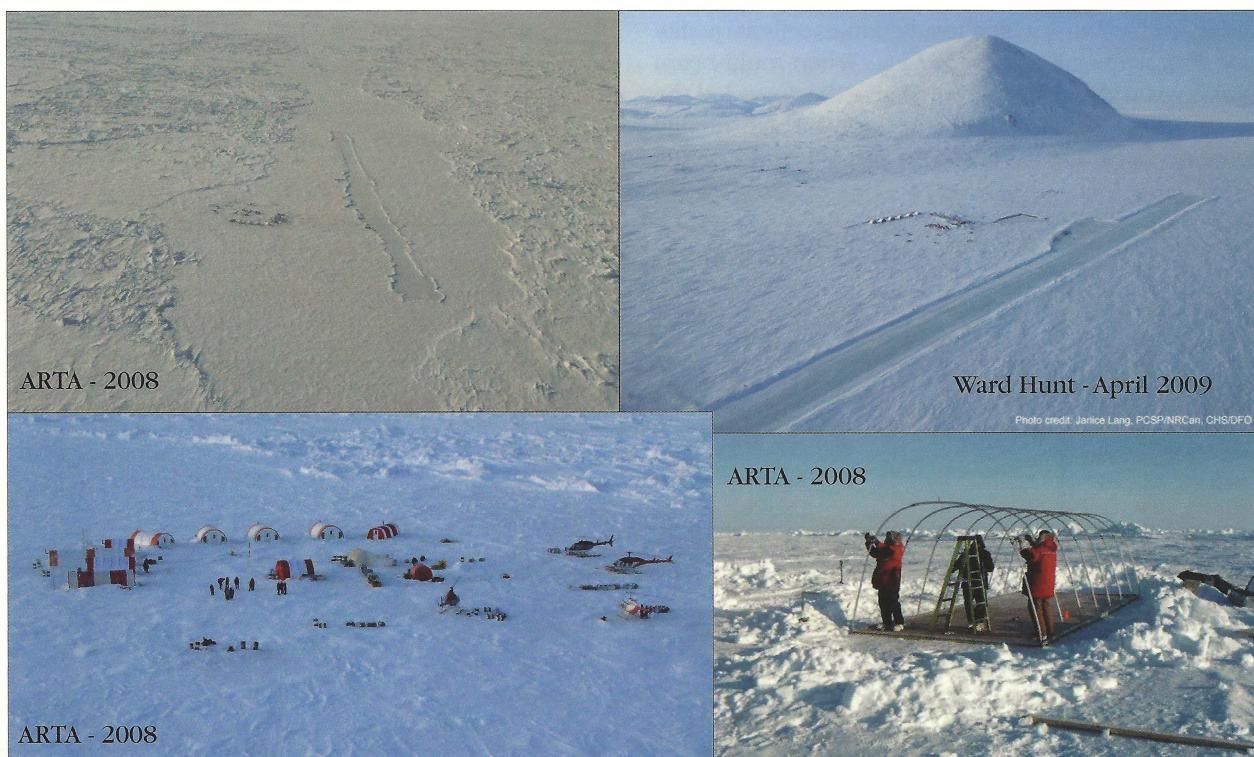


Figure 3 : Ice camps in the Eastern Arctic



Figure 4 : Collecting bathymetry and gravity to determine the shape of the seafloor

Canada utilized the icebreaker CCGS *Louis S. St-Laurent* for the collection of seismic data, single beam bathymetry and spot soundings. The USCGC *Healy* was primarily utilized to collect multi-beam bathymetry and 3.5 kHz CHIRP sub-bottom profile data. There were four joint Canada – US surveys conducted in the Arctic from 2008 to 2011 utilizing these two icebreakers. Canada and the US planned the surveys in the winter and spring. The information, knowledge and experience acquired in the previous surveys were used to prioritize and improve data acquisition and operations for the upcoming survey season (summer and fall).

The two icebreakers complemented each other. When the data collection priority was seismic data the *Healy* led and broke ice for the *Louis* which resulted in excellent quality seismic data acquisition in heavy ice. When multi-beam bathymetry was the collection objective the *Louis* led the *Healy* and this facilitated the acquisition of high quality bathymetric data. Figure 6 shows the US and Canada



Figure 5 : Seismic data collection in the Eastern Arctic

icebreakers surveying in the Western Arctic and Table III summarizes the data acquisition in the Western Arctic 2006 – 2011.



Figure 6 : On left USCGC *Healy* leading (seismic data priority); on right CCGS *Louis S. St-Laurent* leading (multi-beam bathymetry priority)

Region	Year	Joint	Bathymetry	Type	Multi-Channel Seismic	Type	Other Data
Canada Basin	2007		4760 km (12 kHz) 180	SB Spot with Helicopter	2987 km	Reflection	
Canada Basin	2008	US USCGC Healy	5500 km (12 kHz) 3000 km	SB MB	2817 km	Reflection	
Canada Basin	2009	US USCGC Healy	8000 km (12 kHz) 5000 km 177	SB MB Spot with Helicopter	4045 km	Reflection	
Canada Basin	2010	US USCGC Healy	10 700 km (12 kHz) 5250 km 61	SB MB Spot with Helicopter	3650 km	Reflection	
Canada Basin	2011	US USCGC Healy	6823 km (12 & 3.5 kHz) 4500 km 100 km 75	SB MB AUV Spot with Helicopter	1440 km	Reflection	

Table III : Western Arctic Data Collection 2007 - 2011

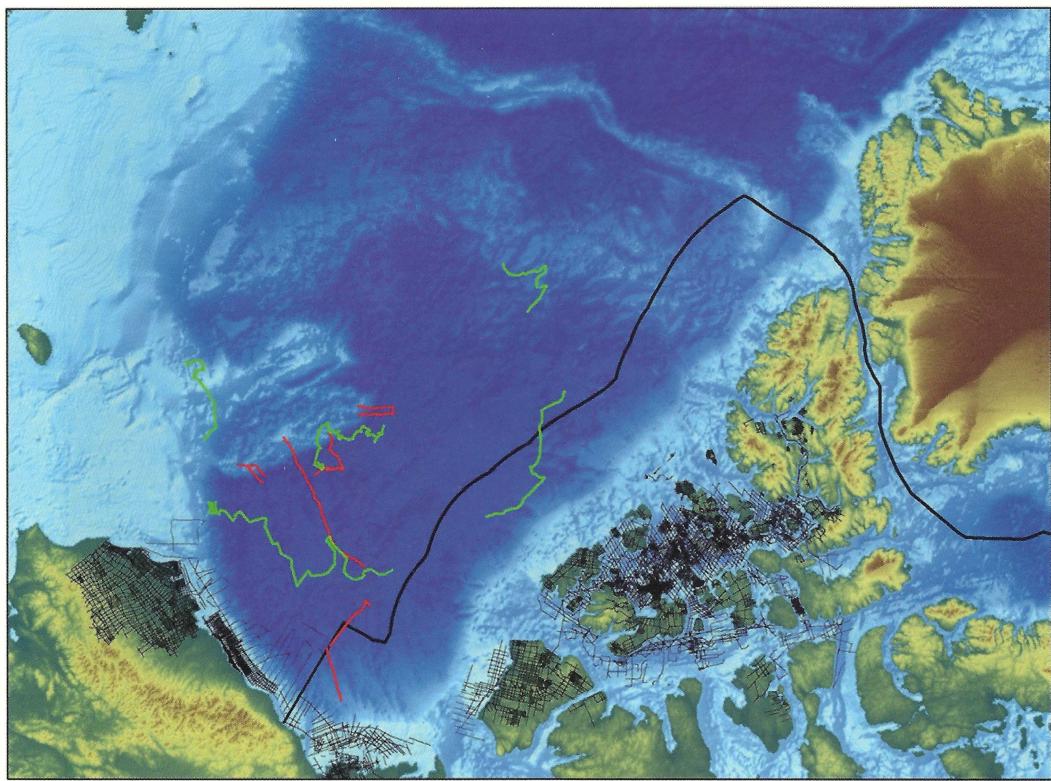


Figure 7 :Seismic data holdings in Canada Basin prior to 2006 and the EEZ (black line)



Figure 8 : Seismic coverage in the Western Arctic including the fall joint survey in 2011 (red line)

The fourth joint survey in 2011 was successful and the Canada's ECS data acquisition objective for the Arctic was met. This was Canada's final Arctic survey prior to the ECS submission date. There was no ice camp survey in the Arctic in the spring of 2011 because ice fracturing in the region of the 2010 ice camp required early removal of personnel and equipment. In 2011 it was decided that operating a camp far offshore in uncertain ice conditions was too risky and this method of data collection was ended.

### 6.3 Arctic Data Collection Summary

As noted, during the years 2006 to fall 2011, the project was successful in meeting objectives in the Arctic. Figure 7 is a view of the status of seismic data collection prior to 2006 in the Canada Basin. Figure 8 shows the data acquisition after 2006 including the 2011 survey. Although the overall data coverage in the Arctic is still sparse, the success of the data collection has been remarkable given the hostile environment and the short time frame for conducting the surveys.

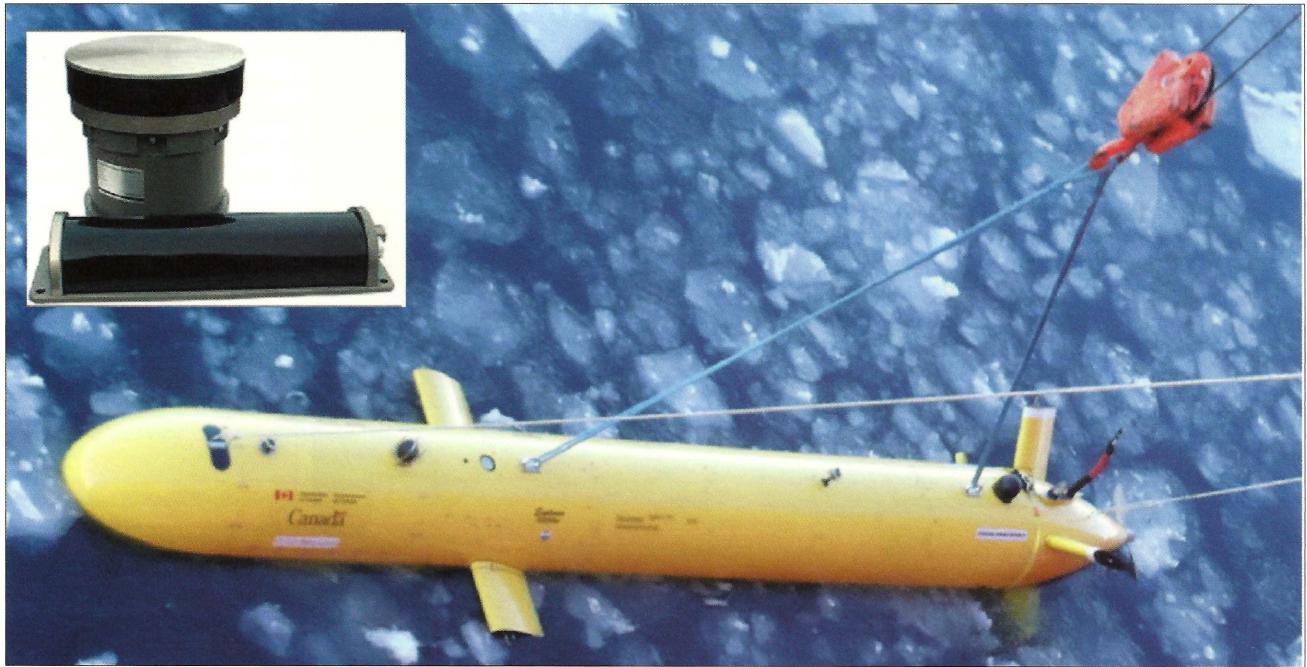


Figure 9 :AUV with Knudsen and multi-beam transducers in upper left corner

## 7. Technological Development and Innovation for Arctic Data Acquisition

It has been stated that “necessity is the mother of invention” and for conducting geological and hydrographic surveys in the Arctic this is a rule. Two significant developments that enhanced the data collection and data quality when surveying in thick multi-year ice contributed to the success of the Arctic data acquisition. A brief description of these developments follows.

