

45th Meeting of the
US - Canada
Hydrographic Commission



National Report by Canada

Executive Summary

This report to USCHC45 provides a summary of Canadian activities and points of interest since the previous USCHC meeting which was held in March 2021.

1. Hydrographic Office

1.1 As of November 15th, 2021, Annie Biron took over the role of acting Regional Director of CHS Quebec Region. The Department of National Defence (DND) enhanced its liaison with Canadian Hydrographic Service (CHS) with the deployment of Senior Staff Officer (Navigation) LCdr Kray Robichaud of the Royal Canadian Navy (RCN) as Geospatial Intelligence (GEOINT) Maritime Desk Officer.

1.2 After five years of funding from the Ocean Protection Plan, the Canadian Hydrographic Service has seen an improvement in navigation products and services for mariners in important coastal areas, including the Arctic and high traffic commercial ports and waterways. The CHS completed modern multi-beam hydrographic surveys for 23 high-priority commercial ports in British Columbia (13), Quebec (7), and the Atlantic provinces (3), and analyzed and incorporated the data collected in the release of 49 new or updated Electronic Navigation Charts (ENCs). In high-risk near-shore areas on the coasts of British Columbia, Newfoundland and Labrador, the Gulf of St. Lawrence and the Great Lakes, the CHS has completed a 4 year bathymetric data acquisition campaign using technologies such as air-borne LIDAR (Light Detection and Ranging) and modern multi-beam sonar surveys.

A total of 98 tide gauges have been refurbished, that make up the CHS' Permanent Water Level Network. Dynamic hydrographic products and services have been developed which can enable e-navigation for 6 ports and waterways: Kitimat, Vancouver, Fraser River, Straits of Canso, St. John's, the St. Lawrence River Quebec-Montreal Corridor. There has also been the acquisition and analysis of hundreds of space-based earth observation satellite images to improve coast-line delineation for CHS products.

1.3 In March 2020, the Canadian Hydrographic Service underwent significant changes in its daily operations in response to the COVID-19 challenge. This continued throughout the past year, as the CHS continued to maintain the majority of its workforce working from home. As of spring 2022, the

CHS has transitioned towards a gradual return to the workplace with the intent of establishing a hybrid model.

1.4 The Canadian Hydrographic Service has continued its efforts towards bringing about positive changes in its workforce and culture. In March, all CHS employees took part in Bystander Intervention Training. This training emphasized empowering employees to be the first line of defence against harassment/bullying and violence.

2. Surveys

2.1 A total of 31,398 km² of bathymetric coverage (exclusive of Trusted and Crowd Source platforms) was collected during the 2021 Arctic season.

2.2 CHS acquired an additional 2,250km² bathymetric data coverage via contract which included the deployment of USVs.

2.3 Over the past 5 years of OPP:

- Increase of approx. 4% of modern and adequate bathymetric coverage within Canada's Arctic NORDREG Area over the course of OPP.

- ~15.8% of the navigable waterways within Arctic's NORDREG area surveyed to modern or adequate standards (CATZOC A1, A2 and B).

- ~42% of the Proposed Primary and Secondary Low Impact Shipping Corridors surveyed to same standard, key aspect of CHS strategy to focus survey and charting efforts in the Canadian Arctic.

- Estimate of the km² increase over the 5 years = ~147,000 km² (*This is a complete estimate and includes data from other sources and legacy data loaded.)

