

**5th meeting of the Arctic Regional Hydrographic Commission
October 28-30, 2015 St. Petersburg, Russia**

National Report of Canada

Prepared by the Canadian Hydrographic Service



This report addresses the Arctic-related activities of the Canadian Hydrographic Service since last regular ARHC meeting.

1. Organizational Updates.

Mr Denis Hains was appointed to the dual role of Director General of the Canadian Hydrographic Service (CHS) and the Hydrographer General of Canada in March 2014.

The Canadian Hydrographic Service is a branch of the Ecosystems and Oceans Science Sector of Fisheries and Oceans Canada, with offices in Ottawa; Sidney, British Columbia; Burlington, Ontario; Mont-Joli, Quebec; Dartmouth, Nova Scotia; and St. John's, Newfoundland and Labrador.

National coordination is expected to be achieved through a governance structure, with Director General as the functional head of the organization, an Executive Committee consisting of the directors managing each of offices and key functions, and a suite of national committees and working groups. CHS had been using the Canadian Coast Guard (CCG) vessels as its primary platform for hydrographic surveys, but it continues to expand its survey coverage through use of vessels-of-opportunity, partnerships and AUV, aerial and satellite platforms to enhance data collection coverage and test new approaches.

In September 2015 the Oceanographic Services Branch of CHS was moved from CHS to the Ecosystem Sciences Directorate, but remains in the same Sector.

2. Surveys

During the past two survey seasons since ARHC4, the CHS has continued its work on non-dedicated CCG vessels to collect data in priority areas or on an opportunity basis. In addition, CHS continues to expand its collaboration with and other federal departments including the Royal Canadian Navy, academia, and the private sector to support hydrography when chart quality information may be obtained. Further to the areas surveyed per the above graphics, multibeam track data is also obtained annually from CCGS Amundsen for all locations she transits through the Canadian Arctic.

Figure 1. CHS 2014 Hydrographic Surveys in the Arctic.