### 7.1 Seismic Data Collection in Ice Infested Waters

The excellent quality of the seismic data collected in the Arctic under varying ice states including heavy ice was due to the engineering and technical development of a specialized module designed for housing the air guns. This development supported deployment of the air gun array and around the clock operation of the seismic gear. The streamer for acquiring the data was short due to



Figure 10 :Recovering the AUV in Arctic waters

operation in ice; however the entire system proved to be very reliable and resulted in collection of very high quality seismic data. Borden Chapman of the Geological Survey of Canada (GSC) and his technical staff at Bedford Institute of Oceanography (BIO) designed and implemented this system for the Arctic seismic acquisition. It was used successfully for five consecutive survey seasons. Considering the ice conditions that the system operated in, the endurance, reliability and the quality of data collected utilizing this innovation was remarkable.

## 7.2 Autonomous Underwater Vehicles

International Submarine Engineering (ISE) in Vancouver, British Columbia manufactured an Autonomous Underwater Vehicle (AUV) for use under ice in Arctic waters. In the fall of 2009 the government of Canada took delivery of two of these vehicles which are Explorer class and were funded by the UNCLOS project and Defense Research and Development Canada (DRDC). The vehicles are meant to collect bathymetry under ice and are rated for 5000 metres depth. They are designed for 72 hour endurance and approximately 400 km range. Each vehicle is equipped with a Knudsen single beam echo sounder and Kongsberg EM 2000 multi-beam sonar (Figure 9).

DRDC, NRCan and DFO deployed the vehicle in the Arctic in the spring of 2009. The AUV was deployed from a camp based near Borden Island, transited to a remote camp 330 km from the deployment site and then returned to the Borden Island site. The AUV also conducted a 300 km survey mission to Sever Spur from the remote camp. All missions were conducted under ice, autonomously. Approximately 1000 km of bathymetry was collected.

During the spring and summer of 2011, DRDC and the AUV implementation team for Project Cornerstone tested the vehicle in southern waters prior to sending two AUVs north on the ice breaker CCGS *Louis S. St-Laurent* for the 2011 high Arctic survey.

The deployment of the vehicle around Sever Spur, under heavy ice conditions, resulted in a successful survey mission and the vehicle collected 100 km of high quality multi-beam data.

Figure 10 shows the vehicle recovery in the Arctic by the CCGS *Louis S. St-Laurent*

## 7.3 Summary

The seismic system development and the proof of concept missions carried out by the AUV in the high Arctic (2010 -2011) were instrumental in Canada being able to collect some of the required seismic and bathymetric data for support of Canada's submission.

## 8. International Cooperation and Collaboration

The following discussion will show the high level of international cooperation and collaboration that has taken place in the Arctic and other regions of mutual interest.

### 8.1 Arctic

During the past four years (2008 -2011) the United States and Canada conducted joint surveys in the Arctic using the Canadian icebreaker, CCGS *Louis S. St-Laurent* and the United States icebreaker USCGC *Healy*. As previously noted, these joint surveys were conducted under an agreement and a Memorandum of Understanding (MOU) between the two nations regarding sharing of data collected.

This joint initiative with the US was beneficial to both nations by reducing the cost to Canada and the US to operate two icebreakers to survey in the high Arctic to meet their individual objectives. The vessels were complementary regarding their scientific infrastructure. *Healy* was equipped with Kongsberg EM122 12 kHz multi-beam sonar for detailed mapping of the ocean bottom and a 3.5 kHz CHIRP sonar for bottom penetration. The *Louis* had a single beam 12 kHz echo sounder and a customized air gun sled and streamers for collecting seismic data.

In addition to the economic benefits for each country, the ships were a backup for each other if problems arose. There is no doubt that the successful acquisition of the required scientific data in the Arctic for Canada's ECS submission was due to this joint surveying approach. It was win-win for Canada and the US and the collaboration was commendable.

Canada also participated in joint projects with Denmark in 2006 and 2009. This included the LORITA project in 2006 on the Lomonosov Ridge. In 2009, Canada and Denmark collected spot soundings in the Ward Hunt area and conducted an aero survey for the acquisition of gravity and magnetic data. Denmark chartered the icebreaker *Oden* and Canada placed a CHS hydrographer on the vessel for multi-beam bathymetry acquisition. Bathymetry and seismic data were acquired on this survey and it also included a visit to the North Pole.

### 8.2 Labrador Sea

Canada has worked very closely with Denmark in the Labrador Sea. In 2009 Canada and Denmark acquired 900 km of seismic refraction data to support each nation's ECS submission in this region. In addition Canada has members on technical task forces with Denmark to address geodetic and other delimitation issues related to each nations ECS in the Labrador Sea. This relationship has been cooperative, collaborative and beneficial to both nations.

### 8.3 Arctic Meetings

To date the Arctic coastal states have participated in five Arctic meetings that included presentations by research scientists, hydrographers, geodesists, engineers and technical support staff to share their research and ECS related topics in a professional and congenial forum. These meetings foster knowledge sharing, collaboration in research and projects and an opportunity to share data where mutually beneficial. This is an important component given the lack of scientific data and knowledge in the Arctic. A sixth Arctic meeting is planned for the fall of 2012 in the US.

### 8.4 Summary

In summary it is obvious there is significant collaboration and data sharing among the Arctic states and between Canada and Denmark in the Labrador Sea. It is to the benefit of all nations submitting ECS submissions to the CLCS to collaborate where possible without prejudice for their ECS submissions and particularly where there is a high probability of overlap.

## 9. Canada's Submission

Canada now has less than two years to complete the ECS submission. The current effort is to analyze the scientific data and prepare the submission. This is not a trivial task and it requires excellent coordination, communication and commitment by every member of the LOS team.

### 9.1 Developing the Submission, Supporting Documents and Scientific Data

The submission presents the scientific rationale and the scientific data required to support the delineation of Canada's ECS as outlined under Article 76. The submission also will reference many supporting documents including relevant published scientific research papers, information qualifying the scientific data (recently acquired as well as older data holdings) and description of all the data sets used to support the submission.

The written documents are accompanied by images depicting the FOS and outer delimitation based on the constraints as defined under Article 76. Each contributing FOS must be described and its relevance for determining the outer limit i.e. FOS + 60 nm, 2500 m contour + 100 nm, sediment thickness (Gardiner) and natural prolongation (natural prolongation of state's land territory as defined in Article 76). The overall delimitation may be maximized using the most advantageous of the choices listed, provided the data analysis supports the choice.

Images depicting the base points utilized as turning points for the baselines are included. The baselines are used to delineate the territorial sea, contiguous zone, the

200nm EEZ and the constraints for the outer limits. The construction of these constraints (e.g. FOS + 350 nm), the EEZ and delimitation of the ECS will be submitted as maps, charts, etc. with the relevant supporting information and documentation.

To facilitate the review of Canada's submission it is planned to submit digital versions that have embedded links to supporting documents, images, data sets, etc. The intent is to simplify and accelerate the review of the submission by the CLCS commissioners.

### 9.2 Status of Canada's Extended Continental Shelf Submission

Canada has an extensive coastline in the Atlantic, Arctic and Pacific. As previously stated the Pacific is lower priority at this time and therefore the submission discussion will be divided into two areas, the Atlantic and the Arctic.

#### 9.2.1 Atlantic

It was decided due to the large geographic extent, the sheer volume of information and the effort necessary to write a submission for the entire Atlantic continental shelf that the Atlantic portion of the submission would be produced initially in three parts i.e. the Labrador Sea, the Grand Banks and the Scotian Shelf.

The rationale of using individual components was advantageous for two reasons. Firstly the submission is not a scientific research paper and the objective is different. This means the organization, structure and presentation of the information is also different and as this was the first time that a Canadian submission had been written, it was thought prudent to begin with the Labrador Sea (considered the least complex area). The second reason was to use this initial effort as a test case to ensure we were on the right track. This was an important fact given the short timeframe remaining to complete the Atlantic and Arctic part of the submission.

The Labrador Sea preparation including supporting documents was begun in the summer of 2011 and Version 2.0 was completed in January 2012. This version was reviewed by a commissioner of the CLCS. The review comments were positive and the overall summary was;

"In summary, this is a very well prepared draft submission which presents a comprehensive and well documented basis for the outer limits." which is very encouraging.

The first draft for the Grand Banks and Scotian shelf is a work in progress and it is anticipated that this draft will be completed by the end of June 2012.

## 9.2.2 Arctic

In parallel with completing the Atlantic part of the submission, the analysis and development of the Arctic submission portion has begun. Initial tasks are to organize all relevant scientific data, supporting documents and analysis of the information for synthesis.

Analogous to the Atlantic, it is planned to initially write two submission portions for the Arctic i.e. the Eastern Arctic and the Western Arctic. Given the geographic extent and the different characteristics of the Western Arctic Beaufort Sea area where the primary approach will be sediment thickness and in the Eastern Arctic utilization of FOS + 60 nm, 2500 m contour + 100 nm and natural prolongation.

## 9.3 Tasks to Complete

It is obvious that the LOS team has a lot of work to complete prior to the submission date on December 6th, 2013 in New York.

Key milestones include;

- a. Complete the Grand Banks and Scotian Shelf portion of the Submission
- b. Complete the Eastern and Western Arctic draft portion of the Submission
- c. Review and edit drafts
- d. Prepare the final submission for CLCS

There are several sub tasks associated with the above milestones and it is clear that there is not a surplus of time to meet the deadline.

## 9.4 Will We “Beat the Clock” and Present Canada’s ECS Submission on Time?

The LOS team is confident that the submission deadline will be met and will present the best scenario for delineating Canada’s ECS outer limits. Therefore Canada will submit on time and honour its UNCLOS commitment.

## 10. Conclusions

To recap, Canada intends to submit the ECS submission for the Atlantic and the Arctic on December 6th 2013, ten years after ratifying UNCLOS.

Canada’s inter-departmental collaboration and support have been instrumental for the success of the project and this cooperation has been evident from the beginning of the project.

The successful surveys and data acquisition in the Arctic could not have been achieved in the timeframe necessary for meeting Canada’s ECS deadline without the collaboration and joint surveys carried out with the Danish in the Eastern Arctic and the contribution of the US in the

four joint Western Arctic surveys. In addition cooperation and collaboration with the Danish in the Labrador Sea facilitated the necessary data acquisition and confirmation of each nation’s baselines in Labrador for Canada and in Greenland for Denmark.

