U.S.-Canada Hydrographic Commission-42nd Meeting
Meeting Minutes
Biloxi, Mississippi, USA
March 18, 2019
(Version posted 13 Feb 2020)

Opening of the USCHC

The 42nd meeting of the U.S.-Canada Hydrographic Commission was held in Biloxi, Mississippi USA on March 18, 2019. The meeting was chaired by Rear Admiral Shepard M. Smith of NOAA Office of Coast Survey with Dr. Geneviève Béchard of the Canada Hydrographic Service serving as co-chair.[1] With meeting quorum having been met (see Participants List USCHC42-1), the chair and vice chair noted the one day agenda was very full and highlighted that US and CA common borders meant the two countries shared many common stakeholders. The USCHC was a valuable venue to learn from each other and keep progressing the field and practice of hydrography. The Secretary-General of the IHO (SG), Dr. Mathias Jonas, observed as a long standing regional hydrographic commission, the U.S. and CA were preeminent supporters of the IHO especially in technology development and its application in hydrographic practice. John Lowell relayed the quote he had heard from the EAHC that offered a valuable perspective at the start of the meeting: "Alone you can go fast; together you can go far." Admiral John Okon of the US Navy, noted this was a significant time of change and partnerships such as represented at the USCHC are critical.

National Reports

CA and US National Reports (see: USCHC42-3A and USCHC42-3B)
Highlights of the Reports and discussions include:

- Canada's Ocean Protection Plan (OPP) is in Year 3;
- CA has received support to accelerate surveying in upcoming years;
- There is a big push on data acquisition;
- Notable progress has been made on production of new edition ENCs recently and this is expected to continue in the upcoming couple years;
- SDB data is being applied to NOAA nautical charts;
- CHS Policy for SDB will be promulgated once completed;
- DND production of Additional Military Layers in its products;
- New Navy vessels coming on line in 2019, embarked with MBES and Hydrographers;
- Suspension of SNC (Standard Nautical Charts) during refinement of 2.0;
- Use of multidisciplinary work roles at CHS among staff;
- ⅓ staff have been in CHS less than 6 years;
- RDML Smith noted interest in how data provision policy changes people's work description. Large countries and large hydrographic offices need to be flexible. Staff with skills in data management and ongoing training will be an ongoing topic of interest. A good portion of NONNA-100 data from CA has been released to the public and DCDB as of 2 weeks ago;

[1] See Statutes of the United States Canada Hydrographic Commission (April 27, 2017)

- CA and US should offer short PPT next year at the USCHC on how agencies are revamping their approach to personnel skill development and career support (see Action below).
- CA is suspending paper chart production in 2019 and has cancelled INT Charts;
- On September 18, a workshop on remote sensing and remote sensing for hydrography will be hosted in CA;
- In CA, a lawsuit against CHS as a result of a grounding in the Arctic, has been dropped/case dismissed as CHS was found to be ISO compliant in its management practices. This decision was helped because of good documentation of practices by CHS;
- NOAA policy on data application to charts is "to use the best available data" and to preserve flexibility and ensure decisions are "defensible." Office of Coast Survey charting processes are fully documented, and the validation/distribution processes are ISO certified through IC-ENC.
- A new NOAA Office of Coast Survey Strategic Plan has been developed for the 2020-2024 period;[2]
- NOAA plans to conduct its chart adequacy workshop "on the road" (ie to be hosted in venues other than NOAA headquarters in Silver Spring, MD USA) in the future;
- In terms of data dissemination, interest was expressed in the handling of data from different agencies and associated dissemination plans and time-lines;
- Development of a new Great lakes datum in both US and CA waters is important. The USCHC needs to come back to this and maintain attention on collaboration in this area; and
- CA expressed desire to follow up with NOAA's plans in the St. Lawrence seaway, especially regarding implications for precision navigation and autonomous shipping.

IHO Report (see: USCHC4203C)

SG provided the USCHC an update on all IHO Work Programme items, namely

1. Corporate Affairs
2. Hydrographic Standards and Services
3. Inter Regional Coordination and Support

He reported on IHO Secretariats improvements in operational support through GIS services and digitization of Circular Letters responses, conference registration, new website, social media and alike. He special emphasis on the uptake of the Seabed 2030 project and the interrelation to the scope and operations of the DCDB as maintained by NOAA on behalf of the IHO.

As of the date of the USCHC, some member states had already begun responding favorably to the CSB initiative.

The SG indicated UN-GGIM as an important process and its support by the open data policies of the USA. He emphasized the high regard and value for the science community for the US policy.

