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Bringing Land and Sea Together - Réunir terre et mer

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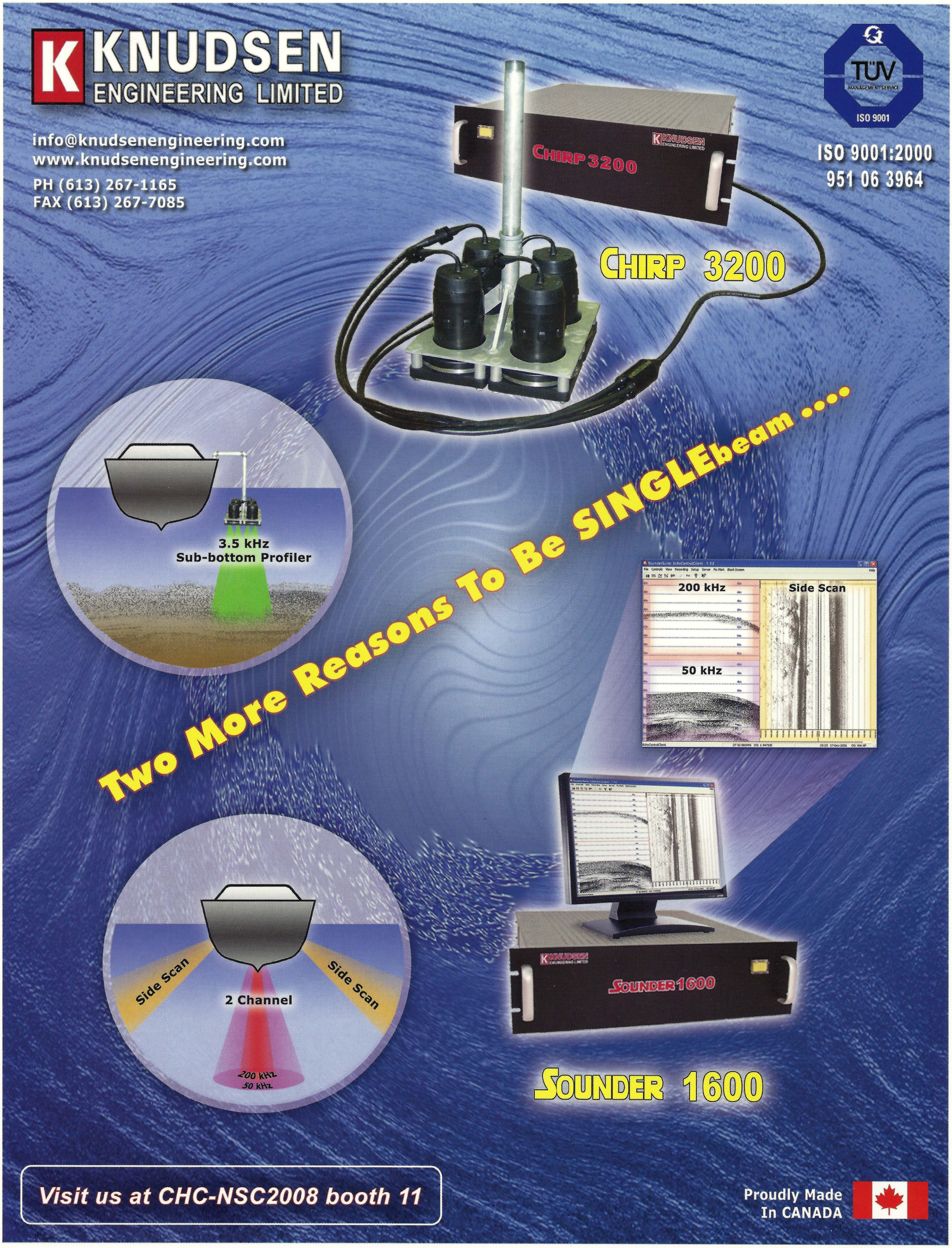

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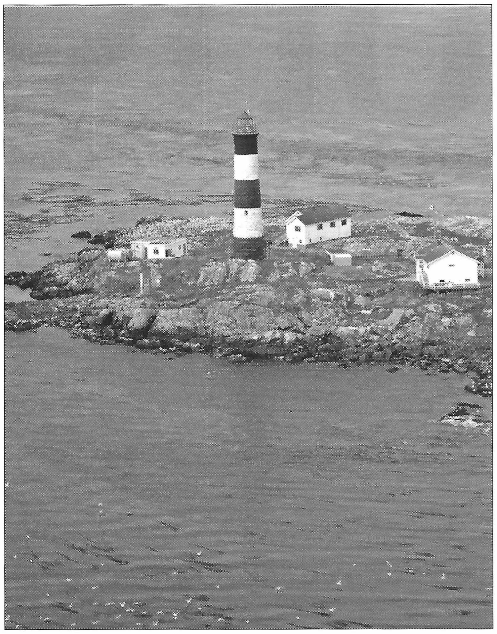

Race Rocks Lighthouse

Race Rocks Lighthouse

Race Rocks Lighthouse, also known as the Imperial Light on Race Rocks Islets, is a vital aid to navigation for ships transiting the Strait of Juan de Fuca. The British Admiralty recognized the need for a light at Race Rocks, which is named for the fact that the tide makes a perfect race around the group of islets, in the 1850's. Great Race Island was selected to be the site of the second lighthouse (Fisgard at the entrance to Esquimalt Harbour being the first) commissioned by the British admiralty on the west coast of Canada. The light was illuminated for the first time on Boxing Day 1860. The distinctive black and white stripes were added by the first light keeper when it became obvious that the tower was difficult to recognize in day light against the back drop of the shoreline. These stripes remain today maintaining the unique appearance. The lighthouse was automated in 1997 with the site and surrounding area turned over to the BC government represented by BC Parks. Race Rocks is now a marine protected area. The area is currently administered by Lester B. Pearson College, for education, research, and supervision of the Ecological Reserve and Marine Protected area.

List of Light # 189
Position: 48°17'52.9"N, 123°31'53.1"W (Source: Coast Guard database)

Photograph credit: Brian M. Watt.

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Editor's Note / Note du rédacteur

It is springtime. I know this because I awoke this morning to the sound of birds singing. It wasn't the 'caw' of crows planning their sweep of the garbage bins. Rather, I imagined that, from their wooing and cooing, they were talking about how nice it would be to come together. "It is finally spring", I thought. The procession of the sun had caught up again with the southern half of the Northern hemisphere. Never mind that I had overslept again – this was a most welcome development. It had been a long winter.

If this is spring then it must be time for another *Lighthouse*. This is the conference edition. It coincides with CHC2008, the biennial conference of the Canadian Hydrographic Association. It both follows and precedes (by a year) the United States Hydrographic Conference. This is an opportunity for hydrographers from across this land and others to come together and share their successes and challenges, discuss future opportunities and see some of the great products that vendors have brought with them to display. This year it is being held in Victoria, British Columbia. As can be seen from the cover, this is a very special part of the country and, if the enthusiasm, energy, and diligence of the hosts is any indication, it promises to be a very special conference.

The conference organizers have decided to co-produce a conference along with the ACLS so the proper name for the conference is the CHC-NSC2008. The theme is "bringing land and sea together". As regular readers of *Lighthouse* know, this journal offers a mix of articles and news from CHA members, the CHS regions, and corporate partners; a little bit of all things hydrographic. There is certainly some of that in this issue. Nick Stuifbergen has a write up on a very useful procedure to recover old charts, there are news from across the country and some great advertisements as well. However, this edition being the conference edition, welcomes the spirit of the conference by publishing all the abstracts from both the land and sea sections, in English and in French. Readers can also consult the conference web site *www.chc2008.ca* for a guide to the full proceedings.

Maybe spring is a time to come together, if only for a short while before everyone sets off to make the most of the longer days and better weather. As with the turn of the seasons and the progress of time, there is room for a little bit of the old and the new. I am not sure how a room of land surveyors shall get on with a room full of hydrographers but I suspect that they will find that they have much in common and enough different to say, 'Vive la difference'. In any case, I am sure that there will be many a story to tell and to exchange. Here at *Lighthouse*, we can't wait to hear them. Have a safe and productive spring and summer.

Craig Zeller

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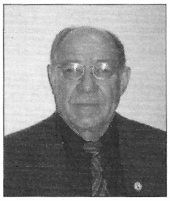
Message from the National President
Mot du Président national



It is with very great pleasure that I write this message for inclusion in the CONFERENCE Issue of our journal "LIGHTHOUSE". I have followed with genuine interest the efforts of the members of the organizing committee of CHC 2008, who have dedicated themselves to ensuring that all attendees have an interesting, stimulating and rewarding conference experience and a delightful and enjoyable stay in beautiful Victoria.

Our organization, the Canadian Hydrographic Association, is proud to co-host this conference and extend an invitation to all interested in marine geomatics to become members of the CHA, to assist us in advancing the development of hydrography, marine cartography and associated disciplines in Canada, as well as assisting in the development of hydrographic sciences in developing countries. Our association continues to encourage this endeavour by an annual "Award to a Deserving Student" in the Geomatics' field, by Bursaries at the University of Victoria (UVIC) and the British Columbia Institute of Technology (BCIT) and by sponsoring timely and pertinent Technical Workshops in furtherance of our members' Continuing Professional Development.

Through our formal association with the Canadian Institute of Geomatics and in conjunction with the Canadian Hydrographic Service and our conference co-host – The Association of Canada Lands Surveyors – we intend to vigorously pursue an initiative to develop a Certification program acceptable to both our membership and to those offering employment to hydrographers.

In discharge of our responsibility as the Hydrography Committee of the Canadian Institute of Geomatics, we support the activities of Commision 4 (Hydrography) of the International Federation of Surveyors (FIG), by participation in commission activities and by attendance at International events organized and/or sponsored by FIG.

C'est avec un très grand plaisir que j'écris ce message à inclure dans l'édition de la Conférence de notre revue LIGHTHOUSE. J'ai suivi avec un véritable intérêt les efforts des membres du comité organisateur de la CHC 2008, qui se sont dévoués pour que tous les participants aient une conférence intéressante, stimulante et enrichissante ainsi qu'un merveilleux et agréable séjour dans la belle ville de Victoria.

Notre organisation, l'Association canadienne d'hydrographie, est fière d'être un hôte conjoint à cette conférence et invite tous ceux ayant un intérêt à la géomatique marine à devenir membre de l'ACH, à nous aider à l'avancement du développement de l'hydrographie, de la cartographie marine et des disciplines connexes au Canada, ainsi qu'à nous aider au développement des sciences hydrographiques dans les pays en voie de développement. Notre association continue d'encourager cet effort par une « bourse annuelle pour un étudiant méritant » en géomatique par des boursiers à l'université de Victoria (UVIC) et à l'Institut de technologie de la Colombie-Britannique (BCIT) et en commanditant des ateliers techniques opportuns et pertinents pour l'avancement de la formation professionnelle continue de nos membres.

Via notre association formelle avec l'Institut canadienne des sciences géomatiques et conjointement avec le Service hydrographique du Canada et, notre hôte conjoint à la Conférence, l'Association des arpenteurs des Terres du Canada, nous avons la ferme intention de continuer l'initiative de développer un programme de certification acceptable à nos membres et à tous ceux qui offrent un emploi aux hydrographes.

Pour s'acquitter de notre responsabilité en tant que Comité de l'hydrographie de l'Association canadienne des sciences géomatiques, nous supportons les activités de la Commission 4 (Hydrographie) de la Fédération internationale des géomètres (FIG) en participant aux activités de la commission et par notre présence aux événements internationaux organisés et/ou commandités par la FIG.

George McFarlane

International Hydrographic Organization Tidal Committee (IHO-TC)

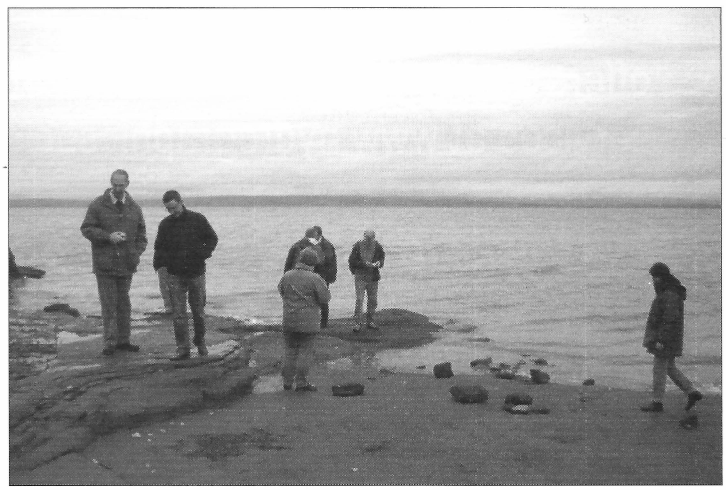
By: Charles O'Reilly, Canadian Hydrographic Service (Atlantic Region), Dartmouth, NS

The Canadian Hydrographic Service (CHS) Atlantic was the official host of the V111th Meeting of the International Hydrographic Organization Tidal Committee (IHO-TC), held Oct. 23-25 at the Maritime Museum of the Atlantic in Halifax. The IHO is an intergovernmental consultative and technical organization whose mission is "to ensure the provision of adequate and timely hydrographic information for world-wide marine navigation and other purposes, through the endeavours of national hydrographic offices. A subsidiary mission is the application of hydrographic data to support science, and to promote its use in geographic information systems." At present, 73 Member States comprise the organization, where much of the work is carried out by technical committees, among which is the IHO-TC.

The IHO-TC meets approximately every 18 months; this is the first time the meeting has been held in North America. Charles O'Reilly of CHS Atlantic has just stepped down after several years as the official Canadian non-voting delegate. A new CHS representative will be named shortly to replace him. This was the best-ever attended meeting, with 11 countries represented by voting delegates, one IHO representative, one industry observer, and a representative from the Global Sea Level Observing System (GLOSS) as a measure to encourage collusion between the organizations. As well, non-voting attendees included representatives from each of the CHS regions. Although all agenda items were of interest to the CHS, of particularly interest were digital tide tables, secondary port calculations methods; Global Sea Level Rise effects and the evolution of digital navigational-quality tide table standards and specifications as a companion to the development of the electronic charts.

Harmonization of vertical datums is a leading priority with the IHO-TC. At the moment, several diverse reference systems exist around the world. The organization is striving to harmonize these nautical measurements of depths, heights, and clearances, from country to country. The issue was addressed at a half-day technical workshop, with presentations from different countries on several vertical datum issues. One resolution of the meeting leaves the organization well favoured to recommend a unique naming convention for vertical hydrographic datums.

During their meeting at the Maritime Museum of the Atlantic, delegates at the IHO-TC (above) enjoyed a tour of the museum and the retired hydrographic vessel, CCGS Acadia. Later, they enjoyed an official dinner at Salty's Restaurant, co-sponsored by the Canadian Hydrographic Association.



On Saturday, the CHS Atlantic took the delegates on a field trip to the Minas Basin. These experts in tides who came from all around the world were excited to see the large tides of the Bay of Fundy..

WGS-84 Horizontal Datum Adjustments For Early CHS Charts

By: Nick Stuifbergen, Canadian Hydrographic Service (Atlantic Region), Dartmouth, NS

The Canadian Hydrographic Service (CHS) has a large inventory of charts, surveyed a century ago by the Royal Navy, now a legacy acquired from the British Admiralty. Coverage is mainly around Newfoundland and along the Labrador coast, frontier regions, with little traffic and low demand for nautical charts. Significant emphasis then was on charting sheltered anchorages, to provide safe havens for vessels of the naval fleet, shallow-draft ships. Access to sheltered waters for small craft is now again of interest to recreational sailors and adventure tourists. At the time of the original surveys, about a hundred years ago, astronomic observations for latitude, longitude and azimuth orientation were the only available means of determining the geographic reference (known as "Astro datum").

With the Global Positioning System (GPS), based on NavStar satellites, now widely used, the previously charted meridians and parallels, and the coastline features, are now seen to be displaced by up to two kilometres from their proper location. Some charts have no graticule for geographic reference at all, not needed in earlier times, because coastal navigation was by recognition of landmarks. These are so-called "non-datum" charts.

These older charts are made usable to navigators equipped with GPS when a new WGS-84 horizontal datum reference is overprinted. Then we can upgrade these charts with safety corridors, cleared for safety-critical passage by new multi-beam surveys that yield 100 percent coverage. CHS can then also supply these charts in electronic form as raster images, compatible with GPS.

The enhanced charts could result in reduced marine insurance premiums, to benefit the cruise line industry, and provide assured access to natural resources for freighters. The rich pictorial near-shore detail of the old British Admiralty charts would not likely be accomplished by more recent shoreline mapping methods.

To resolve the problem of providing a geographic reference, for older charts without survey control markers, a "map-matching" method was devised, and software prepared, to provide a fair estimate of a new WGS-84 datum geo-reference for these early charts.

By comparing landforms on the original charts with landmarks seen on more recent mapping of known datum, usually topographic maps on NAD-27, and knowing the relationship between NAD-27 and NAD-83 (WGS-84), we can find recognizable common features to link the old chart to a new WGS-84 datum. To obtain this linkage, each common feature tie is interpreted and measured on both the original source map and the on-datum reference map.

Since the original control monuments have disappeared long ago, and natural point features for reliable pairs of point matches are scarce or entirely absent, we make use of more plentiful alignment features, e.g. a medial axis of a sharp headland or a tangent taken on a blunt headland. By picking the alignment as the best-fit one-dimensional data value, the accuracy of the link between the pair of chart features is improved. There is an aspect of interpretation skill in this work.

By selecting only those features with adequate resemblance between source and reference map, in places where there has been minimal erosion or deposition over the years, the limitation of differing generalizations is overcome also. The difference in generalisation is also due to mapping by different methods, yielding varying interpretations of the source data, e.g. plane-table sketches compared with aerial photography. The ties are based on alignment of recognisable key features, and not by matching shoreline.

The data pairs of measured feature ties, lineal matches taken in a diversity of orientations, are pooled in a least-squares algorithm to find the best coherent fit, and solve for the mean shift to modern datum, together with the scale and orientation adjustment. The algorithm somewhat resembles bundle adjustment used in photogrammetry. A small modification makes the solution robust with respect to large data outliers, so that the process is "self-editing", to automatically remove the spoiling effect of misidentified points and/or mistaken measurements. Normally about 30 to 50 measurements are taken, a number sufficient to yield some statistical indications of fit quality.

Our measurements reveal a consistent geometry with more recent mapping, indicating a high standard of quality in the work of the early Royal Navy surveyors. The differences we see show mainly as consistent displacements, shifts in X and Y with respect to the WGS-84 datum now used by GPS navigators. The result of the derived transformation is delivered to the cartographer in the form of a table of projected latitudes and longitudes on NAD-83 (equivalent to WGS-84), determined for a set of distinct points seen on the original: the four inner neat-line corners, the old latitude and longitude graticule intersections, and any landmark point features. These serve as computed fiducial reference marks, treated as if they were NAD-83 control markers pinpointed on the original source chart.

This horizontal datum determination amounts to a semi-graphical method. At the level of accuracy of this work, well below geodetic precision, but better than graphical accuracy due to the kind of data averaging process of least-squares, the datum designation WGS-84 is an approximation, quite adequate for the practical GPS navigator.

The projective transformation, available in the CHS utilized MicroStation Irasb™ mapping system, is applied to the original raster source image, to map it, pixel by pixel, into a new "rectified raster image". The transformation is based on the table of control markers provided. The projective transformation can accommodate the shift in latitude and longitude, the scale and rotation adjustment, and compensates as well for any residual uniform distortion in shear (skewness), that may exist in the raster image of the original paper chart.

On the rectified chart, with a new grid of meridians and parallels on WGS-84 in place, the navigator will be able to plot a position fix by GPS, and find that it does agree with a visual or radar fix taken on coastal features, to well within 0.1 nautical mile, the resolution of radar. A few available ground-truth verification points taken so far by GPS have indicated validations seldom exceeding 2 millimetres at the scale of the original chart.

By publishing the renewed charts in raster image form, the presentation of the original legacy chart is preserved, so that the navigator will still be aware that the chart is based on older sextant and lead line surveys as taken more than a century ago. Thus the old original appearance of the renewed chart conveys a message to the prudent mariner that it is to be used with caution, and with an awareness of the limitations of the surveying and chart production methods of earlier times.

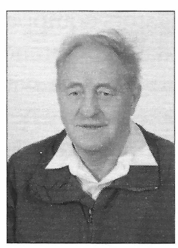
The surveying methods then consisted of:

- A control network accomplished by a local triangulation survey.
- Astronomic observations to find latitude and longitude, for a central point in the control network, hence the designation "Astro Datum" for these charts.
- Astronomical observations for azimuth determination for an orientation of the network.
- Baseline tape measurement to set the scale dimension of the network
- Plane tabling for sketch surveys of coastal topography, important then, because coastal navigation was often by landform recognition.
- Position fixes by horizontal sextant angles to locate the depth soundings.
- Lead line used for the depth measurement (spot soundings).
- Bottom samples to locate suitable anchorage
- Local knowledge of fishermen utilized to help locate hidden hazards, rocks, shoals and shipwrecks.

As of 2005, 35 charts have been completed, yielding cost savings estimated at roughly $25 million. This figure is a vague estimate of future expenditures on resurvey for new charting to modern standards, not now needed in our low-traffic frontier coastline regions, where there is yet little demand for nautical charts. Similar savings may be realized on CHS charts surveyed in the 1950's farther north, and for some older charts in the Arctic and along the Pacific coast.

We acknowledge and appreciate the contributions of numerous co-workers in the Canadian Hydrographic Service, in support of our effort to recover the value of our heritage of British Admiralty charts.

About the Author



Nick Stuifbergen has been an employee of the Canadian Hydrographic Service since 1961, having worked on surveys in many parts of Canada. He received his Diploma at the HTS Survey School in Utrecht, Netherlands in 1959 and he also is a graduate of the Survey Engineering program at the University of New Brunswick.

Re-Thinking Arctic Navigation: the Trans-Polar Route

By: Ron Macnab, Canadian Polar Commission

Melting ice in the Arctic Ocean has given new impetus to the centuries-old quest for a viable shipping route between the Atlantic and Pacific Oceans. Canada's Northwest Passage and Russia's Northern Sea Route are perceived as possibilities, but both routes are fraught with technical and political problems that could militate against their early acceptance by the international shipping community. Shipping interests are therefore exploring the feasibility of an alternative route which would link the Fram and Bering Straits by directing vessels across the central Arctic Ocean. This would entail the deployment of a new class of double-acting cargo icebreakers, shuttling between trans-shipment ports in Iceland and the Aleutian Islands.

The quest for shipping profitability

There's little point in running a shipping line if it doesn't earn a reasonable profit. This economic truism is inspiring efforts to rationalize the global shipping industry in order to maximize returns while carrying growing tonnage. Ship owners constantly seek ways to realize economies of scale by operating larger vessels and by decreasing their transit times.

A major factor in this equation is the length of current global shipping routes. Figure 1 illustrates present and prospective trade routes which link Western Europe and the Far East. Of the seven examples, it can be seen that the four 'traditional' routes (nos. 1 to 4) are considerably longer than the three Arctic routes (nos. 5 to 7) (see Table 1) which are under consideration. This explains the appeal of an Arctic pathway.

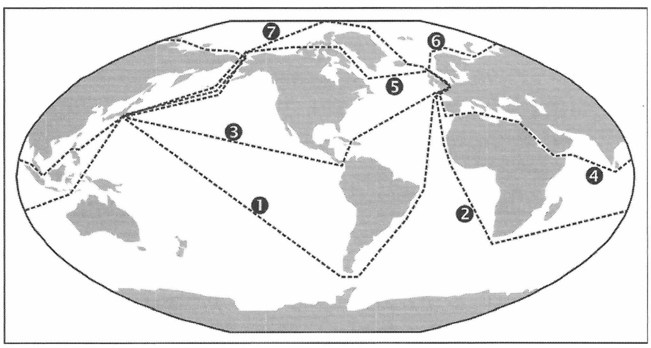


Figure 1: Present and prospective trade routes between Western Europe and the Far East. Lengths are listed in Table 1.

A second factor is the limitation that certain routes impose upon vessel size, given the necessity of transiting locks or restricted passages. This has given rise to a size classification scheme that is based on the constraints encountered on three specific routes, i.e. 'Panamax', 'Suezmax', and 'Malaccamax,' referring to ships that are capable of navigating the Panama Canal, the Suez Canal, and the Strait of Malacca, respectively (Figure 2). Size limitations on these vessels, particularly those passing through the Panama and Suez Canals, translate into lower tonnages and higher shipping costs per unit. Prospective Arctic shipping routes impose potentially fewer restraints on vessel size, thereby strengthening their feasibility as global trade pathways.

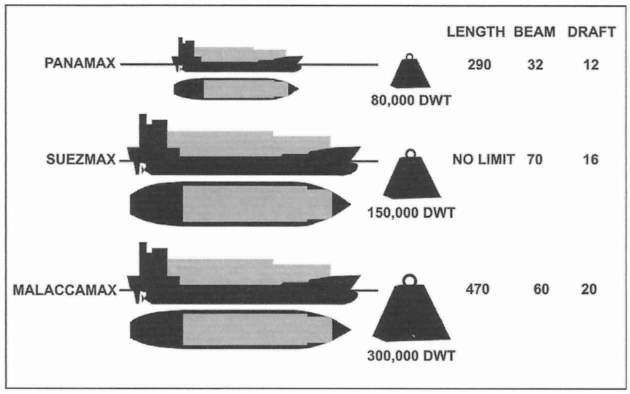


Figure 2: Cargo vessels and their size constraints, imposed by choice of route.

Arctic shipping options

In recent years, the Northwest Passage appears to have become more vessel-friendly during the summer navigation season, but experts remain cautious about the prospects for year-round traffic in the near future, citing seasonal ice buildup and channel constraints that could still pose significant obstacles, compounded by the current uncertainty over the international status of the Passage.

In the meantime, Russia's Northern Sea Route, which skirts the coast of Siberia, has for some time served as a waterway for linking that country's northern ports with southern centres. Ice remains a non-negligible factor in this region, but for international users, the region's evolving regulatory framework represents a major source of uncertainty concerning prospects for innocent passage.

With a pace set by the rate of global warming and by the resolution of geopolitical issues, it may be some time before the Northwest Passage and the Northern Sea Route become international year-round waterways. Meanwhile, the global shipping community will not stand still: driven by economics, it can be expected to consider other options.

No.	Route	Length (nm)
1	Cape Horn	15,000
2	Cape of Good Hope	15,000
3	Panama Canal	12,600
4	Suez Canal	12,000
5	Northwest Passage	7,900
6	Northern Sea Route	6,200
7	Trans-Polar Route	5,700

Table 1: Approximate lengths of trade routes shown in Figure 1.

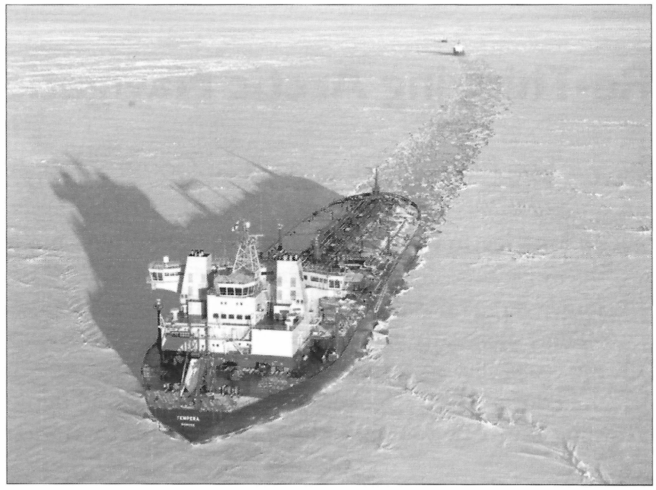


Figure 4: The double-acting icebreaking tanker M/V Tempera, operating in ice. Photo courtesy of Mike Nimi, Aker Arctic Technology, Helsinki.

The Trans-Polar Route

Faced with technical and political issues in the Northwest Passage and the Northern Sea Route, shipping interests are considering the feasibility of a Trans-Polar Route which would guide vessels over the top of the world in a direct line between the Fram and Bering Straits. A current vision is to establish trans-shipment ports in Iceland and the Aleutian Islands, where conventional vessels would transfer their loads to and from a new generation of double-acting cargo icebreakers shuttling between the Arctic's Atlantic and Pacific gateways (Figure 3).

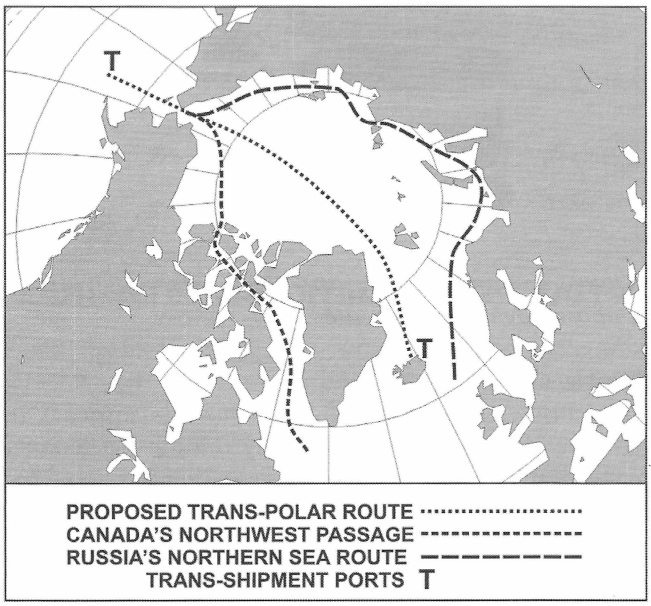


Figure 3: Prospective shipping routes in the Arctic.

A key to the success of this proposition is the development of a new class of double-acting cargo icebreakers. In open water, these ships look and perform like conventional vessels, but on encountering ice, they reverse their direction of travel and proceed stern first into the pack (Figure 4). The ship is pulled through the ice by steerable propulsion pods which feature hardened blades that chop through large ice slabs (Figure 5).

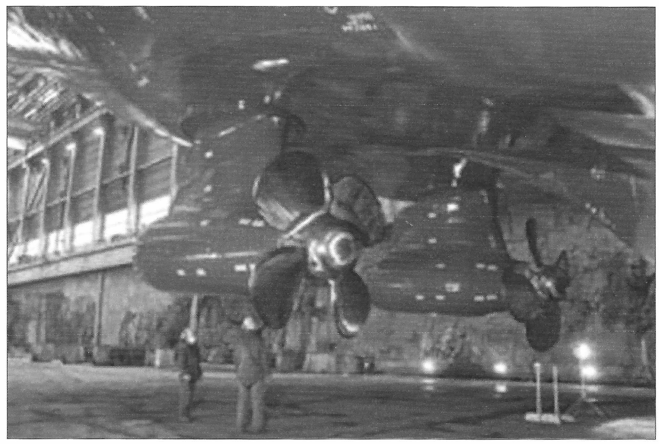
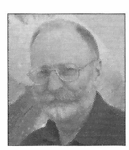


Figure 5: Steerable propulsion pods on a double-acting cargo icebreaker. Photo courtesy of Mike Nimi, Aker Arctic Technology, Helsinki.

Conclusion

In bypassing the technical and geopolitical impediments of other trade routes, the proposed Trans-Polar Route seems to offer an attractive option for commercial shipping in the Arctic. However many problems remain to be solved, not the least of which would be the potential for the degradation of a marine ecosystem whose remoteness has so far protected it from the fate of other oceanic regions. LH

About The Author...



Ron Macnab, a retired marine geophysicist and former DFO Science Alumnus, maintains an active interest in ocean mapping and in the implementation of UNCLOS Article 76 in different parts of the world. He is a member of the Canadian Polar Commission, chairman of the IASC/IOC/IHO Editorial Board for the International Bathymetric Chart of the Arctic Ocean (IBCAO), and past chairman of the IAG/IOC/IHO Advisory Board on the Law of the Sea (ABLOS).

CHA 2007 National Annual General Meeting Minutes
September 25, 2007
Conference Call
CCIW, Burlington

1. Call to Order

The meeting was called to order at 12:02. National President George McFarlane introduced himself and welcomed everyone. George thanked Roger for acting as Secretary and thanked CHS for accommodating the meeting. George thanked everyone for attending and participating.

George requested that any matters arising from the 2006 AGM Minutes will be taken after the Minutes have been reviewed.

Attendees:
George McFarlane – National President
Roger Cameron – A/National Secretary

Pacific Branch – Carol Nowak, Rob Hare, Craig Lessels, Brian Port, Fred Stephenson, Bill Hinds, George Schlagintweit, John Larkin, Ken Halcro

Central Branch –Earl Brown, Kirsten Greenfield, Brian Power, Paola Travaglini, Al Koudys

Atlantic Branch – Mark McCracken, Dick MacDougall, Bruce Anderson, Tammy Doyle, Judy Hammond

Prairie Schooner Branch - Paul Sawyer tried to participate in the teleconference but was unable to do so due to technical difficulties

Regrets:
Terese Herron (Secretary, CHA National), Fred Oliff (V.P. CB), Jim Weedon (CB), Scott Youngblut (Treasurer, CHA National)

2. Review Agenda

The meeting agenda was reviewed

Motion to approve the Agenda:
Nowak/McCracken - CARRIED

3. Motion to accept minutes of 2006 AGM

Minutes of the 2006 AGM were reviewed

Motion to accept as read
Power/Greenfield – CARRIED

Corrections:
Rob Hare noted that Tom McCulloch attended the meeting but was not listed as an attendee.

Motion to accept the 2006 AGM Minutes
Nowak/Travaglini – CARRIED

4. Action Items arising from the Minutes

Brian Power questioned the issue to increase National Dues by $5 to $25 per member to cover the subscription to Hydro International.

George replied that this matter is no longer an issue as the subscription to Hydro International will not proceed.

5. Branch Reports from Directors

Pacific Branch – Presented by Carol Nowak

CHA Pacific Branch
2006 Vice-President's Report

<u>2006 CHA Pacific Executive:</u>

Vice-President	Carol Nowak
Treasurer	Ken Halcro
Secretary	Sarah McDonald
Members at Large	Craig Lessels
	Kay Donaldson
	Dave Gartley

<u>National Meetings:</u> (3)

February 15, 2006	Teleconference
June 6, 2006	Halifax
June 7, 2006	Halifax AGM
November 21, 2006	Teleconference

<u>Pacific Branch Executive and General Meetings:</u> (8)

February 16
February 28
March 29
April 19
May 23

August 22
September 20
November 30

Membership		**2006**
28	Regular	43
1	Life	2
		1 corporate member
29	**Total members**	

Seminars and Social Events: (8) Sarah McDonald

Seminar and Social Events Report for 2006

Seminars:
- Richard Dewey – VENUS
- Rob Hare – Hydrographic Surveys update
- Sarah McDonald – Chart coastline delineation
- Fred Stephenson – Tsunami
- George Schlagintweit – Hydrographic Certification
- Jim Galloway – Acoustic Habitat Mapping

Social Events:
- CHS/CHA sponsored social at CHC 2006
- World Hydrography Day Potluck

Upcoming Events:
- Kim Conway – PGS Talk in January
- GIS Day – February
- Bonspiel – February

CHA memorabilia:
- Pacific Branch has purchased water bottles which are for sale at $10 each.

Lighthouse
- Fall Edition is expected at the end of December. Our Branch activities were submitted for both the Spring and Fall issues.

CHA Pacific Branch Bursary for 2006
- Both of these awards are administered and managed by BCIT and UVIC
- BCIT - $500.00 was presented to Bai Chen who is currently enrolled in the Geomatics Engineering Technology program
- UVIC - $500.00 was presented to Zoe Robson who is currently enrolled in the Geography Co-op program

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George thanked Carol

Atlantic Branch Report – Presented by Mark McCracken

Atlantic Branch 2006 Activity Report.

The Canadian Hydrographic Association's Atlantic Branch is renewed for a second year in 2006. The branch had its Annual General Meeting on March 15, 2006, and the Annual Budget was presented by branch Treasurer, Wendy Woodford. The focus of the CHA's Atlantic Branch was the 2006 Canadian Hydrographic Conference. This event dominated branch activity, with CHA members participating on a variety of committees, as well as co-chairing the conference. The level of organization and commitment by CHA members was exceptional, and the outcome was a successful conference. With the enormous expenditure of effort regarding the CHC2006, there was not the energy to pursue a large number of additional branch activities. The record-keeping that was required subsequent to the conference was considerable, and concluded with an audit by Revenue Canada of the GST transactions. The next major event in the CHA Atlantic calendar year, was the assumption of the editorship of Lighthouse by Atlantic Branch member Craig Zeller.

Branch membership peaked at this time (owing to the conference), with almost 40 individual, student and honourary members. The corporate side was similarly boosted during this time, with 8.

Membership stands at 40 individuals, 8 corporate members and 1 life member

George thanked Mark

Central Branch Report– Presented by Brian Power

Central Branch 2006 Activity Report

COMMUNICATIONS and PUBLICITY

•NewsLetter

Central Branch publishes a newsletter to help our far-flung members keep in touch; it goes out after each business meeting to distribute minutes and news of coming events as well as our finances. Each issue has a message from our Branch V-P and offers a forum for individual members to share their news and views; as well as update on upcoming events and activities sponsored by related associations. Whenever "National issues are published, a message from our National President and news from other branches are included. There were seven issues of the newsletter published this year with circulation going to all Central Branch and International members. In 2006, the newsletter continued to be distributed digitally for members with e-mail access and in hard copy format for members with out e-mail.

• Communications
World Hydrography Day, the GPS for GIS offered by CHA last April and meeting minutes comprised the majority of our communications.

Correspondence from our members is always appreciated and is always brought forward at our general meetings.

• Website
The association maintains a website that covers National and Branch information. The site is updated throughout the year for Central Branch activities as well as for National and other Branches. Our web master Jim Weedon is always looking to receive news from the branches. Log on to *http://www.hydrography.ca*.

• Lighthouse
Early April saw the publication of the much anticipated Edition 67 of Lighthouse. There was no time to relax as the next edition date was planned for CHC2006. Late May saw Lighthouse Edition 68, Conference edition, published and distributed to our worldwide members, subscribers, advertisers, and others who may have an interest in our journal. Edition 68 was available during CHC2006, held in Halifax. The Fall/Winter Edition 69 is currently in production with a projected publication date early in the new year. The efforts of our Lighthouse staff are much appreciated.

MEMBERSHIP

• Branch
The Central Branch membership stands at 68 down from last year's number of 73. This year the branch received five new corporate members – Association of Canada Lands Surveyors, C-MAP, HAS Systems Ltd., NetSurvey Ltd. and Triton Imaging Inc. The corporate membership of the Association of Canada Lands Surveyors was transferred from the Ottawa Branch. With our corporate membership standing at sixteen the branch thanks our continuing corporate members ASI Group, C&C Technologies, Fugro Jacques Geosurveys, L3 Klein Associates Inc., Knudsen Engineering Ltd., Kongsberg Maritime, McQuest Marine Sciences and Sani-International Technology Advisors In. Central Branch is honoured to include several special people in its membership: Earl Brown, Tom McCulloch, Ab Rogers and Sam Weller - Life Members; George Macdonald - Honorary Member and Steve Ritchie - International Life Member.

The 2007 membership renewal notices went out in November with the hope that all renewals will be in by the end of January.

• International
Central Branch of the CHA administers the International Members on behalf of the National Office. This committee helps to maintain contact with the CHA's 12 International members and ensures they have an opportunity to voice opinions and take part in CHA activities. We encourage communication between our members abroad and are delighted when we receive news from them. All International Members receive the Central Branch Newsletter to keep in touch between issues of the CHA's Journal Lighthouse.

• Elections
Nominations for the 2007 Executive were officially opened at our October general meeting and the close of nominations is scheduled for November 30th. A list of Central Branch members in good standing was circulated with the call for nominations. The 2006 executive are: Fred Oliff - vice president, George MacFarlane - treasurer, Roger Cameron - secretary and Tim Janzen, Brian Power, Brad Tinney and Jim Weedon are the additional executive members.