In conclusion this project would not have been possible or successful without the foresight of persons employed at NRCan and DFO in the 1980’s and 1990’s who were responsible for preparing the inventory of scientific research, data and hydrography necessary to plan and support Canada’s ECS initiative in the 21st century.

## Acknowledgements

The authors thank the science party, support staff and the ship’s complement of USCGC *Healy* and CCGS *Louis S. St-Laurent*. In addition we thank the collaboration and cooperation that Canada has received from the Danish research scientists, hydrographers and support staff who participated in joint programs in the Eastern Arctic and sharing of scientific data in the Labrador Sea.

Finally we would be remiss not to acknowledge the dedicated effort from the Canadian LOS team including the research scientists, geologists, geomorphologists, hydrographers, geodesists and DFO and NRCan technical support staff. We also thank the DFAIT personnel who have provided valuable legal advice and direction regarding the aspects of the project that deal with boundaries, legal issues and the legal interpretation of UNCLOS including Article 76. They have also provided advice when dealing with the governments of foreign nations. 

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## Biographical Notes



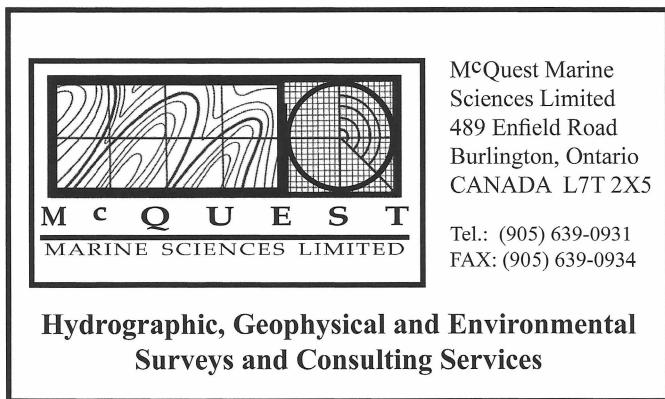
**Steve Forbes** graduated from Mount Allison University, Sackville, N.B. with a Bachelor of Science in Physics and Math and a Certificate in Engineering. He joined the Canadian Hydrographic Service (CHS) in 1972 as a field hydrographer.

In 2007 Steve was appointed Director of Hydrography (Atlantic). In 2011 he was appointed Director, Law of the Sea Project, Canadian Hydrographic Service. The Law of the Sea office is located at the Bedford Institute of Oceanography, Dartmouth, N.S.

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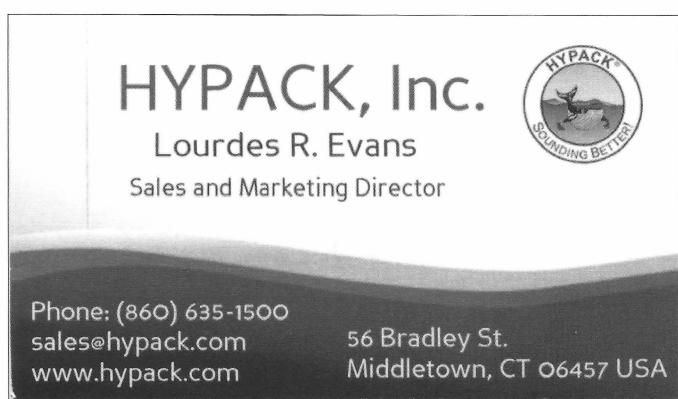
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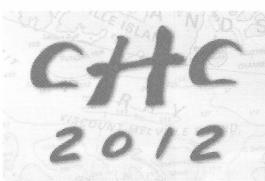
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15-17 May, 2012

Niagara Falls, CANADA

15-17 mai, 2012

## TECHNICAL PROGRAM - PROGRAMME TECHNIQUE\*

**Monday, 14 May 2012****Lundi 14 mai 2012****8:30**

Full Day

**WORKSHOPS / ATELIERS**

- Multibeam Data Collection and Processing using HYPACK 2012
- Collecte et traitement de données à faisceaux multiples à l'aide du HYPACK 2012

*Hypack*

Half Day

- Bathy Database

- Bathy Database

*CARIS*

- Introduction to Sidescan and Sub-bottom Post Processing Using SonarWiz 5

- Introduction au post-traitement des données de sonar latéral et de sous-sol de fond à l'aide du SonarWiz 5

*Chesapeake Technology Inc.*

- Integrated data processing and interpretation with Triton's new Perspective software

- Interprétation et traitement de données intégrés à l'aide du nouveau logiciel Perspective de Triton

*Triton Imaging Inc.*

- Live demo of HYDRINS multibeam survey navigation system with DELPH INS post processing software

- Démonstration en temps réel du système de navigation cartographique multifaisceau HYDRINS avec le logiciel de post-traitement DELPH INS

*iXBlue***13:00**

Half Day

**WORKSHOPS / ATELIERS**

- The International Discussion Group Meeting on Uncertainty Management in Hydrography

- Réunion du groupe de discussion international sur la gestion de l'incertitude en hydrographie

- Planning Considerations for Bathymetric Lidar Surveys

- Facteurs liés à la planification des relevés bathymétriques Lidar

*Fugro-Pelagos Inc.*

- Icecap AUV positioning with IXBLUE GAPS Acoustic Positioning system & integrated INS

- Localisation des champs de glace par VSA avec le système de positionnement acoustique IXBLUE GAPS et le INS intégré

*iXBlue*

- The Modern Hydrographic Workflow with QINSy and ArcGIS

- Le flux de travail hydrographique moderne avec QINSy et ArcGIS

*ESRI and/et QPS***18:30 - 21:30****Icebreaker / Réception d'accueil**

The Icebreaker Event is being held at the R5 Lounge in Fallsview Casino /

La réception d'accueil aura lieu dans le salon R5 du Fallsview Casino

\* subject to change / susceptibles d'être modifiées

8:30	Opening ceremony / Cérémonie d'ouverture
10:00	Break / Pause
Session/Séance 1 10:30	<b>Coastal Zone and Continental Shelf /</b> <b>Les zones côtières et le plateau continental</b> <ul style="list-style-type: none"> <li>• New Bathymetry from the 2011 Canada—U.S. Joint Expedition for Continental Shelf Mapping in the Arctic Ocean</li> <li>• Les nouvelles données bathymétriques du levé intergouvernemental Canada - É.-U. 2011 du plateau continental étendu dans l'Arctique</li> </ul> <p><i>Andrew ARMSTRONG and/et Larry MAYER, United States of America / (États-Unis d'Amérique), Steve FORBES, David MOSHER, Jon BIGGAR, and/et David STREET, Canada</i></p> <ul style="list-style-type: none"> <li>• UNCLOS in the Atlantic: An update on the status of the UNCLOS project off eastern Canada</li> <li>• UNCLOS dans l'Atlantique : un compte-rendu de l'état du projet UNCLOS dans les eaux de la côte Est du Canada</li> </ul> <p><i>Kevin DesRoches</i></p> <ul style="list-style-type: none"> <li>• Developing a Methodology for the Mapping and Characterization of the Nigerian Coastline Using Remote Sensing ('Ping' Presentation)</li> <li>• Élaboration d'une méthode pour la cartographie et la caractérisation du littoral nigérien à l'aide de la télédétection (Présentation « Ping »)</li> </ul> <p><i>Olumide FADAHUNSI, Andrew ARMSTRONG, Shachak PE'ERI, Lee ALEXANDER and/et Christopher PARRISH, United States of America/(États-Unis d'Amérique)</i></p> <ul style="list-style-type: none"> <li>• The Clock is Ticking --- The Journey for Canada's Submission to the United Nations Commission on the Limits of the Continental Shelf</li> <li>• Le compte à rebours est commencé --- Le cheminement de la présentation du Canada à la Commission des limites du plateau continental des Nations Unies</li> </ul> <p><i>Steven FORBES, Jacob VERHOEF, David MOSHER, Canada</i></p> <ul style="list-style-type: none"> <li>• Hydrography and Mobile LiDAR: Rapid Remote Shorelining ('Ping' Presentation)</li> <li>• L'hydrographie et le LiDAR mobile : utilisation de la télédétection rapide pour les relevés côtiers (Présentation « Ping »)</li> </ul> <p><i>Dave SINNOTT, Canada</i></p> <ul style="list-style-type: none"> <li>• Incorporating Lidar Data into HCell Compilation ('Ping' Presentation)</li> <li>• Intégration des données Lidar dans les compilations HCell (Présentation « Ping »)</li> </ul> <p><i>Toshi WOZUMI and/et Peter HOLMBERG, United States of America/(États-Unis d'Amérique)</i></p>
12:00	Lunch / Dîner
Session / Séance 2 13:30	<b>Marine Spatial Data Infrastructure and Management I /</b> <b>Infrastructure et gestion des données spatiales marines I</b> <ul style="list-style-type: none"> <li>• Implementation of CARIS Bathy DataBASE at the Canadian Hydrographic Service, Pacific Region</li> <li>• Mise en œuvre de la base de données bathygraphiques CARIS par le Service hydrographique du Canada, Région du Pacifique</li> </ul> <p><i>Michel BRETON, Gerald KIDSON and/et Paul SCOTT, Canada</i></p> <ul style="list-style-type: none"> <li>• A Specification for Developing a New Method of Visualising Data Quality in Electronic Navigational Charts</li> <li>• Cahier de charges pour le développement d'une nouvelle méthode en matière de qualité des données visuelles dans les cartes de navigation maritime électroniques</li> </ul> <p><i>Sam HARPER, United Kingdom/(Royaume-Uni)</i></p> <ul style="list-style-type: none"> <li>• Maritime Source Data Collection, Management and Integration</li> <li>• Collecte, gestion et intégration de données maritimes à la source</li> </ul> <p><i>John K KLIPPEN, Norway/(Norvège)</i></p>

- Ocean Basemap: Connecting the Marine GIS Community (*'Ping' Presentation*)
- Cartographie des océans : connecter la communauté SIG marine (Présentation « Ping »)

Beata VAN ESCH and/et Craig GREENE, United States of America/(États-Unis d'Amérique)

- Reconciling The Apparently Irreconcilable: New paradigms in Bathymetric Data Management (*'Ping' Presentation*)
- Concilier ce qui paraît inconciliable : les nouveaux paradigmes de gestion des données bathymétriques (Présentation « Ping »)

Bertrand BAUD, United States of America/(États-Unis d'Amérique)

15:00 Break / Pause

Session / Séance 3 15:30 **Marine Spatial Data Infrastructure and Management II / Infrastructure et gestion des données spatiales marines II**

- Remote Processing of Ship-based Hydrographic Multibeam Data
- Téléraitements des données hydrographiques multifaisceaux provenant de navires

Rob HARE, Derrick R. PEYTON and/et John CONYON, Canada

- The Case for a Marine Cadastre to help affirm Canada's sovereignty in the Arctic and enable integrated Marine Spatial Planning
- Plaidoyer pour un cadastre marin comme outil d'affirmation de la souveraineté canadienne dans l'Arctique et pour permettre l'intégration planification spatiale marine

