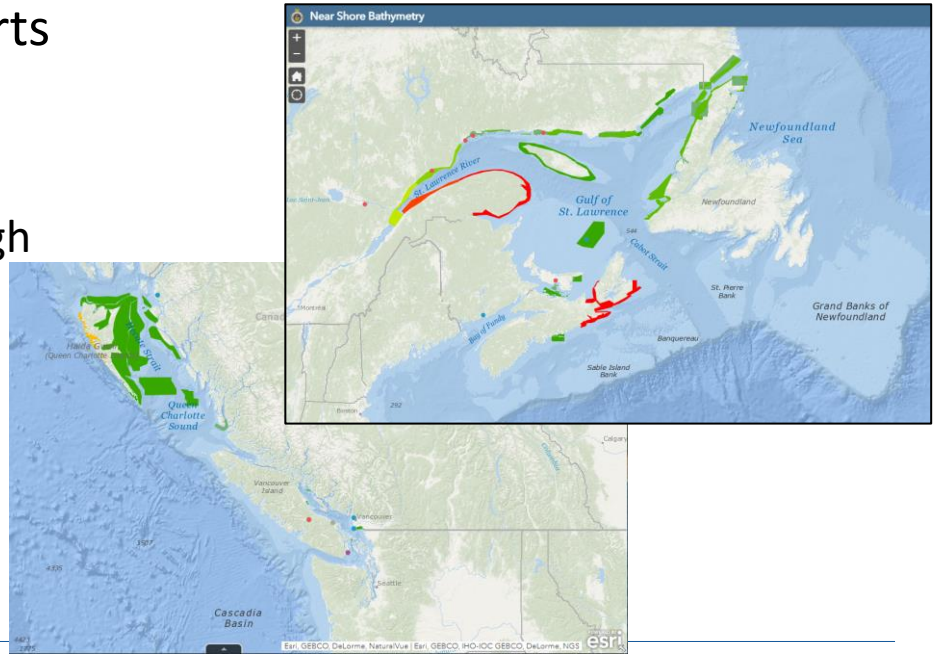
Canada's ocean mapping initiatives 2022 update

Presented by Serge Lévesque,

Fisheries and Oceans Canada,Canadian Hydrographic Service

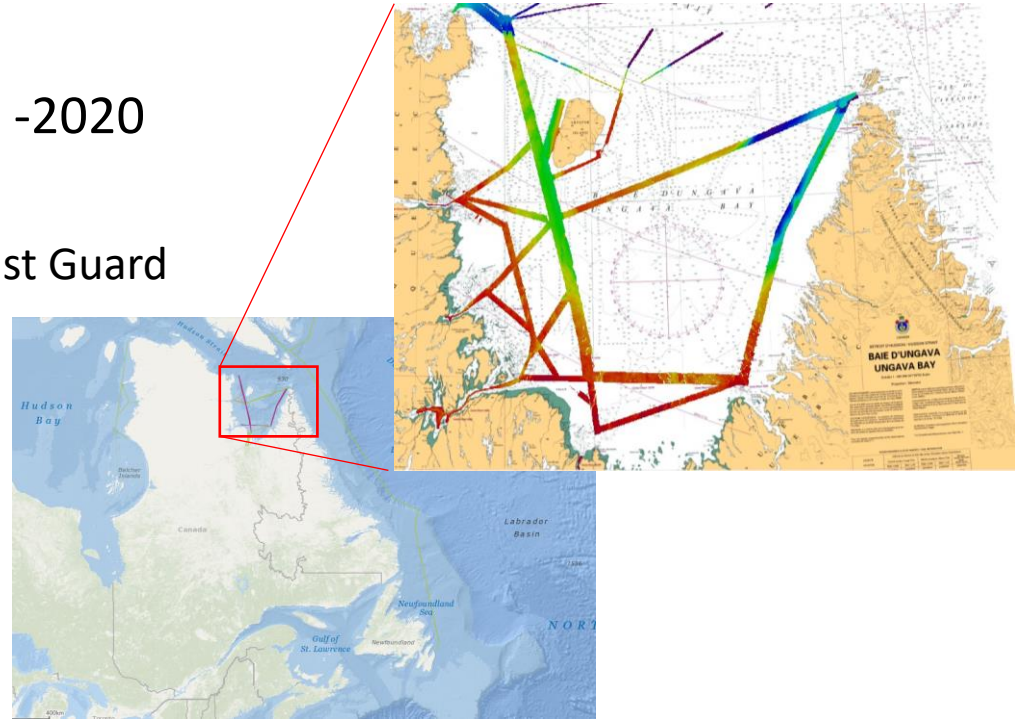
Ocean Protection Plan (OPP) phase 1 (2016-2021) Near Shore Bathymetry with LIDAR and multibeam

