ARMSDIWG Report (ARHC13-C4)

Current status and planned actions of the ARMSDIWG.

13th Arctic Regional Hydrographic Commission Meeting

05-07 SEP 2023

ARMSDIWG7

- **Meetings**
  - ARMSDIWG 7.1, 14 DEC 2022
  - ARMSDIWG 7.2, 12 APR 2023
  - ARMSDIWG 7.3, 09 AUG 2023
  - Task Lead Meetings

- **Highlights**
  - Work Plan Task Leads
  - Communication Plan
  - Strategy for ARMSDIWG's Engagement with Arctic SDI
  - OGC Federated MSDI Pilot: Phase 3
  - IHO Strategic Plan, Target 2.1 Execution

ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

Work Plan Task Leads

Improved organization and focus areas:

- Task A, **Communication**: Strategy, Collaboration, and Outreach
  - Leads: **DNK** & **USA**
- Task B, **Technical**: Standards and Technology Implementation
  - Leads: **CAN** & **NOR**
- Task C, **Operations**: IHO Strategic Plan, Target 2.1 Execution
  - Leads: **CAN** & **USA**

ARHC
ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

Communication: Strategy, Collaboration, and Outreach

- Communication Plan
  - Schedule

Activity	Frequency	Responsible Party
Submit Yearly Report to ARHC	Yearly (Aug/Sep)	ARMSDIWG Chair
Provide Summary Updates to Arctic SDI	Quarterly	ARMSDIWG Communication Task Leads
Update ARHC Webpage	Semi-Annually	ARMSDIWG Communication Task Leads
Log Interactions/Coordination with External Marine Data Authorities/Organizations	Semi-Annually	ARMSDIWG Communication Task Leads
Review Strategic Documents	Semi-Annually	ARMSDIWG Communication Task Leads

- Cooperation with Arctic SDI
  - At the time of this report, the Arctic SDI is still pausing all official meetings until further notice.
  - Respective national-level counterpart engagement.
  - *Strategy for ARMSDIWG's Engagement with Arctic SDI*
- Web Page: https://iho.int/en/armsdi-wg

ARHC
ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

Technical: Standards and Technology Implementation

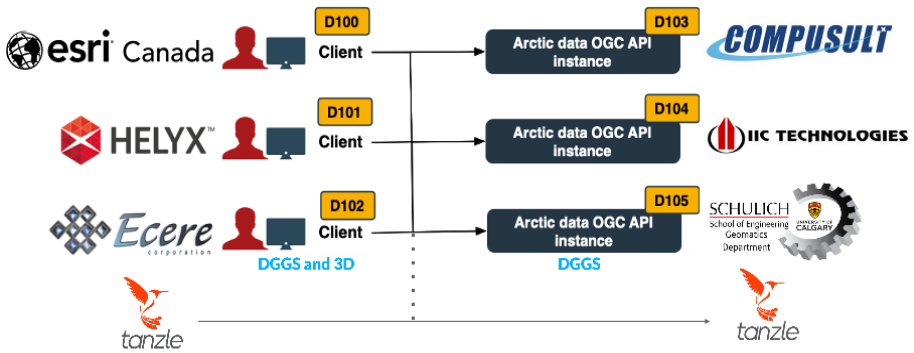
ARHC
ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

Video Demonstrations

Engineering Report

- Concluded in FEB 2023: focused on land/sea use cases in Arctic region and utilized previous work of the **Arctic Voyage Planning Guide (AVPG) under ARHC**, and invited all **ARMSDIWG representatives to participate as observers**.
- **A sea-based, transportation, health and safety scenario** involving an expedition cruise ship, running aground in Kotzebue Sound on the west coast of Alaska. This area included national parks and several Large Marine Ecosystems (LMEs) with challenging navigational conditions. Sub-scenarios demonstrated how technology and data used with **OGC and IHO standards**, such as the **OGC APIs and IHO S-100**, could effectively **aid in decision making during an emergency event.**
- **Despite limited data in the use case area**, all participants were **successful in implementing their respective server or client component**. The available **engineering report** and **video demonstrations** documented and showcased how data can be discovered, accessed, used, and reused, shared, processed, analyzed, and visualized using **OGC APIs, IHO S-100 data, Discrete Global Grid Systems (DGGS)**, as well as identifying gaps experienced and future recommendations for **Digital Twins of the Arctic**.

