

The Canadian Hydrographic Association
Association canadienne d'hydrographie



NEWSLETTER

*** September/October 1998 ***

Vol. 12, No. 5

Canadian Hydrographic Association

Central Branch

1998 Executive

Vice-President:	Fred Oliff	(905) 336-4743
Secretary:	Tim Janzen	(905) 336-4847
Treasurer:	Andrew Leyzack	(905) 336-4831
Executive Members:	Jim Berry	(416) 392-9721
	Al Koudys	(905) 319-6907
	Ed Lewis	(905) 336-4828
	Jacqueline Miles	(905) 336-4871
	Brian Power	(905) 319-6928
	J. "Sam" Weller	(905) 336-4732
(Past V-P)	Terese Herron	(905) 336-4832

Addresses:

Jim Berry, 700 Krosno Blvd.,
Pickering, Ontario L1W 1G3

FAX: (416) 392-9726:

All others

Canadian Hydrographic Association
P.O. Box 5050
Burlington, Ontario L7R 4A6

FAX: (905) 336-8916 or 336-4819

Our Internet addresses: lastnamefirstinitial@dfo-mpo.gc.ca
(Except Jim Berry, which is: jberry@trca.on.ca)

Central Branch Committees

NewsLetter/Web site

J. Weller, J. Berry, T. Herron, B. Power, L. Robbins,
K. Weaver.

Lighthouse

T. Herron, F. Oliff, R. Robitaille, E. Sinclair,
J. Weller.

Social Events

H₂O: J. Miles, B. Power, A. Leyzack.

BBQ: J. Miles, F. Oliff, A. Koudys.

AGM: T. Herron, F. Oliff, J. Miles, A. Leyzack,
A. Koudys.

International Members

F. Oliff, T. Herron, P. Knight, L. Robbins, J. Weller.

Membership/Nominations/Elections

A. Koudys, T. Herron, J. Berry, J. Biggar.

Seminar

T. Janzen, E. Lewis, F. Oliff.

Wade Essay Award

E. Lewis, P. Travaglini, A. Leyzack.

Admiralty Launch Surveyor

A. Leyzack, W. Warrender, J. Dixon, B. Power,
H. Duller, J. Miles.

Notes from the Branch Vice-President

Well, this has turned out to be a busy year. Despite the fact that I did not go out in the field for the first time since I started with the CHS, I was busier than ever. So was everyone else, with just about all CHS staff getting a "spell" in the field.

What a nice summer to get out of the office. I spent August and September in Dartmouth; never having been to Nova Scotia before it is easy to see why Ed Thompson retired to Annapolis Valley. What a beautiful province; thanks for the opportunity of the Regional Exchange. It was a difficult decision to give up a field survey in Bathurst Inlet, but somebody had to make it. It was interesting to see how another region operates; it is too bad that I was not successful generating any enthusiasm in getting CHA up and running again in Atlantic Region.

Now that everyone has returned from the field we can get Central Branch operating again. We have already had our first General meeting, a road trip to the *Toronto & Region Conservation Authority*, hosted by Jim Berry on 8 October. It is too bad that it happened to coincide with many people still in the field and out of town at meetings. Alas, and it was an interesting topic as well, with many useful hydrographic applications.

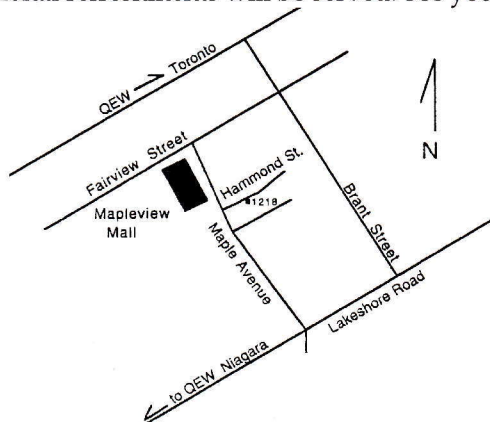
I look forward to the upcoming elections and I would like to take this opportunity to thank everyone on the 1998 Branch Executive for their hard work and dedication to this volunteer Association. Take it from me, we could never have done it without you.

- Fred

Next meeting

Our next meeting is at 19:00 on Wed. 4 November 1998 at Bill & Helen Warrender's home: 1218 Hammond Street, Burlington [off Maple Ave. south of Fairview]. Our guest speaker is Herb Pohl of the Wilderness Canoe Association. His illustrated talk will be on "Canoeing Alone in Labrador".

