



ARCTIC
SDI Arctic Spatial
Data Infrastructure

**Presented at the FIG Working Week 2017,
May 29 - June 2, 2017 in Helsinki, Finland**

Arctic Spatial Data Infrastructure

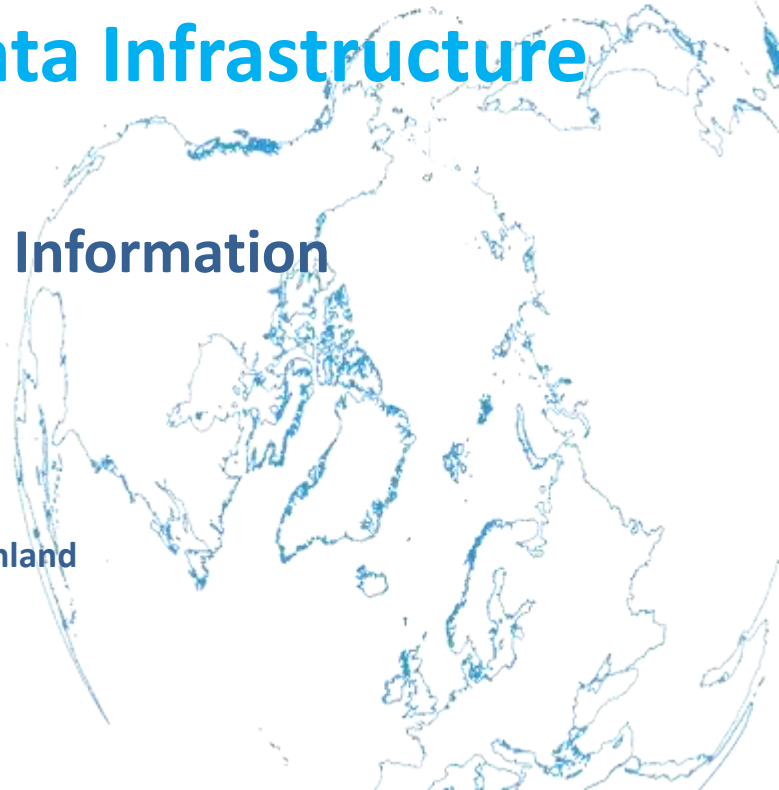
Enabling Access to

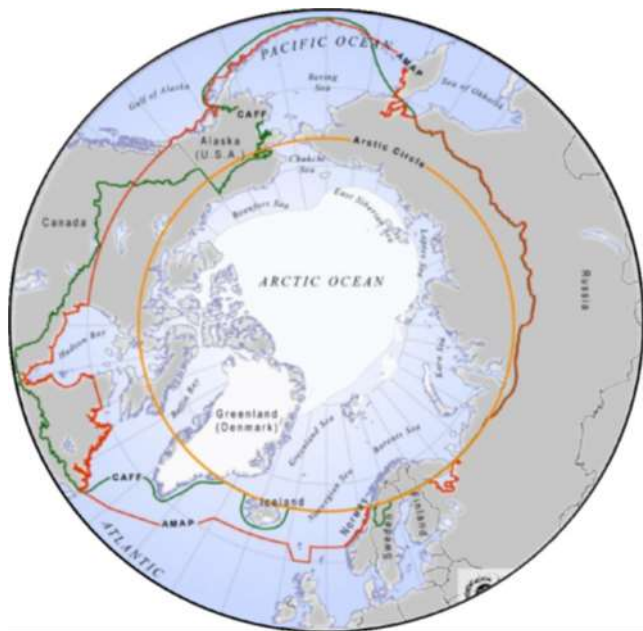
Arctic Location Based Information

Arvo Kokkonen

National Land Survey of Finland

FIG Working Week 2017, Helsinki, Finland





Arctic SDI is based on voluntary commitments by the National Mapping Agencies from 8 countries that border the Arctic Circle

There is a signed MoU towards cooperative development of an Arctic SDI.



