



Fisheries and Oceans
Canada

Pêches et Océans
Canada



United States-Canada Hydrographic Commission 46th Meeting

Name: Dr. Geneviève Béchard, Director General - Hydrographer General of Canada

Mobile, Alabama

March 16-17, 2023

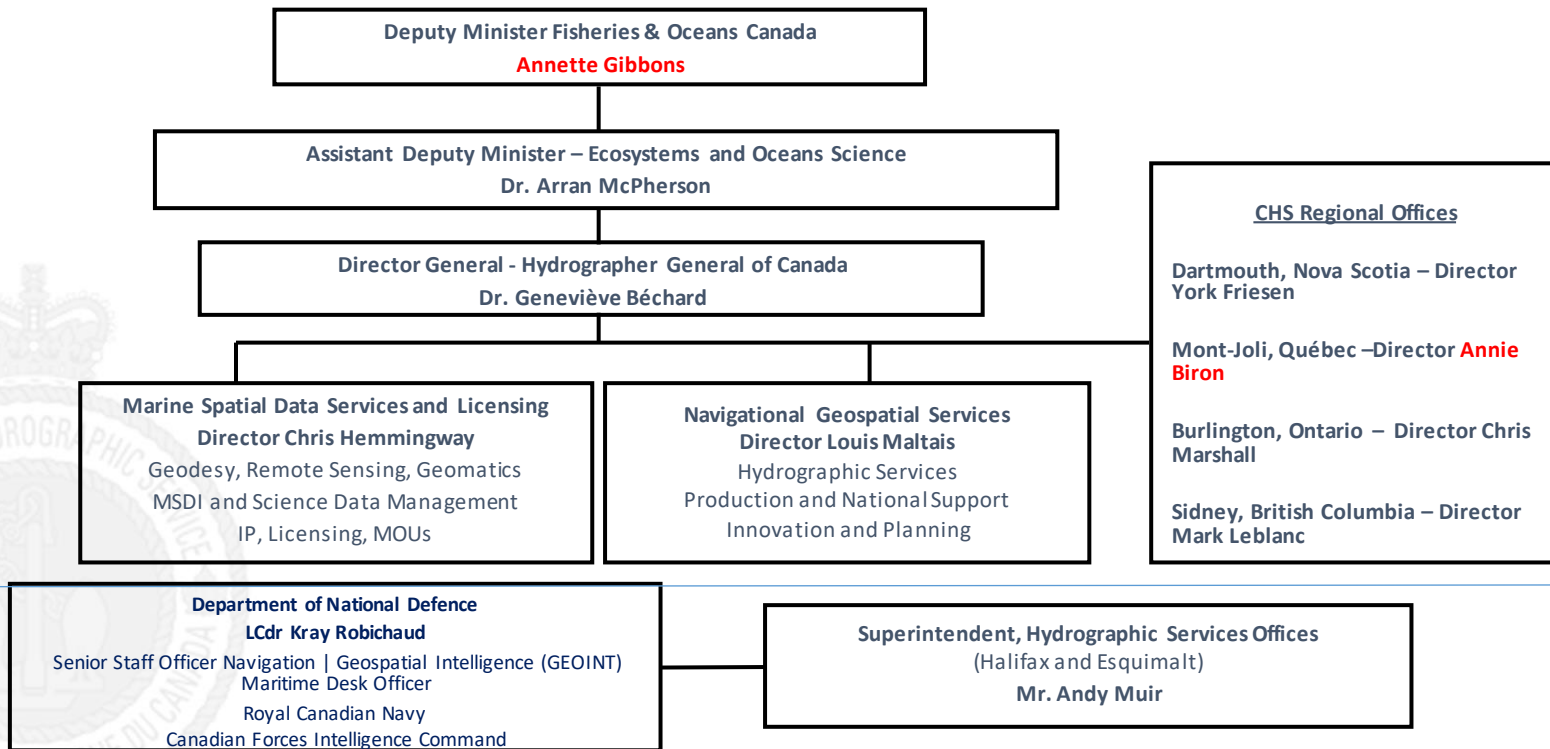
16-17 March 202, Mobile Alabama



Canada



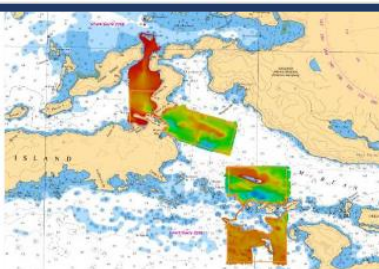
Organizational Updates



Oceans Protection Plan (2017 – 2022) Supported Digital Transformation

Main goal of OPP: To accelerate “Modern Hydrography and Charting in Key Areas”

