

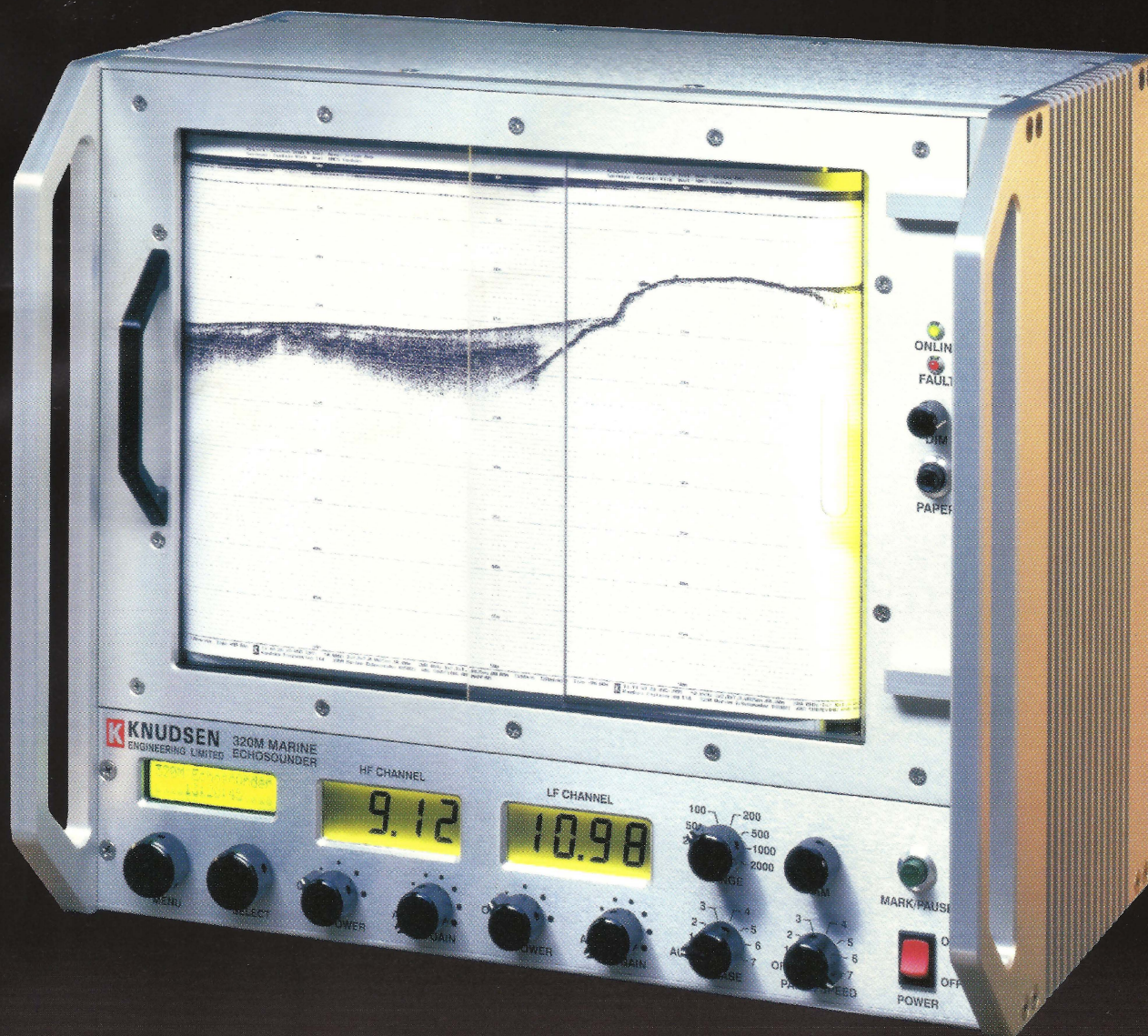
LIGHTHOUSE

JOURNAL OF THE CANADIAN HYDROGRAPHIC ASSOCIATION
REVUE DE L'ASSOCIATION CANADIENNE D'HYDROGRAPHIE

Edition No. 63 Spring / Summer 2003
Édition No. 63 Printemps / Été 2003



ISSN 0711-5628



The 320M

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Every edition also receives assistance from the CHA Lighthouse Committee.

Chaque édition est réalisée grâce à la collaboration du comité Lighthouse de l'ACH.

Views expressed in articles appearing in this publication are those of the authors and not necessarily those of the Canadian Hydrographic Association.

Les opinions exprimées dans les articles de cette revue ne sont pas nécessairement celles de l'Association canadienne d'hydrographie.

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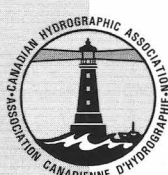
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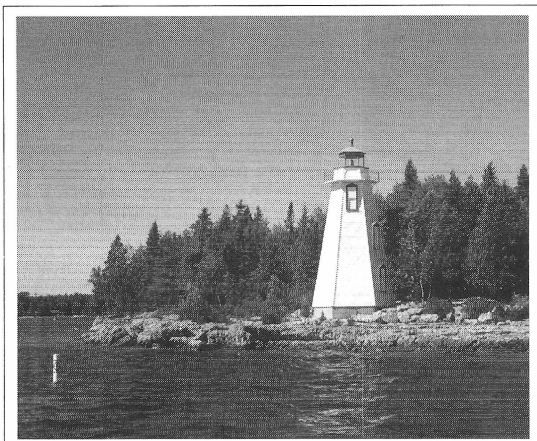


Photo courtesy of Paola Travaglini, CHA

BIG TUB LIGHTHOUSE Tobermory, Ontario

In 1885, due to the dangerous passageways ships had to pass through from Lake Huron and Georgian Bay to reach the harbour, the Department of Marine and Fisheries purchased three lots on the west side of the entrance to Big Tub harbour in Tobermory for a lighthouse. The lots were purchased for \$18.00. The first lighthouse, costing \$675.00, was erected that same year by John George and David Currie of Port Elgin who were contracted to do the job.

Previously, during the 1870's, Charles Earl—one of the area's first settlers—hung a lantern on a tree branch to guide the ships to the harbour's refuge. The tree's location later became the site of the lighthouse itself. Earl was paid the grand sum of \$100 per year for this duty. In September 1885, Abraham Davis was appointed permanent keeper of the light.

In 1913, a wild storm tore off over half of the lighthouse's shingles. They were replaced and the light shone on.

The first lighthouse was later replaced by the present-day structure, a six-sided wooden tower, 43' from the ground to the lantern vane, with a red iron lantern room at the top.

At one time, the coal oil standing lamp shed its light from the harbour entrance. It had a large burner which was turned up or down, according to the lamp brightness desired. Today, an automated red harbour light acts as a guide for boaters. The lighthouse became automated and electrified in 1952.

A hand fog horn, discontinued in 1963, was established in 1910 and was later replaced with a fog signal of unknown type.

In 1985, the lighthouse became more accessible to the walking public and to those wheelchair-bound when a pathway and a viewing area were cleared. An interpretive sign was erected to explain the area's marine history to visitors. The work was the project of the Friends of Fathom Five and the former St. Edmund's Township.

Repairs were required when a winter storm in 1987 washed away many of the lighthouse's shingles and part of its foundation. Part of the walkway and parking area were also washed away.

Tobermory's light still guides boats through powerful currents, frequent fogs and numerous shoals to the safety of Big Tub Harbour. The number of shipwrecks offshore testify to the dangers of these waters. These waters have become a mecca for scuba divers from all over the world.

This excerpt is from "The Lighthouse Destination" for Bruce County Tourism website: www.naturalretreat.com 1-800-268-3838

Visit CHA's new website : www.hydrography.ca

DID YOU KNOW . . .

The Pharos Light

The great Pharos lighthouse at Alexandria was three hundred and seventy feet high and was one of the wonders of the world.

It was built, so say the early chroniclers....."so that all nyght, mariners dryven before ye raging tempest could make greate comforte from its guyding rays."

Which they did, from 274 B.C. until the year of Our Lord 1326. And that's a good record for stability in any man's language.

Editors' Note / Note des rédacteurs

We are pleased to bring you *Lighthouse*, Edition 63, on schedule and with content which will be of interest to a wide variety of those in the hydrographic community. This edition is the fifth published since we assumed the role as co-editors and we are very satisfied with our role in bringing new life to the journal.

As we reflect on the last two and a half years and cast our eyes to the five journals that have been published, we believe we are on target with our original objective. The goal of bringing, to an audience with a broad and diverse background, a new and improved journal with news and articles of current interest, has been met. We promised to publish a journal with many of the traditional content features developed over several decades, and at the same time introducing incremental changes to improve the value of the journal to those who pay to get it to their desk. We will continue to make changes where and when we consider appropriate and would be pleased to consider the implementation of your ideas.

As some of you may have read in our report in the recent "National" CHA newsletter, our subscriber list continues to increase. We now have paid-subscribers in 24 countries and the number is growing. This growth is not as fast or as large as we would like, but it is steady. At a time when many journals and magazines are experiencing a significant decline in readership, we must be realistic and be pleased with any rate of growth. We will continue to promote *Lighthouse* as a "must have journal" and hope that many of you will enthusiastically do likewise.

You may note that the CHA list of corporate members (formerly sustaining) has also recently grown. We are pleased with this growth as, in our opinion, this shows health in our association and is reflected in the results of a healthy *Lighthouse*.

During recent months there has been considerable internal discussion regarding the value of *Lighthouse* becoming a peer review journal. We are not and never have been a peer reviewed publication. There are certain obvious benefits in being considered a journal with that status, but with those benefits come certain liabilities, which in the opinion of your editors, outweigh the benefits of peer review consideration. We, as editors, will continue to assume the role of typical peer review specialists to ensure that articles in *Lighthouse* will be of a high standard and convey realistic messages. We would be pleased to debate the issue with anyone who would like to do so.

Our sincere thanks for your continued input and kind words of encouragement.

Earl Brown and Paola Travaglini

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Message from the National President

Mot du Président national

I was recently contacted by Mr. Ken McMillan, past president of CHA in regards to an upcoming interview between him and *Hydro International*. In our conversation, Ken rhymed off a list of questions posed by *Hydro's* interviewer and one in particular caught my attention. Actually, we both got quite a kick out of it! Apparently after over 30 years of Lighthouse, the folks at *Hydro International* still don't know who publishes our journal. Furthermore, judging by the vague cover note in their July 2002 edition, they still don't know who built the Admiralty Launch Surveyor either. Steve Ritchie, please set our friends at *Hydro International* straight on the "who" and the "what" we are. They are so fortunate to have you as a contributing author for without you they might continue having trouble recalling "As It Was..."

I'd like to take this opportunity to offer a brief overview of what CHA is, where we are going and perhaps dispel a few myths and misconceptions.

Myth: there is a fine blurry line between CHS and CHA.

Reality: CHS is the largest employer of Hydrographers in Canada so naturally our membership is predominantly from CHS.

2nd Reality: there has been an increase in our out-of-house, private sector membership, in fact excluding international membership, almost 50% of Central Branch's membership are non-CHS and our Prairie Schooner (Calgary-based) Branch is 100% private sector.

Myth (*this one's for Hydro*): Lighthouse is produced and published by CHS.

Reality: CHS is a corporate sponsor of Lighthouse however Lighthouse is managed and produced by volunteer labour and paid for by our advertisers, members and subscribers.

Myth: CHA is an "Old Boys" club.

Reality: CHA was founded in 1966, and incorporated in 1988, so it stands to reason some of our members are getting on in years!

Myth: CHA members are looked favourably upon when it comes to job competitions.

Reality: Hydrographers, by virtue of the work they perform are professionals. Quite simply a professional can be defined as an individual whose work has an impact on public safety and therefore owes a duty of care to the public. One of the main duties of a professional is to be a member of the Association or Association(s) which represent their discipline especially if membership in that Association fosters Continuing Professional Development.

Key Words: Hydrographers, Professionals, Professional Association, Professional Attitude. If you were an employer, beyond education and experience, what sort of professional qualities or distinctions would you be looking for in an individual? Go figure.

Myth: CHA is a Social Club.

Reality: Yes we like to have fun but there's a lot more to this Association than BBQs and Bonspiels.

The following was previously published in a National Edition of Central Branch's newsletter and is reprinted as a means of describing the CHA to our subscribers:

To best describe our goals as an Association, I'd like to borrow a motto once used by Fisheries and Oceans Science Sector: "Moving forward with confidence and credibility." I see three main goals and a number of "hows" to help us reach those goals.

Goals:

- Build on our core values and aims as identified in the CHA constitution.
- Build confidence in our members and subscribers.
- Build our credibility and recognition as a professional association.

Message from the National President

Mot du Président national

How's:

- Continuing Professional Development (CPD) through the delivery of Conferences, Workshops and other Educational Courses.
- Continue to Produce and Publish Lighthouse
- Continue to maintain and administer the CHA National and Pacific Branch Student Awards programs.
- Form new alliances and strengthen our existing affiliations with National and International Surveying and Geomatics Associations.

With respect to my last point regarding alliances and existing affiliations, internationally I am referring to the International Federation of Surveyors (FIG) and the Federation of Hydrographic Societies (formerly The Hydrographic Society). Nationally, I am referring to the Canadian Institute of Geomatics (CIG) and the Association of Canada Lands Surveyors (ACLS). With respect to CIG in particular, the CIG council, of which I am the councilor representing hydrography, has approved my proposal to bring CHA on board as the CIG hydrographic committee. The terms of reference require us to appoint three more members to our national executive and I am proposing two from academia and one from the marine industry. What will this do for CHA? I hope it will give us a stronger voice through more direct participation in Canada's National Geomatics association (CIG).

Highlights of Branch Activities:

Pacific Branch

- are developing a national approach to managing our membership.
- have initiated a cooperative effort with Central Branch to establish a National web site on an independent service provider.

Prairie Schooner Branch

- are cooperating with CIG and the ACLS to assist in the delivery of a follow-up to the 2000 ACLS Offshore Consultation Workshop at Geomatics 2003, CIG's next annual conference in Calgary.
- have nominated two national executive members, one from academia, and the other from the marine side.

Ottawa Branch

- has recently established a Friends of Hydrography (FOH) committee to administer the activities of the FOH, who have recently become part of CHA.
- are partnering with CHS Headquarters and the Canadian Nautical Research Institute in co-hosting the delivery of CHC2004.

Central Branch

- their recent efforts in hosting a multibeam sonar training course and assisting in the delivery of CHC2002, were both significant undertakings.
- has recently hosted a Side Scan Sonar training course for 34 participants.
- *Lighthouse* is staffed by Central Branch members, the Newsletter has been extended to include two annual national mailings, and the Admiralty Launch *Surveyor* sails on.

Quebec Branch

- continues to publish *Carnet du Bord*, a recreational boaters log book.
- have recently prepared a digital French translation of the CHA bylaws.

In closing I'd like to say that I'm proud of this Association and I am dedicated to seeing that we deliver a professional product to our members and subscribers.

Andrew Leyzack

The Hydrographic Society

- serves the interests of the world hydrographic surveying community
- promotes knowledge and expertise at symposia, seminars and workshops
- supports improved standards in education and training through Education Funds and Award Schemes
- publishes both the prestigious quarterly Hydrographic Journal and other specialist literature
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Seamless Digital Data and Vertical Datums

By: R. Adams, MRICS, UK Hydrographic Office

Summary

The creation of accurate seamless digital data requires an awareness of many issues. These include, but are not limited to, datums (both horizontal and vertical), projections, the temporal nature of data, accuracy, scale and generalisation. This paper will highlight these concerns, but will then focus on how the United Kingdom Hydrographic Office (UKHO) is aiming to resolve the difficulty of assimilating geospatial data referred to different vertical surfaces. It will investigate the particular challenge of working with Chart Datum. The paper will use examples from the Integrated Coastal Zone Mapping project which is a tri-organisation project between the Ordnance Survey (GB), British Geological Society and the UKHO.

Introduction

Mariners have long wanted seamless geospatial data. Long before the advent of digital data, cartographers strove to assimilate differing data types and sources to create one seamless product for their end users. Now, with the digital era well and truly upon us, this requirement from the user is stronger than ever. No longer are users content to 'cut and paste' analogue products, or switch between differing digital datasets on screen. Mariners, understandably, want to use geospatial data effortlessly, without breaks for datum, scale or other such changes.

At the United Kingdom Hydrographic Office (UKHO) safety is our prime concern, although user requirements obviously have a high impact on how products are produced. We supply a plethora of geospatial information to our customers worldwide, both civilian and military. These customers rely on us for accurate and reliable data. Their desire is for seamless geospatial digital data which can provide the backdrop to their needs; be this navigation, warfare, fishing, mineral exploration, leisure or a multitude of other activities.

Technical Arena

The provision of this data requires the resolution of some quite basic technical issues. The creation of seamless data is, understandably, far more than just joining more than one digital dataset together. Issues such as horizontal datum, projection, temporal changes, error budgets (including accuracy, scale and generalisation) and vertical datums must be considered. Vertical datums are particularly relevant to the UKHO data sources and will be explored in depth in this paper. Ignoring these technical concerns will cause datasets of geospatial information to end up as meaningless and unreliable information.

Horizontal Datum

Horizontal datums are a key issue in the fusion of data. UKHO products use over 70 different horizontal datums, although this figure is gradually reducing as products move to WGS84 Datum, where possible. Figure 1 shows an example of horizontal datum shift in the Maldives. The difference between the original astro graticule and WGS84 Datum is over 3 miles. The largest known shift between WGS84 Datum and any charted feature is in the region of 7 miles. This is fortunately rare – but obviously very significant to navigation.

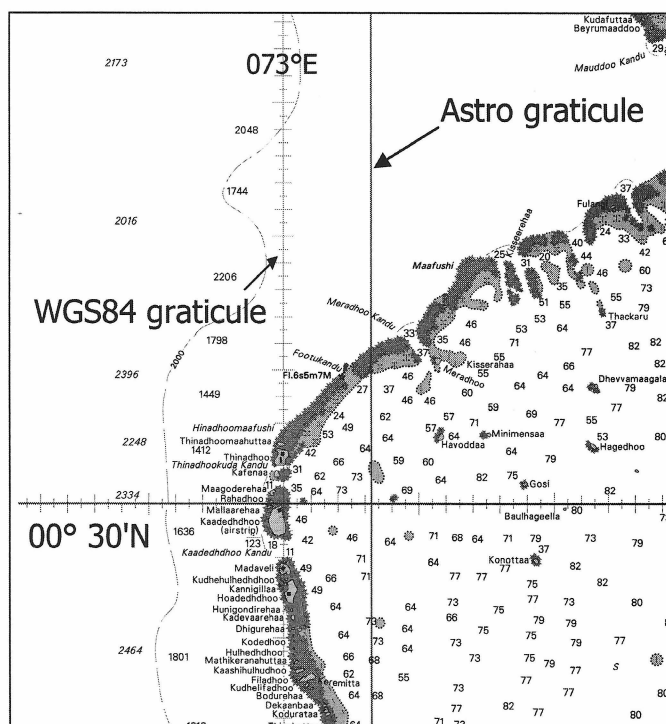


Figure 1: Portion of BA 1101 - Maldives

Closer to home, Figure 2 shows an example of a horizontal datum shift in the River Thames. The portion of chart on the left is referred to OSGB36 Datum whereas the one on the right is ETRS89 Datum (compatible with WGS84 Datum). This Figure shows the difference in position with respect to the Thames Barrier for two vessels which have identical coordinates. If the ship on the left went through the lowest barrier and passed their position to the ship on the right without qualifying which horizontal datum they were using there could easily be a grounding.

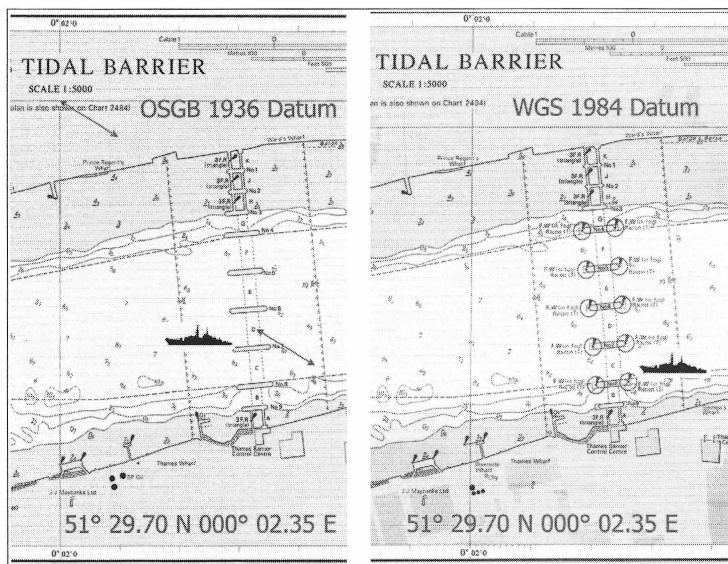


Figure 2: Portions of BA 3337 (previous and current edition)

Relating Charts to WGS84 Datum

The solution to the seamless problem for horizontal datums would be simply to refer everything to WGS84 Datum. Unfortunately about 30% of UKHO charts are not related to WGS84 Datum. This is due to the following reasons:

- The horizontal datum of the chart is not known (for example in many parts of the South China Sea, West Africa, Antarctica, Central America).
- The horizontal datum of the chart is known, but the relationship to WGS84 Datum is not (for example Sao Tomé).
- The horizontal datum of the chart is known, but the uncertainty in the datum shift required to refer it to WGS84 Datum is too great. Hence the error in the shift is plottable at the scale of the product.
- There are internal inconsistencies in the charts (particularly for charts yet to be metricated).

When the relevant information is known, horizontal datums are not a problem – it is a straightforward computation to transform from one datum to another. But where there is a lack of data, for any of the above reasons, the data cannot be referred to WGS84 Datum.

Projections

Projections can sometimes cause problems although these are usually easily surmountable. If a source is being scanned and its projection constants are not known then this can cause difficulties with geo-referencing. There can also be difficulties with scanned documents being displayed on a different projection to that which they were captured on. In such circumstances distortions can occur to the extent that legends become unreadable.

Temporal Issues

It is not possible to simultaneously survey the oceans and therefore time gaps appear in the data. For rocky and/or deep areas these gaps may not be important, as the seabed morphology remains static. However, in areas of shifting sandbanks, such as the English Channel, surveys of different dates provide different results.

Around 1996 a vessel grounded on a 2m shoal in the Clyde which was actually charted as 10m. Subsequently a survey was carried out and Figure 3 shows the results of this survey. It is apparent that the data is not seamless. The Source Data Diagram for this chart is at Figure 4. The area in the west, area 'a', is the newly surveyed area, surveyed in 1997. In the east is the area 'e' which was last surveyed in the 1940s. Time has caused a considerable difference in the bathymetry here.

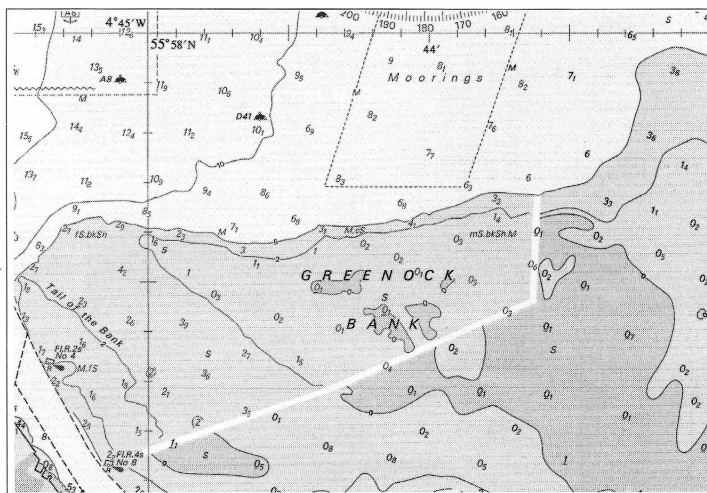


Figure 3: Portion of BA 1994 – Greenock Bank.

Temporal mismatch is also caused by the improvement of survey equipment over time. Features which were once 'hidden' from surveyors using old hydrographic methodology, such as leadline surveying, can be discovered with modern equipment. In such cases, the seabed morphology may have been stable, but improved survey methods have delineated more than was previously known to exist.

