Canadian Hydrographic Service

Recent Developments and Future Directions

39th United States – Canada Hydrographic Commission Meeting

Denis Hains

Director General Canadian Hydrographic Service (CHS) and Hydrographer General of Canada

May 16th, 2016 Halifax, NS

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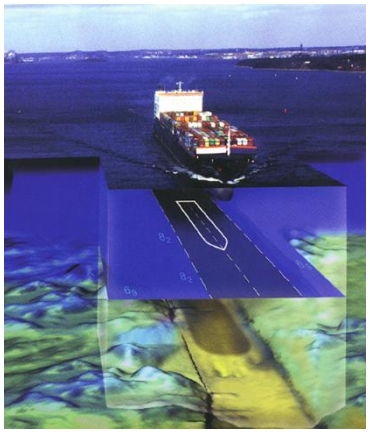
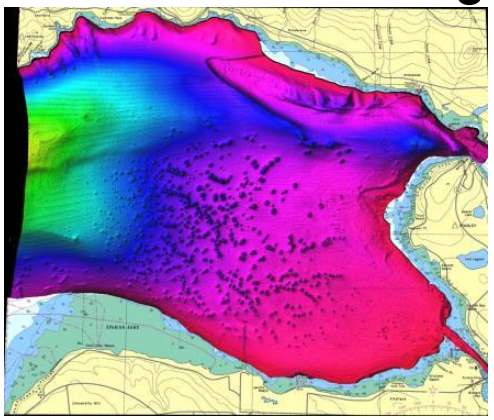
Overview

- CHS' Challenges;
- CHS' Prioritization Model;
- Update on the World Class Tanker Safety System (WCTSS)
- Update on status of CHS' Products and Services;
- CHS' near-term commitments.



CHS' Present Challenges

- Increasing demand for CHS data, products and services
  - Expanding client-base for non-navigation usage
- Making CHS' data available
- Many of our waters have not been surveyed and/or charted adequately, including vast un-surveyed areas
- Foster opportunities that enable innovation, leveraging, partnering and collaboration



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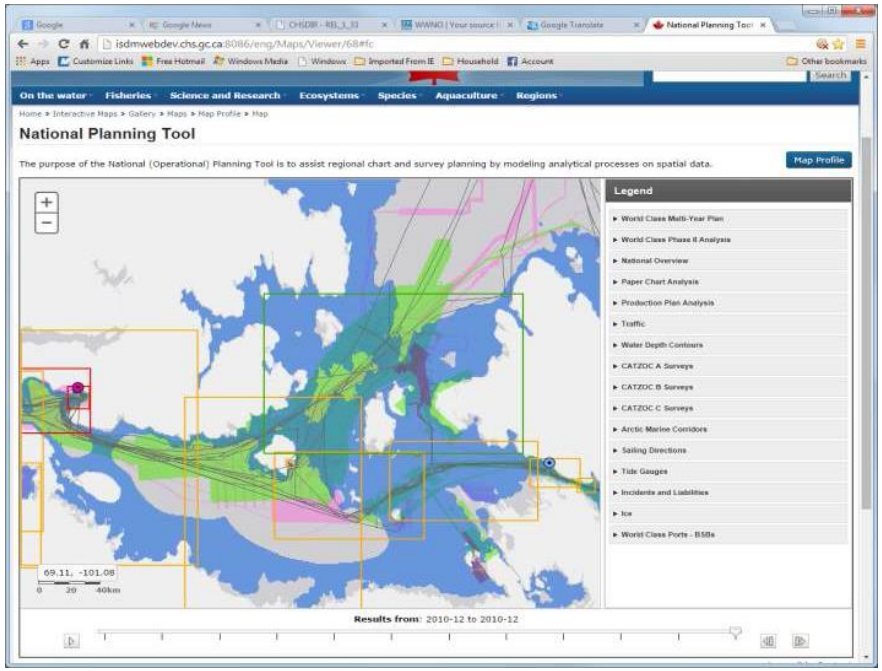
Planning and Prioritization

- The CHS Priority Planning Tool (CPPT):
  - Supports CHS survey and chart priority planning.
  - Provides a single window on CHS' plans and priorities over a one to five year horizon to CHS management, employees and soon clients.
  - Supports monitoring and reporting on progress of ongoing work, including on Government of Canada's priorities, such as the WCTSS.
  - Helps focus resources and equipment usage where most needed.
  - Supports fact-based decision-making.