Participating Countries

Canada
Norway
Finland
Russia



Denmark
Sweden
USA
Iceland

USGS, Chair 2015-2017

NLS FI, Chair 2017-2019

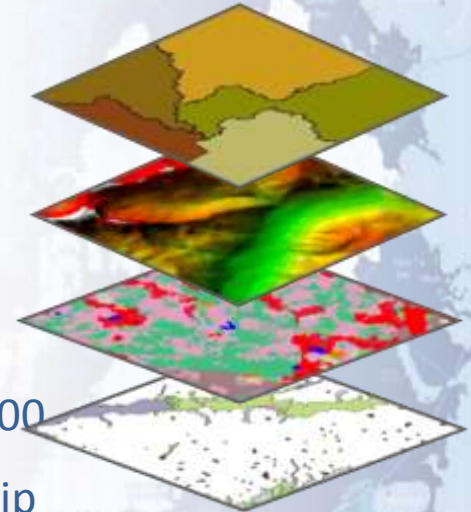


- Earth Sciences Sector of the Department of Natural Resources Canada
- Danish Agency for Data Supply and Efficiency
- National Land Survey of Finland
- National Land Survey of Iceland
- Norwegian Mapping Authority
- Federal Service for State Registration, Cadastre and Mapping of the Russian Federation
- Swedish Mapping, Cadastral and Land Registration Authority
- U.S. Geological Survey

Main Content of the Arctic SDI

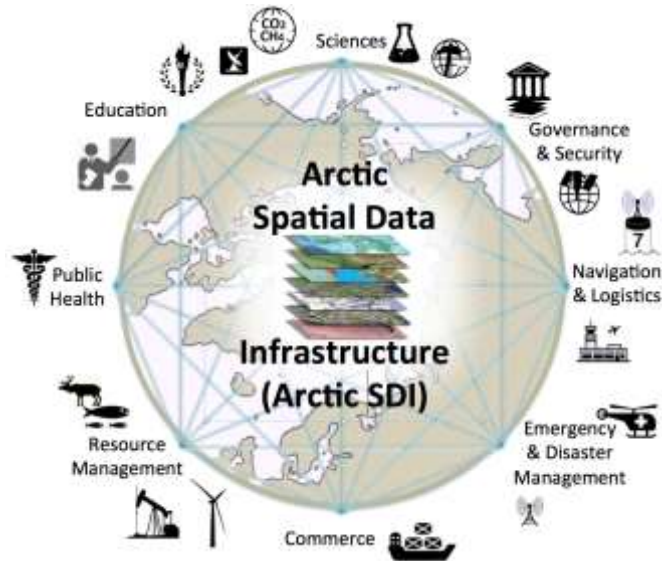
The Arctic SDI is an infrastructure that provides a web portal with easy access to:

- A geoportal for geospatial data viewing and discovery
- A searchable metadata catalogue
- Authoritative reference data as a Web Map Service (WMS) 1:250.000
- Thematic data (birds, icecover, ship routes, land cover change, flora etc.)



A Collaborative Model in the Arctic SDI

- Working with stakeholder organizations to make their key data available, with a focus on the Arctic Council
- Understanding the needs and requirements of stakeholders
- Information Management best practices (lifecycle of geospatial data)
- Open standards and interoperability
- Helping data contributors and users understand how to participate



Capacity Building

SDI Manual for the Arctic with guidelines & practices for

- Data management and sharing
- SDI development
- Standardization guidelines
- Efficient monitoring and decision making
- Key Performance Indicators
- Evaluation once in two years

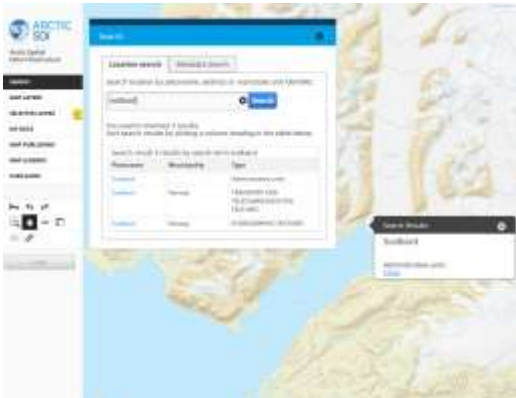


Data Resources

- Pan-Arctic Digital Elevation Map
- Gazetteer Database and Search
- Arctic Reference Basemap
- Marine Data