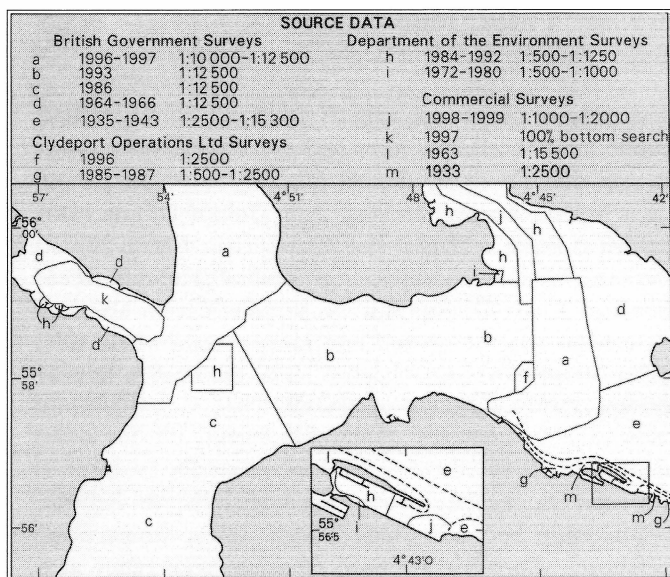


Figure 4: Source Data Diagram for BA 1994.

Unfortunately hydrographic surveying is extremely time consuming, and consequently expensive, compared with land surveying and this situation of mismatch of data due to time is likely to continue for some years to come.

Error Budgets

All data contains errors. This in itself is not a problem, but to maintain data integrity both the data provider and data user need to be aware of the data accuracy issue. There is unfortunately an all too common misunderstanding that because data is digital then it is perfect: it is not. Good quality metadata is an essential element of digital data – especially when data sources of differing accuracy, age and quality are being combined. Without this additional information the user has limited knowledge of the strengths, or weaknesses, of the data.

The final accuracy of one's product depends in part on the following variables:

- Data acquisition errors.
- Resolution of scanning and dimensional stability of original source material.
- Datum shift inaccuracies.
- Scaling differences – (eg small scale source enlarged for larger scale product).
- Positioning errors.
- Cartographic generalization.

This paper won't go into much detail on the above, but included here are a few graphics to illustrate some of the problems encountered with trying to assimilate different types of source data. These graphics all originate from the Integrated Coastal Zone Mapping (ICZMap®) project.

Figure 5 contains an example of a mismatch of data due to different scales of compilation. The detailed coastline is from large scale Ordnance Survey (OS) data – probably compiled at 1:2 500. The polygons are from UKHO data compiled at a far smaller scale than the OS data. It is easy to see the gaps and areas of overlap that the generalisation of the chart compilation has produced.

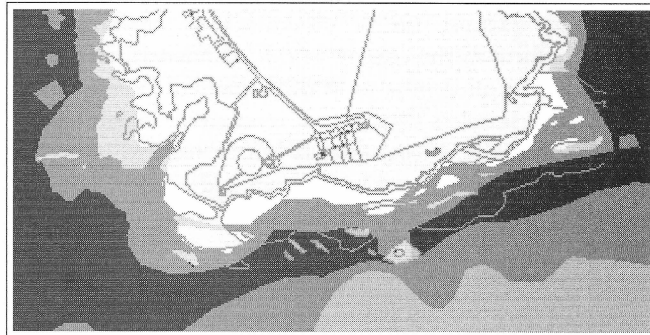


Figure 5: Overlap and missing data due to differences in compilation scale.

Figure 6 shows an example of misaligned data and Figure 7 shows contradictory data. In each case, which is the correct dataset?

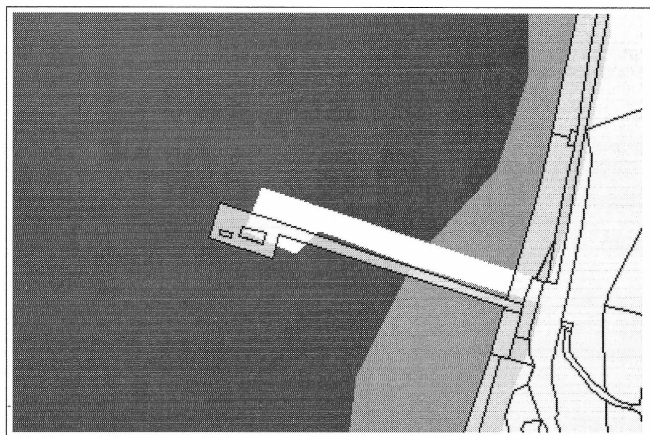


Figure 6: Misaligned data.

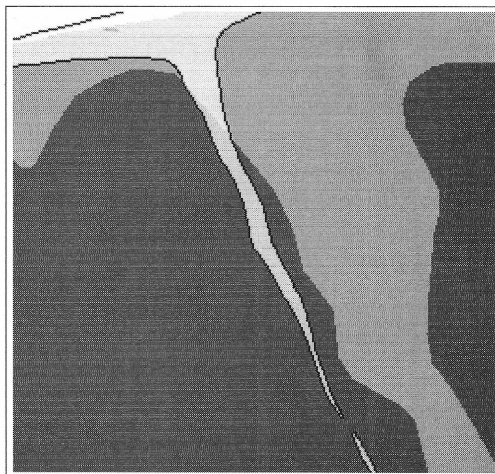


Figure 7: Contradictory data.

The user must also be aware that whatever quality of digital data is used, there will be error in their own location (no method of positioning is perfect) and this must be taken into account when assessing the final accuracy of their position with respect to the digital data.

Vertical Datum

Vertical datums are a considerable challenge for cartographers in the marine world. Ultimately all datasets should refer all depths to WGS84 Datum (or equivalent) to create a seamless database. It is relatively straightforward for land data as geoidal models can be used to derive the separation between local land datum and a global reference surface. However, Chart Datum, to which all soundings are referred, is not a coherent surface. It is certainly not easy to model.

Figure 8 shows the different types of vertical datum used in the UKHO. The key surface is Chart Datum (CD), which approximates to Lowest Astronomical Tide (LAT). Off this hang the other datums such as Mean Sea Level, Mean High Water Springs (which is used for the coastline and above which heights ashore are charted), Mean Low Water Springs, etc.

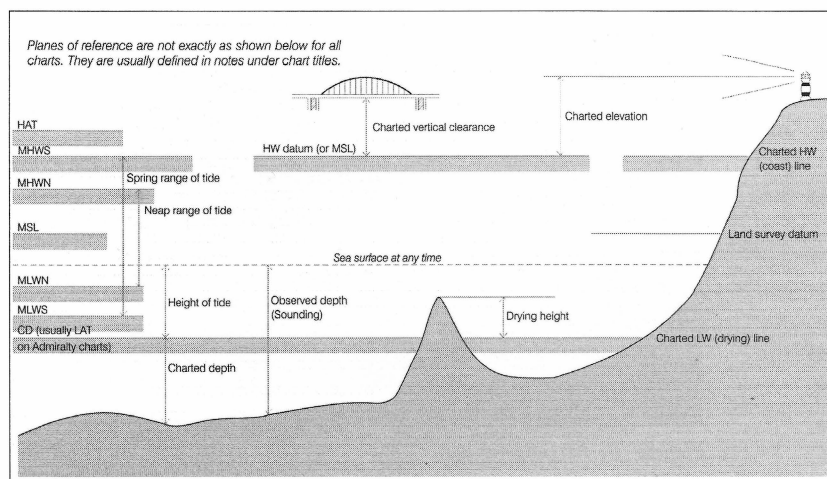


Figure 8: Relationship between different vertical datums.

Chart Datum varies around the UK and, indeed, the world. For example, around UK waters the following examples of differences exist between Chart Datum and Ordnance Datum Newlyn (the national land mapping datum):

- 2.80m at Torquay
- 1.50m at Lowestoft
- 6.10m at Barry
- +0.60m at Barnstaple

ICZMap® Project – Chart Datum Modelling

The ICZMap® project has investigated modelling Chart Datum with respect to Ordnance Survey vertical datum

in Home Waters. This is to allow the integration of OS height data with UKHO depth data.

The differences between Chart Datum and the OS vertical datum are published in the Admiralty Tide Tables. Great Britain uses Ordnance Datum Newlyn, Northern Ireland uses Belfast Datum, Ireland uses Dublin Datum, also known as Poolbeg Datum, and some specific Islands around the coast have individual vertical datums. The differences between Chart Datum and OS vertical datum are only defined at specific coastal locations, usually where tidal observations have been obtained. The challenge is how to extrapolate the differences seaward.

Co-tidal Values

Co-tidal values have long been used to model the relationship between Chart Datum and a 'home port' offshore. Co-tidals are used to relate tidal range at a particular point offshore with a tidal station onshore. They consist of lines of equal tidal range (in metres, to the nearest decimetre) and of equal time of High and Low Water (in hours, to the nearest 10 minutes, depending on the scale of the co-tidal chart). In general, the further offshore one is, the less the tidal range is (except in the vicinity of a degenerate amphidrome when the converse is true). In effect, this means that Chart Datum slopes up towards the geoid as one travels offshore.

Co-tidal factors are used to reduce soundings when surveying. They are also used by navigators to determine the depth of water beneath the keel. They were created graphically some years ago by the UKHO and are only guaranteed to be accurate in the vertical dimension to $\pm 0.5\text{m}$.

Developing the Model

The ICZMap® project has developed a non-navigational model out to 20km offshore (Whitfield and Pepper, 2003).

By relating the co-tidal value offshore to the nearest appropriate port and using an equation developed by the Tidal Branch at the UKHO, an offshore value for the height correction relative to the OS height datum can be obtained. Interpolation techniques can then be employed to grid the derived values around the UK. The production of the geo-referenced grid provides a means for applying a correction to the observed UKHO soundings relative to OS height datum. The resulting dataset can be used to re-contour the bathymetric depths and hence produce, on the same vertical datum, an integrated terrestrial and marine geographic model for the UK. This derived model is a graphical representation and is not suitable for navigation.

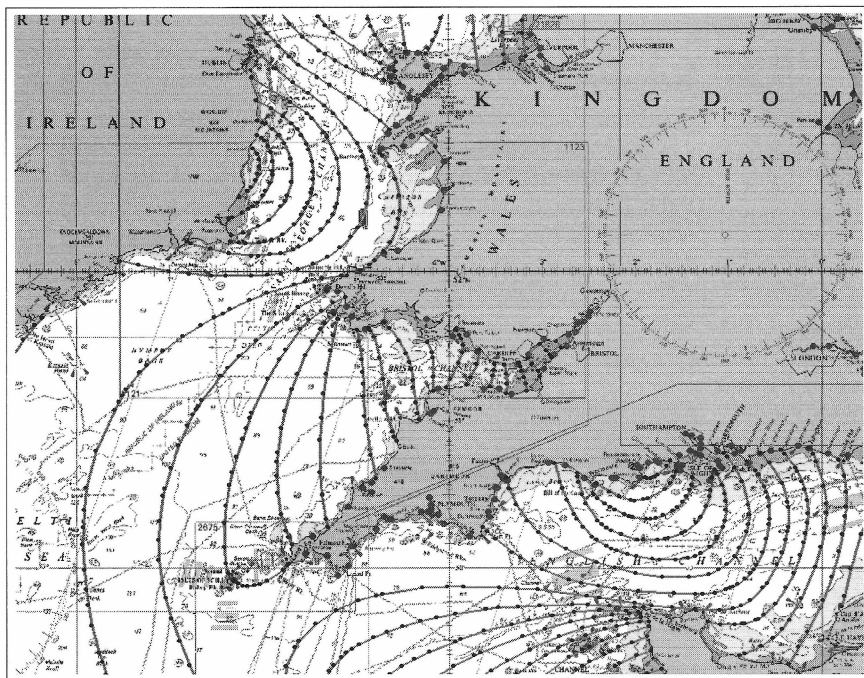


Figure 9 : Co-tidal points, lines and ports.

To date, the separation value of Chart Datum (CD) to the OS vertical datum has been derived via the following process:

1. Input CD to OS vertical datum values for tidal stations around the UK.
2. Digitise co-tidal charts.
3. Break up vector co-tidals to obtain point positions offshore (Figure 9).
4. For each point select nearest tidal station (Figure 10).
5. Compute the CD to OS vertical datum value at these points using co-tidal formula based on the nearest tidal station obtained in 4.
6. Model this separation to create continuous separation surface (Figure 11).

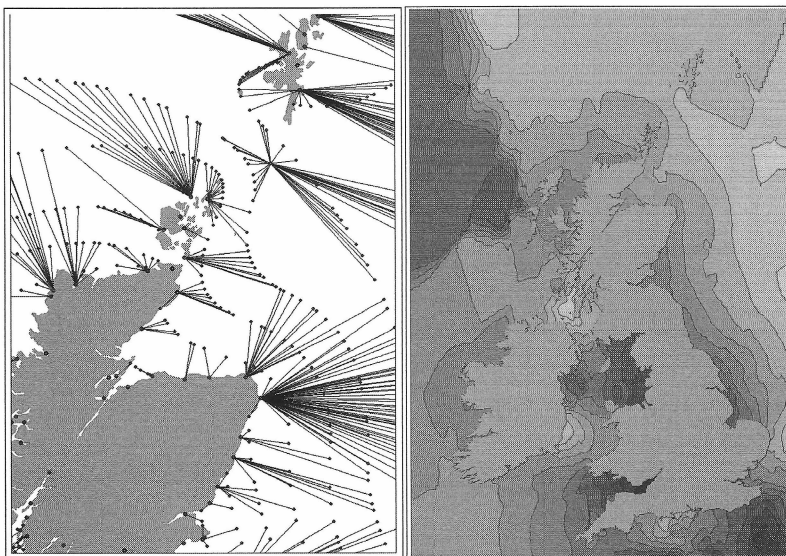


Figure 10: (Far left) Co-tidal point related to nearest port.

Figure 11: (Left) Contoured grid – darker areas are 6m and lighter areas are 0m with 0.5m interval.

When this separation surface is applied to bathymetric data it will result in a consistent height model both onshore and offshore (see Figure 11).

Taking this Model Further

This model has been created as a non-navigational product for use by the ICZMap® product. However, to extend this model further for accurate reduction of survey data to Chart Datum a more detailed approach is necessary.

The Canadian Hydrographic Service has been working on a solution to this for a number of years (O'Reilly, Parsons and Langelier, 1996). A GPS campaign was carried out in selected areas to define the relationship between Chart Datum and WGS84 Datum. From this a separation

surface was derived enabling the Canadian Hydrographic Service to handle data referred to a variety of vertical datums. It is hoped that this approach will be suitable for UKHO use – our investigations continue.

At some stage in the future, the UKHO is going to start receiving depth information with respect to a global reference frame, such as ETRS89. In Home Waters it is easy to obtain an accurate separation value for the difference between ETRS89 and the geoid by using the latest OS model, OSGM02 (Forsberg et al, 2002). But it is the accurate link onwards to Chart Datum which is still the unknown. Without this link it will not be easy to handle ETRS89 depths in the UKHO.

Use of Satellite Altimetry

One of the major concerns with the current derivation of the Chart Datum separation model is the reliance on the co-tidals, which are known to be only accurate to $\pm 0.5\text{m}$.

Satellite Altimetry measures mean sea surface height. It could possibly be used to derive co-tidal information if the mean sea surface height was combined with a tidal model. This would 'strip' out the tidal information so that the relationship between Chart Datum and a reference ellipsoid could be seen. This is only conjecture at the moment and, again, investigations continue in this area.

Conclusion

The provision of seamless data to customers is possible – but there are various technical challenges to overcome. Most are surmountable with sufficient information, but it is the lack of sometimes key data (such as horizontal datum information) which will continue to cause difficulties in this provision.

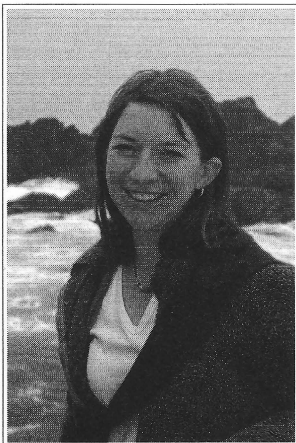
The UKHO is investigating the whole issue of modelling Chart Datum. The creation and maintenance of a separation model between Chart Datum and another stable reference surface is key to the future ability to be able to handle bathymetric data referred to various vertical datums.

Good quality metadata is an essential element of digital data – especially when data sources of differing accuracy, age and quality are being combined. It is essential that the user is made aware of the quality of their data. Seamless data is achievable, but it must be created and used with wisdom.

References

- Forsberg, R., G. Strykowski, J.C. Iliffe, M. Ziebart, P. Cross, C.C. Tscherning, P. Cruddace, O. Finch, C. Bray and K. Stewart, 2002, OSGM02: A New Geoid Model of the British Isles, Proceedings of Gravity and Geoid 2002 - GG2002, 3rd meeting of the International Gravity and Geoid Commission, August 26 -30, 2002, Thessaloniki, Greece.
- O'Reilly C, Parsons S, Langelier D, 1996, A Seamless Vertical Reference Surface for Hydrographic Data Acquisition and Information Management, Proceedings of the Canadian Hydrographic Conference '96, Halifax, N.S., pp. 26 - 33.
- Whitfield M, Pepper J, 2003, Integrated Coastal Zone – Data Research Project (ICZMap®), Presented at USHydro 2003, Biloxi, USA.
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Ruth Adams works for the UK Hydrographic Office based in Taunton heading up the Geodesy, Photogrammetry and Remote Sensing sections. During her career she has worked closely with the Royal Navy hydrographic surveyors and has had periods of detached duty at sea. Her geodetic expertise is a particular strength. Other career postings have included Project Management and charting for the Fleet Air Arm.

She has a degree in Surveying Sciences from the University of Newcastle upon Tyne and is a chartered surveyor with the RICS. She is the RICS UK delegate for FIG Commission 4, Hydrography.

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DID YOU KNOW ...

The Locked Sea-Chest

Old sailors were very jealous of their simple honesty. If a green-horn on his first voyage should carefully lock his sea-chest for safe-keeping, some older member of the crew would take him aside and gently but firmly point out to him the error of his ways; for a locked sea-chest was a personal insult to every seaman in the fo'c'stle.

Navigation Representative's Roles, Responsibilities, and Benefits

By: B. Calderbank, FRICS, CLS, P. Eng.
Hydrographic Survey Consultants Intl. Ltd., Calgary, Alberta, Canada

Procedures covering the roles and responsibilities of a Client Navigation Representative for 3D marine seismic surveys are provided. Some of the benefits of using the services of a navigation representative are briefly discussed.

Introduction

During the author's career as a Client Navigation Representative (hereinafter navigation representative), he has sometimes been provided with a listing of the roles and responsibilities to be undertaken, but more often these have been unstated and left to his own discretion. An updated version of the author's procedures for the roles and responsibilities of a navigation representative are presented.

The legal responsibilities and liabilities of a navigation representative have been dealt with in Calderbank 1992, and will not be discussed in detail. The focus of this article is towards 3D marine seismic surveys and the relationship with the client and the seismic acquisition contractor (hereinafter contractor). However many of the points provided will be applicable to other occasions where a navigation representative could be used for other types of surveys.

These procedures are not designed to be a job description, nor is every task listed to perform the assignment. Generally the navigation representative would be expected to take the initiative in the application of the roles and responsibilities outlined, in order to improve and enhance the survey outcome. This would be from a contractual, a technical and a health, safety and environmental (HSE) perspective.

Generally the navigation representative works in conjunction with a seismic acquisition representative. Some of the functions onboard can be shared, sometimes equally or partially if required by the client, and these are highlighted. This could include HSE issues, as over time the navigation representative has become more involved in HSE as the importance of this issue has developed within the exploration industry. With two people onboard as client representatives, generally they would arrange their working hours to provide 24 hours supervision throughout the survey.

The navigation representative may be carrying out these assignments as an employee of his or her own company in a subcontractor relationship via a linking company or directly

contracted to the client. Whatever the relationship, the more stringent procedures and practices of each company should take precedence unless otherwise instructed by the client.

Some of the benefits of using a navigation representative are explained in the last section by reference to the sorts of navigation and positioning errors encountered. The identification and rectification of such errors could save many projects from problems and potential disasters, and not just in the seismic industry.

Primary Objectives

The primary objectives could be modified by the client as required. However, in most circumstances the following should be appropriate.

- Ensure that the contract specifications with respect to survey, navigation and positioning are being met by the contractor, both to the letter and spirit of the contract.

It is important to understand the opinion of the client with respect to the contract. Some client's see the contract as a guideline to achieve the seismic objectives, and hence would be comfortable with changes and adaptations, which allowed the objective to be met. Other client's may insist on a literal implementation of the contract, but this could be difficult if the survey, navigation and positioning specifications are incomplete. For a comprehensive listing of survey, navigation and positioning guidelines for 3D marine seismic survey specifications see Calderbank 1998.

- Assist with the acquisition of optimal survey, navigation and positioning data throughout the 3D seismic survey, particularly related to the vessel, the sources and the streamers, including the rectification of any possible errors or blunders.

This objective is of paramount importance, and must be obtained within the scope of the contract and the appropriate contract law. The best methods to achieve this are through a well-grounded practical and theoretical understanding of the tasks at hand. It should also be remembered that the 3D seismic survey is a marine

survey to map geophysical and geological targets, which will usually only be well defined once the 3D seismic survey has been completed and interpreted. Eliminating uncertainties in the positioning and having a consistent data set should allow easier analysis of the seismic data since anomalies will be geophysical artefacts mapped on repeatable positioning and unrelated to positioning errors. This will be even more appreciated, if more complex geophysical interpretation is required or later devised using the original data set.

- Ensure that the contractor produces the most realistic real-time binning possible, with the information and resources available onboard the vessel.

Proper collection and binning of the data set will maximize vessel efficiency and reduce the overall cost of the 3D seismic survey. Analysis of the streamer feather angles, tides, currents, towing configuration and vessel speed may allow adjacent lines to be acquired with minimal coverage overlap or loss.

- Provide real-time and onboard analysis of all the parameters effecting the survey, navigation and positioning.

By tracking data trends it is possible, that equipment deficiencies and other problems can be highlighted. Consequently proactive measures could be taken to eliminate or diminish these situations to ensure continued production. With the multi streamer spreads used in the 3D seismic industry, it is essential to be proactive as weather and operational conditions may limit the speedy rectification of such equipment deficiencies.

- Provide a detailed final report with respect to survey, navigation and positioning, independent of the contractor as much as possible, for the performance and analysis of the navigation and positioning systems used.

The portions of the report should include as follows: an introduction; a parameter summary; an executive operational summary; conclusions and recommendations; a performance appraisal of the positioning equipment; an analysis of the data quality and trace coverage; any site specific information including feather angles, currents, tides, well ties, etc.; and a general analysis of the contractor personnel. Generally a draft report should be available within five days of the completion of the survey, and a final report within thirty days.

- Ensure that the client is made aware of any discrepancies between the client's objectives and the results being achieved by the contractor, even if the

contractor is performing to within the contract specifications.

For a variety of reasons the navigation representative may not have been involved in providing advice to the client with respect to survey, navigation and positioning for the 3D seismic survey contract. Consequently there is the possibility that the contract may not adequately reflect the needed navigation and positioning hardware and redundancy, nor adequately specify the accuracies and tolerances required to meet the client's objectives.

The expertise of the navigation representative should be applied to analyse such situations and to provide appropriate advice to the client on the current survey as well as for future surveys. Of course, any such discrepancies should be discussed with the contractor and the seismic acquisition representative.

Technical Duties

These technical duties may not be applicable in every situation, depending on when the navigation representative was brought in on the project, and could be modified by the client as required. However, in most circumstances the following should be appropriate.

Pre-Survey

- Provide advice on survey specific navigation and positioning requirements, hardware, software, and specifications for the contract prior to the commencement of the bidding process.
- Provide analysis of the submitted proposals with respect to conformance with the navigation and positioning specifications.

If the client does not have in-house expertise the navigation representative may be relied on to provide the needed practical and technical background for the 3D seismic survey with respect to survey, navigation and positioning.

- Attend to any mobilisation details specified by the client.
- Attend a briefing with the client prior to the start of the survey.

The client briefing could include as follows: the geophysical and geological targets; a review of the survey logistics and planning; priority acquisition area(s); coverage and infill requirements; line naming and shot point numbering conventions; header content; tidal information and water depth reduction; positioning data required at the end of the 3D seismic survey; navigation data delivery address(es); and HSE reporting criteria.

