Fisheries and Oceans Canada | Pêches et Océans Canada

Canadian Hydrographic Service

10th Meeting of the

Arctic Regional Hydrographic Commission

National Report of

CANADA

Virtual meeting hosted by the USA
13-14 August 2020

Dr. Geneviève Béchard, Hydrographer General of Canada

Canada

Canadian Hydrographic Service

Organization Update

- All CHS executive positions now staffed: York Friesen appointed Director, CHS Atlantic in February, Dave Prince retired and Mark Leblanc replaced him as Director, CHS Pacific in March.
- Chris Marshall, CHS Director of Ontario, Prairie and Arctic region and Major Peter McRae from National Defense are new members of the Canadian delegation to ARHC.
- CHS Ottawa office stabilized its organizational structure in January 2020, realigning functions under Louis Maltais for navigational products and services and Chris Hemmingway for hydrography in support of the blue economy.
- CHS launched a 10-year digital transformation, with early action focused on its databases.
- CHS is in year 4 of the 5-year Oceans Protection Plan (OPP); OPP has supported significant progress on the Arctic front.
- The Marine Spatial Data Infrastructure went live in late 2019: https://open.canada.ca/data/en/dataset/97ab458b-44b2-4cb4-8e06-8351e1c745b3
- A S-100 federal government working group was established to bring together all agencies involved in S-100 implementation.

Status of Hydrographic Surveys in the Canadian Arctic

In light of the global pandemic, CHS and our partners recognised the critical nature of CHS' Arctic program and how it links directly to the essential services delivered in the Arctic by the broader Department and Government of Canada.

Canadian Hydrographic Service

All About Capacity

- ***CCGS Amundsen*** MBES operational since 2003
- Bathymetric data from *CCGS Amundsen* represents >50% of all of CHS' modern hydrography in the Arctic.
- Data from *CCGS Amundsen* has been incorporated on 83 charts to date
- *Amundsen's* success established a blueprint for the rest of the icebreaking fleet

