



**ARCTIC
SDI** Arctic Spatial
Data Infrastructure

Arctic Spatial Data Infrastructure

Enabling Access to Arctic Location-Based Information

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arctic-sdi.org

Arctic Regional Hydrographic Commission
Open Forum 2018

Stakeholder needs requirements

Arctic Council Working Groups

- Digitalized data
- Easy access to data in general
- Easy access to specific data sets
- Data to be interoperable
- Guidance and tools



Stakeholder needs requirements

Agreement on Enhancing International Arctic Scientific Cooperation (May 2018)

- the agreement aims to improve use of existing infrastructure that were previously unavailable; ... promote sharing of data and metadata...





← → ↻ Turvallinen | https://geoportal.arctic-sdi.org



Arctic Spatial
Data Infrastructure

SEARCH

MAP LAYERS

SELECTED LAYERS

MY DATA

MAP PUBLISHING

MAP LEGENDS

A: MAP LAYERS

LAYER RIGHTS

ADMINISTRATION

A: USERS

Home

Map

Layers

Tools

[Account](#)

[Logout](#)

Map Legends

Sea ice amphipod total abundances

Total abundance

- 0
- 1
- 50
- 500
- 1000
- 2000

Average September sea ice extent 1979

Average sept. 1979

Arctic SDI Geoportal

Coordinates

Type coordinates or click a point on the map.

North Pole LAEA Europe coordinates

N: 1535079

E: -52523

☐ Show mouse cursor coordinates

Center map

Add marker

Arctic SDI Geoportal

- Easy access to geospatial data and standardized services
- geoportal.arctic-sdi.org



Provided Directly
from the
**8 Arctic National
Mapping Agencies**

5 km
2 mi

Terms of Use Data Sources



Arctic SDI Basemap

- Based directly on data from the National Mapping Agencies of the 8 Arctic countries
- Deliver images to any client supporting OGC WMTS 1.0
- Available in six rotations of the North Pole Lambert Equal Area Projection



Circumpolar Gazetteer

The screenshot displays the Arctic Spatial Data Infrastructure (SDI) website. The main navigation bar includes 'Strategic Documents - Arctic SDI' and 'Arctic SDI - Geoportal'. The left sidebar contains links for 'ARCTIC SDI', 'Arctic Spatial Data Infrastructure', 'SEARCH', 'MAP LAYERS', 'SELECTED LAYERS' (with 8 items), 'MY DATA', 'MAP PUBLISHING', 'MAP LEGENDS', and 'USER GUIDE'. The main content area features a search interface with a 'Location search' tab selected. The search input field contains 'longyearbyen', and the results show 3 items. A table lists the search results:

Placename	Region	Type
Longyearbyen	Greenland	Other populated places
Longyearbyen	Norway	Populated places
Longyearbyen	Greenland	Natural terrain areas or regions


Below the table, a text overlay states: 'Provided Directly from the 8 Arctic National Mapping Agencies'. A search results popup is visible on the right, showing 'Longyearbyen' and 'Norway Populated places' with a 'Close' button. The background is a topographic map of the Arctic region, showing various geographical features and place names like 'Grum' and 'ord'. A scale bar indicates 5 km. The bottom of the page includes links for 'Terms of Use' and 'Data Sources'.

Arctic SDI Gazetteer Service

- Using authoritative Mapping Agency data
- Standard Compliance OGC Web Feature Service Gazetteer Application Profile (WGS-G)
- Over 2.5 million place names



Metadata Search



SEARCH

MAP LAYERS

SELECTED LAYERS 4

MY DATA

MAP PUBLISHING

MAP LEGENDS

USER GUIDE

1000 km

[Terms of Use](#)
[Data Sources](#)

Search

Location search

Metadata Search

Search Results

Name

Land Water Mask (publication:2014-12-16, update frequency: unknown)

Drinking Water Advisories in First Nations Communities

Trends in water temperature and salinity (a) and density of phytoplankton

Local water quantity in Canadian rivers - Water quantity at monitoring stations in Canada