Jean-Claude TÉTREAULT, Jean GAGNON and/et José M'BALA, Canada

- Developing a GIS-Database and Risk Index for Potentially Polluting Marine Sites
- Développement d'une base de données SIG et d'un indice de risque pour les sites marins potentiellement polluants

Giuseppe MASETTI, Brian CALDER and/et Lee ALEXANDER, United States of America/(États-Unis d'Amérique)

- Marine Spatial Data Infrastructure: GIS for a Blue Planet
- Infrastructure des données spatiales marines : un SIG pour une planète bleue

Rafael PONCE, United States of America/(États-Unis d'Amérique)

- Bathymetry in the Cloud with GIS (*'Ping' Presentation*)
- La bathymétrie dans le nuage avec le SIG (Présentation « Ping »)

Timothy KEARNS and/et Beata VAN ESCH, United States of America/(États-Unis d'Amérique)

17:00 End of Sessions / Fin des séances

17:30 - 20:30 Exhibitors Evening / Soirée des exposants

The Exhibitors Evening will be held in the Scotiabank Place Exhibitors Grand Hall / La Soirée des exposants aura lieu dans le Exhibitors Grand Hall de la place Scotiabank

**Wednesday, 16 May 2012**

**Mercredi 16 mai 2012**

Session / Séance 4 8:30 **New & Emerging Technology I / Technologies nouvelles et émergentes I**

- Proper Environmental Reduction for Attenuation in Multi-sector Sonars
- Réduction adéquate de l'impact environnemental : l'atténuation des signaux des sonars multisecteurs

Rodrigo de Campos CARVALHO, Brazil/(Brésil) and/et John E. HUGHES CLARKE, Canada

- Validation of Terrestrial Aspect of CZMIL (*'Ping' Presentation*)
- Validation de la représentation terrestre du CZMIL (Présentation « Ping »)

Abel DEAN, Antoine COTTIN, Josephine MAISANO, United States of America/(États-Unis d'Amérique)

- **MBES Swath Angle in Relation with Data Processing Quality, Time and Cost**
- **L'incidence de l'angle de fauchée MBSE sur la qualité, la rapidité et le coût du traitement des données**

Saad MESBAH, Mohamed MOHASSEB, Moustafa HANY, Hassan HALWANEE, Mohamed ELMELEGY, Egypt/Égypte), Pat SANDERS, USA/É.U.)

- **Calibration of Vessel Mounted LiDAR**
- **La calibration des LiDAR embarqués sur des navires**

Alan PICARD, Thomas TOUZÉ, Nicolas SEUBE, France, Jean-Guy NISTAD, Mathieu RONDEAU, Canada

- **Process for Capturing Real World Features from 3D Laser Scanned Point Clouds**
- **Processus de saisie de caractéristiques réelles à partir de nuages de points laser détaillés en 3D**

Katrina WYLLIE, Grant FROELICH, Karen HART, United States of America/États-Unis d'Amérique), Karen COVE, Canada

- **TruePix backscatter, Ultra High Resolution, and very compact sonars, broaden the application range of Multi-Beam Echo Sounders ('Ping' Presentation)**
- **La rétrodiffusion TruePix, la ultra-haute résolution et les sonars très compacts élargissent l'éventail des applications des échosondeurs multifaisceaux (Présentation « Ping »)**

Jens STEENSTRUP, United States of America/États-Unis d'Amérique)

10:00

Break / Pause

Session / Séance 5

10:30

**Training and Professional Development /**  
**Formation et perfectionnement professionnel**

- **The Hydrographic Society of America Student Outreach Program: Reaching Across Borders**
- **Le programme d'extension des services aux étudiants de l'Hydrographic Society of America : transcender les frontières**

Jana DaSILVA LAGE, United States of America/États-Unis d'Amérique)

- **Training Multi-Disciplinary Hydrographers at the Canadian Hydrographic Service ('Ping' Presentation)**
- **La formation d'hydrographes pluridisciplinaires au Service hydrographique du Canada (Présentation « Ping »)**

Dr. Kian FADAIE, Canada

- **Hydrography and the ACLS**
- **L'hydrographie et le l'AATC**

Jean-Claude TÉTREAU, Canada

- **A Modular Approach to Hydrographic Expertise Development**
- **Une approche modulaire pour le développement de l'expertise hydrographique**

Guy NOLL, United States/États-Unis d'Amérique), Michael BRISSETTE, Canada

- **The European Union Erasmus Intensive Program in Hydrography and Geomatics: Survey training at the international level**
- **Le programme intensif Erasmus en hydrographie et en géomatique de l'Union européenne : une formation en cartographique à l'échelle internationale**

Nicolas SEUBE, Nathalie DEBESE, Thomas TOUZÉ, Rodéric MOITIÉ, Irvin PROBST, Alan, PICARD, France, Maude AUDET MORIN, Canada, Volker BÖDER, Germany/Allemagne), Alain DE WULF, Belgium/Belgique)

- **The Hydrographic Academy, Distance Learning with Plymouth University**
- **L'Hydrographic Academy, le téléapprentissage à l'Université Plymouth**

Don VENTURA, United States of America/États-Unis d'Amérique), Dr Richard THAIN, United Kingdom/Royaume-Uni)

12:00

Lunch / Dîner

Session / Séance 6

13:30

**New & Emerging Technology II (Water Column) /**  
**Technologies nouvelles et émergentes II (les colonnes d'eau)**

- Multibeam Echosounder System Optimization for Water Column Mapping of Undersea Gas Seeps ('Ping' Presentation)
- L'optimisation des systèmes d'échosondage multifaisceaux pour la cartographie des colonnes d'eau des dégagements gazeux sous-marins (Présentation « Ping »)

Jonathan BEAUDOIN, T. WEBER, K. JERRAM, G. RICE, M. MALIK and/et L. MAYER, United States of America/États-Unis d'Amérique)

- Modelling the estuarine circulation of the Port of Saint John: Visualizing complex sound speed distribution.
- Modélisation de la circulation estuarienne dans le port de Saint John : visualisation d'une distribution complexe de la vitesse sonore

Ian CHURCH, John HUGHES CLARKE, Susan HAIGH and/et Reenu TOODESH, Canada

- The Squamish ProDelta: Monitoring Active Landslides and Turbidity Currents
- Le prodelta de la rivière Squamish : surveillance des glissements de terrain actifs et courants de turbidité

Dr. John E. HUGHES CLARKE, Canada

- Automatic Mid-Water Target Tracking using Multibeam Water Column
- Poursuite automatique de cibles pélagiques à l'aide de sondeurs multifaisceaux dans les colonnes d'eau

Carlos RUBRIO MARQUES, Portugal and/et John E. HUGHES CLARKE, Canada

- Methods for Collecting and Using Field Calibration Information for the Reson 7000 Series Multibeam
- Méthodes de collecte et d'utilisation de l'information de calibration sur le terrain pour le sondeur multifaisceau Reson 7000

Glen RICE, Samuel GREENAWAY, Tom WEBER and/et Jonathan BEAUDION, USA/É.U.)

- Multi-Dimensional Water Column Analysis As A Catalyst For Sustainable Hydrographic Survey ('Ping' Presentation)
- L'analyse multidimensionnelle des colonnes d'eau comme catalyseur de relevés hydrographiques durables (Présentation « Ping »)

Corey M. COLLINS, Canada

15:00

Break / Pause

Session / Séance 7

15:30

## Vertical Reference Frame and Datum Issues / Cadre de référence altimétrique et problèmes référentiels

- Vertical Datum Separation Models for the British Columbia Coast
- Modèles de séparation des références altimétriques pour le littoral de la Colombie-Britannique

Bodo DE LANGE BOOM, Canada

- The Canadian Hydrographic Continuous Vertical Datum Project Progress and new developments ('Ping' Presentation)
- Les progrès du projet de Référentiel géographique du littoral canadien et les plus récents développements (Présentation « Ping »)

Andre GODIN\*, Terese HERRON, Bodo de LANGE BOOM, Denis LEFAIVRE, Phillip MACAULAY, Denny SINNOTT, Anne BALLANTYNE, Julie BARBEAU, Louis MALTAIS, Catherine ROBIN, Calvin KLATT and/et Marc VÉRONNEAU, Canada

- Consolidation, Automation and Visualization: CHS Atlantic's GPS & Tidal Data Holdings
- Consolidation, automatisation et visualisation : le fonds de données GPS et marégraphiques du SHC, Région de l'Atlantique

Mike MCMAHON, Canada

- The Canadian Hydrographic Continuous Vertical Datum: Methodology and Accuracy
- Le Référentiel géographique du littoral canadien : méthodologie et exactitude

Catherine ROBIN\*, Andre GODIN, Phillip MACAULAY, Bodo DE LANGE BOOM, Denis LEFAIVRE, Terese HERRON, Denny SINNOTT, Anne BALLANTYNE, Julie BARBEAU, Louis MALTAIS, Calvin KLATT and/et Marc VÉRONNEAU, Canada

- A New Height System for Canada: CGVD2013
- CGVD2013 : le nouveau système de référence altimétrique du Canada

Marc VÉRONNEAU, Canada

17:00	<b>End of Sessions / Fin des séances</b>
18:00 - 22:00	Conference Dinner to be held at Elements Restaurant by the Falls / Souper-conférence au restaurant Elements près des chutes

**Thursday, 17 May 2012**

**Jeudi 17 mai 2012**

<b>Session / Séance 8</b>	<b>Tides, Currents, and Water Levels /</b>
8:30	<b>Marées, courants et niveaux d'eau</b>
	<ul style="list-style-type: none"> <li><b>Predicted vs. Observed Water Levels for Sounding Reduction in the Arctic and other Remote Areas</b></li> <li><b>Niveaux d'eau prévus vs observés pour la réduction des sondes dans l'Arctique et autres régions éloignées</b></li> </ul> <p><i>Anne BALLENTYNE, Canada</i></p>
	<ul style="list-style-type: none"> <li><b>Surface Currents from High Frequency Radar in Support of Ports and Harbours</b></li> <li><b>La mesure des courants de surface par les radars à haute fréquence au service des ports et des havres</b></li> </ul> <p><i>Stephan HOWDEN, Amy KERN, United States of America/États-Unis d'Amérique)</i></p>
	<ul style="list-style-type: none"> <li><b>Error Analysis Procedures Used by the National Ocean Service to Compute Estimated Error Bounds for Tidal Datums in the Arctic Ocean</b></li> <li><b>Procédures d'analyse d'erreurs utilisées par National Ocean Service pour l'évaluation des limites d'erreur dans le calcul du zéro des marées dans l'océan Arctique</b></li> </ul> <p><i>Michael MICHALSKI, Lijuan HUANG and/et Gerald HOVIS, United States of America/États-Unis d'Amérique)</i></p>
	<ul style="list-style-type: none"> <li><b>Implementation of a TCARI Tidal Model Solution over an extensive coastal survey project in the Torres Strait: Why, How and an Analysis of the Results</b></li> <li><b>Mise en œuvre d'une solution de modélisation des marées TCARI dans le cadre d'un projet de relevé côtier complet dans le détroit de Torrès : le pourquoi, le comment et une analyse des résultats</b></li> </ul> <p><i>Don VENTURA, United States of America/États-Unis d'Amérique)</i></p>
	<ul style="list-style-type: none"> <li><b>A Ruggedized Portable Tide Station for Short-Term Installation in Remote Regions of Alaska ('Ping' Presentation)</b></li> <li><b>Un observatoire de marée robuste et portatif pour installation temporaire dans les régions éloignées de l'Alaska (Présentation « Ping »)</b></li> </ul> <p><i>Caleb GOSTNELL, Lynn ASBECK, Keith BRKICH, United States of America/États-Unis d'Amérique)</i></p>