Canadian Hydrographic Service

CCGS Sir Wilfrid Laurier

CCGS Pierre Radisson
CCGS Des Groseilliers

CCGS Amundsen, CCGS Henry Larsen

CCGS Louis S St. Laurent

Planned multi-beam installations to be completed by March 31, 2021

Image courtesy Kongsberg Maritime

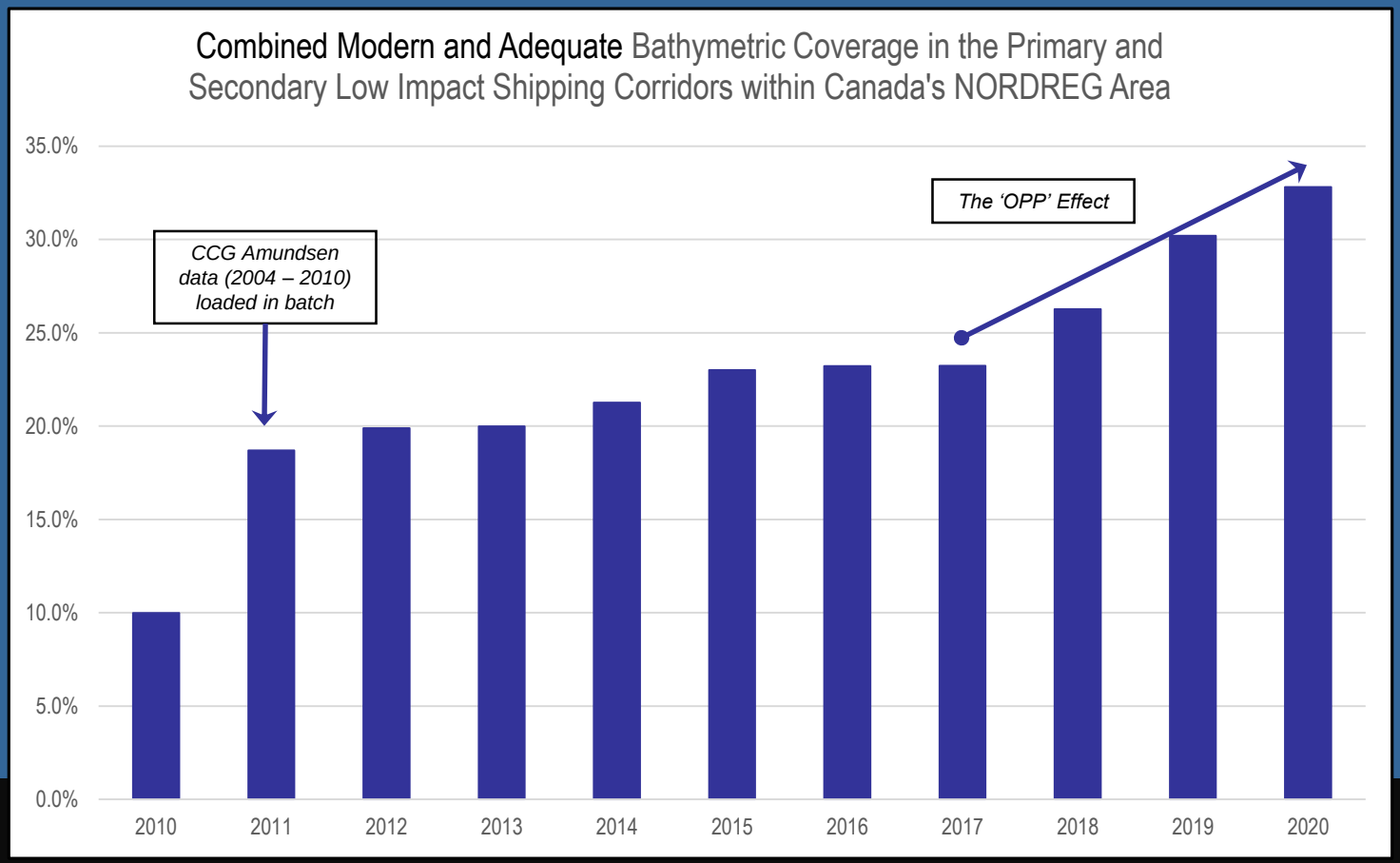
To be installed

Already installed

Canada

Canadian Hydrographic Service

Status of Hydrography in the Canadian Arctic



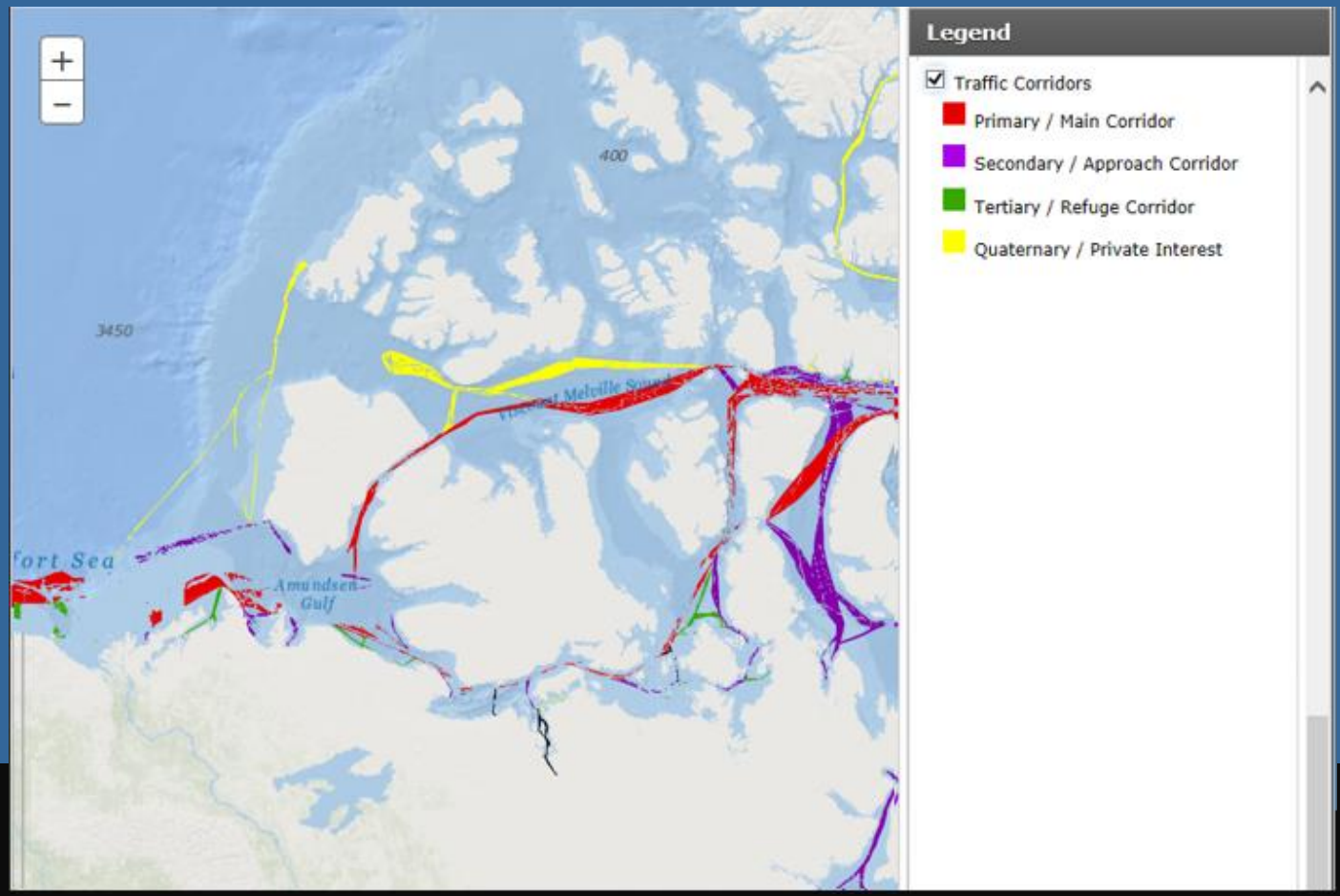
Modern = CATZOC A1 & A2

Adequate = CATZOC B

Modern and Adequate data in combined Primary and Secondary corridors has increased from 23.2% in 2017 to **32.8% in 2020**.