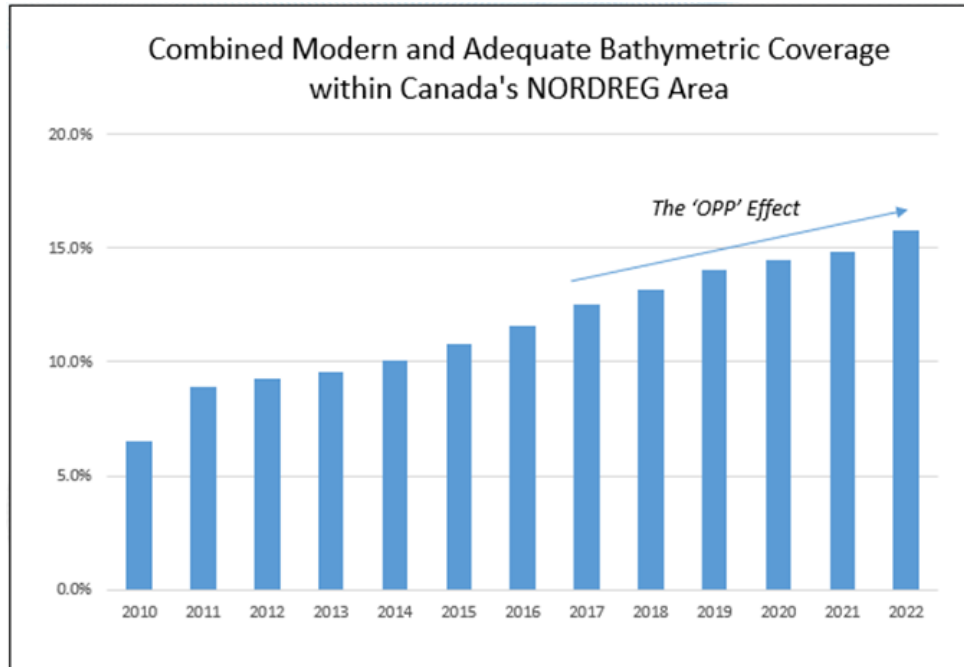


Figure 1 – Combined Modern and Adequate Bathymetric coverage within Canada’s NORDREG Area.

2.4 The CHS has been moving towards making the survey and charting plan public. The CHS has developed an online tracking application entitled *the CHS Operational Plan (CHS-OP) application*. The public will soon be able to track the status of the CHS’s updates from planning to dissemination of navigational products to keep better informed.

2.5 The following is a CHS Survey plan showcasing a national two year plan (2021 – 2022). There are currently 69 planned surveys (however, this number is subject to change).



Fig 2 – CHS 2021-2022 Survey Plan

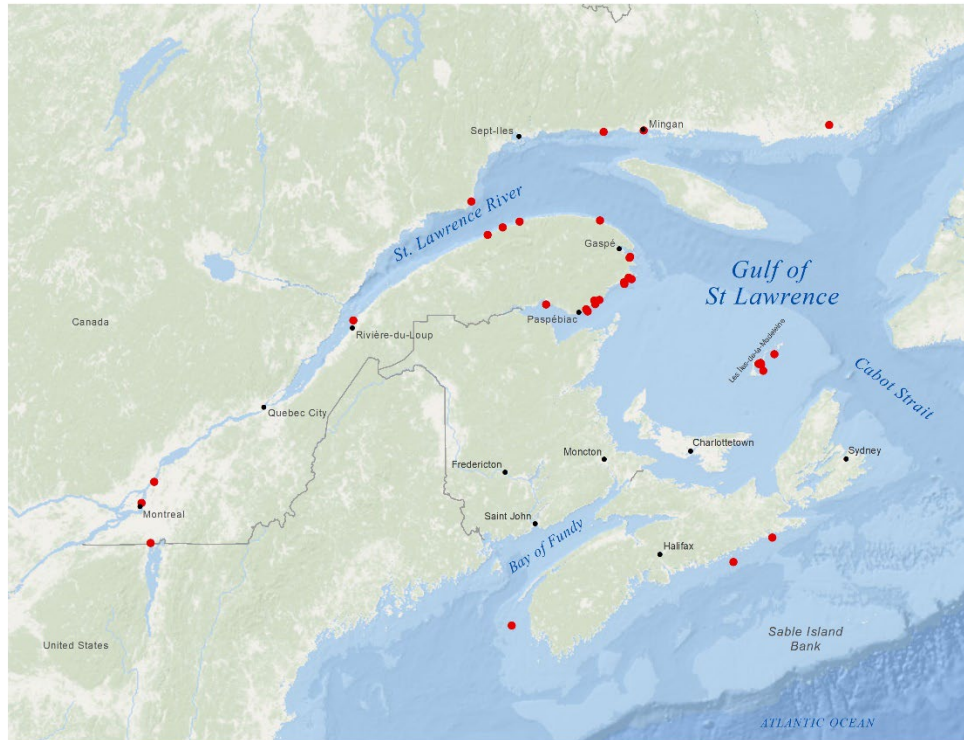


Fig. 2 - 2021 – 2022 Survey Plan Eastern Canada (point location)