- Understand the contractual obligations between the client, contractor and subcontractor(s) (if used).
- Review the seismic program with the contractor to establish the degree of flexibility acceptable for certain system specifications relating to survey, navigation and positioning.
- Ensure that all of the specified pre-survey positioning checks, verifications and calibrations are completed and documented correctly.
- Review the data to determine the acceptability of the positioning in relation to the contract specifications and tolerances, such that the overall data quality is of the desired standard and ensures a consistent data set.
- Seek to identify random and systematic errors in any of the navigation and positioning systems.
- Maintain the navigation portion of a quality control or database system (if available), to provide an independent means of tracking the navigation and positioning performance.

Generally the contractor will engage a subcontractor to perform most of the positioning verification and calibration tasks. They may include as follows: DGPS (differential GPS) and rGPS (relative GPS) verifications, laser and gyrocompass calibrations, GPS heading unit calibration, streamer compass calibrations, streamer compass verifications, and echo sounder checks. The contractor's and subcontractor's procedures for these tasks should be examined to ensure good survey practices are observed, and that the obtained results meet the requirements. For a comprehensive listing of acceptable results for pre-survey checks, verifications and calibrations see Calderbank 1998.

Survey

- Monitor the performance of all navigation and positioning equipment, particularly after any repair or replacement of components or units, and changes to the acquisition configuration.
- Ensure that all instrument and other tests are properly and conscientiously carried out by those involved.
- Check that the positioning data is correctly input into the contractor's on-line integrated navigation system, navigation post processing system, and binning system.
- Check that the filtering, smoothing or combinations thereof used for the network solution are appropriate.
- Ascertain that all positioning data is logged in an unambiguous format that is acceptable to the client and make periodic checks of the logged data going to tape (if possible).
- Ensure that the contractor provides detailed logical documentation of the data logged, the performance of the navigation and positioning systems, and any statistics provided.
- Assess the positioning quality of each line acquired, including the performance of the navigation and positioning systems, as well as the overall quality of the network solution.

The results should be organized in a systematic and logical manner to aid analysis. Examples of the contractor documentation examined should include as follows: prospect and configuration diagrams; navigation line log; observer's line log; end of line (EOL) printouts; navigation post processing printouts; viewing the on-line and post processed displays; and certain electronic statistical files generated by the contractor's post processing system.

- Monitor the onboard navigation post processing.
- Use a contractor's navigation data or 'guest' terminal (if supplied) to review the navigation post processed data.
- Ensure that all of the specified positioning checks, verifications and calibrations required during the 3D seismic survey are completed and documented correctly.

For a comprehensive listing of acceptable results for the checks, verifications and calibrations during the 3D marine seismic survey see Calderbank 1998.

- Provide the navigation comments and equipment performance for the daily report to client.

The format of the report would usually be agreed with the seismic acquisition representative and the client. The navigation representative may also provide weekly, monthly, and end of trip reports as required by the client.

- Be attentive to the planning and co-ordination of the work to take advantage of weather, logistics and other operational conditions.

The navigation representative should encourage the contractor to repair and replace in-sea equipment as soon as practicable within the limits of weather, daylight operations and safety. Client involvement in planning and co-ordination will generally be the responsibility of the seismic acquisition representative. Complications arising out of seismic equipment maintenance, seismic interference and swell noise, timeshare, or fishing

activities should be the responsibility of the seismic acquisition representative.

- Review the coverage plots to assist in defining the amount of infill necessary to complete the seismic coverage required.

This task will generally be the responsibility of the seismic acquisition representative but could be shared equally or partially with the navigation representative.

- Observe the performance of the personnel responsible for the maintenance and operation of the navigation and positioning equipment.

Post-Survey

- Ensure that all of the specified post-survey positioning checks, verifications and calibrations are completed and documented correctly.

For a comprehensive listing of acceptable results for post-survey checks, verifications and calibrations see Calderbank 1998.

- Attend to any demobilisation details specified by the client.
- Attend a debriefing with the client immediately or soon after leaving the vessel.

The debriefing could include a review of: the overall operations effectiveness, the conclusions and recommendations; the performance of the various systems; and coverage and infill acquired.

HSE Duties

The HSE duties could be shared equally or partially with the seismic acquisition representative. If this responsibility is shared then each representative should be involved in the reporting and monitoring of the work and related HSE activities. In these circumstance the following should be appropriate:

- Be attentive to onboard HSE issues.

This could include a proactive involvement with the personnel onboard concerning HSE issues to include as follows: conducting regular work practice checks; ensuring audit findings are properly closed out by the contractor; and attending safety meetings and promoting HSE awareness.

- Become familiar with the relevant HSE legislation, client and contractor HSE policies, emergency and environmental plans, safety cases, audits and other

documentation provided by the client and the contractor.

The navigation representative is not a lawyer and should not be expected to know all of the applicable law involved in a 3D marine seismic survey project. For instance, the application of employee and employer laws in the offshore jurisdiction of any particular country. Above all, this is not feasible since most of the personnel who act as a navigation representative, carry out these assignments throughout the world. It would be impossible to be aware of all the legislative requirements of every country where offshore exploration is under way. However it is not unrealistic for the navigation representative to become familiar with such documentation immediately relevant to the survey.

- Endeavor to observe HSE activities associated with the survey to ensure compliance with the relevant HSE requirements.

The navigation representative cannot be expected to ensure all HSE activities associated with the survey comply the all HSE requirements. The open-ended liability implied should not be acceptable. However the navigation representative should try his or her best to observe HSE activities, particularly those related to navigation and positioning, with the proviso that the relevant HSE requirements would be related to such documentation immediately relevant to the survey.

- Become familiar with the client and contractor incident reporting procedures and follow the reporting requirements specified by the client.

Each client will have different HSE criteria and reporting procedures, which could be addressed in the initial briefing.

- The client may have specific written and verbal reporting criteria, and an associated report generation timing criteria that should be followed.

The navigation representative's own company or the linking company being used for the project may also have reporting criteria that will need to be followed.

Lines of Responsibility

The navigation representative is usually directly responsible to the seismic acquisition representative in matters concerning line acceptance criteria, although this may not be clearly documented. The navigation representative should inform the seismic acquisition representative if the survey, navigation or positioning specifications are not being met. The decision to continue acquisition usually rests with the seismic acquisition representative.

Generally the lines of responsibility onboard could be as shown below. Different companies use different titles but the intent should be clear.

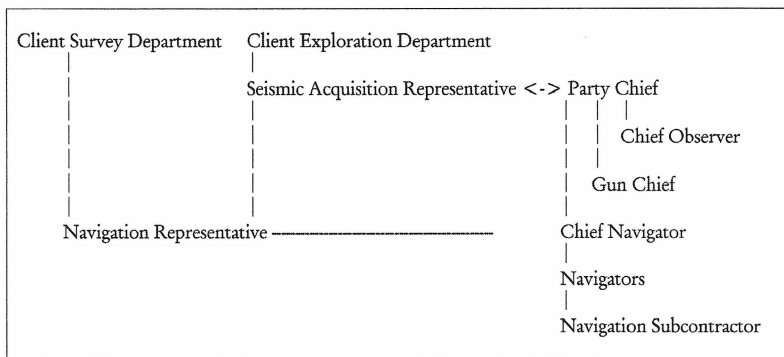


Figure 1. *Lines of Responsibility - Schematic*

If the navigation representative is of the opinion that the seismic acquisition representative is not giving sufficient weight to the concerns of the navigation representative, he or she should be allowed to contact the client directly with those concerns.

The navigation representative should liaise with the Navigators while on-line to ensure optimum navigation and positioning performance. The navigation representative should be in direct communication with the Chief Navigator concerning such issues as systematic problems, and where the contractual navigation and positioning specifications are not being met.

If possible the navigation representative should be involved in all technical discussions between the contractor and the navigation subcontractor (if used).

Any discussions with the Party Chief, the Chief Observer and the Gun Chief should usually occur after a preliminary discussion of the navigation representative's requirements with the seismic acquisition representative.

The intention is that the navigation representative should be informed, either directly or indirectly, of all matters related to survey, navigation and positioning throughout the 3D marine seismic survey.

Methodology

Generally the legal status of the navigation representative will not be mentioned in the 3D marine seismic survey contract or other relevant documentation. Usually in the contract an agent will be appointed, but this person would typically be part of the client onshore team. Hence with respect to contract law, in the opinion of the author, the navigation representative would be viewed as an observer for the client. The client would have to authorize in writing any actions, which would have contractual or financial implications.

The seismic acquisition representative may be empowered

by the client to suspend operations if and when it is judged conditions could allow or have allowed deficient technical performance, a failure to meet contractual obligations, or unacceptable HSE functionality. However such authority would generally be tempered with a requirement that the client be informed when such a situation has occurred. Depending on the situation the client may have to be informed immediately, or notified in the due course of the days operations.

Given these legal restrictions the navigation representative should endeavour to achieve the above objectives and duties through diplomatic advice and encouragement. The navigation representative cannot impose any procedures or practices upon the contractor even though in the opinion of the navigation representative there would be an improvement in the survey data quality for the 3D marine seismic survey. This situation also reinforces the need for clear and comprehensive survey, navigation and positioning specifications as outlined in Calderbank 1998. Without such supporting contractual documentation the ability of the navigation representative to carry out the primary objectives can be limited.

The only appropriate situation could be when the specifications are not being met, and even then it is the obligation of the contractor to resolve the situation so that the specifications are met. The contractor has the choice to accept or disregard the advice and expertise of the navigation representative. The contractor will be responsible for whatever outcome arises, unless the client provides written instruction in such situations.

Hence a professional and courteous attitude toward the contractor and any subcontractor staff is appropriate at all times. The navigation representative should maintain good communications onboard and get to know everyone as much as possible. This will allow a better understanding of the outlook of the contractor's personnel with respect to the survey, contract issues and morale.

The navigation representative should attempt to resolve any disagreements with regard to the navigation and positioning onboard, while keeping the client informed of developments. This should avoid unnecessary conflict and disruption.

A positive attitude and an ability to encourage the best from the personnel with whom the navigation representative becomes involved are required. This should encourage win-win solutions for both the client and the contractor.

The hallmark of a good navigation representative is the ability to be innovative and to be able to make the best use of the available resources. In addition the client will expect the utmost diligence and professionalism to be applied.

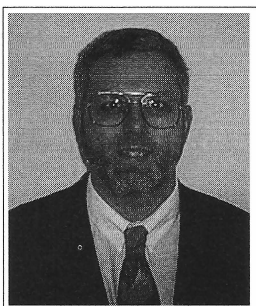
Benefits

As the marine seismic acquisition industry developed, and radio positioning was used further offshore and in more varied locations around the world, problems were identified with some of the data which related to poor positioning. The advent of GPS positioning has removed some of these possible error sources but many others took their place with the increasing prevalence of multi streamer 3D marine seismic surveys.

Examples of problems encountered after numerous assignments with different clients and contractors have included as follows:

- Poor or improper survey practices.
- Incorrect or poor positioning system installations.
- Incorrect positioning set up parameters.
- Poor checks, verifications and calibrations procedures and incorrect or improper execution.
- Incorrect application of computed minus observed corrections of various positioning systems.
- Incorrect datum, spheroid, projection or combination thereof.
- Incorrect datum transformation parameters.
- Incorrect vessel offsets.
- Incorrect gyrocompass or improper heading input.
- Incorrect source and streamer offsets.
- Incorrect parameters used in the on-line integrated navigation system, navigation post processing system, binning system or combination thereof.
- Switched acoustic data, streamer compass data, or combination thereof between various streamers.
- Incorrect or poor filtering and smoothing of the data used in the network solution.
- Incorrect application of draught, water velocity corrections or a combination thereof.

It is not only the positional errors that such problems introduce, but also the consequent inconsistencies in the final data set. The positioning errors encountered were generally less than 10 metres, although other gross errors were hundreds and thousands of metres. On many occasions several relatively small (less than 5 metre) positioning errors were found which combined to displace the source and receiver positions sufficiently so that the consistency of the data set was questionable. Due to various constraints it was not possible to provide figures illustrating these errors.



About the Author...

Bruce Calderbank is President of Hydrographic Survey Consultants Intl, in Calgary Alberta, specializing in offshore survey, navigation and positioning consultancy worldwide. HSCIL has carried out 3D marine seismic survey consulting assignments as the Client Navigation Representative for over 30 companies, while supervising a variety of contractors. This background and over 23 years of experience has allowed HSCIL to produce these procedures. He can be contacted at bruce_calderbank@nucleus.com

The possibility of such errors being included in a data set has encouraged the use of the services of a navigation representative for 3D marine seismic surveys. Although the seismic industry has grown and matured over the years, one of the problems facing the industry is the difficulty in retaining personnel. The loss of experienced navigators from any company reduces the ability of the contractor to adapt to the ever-changing navigation and positioning technology. The loss of this experience is difficult to replace.

The use of a navigation representative provides the client with expertise and practical knowledge that will not readily be found otherwise. If involved in the contract and bidding process the navigation representative should ensure survey, navigation and positioning issues are reviewed and addressed appropriately. Onboard the in-depth knowledge of the navigation representative based on many years of experience can be beneficial to both the client in following the procedures in this paper, and to the contractor in providing information, alternatives and solutions to awkward or unusual operational situations.

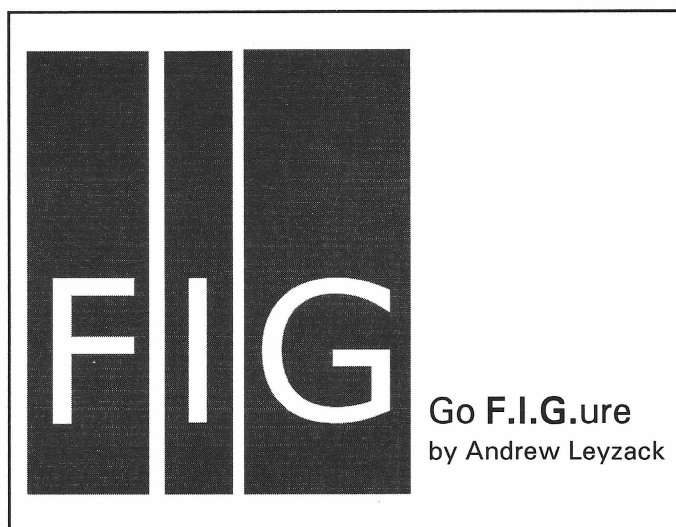
Acknowledgments

The author wishes to thank various colleagues for their suggestions and comments.

This article was previously published in a different format in The Hydrographic Journal, No. 101, July 2001, pp 11 to 15.

References

- B. Calderbank, *Survey, Navigation and Positioning Guidelines for 3D Marine Seismic Survey Specifications*, The Hydrographic Journal, No. 90, October, 1998, pp. 11-20; Recorder, Canadian Society of Exploration Geophysicists, Vol. XXIV, Nos. 5 and 6, feature article May and June, 1999; Lighthouse, Fall 2000, Edition 58, pp. 7-17.
- B. Calderbank, *Legal Responsibilities and Liabilities of the Offshore Surveyor*, The Hydrographic Journal, No. 64, April, 1992, pp. 25-32; International Hydrographic Review, Vol. LXIX, No. 2, September, 1992, pp. 129-148; Geomatica, Vol. 47, No. 2, Summer, 1993, pp. 139-149.



The International Federation of Surveyors (FIG) is a non-government organization comprised of nine technical Commissions representing various surveying disciplines and activities. Commission 4 in particular, strives to represent the interests of hydrographic surveyors from every discipline through participation within their respective national surveying and/or national hydrographic associations. Commission 4 has formal relations with the International Hydrographic Organization (IHO), and more recently the International Cartographic Association (ICA). As I identified in *Go FIGure*, Lighthouse Edn. 62, hydrographic interests in Canada are represented internationally by two streams: By way of the International Hydrographic Organization (IHO), an intergovernmental organization (IGO), whose interests are governed by the hydrographic offices of its member states and whose activities are primarily directed towards nautical charting.

By way of FIG Commission 4, a non-governmental organization (NGO), whose interests are governed by hydrographers in private sector, government and academia through their membership in the Canadian Institute of Geomatics (CIG) and indirectly by CHA's affiliation with CIG.

Terms of reference

- Hydrographic surveying.
- Hydrographic education, training and Continuing Professional Development (CPD).
- Marine environment and Coast Zone Management.
- Data processing and management.
- Nautical charting and bathymetric maps - analogue and digital, includes ENCs (Electronic Navigational Charts).

Mission Statement

- Promote the aims and objectives of FIG to hydrographers through the active involvement of national delegates from member associations and other interested parties in the activities of the commission.
- Foster closer links with all sister organizations currently active within the global hydrographic community.
- Develop guidelines and standards that will assist hydrographers in the provision of their services.
- Disseminate information relevant to the profession through participation in international meetings, conferences and committees.

In the fall of 2002 I forwarded information from Adam Kerr, chairman of Commission 4's Working Group on Strategic Partnerships regarding the benefits of membership in FIG to the CHA directors. Of relevance to CHA are FIG's Special Publications 16 and 17, which present guidelines, a code of conduct and standards of practice for professional associations.

The CHA directors recently met to discuss, among other things, the issue of membership with FIG and The Hydrographic Society where, I emphasized the professional nature of the CHA and that membership in professional organizations like FIG, would strengthen our status in that regard. The CHA directors were in favour of further pursuing the FIG proposals especially Bruce Calderbank of our Prairie Schooner Branch (PSB), in Calgary, AB. It is interesting to note that our PSB membership is entirely from the private sector and judging by the response carried forth from that branch's AGM they are keen on the potential benefits of not only CHA's membership in FIG but also the International Federation of Hydrographic Societies. That said, the recent trend in CHA's membership enrollment has seen an increase in private sector representation.

This year marks the 125th Anniversary of FIG. FIG Working Week 2003 and the 26th FIG General Assembly were held 13 to 17 April in Paris. Please tune into the next edition of *Go FIGure* for a report on these events and the activities of Commission 4 (Hydrography).

For information on the specific objectives of Commission 4 and its working groups, look up Commission 4 under :
www.FIG.net

Lighthouse puzzler

By
Beth Weller

	Hydrographer	International Member	Student	Cartographer	Sewing canvas	Sanding the mast	Picking oakum	Scraping the oars	New Zealand	Edinburgh	Ottawa	Grimsby
Andrew												
Julia												
John												
Terese												
New Zealand												
Edinburgh												
Ottawa												
Grimsby												
Sewing canvas												
Sanding the mast												
Picking oakum												
Scraping oars												

Lighthouse Puzzler # 23

It is now ten years since Central Branch's Admiralty launch *Surveyor* was completed as a Branch Project that had been initiated at the Branch AGM in December 1990. The launch is a replica of the boat used by Joseph Bouchette to survey Toronto Harbour in 1792 and has shown the CHA flag, so to speak, at many interesting events and re-enactments during those ten years. Last week, four of the volunteers (one of whom was a student from Ottawa working on the oars) were busy doing some maintenance on the launch for its anniversary celebrations.

From the rather rambling narrative given by the guide, can you figure out who was doing what?

The clues:

1. Andrew, who was sewing canvas, is not from New Zealand.
2. Julia; the person from Edinburgh; the woman scraping the oars; and the International Member were working together for the first time.
3. The man from New Zealand was not picking oakum.
4. The hydrographer is from Edinburgh.

Solution to Puzzler #22

By clues 1, 2 & 5, the one with the Hydrographic Society must be Steve, and he is not the lecturer from the UK (clue 1) nor is he from NZ or Australia (clues 3 & 5) he so must therefore be from the USA, and the New Zealander must be Peter, and Bob, with the IHO (clue 2), is the lecturer from the UK.

By elimination and filling in the blanks, the cartographer with the CPS (clue 4) must be from NZ. This means Tim is the hydrographer and is the one with the CMMC.



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Canada's Role in Advancing Interoperability Through the Open GIS Consortium (OGC)

By: M. Reichardt, Executive Director, OGC Outreach and Adoption Program

Introduction

Canadian private and public sector organizations have been leaders in the development and use of digital geoprocessing technologies since the 1960s. The Open GIS Consortium (OGC) is pleased that Canadian organizations have played an important role in the growth of geoprocessing interoperability through their participation in the OGC in the early 1990's and beyond. Canadian companies, universities and government organizations participate in the OGC, along with 214 members from 26 other countries. Together these members participate in the development of publicly available software interfaces and schemas that enable interoperability among different brands and types of geomatics software. Most of the world's major vendors of GIS, AM/FM, Earth imaging, surveying/mapping, navigation and location services software are involved. The specifications developed by OGC are becoming key elements of Spatial Data Infrastructures (SDIs) around the world, including the Canadian Geospatial Data Infrastructure (CGDI). To appreciate where interoperability is today, in Canada and worldwide, its worth exploring the contributions made by OGC's Canadian members.

The Early Years

In 1992, two years before OGC was founded as an industry standards consortium, OGC's founders started the Open GRASS Foundation (OGF). OGF's mission was to nurture commercial activity based on the Geographic Resource and Analysis Support System (GRASS), an open source raster and vector GIS developed by the US Army Corps of Engineers. The goal was to develop a viable open source model for the geomatics industry, to provide users with greater choice, control, economy and interoperability.

Bob Moses, president of PCI Geomatics, made his company OGF's first commercial sponsor. PCI's support was critical to OGF's survival in those difficult early years. Osiris Systems of Sidney, B.C. was also an early OGF member.

Experience led the OGF principals to reorganize from a foundation to an industry standards consortium called the Open GIS Consortium, Inc. The GRASS open source model might have resulted in a robust and widely used "free" GIS, reducing software costs for some users. But it would always have competed against commercial GIS and

Earth imaging systems, and it could never have provided the interoperability among these systems that was needed by users. The open or shared interface model, if the vendors could be persuaded to work together to implement it, offered the possibility of a rich variety of commercial products communicating "transparently" across local and wide area networks.

OGC faced difficult technical and organizational challenges from 1994 to 1998:

- A distributed computing architecture had to be devised that would enable interoperability across diverse, competing distributed computing platforms, including at least OLE/COM and CORBA, with accommodations for JAVA. There was, of course, an increasing market focus on the World Wide Web.
- Most members thought it was necessary to develop a good working liaison with ISO TC/211 and other standards organizations in this technical space. The relationship with TC/211 was not strong at first, but it evolved as the two organizations sorted out their complementarity. Similarly, in the U.S., OGC's relationship with the Federal Geographic Data Committee has strengthened over time, and in Canada, OGC's relationship with Natural Resources Canada (NRCan) has strengthened over time.
- It was necessary to develop critical mass, recruiting and keeping enough members whose commitment was sufficient to sustain activity over several years of developing the OpenGIS Abstract Specification, before interoperability would be possible.

Through the power of the idea, the needs of user members, and the faith and commitment of technology provider members, OGC survived, agreed on a basic architecture, and began steadily building a set of OpenGIS Implementation Specifications.

Mark Sondheim of the British Columbia government attended some of the earliest technical meetings that eventually led to OGC. He was leading the development of SAIF (Spatial Archive and Interchange Format), and in 1991 he presented SAIF at one of these meetings. SAIF is

of interest because it is a self-describing format based on an extensible geographic object paradigm, including a Class Syntax Notation for expressing object models and an Object Syntax Notation for representing instances conforming to the models. SAIF and these notations are clear precursors to OGC's Geography Markup Language (GML). Mark argued persuasively for an object-oriented approach based on common interfaces, helped develop the methodology for specification development and was a principal author of the first prototype OpenGIS Specification. The Feature Manipulation Engine (by Safe Software), a widely used interoperability tool, now with strong support for GML, began its life as a SAIF translator capable of model to model transformations. More recently, and with support from the Canadian GeoConnections program, led by NRCan, Mark initiated the Java Topology Suite, an open-source development (by Vivid Solutions) that implements OGC predicates and functions. He has also helped back the development (by Refrations Research) of another OGC based open-source exercise, the postGIS spatial extensions to the open-source PostgreSQL database.

