ARCTIC SDI
Arctic Spatial Data Infrastructure

Enabling Access to Arctic Location Based Information - the Arctic SDI

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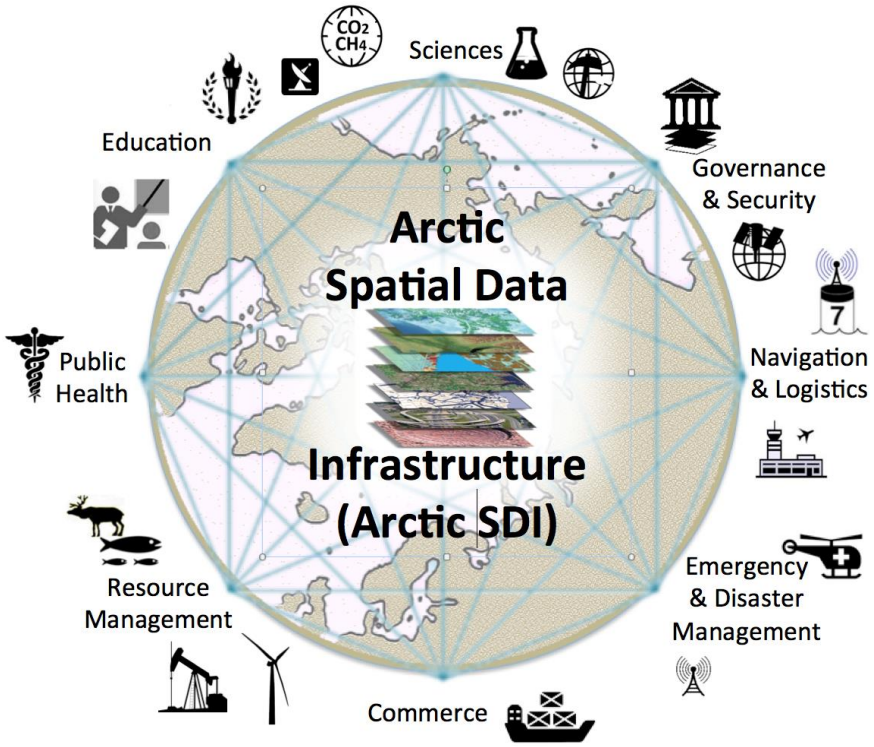
SAO Chair, WG Chairs and Executive Secretaries meeting
27th October 2017

arctic-sdi.org

Spatial Data Infrastructure is..



- Technology
- Policies
- Open Standards
- Human Resources

…necessary to acquire, process, distribute, use, maintain and preserve spatial data

Graphic Source: OGC

ARCTIC SDI Arctic Spatial Data Infrastructure

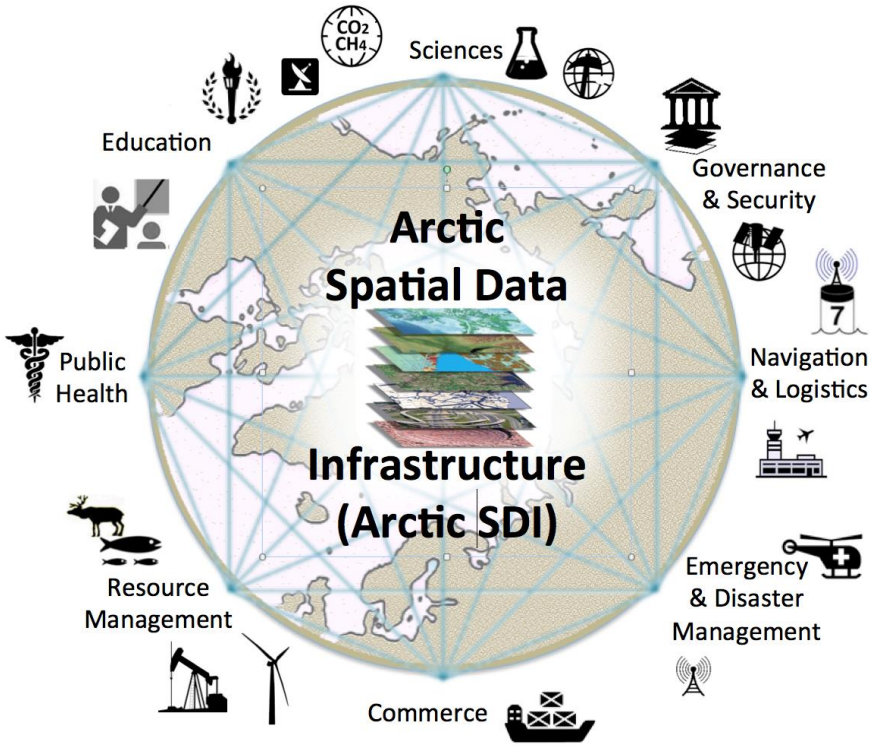
What is Arctic SDI?