Fig. 3 - 2021 – 2022 Survey Plan Great Lakes (point location)

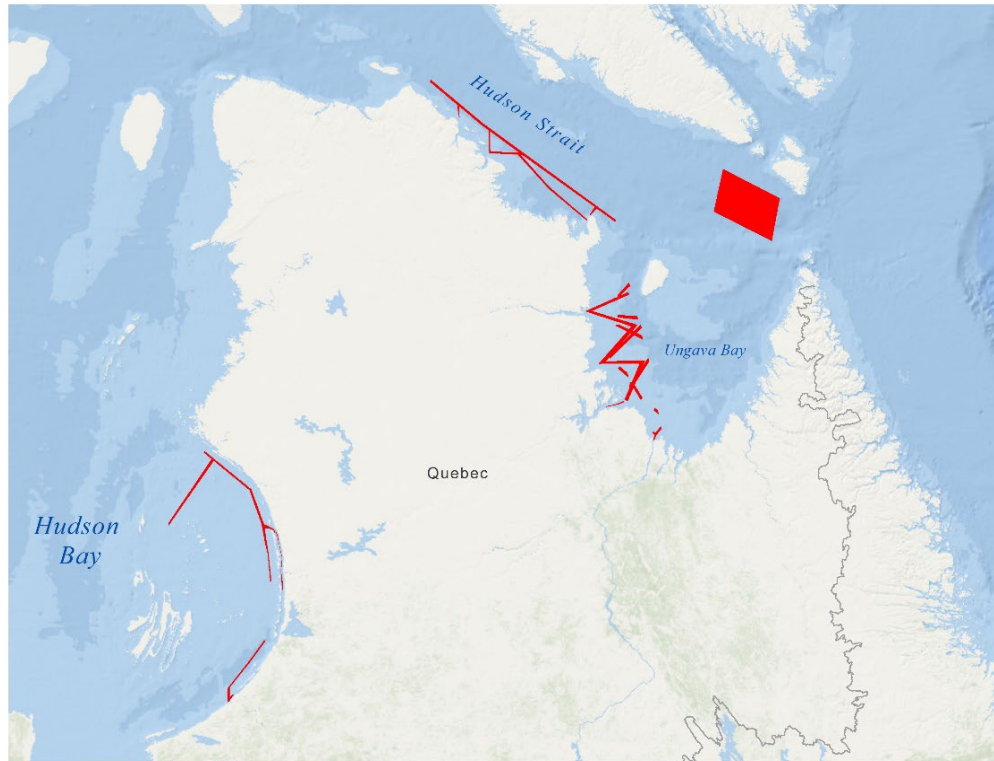


Fig. 4 - 2021 – 2022 Survey Plan Hudson Bay, Hudson Strait and Ungava Bay. (polygon form)