• Admiralty launch '*Surveyor*'
Surveyor is starting to show her age; this year rot was discovered is her keel section. The rot is confined to the stern of the launch just below the transom. The rot in the oak appears to be fairly expensive and the location of the rot makes repairing it difficult. The launch committee has decided to contact Gill Bibby and have him access the damage. Once Gill has determined what needs to be done a decision will be made on how to proceed with the repairs. To date Gill has not had an opportunity to see the launch.

Surveyor spent the entire season on her trailer making only one public appearance this past summer. June 21st has been declared "World Hydrgraphy Day (WHD)" by the United Nations and will be celebrated around the world each year on this day in June. This was the first year for WHD and the CHA Admiralty Launch was invited to participate in the celebrations. The event took place at the Canadian Marine Discovery Centre (CMDC) located on Hamilton's Bay Front Park. Surveyor flying all her colours was on display just out side the entrance to the CMDC.

A late season request by a film company out of Boston Massachusetts to film *Surveyor* on the water doing a traditional 1830's hydrographic survey is currently under negotiation. The film is being done at the request of NOAA to celebrate 200 years of their Coast Surveys unit. The launch crew enthusiastically supports this endeavor, a great show of spirit considering the filming date is set for December 10th of this year.

EDUCATION and DEVELOPMENT

• Gerry Wade Memorial Library
The library has been pretty quiet in 2006. There have been a few new additions and we expect to include copies of the new edition of the offshore boundaries text.

A catalogue of the library is available on the CHA web site, and will be updated from time to time. For the most up-to-date listings check with Mr. Janzen.

•Seminars
Six CHA Central & Arctic Branch general meetings were held in 2006. In addition to the business portion of the meetings, a wide variety of interesting topics were presented.

Those Speakers and their topics were:

- CARIS representative Matthew Holland reviewed some of the new hydrographic software that CARIS is currently developing
- After the business part of the meeting, we enjoyed a spirited discussion on the future direction of the CHA
- Life member Sam Weller presented a Power Point presentation on his trip to Estonia where he taught English as a second language.
- David Auger of the Beach Canal Lighthouse Group reviewed his organization's attempts to acquire the Burlington lighthouse and lightkeepers cottage. They plan to restore the structures in time for the 150th anniversary. A history of the lighthouse and photos chronicling its history were presented
- Glenn Butt and Eivind Eik Mong demonstrated some of C-Map's new product line and answered questions about the industry.
- We held a meeting at The Canada Centre for Inland Waters and intended to show a "home" movie from Derek Hatfield but there was a lot of business to cover and we ran out of time.

Thank you to the guest speakers for your informative presentations.

And a special thanks to Heimo Duller, Sam Weller, Ab Rogers and Brian Power for hosting meetings this year. Your hospitality is greatly appreciated.

•GPS/GIS course
A GPS/GIS course, instructed by Pierre Sauve from NRCan in Ottawa, was held at the Canada Centre for Inland Waters in Burlington, Ontario in April, 2006. Thirty-nine people attended the two day course. Some people managed to utilize what they learned already!

SOCIAL EVENTS

•AGM
The 17th Annual Dinner Meeting was held at the Mimico Cruising Club on December 7th 2006. Meeting was called to order at 18:17 or so. Master of Ceremonies Keith Weaver opened the evening with welcoming remarks. Fred Oliff, CHA Central Branch V.P. thanked Keith. He also thanked Jim Weedon for creating the AGM program. The business part of the meeting is kept to a minimum with all committee reports being published in the program ahead of time and outstanding items dealt with quickly.

The CHA President Andrew Leyzack was on hand to discuss his 2006 report to CIG which profiled the CHA. In his presentation some of the issues he reviewed are:

- The CHS- Association of Canada Land Surveyors (ACLS) publication of *Canada's Offshore: Jurisdiction, Rights and Management.*
- The CHA and ACLS recommendations on the Certification of Hydrographers
- Journal of the CHA *Lighthouse*
- The 2006 National Student award: This years award was won by Monica Beeton currently enrolled in Cartography and Digital Mapping at the Centre of Geographic Sciences in Lawrencetown, Nova Scotia
- CHC 2006 co-chaired by Atlantic Branch. There were 440 participants, and 45 exhibitors from 16 countries.

Following the business portion of the meeting, Master of Ceremonies Keith Weaver introduced our guest speaker Derek Hatfield, Skipper of "*The Spirit of Canada*".

Derek sailed around the world alone and finished 3rd in his class in the 2002-2003 around the world race. He is only the 2nd Canadian to sail solo around the world. The race covered 28000 miles and took 182 days.

Derek has built Canada's first Open 60 sailboat to compete in the 2008 Vendee globe around the world alone race. His new Open 60 "*The Spirit of Canada*" is currently moored at the Port Credit Yacht Club and currently has 3700 of and expected 10000 sponsors.

After his presentation, Fred thanked Derek and presented him with a CHA swag. Keith closed the evening by thanking the Mimico Cruising Club and its staff for the fine food and ambiance.

•BBQ
This year Brad Tinney hosted the annual event, on July 8, 2006. The day was hot and sunny and everyone brought his or her sun umbrellas. The event was well attended with twenty members, their family and friends present to enjoy Brad's cooking on the BBQ. The branch provides the food for the BBQ and drinks and the members bring salads and desserts, there is not shortage of food or drink.

•H_2O Bonspiel
For the last 35 years CHA Central Branch has supported the sport of curling in Canada.

This year's 2006 annual H_2O Bonspiel took place at the Grimsby Curling Club on Saturday the 18th of February. Sixty-four enthusiastic curlers showed up to enjoy a day of curling with the expectation of seeing their names engraved on the first and second place trophies. Once again, this year's bonspiel met with great success and the bonspiel committee would like to thank all the curlers for their support.

Congratulation to this year's first place winners goes to the rink of Paul Winslow – skip, Mike Mawhinney – vice, Ryan Winslow – second and Paul Mawhinney as lead.

Congratulations are also extended to the Second Place winners, Michele Clarke as Skip, Mike Campbell - Vice, John Kisneris - Second and a first this year the lead position was shared by mother and daughter - Judy and Claire Campbell.

The 2006 organizers were Earl Brown and Brian Power and they wish to thank the sponsors for their generosity and continuous support.

ASI Group
Canadian Hydrographic Association
Canadian Hydrographic Service
Canadian Coast Guard
CARIS
DataQC Inc.
HYPACK Inc.
IIC Trchnologies
Kongsberg Maritime
Knudsen Engineering Ltd.
Marshall Macklin Monaghan
McQuest Marine Sciences
Ontario Great Lakes Area
Seaway Marine Transport
Stanley Tools Canada

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6. Financial Statements and Auditors Report for 2006

Financial Statement

Scott is working on the Financial Report – it picks up where the Audited Financial Report left off.
Outstanding item noted: CHC Book Launch $230.00
A signed copy of the report is apparently not available.
George will see that this document is circulated to all Branches

Proposed Budget - Only item received by Atlantic Branch

George reviewed Scotts working Financial Report.
The liability insurance has been reduced.
George thanked Scott for preparing the Report and Brian and Al for auditing.

Auditors Report for 2006

The audited Report for 2006 was reviewed

Motion to accept:
Koudys/Powers – CARRIED

7. Appoint Auditors for 2007

Al Koudys and Brian Power accepted the role of auditors for 2007

Motion to accept:
ACCEPTED

8. Proposed National Budget

George presented the Proposed National Budget as Scott was absent.

Earl requested that "Friends of Hydrography" be supported by National with a stipend of $200 annually. George replied that was a reasonable request. Pacific, Atlantic and Central branches agreed. George proposed to increase the amount to $500 and will advise Scott.

George noted that the budget is a deficit budget but there are no problems with funds, only with membership. Hopefully next year will be better.

Surplus Funds – Atlantic branch transferred $10,000 to National. It is expected that the 2008 Conference will also provide surplus funds.

The Lighthouse cheque has not been paid. George will ask Scott to do so as this will help to bring the balance down.

Motion to accept:
MacCracken/Brown – CARRIED

9. Lighthouse Report

George read Craig Zellers report. George would like to congratulate Craig on all his hard work and noted that we will try to get out the next edition by Christmas.

<u>Editor's report for Lighthouse for the 2007 CHA National Annual General Meeting.</u>

It has been an active year for *Lighthouse*; one which saw the publication of Editions 69 and 70. The former was out in early summer and the latter was distributed towards the end of March. Both editions looked slick as ever, thanks again to Jim Weedon's layout prowess. The quality and variety of the material was decent but we could use a lot more of it. Nonetheless, many thanks are due to all the contributors. Please keep the material coming. It was great to see to us keep up with the two editions a year commitment. There is still persistent urging to have us deliver the winter edition earlier in the period. It certainly would be beneficial to having the release closer to the submission deadline to keep the material current.

President George has been actively lending a hand to the journal on many fronts – finance, advertising, marketing and content. The help is appreciated. Perhaps the most significant contribution to the long term sustainability of the journal is the establishment of a Lighthouse Committee. George proposed a committee of:

Craig Zeller - Editor in Chief
Jim Weedon – Layout
Earl Brown –Subscriptions
Bernard Labrecque- Translation
George McFarlane – Finance
ALL – Advertising

In addition, he has spoken to Paola about re-joining the committee and to Carol Robinson about helping out with the layout software. Some of these actions are pending while CHS staff are in the field.

The work on Edition 71 has begun. Many contributors are still away but there will be a concerted effort to distribute this edition by Christmas. Furthermore, we are planning to make Edition 72 the CHC2008 conference edition, which must be ready by the end of April. Please send along you contributions, articles, letters, comments and ideas. It is your journal and, to many organizations beyond our borders, it is a voice of Canadian Hydrography. Also, please don't forget to contact and include our corporate partners.

George can speak to the financial aspects of the journal, wearing the hat of treasurer of the Central and Arctic Branch.

The last two editions have been printed by Transcontinental. Although they have done good work cost effectively, we plan to return to a competitive bidding process for the next edition.

100 pewter pins were purchased. Among other uses, they can be given to first time authors. Please submit an article and get one of the fine mementoes. We need your help. We appreciate your efforts and your support. For contact information, please look inside of Lighthouse or online at *www.hydrography.ca*

Craig Zeller 19-Sep-07

The Lighthouse account stands at $7925.83. As mentioned above, the cheque from National to cover the invoicing for Edition's 69 and 70 is outstanding. George will pursue this matter.

Earl noted that it costs between $4000 and $4500 to print each edition. The income from advertising does not cover this expense, however with National's support there is only a small deficit.

The ACLS has made a request for 500 free copies for their upcoming Conference. The committee is considering this request.

Carol suggested that the Conference edition should be the one printed.

George Schlagintweit noted that it would be in CHA's interest to provide the 500 copies as it could solicit new membership.

Earl noted that the edition after the Conference would be more relevant; however he questioned whether it would be out in time. George is confident that the edition will get out in time.

Craig noted that the Conference edition won't contain papers from the Conference. George is hopeful that more advertisers will be acquired for the Conference edition.

September 15th was the nominal deadline however all material has to be received by the editor by the third week in October in order to get the edition out by the beginning of December.

10. Student Awards Program Report

Report from Barry Lusk

The Canadian Hydrographic Association award was created in 1992 under the leadership of Barry M. Lusk, the National President of the Canadian Hydrographic Association, during the years 1987 to 1990.

The perpetual funds necessary to finance the award were earned by the CHA through the management of a CIDA project that was then under the direction of Thomas McCulloch, ex Director General of CCIW. Mr. McCulloch's CIDA projects focused on creating hydrographic expertise in developing countries during a period of about 15 years. The CHA's professional sponsorship of these endeavours provided real time support of worthwhile hydrographic related activities.

The first CHA "Award for Deserving Students" was made in 1993 and has continued providing the very generous $2000 per year assistance since that time.

In 2000, no award was made as all the applicants were judged to be non compliant. This means that none of the applications received were from students that met the rules criteria in respect to an appropriate faculty.

This years winner (2007) was Katie Seely who, at the time of her application, was a student at the Northern Alberta Institute of Technology and was enrolled in their Geomatics Engineering Technology programme. These programmes are considered relative to this award as "hydrography only" programmes in Canadian schools are non-existent or at least minimal.

I, as manager of this award, congratulate Ms. Seely on the quality and timeliness of her application ,her outstanding marks while in school and her desire to become a provincial and Canada land surveyor.

George tried to get a current financial report for the awards committee but was informed that there was no committee. He would like to see a committee formed to oversee the funds and the Student Award as currently only one individual is making the selection. As things currently stand, Barry Lusk makes the selection and controls the funds. Apparently no one can dispense these funds however Dave Gartley is now a signatory.

George would like more information be available to members and have the process of selection be more transparent. Hopefully we will be able to resolve this issue.

Barry Lusk will be producing a report in January and hopes to publish something in the next journal about the Student Award.

George reads the letter of thanks from Ms. Seeley.

ACTION: George to strike a committee

11. Status of Quebec, Ottawa and Prairie Schooner Branches

George noted that Prairie Schooner Branch is dormant and affairs are being handled by Pacific Branch which has taken in its members. Ottawa Branch has been closed.

Carol inquired of the status of Ottawa Branches members. George replied that he has been unsuccessful in acquiring any information and it has been 7 months of frustration. According to information provide to George by Terese, branch items have been boxed and there should be an upcoming financial report.

George requested a list of Ottawa members from anyone who may have that information. Brian mentioned that Corporate member ACLS has transferred from Ottawa Branch and that Honourary Member Tim Evangelatos is now a member of Central Branch. George does not want Ottawa members to be left out in the cold and is hoping that the boxes will arrive soon.

There has been no response from Quebec and they have not been forthcoming with information. They are next branch slated to host CHC in 2010. George expressed his concern as to what is likely to happen if things don't improve. Brian Port noted that Bernard Labrecque has been their only V.P. and as such Quebec is not operating within the Constitutional requirements.

Earl questioned whether Quebec Branch has management support from CHS and that CHS may do the conference themselves. Dick McDougall noted that the conference likely wouldn't go on without management support. George countered that would infringe on CHA's national identity and that a national identity needs to be established. He stated that a national organization cannot be supported by a government organization.

12. Update on National Executive Activities

Presented by National President George McFarlane

It has been an interesting year since our last AGM and a busy one for me since my election as your National President last February 19th. Once again I would like to thank the membership for the confidence they have placed in me and for the privilege of providing leadership to our National organization.

CIG

As many of you are aware the CHA is the CIG's hydrographic committee and your National President the Technical Councilor representing Hydrography. I attended my first council meeting in March and was duly ratified as Technical Councilor. I noted that the Terms of Reference for the Committee was woefully out of date having last been reviewed on the 24th July 1995 and the Committee itself was not functional. I have brought this to the attention of our Board of Directors and National Executive Committee and hope to have a revised Term of Reference submitted to the CIG in the very near future and to have the Hydrography committee reconstituted in accordance with the updated Terms of Reference.

Part of the duties of the committee is to represent Canadian Hydrographic Surveying Internationally. As a consequence I will be attending the 6th Regional FIG Conference in San Jose Costa Rica in November of this year. I also attended the CIG AGM in Toronto on May 23rd but will be unable to attend the next council meeting in Quebec City on October 2nd having being summoned to Jury duty that day. Today I received the proposed agenda for the meeting and noted two items that affect us – the terms of Reference and the International representation. I paid a courtesy call on Mr. Dale Nicholson Director of Hydrography, Central and Arctic Region on Thursday July 26th and discussed matters of mutual interest. I hope to be able to make similar calls to the Atlantic and Pacific Regions before the years end.

Note: CIG also continues to process our credit card payment for a nominal fee.

ACLS
Attended the 3rd National Surveyors Conference in Quebec City in June. They have for the last year been actively been pursuing membership in FIG hence the emphasis on being the only National Surveyors group, as membership in FIG is for National Professional Societies. With regard to the CHA-ACLS Joint Task Force on certification, I was belatedly advised in June that the ACLS Offshore Issues Committee had decided to disband the Joint Task Force given that they had accomplished all that they set out to do.

CHC 2008
Preparations are well under way for this bi-annual meeting under the Chairmanship of Brian Port. The 2008 Conference is being coordinated by the Canadian Hydrographic Association and the Association of Canadian Land Surveyors and will be held in Victoria B.C. May 5-8, 2008. A Memorandum of Understanding is being negotiated between CHA and ACLS. I have been receiving minutes of the committees meetings from Brian and hope that as many of us as possible will attend and give this conference the support it deserves.

Surplus Branch Funds
The issue of transfer to National of surplus Branch funds is again being revisited and needs to be resolved in the very near future. The existing policy appears to have been ratified at the CHA National AGM in Calgary in October 2003.

Friends of Hydrography
We continue to work closely with and support our Friends

World Hydrography Day
Next year I hope to see the CHA have greater visibility in these celebrations

George feels that it is important we re-align ourselves with CHS management.

The ACLS wants to be a body which certifies hydrographers. Atlantic has concerns with the ACLS certification process.

George hopes to see WHD as more a CHA event than a CHS event, we should promote our association and be more active with WHD.

George Schlagintweit will be drafting the MOU between CHA and ACLS on how the 2008 Conference is coordinated from a financial standpoint.

13. Other Business

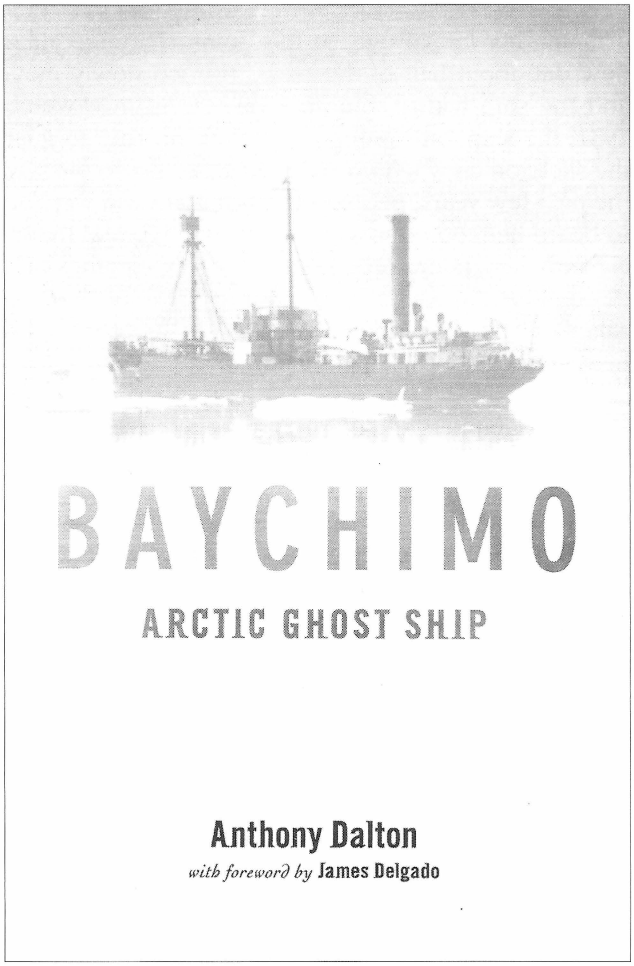
Website - Brian Port noted that more control should be given to each Branch as currently everything has to go through Jim Weedon. Someone from each branch should be able to do updates as most links do not work. George supported this idea and will discuss this with Jim and have him contact Brian Port.

The CHC 2006 website should still be up as the proceedings disappear too quickly. Papers and presentations from previous conferences should be made available. Any server costs should be nominal.

ACTION: George to approach Jim regarding these issues

14. Time and Place of Next Meeting.
Time is set for Wednesday May 6, 2008 17:00 to 18:30 at CHC 2008. The ACLS presenter's forum is the only conflict

15. Motion to Adjourn
Motion to adjourn:
Lessels/Power – CARRIED
Meeting adjourned at 13:45



BAYCHIMO Arctic Ghost Ship

Written by Anthony Dalton

Review contributed to *Lighthouse* by David Gray

Published by Hertitage House Publishing Company, Surrey, BC , 2006. 243 pages, 36 photographs, 5 maps, glossary, bibliography, index, $19.95 (Cdn)

ISBN 13:978-1-894974-14-1 or ISBN 10:1-894974-14-X

To me, this book should be required reading of all Canadian Hydrographic Service directors, managers, sailing directions officers, and planning staff because it describes the efforts of the organization's clientele – the mariner – in poorly surveyed areas while working with atrocious navigation conditions.

The Hudson's Bay Company Arctic supply ship *Baychimo* started life in the Lindholmen's shipyard in Sweden in 1913 for the Baltische Reederei K.G. of Hamburg, Germany. When launched in 1915, she was named *Ångermanälven* and was an ice-strengthened 230-foot (70.7m) long, 36-foot (11m.) beam, 1,322 ton cargo ship powered by a single screw whose steam engine powered by three boilers. Her icebreaker style bow and generally strong construction meant that she could continue to work in the Baltic Sea when other ships were confined to port. At the end of the First World War, Germany had to give up, as reparations, enough ships to equal the tonnage sunk by German forces. Early in 1921, the Hudson's Bay Co. bought the ship for £15,000. Her sturdy bow, and small size, made her ideal for trading voyages to coastal settlements in Canada's north.

The summer season of 1921 saw *Baychimo* on the east coast of Canada – her only season there. She sailed from Cardiff, Wales in June 1921 under the command of Capt. Thomas Smellie (later to command the Hudson's Bay Co. *Nascopie* for years) to Montreal. Then under the command of Capt. Enoch Falk, she visited eastern Arctic communities between Port Burwell and Pond Inlet before returning to Montreal. She completed her season by returning to England.

During the shipping seasons of 1922-4, *Baychimo* was sent to the eastern Siberian coastline of the Pacific and Arctic Oceans to trade for furs. The first year she was under the command of Capt. Bertram Edmunds, but after that, and until her loss in 1931, by Capt. Sydney A. Cornwell, for whom Cornwell Bay (at 70° 11'N, 124° 36'W) is named. The route was from Great Britain via the Panama Canal to Vancouver before heading to the trading area then to return the same way. In 1924 however, she went out via the Suez Canal, thus making a complete circumnavigation of the globe.

When *Baychimo* was sent to the western Arctic in 1925, she was the first "large" steel-hulled ship to pass Point Barrow, the bottle neck to the western Arctic; i.e., the space between the shore-fixed ice and the polar icecap just a few miles (at best) offshore. She successfully passed Point Barrow going in and out that year and the next four. She visited about a dozen Hudson's Bay Co. Posts from Herschel Island to Cambridge Bay. Much of this area had to be navigated without charts. Capt. Cornwell's preliminary instructions for the 1929 season were to attempt a west to east transit of the Northwest Passage. As it turned out, he certainly could have done it since he met HBC ships that entered the Arctic from the east and which exited the Arctic the way they came.

The 1931 season was a year fraught with heavy ice. It took *Baychimo* more than a month to pass Point Barrow and she encountered ice wherever she went. She finally exited past Point Barrow but got thoroughly caught in heavy ice near Wainwright, Alaska. The crew moved ashore with as many provisions as possible to stand guard against others claiming her for salvage. At this point, chartered aircraft flew out about half of the crew. The ice slowly moved and the ship with it, but after one storm in November 1931, the ship had disappeared. With no ship to guard, the skeleton crew left on shore was also flown out. Over the next few years, people saw *Baychimo* and were able to board her and remove parts of her cargo and fixtures. Nevertheless, people continued to report sightings of her throughout the Arctic and northern areas of the North Atlantic. The last sighting seems to have been in 1969 near where she was abandoned.

For hydrographers and oceanographers the story is worth reading. The dilemma of the mariner with poor charts, no sailing directions, limited navigational aids, tricky radio communication, foul weather, and ever-changing ice conditions is a reality check while hydrographers and chart makers sit at their computers in a comfortable office in southern Canada. Oceanographers can grapple with the supposed sightings and argue, over morning coffee, as to their plausibility. LH

Friends of Hydrography

A Canadian Volunteer Group

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

The Friends of Hydrography are a small group of both retired and current Canadian Hydrographic Service (CHS) employees who believe there is a need to record and preserve the historical highlights of Canadian hydrography.

Please browse the many pages of the site to get a sense of the history of Canadian hydrography and the Canadian Hydrographic Service (CHS). If you ever worked with the CHS, or had friends who did, search the site for their names. If you don't find the name please contact us. Also, if you have photographs of ships or launches, used at any time by the CHS we would be grateful if you would share them with us.

The site is the primary distribution vehicle for Friends of Hydrography and is a work in progress. The site has grown nicely since its inception in 1998 and new information is added on an opportunity basis.

Please feel free to contact us at (CANFOH@cogeco.ca) We would be delighted to hear from you. Your questions, comments, corrections and/or contributions to the site are welcomed.

Supported by and in collaboration with the Canadian Hydrographic Association and the Canadian Hydrographic Service

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 survey science program (the program must have a Hydrographic Survey or a Geographic Information Systems, Cartographic or Land Survey component) in a university or technological college anywhere in Canada. Environmental studies only will not be eligible. The Manager of this award will determine the eligibility of the program for the 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* and sent to:

Critères d'admissibilité:

1. Le candidat ou la candidate doit être un étudiant ou une étudiante inscrit à plein temps à un programme reconnu en sciences géodésiques (ce programme doit inclure les levés hydrographiques ou un contenu des systèmes d'informations géographiques, de cartographie ou des levés terrestres) par une université ou un collège situé au Canada. Un programme en environnement seulement ne sera pas éligible. L'administrateur de cette bourse déterminera l'admissibilité du programme pour la bourse d'études.

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 préférablement téléchargée à partir du site internet officiel de l'ACH « www.hydrography.ca » et envoyée à :

Barry M. Lusk, Manager / Administrateur
Canadian Hydrographic Association Award Program / Bourse de l'Association canadienne d'hydrographie
4719 Amblewood Drive, Victoria, BC V8Y 2S2
luskbm@telus.net FAX / Télécopieur: (250) 658-2036 *www.hydrography.ca*

Canadian Hydrographic Conference and National Surveyors Conference /

Conférence hydrographique du Canada et Conférence nationale des arpenteurs-géomètres

Bringing Land and Sea Together / Réunir terre et mer

Conference Abstracts / La conférence Soustrait

Technical Program

Tuesday 06 May 2008

Session 1A Future of Marine Charting 10:30-12:00 Theatre, Chair: John Lowell (National Oceanic and Atmospheric Administration, USA)

1A-1 CHS & HPD - The New Hydrographic Production Environment

Lynn Patterson (Canadian Hydrographic Service)

CHS began investigating alternative production environments in recent years in order to continue to produce quality products and to produce them in greater numbers with fewer resources. We needed to find another way of doing our business in order to continually provide the mariner and our expanded client base with up to date products. 5 years ago we began to investigate the potential of the Hydrographic Production Database, which offered many potential benefits such as the ability to produce more products with fewer resources and with less duplication of work. CHS has been migrating their production environments towards this next generation of hydrographic software for the production of Electronic Navigational Charts (ENCs) and Paper products for the last 1-2 years. In the near future, CHS will look at migrating other CHS products and potentially the creation of new product lines as well in this environment. This presentation will detail to the viewer, the CHS production environment before HPD, since HPD, and the future.

1A-2 Future of Nautical Charting at NOAA

Julia Powell (NOAA), Travis Newman, Beata Van Esch, Rafael Ponce, Paul Lewis and Jorge Arias

As Hydrographic Offices face greater workloads of producing both Paper and Electronic Navigational Charts without an increase in resources, they are looking for new ways to streamline the production process. This streamlining needs to be efficient and deliver high quality and consistent products to the mariner in order to promote safe navigation. This requires new and improved ways of organizing data and workflows in making products, taking into consideration multiple sources and formats. In order to accomplish this goal some Hydrographic Offices have chosen a central database solution from which all products can be extracted. The National Oceanic and Atmospheric Administration (NOAA) embarked on a multiyear effort to streamline its nautical chart production. NOAA has contracted with McDonald Bradley, Inc. using ESRI PLTS Nautical software to create a centralized nautical database. The Nautical Chart System II will not only be capable to receive data from differing sources, but have enough versatility to build those products needed by the maritime community and establish connections with the national geospatial database infrastructure and other agencies to exchange data in a seamless way. This paper describes how NOAA is implementing such a system, the challenges faced and key outcomes once it is operational.

1A-3 IHO S-100 - The New Hydrographic Geospatial Standard for Marine Data and Information

Robert Ward (International Hydrographic Bureau)

IHO Publication 57 (IHO S-57) is the IHO Transfer Standard for Digital Hydrographic Data. It is the standard intended to be used for the exchange of digital hydrographic data between hydrographic offices, and for the distribution of hydrographic data to manufacturers, mariners and other data users (e.g., environmental management organizations).

It was developed so that the transfer of all forms of hydrographic data would take place in a consistent and uniform manner. However, to date, S-57 Edition 3.0/3.1 has been used almost exclusively for encoding Electronic Navigational Charts (ENCs) for use in Electronic Chart Display and Information Systems (ECDIS). While S-57 was intended to support all types of hydrographic data, customers and the technology for hydrographic data, this has not happened. One of the reasons for this is that S-57 is not a contemporary standard that is widely accepted in the GIS domain. Accordingly, the IHO has embarked on the development of a new standard – S-100 – that will form part of the ISO 19100 series of geographic information standards being developed by ISO Technical Committee 211. S-100 should therefore form an attractive basis upon which a wide range of digital products and transfer standards for hydrographic and related applications can be developed. The paper explains the new IHO Geospatial Information Infrastructure under which all IHO data standards are now being developed. In particular, the paper shows how the S-100 standard is being developed and how potential stakeholders and users from areas other than charting and HOs can be involved both in the development process and in the creation of specific data profiles that address their areas of interest.

1A-4 High definition bathymetry production, distribution and updating

Louis Maltais (Canadian Hydrographic Service)

Canadian Hydrographic Service is involved in the definition and experimentation of the next standard for high definition bathymetry (S-100). This new standard will enable Hydrographic offices to deliver bathymetry to a level of detail never seen before. Defining the standard is one thing, implementing the standard into production will be the challenge. Like traditional marine charts, those high definition bathymetry files need to be created, distributed and updated. In addition, the turn around time to accomplish all the steps involved, will need to be kept to a minimum. Many challenges need to be overcome in order to be efficient in that production mode. This paper discusses possible solutions to address some critical issues.

Poster Session 1A 12:00-13:00 Exhibition hall

P1A-1 Divide and Impera: An Analysis of the River Schelde Project

Azing Vondeling (QPS bv)

Like Caesar before them, QPS aims to "Divide and Conquer" with Qarto, the new ENC Production Suite. Imagine piloting a 360m container ship into port TODAY using an ENC updated with survey data collected YESTERDAY. Isn't this order of turnaround time the ultimate dream of any ENC production agency? Modern echosounders are able to provide a staggering amount of sounding data. Managing, and storing, the ever increasing volume of survey data is a hot item on the agenda of many ENC producing agencies, including port and river authorities who have taken on the responsibility of creating and maintaining their own ENCs. Processing voluminous data into high quality, high density ENCs requires a powerful, flexible and easy-to-use ENC production platform. QPS, in collaboration with Dutch Oracle specialists Atlis, has developed a flexible database solution that combines a bathymetric warehouse with a nautical warehouse for ENC data into an easy-to-use ENC production platform, collectively known as Qarto. This paper examines the development issues experienced, and the successes achieved when implementing the solution in the River Schelde, where today's multibeam survey is available in an updated ENC tomorrow.

P1A-2 Maritime Infrastructure-New Technology for production/management of ENC and paper Charts

John Klippen (Jeppesen Norway AS)

The paper will focus on processes for a partnership between a government institution (Norwegian Hydrographic Service NHS) and private industry (Jeppesen Norway AS - JN (previously known as HydroService AS)) based on the system design, implementation, roll-out, quality aspects and completion of a contract between NHS and JN (the MINTEC project). The paper will be presented by Jeppesen Norway AS, but will be put together in collaboration with the MINTEC Project team at NHS. The MINTEC presentation will focus on practical key elements experienced between the two parties over the last 2 years, where implementation of a complete and full production line for ENCs and paper charts are established working with NHS's existing Oracle Primary Database. Handling all product extracts from source to chart, as well as a fully integrated maintenance system utilizing any revisions made to the sources in the Oracle Primary Database. The paper will highlight, among other, following themes:

1. Systemizing/tailoring of a solution, based on provided specifications
2. Implementation processes and procedures
3. Test scripts and verification process
4. Organization and Administrative issues
5. Individual understandings and expectations to requirements
6. Meeting the individual requirements.

P1A-3 Debris Mapping in Lake Borgne, Louisiana

Paul Donaldson (SAIC), Gary Davis, Rebecca Quintal and Walter Simmons

Science Applications International Corporation (SAIC) recently completed a survey of Lake Borgne, Louisiana for mapping debris deposited by Hurricane Katrina in August, 2005. This survey was performed under contract to the National Oceanic and Atmospheric Administration (NOAA) Office of Coast Survey. In addition to debris detection, the survey required the collection of bathymetry to the four foot depth curve. SAIC deployed two vessels, one with a Klein 3000 sidescan sonar and an Odom Echotrac CV singlebeam sonar, and the other vessel with a GeoAcoustics GeoSwath interferometric sonar. This poster presents the challenges encountered during this survey effort relating to the generation of a Total Propagated Error (TPE) model required for the GeoSwath interferometric sonar and other data processing challenges.

Session 1B Cadastral systems for sustainable land management 10:30-12:00 Salon C, Chair: Peter Sullivan (Surveyor General, Canada)

1B-1 Canadian contributions to land management in Africa: The future is both there and here

Brian Ballantyne (Canada Centre for Cadastral Management) and Peter Sullivan

In December 2006, the United Nations' Economic Commission for Africa (UNECA) held a symposium in Ethiopia on appropriate land management information systems (LMIS) in the knowledge economy. The symposium was sponsored by the Canadian ePolicy Resource Centre and NRCan. The Office of the Surveyor General for Canada Lands was instrumental in participating in the symposium and in drafting 16 principles after the symposium that formed the core of UNECA's discussion paper. The process revealed that, although cadastral reform and LMIS upgrades must be context-specific, there is much common ground between Canada Lands issues (such as the current transformative process within 3CM) and LMIS issues in much of Africa. Indeed, while we have much to offer LMIS administrators in Africa, they in turn have insights that can benefit cadastral management on Canada Lands.

1B-2 The Socio-Economics of Yala Swamp and implications of American based Dominion Farm Ltd., Reclaims National Heritage in Kenya.

John Vorster (Victoria Institute for Research on Environment and Development-VIRED)

Yala Swamp is one of the largest wetlands along Lake Victoria, the second largest freshwater lake in the world after Lake Superior. The wetland lies within the equatorial band and enjoys a rich biodiversity. Yala Swamp covers 175 km^2 and contains three other satellite freshwater lakes. The Swamp has great ecological importance - it filters the waters flowing through to Lake Victoria, provides fisheries for the communities as well as vegetation cover and forage for endangered native fish species, birds and mammals. The presentation discusses research findings in relation to property rights management, environmental stewardship and healthy ecosystems from case studies of Yala Swamp in Kenya. Yala Swamp is home and a living museum for many endangered fish species. The Swamp was once drained by the government through the United Nations Development Program (UNDP) and later reclaimed by the UNDP through the GEF program. Currently, the Swamp has been leased to an American investor for the purpose of agricultural production. Within the project, a number of communities have been forced to sell their lands and homes. Conflict of interest issues arose and created a vacuum in the area of land rights management and ownership when the State leased lands to foreign-based developers without conducting EIA and considering the socio-economic factors of wetland reclamation. Dominion Farms' agricultural activities are presently threatening the health and the integrity of both the wetlands and the community. In summary, the paper will explore and inventory actual and potential biological losses from areas converted to agricultural use, the implication of soil losses for downstream users and the entire ecosystem, waste management issues, environmental pollution issues as well as socio-economic and cultural issues pertaining to land rights and ownership, the participation of the community and dialogue and EIA with flexible recommendations for future reference in such like activities.

1B-3 Informing the Duty to Consult: Mapping Aboriginal Spatial Demands in Canada

Khaleel Khan (Canada Centre for Cadastral Management) and Brian Ballantyne

The duty to consult is founded in the honour of the Crown; "the duty arises when the Crown has knowledge, real or constructive, of the potential existence of [an] Aboriginal right or title and contemplates conduct that might adversely affect it." [Haida Nation v. British Columbia] Research to aid in this effort, aimed at producing a national map of Aboriginal spatial demands, allowed the following observations: that government departments dealing with aboriginal spatial demands applaud the idea of such a map; that the depiction of the spatial extent of land in which rights are claimed can be problematic, in terms of potentially compromising the Crown's position at court or within land claims processes; that the degree of specificity (and conversely, ambiguity) in claim descriptions varies among provinces; and that it is difficult to obtain a national overview of the location and extent of lands currently claimed. Finally, the paper situates the mapping initiative as an element of a similar crystallizing vision within the Surveyor General's Office.

1B-4 Multimedia Data in Land Records Systems: Field Trials in Nigeria

Michael Barry (University of Calgary)

After years of military rule, Nigeria recently celebrated its first instance of a democratically elected president relinquishing power to a newly elected president. As a consequence of years of misrule, some 3% of formal properties in Nigeria are registered and registration and cadastral survey systems have fallen into disuse in many of the states. In addition, access to land in rural areas has become increasingly difficult due to population pressures, and there are numerous territorial boundary disputes between local customary authorities. Multi-media data in the form of videos, sound recordings and still photographs are a means of collecting and recording land tenure related information in uncertain situations such as a post-conflict situation or in situations where land rights are contested. Multimedia are also useful in recording claims to land rights in societies where oral traditions rather than documentary evidence forms the basis of the land tenure system and the property rights associated with it. Land records systems can use multimedia data on their own as the sole record of land rights, as a start up system where the data is used for adjudication purposes, and as data to augment existing documentary evidence such as cadastral survey plans and deeds or titles. This paper describes a set of field tests using multimedia data in land regularization projects in the city of Lagos, in recording the resolution of rural boundary disputes, and in documenting inventories of properties and fruit trees and crops in customary lands on the urban periphery which were scheduled to be turned into housing estates in central and northern Nigeria. It also describes the design and testing of software to support the use of various forms of data in a land records system.

Poster Session 1B 12:00-13:00 Exhibition Hall

P1B-1 The Role of the Surveyor in Delimiting Oceans Act MPA Boundaries

Sam Macharia Ng'ang'a (Fisheries and Oceans Canada)

There is general consensus that the clear delimitation of the spatial boundary of a regulated area, such as a Marine Protected Area (MPA), is important for governance purposes (i.e., for the purpose of MPA establishment and management). However, there is limited documentation available to the MPA practitioner regarding boundary delimitation processes (i.e. what is involved in creating appropriate boundaries for MPAs).

This presentation will reflect deliberations from a marine boundary session that was convened by the author at SAMPAA 2007 conference held in Wolfville, NS. The presentation will:

1) provide insight into the steps and processes involved in boundary delimitation specific to Oceans Act MPAs;
2) describe the challenges encountered, as well as lessons learned, in trying to accomplish these steps in previous MPAs.

Session 2A Legal issues and sovereignty, UNCLOS 13:00-14:30 Theatre, Chair: Wendell Sanford (Foreign Affairs and International Trade Canada)

2A-1 Legal issues of ocean surveying in the exclusive economic zone

Keyuan Zou (University of Central Lancashire)

This paper will address the legal issues arising from State practices in the implementation of the 1982 UN Convention on the Law of the Sea, particularly relating the practice in the Asian-Pacific region. The Convention has a whole chapter governing marine scientific research, but there is no clear-cut definition of it, thus causing different interpretations by different countries. Hydrographic surveying when it is undertaken for military purposes remains a grey area. What causes the issue more complicated is the dichotomy of the legal status of the exclusive economic zone, a maritime zone within national jurisdiction but subject to freedoms of high seas. It is perceived that the world community needs to find a way to conciliate different State practices in this respect and enhance the rule of law in the ocean.