- Approaches to 12 OPP-selected ports surveyed
- Coastal/near shore areas:
  - 30 areas of interest with high risk, high priority
    - Estuary and Gulf and of St-Lawrence, Maritimes, Pacific, Great Lakes
    - Airborne Lidar
    - Hydrographic launches with multibeam



Ocean Protection Plan phase 1
Coverage increase in Ungava Bay, Canadian Arctic

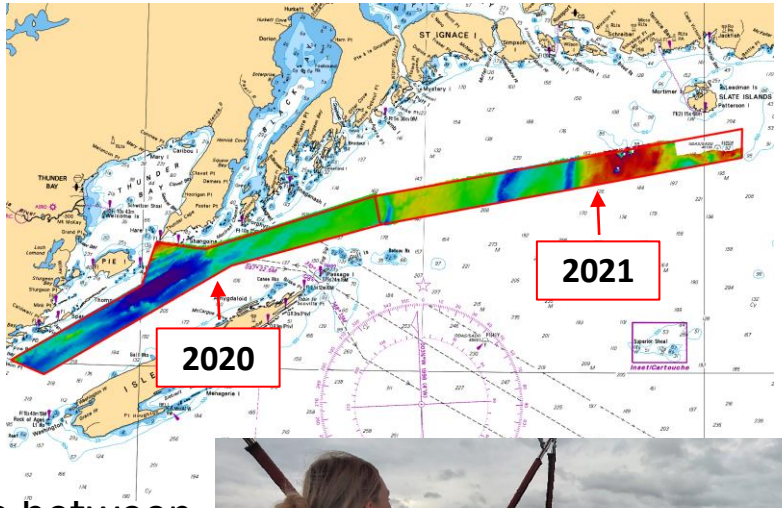
- Multibeam data acquired 2017 -2020
- Deep water vessels:
  - Newly multibeam-equipped Coast Guard ship
  - Commercial contracts



Multibeam Sonar Equipped CCG Icebreakers

Technology trials: Uncrewed Surface Vessels (USV) Lake Superior – 2021

- Approximately 697 km² of modern bathymetric data acquired (2021) with XOCEAN platform
- 100% of data met IHO S-44 Special Order and achieved IHO CATZOC A1
- 90% of planned coverage completed
- ~354 hours of maintenance, 206 hours of transit time between September 17 and November 18, 2021
- Concurrent use of auxiliary scientific payloads



Uncrewed Surface Vessels (USV) Operations Challenges

LOGISTICS
- Large technical team to support (approx. 33 personnel).
- Launch/recovery of equipment
- Maintenance – USV requires secure and indoor/covered space

TECHNICAL LIMITATIONS
- Support boat limitations
- Incompatible auxiliary payloads
- Securing further (potential) payloads: planning/lead time
- Problems with SVP winch and generator (ice build up)

WEATHER-RELATED :
- Ice buildup
- Risky emergency recovery

Uncrewed Surface Vessels (USV) Operations
Next Steps

- **USVs in the Arctic via OPP2**
  - Contracts with private sector
  - Data acquisition as a service.

- **USV as a force multiplier**
  - Collect other scientific data concurrently with bathymetry
  - Collaborations with other partners
    - Share the cost of mobilization.

- **USVs in navigationally complex areas.**
  - Assess efficacy
  - Investigate research funding envelopes

Renewal of Canada's Ocean Protection Plan

- In August of this year, the Government of Canada announced a renewal of the Ocean Protection Plan.
- Significant investment for the CHS to improve Hydrographic Services in the Arctic - **$84M over 9 years**.
- OPP2 includes 2 initiatives for CHS:
  - Modern Hydrographic Services in the Arctic
  - A new Community Hydrography Program
- 2022 is the first year of this funding