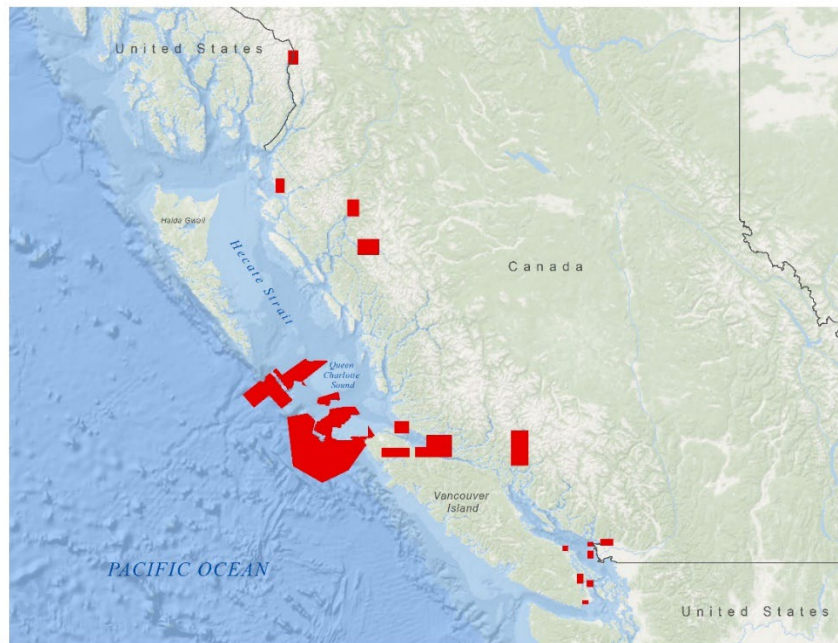


Fig. 5 - 2021 – 2022 Survey Plan Pacific (polygon form)

3. New charts and updates

3.1 Between March 1, 2021 and May 1st 2022, the CHS released 121 new ENC's, 6 new paper charts, and 43 patches. There were also 837 navigational warnings (NAVWARNS)

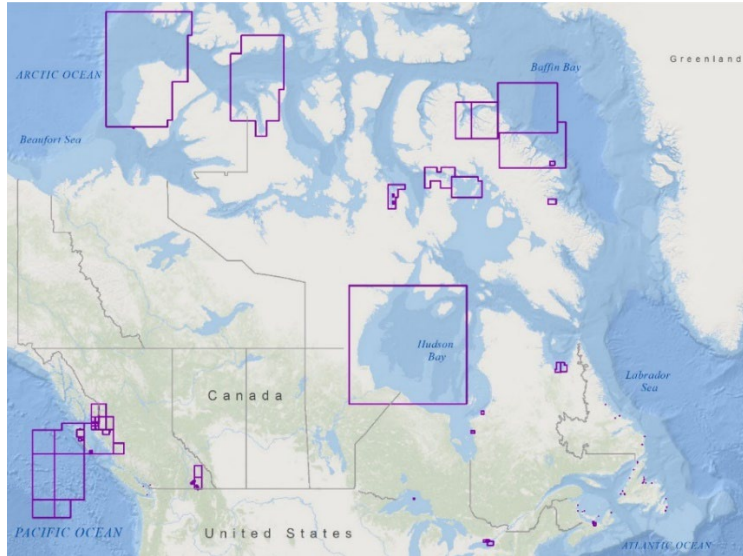


Fig. 6 – ENC's produced March 1st 2021 to May 1st 2022

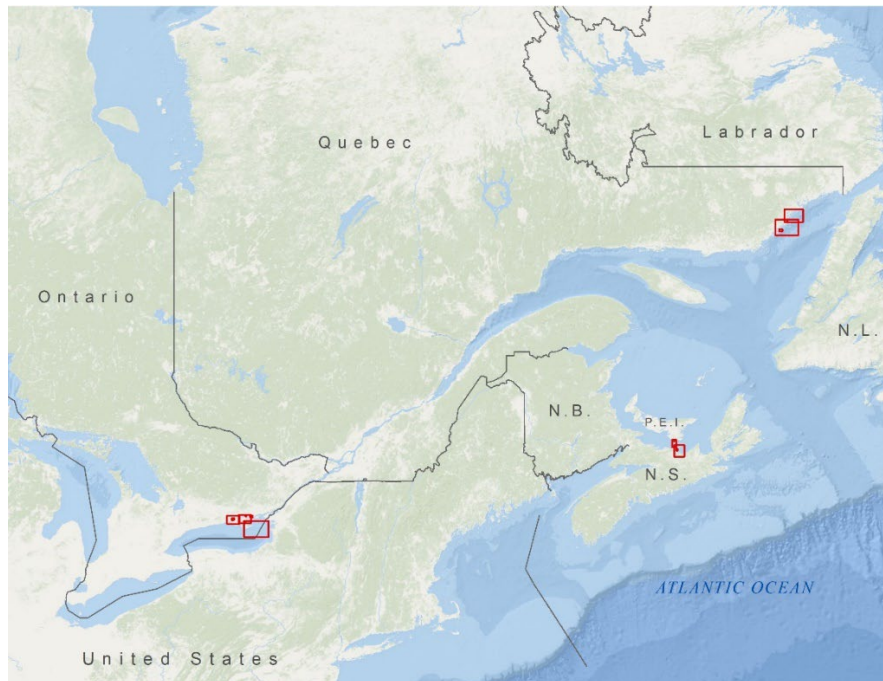


Fig 7 - Paper Charts produced March 1st 2021 to May 15, 2022.