North America Surface Water Values

Water quality in Canadian rivers - Water quality at monitoring sites, Canada

USGS Watershed Boundary Dataset (WBD) Overlay Map Service from The National Map of Canada

USGS Hydrography (NHD) Overlay Map Service from The National Map of Canada

National Long-term Water Quality Monitoring Data

Releases of harmful substances to water - Releases of mercury to water by the Government of Canada

Releases of harmful substances to water - Releases of lead to water by the Government of Canada

Land and Water Area by Province/Territory and Ecozone

Land and Water Area by Province/Territory and Ecoregion

Metadata

Trends in water temperature and salinity (a) and density of phytoplankton.

Basic information

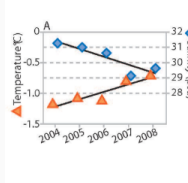
ISO 19115 metadata

Inspire metadata

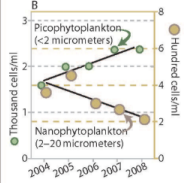
Data quality

Actions

A



B



TRENDS IN WATER TEMPERATURE AND SALINITY (A) AND DENSITY OF PHYTOPLANKTON.

ABSTRACT TEXT (DATA)

Trends in water temperature and salinity (A) and density of phytoplankton of two size ranges (B), Canada Basin, 2004 to 2008.

Stratification of the water column increased throughout the Canada Basin over a recent five-year period, accompanied by a change in phytoplankton communities. The upper ocean layer showed trends of increased temperature and decreased salinity (Figure 18A), which combine to make this layer progressively less dense. The layer of water below this did not change in density over this period (not shown). The larger size class of phytoplankton (which would include diatoms) decreased in abundance, while the smaller types of plankton increased (Figure 18B). In addition to the trends shown, nutrient content in the upper ocean water layer decreased. Abundance of microbes (bacteria and similar organisms) that subsist on organic matter increased. Total phytoplankton biomass, however, remained unchanged.

If this trend towards smaller species of phytoplankton and microbes is sustained, it may lead to reduced production of

10

Metadata Search

Machine Discovery Service API

- Build on GeoNetwork 2.6
- Standard Compliance OGC CSW API v/2.0.2 and ISO 19115/19139





SEARCH

MAP LAYERS

SELECTED LAYERS 4

MY DATA

MAP PUBLISHING

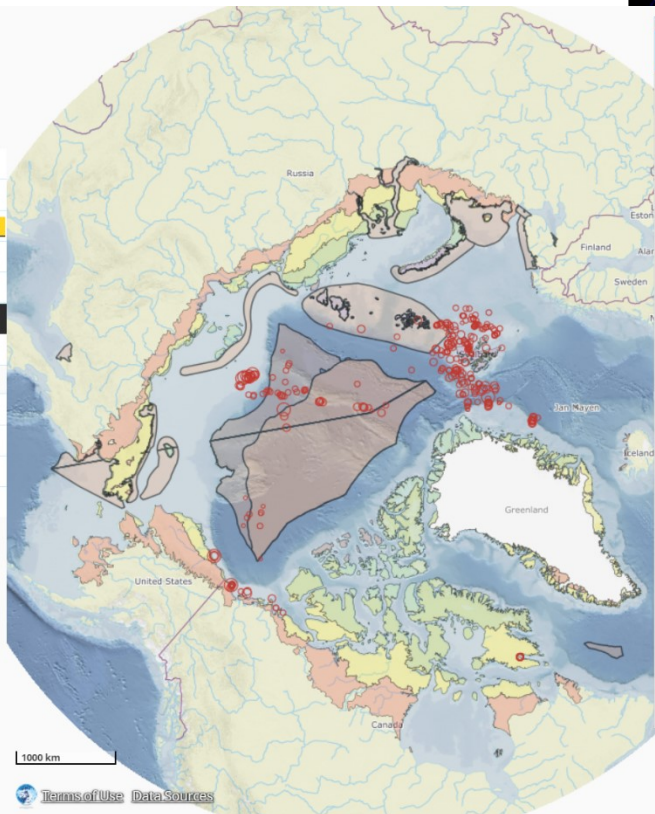
MAP LEGENDS

USER GUIDE



[Register](#)