This meeting will receive the Nominations Committee report with names of people nominated for election to the Central Branch Executive for the year 1999. Traditional refreshments will be served. See you there!



Central Branch Treasurer's Report

31 December 1997 to 30 June 1998

Balance forward 31 December 1997: \$ 3,413.24

Receipts

Membership Dues (1997)	\$ 60.00	
Membership Dues (1998)	1,943.46	
NewsLetter	50.00	
AGM	100.00	
H2O Bonspiel	250.00	
		\$ 2,403.46
		\$ 5,816.70

Expenditures

National Dues	\$ 1,552.50	
Postage	373.75	
Seminars	187.53	
H2O Bonspiel	860.00	
CIG MasterCard charges	1.05	
1997 AGM Arrears	75.00	
		\$ 3,049.83

Working Balance 30 June 1998: \$ 2,766.87

NOTE: 1997 AGM Arrears are funds accounted for in the 1997 year-end but owing to the Branch.

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[Note: To assist *Surveyor's* team, the Central Branch treasurer handles some launch income and expenses (reported below). The balance is held available and is used by the Launch Committee as required.]

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Launch "Convenience" Account

31 December 1997 to 30 June 1998

Balance forward 31 December 1997: \$ 457.05

Receipts

Print Draw	\$ 30.00	
		\$ 487.05

Expenditures

Maintenance	\$ 235.21	
CWM Plaque	43.53	
		\$ 278.74

Working balance 30 June 1998: \$ 208.31

NOTE: Liability Insurance for the 1998 sailing season was paid by the Museum of Civilization (Canadian War Museum).

Funding from the Museum of Civilization is pursuant to the CHA/CWM maintenance agreement.

Minutes of General Meeting of CENTRAL BRANCH held on 8 October 1998

1) This year's 4th General Meeting was hosted by Jim Berry at *Toronto & Region Conservation Authority* premises in Scarborough. Fred welcomed everyone, thanked Jim Berry and the Authority for their hospitality, and called the meeting to order at 19:00.

Attendees:

Fred Oliff	-V.P.- Chair	
Mike Bennett	Jim Berry	Earl Brown
Cathy Burbage	Joe Della Fave	Mike Marsden
Milo Sturm	Keith Weaver	David Young

2) Minutes of 22 April 1998 Meeting were circulated in the newsletter but were not available at the meeting.

3) As the Treasurer was absent, with regrets, the two parts of the financial reports were circulated but did not raise any questions. Motion to accept the reports.

- Moved J. Berry/M. Bennett CARRIED

4) Correspondence: Keith received a Membership request; Al Koudys sent out the membership package. E-mail from Nick Emerson (with new address), also from Larry Robbins and Peter Knight. E-mail from Brian Power (National Secretary) asks for a Central Branch representative for the National Nomination Committee. It was agreed that Keith Weaver would be the ideal candidate. Keith volunteered [but discovered later, not on the e-mail, that this would be the Chair position...].

5) Committee Reports

Admiralty Launch Surveyor: Chairman not available. A written report was received later: [The Surveyor and crew with Bill Warrender as coxswain participated in re-enactments and an educational (school tour) day at the Faire at the Forks in Chatham last weekend.]

Membership: The committee was not available, but in their absence some issues were raised in the handling of membership dues. Keith Weaver paid his dues for 1998, but the cheque was never cashed. He then received a notice for dues owing! Mike Bennett said he had also paid but was asked again. This needs to be addressed.

Seminar: As only one person from this committee was available, no report was given. Suggestions were solicited but decisions were deferred as a new Executive will be in place before the first 1999 General meeting.

Lighthouse: There was much discussion regarding this item. What we know right now is that Terese would prefer that someone else take over as Editor. Elizabeth Sinclair is the layout person and it was decided that since we have a Macintosh and the conversion of the files to PC is so difficult that we will stay with Mac, at least for the upcoming issue. Other points raised were that Lighthouse is not just a Branch item and that National should seek other "healthy" branches to participate in the production of the journal.

6) Nominations Committee: Jim Berry suggested that the Committee canvas all members for nominations to the 1999 Branch Executive. Jim also nominated Ken McMillan for a second term as National President.