- CPPT outputs need to consider client input, Government of Canada priorities, etc.

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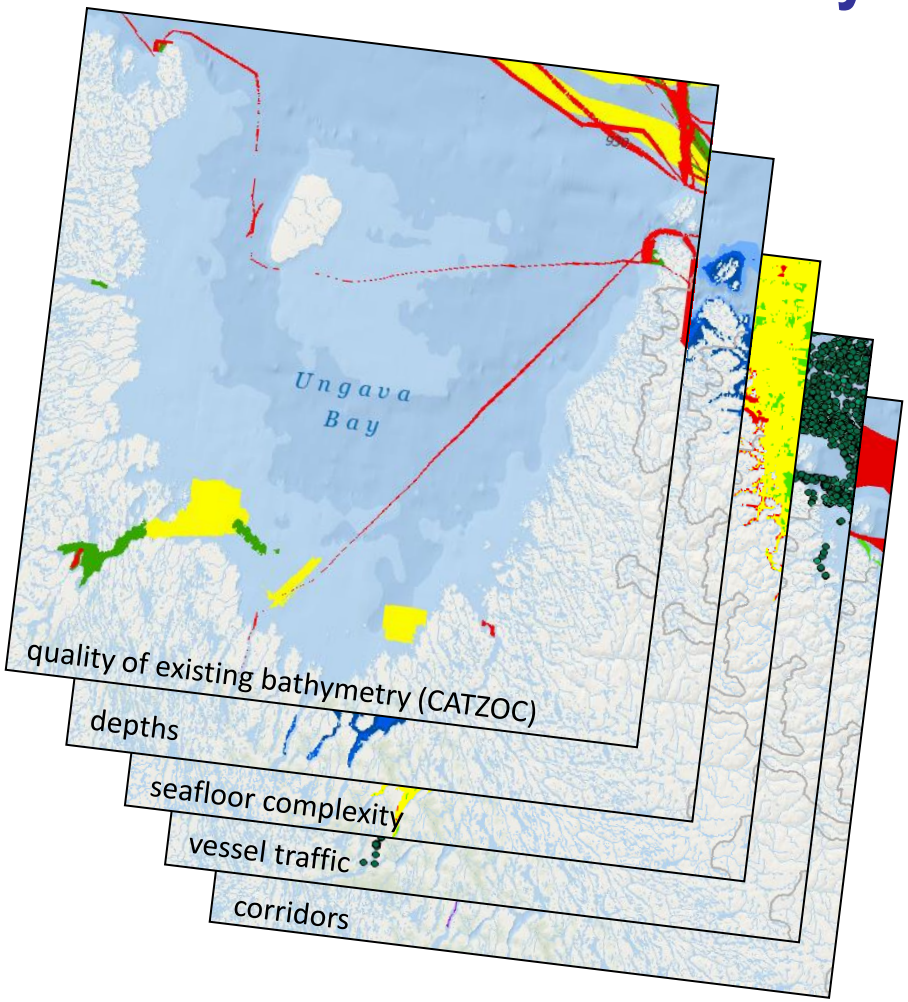
Visualization of Hydrographic Priorities



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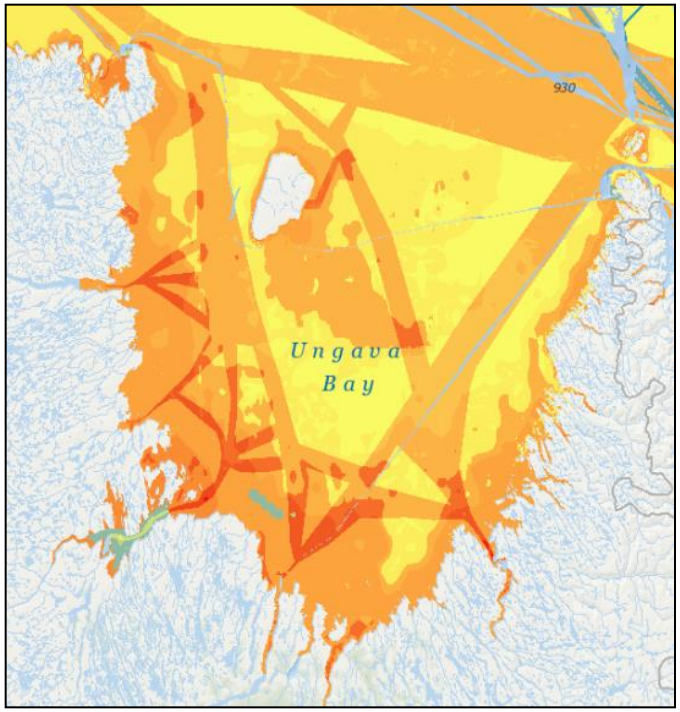