2A-2 Baseline Claims and Sea-Level Rise

Trent Palmer (National Geospatial-Intelligence Agency)

The discussion concerning the nature of baselines (fixed vs. ambulatory) becomes even more interesting in the light of rapid sea-level change. The variability of the coastline over time is well-accepted, but what would be the effect of a faster than normal change in a coastline? Currently there is much attention being given to predictions and reports of rising sea levels. With this, it may be an opportune time to consider the need for revising the approach to baselines and the maritime claims that begin with them. Fixed baseline coordinates may be considered nonsensical when they are submerged. While a coastal state may not be motivated to adjust baselines based on sea-level rise (sea area coastward of the baseline becomes internal waters), there would be strong calls for readjustment if there were to be sea-level reduction (more territory and potential extension into the sea). This study will not seek to consider causes for sea-level change nor even attempt to evaluate sea-level rise predictions. The discussion can be extended to all maritime zones that begin with the baseline and are established in accordance with the United Nations Convention on the Law of the Sea. Beyond a general discussion of the theoretical nature of the topic, some specific cases will be examined to show the effect of rapid sea-level rise on current maritime claims.

2A-3 From the Arctic to the Tropics: The U.S. UNCLOS Bathymetric Mapping Program

James Gardner (CCOM/JHC University of New Hampshire), Larry Mayer and Andrew Armstrong

Since CHC2006, the University of New Hampshire's Center for Coastal & Ocean Mapping/Joint Hydrographic Center has mapped with multibeam the bathymetry of an ***additional ~220, 000*** km2 of seafloor in areas as diverse as the Arctic, the Northern Marianas of the western Pacific and the Gulf of Mexico. The mapping supports any potential U.S. submissions for of an extended continental shelf under Article 76 of the United Nations Convention of the Law of the Sea. Therefore, the mapping has concentrated on capturing the complete extent of the 2500-m isobath and the zone where the Article 76-defined foot of the slope exists. In practice, the complete area between ~1500 and ~4500 m water depths is mapped in each region. The data have been collected in conditions that range from harsh Arctic sea ice to the calms of the Pacific tropics. Although, some of the conditions have limited the quality of some of the data, the data quality is generally quite good and geological surprises have been uncovered on each of the cruises.

2A-4 Ice and No Ice: The Canadian UNCLOS Bathymetric Mapping Program

Richard MacDougall (Canadian Hydrographic Service), Wendell Sanford and Jacob Verhoef

Since CHC2006, Canada has mapped approximately 65% of the required area in the Atlantic and 15% of Arctic area of the extended continental shelf using a combination of ship borne and through-ice methodologies. The mapping supports the 2013 Canadian submission of the outer limits of the continental shelf under Article 76 of the United Nations Convention of the Law of the Sea. Therefore, the mapping has been prioritized based on which formula will maximize the Canadian continental shelf. Data collection concentrated on capturing bathymetric data to define and the foot of the slope and the 2500-m isobath where that constraint formula will be used . Seismic surveys to determine sediment thickness have been conducted in the areas where the sediment formula will be used. In addition, refraction seismic surveys have been carried out in support of tests of appurtenance. This paper examines the surveys conducted in the different areas and the challenges posed, particularly in the Arctic where ice conditions dictate where data can or cannot be collected in any particular time frame.

Poster Session 2A 14:30-15:00 Exhibition Hall

P2A-1 Boundary Bay Boundary

Brian Ballantyne (Canada Centre for Cadastral Management)

The 49th parallel of latitude, which is nominally the Canada - United States boundary in much of western Canada, runs through Boundary Bay, between Point Roberts and Blaine. However, the Boundary Bay boundary is neither the 49th parallel of latitude, nor, indeed, is it a parallel of latitude. Owing to an 1869 Agreement between the two countries, the boundary is a geodesic line between two shore monuments some 18 km apart. This agreement has been a mixed blessing. On the one hand, it avoided the sort of arbitration required to resolve the offshore boundary west of Point Roberts, meaning that the Emperor of Germany has had little influence in Boundary Bay. On the other hand, the Agreement led to uncertainty as to the location of the boundary on the water, which led to the establishment of a series of range marks, beginning in 1929. The range marks themselves have not been without controversy, for they have played a part in crab fishing disputes, in expert witness hubris, in the demise of cormorants, and as an aid to tide gauges. The definition and demarcation of the boundary in Boundary Bay thus says much about various boundary issues: offshore sovereignty, inter-governmental cooperation vis-à-vis the International Boundary Commission, the extent of navigable waters, environmental impacts of boundary monuments and confusion between the boundary as a geodesic and the boundary as a parallel. Between 1846 and 2007 this confusion has led to the demarcation of the boundary being a function of technology, expertise, fiscal restraint and users' needs.

P2A-2 FoSMiner - An added value tool for UNCLOS article 76 implementation

Aldino Campos (EMEPC), Manuel Abreu, Fernando Pimentel and the EMEPC Task Group

The ratification of the United Nations Convention on the Law of the Sea (UNCLOS) by Portugal, on November 3rd, 1997, was the first step to engage in the largest systematic hydrographic survey operation in the Portuguese history. From this ongoing mission, a huge amount of high resolution bathymetric data has resulted. To efficiently manage these data, fully optimizing the available resources and making the process possible within the time frame constraints, incorporating the provisions described by article 76, a dedicated Spatial Data Infrastructure was established. Built on top of a commercial off-the-shelf Database Management System, with spatial capabilities (Oracle 10g Spatial), this infrastructure solves two major challenges. The first one is related to the data management, mainly to its high volume and geodetic related computations. The second relates to an appropriate methodology to extract the most positive sets of deliverables to support the Portuguese sustained submission. This paper describes the data flow process, within this infrastructure, from the data acquisition to the final analysis stages. It also presents a detailed composition of all FoSMiner modules in order to extract the desired knowledge in an automated approach.

Session 2B Cadastral innovation and technology 13:00 14:30 Salon C, Chair: Chris Chiasson (Altus Geomatics, Canada)

2B-1 Geo-Referencing Requirements of Surveys of Canada Lands

Brian Thompson (Natural Resources Canada)

The Canada Centre for Cadastral Management has recently made several changes to the general survey requirements outlined in Chapter D1 of the e-Edition, including the requirement to geo-reference some surveys. This presentation will outline the new geo-referencing standards, their required accuracies, and when they apply. It will also discuss common geo-referencing survey techniques being used to meet the standard, and how the geo-referenced surveys are being used to improve the cadastral datasets and provide benefits to the land surveyor.

2B-2 Cadastral Evolution in British Columbia

Brent Taylor (Polaris Land Surveying Inc.) and Jeff Beddoes (Senior Deputy Surveyor General of British Columbia)

Since the first settlement of British Columbia in the 1800's the legal survey profession has been conducting field surveys and representing that work on physical media. The focus of these legal surveys has been to establish or re-establish property lines relative to nearby properties. Over the past several years collective efforts by the Surveyor General and the Association of BC Land Surveyors have seen the emergence of an expanded vision of the role of the land surveyor in British Columbia. In this new vision the land surveying profession would not only conduct traditional legal surveys but they would also position those surveys in the world and represent their work in a dynamic, digital representation of the cadastre. This presentation will take the audience through the journey of moving from the world of relative positioning represented on Mylar to the added value of absolute positioning or georeferencing and digital representation of legal surveys.

2B-3 Defining boundaries using only coordinates

Brian Ballantyne (Canada Centre for Cadastral Management)

The debate between 1997 and 2002 on using coordinates to define boundaries was sponsored by CCOG and ALSA. The debate had much energy; according to the Cook Paradigm, it left some surveyors strangely calm and others horribly terrified. The analysis focused on examining the technical, social and legal implications of using coordinates - is it technically feasible, is it socially desirable, and is it legally possible? In addition, deferred monumentation and monument survival rates were examined. It is now time to revisit the analysis, in order to pose three questions:

1. Why were the recommendations that resulted from the analysis not pursued?
2. Can coordinates be used to define the boundaries of parcels being added to Indian Reserves?
3. Is there merit in using coordinates to define the boundaries of utility rights-of way, such as electrical transmission corridors?

2B-4 The LTSA and the Office of the Surveyor General

Mike Thomson (Land Title and Survey Authority of British Columbia)

A discussion paper on the creation of the Land Title and Survey Authority of BC (LTSA) and its mandate to manage operate and maintain British Columbia's land title and land survey systems. Established in 2005 under the Land Title and Survey Authority Act, the LTSA is an independent corporation committed to enhancing customer service through continuous innovation and business process improvements. The LTSA provides services to the public and professionals, lawyers, notaries public and land surveyors through offices in Kamloops, New Westminster and Victoria. The LTSA provides for the registration of all real property ownership and all private and Crown land surveys through its secure and reliable systems.

This paper will discuss the reasons for the creation of the LTSA, its formation, governance structure and major strategic objectives and the business divisions providing public service. The Land Title Division's primary function is to ensure the integrity of British Columbia's Torrens' system for registering land titles, and other interests in land such as mortgages and rights-of-way, etc. The Surveyor General Division's primary function is to maintain the quality of the land survey structure of the province.

This paper will explore the role of the Surveyor General in the LTSA, working with land surveying professionals to establish survey standards; approving legal survey plans of public and certain private lands and the protection of the cadastre. The paper will look at the new working relationships being forged by having the land title and land survey systems operated under a single umbrella. Finally the paper will explore the work of the Surveyor General Division in issuing Crown grant documents which transfer Crown land into private ownership.

Poster Session 3A 14:30-15:00 Exhibition Hall

P3A-1 Development and Assessment of Airborne Lidar Bathymetry Products for Shoreline Mapping

Lynnette Morgan (NOAA), Shachak Pe'eri and Andrew Armstrong

Accurate and consistent shoreline determinations play a major role in coastal management boundary assessment. Delineations along this dynamic margin are dependent upon the stage of tide and are demarcated by tidal datums such as Mean High Water (MHW) and Mean Lower Low Water (MLLW). This study investigates airborne lidar bathymetry (ALB) as a potential tool to support shoreline mapping. A computerized process is devised to obtain shoreline determinations from a lidar dataset processed using various algorithms that distinguish land and water. The algorithm-derived land-water interfaces are analyzed against the reference shoreline constructed from the ortho-rectified aerial imagery simultaneously collected with the ALB data. The study area includes a variety of shoreline types such as rocky, sandy, and man-made, to evaluate the performance of the various algorithms in differing environmental conditions. Examination of the results assesses the quality of the shoreline products in comparison to current shoreline methods and considers whether ALB provides a solution to problems currently associated with shoreline mapping. This evaluation includes analysis of the reliability, resolution, and uncertainty of the shoreline determinations and an assessment as to whether the land-water interfaces derived from ALB can meet charting standards.

Session 3A Mapping from land to sea - I 15:00-16:30 Theatre, Chair: Richard Sanfaçon (Canadian Hydrographic Service)

3A-1 Facing Challenges with New Techniques: Southeast Alaska to the Aleutian Islands

Jana DaSilva Lage (Fugro Pelagos), Andrew Orthmann, Robert Richards Jr., Dean Moyles and Carol Lockhart

In 2006, Fugro Pelagos Inc. (FPI) was awarded the largest single task order for contract hydrographic surveys in Alaska by the National Oceanic and Atmospheric Administration. The primary objective of these surveys was to provide data in support of nautical charting. The challenge was to survey more than 600 square nautical miles, in two areas, separated by approximately 1,100 nautical miles, during the 2007 field season. In the Aleutian Islands, the hydrographers faced tidal currents up to 9.5 knots, whirlpools, rapidly changing weather, and dense impassable kelp beds along the shoreline. The survey area along Chatham Strait in Southeast Alaska included numerous uncharted rocks, kelp, and dangers to navigation. The surveyors also faced extreme currents and tides in and around Mitchell Bay, a very complex area that was last surveyed in 1895. To successfully complete this task, FPI utilized four survey vessels operating Reson 8111, 8101, and 8125 multibeam systems and two unique operational methods. First, the multibeam system on the shoreline vessel was operated with a tilted sonar head. Additionally, a SHOALS 1000T Airborne Lidar Bathymetry system with a DuncanTech DT4000 digital camera was used to collect reconnaissance data in Mitchell Bay; this dramatically accelerated the survey schedule.

3A-2 Withdrew

3A-3 Surveying Objects - Efficiencies in Data Acquisition and Transformation

Andrew Leyzack (Canadian Hydrographic Service)

For many hydrographic offices, the introduction of electronic nautical charting has created two production streams: traditional (hardcopy) chart production and electronic (softcopy) or ENC (Electronic Nautical Chart) production. Until recently, survey technology and methodologies were designed to support the acquisition of data by providing deliverables suited to hardcopy chart production; additional data transformation including the creation of spatial objects and attributes were required to satisfy IHO standards for ENC production. Cartographic development has lead hydrographic offices to consider the use of a common digital data source for the production of both paper and electronic publications. Similarly, tools and methods have been developed which enable the hydrographic surveyor to support and expedite the process of common source chart production. This paper provides an overview of the processes and survey deliverables involved with capturing and transforming hydrographic features into spatial objects accordance with the IHO S-57 (Special Publication No. 57) standard.

3A-4 Evaluation of the Expeditionary Multibeam Kit (EMK-1) in the Coastal Zone and the Amazon Region of Peru

Elliot Arroyo-Suarez (Naval Oceanographic Office) and Jaime Valdez

The Naval Oceanographic Office (NAVOCEANO) has being working with the private sector on the integration of a small, low-cost and simple to use expeditionary multibeam kit (EMK) to be utilized by teams of Junior METOC officers embedded with expeditionary forces. The availability of the EMK to the METOC officer and coastal and riverine operators will enable the collection bathymetric measurements on patrol boats and other vessel of opportunity without much intrusion and without requiring much expertise on the gruelling task of installing and calibration a typical multibeam system. While the initial concept of operation does not necessarily requires that the system meet an IHO Order specification, this paper will describe the performance of the system on test performed in coastal zones of North America and in the riverine environment of the Amazon region.

Session 3B Future of the Survey profession 15:00-16:30 Salon C, Chair: Hugh O'Donnell (MMM Group International Inc., Canada)

3B-1 Supporting Lifelong Learning and Education of Geomatics Professionals

Steve Lam (Hong Kong Polytechnic University)

Human beings are born to be lifelong learners by having the basic need to learn how to survive, be employed and enjoy life in various forms of learning and education. This paper presents the international trends of lifelong learning for geomatics profession with discussions on:

1. the reasons, aims, forms and quality requirements of lifelong learning;
2. how to organize the learning in views of formal and non-formal education, and social/situated learning;
3. what geomatics courses are demanded by the profession and learners at large;
4. making policy work under the balanced welfare and market-oriented model.

3B-2 Licensing issues for cadastral surveying: Parochialism, cooperation & mobility

Khaleel Khan (Canada Centre for Cadastral Management), Brian Ballantyne and Peter Sullivan

Licensing land surveyors by provincial and Canada Lands survey associations is ostensibly done in the public interest, to ensure that practitioners' education, experience, skills and ethics are high. For instance, a distinction is made between the licenses required to survey on and off Canada Lands. However, such noble aims must now confront four issues. First, must a survey of well site licenses on Indian Reserves in western Canada be performed by a surveyor holding a dual commission - CLS and the relevant provincial land surveying license? Second, who can survey in the British Columbia offshore, and indeed, in Canada's offshore in general? Third, why have only 20 surveyors availed themselves of the Mutual Recognition Agreement allowing for inter-provincial mobility? Fourth, what are the implications of the Agreement on Trade, Investment and Labour Mobility (TILMA) on the autonomy of surveyors' licensing bodies, on surveyors' mobility and on the commonwealth?

3B-3 A Vision for the Future of the Surveying Profession in Canada

Sarah Cornett (Canadian Council of Land Surveyors), J. Hugh O'Donnell, James Statham and Michael O'Sullivan

Outline The status quo is not acceptable: Current demographics are a threat to the future viability of our profession. The profession has evolved into 11 different Canadian versions of the surveying profession with fewer than 3000 individual surveyors. The profession is fractured without an efficient cohesive voice to respond to the profession's key users in government, industry and the public. Lack of meaningful interaction with the broader professional community results in lost opportunities for all. There is a sense of urgency locally, nationally and globally: Issues of demographics, pressures on associations to fulfill their mandates, and volunteer burnout have been recognized and discussed at the membership and council level within the associations. These issues have been discussed nationally amongst association's level leading directly to this initiative. Several presenters at the October 2-5, 2007 international geo-conference in Quebec

City focused on the need to address future issues of the broad profession. Task force research shows that professional surveyor organizations in the European Union, New Zealand, Australia and The United States are struggling with the same issues. A strategy for change: To examine the definition of professional surveying including core competencies and potential opportunities which build on the core exclusive practice, and encourage value added and related competencies and disciplines to be recognized as part of the profession at the national level. To develop a national association of professional surveyors that is member driven, has the wellbeing of the profession as its prime purpose, does not affect the rights and responsibilities of the regulating associations, and develops a stronger, more inclusive and relevant profession in Canada. To develop national professional recognition, build a strong, cohesive, influential and broad profession of land professionals and para-professionals.

Wednesday 07 May 2008

Session 4 Vertical referencing systems / issues 08:30-10:00 Theatre, Chair: Fred Stephenson (Canadian Hydrographic Service)

4-1 Vertical Datum Issues for Continuity from the Land to the Seafloor

Christian Andreasen (National Geospatial-Intelligence Agency)

NGA is working to develop a database approach for product generation called the Geospatial Knowledge Base (GKB). One element of this is long-term development of a database to include a continuous elevation surface between topography and bathymetry. This approach faces a number of major obstacles, principally related to bathymetry. This paper discusses the obstacles: local and regional datums, difficulties of tides in the 0-200 meter depth zone, inadequacies of data processing systems and possible approaches for hydrographers to build such a database over time and reasons for doing so.

4-2 Developing a Concept of Operations for Military Surveys to IHO Standards without Shore-Based Stations

Maxim Van Norden (NAVOCEANO), Elliot Arroyo-Suarez and Rodney Ladner

The Naval Oceanographic Office (NAVOCEANO) conducts hydrographic surveys in accordance with International Hydrographic Organization (IHO) S-44 hydrographic survey standards. The new IHO draft standards for Order 1a/1b for waters shallower than 100 meters limit the Total Vertical Uncertainty (TVU) to a maximum of 0.5 meters plus a depth dependent factor. Presently, to meet this standard, shore stations must be established for collecting tide information that is used to define the local vertical chart datum and derive tidal correctors to reduce soundings to the chart datum. This current concept of operations (CONOPS) requires clearances and permissions from national/local authorities and landowners to access and establish these shore stations. It also requires substantial efforts to establish or maintain security for both shore parties and equipment left behind at the shore stations. NAVOCEANO can no longer rely on the traditional methods for conducting hydrographic surveys. The terrorism threat and nations unwilling to provide access to shore sites have severely decreased traditional NAVOCEANO hydrographic survey operations. The CONOPS under development at NAVOCEANO, which uses Real-Time Gipsy (RTG), Post-Processed Point Positioning (PPP) technology, and GPS buoys, provides a capability to conduct military surveys meeting IHO Order 1 requirements. A CONOPS is under development which uses improved survey procedures to map the seabed tied to the WGS-84/ITRF00 reference frame. Modeling and other techniques are utilized to determine the WGS-84 Ellipsoid/chart datum separation to enable production of electronic and paper chart products referenced to traditional chart datums. This paper will discuss the status of the efforts to develop the NAVOCEANO CONOPS to date.

4-3 Tightly Integrated Inertially-Aided GPS Network Positioning for Marine Hydrography

Peter Canter (Applanix Corp.), Richard Brennan and Edward Van Den Ameele

Today's positioning technique for Marine Hydrography involves integrating GPS and inertial navigation systems (INS). The Inertial Measurement Unit (IMU) aids in reducing GPS noise as well as providing high bandwidth, un-interrupted solutions during GPS outages. For high precision surveys (5 centimetres or better in x, y and Z), the most common technique is the post processed Inertially-Aided Kinematic Ambiguity Resolution (IAKAR) mechanization, which requires a reference station in the proximity of the survey area. The reference station helps to mitigate atmospheric and satellite biases and to resolve integer ambiguities. The GPS rover position must be within 20km from the reference station, otherwise the atmospheric biases degrade the accuracy of the results and this imposes significant limitations (and increased survey cost). This paper will describe the Post Processed Virtual Reference Station (PPVRS) technique which makes use of GPS network stations to determine atmospheric biases at the rover positions and tightly integrate GPS with the inertial data to provide a continuous high precision navigation solution with baselines up to 100km. A case study will be included. The expected result will be a method for Hydrographic survey with the necessary precision to eliminate the need for dedicated GPS reference stations for all of the continental U.S. inland waters and near shore areas. PPVRS will change the way Hydrographic surveys are acquired by reducing logistics and ensuring sub 5 centimetre positioning.

4-4 Atlantic Canada's Real-Time Water Level System (Observations, Predictions, Forecasts and Datums on the Web)

Phillip MacAulay (Canadian Hydrographic Service), Charles O'Reilly and Keith Thompson

As part of Canada's national initiative to revitalize its water level monitoring capacity, CHS Atlantic Region has upgraded and enhanced its water level monitoring system with: new data collection equipment, new database architecture, and a new real-time, web-based data dissemination system for use by emergency measures organizations (via the Atlantic Storm Prediction Center ASPC and Alaska Tsunami Warning Center ATWC). CHS Atlantic's new water level system now provides: up to the minute water level data from multiple sensors, constituent based predictions, local tidal datum information, and the best possible water level forecasts. Water level forecasts differ from simpler constituent based predictions in that they include the effects of weather on water levels, and they include projection into the future of persistent observed differences between water level observations and water level expectations, where expectation is defined as constituent based prediction forecast weather effects. Weather effects are included in the forecast through a daily feed from the DalCoastII operational oceanographic storm surge model running at Dalhousie University. The persistent-differences between water level observation and expectation are included through use of a Kalman filter based technique - termed spectral nudging. Persistent-difference estimates are forecast every 2 hours using an automated process developed in Matlab. The paper will provide an overview of Atlantic Region's real-time water level system. It will present and discuss its new forecasting capability, and will look towards future water level system enhancements to include anywhere, anytime on-datum water level predictions via WebTide, and the development and dissemination of seamless 2D tidal datum surfaces.

Poster Session 4 10:00-10:30 Exhibition Hall

P4-1 Updating the International Great Lakes Datum (IGLD)

Thomas Landon (NOAA, National Ocean Service) and Stephen Gill

Movement of the earth's crust due to isostatic rebound requires the revision of the datum, or elevation reference system used to define water levels within the Great Lakes-St. Lawrence River system, every 25 to 30 years. This system, one of the world's greatest fresh water resources, is shared and its resources jointly managed by the United States and Canada. The revision of IGLD requires the updating of IGLD at approximately 125 small harbors in the United States, as compared to the master control station on each of the major lakes. The revised datum is critical to the updating of NOAA's nautical charts and navigation safety, particularly during periods of low lake levels. This paper describes the many details involved in the coordinated revision of IGLD.

P4-2 Using Globally-corrected GPS solutions to assess the viability of hydrodynamic modeling in the Bay of Fundy

Ian Church (University of New Brunswick), John Hughes Clarke, Susan Haigh, Mike Lamplugh, Jon Griffin and Russell Parrott

Traditionally, hydrodynamic models are tuned to best reproduce observed tidal constituents within the model domain. Such observations are normally limited to coastlines at the edges of the model and are often in small bays cut off by constrictions that are not resolved by the model and thus may not be representative of the tides just offshore. Now that Globally-corrected GPS (GcGPS) elevations are available at decimetre-level accuracy, it is possible to test the validity of the model in open water regions through comparison of instantaneous sea level variations from vessel transits. Rather than testing at a point location, transects can be made through critical choke point areas where phase and amplitude are predicted to change very rapidly. These observations can check on the fidelity of the model in these sensitive regions. As part of regional mapping operations within the Bay of Fundy under the Geoscience for Ocean Mapping program of NRCan, five different vessels have been collecting GcGPS using either Fugro Omnistar HP or C-Nav. Results of comparisons of the long period (minute) vertical perturbations of these vessels is presented with respect to both the regional WebTide Scotian Shelf model and nested higher resolution models.

P4-3 Monitoring Changes in Mean Sea Level across the Arctic with Tide Gauges and GPS Receivers

Terese Herron (Canadian Hydrographic Service), Michael Craymer, Andrew Leyzack and Carol Robinson

The Canadian Hydrographic Service (CHS) operates a network of five permanent tide gauge stations across the Canadian Arctic co-located with Global Positioning System (GPS) receivers operated by Natural Resources Canada (NRCan). The stations are located at Nain (Labrador), Qikiqtarjuaq and Alert (Nunavut), and Ulukhaktok and Tuktoyaktuk (Northwest Territories). Water levels from the Arctic gauges provide a quantitative measure of mean sea level (MSL), a base level climate change indicator; the data will show changes in MSL over time. The GPS receivers provide data for monitoring vertical movement of the earth's crust. Combined, the two measurements enable the determination of absolute changes in Arctic sea level. The data are also used to validate storm surge models and to assess the impacts of winter surge events, flooding, and erosion on coastal property. Equally important, the CHS also uses this data to establish the relationship between MSL and chart datum, the vertical reference surface for all CHS bathymetry.

P4-4 Development of a vertical reference surface in coastal zones: A case study on the Atlantic coast

Azadeh Koohzare (McElhanney Consulting Service Ltd.)

In recent years, there has been a growing awareness of the fragile ecosystems that exist in our coastal zones and the requirement to manage special references in a more structured and sustainable manner. A major impediment is that we do not have a consistent height datum across the land/sea interface. Current practise is to reference depth data to a chart datum and land elevation to a terrestrial vertical datum. This makes it difficult to easily analyse natural events that occur across the land/sea interface, such as tsunami, sea level rise and global warming. Development of a vertical separation model will allow easier assimilation of land and maritime data resulting in seamless vertical data. This paper describes a case study in eastern coast of Canada that used tide gauge records and GPS data to define a transformation model between chart datum and height datum; or vertical surface separation. Tide gauge records in eastern coast reflect glacial isostatic submergence of the coasts, as well as other global, regional and local effects, that need to be considered. The paper presents a summary of the data analysis and the main technical problems for seamless data definition. The paper also proposes some feasible methods and procedures to define the best vertical surface separation model for coastal areas with minimum cost.

P4-5 Integrating Topographic and Hydrographic Data (Land & Water)

Mike Williams (US Army Corps of Engineers)

Data Acquisition: Being located on the Mid-Atlantic coast of the United States, our tidal range is varies from 0.9 to 5.0 feet. By taking advantage of high and low tides we can facilitate the process of integrating surveys by scheduling survey times and styles based on tide. When a survey requires data integration there are several methods we use to ensure data agreement and overlap. When performing the hydrographic survey first, we will get a target position (X, Y, Z) at the end of each hydrographic section when the boat has reached its sounding limit. This provides us points to meet with our topographic work. These targets can be input into our data collector to make certain the data is in agreement and assures coverage overlap. When performing the topographic work first, we will record the last point acquired on each section and will bring these points into HYPACK as targets. If there is enough time between surveys, we will download the entire topographic data and generate a file format compatible with our HYPACK software (such as .XYZ or .DXF). Once this format is created it can be imported into our hydrographic surveying software and viewed real-time, guaranteeing conformity and overlap. Data Analysis: When combining the data from two different sources, overlap data becomes a key quality assurance check. The comparison of vertical data in overlap areas is something that needs to be readily available and carefully monitored. If vertical and/or horizontal information does not match well, quality control procedures for both surveys would be evaluated. Differences can quickly indicate the possibility of such errors as: poor equipment calibration, improper tidal modeling, vertical datum disagreement, and blunders. NOTE: Because the vertical error budget for the acoustic hydrographic work is larger than the topographic methods, the topographical data is usually more accurate. This unfortunately does not preclude the introduction of blunders.

Session 5 Data integration and management: problems and solutions 10:30-12:00 Theatre, Chair: Jean Gagnon (Canada Centre for Cadastral Management)

5-1 An evaluation of CARIS Bathy DataBASE as a bathymetric data management solution for CHS Quebec

Jean-Guy Nistad (Centre Interdisciplinaire de développement en cartographie des océans), Karen Cove and Frédéric Lavoie

A bathymetric data management solution has been identified by the Quebec region of the Canadian Hydrographic Service (CHS) as the missing element in the transition from a file-based to a database-driven operational workflow. Responding to this need, a pilot project was initiated by the CHS Quebec Region and the Interdisciplinary Center for the Development of Ocean Mapping (CIDCO) to evaluate the solution provided by CARIS Bathy DataBASE. The pilot project's aims were to determine if Bathy DataBASE could provide efficient loading, management, extraction and distribution operations of CHS Quebec Region bathymetric data. The criteria used for the evaluation were performance, data integrity and robustness. This paper provides a description of the evaluation and identifies the considerations of integrating Bathy DataBASE into the CHS Quebec Region operational workflow. A better understanding of Bathy DataBASE's current capabilities and limits provides for a smoother system integration and better overall utilization.

5-2 Integration of Hydrographic Data Products in a Global GIS

António Calado (EMEPC), Manuel Abreu, Rogério Chumbinho, Alberto Silva and Luis de Sousa

Seafloor morphology is one of the main subjects of ocean researches. However, currently there are some obstacles to the dissemination of this information. Web based GIS could play an important role in minimizing this problem, breaking some barriers between the potential users community and the data. Web-GIS can effectively maximize the hydrographic data potential, providing a set of information exploration tools, facilitating the dissemination of many hydrographic products and, therefore, allowing users to add these products to their own georeferenced data. This study intends to explore Web-GIS as a tool to distribute hydrographic products, particularly the Portuguese offshore seafloor. The original data was collected for the Portuguese Task Group for the Extension of the Continental Shelf (EMEPC) and the generated products include not only bi-dimensional information but also some three-dimension data. The main products generated are KML files, which can be visualized in global geographic information systems such as Google Earth or NASA World Wind. Supported by Web-GIS some links to other generated objects, such as Fledermaus objects, were also created, allowing a different interaction with the data and making possible the exploration of their morphological characteristics. Keywords: GIS, KML, Google Earth, Fledermaus, seafloor, hydrographic products

5-3 Composite Source Feature File: Simplifying the Complexities of Near Shore Hydrography

Kyle Ward (NOAA) and Megan Palmer

Surveying the steep rocky shores of Alaska and the Pacific Northwest is a complex and potentially hazardous undertaking. Accurate charting of near shore features is essential for maritime safety and protection of the marine and coastal environment. The complicated process of surveying these areas has now been simplified by supplying field units with a composite (charted) source feature file produced with spatial extract transfer and load (ETL) technologies. In the past the myriad of sources for near shore feature information--including raster and electronic charts, prior hydrographic surveys, aerial and satellite derived shoreline files and LIDAR--have complicated the process of verifying or disproving these features. Analyzing and manipulating these various sources in their diverse formats into a useable format is a complex and time consuming task often completed by shipboard personnel. This paper addresses the process used to manipulate these sources into a composite source file in IHO S-57 standard exchange format prior to delivery to the field unit. This file is then easily ingested into shipboard processing and acquisition systems. Efficiencies created in data integrity and processing time will be addressed.

5-4 The National Hydro Network (NHN)

Yves Belzile (Natural Resources Canada)

The National Hydro Network (NHN) is the hydrography layer of GeoBase. RHN uses the best base data in Canada to provide a data set capable of supporting the applications of spatial network analysis. Beyond the elements that define traditional hydrography on base maps, RHN gathers data on the basis of watershed, adds a linear flow network (with flow direction), binds names to bodies of water, therefore creating the hydrographic routes and allows the blending of elements connected in the form of events in dynamic segmentation (Linear referencing System, LRS) on the network. The RHN is defined by a national standard developed in consultation with the community and formally adopted by the CCOG. The initial RHN data were available on the GeoBase website October 1, 2007 and the first national coverage will be achieved in 2008. RHN is a collaborative effort cost-shared between the federal, provincial and territorial governments. The presentation will describe the strategy for implementing the RHN, will make a statement on the situation and discuss the key challenges and next steps.

Poster Session 5 12:00-13:00 Exhibition Hall

P5-1 Adjusting the Nautical Cartography from ED50 to ETRS89 in a Database Production Environment

Aldino Campos (EMEPC), Virgilio Chim, Ana Navarro and Fernando Artilheiro

The Portuguese Cartographic Authority has recently established a new geo-referencing system to be used in Portugal based on the European Terrestrial Reference System 1989 (ETRS89). In order to establish an association with the national nautical cartographic folio series, migrating from the actual ED50 to ETRS89, several adjustment techniques were considered at the Portuguese Hydrographic Institute (IHPT). Although there are several techniques to perform this adjustment process, the present option allows computing the correction value for all cartographic vertices (such as points, lines and polygons) as well as estimates its associated uncertainty. The proposed adjustment is divided in two steps. The first one is the establishment of a geo-statistical model that represents the true differences between the transformed coordinates (from ED50 to ETRS89) and the surveyed coordinates ("pure" ETRS89). This model is refined with some more locally selected differences until the affected areas have an insignificant uncertainty value. The second step is the extraction of the ordinates that assemble a cartographic geometry on the database underling CARIS HPD (Oracle Spatial Object), the analysis of those values against the geo-statistical model and the application of the local adjustment to all coordinates that belong to a unique geometry (each coordinate has its own adjustment). This paper presents the geo-statistical technique to adjust the existent cartographic products (not only the official nautical charts), from the traditional ED50 datum to ETRS89, within an accepted error budget. It also presents the technological approach, advantages and constraints to implement this solution in the IHPT's cartographic production database.

P5-2 Reconciling Multiple Riverine Surveys in a Single Charting Product Database

David Dodd (University of Southern Mississippi)

Over the past six years, students from the Hydrographic Science program, at The University of Southern Mississippi, have conducted five bathymetric charting surveys on the Pearl River in Mississippi. The surveys were conducted over various portions of the river; which, when combined, resulted in complete coverage from the Stennis Space Center to the mouth, a distance of approximately thirty kilometers. Each of the five surveys was conducted as a final field project for that year's graduating class. Surveys were executed with minimal information from the previous years, such as project extents and lessons-learned. Each class went through the process of establishing a survey datum from water level observations for the ENC production. Thus, a lack of continuity is evident in vertical datum development and overlap in ENC extents. The current class (of 2008) combined all of the depth data and has established a single ENC (IENC) and paper chart database using information from all of the previous years. This paper looks at the processes used to combine the five years of disconnected surveys into a single product database for ENC and paper chart production. It discusses the issues arising from using different vertical datums, in a tidally influenced riverine environment, and how using a GPS based reference ellipse is used to resolve them. It also looks at how the depth surfaces, developed from each survey, were combined to create a continuous contour and depth-area dataset.

Session 6 Mapping from land to sea - II 13:00-14:30 Theatre, Chair: Dick Pickrill (Natural Resources Canada)

6-1 Merging Marine and Land Data for Coastal Area Mapping

Emily Masry (CARIS) and Andrew Hoggarth

As climate change continues to raise concerns about coastal areas, the need for accurate and useful mapping of these areas is on the rise. This rising need has highlighted the issues presented when trying to merge land and marine spatial data, as these datasets followed divergent data display standards. Disparity between data scales, symbology and vertical datum causes various data integration issues when these data sets are merged to create a representation of the coastal zone. A combination of topographic and hydrographic spatial database technologies will be used to address land and marine data integration issues through multiple representations of objects on a continuous map surface. An object based data model that incorporates both topographic and hydrographic objects will be demonstrated, and will be used to solve the disparity between these data sets. The approach presented will maintain the integrity of each specific data set and allow for easier maintenance of the map data, as geometric objects will be edited once, and all the representations associated with that object will be updated.

6-2 Integration of Multibeam Bathymetry and Lidar Surveys of the Bay of Fundy, Canada

Russell Parrott (Natural Resources Canada), Brian Todd, John Hughes Clarke, Jonathon Griffin, Bruce MacGowan, Michael Lamplugh and Timothy Webster

Canadian vessels equipped with multibeam bathymetry systems are in high demand by the Canadian Hydrographic Service (CHS) and by researchers from the Geological Survey of Canada (GSC). For several years, survey time for geological mapping was allocated in relatively small blocks of 10-20 days to provide as many applicants as possible the opportunity to collect multibeam bathymetry data. The resulting small-area surveys provided tantalizing glimpses of the wide diversity of the character of the seafloor on the Canadian continental shelf but did not provide the regional context required for a full understanding of the features discovered. In 2006, the GSC, in conjunction with CHS and several universities, commenced a three year program to map the Bay of Fundy on the east coast of Canada. The Bay of Fundy has the largest recorded tides in the world, with a maximum range of about 17 metres at the head of the bay. Tidal current velocities that exceed 4.5 metres/s in restricted narrow passages at various points in the bay could be harnessed for electrical power generation. To date about 10,000 km^2 of multibeam bathymetry have been collected in the bay. Sub-bottom profiler data were collected simultaneously to provide information on the character and thickness of the sediments on the seafloor. Large drying areas were surveyed using airborne terrestrial laser (LIDAR), providing an opportunity to generate a continuous map of the marine, intertidal and terrestrial areas. CHS will improve navigation charts and GSC will integrate information from geophysical surveys, seafloor samples, photographs and video transects to produce surficial geology and benthic habitat maps. The resulting 1:50,000 scale maps will be released as part of a new Canadian national marine map series. The presentation will focus on the status of the project after the first two years of data collection, challenges and future plans of the project with an interpretation of the most recent data.

6-3 Comparing Lidar and Acoustic Bathymetry Using Total Propagated Error (TPE) and the Combined Uncertainty and Bathymetry Estimator (CUBE) Algorithm

Carol Lockhart (Fugro Pelagos), Douglas Lockhart and Jose Martinez

In August 2007, Fugro Pelagos collected data with the SHOALS-1000T bathymetric Lidar system in Shilshole Bay, Seattle, for NOAA OCS. Data were collected at various spot spacing, altitudes, and times of day, over an area previously surveyed with an 8101 multibeam echo sounder. In addition, the area contained targets of known size, built and placed on the seafloor by Fugro Pelagos in 2004. Previously, when comparing Lidar datasets to other Lidar or acoustic datasets, the comparisons have always presumed that one control dataset is ultimately correct, with no errors. All error is attributed to the second dataset. Surface and target analysis methods have therefore been somewhat subjective. However the use of TPE takes into account the fact that each depth or elevation point is an estimate with an associated uncertainty. These uncertainties can then be used by the CUBE algorithm to build an attributed bathymetry surface: now a required standard deliverable for NOAA OCS. This paper discusses how TPE and CUBE were used for the first time to compare Lidar bathymetry and acoustic datasets. It will include a review of the difficulties in developing the process, the parameters used and the results of the analyses.

6-4 Multiple Applications of Bathymetric Lidar

James Guilford (Tenix LADS, Inc.) and Megan Palmer

This paper will examine the multiple applications of bathymetric LIDAR within one agency, NOAA, and the advantages of deriving multidisciplinary datasets from one survey source. Advancements in bathymetric LIDAR technology have allowed surveyors to examine the littoral zone in greater detail by complementing traditional bathymetric data (xyz) with topographic heights, digital imagery and bottom reflectance data. NOAA's focus for LIDAR applications has mainly centered on nautical charting, but the high demand for ancillary near shore data, along with the high cost of data acquisition in shallow water, has driven significant technological advancements. Some of the factors in compiling a quality survey dataset that can be used across multiple disciplines include project planning, exchange formats, datum, and dissemination of information. The concept of "surveying once for multiple uses" across disciplines such as shoreline mapping, habitat mapping, fisheries and inundation modeling is a challenging endeavour but ultimately the most efficient and cost effective way to survey.

Poster Session 6 14:30-15:00 Exhibition Hall

P6-1 Bridging the Land/Water Boundary Using SHOALS Bathymetric Lidar

Eric Yang (Optech, Incorporated), Michael Sitar, Wenbo Pan and Karen Francis

Efforts to extract shallow water depths from bathymetric lidar data have historically been challenging. Optech has largely overcome this challenge for its Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) bathymeter by developing an algorithm to extract bottom surface returns in areas less than 1.5m deep, creating seamless datasets at the land/water interface.