3.2 The following showcases the CHS's national Paper Chart two year plan (2022 – 2023). There are currently 43 new editions of charts planned (however, this number is subject to change).

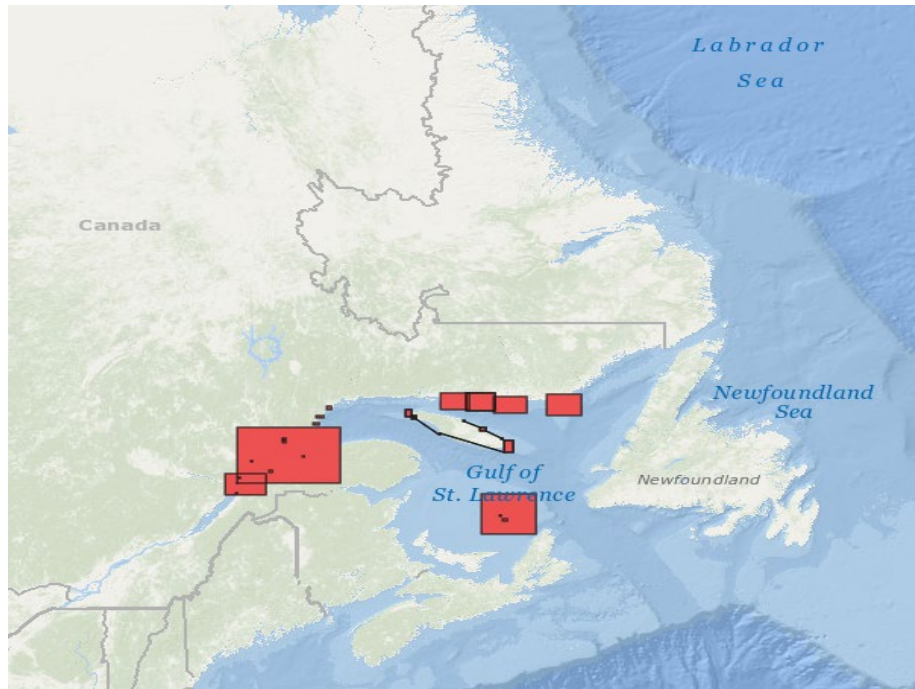


Fig. 8 - 2021-2022 Chart Plan Canada East



Fig. 9 - 2021-2022 Chart Plan Canada West

3.3 There are currently 39 new editions of ENC's planned for 2022-2023 (however, this number is subject to change).

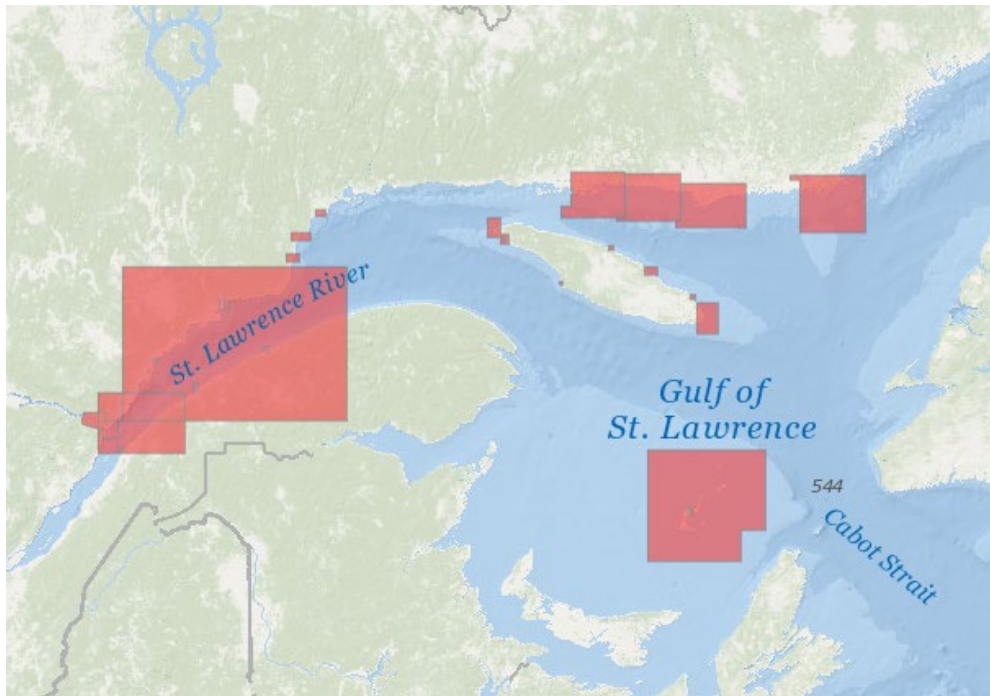


Fig. 23 - 2022-2023 Eastern Canada ENC Plan

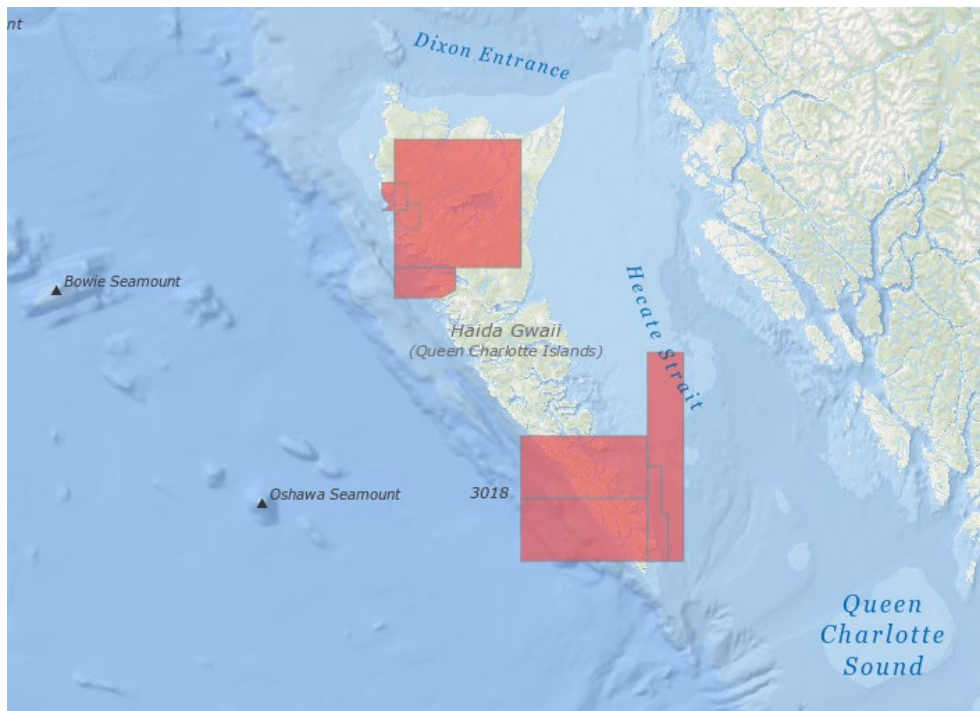


Fig. 23 - 2022-2023 Western Canada ENC Plan

3.4 The S-100 next generation of dynamic geospatial navigation services is currently underway. It is transitioning from a static product to a dynamic subscription based service. In partnership with Teledyne CARIS, CHS is moving its products and services towards leveraging cloud services and infrastructure. CARIS cloud technology provides highly automated workflows that reduce the survey-to-bridge timeline. It is foundational technology for e-Navigation and autonomous shipping and positions Hydrographic Offices as leaders in the Blue Economy.