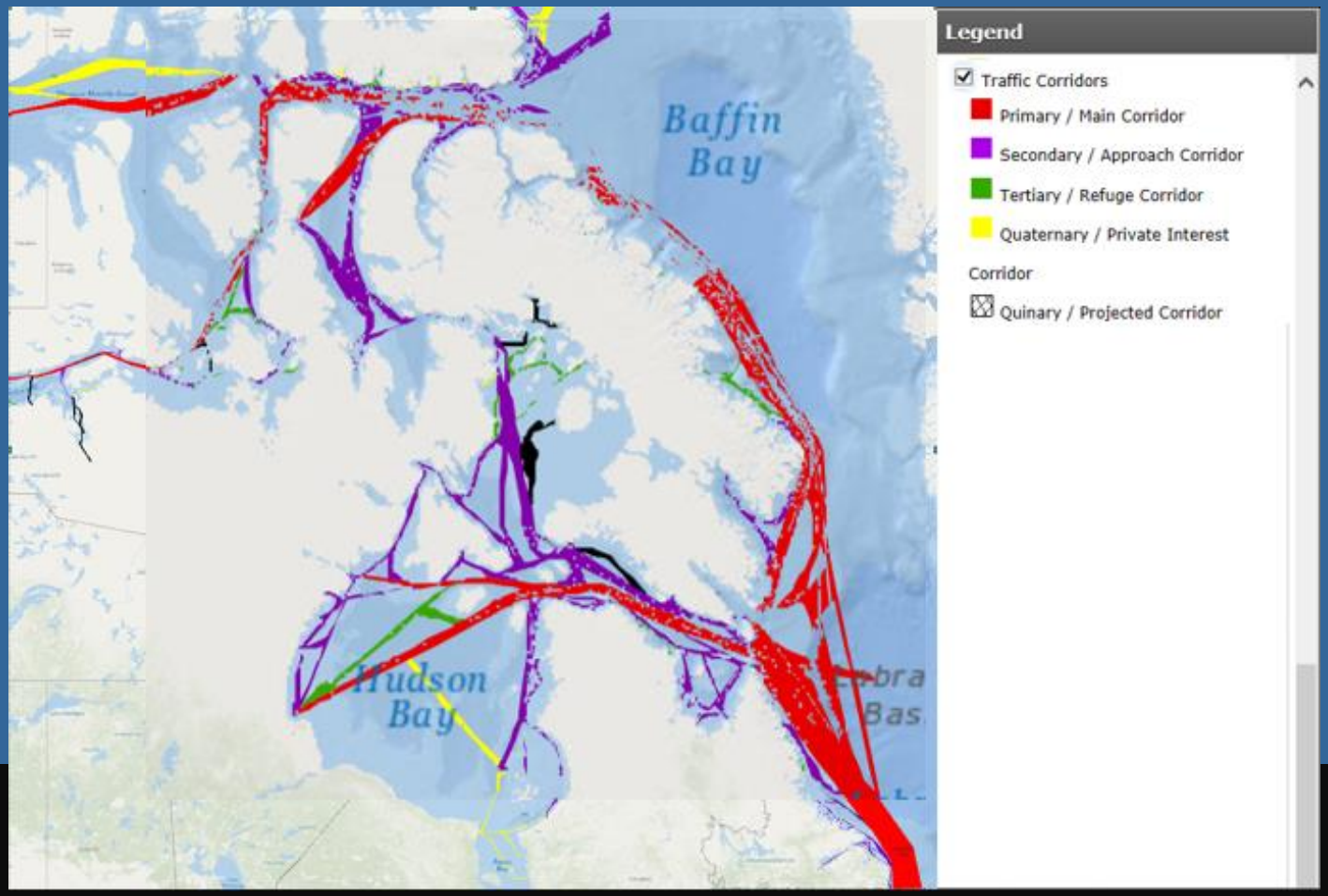
Canadian Hydrographic Service

Hydrographic Priorities in Canada's Western Arctic



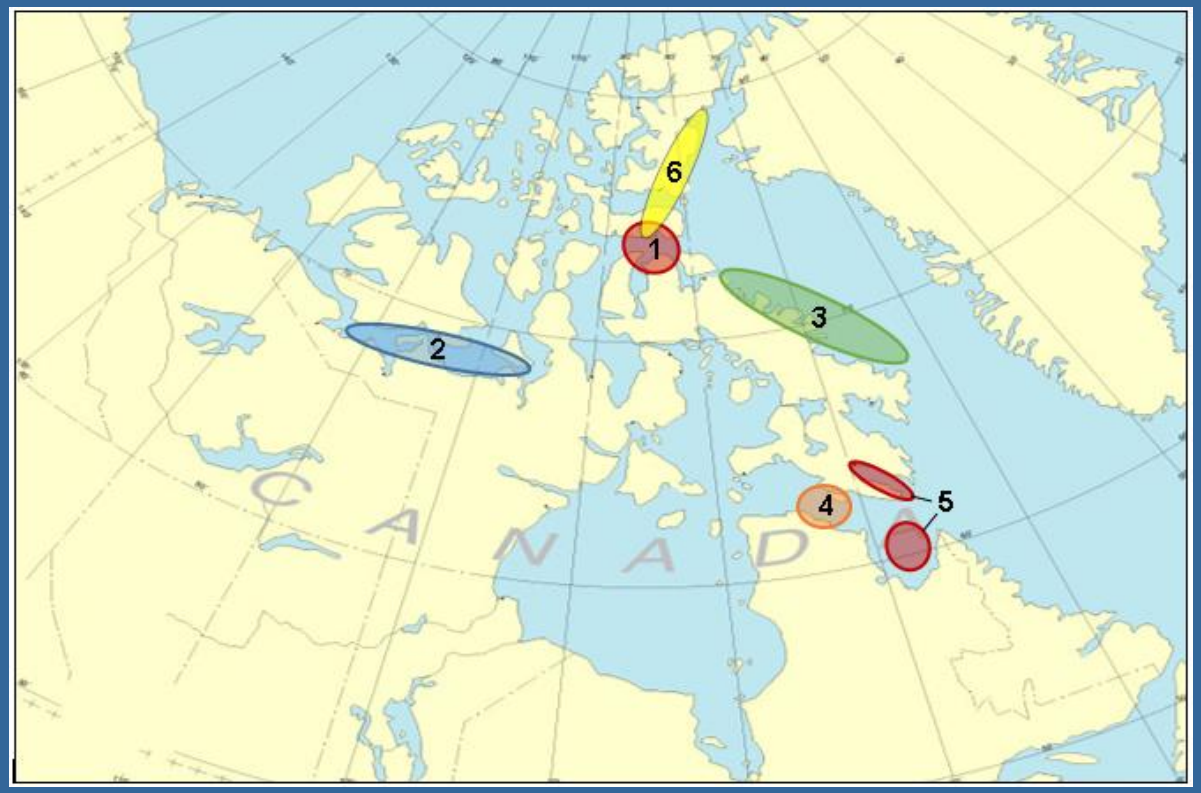
Canadian Hydrographic Service

Hydrographic Priorities in Canada's Eastern Arctic



Canadian Hydrographic Service

2020 Surveys in the Arctic



Surveys on CCG icebreakers:

1) *Pierre Radisson*
2) *Sir Wilfrid Laurier*
3) *Louis S. St. Laurent*
4) *Des Groseilliers*
5) *Amundsen*

Modified program in light of the pandemic: no launches deployed from icebreakers.

Opportunistic contract survey : 6) *MV Vagabond*
Other contract surveys in the Eastern Arctic delayed.

In anticipation of an Arctic survey next year, a contract is being let in Lake Superior to evaluate off-the-shelf autonomous technology for hydrography

Developments from the Royal Canadian Navy (1)

- ***Harry-DeWolf*-class Arctic and Offshore Patrol Vessel**
  - Capability of embarking additional, non-RCN personnel (CHS, RCMP, Border Security, etc.) as mission requires
  - No MBES fitted in final design
  - DND (with CHS assistance) is in the early stages of producing an engineering change to install MBES

Canadian Hydrographic Service

Developments from the Royal Canadian Navy (2)

Ship	Hull No.	Laid down	Launched	Commissioned
Harry DeWolf	AOPV 430	11 Mar 16	15 Sep 18	
Margaret Brooke	AOPV 431	29 May 17		
Max Bernays	AOPV 432	19 Dec 17		
William Hall	AOPV 433			
Frédérick Rolette	AOPV 434			
Robert Hampton Gray	AOPV 435			