The Optech SHOALS solution has proven to be an efficient means of providing depth information ranging from approximately 1.5 meters to 50 meters in clear water. However, the traditional depth extraction algorithm has limitations in very shallow water and/or turbid areas where lidar signals from the water surface and water bottom merge. Such limitations inhibit seamless lidar sounding at the land-water boundary and restrict a much broader application of laser bathymeters in inland environments as well as very shallow coastlines.

Historically, various approaches have been attempted towards recovering lidar points within the very shallow water region, but with limited success. However, over the past two years very promising advances in shallow water algorithms have been made, demonstrating the depth-sounding capability of airborne lidar bathymeters in extremely shallow water as well as a seamless lidar depth solution across the land-water boundary.

A case study is presented using data collected around the Gulf of St. Lawrence in Quebec, Canada, where bathymetric lidar measurements were obtained in shallow river channels and marsh environments. A review of the capabilities of SHOALS bathymetric lidar system in inland water environment will be presented. Particularly, the challenges of delineation of complex land/water boundaries and depth extraction in extremely shallow water will be discussed.

Session 7 Data for New/Emerging clients 15:00-16:30 Theatre, Chair: Gerd Glang (National Oceanic and Atmospheric Administration, USA)

7-1 Human Vulnerability and Climate Change: An assessment of Greater Vancouver's human vulnerability to sea level rise in 2100

Emily Nixon (Ministry of Health, BC)

Human vulnerability to climate change is a growing concern on a global scale. This dissertation analyzes and assesses human vulnerability to sea level rise in Greater Vancouver, Canada for the year 2100. In order to understand this area of study, this dissertation works through four objectives. Firstly, a conceptual framework is created to assess human vulnerability. Secondly, modeled projections of sea level rise in 2100 from the Intergovernmental Panel on Climate Change Fourth Assessment Report and Overpeck and Otto-Bliesner (2006) are used to represent best case, worst case and catastrophic case scenarios. Thirdly, GIS mapping techniques are used to visually represent levels of vulnerability and sea level rise for the communities of Greater Vancouver. Finally, based on the above findings, recommendations for the future planning of communities through policy and mitigation are provided. Also addressed, are the limitations, potential criticisms and challenges associated with this research. Finally, the future objectives of this project are identified, with the hope that this research will be further developed. Continued work on this project is underway to review its applications in assessing human vulnerability to earthquake sensitivities. This portion of the research should be completed in early January, 2008 and will complement the research already completed to this date.

7-2 An Introspective Approach to Enabling Discovery, Understanding and Appropriate Use of NOAA Hydrographic Data for New and Emerging Clients

Jeremy McHugh (NOAA), Dan Neumann, John Tucker and James Hiebert

Hydrographic survey data is acquired at great expense and can be extremely valuable for uses beyond nautical charting. The gateway to the widest and best use of that valuable data is hinged on the quality of and accessibility to its metadata. The standard metadata document for the National Oceanic and Atmospheric Administration's (NOAA's) hydrographic surveys is and has been a narrative style report to accompany each survey. NOAA is developing an efficient way to create a new generation of XML-based reports to attain consistently higher quality and increased utility of the reports and to more easily meet our internal and external metadata requirements. NOAA has taken a fresh look at the content requirements for the reports and has encoded our internally required metadata into XML schemas. Schemas for external metadata are in development. The ultimate goal is to have our internal schemas included in a superset of metadata that will be compliant with International Standards Organization's 19139 Technical Specification and the Federal Geographic Data Committee's Content Standard for Digital Geospatial Metadata. This paper will focus on the development of XML schemas that will hold NOAA's internally required metadata and the development of the software interface used to populate those schemas.

7-3 The Complexities in the Design and Definitions of the North West Atlantic Data Set: Searching for Rational Architecture to implement Diverse Bathymetric Data

Herman Varma (Canadian Hydrographic Service), Gerard Costello, Ron MacNab, Tobias Spears and Christine Delbridge

A modern bathymetric database needs to be able to accommodate many different flavours of bathymetric data into a consistent, accurate and intelligible whole. In some cases the data is a collection of depth measurements that are assembled with full knowledge of the horizontal location and sampling time of each data point. This data has to be stored in a manner that accounts for the different nature of the collection mechanisms without overloading the storage capacity of the organization. In other cases the bathymetric data is a gridded data set where the temporal information is lost and uncertainty is introduced due to the gridding process; the original collected data points are no longer recoverable. The purpose of this paper is to showcase a statistical architecture that harmonizes the two scenarios called the VCH format specification, designed and developed by Canadian Hydrographic Service, Department of Fisheries and Oceans and Natural Resources Canada, Atlantic Region. This data set spans North Atlantic bathymetric data from 1758 to 2006 including Digitized Field Sheets, Single beam, Multibeam, Lidar and Gridded data all within the same VCH format specification. The VCH architecture allows for variable data densities to satisfy storage restrictions while maintaining source resolution and statistics. A system for internet delivery is being created that includes automated query tools and real time statistical aggregation that will generate proper statistics on the extracted data based on the defined scale of extraction.

7-4 Marine Geospatial Data Infrastructures: Workflows and Standards

Emily Masry (CARIS)

This paper will discuss some of the workflows required in establishing a Marine Geospatial Data Infrastructure (MGDI) that handles hydrographic information and facilitates its integration into a National Spatial Data Infrastructure (NSDI). It will describe how existing data needs to be easily discovered to allow hydrographic survey missions to be planned and executed effectively. It will discuss how data collected in the field finds its way back to the agency responsible for its storage and subsequent discovery. This marine information will be housed in a single interoperable database, which different geospatial applications or clients can connect to. The paper will describe how the data in the central database can be accessed through thick desktop clients for quality control purposes, via industry standard formats like IHO S-57 and Bathymetric Attributed Grid (BAG), or via thin web clients for to browse and download data utilizing Open Geospatial Consortium, Inc.® formats like WMS and WFS. All the data entered into the MGDI will have metadata associated with it to aid easy discovery; the ISO 19115 standard will form the basis but it has been recognized that it does not go far enough for Marine data. This paper will discuss some possible extensions to 19115. Both the metadata capture and subsequent data discovery within the MGDI will take place through a single portal. The portal will utilize the latest web mapping and catalogue technology. Finally, the paper will introduce the concept of a workflow management system as a means for stakeholders to interact with the MGDI and to ensure ongoing quality, consistency and completeness of the marine data flow.

Thursday 08 May 2008

Session 8 Applications of surveying and mapping to other disciplines 08:30-10:00 Theatre, Chair: John Anderson (Fisheries and Oceans Canada)

8-1 Habitat Mapping of British Columbia with acoustic seabed classification

James Galloway (Canadian Hydrographic Service), James Parks and Ralph Loschiavo

The Canadian Hydrographic Service (CHS) is systematically mapping bathymetry along the BC coast. The multibeam systems used to measure this high resolution bathymetry also record acoustic backscatter in each of many beams. This backscatter can be classified using commercial software tools to ultimately map detailed seafloor geomorphology. Essentially, CHS bathymetric survey platforms become vessels of opportunity for habitat mapping programs. Acoustic backscatter responds to habitat structure in the benthic area because it is sensitive to variations in geologic and biotic components on (and in) the seafloor. The resulting benthic habitat model is one vital component of the complete ecosystem picture, crucial to modern habitat management philosophy. Classified backscatter by itself is not a useful metric but, once calibrated by sediment or demersal population samples, a habitat picture evolves. However, there are scaling and other issues which impact the accuracy with which the acoustic diversity can be used to represent the ecosystem. CHS applies sediment grab samples, concurrent seafloor video and high resolution bathymetry to validate acoustic classes. Georgia Basin is the current focus of this habitat mapping program and four areas corresponding to CHS charts are nearing completion.

8-2 Inter-calibrating multi-source, multi-platform backscatter data sets to assist in compiling regional sediment type maps: Bay of Fundy

John Hughes Clarke (University of New Brunswick), Kashka Iwanowska, Russell Parrott, Garrett Duffy, Mike Lamplugh and Jon Griffin

The Bay of Fundy has seen ongoing multibeam mapping since 1992 as part of a series of local projects, and most recently in a major regional program in the last 2 years. The data compilation sensors include EM1000, EM3000, EM1002, EM3002, EM710 with centre frequencies ranging from 70 to 300 kHz. All data is acquired through the Kongsberg standard backscatter data reduction process that is supposed to generate estimates of seabed backscatter strength, ideally an inherent property of the seafloor. To achieve this data reduction, assumptions are required about absolute source level, pulse length, absolute and time varying receiver gains, seawater attenuation coefficients and sonar transmission and reception sensitivities. Because of uncertainty in all of these, the standard output value is effectively a relative measure. As a result inter-survey consistency is poor. A method is therefore required to pick an arbitrary reference (sonar hardware and software configuration) and adjust every other survey, through overlapping coverage, to that reference. For each configuration, specific adjustments need to be made to both absolute levels, variations by angle, by pulse length settings and correcting for applied attenuation coefficients. Once all these correction have been made, a second set of adjustments needs to account for the spatially variable shape of the inherent seabed angular response curves.

8-3 Application of multibeam bathymetry to geological mapping

John Shaw (Natural Resources Canada)

Multibeam bathymetry data have been used by researchers at the Geological Survey of Canada (Atlantic) since the mid-1990s. The data have been applied to a range of research questions, including the history of sea-level change, glacial history, human impacts on the sea floor, and studies of benthic habitat. After an initial period during which images derived from multibeam data appeared as posters, or in science papers, researchers developed a new approach to making maps. The standard 1:50,000 A-Series maps derived from multibeam bathymetry are:

1) Sun-illuminated seafloor topography;
2) Backscatter Strength; and
3) Surficial Geology.

Examples of these maps from various parts of Atlantic Canada will be shown. The approaches to extracting and displaying backscatter and to making the surficial geology maps will be examined. A new type of map is also being explored by the Geological Survey of Canada: the Seascape map. The units in this map are defined as mapable entities with specific attributes of morphology, sediment texture, and biota. This type of map may serve as a bridge between the surficial geology approach and the requirements for management of benthic habitats.

8-4 SHOALS3000 Surveying above Dense Fields of Aquatic Vegetation – Quantifying and Identifying Bottom Tracking Issues

Pim Kuus (University of New Brunswick), John Hughes Clarke and Steve Brucker

When a survey area is populated with biological growth such as kelp and sea grass, the range performance of lidar is challenged. Aquatic vegetation can lead to bottom miss-tracking or even absence of the optical signal return. The former results in shoal biased soundings; the latter results in data gaps. This last result is especially concerning; implying that marine life covered navigational hazards might appear as data gaps, while these are commonly assumed to be caused by lidar extinction depths. With ground truthing data (e.g. underwater photography, acoustics) vegetation presence or tracking of mid-water vegetation can be identified, although these datasets are commonly not available during a lidar survey. Incorporating characterized SHOALS3000 green laser waveform data yields a method to validate lidar soundings. This paper presents an assessment of the SHOALS3000 lidar bottom tracking performance in submerged vegetated areas, and a method to identify improper bottom tracking.

Poster Session 8 10:00-10:30 Exhibition Hall

P8-1 A Qualitative Assessment of Two Multibeam Echosounder (MBES) Backscatter Analysis Techniques

Lorraine Robidoux (NOAA), Luciano Fonseca and Glenda Rathwell

Seafloor characterization, the description and identification of the physical properties of the seafloor, is an essential component of a number of important marine fields, including fisheries habitat management, coral reef management and marine geology studies. Typical seafloor classification methods use a combination of ground-truth and acoustic multibeam echosounder (MBES) or side scan sonar (SSS) data. A variety of techniques that analyze the backscatter data from MBES systems for seafloor classifications have been proposed recently. Two of the leading techniques, the Angular Range Analysis (ARA) approach developed at the University of New Hampshire's (UNH) Center for Coastal and Ocean Mapping (CCOM), and statistical parameterization of backscatter amplitudes from Quester Tangent Corporation's (QTC) MultiView operate on fundamentally different premises. This paper evaluates the two methods for their effectiveness in classifying the seafloor and compares them, identifying the strengths and weaknesses of each technique. The results indicate that both techniques are successful in delineating prominent differences in seafloor types and that there is general agreement of both with the ground-truth data. Subtle differences between the two techniques were observed in regions with large slopes and in transition zones.

P8-2 Inner continental shelf mapping and submerged archaeological landscape investigation: collaborative site investigations from Newfoundland and Ireland

Kieran Westley (Memorial University, Newfoundland), Rory Quinn and Trevor Bell

Rising global sea-levels since the last Ice Age have inundated continental shelves around the world, and in doing so, the archaeological sites that were situated on them. Locating this submerged record is a complex exercise hindered by water depth, visibility and, in many cases, erosion and burial of the formerly exposed landscape. Current approaches therefore focus on predicting site locations on the basis of past human preference and local preservation conditions as a means of identifying areas of high archaeological potential. This in turn requires knowledge of the past landscape which has to be generated from seabed (e.g. multibeam sonar) and sub-seabed (e.g. cores and sub-bottom profiles) mapping surveys. This paper will present work currently being undertaken in Newfoundland and Ireland to reconstruct submerged archaeological landscapes. The initial stages in this approach combine palaeo-shoreline predictions from geophysical models with geological and geomorphological information derived from marine mapping surveys. This will identify buried and exposed features relating to the past landscape which can subsequently be targeted for archaeological investigation.

P8-3 Acoustic Seabed Classification of Seabed Habitats using an Autonomous Underwater Vehicle

John Anderson (Fisheries and Oceans Canada), Ron Lewis, Christopher Lang, Sara Adams and Neil Ollerhead

Acoustic seabed classification (ASC) is a remote sensing technique capable of mapping habitats from fine spatial scales to mega scales over a wide range of water depths. ASC typically involves data collected from surface mounted transducers where sampling range and area of the seabed ensonified varies with water depth. For example, the degree of spatial overlap of individual pings for a normal incidence transducer in standard survey mode (e.g. 10° beam angle, 2.6 metres/s, 1 pulse/s) is 0% for sampling range < 30 metres increasing to 6% at 100 metres and 15% at 200 metres. Theoretically holding the sampling range constant should improve our ability to interpret acoustic backscatter when a wide range of water depths are surveyed. Here we examine the effect of a constant sampling range on ASC using an autonomous underwater vehicle (AUV) in the coastal waters of Newfoundland. Water depths ranged from approximately 20 metres to 200 metres in the study area. The AUV was flown at a constant depth of 5 metres compared to a constant sample range of 50 metres. A comparison of unsupervised classifications of the seabed based on these different survey modes will be presented.

Session 9 Safe and accessible transportation corridors 10:30-12:00 Theatre, Chair: Rick Bryant (British Columbia Chamber of Shipping, Canada)

9-1 Northern Labrador Inshore Route Survey

Michael Lamplugh (Canadian Hydrographic Service)

Last year, (2007) was to be the final year of a three year program to survey the very rugged and shoal infested coastline between Cape Mugford and Cape Chidley. This was the last piece needed to complete the inshore route along the entire Labrador Coast. If we were successful a vessel could now transit the entire length of the Labrador within surveyed waters and always have a "harbour of refuge" close by if required. The northern half of inshore Labrador is one of the most dangerous stretches of coastline on the east coast of Canada. It has been a goal of the Atlantic Region of the Canadian Hydrographic Service since the 1970s to have this route surveyed to modern standards.

The CCGS Matthew is primarily a hydrographic vessel which carries two hydrographic launches. The 2007 field season was a significant one for the Matthew survey platform, as this was the first time the second launch (Pipit) was also equipped with multibeam capability (Kongsberg EM3002). The additional multibeam (Plover was already so equipped) greatly increased the efficiency of inshore survey operations. The Matthew itself utilizes the high resolution Kongsberg EM710 multibeam system. Without this additional survey capacity we would not have been able to complete the route survey in 2007.

This presentation will be a combination of the journey taken by CHS to upgrade the Matthew to have these capabilities (we started in 2003) and some of the very scenic wildlife and fiords we encountered in this quest.

9-2 Use of Portable Piloting Units by Maritime Pilots

Lee Alexander (University of New Hampshire)

On the St. Lawrence River there is a federal government initiative to improve navigation safety through the use of onboard electronic chart-related equipment and services. In particular, maritime pilots are to be equipped Portable Piloting Units (PPUs). A PPU is computer-based system that a pilot brings onboard for decision-support when navigating in confined waters. In order to make informed decisions regarding the acquisition and use of PPUs in the St. Lawrence River pilotage system, the Laurentian Pilotage Authority commissioned a study to determine what other pilotage organizations use as PPUs. The study included computer hardware, ECS software, electronic chart data, internet access, and interfaces to other navigation-related sensors/systems (e.g., GPS/DGPS, AIS, and VTS). Other topics included financial and ownership options, legal and regulatory considerations, and training/operational requirements. Study results indicate that there is no one "fits-all" PPU. Instead, consensus we found pertains more to the process of how pilots choose or design a system -- rather than the system itself. Based on the pilots we interviewed, in Europe and North America, Maritime Pilots clearly know what information is needed and available, as well as how to obtain and use it in a PPU.

9-3 Shifting Vessel Routing Measures to Protect North Atlantic Right Whales

Paul Turner (NOAA) and Joseph Robinson

In 2007 shipping lanes were shifted and new recommended routes established in an effort to reduce potential vessel strikes of the endangered North Atlantic Right Whales. Various offices within the National Oceanic and Atmospheric Administration (NOAA), the U.S. Coast Guard, and several other Federal and Non-Federal Agencies worked closely together to shift the existing shipping routes in Cape Cod Bay, approaches to Boston, Massachusetts, and critical areas along the U.S. southeast coast. Studies were conducted to determine alternate routing measures for reducing vessel strikes while minimizing the impact to the maritime commerce in the area. As a result, this project provided a compromise between commercial needs and the importance of marine conservation. This paper will further discuss the complexities involved with the planning, initiating, and charting of the shipping lane alterations.

9-4 Mapping Canada's Arctic Seabed: Collaborative Survey Processing and Distribution Strategies

Jonathan Beaudoin (University of New Brunswick), John Hughes Clarke, Jason Bartlett, Steve Blasco and Robbie Bennett

There has been recent renewed political interest in mapping Canada's north, for example the October 2007 throne speech to Parliament stated that "As part of asserting sovereignty in the Arctic, our Government will complete comprehensive mapping of Canada's Arctic seabed. Never before has this part of Canada's ocean floor been fully mapped." The Canadian Hydrographic Service, the Geological Survey of Canada and the ArcticNet NCE program have been mapping in the Arctic for many years and have amassed considerable amounts of data. Current clients require this data for all of navigation, engineering, natural resources and benthic habitat applications. Thus, products beyond "least depths", including geomorphology, surficial backscatter and shallow sub-bottom data, need to be processed and distributed simultaneously. Regarding future mapping efforts, there is a need to collate existing data sets and to make them available to the various parties that will be involved. This will facilitate their task by helping (1) to avoid redundant data collection and (2) to prioritize areas which should be remapped (e.g. due to low resolution or accuracy). Through its involvement in ArcticNet, the OMG has developed an expandable data distribution model that allows for web-based perusal and retrieval of the ArcticNet data set. As the model was developed to serve the various needs of the many parties involved with ArcticNet, the ideas are adaptable to serving the various agencies that will be tasked with mapping Canada's Arctic seabed.

Poster Session 9 12:00-13:00 Exhibition Hall

P9-1 Port environmental services for ships: A comparative analysis between Canada and Panama

AnaJulia Carreira (Carreira Pitti P. C. attorneys at law)

The current demand for port services is growing as the international traffic in goods carried by ships continues to increase exponentially, placing a demand on ports to increase their capacity. Hence, the dilemma of the ports is how to meet environmental standards and at the same time maintain the competitiveness of the services that they provide. Higher port environmental standards will involve economic, market, and social implications for both countries analyzed in this study, Panama and Canada. Port environmental management strategies have been mainly promoted internationally through soft law instruments, which although not legally binding, provide useful guidelines to ports on how to efficiently implement environmental management strategies. Subsequently, the characteristics of an efficient port environmental management strategy have been analyzed and attention has equally been given to the current regulatory framework within which the Canadian and Panamanian ports operate. Port environmental services should be considered an integral part of those environmental management strategies. The concept of port environmental services for ships is defined as the marine pollution control mechanisms that are expected to be implemented, consistent with international conventions and internal policies, laws and regulations, to assist the vessels in order to achieve marine pollution avoidance. Port environmental services for ships involve the implementation of marine pollution mechanisms or strategies that have been tested and implemented worldwide, intended to contribute to control the environmental concerns associated with the shipping industry. The concept of port environmental services for ships is intrinsically related to the provision of adequate waste reception facilities.

P9-2 Meeting New Navigational Needs - Modernization of Charts on the BC North Coast

David Prince (Canadian Hydrographic Service)

For over a century mariners have relied on the traditional paper chart to plot their course safely along Canada's rugged shoreline. These charts were the result of very labour intensive surveys, many with lead lines and some with single beam echo sounders positioned with sextant angles. The charts that were built from these surveys were often hand drawn and their accuracy was only as good as the original surveys.

These charts were adequate for what was then the commercial ships of the day. But as Canada's economy has evolved, so has the nature of shipping on the BC coast. Today, the Inside Passage and the channels to Kitimat see cruise ships, passenger ferries, bulk and aggregate carriers, liquid natural gas tankers, tugs and tow, fishing vessels, and proposed very large crude carriers. Due to this changing type of traffic and the need for more detailed and accurate navigational charts, the Canadian Hydrographic Service is being responsive to client needs and is modernizing the surveys and charts in this area. Towards this goal, the CHS did extensive client analysis, to ensure there was a clear understanding of what they required for safe navigation in terms of charting. Once the overall chart scheme was defined, a careful review of the CHS bathymetry was undertaken and areas in need of better scale surveys were determined. Detailed planning then occurred to survey in the correct order to meet the charting production schedules. The CHS will release 5 new charts per year until all 23 new charts are produced. To date, the CHS is on target with releasing the first 5 new charts (paper and ENCs) by March 31, 2008. This poster session will review this entire process of improving charting along these corridor routes.

Session 10 Hardware and software technology advances 13:00-14:30 Theatre, Chair: Lindsay Gee (IVS-3D, USA)

10-1 NOAA's Phase Differencing Bathymetric Sonar Evaluation and Integration Effort for Hydrographic Survey

Steve Brodet (NOAA), Michael Annis, Richard Brennan, Caleb Gostnell, Olivia Hauser and Jake Yoos

NOAA's Office of Coast Survey (OCS) began an effort in 2004 to test and evaluate Phase Differencing Bathymetric Sonar (PDBS), also known as interferometric sonar, as a tool to increase data collection efficiency in shallow water (i.e. <20m) and safety for near-shore areas while maintaining nautical charting data quality specifications. PDBS holds promise as a cost-effective method to simultaneously acquire side-scan imagery and bathymetry at increased swath widths in shallow water when compared with traditional single-head shallow-water multibeam. This paper will discuss the activities and results of NOAA's transition project to date focusing on comparing the data acquired with three different phase differencing systems, bathymetric validation over a common reference surface, and describe the plans for operational implementation.

10-2 HISAS 1030 - High resolution interferometric synthetic aperture sonar

Terje Fossum (Kongsberg Maritime AS), Torstein Sæbø, Bjørnar Langli, Hayden Callow and Roy Hansen

Multibeam echo-sounders (MBE) and sidescan sonar's (SSS) have until quite recently been the leading technology for detailed imaging and mapping of the seafloor. Synthetic aperture sonar's (SAS) have the potential for high area coverage rates (typically 2km²/h) and very high, range independent resolution (typically 2 - 5cm) out to a few hundred metres. Synthetic aperture sonar's were initially developed for demanding military applications such as mine detection and classification. In the next few years, as synthetic aperture sonar's become more widely available, such sonar's will also find use in the civilian market and be a valuable supplement to, and in some cases a replacement for existing technology. Kongsberg Maritime (KM) and the Norwegian Defence Research Establishment (FFI) have developed a high resolution synthetic aperture sonar with bathymetric capabilities primarily designed for use onboard autonomous underwater vehicles. The new sonar is named the HISAS1030 and is installed onboard KM's AUV, the HUGIN1000. HISAS1030 is capable of providing detailed images with a resolution better than 5x5cm out to a range of 200m, and being an interferometric system also make it possible to generate bathymetric data with a resolution better than 50x50cm out to full range. This paper gives a description of the basic principles of SAS imaging and mapping and a presentation of the HISAS1030 system together with results from field trials using the system.

10-3 Automated Side-Scan Target Detection: New Tools for Hydrography

Rebecca Quintal (SAIC) and John Shannon Byrne

Science Applications International Corporation (SAIC) is undertaking a research and development effort to automate side-scan sonar target detection for hydrographic surveys. While recent developments in bathymetric data processing have allowed for a decrease in the labor required to process data, many hydrographic surveys acquire side-scan sonar data as well. Hydrographic data processing techniques for side-scan sonar data have not seen the same level of technology improvements as have occurred for bathymetry data. To date, processing side-scan data has been almost exclusively manual, time consuming, and prone to missed targets. This article presents the progress SAIC has made in developing the automatic detection algorithms and directions moving forward to utilize this technology not only on hydrographic surveys but for search and locate and port security.

10-4 An Algorithm for Estimating the Sound Speed Component of Total Depth Uncertainty

Gretchen Imahori (NOAA) and James Hiebert

Estimating the sound speed component of the total propagated uncertainty (TPU) of multibeam echosounder depth involves the uncertainties in the sensor's measurements and in the calculation of sound speed (if appropriate) as well as in the spatial and temporal environmental variability of the survey area. Hydrographers using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm are required to estimate the sound speed component of the TPU such that the algorithm can determine the true depth with its associated uncertainty. Up until now a concise methodology for estimating this has been non existent. In this paper we will outline the motivation which led to this work, discuss the new algorithm and corresponding implementation which can be used to estimate the sound speed component of the TPU, and provide a discussion of the field testing and validation of the algorithm and implementation. Finally, we will discuss the field application of this new algorithm and how it is affecting the future direction on sound speed research.

Poster Session 10 14:30-15:00 Exhibition Hall

P10-1 Gavia AUV System Performs Under Ice Mapping

Chris Roper (Roper Resources Ltd.)

In April 2007 a man-portable Gavia underwater vehicle was deployed to perform high-resolution bathymetric surveys of the underside of the Arctic ice cap at the SEDNA ice camp in the Beaufort Sea. Deployment and recovery was through a single hole in the steadily drifting ice cap. The vehicle was flown inverted for optimum use of its normally down-facing payload sensors, which included the GeoSwath 500 swath bathymetry sonar providing co-registered high-resolution swath bathymetry and side-scan sonar imagery and a high-frame rate digital camera simultaneously providing a continuous photographic survey. Navigation was by an inertial navigation system aided by Doppler Velocity log tracking the underside of the steadily drifting ice sheet, thereby referring both vehicle navigation and scientific data to the moving ice cap. The resulting data provided a uniquely detailed rendering of the underside of Arctic pressure ridges that determine navigability of the future Arctic seaways as the ice cap becomes thinner by global warming.

P10-2 Autonomous Underwater Vehicles (AUVs) as Hydrographic Survey Tools: NOAA's AUV Research to Operations Transition Project

Rob Downs (NOAA), Steve Brodet and Michael Annis

NOAA's Office of Coast Survey (OCS) and Office of Marine and Aviation Operations (OMAO) initiated a partnership in 2004 to test, evaluate, and transition Autonomous Underwater Vehicles (AUVs) into NOAA's operational survey fleet. The objectives of the project are to build technical expertise, define functional and technical requirements, and develop standard operating procedures. NOAA has made significant progress towards meeting those objectives while pushing the use of AUVs towards true autonomy and exploring other uses, including incident response and unexploded ordnance surveys. This paper will discuss the activities and results of NOAA's transition project to date and describe the upcoming milestones and plans for operational implementation.

P10-3 Experiences with HydroCap: Production Using the Semi-Automated Field Sheet Character Recognition Software.

Andrew Smith (Canadian Hydrographic Service)

HydroCap® is vectorization software made by the Norwegian Company ProCaptura AS, tailor-made for facilitating the digitization of Hydrographic field sheets. This poster will attempt to outline the workflow, issues, experiences and conclusions which have been distilled from months of hands-on work with HydroCap. There will be an emphasis on the interesting and unique Quality Control tools that are incorporated into this software. This poster is geared to one of the major conference themes – that of Hardware and Software Technology Advances.

The hydrographic services of many countries including Canada have large numbers of purely raster and hard-copy (analogue) field sheets. The data presented on most historical field sheets are still relevant, and it is extremely expensive to collect or replace field data. Modern methods of digitizing Field Sheets require table digitizing, with generally equal amounts of Quality Control (QC) to ensure accurate digitizing. The HydroCap software permits the incorporation of QC measures into the digitizing and classification process, essentially cutting the QC in half. The digitization process is quite different from manual digitizing and resists direct comparison.

The poster presentation will detail the various steps in the semi-automated production process: scanning; importation into HydroCap; segmentation; digitization; classification; clustering and final QC. The Field Sheet is virtually complete at this point, with some further final QC steps to be taken prior to export of the data, which can then be imported into a variety of GIS software packages. The poster will attempt to detail the foregoing with annotation and graphics, and then conclude with a discussion as to the effectiveness of the software.

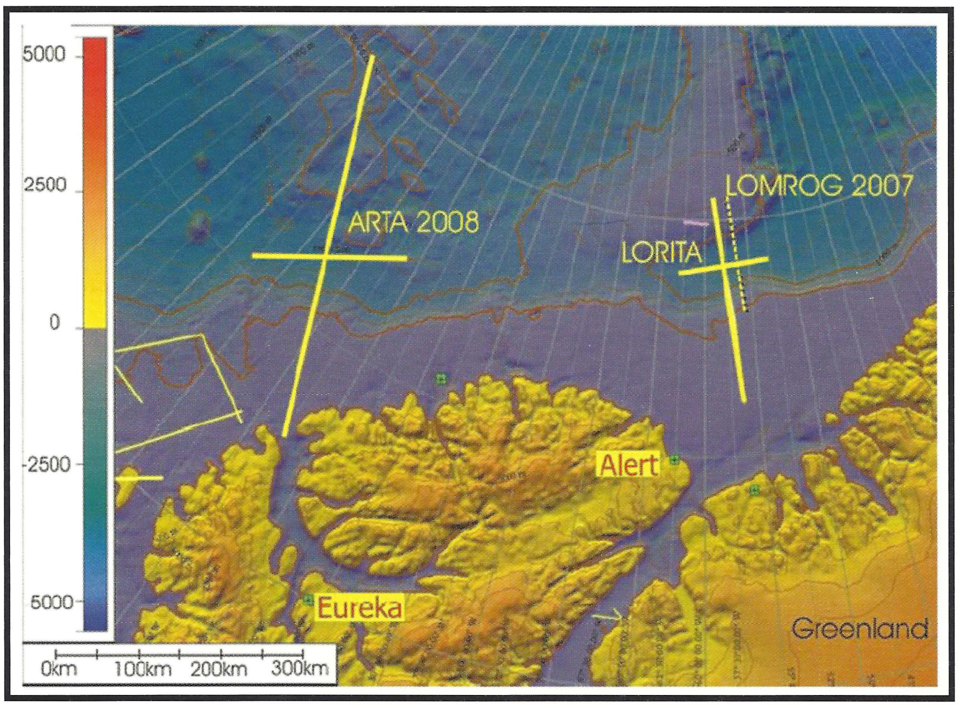
NOTES:

UNCLOS Update - Winter and Spring Field Season In The Far North

By: Richard MacDougall, Director, Law of the Sea Project, Canadian Hydrographic Service
Photos Courtesy of Ron Verrall, Geological Survey of Canada

The Canadian Hydrographic Service (CHS) and the Geological Survey of Canada (GSC) are conducting a joint bathymetric, gravity and seismic survey on the Arctic Ocean north of Ellesmere Island in winter 2008 to collect data for Canada's submission to the United Nations of the outer limits of the continental shelf. Named the Alpha Ridge Test of Appurtenance (ARTA) project, the primary objective is a deep seismic line between Ellesmere Island and Alpha Ridge with an aim of determining the structure of the seabed down to 30-40Km below the seabed. Each 200Km long line segment is being done by placing 115 seismic instruments on the ice, each 1.5-2Km apart and using 11 explosive charges spaced 20Km apart as sound sources. In parallel, CHS is measuring the depth at the site of each seismic instrument and is surveying bathymetric profiles roughly 50NM apart to determine foot of slope and where applicable, the 2500m depth contour. The seismic program is led by Ruth Jackson, GSC, while the bathymetric program is led by Jon Biggar, CHS.

The survey is staged out of Eureka with a main camp near the mouth of Nansen Sound and a satellite camp 155Km offshore near the seismic cross line. The weather has been particularly cold (-50°C), which impacts camp construction. Many things with moving parts do not move - but cold weather also brings clear weather and good flying conditions. Establishing a runway for a larger aircraft on wheels has been a challenge. Unfortunately the DC-3 on skis that was to bring in the Bobcat to make the runway crashed in Antarctica in December which led to Plan B: involving much manual labour, rented smaller equipment, and a shorter runway. The camp materials and fuel have been brought in by small aircraft. All was operational by early April thanks to a small air force consisting of 5 helicopters, several Twin Otters and a Skyvan ferrying fuel. The logistics of establishing and operating a large camp (25 people) on the Arctic consumes as much energy as the scientific programs. The following photos depict activities on the survey. LH



Map above shows the area of interest - the LORITA 2006 project covered the area known as the Lomonosov Ridge - The ARTA 2008 project covers the Alpha Ridge. The distances covered by the projects is evident by the scale at the bottom of the map. The big inlet running north of Eureka is called Nansen Sound and the ice camp is located just east of the mouth of the Sound - approximately 10km off-shore.

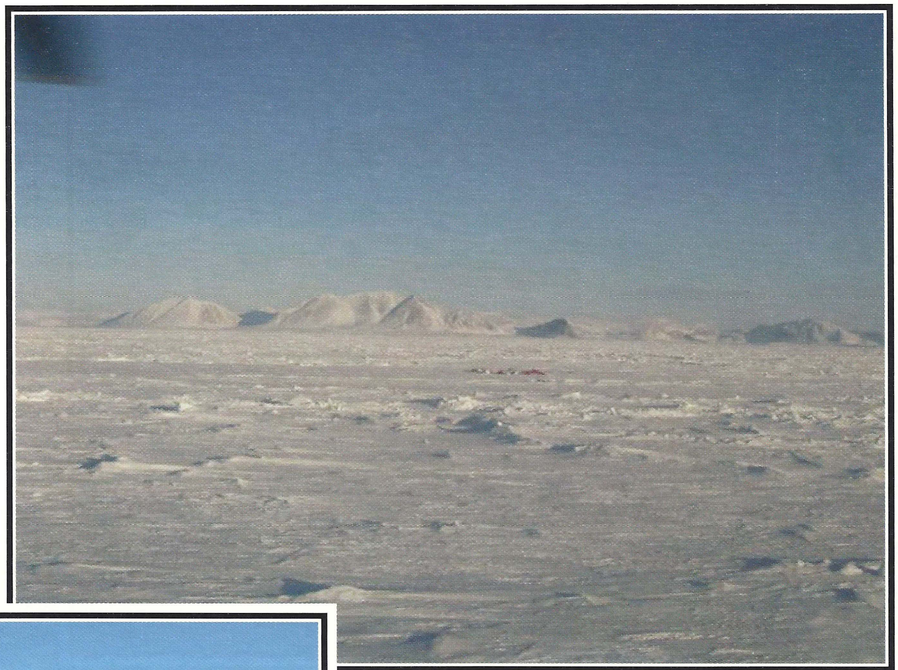
The framework for the last of the tents is being set up on a relatively warm and sunny -25°C morning. Though there is no wind the guys are still bundled up in their parkas, attesting to the fact that it is still cold. It is much better than the -50°C temperatures experienced when they first arrived.

Aerial view of the 'Hydrographic Camp'. This is home for the hydrographers, seismic workers, technians, helicopter crew and, most importantly, the cooks.

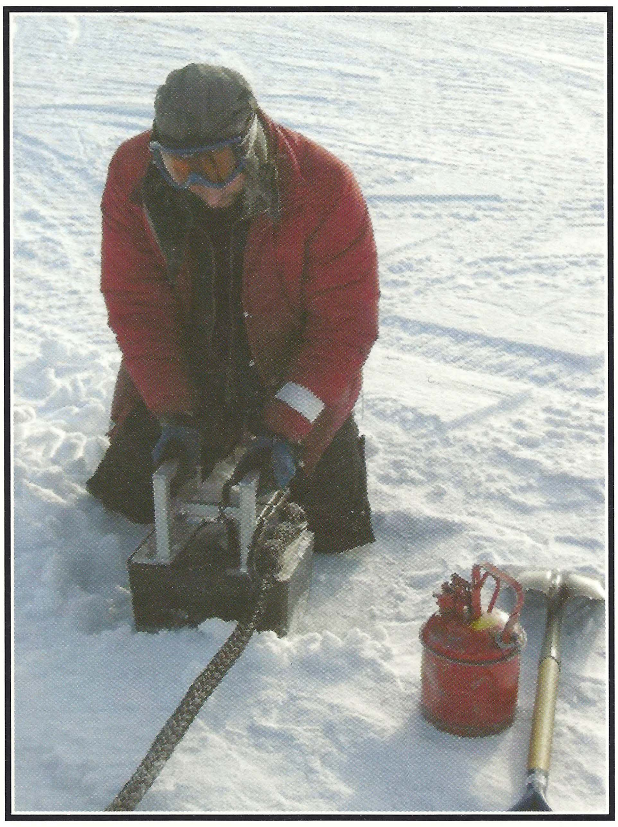
Work on constructing a runway suitable for the larger aircraft to land proved to be an elaborate and, at times, duanting task. The lack of a large, heavy snow mover, the cold, wind, and breakdowns meant that the Bobcat, ATV and crew had an arduous task to clear the snow.

Bobcat outfitted with snowblower and an ATV with a small plow and tracks. The hard packed snow proved too much for both of them at times.

An example of the good visibility that the helicopters were experiencing (due in part to the cold temperatures). The ice camp is located in the middle of the picture, and the cold mountains of the northern Ellesmere coast are in the background - approximately 15kms away.



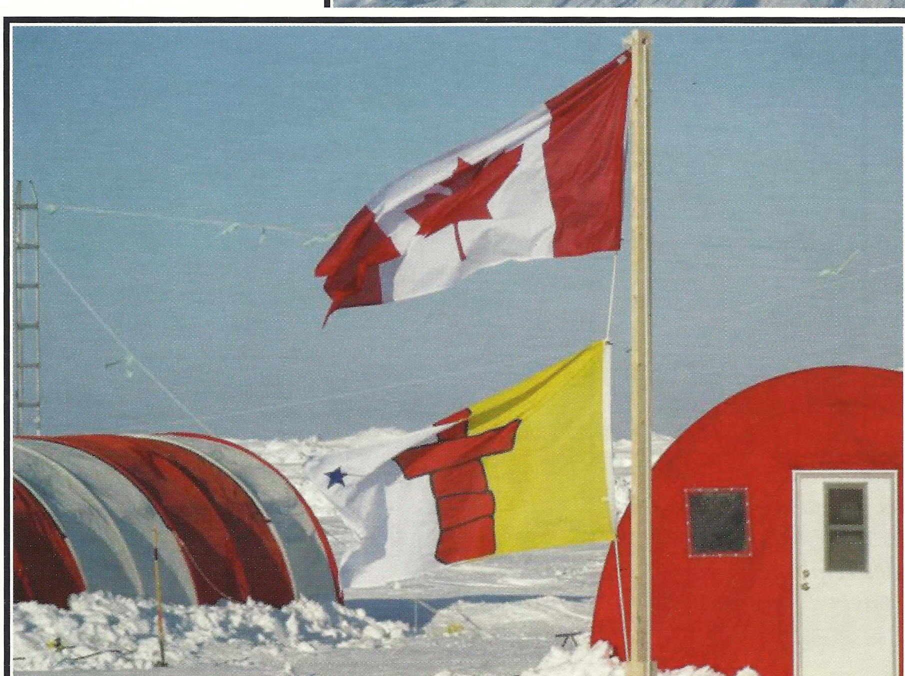
Taking a gravity measurement on the ice. The snow is cleared away and then the instrument is placed directly on the ice.