7) The business part of the meeting adjourned at 20:00.

Milo Sturm, President of *Shoreplan Engineering Ltd.*, gave us an interesting talk on the Coastal Zone Management Projects he and his company have been involved with. These included various projects on the Great Lakes for shore protection and habitat rebuilding (i.e. various sites for TRCA, Port Credit, and Georgian Bay). They have also done beach rejuvenation in the Goderich area and coastal & marine engineering projects in the Caribbean.

Milo demonstrated the evolution of their analysis tools over a twenty-year period, culminating in the use of CHS digital field sheet data (obtained through *Nautical Data International*) incorporated with wind data, to produce wave height and orientation models and predict the effect on the shoreline.

This was a very interesting talk and has potential for a presentation to the Scientists at CCIW.

Canadian Hydrographic Association

***** Central Branch *****

1998 ANNUAL GENERAL MEETING & DINNER

Wednesday 9 December 1998 at

Mimico Cruising Club
Humber Bay West Park
Etobicoke (Toronto)

CHA Members and Guests: \$25.00 per person

Cash Bar

Cocktail Reception 4:30 p.m.
Annual General Meeting 6:15 p.m.
Dinner 7:00 p.m.
Guest Speaker 8:00 p.m.

A Registration Form will be in the next NewsLetter.

For reservations and information please contact

Canadian Hydrographic Association
P.O. Box 5050
Burlington, Ontario L7R 4A6
FAX: (905) 336-8916

Last day for Registration: Thursday 3 December

The International Column

Surveying on the equator by Dave Wells and Ken McMillan

We are glad to welcome Guest Columnists Dr. Dave Wells and Ken McMillan to our International Column. Dave is on the faculty in the Department of Geodesy and Geomatics Engineering at the University of New Brunswick. Ken is National President of CHA and President of McQuest Marine Sciences. Dave and Ken recently returned to Canada after teaching at Universiti Teknologi Mayasia in Kuala Lumpur.

On Friday, 6 August 1998, two teams from the Hydrographic Cat B class at UNITEKMA (Universiti Teknologi Malaysia) competed to acquire the highest number and highest quality hydrographic data points within a 90 minute deadline.



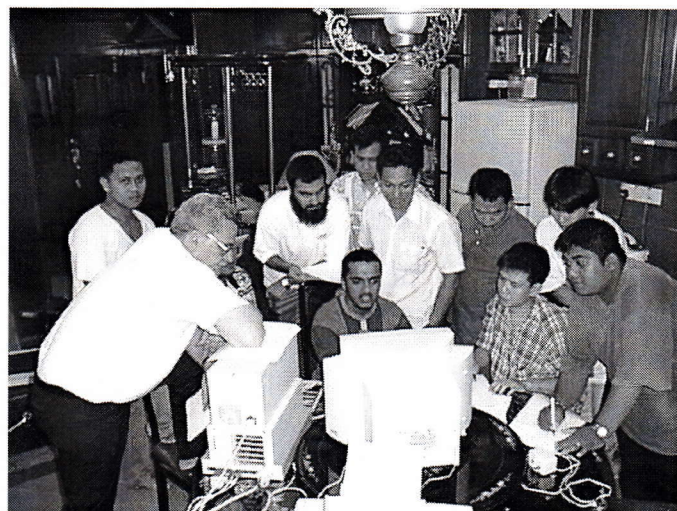
Ready for an early start.

The team styling themselves as "Garfield Hydrographic Stn Bhd" won the competition by collecting 1178 depths, 75% of which were within less than 10 metres deviation from the planned survey lines.

The second team, styling themselves "Team Hydro Malaysia", trailed close behind with 1036 depths, 65% of which were within 10 metres of the planned survey lines (this team also finished 10 minutes faster than did the winners).



The DGPS base station.



Processing the data.

The DGPS system used for vessel track control was a Trimble DSM Pro tracking a marine beacon transmitter in Singapore. This system provided WGS84 coordinates clustered within about 50 cm, but offset by 3m from WGS84 control point "Kastam" established in June jointly by the Malaysian and Singaporean governments: coordinates 1-22-13.6628N, 104-5-19.3820E.

The Canadian Hydrographic Association, Canadian Hydrographic Service, and UNB Geodesy & Geomatics Engineering Department have all supported the establishment of this Cat B course in Malaysia over the past decade. Ken McMillan, President of the CHA, and Dave Wells from UNB have been instructors on this course for the past three years.