Pan-Arctic DEM



Gazetteer search



Shaded relief for depths⁸

Authoritative Reference Basemap



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

- **Common Cartographic Specification**
- **A Trusted Source of Detailed Information**



Arctic Spatial Data Infrastructure

SEARCH

MAP LAYERS

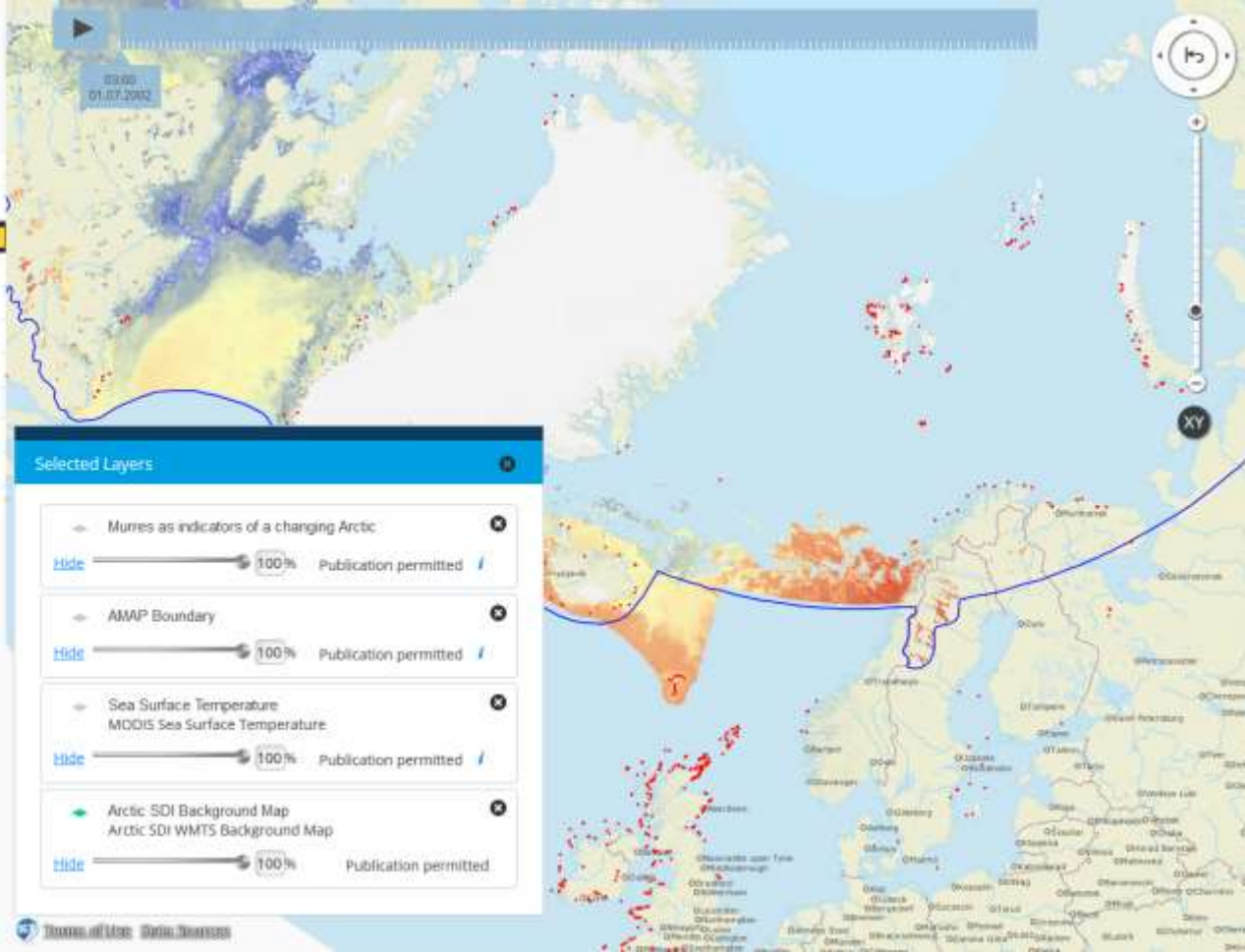
SELECTED LAYERS **4**

MY DATA

MAP PUBLISHING

MAP LEGENDS

USER GUIDE



Selected Layers

- ◀ Murren as indicators of a changing Arctic ✕

Hide 100% Publication permitted !
- ◀ AMAP Boundary ✕

Hide 100% Publication permitted !
- ◀ Sea Surface Temperature
MODIS Sea Surface Temperature ✕