Darker within corridors = higher priority

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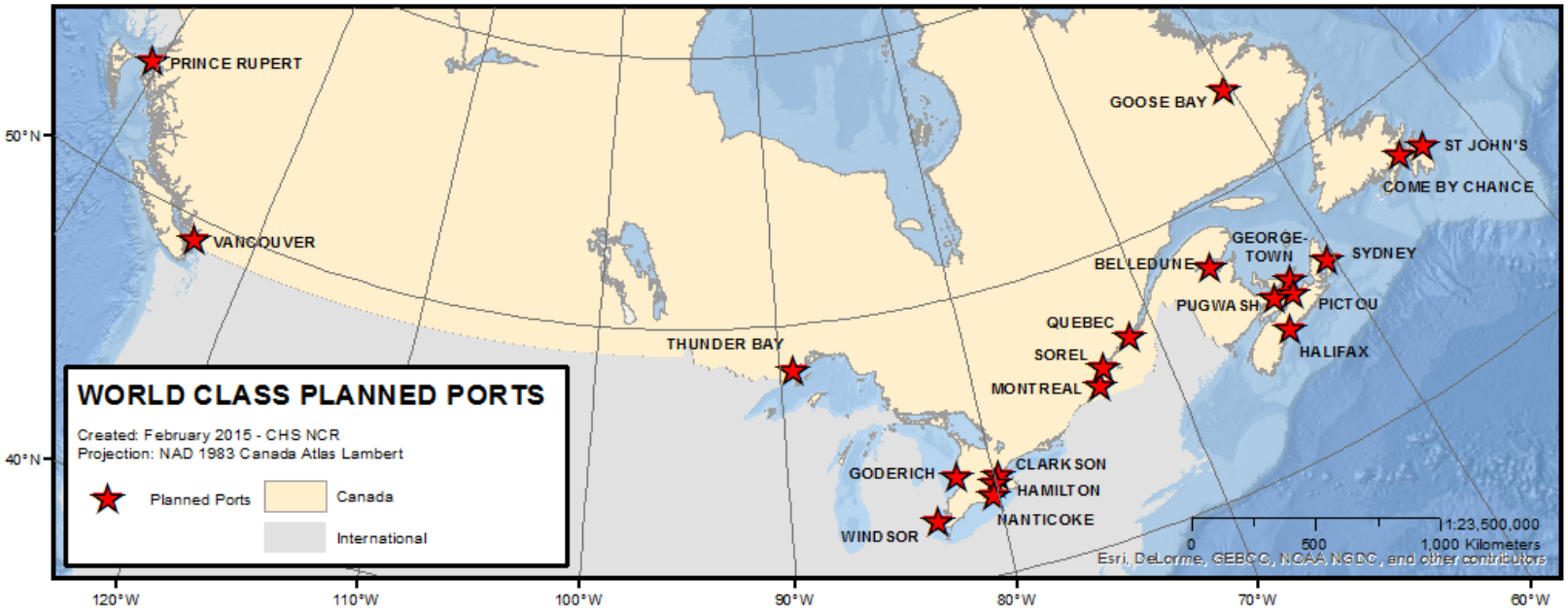
WCTSS

- Phase I focussed on Approaches to Kitimat
  - 20 of the 25 new charts in multiple formats have been released
- Phase II consisted of hydrographic data acquisition and release of new and/or updated Electronic Navigational Charts (ENC) for 20 significant commercial ports and waterways.
  - 13 of 20 ports surveyed, 6 ENCs released.