10:00	<b>Break / Pause</b>
<b>Session / Séance 9</b>	<b>Nautical Cartography /</b>
10:30	<b>Cartographie nautique</b>
	<ul style="list-style-type: none"> <li><b>Using Depth Areas To Improve Automated Sounding Selection</b></li> <li><b>Utilisation des zones de profondeur pour améliorer la sélection automatique des sondages</b></li> </ul> <p><i>CDR Rick BRENNAN, Edward OWENS, United States of America/États-Unis d'Amérique)</i></p>
	<ul style="list-style-type: none"> <li><b>Cartographic Symbolization: An Evolution from Sea Monsters to Inukshuit</b></li> <li><b>L'évolution des symboles cartographiques : des monstres marins aux inukshuit</b></li> </ul> <p><i>John MERCURI, Canada</i></p>
	<ul style="list-style-type: none"> <li><b>Development of a Geo-Spatial Analysis Methodology for Assessing the Adequacy of Hydrographic Surveying and Nautical Charts</b></li> <li><b>Développement d'une méthodologie d'analyse géospatiale pour l'évaluation de la pertinence des relevés hydrographiques et des cartes nautiques</b></li> </ul> <p><i>Chukwuma AZUIKE, Shachak PE'ERI, Lee ALEXANDER, Christopher PARRISH and/et Andrew ARMSTRONG, United States of America/États-Unis d'Amérique)</i></p>

- Beyond the Chart: the Use of Satellite Remote Sensing for Assessing Chart Adequacy and Completeness Information
- Au-delà la carte : l'utilisation de la télédétection par satellite pour l'évaluation de la pertinence des cartes et de l'exhaustivité de l'information  
*Shachak PE'ERI, Chukwama AZUIKE, Lee ALEXANDER, Christopher PARRISH and/et Andrew ARMSTRONG, United States of America/(États-Unis d'Amérique)*
- Integrated data streams as information backbone of e-Navigation ('Ping' Presentation)
- Les flux de données intégrés comme support informatique principal de la navigation électronique (Présentation « Ping »)  
*Michael BERGMANN, Germany/(Allemagne) and/et Eivind MONG, Canada*

12:00

Lunch / Dîner

Session / Séance 10

13:30

### Opportunities for Collaborative Approaches / Des ouvertures pour l'adoption d'une approche collaborative

- Establishing a multibeam sonar evaluation test bed near Sidney, British Columbia
- Implantation d'une plateforme d'essai pour radars multifaisceaux près de Sidney, en Colombie-Britannique  
*Rob HARE, John HUGHES CLARKE, Canada, Clay WHITTAKER, Melvin BROADUS, Rebecca MARTINOLICH, Jonathan BEAUDOIN, United States of America/(États-Unis d'Amérique)*
- Arctic Charting and Mapping Pilot Project: Sharing Modern Technologies and Resources towards a Common Goal
- Projet pilote de relèvement hydrographique et cartographique en Arctique : partage des technologies de pointe et des ressources pour la réalisation d'un objectif commun  
*Andrew LEYZACK, Ryan HARRIS, Jason DUFFE, Canada and/et Mark MACDONALD, United States of America/(États-Unis d'Amérique)*

- Navigability Of The Canadian Arctic
- Navigabilité de l'Arctique canadien  
*Christopher WRIGHT, Canada*

- NHS – MINTEC, Print on Demand
- NHS – MINTEC, impression sur demande  
*John K KLIPPEN, Norway/(Norvège)*

- Arctic navigation : a technical but also a human challenge! ('Ping' Presentation)
- La navigation dans l'Arctique : un défi technologique... et humain! (Présentation « Ping »)  
*Yves PATUREL, France*

- Economic Benefits of Hydrography ('Ping' Presentation)
- Les retombées économiques de l'hydrographie (Présentation « Ping »)  
*Olumide OMOTOSO, Nigeria*

15:00

Break / Pause

15:30

Closing Ceremony / Cérémonie de clôture

17:00

End of Conference / Fin du congrès

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- **News from corporate members in every edition of *Lighthouse*.**

The CHA, through *Lighthouse*, is active in promoting the strength and diversity of organizations and companies that support the hydrographic and related communities. Get onboard with us as a corporate member and we will help you reach potential customers throughout our worldwide distribution.

To join, please contact one of the Directors as listed on page 2. International applicants please remit to Central Branch. To obtain an application visit us at [www.hydrography.ca](http://www.hydrography.ca)

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### ASI Group Ltd

ASI Group provides a complete range of hydrographic, geophysical and visual inspection techniques to conduct underwater investigations. Lake bottom surface features and targets are located, measured and mapped with precision accuracy in real-time using a combination of geophysical mapping and charting tools. In-house cartographers and graphic specialists interpret geophysical data to produce quality technical reports in hardcopy and GIS compatible formats.

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- Geological investigations
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- Underwater search, survey and recovery
- Dredging surveys and volumetric determination
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For further information please contact:

ASI Group Ltd

Tel: (905) 641-0941    E-mail: [dkeyes@asi-group.com](mailto:dkeyes@asi-group.com)    Website: [www.asi-group.com](http://www.asi-group.com)

# Corporate Members

## Membres corporatifs

### Association of Canada Lands Surveyors

### Association des Arpenteurs des Terres du Canada

The ACLS is a national self-regulating professional association. It has 560 members located across Canada (and the world), who have expertise in surveying, photogrammetry, remote sensing, geodesy, hydrography and land information systems.

The ACLS is committed to raising awareness of the responsibilities and concerns of respective stakeholders in offshore Canada lands, and to find a common strategy to move this industry sector forward for the betterment of all. The following is a short list of the current main thrusts:

- Promotion of a Marine Cadastre for Canada
- Promotion of the ACLS national certification program for hydrographers
- Publication and promotion of the new book entitled "Canada's Offshore: Jurisdiction, Rights, and Management". Copies can be purchased from: [www.acls-aatc.ca](http://www.acls-aatc.ca) or [www.trafford.com](http://www.trafford.com)

L'A.A.T.C. est une association professionnelle de juridiction fédérale. Elle est composée de 560 membres répartis aux quatre coins du Canada (et du monde) qui ont une expertise en arpantage, en photogrammétrie, en télédétection, en géodésie, en hydrographie et en systèmes d'information foncière à référence spatiale.

L'A.A.T.C. est engagée à l'amélioration de la sensibilisation aux responsabilités et aux préoccupations des intervenants respectifs des terres extracotières du Canada et de l'adoption d'une stratégie commune pour faire progresser ce secteur de l'industrie en vue de la plus-value pour tous. Voici la liste des activités principales en cours :

- Promotion d'un cadastre marin pour le Canada.
- Promotion du programme national de certification des hydrographes de l'AATC.
- La publication et la promotion du nouveau livre : *Zone extracotière canadienne : juridiction, droits et gestion*. La version française sera disponible en novembre 2007. Vous pouvez faire l'acquisition de copies en visitant : [www.acls-aatc.ca](http://www.acls-aatc.ca) ou [www.trafford.com](http://www.trafford.com)

For further information please contact:

Association of Canada Lands Surveyors  
Tel: (613) 723-9200 FAX: (613) 723-5558 E-mail: [admin@acls-aatc.ca](mailto:admin@acls-aatc.ca)  
Website: [www.acls-aatc.ca](http://www.acls-aatc.ca)

### Blodgett-Hall Polar Presence LLC

The Blodgett-Hall Polar Presence LLC is a US registered non-profit non-commercial entity set up to promote geomarine research in the Arctic Ocean by combining modern technology with the advantages of working on the drifting sea ice cover. It has built and tested a research hovercraft, the R/H *SABVABAA*, which is based at UNIS, the University in Longyearbyen, Svalbard. The hovercraft, whose Inuit name means "flows swiftly over it", is equipped for work in marine geophysics, marine geology, and oceanography in the most inaccessible parts of the high Arctic. The program intends to put "boots on the ice" for extended periods, using a relatively inexpensive, very habitable platform with a minimum crew of two or three. Whether in motion along leads, or drifting on floes, it can carry out deep and shallow reflection and wide angle

seismics, and home in on geological targets for direct coring, dredging, and bottom photography. Oceanographic instrumentation consists of electromagnetic ice thickness measurements every 2sec, CTD casts to 500m, and Acoustic Doppler Current Profiling. The hovercraft was especially designed to investigate the Alpha Ridge, in areas of thick multiyear ice presently inaccessible to icebreakers north of Ellesmere Island and Greenland. In preparation for this the hovercraft has undergone three summers of testing over the Yermak Plateau. More than 10,000nm of travel have been recorded, while dredging, making CTD casts, seismic profiles, and testing autonomous drifting buoys for unattended seismic profiling, echo-sounding, and shallow CHIRP.

For further information please contact:

Website at [www.polarhovercraft.no](http://www.polarhovercraft.no)

# Corporate Members

## Membres corporatifs

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### C & C Technologies

C & C Technologies, Inc. is a privately-owned international surveying and mapping company specializing in deepwater services. Our cutting-edge technologies, inspiring workplace and “can do” attitude endear our clients and attract the industry’s leading innovators. C & C services

include autonomous underwater vehicle surveys, C-Nav® globally corrected GNSS, marine construction surveys, geophysical surveys, geosciences services, government services, land and coastal surveys, a free GoM GIS viewer, and geotechnical services.

For more information regarding C & C Technologies services please contact:

Thomas Chance, CEO  
at (337) 261-0000 email to [marketing@cctech.us](mailto:marketing@cctech.us) or  
visit C & C's Website at [www.cctech.us](http://www.cctech.us)

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### CARIS

Established in 1979, CARIS is a leading developer of geospatial software designed for the hydrographic and marine industries. Developed in cooperation with hydrographic clients and universities worldwide, CARIS software is designed to cater specifically for the marine GIS community, and is built on decades of hydrographic experience.

No other single company can supply a software solution for your entire offline workflow. The CARIS Ping-to-Chart solution is designed to deliver an integrated and seamless solution for the entire workflow of hydrographic information from processing the echo-sounder ping to the production and distribution of the chart. This integrated software solution provides our clients with resource optimization and a true operational advantage.

The CARIS Ping-to-Chart solution includes products that address the need to manage bathymetric data

sets containing billions of soundings, to support the development of multiple chart types from a single source and to be able to distribute and interrogate high density bathymetry over the internet.

CARIS software also offers peace of mind backed by a comprehensive level of industry leading support. CARIS offers training sessions, consulting and technical support services, as well as an extensive series of courses to make sure that its clients fully utilize the software's capabilities. Users can also gain swift access to qualified technical experts via on-line services, multilingual telephone support and email.