Ron Lake of MacDonald Dettweiler Associates (MDA) came to his first meeting in 1993. MDA was a consultant on SAIF. Ron Lake had initiated a project at MDA called Geomate, in which Don Murray and Dale Lutz were later involved. MDA was involved in SAIF because Geomate was an object-oriented GIS and photogrammetric system. Around 1994, Ron contributed to the object-oriented view of spatial information systems in OGC, offered the idea and the name of "Information Community," and helped write various parts of the OpenGIS Abstract Specification.

Orest Halustchak of SHL (Systemhouse) was an early Canadian participant, as well as Mark Ashworth of UNISYS System Nine.

Global Geomatics (Montréal, Québec) submitted a proposal in 1996 for OGD I (Open Geospatial Datastore Interface) in response to OGC's first Request for Proposals, which requested proposals for "Simple Feature Access" in the Internet distributed computing domain. OGD I, which at that time was already quite well developed and had been implemented by a number of OGC members in some of their products (mainly for use in major Canadian government programs), enables cross-application access to data stores. It is a set of interfaces that enable a server to respond to data retrieval requests received from other applications. OGD I can pass information that matches the search criteria from a number of proprietary and non-proprietary data store types: VPF, Arc/Info, MGE, MapInfo, LaserScan, Arc/Shape, Small World, and others. Several off-the-shelf products provide this capability today. Unfortunately, this data access approach required a unique interface for each vendor's data format. This was different

from the approach OGC sought, which was based on all the vendors, integrators and non-commercial developers agreeing on and adhering to a single interface specification for each of a wide number of operations in addition to data access. As this capability for interoperable processing was not present in the OGD I proposal to OGC at the time, OGD I failed to gain the consensus of OGC members.

In the intervening years, OGD I has been "wrapped" with interfaces that implement OpenGIS Specifications, so OGD I installations can now interoperate with other installations that have such interfaces. This open source software was, until November 2002, maintained by the Information Interoperability Institute (3i) in Hull (Quebec).

3i was formed in 1999 to encourage the development of interoperable, open standards-based solutions to challenges in Web-based access to information, in particular geospatial information, in support of informed decision-making by end users. 3i was based on a Canadian membership comprised of private and public sector organizations closely involved in the development of interoperable products and in their integration in information infrastructures. 3i was a member of OGC and participated in OGC pilot project activities. 3i also held an annual forum in the Fall of 2001 that allowed a variety of stakeholders to learn about on-going efforts in the field of interoperability. 3i closed its operations in November, 2002.

Following attendance of early meetings of OGC by Bob O'Neil of Natural Resources Canada and Tim Evangelatos, staff from the GeoConnections program developed a working relationship with OGC. NRCan joined OGC in the spring of 1997 and is now a Principal Member. NRCan is also the lead agency in GeoConnections, a national partnership initiative to build the Canadian Geospatial Data Infrastructure (CGDI), which will provide Canadians with access to geospatial information, technologies and services over the internet.

Board Participation

Canada has also been represented on OGC's Board of Directors, an international group of individuals who are prominent in geoprocessing and related domains of activity.

Dr. John McLaughlin, now President and vice-chancellor at the University of New Brunswick in Fredericton, N. B., served on the Board from 1998 to 2000. He is one of the world's most well-known and respected experts in land administration, land information management systems, and the use of geographic information in public decision-making.

Dr. Robert Moses, president and CEO of PCI Geomatics, recently joined OGC's Board and will begin his term in

February, 2003. In addition to his 17 years of executive experience at PCI Geomatics, Dr. Moses brings to the OGC Board a wealth of industry knowledge gained through advisory positions to various Canadian government bodies. Dr. Moses serves as: a member of the Council of Science and Technology Advisors for the Government of Canada; Co-chairman of the National Advisory Board on Earth Sciences for the Ministry of Natural Resources, Government of Canada; Chairman of CRESTech (Centre of Research for Earth and Space Technologies), Ontario Center of Excellence; Chairman of the Ministerial Advisory Council on Science and Technology for the Ministry of Natural Resources, Government of Canada; member of the Board of Director of GEOID a National Centre of Excellence; and Geomatics Industry Champion for the Government of Canada Innovation Agenda.

The Emergence of Web Mapping

In 1998 and 1999 it became quite clear that the Web would become the dominant distributed computing platform for distributed geoprocessing. This was not a surprise to many of the technologists in OGC, including a number of Canadians. Indeed, Ron Lake and Mark Sondheim had participated in a project in British Columbia in the early 90's to build a distributed spatial information system. The system was migrated to the emerging World Wide Web when Mosaic became available on Windows.

The Canadian companies Compusult, CubeWerx and Galdos played a role in OGC's very successful first Web Mapping Testbed (WMT-1), along with participants from a number of other countries. This testbed launched OGC's Interoperability Program, which uses testbeds, pilot projects, and other "interoperability initiatives" to rapidly develop, test, and promote the implementation of OpenGIS Specifications. WMT-1 led to OGC's focus on implementation specifications that are dependent on the Web platform, and to OGC's promotion of the "Spatial Web" (or "Geo-Web," as some members refer to it).

Ron Lake founded Galdos Systems Inc. in Vancouver in 1992 and turned it into a full time business in June 1998, just before the Web Mapping Testbed began. From December, 1998 onwards Galdos has focused on the development of Geography Markup Language (GML) in OGC. GML has become the world standard for encoding of spatial data in XML (eXtensible Markup Language). Because XML-structured text can be parsed by virtually all Web browsers, and because applets, servers or client applications can process and present the text-encoded data in very flexible ways, GML is a very powerful geodata format. It has been adopted by the U.K. Ordnance Survey, the U.S. Census Bureau and a growing list of other organizations. Because XML is essentially a language for writing data schemas, it promises automated translation

between different Information Communities' data dictionaries, and will thus play an important role in data coordination and automated data sharing. Ron Lake authored the main GML technical documents and worked with the Japanese to harmonize their early efforts and OGC's efforts. As Chair of the GML working group in OGC, he has continued to lead the GML development effort and to promote GML in OGC and in the world of enterprise computing. OGC honored him with the Ken Gardels Award in June, 2002 in London (U.K.). He was introduced at that event by NRCan's Terry Fisher.

Galdos has also been active in the development of products supporting GML and OGC Web Services, and in the development of related specifications such as the Web Registry Service (for which Galdos is lead author and editor), the Web Feature Service (for which Galdos is a member of the RWG) and the Styled Layer Descriptor (for which Galdos is a member of the RWG). Galdos has participated or is currently participating in eleven different OGC pilot projects and test beds leading to or evaluating OGC specifications.

Established in 1996, CubeWerx has developed its entire business model around developing software products responding to requirements for interoperability in Spatial Data Infrastructures. In OGC, CubeWerx was an important contributor to the original OpenGIS Web Map Server Specification. More recently, CubeWerx staff played key roles in the adoption of three new version 1.0 OpenGIS Specifications at the September, 2002 OGC Technical Committee and Planning Committee Meetings in Noordwijk, Netherlands. Peter Vretanos of CubeWerx was the editor of the OpenGIS Web Feature Server and Filter Specifications and Bill Lalonde of CubeWerx was the editor of The OpenGIS Styled Layer Descriptor Specification. CubeWerx has participated in four OGC testbeds that produced "Interoperability Program Reports" that resulted in new OpenGIS Specifications. CubeWerx also participated in four OGC pilot projects that tested interfaces based on OpenGIS Specifications and that resulted in change proposals to those specifications. In 1999 CubeWerx pioneered Web service chaining by developing the first "Cascading Web Map Server" which enables a user with a plain Web browser to access multiple map servers in a single session and flexibly overlay map views acquired from each of the servers. The Cascading Map Server has played an important role in Web Mapping Testbed 1 and in the final demonstrations of all subsequent OGC testbeds and pilot projects. CubeWerx has demonstrated that standardized services can be created which are reliable and robust.

CubeWerx is also an active participant in CGDI. CubeWerx is a member of the CGDI System Architecture

Working Group (SAWG), CGDI Technology Advisory Panel (TAP) and the CGDI Access Node. CubeWerx was a founding member of 3i.

Following its pioneering involvement in the early OGC, PCI Geomatics has continued to play an active role in the OGC Technical Committee, Interoperability Program, and for most of OGC's eight years, the Planning Committee. PCI's Louis Burry has done much of the work on Feature Coverages, and Trevor Taylor has played a leading role in an OGC-focused European Commission project GETIS (Geo-processing Networks in a European Territorial Interoperability Study) with potential for a GIMES follow up project. Also, Stephane Fellah has led in specification work on the Web Coverage Server. PCI is also a strong supporter of GeoConnections and was an active member of 3i.

In recent years Compusult Limited has been actively involved in the specification and implementation of international data and metadata standards, especially within a Web-based environment. These specifications have been used to enhance and extend the Web-based components of Compusult's e-commerce products. The company's Technical Committee Membership in OGC is evidence of its commitment to promote the interoperability of geospatial information processing systems. Four of the OGC Web Mapping Testbed projects have included software from Compusult.

Participation in OGC's Interoperability Program and Specification Program

Canadian organizations have participated in almost all OGC Interoperability Initiatives beginning with the first Web Mapping Testbed (WMT 1) and running through WMT 2, to OWS 1.1 and CIPI. NRCan has been a sponsor of the Geographic Information for Sustainable Development (GISD) Initial Capability Pilot. Interfaces implementing OpenGIS Specifications will continue to be key elements of the Canadian Geospatial Data Infrastructure (CGDI). Canadian companies continue to supply quality proposals to initiatives, resulting in Canadian organizational involvement as participants in testbeds and pilots.

Canadian companies provide technical experts who chair three of the OGC Technical Committee's working groups: the Earth Observation Working Group, the GML Working Group, and Styled Layer Descriptor Working Group.

There are 17 Canadian OGC members as of December 12, 2002:

Principal Member

Natural Resources Canada

Associate Members

CARIS

Geosoft Corporation

MacDonald Dettwiler & Assoc.

Niagara College

Safe Software, Inc.

Technical Members

Compusult Limited

Cquay, Inc.

CubeWerx, Inc.

Galdos Systems Inc.

PCI Geomatics

University Members

British Columbia Institute of Technology

Laval University, Center for Research in Geomatics

University of Calgary

University of Northern British Columbia

University of Waterloo

York University

Conclusion

Canada pioneered the field of geomatics in the world. It now continues to be a world leader in geomatics in an era during which the most significant geomatics advances relate to interoperability. The organizations mentioned in this article are helping to connect the world's geodata and geoprocessing resources to build a seamless set of geographic data layers covering the Earth like layers of an onion, available for thousands of uses by a variety of user communities. Canadian companies and agencies actively help build the enabling interoperability platform, because it is this platform that:

- Enables growth in a market which Canadian companies have helped to build.
- Enables Canadian geomatics companies to discover and profit from emerging geomatics market segments.
- Provides user organizations with greater choice of software and better options for data sharing, in Canada and outside Canada.
- Enables the establishment of a Global Spatial Data Infrastructure (GSDI), or the global "Spatial Web."

OGC's members and stakeholders are indeed fortunate to have these Canadian organizations engaged in OGC's project to integrate geospatial information into the Global Information Infrastructure.

This article was previously published in a different format in Geomatica, Volume 57, Number 1, 2003, pp 68 to 71.

Finding One-of-a-Kind British Admiralty Charts at CHS

By: D. H. Gray, Canadian Hydrographic Service, Ottawa, Canada

Some years after my 1971 arrival at Canadian Hydrographic Service, I was let in on a “little secret”. In hush-hush tones I was told that during the Second World War, the CHS had been given a full set of British Admiralty charts, and that these were maintained with periodic mailings of new printings from the Admiralty.

Some years later, I took over the duty of maritime boundaries and started making reference to these charts with respect to the geography of distant places around the world. It is amazing to realize the inadequacies of maps in even the better atlases when one wants to see the real detail of a coast. Eventually, I became the custodian of these charts by default. Yet, I did not have total say in these affairs: the administrative officer of the day wanted to reduce the storage space and got another person to throw out the collection, and my manager told the British Admiralty that it was no longer necessary to send new printings. Thus, my supply was lost and my resupply was cancelled. However, I did spot the charts in the dumpster, and noted that there were some charts that were printed by copper plate engraving – many marked “E Proof”. Knowing that this was an antique printing method, I tried to recover as many as possible and cached them away in my office. (If anyone has seen my office, they will know that I have lots of things “cached” away!)

The autumn of 2002 Andrew Cook, Ph.D., British Library, came to Ottawa, and included a visit to my office. He was researching material at Archives for his paper at the 2004 Canadian Hydrographic Conference. During his visit the topic of conversation strayed to other things, and I pulled out these few copper engraved charts.

He was flabbergasted for here were the answers to several questions about Second World War charting activity. With that, he apprised me of the significance of these charts.

In the dark days of the early part of the war, Britain thought that it might easily be heavily bombed, invaded, and totally overrun by the Germans. The gold and paper securities of the Bank of England were shipped to Canada.¹ The printing of nautical charts in Britain was moved from London to Exeter (near the future home of the Hydrographic Department at Taunton). But also, pristine copies of charts were sent to several depots² so that people at these depots could photograph them and make lithographic copies. For

the copper plate engraved charts, it was a case of printing the copies on baryta-coated paper. Each such chart was individually stamped “A Proof”, “B Proof”, etc. From the copies that I had managed to save, Dr. Cook now knew that Canada had been sent a full set of charts, not just charts of Canadian waters, or even just the North Atlantic. The saved charts were inconsequential ones of small harbours in the Bay of Bengal, small islands in the Pacific, and the African coast. From the dates on the charts, it appears that the process of making baryta paper proofs continued into the mid-1950s.

Admiral Morris tells the story a little differently. The use of baryta-coated paper started in 1930s as a precaution in the days of changing printing techniques. Baryta proofs of the whole world-wide series were made and kept, first at Plymouth and Bath, and later at Nottingham and in Canada. The scheme was later extended to provide sets of baryta proofs covering their own areas to various Fleet Hydrographic Offices, Dominion Hydrographic Offices and the United States Hydrographic Office. Not only did this ensure against invasion, but also enabled stocks of fairly satisfactory charts to be printed locally if supplies from Britain were lost or delayed.³

Baryta paper is paper coated with barium sulphate to obtain a smooth high-reflectance surface for subsequent coatings. This paper is frequently used as a base for photographic emulsions, in which case the paper must be free from materials injurious to such emulsions.⁴ Barium Sulphate, also known as Baryta or Barium White, is described as a chemical compound (Latin name: sulfas bariticus; formula: BaSO₄) obtained either from the natural mineral barytes or by chemical reaction. It is used as a filler in the manufacture of paper or as an extender in printing ink in combination with other pigments. The artificial products are called blanc fixe, fast white, pearl white, and permanent white.⁵ As a paper for use in a wheelhouse on board ship, the baryta paper is totally inappropriate, for it would not stand up to any usage. However, as a super-white paper with a bit of sheen, upon which the black, pasty, ink from the copper plate engraving technique forms raised ridges on the paper, it is superb for photographic reproduction.

Now knowing the significance of these one-of-a-kind charts, I searched for a permanent home for them. The Cartography and Architecture Archives Section of Library

and Archives, Canada has expressed an interest in adding the charts to its holdings since they are important historically in terms of Canada's relationship to Britain and

the allied war efforts. I have saved one chart, #1209 of Bonne Bay, Newfoundland, for framing and displaying in the Boulton Room at CHS headquarters.

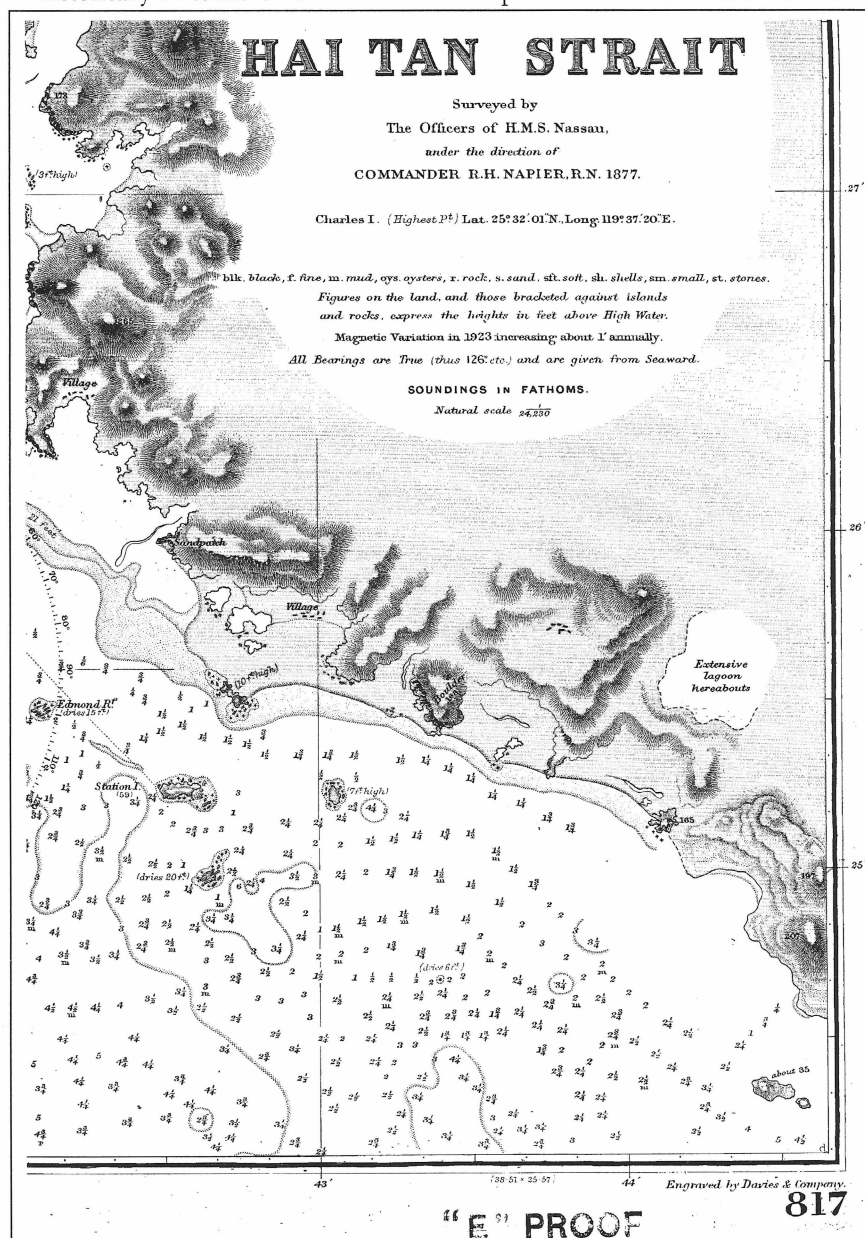
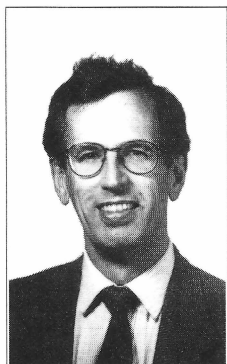


Figure: The lower right corner of British Admiralty chart 817 of the Narrows of Hai Tan Strait on the east coast of China (25° 25' N, 119° 43' E).

(Footnotes)

- ¹ My father, J. Ross Gray, Captain in the Royal Canadian Corps of Signals, was invalided home from Britain in July 1940 in a convoy that included ships carrying the Bank of England gold and securities. His business associates at Sun Life, in Montreal, told him the story of having its vaults taken over to house the securities, just days after his landing at Halifax. Apparently, the gold went to the Royal Canadian Mint.
- ² The depots as of December 1942 were: Australia (A), Bath (B), Nottingham (C), East Africa (D), Canada (E), and Capetown (F).
- ³ R.O. Morris, *Charts and Surveys in Peace and War* (London: Her Majesty's Stationery Office, 1995) pp. 117-118.
- ⁴ < http://www.polymetaal.nl/beguinn/mapb/baryta_paper.htm > (21 January 2003)
- ⁵ < http://www.polymetaal.nl/beguinn/mapb/barium_sulphate.htm > (21 January 2003)

About the Author...

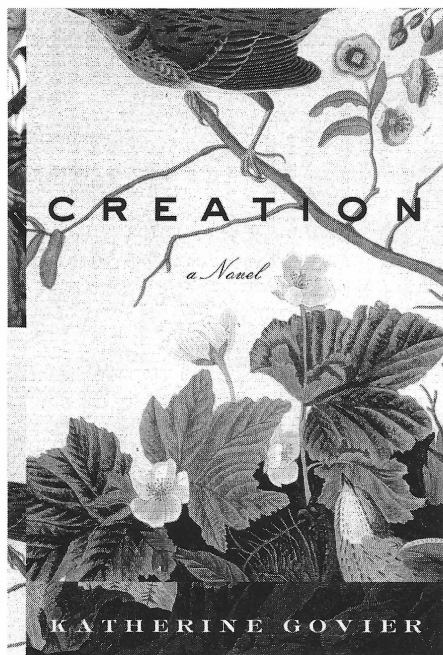


David H. Gray has a B.A.Sc. and a M.A.Sc. from the University of Toronto and is a P.Eng. (Ontario) and a CLS. He did geodetic triangulation in Ontario, Nova Scotia and Newfoundland and geodetic adjustments and error propagation analyses for Geodetic Survey of Canada, EMR, for a few years before joining the Canadian Hydrographic Service in 1971. He is responsible for the technical data to convert CHS charts to NAD 83. He was a member of the Canadian Team for the Canada/France maritime boundary arbitration, was the technical expert to the Tribunal between Nova Scotia and Newfoundland concerning their offshore resource boundary, and provides technical advice on maritime boundaries and limits to Dept. of Foreign Affairs. He has served the department as an expert witness in over 20 court cases involving fishing violations where positioning and boundaries need explanation.

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BOOK REVIEW



Creation by: Katherine Govier

Review contributed to *Lighthouse*
by Andrew Brown

Published by Random House (ISBN: 0-679-31181-5)

Except for those with an interest in the history of hydrography, the name Henry Wolsey Bayfield is relatively unknown in Canada today. Visitors to Discovery Harbour in Penetanguishene might stumble upon a kiosk dedicated to this Royal Navy surveyor. It's not far from where Bayfield spent several winters in the 1820s, perfecting his charts of Georgian Bay.

After completing his Georgian Bay survey, Bayfield moved on to chart the Quebec shores and Gulf of St. Lawrence, most of the Maritime provinces and the Labrador coast. One of the greatest of hydrographic surveyors, he was promoted to admiral in 1867 – and then largely forgotten.

Incredibly, Bayfield has made a comeback in the pages of *Creation* (Random House, \$34.95), a new novel by one of Canada's leading writers. Katherine Govier, the author of six previous works of fiction, has plucked Henry Wolsey from the dustpan of history. As *Creation* opens, it is 1833. Captain Bayfield of the Royal Navy is fog-bound at Little Natashquan on the St. Lawrence River when he has a chance encounter with a contemporary who would go on to fame and fortune.

His name was John James Audubon. According to the historic record, Audubon, his son and a party of “young gentlemen” have sailed for the bird nesting grounds of the Strait of Belle Isle. Having set a task for himself of painting all the birds of North America, Audubon is in search of an Ivory gull, a Labrador duck and a Great auk. In the process, he finds Bayfield.

When Audubon first steps onto the Bayfield's survey ship *Gulnare*, “Bayfield is busy with his theodolite. The device commands the centre of the foredeck, an altar around which he, the priest, in his blue uniform, moves with stately grace.”

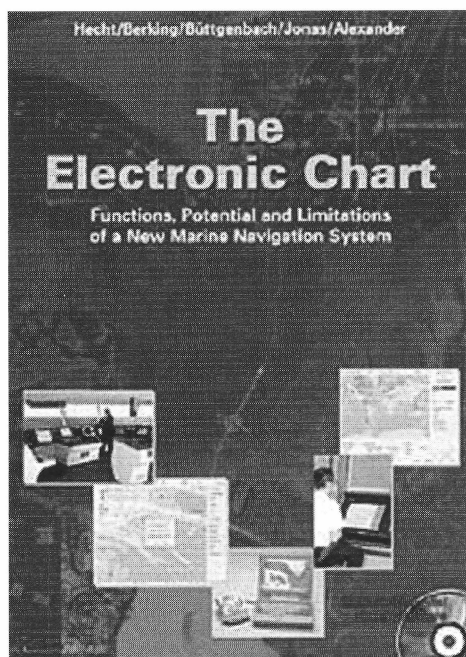
Audubon hunts for new birds. Bayfield surveys the labyrinthine St. Lawrence coast. And when they are not at work, they talk. For Audubon, Bayfield represents civilization. Surveyors, he argues, make the wild less wild. Bayfield, in turn, worships progress and the quadrant.