4.0 New publications, updates, and other developments

5. Maritime Safety Information (MSI).

5.1 Information on marine communications and traffic services (MCTS) in Canada is available at:

<http://www.ccg-gcc.gc.ca/Marine-Communications/Home>

5.2 Canadian Coast Guard (CCG) continues to operate the Navigational Warnings (NAVWARNs) web site and subscription service which replaced the domestic Notice to Shipping (NOTSHIP) services. For further information visit:

<http://nis.ccg-gcc.gc.ca/>

6. C-55 for INT Region - N; Country – Canada –Arctic Region

6.1 Canada is in the process of updating its C-55 information, including MSI.

7. Capacity Building

7.1 After multiple pilot projects, CHS is embarking on a funded initiative to support community hydrography and crowd-sources bathymetry collection. This work includes staffed positions, workshop(s) to discuss successes, challenges and way ahead, the development of a CHS policy on the use of community data, with the ultimate goal of having data collected and controlled by the community. For more information see the document [USCHC45-18A Community Hydrography and CSB](#).

7.2 Canada continues to support Women in Hydrography (WIH) activities, including funding for the IHO Empowering Women in Hydrography project, and the sponsoring of a WIH sessions at the 2022 Canadian Hydrographic Conference (CHC2022).

8. Other activities and points of interest

8.1 Over the last 3 years, automatic compilation tools have been developed and automatic contour generation tools have been enhanced in CARISBE. A pilot project to establish new processes with these tools have been carried out over the last two years and the release of the first chart using these tools 1221 – CA379028 has been recently released.

8.2 CHS has upgraded its provision of water level data and launched a new [integrated water level system](#). The utility of the system is enhanced by a companion mobile application and by the access to updated REST API services.

8.3 CHS's Remote Sensing Centre of Expertise (RSCoE) continues to fulfill requests to complement the updating of nautical products. The most common requests are related to shoreline extraction and Satellite

Derived Bathymetry. Other requests were for mission planning, evaluation of rate of change and water clarity analysis.

8.4 CHS hosted an international workshop the Hydrographer of the Future (HOTF). It had over 80 participants from more than 25 countries and organizations. A final report on the workshop will be distributed.

8.5 There are several elements of CHS's transformation process that are on-going.

- CHS has begun the elimination of provision of raster navigational charts in all areas where ENCs are available. One-third of these RNCs have been cancelled and an additional third will be cancelled in 2022.
- A new business model for print-on-demand is being developed and process of establishing a standing offer to outsource all chart printing is under way. The chart dealer agreement mechanism is being reviewed with the goal of streamlining the chart dealer network.
- CHS nautical publications (Tide and Current Tables, Sailing Directions, Paper Chart Catalogues, Chart 1, and Atlas of Tidal Currents) are moving to a digital-only state, which will be continuously maintained. Plans are also underway to modernize the Sailing Directions publication in concert with preparations for S-126.

8.6 In the area of S-100, CHS now has active S-102 coverage in select areas and active S-111 coverage for all CA waters. S-104 coverage in selected areas is expected in the coming months. Industry engagement has been encouraging with companies like SeaIQ, NAVSIM, Trelleborg, Rosepoint, and OSI ECPINS testing and using S-100 Services.

8.7 CHS and DND are members of the Canadian S-100 Committee which is an interagency, government of Canada group that is coordinating and collaborating on the implementation of S-100 in Canada.

9. Conclusions

9.1 COVID continued to impact field operations and the effectiveness of committee and working group activities, however, government-wide back-to-work plans are being implemented.

9.2 CA agencies continue to work towards creating a more diverse, inclusive, safe, and respectful work place.

9.3 CA recognizes that the full implementation of S-100 is a complex process which requires cooperation and collaboration between government agencies, regional hydrographic offices, industry partners, and the IHO. CA will continue working domestically and internationally to deliver a seamless end user experience for finding and accessing hydrographic data and services.

9.4 CHS's transformation continues to better position itself as a modern, effective, and efficient hydrographic office.