[Login](#)



Map Legends

▼ Sea ice amphipod total abundances



Total abundance

- 0
- 1
- 50
- 500
- 1000
- 2000

▼ Arctic Ecologically and Biologically Significant Areas



EBSAs



▼ Circumpolar Bioclimate Subzones



Circumpolar Bioclimate Subzones

- Subzone A
- Subzone B
- Subzone C
- Subzone D
- Subzone E
- None Arctic
- Greenland Glacier

▼ Arctic SDI Topographic Basemap

default

- | | | |
|---------------------------|--------------------|--------------------------|
| ○ Populated places | ● Railway stations | --- Soil surface regions |
| — National boundaries | ● Ports | --- Moraines |
| — Sub-national boundaries | ● Seaplane bases | --- Soil surface regions |
| □ Protected sites | ● Heliports | --- Moraines/story |
| | | --- Soil surface regions |

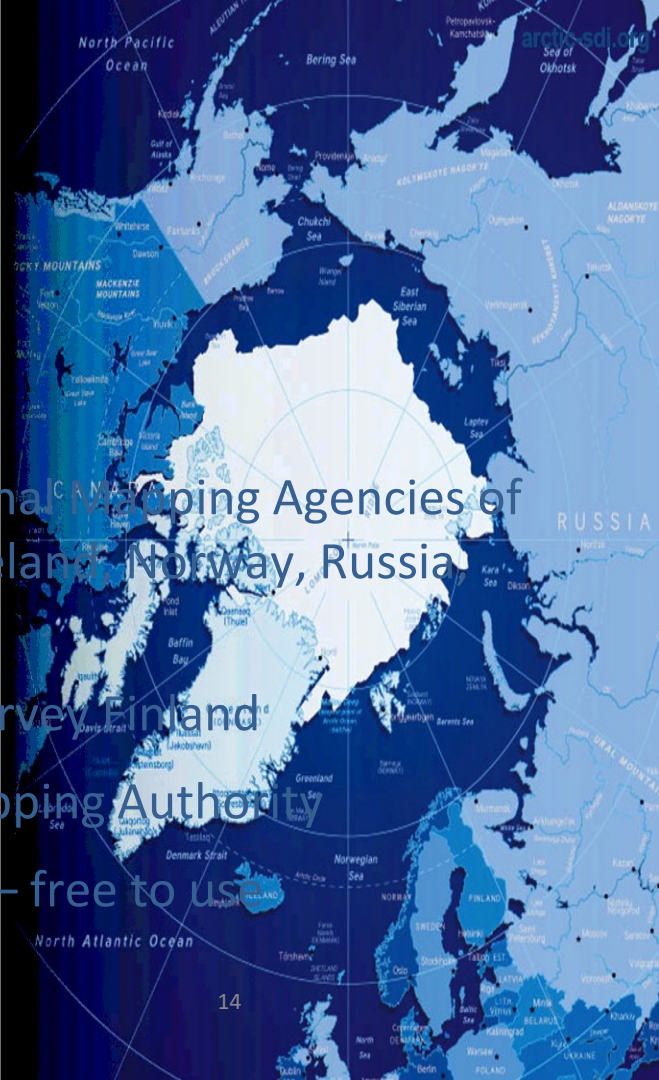
Access to selected data sets and tools to make maps

- Thematic data sets (Environment, Biodiversity, climatology, boundaries
- Arctic DEM (Digital Elevation Model, Polar Geospatial Center)
- Create and publish embedded maps to for websites
- Time series



Arctic SDI Geoportal

- A cooperation between National Mapping Agencies of Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and USA
- Operated by National Land Survey of Finland
- Hosted by the Norwegian Mapping Authority
- Oscari Open Source software – free to use