“We hold it vertical, like this, and tilt it to where the sun's – or, in this case the moon's – rays penetrate the sights. Then we can read by the thread on the plummet the altitude of that sun or moon. This simple instrument is poetry to me.”

Creation is a poetic exploration of early environmentalism. An unusual historical novel, it brings to life one of Canada's early heroes – Henry Wolsey Bayfield.

DID YOU KNOW . . .

- The polar ice caps contain 70 per cent of the world's supply of fresh water.
- Russia's Lake Baikal contains 20 per cent of the world's supply of fresh water.
- That leaves only 10 per cent for the six billion of us, who don't live in Arctic or Antarctica or own a cottage on Lake Baikal.



The Electronic Chart; Functions, Potential and Limitations of a New Marine Navigation System

by: Horst Hecht, Bernhard Bernking, Gert Büttgenbach, Mathias Jonas and Lee Alexander

Review contributed to *Lighthouse*

by Captain John D. Pace, Master Mariner

Press release by Geodetic Information and Trade Centre (GITC)

Published by GITC, www.gitc.nl (ISBN: 90-806205-1-3)

This book is written by experts in the field (Horst Hecht, Bernhard Bernking, Gert Büttgenbach, Mathias Jonas and Lee Alexander) and is peer reviewed by Adam Kerr. The latest technical developments and all related disciplines have been taken up in the text. The book describes the basic components, functionality, and capabilities and limitations of Electronic Charts including:

- System-configuration.
- Data base and data structure for vector and raster data.
- Chart data updating.
- Data availability and data distribution.
- ECDIS voyage planning and monitoring.
- Integration with GPS, radar, AIS and track Control Hydrographic basics.
- Liability, legal and economic aspects.
- Glossary of ECDIS and modern navigation.

“The Electronic Chart” may be used for education and training, daily use onboard and familiarisation with this new navigation tool by hydrographic offices, maritime safety administrations, shipping companies, maritime academies, universities, equipment manufacturers, and professional mariners, among others. To enable the reader to experience the potential of ECDIS, the book is

accompanied by software offering demonstrations of the several systems described.

“The publication of this book marks a great step forward in the broad acceptance of electronic charting technology. The authors are among the most highly respected pioneers in this field.”

Michael J. Casey, Canadian Hydrographic Service

“Overall, the book provides the professional navigator with an excellent insight into the functionalities and characteristics of the electronic chart and ECDIS. From a technical point of view, the book should also prove itself to be a standard reference on the topic for students, teachers and researchers alike. The provision of ECDIS demonstration software further enhances the attractiveness of this very welcome publication in the field of navigation.” Professor Peter Muirhead, Inmarsat Professor of Maritime Education & Training

“Like radar, GPS, and AIS, the electronic chart is destined to become an important addition to the modern navigation bridge. Similar to the way ECDIS improves situational awareness, this book reveals the big picture about electronic charting. The authors identify and explain key issues concerning the use of electronic charts that will empower mariners to harness the potential of ECDIS to optimise navigation safety, efficiency and economy.”

DID YOU KNOW . . .

Dead Reckoning

This navigation term was originally spelled “ded” (the abbreviation for deducted) reckoning. An unscholarly British shipmaster thought the “a” had been omitted, so inserted it. Ever since then, even the officially printed forms spell it “dead” reckoning.

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DID YOU KNOW ...

Sailing Ships and "Brass Monkey's"

In the heyday of sailing ships, all war ships and many freighters carried iron cannons.

Those cannons fired round iron cannon balls. It was necessary to keep a good supply near the cannon, but how to prevent them from rolling about the deck.

The best storage method devised was a square based pyramid with one ball on top, resting on four resting on nine which rested on sixteen. Thus, a supply of thirty cannon balls could be stacked in a small area right next to the cannon.

There was only one problem - how to prevent the bottom layer from sliding / rolling from under the others.

The solution was a metal plate called a, "Monkey," with sixteen round indentations.

If this plate was made of iron, the iron balls would quickly rust to it.

The solution to the rusting problem was to make "Brass Monkeys."

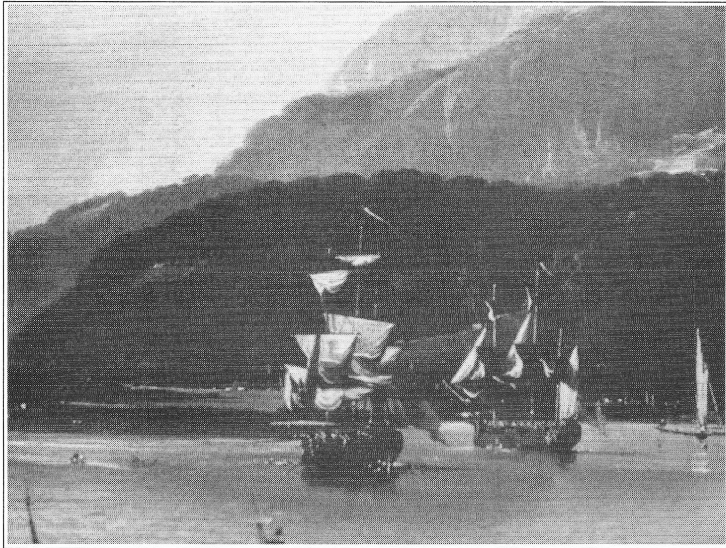
Few landlubbers realize that brass contracts much more and much faster than iron when chilled. Consequently, when the temperature dropped too far, the brass indentations would shrink so much that the cannon balls would come right off the monkey.

Thus, it was quite literally, "Cold enough to freeze the balls off a brass monkey!"

AIS & ECDIS ~ From a Mariners Perspective

By: Captain Stephen W. Poole, BC Ferry Services

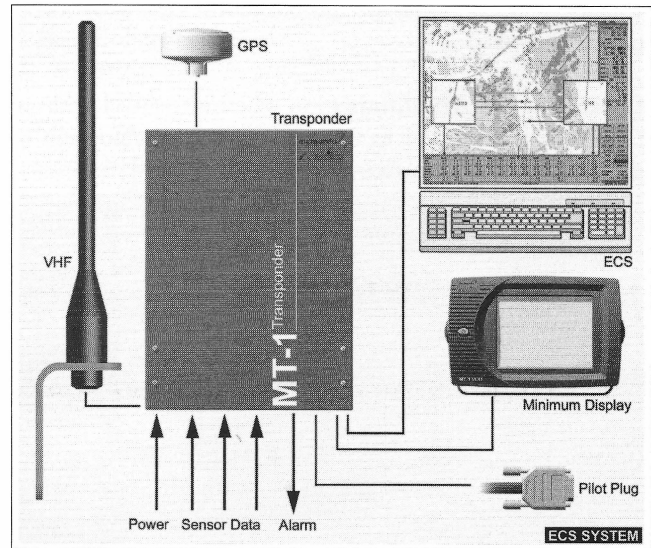
Since the time when sailing ships first entered into the waters of the Pacific Northwest, the coastal waters of British Columbia have always challenged seafarers.



Our rugged coastline ...with its long inlets, narrow passages, and hundreds of Islands, present Mariner's with a constant need for vigilance and an uncanny skill for pilotage. The last few decades have been an exciting time for the Maritime Community as it pertains to the development of Electronic Aids to Navigation. The advances in this area have taken off with the acceleration of today's computer and space technologies.

A Mariner's responsibility has always been to accurately determine the position of his vessel and to safely navigate to his final destination. Thirty years ago the inception of gyro compasses, stabilized radar, and Loran-C, were significant changes in how a Master utilized electronics. Now, ...fiber-optic gyro's, daylight viewing ARPA's, Electronic Charting Systems, AIS, DSC and GPS, are the tools leading the Mariner of today into the twenty-first century. The traditional sense of "a star to navigate by" is long gone and that star has been replaced with modern electronic digital technologies with satellites in space.

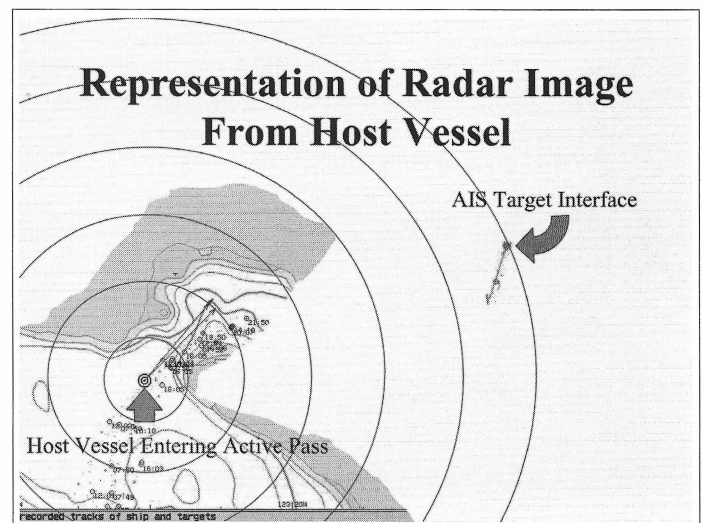
AIS and ECDIS are some of the technologies that are revolutionizing navigation for today's Mariner. With the advent of GPS integration, reliability and accuracy have improved significantly and the developments of AIS & ECDIS have taken off.



The ability of AIS to fully integrate with ECDIS and Radar now make it a significant component that every commercial operator will be using in the coming years.

When we look at interfacing AIS with other shipboard navigational systems, the question arises of which system is best to interface the AIS with? Our Officers unanimously agreed that AIS is better when interfaced with an Electronic Chart or ECDIS for the purposes of Coastal Navigation.

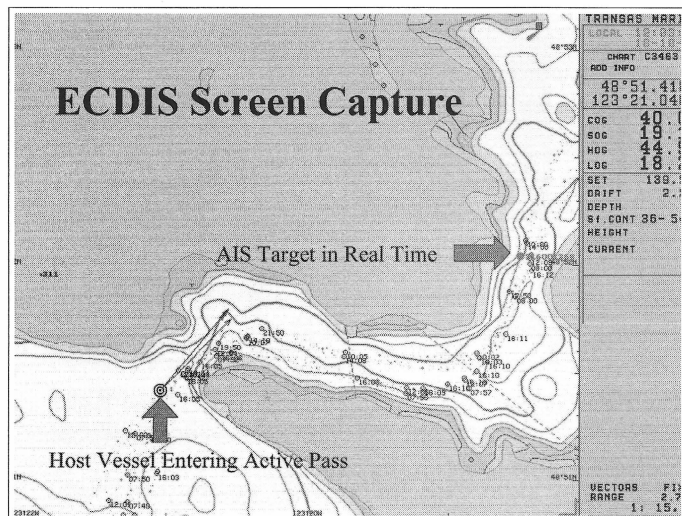
AIS when interfaced with ARPA Radar does not give the Mariner a clear appreciation of target position due to the inherent shadow sectors that radar has.



This slide is representative of the information radar would present to a Mariner as he is entering Active Pass from the south.

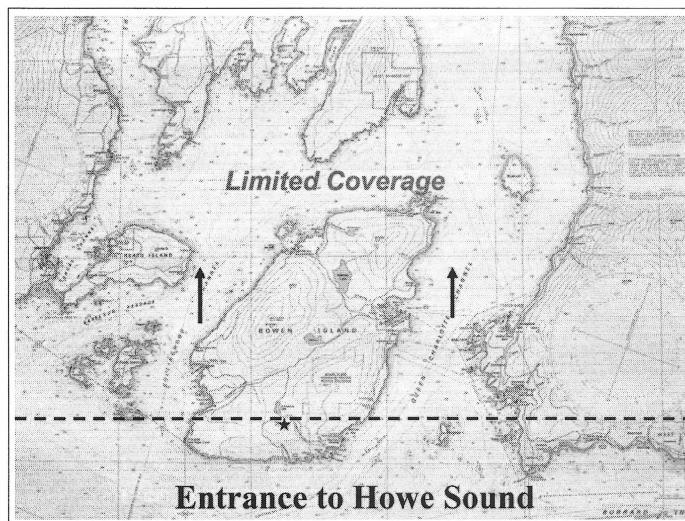
The Host vessel's radar would not see much more than what is depicted here. The AIS interface would show a target on the screen; however the mariner on the Host vessel would not really appreciate the targets position as it relates to the channel.

Looking at the AIS information when interfaced with an ECDIS, it is very clear to the Mariner the exact position of the AIS target within Active Pass.



The Captain's on both vessels can assess the opposing AIS target and safely plan their passage.

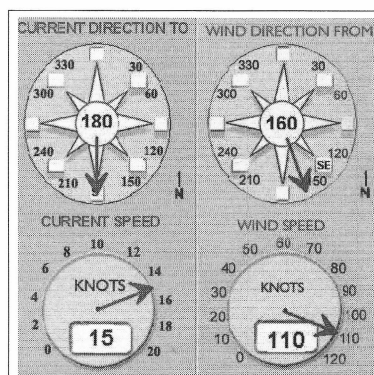
Some areas of our Vessel Traffic Services are limited with radar coverage by geographical restrictions. It is not always possible to provide accurate information for opposing vessels due to the inherent blind spots within their coverage areas.



The carriage of AIS transponders by vessels would allow other Mariners and the VTS advisor to have accurate real-time locations of other fitted vessels when transiting within these areas.

ARPA radar is susceptible to having targets swap when they are in close proximity of one another. The refresh rate of data is also delayed when a target, or own ship, is maneuvering. AIS data is more accurate as there is no swapping of targets when in close proximity and processing of information is instantaneous.

An important aspect that cannot be underscored enough is – AIS & ECDIS provides the Mariner with “**REAL-TIME**” information of his exact location as it relates to his surroundings and that of other AIS fitted vessels he will encounter during his voyage. The options of data input from AIS that are available to the Maritime Community are many. “Regional Messaging” sensors located in strategic locations can transmit tidal and wind information to the Mariner that can be displayed on his ECDIS in “Real Time” allowing the Mariner to determine his best plan of action for transiting high-risk tidal areas such as Active Pass, or Seymour Narrows.



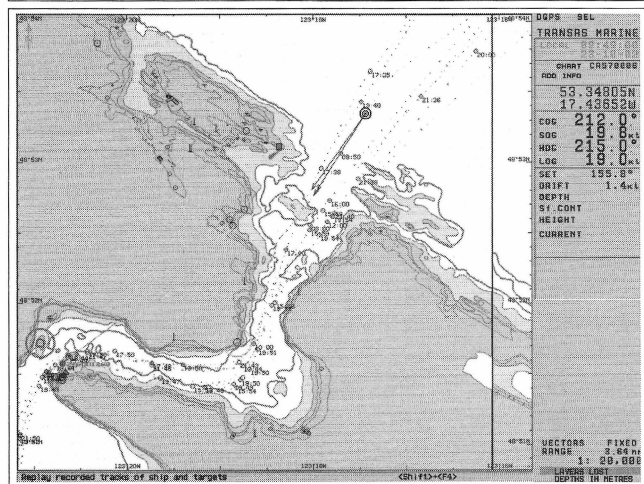
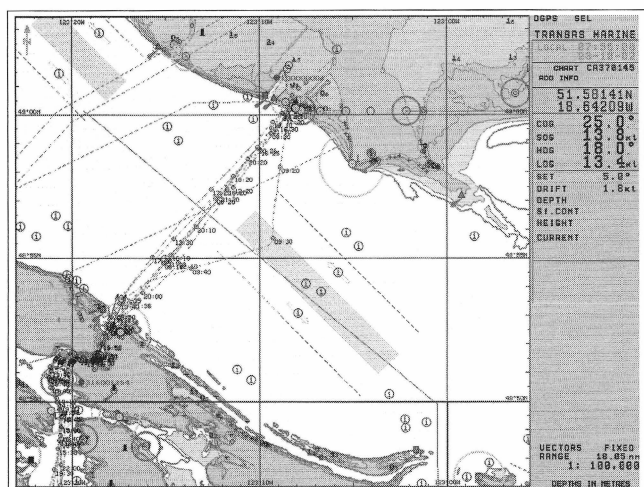
Information that can be transmitted to the Mariner while at sea can be as diverse as bridge span openings, dredging operations, lock transit schedules, Notices to Mariners, visibility limits within a Harbour, and the significant wave height at pilot

stations. The possibilities are endless.

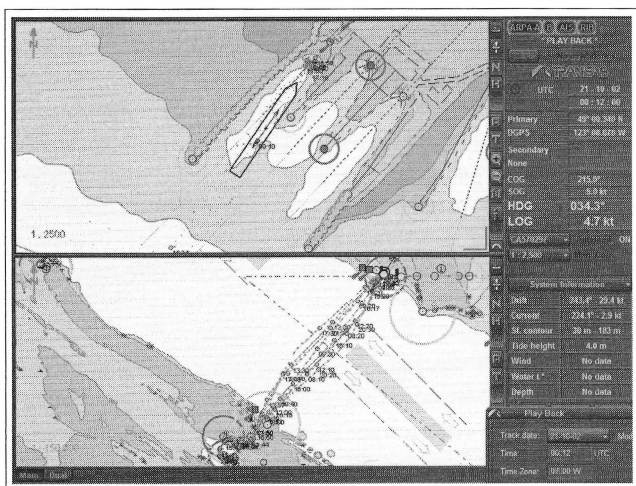
With these technological advancements and the introduction of integrated bridge systems, the Mariner of today cannot just sit back and let this newfound electronic world do all his work for him. A much higher level of Watch-keeping discipline, diligence and training is most certainly required. There is a higher cost to the Mariner than just purchasing these systems - training and proficiency in their use is imperative.

These are exciting times for the Maritime Community. The advancements along the Electronic Marine Highway are providing a safer and more manageable resource to the Navigator allowing him to enhance the safety of our vessels, and passengers. As more Companies retrofit these newer technologies to their ships, all Mariners, Ship Owners and Underwriters will benefit. The general risk of collision or grounding is significantly reduced - which also protects the environment.

You will appreciate when seeing AIS, ECDIS and ARPA integrated together how the Navigator's ability to manage the safety of his voyage is greatly enhanced.



Functionality of the charting software can let you monitor your own position in great detail while also allowing you to see a larger overview of all traffic you may want to be monitoring.



These new technologies are improving safety at sea for everyone. The commitment to provide the highest level of safety within the Maritime Community when sharing the waters of the Pacific Northwest is crucial.

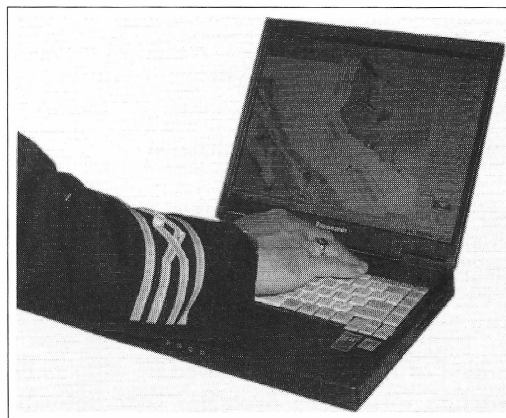
Improving Safety At Sea



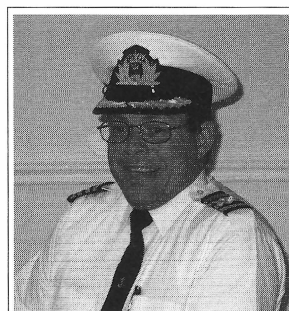
We've come a long way!

Within the span of the last century, we have come a long way to achieve this goal.

A Mariner may wishfully cast his eyes aloft in search of that lone star to guide his ship, but his fingers will always be on the trackball that operates today's principle electronic navigational systems – knowing he can trust them to ensure the safety of his ship and that of others.



About the Author...



Captain Stephen W. Poole is a member of the Company of Master Mariners of Canada, Vancouver Island Division. He has been employed by the BC Ferry Corporation for 31 years and has served on BCFC vessels based from Prince Rupert to the

Southern Gulf Islands. Captain Poole is presently serving as Master on the "PacifiCat" & "Cowichan" class vessels based on Vancouver Island and has been BCFC's Chairman of the Navigational Electronics Committee since 1999.

SOUNDINGS ...

"Soundings" is a regular feature of Lighthouse. It is named in recognition of a newsletter named "Soundings" that was produced by the Dominion Hydrographer's Office many years ago. It is intended to stimulate thought and discussion within the hydrographic community. We invite your comments.

Your responses to Falls' edition topic : Recovery of Digital Data

Ref "Soundings" Fall issue; I had to laugh with your experiences of your Houdini Lighthouse files. The speed and volumes of digital data we work with these days is truly remarkable. The standards, ability and responsibilities for checking this data not necessarily matching this dramatic evolution. Software wobbles don't help. Several years back I emailed a preliminary rig move drill site coordinate data to a Drilling Manager ashore. All checks were made, copies co-signed and the email sent. Several days later back ashore I received the emailed copy, rechecked the coordinate data... fine. Then noticed the DM's name had been changed from Prevett to "Pervet" compliments of a Microsoft "weknowwhatisbestforyou" spellcheck.

Ask anyone in the seismic industry about missing or convoluted digital data and the time spent recovering the same. Plenty of sea-stories there.

Similarly, people offshore that process data are now treated with the kind of reverence once bestowed by villagers on their tribal witchdoctors. When problems arise onboard with data typically on a tight budget job, note the respectful tones as all wait for the synopsis on recovering the data... "the processors are working on it". With the amount of data collected now added to the survey data budget, it's no wonder processors are usually the ones with the sign over their work space, "You wanted it when!" - The caricatures falling over each other with laughter.

As for recovering data in years to come, if the archiving locale, methodology, person(s) familiar with recovery, storage and medium(s) for reading it are consistent with yours and correspondingly your customers requirements, recovery should be a snap.

However the relationship between successful data recovery and time lapsed proves to be somewhat exponentially divergent in that the greater period of archival, the higher the likelihood of problems with recovery. Let alone the responsibility for the tapes or medium, ask any museum.

With offshore resource industry related projects recovering digital data is usually not too much of a problem as contractual links are established between the contractors' collecting the data, the installers and eventually the operator that assumes warranty for constructed works. This process can be anywhere from 5 years post commissioning to the life of the field or cable. Increasingly with fast-tracking of projects it is rare specific data recovery would be required after approximately 12 months or so post commissioning. The inadequacies of recovery being overcome by commercial expedience. In offshore resource terms it's now not uncommon to have operator or owners of a field or cable change hands several times over their life. Intermediary parties such as the construction companies may also evolve, or be relocated or cease to exist. In these cases the time line for recovering survey related data becomes extremely tenuous. Fortunately astute survey contractors will have key data archived. Not necessarily for contractual reasons, simply good business sense.

I believe the onus of recoverability is quite different from HO charting data which is retained for the life of the chart or until revised. I'm not suggesting any particular data set is more important or has greater quality but clearly, the time line of "painless" recovery will vary hugely. Roger Lott * of BP noted recently; "...*Swathe bathymetry acquisition, and especially processing, remains an area of concern*". Presumably we are not alone with our misgivings Earl.

In the late 80's I was bunkered down in the basement of your BIO for several weeks working on a contract for an offshore gold mining company. It was believed that close examination of (amongst other records) old MS.26B echosounding analogue, patterns of seabed textural characteristics could be interpreted; Outcropping, sands, seagrasses etc. The client being specifically interested in an acoustic signature correlating with shallow sub-surface gold deposition.

Working through boxes of musty old rolls distinct patterns through the low frequency return began to emerge. It became quite interesting reading the annotated information on the rolls corresponding to season and coastal location. Within days you could pull out a roll and recognise coastal region, vessel, weather conditions, gain settings etc. Hydrographers signed off on the QC checks (seem to remember SMB "Scooter" using inferior wet paper) and occasionally made comments "breakers ahead, EOL" hurriedly scrawled. The documentation was consistent relevant information, standard international HO practice. Because of these practices the data retained value beyond their immediate purpose. Some of these echo rolls off the East coast dated from the late 1950's... over 30 years old.

I started out to share some thoughts on your question "are we giving enough thought to the painless recovery of error free digital information at any point down the road". What was to be a couple of paragraphs has turned into pages, and I've probably only muddled the waters! It is a

complex question but ultimately one worth asking.