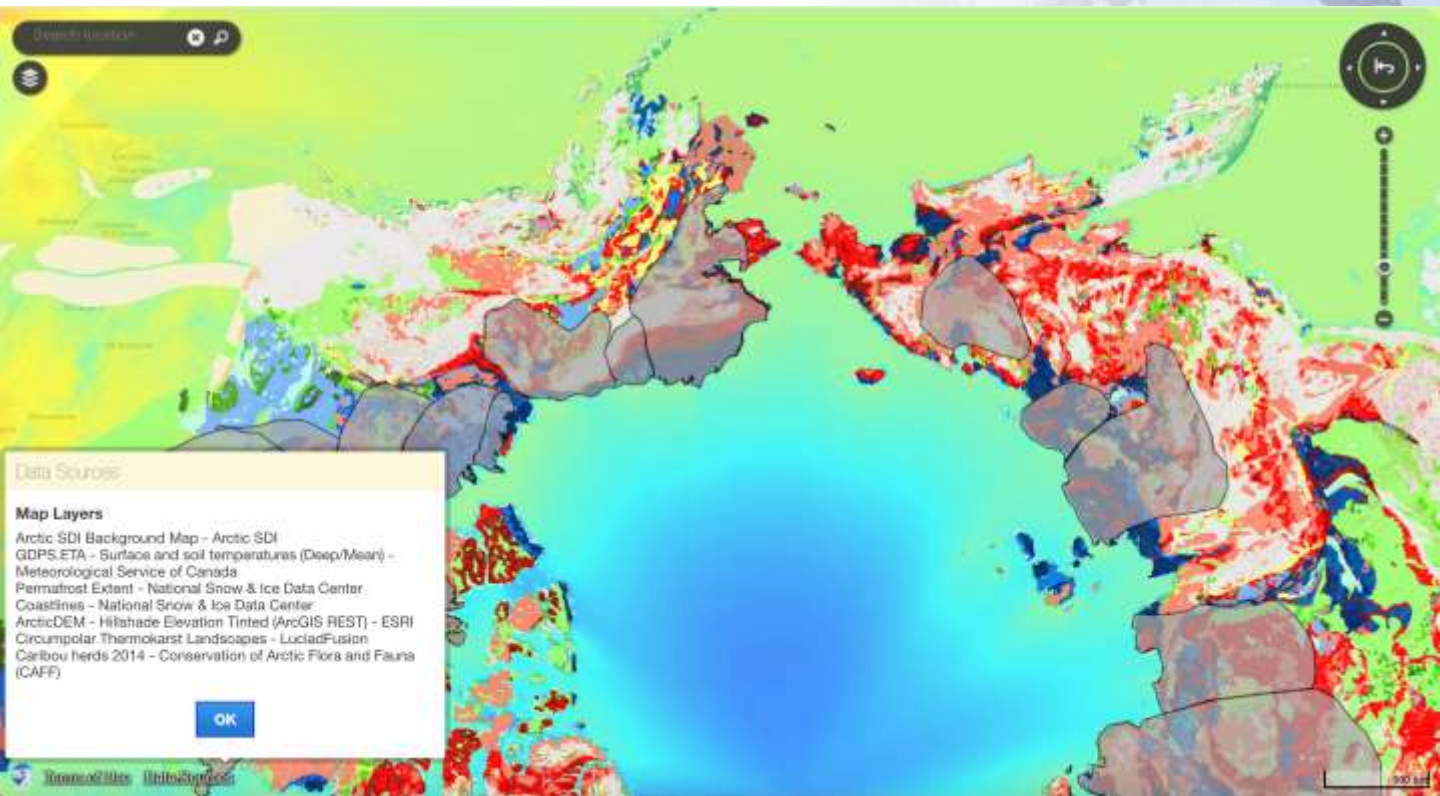
Hide 100% Publication permitted !
- ▶ Arctic SDI Background Map
Arctic SDI WMTS Background Map ✕