Taking a depth measurement with an acoustic sounder. The snow is cleared and the instrument set directly on smooth/clear ice (free of bubbles, cracks, rough ice). Despite the relatively thin layer of snow shown here - most sites require clearing 2-3 feet of hard packed snow to reach the ice.

Thirty boxes of explosives together with primacord, rope and everything else necessary to prepare three sites. The helicopter will ferry the explosives out to each site where holes have been drilled by another crew.

At each site, one or more holes have been drilled ready for explosives to be lowered to the correct depth. This picture shows a string of ten charges ready to be lowered. The drills and long support rope can be seen behind the charges and the primacord is to the far right.



The Canadian and Nunavut flags blowing in the wind at the ice camp April 6th, 2008. Temperatures have warmed to around minus 25-30°C on a fairly consistent basis. Another fews weeks to go before the crew packs up and head south to warmer surroundings.

Conférence hydrographique du Canada et Conférence nationale des arpenteurs-géomètres /

Canadian Hydrographic Conference and National Surveyors Conference

Réunir terre et mer / Bringing Land and Sea Together

La conférence Soustrait / Conference Abstracts

Programme technique

Mardi 06 mai 2008

Session 1A - Avenir de la cartographie marine 10h30-12h00 théâtre, président : John Lowell (National Oceanic and Atmospheric Administration, États-Unis)

1A-1 – SHC et BPH – Le nouvel environnement de production hydrographique

Lynn Patterson (Service hydrographique du Canada)

Au cours des dernières années, le Service hydrographique du Canada (SHC) a commencé l'examen d'environnements de production alternatifs qui lui permettront de poursuivre la production de produits de qualité en plus grand nombre et en utilisant moins de ressources. Nous devions trouver une autre façon de mener nos affaires afin de continuer de fournir des produits actualisés aux marins et à notre clientèle toujours grandissante. Il y a 5 ans, nous avons commencé à explorer le potentiel de la Base de données de Production Hydrographique (BPH) qui offre potentiellement l'avantage de pouvoir produire plus en utilisant moins de ressources et en évitant les chevauchements de tâches. Le SHC a entrepris la migration de ses environnements de production vers cette nouvelle génération de logiciels hydrographiques pour la production de cartes marines numériques papier depuis 1 ou 2 ans. Dans un avenir rapproché, le SHC verra s'il peut entreprendre la migration de production d'autres de ses produits et possiblement créer de nouveaux produits dans cet environnement. Cette présentation fera le point sur l'environnement de production du SHC avant la BPH, depuis la transition à la BPH et, finalement, l'avenir.

1A-2 – L'avenir de la cartographie marine au NOAA

Julia Powell (NOAA), Travis Newman, Beata Van Esch, Rafael Ponce, Paul Lewis et Jorge Arias

Puisque les services hydrographiques doivent composer avec une augmentation de leur charge de travail reliée à la production de cartes marines papier et numériques et ce, sans augmentation de leurs ressources, ils cherchent à trouver de nouveaux moyen rationaliser le processus de production. Cette rationalisation doit être efficace et produire des produits conformes et de haute qualité au marin afin de garantir une navigation sécuritaire. Pour ce faire, de nouveaux moyens d'organiser les données et le cheminement du travail requis à la réalisation des produits, et dans lesquels entrent en ligne de compte des sources et formats multiples, sont requis. Afin d'atteindre cet objectif, certains services hydrographiques ont choisi une solution axée sur une base de données centrale de laquelle ont peut extraire tous les produits. La National Oceanic and Atmospheric Administration (NOAA) déploie depuis plusieurs années des efforts visant la simplification de la production des cartes marines. La NOAA a utilisé les services de McDonald Bradley, Inc. utilisant les logiciels PLTS de ESRI afin de créer une base de données marines centrale. Le The Nautical Chart System II, en plus de pouvoir recevoir des données de sources différentes, aura la polyvalence nécessaire à la production des produits requis par la communauté maritime, et pourra établir des liens et échanger des données d'une manière transparente avec l'infrastructure nationale de données géospatiales et autres organismes. Cette communication décrit la manière utilisée par la NOAA pour mettre ce système en place, les obstacles à surmonter et les résultats anticipés lorsqu'il sera opérationnel.

1A-3 – OHI S-100 – Les nouvelles normes géospatiales pour les données hydrographiques

Robert Ward (Bureau hydrographique international)

La publication 57 de l'Organisation hydrographique internationale (OHI S-57) est la norme de l'OHI pour le transfert de données hydrographiques numériques. C'est la norme qui standardise l'échange de données hydrographiques numériques entre les bureaux d'hydrographie et qui est utilisée lors de la distribution de données hydrographiques aux fabricants, marins et autres usagers des données (i.e. : organismes de gestion environnementale). Elle a été développée afin d'uniformiser l'échange des données hydrographiques sous toutes leurs formes. Toutefois, à ce jour, la norme S-57, édition 3,0/3,1, n'a été utilisée presque exclusivement que pour coder les cartes numériques de navigation (ENC) utilisées dans les systèmes d'affichage de cartes numériques (ECDIS). Même si la norme S-57 a été conçue pour être compatible avec tous les types de données hydrographiques, tout client et la technologie des données hydrographiques, ceci ne s'est pas produit. Une des raisons est que S-57 n'est pas une norme contemporaine largement acceptée dans le secteur des SIG. Par conséquent, l'OHI a initié le développement d'une nouvelle norme, la norme S-100, qui fera partie de la série de normes de données géographiques ISO 19100 qui sont actuellement en développement par le comité technique 211 de l'ISO. La norme S-100 devrait alors devenir une base intéressante pour le développement d'une large gamme de produits numériques et de normes de transfert pertinentes à l'hydrographie. La communication explique la nouvelle infrastructure de données géospatiales de l'OHI sur laquelle s'appuie le développement de toutes les normes de données de l'OHI. Plus particulièrement, la communication illustre de quelle manière la norme S-100 est développée et comment les intervenants éventuels et usagers de milieux autres que celui de la cartographie et d'organisations hydrographiques peuvent participer tant au développement qu'à la création de profils de données pertinents à leur intérêts particuliers.

1A-4 – Production, distribution et mise à jour de la bathymétrie à haute définition.

Louis Maltais (Service hydrographique du Canada)

Le service hydrographique du Canada est un des intervenants dans la définition et les essais de la prochaine norme de bathymétrie à haute définition (S-100). Cette nouvelle norme permettra aux services hydrographiques de produire une bathymétrie d'un niveau de détail encore jamais vu. La définition d'un standard est une chose. C'est la mise en oeuvre de cette norme qui représente un défi. Tout comme les cartes marines traditionnelles, les fichiers bathymétriques doivent être créés, distribués et mis à jour. De plus, les délais d'exécution de toutes les étapes devront être réduits à leur minimum. Plusieurs défis devront être relevés afin d'atteindre un certain niveau d'efficacité en mode production. Cette communication énonce les solutions possibles à certains problèmes importants.

Exposition d'affiches 1A - 12h00-13h00 Salle d'exposition

P1A-1 – Diviser pour conquérir : une analyse du projet de la rivière Schelde

Azing Vondeling (QPS bv)

Comme César avant eux, QPS veulent "Diviser pour conquérir" avec Qarto, la nouvelle suite de production CMN (Cartes Marines Numériques). Imaginez de piloter un porte-conteneurs de 360m à quai AUJOURD'HUI, avec des données CMN récoltées HIER. C'est le cheminement de travail dont rêvent toutes les agences de production CMN. Les échosondeurs modernes peuvent fournir une quantité énorme de données de sondage. La gestion, le stockage, le volume toujours grandissant des données recueillies deviennent des questions urgentes à résoudre pour plusieurs maisons de production CMN, incluant les autorités portuaires et fluviales qui ont assumé la responsabilité de crééer et de maintenir leurs propres CMN. La transformation de données volumineuses en CMN de haute qualité et de haute densité exige une plate forme de production CMN à la fois puissante, flexible et facile à utiliser. QPS, avec le concours de Atlis, spécialiste néerlandais de Oracle, a conçu un programme de service de base de données flexible qui incorpore un entrepôt bathymétrique et un entrepôt marin de données CMN en une plate forme de production CMN d'utilisation facile – Qatro. Cette affiche examine les questions liées, les succès obtenus lors de son application au projet de la rivière Schelde, où les levés multifaisceaux effectués au cours d'une journée sont disponibles sous forme de CMN mises à jour le lendemain.

P1A-2 – Infrastructure maritime –Nouvelle technologie de production / gestion des CMN et cartes papier

John Klippen (Jeppesen Norway AS)

Cette affiche examinera les aspects d'un partenariat entre un organisme gouvernemental (Norwegian Hydrographic Service - NHS) et le secteur privé (Jeppesen Norway AS - JN (auparavant connu sous le nom HydroService AS)) basé sur la conception, la mise sur pied, la mise en application, les aspects qualitatifs et l'achèvement d'un contrat entre NHS et JN (le projet MINTEC). L'affiche sera présentée par Jeppesen Norway AS, mais sera élaborée avec l'aide de l'équipe du projet MINTEC chez NHS. La présentation de MINTEC examinera plus particulièrement les éléments pratiques importants qui ont interpellé les deux parties au cours des deux dernières années où, avec la base de données primaire Oracle de NHS, on a su mettre en application une ligne de production complète pour les CMN et les cartes papier. La gestion de tous les produits, depuis la source jusqu'aux cartes, est prise en charge et mise à jour, en utilisant toute révision faite aux sources dans la base de données primaire Oracle. L'affiche examinera plus particulièrement les thèmes suivants:

1. Systémisation / adaptation d'une solution à partir de spécifications fournies
2. Procédés et procédures de mise en place
3. Scripts test et processus de vérification
4. Questions organisationnelles et administratives
5. Ententes et attentes individuelles en fonction des exigences
6. Réponse aux exigences individuelles.

P1A-3 – Cartographie des débris dans le Lac Borgne en Louisiane

Paul Donaldson (SAIC), Gary Davis, Rebecca Quintal et Walter Simmons

Science Applications International Corporation (SAIC) a récemment effectué un levé des débris déposés par l'ouragan Katrina dans le lac Borgne en Louisiane pour fins de représentation cartographique. Ce levé a été effectué sous contrat pour le bureau des levés côtiers de la National Oceanic and Atmospheric Administration (NOAA). En plus de la détection de débris, le levé devait saisir les données bathymétriques jusqu'à la courbe isobathe de 4 pieds. SAIC a déployé deux navires, le premier équipé d'un sonar latéral Klein 3000 et un sonar Odom Echotrac CV à faisceau unique et le deuxième, équipé d'un sonar interférométrique GeoAcoustics GeoSwath. Cette affiche présente les obstacles qu'on a du surmonter lors du levé au niveau de la logistique, de l'eau peu profonde, cheminement des données et poids des fichiers de données. De plus, les résultats du levé incluant les processus de traitement des données utilisés pour produire les fichiers S-57 finaux et les grilles bathymétriques sont inclus. On mettra l'accent sur la création d'un modèle d'erreur requis pour le sonar interférométrique GeoSwath.

Session 1B - Les systèmes cadastraux pour la gestion durable des terres 10h30-12h00 salon C, président : Peter Sullivan (Arpenteur général du Canada)

1B-1 – Contributions canadiennes à la gestion des terres en Afrique : l'avenir est à la fois là-bas et ici.

Brian Ballantyne (Centre canadien de gestion cadastrale) et Peter Sullivan

Au mois de décembre 2006, la Commission Économique pour l'Afrique (CEA) des Nations Unies a organisé un symposium en Éthiopie sur les systèmes informatiques d'aménagement des terres (SIAT) appropriés dans une économie de connaissance. Le symposium a été commandité par le Centre canadien de ressources en cyberpolitiques (CCRcP) et RNCan. Le bureau de l'Arpenteur général des terres du Canada a participé au symposium et à la rédaction de 16 principes qui, après le symposium, ont établi la base du document de travail de l'UNCEA. L'exercice a démontré que, malgré le fait que la réforme du cadastre et que les mises à niveau du SIAT doivent être contextuelles, les terres du Canada et les terres d'Afrique partagent plusieurs problèmes (comme par exemple les processus de transformation au sein de CCGC). En réalité, même si nous avons plusieurs choses à offrir aux gestionnaires des systèmes informatiques d'aménagement des terres en Afrique, ils peuvent nous offrir, en retour, des connaissances qui pourraient être utiles à la gestion du cadastre des terres du Canada.

1B-2 – Les conditions socio-économiques du marais Yala, l'implication de l'entreprise américaine Dominion Farms Ltd., la remise en état du patrimoine national au Kenya.

John Vorster (Victoria Institute for Research on Environment and Development-VIRED)

Le marais Yala est une des plus grandes terres humides du Kenya, avoisinant le lac Victoria, le deuxième plus grand lac d'eau douce au monde derrière le lac Supérieur. Ces terres humides, en zone équatoriale, présentent une biodiversité impressionnante. Le marais Yala couvre une superficie de 175 km carrés et contient trois lacs d'eau douce. Le marais est important du point de vue écologique puisqu'il filtre les eaux qui approvisionnent le lac Victoria et abrite et nourrit une population énorme de poissons en voie de disparition, d'oiseaux et de mammifères. La communication examine le résultat des recherches effectuées au niveau de la gestion des droits fonciers, l'intendance environnementale et les écosystèmes à partir d'études de cas effectuées dans le Marais Yala au Kenya. Le marais Yala abrite et pourrait être considéré comme musée vivant pour plusieurs espèces de poisson. Le marais a déjà été drainé par le gouvernement sous le Programme des Nations Unies pour le Développement (PNUD) et par la suite récupéré par le PNUD sous le programme GEF (Global Environment Facility). Présentement, dans le marais, une concession a été accordée à un investisseur américain à des fins de production agricole. Dans le cadre de ce projet, bon nombre de communautés ont dû vendre leurs terrains et habitations. Des conflits d'intérêts ont créé un vide au niveau de la gestion et de la propriété des droits fonciers lorsque l'État a accordé des concessions à des intérêts étrangers sans effectuer d'études d'impact socio-économique. Les activités agricoles de Dominion Farms ont un impact négatif sur l'intégrité des terres humides sur la communauté. Enfin, la communication examine et fait l'inventaire des pertes biologiques réelles dans les zones converties à l'exploitation agricole, l'implication de la perte des sols pour les usagers en aval et pour l'écosystème, la gestion des déchets, la pollution, les questions culturelles et socio-économiques découlant des droits fonciers, la participation de la communauté aux discussions et les recommandations qui pourront s'appliquer aux projets de cette nature à venir.

1B-3 – Aviser du devoir de consulter : représentation cartographique des exigences spatiales des autochtones au Canada

Khaleel Khan (Centre canadien de gestion cadastrale) et Brian Ballantyne

Le devoir de consulter puise ses sources dans l'Honneur de la Couronne : l'objectif de conciliation ainsi que l'obligation de consultation, qui reposent sur l'Honneur de la Couronne, tendent à indiquer que cette obligation prend naissance lorsque la Couronne a connaissance, concrètement ou par imputation, de l'existence potentielle du droit ou titre ancestral et envisage des mesures susceptibles d'avoir un effet préjudiciable sur celui-ci. [Nation haïda c. Colombie-Britannique] La recherche appliquée dans ce dossier, afin de produire une carte nationale des exigences spatiales des autochtones, a permis de définir les observations suivantes: que les service gouvernementaux qui composent avec les exigences spatiales des autochtones accueillent avec plaisir l'idée d'une telle carte; que la représentation spatiale de ces étendues de terres, sur lesquelles des revendications de droits pourraient s'avérer problématiques, pourrait peut-être compromettre la position de la Couronne en Cour ou lors de procédures de revendications territoriales; que la spécificité (ou l'ambiguité) de la description des revendications varie selon les provinces; qu'il est difficile d'obtenir un aperçu national de l'emplacement et de l'envergure des terres revendiquées. Enfin, la communication situe l'initiative cartographique à titre d'élément d'une vision similaire, partagée par le bureau de l'Arpenteur général du Canada.

1B-4 – Données multimédia dans les sytèmes de documents relatifs aux terres : essais pratiques au Nigéria

Michael Barry (Université de Calgary)

Après des années de vie sous un régime militaire, le Nigeria a récemment vécu son premier cas où un président, élu démocratiquement, a passé le pouvoir à un président nouvellement élu. Suite à des années de gestion douteuse, à peu près 3% des terrains ou propriétés du Nigéria sont enregistrées, et les systèmes d'enregistrement et de levés cadastraux ont été mis au rancart dans plusieurs de ses États. De plus, l'accès à la terre en zones rurales est devenu de plus en plus difficile à cause de la pression démographique. On y trouve, de plus, de nombreux conflits de limites territoriales mettant aux prises les autorités locales. Le données multimédia, sous forme de vidéos, d'enregistrements sonores et de photos deviennent un moyen de recueillir et d'enregistrer l'information reliée à la méthode de tenure dans des situations d'incertitude telles celles qui prévalent après un conflit ou lorsque les droits fonciers sont contestés. Le multimédia est utile de plus lorsqu'il s'agit d'enregistrer des revendications territoriales dans des sociétés où la tradition orale, plutôt que la preuve documentaire, est à la base du régime foncier et du droit à la propriété. Les régimes d'enregistrement foncier peuvent utiliser les données multimédia comme unique registre des droits fonciers, comme système de démarrage où les données sont utilisées à des fins d'arbitrage où enfin, à titre de données servant à appuyer la preuve documentaire, telle les levés cadastraux, actes et titres de bien-fonds. Cette communication décrit un ensemble d'essais effectués sur le terrain en utilisant des données multimédia lors de projets de remaniement des terres dans la ville de Lagos, d'enregistrement de résolutions de litiges de frontières rurales, de documentation des inventaires de propriété, d'arbres fruitiers et de récoltes en terres de régime coutumier en périphérie urbaine destinés à être transformées en ensembles résidentiels dans les parties du centre et du Nord du Nigéria. Elle décrit, de plus, la conception et la mise à l'essai de logiciels destinés à appuyer l'utilisation de plusieurs formes de données dans un régime d'enregistrement foncier.

Exposition d'affiches 1B - 12h00-13h00 Salle d'exposition

P1B-1 – Le rôle l'arpenteur dans la délimitation des zones de protection marine selon la Loi sur les océans

Sam Macharia Ng'ang'a (Pêches et océans Canada)

Il existe un consensus qu'une définition claire des limites spatiales d'une zone réglementée, telle une zone de protection marine (ZPM), est importante au niveau de la gouvernance (c'est-à-dire, pour les fins d'établissement et de gestion d'une ZPM). Toutefois, il n'existe que peu de documentation disponible à l'intervenant en ZPM au sujet du processus de détermination des limites (c'est-à-dire, ce qu'implique la création des limites appropriées pour les ZPM).

Cette présentation se base sur les délibérations qui ont eu lieu lors d'une session sur les limites marines convoquée par l'auteur lors de la conférence SAMPAA 2007 à Wolfville, N.-É. La présentation couvrira premièrement les étapes et processus utilisés lors de la détermination des limites des ZPM couvertes par la Loi sur les océans et, deuxièmement, elle décrira les défis à relever et les leçons apprises en essayant d'appliquer ces étapes lors de la création antérieure de ZPM.

Session 2A - Questions juridiques et souveraineté, Convention des Nations Unies sur le droit de la mer (CNUDM) 13h00-14h30 théâtre, président : Wendell Sanford (Affaires étrangères et Commerce international Canada)

2A-1 – Questions de droit – levés hydrographiques en zones économiques exclusives

Keyuan Zou (Université du Central Lancashire)

Cette communication touche les questions de droit soulevées par les pratiques des États lors de l'application de la Convention des Nations Unies sur le Droit de la Mer de 1982, plus particulièrement de son application dans la région du Pacifique asiatique. La Convention comporte un chapitre entier sur la régie de la recherche scientifique marine mais n'en contient aucune définition précise. Conséquemment, ses interprétations varient selon les pays. Les levés hydrographiques utilisés à des fins militaires demeurent une zone grise. Ce qui complique encore plus la situation est la dichotomie du statut juridique de la zone économique exclusive, une zone maritime sous juridiction nationale mais assujettie à la liberté de la haute mer. On perçoit que la communauté internationale doit trouver moyen de concilier les pratiques des États dans ce cas-ci, et améliorer les règles de droit de la mer.

2A-3 – Revendications des lignes de base et augmentation du niveau de la mer

Trent Palmer (National Geospatial-Intelligence Agency)

La discussion au sujet de la nature des lignes de base (fixes vs. ambulatoires) devient plus intéressante à cause du changement rapide du niveau de la mer. La variabilité dans le temps de la ligne de côte est bien acceptée. Mais quel serait l'effet d'un changement plus rapide que la normale de la ligne de côte ? On consacre actuellement beaucoup de temps aux prédictions et aux rapports touchant l'augmentation du niveau de la mer. Il serait donc peut-être opportun d'examiner le besoin de réviser notre approche face aux lignes de côte et aux revendications maritimes qui s'y rattachent. Des coordonnées de lignes de côte fixes peuvent nous paraître absurdes lorsqu'elles sont submergées. Alors qu'un État côtier hésiterait à effectuer un ajustement des lignes de base en fonction d'une mer dont le niveau s'élève (la zone marine située entre la ligne de base et le rivage devient une étendue d'eau interne), on exigerait certainement des ajustements si le niveau de la mer devait baisser (plus de territoire et d'expansion éventuelle vers la mer). Cette étude ne vise pas à déterminer les causes du changement de niveau de la mer ni de faire une évaluation des prédictions des hausses. La discussion peut s'étendre à toutes les zones marines qui débutent à la ligne de base et qui sont établies selon la Convention des Nations Unies sur le droit de la mer. Au-delà d'une discussion générale sur la nature théorique du sujet, nous examinerons certains cas précis afin d'illustrer les effets du changement rapide du niveau de la mer sur les revendications territoriales maritimes courantes.

2A-2 – De l'Arctique aux tropiques : le programme de cartographie bathymétrique É.-U. CNUDM

James Gardner (CCOM/JHC Université du New Hampshire), Larry Mayer et Andrew Armstrong

Depuis CHC2006, le Center for Coastal & Ocean Mapping/Joint Hydrographic Center de l'Université du New Hampshire, à l'aide d'un appareil multifaisceau a effectué une représentation cartographique d'approximativement ~220, 000 km2 du plancher océanique dans des régions aussi diverses que l'Arctique, Les îles Marianne du Nord dans l'ouest du Pacifique, et dans le Golfe du Mexique. La cartographie vient en appui à toute proposition d'extension du plateau continental selon l'article 76 de la Convention des Nations Unies sur le Droit de la Mer. Ainsi, la cartographie a porté plus particulièrement sur la saisie de l'isobathe de 2500m en entier et de la zone où, selon la définition de l'article 76, se trouve le pied du talus continental. En fait, la zone entière comprise entre les profondeurs de ~1500 et ~4500 mètres est relevée dans chaque région. Les données ont été saisies dans des conditions variées dont les glaces de l'océan Arctique et le calme des mers tropiques du Pacifique. Même si certaines des conditions rencontrées ont eu un impact sur la qualité des données recueillies, celles-ci sont généralement de bonne qualité et chacune des expéditions nous a réservé des surprises géologiques intéressantes.

2A-4 – Avec ou sans glace : le programme canadien CUNDM de cartographie bathymétrique

Richard MacDougall (Service hydrographique du Canada), Wendell Sanford et Jacob Verhoef

Depuis CHC2006, Le Canada a effectué des levés du plateau continental sur approximativement 65% de la zone requise de l'Atlantique et 15% de la zone arctique en utilisant une combinaison de méthodes basées sur des navires et de méthodes traversant la glace. Ces levés appuient la soumission de 2013 du Canada sur les limites extérieures du plateau continental selon l'article 76 de la CNUDM. Ainsi, l'ordre des priorités des levés a été établi selon une formule qui permettrait au Canada de maximiser la superficie de son plateau continental. La saisie des données bathymétriques a été effectuée afin de déterminer le pied du talus et l'isobathe de 2500m lorsque ce facteur limitatif est utilisé. Des levés sismiques, afin d'établir la profondeur de la couche sédimentaire, ont été effectués dans les zones où la formule sismique sera utilisée. De plus, des levés de réfraction sismiques ont été effectués afin d'appuyer les tests de dépendance. Cette communication couvre les levés effectués dans différentes zones et les défis à relever, surtout en zone Arctique où la condition des glaces détermine le temps et le lieu où des levés peuvent, ou ne peuvent pas être effectués.

Exposition d'affiches 2A - 14h30-15h00 Salle d'exposition

P2A-1 – La frontière de la baie Boundary

Brian Ballantyne (Centre canadien de gestion cadastrale)

Le 49e parallèle de latitude, qui est supposément la frontière entre le Canada et les États-Unis dans une grande partie de l'Ouest canadien, traverse la baie Boundary, entre la pointe Roberts et Blaine. Cependant, la frontière à la baie Boundary n'est ni le 49e parallèle ou même un parallèle de latitude. À cause d'une entente intervenue entre les deux pays en 1869, la frontière est une ligne géodésique qui relie deux bornes situées sur les rives à quelque 18 kilomètres l'une de l'autre. Cette entente est une arme à deux tranchants. D'un côté, elle a permis d'éviter le genre d'arbitrage qui a été requis pour résoudre la question de la limite de la zone extracôtière à l'ouest de la pointe Roberts, ce qui veut dire que l'Empereur d'Allemagne n'a pas eu beaucoup d'influence à la baie Boundary. De l'autre côté, l'Entente a provoqué une incertitude quant à l'emplacement de la limite sur l'eau, ce qui mené à l'installation d'une série de repères à partir de 1929. Les repères eux-mêmes ont été à l'origine de controverses puisqu'ils ont joué un rôle dans des litiges sur la pêche au crabe, dans des concours d'orgueil entre témoins experts, dans l'effondrement de la population de cormorans, et comme accessoire aux jauges de marée. La définition et la démarcation de la frontière à la baie Boundary sont éloquentes quant aux divers problèmes de limites : la souveraineté en zone extracôtière, la collaboration intergouvernementale vis-à-vis la Commission de la frontière internationale, l'étendue des eaux navigables, les impacts environnementaux des bornes, ainsi que la confusion entre une frontière définie par une ligne géodésique et une frontière définie par un parallèle. Entre 1846 et 2007 cette confusion a amené la frontière à être définie par la technologie, l'expertise, la prudence fiscale et les besoins des usagers.

P2A-2 – FoSMiner – Un outil à valeur ajoutée pour l'application de l'Article 76 de la CNUDM

Aldino Campos (EMEPC), Manuel Abreu, Fernando Pimentel et le groupe de travail de l'EMEPC

La ratification de la Convention des Nations Unies sur le droit de la mer (CNUDM) par le Portugal, le 3 novembre 1997, était la première étape du plus grand levé hydrographique systématique jamais entrepris par le Portugal. À partir de cette mission de longue durée, une quantité énorme de données bathymétriques haute résolution a été saisie. Afin de bien gérer ces données, utiliser au maximum les ressources disponibles et rendre le processus possible dans les délais prescrits, tout en y intégrant les dispositions de l'Article 76, une infrastructure de données spatiales spécialisée a été mise sur pied. Développée à partir d'un système de gestion de bases de données commercial ordinaire avec capacité spatiale (Oracle 10g Spatial), cette infrastructure résout deux problèmes majeurs. Le premier touche la gestion des données, surtout à cause du volume et des calculs géodésiques requis. Le deuxième porte sur la méthodologie requise pour extraire le plus de jeux de données positives livrables pour étayer la soumission du Portugal. Cette affiche présente le processus de cheminement des données au sein de cette infrastructure, à partir de la saisie des données jusqu'aux étapes d'analyses finales. Elle présente aussi un portrait détaillé de la composition de tous les modules FoSMiner requis pour extraire l'information requise de manière automatisée.

Session 2B - Technologie et innovations cadastrales 13h00-14h30 salon C, président : Chris Chiasson (Altus Geomatics, Canada)

2B-1 – Exigences géoréférentielles des levés des terres du Canada

Brian Thompson (Ressources naturelles Canada)

Le Centre canadien de gestion cadastrale a récemment effectué plusieurs changements aux exigences touchant les levés décrits dans le chapitre D-1 de l'édition électronique, incluant l'exigence de géolocaliser certains levés. Cette présentation examinera les nouvelles normes de géolocalisation, le degré de précision requis et les circonstances où elles doivent être appliquées. Elle couvrira de plus les techniques de levés géoréférentiels utilisées pour respecter ces normes et comment les levés géoréférentiels sont utilisés dans l'amélioration des ensembles de données cadastrales et comment elles peuvent être utiles à l'arpenteur-géomètre.

2B-2 – Évolution cadastrale en Colombie-Britannique

Brent Taylor (Polaris Land Surveying Inc.) et Jeff Beddoes (Adjoint principal à l'Arpenteur général de Colombie-Britannique)

Depuis la colonisation de la Colombie-Britannique dans les années 1800, la profession d'arpenteur-géomètre a effectué des levés sur le terrain et reporté le résultat de ce travail sur des supports physiques. Le but de ces levés légaux était d'établir ou de rétablir les limites des terrains relativement à celles des terrains à proximité immédiate. Au cours des dernières années les efforts conjoints déployés par l'Arpenteur général et l'Association des arpenteurs-géomètres de Colombie-Britannique ont donné naissance à une vision plus large du rôle de l'arpenteur-géomètre en Colombie-Britannique. Dans le cadre de cette vision, la profession d'arpenteur se verrait confier un rôle qui dépasserait les levés légaux traditionnels pour inclure le positionnement de ces levés à l'échelle mondiale et la représentation de son travail dans une représentation dynamique et numérisée du cadastre. Cette présentation fera passer l'auditoire du monde de la représentation relative sur Mylar à celui de la valeur ajoutée que procure le positionnement absolu ou géolocalisation et la représentation numérique des levés légaux.

2B-3 – Définition des limites uniquement à l'aide de coordonnées

Brian Ballantyne (Centre canadien de gestion du cadastre)

Le débat, entre 1987 et 2002, sur l'utilisation de coordonnées pour définir les limites a été commandité par le COCG et ALSA. Très énergique, le débat, selon le paradigme de Cook, a laissé plusieurs arpenteurs d'un calme glacial tandis que d'autres en ont été horrifiés. L'analyse portait sur les implications techniques, sociales et juridiques de l'utilisation de co-ordonnées – Est-ce techniquement réalisable, est-ce souhaitable du point de vue social, est-ce possible du point de vue juridique ? De plus, l'abornement différé et la pérennité des bornes ont été examinés. Il est temps de revoir cette analyse afin de poser trois questions :

1. Pourquoi les recommandations découlant de l'analyse n'ont-elles pas été approfondies ?
2. Peut-on utiliser les coordonnées pour définir les limites des parcelles ajoutées aux réserves autochtones ?
3. L'utilisation de coordonnées pour définir les limites des emprises ou droits de passages des services publics est-elle bien fondée ?

2B-4 – Le Land Title and Survey Authority (LTSA) de Colombie-Britannique et le bureau de l'Arpenteur général.

Mike Thomson (Land Title and Survey Authority de Colombie-Britannique)

Présentation d'un document de travail sur la création du Bureau administratif des titres de bien-fonds et des levés en Colombie-Britannique (traduction libre) et de son mandat de gérer, de faire fonctionner et de maintenir les systèmes pertinents aux titres de bien-fonds et de levés.

Établie en 2005 sous la Loi Land Title and Survey Authority, la LTSA est une corporation indépendante qui vise à améliorer le service à la clientèle par l'innovation et l'amélioration continue de ses processus administratifs. La LTSA fournit des services au public et aux professionnels, aux avocats, notaires et arpenteurs-géomètres à ses bureaux situés à Kamloops, New Westminster et Victoria. La LTSA subvient, par le biais de ses systèmes sécuritaires et fiables, aux besoins d'enregistrement de toutes les propriétés de biens réels et de tous les levés privés et sur les terres publiques.

Cette présentation fait un survol des raisons qui ont amené la création du LTSA, sa formation, sa structure de gouvernance, ses objectifs stratégiques, et la création de ses divisions d'affaires qui fournissent des services au public. Le rôle premier de la division des titres de bien-fonds est d'assurer l'intégrité du système Torrens de Colombie-Britannique qui assure l'inscription des droits et autres aspects du système foncier tels les hypothèques, droits de passage et autres. Le rôle premier de la division de l'Arpenteur général est de maintenir la qualité de la structure des levés de la province.

Cette communication examine le rôle de l'Arpenteur général au sein de la LTSA, de son travail avec les arpenteurs-géomètres pour établir les normes des levés, l'approbation des levés légaux des terres publiques et de certaines terres privées et d'assurer la protection du cadastre. Cette communication examine de plus les nouvelles relations de travail issues du fait que les registres fonciers et les systèmes d'arpentage co-habitent maintenant sous un même toit. Enfin, la communication examine le travail de l'Arpenteur général au niveau de l'émission de documents de concession de la Couronne qui cèdent ou transfèrent des terres de la Couronne à des intérêts privés.

Exposition d'affiches 3A - 14h30-15h00 Salle d'exposition

P3A-1 – Développement et évaluation de produits bathymétriques Lidar aéroportés pour la cartographie des traits de côte

Lynnette Morgan (NOAA), Shachak Pe'eri et Andrew Armstrong

En gestion côtière, la délimitation précise et fidèle des côtes joue un rôle important dans l'établissement des lignes de démarcation. Le tracé des limites de cette limite dynamique dépend des phases de la marée et est délimité par les zéros des marées telles la ligne de pleine mer moyenne (MHW) et la ligne moyenne des basses mers inférieures (MLLW). Cette étude examine l'utilisation possible de bathymétrie Lidar aéroportée (BLA) comme aide à la cartographie des lignes côtières. Un processus informatisé est utilisé pour acquérir les démarcations des côtes à partir d'un jeu de données lidar à l'aide de divers algorithmes qui font le départage entre la terre et l'eau. Les interfaces terre-eau dérivées des algorithmes sont analysées comparativement à la ligne de côte bâtie à partir de l'orthoimagerie aérienne qui a été recueillie en même temps que les données BLA. La zone d'étude inclut une variété de types de rivages, incluant les rivages rocheux, sablonneux, et artificiels, pour évaluer le rendement de divers algorithmes dans des conditions environnementales variées. L'analyse des résultats permet d'évaluer la qualité du produit côtier comparativement aux méthodes actuellement utilisées et permet d'estimer si le BLA fournit une solution aux problèmes actuellement liés à la cartographie des côtes. Cette évaluation inclut une analyse de la fiabilité, de la résolution et de l'incertitude de la délimitation de la ligne de côte ainsi qu'une évaluation quant à la capacité des interfaces terre-eau dérivées de BLA de satisfaire aux normes cartographiques.

Session 3A – Cartographie de la terre à la mer - I 15h00-16h30 théâtre, président : Richard Sanfaçon (Service hydrographique du Canada)

3A-1 – Relever les défis avec de nouvelles techniques : du Sud-Est de l'Alaska aux îles Aléoutiennes

Jana DaSilva Lage (Fugro Pelagos), Andrew Orthmann, Robert Richards Jr., Dean Moyles et Carol Lockhart

En 2006, Fugro Pelagos Inc. (FPI) a obtenu le plus gros contrat de levés hydrographiques émis en Alaska par le National Oceanic and Atmospheric Administration. Le but premier de ces levés était de fournir des données en appui à la cartographie marine. Le défi était d'effectuer des levés sur 600 milles marins carrés, dans deux zones séparées par approximativement 1 100 milles, pendant la saison de travail de 2007. Dans les îles Aléoutiennes, les hydrographes devaient affronter des courants de marée jusqu'à 9,5 noeuds, des remous, des conditions climatiques changeant rapidement et, le long de la côte, des peuplements denses et infranchissables d'algues brunes. Dans la zone des levés, dans le détroit Chatham au Sud-Est de l'Alaska, on trouvait de nombreux écueils non indiqués, algues et dangers à la navigation. Les hydrographes ont aussi dû affronter des courants et marées extrêmes dans et aux alentours de la baie Mitchell, une zone très complexe dont les derniers relevés ont été effectués en 1895. Afin de mener à bien cette tâche, FPI a utilisé 4 bâtiments hydrographiques équipés de systèmes multifaisceau Reson 8111, 8101, et 8125 et deux méthode d'exécution de travail uniques. Premièrement, le système multifaisceau du bâtiment côté littoral a été utilisé avec une tête posée à angle. De plus, un système bathymétrique Lidar aéroporté SHOALS 1000T avec une caméra numérique DuncanTech DT4000 a été utilisé pour faire la collecte de données de reconnaissance dans la baie Mitchell, ce qui a grandement accéléré le plan d'exécution des levés.

3A-2 – a retiré

3A-3 – Levés d'objets – Efficacité de la collecte et de la transformation des données

Andrew Leyzack (Service hydrographique du Canada)

Pour plusieurs bureaux de services hydrographiques, la mise en circulation des cartes marines numériques a créé deux cheminements de travail : traditionnel (cartes papier) et électronique (image-écran) ou CMN (Carte marine numérique). Jusqu'à récemment, la technologie et la méthodologie liées aux levés visaient à appuyer la collecte de données afin de fournir des livrables qui convenaient à la production de cartes papier; la transformation supplémentaire des données, incluant la création d'objets et d'attributs spatiaux ont été requis pour satisfaire aux normes de production des CMN de l'OHI. Le développement du domaine de la cartographie a amené les bureaux de services hydrographiques à étudier la possibilité d'utiliser une source de données numériques unique pour les publications tant papier que numériques. Dans le même ordre d'idées, des outils et méthodes ont été conçus pour permettre aux hydrographes d'utiliser et faciliter le processus de production de cartes à partir d'une source commune. Cette communication donne un aperçu des processus de levés et des livrables qui font partie de la collecte et de la transformation de détails hydrographiques en objets spatiaux selon la norme OHI-S-57 (Publication spéciale No 57).

3A-4 – Évaluation d'une trousse multifaisceau expéditionnaire (Expeditionary Multibeam Kit – EMK-1))dans la zone littorale et dans la région amazonienne du Pérou

Elliot Arroyo-Suarez (Naval Oceanographic Office) et Jaime Valdez

Le Naval Oceanographic Office (NAVOCEANO) travaille, avec le secteur privé, à l'intégration d'une trousse multifaisceau expéditionnaire (EMK) de petite taille, peu dispendieuse et conviviale qui sera utilisée par les officiers subalternes du METOC intégrés aux corps expéditionnaires. La disponibilité du EMK aux officiers du METOC et aux opérateurs côtiers et riverains permettra la collecte de données bathymétriques à partir de vedettes et autres embarcations de circonstance de manière peu intrusive et sans requérir grande expertise dans la tâche ardue que peut être l'installation et le calibrage d'un système multifaisceau traditionnel. Alors que le concept initial de fonctionnement n'est pas tenu de se conformer à une résolution de l'OHI, cette communication examine le rendement du système lors de tests effectués en zone littorale en Amérique du Nord et dans un environnement riverain de la région amazonienne.

Session 3B - Avenir de la profession d'arpenteur-géomètre 15h00-16h30 salon C, président : Hugh O'Donnell (MMM Group International Inc., Canada)

3B-1 – Appuyer l'apprentissage permanent et l'éducation chez les professionnels de la géomatique

Steve Lam (Université polytechnique de Hong Kong)

Les humains naissent avec le goût inné de l'apprentissage permanent, en ayant le besoin d'apprendre comment survivre, de travailler et de jouir de la vie à travers diverses activités d'apprentissage et d'éducation. Cette communication examine les tendances internationales au niveau de l'apprentissage permanent chez les professionnels de la géomatique avec des discussions sur :

1. Les raison, buts, formes et exigences qualitatives de l'apprentissage permanent;
2. comment organiser l'apprentissage en fonction de l'éducation scolaire et de l'éducation non institutionnelle et de la formation sociale / localisée;
3. quels cours sont exigés par la profession et par les apprenants en général;
4. comment faire fonctionner les politiques dans un modèle équilibré bien-être/axé sur le marché.