[2] See https://www.nauticalcharts.noaa.gov/hsrp/new-orleans-2019/ocs-strategic-plan-draft-v4.pdf

The Nippon Foundation-GEBCO Seabed 2030 Project (SB 2030) continues to mature its processes for planning and coordination. The IOC and IHO meetings are leading to better relationships with the donor community. This is illustrated recently by i) the Fugro partnership, ii) funding from the Nippon Foundation, iii) developments with GEBCO, iv) development of edition 2 of IHO document B-12 ("Guidance on Crowdsourced Bathymetry"), v) the elaboration of the role of "the crowd" in bathymetric data collection, and others. The goal of SB 2030 is to continue expanding the global holdings of IHO's Data Center for Digital Bathymetry (DCDB) with as much available hydrographic data as possible.

The SG called for regional testbeds for S-100 products, noting the intent of such for Malacca Straits with Indonesia. It is seen as necessity for regular production of data sets to be made otherwise industry will not follow with provision of new capabilities. Hydrographic Offices must lead the provision of public data.

The quality of data is an important factor to consider. And, the data is not just for ENCs but for all services envisioned, including in the case of "machines talking with machines." Data quality must be understood as a compelling condition to be met by all existing 17,000 ENCs worldwide.

The IHO statistics noted 3 ENC overlaps in USCHC region.

The SG briefed on Iridium as a new MSI provider and called on the USCHC for action (see slides 22 and 23 of USCHC42-2019 3C). John Lowell noted the big value of Iridium is in the Arctic and Antarctic as IMARSAT does not cover these areas. New vessels should look into Iridium if they are going to be active in the poles.

The SG expressed appreciation for the remote secondment to the IHO by NOAA of Kristen Crossett to the IHO for assistance with public outreach, web design, and social media. This experience has been a very good example of valuable in kind contributions that can be made by member states to the IHO.

A new IHO website will be launched for World Hydrography Day 2019.

For the upcoming IHO Assembly-2 meeting (April 2020), IHO might consider submission to UN General Assembly of a paper on how IHO can contribute to UN Strategic Development Goals. Doing so would indicate expansion of the scope of the work of the IHO beyond navigation.

In discussions, it was noted, given the anticipated realization of the S-100 hydrographic model, there should be attention placed on the large scale IMO MASS (Maritime Autonomous Surface Ships) initiative of future hydrographic products going forward. Is this on the HSSC agenda? CA noted CHS has lead for UN Decade of Oceans for CA.

SG shared his view that the IMO mechanism is not well tailored to lead the development new technologies, techniques, and products. But, the demand for technology is strong. In this, new technologies and service provision models are nevertheless developing outside the ECDIS

framework. For example, the transition from S-57 to S-101 based ENCs is occurring and creating new needs. It was noted that Japan will have a complete suite of S-101 ENCs by 2022. And, the Republic of Korea has indicated the entire region will be serviced by S-101 ENCs in 2024/25. The IHO community should develop a common phase in plan on S-101.

Actions from the morning discussions

Action 42-01: Take note of the anticipated rearrangements as discussed above and prepare information for affected shipping industry.

Action 42-02: US and CA to exchange information on staff career development in a new era of hydrography and cartography (data manipulation and presentation skills, job position flexibility, hiring, training and career development).

Action 42-03: CHS and NOAA to follow-up on the issue of coordination in the new Great Lakes Datum.

Action 42-04: USCHC chair to respond to proposed updates on IHO Resolution on RHCs.

Hydrographic Geospatial Products and Services Committee (HGPSC) (formerly Chart Advisory Committee)

CA plans for the future charts only supports 3 usage bands. The US is planning for 5 bands. NOAA system is based on a binary scale which is what web mapping looks like and ties to MSDI applications as well. Radio band scales is yet another approach approved by HOs for usage bands of charts. US Great Lakes new schemed ENCs are expected to be publically available in 6-9 months. New US charts will be metric.

Action 42-05: Within the context of the national gridded schemas and the future implications for S-100 products and services, HGPSC to investigate and, using a common methodology, propose a resolution to ENC overlaps.

Action 42-06: Consider how the application of new ENC approaches in the Great Lakes and other S10# products and services come together.

Action 42-07: Introduce these plans to S101 project team to help project team look at scale options and implications for the future.

Action 42-08: Include a US-CA paper and powerpoint to Al Armstrong (USA) for his work as chair of the S-101 Working Group.

Paper Chart 2.0

CA presented an update on its vision of the paper chart.

NCWG has an action to review the future of the paper chart for which CA's Paper Chart 2.0 is highly relevant. CHS throughput capacity must triple capacity to deal with all the data and

maintenance of charts. CHS has acquired additional ESRI licenses to assist with the new transition.

The CA presentation underscores the importance, value, and principle of "ENC First." It illustrates the promise of a best approach considering chart maintenance, data centric models, and the need for product specifications- all of which should result in improved maritime safety. The CA Paper Chart 2.0 also offers a good approach to having mandated "back up" charts aboard required vessels.