Hide 100% Publication permitted

Oskari – Geoportal for ASDI

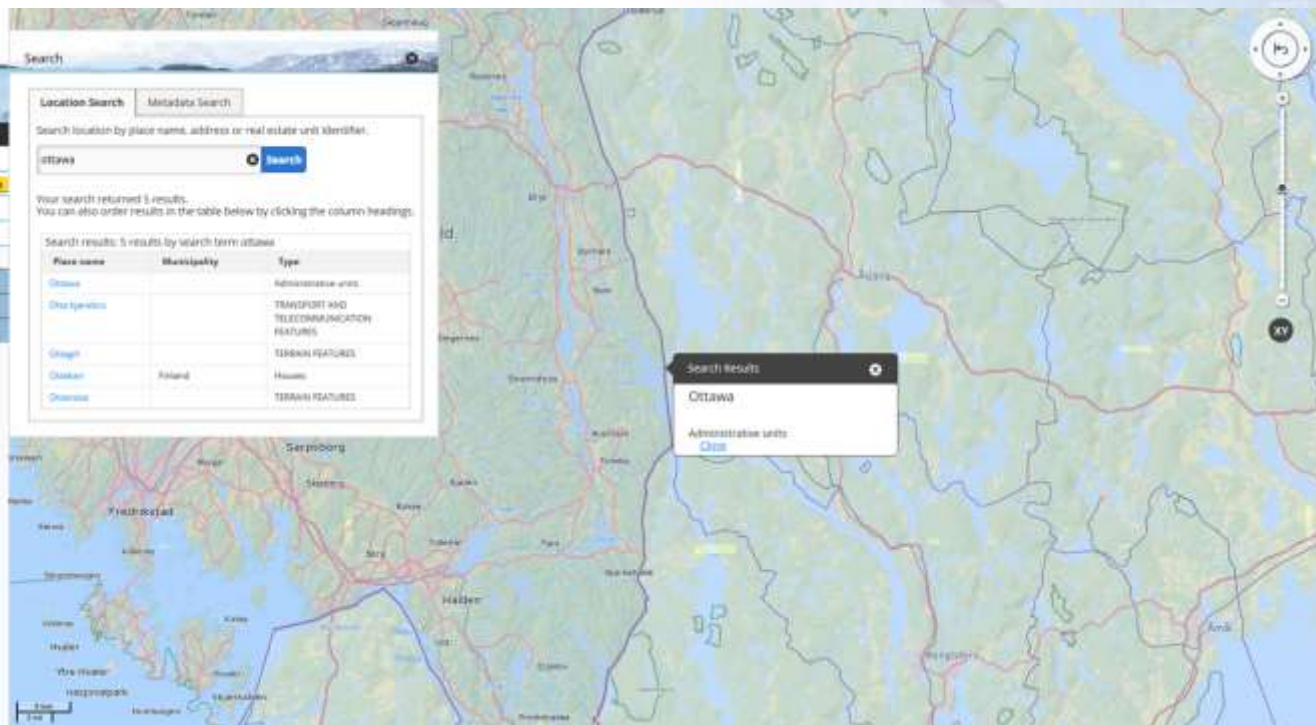
- Open Source Framework for Geoportals
- Easy-to-use tools for using Distributed SDI's like Arctic SDI, INSPIRE and European Location Framework (ELF)
- Access to OGC standard API's
- Embedded Maps Tool and Integration API - like Google maps with rich SDI content
- Time Series Data Visualization
- Thematic Mapping with Statistical Information