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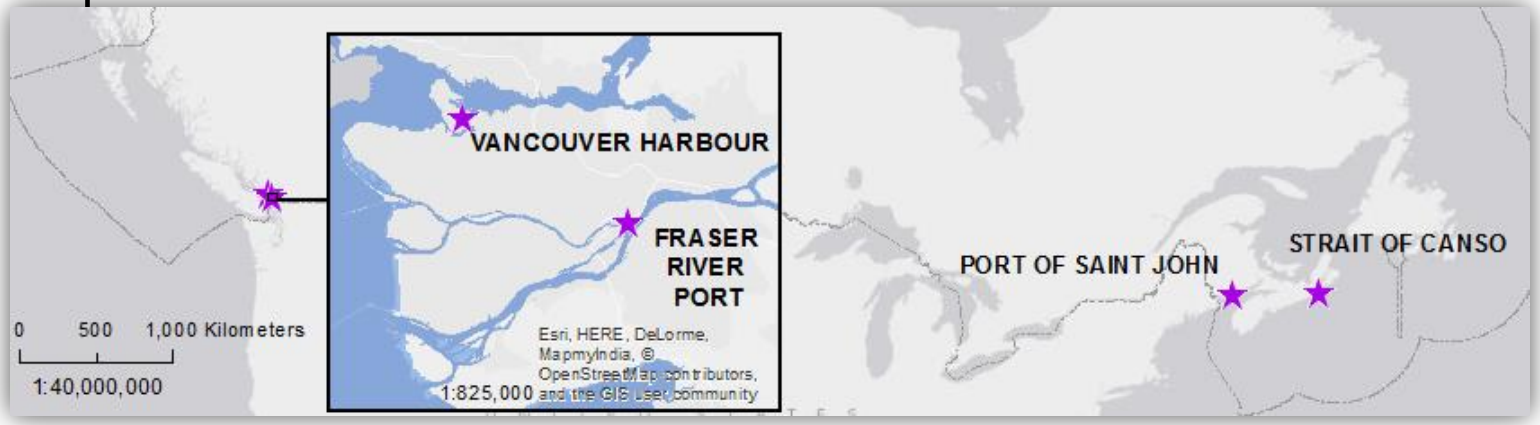
WCTSS Phase II & III

- Four pilot sites for dynamic tides and currents (Tides, Currents and Water Levels instrumentation & data, bathymetry, modelling, next generation service delivery)
- Data collection and development of delivery mechanism ongoing in parallel.



- Intent is to operationalize to include the implementation of the S-100 standard for the next generation of ENC and dynamic data services
- Will extend lessons learned to other sites

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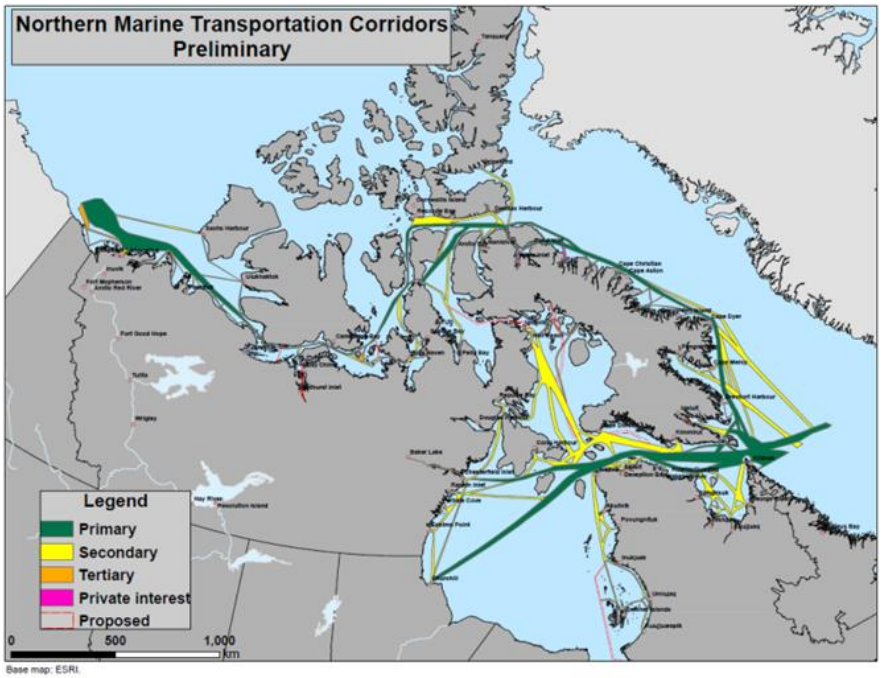
Northern Marine Transportation Corridors (NMTC)

- A framework for Government of Canada departments and agencies to prioritize and coordinate efforts to make best use of limited resources.
  - For CHS, NMTC are used to identify and prioritize areas to survey and chart if dedicated funding becomes available