- ❖ Completed modern surveys and 49 Electronic Navigational Charts (ENCs) for 23 **high-priority commercial ports**
- ❖ 85,000km² of Critical Habitat **Near Shore Surveys** completed through Airborne LIDAR acquisition
- ❖ **Arctic:** approx. 8700 km² contracted collected surveys and approx. 103,200 km² from CHS led missions, released 72 new ENCs and 28 Paper Charts
- ❖ **Modeling Dynamic Currents & Water Levels:** six port/waterway model solutions completed, 3 operating, Canada wide S-111 file production coverage for In-transit and port approach navigation
- ❖ 98 **Water Level Network** Stations Refurbished, new digital Integrated Water Level Service
- ❖ **CVD Integration:** Updated Continuous Vertical Datum surfaces for Pacific (Atlantic and Arctic ongoing), CVD surfaces used to vertically reference ocean model bathymetry and water level outputs





Renewal of the Ocean Protection Plan (OPP2) -CHS

Improve safety of navigation by leveraging modern and emerging technologies & continue to **fill important gaps** in surveying and charting in Canadian Arctic waters

**ADVANCING ARCTIC
SURVEYING AND
CHARTING**

**COMMUNITY-BASED
HYDROGRAPHIC
DATA COLLECTION**

Empower indigenous and coastal communities to collect and use hydrographic data, building and expanding on recent pilots and initiatives



Community Hydrography

2022-2023 Results

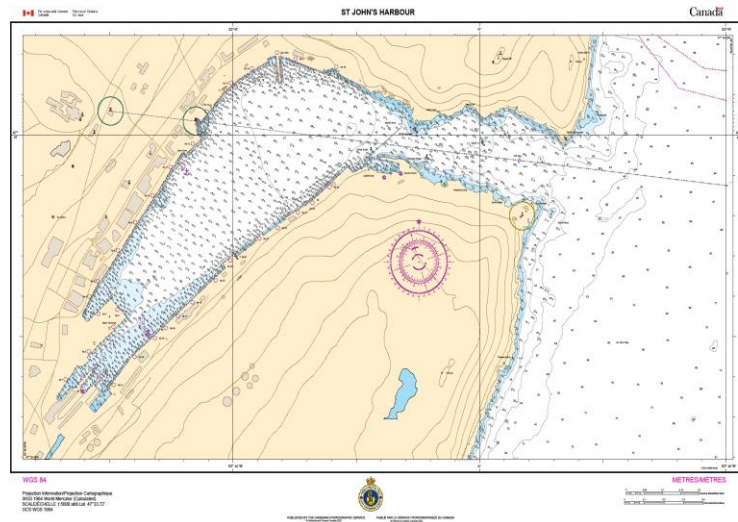
- Project Implementation Plan
- Ocean Protection Plan Pacific Marine Dialogue
- Community Hydrography State-of-play report
- 3 new Contribution Agreement with communities
- UNH-CHS collaboration on WIBL data loggers



Community workshop, fall 2022

Modernizing

- CHS is continuing to withdraw BSB raster products where adequate ENC coverage exists.
 - *This is a multi-year process.*
- First ENC on the grid released June 4th, 2021; 137 released on the grid so far.
- Paper Chart 2.0 optimizes and automates the production of paper charts from ENC's.
 - *Contract initiated to assess Paper Chart 2.0 against IHO S-4 standards.*
- S-101 ENCs & S-128 Catalogue are now priorities.
- CHS, working through the Geographic Names Board of Canada, is beginning to address derogatory names.
 - *UNEGN Canada/US Division has recently been reactivated and this will be an issue to address.*





Transformation

Operationalizing the following chapters:

Chapter 1

CHS Workforce and
Workplace:

Enhancing our
technical expertise.



Chapter 3

Data Acquisition
Transformation:
Modernizing our
data acquisition
methods.



Chapter 2

Business Model
Modernization:
Streamlining and
strengthening
our business
practices.



Chapter 4

Database
Transformation:
Transforming
our databases.