Find out why CARIS software is selected by national mapping and charting agencies, survey companies, port and waterway authorities, oil and gas companies and academic institutions around the world by visiting [www.caris.com](http://www.caris.com).

For more information regarding CARIS services please contact:

Sheri Flanagan  
at (506) 458-8533 email to [info@caris.com](mailto:info@caris.com)  
visit CARIS's Website at [www.caris.com](http://www.caris.com)

# Corporate Members

## Membres corporatifs

### CIDCO

Le Centre Interdisciplinaire de Développement en Cartographie des Océans (CIDCO) est un organisme de R&D en géomatique marine. Dédié à la mise en valeur des technologies de pointe pour l'acquisition, la gestion et la représentation graphique de données spatiales marines, le CIDCO est un organisme sans but lucratif qui répond aux besoins en R&D de l'industrie et de la communauté scientifique.

#### Cartographie haute résolution

Les équipements du CIDCO permettent un niveau de précision allant du mètre à quelques centimètres selon le contexte. Cette précision permet d'identifier les objets se trouvant sur le fond marin, sous des couches sédimentaires ou flottant dans la colonne d'eau. De plus, les données acquises permettent la production d'images bathymétriques et d'images de réflectivité du fond marin.

Le CIDCO possède l'expertise en traitement de données (bathymétrie et imagerie) issues de sonars monofaisceau, multifaisceaux et interférométriques. De plus, il améliore continuellement le flux de travail du traitement de données afin de réduire le temps nécessaire à la réalisation de produits de géomatique marine.

Le CIDCO est continuellement en évolution par l'apprentissage de nouvelles méthodes et l'utilisation de nouveaux outils. L'organisme est au cœur du milieu de la géomatique marine par sa veille technologique et son positionnement stratégique ainsi que par l'organisation de formations et d'ateliers avec des scientifiques du milieu et les professionnels du CIDCO.

The Interdisciplinary Centre for the Development of Ocean Mapping (CIDCO) is a marine geomatics R&D organization. Dedicated to the enhancement of state-of-the-art technology for marine geospatial data acquisition, management and graphic representation, the CIDCO is a not for profit organization answering the R&D needs of the industry and the scientific community.

#### High-resolution Mapping

CIDCO's equipments allow for precision levels varying from meter to centimetre-level precision depending on the survey context. This precision enables identification of objects on the seabed, buried under sedimentary layers or suspended in the water column. Moreover, the survey data is used to produce both bathymetric and backscatter imagery of the seabed.

CIDCO possesses the expertise in data processing (bathymetry and imagery) acquired from singlebeam, multibeam and interferometric echo sounders. Moreover, it continuously strives to improve the data processing workflow in order to reduce the time required for production of marine geomatics products.

CIDCO is continually evolving through learning of new methods and uses of new tools. The organization is at the heart of the marine environment of the marine geomatics sector by its organization of courses, training and workshops with the scientific community and CIDCO employees.

For more information regarding CIDCO services please contact:

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visit CIDCO's Website at [www.cidco.ca](http://www.cidco.ca)

# Corporate Members

## Membres corporatifs

### **Fugro GeoSurveys Inc.**

Fugro GeoSurveys Inc. (FGI) is Canadian-based and staffed, with offices in St. John's, NL and in Dartmouth, NS and has a large, locally based, inventory of hydrographic, geophysical, geotechnical and positioning equipment. With approximately 75 employees, FGI has established an impressive track record in Canada and on the international stage.

FGI has provided seabed mapping and construction support services for all of Eastern Canada's offshore oil and gas developments and is also actively involved in marine based non-oil and gas projects such as Canada's UNCLOS mapping, hydrographic charting in Canada's North, large area habitat mapping, pipeline and cable route surveys, ice scour studies, wharf investigations and a broad range of engineering and construction support surveys.

FGI's Hydrographic Group operates a wide range of multibeam equipment including Reson 8101, 8111 and 8125 systems. These systems are routinely mobilized by FGI on ocean going vessels, as well as our customized

26 foot inshore survey launch. Systems have also been mobilized on ROVs for detailed oil and gas related infield mapping projects.

Multibeam data are processed in the field and at bases in St. John's and Dartmouth using CARIS HIPS/SIPS, IVS' Fledermaus visualization tools, and Fugro's own Starfix software suite. The resultant multibeam data are commonly integrated with seabed sampling, underwater imagery, geotechnical, seismic, sidescan and sub-bottom profiler data to deliver superior data products for use in seafloor and sub-seafloor assessments.

Throughout each project, FGI is committed to the health and safety of its employees, partners and clients, and to the protection of the environment. This is accomplished through the company's comprehensive HSE policy and Safety Management System which is OHSAS 18001 certified.

If you would like to receive further information about Fugro GeoSurveys Inc. please contact:

Fugro GeoSurveys Inc.  
Tel: (709) 726-4252 FAX: (709) 726-5007 E-mail: [todd.ralph@fugro.com](mailto:todd.ralph@fugro.com)  
Website: [www.fugro.com](http://www.fugro.com)

### **L'Institut maritime du Québec**

Fondé à Rimouski en 1944, l'Institut maritime du Québec (I.M.Q.) est le plus important centre de formation maritime au Canada et le seul francophone. Faisant partie des cinq écoles nationales du Québec, il offre des formations collégiales techniques de haut niveau comme Techniques de la logistique du transport et des spécialités qui lui sont exclusives : Technologie de l'architecture navale, Navigation, Techniques de génie mécanique de marine et Plongée professionnelle.

L'I.M.Q. jouit d'une réputation d'excellence à l'échelle internationale pour la qualité de la formation qu'il offre, pour son expertise très vaste dans les domaines maritimes et de la logistique du transport et pour la compétence reconnue de ses élèves diplômés. D'ailleurs, plusieurs d'entre eux occupent aujourd'hui des positions-clés dans l'industrie en Amérique et en Europe.

Pour plus d'informations à propos de L'Institut maritime du Québec s'il vous plaît contactez:

L'Institut maritime du Québec  
Tel: (418) 724-2822 FAX: (418) 724-0606 E-mail: [infoscol@imq.qc.ca](mailto:infoscol@imq.qc.ca)  
Website: [www.imq.qc.ca](http://www.imq.qc.ca)

Afin de maximiser les apprentissages, l'I.M.Q. met à la disposition des élèves des équipements de pointe comprenant des laboratoires informatiques, des ateliers bien aménagés, un bassin de plongée, ainsi que des simulateurs de navigation, de salle des machines et de communication maritime. Son personnel hautement qualifié participe également à sa réputation et à son rayonnement au Canada et ailleurs dans le monde.

Bien branché sur les besoins du marché du travail, l'I.M.Q. propose des formations incluant des stages. Orchestrée en partenariat entre l'Institut maritime du Québec et l'industrie, la formule est gagnante pour tous les intervenants — entreprises, élèves et maison d'enseignement — car elle contribue à l'amélioration de la qualité des apprentissages tout en permettant à l'élève d'évoluer dans son futur milieu de travail.

# Corporate Members

## Membres corporatifs

### Jeppesen Norway AS

Jeppesen is a leading provider of solutions that support decision-making in commercial maritime operations. Today we contribute to the smooth operation of thousands of commercial ships and shipping companies around the world.

As a natural extension of our commercial products, we have supported production of charts and publications at national hydrographic offices worldwide for over a decade. Jeppesen dKart Office technology organizes the production and maintenance of traditional paper charts and survey sheets, electronic charts such as ENCs, lists of lights, Notices to Mariners, sailing directions and print-on-demand products.

Our commercial clients rely on us for electronic charts, weather and met-ocean data, weather routing and voyage optimization. We were one of the first companies in the world to offer digital chart data to commercial shipping,

and we are fast becoming one of the world's leading suppliers of official chart data (ENCs). In addition, we have developed a vast array of solutions that meet the operational needs of the shipping industry.

Both our national and commercial customers recognize our ability to meet their business needs, for quality assurance, rapid updating, user-friendly operation, flexible procurement, business integration and compatibility.

Recent major projects for national hydrographic offices include one recently concluded with Croatia, and another just underway for the Sultanate of Oman. For each, Jeppesen has been commissioned to supply the countries with its dKart Office suites, including tools, processes and training services. Production and maintenance of ENCs and paper charts and NtM processing have been key. Finally, Jeppesen is finalizing a print-on-demand extension for the Norwegian Hydrographic Service.

For further information please contact:

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Website: [www.jeppesenmarine.com/National-Hydrographic-Services/](http://www.jeppesenmarine.com/National-Hydrographic-Services/)

### Knudsen Engineering Limited (KEL)

Knudsen, a long-standing corporate member and familiar face to the Canadian hydrographic world, is recognized worldwide for its innovative high performance singlebeam echosounders used in numerous commercial/defence applications including survey, navigation, dredging, sub bottom profiling, and ocean research.

Known for advanced underwater acoustics technology, Knudsen introduced the first 'all-digital' echosounder with its 320M echosounder and followed with the industry's first "blackbox" echosounder, the 320BP. Product innovation has continued and today, a common set of technology components - embedded Digital Signal Processing firmware, Windows application software , and modular hardware design - are bases of the Sounder and Chirp Series of Echosounders that provide leading edge solutions for the world of today and into the future. Digital signal

processing is again the key to the performance of these new product lines. Both Sounder and Chirp series systems digitize the entire incoming signal over an exceptionally wide bandwidth and extract the frequency of interest entirely with digital signal processing software. Knudsen Sounder and Chirp echosounders provide stability and selectivity simply not achievable with analog components and offer sufficient processing power to recover the signal from even the noisiest environments.

Knudsen, an ISO certified manufacturer, located in Perth, Ontario Canada, has a current customer base that spans more than 60 countries. Knudsen cornerstones - 'Meeting customer needs through ongoing product innovation and unparalleled customer support' - continue to identify Knudsen products as the established benchmark for performance and accuracy.

For additional information please contact:

Judith Knudsen

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# Corporate Members

## Membres corporatifs

### Kongsberg Maritime

Kongsberg Maritime, a company in the Kongsberg Group, is a leading supplier of advanced multibeam and single beam echosounders and instrumentation systems.

With its strong application knowledge and trend-setting quality products, Kongsberg Maritime is able to offer unique and complete solutions for ROVs, AUVs, positioning systems and sea bed surveying and mapping.

Kongsberg Maritime has about 980 employees with subsidiaries world wide. Canadian operations include a sales office in Halifax and a factory in Port Coquitlam, British Columbia. The headquarters are located in Kongsberg, Norway. Kongsberg Maritime exports its products to all of the world's major markets.

For more information regarding Kongsberg Maritime please contact:

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Survey & Underwater Vehicle Instrumentation  
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or visit Offshore: [www.km.kongsberg.com](http://www.km.kongsberg.com) and Marine: [www.simrad.no](http://www.simrad.no)

### Rolls-Royce Naval Undersea Systems (ODIM Brooke Ocean)

ODIM Brooke Ocean, Dartmouth, Nova Scotia, is a world leader in the development and supply of sensor platforms for moored and underway use. The company provides hardware, engineering, repair and overhaul, life cycle support and R&D services to the hydrographic and oceanographic communities as well as to the naval and oil & gas sectors. Products include advanced data collection platforms, instrumentation, cable-handling hardware and launch/recovery systems.