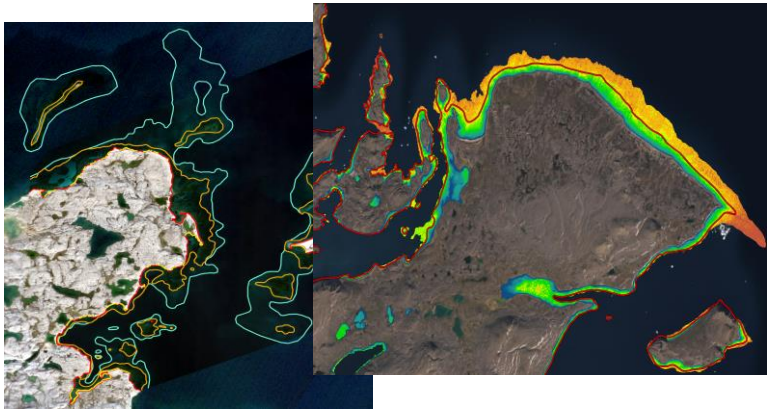
Link to the official announcement by Minister Murray

The Honourable Joyce Murray, Minister of Fisheries, Oceans and the Canadian Coast Guard visited Rankin Inlet Nunavut Wednesday August 10 2022 to announce funding to improve charting in Arctic waters. Minister Murray met with the DFO's Regional Director General Gabe Nirlungnayuq, and Regional Director of the Canadian Hydrographic Service Chris Marshall (pictured). New funding under the Oceans Protection Plan will expand charting of Canadian Arctic waters and boost the Canadian Coast Guard's response capabilities in the North.

OPP2 – Highlights of CHS deliverables

Significant investment, building upon work CHS achieved over the past 5 years of OPP1

- **Accelerate bathymetric data collection**.
- **Dedicated Arctic Data Integration and Chart Production Team**
- **Develop and test new services** to communicate risk for Arctic navigation.
- **Implement a Community Hydrography program**

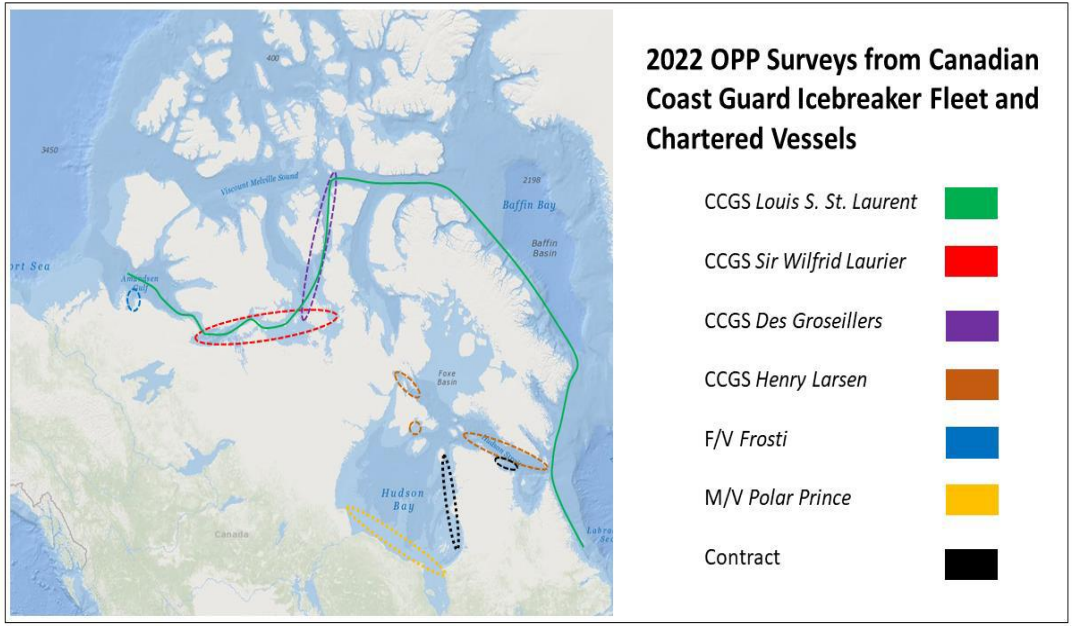


Scale and operationalize use of remote sensing and SDB

Inshore Rescue Boat – Rankin Inlet, NU – CSB data collection.