So the best I can do Earl is ask you to qualify "painless" and "down the road". If that means hydrographers in 2030 - making sense of digital survey data collected today; I'd put the question back to you or your colleagues; Are we doing the job properly?

All the best,

Peter Barr

Barmarine P/L
41 Alexander St.
Manly NSW 2095
Australia
E-mail: Barmarin@pip.com.au

* Quotation, Roger Lott, Head of Survey BP Exploration - Article "Hydrography for Exploration", Hydro Int: Dec 2002

Earl asked for comments - Ed. 62

In Pacific Region, we have been recently involved in the recovery of digital data from the 1970s and 80s. These data were archived in different forms on 9-track tape. In some cases, the archival was a binary format and in others it was in plain ASCII format - either delimited or in fixed width formats. Fortunately for us, the binary format was well described (HIPPIE) and programs still existed (and the platform to run them - VAX) at the time of the retrieval (pre-Y2K, after which many platforms were discontinued). We were in all cases able to recover the data (soundings) from those tapes and import them to CARIS - it could have been any GIS with a generic data parser. That is, one where you define the format and the content of the input fields (create a map from input to GIS format). The biggest difficulty was in recovering the data off the 9-track tapes, which had to be sent to a private company in those cases where both A and B back-up tapes had bad blocks - there was a production run of these tapes with manufacturers flaws.

An additional problem we discovered, is that the data that was archived was not in fact always the final form that was used to generate the plot files that created the field sheet plot. None of these plot files, nor the programs nor platforms on which they ran exist today. However, in the

majority of cases we have recovered vast amounts of correct digital soundings that would otherwise have had to be digitized, with a subsequent loss of positioning accuracy.

I guess one lesson to learn is - KISS. ASCII is very transportable and for soundings, as long as we know the format (one can usually figure it out just by looking at it) it's easy to read into any GIS and plot soundings by coordinates. Doesn't matter too much after that whether the font or point size is correct - it's the underlying data that's important.

Another lesson we have learned, though, is keep at least two back-ups and keep them current. These back-ups were in fact the second set since the original data archive - Kal Czotter took all the original tapes and rolled the data onto newer media that could be read by our (then) current machines. Had that not happened, who knows whether we would have recovered any of it.

Regards,

Rob Hare, P.Eng., C.L.S.
Manager, Hydrographic Surveys, CHS Pacific Region
E-mail: HareR@pac.dfo-mpo.gc.ca

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

(est. 1992 / établier en 1992)

\$2,000 for a "Deserving Student" / 2000\$ pour un étudiant méritant

1. The applicant must be a full time student registered in an accredited survey science program (the program must have a Geographic Information Systems, Cartographic, Land or Hydrographic Survey component) in a university or technological college anywhere in Canada. The Administrator of this award will determine the eligibility of the program for the award.

2. The award will be available only to students who are in their second year of study in the degree or diploma program (under graduate) that conforms to the basic subject topic. The applicant will be required to submit a transcript of his/her first year 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 Administrator of Canadian Hydrographic Association Award Program 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.

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 a 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, which is available from your school's awards office, and sent to:

Critères d'admissibilité:

1. Le candidat doit être un étudiant inscrit à plein temps à un programme reconnu en sciences géodésiques (ce programme doit inclure les systèmes d'informations géographiques, la cartographie, les levés terrestres et hydrographiques) dans une université ou un collège au Canada. L'administrateur de cette bourse déterminera l'éligibilité du programme pour la bourse d'études.

2. La bourse s'adresse seulement aux étudiants qui seront à leur deuxième année d'étude dans un programme menant à un diplôme collégial ou de premier cycle universitaire conforme aux sujets de base. Le candidat doit soumettre une copie de son relevé de notes de sa première année avec sa demande. Les notes doivent être supérieures à la moyenne et avoir une moyenne inconditionnelle supérieure à 70 %.

3. La bourse sera remise au candidat qui, de bonne foi, peut démontrer ses besoins financiers et qui respecte les performances académiques exigées ci-haut.

4. Le candidat devra écrire un court texte, d'une manière claire et concise, 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'administrateur du programme de la bourse de 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 à chaque année civile.

7. Le récipiendaire recevra un certificat spécial de l'Association canadienne d'hydrographie, dûment encadré. Il recevra aussi un médaillon à l'effigie de l'Association canadienne d'hydrographie et son nom sera ajouté sur la plaque des gagnants. Une photo de la plaque gravée sera postée au gagnant avec un chèque de 2000 \$ au cours de la deuxième semaine de juillet.

8. Le candidat 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 peut recevoir la bourse qu'une seule fois.

10. Une lettre d'appréciation du récipiendaire sera publiée dans l'édition suivante de notre revue professionnel "Lighthouse".

11. La demande devra être faite sur le formulaire prescrit, lequel est disponible aux bureaux de vos écoles, et envoyée à :

Barry M. Lusk, Manager / Administrateur

Canadian Hydrographic Association Award Program / Bourse de l'Association canadienne d'hydrographie

4719 Ambleswood Drive, Victoria, B.C. V8Y 2S2

email/ courriel luskbm@telus.net Fax : 250 658 2036 Website: www.hydrography.ca

PERSONALS

ANNONCES PERSONNELLES

With respect to the Personals listed below, CHA provides this listing as a value-added service to our members via editions of the National Newsletter and Lighthouse. Members are encouraged to submit a one paragraph abstract and/or a brief overview of their career.

Michael J. Brent – Hydrographer

Mike graduated from Humber College of Applied Arts and Technology in 1988 with a 3 year honours diploma in Hydrographic Survey Technology. Between studies he was employed for two seasons as a student hydrographer with the Canadian Hydrographic Service, Central Region.

After a short term with Public Works Canada he then joined McElhanney Geosurveys Ltd. in Halifax, NS. Over a period of 4 years he gained valuable experience as a hydrographer on various offshore projects worldwide. This included telecommunication cable route surveys and corridor investigations, seismic surveys, cable and pipeline installation including post-lay burial and inspection, rig positioning, swath bathymetric and hydrographic surveys. Mike gained expert knowledge in vessel positioning, navigation and survey software, data acquisition and post processing as well as sub-sea positioning and calibration techniques.

Since 1994 Mike has worked independently for a variety of clients worldwide. In the mid 1990's he became increasingly involved in the submarine cable survey and installation business and was directly involved from the planning stages to final installation and testing of the product.

Initially acting as senior surveyor in charge of navigation, data acquisition, chart production and final reports he quickly moved into a consulting capacity as client representative for the owners and as cable route engineer for one of the worlds leaders in submarine cable installation and maintenance services.

Most recently he worked in the capacity as client representative for a major oil company in charge of navigation quality control on a 3D seismic survey in the Caspian Sea.

Last year he attended the Coastal Multibeam Sonar Training Course in Burlington, Ontario and also updated his Basic Offshore Survival and Marine Emergency Duties training courses in St. John's Nfld.

Affiliation – CHA, Central Branch

If you could use Mike's services, please contact him at:
Tel: (613) 384-1817, Fax: (613) 384-9085,
E-mail: mbrent@kingston.net

Liamutis Liatukas – Hydrographer

Extensive knowledge and experience in managing, operating, calibrating *Multi/Single Beam (ELAC Nautik)* and *Swath Sonar Systems*, surveying techniques and planning; Thorough knowledge in Bathymetric data processing and Quality Control; Self-motivated professional, focused on result achievements, familiar with working under high-pressure environments, technically oriented and experienced navigator aboard ships of 500BRT or more.

Affiliation – CHA, Central Branch

If you could use Liamutis' services, please contact him at:
Tel: (416) 588-2331,
E-mail: laimisl@yahoo.com

Dan Dixel – Hydrographer/Cartographer

Diverse background in nautical chart making, mapping, single and multi-beam surveying/processing and dredging with specialization in trailing suction hoppers. Possess Marine Emergency Duties (MED) A1, B1, B2, C and D training, a Small Craft Master Ticket, Hypack Max training from Coastal Oceanographics and Canadian Coast Guard Rescue and Environmental Response Training.

Affiliation – CHA, Central Branch

If you could use Dan's services, please contact him at:
Tel: (630) 841-9522,
E-mail: dandixel@aol.com

DID YOU KNOW . . .

Purser

The ship's purser was originally known as the "Burser," the man who had his fingers on the vessel's money-bags and paid bills, wages, etc. From this same derivation we get also the word "disbursement."

CORPORATE MEMBERS / MEMBRES CORPORATIFS

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

- *Receive three copies of each issue of Lighthouse (published twice annually).*
- *An invitation to participate in CHA seminars.*
- *Listing and recognition in every edition of Lighthouse.*
- *An annual 250 word description of your organization in Lighthouse.*
- *10% off advertising rates in Lighthouse.*
- *10% off exhibitor fees at CHA sponsored events.*
- *Listing and link to your home page on each CHA Branch Web site.*
- *News from corporate members in every edition of Lighthouse.*

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

To join, please contact one of the Directors as listed on page 3. International Applicants please remit to Central Branch. To obtain an application visit us at www.hydrography.ca

Annual dues for CHA Corporate Membership are \$150.00 (Canadian). Current Corporate Members are listed below.

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P.O. Box 2205, 250 Martindale Road
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Contact: Darren Keyes, Senior Operations Manager
Tel: (905) 641-0941 FAX: (905) 641-1825
E-mail: marine@asi-group.com
Website: www.asi-group.com
(affiliation - CHA Central Branch)

Fugro Jacques Geosurveys Inc.

25 Pippy Place, St. John's, NF A1B 3X2 Canada
Contact: Todd Ralph,
Tel: (709) 726-4252 FAX: (709) 726-5007
E-mail: toddralph@fjg.ca
Website: www.fugro.com
(affiliation - CHA Central Branch)

C & C Technologies

730 East Kaliste Saloom Road, Lafayette, LA 70508 USA
Contact: Art Kleiner,
Tel: (337) 261-0660 FAX: (337) 261-0192
E-mail: aak@cctechnol.com
Website: www.cctechnol.com
(affiliation - CHA Central Branch)

Gemini Positioning Systems Ltd.,

611 - 71st Avenue S.E., Calgary,
Alberta, T2H 0S7 Canada
Contact: Frank Wiskar, President at (403) 252-5007
E-mail: fwiskar@gps1.com
Website: www.gps1.com
(affiliation - CHA Praire Schooner Branch)

Canadian Centre For Marine Communications

P.O. Box 8454, St. John's, NF A1B 3N9 Canada
Contact: Bill Carter, Director, Information Marine
Tel: (709) 579-4872 FAX: (709) 579-0495
E-mail: bcarter@ccmc.nf.ca
Website: www.ccmc.nf.ca
(affiliation - CHA Central Branch)

Helical Systems Ltd.

Technology Innovation Centre, One Research Drive
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Toll Free: 1-866-226-0257 FAX: (902) 466-6889
E-mail: info@helical.ns.ca
Website: www.helical.ns.ca
(affiliation - ACH Section du Québec)

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Dept of Geodesy and Geomatics Engineering**
PO Box 4400, Fredericton,
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Contact: Dr Peter Dare, FRICS, FRAS Chair
Tel: (506) 447-3016 FAX: (506) 453-4943
E-mail: marine@asi-group.com
Website: <http://gge.unb.ca/>
(affiliation - CHA Central Branch)

l'Institut maritime du Québec
53 St-Germain Ouest
Rimouski, QC, G5L 4B4 Canada
Contact: Claude Jean,
Téléc: (418) 724-0606
Website: www.imq.qc.ca
(affiliation - ACH Section du Québec)

Klein Associates
11 Klein Drive, Salem, NH, USA 03079
Contact: Garry Kozak,
Tel: (603)893-6131 FAX: (603) 893-8807
E-mail: gkozak@kleinsonar.com
Website: www.kleinsonar.com
(affiliation - CHA Central Branch)

McQuest Marine Sciences Ltd.
489 Enfield Road
Burlington, ON, Canada L7T 2X5
Contact: Ken McMillan,
Tel: (905) 639-0931 FAX: (905) 639-0934
E-mail: email@mcquestmarine.com
Website: www.mcquestmarine.com
(affiliation - CHA Central Branch)

Knudsen Engineering Ltd.
10 Industrial Road, Perth, ON K7H 3P2 Canada
Contact: Judith Knudsen,
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E-mail: judith@knudsenengineering.com
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The Office, Astell Farm, Claydon, Banbury
Oxon, OX17 1ES, United Kingdom
Contact: Duncan Mallace,
Tel: 44 1295 690 007 FAX: 44 1295 690 881
E-mail: duncan@netsurvey.co.uk
Website: www.multibeam.net
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Kongsberg Simrad Mesotech Ltd.
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Dartmouth, NS, B3B 2B6 Canada
Contact: John Gillis,
Tel: (902) 468-2268 FAX: (902) 468-2217
E-mail: jgillis@kongsberg-simrad.ns.ca
Website: www.simrad.ca
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RTT Integra Inc.
675, Pine Avenue,
Saint-Lambert, QC J4P 2P4
Tel: 1-877-INTGRA1 (468-4721) FAX: 450 465-1938
E-mail: salesrtt@rttintegra.com
Website: www.rttintegra.com
(affiliation - ACH Section du Québec)

National Hydrographic Office
P.O. Box 75, 107 A Rajpur Road
Dehradun - 248 001, India
Contact: Chief Hydrographer,
Tel: 91 135-747365 FAX: 91 135-748373
E-mail: nho@sanchar.net
(affiliation - CHA Central Branch)

Terra Remote Sensing Inc.
1962 Mills Road, Sidney, BC, Canada V8L 3S1
Contact: Rick Quinn,
Tel: (250) 656-0931 Fax: (250) 656-4604
E-mail: rickq@terraremove.com
Website: www.terraremove.com
(affiliation - CHA Pacific Branch)

News From Corporate Members

Nouvelles de Membres corporatifs

C & C Technologies

C & C Technologies(C & C), an international hydrographic surveying company, headquartered in Lafayette, Louisiana, has approximately 170 employees and four 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 20 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 ROV's, 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 3000 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 11,000 nautical miles of survey lines for a variety of worldwide clients.

Additional services offered by C & C include: C-Navä, the highest accuracy worldwide Gc-GPS differential correction service available, deep water jumbo coring (up to 30m) collected in water depths to 3000m, 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:

Mr. Mike Dupuis, Mr. Jeff Fortenberry, Mr. Art Kleiner, or Mr. Frank Lipari
at (337) 261-0660 email to info@cctechnol.com or
visit C & C's website at www.cctchnol.com

NIMA Contract Awarded to C & C

C & C Technologies, as a Team Member with Harris Corporation, the Prime Contractor, has been awarded a Global Geospatial Intelligence (GGI) contract by the National Imagery and Mapping Agency (NIMA). This intelligence contract, based upon ten calendar years of service, requires C & C to provide NIMA with Mapping and Charting Production Services that include: 1) Surveys, 2) Compilation Services, 3) GIS Analysis/Maintenance/Generation, 4) Map Digitizing and Scanning, 5) Acquisition of Source Information, and 6) Scene Visualization and Geospatial/Image Manipulation.

C & C is an international surveying and mapping corporation that specialized in Autonomous Underwater Vehicle (AUV) services and Globally-corrected GPS positioning based upon JPL space docking technology. C & C's AUV has amassed more than 20,000 linear kilometers of commercial mapping to date in depths to 2,750 meters and has discovered historic WWII shipwrecks including the German U-166 in the Gulf of Mexico and the HMS Ark Royal in the Mediterranean Sea.

Delta-Wide Crevasses Project Completed by C&C

C & C Technologies, Inc., as a sub consultant to Brown Cunningham Gannuch (BCG) Engineering Firm, recently performed RTK GPS surveys in the Mississippi Delta southeast of Venice, Louisiana. The survey required collecting profile, cross-section, and baseline elevation data at six existing crevasse sites and nine proposed crevasse sites within the boundaries of the Pass A

Loutre Wildlife Management Area and the Delta Wildlife Refuge.

The survey data was used by Louisiana Department of Natural Resources (LDNR) to monitor accretion of sedimentation in the bays adjacent to the crevasses. This project was completed in 14 days with RTK GPS equipment installed aboard an airboat and C & C's *R/V Hydrosurveyor*.

C & C Technologies Searches for the Space Shuttle Columbia

C & C Technologies, an international survey company based in Lafayette, Louisiana, was selected to assist in the recovery of the Columbia space shuttle within Toledo Bend Reservoir. In association with Phoenix International and the United States Navy, this project will incorporate three small research vessels with bow-mounted side-scan-sonars and multibeam sonar systems to image the reservoir bottom. Accurately positioned with C-Navä GcGPS (Globally-corrected GPS), these detailed images will be used to identify and geo-reference shuttle debris, which is critical to investigation of the accident.

When asked about the degree of complexity associated with this project, Mike Dupuis, C & C's Assistant General Manager responded, "This project is significantly different from most projects and brings new challenges to C & C. Some of the major challenges of mapping Toledo Bend are the variety of obstacles such as standing timber above and beneath the water, submerged aquatic vegetation, and artificial fishing reefs".

News From Corporate Members

Nouvelles de Membres corporatifs

NetSurvey Limited

NetSurvey, is one of the leading multibeam service solution providers worldwide. We provide a specialist service to survey companies, ports & harbor authorities and research & 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 offer bespoke training courses with a practical emphasis.

All of our surveyors/engineers are trained up on Reson, ELAC, Simrad and GeoAcoustics multibeams; 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.multibeam.net

If you would like to receive further information about NetSurvey and its services contact:

Mr. Duncan Mallace

Tel: 44 1295 690 007 FAX: 44 1295 690 881 E-mail: duncan@netsurvey.co.uk
website: www.multibeam.net

Kongsberg Simrad

Kongsberg Simrad, 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 Simrad is able to offer unique and complete solutions for ROVs, AUVs, positioning systems and sea bed surveying and mapping.

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

For more information regarding Kongsberg Simrad please contact:

Mr. Nick Burchill,

Survey & Underwater Vehicle Instrumentation

Tel: (902) 468-2268 FAX: (902) 468-2217 E-mail: burchill@kongsberg-simrad.ns.ca
or visit Offshore: www.kongsberg-simrad.com and Marine: www.simrad.no

New Military AUV – The HUGIN 1000 system

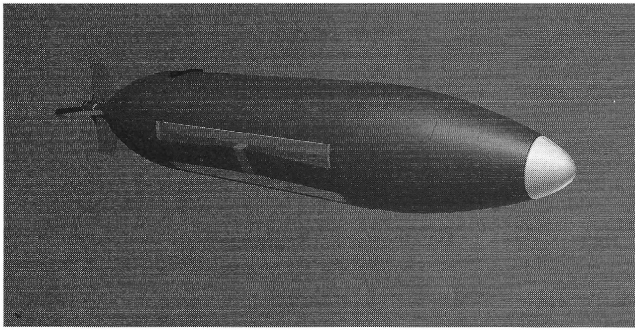
On January 20th 2003 the Royal Norwegian Navy (RNoN) directed the Norwegian Defence Research Establishment (FFI) to deliver a military Autonomous Underwater Vehicle (AUV) prototype. The Navy intends to use the military AUV system in mine countermeasure (MCM) and rapid environmental assessment (REA) operations. The delivery of a military AUV prototype is part of a long-term national plan to establish a forward autonomous MCM/REA capability to the Navy. The delivery is a successor to the

very successful operations, test and evaluations performed by the use of the HUGIN I vehicle from one of the RNoN MCM vessels during the last two years.

Kongsberg Simrad will produce and deliver the vehicle by the end of 2003. By 2005 a full-performance capability (HUGIN Mine Reconnaissance System) will be transitioned to the Navy and will be subjected to operational evaluation by the Mine Warfare Flotilla. Thus, by taking delivery of a military AUV prototype now the Navy is speeding up their original schedule by establishing a preliminary capability from 2004.

News From Corporate Members

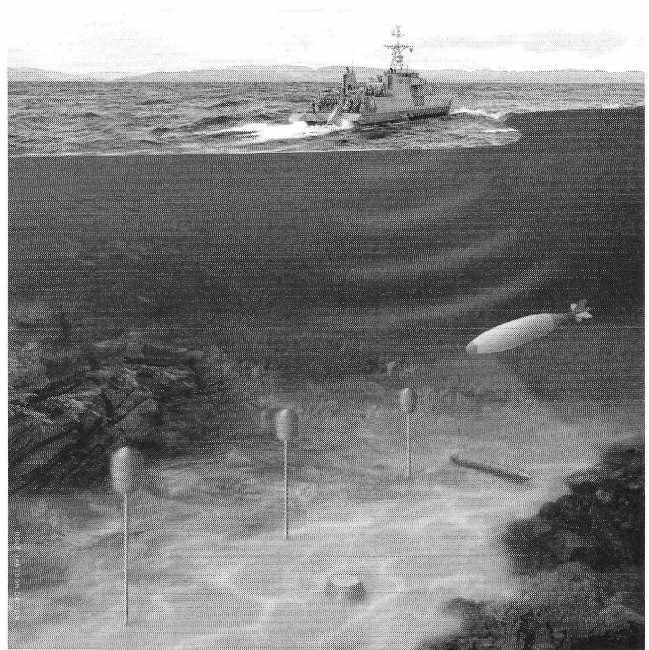
Nouvelles de Membres corporatifs



The HUGIN 1000 vehicle is a new generation of HUGIN AUVs, and will have an endurance of 20 hours and a depth rating of 600 meters. Additionally, it will have a sensor suite capable of doing high-precision seabed route surveys, mine detection, classification and localization in forward positions to the MCM vessel. The system will be used in regular MCM and REA operations in national and international waters. The vehicle will be operated from the KNM Karmøy mine hunting vessel and will represent a significant force-multiplying element to the fleet of mine hunting vessels.

The HUGIN 1000 system is built on the technology and experience from the original HUGIN 1 and 2 (operating in the North Sea since 1997) and on the deepwater HUGIN 3000s. The new technology developments by FFI and Kongsberg Simrad comprise accurate navigation, sensors, sensor processing, power sources and autonomous control technology.

To date the HUGIN AUV systems have accumulated more than 25000 line kilometers and 4000 hours of commercial and research survey operations in the North Sea, Gulf of



Mexico, and in the Brazilian, Mediterranean and West African waters. Surveys have been performed down to 2850 meters with endurances up to 2.5, days providing excellent data quality and operational efficiency.

For more information, please contact:

Kongsberg Simrad:

E-mail: horten.sales@kongsberg-simrad.com

Tel: 47 33 02 38 00

or

E-mail: nils-j.storkersen@ffi.no

Tel: 47 63 80 75 05

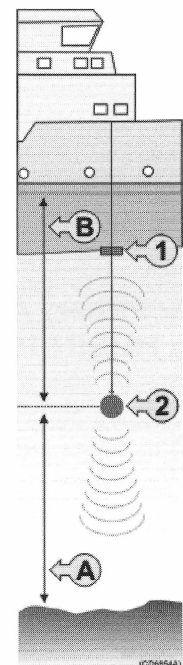
EA 600 – Improved functionalities!

The new EA 600 single beam echo sounder has undergone a series of improvements – making it the market's most effective echo sounder for deep water surveys. Here are some of the highlights:

- **Multipulse**
In deeper waters, the EA 600 echo sounder supports a multipulse function, which allows a higher ping rate - and thus better accuracy than what would normally be possible
- **Pinger Mode**
The EA 600 provides an advanced and synchronized passive mode for depth measurements using a pinger.

This pinger is normally attached to a device, and the purpose is to track and display the current depth of this device.

- **Built-in survey software**
With this option the echo sounder is extended to be a complete survey system, including survey planning, navigation, data storage and plotting of results. No external survey computer is required!
- **Sidescan sonar option**
The EA 600 may also be used for sidescan sonar surveying.



News From Corporate Members Nouvelles de Membres corporatifs

Gemini Positioning Systems Ltd.

Gemini Positioning Systems Ltd. is a Calgary based GPS company with over 20 years experience in satellite positioning technology. In addition to providing integrated GPS based solutions, Gemini is the exclusive Canadian Ashtech distributor for Thales Navigation. Gemini also distributes the CSI Wireless brand of DGPS receivers and software.

The knowledge and experience of the management and staff have gained Gemini the distinction of being one of the premier Canadian companies geared exclusively towards the promotion, integration and support of GPS based solutions. On staff engineers, programmers and technicians allow Gemini to successfully find solutions to our clients needs.