HMCS Harry-DeWolf

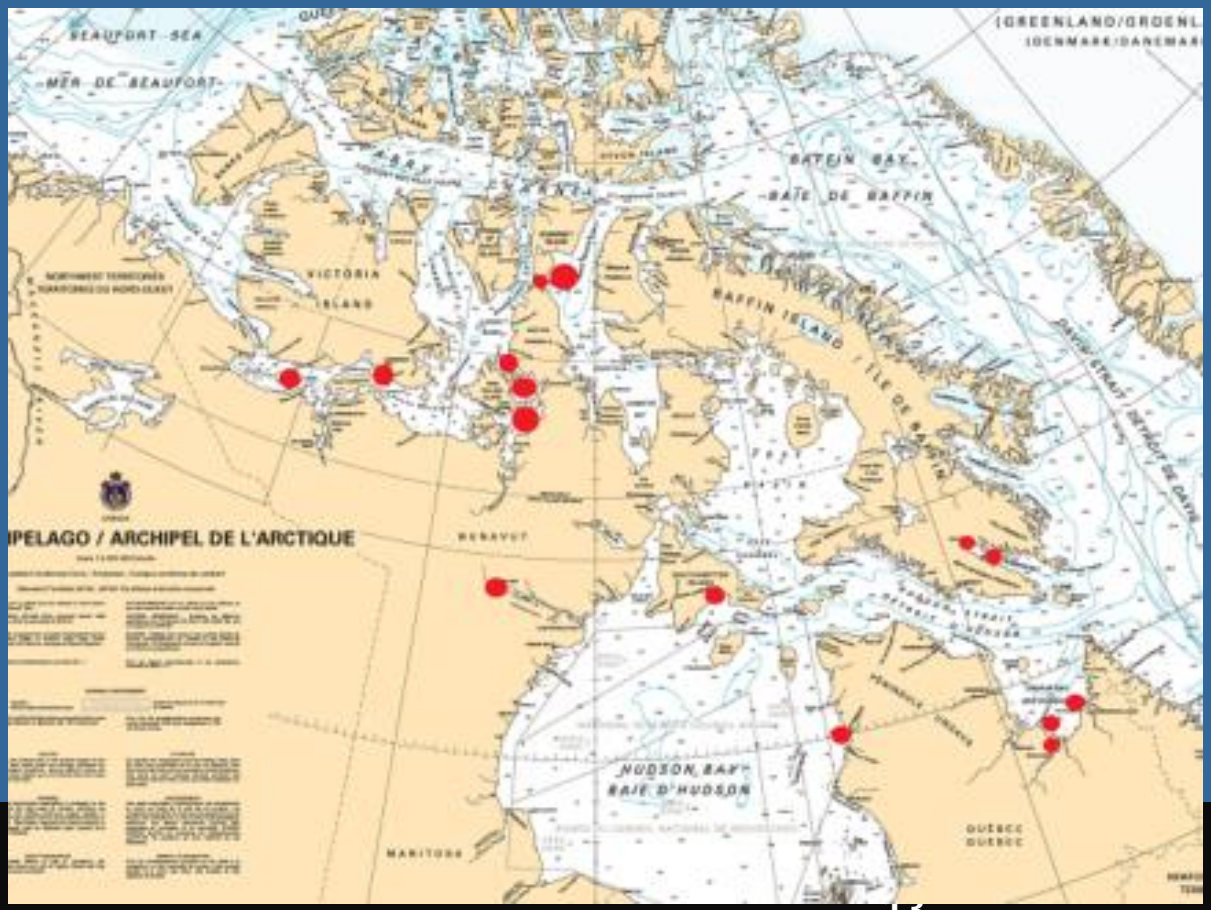
- Sea Trials, Work-ups in 2020
- Expected Commissioning in 2021
- Deployment to Canadian Arctic planned, with intent to circumnavigate North America