Member states should evaluate the CA approach to Paper Chart 2.0 and the implications to IHO Publication S-4 ("Regulations for International (INT) Charts and Chart Specifications of the IHO.") NCWG and HSSC should be studying and evaluating the CA paper on making paper charts from ENCs. US should review the CA paper and reach out to France, Korea, and UK to share perspectives. Some implications of this effort could include freezing on S-4 and NCWG going dormant.

Consideration should be given to the steps to realize the operationalization for Paper Chart 2.0 as presented.

US expressed appreciation to CA for leadership.

Action 42-09: Both nations to engage with the NCWG future of the paper chart effort. CA to articulate the difference, if any, between various approaches, including how the CA Paper Chart 2.0 model offers promise to the hydrographic community. The articulation should be tied to "use case scenarios."

<u>WENS</u>

Right now, the HO community has no coordination about future development of S10X services. To address that, the U.S. introduced the WENS concept for discussion, noting WENS

- promises to enhance cooperation and avoid duplication;
- includes non navigation aspects- borders not that relevant; and
- offers best experience for the user.

Decision: The USCHC stated its position on WENS as "Noting the USCHC supports adoption of WENS principles, US and CA will look forward to implementation of these when finalized."[3]

Participants offered the following observations and points in discussion:

- S-100 data distribution should be at a constant frequency and at appropriate scales to feed user needs.
- An S-111 (Surface Currents) operational timeline has been developed although it is notional and has not been vetted;

[3] After the meeting, the observation was made that since the principles are still in discussion, attention might be more appropriately placed on the development of the principles as opposed to the implementation per se at this point.

- S-102 (Bathymetric Service) is anticipated this year;
- Where should data be stored? S-100 cloud distribution could leverage Amazon cloud; multiplatform; and/or combine S-102 (Bathymetric Surface) and other S-100s. A demo of the S-100 cloud distribution with PRIMAR project is planned for Vancouver, St Lawrence and a third location. Caris is a closed system but consider a new cloud based Caris system (Cloud.caris.com);
- PRIMAR and others would add value and get data from CARIS cloud;
- CHS will be using the meteorological service for provision of services to the port of Vancouver 4 times a day. US and CA need to follow-up on S-104 (Water Level Information for Surface Navigation) and S-111 (Surface Currents) work;
- CHS is doing a pilot on S-121 (Maritime Limits and Boundaries) implementation with Australia;
- S-100 services require considerable technical infrastructure. Looking globally, there are not many places where this is feasible and may cause consternation among some member states. There should be a balance between the "global view" and the "local view;" and
- There will be a series of oceanographic conferences in Halifax in 2019 (GODAE 2019; Ocean Predict 2019).

Schedule A: Survey in 2018

CA completed a hydrographic survey in the St. Lawrence seaway for which the USCHC Schedule A template was used to record and agree to the details for a survey effort conducted by one country that potentially spanned the waters and/or coastline of the other. CA confirmed the survey was successful and the data is available to NOAA at NOAA request.

Action 42-10: CHS and NGS will explore appropriateness of the Schedule A vehicle and propose an update Schedule A, if required. CA and US to review and vet with other partners who may have an interest.

The co-chairs noted the Schedule A template and approach was a good case study facilitating timely cooperation.

Ocean Protection Plan

1.5 billion Canadian dollars have been allocated and planned to support Canada's Ocean Protection Plan (OPP) which has been a major boost to the survey and tides program. The CA presentation noted navigation corridors, surveying priorities, and needs for partnerships with contractors.

Over the course of the OPP, CHS plans to fly near Boundary Bank which may involve US airspace.

Action 42-11: Monitor OPP plans, including cases where the Schedule A may facilitate efforts, such as Boundary Bank.

Unmanned Vehicles

As countries move to autonomous shipping, questions will need to be addressed such as which agency(ies) lead development of regulations and how hydrographic offices (HOs) engage. The US noted a preference for a clear and permissive framework.

The US Navy briefed on contract solicitations and in house capacity development for unmanned vehicle operations. Requirements and nature of work all point to web based solution (ESRI).

Staffing and personnel implications should be studied in contracts involving unmanned vehicles. Experience indicates no fewer staff are needed in autonomous vs. remote control. Important lessons learned are being assembled which call for new ways of thinking about personnel.

Personnel exchange

CA identified 3 experts to join US survey activities in 2019.

The US suggested the USCHC could encourage such exchanges in those areas where we are looking at organizational transformation to learn and bring back new ideas. For example NOAA National Centers for Environmental Information (NCEI) may be one promising exchange partner. NOAA has exchanged personnel with the UK and there is interest with Korea to look at operationalizing S-100.

The US Navy expressed interest in personnel exchanges and requested additional information as to interests, opportunities, and requirements. For example, what kind of folks and skill sets are sought? What kinds of data expertise or foci is prioritized? What hydrographic or other competencies would be needed?