Video:

- **Arctic SDI 101**
- **AC endorsed 2009**
- **MoU in Place**
- **Strategic Plan**
- **Technical Implementations**
- **Publications**

http://wallpaper.imcphoto.net/animals/polar-bear/polar-bear-on-ice.jpg

The Arctic SDI is focused on



- Open data standards and provision of authoritative data
- Understanding the needs and requirements of stakeholders
- Working with organizations to make their data available, with a focus on the Arctic Council
- Information Management best practices (geospatial data lifecycle)

Graphic Source: OGC

Data

- Ecosystem-based analysis requires seamless sharing of data across jurisdictions and organizations

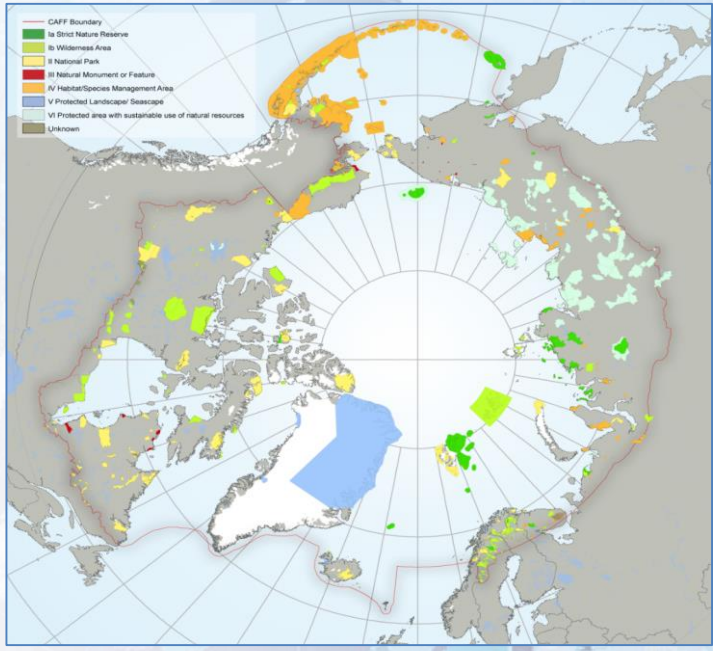
Source: blogs.vmware.com

- Arctic SDI is providing shared tools and information management practices to Arctic stakeholders to break down silos
- Arctic SDI brings together the National Mapping Agencies, trusted map data and geospatial data expertise

Arctic SDI is Partnering to Enhance Data Management Best Practices

Collaborating with Arctic Council Working Groups to develop common data sharing methodologies and best practices:

- SDI Manual for the Arctic
- Arctic SDI Glossary of Terms
- MODIS satellite data derived products (2002-2012) and migratory birds index published ABDS based SDI web standards (ISO, OGC),
- Contributing to the data management plan of the Biodiversity Monitoring Stations (Iceland, Canada, Greenland) project lead by CAFF,
- Collaborating with CAFF and PAME to enable time series embedded maps of the new protected areas database (1900-2016),
- Assisting with CAFF's Earth Observation Plan to acquire and distribute derived products for Landsat EO data (1970 to present),
- Arctic Council Working Group Meeting, September 2015, Tromsø; Standardized Geospatial Data Management and Sharing.