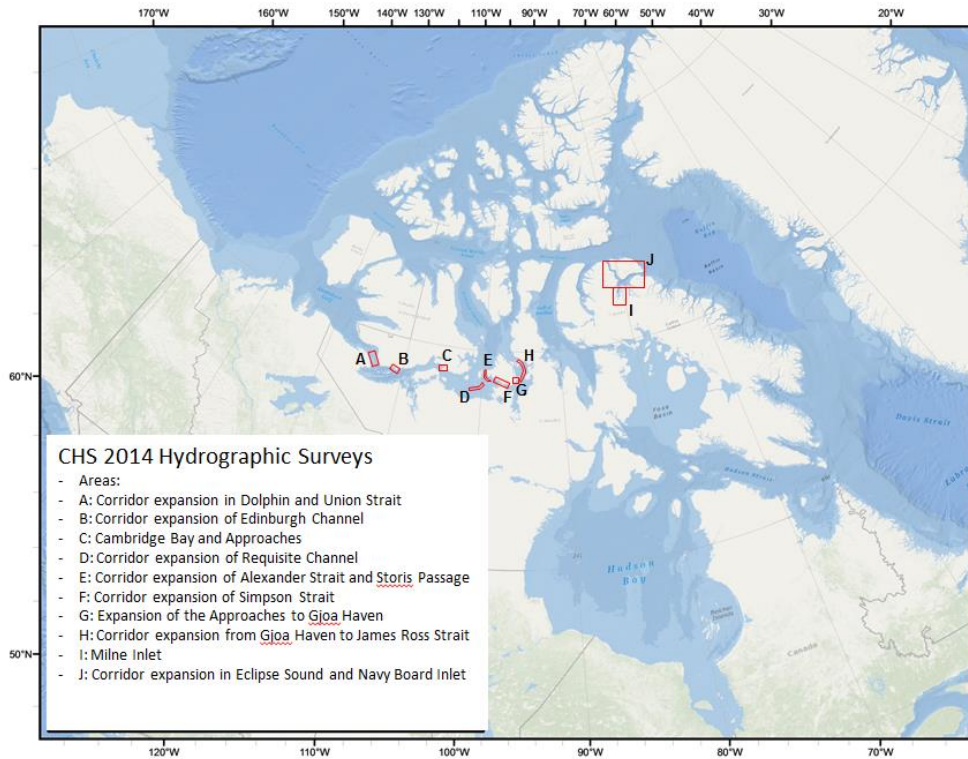
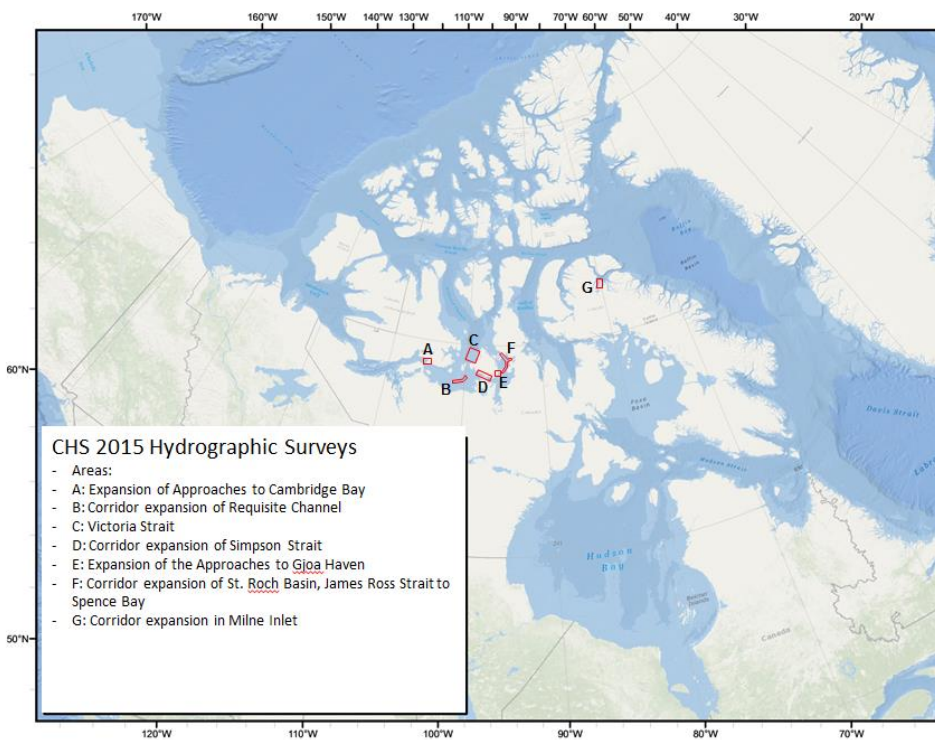