ODIM Brooke Ocean's Moving Vessel Profiler™ (MVP) collects real-time free fall data profiles from ships underway at speeds of up to 12 knots. In addition, the ODIM Free Fall Cone Penetrometer (FFCPT) was developed to collect geotechnical and geophysical data during route location surveys for seabed cable and pipeline installations, bottom classification and acoustic groundtruthing, mine countermeasures and geo-environmental studies.

The ODIM FFCPT can be used either on-station or from a vessel underway at speeds up to 6 knots, using an ODIM MVP. Deployment of the ODIM FFCPT from an ODIM MVP offers a rapid and reliable method for characterizing the seafloor sediment, as well as the sound velocity of the water column.

Another of ODIM Brooke Ocean's primary areas of specialization is in the development of shipboard Launch And Recovery Systems (LARS) to deploy and recover various payloads from a ship at sea. These payloads include Autonomous Underwater Vehicles (AUVs), Unmanned Surface Vehicles (USVs), offboard sensors, oceanographic equipment, and manned submersibles.

If you would like to receive further information about ODIM Brooke Ocean and its services please contact:

Arnold Furlong  
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Website: [www.brooke-ocean.com](http://www.brooke-ocean.com)

# Corporate Members

## Membres corporatifs

### SANI-INTERNATIONAL TECHNOLOGY ADVISORS INC. (SANI-ITA)

SANI-INTERNATIONAL TECHNOLOGY ADVISORS INC. (SANI-ITA), an Ontario Corporation, provides services and consulting in geographic information systems, remote sensing, softcopy photogrammetry and hydrography. The Corporation is a Distributor for GeoEye (50 centimetre imagery) LizardTech (MrSID and LiDAR data compressors), Nuvision and TRUE3Di (softcopy photogrammetry hardware) and is also the Authorised Training Centre for the complete suite of ERDAS IMAGINE software products. SANI-ITA is a sister company to Spatial Geo-Link Limited, the sole distributor in for ERDAS softcopy photogrammetry, geographic imaging and enterprise solutions in Canada.

SANI-ITA committed to providing services that meet or exceed approved designs, specifications and accepted industry practices. Our Corporation is technology driven and provides innovative solutions, high quality services and timely deliveries in the field of geomatics. The Corporation is ISO 9001:2008 registered.

Services offered by SANI-ITA include:

- Project Consulting
- Project Management
- Management of airborne and spaceborne data acquisitions missions
- Control surveys in support of geodetic or photogrammetric projects
- Hydrographic surveys
- Aerial triangulation of airborne and satellite data
- Digital Elevation/Terrain collection – automatic or static mode
- Orthoimagery
- Digital topographic mapping
- Digital map revision
- GIS data structuring
- Map conversion and data translation services
- Image compression services - MrSID, ECW and JPEG2000
- Quality assurance services
- Third party audits of mapping and imagery
- 3D Visualisations

For additional information on the Corporation, please visit our website at:

[www.sani-ita.com](http://www.sani-ita.com)

or contact us at

Tel: (905) 943-7774 FAX: (905) 943-7775

### Shark Marine Technologies Inc.

Shark Marine Technologies Inc. was founded in 1984 with a mandate to offer products and services that are innovative, high quality, dependable and cost effective.

Over the years, we have gained global respect for our developments in undersea technology, and the expertise we bring to on-site operations. As a manufacturer we have made significant advancements in underwater imaging equipment, remotely operated vehicles and other survey systems. In our services we have provided consultation, software development, custom manufacture, hydrostatic testing, equipment rentals and location operations.

Shark Marine Technologies Inc. is also a world leader in the development and manufacture of new technologies for maritime security and SAR organizations. Products such as diver detection and deterrent systems, remotely operated inspection and intercept vehicles; diver-held imaging sonar units and ship hull inspection devices, highlight our focus on security. Along with our own manufactured products we are also proud to be the North American representatives for Systems Engineering

and Assessment (SEA) Ltd. of the U.K., for their line of SWATHplus bathymetric survey systems.

Our customer base has grown over the years to include gas and oil exploration, commercial diving, various governments, fisheries and undersea research facilities, search and rescue organizations, and survey firms. Our location services have taken us from warm waters to the frozen Arctic, where we have gained international recognition. These include pipeline surveys, locating of sunken vessels and other objects, search and recovery, as well as magnetic and sonar mapping.

Our manufacturing and global sales facilities are located in St.Catharines, Ontario, Canada, with associated sales offices in North Liberty, Iowa, USA and Grenoble, France as well as various sales representatives throughout the world.

Our experience in the diverse aspects of this field allows us the ability to create innovative solutions to often difficult or costly tasks.

For further information about please contact Shark Marine Technologies Inc.:

Jim Garrington

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Website: [www.sharkmarine.com](http://www.sharkmarine.com)

# Corporate Members

## Membres corporatifs

### Technopole maritime du Québec

La mission de Technopole Maritime du Québec est de promouvoir et accélérer le développement du créneau des sciences, technologies et biotechnologies marines du Québec en assurant son rayonnement sur les scènes nationale et internationale, en offrant des services à valeur ajoutée aux membres du créneau et en soutenant l'avancement des projets prioritaires à long terme. De plus, Technopole Maritime du Québec a pour objectif de positionner son réseau comme leader au niveau québécois et canadien dans les secteurs d'excellence des sciences marines, des biotechnologies marines et des technologies maritimes afin d'y accélérer la création de richesse par la croissance et les nouveaux investissements dans les entreprises, institutions et organismes. Les actions de Technopole maritime s'inscrivent dans une volonté de mobiliser les forces vives du créneau des sciences et technologies marines, à savoir les institutions d'enseignement, les organismes de transfert, les installations et les laboratoires de recherche et, surtout, bon nombre d'entreprises qui vivent à l'heure de l'innovation technologique.

- Par ses actions de maillage et de réseautage, TMQ est l'animateur par excellence du domaine des sciences de la mer dans la région;
- Par ses actions de représentation, TMQ contribue au développement de liens d'affaires solides entre les acteurs de l'industrie des sciences de la mer au Québec et au Canada;
- Par ses actions de communication et de promotion, TMQ contribue au rayonnement et à la reconnaissance du domaine des sciences de la mer dans la région et à l'extérieur de celle-ci;
- Par son leadership, TMQ est à même d'identifier et de piloter des projets d'envergure qui sont rassembleurs pour la communauté des sciences de la mer de la région.

The mission of the Technopole Maritime du Québec (TMQ) is to promote and advance the development of marine sciences, technology and biotechnology in Quebec by increasing their visibility on both the Canadian and international stages, providing value-added services to the members of this niche sector, and supporting the progress of priority projects over the long term. Furthermore, the goal of the Technopole Maritime du Québec is to position its member network as the provincial and national leader in the marine sciences, biotechnology and technology sectors. Doing so will enhance wealth creation and attract new investments to the sector's industries, institutions and organizations. The Technopole's actions are driven by the will to mobilise the dynamic strength of the marine sciences and technology sector, namely the educational institutions, technology transfer organizations, research laboratories and facilities, and the numerous companies that are currently thriving through technological innovation.

- Through its communication and promotional strategies, TMQ contributes to the reach and recognition of marine sciences in the region, in Canada and around the world ;
- Through its representation work, TMQ contributes to the development of successful business relationships between actors in the marine science industry in Quebec and Canada ;
- Through its networking strategies, TMQ is an outstanding coordinator for the marine sciences sector in the region ;
- Through its leadership, TMQ is well-placed to identify and spearhead major projects that promote joint action in the regional marine sciences community.

For more information regarding technopol maritime du Québec please contact:

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Website: [www.tmq.ca](http://www.tmq.ca)

# Corporate Members

## Membres corporatifs

### Terra Remote Sensing Inc. (TRSI)

Terra Remote Sensing Inc. (TRSI) is a spatial data organization offering world-class expertise and technology for clients requiring fast, accurate, detailed and cost effective surveys. Our teams specialize in the acquisition and positioning of remotely sensed data in terrestrial and marine environments, and in the transformation of that data into a wide array of products to meet our client's needs.

TRSI was established in 1983 in Sidney, British Columbia as the West Coast subsidiary of Terra Surveys Ltd, based in Ottawa Canada. The company began by providing consulting, engineering, training and technical services in coastal and land-based resource studies, hydrography, marine geophysics and remote sensing. TRSI, a 100% employee-owned venture, was launched in 1999 to allow the company to further develop its technology and processes. Our new sensor technologies and associated applications are testaments to our innovation approach.

TRSI has over 50 dedicated full-time professionals that work on both national and international projects. Senior management is comprised of a core group of professional engineers and business specialists.

A highly qualified permanent staff of Geomatic Engineers, GIS Specialists, Mapping Technicians, Computer Programmers, Electronic Engineers, Hydrographers, Geophysicists and Surveyors comprise TRSI's multi-disciplinary team.

TRSI established a wholly owned subsidiary in Chile in late 2008. The Chile operation maintains a commercial office in Santiago and an operational office located in Carauma near Valparaiso, in order to provide access to qualified staff.

Our wholly-owned US entity was established in 2009 as a sales office to provide a US base for our clients. Their focus is the Pacific Northwest region, which is a natural extension from our Sidney head office.

For more information regarding Terra Remote Sensing please contact:

Rick Quinn

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Website: [www.terraremote.com](http://www.terraremote.com)

### Réformar

Reformar a pour principale mission de soutenir les chercheurs, les institutions de recherche et de formation et les organisations gouvernementales et privées, lors de la réalisation de leurs projets scientifiques en sciences et technologies de la mer, par le biais de ses infrastructures, dont le navire de recherche le Coriolis II. Par le biais de son réseau de partenaires publics et privés, Reformar a ainsi accès à un parc d'équipements d'une valeur d'une dizaine de millions de dollars, ce qui permet d'équiper le Coriolis II pour tous ses différents travaux de recherche.

Véritable laboratoire flottant, le Coriolis II dispose d'espaces dédiés exclusivement aux travaux de recherche. Ses laboratoires, dont l'espace totalise plus de 55 mètres

carrés, permettent de former des équipes de recherche multidisciplinaires pouvant accueillir 14 personnes, en plus de l'équipage régulier du navire.

Le Coriolis II répond aux plus hautes normes de certification maritime internationale, dont la certification ISM et ISPS. Il est classé auprès de la société ABS et est conforme à la convention SOLAS. Il peut naviguer non seulement au Canada, mais partout dans le monde et ce, dans un cadre opérationnel des plus sécuritaire. Doté d'équipements de pointe, Le Coriolis II est maintenant équipé de deux systèmes de multifaisceaux dont un pouvant aller jusqu'à une profondeur de 7000 mètres, ce qui en fait un des 20 navires au monde équipé d'une telle technologie.