The wrap-up banquet.

News & interesting items from (or about) International Members are always welcome. Send to: Larry Robbins 42 Knights Road, Rothesay Bay, Auckland 1310, NEW ZEALAND. Or on the Internet: larry@robbins.gen.nz.

INTERNATIONAL MEMBERS of CHA [28 October 1998]

Rhea Metin Alkan	Turkey
Capt. F. Angelini (ItN)	Italy
Peter Barr	Australia
Guenther Bellach	Thailand
Fosco Bianchetti	Italy
Guiseppe Biscontin	Italy
Gary Chisholm	New Zealand
Luis Leal de Faria	Portugal
Ir. Eka Djunarsjah	Indonesia
Nick Emerson	Hong Kong
Randall Franchuk	U.S.A.
Ronald Furness	Australia
George Goldsteen	Australia
Instituto Hidrographico	Spain
Chih Ping Hu	Taiwan
Adam Kerr	United Kingdom
Karl Kieninger	U.S.A.
Peter Knight	New Zealand
Ahmad Shahlan Mardi	Malaysia
Charles Meador	U.S.A.
Capt. Keith Millen	United Kingdom
Rumlan Bin Mukhtar	Malaysia
Rr Adm Steve Ritchie (Ret'd)	Scotland (Life Member)
Cdr. Larry Robbins	New Zealand
Dr. Shiahn-wern Shyue	Taiwan
Kevin Smith	New Zealand
Reid W. Stanford, III	U.S.A.
Paul Stern	United Kingdom
Jack Wallace	U.S.A.

Central Branch Nominations

Dear Member,

As we get into autumn, it is the season for Central Branch Elections. Nominations for the 1999 Branch Executive are now open and your Nominations Committee is looking forward to receiving your nominations for the 1999 executive. Anyone accepting nomination should be prepared to set aside time to participate in CHA activities and duties.

All members in good standing are eligible to run for a position on the executive and may also submit nominations for people they would like to see on the 1999 executive. To all Out-House and International members, we encourage you to participate in the election process.

Positions available for 1999: Vice-President, Secretary, Treasurer, 6 Executive Members

Members eligible for nomination are listed above and on Page 5. Please mail, phone, email (herront@dfo-mpo.gc.ca) or fax (905)336-4832 nominations to one of us:

Terese Herron	(905) 336-4832
Al Koudys	(905) 319-6907
Jim Berry	(416) 392-9726
Jon Biggar	(905) 336-4832

Nominations will be closing at the meeting November 4th, 1998. Ballots will be distributed with the newsletter from the November 4th meeting and the results will be announced at the Annual General Meeting on December 9th at the Mimico Cruising Club.

Anticipating hearing from you,

Terese Herron, Nominations Committee

MEMBERS of CENTRAL BRANCH [28 October 1998]

CCIW in-house

Mike Bennett
Jon Biggar
Jennifer Campbell
Daniel Brousseau
Mike Crutchlow
Janis Davies
Dan Dexel
Ken Dexel
John Dixon
George Fenn
Helen Fuchs-Trapp
Julian Goodyear
Chris Gorski
Terese Herron
Sean Hinds
Tim Janzen
Mike Johnston
Al Koudys
Ed Lewis
Andrew Leyzack
Mike Marsden

John Medendorp
Jackie Miles
Fred Oliff
Brian Power
Paul Read
Bruce Richards
Carol Robinson
Dennis St. Jacques
Laura Sandilands
Rick Sandilands
Al Shepherd
Brad Tinney
Glenn Toldi
Paola Travaglini
Ray Treciokas
Keith Weaver
Jim Weedon
Sam Weller
Arnie Welmers
Dave Willis

Private Industry etc.