3B-2 – Questions sur les permis de pratique pour effectuer des levés cadastraux : chauvinisme, co-opération et mobilité

Khaleel Khan (Centre canadien de gestion du cadastre), Brian Ballantyne et Peter Sullivan

L'émission de permis de pratique par les associations d'arpenteurs-géomètres provinciales et des Terres du Canada s'effectue dans l'intérêt public, afin d'assurer que la scolarité, l'expérience, la compétence et l'éthique des praticiens soient du plus haut niveau. Par exemple : on fait une distinction entre les permis requis pour effectuer les levés sur, et hors des Terres du Canada. Toutefois, on peut soulever quatre questions liées à ces intentions pourtant honorables. Premièrement : est-ce qu'un arpenteur-géomètre, qui effectue des levés des emplacements de puits sur les réserves autochtones dans l'Ouest canadien, doit détenir deux permis - celui émis par l'ATC et le permis approprié délivré par l'autorité provinciale ? Deuxièmement, qui peut effectuer des levés en zone extracôtière de la Colombie-Britannique, ou tout simplement dans la zone extracôtière du Canada en général ? Troisièmement, comment se fait-il que seulement 20 arpenteurs-géomètres se sont prévalus de l'entente de reconnaissance mutuelle qui permet la mobilité interprovinciale ? Enfin, quelles sont les conséquences de l'Entente sur le commerce, l'investissement et la mobilité de la main-d'oeuvre sur l'autonomie des organismes d'attribution des permis d'arpenteurs-géomètres, sur la mobilité des arpenteurs et sur le Commonwealth ?

3B-3 – Une vision de l'avenir de la profession d'arpenteur-géomètre au Canada

Sarah Cornett (Conseil canadien des arpenteurs-géomètres), Hugh O'Donnell, James Statham et Michael O'Sullivan

Le statu quo est inacceptable : les données démographiques actuelles annoncent une menace à la viabilité de notre profession. La profession a évolué sous 11 versions canadiennes de la profession d'arpenteur-géomètre et ce, avec moins de 3 000 arpenteurs-géomètres. La profession est fractionnée sans pourtant profiter d'une voix cohésive qui peut répondre au nom de celle-ci aux intervenants du gouvernement, de l'industrie et du public. Cette lacune au niveau de l'interaction avec la communauté professionnelle en son ensemble limite nos horizons de plusieurs manières. Il existe un sentiment d'urgence local, national et global : les questions démographiques, la pression exercée sur les associations de remplir leurs mandats et l'épuisement professionnel sont des faits reconnus qui donnent lieu à des discussions aux niveaux des membres et des conseils d'Associations. Ces questions ont été débattues au niveau national par les Associations, ce qui nous amène directement à cette initiative. Plusieurs présentateurs au GéoCongrès international de Québec, tenu du 2 au 5 octobre 2007, ont fait un réquisitoire sur le besoin d'aborder les questions qui nous interpellent sur l'avenir de la profession dans son sens le plus large. La recherche effectuée par le groupe de travail indique que les organismes professionnels d'arpenteurs-géomètres de la communauté européenne, de Nouvelle-Zélande, d'Australie et des États-Unis partagent les mêmes problèmes. La stratégie du changement : examiner la définition de l'arpentage professionnel, incluant les compétences de base et les occasions qui se présentent de tirer du capital des occasions axées sur celles-ci, et d'encourager le développement des compétences connexes et à valeur ajoutée qui pourraient être reconnues à la profession au niveau national. - Promouvoir une association nationale d'arpenteurs-géomètres à l'image de ses membres, qui a pour but principal le bien-être de ses membres, qui n'affecte pas les droits et responsabilités des associations de réglementation et qui peut donner lieu au développement d'une profession plus forte, plus inclusive et plus pertinente au Canada. Il s'agit de développer une reconnaissance nationale de la profession - de construire une profession forte, large, cohérente, et influente de professionnels et de paraprofessionnels de l'arpentage.

Mercredi 07 mai 2008

Session 4 - Systèmes de référence verticale : enjeux 08h30-10h00 théâtre, président : Fred Stephenson (Service hydrographique du Canada)

4-1 – Problèmes de continuité du canevas altimétrique de la terre au fond marin

Christian Andreasen (National Geospatial-Intelligence Agency)

La NGA travaille à générer des produits à partir d'une approche axée sur les bases de données appelée Geospatial Knowledge Base (GKB) (Base de connaissance géospatiale). Une de ses composantes est le développement à long terme d'une base de données qui inclura une surface d'élévation ininterrompue entre la topographie et la bathymétrie. Cette approche doit surmonter plusieurs obstacles, notamment, ceux liés à la bathymétrie. Cette communication examine les obstacles : données locales et régionales, problèmes de marées dans la zone de profondeur de 0 à 200 mètres, le manque d'adaptation des systèmes informatiques ainsi que les démarches que pourront adopter les hydrographes pour bâtir, avec le temps, une telle base de données et les raisons qui les poussent à le faire.

4-2 – Développement d'un concept d'opération pour les levés militaires répondant aux nomes OHI sans utiliser de bases terrestres

Maxim Van Norden (NAVOCEANO), Elliot Arroyo-Suarez et Rodney Ladner

Le Naval Oceanographic Office (NAVOCEANO) effectue des levés hydrographiques selon la norme de levés S-44 de l'Organisation hydrographique internationale (OHI). La nouvelle norme de l'OHI d'ordre 1a/1b pour les eaux de moins de 100 mètres de profondeur limite l'incertitude verticale totale à 0,5 mètres plus un facteur relié à la profondeur. Actuellement, afin de répondre à cette norme, des bases terrestres doivent être établies pour recueillir des données sur les marées qui servent à définir les données cartographiques verticales et définir les correctifs dus à la marée pour réduire le sondage au zéro hydrographique. Ce concept d'opération (CONOPS) exige l'obtention de permissions de la part des autorités nationales / locales et des propriétaires de terrains pour établir et avoir accès aux bases terrestres. De plus, des efforts importants doivent être déployés afin d'établir et maintenir la sécurité du personnel et des équipements laissés sur place. NAVOCEANO ne peut plus compter sur les méthodes traditionnelles pour effectuer des levés hydrographiques. La menace du terrorisme et les États qui ne permettent pas l'accès aux sites terrestres ont sérieusement réduit la capacité de NAVOCEANO de mener à bien des levés hydrographiques selon les méthodes traditionnelles. Le CONOPS en voie de développement par NAVOCEANO, qui utilise le positionnement en temps réel, positionnement par post-traitement, et des bouées GPS, lui permet d'effectuer des levés militaires qui respectent la norme 1 de l'OHI. Un CONOPS est en voie de développement qui, avec des processus de levés améliorés, permet d'effectuer des levés du fond marin selon le cadre de référence WGS-84/ITRF00. La modélisation et d'autres techniques sont utilisées pour établir la séparation ellipsoïde / zéro des cartes selon le système de coordonnées WGS-84 afin de permettre la production de cartes papier et numériques référencées aux zéros des cartes traditionnelles. Cette communication examine l'état du travail accompli à ce jour pour développer le CONOPS NAVOCEANO.

4-3 – Réseau étroitement intégré de positionnement inertiel-GPS pour la cartographie marine

Peter Canter (Applanix Corp.), Richard Brennan et Edward Van Den Ameele

La technique actuelle de positionnement pour l'hydrographie marine inclut l'intégration du GPS et de systèmes de navigation inertiels. L'unité de mesure inertielle aide à réduire le bruit du GPS tout en fournissant des solutions ininterrompues et à bande passante élevée lors des indisponibilités du GPS. Pour les levés de haute précision (5 cm ou moins dans les axes x, y et z), la technique la plus utilisée est celle de la «Mécanisation cinématique de la résolution des ambiguïtés à l'aide de l'inertiel» (IAKAR), qui exige une base de référence à proximité de la zone du levé. La base de référence aide à atténuer les biais atmosphériques et satellitaires et à résoudre les ambiguïtés des entiers relatifs. Le rover GPS doit se trouver à moins de 20 KM de la base de référence sinon, les biais atmosphériques dégradent la précision des résultats et imposent de sérieuses limites (et des coûts accrus associés au levé). Cette communication décrit la technique de post-traitement d'une base de référence virtuelle (PPVRS) qui utilise le réseau de bases GPS pour déterminer les biais atmosphériques aux positions du rover tout en intégrant étroitement les données GPS et inertielles pour fournir une solution navigationnelle de haute résolution avec des lignes de base s'étendant jusqu'à 100 km. Une étude de cas sera incluse. Le résultat attendu sera une méthode pour effectuer des levés hydrographiques d'une précision telle, qu'elle éliminera le besoin des stations GPS spécialisées pour les eaux intérieures de toute la région continentale et riveraine des États-Unis. Le PPVRS changera la façon dont les levés hydrographiques sont effectués en réduisant la logistique afférente tout en assurant un positionnement sous la barre des 5 cm.

4-4 – Le système témoin de niveau des eaux en temps réel du Canada de l'Atlantique (Observations, prédictions, prévisions et références sur le Web)

Phillip MacAulay (Service hydrographique du Canada), Charles O'Reilly et Keith Thompson

Le SHC, Région Atlantique, s'inscrivant dans l'initiative nationale de revitaliser sa capacité de surveiller les niveaux d'eau, a mis à niveau et amélioré sa capacité de surveiller les niveaux d'eau avec : de nouveaux équipements de collecte de données, une nouvelle architecture de sa base de données et un nouveau système, fonctionnant en temps réel, de diffusion des données à être utilisé par les organismes de mesures d'urgence (via le Centre de prévision des intempéries de la Région de l'Atlantique et du Alaska Tsunami Warning Center). Le nouveau système de surveillance du niveau d'eau du SHC fournit : des données actuelles du niveau d'eau acheminées par des capteurs multiples, des prédiction basées sur les attributs constitutifs, données locales sur les marées ainsi que les meilleures prévisions de niveaux d'eau. Les prévisions de niveaux d'eau diffèrent des prédictions plus simples basées sur les attributs constitutifs puisqu'elles incluent les effets de la météo sur les niveaux d'eau, et qu'elles incluent des projections temporelles des différences persistantes entre les observations des niveaux d'eau et les niveaux d'eau attendus, où les attentes sont définies en fonction des effets de la météo sur les attributs constitutifs. Les effets du temps sont inclus dans les prévisions par le biais d'une alimentation quotidienne du modèle des ondes de tempêtes océanographiques DalCoastII exécuté par l'Université Dalhousie. Les différences persistantes entre l'observation des niveaux d'eau et les attentes sont incluses grâce à l'utilisation d'une technique basée sur le filtre Kalman – qu'on pourrait appeler une « poussée » spectrale. Les estimés de différences persistantes sont émis à toutes les 2 heures grâce à un processus automatisé développé chez Matlabs. La communication donnera un aperçu du système de surveillance du niveau d'eau en temps réel de la région du Canada de l'Atlantique. Elle présentera et examinera ses nouvelles capacités de prévision, et jettera un coup d'oeil sur les améliorations à venir au système de surveillance des niveaux d'Eau qui pourront inclure des prévisions du niveau d'eau en tout temps, en tout lieu par le biais de WebTide, ainsi que le développement et la diffusion des surfaces de référence marégraphiques en 2D.

Exposition d'affiches 4 - 10h00-10h30 Salle d'exposition

P4-1 – La mise à jour du Système de référence international des Grands Lacs (SRIGL)

Thomas Landon (NOAA, National Ocean Service) et Stephen Gill

Le mouvement de l'écorce terrestre dû au relèvement isostatique exige la révision des zéros, ou du système de référence de l'élévation, utilisé lors de la définition des niveaux d'eau dans le système des Grands Lacs et du fleuve St-Laurent à tous les 25 à 30 ans. Ce système, une des plus grandes ressources d'eau douce au monde, est partagé et ses ressources sont gérées conjointement par les États-Unis et le Canada. La révision du Système de référence international des Grands Lacs (SRIGL) exige une mise à jour comparative du SRIGL dans à peu près 125 petits ports aux États-Unis vis-à-vis les postes de contrôle établis sur chacun des Grands Lacs. Le zéro révisé est d'une importance essentielle à la mise à jour des cartes marines du NOAA et de la sécurité de la navigation, surtout en périodes d'eau basse dans les Grands Lacs. Cette affiche décrit les étapes importantes d'une révision coordonnée du SRIGL.

P4-2 – L'utilisation de solutions GPS corrigées globalement pour évaluer la viabilité du modelage hydrodynamique de la baie de Fundy

Ian Church (Université du Nouveau-Brunswick), John Hughes Clarke, Susan Haigh, Mike Lamplugh, Jon Griffin et Russell Parrott

La modélisation hydrodynamique est traditionnellement configurée pour reproduire les composantes de marée observées dans le domaine du modèle. Les observations de ce type se limitent habituellement aux rivages limitrophes du modèle et sont souvent de petites baies exclues par les étranglements qui ne sont pas résolus par la modélisation et, conséquemment ne pourraient représenter les marées au-delà du rivage immédiat. Depuis la disponibilité des élévations GPS corrigées globalement avec une précision à l'échelle du décimètre, il devient maintenant possible de valider le modèle en eau libre en comparant les variations instantanées du niveau de la mer à partir du passage de navires. Plutôt que d'effectuer des relevés à un point précis, un transect peut être effectué à travers certains points d'étranglement où on prévoit un changement rapide de la phase et de l'amplitude. Ces observations peuvent valider le modèle dans ces régions critiques. Dans le cadre des opérations de cartographie régionales de la baie de Fundy, sous l'égide du Programme des géosciences à l'appui de la cartographie marine de RNCan, cinq navires ont amassé des données GcGPS à l'aide de Fugro Omnistar HP ou du C-Nav. Le résultat des comparaisons des perturbations verticales à longue échéance (minute) de ces navires est présentée en fonction tant du modèle WebTide du plateau Néo-écossais que du modèle imbriqué à haute résolution.

P4-3 – Surveillance des changements du niveau moyen de la mer dans l'Arctique au moyen de marégraphes et de récepteurs GPS

Terese Herron (Service Hydrographique du Canada), Michael Craymer, Andrew Leyzack et Carol Robinson

Le Service hydrographique du Canada (SHC) exploite un réseau de cinq postes permanents de marégraphie dans l'Arctique canadien co-localisés avec des récepteurs GPS exploités par Ressources Naturelles Canada (RNCan). Les postes sont situés à Nain (Labrador), Qikiqtarjuaq et Alert (Nunavut), et Ulukhaktok et Tuktoyaktuk (Territoires du Nord-Ouest). Les données fournies par les jauges de niveau de l'Arctique fournissent des mesures quantitatives du niveau moyen de la mer, un niveau de base de changements climatiques; les données indiqueront les changements du niveau moyen de la mer dans le temps. Les récepteurs GPS fournissent les données pertinentes au mouvement vertical de l'écorce terrestre. Ensemble, ces deux mesures permettent de déterminer les changements absolus du niveau de la mer Arctique. Les données sont de plus utilisées pour valider les modèles d'ondes de tempêtes et pour évaluer les impacts des crues hivernales, inondations et érosion du littoral. D'une même importance, le SHC utilise ces données pour établir la relation entre le niveau moyen de la mer et le zéro des cartes, la surface de référence verticale pour toute la bathymétrie du SHC.

P4-4 – Développement des surfaces de référence verticales en zones littorales : une étude de cas sur la côte de l'Atlantique

Azadeh Koohzare (McElhanney Consulting Service Ltd.)

Depuis quelques années, nous sommes plus conscients des écosystèmes fragiles présents dans nos zones côtières et du besoin de gestion structurée et soutenue qu'engendrent ces endroits particuliers. Un des obstacles principaux que nos devons surmonter est la carence de zéros au niveau du littoral. La pratique courante est de référencer les données de profondeur à une carte marine et les données d'élévation terrestre à un zéro altimétrique. Ceci rend difficile l'analyse d'événements naturels qui se produisent dans la zone littorale, tels les raz-de-marée, l'augmentation du niveau de la mer et le réchauffement global. Le développement d'un modèle de séparation vertical permettra une assimilation plus aisée des données marines et terrestres, donnant ainsi des données verticales ininterrompues. Cette affiche examine une étude de cas effectuée sur la côte Est du Canada qui utilisait les données des marégraphes et les données GPS pour définir un modèle transformationnel entre le zéro des cartes et le zéro terrestre; ou séparation des surfaces verticale. Les données des marégraphes sur la côte Est révèlent la submergence isostatique glaciale des côtes, en plus d'autres effets globaux, régionaux et locaux qui doivent être considérés. L'affiche présente un résumé de l'analyse des données et des problèmes liés à la définition de données ininterrompues. On y propose aussi des méthodes et procédures applicables à la définition du meilleur modèle de séparation des surfaces verticale en zones côtières en réduisant les coûts à un minimum.

P4-5 – Intégration des données topographiques et hydrographiques (Terre et mer)

Mike Williams (US Army Corps of Engineers)

Collecte des données : étant situés au milieu de la côte Est de l'Atlantique des Etats-Unis, nos marées varient de 0,9 à 5,0 pieds. En tirant avantage des marées hautes et basses, nous pouvons faciliter le processus d'intégration des levés en planifiant l'horaire et le style de nos levés en fonction des marées. Lorsqu'un levé exige l'intégration des données, nous avons plusieurs méthodes à notre disposition pour assurer la correspondance et le chevauchement des données. Lorsque nous effectuons le levé hydrographique en premier lieu, nous obtenons une position cible (X, Y, Z) à l'extrémité de chaque section où le navire atteint sa limite de sondage. Ceci nous donne des points de rencontre pour le travail topographique. Ces cibles peuvent être saisies dans notre carnet de levés électronique pour nous assurer que les données correspondent et se chevauchent. Lorsque nous effectuons le travail topographique en premier lieu, nous saisissons le dernier point relevé et inscrivons ces points comme cibles dans HYPACK. Si le temps le permet entre les levés, nous téléchargeons toutes les données topographiques et générons un format de fichier compatible avec notre logiciel HYPACK (.XYZ ou .DXF par exemple). Une fois ce format créé, nous pouvons l'importer dans notre logiciel de levés hydrographiques et le consulter en temps réel, assurant ainsi la conformité et le chevauchement. Analyse des données : lorsqu'on combine des données issues de deux sources, les données de chevauchement deviennent la clé de la vérification de la qualité. La comparaison des données verticales en zones de chevauchement doit être facilement accessible et surveillée de près. Si l'information verticale et/ou horizontale ne correspond pas bien, les processus de contrôle de qualité pour les deux levés doivent être évalués. Des différences peuvent rapidement indiquer la possibilité d'erreurs telles : mauvaise calibration de l'équipement, mauvaise modélisation des, conflit de données verticales et, les erreurs. NOTE : puisque le bilan d'erreurs est plus élevé dans le travail hydrographique acoustique que dans les méthodes topographiques, les données topographiques sont habituellement plus précises. Malheureusement, ceci n'exclut pas la possibilité d'erreurs.

Session 5 - Intégration et gestion de données, problèmes et solutions 10h30-12h00 théâtre, président : Jean Gagnon (Centre canadien de gestion cadastrale)

5-1 – Une évaluation de Bathy DataBASE de CARIS en tant que solution de gestion de données bathymétriques pour SHC Québec

Jean-Guy Nistad (Centre Interdisciplinaire de développement en cartographie des océans), Karen Cove, Frédéric Lavoie

Une solution de gestion des données bathymétriques a été retenue par la division du Québec du Service hydrographique du Canada (SHC) comme étant l'élément qui manquait lors de la transition entre le cheminement de travail axé sur les fichiers et le cheminement axé sur les bases de données. En réponse à ce besoin, un projet pilote a été mis sur pied par le SHC région du Québec et le Centre interdisciplinaire de développement en cartographie des océans (CIDCO) afin d'évaluer la solution offerte par la base de données Bathy DataBASE de CARIS. Les objectifs du projet pilote étaient de déterminer si Bathy DataBASE pouvait fournir une solution efficace lors du chargement, de la gestion, de l'extraction et de la diffusion des données bathymétriques de SHC Québec. Les critères d'évaluation étaient le rendement, l'intégrité des données et la robustesse du système. Cette communication décrit cette évaluation et les points à examiner lors de l'intégration du Bathy DataBASE dans le cheminement de travail du SHC région du Québec. Une meilleure compréhension des capacités actuelles et des limites de la base de données Bathy DataBASE donnent comme résultat une meilleure intégration des systèmes et une utilisation optimale du système.

5-2 – Intégration des produits de données hydrographiques dans un SIG global

António Calado (EMEPC), Manuel Abreu et Rogério Chumbinho

La morphologie des fonds marins est un des sujets privilégiés de la recherche océanique. Il existe toutefois certains problèmes liés à la diffusion de cette information. Les SIG axés sur le Web pourraient jouer un rôle important dans l'amoindrissement du problème en éliminant certaines barrières qui existent entre les données et les usagers éventuels. Web-SIG peut effectivement maximiser le potentiel des données hydrographiques, donnant ainsi un jeu d'outils d'exploration de l'information, rendant ainsi plus facile la diffusion de plusieurs produits hydrographiques et, ainsi, permettant aux usagers d'adjoindre ces produits à leurs propres données géoréférentielles. Cette étude examine l'utilisation de Web-SIG comme outil de diffusion des produits hydrographiques, tout particulièrement ceux touchant les fonds marins extracôtiers du Portugal. Les données originale ont été recueillies par le groupe de travail portugais sur l'extension du plateau continental (EMEPC) et les produits générés incluent non seulement des données 2D mais aussi des données 3D. Les principaux produits générés sont des fichiers KML qui peuvent être consultés à l'aide de systèmes de visualisation géographiques globaux tels Google Earth ou World Wind de la NASA. Appuyés par Web-SIG certains liens menant à d'autres objets ont été créés comme par exemple les objets Fledermaus, permettant diverses manières d'interagir avec les données tout en donnant la possibilité d'examiner leurs caractéristiques morphologiques. Mots clés : SIG, KML, Google Earth, Fledermaus, fonds marins, produits hydrographiques.

5-3 – Fichier source de caractéristiques composites : simplification de l'hydrographie à proximité des côtes

Kyle Ward (NOAA) et Megan Palmer

Effectuer des levés le long des côtes escarpées et rocheuses de l'Alaska et du Nord-Ouest du Pacifique peut s'avérer une tâche complexe, voire même dangereuse. Les levés précis des caractéristiques marines le long des côtes sont essentiels à la sécurité et à la protection de l'environnement côtier et marin. Le processus compliqué d'effectuer des levés dans ces zones a été simplifié en fournissant aux équipes sur le terrain un fichier source composite des caractéristiques produit à partir de technologies d'intégration et de chargement des données (ETL). Auparavant, la foule de sources d'information sur les caractéristiques littorales – incluant les cartes matricielles et numériques, les levés hydrographiques antécédents, les fichiers de données aériens et satellitaires des zones littorales et Lidar, ont compliqué la tâche de valider ou d'invalider ces caractéristiques. L'analyse et la manipulation de ces sources sous des formats divers, afin de les intégrer à un format utile est une tâche longue et complexe, souvent effectuée par le personnel embarqué. Cette communication examine les procédés utilisés pour manipuler ces sources d'information afin de les intégrer dans un fichier répondant à la norme S-57 de l'OHI avant de les livrer aux équipes sur le terrain. Ce fichier peut par la suite être facilement intégré aux systèmes de traitement et de collecte embarqués. Les économies au niveau de l'intégrité des données et au niveau du temps seront de plus examinées.

5-4 – Le Réseau hydro national (RHN)

Yves Belzile (Ressources naturelles Canada)

Le Réseau hydro national (RHN) est la couche hydrographique de la GéoBase. Le RHN utilise les meilleures données de base au Canada pour fournir un jeu de données capable de supporter les applications d'analyse spatiale de réseau. Au-delà des éléments qui définissent traditionnellement l'hydrographie sur les cartes de base, le RHN regroupe les données sur la base de bassins versants, ajoute un réseau de filamentaires avec sens d'écoulement, lie les toponymes aux entités hydrographiques en créant du fait même les routes hydrographiques, et permet l'association d'éléments reliés sous la forme d'événements en segmentation dynamique (Système de Segmentation Dynamique - SSD) sur le réseau. Le RHN est défini par une Norme nationale développée en consultation avec la communauté et adoptée formellement par le COCG. Les premières données RHN sont disponibles sur le site GéoBase depuis le 1er octobre 2007 et une première couverture nationale sera réalisée en 2008. Le RHN est un effort collaboratif à coûts partagés entre les gouvernements fédéral, provinciaux et territoriaux. La présentation décrira la stratégie de mise en ouvre du RHN, fera un état de la situation et discutera des principaux défis et étapes à venir.

Exposition d'affiches 5 - 12h00-13h00 Salle d'exposition

P5-1 – Ajustement de la cartographie marine de la norme ED50 à la norme ETRS89 dans un environnement de production de bases de données

Aldino Campos (EMEPC), Virgilio Chim, Ana Navarro et Fernando Artilheiro

La Portuguese Cartographic Authority a récemment mis sur pied un nouveau système géoréférentiel basé sur le Système de référence terrestre européen de 1989 (ETRS89). Afin d'établir un lien avec la série nationale de cartographie marine, plusieurs techniques d'ajustement ont été examinées par le Portuguese Hydrographic Institute (IHPT) afin d'effectuer la migration des données de la norme ED50 à la norme ETRS89. Même s'il existe plusieurs techniques pour effectuer cet ajustement, L'option que nous vous présentons permet de calculer les valeurs de correction pour tous les sommets cartographiques (tels les points, lignes et polygones) en plus d'estimer le facteur d'incertitude. L'ajustement suggéré comporte deux étapes : la première exige l'établissement d'un modèle géostatistique qui présente les différences réelles entre les coordonnées transformées (de ED50 à ETRS89) et les coordonnées relevées sur le terrain (ETRS89 « à l'état pur »). Ce modèle est raffiné à l'aide de données différentielles choisies jusqu'à ce que les zones examinées ne présentent qu'un facteur d'incertitude négligeable. La deuxième étape comporte l'extraction des ordonnées qui composent une cartographie géométrique basée sur la base de données CARIS HPD (Oracle Spatial Object), l'analyse de ces valeurs vis-à-vis le modèle géostatistique et l'ajustement local des coordonnées appartenant à une géométrie unique (chaque coordonnée possède son propre point d'ajustement). Cette affiche présente la technique géostatistique utilisée lors de l'ajustement des produits cartographiques actuels (non seulement les cartes marines officielles), à partir des normes traditionnelles ED50 jusqu'à la norme ETRS89. Elle présente de plus l'approche technologique, les avantages et contraintes qui font partie de la mise en place de cette solution dans la base de données de production cartographique de l'IHPT.

P5-2 – Conciliation de levés riverains multiples en une seule base de données cartographique

David Dodd (Université du Southern Mississippi)

Au cours de six dernières années, les étudiants en sciences hydrographiques de l'Université du Southern Mississippi, ont effectué cinq levés bathymétriques sur la rivière Pearl au Mississippi. Les levés, effectués sur diverses portions de la rivière, ont été combinés pour donner une couverture complète de la rivière à partir du Stennis Space Center jusqu'à l'embouchure, une distance d'à peu près 30 kilomètres. Chacun des cinq levés a été effectué en tant que projet final pour les finissants de l'année. Les levés ont été effectués avec un minimum d'information des années précédentes telle l'étendue des projets et les leçons apprises. Chaque classe a dû établir les zéros des cartes à partir de l'observation des niveaux d'eau pour produire les CMN. Ainsi, on dénote une lacune au niveau de la continuité altimétrique et des chevauchements des CMN. La classe de cette année (2008) a compilé toutes les données de profondeur pour en arriver à une seule base de données CMN et carte papier en utilisant les données de toutes les années antérieures. Cette affiche examine les processus utilisés pour compiler les levés disparates des cinq dernières années en une base de données pour livrer un seul produit pour la production des les CMN et des cartes papier. Elle examine les problèmes causés par l'utilisation de données verticales variées, dans un environnement riverain affecté par les marées et, comment l'utilisation d'un ellipse axé sur les données GPS est utilisé pour résoudre ces problèmes. Elle examine de plus de quelle manière l'utilisation des surfaces de profondeur, extraites de chaque levé, ont été compilées pour créer un jeu de données hypsométriques et de profondeur ininterrompu.

Session 6 - Cartographie de la terre à la mer - II 13h00-14h30 théâtre, président : Dick Pickrill (Ressources naturelles Canada)

6-1 – Fusion des données hydrographiques et topographiques dans la cartographie des zones littorales

Emily Masry (CARIS) et Andrew Hoggarth

Puisque les changements climatiques soulèvent des problèmes en zones littorales, le besoin d'une cartographie précise et utile des ces régions se fait valoir de plus en plus. Ces besoins ont fait valoir les questions de fusion des données spatiales terrestres et maritimes, puisque ces jeux de données sont associés à des normes qui affichent des anomalies. Les anomalies entre les échelles de données, la symbologie et les données verticales provoquent des problèmes d'intégration des données lorsque celles-ci sont intégrées pour créer une représentation de la zone côtière. La combinaison des technologies de bases de données spatiales topographiques et hydrographiques sera utilisée pour résoudre les problèmes d'intégration de données terrestres et maritimes par le biais de représentations multiples d'objets sur une surface cartographique ininterrompue. Un modèle qui inclut tant les objets topographiques qu'hydrographiques sera utilisé afin d'illustrer la manière d'éliminer les anomalies entre ces deux jeux de données. L'approche illustrée appuiera l'intégrité de chaque jeu de données et permettra une mise à jour plus aisée des données cartographiques en tant qu'objets géométriques qui ne seront révisés qu'une seule fois afin que toutes leurs représentations graphiques soient mises à jour.

6-2 – Intégration de la bathymétrie multifaisceau et de levés Lidar dans la baie de Fundy au Canada

Russell Parrott (Ressources naturelles Canada), Brian Todd, John Hughes Clarke, Jonathon Griffin, Bruce MacGowan, Michael Lamplugh et Timothy Webster

Les navires canadiens équipés de systèmes de bathymétrie multifaisceau sont populaires auprès du Service hydrographique du Canada (SHC) et des chercheurs de la Commission géologique du Canada (CGC) Pendant plusieurs années, le temps pour effectuer des levés géologiques était attribué en blocs relativement petits de 10-20 jours afin de permettre au plus grand nombre possible de requérants de faire la collecte de données bathymétriques multifaisceau. Ces levés couvrant de petites zones ont fourni un aperçu fascinant de la diversité des fonds marins du plateau continental du Canada sans toutefois fournir le contexte régional requis à la compréhension complète des caractéristiques découvertes. En 2006, la CGC, conjointement avec le SHC et plusieurs universités, a entrepris un programme de trois ans visant à cartographier la baie de Fundy sur la côte Est du Canada. La baie de Fundy possède les plus hautes marées enregistrées au monde avec une amplitude maximale d'à peu près 17 mètres au fond de la baie. La vélocité des courants tidaux, qui dépasse 4,5 mètres/s dans certains passages étroits de la baie pourrait être exploitée à des fins hydro-électriques. Actuellement, des données bathymétriques multifaisceau couvrant une surface d'à peu près 10 000 km2 on été collectées dans la baie. Des données sur le sous-sol du fond ont été amassées simultanément afin d'obtenir de l'information sur la nature et l'épaisseur des sédiments. Des levés ont été effectués sur de grandes zones découvrantes à l'aide de lasers terrestres aéroportés (Lidar), donnant ainsi l'occasion de produire une carte ininterrompue des zones marines, intertidales et terrestres. SHC apportera des améliorations aux cartes de navigation et le CGC intégrera l'information extraite des levés géophysiques, des échantillons du fond marin, phots et transects vidéo afin de produire des cartes géologiques superficielles et d'habitats benthiques. Ces cartes à l'échelle de 1 :50,000 seront publiées dans le cadre de la nouvelle série de cartes marine nationales du Canada. La présentation portera sur l'état du projet après deux ans de collecte de données, les défis et les plans d'avenir pour ce projet et une interprétation des données les plus récentes.

6-3 – Comparaison du Lidar et de la bathymétrie acoustique au moyen de l'erreur totale accumulée (total propagated error [TPE]) et de l'algorithme Combined Uncertainty and Bathymetry Estimator (CUBE)

Carol Lockhart (Fugro Pelagos), Douglas Lockhart et Jose Martinez

En août 2007, dans la baie Shilshole, à Seattle, Fugro Pelagos a, pour le compte du bureau d'hydrographie côtière (Office of Coast Survey [OCS]) de la NOAA, rassemblé des données à l'aide du système bathymétrique Lidar SHOALS-1000T. Les données ont été recueillies à divers espacements entre les points, altitudes et périodes du jour variés, au-dessus d'un secteur auparavant étudié avec un échosondeur multi-faisceaux 8101. Le secteur visé contenait des cibles de taille connue, qui avaient été construites et déposées sur le plancher océanique en 2004 par Fugro Pelagos. Antérieurement, lors des comparaisons de jeux de données Lidar à d'autres jeux Lidar ou à des jeux de données acoustiques, on a toujours supposé qu'un jeu de données de contrôle est en dernier ressort correct et sans erreur, toute erreur étant attribuée au second jeu de données. Par conséquent, les méthodes d'analyse de surface et d'objectifs ont toujours été teintées de subjectivité. Toutefois, l'emploi de l'erreur totale accumulée (total propagated error [TPE]) prend en compte le fait que chaque profondeur ou point d'élévation est une estimation associée à une incertitude. Les incertitudes peuvent alors être utilisées par l'algorithme Combined Uncertainty and Bathymetry Estimator (CUBE) pour définir une surface bathymétrique, ce qui constitue d'ailleurs maintenant une norme à respecter pour le bureau d'hydrographie côtière de la NOAA. Cette communication décrit comment l'erreur totale accumulée et l'algorithme Combined Uncertainty and Bathymetry Estimator (CUBE) ont été utilisés initialement pour comparer des jeux de données bathymétriques Lidar et des jeux de données acoustiques. Elle passe en revue les difficultés affrontées pendant le développement du processus, les paramètres utilisés et les résultats des analyses.

6-4 – Applications multiples du Lidar bathymétrique

James Guilford (Tenix LADS, Inc.) et Megan Palmer

Cette présentation examine les applications multiples du LIDAR bathymétrique mises en place par une seule agence, la NOAA, et des avantages de tirer des jeux de données multidisciplinaires à partir d'une seule source de levés. Les progrès de la technologie bathymétrique LIDAR permettent maintenant aux hydrographes d'examiner la zone littorale d'une façon plus détaillée en complétant les données bathymétriques traditionnelles (xyz) avec la hauteur topographique, l'imagerie numérique et les données de réflectance du fond. L'utilisation faite par NOAA du LIDAR est surtout axée sur la cartographie marine mais, la demande croissante pour des données connexes relevées près des côtes, ainsi que les coûts élevés associés aux levés en eau peu profonde, ont stimulé le progrès technologique. Parmi les facteur principaux de la compilation d'un jeu de données de haute qualité utile à plusieurs disciplines on compte : la planification du projet, les formats d'échange, les références, et la diffusion de l'information. Le concept d'effectuer des levés pour des utilisateurs multiples, dont les disciplines de cartographie du littoral, cartographie de l'habitat, les pêches, et la modélisation d'inondations est une tâche qui représente plusieurs défis mais qui, en bout de ligne s'avère une méthode efficace et efficiente d'effectuer des levés.

Exposition d'affiches 6 - 14h30-15h00 Salle d'exposition

P6-1 – Éliminer la limite terre-mer à l'aide du Lidar bathymétrique SHOALS

Eric Yang (Optech, Incorporated), Michael Sitar, Wenbo Pan et Karen Francis

L'extraction de données de profondeur en eau peu profonde à l'aide de données bathymétriques Lidar a toujours représenté un certain défi. Optech a pu en grande partie surmonter l'obstacle auquel devait faire face son bathymètre Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) en développant un algorithme qui permet d'extraire les retours du fond vers la surface en zones de moins de 1,5 m de profondeur, créant ainsi des jeux de données pratiquement ininterrompues à l'interface terre/mer.

La solution SHOALS de Optech a fait ses preuves au niveau de la collecte de données dans des eaux claires de 1,5 à 50 mètres. Toutefois, cet algorithme traditionnel d'enregistrement de la profondeur connaît des limites en eau très peu profonde et/ou turbide où les signaux Lidar de la surface et du fond se confondent. Ces limites inhibent les sondages Lidar ininterrompus à la limite terre/mer et limitent une utilisation plus grande des bathymètres laser dans les eaux intérieures et le long de côtes à petits fonds.

Historiquement, on a tenté plusieurs approches pour essayer de récupérer les points Lidar en eaux peu profondes, mais avec un succès mitigé. Toutefois, au cours des deux dernières années, on a fait du progrès au niveau des algorithmes destinés à l'évaluation des eaux peu profondes, démontrant ainsi la capacité de sondage du Lidar aéroporté en eaux très peu profondes ainsi que son application lors de la génération de données de profondeur ininterrompues le long des limites terre/mer.

Une étude de cas de données recueillies dans le golfe du Saint-Laurent au Québec sera présentée où des mesures de profondeur bathymétriques Lidar ont été obtenues dans des passages fluviaux et dans des marais. Nous présenterons une analyse des capacités du système Lidar bathymétrique SHOALS dans un environnement d'eaux intérieures. Plus particulièrement, nous examinerons les défis que comportent la délinéation complexe des limites terre-mer en eaux peu profondes.

Session 7 - Données sur la nouvelle clientèle 15h00-16h30 théâtre, président : Gerd Glang (National Oceanic and Atmospheric Administration, États-Unis)

7-1 – La vulnérabilité humaine et les changements climatiques : une évaluation de la vulnérabilité de la population du Grand Vancouver à l'augmentation du niveau de la mer en 2100

Emily Nixon (Ministère de la santé, CB)

La vulnérabilité de l'espèce humaine aux changements climatiques est une source d'inquiétude grandissante à l'échelle globale. Cette dissertation analyse et évalue la vulnérabilité de la population du Grand Vancouver à l'augmentation du niveau de la mer en 2100. Afin de faciliter la compréhension de cette étude, la dissertation parcourt quatre objectifs. Premièrement, un cadre conceptuel est établi pour évaluer la vulnérabilité humaine. Deuxièmement, des projections modélisées de l'augmentation du niveau de la mer en 2100, tirées du Groupe d'experts intergouvernemental sur l'évolution du climat, Rapport de la quatrième évaluation et Overpeck et Otto-Bliesner (2006) sont utilisés pour représenter le scénario de la réussite, le pire des scénarios et les scénarios catastrophiques. Troisièmement, des techniques de cartographie SIG sont utilisées pour représenter visuellement les niveaux de vulnérabilité et l'augmentation du niveau de la mer dans la région du Grand Vancouver. Enfin, des recommandations sur la planification future des communautés basées sur les politiques et des mesures d'atténuation sont proposées en se fonction des constatations précédentes. De plus, on discute des limites, des critiques éventuelles et des défis associés à cette recherche. Enfin, on dégagera les objectifs futurs de ce projet, dans l'espoir que cette recherche se poursuive. Le travail se poursuit sur ce projet afin d'étudier son application à l'évaluation de la vulnérabilité humaine aux tremblements de terre. Cette portion du projet de recherche devrait être complétée en janvier 2008 et devrait appuyer la recherche déjà complétée.