Example of an Embedded Map



From Arctic Spatial Data Pilot

Gazetteer Search



The screenshot displays the Arctic SDI Gazetteer Search interface. On the left, a sidebar contains navigation options: SEARCH, MAP LAYERS, SELECTED LAYERS, MY DATA, and MAP PUBLISHING. The main search window is titled "Search" and includes a "Location Search" tab and a "Metadata Search" tab. Below the tabs, a search box contains the text "OTTAWA" and a "Search" button. A message below the search box states: "Your search returned 5 results. You can also order results in the table below by clicking the column headings." Below this message is a table with the following data:

| Place name | Municipality | Type |
|------------------------|--------------|--|
| Ottawa | | Administrative units |
| Ottawa | | TRANSPORT AND TELECOMMUNICATION FEATURES |
| Ottawa | | TERRAIN FEATURES |
| Ottawa | Island | House |
| Ottawa | | TERRAIN FEATURES |

The map in the background shows a geographical area with various features. A "Search results" popup window is visible over the map, displaying the search term "OTTAWA" and the selected result: "Administrative units" with a link to "Ottawa".

Metadata Search

Search

Location Search | Metadata Search

Search Results [Full search options](#)


None

| | | |
|--|----|---|
| Boundary for Commission of Arctic Flora and Fauna (CAFF) working group of the Arctic Council, CAFF | 1 | 0 |
| Processed areas, CAFF | 1 | 0 |
| Sites of existing river biotic and abiotic data in the CAFF designated zone, CAFF | 31 | 0 |
| Within Arctic regions, CAFF | 31 | 0 |
| Boundaries of the geographic area covered by the Arctic Biodiversity Assessment, CAFF | 31 | 0 |
| The distribution and observed trends of arctic bivalve populations throughout the circumpolar Arctic, CAFF | 31 | 0 |
| Large Marine Ecosystems (LMEs) of the Arctic - 2012, CAFF | 31 | 0 |
| Diversity of Arctic marine phytoplankton based on surveys in the Russian Arctic | 31 | 0 |
| Species numbers of species-rich insect genera and families | 31 | 0 |
| Cumulative numbers of stream fish | 31 | 0 |
| Number of marine invertebrate species | 31 | 0 |
| Marine as indicators of a changing Arctic | 31 | 0 |
| Vegetation indices | 31 | 0 |
| Number of terrestrial terrestrial species | 31 | 0 |

Metadata

Sites of existing river biotic and abiotic data in the CAFF designated zone.

Basic information | ISO 19115 metadata | Inquire metadata | Data quality [ISO 19129 XML file](#)



SITES OF EXISTING RIVER BIOTIC AND ABIOTIC DATA IN THE CAFF DESIGNATED ZONE.

ABSTRACT TEXT (DATA)