James Berry
Earl Brown (**Life Member**)
Joseph Delle Fave
Ron Dreyer
Heimo Duller
Steve Grant (Atlantic)
Jan Egerdee
Peter Fox
John Halsall
Ryk Karczuga
Anthony C. Knott
Don Knudsen
George Macdonald (**Honorary Member**)
George McFarlane
Robert Marshall

Tom McCulloch (**Life Member**)
Bruce MacGowan (Atlantic)
R. Ken McMillan
J.W.L. Monaghan
Ken Paul (Atlantic)
Ken Richmond
Roger Robitaille
Ab Rogers (**Life Member**)
Mike Romanchuk
John Smart (Atlantic)
S. James Statham
Nick Stuijbergen (Atlantic)
Wm. Warrender
Dave Wells (Atlantic)

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SUSTAINING MEMBERS of CENTRAL BRANCH

Kongsberg Simrad Mesotech Ltd., 202 Brownlow Avenue, Dartmouth, NS, Canada B3B 1T5
[contact: John Gillis, Manager (East Coast) and Manager of Marketing, at (902) 468-2268]

NovAtel Inc, 1120-68 Ave N.E., Calgary, AB, Canada T2E 8S5
[contact: Art Silver, Manager Marine Products, at (403) 295-4500]

Seatex Inc., 1111 Third Avenue, Suite 2500, Seattle, WA, USA 98101-3263
[contact Karl Kieninger, Hydrographer, at (201) 295-1443]

THE GPS WEEK 1024 ROLLOVER

This was received by e-mail which said "Information supplied by Joe Gwinn, Raytheon Electronic Systems, Sudbury, Mass. (E-mail: gwinn@ed.ray.com)"

"GPS System Time will roll over at midnight 21-22 August 1999, 132 days before the Year 2000. On 22 August 1999, unless repaired, many GPS receivers will claim that it is 6 January 1980, 23 August will become 7 January, and so on. Accuracy of navigation may also be severely affected. Although it appears that GPS broadcasts do contain sufficient data to ensure that navigation need not be affected by rollover in 1999, it is not proven that the firmware in all receivers will handle the rollovers in stride; some receivers may claim wrong locations in addition to incorrect dates.

Some manufacturers have already solved the problem, but some have not.

This is how the precise rollover date is computed: The timescale origin (time zero) of GPS System Time, 00:00:00 UTC 6 January 1980, is Julian Day 2,444,244.500. A GPS Cycle is 1,024 weeks, or 7,168 days, so the first GPS rollover will occur at Julian Day $(2444244.5 + 7168) = 2,451,412.5$, which is 00:00:00 UTC 22 August 1999 AD, which is the midnight between Saturday night the 21st of August, and Sunday morning the 22nd of August, 1999 [i.e. at 19:00 EST on 21 August].

Section 3.3.4(b) (page 33) of the ICD-GPS-200 rev B (30 November 1987 issue) states that the "GPS Week" count starts at midnight 5-6 January 1980 UTC, and that the GPS Week field is modulo 1024. This means that the week count will roll over $1024/52 = 19.69$ years from then, or in $1980 + 19.7 = 1999.7$ (August 1999), only a few years from now.

In the July 1993 update of ICD-GPS-200, a note was added (also on page 33) saying that the week number *will* roll over, and that users must account for this, but no way to accomplish this is mentioned. I take this note as further evidence that there is no way to tell, given only the signal-in-space definition as of July 1993. ICD-GPS-200 is available in paper only from the USCG Navigation Center (703-313-5900).

Section 2.3.5 (pages 18-19) of the GPS SPS Signal Specification, 2nd Edition, issued on 2 June 1995, repeats the words and warnings of ICD-GPS-200. The GPS SPS Signal Specification may be obtained from the web as an Adobe Acrobat (.pdf) document, at the US Coast Guard's site at

www.navcen.uscg.mil/gps/reports/sigspec/sigspec.htm

The firmware in all affected (mostly older) receivers will have to be replaced. This will involve replacement of

PROMs; some are socketed, some are soldered. As a technical matter, the solution is quite simple. It's the logistics that will take some effort.

Without a GPS Simulator, there is no way for users to test a GPS receiver for this problem. Users are encouraged to contact their receiver manufacturer to determine if their receiver will be affected, in particular if a failure of navigation could put lives or property at risk."

Magellan Systems' Position Statement on the GPS Week Rollover

On August 22, 1999, the Global Positioning System (GPS) method of reporting time will reset to Week One which, theoretically, could affect the ability of a GPS receiver to locate and acquire the satellite signals needed to determine position, velocity and time. Magellan Corp. has engineered a software solution to this problem. When the Magellan GPS receiver detects a GPS week number lower than the current week's number plus one, it will automatically add 1,024 weeks to the GPS week, thus bringing the satellite week and the receiver week into synch. GPS Week Two (which is week 1,025 plus one in the receiver) becomes week 1,026 and so on. In this manner, Magellan GPS receivers will continue to function as if there had been no GPS week rollover at all.