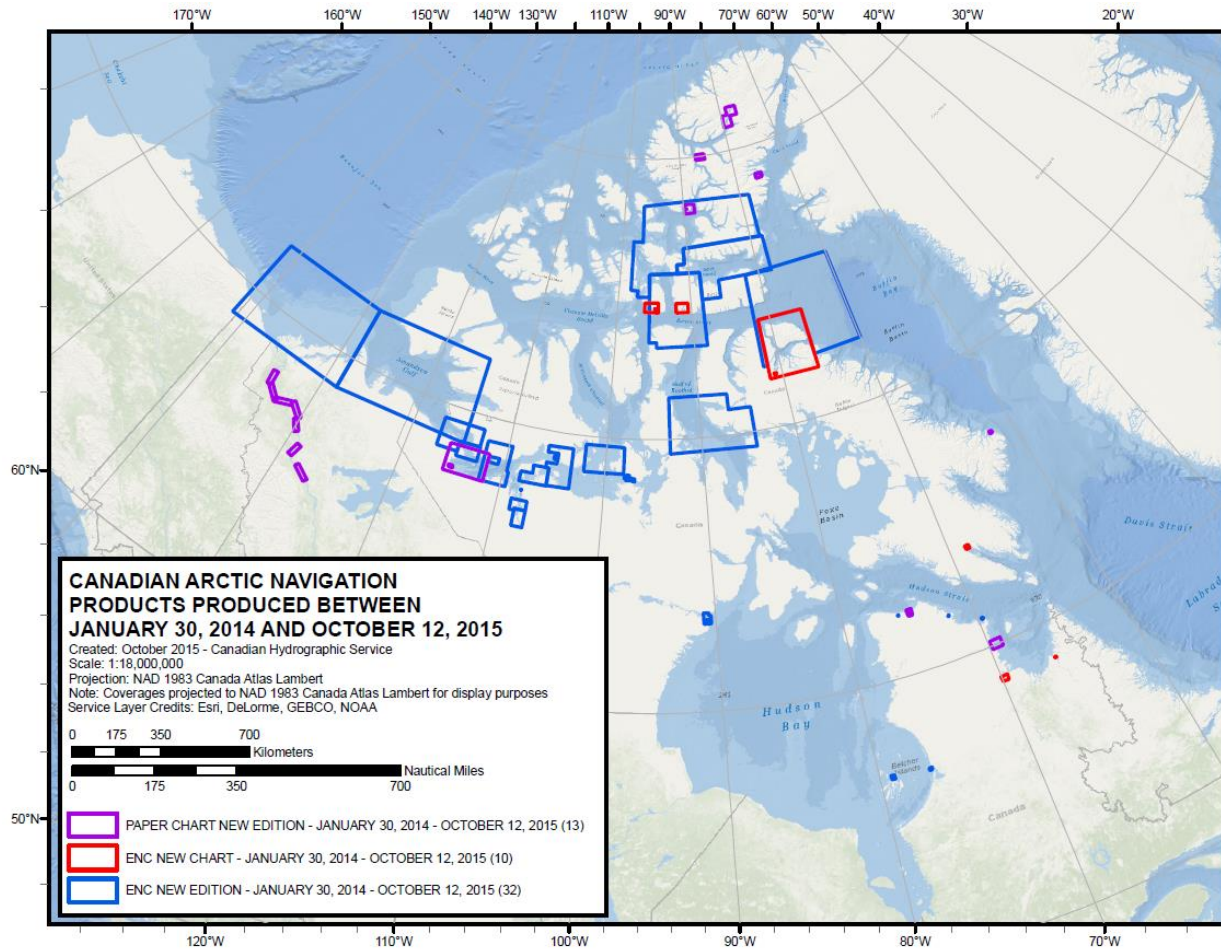
Figure 2. CHS 2015 Hydrographic Surveys in the Arctic.



3. New Navigation Products in the Arctic

Thirteen new paper charts, ten new ENC, and thirty-two new edition ENCs have been released between January 2014 and October 2015.

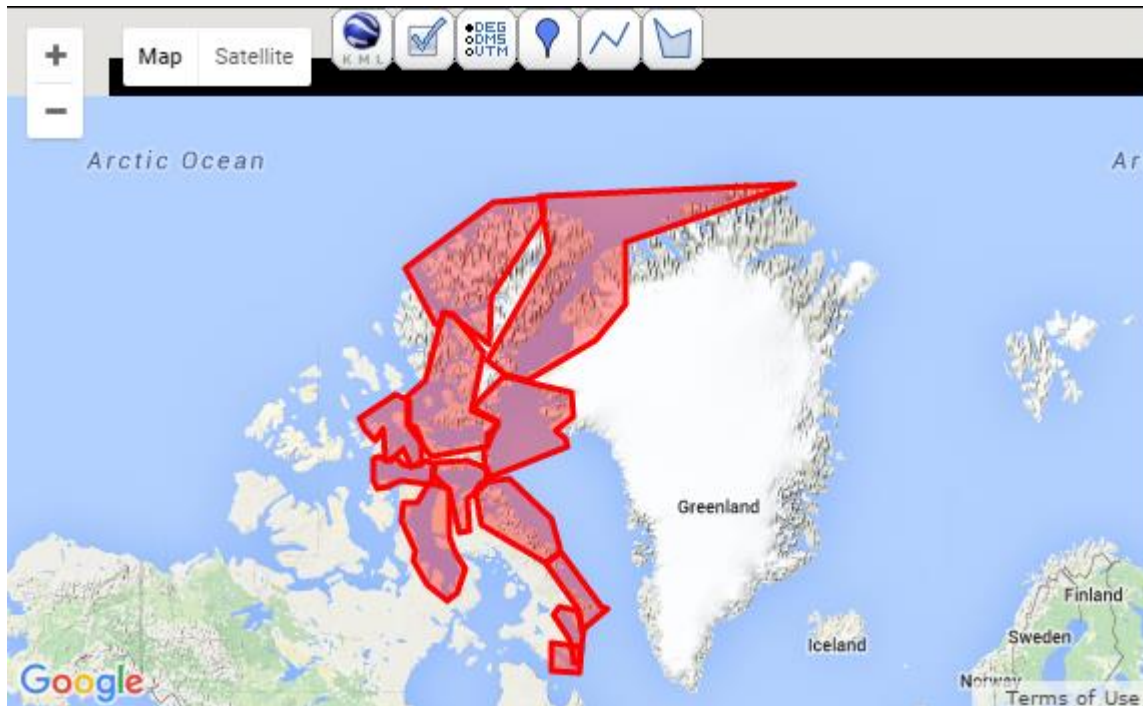
Figure 3. New Navigation Products in the Arctic