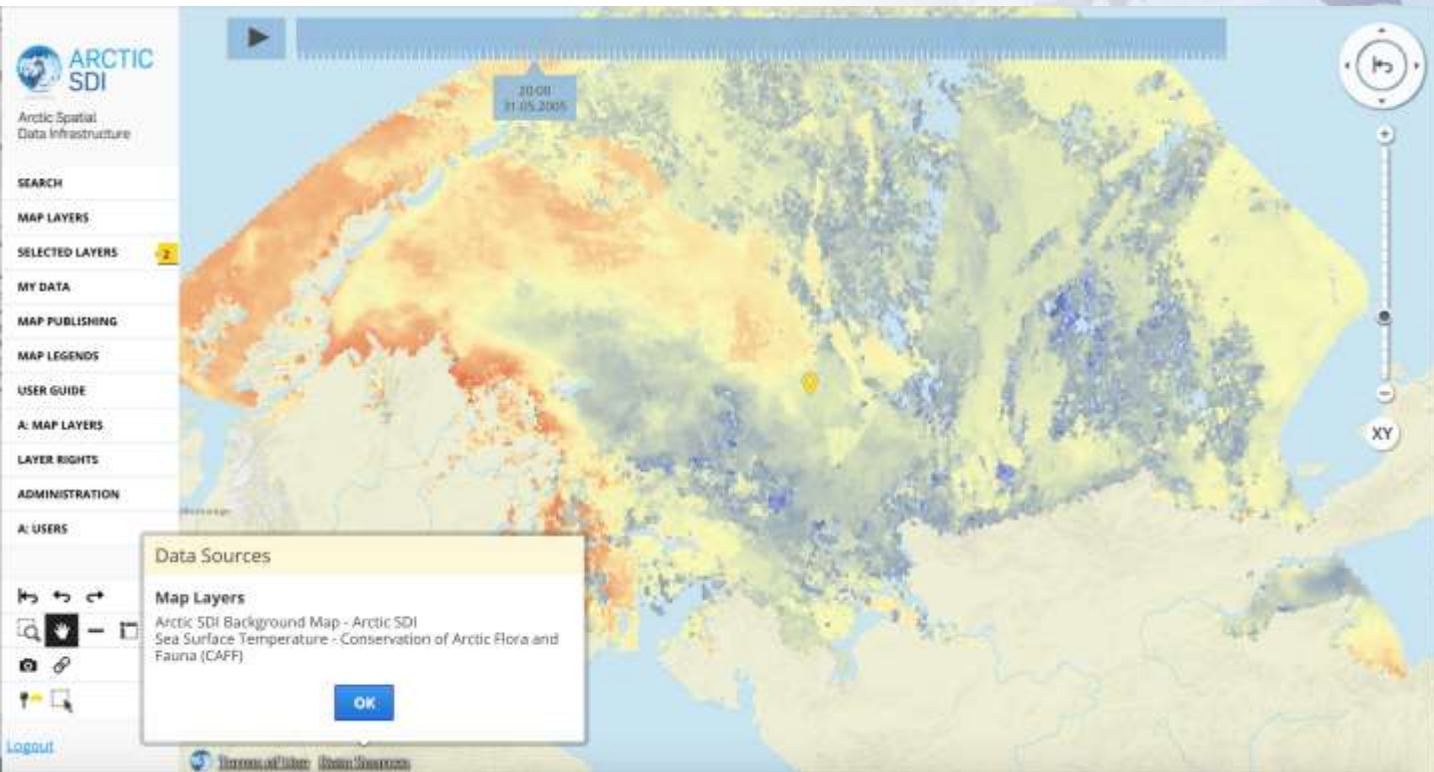
River dataset showing location of study sites in rivers for the Arctic Freshwater Biodiversity Monitoring Plan. Published in the Arctic Freshwater Monitoring Plan brochure released in 2013

http://www.caiff.ca/freshwater/arctic/brochure_assessment/27/arctic_freshwater_biodiversity_monitoring_plan_brochure

METADATA DATE

2015-05-05T11:32Z

Time Series (WMS-T)