Why the Arctic SDI

- Guide the development of an Arctic Spatial Data Infrastructure
- Develop Arctic Basemap, services and tools through the Arctic SDI Geoportal
- Board – General Directors of Mapping Agencies
- Partners – Norwegian Polar Institute and IHO / Arctic Regional Hydrographic Commission
- Report to the Senior Arctic Officials meetings



Who is behind the Arctic SDI

- National Resources **Canada**
- Agency for Data Supply and Efficiency **Denmark**
- National Land Survey of **Finland**
- National Land Survey of **Iceland**
- **Norwegian** Mapping Authority
- Federal Service for State Registration, Cadastre and Mapping of the **Russian** Federation
- **Swedish** Mapping and Land Registration Authority
- **United States** Geological Survey



Partnering with Arctic Council

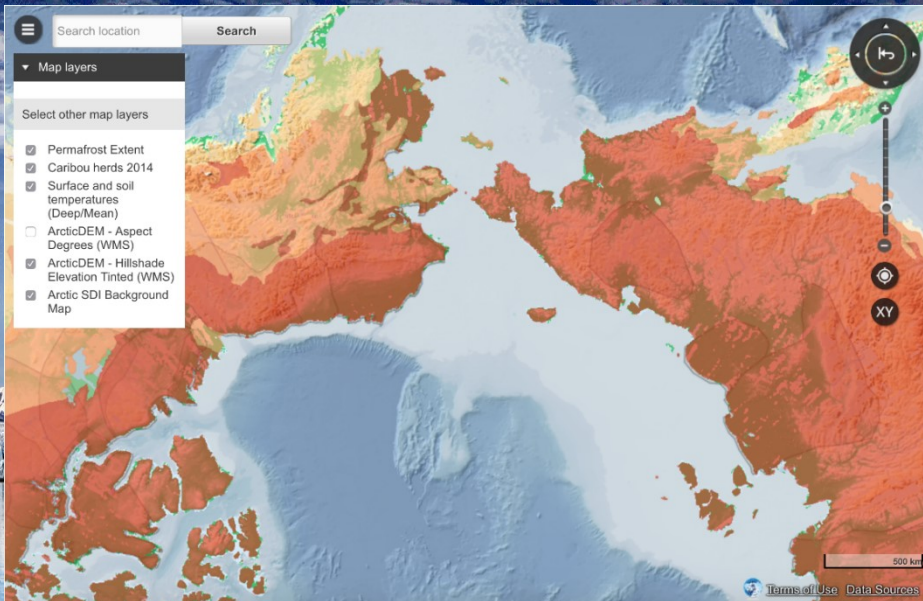
Enhance Data Management Best Practices across Working Groups