7-2 – Une approche introspective pour permettre la découverte, la compréhension et l'utilisation appropriée des données hydrographiques de la NOAA par de nouveaux clients

Jeremy McHugh (NOAA), Dan Neumann, John Tucker et James Hiebert

Les données de levés hydrographiques sont acquises à grands frais et peuvent être extrêmement utiles dans des cadres qui dépassent celui de la cartographie marine. La clé de l'utilisation la meilleure et la plus étendue repose sur la qualité et l'accessibilité de ces métadonnées. Le document de métadonnées standard pour les levés hydrographiques de la National Oceanic and Atmospheric Administration's (NOAA) est, et a toujours été un rapport au style narratif qui accompagne chaque levé. NOAA est à développer un moyen efficace de créer une nouvelle génération de rapports XML afin d'atteindre de façon constante, pour ces rapports, des niveaux plus élevés de qualité et d'utilité, et de satisfaire plus facilement aux exigences internes et externes relatives aux métadonnées. NOAA a réexaminé les exigences au niveau du contenu de ses rapports et a codé ses exigences internes au niveau des métadonnées dans des schémas XML. Les schémas pour les métadonnées externes sont en voie de développement. Notre objectif final est de voir nos schémas internes inclus dans un surensemble de métadonnées qui sera conforme à la norme 19193 de l'Organisation internationale de normalisation (ISO) et à la norme des métadonnées géospatiales numériques du Federal Geographic Data Committee. Cette communication présentera le développement des schémas XML qui contiendront les métadonnées requises à l'interne du NOAA et le développement de l'interface de logiciels utilisés pour garnir ces schémas.

7-3 – Les complexités de la conception et de la définition du jeu de données de l'Atlantique du Nord-Ouest : la recherche d'une architecture rationnelle pour implanter des données bathymétriques variées.

Herman Varma (Service hydrographique du Canada), Gerard Costello, Ron MacNab, Tobias Spears et Christine Delbridge

Une base de données bathymétrique moderne doit pouvoir accepter et intégrer toute sortes de données bathymétriques en un tout compatible, précis et intelligible. Dans certains cas, les données sont un assemblage de sondages de profondeur qui incluent des données de position horizontales et le temps d'échantillonnage de chaque point de données. Ces données doivent être stockées d'une manière qui tient compte de la nature variée des mécanismes de collecte sans toutefois surcharger la capacité de mémoire de l'organisme. Sous autres circonstances, les données bathymétriques sont des données rectangulaires où les informations temporelles sont perdues et où le facteur d'incertitude prend une certaine importance dû au processus de maillage; Le but de cette communication est de présenter une architecture statistique qui vise l'harmonisation de deux scénarios connus sous le nom de format VCH, conçus et développés par le Service hydrographique du Canada, Pêches et océans Canada et Ressource Naturelles du Canada, région de l'Atlantique. Le jeu de données couvre les données thymétriques de l'Atlantique du Nord entre 1758 et 2006, incluant les données de champs numérisées, données faisceau simple, multifaisceau, Lidar et données rectangulaires sous des spécifications VCH communes. L'architecture VCH permet de stocker des données de densités variables afin de minimiser la capacité de stockage requise tout en maintenant la résolution et les statistiques de la source. Un système de diffusion Internet est en voie de création. Il inclura des outils de recherche automatisés et un regroupement statistique qui permettra d'extraire les statistiques des données selon les échelles d'extraction que nous pourrons définir.

7-4 – Infrastructures marines géospatiales : cheminements et normes

Emily Masry (CARIS)

Cette communication étudie certains des cheminements de travail qui font partie de l'établissement d'une infrastructure de données géospatiales marines qui peuvent prendre en charge l'information hydrographique et faciliter son intégration dans une infrastructure marine géospatiale. Elle décrit le besoin de découvrir les données existantes afin de permettre la planification et la réalisation efficace de levés hydrographiques. Elle examine de quelle manière les données recueillies sur le terrain doivent se retrouver à l'agence responsable de leur stockage et de leur découverte subséquente. Cette information marine se retrouvera dans une seule base de données interexploitable à laquelle diverses applications géospatiale, ou clients, peuvent avoir accès. La communication décrit de quelle manière les clients lourds peuvent accéder à la base de données à des fins de contrôle de qualité, par le biais de formats industriels standardisés tels OHI-57 et la grille bathymétrique (BAG), ou via des clients Web plus légers pour explorer et télécharger des données par le biais de formats Open Geospatial Consortium, Inc.® tels que WMS et WFS. Toutes les données inscrites à l'infrastructure de données géospatiales marines seront associées à des métadonnées qui faciliteront leur découverte; La norme ISO 19115 en sera la base mais il est reconnu qu'elle ne va pas assez loin au niveau des normes de données marines. Cette communication examine la possibilité d'étendre la norme 19115. La saisie des métadonnées et la découverte ultérieure des données dans l'infrastructure de données géospatiales marines se feront par le biais d'un seul portail. Ce portail fonctionnera à partir des technologies de mappage et de catalogage Web les plus récentes. Enfin, la communication présentera un concept de gestion de cheminement du travail comme outil pour les intervenants qui veulent interagir avec l'infrastructure de données géospatiales marines et pour assurer la qualité, la cohérence et l'intégralité du cheminement des données marines.

Session 8 – Application de l'arpentage et de la cartographie à d'autres disciplines 08h30-10h00 théâtre, président : John Anderson (Pêches et Océans Canada)

8-1 – Cartographie de l'habitat en Colombie-Britannique avec classification acoustique des fonds marins.

James Galloway (Service hydrographique du Canada), James Parks et Ralph Loschiavo

Le Service hydrographique du Canada (SHC) effectue un levé cartographique bathymétrique côtier systématique en Colombie-Britannique. Les systèmes multifaisceau utilisés pour saisir ces données bathymétriques haute résolution saisissent de plus les données de rétrodiffusion acoustique pour chaque faisceau. Cette rétrodiffusion peut être classifiée à l'aide de logiciels commerciaux afin de cartographier en détail la géomorphologie des fonds marins. Essentiellement, les plates-formes de levés bathymétriques du SHC sont opportunes pour les programmes de cartographie des habitats. La rétrodiffusion acoustique répond bien à la structure d'habitats dans la zone benthique parce qu'elle est sensible aux composantes géologiques et biotiques sur (et sous) le sol marin. La modélisation des habitats benthique est une composante essentielle du portrait global de l'écosystème et aspect vital de la philosophie moderne de gestion des habitats. La rétrodiffusion classifiée n'est pas en soi une mesure utile mais, lorsque calibrée en fonction des sédiments et d'échantillons de la population demersale, un portrait de l'habitat devient apparent. Toutefois, il existe des questions d'échelles et autres facteurs qui affectent la précision avec laquelle on peut utiliser la diversité acoustique lors de la représentation de l'écosystème. Le SHC utilise des échantillons de sédiments, des vidées du sol marin et la bathymétrie haute résolution pour valider les classifications acoustiques. Le bassin de Géorgie fait actuellement l'objet de ce programme de cartographie de l'habitat et le travail sur quatre zones correspondant à des cartes SHC est presque terminé.

8-2 – L'inter-étalonnage de jeux de données de rétrodiffusion multi-sources et multi plates-formes dans la compilation de cartes régionale des types de sédiments : la baie de Fundy

John Hughes Clarke (Université du Nouveau-Brunswick), Kashka Iwanowska, Russell Parrott, Garrett Duffy, Mike Lamplugh et Jon Griffin

La baie de Fundy fait l'objet de cartographie multifaisceau depuis 1992 dans le cadre d'une série de projets locaux et, au cours des deux dernières années dans le cadre d'un projet régional majeur. Parmi les capteurs de données on compte les EM1000, EM3000, EM1002, EM3002, EM710 avec des fréquences centrales réparties entre 70 et 300 kHz. Toutes les données sont acquises en utilisant le processus standard de réduction des données de rétrodiffusion Kongsberg qui doit en principe générer des estimés de la puissance de la rétrodiffusion du fond marin, idéalement, une propriété inhérente du fond marin. Afin d'obtenir cette réduction des données, on doit utiliser des hypothèses sur le niveau absolu de la source, la durée de l'impulsion, le gain du récepteur en termes absolus et variables dans le temps, les coefficients d'atténuation dus à l'eau de mer ainsi que la sensibilité d'émission et de réception du sonar. À cause du facteur d'incertitude inhérent à ce qui précède, la valeur de sortie standard n'est effectivement qu'une mesure relative. La cohérence inter-levés est donc médiocre. Une méthode par laquelle on peut choisir une référence arbitraire (configuration matériel/logiciel du sonar) qui servirait, par chevauchement, à ajuster tous les autres levés est requise. Pour chaque configuration, des ajustements particuliers doivent être effectués aux deux niveaux absolus, aux variations selon l'angle, selon les réglages de durées d'impulsion. Il faut de plus utiliser des correctifs pour les coefficients d'atténuation appliqués. Lorsque toutes ces corrections ont été apportées, une deuxième ronde d'ajustements est requise pour tenir compte des formes spatiales variables des courbes de réponse angulaires inhérentes du fond marin.

8-3 – Application de la bathymétrie multifaisceau à la cartographie géologique

John Shaw (Ressources naturelles Canada)

Les données de bathymétrie multifaisceau sont utilisées par la Commission géologique du Canada (région de l'Atlantique) depuis le milieu des années 90. Ces données ont été appliquées à une foule de questions liées à la recherche incluant l'historique des changements du niveau de la mer, l'historique glaciaire, l'impact de l'homme sur les fonds marins et l'étude des habitats benthiques. Après une période initial où les images tirées des données multifaisceau se sont trouvées dans des affiches, ou des publications scientifiques, les chercheurs ont développé une nouvelle approche à la production de cartes. Les cartes standard 1 :50 000 de Série A dérivées de données bathymétriques multifaisceau sont :

1. Topographie du fond marin en relief ombragé;
2. intensité de la rétrodiffusion; et
3. géologie superficielle.

Des exemples de ces cartes de régions du Canada de l'Atlantique seront présentés. On examinera aussi les méthodes d'extraction et d'affichage de la rétrodiffusion ainsi que celles utilisées dans la fabrication des cartes de géologie superficielle. La Commission géologique du Canada examine aussi un nouveau type de carte : la carte de « Paysage marin ». Les unités de cette carte sont définies en tant qu'entités définies avec des attributs particuliers au niveau de la morphologie, texture des sédiments et du biote. Ce type de carte pourrait servir de lien entre l'approche de géologie superficielle et les exigences au niveau de la gestion des habitats benthiques.

8-4 – SHOALS3000 - Effectuer des levés au-dessus de champs de végétation aquatique denses – quantifier et identifier les problèmes de repérage du fond

P. Kuus (Ocean Mapping Group, Université du Nouveau-Brunswick), John Hughes Clarke et Steve Brucker

Lorsqu'une zone de levés est peuplée d'éléments biologiques, tels le varech et les zostères marines, l'efficacité de la portée des Lidar est mise à l'épreuve. La végétation aquatique peut provoquer des erreurs de repérage du fond ou même l'absence d'un signal de retour optique. Dans le premier cas, on se trouve avec des signaux de hauts-fonds factices, et dans le deuxième cas, avec des trous dans les données. Ce dernier résultat est plutôt inquiétant puisque des dangers à la navigation, recouverts de flore marine, pourraient apparaître sous forme de trous dans les données alors qu'on attribue habituellement leur cause à la profondeur d'extinction Lidar. Avec des données de réalité de terrain (photographie sous-marine et données acoustiques, par exemple), la présence de végétation ou sa localisation en zone pélagique peuvent être déterminées, même si ces jeux de données ne sont pas habituellement disponibles lors de levés Lidar. L'ajout des données de formes d'ondes caractérisées au laser vert SHOALS3000 fournit une méthode de validation des sondages Lidar. Cette communication présente une évaluation des résultats de l'utilisation du Lidar SHOALS3000 lors du repérage du fond en zones de végétation submergée ainsi qu'une façon d'identifier les faux retours de fond.

Exposition d'affiches 8 - 10h00-10h30 Salle d'exposition

P8-1 – Une évaluation qualitative de deux techniques d'analyse de données de rétrodiffusion de deux échosondeurs multifaisceau

Lorraine Robidoux (NOAA), Luciano Fonseca et Glenda Rathwell

La caractérisation du sol marin, la description et l'identification de ses propriétés physique est une composante essentielle de plusieurs domaines importants d'activités marines, incluant la gestion des habitats marins pour les pêches, la gestion des récifs de corail et les études géologiques marines. Les méthodes de classification typiques des sols marins utilisent des données tirées de relevés au sol, de données d'échosondage multifaisceau et de sonar à balayage latéral. Une foule de techniques d'analyse de la rétrodiffusion des systèmes multifaisceau pour la classification des sols marins ont été proposées récemment. Deux des techniques les plus populaires, l'Analyse de la portée angulaire (ARA) mise au point par le Center for Coastal and Ocean Mapping (CCOM) de l'Université du New Hampshire (UNH) et la paramétrisation statistique des amplitudes de rétrodiffusion du système MultiView de Quester Tangent Corporation fonctionnement sur des principes fondamentalement différents. Cette affiche évalue les deux méthodes au niveau de leur efficacité lors de la classification des sols marins tout en les comparant pour extraire leurs forces et faiblesses respectives. Les résultats démontrent que les deux techniques sont efficaces en ce qui touche la délinéation de différences éminentes entre les types de fonds marins et que les deux s'accordent sur les données de réalité de terrain. On a pu observer des différences mineures entre les résultats des deux techniques en régions avec des talus prononcés et dans les zones de transition.

P8-2 – Cartographie du plateau continental intérieur et investigation archéologique du paysage submergé : investigation des sites en collaboration entre l'Irlande et Terre-Neuve-et-Labrador

Kieran Westley (Université Memorial, Terre-Neuve-et-Labrador), Rory Quinn et Trevor Bell

L'augmentation globale du niveau des mers depuis la dernière période glaciaire a inondé les plates-formes continentales autour de la terre et, ce faisant, inondé les sites archéologiques qui y étaient situés. La localisation de ces spécimens est une tâche complexe qui est rendue plus ardue encore par la profondeur de l'eau, la visibilité et, souvent, par l'érosion ou l'enfouissement d'un paysage autrefois émergeant. Les approches couramment utilisées sont axées sur la prédiction des emplacements des sites en se basant sur les préférences humaines antérieures et sur les conditions locales de préservation afin d'identifier les zones présentant un fort potentiel archéologique. Cette approche exige cependant une connaissance du paysage qui doit être généré à partir de levés du fond marin (échosondage multifaisceau) et du sous-sol marin (carottes et profils du sous-sol). Cette affiche présente le travail de reconstruction des paysages archéologiques submergés à Terre-Neuve et en Irlande. Les étapes initiales de cette approche associent les prédictions paléo-littorales tirées de modèles géophysiques aux données géologiques et géomorphologiques tirées des levés cartographiques marins. Cette démarche permettra d'identifier les caractéristiques enfouies et découvrantes du paysage passé qui pourra ensuite faire l'objet de recherches archéologiques.

P8-3 – Classification acoustique des habitats du fond marin à l'aide d'un véhicule sous-marin autonome.

John Anderson (Pêches et océans Canada), Ron Lewis, Christopher Lang, Sara Adams et Neil Ollerhead

La classification acoustique du fond marin est une technique de télédétection qui peut mapper les habitats à partir d'échelles qui vont de la plus petite aux plus grandes, et ce dans des gammes de profondeurs variées. Cette classification acoustique comprend des données récoltées à partir de transducteurs de surface où la portée des sondages et la superficie du fond marin couverte varient selon la profondeur de l'eau. Par exemple, le niveau de chevauchement spatial des ping pour un transducteur à incidence normale en mode de levés standard (par exemple un angle de faisceau de 10° à 2,6 mètres/s, 1 impulsion/s) est de 0% pour une étendue d'échantillonnage de < 30 mètres augmentant à 6% à 100 mètres et 15% à 200 mètres. Le maintien théorique de l'écart d'échantillonnage devrait améliorer notre capacité d'interpréter la rétrodiffusion acoustique lorsque des levés sont effectués sur plusieurs niveaux bathymétriques. On étudie ici l'effet d'un taux d'échantillonnage constant sur la classification du fond marin en utilisant un véhicule sous-marin autonome dans les eaux côtières de Terre-Neuve. Dans la zone d'étude, la profondeur variait de 20 à 200 mètres. Le véhicule sous-marin autonome a été piloté à une profondeur constante de 5 mètres comparativement à une portée d'échantillonnage de 50 mètres. Les classifications non supervisées basées sur ces méthodes de levés seront présentées.

Session 9 – Voies de communication sûres et accessibles 10h30-12h00 théâtre, président : Rick Bryant (British Columbia Chamber of Shipping, Canada)

9-1 – Levé de la route intérieure du Nord du Labrador

Michael Lamplugh (Service hydrographique du Canada))

L'an dernier, 2007, devait être la dernière année d'un programme triennal visant à effectuer des levés de la côte entre Cape Mugford et Cape Chidley, une région accidentée et infestée de hauts-fonds. C'était la dernière pièce du casse-tête requise pour terminer les levés de la route intérieure de la côte du Labrador. Comme preuve de notre réussite, un navire pourrait transiter la côte entière du Labrador à l'intérieur de zones hydrographiées et toujours avoir accès à un « port de refuge ». La portion nordique des eaux internes du Labrador est une des zones côtières les plus dangereuses de la côte Est du Canada. Depuis les années 70, un des objectifs du Service hydrographique du Canada est d'assurer la production de levés de cette zone selon les normes les plus modernes.

Le navire de la garde côtière canadienne Matthew est à l'origine un navire de recherche hydrographique qui porte à son bord deux vedettes hydrographiques. La saison de levés 2007 a été d'une importance capitale pour la plate-forme de levés du Matthew puisque c'était la première fois que la deuxième vedette du Matthew (Pipit) était équipée d'équipements multifaisceau (Kongsberg EM3002). Cet appui multifaisceau (le Plover avait déjà reçu le même équipement) a amélioré l'efficacité des levés côtiers. Le Matthew lui-même utilisait la technologie haute résolution multifaisceau Kongsberg EM710. Il aurait été impossible de réaliser les levés sur la route intérieure sans cette capacité de données supplémentaires en 2007.

Cette communication présente les démarches entreprises par le SHC pour mettre à jour le Matthew selon ces nouvelles normes (initiées en 2003) tout en faisant valoir les plus beaux paysages, fjords et espèces sauvages rencontrés lors de nos expéditions.

9-2 – Utilisation d'appareils de pilotage portatifs par les pilote maritimes

Lee Alexander (Université du New Hampshire)

Il existe, sur le fleuve St-Laurent, une initiative du gouvernement fédéral visant l'amélioration de la sécurité au niveau de la navigation par le biais de l'utilisation d'équipements et de services cartographiques embarqués. De façon plus particulière, les pilotes doivent être munis de systèmes de pilotage portatifs (SPP). Un SPP est un système informatisé d'aide à la décision utilisé par le pilote lors de la navigation en eaux restreintes. Afin de prendre les bonnes décisions au sujet de l'utilisation de systèmes SPP lors du pilotage dans le système fluvial du St-Laurent, l'Administration de pilotage des Laurentides a commandé une étude afin de savoir quels SPP sont utilisés par les autres organisations de pilotage. L'étude comprenait les équipements informatiques, logiciels de visualisation des cartes marines, données des cartes numériques, accès à l'Internet, ainsi que les interfaces avec les autres détecteurs/capteurs utilisés en navigation (GPS/DGPS, systèmes d'identification automatique et STM par exemple). On y étudiait aussi les options financières et de propriété, les questions juridiques et de réglementation ainsi que les exigences au niveau de la formation et des besoins opérationnels. Les résultats de l'étude démontrent qu'il n'existe pas de système SPP « passe-partout ». Le consensus se trouve au niveau du processus de sélection et de conception du système par les pilotes plutôt qu'au niveau du système lui-même. À partir des entrevues menées auprès de pilotes en Europe et en Amérique du Nord, les pilotes savent quelle information est requise et disponible et savent de plus comment l'utiliser dans un SPP.

9-3 – Transformation des mesures d'organisation du trafic maritime pour protéger la baleine noire de l'Atlantique Nord

Paul Turner (NOAA) et Joseph Robinson

En 2007 des routes maritimes ont été déplacées et de nouvelles routes ont été établies afin de réduire le risque d'impacts entre les navires et les baleines noires de l'Atlantique Nord, une espèce en voie de disparition. Plusieurs services au sein de la National Oceanic and Atmospheric Administration (NOAA), la Garde Côtière des Etats-Unis, et plusieurs organismes gouvernementaux et non-gouvernementaux on travaillé étroitement ensemble afin de déplacer les routes maritimes dans la baie de Cape Cod, les approches de Boston, Massachusetts, et des zones critiques le long de la côte du Sud-Est des États-Unis. Des études ont été faites pour déterminer l'emplacement de routes alternatives qui réduiraient le risque d'impacts entre les navires et les baleines, tout en maintenant à un minimum l'impact sur le commerce maritime dans ces zones. Le projet a donné lieu à un compromis entre les besoins commerciaux et l'importance de la conservation marine. Cette présentation examine la complexité de la planification, de la mise sur pied, et de la cartographie des changements apportés aux routes maritimes.

9-4 – Cartographie des fonds marins de l'Arctique : traitement des levés et stratégies de distribution collaboratives

Jonathan Beaudoin (Universitédu Nouveau-Brunswick), John Hughes Clarke, Jason Bartlett, Steve Blasco et Robbie Bennett

On a récemment assisté à un renouveau de l'intérêt politique à cartographier le nord du Canada. Citons le Discours du Trône d'octobre 2007 : «Toujours dans une perspective d'affirmation de notre souveraineté, notre gouvernement dressera pour la première fois la carte complète du plancher océanique de l'Arctique canadien.» Le Service hydrographique du Canada, la Commission géologique du Canada et le programme RCE de ArcticNet effectuent des levés dans l'Arctique depuis plusieurs années et ont recueilli une quantité considérable de données. La clientèle actuelle utilise ces données à des fins de navigation, d'ingénierie et de gestion des ressources naturelles et des habitats benthiques. Ainsi, des produits qui dépassent les cadres des produits « profondeur minimum », incluant la géomorphologie, la rétrodiffusion superficielle et les données du sous-sol du fond doivent être traitées et distribuées simultanément. Il existe un besoin, au niveau des levés futurs, de réunir les jeux de données existants et de les rendre disponibles aux différents intervenants. Leur tâche sera ainsi rendue plus facile par : (1) l'élimination de la collecte de données redondantes et (2) la priorisation des zones qui doivent être relevées de nouveau (à cause de basse résolution ou de manque de précision, par exemple). Travaillant avec ArcticNet, le GOM à mis au point un modèle de distribution des données ouvert qui permet la consultation sur le Web et l'extraction du jeu de données de ArcticNet. Puisque le modèle a été conçu pour répondre aux divers besoins des nombreuses parties impliquées dans ArcticNet, ces idées peuvent être adaptées aux besoins des nombreuses agences sur lesquelles sera dévolue la tâche de cartographier les fonds marins de l'Arctique du Canada.

Exposition d'affiches 9 - 12h00-13h00 Salle d'exposition

P9-1 – Services portuaires environnementaux pour les navires : une analyse comparative entre le Canada et le Panama.

AnaJulia Carreira (Carreira Pitti P. C. avocats)

La demande actuelle pour les services portuaires augmente, puisque le trafic international de marchandise transportée par navire continue de croître d'une façon exponentielle. Ceci contraint les ports à augmenter leur capacité. Ainsi, le dilemme des ports est de répondre aux normes environnementales tout en maintenant l'aspect concurrentiel des services qu'ils fournissent. Des normes environnementales portuaires plus strictes auront des conséquences économiques, commerciales et sociales dans les deux pays examinés dans cette étude, Panama et le Canada. Les stratégies portuaires de gestion de l'environnement sont surtout mises en valeur au niveau international par le biais de directives n'ayant pas de caractère obligatoire qui, même si elles ne sont pas juridiquement contraignantes, fournissent aux ports des lignes de conduite utiles lors d'une mise en place efficace de stratégies de gestion environnementales. Par la suite, les caractéristiques d'une stratégie efficace de gestion environnementale portuaire ont été analysées ainsi que les cadres de réglementation auxquels doivent se soumettre les ports canadiens et panaméens. Les services environnementaux portuaires doivent faire partie intégrante de ces stratégies de gestion environnementales. Le concept de services portuaires environnementaux pour les navires se définit comme étant les mécanismes de contrôle de pollution marine qui devraient être mis en place, conformément aux conventions internationales et politiques, lois et règlements internes, pour aider les navires à éviter la pollution marine. Les services portuaires environnementaux pour les navires comportent la mise en place de mécanismes de prévention de la pollution marine qui ont été testés et mis en place à l'échelle mondiale, afin de contrôler les conséquences environnementales associées à l'industrie du transport maritime. La provision d'installations de réception des déchets est intrinsèque au concept de services portuaires environnementaux pour les navires.

P9-2 – Satisfaire aux nouveaux besoins maritimes : modernisation des cartes marines de la côte Nord de Colombie-Britannique

David Prince (Service hydrographique du Canada)

Depuis plus d'un siècle, les marins se servent de cartes traditionnelles en papier pour tracer un parcours sécuritaire le long de la côte accidentée du Canada. Ces cartes étaient le résultat de levés exigeants en main d'œuvre, souvent avec des sondes plombées ou encore avec des échosondeurs à faisceau unique positionnées à partir d'angles de sextant. Les cartes issues de ces levés étaient souvent dessinées à la main et leur précision dépendait de celle des levés originaux.

Ces cartes faisaient l'affaire pour ce qu'était la navigation commerciale de l'époque mais, l'économie du Canada a évolué, tout comme le transport maritime côtier en Colombie-Britannique. De nos jours, le Passage Intérieur et les chenaux menant à Kitimat voient des navires de croisière, des traversiers, des vraquiers et porte-conteneurs, des navires-citernes de gaz naturel liquéfié, remorqueurs, bateaux de pêche et bientôt, des transporteurs de brut de grandes dimensions. À cause de ces changements à la circulation maritime, et à cause du besoin pour des cartes marines plus précises et plus détaillées, le Service hydrographique du Canada répond aux besoins de sa clientèle en mettant à jour les levés et les cartes marines de la région. Afin d'atteindre cet objectif, le SHC a effectué une analyse des besoins des clients afin de bien comprendre leurs besoins au niveau cartographique pour assurer une navigation sécuritaire. Une fois le projet défini, un examen approfondi de la bathymétrie du SHC a été effectué afin de déterminer les zones où des levés à meilleure échelle étaient requis. Par la suite, une planification détaillée a été effectuée afin que les levés soient effectuées dans l'ordre voulu afin respecter les horaires de production des cartes. Le SHC publiera 5 nouvelles cartes par année jusqu'à ce que les 23 nouvelles cartes soient produites. Jusqu'à présent, le SHC rencontre bien ses échéanciers avec la publication des 5 premières cartes (papier et numériques) avant le 31 mars 2008. Cette affiche examine le processus entier d'amélioration de la cartographie marine le long de ces corridors.

Session 10 – Progrès technologiques touchant le matériel et les logiciels 13h00-14h30, théâtre, président : Lindsay Gee (IVS-3D, É.-U.)

10-1 – Initiative NOAA d'évaluation et d'intégration du sonar bathymétrique à différenciation de phase pour les levés hydrographiques

Steve Brodet (NOAA), Michael Annis, Richard Brennan, Caleb Gostnell, Olivia Hauser et Jake Yoos

Le bureau d'hydrographie côtière (Office of Coast Survey [OCS]) de la NOAA a lancé en 2004 une initiative visant à mettre à l'essai et à évaluer le sonar bathymétrique à différenciation de phase (SBDP), également connu sous la désignation de sonar interférométrique, son utilisation pouvant améliorer l'efficacité de la collecte de données en eau peu profonde (c.-à-d.<20 m) et accroître la sécurité dans les eaux à proximité du rivage, tout en respectant les normes de qualité applicables à la cartographie marine. Le SBDP tient promesse et représente, en eau peu profonde, un moyen rentable d'acquisition simultanée de données par sonar à balayage latéral et par bathymétrie à des largeurs de couloir accrues par rapport au dispositif multifaisceau à tête simple utilisé traditionnellement en eau peu profonde. Cette communication définira le travail effectué et les résultats obtenus jusqu'à maintenant dans le cadre de ce processus de transition de la NOAA, en se concentrant sur la comparaison des données acquises au moyen de trois différents systèmes à différenciation de phase avec une validation bathymétrique portant sur une surface de référence commune, et décrira les plans de mise en œuvre opérationnelle.

10-2 – HISAS 1030 - Sonar interférométrique à synthèse d'ouverture à haute résolution

Terje Fossum (Kongsberg Maritime AS), Torstein Sæbø, Bjørnar Langli, Hayden Callow et Roy Hansen

Jusqu'à tout récemment, les échosondeurs multifaisceau et les sonars à balayage latéral ont technologiquement dominé dans les champs de l'imagerie et de la cartographie détaillées du fond des mers. Les sonars à synthèse d'ouverture (synthetic aperture sonar [SAS]) peuvent potentiellement atteindre un taux élevé de couverture de zone (généralement 2 km²/h) et, indépendamment de la portée, un très grand pouvoir séparateur (généralement 2 à 5 cm) sur quelques centaines de mètres. Les sonars à synthèse d'ouverture ont été conçus au départ pour satisfaire aux fortes exigences d'applications militaires comme, par exemple, la détection et la catégorisation de mines. Après quelques années, alors que leur usage se répandait, les sonars à synthèse d'ouverture ont trouvé des débouchés dans le marché civil et complété efficacement des technologies en usage, les remplaçant même parfois. Kongsberg Maritime (KM) et le centre de recherche de la Défense norvégienne (FFI) ont mis au point un sonar à synthèse d'ouverture à haute résolution doté de capacités bathymétriques et principalement destiné à l'emploi dans des engins sous-marins autonomes. Ce nouveau sonar porte la désignation HISAS1030 et il est embarqué dans l'engin sous-marin autonome HUGIN1000 de KM. Le sonar HISAS1030 peut réaliser des images détaillées à une résolution supérieure à 5 x 5 cm sur une portée de 200 m. De plus, puisqu'il constitue un système interférométrique, il lui est possible de produire des données bathymétriques à une résolution d'au-delà de 50 x 50 cm sur sa portée maximale. Cette communication décrit les principes généraux de l'imagerie et de la cartographie par sonar à synthèse d'ouverture et présente le sonar HISAS1030 ainsi que les résultats d'essais de celui-ci en conditions réelles.

10-3 – Détection automatisée des objectifs par balayage latéral : de nouveaux outils hydrographiques

Rebecca Quintal (SAIC) et John Shannon Byrne

La Science Applications International Corporation (SAIC) lance un programme de recherche et de développement en vue d'automatiser la détection des objectifs de levés hydrographiques par les sonars à balayage latéral. Bien que de récents progrès réalisés dans le traitement des données bathymétriques aient permis de réduire le travail exigé pour ce processus, de nombreux levés hydrographiques continuent de tirer parti de données produites par des sonars à balayage latéral. Les techniques de traitement des données hydrographiques obtenues au moyen des sonars à balayage latéral ne bénéficient pas du même degré d'évolution technologique que les données bathymétriques. Jusqu'à présent, le traitement des données issues des sonars à balayage latéral, quasi exclusivement manuel, s'est avéré coûteux en temps et sujet à dévier des objectifs. Cette communication met en lumière l'avancement des travaux de la SAIC dans le développement des algorithmes de détection automatique et les orientations prises afin que cette technologie soit utilisée non seulement pour les levés hydrographiques, mais aussi en détection et localisation ainsi que dans les mesures de sécurité portuaire.

10-4 – Un algorithme d'analyse de la composante de vitesse du son dans l'incertitude de profondeur totale

Gretchen Imahori (NOAA) et James Hiebert

L'appréciation de la composante de vitesse du son dans l'incertitude totale progagée (total propagated uncertainty [TPU]) de la profondeur d'un échosondeur multi-faisceaux met en jeu les incertitudes présentes dans les mesures du capteur et dans le calcul de la vitesse du son (le cas échéant) de même que dans la variabilité spatiale et temporelle du milieu étudié. Les hydrographes qui se servent de l'algorithme Combined Uncertainty and Bathymetry Estimator (CUBE) doivent évaluer la composante de vitesse du son dans l'incertitude totale progagée (total propagated uncertainty [TPU]) de manière à ce que l'algorithme puisse déterminer la véritable profondeur et son incertitude correspondante. Il n'y avait jusqu'à maintenant aucune méthodologie d'estimation concise à cet égard. Dans cette communication, nous mettons en évidence les motifs qui ont permis de réaliser ce travail, définirons le nouvel algorithme ainsi que les outils correspondants pouvant être employés pour estimer la composante de vitesse du son dans l'incertitude totale progagée (total propagated uncertainty [TPU]) et engagerons un débat sur l'essai et la validation en conditions réelles de l'algorithme et de sa mise en œuvre. Enfin, nous parlerons de l'application sur le terrain de ce nouvel algorithme et de la réorientation des recherches sur la vitesse du son qu'il entraînera.

Exposition d'affiches 10 – 14h30-15h00 – Salle d'exposition

P10-1 – Efficacité de l'engin sous-marin autonome Gavia pour la cartographie du couvert de glace

Chris Roper (Roper Resources Ltd.)

En avril 2007, un engin sous-marin portable Gavia a servi à réaliser des levés bathymétriques à haute résolution du dessous de la calotte glaciaire arctique, au camp d'observation des glaces SEDNA dans la mer de Beaufort. La mise à l'eau et la récupération de l'engin se sont faites par un seul trou pratiqué dans la calotte glaciaire qui se déplaçait de façon constante. L'engin a plongé en position renversée pour que ses appareils embarqués, normalement orientés vers le bas, puissent être utilisés de façon optimale. Il s'agissait d'un sonar bathymétrique à sondage par secteurs GeoSwath 500 procurant des levés bathymétriques à haute résolution et des images de sonar à balayage latéral mises en correspondance et d'un appareil photo numérique à prises de vue rapides offrant simultanément des levés photographiques en continu. La navigation était réglée par un système à inertie assisté d'un loch Doppler qui suivait par le dessous la dérive constante de la nappe de glace, faisant ainsi correspondre les données de navigation de l'engin et l'information scientifique à la calotte glaciaire en mouvement. Les levés obtenus ont fourni un rendu d'image exceptionnellement détaillé de la face inférieure des crêtes de pression qui détermineront la navigabilité des futures routes maritimes de l'Arctique, au fur et à mesure que le réchauffement climatique amincira la calotte glaciaire.

P10-2 – L'engin sous-marin autonome comme outil pour les levés hydrographiques : le programme de recherche et de mise en exploitation sur les engins sous-marins autonomes du bureau d'hydrographie côtière de la NOAA.

Rob Downs (NOAA), Steve Brodet et Michael Annis

Le bureau d'hydrographie côtière (Office of Coast Survey [OCS]) et le bureau de navigation et aérienne et maritime de la NOAA (Office of Marine and Aviation Operations [OMAO]) a lancé en 2004 un partenariat visant à essayer, évaluer et mettre en exploitation, dans la flotte opérationnelle de bâtiments hydrographiques de la NOAA, des engins sous-marins autonomes. Le programme a pour objectifs d'établir une expertise technique, de définir des exigences fonctionnelles et techniques et de mettre au point des procédures d'utilisation normalisées. La NOAA a réalisé des progrès sensibles à l'égard de ces objectifs, tout en visant à assurer aux engins sous-marins autonomes une autonomie véritable et en explorant d'autres possibilités d'utilisation, par exemple dans les domaines de la capacité de réaction aux incidents et des levés sur les munitions explosives non explosées. Cette communication décrit les travaux réalisés et les résultats obtenus dans le cadre du programme de mise en exploitation de la NOAA jusqu'à maintenant et aussi les étapes ainsi que les plans qui restent à franchir et à exécuter.

P10-3 – Expérimentation d'HydroCap : numérisation des minutes à l'aide du logiciel semi-automatisé de reconnaissance de caractères.

Andrew Smith (Service hydrographique du Canada)

HydroCap[MD] est un logiciel de vectorisation élaboré par la société norvégienne ProCaptura AS. Il est adapté pour faciliter la numérisation des minutes hydrographiques. Cette communication met en relief le flux des travaux, les enjeux, les expériences et les conclusions qui on rempli de nombreux mois d'activité concrète avec le logiciel HydroCap. On y définit les outils de contrôle de la qualité intéressants, uniques en leur genre, qui sont incorporés dans le logiciel. La communication porte sur l'un des grands thèmes de la conférence, celui intitué Progrès technologiques touchant le matériel et les logiciels. Les services hydrographiques de plusieurs pays, parmi eux le Canada, ont accumulé de grandes quantités de minutes essentiellement matricielles et imprimées (analogiques). Les données apparaissant sur la plupart des minutes anciennes demeurent pertinentes, vu le coût extrêmement élevé de la collecte ou du remplacement des données de terrain. Les méthodes modernes de numérisation des minutes nécessitent une table numérisante et, généralement, un contrôle intégral de la qualité pour que la numérisation soit précise. Le logiciel HydroCap permet l'application de mesures de contrôle de la qualité dans le processus de numérisation et de classification, mais en les réduisant essentiellement de moitié. La numérisation logicielle diffère grandement de la numérisation sur table et ne peut être drectement comparée. La communication illustre également les diverses étapes du processus de production semi-automatisé : balayage, importation dans le logiciel HydroCap, segmentation, numérisation, classification, agrégation et contrôle final de la qualité. Le traitement d'une minute est alors pratiquement terminé, bien que quelques interventions de contrôle de la qualité restent à effectuer avant que les données puissent être exportées dans les logiciels de divers systèmes d'information géographique. Enfin, la communication apporte des précisions sur ce qui précède, au moyen de commentaires et d'éléments graphiques, puis conclut par un débat sur l'efficacité du logiciel.

FIG 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).

Commission 4 Newsletter – April 2008

Final preparations are well underway for the annual FIG Working Week[1]. This year we will be meeting in Stockholm, Sweden from 14^{th} June to 19^{th} June and given the nearness to summer solstice delegates would have an opportunity to travel north to above 66¼°N to witness the midnight sun. The theme this year is **Integrating Generations**. To quote the meeting's organizers, the theme presents an opportunity for participants to address 'many of the issues facing surveyors in the next years. These include questions related to the need of getting young people interested in surveying and geomatics, how to keep the professional qualifications up to date, need for capacity building – all issues of great interest for FIG and the local organising committee. The theme can also be read more closely related to the profession itself: what is the role of modern technology in GNSS (Global Navigation Satellite System), geoinformatics, laser scanning etc. These fast growing technologies are changing the way of our profession.' To those of who have an interest in hydrography and the challenges facing the profession, particularly those that relate to attracting young hydrographers to the profession, the chosen theme is likely to have significant meaning.

The technical programme has three sessions plus a tour which will be of interest to hydrographic surveyors. Commission 4 has accepted many hydrographic/ coastal area papers on Coastal Zone Management, case studies in hydrographic measurement and professional practice. Further, there will be a joint workshop with Commission 8 on issues relating to the urban coastal zone. Indications so far area are that the RICS and the IHO will send representatives (Steve Shipman and Ruth Adams respectively) who are both hydrographers. Ruth, a former Vice Chair for Commission 4 and lead author of FIG special publication on vertical reference frameworks is now the Chair of the Geomatics Faculty Board of the RICS. Ruth also maintains an interesting survey-related blog[2] that some of you may want to check out. Unfortunately our Chair, because of the pressure of work commitments in the Canadian North, will not be able to attend; instead the Vice Chair Administration (David Neale) will lead the Commission's efforts in Stockholm. At the Commission's executive level, there is one nominee for the post of incoming Chair 2010 - 2014: Dr. Michael Sutherland who has been nominated by the Canadian Institute of Geomatics. Michael is presently the Vice Chair and leads the Commission's Work Group 4.3 on Administering Marine Spaces.

Commission 4 will be holding a workshop, 5 May, during the Canadian Hydrographic Conference and National Surveyor's Conference in Victoria, Canada[3]. The workshop will include an overview of FIG and introduce the work of Commission 4 (Hydrography). Dr. Michael Sutherland will chair an information session which will provide an international perspective on good practice recommendations for land management within the coastal zone. The workshop will endeavour to provide particpants with an understanding of the challenges and issues eg. the impact of climate change upon coastal communities; the role of the surveyor and other land managment professionals in respect of the Administration of Marine Spaces. Participants will be provided with a copy of FIG Publication 36, Administering Marine Spaces, International Issues[4].