Summary of 2022 Survey Program in the Arctic

- CHS Survey Operations
  - Onboard 4 of the 5 Canadian Coast Guard (CCG) icebreakers
  - Opportunistic data from CCGS Amundsen (ArcticNet)
- Partnerships
  - Students on Ice (M/V Polar Prince)
  - DFO Arctic Science (F/V Frosti)

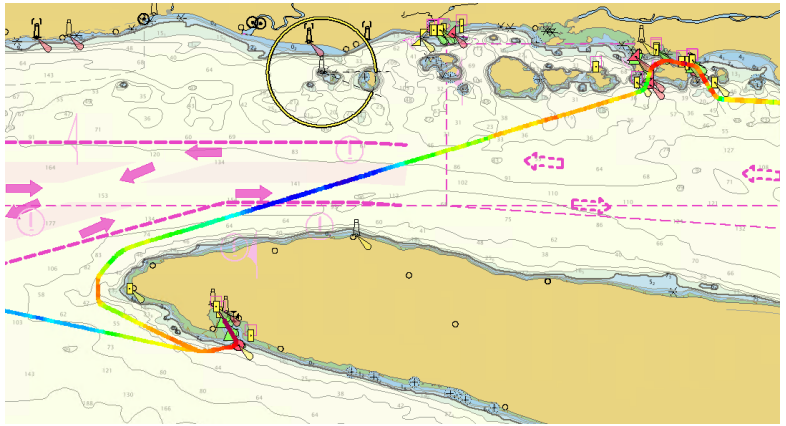


Community Hydrography, the Canadian Approach

- Initiative built on successful pilot projects
- Under Oceans Protection Plan, phase 2 (2022 – 2030)
  - Workshop with coastal communities
    - successes, challenges and way forward
  - Community control over the data and its collection
  - Involve industry and academia (COMREN)
- Develop a CHS Policy on the use of Community data

Community Hydrography: Objectives

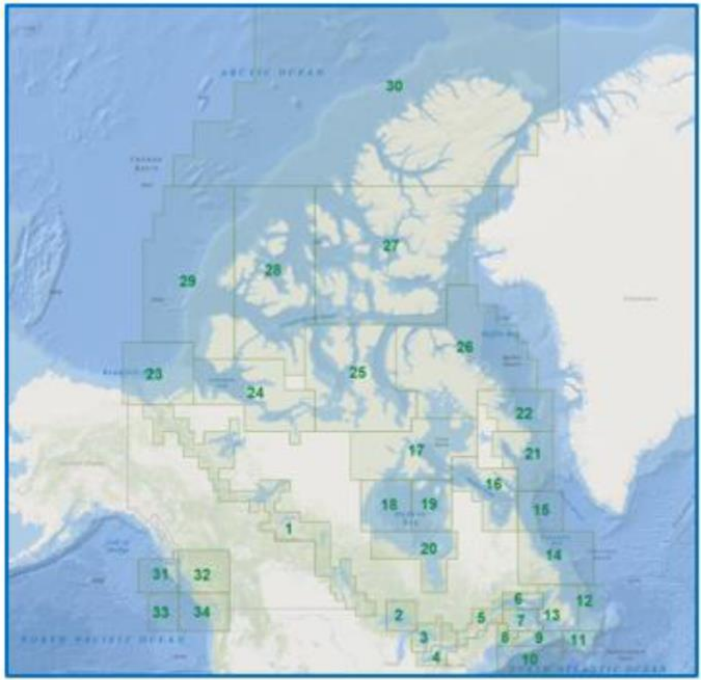
- **Local:** Hydrographic work knowledge transfer
  - Empower volunteer mariners and young generations
- **Local:** Build capacity for crowd sourced bathymetry by “non-experts”
  - Remote coastal communities
  - Small craft harbours
  - Data fit to purpose for local needs
- **National:** Fill-in the gaps in remote areas
- **International:** Voluntary contribution to GEBCO DCDB and Nippon Foundation - GEBCO Seabed 2030 project



Opportunistic track collected with HydroBlock on St-Lawrence River, 2022

NONNA10 and 100 grid updates

- CHS NONNA v.3.0, 2022 release
  - New web-based portal:
    https://data.chs-shc.ca/login
  - New download by package
- Referencing to chart datum:
  - Removal of data not yet corrected to chart datum
- Continuous gap analysis:
  - Initial assessment (2022), Automation (2023), Metrics Dashboard (2024)



CHS NONNA PACKAGES

Thank-you
Merci

For further information and questions please contact:

Serge Lévesque

serge.levesque@dfo-mpo.gc.ca

Chris Marshall

Chris.marshall@dfo-mpo.gc.ca

http://www.charts.gc.ca