CHS noted it is putting a Quality Management System (QMS) process into place for career development which identifies interested staff, interest areas, and assignment opportunities, etc… This internal CHS document is produced every December.

Canadian Hydrographic Service Non-Navigational (NONNA-100) Bathymetric Data

CA presented and lead discussion of the NONNA project and products in response to US presentation on US status going into SB2030. NONNA, through open.canada.ca/data, represents a significant contribution to SB2030. A next step for CHS NONNA-10 efforts would be to create a 10 meter resolution of the data using a grid approach.

Participants discussed how NONNA-100 would become part of GEBCO- this was, as yet, unclear and participants agreed to continue to work with the IHO DCDB and GEBCO to clarify a path. Participants agreed to confirm with GEBCO and DCDB that NONNA-100 data had been incorporated into the IHO DCDB and the GEBCO process.

Action 42-12: US and CA to report the status of the follow-up described in the above paragraph at USCHC-43, specifically the incorporation of NONNA-100 data into the IHO DCDB and GEBCO Process and lessons learned (if any)

GEBCO and Seabed 2030

The U.S. provided its gap analysis and statistics for answering the question "how much of the US waters are mapped?" using the definition that "1 sounding in 100 m grid is considered mapped for that grid." Soundings also must no earlier than 1960. (GEBCO does not limit the date of sounding).The US is not doing a DTM like Canada. Soundings in Great Lakes are LDW. The involvement of the RDACCs[4] in the SB2030 structure within the overall SB 2030 initiative is important to ensure a consistent global understanding of the "gap."

Querying the data and generating statistics requires a common approach and methodology. The methodology for generating statistics and counting should be consistent and stable.

Participants noted a desire see a USCHC region statistical characterization from GEBCO. Can the gap analysis presented for US waters be expanded to the USCHC region? And, the relationship of the USCHC should be clarified vis-à-vis the SB 2030 RDACCs. For example, the role of the RDACCs to the Regional Hydrographic Commissions in terms of generating statistical analyses and other SB 2030 reporting services should be well understood.

Action 42-13: CHS would like to collaborate and talk about extending presented US gap analysis methodology to the US-CA region.[5]

Action 42-14: US to assess level of effort to extend the gap analysis to CA including in regards to NONNA100 for USCHC

GGIM

Participants noted the important developments in the GGIM initiative. At present there is no need for decision or action on the part of the hydrographic offices. The nations (CA and US) are already actively engaged.

Action 42-15: Solicit an acknowledgement note from GEBCO about how and where NONNA 100 will be reflected in the new GEBCO chart.

Over the next 2 years, the US will be chair a multilateral effort in support of the "Galway Statement on Atlantic Ocean Cooperation" which sets collaborative transatlantic survey priorities.

CSBWG

Doug Brunt briefed on the CSBWG. The WG has broad attendance and strong interest for participation. A question raised in discussion concerned how hydrographic offices, member states or other data contributors would be routinely informed of their contributions to the CSB collection efforts?

[4] Regional Data Assembly and Coordination Centers

[5] The region corresponding to the USCHC as presented (https://iho.int/en/rhcs) includes waters addressed by the North Pacific Arctic Ocean RDACC and the Atlantic and Indian Ocean RDACC.

IHO Work Program

Participants discussed the IHO Work Program for 2019 to be approved at the IRCC meeting and subsequently proposed to the IHO Council meeting. Four priority key deliverables for the USCHC for 2019 to the work program include: 1) Seabed 2030, 2) WENS, 3) S-100 services Delivery, and 4) Next steps for CSB.

Dave Prince and Doug Brunt will lead representation of the USCHC to IRCC.

Action 42-16: CA to review proposed changes to the IHO Resolution on disasters and incorporate into the USCHC Report to IRCC, and if timely, inform drafting team leads Australia and Japan in advance of IRCC.

Action 42-17: US to evaluate if it will be part of the CA Chart 2 and S100 distribution?

Action 42-18: See if SWHPC provided feedback back to Japan and Australia regarding revisions to the IHO Resolution 1/2005 on natural disasters.

Action 42-19: CA to circulate and draft USCHC report to IRCC and include topics of interest to the work program.

Other

The USCHC nominated Denis Hains to represent USCHC on the International Hydrographic Review (IHR) editorial board.

Mr. Calvin Martin will continue as USCHC representative to the CBSC.

Action 42-20: The USCHC approved and the US to submit to USCHC background summary. (See USCHC42-12A)

Next Meeting and Conclusion

Chairs reflected on the great cooperation across boarders and that a high percentage of people in the meeting room attending USCHC-42 who are directly involved in IHO work. The USCHC is making important contributions to the advancement of hydrographic sciences, technologies and services.

With the closure of the USCHC-42, CHS assumes chair, secretariat and hosting for USCHC-43 which will be held in Quebec City, February 24, 2020.