In other news the FIG/IHO/ICA Advisory Board on the Standards of Competence for Hydrograhic Surveyors and Nautical Cartographers meets this month (April) in Sydney, Australia and will consider an impressive list of applications by hydrographic courses for accreditation including course from Turkey, Italy, Japan, Mexico, Malaysia and New Zealand. There have been some recent changes to the board membership most notably, David Neale was recently appointed. The Board Chair, Mr. Gordon Johnston has promised to provide us with a report on their deliberations at the upcoming Working Week.

In all we expect that the Working week will provide us with a opportunity to continue the work of the Commission as well as deepen our relationship with other Commissions in joint activities. It will also be the launch of FIG's voluntary peer review process. We look forward to seeing you in the land of the midnight sun.

David Neale

Commission 4 Chair of Administration and Communications

Web References

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We invite your organization to become a corporate member in our association. Consider the following benefits:

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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.

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Annual dues for CHA Corporate Membership is $150.00 (CDN).

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.

ASI's survey vessels are trailerable and equipped with a wide variety of survey equipment packages. In addition to surface vessels, ASI owns and operates a fleet of purpose-built remotely operated vehicles (ROVs) to deploy sonar and video imaging in open water, tunnels and pipelines.

ASI provides greater efficiency and accuracy in mapping rivers, estuaries, channels, lakes or harbour bottom surfaces for:

- Geological investigations
- Habitat mapping and archaeological surveys
- Underwater search, survey and recovery
- Dredging surveys and volumetric determination
- Sonar profiling/imaging surveys
- Remotely operated vehicle inspections
- Integrated navigation and positioning services
- Cable and pipeline inspections.

For further information please contact:

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Corporate Members
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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 or 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 arpentage, 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 extracôtières 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 extracôtière 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 ou www.trafford.com

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C & C Technologies

C & C Technologies (C & C), an international hydrographic surveying company, headquartered in Lafayette, Louisiana, has approximately 400 employees and seven offices worldwide.

As of January 2003, eighty percent of C & C's revenues were derived from survey work for the oil and gas industry and the other twenty percent are derived from US government contracts. The oil industry work includes high-resolution marine geophysics for hazard studies and pipeline route surveys, rig and barge positioning, acoustic positioning for ROVs, as well as satellite navigation services. The company has separate offshore oil industry survey departments for geophysical work, marine construction, and navigation.

C & C Technologies has performed hydrographic survey work for various Government groups including NOAA, the US Geological Survey, and the Corps of Engineers. In 1994, C & C was contracted by the U.S. Naval Research Labs to perform research and development work on semi-submersible autonomous underwater vehicles (AUV's) for hydrographic surveying purposes. In January 2000, C & C and Kongsberg Simrad began working on C & C's new commercial AUV rated for water depths up to 4500 meters. The AUV's sensor payload included multibeam swath high resolution bathymetry and imagery, chirp side-scan sonar and sub-bottom profiler, differential GPS integrated with acoustic / inertial navigation and acoustic communications. Since delivery in January 2001, C & C's AUV has completed over 100,000 kilometres of survey lines for a variety of worldwide clients.

Additional services offered by C & C include: C-Nav™, the highest accuracy worldwide Gc-GPS differential correction service available, in-house state-of-the-art soil analysis lab, and 3 D hazard assessment reporting for MMS deep water site clearances.

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

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at (337) 261-0660 email to info@cctechnol.com or
visit C & C's Website at *www.cctechnol.com*

Canadian Seabed Research Ltd

Canadian Seabed Research Ltd. (CSR) is an established company of geophysicists, hydrographic surveyors, and geologists. We operate worldwide, conducting hydrographic and geophysical surveys for a wide range of applications including charting, offshore petroleum, port engineering and marine environmental applications.

Our team of professionals provide a complete marine survey solution that includes positioning, hydrographic surveying, seafloor imaging, subbottom profiling, geotechnical analysis, comprehensive reporting and mapping.

Established in 1985, CSR has developed a solid reputation for achieving the highest quality results. This is based on careful project planning, the use of innovative equipment, and the unique experience our professional team brings to project interpretation and reporting.

CSR's suite of geophysical systems enable us to offer a wide variety of services to our clients. Our multiple profiling systems are used to accurately map depth to bedrock and surficial sediments. Sidescan sonar technology allows us to achieve high resolution seabed imagery for geohazard detection. Our single and multibeam surveys achieve the highest quality bathymetric data for hydrographic and engineering applications.

CSR has conducted surveys throughout Canada and the United States, Beaufort Sea, Russia, South America, North Sea and the High Arctic. Our survey solutions are innovative and based on a thorough understanding of marine geologic and geophysical principles.

Our future will continue to be based on excellence and creative innovation in the earth sciences.

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ESRI Canada Limited

Since its establishment in 1984, ESRI Canada has made a commitment to promote, support, and implement GIS technologies in different areas and fields. ESRI Canada has dedicated itself to providing superior products, outstanding client support, and contributing technical knowledge, people, and expertise to the collection, analysis, and communication of geographic information.

As a member of the international ESRI family, ESRI Canada is one of 91 international distributors and consulting firms (totalling over 2,300 employees) that provide ESRI software and services around the world. Headquartered in Toronto, Ontario, ESRI Canada has regional offices and training centres in major urban areas, coast to coast, providing a complete range of GIS services to Canadian clients. With over 200 employees and 20 years of experience, ESRI Canada has built a highly coordinated and innovative team of engineers, information technology specialists, GIS specialists, and resource professionals.

ESRI Canada provides complete, GIS-oriented, business solutions to our valued customers, building an excellent reputation for the application of information technology within both private and public sectors. To accomplish this, we have organized ourselves to deliver both GIS software solutions and professional customer services.

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Corporate Members
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Interactive Visualization Systems (IVS 3D)

Interactive Visualization Systems (IVS 3D) with its world class, scientific 3D visualization and analysis software, Fledermaus, provides innovative, interactive and client-driven solutions and knowledge for surveying, mapping and research. Fledermaus presents intuitive insight into massive geographic data sets of numerous data types promoting professional interaction and collaboration.

Fledermaus has been developed to allow our clients to explore, analyze, manipulate and gain knowledge from their data by representing very large complex information in the best possible way - in an intuitive fashion - in the way that we perceive the real world everyday. This virtual reality allows new insight to be rapidly gained and more information to be extracted from the underlying data. This results in Fledermaus providing our clients with added value in efficiency, accuracy, completeness, integration, and communication.

IVS 3D has a dynamic and creative team of professionals that are committed to advancing visualization technology; and dedicated to unveiling opportunities to develop and improve visualization and interpretation software in ways that will provide our clients with first-rate software tools to ensure success of their business or research endeavours.

IVS 3D is headquartered in Fredericton, New Brunswick, Canada with an office in Portsmouth, New Hampshire. Both offices provide full support, worldwide in association with a number of alliance partners.

If you would like to receive further information about IVS 3D and its services please contact:

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Jeppesen Norway AS

Through Jeppesen's aviation heritage, the company has over 70 years of valuable experience working with complex data, enhancing, assembling and packaging that data to meet the needs of its customers. Jeppesen has long believed in the value and importance of strategic partnerships with industry groups and source providers, and we carry those beliefs forward with us into the marine industry.

Based upon Jeppesen Marine's relationships with hydrographic offices around the world, we share a common goal of providing superior data solutions to mariners, whether they are on the high seas, coastal or inland waterways. Jeppesen Marine also shares a common bond in improving waterway safety, increasing customer efficiency, and ensuring environmental protection.

Coupled with the acquisition of C-Map and HydroService AS, Jeppesen Marine utilizes a range of data types including vector and raster navigation charts and other digital products. By applying advanced technologies, Jeppesen Marine increases the usefulness, availability and timeliness of hydrographic data, tightly packaging that information into systems and tools that anticipate and meet customer needs.

Customers count on Jeppesen Marine to provide them with the most innovative, reliable navigational tools and data solutions for their commercial or maritime needs. Services include: Cartography services, dKart office tools and services, CM-93 data services and OEM toolkits, CM-ENC toolkit, and 24/7 customer support.

Jeppesen Marine values the unique contributions of hydrographic offices and other data providers and looks forward to continuing to build strategic alliances in the spirit of working together to advance the interests and welfare of mariners around the world.

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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 Colombia.The Headquarters are located in Kongsberg, Norway. Kongsberg Maritime exports its products to all of the world's major markets.

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NetSurvey Limited

NetSurvey is one of the leading multibeam service solution providers worldwide. We provide a specialist service to survey companies, ports and harbor authorities and research and government organizations. We are at the forefront of multibeam technology, combining the latest equipment and software to give unrivalled results in new and complex areas, such as ROV based surveys, fisheries habitat mapping, detailed wreck investigation and many others.

We can supply any portable multibeam system suitable for vessel, ROV or AUV deployment and all ancillary sensors installed, operated and processed by a team of highly trained multibeam surveyors and engineers. Our specialist personnel are also available to supplement your offshore teams or to act as client representatives.

We offer an in-house data processing service that can range from simple swath bathymetry cleaning to full 3D Visualization and fly-through using Fledermaus software. NetSurvey also offers bespoke training courses with a practical emphasis.

All of our surveyors/engineers are trained-up on Reson, ELAC, Simrad and GeoAcoustics multibeam systems; Applanix, TSS, Kongsberg-Seatex and CODAOctopus motion sensors; QPS, Eiva, CARIS HIPS/SIPS and Fledermaus software.

With our large equipment pool available for hire and some of the most experienced multibeam specialist personnel, NetSurvey can provide you with peace of mind and the complete multibeam solution at a very competitive rate.

If you would like to receive further information about NetSurvey and its services contact Duncan Mallace or visit *www.netsurvey.co.uk*

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RESON Inc.

Established in 1976, RESON has grown steadily and is now one of the world's leading companies in the field of underwater acoustics and high-power ultrasonics. In addition, RESON is the leading company in the design, manufacture, delivery, and support of integrated multibeam echo sounder systems. RESON also designs and manufactures specialty Transducers, Hydrophones, and complete Sonar Systems.

RESON is an international corporation with offices in Denmark, Scotland, Germany, South Africa, Singapore, the Netherlands, Italy and the United States.

We have assembled a team of highly skilled engineers committed to advanced engineering and to the design of sonar and acoustic systems. In addition, RESON employs a team of more than one hundred professionals dedicated to such disciplines as Program Management, Quality Assurance, Manufacturing, Software Development, Security, and Administration. The resulting corporation, RESON, is renowned for providing innovative solutions to complex underwater surveying and military problems.

To date, RESON has delivered over 700 multibeam systems, more than all our competitors combined.

In summary, RESON is involved in the following application areas:

- Seafloor Mapping and Inspection
- Offshore and Construction
- Acoustic Calibration
- Acoustic Test Range
- Surveillance and Security
- Mine Counter Measures, MCM
- Anti-Submarine Warfare, ASW
- Systems Performance Modeling
- High-Speed Signal Processing Hardware and Software
- Image Processing.

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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 (IKONOS and OrbView imagery) Lizardtech (MrSID GeoExpress and DocumentExpress) and Nuvision (softcopy photogrammetry hardware) and is also the Authorised Training Centre in Canada for the complete suite of ERDAS IMAGINE software products running on SUN Solaris (UNIX) and Microsoft Windows platforms. SANI-ITA is a sister company to Spatial Geo-Link Limited, the exclusive distributor in Canada for Leica Geosystems softcopy photogrammetry and geographic imaging products.

SANI-ITA is ISO 9001:2000 registered. ISO 9001:2000 (the most comprehensive of the ISO 9000 series of standards for quality assurance developed by the International Organisation for Standardisation) encompasses all aspects of quality management inclusive of understanding customer requirements, design control and development and consulting services.

Services offered by SANI-ITA include:

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- Control surveys
- Hydrographic surveys
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- Digital Elevation/Terrain collection – automatic or static mode
- Orthomagery production
- Digital topographic mapping and map and chart revision
- GIS data structuring
- Map conversion and data translation services
- Image compression services (lossy and lossless)
- Third party audits of mapping and image data
- Visualisation services including dynamic fly-throughs and stereoscopic viewing

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

www.sani-ita.com
or contact us at
Tel: (905) 943-7774 FAX: (905) 943-7775

Association of Canada Lands Surveyors / Association des Arpenteurs des Terres du Canada

The largest jurisdiction, in terms of geographic size for surveyors in Canada, is called "Canada Lands" and covers a territory of approximately 10,900,000 square kilometres, which is about seven times the surface area of the Province of Quebec. The cadastral surveying profession on this vast area is governed by the Association of Canada Lands Surveyors (ACLS) which is the third largest professional surveyor's association with 560 members.

Despite its youth, the ACLS has been able to distinguish itself by its leadership through achievements. In June of 2007, the ACLS hosted the third National Surveyor's Conference in Québec City which was open to all professional surveyors. Through the Canadian Council of Land Surveyors (CCLS) and in cooperation with all professional surveying associations across Canada, it introduced the David Thompson National Geomatics Awards Program at this event. The inaugural awards were presented at the Gala Dinner. Additionally, the ACLS was instrumental in setting up the new Canadian Board of Examiners for Professional Surveyors (CBEPS) which is responsible for the certification of candidates for the four Western Provinces and "Canada Lands" since May 8th, 2006. The Provinces of Ontario and New Brunswick joined earlier this year. This initiative is aimed at harmonizing accreditation criteria for professional land surveyors across the country.

Since the Offshore is the largest part of its area of jurisdiction, the ACLS has shown leadership by putting forth the following initiatives:

- Promotion / advocacy of a Marine Cadastre for Canada.
- Promotion of the ACLS national certification program for hydrographers, in order to establish a standard for which hydrographic competence may be measured.
- Publication and promotion of the new book – in both official languages - entitled "Canada's Offshore: Jurisdiction, Rights, and Management". Copies can be purchased from: *www.acls-aatc.ca* or *www.trafford.com*

Discussions are ongoing with the Canadian Hydrographic Service on the implementation of the certification program for hydrographers. Developed by a joint CHA - ACLS task force, much of the proposed certification model is already aligned with recommended or mandatory training for CHS Multidisciplinary Hydrographers. It is intended that once in place, this certification model will provide hydrographers with a goal they should strive to attain, albeit on a voluntary basis, as they pursue their careers. It is also intended to enhance the identity of hydrographic surveying as a profession, as well as serve as a catalyst for labour mobility.

Jean-Claude Tétreault, CLS, a.-g., P. Eng., MBA
Executive Director

La plus grande juridiction, en termes de superficie géographique pour les arpenteurs au Canada, est les "Terres du Canada", qui couvrent un territoire de près de 10 900 000 kilomètres carrés, soit à peu près sept fois la superficie de la province de Québec. La profession d'arpentage cadastral sur cette zone immense est régie par l'Association des arpenteurs des Terres du Canada (AATC) qui, avec ses 560 membres, est la troisième association d'arpenteurs-géomètres en importance au Canada.

Malgré son jeune âge, l'AATC a déjà su se distinguer par son leadership et ses réalisations. Au mois de juin 2007, l'AATC a organisé la troisième Conférence nationale annuelle des arpenteurs-géomètres à Québec, un événement ouvert à tous les arpenteurs-géomètres. Par le biais du Conseil canadien des arpenteurs-géomètres (CCAG), et en collaboration avec toutes les associations professionnelles d'arpenteurs-géomètres du Canada, elle a institué le programme national de prix en géomatique David Thompson. Les premiers prix David Thompson ont été décernés lors de la soirée gala de la conférence. L'AATC a de plus joué un rôle déterminant dans la mise sur pied du Conseil canadien des Examinateurs pour les Arpenteurs-géomètres (CCEAG), qui est responsable de la certification des candidats pour les quatre provinces de l'Ouest canadien, et les « Terres du Canada » depuis le 8 mai 2006. Les provinces de l'Ontario et le Nouveau-Brunswick se joint plutôt cette année. Cette initiative vise l'harmonisation des critères d'agrément des arpenteurs–géomètres partout au Canada.

Puisque la zone extracôtière compose la plus grande partie de sa juridiction, L'AATC a fait preuve de leadership en mettant de l'avant les initiatives suivantes :

- Promotion et défense de la cause d'un cadastre marin au Canada.
- Promotion du Programme national de certification des hydrographes, afin d'établir des normes selon lesquelles les compétences en hydrographie peuvent être mesurées.
- Publication et promotion du nouveau livre – disponibles dans les deux langues officielles - intitulé « Zone extracôtière canadienne : juridiction, droit et gestion ». On peut acheter des copies de cet ouvrage auprès de : *www.acls-aatc.ca* ou *www.trafford.com*

Des discussions sont en cours avec le Service hydrographique canadien au sujet de la mise en place du programme de certification pour les hydrographes. Développé par un groupe de travail conjoint ACH - AATC, la plus grande partie du modèle de certification rejoint déjà la formation recommandée ou obligatoire pour les hydrographes multidisciplinaires du SHC. Nous avons l'intention, qu'une fois en place, ce modèle de certification devienne, quoique sur une base volontaire, un objectif de carrière que voudront atteindre les hydrographes. Ce modèle devrait de plus rehausser l'identité de la profession d'hydrographe tout en catalysant la mobilité de la main-d'œuvre.

Jean-Claude Tétreault, A.T.C., a.-g., ing., MBA
Directeur exécutif

For further information please contact:

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Tel: (613) 723-9200 FAX: (613) 723-5558 E-mail: admin@acls-aatc.ca
Website: *www.acls-aatc.ca*

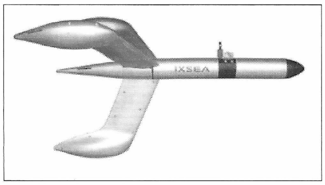
Celebrate...

World Hydrography Day - June 21st

The United Nations, in its General Assembly Resolution A/60/30 of 29 November 2005, "Welcomes the adoption by the International Hydrographic Organization of the "World Hydrography Day", to be celebrated annually on June 21st, with the aim of giving suitable publicity to its work at all levels and of increasing the coverage of hydrographic information on a global basis, and urges all States to work with that organization to promote safe navigation, especially in the areas of international navigation, ports and and where there are vulnerable or protected marine areas."

IXSEA

IXSEA launches GRADIOMAGIS at Oi08



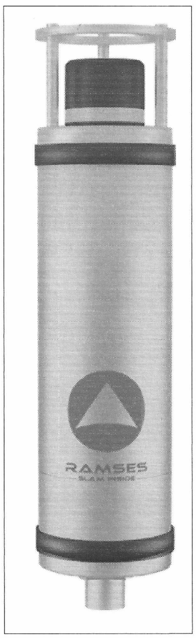
IXSEA announced plans Monday March 10, 2008 to launch GRADIOMAGIS, the high precision gradiometer, at Oi08, which [took] place from 11 to 13 March at ExCeL, London.

GRADIOMAGIS is a truly omnidirectional gradiometer designed to map unexploded ordnance or other small metallic objects. Its real-time magnetic gradient computation allows for a better spatial resolution and sensitivity to detection features. It provides closely spaced sources, tighter anomalies around compact sources and easier delineation of pipe-like sources.

Key features include: real-time gradient computation, four magnetic probes as well as an altimeter, inclinometer, pressure sensor and optional acoustic positioning.

"GRADIOMAGIS offers high spatial and amplitude sensitivity as well as high resolution gradiometric mosaic," said Robert Girault, Industrial Director, IXSEA. "It has worldwide coverage, no blind zone, alignment free and calibration free, and provides real-time georeferenced data."

IXSEA presents RAMSES, the intelligent embedded positioning system



IXSEA [presented] its new product, RAMSES, at 0i08, which [took] place from 11 to 13 March 2008 at ExCeL, London, the company announced Friday, March 7, 2008.

RAMSES is a unique positioning system which combines an embedded data fusion engine, real-time range and positioning computation, USBL acoustic positioning data as well as coupling with PHINS Inertial Navigation System.

RAMSES' operating principle, Simultaneous Localization And Mapping (SLAM), was developed in the 80s as a technique used by robots to position themselves while building up a map within an unknown environment. RAMSES uses SLAM to compute the unknown positions of beacons deployed on the seabed while keeping track of its own current location and to provide on-the-fly array calibration. When RAMSES is aided by an external subsea positioning system (INS or USBL), SLAM can be operated with only one transponder and delivers unique sparse array operating capacity.

RAMSES works in an open and flexible way and can be either used in stand alone mode or combined with other positioning systems to improve overall performance. In stand alone mode, RAMSES can be used on small Autonomous Underwater Vehicles (AUV) and small Remotely Operated Vehicles (ROV). When combined with PHINS Inertial Navigation System, applications include: AUV long-term navigation such as pipe survey; accurate seabed imagery survey; AUV defense applications with deployed transponders not previously calibrated and ROVs. When coupled with PHINS Inertial Navigation System plus GAPS (IXSEA's calibration free USBL) or any other high-grade USBL, it can be used for ROV inspection, maintenance and repair as well as subsea construction.

"RAMSES, the intelligent embedded positioning system, is definitely a technological breakthrough which works in either stand alone mode or in combination with IXSEA's other systems," said RAMSES Product Line Manager, François Crétollier.

About IXSEA
At IXSEA, we combine smart technology and experience with marine know-how to provide our customers with the most efficient and user-friendly navigation, positioning and imagery systems and solutions.

We constantly strive to exceed our customers' expectations with our high-performance technology, our international sales network, installation and round-the-clock customer support.
To sail. To sound. To analyze.

Further information:

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CENTRAL REGION

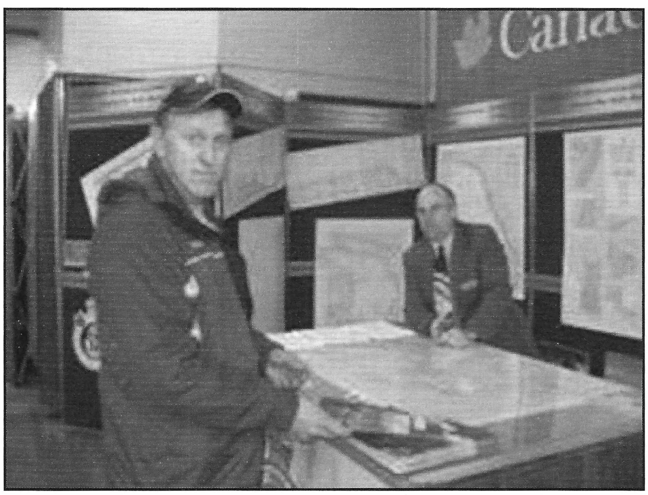
CHS Central & Arctic Region News
January 2008 to March 2008

Charts Released

- ENC CA373064 - Chart 2058, Cobourg to/à Oshawa
- ENCs CA573105, CA573314, CA573316, CA573326 – Chart 2181, Harbours in Lake Erie/Havres dans le lac Érié

Activities

- CHS employees staffed the booth at the Toronto International Boat Show
- Canadian Power and Sail Squadron (CPS) volunteers visited Canada Centre for Inland Waters (CCIW) to learn about the CHS/CPS Marine Information Reporting Program



- CHS employees staffed the London Boat Show.

Notable Hires and Retires:

- Ron Gammon left us after nearly 40 years of service. All the best Ron, we will truly miss you and hope you have many years of healthy retirement ahead of you!
- Don Robertson retired from the Data Management section after 31 years. One of Don's notable achievements was as Regional Quality Control Co-ordinator during the ISO certification and auditing process; well done Don, enjoy that Corvette!
- Michel Desjardins retired after a long career as both a coxswain and hydrographer, most recently with Eastern Arctic and Revisory surveys; may you enjoy many happy retirement years.
- Dave House returned to us after graduating college! Welcome back Dave.
- Erica Vivian continued the latest trend of C&A stealing the best from Atlantic Region. Welcome to Upper Canada Erica!

Temporary Departures:

- Mina Foroutan is on parental leave after the birth of her daughter.
- Tracy Segal has left the Data Management department a little early to prepare for the birth of her twins! We wish them all good luck and safe deliveries!

Surveys:

The cold weather types are already up on the ice somewhere northwest of Nansen Sound, Ellesmere Island (northwest of Eureka, NT). Jon Biggar and crew from Central & Arctic Region are bolstered this year with additional staff from Pacific Region and Headquarters for the ARTA Project, which stands for Alpha Ridge Test of Appurtenance. This is a multi-year project in support of the UNCLOS treaty ratification process.

Additional surveys planned for this year are a greatly shortened Great Lakes Revisory survey, an Eastern Arctic survey, and two Western Arctic surveys, one in support of ongoing work by NRCan and one in the Queen Maud

PACIFIC REGION

CHS Pacific Navigational Products and Services Division

CHS Pacific reorganized their region into 2 divisions during the 07-08 Fiscal Year. At this time, the old Nautical Publications division became the Navigational Products and Services Division, where we saw the Hydrographic Data Centre, Notices to Mariners and certain portions of Validation of the former Geomatics division returning to unite with the paper charts and electronic navigational charts production section. As one group, the goal was to unify production and group like activities, handle data fewer times and become more productive.

Over the fiscal year, a great number of navigational products were produced. The following is a summary of the outputs of the NP&S division for the 07-08 fiscal year.

Paper Charts:

1) released the following New Paper Charts:
- 3479 (Sidney)
- 3944 (Princess Royal Channel) - Gateway project
- 3946 (Grenville Channel) - Gateway project

2) completed production of New "Gateway" Charts (not yet released):
- 3941
- 3942
- 3943

3) released the following New Editions:
- 3312 - Gulf Islands Cruising Atlas
- 3811 - Harbours in Queen Charlotte Islands
- 3539 - Discovery Passage

4) completed production of the following HPD produced New Edition (not yet released):
- 3955 - Plans - Prince Rupert Harbour

ENCs:

New ENCs = 15
New Edition ENCs = 7
NtM updates = 48
In addition there are 12 additional new ENCs in the final stages and close to completion.

The main focus in the coming year is the production of a new edition of chart 3313, Gulf Islands Cruising Atlas. This product is extremely popular with the recreational boater on the BC coast, and accounts for nearly $100,000 in retail sales annually. The new edition will incorporate a new boarder on all chart pages, include updated charts, new colour photos and revised sailing directions.

The other major ongoing project is new charting on the north coast of BC, in the approaches to Kitimat. After a year long consultation process with stakeholders, a new chart scheme was developed with 25 new charts to be produced. These charts are necessary to accommodate a variety of new navigational needs arising from the changes to shipping in this area. In addition to the cruise ships and ferries, bulk carriers and tugs with tows, aggregate carriers and fishing vessels, there are a variety of tankers existing and proposed for this area. In order to meet the needs of this diversified and changing navigational group, new charts were planned and data was collected to produce the new charts. This is proposed to be a 5 year project with approximately 5 new charts being completed each year. This target was achieved for the year in review.

The other major accomplishment was the completion of the first major charting project utilizing the CARIS produced HPD tool. Chart 3955, a plans chart in Prince Rupert Harbour was the first New Edition produced in Pacific Region using this tool. Two other new editions are currently in production using HPD.

ATLANTIC BRANCH

The Atlantic Branch of the CHA was a sponsor of the IHO Tidal Committee Conference, which took place in Halifax, NS, in the fall of 2007. Since that conference, this branch of the CHA has agreed to act as one of the sponsors for the upcoming ICES conference (*http://www.ices.dk/iceswork/asc/2008/index.asp*). ICES is the INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA, and it is the organization that coordinates and promotes marine research in the North Atlantic.

In other upcoming news, the CHA's Atlantic Branch is again planning a BBQ event for the World Hydrography Day celebration on June 21, 2008.

With so many close ties to the Canadian Hydrographic Service, it would be remiss not to mention the recent and pending retirements of longtime CHA members and CHS employees and hydrographers, Gary Rockwell, Nick Stuifbergen, Cathy Schipilow and Richard Palmer. Other news of significance is the ongoing project being undertaken by CHA Atlantic - to fund the construction of a series of display cabinets for the collection and presentation of hydrographic related artifacts.

CENTRAL BRANCH

We recently held our AGM and elections for the 2008 executive. Carol Robinson has assumed the reins of Branch treasurer from George McFarlane. Roger Cameron and Fred Oliff have agreed to stay in their positions for another year.

Central Branch has held three general meetings so far this year: in January, February and March. In January, we viewed a video provided by our host Heimo Duller, on the history of ice-breaking on the Great Lakes and onthe construction of new vessels specifically for high Arctic use, featuring the *Healy*. In February, Brian Power hosted a meeting where our presenter was John Hall, RAP Coordinator for the Hamilton Harbour Remedial Action Plan. In March, Andrew Leyzack, Engineering Project Supervisor with the CHS Central & Arctic Region, gave us a very informative presentation on his involvement with the FIG, specifically Commission IV on Hydrography. Thanks to all our presenters and to the meetings committee for arranging such an interesting slate of presenters!

Central Branch currently has over 60 paid-up members, including Life, Honorary and Corporate members. Newsletters have been published in all three months and distributed to all members via e-mail. Central Branch recently hosted another very successful bonspiel, which is summarized below.

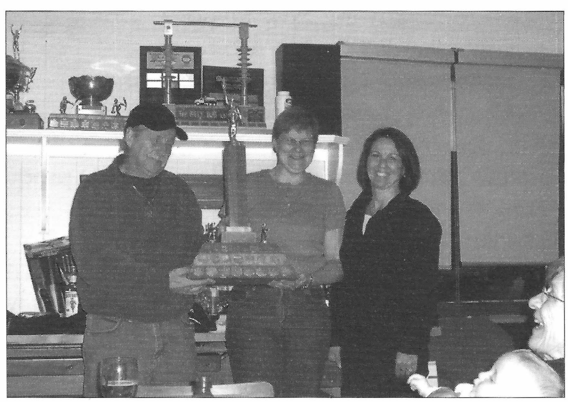
Faire winds and hope to see you all at CHC2008!

37th Annual H2O Bonspiel

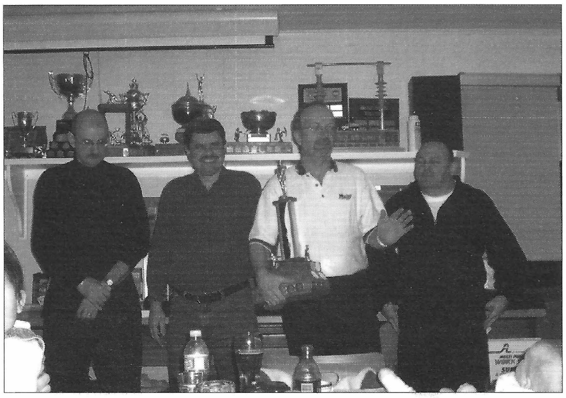
A moment to reflect - The year is 2008, the Canadian Men's Curling Championships will be celebrating its' 79th Brier, the Grey Cup has been a part of Canadian sports since 1909, the Stanley Cup has been around for over 98 years and the Canadian Hydrographic Association, Central Branch has been hosting a sporting event since 1971. This year will mark the 37th anniversary of our own curling event the CHA H2O Bonspiel. From the beginning curlers have competed for the first and second place trophies. In 1971 the winning rinks where- first place skipped by K. Daechsel (Dexel) team members R. Schmidt, H. Blandford and M. Hipkin and the second place team skipped by B. Lane, team members J. Courtnage, R. Kelly and N. Stuifbergen. There may be some of us who can still remember these curlers.

This year's annual H2O Bonspiel took place at the *Grimsby Curling Club* on Saturday the 23rd of February. There were sixty-four enthusiastic curlers that showed up to enjoy a day of curling and the expectation of seeing their names engraved on the first and second place trophies. The organizing committee was very pleased by the over welling response this year. As is past years there has been a trend to enter family teams and to encourage new people to come out and experience the sport of curling. Once you have done it once you are sure to try it again as did our friends from "Seaway Marine Transport" from St. Catharines,ON.

On behalf of the Canadian Hydrographic Association many thanks to this year's bonspiel committee of Earl



Congratulations to the first place winners, the rink skipped by Wayne Bedford, Mel Webber as vice, Jane Bedford as second and Margaret Cutler as lead.



Congratulations are also extended to the Second Place winners, the rink skipped by Don Burnett, Jim Logan as Vice, Tim Leydit as second and Marvin Medelko as lead.

Brown and Brian Power for their continued hard work in making this annual curling event a success. As well, we wish to thank our sponsors for their generosity and continuous support. During the last 37 years the CHA, Central Branch has been very fortunate to have a strong sponsorship group. This year's prize table had an excellent selection of goodies for all curlers. Our sincere thanks to the following sponsors:

Canadian Hydrographic Association
Canadian Hydrographic Service
CARIS
Fugro Jacques GeoSurveys Inc.
HYPACK Inc.
Knudsen Engineering Ltd.
Kongsburg Maritime
Seaway Marine Transport

PACIFIC BRANCH

If you are reading this then you might just be attending the conference, since this is the conference edition. We here at Pacific Branch want to welcome everyone to the Canadian Hydrographic Conference and National Surveyors Conference. This is the first time that these two events have been combined. This is also the first time since 1998 that the Canadian Hydrographic Conference has been in Victoria. We welcome everyone to the Victoria area.

The branch has been busy working with the CHC-NSC organizing committee over the last few months, preparing for this event. We have had many of our members working on the organizing committee. The workload has steadily increased over the past few months to a feverish pitch recently in order to put the final touches on the conference.

While the conference has been the focus of the branch we have managed to do a few other things that are not conference related. At the end of January we held our annual general meeting. The members were treated to a free lunch. We want to thank those members that attended. We congratulate Carol Nowak for her continued role as Vice President, Ken Halcro continues as Treasurer, Craig Lessels as Secretary, and Tracey Prentice (Seminars), Brian Port (Conference Chair), and Alex Raymond (Outreach) as directors. We thank these members for taking on leadership roles.

We held one seminar in the past few months. We were privileged to show the NOAA video "The Surveyors". This video was created to celebrate the 250th anniversary of hydrography in the US. NOAA was kind enough to provide us a copy of this fascinating presentation. The video presentation was well received. We thank our NOAA counterparts for the opportunity to show this video.

We would like to welcome a couple of new corporate members. We welcome Atek Hydrographic Surveys and the Northern Alberta Institute of Technology (NAIT).

We look ahead to the days of the conference, celebrating World Hydrography day, and what promises to be a busy field season for our membership.

QUÉBEC BRANCH

La Section du Québec a conclu une entente d'une durée de trois ans avec le Regroupement des plaisanciers du Québec en décembre. Cette entente a permis de faire passer le tirage du Carnet de Bord de 4000 copies à près de 35000 copies. L'entente étant survenue tardivement, nous n'avons pu exploiter pleinement ce partenariat pour améliorer la rentabilité du Carnet de Bord. C'est lors de la prochaine campagne pour la recherche de publicitaires que nous verrons les résultats pour l'édition 2009.

Nous progressons dans la réalisation d'un projet conjoint avec le Service hydrographique du Canada, région du Québec, pour mettre en évidence la contribution et l'évolution de l'hydrographie au développement de la ville de Québec dans le cadre de son 400e anniversaire de fondation. La baleinière hydrographique SURVEYOR de la Section Centrale en sera l'attraction majeure. Lorsque vous lirez ces lignes, nous espérons avoir ficeler le tout.

Nous comptons nous servir des résultats de ces deux partenariats pour poursuivre notre travail de promotion des buts de notre Association pour l'adhésion de nouveaux membres et membres corporatifs. C'est un travail de longue haleine.

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 discrétion de l'éditeur.

DIGITAL REQUIREMENTS
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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.

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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 *Couverture arrière*	NA/SO	$1,025
Inside Cover *Couverture intérieure*	NA/SO	$825
Body, Full Page *Pleine page*	$475	$675
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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.

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Fax/Télécopieur: (902) 426-1893
E-mail editorlighthouse@hydrography.ca

SUGGESTIONS TO AUTHORS

LIGHTHOUSE publishes material covering all aspects of hydrography.
Authors submitting manuscripts should bear the following points in mind:

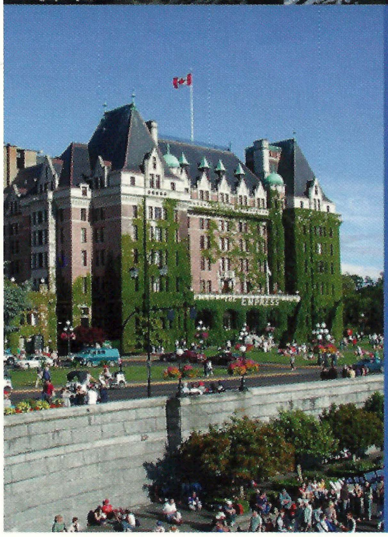
1. Submit a hardcopy complete with graphics including tables, figures, graphs and photos.
2. Submit digital files, one with text only and a separate file for each graphic (tables, figures, photos, graphs) in its original form or in .tif format (600 DPI). Photos may be submitted separately to be scanned. 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.
4. An abstract, information about the author(s) and contact information should be included.

Canadian Hydrographic Conference and National Surveyors Conference

Conférence hydrographique du Canada et Conférence nationale des arpenteurs-géomètres

Bringing Land and Sea Together

Réunir terre et mer



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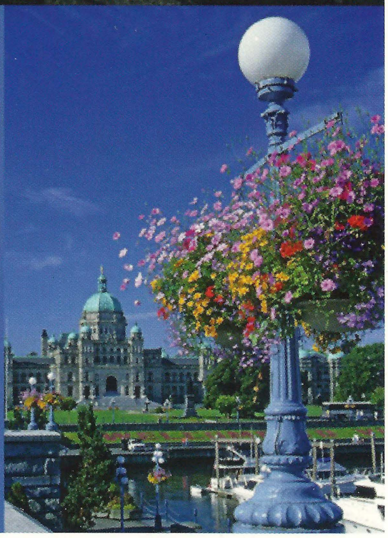

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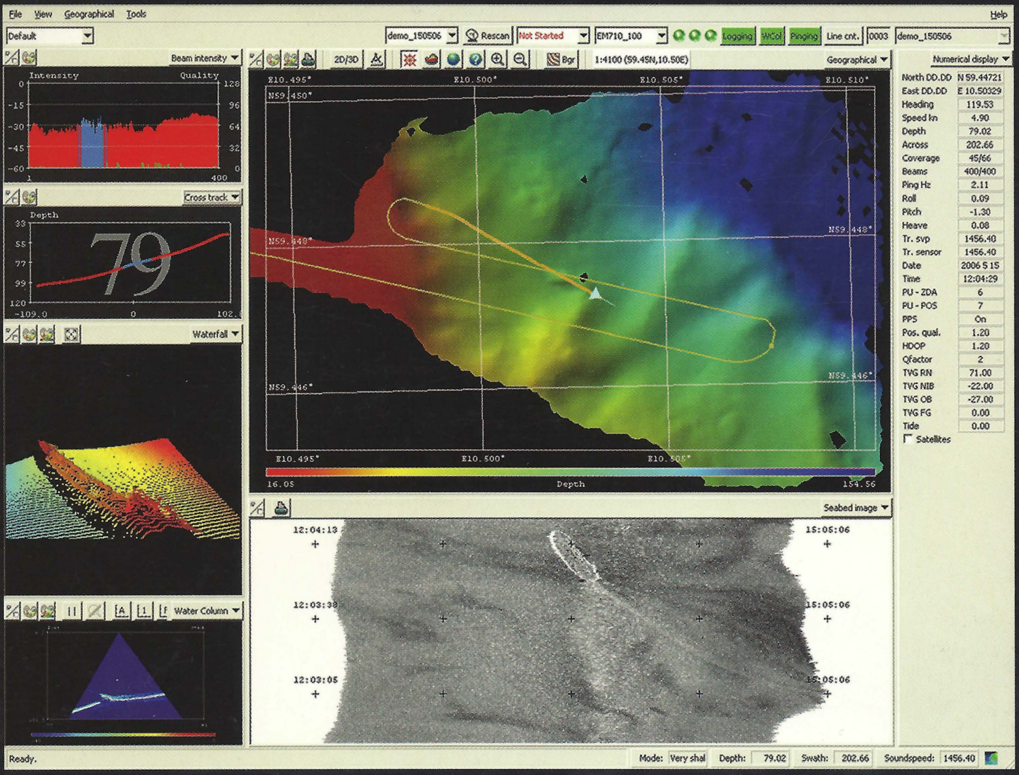

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