- CHS, working with CCG and TC, used a GIS approach to identify corridors
- Corridors identified use mainly AIS and CHS nautical charts and publications
  - to aid planning for vessels travelling in NORDREG Zone;
  - includes the Mackenzie River

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Arctic Challenges

- Previously un-accessible areas are opening up
- Infrastructure development relies on modern nautical information and products, which are sparse in most areas.
- October 2014 Commissioner of the Environment and Sustainable Development Audit of Arctic Marine Navigation:
  - Canadian Arctic waters are inadequately surveyed and charted;
  - Capacity to survey and chart the Canadian Arctic waters is limited;
  - Recommended national priority setting and a long-term implementation plan.
- In response:
  - CHS is working with the CCG and the Royal Canadian Navy to outfit more vessels with modern hydrographic survey equipment;
    - WCTSS Phase III is focussed on the installation of multi-beam sonars on four CCG icebreakers to help address Arctic hydrography.
  - Greater multi-departmental and agency collaboration.
  - CHS' NMTC and national prioritization efforts will support these efforts.

CHS' Products and Services

- Modernize Print on Demand (PoD) chart service.
- By June, 2016, all Sailing Directions should be available via PoD.
  - At this time last year 27/34 were available, and currently 30/34 are available.
  - Two small craft guides will be converted to sailing directions next year
- CHS aiming to have a completely electronic publication environment so that access to our data is as effortless as possible
- Move from static to dynamic products for e-Navigation:
  - Surface currents
    - S-111 standard in development for the delivery and presentation of navigationally significant surface current information.
  - High definition bathymetry
    - S-102 standard adopted – software and delivery mechanisms in development

CHS' Products and Services *cont'd*

- Web service for water level observations, data from Permanent Water Level Network gauges of Quebec, Pacific, Atlantic and Central & Arctic http://www.tides.gc.ca/eng/info/WebServicesWLD
  - Additional network stations across the country will be added over time.
- Web services for surface currents: http://www.tides.gc.ca/eng/info/WebServicesMSC

CHS' Near-term Commitments

- Be more **data centric** – improve data management practices & facilitate access to CHS' marine geospatial data
- **Influence and / or lead** international standards development.
- **Increased private sector leveraging** of surveys, printing…
- Create policy on '**controlled crowd sourcing**'
- Establish **innovative pilot projects** to improve services and efficiencies, i.e., satellite-derived bathymetry (SDB) – remote sensing, real time tides, currents and water levels, Autonomous Surface Vehicles (ASVs), etc.
- Increase **liaison/collaboration** with the marine community

Canadian Hydrographic Service

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Boundaries, Limits & Sovereignty
Career Development and Training
Standards and Interoperability
UNCLOS

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Canadian Armed Forces National Presentation