Canadian Hydrographic Service

Status of Products and Services in the Canadian Arctic

Canadian Hydrographic Service

Status of Charting in the Canadian Arctic

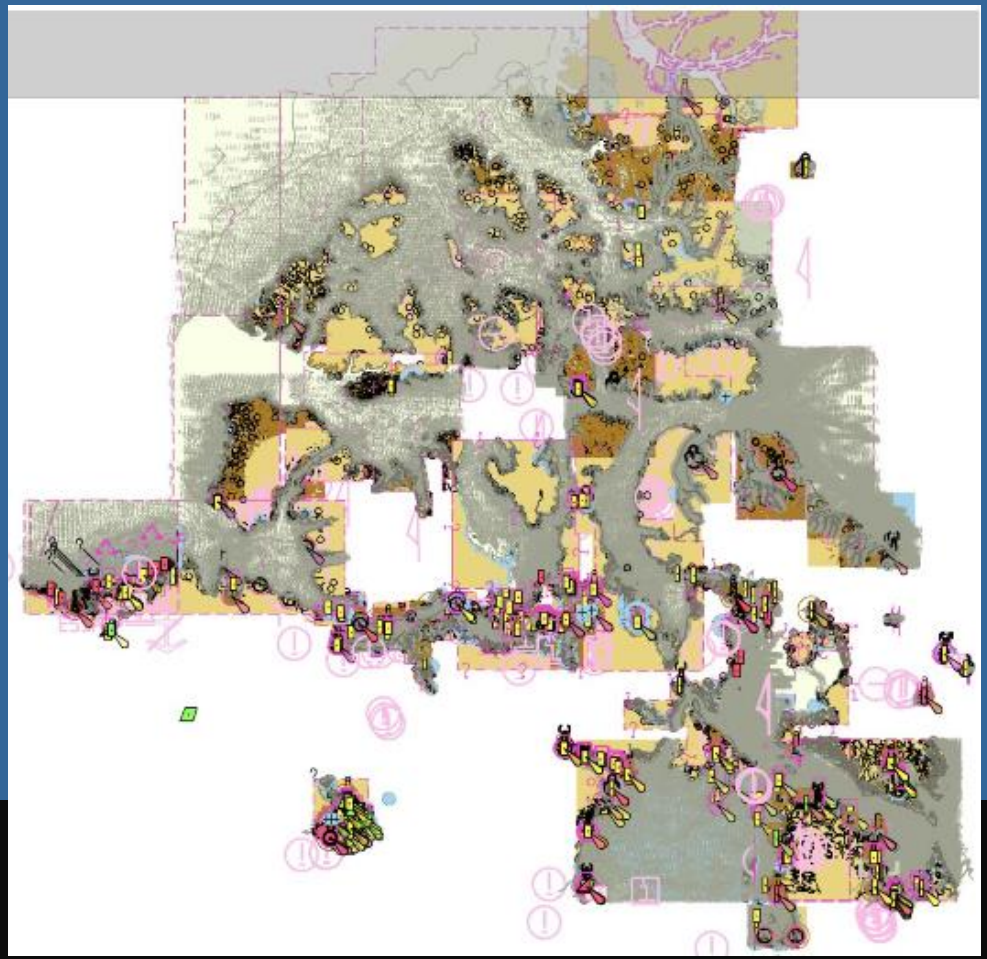


Areas where products were released from April 1, 2019 to July 31, 2020.

- 2019-20 18 ENCs, 8 paper charts
- 45 NOTMARs published

Canadian Hydrographic Service

Status of Charting in the Canadian Arctic



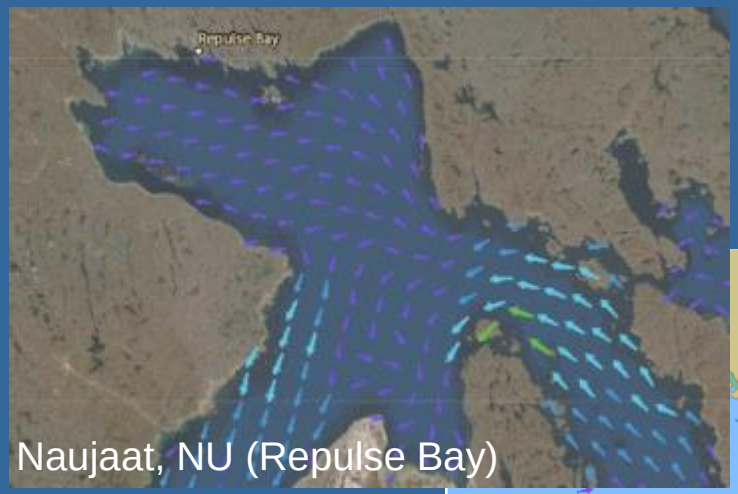
- Loading of vector data in the Arctic accelerated to support creation of ENCs
- 2020-21 production focused on filling vector data gaps and preparing new ENCs
- Awaiting approval of cell scheme by Arctic International Charting Coordination Working Group (AICCWG) to proceed with moving to gridded cells

Canadian Hydrographic Service

Dynamic Surface Currents Released Summer 2020

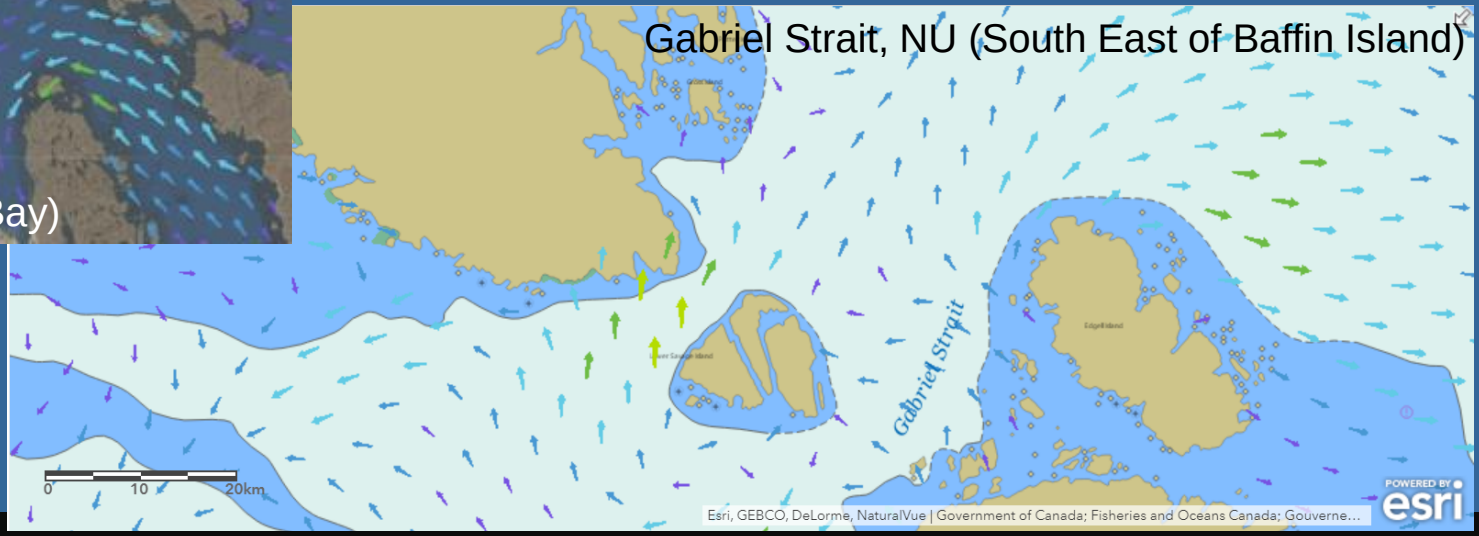
MSDI used to display a new non-navigational product offering predictions:

- Live Map Viewer
- Web Map Service (WMS)



Naujaat, NU (Repulse Bay)

Gabriel Strait, NU (South East of Baffin Island)



Available on Open Data: https://open.canada.ca/data/en/dataset/97ab458b-44b2-4cb4-8e06-8351e1c745b3

Looking Ahead

CHS is in the process of accelerating its digital transformation

10-year transformation plan includes technical, people and business considerations and will cover all aspects of our business:

a) Early actions lay foundation for transformation (filling ENC gaps, digitalizing, rationalization and simplifying licensing)
b) S-102, S-104, S-111 piloted and implemented as initial service offerings
c) Investing in other international standards for S121, Paper Chart 2.0
d) An interdepartmental S-100 working group established to advance development of a federal S-100 service to mariners

Canadian Hydrographic Service

Creating a Canadian S-100 service?

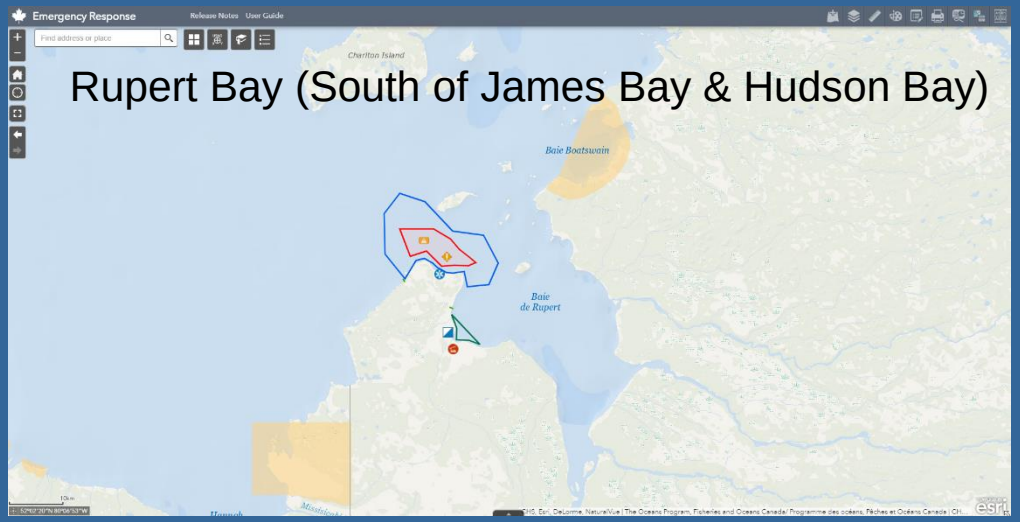
S-100 based product specification	Responsible department
S-101 Electronic Navigational Chart	CHS
S-102 High definition bathymetric chart	CHS
S-103 sub-surface navigation	TBD
S-104 Tidal information	CHS
S-111 Surface Currents	CHS
S-121 Maritime Limits and Boundaries	CHS
S-122 Marine Protected Areas	ECCC / DFO
S-123 Marine Radio Services	CCG
S-124 Navigational Warnings	CCG
S-125 Navigational Services	CCG
S-126 Marine Physical Environment	Multi-agency responsibility
S-127 Marine Traffic Management	Multi-agency responsibility
S-128 Catalogues of Nautical Products	Multi-agency responsibility
S-129 Under Keel Clearance Management	CCG
S-1xx Harbour Infrastructure	CHS
S-201 Aids to Navigation Information	CCG
S-210 Inter VTS Exchange Format	CCG
S-211 Port Call Message Format	CCG
S-212 VTS Information Service	CCG
S-240 DGNSS Station Almanac	CCG
S-401 Inland ENC	Not currently relevant to Canada
S-402 Bathymetric Contour Overlay for Inland ENC	Not currently relevant to Canada
S-411 JCOMM Ice information	ECCC / Ice Service
S-412 Weather Warnings	ECCC
S-413 Weather and Waves Conditions	ECCC
S-414 Weather and Waves Observations	ECCC
S-421 Route Exchange format	CCG