Regular dialog with Arctic
Council

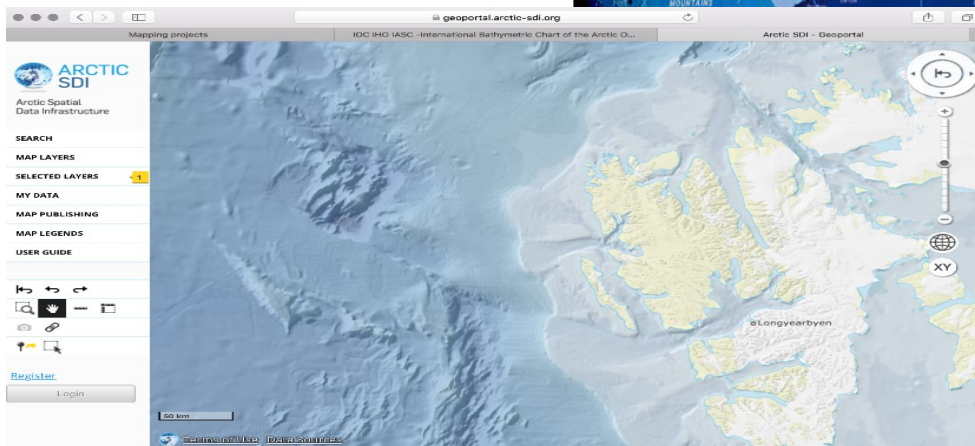
- Biannual Reporting
through CAFF

Incorporation of SDI
standards into published
data products

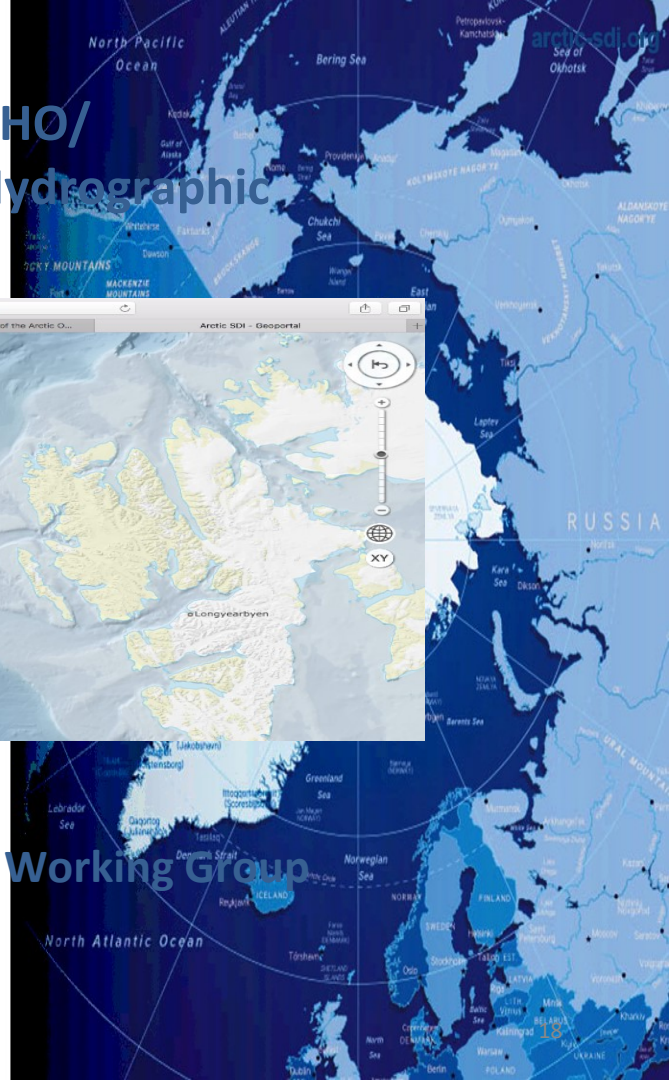
- Using Arctic SDI Geoportal to enable customized embedded maps



Partnering with IHO/ Arctic Regional Hydrographic Commission



Arctic Regional Marine SDI Working Group





SDI Manual for the Arctic

Provide Guidelines & Best Practices

- **Data Management and Sharing**
- **Standardization**
- **Guidelines for Data Providers**