Various industries that Gemini provides product and technical support for include surveyors, forestry, marine, seismic, mining, municipal and aerial applications. Gemini supports a national network of dealers and sub-dealers that provide coverage to all regions in Canada. Gemini's relationship with our sub-dealers includes provisions for joint sales and marketing efforts as well as educational seminars, product training and presentations of new technologies.

Due to the acquisition of Ashtech by Thales Navigation the DSNP product names such as 6501 SK/MK, 6502 SK/MK, Aquarius and Sagitta and the full Ashtech product line will be re-branded under the Thales Navigation brand name. Thales concluded that to enhance marketing efficiency these two product lines would best be represented under one professional brand name.

Gemini maintains an extensive lease pool of precision GPS products that are available for daily, weekly and monthly rentals. This lease pool is maintained at both our Ottawa and Calgary facilities and available for immediate delivery.

No matter what your GPS demands entail Gemini has the means to provide top line GPS equipment and unique solutions for all types of GPS applications.

For further information contact:

Mr. Frank Wiskar

Tel: (403) 252-5007 E-mail: fwiskar@gps1.com

website: www.gps1.com

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Fisheries and Oceans Canada / Pêches et Océans Canada

Central and Arctic Region

Arctic Gauging Project

Run jointly with the CHS, Natural Resources Canada (NRCan) and Environment Canada (EC), the Arctic Gauging Project is a five-year project whose purpose is to establish a network of gauging stations in the Canadian Arctic to monitor mean sea level change. The installation of gauging stations is funded through the Canadian Climate Action Fund administered by Environment Canada. A reconnaissance trip in the fall of 2002 looked for an appropriate site to install a station in 2003 on the East Coast of Baffin Island.

The Arctic Gauging Project is planning to install gauges at Broughton Island on the East Coast of Baffin Island and at Tuktoyaktuk in the western arctic. Data will be collected from the gauges installed last year and an annual inspection of these stations will be completed.

Hydrographic Surveys

Multibeam surveys are to take place in the Beaufort Sea, this fall, in support of Northern Oil and Gas development of a potential pipeline project. This project will be conducted in partnership with NRCan, Indian and Northern Affairs Canada (INAC) and DFO Science & Oceans. Funding has been approved for 2 years. Aboard the *CCGS Nahidik*, Jon Biggar, Paola Travaglini and Dave Tobio will be staffing this survey as Hydrographer-In-Charge (HIC), multibeam processor and electronics technician, respectively. Working the multibeam launch will be Al Shepherd and Bill Briggs with Heather MacArthur on the single beam launch for her first trip to the arctic.

Under the direction of Jon Biggar, Tim Janzen will be leading a sub-party to continue the harbour and approach surveys for the Government of Nunavut in Hudson Strait, Foxe Basin and if possible, at some of the communities on the east coast of Baffin Island. Tim will be accompanied by Dan Mahaffy as processor, and Arnie Welmers and Michel Desjardins on single beam launches.

As in the past, Revisory Surveys will once again make its way around the Great Lakes and the St. Lawrence to collect data for the update and revision of charts in production.

Under the direction of John Medendorp as HIC, Janis Davies as processor, Rudy Cutillo as electronics technician and Larry Toomer as coxswain/mechanic, hydrographers Raj Beri, Jim Weedon, Scott Youngblut and Roger Cameron will be collecting information for charts in the Rideau River, the Muskokas, Lake Erie and the Trent-Severn.

Boat Shows

Seventeen CHS employees staffed a booth at the 2003 Toronto International Boat Show, January 11th to 19th. The booth was shared with the Canadian Coast Guard, Marine Programs, Aids to Navigation and NDI. During this show the CHS participated in many activities including providing a gift certificate for the Children's Charity silent auction VIP night. The CHS was active in the organization of the Canadian Safe Boating Awards (CASBAs) that ran in conjunction with the boat show and was also a major sponsor of the event. The CHS entertained guests from the Canadian Power and Sail Squadrons (CPS), the Great Lakes Cruising Club (GLCC), Nautical Data International (NDI) and the Ontario Marine Operators Association (OMOA) at the gala dinner. The CHS took part in the Canadian Safe Boating Council Directors meeting that was held at the show on January 13th. Mid-week, two Georgian Bay Charting Focus Group dinner meetings were held, one with sailors and the other with power boaters to discuss the charts on Georgian Bay. On opening day, the 2003 OMOA Marina Directory was released and includes CHS produced maps with marina locations. In return for this contribution to the publication, CHS gets our crest and motto recognized on 13 maps and a full-page ad. This publication is free to the public and distributed by the OMOA and its members and by Tourism Ontario. The winter issue of Boat Guide magazine was also released at the show and it contained a ½ page CHS ad. At the CHS booth, 128 CHS boat show questionnaires were completed for a chance to win charts. This completes a 1-year cycle of data collection at the 4 boat shows that Central and Arctic Region participates in (London, Orillia, Port Credit and Toronto).

Mike Bennett and Raj Beri prepared and worked the CHS booth at the 2003 London Boat, Cottage and Fishing Show, February 21st to 23rd, 2003. As always, this show was busy with many attendees visiting our booth.

Nautical Publications

Yet another busy quarter in Nautical Publications in the Central and Arctic Region. Three New Charts were released including, Chart 1431 *Canal de Beauharnois*, Chart 5631 *Eskimo Point to/à Dunne Fox Island* and Chart 7793 *Bathurst Inlet – Southern Portion/Partie sud*. In addition, 43 New Editions were published including the Mackenzie River Chart Series as well as three Lake of the Woods charts.

Compilation has also begun on the charts of Lake Timiskaming. The Canadian Hydrographic Service carried out a detailed survey of the waters of Lake Timiskaming in

July and August 2002. This survey was done using multibeam echo sounding, supplemented by single-beam work, positioned with using survey-quality, differential GPS and NRCan's GPS-C for differential corrections. The use of modern multibeam equipment provides near total ensonification of the lake bottom in areas where it can be used.



Multibeam view of Mission Point from south

This view of the lake, looking northwards towards Mission Point and Ville Marie, is a compilation of the multibeam survey data and gives an overview of the depth contours of the lake from Montréal River to Paradis Bay, 14 nautical miles to the north, and shows the waterfall effect of the narrows at Mission Point. Composite views were specially prepared by Paola Travaglini.

Electronic Navigational Charts

Five ENC's were released this past winter, *Passage Island to/à Thunder Bay*, *Pointe aux Pins to/à Point Pelee*, *Scotch Bonnet Island to/à Cobourg*, *Croil Islands to/à Cardinal* and *Île St. Régis to/à Croil Island*. Work has begun on new chart 1431 *Canal de Beauharnois* which will be ready for the navigation season. New chart 1431 will be the last of the new series on the St. Lawrence River west of Montreal and cancels chart 1411.

Sailing Directions

The First Edition of the new Sailing Directions booklet *CEN 308 – Rideau Canal and Ottawa River* was published in time for the 2003 navigation season. This booklet cancels the 1986 edition of the *Small Craft Guide, Rideau Waterway and Ottawa River* and its 1995 Reprint.

As well as updated information on the Rideau Canal and other parts of Ottawa River, this new publication includes a description of Lake Timiskaming based on survey data collected by the CHS field survey team in the summer of

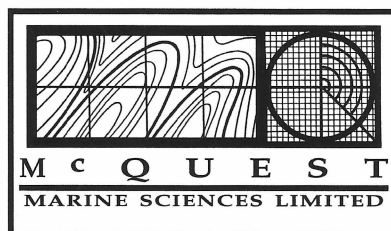
2002. This is something of a record: the survey information was published for the marine community within a few months of being collected by the field survey party. This achievement was possible thanks to the support of John Medendorp and Raj Beri of the Data Acquisition Division. This new SD publication also includes the relevant pages from the Canadian Coast Guard *List of Lights, Buoys and Fog Signals* as an appendix. This addition was suggested by Rick Martin of the CHS Regional Navigation Information Office, and the suggestion was supported by the Aids to Navigation staff in the Canadian Coast Guard Regional office. This feature means the mariner now has virtually all the information in one package to accompany the appropriate charts.

Retired...

This winter saw the retirement of a long time CHS and CHA member, hydrographer Ken Dixel. Friends and colleagues celebrated the career of Ken Dixel on Monday January 13th. After 35 years as a hydrographer with the Service, Ken retired from the Government on Wednesday January 15th, 2003. In his lengthy career, Ken has had the pleasure of surveying some of the most beautiful waters in the Caribbean and some of the harshest in the Arctic.

Staff gathered to pass on their best wishes and for a slice of cake. Our Regional Director of Hydrography, Dennis St. Jacques presented Ken with a 35-year pin and plaque as well as a gift purchased by his friends and colleagues.

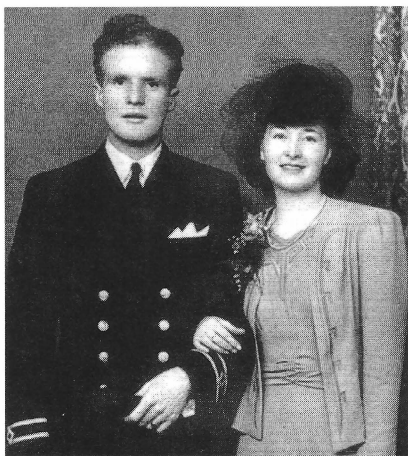
From all the staff at the CHS, we would like to thank you Ken for your service and dedication to the organization and we wish you all the best in your future endeavours. You will be greatly missed.



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**Hydrographic, Geophysical and Environmental
Surveys and Consulting Services**



Ian Miller and his wife Jane on their wedding day.

A Life of Survival and Perseverance

Ian Miller escaped three torpedo attacks during the war and went on to captain ships for Iraq's King Faisal.

Andrea Macdonald looks back on his life.

Ian Miller had the sea in his blood. He survived three torpedo attacks during the Second World War, was a harbourmaster in Iraq and Iran, and at one point commanded the royal yacht of Iraq's ill-fated King Faisal II.

The Scottish-born sailor with the British Merchant Navy, who liked Ottawa so much he retired here even though it's a long way from salt water, documented his life of adventure in his autobiography, *Voyages Into Eternity*.

"It is absolutely an amazing book of perseverance and survival," said Mary Cook, a close friend of 40 years who wrote the introduction to Mr. Miller's book.

Mr. Miller's death March 23 at the age of 85 brings his story to a close.

At the beginning of the Second World War, Mr. Miller was aboard an oil tanker that burst into flames then sank in the North Sea after being torpedoed by enemy fire.

He managed to survive the attack and found his way into a small boat with

other survivors. They rowed to keep away from the flames and were plucked from the sea by the crew of the *HMS Kelly*, a destroyer in the Royal Navy commanded by Lord Louis Mountbatten, Prince Philip's uncle.

A few hours after they were picked up, the *Kelly* was torpedoed and sustained major damage, but did not sink.

Once again Mr. Miller survived and reached the shores of his native Scotland, aboard yet another vessel. In Scotland, he was awarded a Distinguished Service Order award.

"The military hadn't had any survivors return at that point, so they didn't know what to do with him," said John Ough, a former shipmate and long-time friend.

Mr. Miller received six weeks' leave, during which he joined his family and his bride on their farm in Linlithgow, Scotland.

A few months later, he was sent to northern Norway in a freighter to get supplies to British troops. Again, his ship was torpedoed and he ended up in icy waters. The freighter up-ended in front of his eyes. Trying to get away, he looked up and saw one of the five-tonne anchors falling from the ship. He moved just as it crashed into the water beside him.

Once again, he was given leave to see his family for a few weeks before his next deployment.

After the end of the war, Mr. Miller served as a senior harbourmaster in the Iraqi port of Basra, where he lived with his family for seven years.

"Everywhere, I moved with him," said Jane Miller, Mr. Miller's widow. "We've had about 26 homes in our lives together."

In Basra, he was chosen by the young Faisal, then king of Iraq, to be

commander of his royal yacht, the *Queen Aliyah*.

"It was a magnificent ship. Everything was gold, I remembered that," said Mrs. Miller.

The Miller family then moved to Abadan, Iran, a city near the coast of the Persian Gulf, but their stay was short-lived due to upheaval and social unrest in the area.

"We just got out by the skin of our teeth, and we left a lot of stuff in the process," said Mrs. Miller.

Their path eventually brought them to North America, where Mr. Miller worked for many different companies as a hydrographers, surveying bodies of water.

They eventually ended up in Ottawa, bringing with them one daughter, Lynn Miskelly. The couple's other daughter, Janice Hanks, remained in Austin, Texas, with her new husband.

In 1998, after writing for three years, Mr. Miller published his book in the United Kingdom.

"He just wrote from his memory: names, dates and places. He didn't keep a journal, he just had a photographic memory," said Ms. Miskelly.

In recent years, Mr. Miller spent Sunday afternoons on his porch with Mr. Ough who also emigrated to Ottawa, talking about "the old days in Iraq."

"He was forthright and humorous – especially for a Scotsman," said Mr. Ough.

"He was just a good egg."

from:
The Ottawa Citizen, April 03, 2003

Minutes Canadian Hydrographic Association

2002 National Annual General Meeting

Held 13:30, 27 May 2002, The Westin Harbour Castle, Toronto

Andrew called the meeting to order at 13:45, welcomed everyone and proceeded to share with the audience a vision for CHA. The CHA was established thirty-six years ago to assist in the delivery of accredited training programs to Hydrographers. Andrew would like to see a return to these roots, a strengthening of linkages with the Canadian Institute of Geomatics (CIG) and the International Federation of Surveyors (FIG). In terms of CIG this would involve activating the Hydrographic Committee with representatives from academia, private industry, public sector and the marine community. We would then be able to build a relationship with FIG through CIG. The CHA could build on its professional image within the hydrographic community.

Attendees:

Brent Beale	Dave Gray	Dennis St. Jacques
Dan Brousseau	Kristen Greenfield	Rick Sandilands
Earl Brown	Terese Herron	Jim Statham
Janis Davies	Tim Janzen	J-C. Tétreault
Ken Dixel	Andrew Leyzack	Jeff Walker
Dr. A. El Rabbney	George McFarlane	Sam Weller
Dave Gartley	Brian Power	Scott Youngblut

1. To receive the reports of the Director's for the years 1998, 1999, 2000 and 2001.

A motion was put to the floor to accept the Branch Reports as provided by the Branch VP's for the years 1998, 1999, 2000 and 2001, with the exclusion of Quebec Branch 2001.

Moved: Tim Janzen Second: Dave Gartley
CARRIED

2. To accept the financial statements of the Corporation and the auditor's financial report for the years ending 31 December 1999, 2000 and 2001.

Brian reviewed income and expenditures for the past several years and pointed out an error in the date on the 2002 statement where the year should be 2002 not 2001. The 2002 dues were paid early on and the liability insurance is due.

A motion was made to accept the financial statements for the years ending 31 December 1999, 2000 and 2001 with the amendment on the 2001 statement to reflect Lighthouse expenditure was for Editions 58, 59 and 60.

Moved: Sam Weller Second: Earl Brown
CARRIED

Discussion:

2001 – Lighthouse expenditure is greater than usual as it covers three editions not two.

McFarlane – Where is the advertising revenue for Lighthouse? It is an ok expense to finance Lighthouse to get it on its own financial footing.

Leyzack – starting with the 2002 year-end financial statement, all financial statements including the branches, student award and Lighthouse will be rolled up in one financial report.

A motion to accept the 2002 financial statement for discussion only.

Moved: Sam Weller Second: George McFarlane
CARRIED

Discussion:

McFarlane – what profit will be made from the multibeam course? What will be done with it?

Leyzack – The multibeam course is a separate item being offered by Central Branch and will be reflected in the Branch reports.

McFarlane – if a branch makes excess funds and the National Account is not healthy, funds should be redirected back to National.

Leyzack – this will be addressed under other business
Gray – the membership dues amount is not divisible by 15. Why?

Power – The amount is not always \$15.00, for a sustaining member it is \$100 and for a student it is \$7.50.

3. To accept the minutes of the 1998 Annual General Meeting held in Victoria, B.C.

Moved: Dave Gartley Second: Tim Janzen
CARRIED

4. To accept the minutes of the 1999 Annual General Meeting held via conference call 19 January 2000.

Moved: Dave Gray Second: Rick Sandilands
CARRIED

5. To accept the proposed National Budget for the year 2002.

The National budget for the year 2002 was made available online and at the meeting.

Moved: Dave Gartley Second: Brian Power
CARRIED

Discussion:

Weller – Is \$1200 enough support for Lighthouse?

Leyzack redirected the response to Earl Brown. Earl would like to see a fixed amount per member directed to Lighthouse as was the procedure in the past. This seems to have gone by the wayside in recent years. \$1200 is a low amount for Lighthouse.

Beale – liability insurance, not quite the same as in 2002 financial report.

Leyzack – the budget was an estimate of what the liability insurance might be based on events of 9/11. The actual invoice received was for less, this is why they are different. Budget was prepared and released prior to the invoice being received.

St. Jacques – a complete financial photo summarized in one document would make it easier to see the whole financial picture.

6. To appoint Jon Biggar and Al Koudys as auditors for the year 2002.

**Moved: Dave Gartley Second: Dave Gray
CARRIED**

Discussion:

Gray – Are either Jon or Al involved in branch activities?

Leyzack – No, they are not involved in branch activities.

McFarlane – Has there been any thought given to having out-house members to be involved as auditors?

7. National Dues Increase \$5.00/member to be implemented for the year 2003. To cover increasing costs of Liability Insurance and other items in the National Office.

The increasing costs associated with operating the National Office and the unhealthy state of the National bank account are driving this increase in national dues. In order to sustain increases in liability insurance payments and other operating costs such as Lighthouse an increase in national dues is required.

Motion: To increase the national dues per member by \$5.00, or increase the national dues from \$15.00 per member to \$20.00 per member.

**Moved: George McFarlane Second: Jeff Walker
CARRIED**

Discussion:

St. Jacques – Is the \$5.00 going directly to Lighthouse?

Leyzack – that discussion will take place in June after Earl has some indication of revenue response following CHC2002.

Statham – Quorum ..do we have one today?

McFarlane – yes – we have been duly notified

Weller – the amount of approximately \$600.00 is not enough to operate or do mailings.

8. Lighthouse Report including Financial Statement

Three journals have been produced in the last 15 months. The financial situation is not good and there is concern with the high costs of producing the journal. Colour increases the cost of printing and Edition 62 will be primarily B&W, to keep the cost down. There

is a cost incurred with getting Lighthouse back on track and maintaining the quality. We are not there yet but we will be. Retention of Sustaining Members is an issue as we need their support over the long haul. The Editors need support from the membership as well in order to continue to produce a quality product.

Discussion:

- produce 1/year and post on the internet
- stay with printing, better distribution and something to have on hand.
- Go with incremental changes instead of big changes
- Approach CHS and CCG for financial support and articles.

St. Jacques – thank you to Earl and Paola for their efforts – is aware how much work is involved.

Rick Sandilands presented the financial statement, the largest expense being the cost of printing.

9. Student Awards Program Report

The report will be posted on the National website www.hydrography.ca. The report includes a brief description of the purpose and includes the listing of recipients. Discussion revolved around the investments generating the interest and sustaining the \$2,000. A question was raised as to whether the \$2,000 amount is engraved in stone, perhaps it should be a maximum value. Does the liability insurance extend to the Student Award Manager, if not should it be extended to include the Award Manager?

ACTION: next Director's meeting.

10. CHA Involvement with Hydrographic Accreditation and Training

The spring 2002 Edition of Lighthouse has the CHA/CIDA Training project report. This report will also be posted on the National website. CIDA is no longer supporting CHA involvement in training overseas. Their requirements for funding have changed and they are much more stringent. In light of this we will turn our efforts inward and look at accreditation here in Canada for hydrographers.

ACTION: Directors

11. Motion to adjourn

**Moved: Dave Gartley Second: Dave Gray
CARRIED**

Andrew thanked everyone for coming. Meeting adjourned at 14:55.

After a short break J-C. Tétreault, executive director of the ACLS gave a presentation on the ACLS and hydrography.

ANNOUNCEMENTS / ANNONCES

The editors of Lighthouse realize that the number of events and happenings associated with the world of hydrography over a given period could make for a rather exhaustive listing. In presenting the following listing of announcements we are focusing on the activities of organisations and individuals who are either directly or indirectly affiliated with the Canadian Hydrographic Association...

NEW CHA WEBSITE UNDERWAY

Thanks to the effort of CHA Pacific and Central Branch members, CHA will soon be online with a new website using a private domain internet service provider. Annual funding for the site was approved at the January director's meeting. Both Central and Pacific have operated their own sites via the CHS-DFO network and recently Central Branch has been reworking its design to reflect a more National appearance. The website is now accessible under the name www.hydrography.ca.

SUSTAINING BECOMES CORPORATE

A motion, put forth by Pacific Branch at the January directors meeting, to change the name 'Sustaining' to 'Corporate' was approved. It was agreed by all that Corporate best describes the nature of our member organizations.

NEW OTTAWA BRANCH VP

Stacey Turcott has stepped forward to run Ottawa Branch. Our thanks to past vice-president David Gray. Mr. Gray will remain on the Ottawa Branch executive as chair of the Friends of Hydrographic Committee.

UK HYDROGRAPHIC OFFICE ARCHIVE NAMED AFTER STEVE RITCHIE

Due to open this September, the new archive at the UKHO at Taunton has been named after CHA Life member, Rear Admiral Retired Steve Ritchie. For more details, please refer to The Hydrographic Journal, No. 107, January 2003.

CHA NATIONAL AGM

This year's National AGM has been tentatively scheduled for **mid-October** in Calgary to coincide with Geomatics 2003. The exact date and location will soon be posted on the CHA web site and will be published in the summer (National Edition of the Central Branch Newsletter. Stay tuned.)

CIG, GIAC, CCLS and ACLS Announce New Cooperative Measures

Four of Canada's national geomatics organizations, the Canadian Council of Land Surveyors (CCLS), Canadian Institute of Geomatics (CIG), Geomatics Industry Association of Canada (GIAC), and the Association of Canada Lands Surveyors (ACLS) wish to announce a trial co-location/co-management agreement.

The CCLS, CIG and ACLS, who are currently co-located, have agreed to GIAC co-locating for a one-year trial period commencing February 1, 2003.

Primary contributing factors were CCLS, CIG and GIAC's mutual desire to reduce costs and improve member services, and an overall desire to improve cooperation on dealing with national issues, while respecting the different perspectives and priorities of each organization.

A significant part of the agreement is the establishment of a Joint Communications Committee comprised of representatives of each of the four organizations, which will meet at least four times during this trial period to:

- provide a formal means of communication between the participating organizations, specifically related to common goals and objectives and common members
- develop and promote a common vision of the future of the geomatics sector in Canada
- identify opportunities for coordinated action to achieve this vision or address issues of interest or concern to the participating organizations
- provide direction to the senior staff members of the participating organizations in the development and implementation of service exchange arrangements in order to act on those opportunities
- discuss the appropriateness of long term co-location/co-management of professional organizations such as CCLS and ACLS with an industry organization such as GIAC

The office for all four organizations will be Suite 400, 1390 Prince of Wales Drive, Ottawa, effective February 3, 2003.

For further information, contact: Sarah Cornett, Executive Director, Canadian Council of Land Surveyors
Tel: (613) 226-5110, Toll Free: 1-800-241-7200,
E-mail: exdir@ccls-ccag.ca

Canadian Hydrographic Conference



Conférence Hydrographique du Canada

*A Canadian Celebration of
Hydrography:
Foundation for the future*

*Hommage Canadien
à l'hydrographie :
La fondation pour l'avenir*

For registration or exhibitor
information visit us on-line at

www.chc2004.com

Pour enregistrement ou information
d'exposants visiter



Ottawa, Canada

at the Westin Hotel

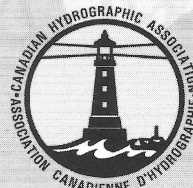
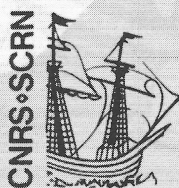
May 24-27, 2004

24-27 mai 2004

Ottawa, Canada

à l'hôtel Westin

100 years of
Canadian Hydrography
1904-2004



Le centenaire des levés
hydrographiques
au Canada 1904-2004

L'ACSG, l'ACEG, le CCAG et l'AATC annoncent de nouvelles mesures de coopération

Quatre associations nationales s'intéressant aux sciences géomatiques au Canada, le Conseil canadien des arpenteurs-géomètres (CCAG), l'Association canadienne des sciences géomatiques (ACSG), l'Association canadienne des entreprises de géomatique (ACEG) et l'Association des arpenteurs des terres du Canada (AATC) désirent annoncer leur entente de co-installation et de cogestion qui sera soumise à une période d'essai.