The Human Side of Digital Transformation

- Transformation Chapter 1: Workforce and Workplace
- Hydrographer of the Future Project – Envisioning the CHS Hydrographer of the Future.
 - International workshop (support from international Advisory Board)
 - Engaging CHS Staff in April
- Culture Review – understanding our current and desired culture
 - Supports cultural shifts
 - Measuring progress annually
- Building Human Resources and Training plans with the aim of shaping the workforce we will need in the future.



e-Navigation: Where We Are Going

- Upgrading databases and data management systems, leveraging cloud computing to setup the framework for the volume of data required
- Harnessing new technologies (eg. AUVs, remote hydrography) and new data sources (satellite imagery, third party data, community-based hydrography) to feed data hungry S100 services
- Integrating with other data providers and aligning with other countries for seamless data delivery under e navigation.
- Updates to adapt to changing legal and regulatory implications and alignment with international standards
- Iterative engagement with users to refine S100 services



Modeling for Dynamic E-nav

Operational Delivery:

- **In-transit** (open ocean) – RIOPS, CIOPS (existing ECCC NEMO operational systems)
- **Approach** (shelf and coastal) CIOPS (existing), POPS intermediate (new NEMO systems)
- **Nearshore, Port and waterway** – POPS (new NEMO systems)

Port Prediction Systems (POPS) – new, end of downscale chains, medium and high resolution (to 20-100 m) NEMO prediction systems for high-traffic, high-risk Canadian Ports and Waterways, parallel development, only possible through existing/expanded cooperations.

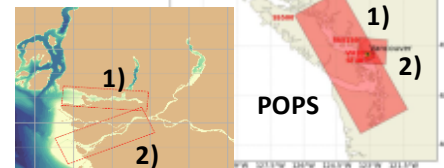
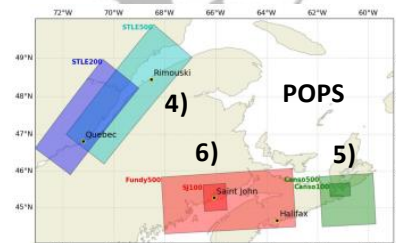
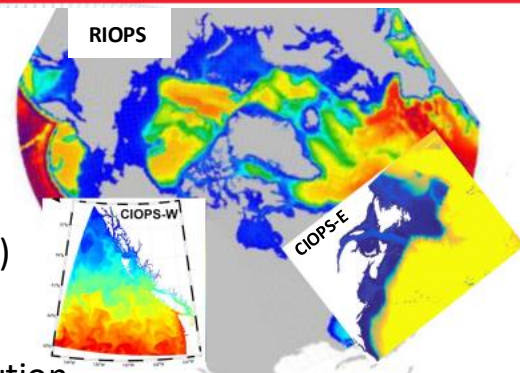
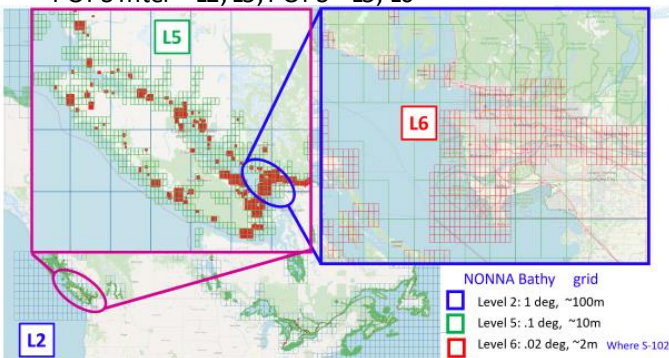
- 1) Port of Metro Vancouver BC
- 2) Fraser River BC
- 3) The Kitimat Estuary BC
- 4) The St. Lawrence River Estuary Que
- 5) Port of Canso NS
- 6) Port of Saint John NB

CSAS ‘fit for purpose’ evaluations – March 2023

- Invited dE-nav experts:
 - NOAA, SHOM, UKHO, UNB

Tiled S-100 product delivery:

- RIOPS – L2, CIOPS – L2, L5, L6
- POPS Inter – L2, L5, POPS – L5, L6



1. Allied System for Geospatial Intelligence Maritime Sub-Group (AMSG) visit to Victoria, BC 14-17 Nov 2023 & NATO Geospatial Maritime Working Group (GMWG) co-production.
 - a. Additional Military Layers
 - b. Military ENC | Submarine ENC
 - c. Derived bathymetry products
2. Commander Naval Meteorology and Oceanography Command (CNMOC) staff visit to Halifax, NS, 17-21 Apr 2023
 - a. DND | DoD Memorandum of Understanding
 - b. Exchange of operational **Hydrography, Meteorology** and **Oceanography** data, products & info
3. Royal Canadian Navy / CHS collaboration re. CHS Arctic Operations/Surveys, 2023 & beyond





Thank you