International alignment

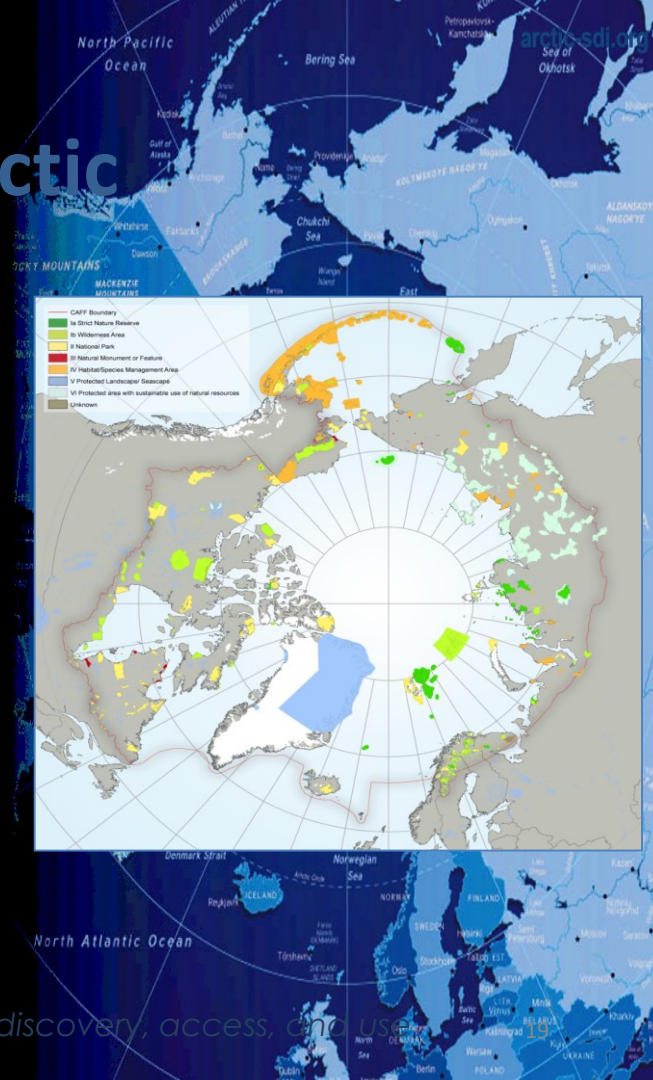
UN-GGIM

ISO

OGC

IHO

Increased efficiency and improved discovery, access, and use





Strategic Documents

Who and What is the Arctic SDI?

- [2015-2017 Biennial Report](#): Highlights from the US Chairmanship
- [Arctic SDI Fact Sheet 2016](#)

Governing Documents

- [Signed Memorandum of Understanding](#)
 - English, French, and Russian version
- [Arctic SDI Governance](#) v2.0

Arctic SDI Strategic Plan Documents

- [Strategic Plan 2015-2020](#)
- [Implementation Plan](#)
- [Roadmap](#)

Arctic Spatial Data Pilot

- [Open Geospatial Consortium Spatial Data Pilot](#) with data intensive scenario based videos and a Final Engineering Report

Pan-Arctic Digital Elevation Model

- [ArcticDEM – Arctic SDI Board Position Statement](#)
 - [Polar Geospatial Center ArcticDEM Documentation](#)

Arctic SDI Documentation

- [SDI Manual for the Arctic with Glossary of Terms](#)
 - Guidance and information management good practices on commonly accepted SDI operational policies and standards.
 - Audiences: strategic decision makers, data providers, distributors and end users of Arctic data
- [Arctic SDI Glossary of Terms](#)
 - A living glossary providing terms, acronyms, definitions and sources
- [Arctic SDI Evaluation](#)
 - [Arctic SDI Evaluation Report](#)
 - [Arctic SDI Evaluation Framework](#)
 - [Arctic SDI Evaluation and Benchmarking presentation](#)



Arctic SDI Historical Framework

- [Arctic-SDI-Framework-Document_V2 0](#)

Arctic SDI Video on YouTube



arctic-sdi.org

Arctic SDI Fact Sheet



GEOSPATIAL DATA – A TOOL FOR BETTER INFORMED DECISIONS AND MORE EFFICIENT ADMINISTRATION IN THE ARCTIC

Improved access to geospatial data can help us better to predict, understand and react to changes in the Arctic. Responses to the impact of climate change and human activities in the Arctic requires accessible and reliable data to facilitate monitoring, management, emergency preparedness and decision making.

Important data sets are produced and distributed by many stakeholders – public and private sector – and most of it can be geographically referenced. A spatial data infrastructure provides tools for data distributors to ensure that their geospatial data is easier for users to access, validate and combine with other data.

The Arctic SDI provides such an infrastructure and its development is facilitated by the National Mapping Agencies of the eight Arctic countries.

The Arctic SDI Geoportal and the initial Arctic SDI Reference Map – the basic building blocks in the Arctic Spatial Data Infrastructure are available

• The Arctic SDI Geoportal providing a web map viewer for use by any interested user to access the Reference Map. More details are available at arctic-sdi.org



Arctic SDI Geoportal in the