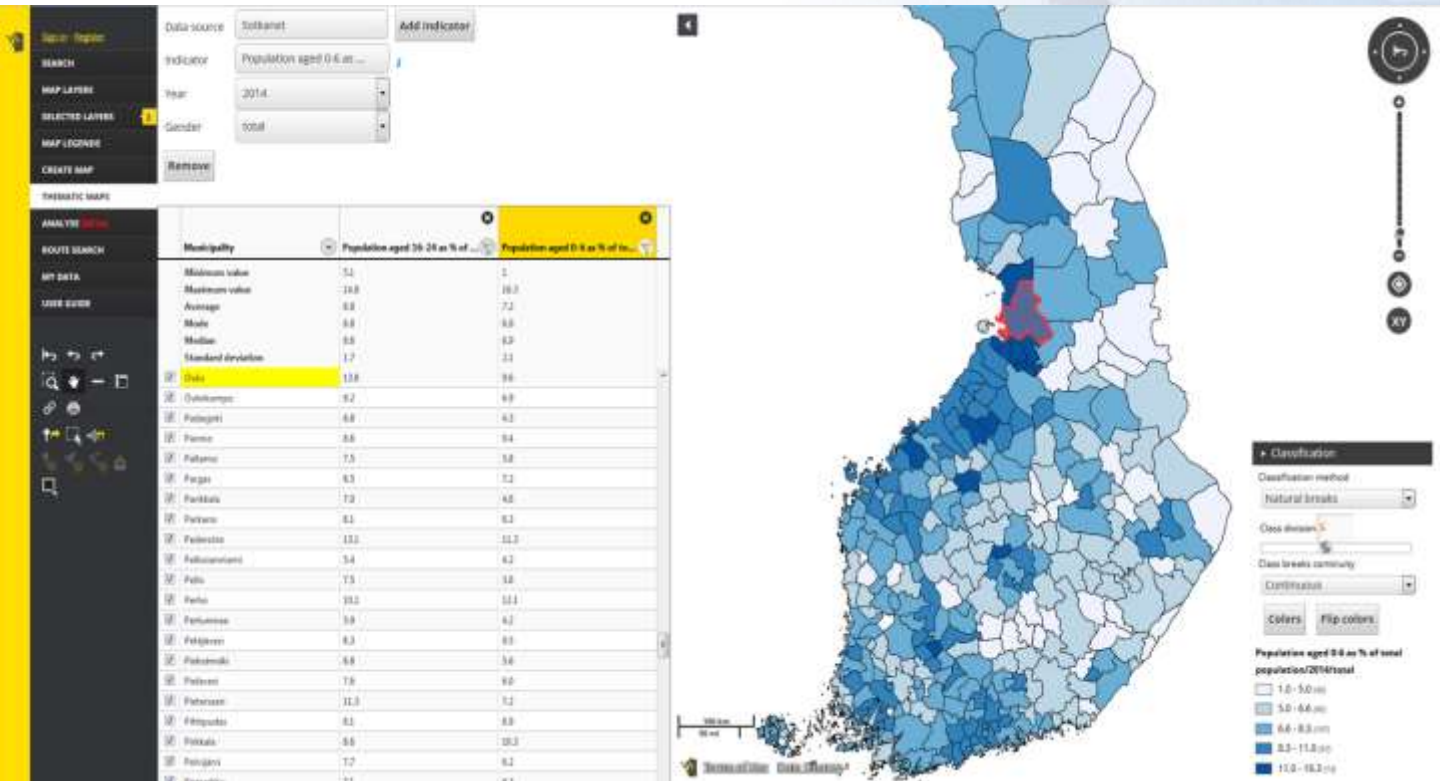


The screenshot displays the Arctic SDI Time Series (WMS-T) interface. At the top, a blue timeline slider is set to 2008-11-05, 2005. The main map area shows a color-coded overlay of sea surface temperature over the Arctic region, with warmer temperatures in orange and red, and cooler temperatures in blue. A yellow location pin is visible in the central Arctic. On the left side, a navigation menu includes options like SEARCH, MAP LAYERS, and MY DATA. A 'Data Sources' dialog box is open in the foreground, listing the following layers:

- Arctic SDI Background Map - Arctic SDI
- Sea Surface Temperature - Conservation of Arctic Flora and Fauna (CAFF)

The dialog box has an 'OK' button at the bottom. The interface also features a search bar, a map legend, and a 'Logout' link at the bottom left.

Future development: Spatial and Statistical Data combined over Arctic



Arctic SDI Video on YouTube

The video player shows a map of the Arctic region with a central globe and arrows pointing outwards to various countries. Below the video, the title 'Introduction to the Arctic Spatial Data Infrastructure' is displayed, along with the channel name 'Arctic Spatial Data Infrastructure' and a 'Subscribe' button.

YouTube

Search

The Arctic SDI is a cooperation between the 8 National Mapping Agencies of Canada, Finland, Iceland, Norway, Russia, Sweden, USA and The Kingdom of Denmark.

1:04 / 3:09

Introduction to the Arctic Spatial Data Infrastructure

Arctic Spatial Data Infrastructure

Subscribe

Arctic SDI Fact Sheet

The fact sheet features a scenic background of an Arctic landscape with mountains, a lake, and icebergs. The Arctic SDI logo is in the top right corner. The main title is 'GEOSPATIAL DATA – A TOOL FOR BETTER INFORMED DECISIONS AND MORE EFFICIENT ADMINISTRATION IN THE ARCTIC'. Below this, there are three paragraphs of text. At the bottom, there is a box with text about the Arctic SDI Geospatial and the initial Arctic SDI Reference Map, and a laptop displaying a map.

ARCTIC SDI Arctic Spatial Data Infrastructure

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

- The Arctic SDI Geospatial providing a web map viewer for use by any internet user to access the data from the Arctic countries.

Arctic SDI Geospatial in the