Area of interest and grounded expedition ship

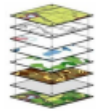


Participants and their roles

ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

Federated Marine SDI Pilot – Phase 3: Emergency Response to an Expedition Ship Running Aground in Alaska

Data Sources



Geospatial Feature Data / Coverages / Maps and Other GIS Data

Earth Observation

Sensors

Land / Sea Data:

from distributed infrastructures in a variety of formats and standards

S-100 Framework Data:

- S-101 Electronic Nautical Chart (ENC)
- S-102 Bathymetric Surface
- S-104 Water Level Information
- S-111 Surface Currents
- S-122 Marine Protected Areas
- S-201 Aids to Navigation
- Others

Land/Sea Data: from Distributed Infrastructures

- Hydrographic
- Meteorology
- Nautical Charts
- Ocean Currents
- Vessel Traffic
- Topography
- Land Cover
- Optical and radar imagery
- Marine / Terrestrial Ecosystems
- Arctic Map of Permafrost

Data Providers

NOAA | NGA | NASA | State of Alaska | USGS | FAA | NSIDC | Others

Internet

Fusion / Ingestion Servers

D103 COMPUSULT

D104 IIC TECHNOLOGIES

D105 SCHULICH School of Engineering Geomatics Department, University of Calgary — DGGS