For more information regarding Réformar please contact:

Martial Savard

Réformar

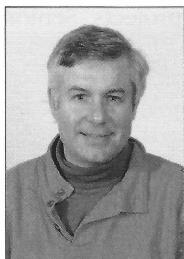
Tel: (418) 723-1986 FAX: (418) 724-1842 E-mail: [msavard@reformar.ca](mailto:msavard@reformar.ca)  
or visit [www.reformar.ca](http://www.reformar.ca)

# Canadian Hydrographic Service NEWS

## NOUVELLES Service hydrographique du Canada

### ATLANTIC REGION

#### PIETRZAK, 'Bob'



**Pietrzak, Robert Charles**, 56, of Fall River, passed away Thursday, March 1st, 2012. He was born in Kitchener, Ont. in 1956, the son of Mary (Burek) and the late Stan Pietrzak. After graduating from the Canadian Coast Guard College in Sydney, Robert spent most of his life in Nova Scotia, where he worked for the Canadian Coast Guard and the Bedford Institute of Oceanography (Department of Oceans and Fisheries) in Dartmouth. Robert developed a keen appreciation for jazz and all things Atlantic; and could be counted on to bring fresh shellfish to any family gathering. A project of particular

interest was the Nova Scotia Lighthouse Preservation Society. Robert is survived by his mother, Mary Pietrzak, Cassleman, Ont. He will be missed by his sister, Marlene Orton; and nephews, Adam Jacob and Eric Grant of Ottawa, Ont. Donations in memory can be made to local Boys and Girls Clubs of Canada: Sackville, East Dartmouth and Spryfield.

*Editor's note:* Bob was the Sailing Directions Officer in the Atlantic Region until his retirement. He was known to many through his work with mariners, industry partners, and government peers, at boat shows, conferences, and other collaborative works. A good friend, his keen mind and sage advice were appreciated and put to use in several editions of *Lighthouse*.

## Canadian Hydrographic Association NEWS

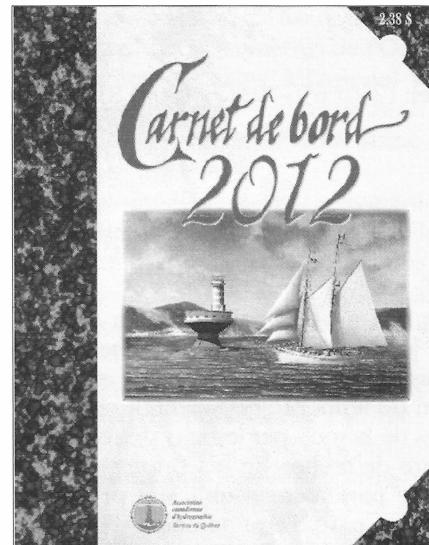
### NOUVELLES Association canadienne d'hydrographie

#### SECTION DU QUÉBEC

Depuis sa dernière assemblée générale annuelle en février, le conseil d'administration et les membres de la Section du Québec ont mis une emphase au recrutement. Bernard Arseneau a approché plusieurs organismes dont deux de ses demandes ont porté fruit. La Section du Québec désire souhaiter la bienvenue aux nouveaux membres corporatifs, soit l'Institut maritime du Québec et son département de navigation. Nous espérons accueillir d'autres membres et membres corporatifs prochainement ce qui permettra de faire des échanges encore meilleurs à l'interne et avec le grand public en général.

Lors de l'assemblée générale annuelle, madame Maude Audet Morin a présenté une conférence à l'auditorium de l'Institut Maurice-Lamontagne de Mont-Joli, Québec, aux membres de la Section du Québec et aux employés du Service hydrographique du Canada (SHC), région du Québec, concernant le « Programme intensif Erasmus : Formation d'hydrographes à l'international ». Madame Audet Morin est géographe-géomaticienne marin et travaille au Centre interdisciplinaire de développement en cartographie marine (CIDCO) à Rimouski.

La Section du Québec a publié son Carnet de Bord en février 2012 dont une large distribution se fait dans les écoles de voiles ainsi que dans plusieurs points de vente au Québec et dans l'Est de l'Ontario. Elle offre toujours le service de vente de cartes et publications du Service hydrographique du Canada en plus des cartes topographiques.



La Section du Québec a continué sa collaboration avec la revue « Québec Yachting » en publiant ce printemps une deuxième chronique portant sur la vigilance sur l'eau. Cette chronique fait suite au récent naufrage du paquebot de croisière « Costa Concordia » en Méditerranée près des côtes italiennes. Elle met en lumière que personne n'est à l'abri de gestes commis ou omis qui mettent la sécurité de l'équipage et des invités à bord d'un bateau, qu'il soit petit ou grand.

La Section du Québec souhaite le plus vif des succès à la Conférence hydrographique du Canada 2012 considérant tous les efforts mis dans son organisation par le SHC, l'ACH et sa Section centrale.

# Canadian Hydrographic Association NEWS

## NOUVELLES Association canadienne d'hydrographie

### CENTRAL BRANCH

#### 41st Annual Canadian Hydrographic Association H2O Bonspiel

The annual H2O Curling Bonspiel put on by the Canadian Hydrographic Association, Central Branch took place at the Grimsby Curling Club on February 18, 2012.

For the past 41 years the Canadian Hydrographic Association has proudly hosted this popular curling event. The H2O bonspiel continues to be a major yearly event for full time and part time curlers. This year the response was very positive as the organizing committee had no difficulty filling the rinks and had to put a number of people on a waiting list.

Each year the H2O trophies are awarded to the first and second place teams with the highest score after two games. There are 64 curlers or 16 rinks battling for top honors. By the end of the day it all comes down to having a great time as curling is all about friendships renewed and made.

This year's first place team is the Russ Springer team:  
Skip- Russ Springer, Vice ship- Les Springer,  
Second- Cindy Latendresse, Lead Tianyi Zhu

The runners up in second place is the Andy Thomson team:  
Skip- Andy Thomson, Vice Skip- Steve Sawell, Second  
Mary Hickey, Lead- Eric Vale.



41<sup>st</sup> H2O Bonspiel Winners

From Left to Right: Earl Brown (event coordinator), Russ Springer, Cindy Latendresse, Tianyi Zhu, Les Springer and Brian Power (event coordinator)

As in many sports today we cannot succeed without volunteers and outside support. A sincere thank you to the companies who have supported us over the many years.

The 2012 CHA Bonspiel committee would like to acknowledge those companies who made donations to this year's prize table.

ALGOMA CENTRAL CORPORATION  
St. Catharines, Ontario

Canadian Hydrographic Association  
Central Branch

Canadian Hydrographic Service  
Central & Arctic Region

CARIS  
Fredericton, New Brunswick

Hoskin Scientific Limited  
Burlington, Ontario

Knudsen Engineering Ltd  
Perth, Ontario

Kongsberg Maritime Ltd  
Dartmouth, Nova Scotia

Performance Brush Team  
Trois - Rivieres, Quebec



41<sup>st</sup> H2O Bonspiel Runners-Up

From Left to Right: Eric Vale, Mary Hickey, Steve Sawell, Andy Thomson and Brian Power (event coordinator)

# Rates / Tarifs

## POSITIONING / EMPLACEMENTS

The acceptance and positioning of advertising material is under the sole jurisdiction of the publisher.

*L'approbation et l'emplacement de l'annonce sont à la discréction de l'éditeur.*

## DIGITAL REQUIREMENTS

### EXIGENCES NUMÉRIQUES

Advertising material must be supplied by the closing dates as digital Tiff 600dpi files. Proofs should be furnished with all ads.

Single-page inserts will be charged at a full-page body rate. Material must be supplied by the client. Page size must conform to the single page insert trim size (below).

*L'annonce publicitaire doit être fournie aux dates de tombée. Les épreuves devraient être fournies avec tous les suppléments.*

*Les insertions d'une page seront chargées au tarif d'une pleine page. Le matériel devra être fourni par le client.*

## PUBLICATION SIZE

### DIMENSIONS DE LA PUBLICITÉ

Publication Trim Size/ Dimension de la revue: 8.5" x 11.0"

Live Copy Area/ Encart libre: 7.0" x 10.0"

Bleed Size/ Publicité à fond perdu: 8.75" x 11.5"

Single Page Insert Trim Size/ Insertion d'une page 8.25" x 10.75"

Standard Ad Sizes/ Grandeur standards des suppléments:

Full Page/ Pleine page: 7.0" x 10.0"

1/2 Page/ Demie-page: 6.875" x 4.75"

or/ ou: 3.375" x 9.75"

## PRINTING / IMPRESSION

Offset screened at 133 lines per inch.

*Internégatif tramé à 133 lignes au pouce.*

## CLOSING DATES / DATES DE TOMBÉE

LIGHTHOUSE is published twice yearly, in Spring and Fall. The closing dates are March 15th and September 15th respectively.

*LIGHTHOUSE est publiée deux fois par année, au printemps et à l'automne. Les dates de tombée sont le 15 mars et le 15 septembre respectivement.*

## RATES / TARIFS

All rates are quoted in Canadian Funds. Corporate Members receive a 10% discount.

*Tous les tarifs sont en devises canadiennes. Les membres corporatifs ont droit à un rabais de 10%.*

	B & W/ N & B	Colour/Couleur Four/Quatre
Outside Back Cover <i>Couverture arrière</i>	NA/SO	\$1,025
Inside Cover <i>Couverture intérieure</i>	NA/SO	\$825
Body, Full Page <i>Pleine page</i>	\$475	\$675
Half Page <i>Demie-page</i>	\$300	\$475
Single-page Insert <i>Insertion d'une page</i>	\$475	\$675
Professional Card <i>Carte d'affaire</i>	\$125	NA/SO

## RATE PROTECTION

### TARIFS ASSURÉS

Advertisers will be protected at their contract rates for the term of their contracts up to one year. Cancellations are not accepted after closing date.

Les tarifs sont assurés aux termes des contrats publicitaires jusqu'à concurrence d'un an. Les annulations ne sont pas acceptées après la date de tombée.

All advertising material should be directed to:

*Tout le matériel publicitaire doit être acheminé à:*

## LIGHTHOUSE

LIGHTHOUSE, Canadian Hydrographic Association

CHS Central & Arctic, Jim Weedon

867 Lakeshore Road, P.O. Box 5050

Burlington, ON Canada L7R 4A6

Telephone/Téléphone: (905) 336-4841

Fax/Télécopieur: (905) 319-6916

E-mail: layoutlighthouse@hydrography.ca

## SUGGESTIONS TO AUTHORS

LIGHTHOUSE publishes material covering all aspects of hydrography.

*Authors submitting manuscripts should bear the following points in mind:*

1. Submit a hardcopy complete with graphics including tables, figures, graphs and photos.
2. Submit digital files, one with text only and a separate file for each graphic (tables, figures, photos, graphs) in its original form or in .tif format (600 DPI). Photos may be submitted separately to be scanned. These may be submitted via E-mail or on CD ROM to the Editor.
3. Papers should be in either English or French and will be published without translation.



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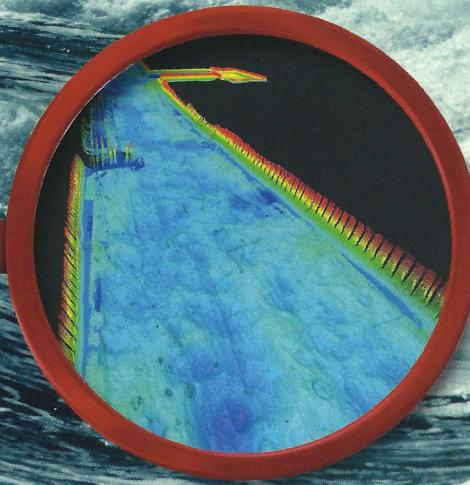


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