Canadian Hydrographic Service

The Marine Spatial Data Infrastructure

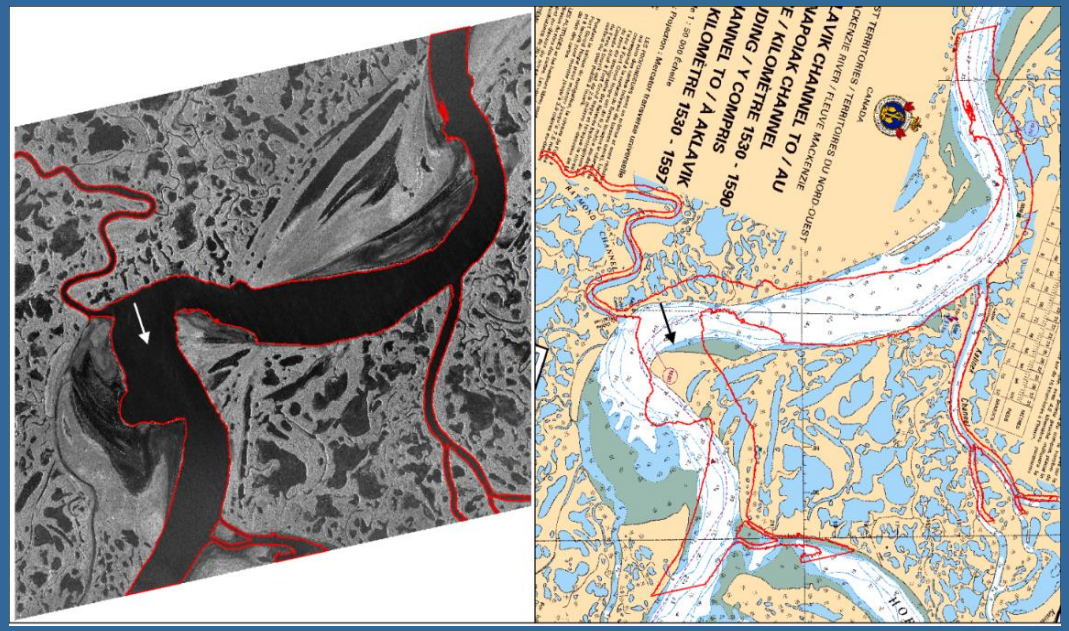
MSDI launched in 2019, currently offering over **325 data services (of which 291 are publically available) and 30 value-added GIS Web applications.**

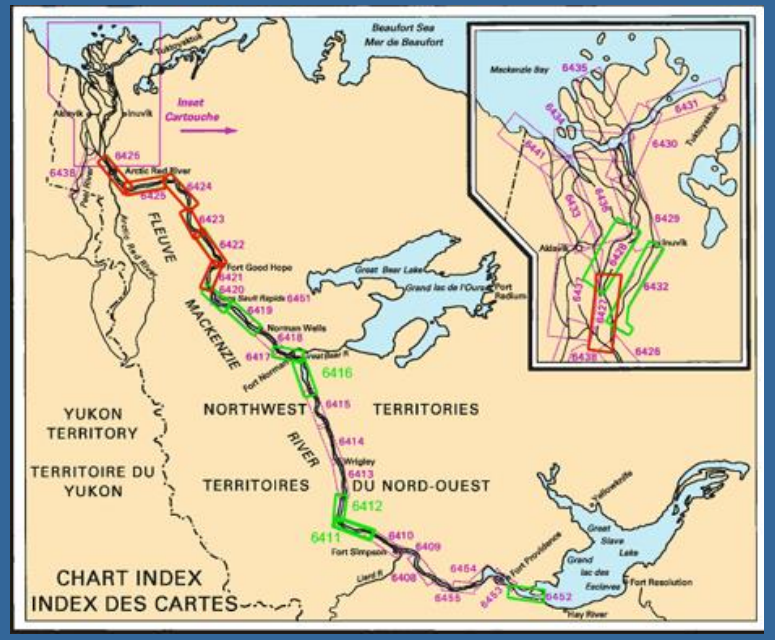
- MSDI supporting Marine Spatial Planning, a new program launched in 2019
- MSDI also supports Emergency Response application (ESpER)



Canadian Hydrographic Service

Addressing Gaps: Supporting Safe Navigation in Dynamic Zones





Example of shoreline extracted from EO data over the Mackenzie River. New shoreline overlapped on the RADARSAT-2 (RS-2) Spotlight image and chart 6428. Note the arrow on both maps: on RS-2(a), the arrow is situated near the current center of the main Mackenzie River channel. The same arrow on the chart 6428 indicates an area of land.

Medium risk 9 Charts

High risk 7 Charts

The original shoreline from most of the 37 Mackenzie charts were generated in the 1970's and were never updated

Canada


QUESTIONS?