tanzle

Interfaces

- OGC API Features
- OGC API Coverages
- OGC API DGGS
- OGC WMS

Other Web Services

WFS
WMS

Local Files

Raster Data
Vector Data
Tabular Data

Internet

Visualization / Analysis Tools & Applications

D100 esri Canada

D101 HELYX

D102 Ecere corporation — DGGS + 3D

tanzle

Arctic Voyage Planning Guide

Themes

Open Geospatial Consortium

End Users

SAR / First Responders

Ship Passengers & Crew
Ship Owner

Governments

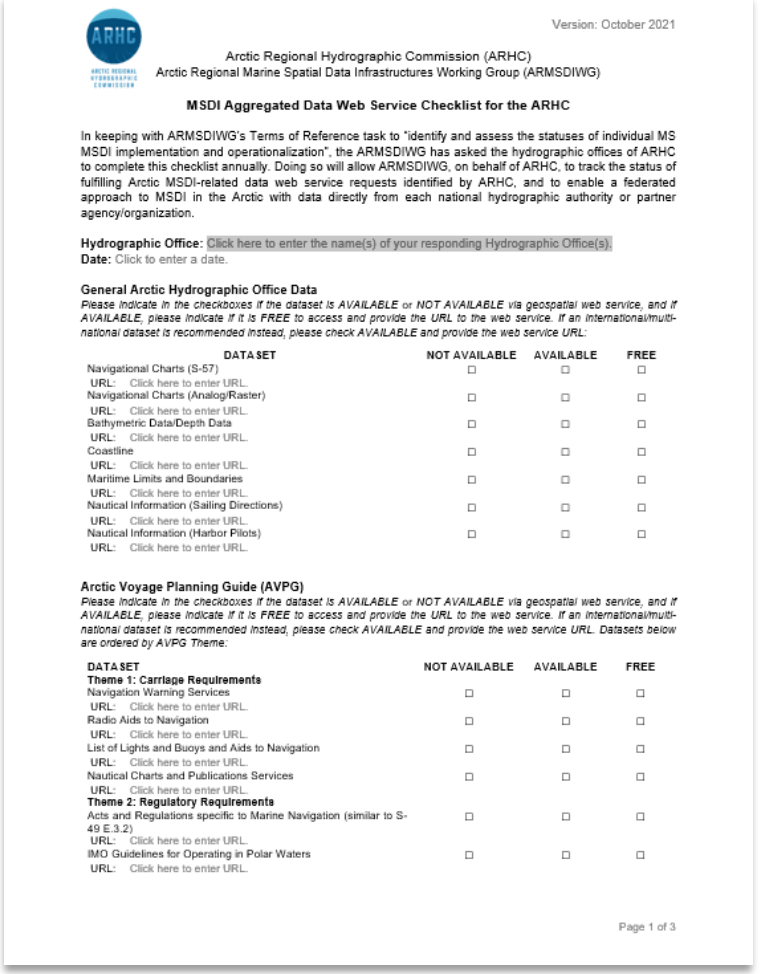
Environmental Monitoring

Communities

Indigenous Peoples

Operations: IHO Strategic Plan, Target 2.1 Execution

- ARMSDIWG reps will continue to participate in IHO MSDIWG to understand IRCC's guidance on thematic layers that should be contributed to the existing IHO GIS infrastructure, for the Arctic region, to assist in implementation of IHO Strategic Plan, Target 2.1.
- Previously, at ARHC 11, ARMSDIWG provided a MSDI Aggregated Data Web Service Checklist for the ARHC, which could still serve a guide, or furthermore, an annual checklist, if accepted by ARHC MS as an annual document for submittal along with Member State national.
- This checklist could also be revised with respect to support the targets of UN Sustainable Development Goal (SDG) #14 in the Arctic region through the goal of sharing core, marine/maritime, spatiotemporal data that is reusable, as defined in ARMSDIWG's Terms Of Reference.



Version: October 2021

Arctic Regional Hydrographic Commission (ARHC)
Arctic Regional Marine Spatial Data Infrastructures Working Group (ARMSDIWG)

MSDI Aggregated Data Web Service Checklist for the ARHC