4. New Publications and Updates

In 2014, a new Sailing Directions booklet (ARC 402) was released. The 12 chapters of this booklet cover the Eastern Canadian Arctic.

Figure 4. Geographic Coverage of the 12 Chapters of Sailing Directions Publication ARC 402



5. MSI in the Canadian Arctic

No updates.

6. IHO C-55 Status of Surveying and Charting.

CHS will be providing the IHO CATZOC information from its ENCs as requested by IHO CL 52-2015.

CHS has recently completed the IHO C-55 questionnaire using a GIS approach. It will be submitting the response very soon.

7. Capacity Building

Not applicable.

8. Oceanography

a. Tide Gauge Network.

CHS operates six permanent tide gauges in the Canadian Arctic: Alert on the Lincoln Sea, Qikiqtarjuaq on Davis Strait, Uluhaktok on the Amundsen Gulf, Tuktoyaktuk on the Beaufort Sea, Churchill on Hudson Bay and Nain on the Labrador Sea. In 2014 ice damaged the underwater infrastructure at Qikiqtarjuaq, so this infrastructure was replaced in 2015. Submersible gauges were retrieved and replaced on the sea floor at Uluhaktok and Alert in 2015. In future years CHS plans to strengthen the underwater installations for both the Uluhaktok and Alert permanent gauges with similar components as were used in Tuktoyaktuk. NRCan operates continuous recording GNSS receivers at all six sites.

In 2014 submersible tide gauges with year-long records were successfully retrieved from seven sites in the Canadian Arctic. In the 2015 season, three more sites experienced successful retrievals and two more were deployed. Along with GNSS occupations that were conducted nearby all year-long tide gauge sites, the data collected will be used to improve tidal constituents, update/improve chart datum and improve the Continuous Vertical Datum separation model.

b. Continuous Vertical Datum for Canadian Waters

The goal of the CVDCW is to develop a surface connecting Chart Datum to the GRS80 ellipsoid in the NAD83(CSRS) reference frame which captures the relevant spatial variability as modeled by integrating ocean models, gauge data (water levels and GPS observations), sea level trends, satellite altimetry, and a geoid model.

As reported to ARHC4, in 2013 the first cut of the Continuous Vertical Datum model was calculated for the Canadian Arctic and has been used successfully in bathymetry reduction for hydrographic surveys. The first version also highlighted areas where additional work is required, and will be the focus in the coming years for new data acquisition. In 2015, new station data (tidal constituents, GPS observations, and new Geoid) along with more advanced interpolation/extrapolation techniques will lead to version 2.

9. Other Activities.

a. Canada continues to support the government of Canada's Arctic Marine Corridors initiative.

b. CHS has been an active participant in the search for the remnants of the Franklin Expedition. This collaborative effort led to the discovery of the *HMS Erebus* in 2014.