Le CCAG, l'ACSG et l'AATC qui sont co-installés à l'heure actuelle, ont conclu une entente avec l'ACEG afin qu'elle se joigne à eux pour une période de co-installation d'essai d'un an qui commencera le 1^{er} février 2003.

Les principaux facteurs en jeu étaient le désir réciproque du CCAG, de l'ACSG et de l'ACEG de réduire les coûts et d'améliorer les services aux membres ainsi qu'un désir général d'améliorer la coopération pour traiter des questions nationales, tout en respectant les priorités et les points de vue différents de chaque organisation.

Une composante importante de l'entente est l'établissement d'un comité conjoint des communications composé de représentants de chacune des quatre organisations. Ce comité se réunira au moins quatre fois au cours de la période d'essai pour :

- agir comme moyen officiel de communications entre les organisations participantes, surtout en ce qui a trait aux buts et objectifs communs ainsi qu'aux membres communs,
- développer et promouvoir une vision commune sur l'avenir du secteur de la géomatique au Canada,
- déterminer des possibilités d'activités coordonnées pour réaliser cette vision ou afin d'aborder des questions intéressant ou préoccupant les organisations participantes,
- fournir l'orientation au personnel de la haute direction des organisations participantes en ce qui a trait au développement et à la mise en œuvre d'accords d'échanges de services pour tirer profit de ces possibilités,
- discuter du caractère adéquat de la co-installation et de la cogestion à long terme d'organisations professionnelles comme le CCAG et l'AATC avec une organisation de l'industrie, comme l'ACEG.

Le bureau des quatre organisations sera situé au 1390, promenade Prince of Wales, bureau 400 à Ottawa dès le 3 février 2003 et le processus est en cours en vue de recruter le nouveau PDG de l'ACSG/ACEG.

Pour de plus amples renseignements, veuillez communiquer avec : Sarah Cornett, Directrice exécutive, Conseil canadien des arpenteurs-géomètres Téléphone : (613) 226-5110, Sans frais : 1-800-241-7200, Courriel : exdir@ccls-ccag.ca

Association of Canada Lands Surveyors, is proposing a follow-up OFFSHORE ISSUES Consultation Workshop

Prior to CIG's Geomatics 2003, Calgary, the Association of Canada Lands Surveyors, Offshore Issues Committee are proposing to conduct a follow-up session of the 2000 Offshore Issues Consultation Workshop. Sponsorship is being sought from CHS, NRCan's Legal Surveys Division and CHA National. With the assistance from CHA's **Prairie Schooner Branch**, the ACLS are proposing to deliver a Seminar on Offshore Management as it pertains to Offshore Property Rights. We'll keep you posted on this item!

Canadian Institute of Geomatics 2003 ANNUAL CONFERENCE / l'Association canadienne des sciences géomatiques LA CONFÉRENCE ANNUELLE DE L'ACSG 2003, GEOMATICS 2003

Geomatics for Industry: Micro to Macro / Les sciences géomatiques et l'industrie: de micro à macro **16-18 October / octobre, 2003** Fairmont Palliser, Calgary Alberta

Micro

Industrial Metrology / Métrologie industrielle
Deformation Analysis / Analyse en altération
Precise Leveling / Nivellement de précision
Equipment Alignment / Ajustement de l'équipement
Terrestrial Laser Scanning / Balayage terrestre au laser
Close Range Photogrammetry / Photogrammétrie à courte portée

Macro

GIS (web based, decision making) / SIG (axé sur WEB, prise de décisions)
Topographic Surveys / Levés topographiques
Cadastral Surveying and Cartography / Levé cadastral et cartographie
Linear and Area Mapping Projects / Projets linéaires de cartographie régionale
Airborne and Satellite Remote Sensing / Télédétection aérienne et par satellite
Navigation and Positioning / Navigation et positionnement
For more information visit / Pour de plus amples renseignements, visitez: www.cig-acsg.ca

7th South East Asian Survey Congress (SEASC2003)

The Hong Kong Institute of Surveyors will be hosting 7th South East Asian Survey Congress (SEASC2003), **3-7 November**, in Hong Kong. This 7th SEASC is co-sponsored by FIG and its Commissions 4 and 5.

With the theme, "From Compass & Pacing to Cyber Spacing - How does SE Asian Surveying Measure Up?", the aim of SEASC 2003 is to provide a regional forum that is non-political and non-aligned, where delegates can exchange views and work together for the advancement of the surveying profession in the various streams and disciplines where their expertise lies. In the history of this Congress, we have delegates from all the South East Asian countries and the Pacific Regions including Australia and New Zealand; and now there are a growing number of delegates from Europe, North America and East Asia including Mainland China.

Topics Include:

1. Cadastral Surveying
2. Geodetic Surveying
3. Engineering Surveying
4. Hydrographic Surveying
5. Photogrammetric Surveying and Remote Sensing
6. GIS and Spatial Information Management
7. Valuation and Land Management
8. Project, Cost and Contract Management
9. Survey Instruments
10. Professional Standards and Education
11. History of Surveying

For more information visit www.seasc2003hk.org or contact the Congress Secretariat
Tel: (852) 2559 9973 FAX: (852) 2547 9528
or via E-mail: enquiry@seasc2003hk.org.

CHC 2004 – A Canadian Celebration of Hydrography: Foundation for the future

Plan to attend the **Canadian Hydrographic Conference in Ottawa, 24 to 27 May, 2004**, to help us celebrate 100 years of hydrographic achievements (1904 – 2004) while looking forward to an exciting future. CHC 2004 will be co-hosted by the CHA Ottawa Branch, the Canadian Hydrographic Service and the Canadian Nautical Research Society (CNRS).

The program will provide an outstanding opportunity to revisit the pioneering spirit and achievements of early hydrographers, while building upon those accomplishments to look at the future of the profession. Sessions and exhibitions will take place at the Westin Hotel in downtown Ottawa.

The co-hosts invite anyone interested to contact the CHC 2004 Planning Committee to inquire about sponsorship opportunities.

For more information contact the Canadian Hydrographic Conference 2004, 300-615 Booth Street, Ottawa, Ontario, Canada K1A 0E6, www.chc2004.com or email info@chc2004.com.

CHC 2004 –Hommage canadien à l'Hydrographie : La Fondation pour l'Avenir

Participez à la Conférence hydrographique du Canada qui se tiendra à Ottawa, 17 au 22 mai, 2004. Joignez-vous à la célébration du Centenaire de l'hydrographie canadienne, (1904 – 2004) tout en étudiant le futur de l'hydrographie. Hôtes de la CHC 2004: L'Association hydrographique canadienne section du Ottawa, le Service hydrographique du Canada et la Société canadienne pour la recherche nautique (CNRS).

Le programme donnera l'extraordinaire possibilité de reprendre contact avec l'esprit pionnier et les exploits des premiers hydrographes, tout en offrant un regard sur l'avenir de la profession. Toutes les sessions et exposition se tiendront à l'hôtel Westin dans le centre-ville d'Ottawa.

Les organisateurs invitent tous les commanditaires à contacter le Comité de planification de la CHC 2004 pour étudier les possibilités de commandites.

Pour de plus amples renseignements, veuillez communiquer avec: Conférence hydrographique du Canada 2004, 300-615, rue Booth, Ottawa (Ontario) K1A 0E6 Canada, www.chc2004.com ou courriel info@chc2004.com.

MULTIBEAM SONAR Training Course / Cours de formation en SONARS MULTIFAISCEAUX

The United States/Canada Hydrographic Commission Coastal Multibeam Sonar training course will take place in Ottawa-Gatineau from **17 to 22 May, 2004**. This training is regarded as one of the best sources for multibeam sonar training in the world. The course will precede CHC 2004. For more information visit www.chc2004.com or E-mail info@chc2004.com.

Le cours de formation de la Commission hydrographique US/Canada de Sonars cotiers multifaisceaux se tiendra du **17 au 22 mai, 2004** à Gatineau-Ottawa. Ce cours est l'un des meilleurs au monde en cette matière.

Pour de plus amples renseignements, visitez : www.chc2004.com ou courriel info@chc2004.com.

"Back to Back Down Under" Third International Conference in High Resolution Surveys in Shallow Water - Shallow Survey 2003, Sydney, Australia.

To be held in Sydney, Australia from **17-20 November 2003**.

www.dsto.defence.gov.au/corporate/conferences/swsurvey/ Contact: Philip Chapple
Tel: 61 2 96921536 Fax 61 2 96921560
E-mail: philip.chapple@dsto.defence.gov.au

HYDRO 2003 - The 4th Australasian Hydrographic Symposium

To be held in Christchurch from **24-26 November**, HYDRO 2003 will be the fourth Australasian hydrographic symposium and is being organized by the Australasian Hydrographic Society's New Zealand region. The last symposium was in Perth five years ago and was enjoyed by about 150 attendees and exhibitors.

In other words it's a great opportunity to come and either display your products or meet like minded professionals.

Surveying Extremes is the main theme of proceedings for HYDRO 2003, planning for which is well underway. So far, around 24 individual papers are scheduled on topics covering Offshore Development, Data Management (UNCLOS etc), Environmental, Navigation and Technical Innovation. The organizers are keen to hear from people wanting to present a paper.

There will be 18 exhibitors' booths and many of them are already booked. There are booths left so please visit the website below to get the details.

It is likely that two hydrographic survey vessels from the NZ and Australian Navy will be coming to the local port – Lyttelton – for this symposium.

Also try and convince your partner to travel with you. There is a Partners programme organized for the Symposium. The South Island of New Zealand is a scenic location.

For more information visit:
www.hydrographicsociety.org.nz

CHA NEWS NOUVELLES de l'ACH

Ottawa Branch

The Ottawa Branch has recently changed its executive members. Stacey Turcotte takes over for Dave Gray as Vice President, and Dana Tallon has relieved Jennifer Ross of her duties as Treasurer. We'd like to thank Dave and Jenn for all their hard work, along with the other executive members, Sheila Acheson, and Ilona Monahan. We had a great year that included a very successful Christmas party, attended by new and retired CHA members, and we also had the pleasure of having Mike Casey give a lunchtime presentation on his trip to Nepal. He discussed many aspects of the cultural and physical geography of the area including the rising water levels of a mountain lake in danger of flooding the valley below. We are looking forward to a new year leading up to the Canadian Hydrographic Conference in 2004.

CHA NEWS NOUVELLES de l'ACH

CENTRAL BRANCH AGM

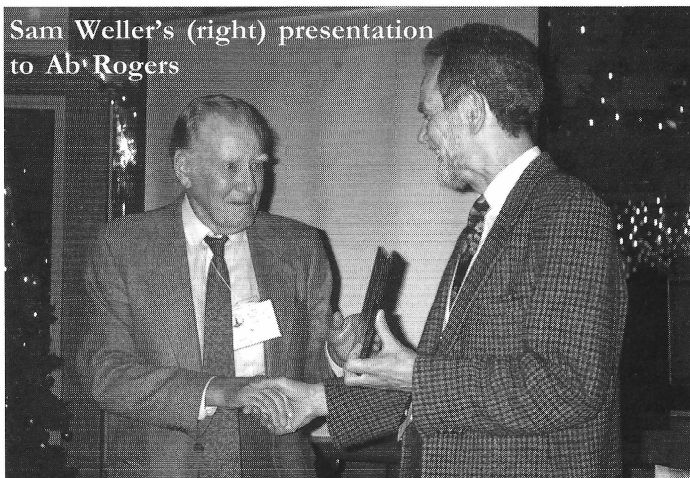
The 13th Annual General Meeting and Dinner of the CHA, Central Branch was held on December 12th at the charming Mimico Cruising Club in Etobicoke. On the agenda was the introduction of the new Central Branch Executive Committee by Tim Janzen, Branch VP: Fred Oliff (Secretary), Jeff Walker (Treasurer), Heather MacArthur, George McFarlane, Brian Power, Jim Weedon and Scott Youngblut (Executive Members).

After an enjoyable meal, CHA members and their guests were captivated by speaker Paul Carroll's account of the discovery of the SS Wexford, a ship that sank during the Great Storm of 1913. Special thanks to Paul, and to the organizing committee, for ensuring a pleasant evening was had by all.

Member News

Best wishes to John Dixon and his wife Barbara Monk, who were suitably married at old Fort Henry in Kingston on February 8th. One of *Surveyor's* leading hands, John met Barb while enjoying a mutual hobby, re-enacting and so what better place to celebrate than at a 19th century British military fortress

Ab Rogers, a Central Branch Life Member, was part of the Canadian force who liberated the Netherlands during WWII. During last November's Remembrance Day celebrations, a photograph of Ab along with several visiting Dutch students was featured in the Hamilton Spectator. It was certainly a day of recognition for Ab's wartime contribution to Canada and to Holland. At Central Branch's AGM, Ab was presented with a framed copy of that photograph as a small token of our appreciation for his service to our country during the Second World War.



NOUVELLES Association canadienne d'hydrographie

Also recognized at the AGM were Sam Weller's past and present contributions to the Central Branch executive and in particular the Newsletter. Sam was presented with a pewter Lighthouse lapel pin, a gift which has traditionally been bestowed upon first-time authors contributing to Lighthouse.

Congratulations to international member Kevin Smith who was recently elected Chairman of the New Zealand region of the Australasian Hydrographic Society.

Two thousand and two marked the Queen's Golden Jubilee. To celebrate, a Golden Jubilee Medal was awarded to Canadians who demonstrated outstanding or exemplary achievement or service to the community or to Canada as a whole; or those who have made a sustained contribution over and above what might reasonably be expected of paid employment or voluntary action. We are proud to say that three Central Branch CHA members were awarded the Queen's Jubilee Medal: Mike Bennett, Ed Lewis and Dennis St. Jacques. Congratulations!

Admiralty Launch *SURVEYOR*

The month of March has usually been the time to start thinking about readying *Surveyor* for the coming season but with the launch covered by three feet of snow and day time temperatures below freezing it has been difficult to motivate oneself.

There is always work to be done and events to plan and this year's schedule of events are starting to take shape. The first event of the year occurs in early May; The Upper Canada Trade Faire at Brentwood Farms, Odessa Ontario runs for three days from May 9th to 11th and includes an educational (visiting schools) day on the Friday. Unfortunately the British Garrison Weekend on June 6th-8th which was to be a major event for the Surveyor and her crew was cancelled. The Surveyor would have been part of a Royal Navy Flotilla sailing across Lake Ontario from a harbour east of Toronto to the mouth of the Niagara River and Old Fort Niagara, New York.

Other events that are proposed are GunBoat Weekend; Mallorytown ON, June 21-22, 1812 Heritage Day Weekend; Gananoque ON, August 15-17, Thunder on the Reach; Adolphstown ON, August 30-31, Marine Heritage Festival; 2003 September 19th Goderich ON, and The Faire at the Forks; Chatham ON.

The CHA Admiralty Launch Committee is proposing to meet with representatives of The Hamilton Ships Company to discuss future programs for the launch. As well the

committee is also planning on providing an exhibit at the Canadian Marine Discovery Center currently being developed at Pier No. 8, Hamilton.

H₂O Bonspiel

They did it again! Earl Brown, Jacqueline Leyzack and Brian Power organized yet another successful H₂O Bonspiel at the Grimsby Curling Club. Inspired by the ladies *Tournament of Hearts* which was taking place at the same time in Kitchener, the *Canadian Hydrographic Association* hosted its' 32nd annual H₂O Bonspiel on Saturday the 22nd of February. There were sixty-four enthusiastic curlers who curled with the aspiration of seeing their names engraved on the trophies.

First place honours goes to the rink of Brian Power (Skip), Dennis Grabuski (Vice), Jason Power (Second) and Steve Capampan (Lead).

Congratulations are also extended to the second place winners: Michele Clarke (Skip), Judy Campbell (Vice), John Kisneris (Second) and Mike Campbell (Lead).

This year's prize table had an excellent selection of goodies for all curlers. Our sincere thanks to the following sponsors for their generosity and continued support:

Algoma Central Marine

Canadian Hydrographic Association

Canadian Hydrographic Service

DataQC Inc.

Emma's Back Porch

Fish Habitat Management

IIC Technologies

Joe Dogs Gas Bar and Grill

Kongsberg Simrad Mesotech

Knudsen Engineering Ltd.

Marshall Macklin Monaghan

McQuest Marine Sciences

Stanley Hardware

Upper Lakes Group Inc.

DID YOU KNOW . .

Painters

The light line secured to a small boat's stempost receives its name from the Fench word "Peyntours," meaning a noose or bight.

The Canadian Hydrographic Association (CHA) is a non-profit, scientific and technical group of more than 500 members with the objectives of:

- advancing the development of hydrography, marine cartography and associated activities in Canada;
- furthering the knowledge and professional development of its members;
- enhancing and demonstrating the public need for hydrography;
- assisting in the development of hydrographic sciences in developing countries.

It is the only national hydrographic organization in Canada. It embraces the disciplines of:

- hydrographic surveying;
- marine cartography;
- marine geodesy;
- offshore exploration;
- tidal and tidal current studies.

The Canadian Hydrographic Association is formally affiliated with the Canadian Institute of Geomatics. It is informally associated with The Hydrographic Society.

What the CHA Can Do For You:

- advance your knowledge of hydrography, cartography and associated disciplines, and keep you abreast of the latest development in these disciplines;
- enable you to develop and maintain contacts with others involved with hydrography, nationally and internationally.

These benefits are provided through the publication of *LIGHTHOUSE* (one of only three journals in the world devoted exclusively to hydrography) and through the sponsorship of seminars, colloquiums, training programs, national conferences, and Branch and National meetings.

LIGHTHOUSE

The journal of the Canadian Hydrographic Association, *LIGHTHOUSE*, is published twice yearly and distributed free to its members. Timely scientific, technical and non-technical papers and articles appear in the journal, with authors from national and international academia, industry and government. Present circulation of *Lighthouse* is approximately 900.

Membership

Membership is open to all those associated with the hydrographic community as well as those working in associated disciplines.

Branch & Regional Activities

The Canadian Hydrographic Association has five (5) branches located across Canada. National headquarters is located in Ottawa.

L'Association canadienne d'hydrographie (ACH) est un organisme sans but lucratif réunissant un groupe scientifique et technique de plus de 500 membres ayant des objectifs communs, comme:

- faire progresser le développement de l'hydrographie, de la cartographie marine et de leurs sphères d'activités au Canada
- permettre les échanges d'idées et le développement professionnel de ses membres
- rehausser et démontrer l'importance de l'hydrographie auprès de public
- assister au développement des sciences de l'hydrographie dans les pays en voie de développement

Au Canada, l'Association est la seule organisation hydrographique qui embrasse les disciplines suivantes:

- levé hydrographique
- cartographie marine
- géodésie marine
- exploration extra-côtière
- étude des marées et courants

L'Association canadienne d'hydrographie est affiliée à l'Association canadienne des sciences géomatiques, et non-officiellement liée à The Hydrographic Society.

Ce qu'elle L'ACH peut faire pour vous:

- parfaire vos connaissances de l'hydrographie, de la cartographies et des disciplines connexes, tout en vous tenant au courant des nouvelles techniques et des derniers développements réalisés dans ces domaines;
- établir et maintenir des contacts avec ceux qui oeuvrent en hydrographie, au niveau national et international.

Ces avantages sont transmis par l'entremise de *LIGHTHOUSE* (une des trois revues au monde traitant exclusivement d'hydrographie) et par la tenue de séminaires, de colloques, de programmes de formation et d'assemblées régionales et nationales.

LIGHTHOUSE

La revue de l'Association canadienne d'hydrographie, *LIGHTHOUSE*, est publiée deux fois l'an et distribuée gratuitement aux membres. Des articles scientifiques, techniques et non techniques, provenant du milieu de l'industrie ou du gouvernement autant national qu'international, apparaissent dans cette revue. Le tirage actuel de la revue est d'environ 900 copies.

Comment devenir membre

Le statut de membre est offert aux tout ceux oeuvrant ou ayant un intérêt dans des disciplines associées.

Sections et activités régionales

L'Association canadienne d'hydrographie possède cinq (5) sections à travers le Canada. L'administration central se trouve à Ottawa.

For further information write to / Pour plus d'information, s'adresser au:

National President/Président national
Canadian Hydrographic Association
1390 Promenade Prince of Wales Dr., Suite/Bureau 400
Ottawa, Ontario Canada K2C 3N6

Rates Tarifs

POSITIONING / EMBLEMENTS

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

EXIGENCES NUMÉRIQUES

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

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

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

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

PUBLICATION SIZE

DIMENSIONS DE LA PUBLICITÉ

Publication Trim Size/ Dimension de la revue:	8.5"	x	11.0"
Live Copy Area/ Encart libre:	7.0"	x	10.0"
Bleed Size/ Publicité à fond perdu:	8.75"	x	11.5"
Single Page Insert Trim Size/ Insertion d'une page:	8.25"	x	10.75"
Standard Ad Sizes/ Grandeurs standards des suppléments:			
Full Page/ Pleine page:	7.0"	x	10.0"
1/2 Page/ Demie-page:	6.875"	x	4.75"
or/ ou:	3.375"	x	9.75"

PRINTING / IMPRESSION

Offset screened at 133 lines per inch.
Internégatif tramé à 133 lignes au pouce.

CLOSING DATES / DATES DE TOMBÉE

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

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

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HINTS TO AUTHORS

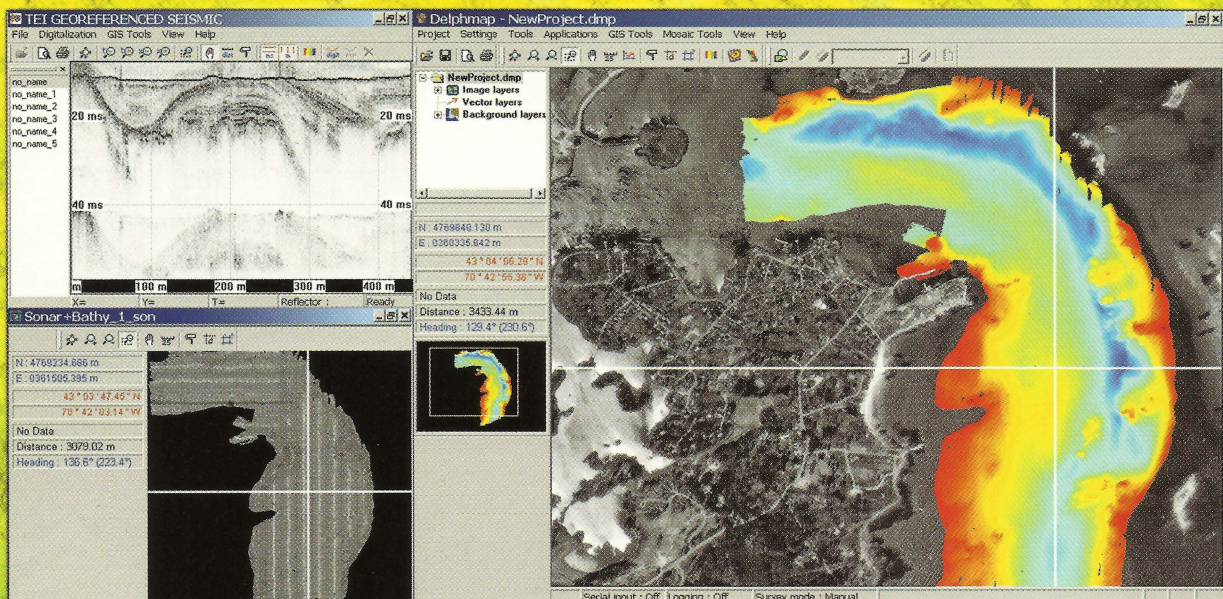
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2. Submit digital files, one with text only and a separate file for each graphic (tables, figures, photos, graphs) in its original form or in .tif format (600 DPI). Photos may be submitted separately to be scanned. These may be submitted via E-mail or on CD ROM to the Editor.
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