In keeping with ARMSDIWG's Terms of Reference task to "identify and assess the statuses of individual MS MSDI implementation and operationalization", the ARMSDIWG has asked the hydrographic offices of ARHC to complete this checklist annually. Doing so will allow ARMSDIWG, on behalf of ARHC, to track the status of fulfilling Arctic MSDI-related data web service requests identified by ARHC, and to enable a federated approach to MSDI in the Arctic with data directly from each national hydrographic authority or partner agency/organization.

Hydrographic Office: Click here to enter the name(s) of your responding Hydrographic Office(s).
Date: Click to enter a date.

General Arctic Hydrographic Office Data

Please indicate in the checkboxes if the dataset is AVAILABLE or NOT AVAILABLE via geospatial web service, and if AVAILABLE, please indicate if it is FREE to access and provide the URL to the web service. If an international/multi-national dataset is recommended instead, please check AVAILABLE and provide the web service URL:

DATA SET	NOT AVAILABLE	AVAILABLE	FREE
Navigational Charts (S-57)	☐	☐	☐
URL: Click here to enter URL.			
Navigational Charts (Analog/Raster)	☐	☐	☐
URL: Click here to enter URL.			
Bathymetric Data/Depth Data	☐	☐	☐
URL: Click here to enter URL.			
Coastline	☐	☐	☐
URL: Click here to enter URL.			
Maritime Limits and Boundaries	☐	☐	☐
URL: Click here to enter URL.			
Nautical Information (Sailing Directions)	☐	☐	☐
URL: Click here to enter URL.			
Nautical Information (Harbor Pilots)	☐	☐	☐
URL: Click here to enter URL.			

Arctic Voyage Planning Guide (AVPG)

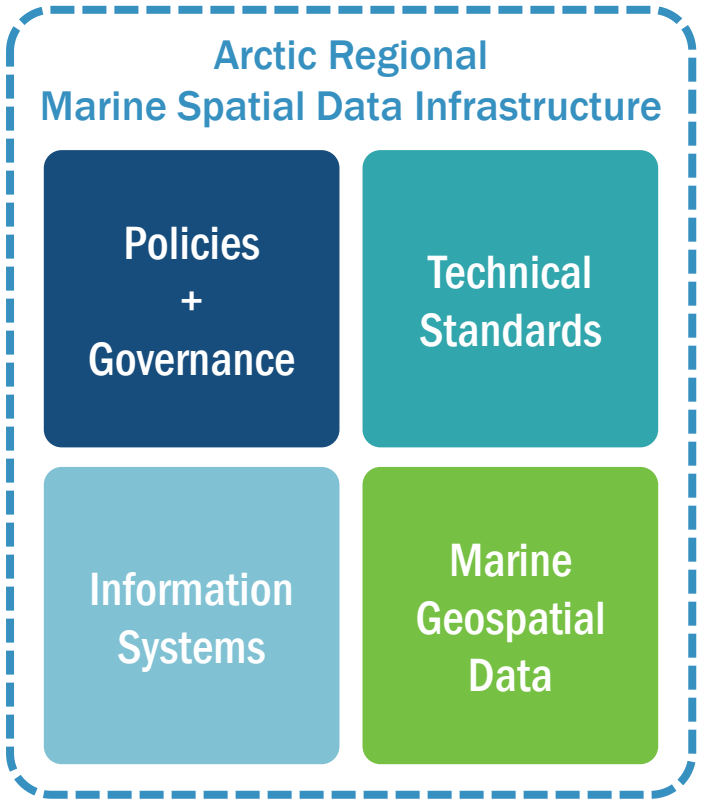
Please indicate in the checkboxes if the dataset is AVAILABLE or NOT AVAILABLE via geospatial web service, and if AVAILABLE, please indicate if it is FREE to access and provide the URL to the web service. If an international/multi-national dataset is recommended instead, please check AVAILABLE and provide the web service URL. Datasets below are ordered by AVPG Theme:

DATA SET	NOT AVAILABLE	AVAILABLE	FREE
Theme 1: Carriage Requirements			
Navigation Warning Services	☐	☐	☐
URL: Click here to enter URL.			
Radio Aids to Navigation	☐	☐	☐
URL: Click here to enter URL.			
List of Lights and Buoys and Aids to Navigation	☐	☐	☐
URL: Click here to enter URL.			
Nautical Charts and Publications Services	☐	☐	☐
URL: Click here to enter URL.			
Theme 2: Regulatory Requirements			
Acts and Regulations specific to Marine Navigation (similar to S-49 E.3.2)	☐	☐	☐
URL: Click here to enter URL.			
IMO Guidelines for Operating in Polar Waters	☐	☐	☐
URL: Click here to enter URL.			

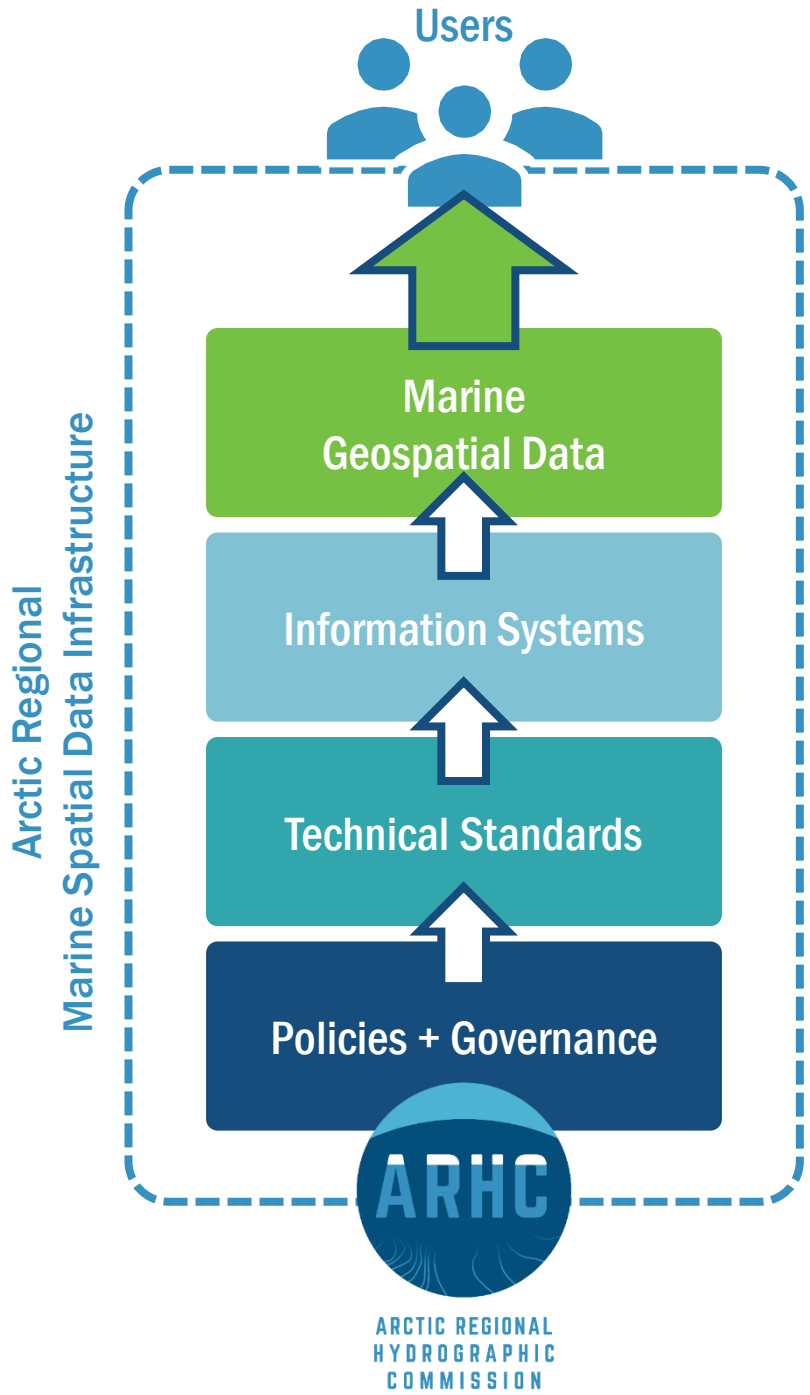
Page 1 of 3

ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

ARCTIC REGIONAL HYDROGRAPHIC COMMISSION



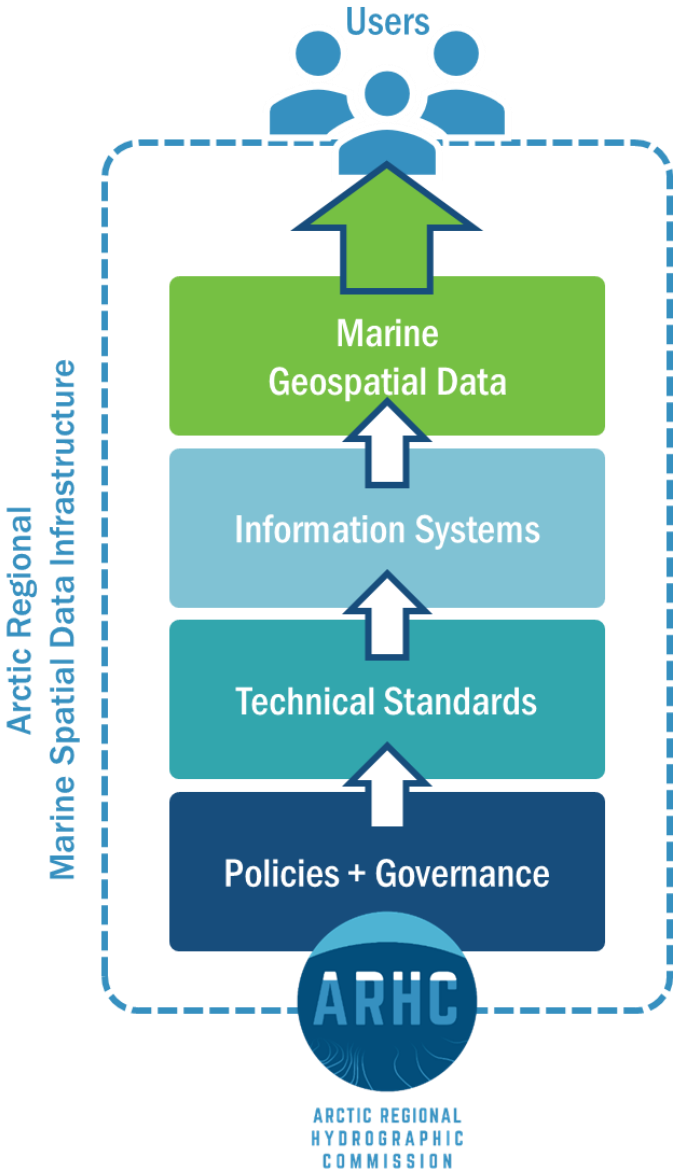
ARCTIC REGIONAL HYDROGRAPHIC COMMISSION



ARHC
ARCTIC REGIONAL
HYDROGRAPHIC
COMMISSION

Invited Actions of ARHC

- Take note of the report.
- Take note of the ARMSDIWG Communication Plan 2023-2026 provided in Annex A.
- Take note of the Strategy for ARMSDIWG's Engagement with Arctic SDI in Annex B.
- Reconsider revising and utilizing the MSDI Aggregated Data Web Service Checklist for the ARHC, to help implement IHO Strategic Plan, Target 2.1 from an Arctic regional perspective.
- Select a new ARMSDIWG Chair in accordance with ARMSDIWG Terms Of Reference.
- Take action as seen appropriate.



ARHC
ARCTIC REGIONAL
HYDROGRAPHIC
COMMISSION