GPS Week Rollover

As we near the year 2000, a great deal of attention is being paid to and warnings are being raised about the effect of this change in year numbering on computer systems. That focus also prompted questions about the change in the Global Positioning System's (GPS) method of counting time, which is based on a cycle of 1,024 weeks (and will not be affected by the change in year at the end of the century). Questions have arisen lately about the effect of the GPS week rollover which will occur in August 1999. The following describes the situation at issue and the preemptive correction Magellan Systems has taken to deal with it.

What is the GPS Week Rollover?

Rather than using a second/hour/day/month/year approach to reporting time, as we are accustomed to doing, the Global Positioning System (GPS) represents time as a numbered week and the number of seconds into that week. The GPS weeks are numbered Zero through 1,023. Week Zero of the GPS clock began in January 1980. At the completion of Week 1,023 on August 21/22, 1999, the GPS week will "rollover" and begin again with Week Zero.

THE GPS WEEK 1024 ROLLOVER

What impact will the rollover have on a GPS receiver?

The message broadcast by each GPS satellite includes the precise time (numbered week and second of the week), the position of the satellite, the health of the satellite, and orbital information about the other satellites in the system. GPS receivers use clock synchronization and time codes to determine how long it takes the signal from each satellite to reach the receiver. The time, divided by the speed of light (186,000 miles per second) equals distance. The distance of the receiver from three or four satellites is triangulated resulting in an intersection representing the position of the GPS receiver on or above the Earth.

The rollover of the GPS Week to Zero in 1999 could have the following effects:

- A GPS receiver which had been in use prior to the rollover may, on its first attempt to lock onto satellite signals after the week rollover, begin looking for satellites where they aren't, thinking that it is 1980.
- A GPS receiver may reject satellites as "unhealthy" because it believes those satellites are broadcasting incorrect time. In either instance, it is possible that the GPS receiver may not be able to calculate an accurate position or report accurate time.

The Magellan Solution:

Anticipating the GPS week rollover issue, Magellan has been inserting its own rollover correction into the software of all of its GPS receivers. This correction will allow the unit to function unaffected by week rollover for 19 years from the software production date. This is accomplished as follows:

- Every version of software for Magellan's GPS receivers has the then current GPS almanac (the complete data on the orbits and location of the GPS satellites) installed in non-volatile Read Only Memory (ROM). This almanac is anywhere from one to six weeks old, and it has a week number associated with it.
- Magellan's software assumes that the current date is always AFTER the week in the ROM almanac.
- When the week number broadcast by the satellite is less than the week in the Magellan ROM almanac, the software automatically increases the week number by 1,024 to account for the rollover. Therefore in August 1999, when the GPS week resets to Zero, any Magellan receiver in service at that time will increase the week broadcast by the satellites by

1,024, thus synchronizing the GPS week with that recognized by the receiver.

- In this manner, a Magellan GPS receiver will function through the GPS week rollover period unaffected. It will have its own rollover in 1,024 weeks from the time the software version was created, however, if the receiver is initialized at that time with the then current day, date and time, the receiver will again add 1,024 weeks and begin a new 19-year cycle.

EXAMPLE:

A Magellan GPS receiver with software released on 11/17/95 contained a ROM almanac for GPS Week 824 (week starting 10/22/95). On August 22, 1999, the Magellan receiver enters week 1,024 and the GPS week rolls over to Week Zero. By adding 1,024 to the GPS week, the Magellan receiver brings both time periods into synch at 1,024. The Magellan GPS receiver continues to function until week 1,848 (824 PLUS 1,024) which is the calendar date of May 31, 2015. The software has been designed such that if the user merely enters in the current date and time, the receiver will recycle and begin another 1,024 weeks.

We are glad to share our Ad-spot this month with James Detar of HydroSERVICE. James tells us that their slogan at HydroSERVICE is:

Solutions for the Digital Hydrographic Office, from the management of source data to the delivery of navigation-ready products.

And their Mission:

To assist National Hydrographic Offices, in the generation, maintenance and distribution of high quality Electronic Navigation Charts (ENCs), in order to improve the safety of nautical navigation and promote protection of the greater marine environment...



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