USCHC 39 16 May 2016

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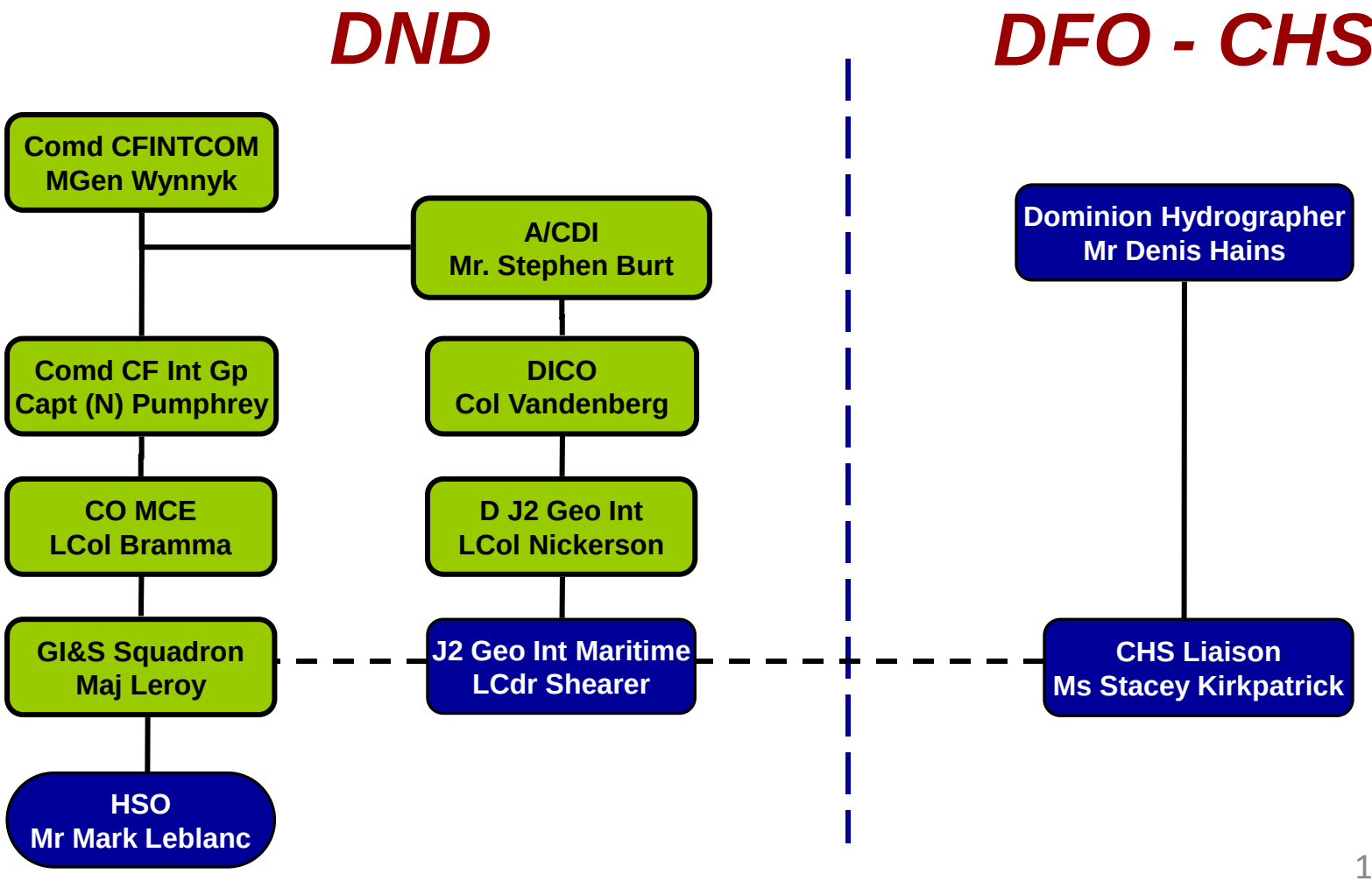
Canada's Maritime GEOINT Structure is split between the Civilian (Canadian Hydrographic Services-CHS) and the Military (Hydrographic Services Office-HSO). CHS provides the hydrographic data to the HSO which is responsible for adding additional military requirements and Chart distribution to the Military users.



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- (July 2016… TBP)

- **Operations Manger (HSO) and NATO LO**
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HSO Capabilities

The Canadian Maritime Digital Production Team is composed of eight staff (three senior and five geomatics technicians), located in Esquimalt, BC and Halifax NS. The Digital Production Team's main tasks include:

- Canadian Pacific and Atlantic AOR domestic AML production.
- NATO AML Co-Production.
- Hydrographic Field Sheets.
- Bathymetry processing and surface generation.
- Littoral Briefing Charts
- Submarine ENCs
- OPAREA Charts
- Paper Charts (3456)
- BSB Raster (3456)
- Digital Response Products (Custom Maps and Charts)
- GeoTIFF Charts (Can be loaded onto WECDIS)
- GeoPDF

2015-2016 HSO products

PRODUCTS	REMARKS	QUANTITY ISSUED 2015-16	
Custom Digital Products In Process or Completed	OPAREA CHARTS / PORT IMAGE MAPS (NEW PRODUCTS / REPRINTS)	53	570
Print-On-Demand (POD) Charts	CDN / NOAA / UKHO	12 768	
Safety of Navigation Notices	Originated by HSO for ship safety	880	
Additional Military Layers (AML)	For use by ships at sea in ECDIS	31	
NACPP AML*	For use by NATO Partners	42	
DNC QA**	QA of contractor deliverables	15	
SubENC	PRODUCTION TO BEGIN 2016-17	0	
Client Orders Processed	RCN / CDN COAST GUARD / RCMP	10 742	

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Current Mar Geo Priority – Arctic

- Canada's most dangerous region for Maritime Ops (<10% surveyed)
- Highest priority charting area
- HMCS MONCTON (2015)
  - R2Sonic Pole Mounted Multi-Beam

Thank you!

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