11,4 % protected
4,7 % marine
20,2 % terrestrial

Tromsø Sept 16, 2015 meeting outcomes

- Arctic SDI facilitated a Breakout Session at the Joint Arctic Council Working Group Meeting of four AC WGs held in Tromsø
  - Arranged follow up meetings to enhance common understanding of the benefits of standards and cooperative efforts to improve access to data
  - Report on Arctic DEM progress was to be delivered
  - Recognized need of terrestrial and marine base maps
  - Arctic SDI could be used as a tool to enhance coordination across Arctic Council Working Groups

Progress since Tromsø 2015

- What steps have been taken?
  - The Arctic SDI Manual
  - Outreach activities towards AC WGs
  - Demonstrations and presentations in conferences etc.
  - SAMBR data published in Arctic SDI Geoportal
  - OGC Spatial data pilot and climate change scenario videos
  - IHO / ARMSDIWG affiliation to start progress on Marine base data
  - Base map, Geoportal and processes development

Arctic Spatial Data Pilot - Climate Change Scenarios

- Sponsored by NRCan and USGS, this Open Geospatial Consortium Arctic Spatial Data Pilot:
  - Defined land and sea climate change scenarios to break down *information management silos* with technical piloting activities:
    - Improve access to reliable data for monitoring, management, emergency preparedness and decision making in the Arctic,
    - Produce a video to showcase how standards and common approaches to data management are deployed.
  - Addressed technology issues to meet the realities of Arctic frontier economies, such as in zero/low bandwidth Internet.

http://www.opengeospatial.org/projects/initiatives/arcticsdp
http://www.opengeospatial.org/pub/ArcticSDP/pilot-initiative.html

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Natural Resources Canada

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Arctic Spatial Data Pilot – Summary Video

To showcase how standards and common approaches to data management are deployed

This summary video provides the key results of the Arctic Spatial Data Pilot. It integrates highlights from the various scenarios, adds statements from key stakeholders that we interviewed and can be used to get a quick overview of the power and value of data and processing capacitities served at standardized Web services.

ASDI Affiliation with IHO / ARMSDIWG

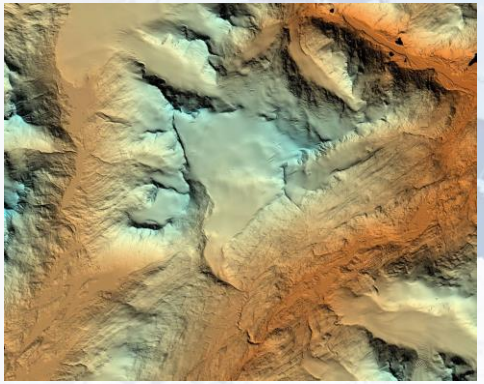
- = Arctic Regional Marine Spatial Data Infrastructures WG
  - Aims to develop a Marine SDI to focus on discoverability, accessibility and interoperability of Marine data
- Marine data, e.g. Bathymetry seen as key base data for AC and Arctic SDI - sharing of such data to be investigated
- Arctic SDI and ARMSDIWG have established contact and arranged a joint meeting in spring 2017 to streamline efforts on Marine base data delivery

ASDI / ARMSDIWG future collaboration

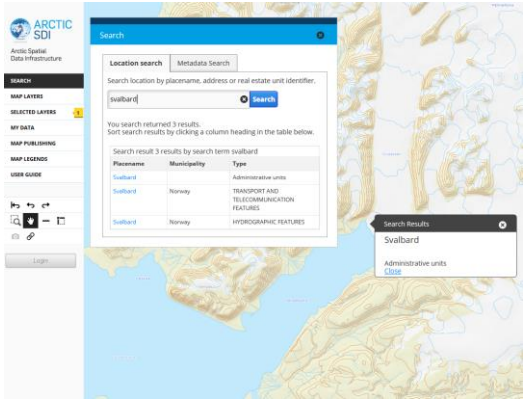
- Identifying the major datasets between domains – to provide the reference land/sea data for the foundation context of other datasets in the SDIs
- Further coordinated outreach to include a joint white paper and presentations
- Building a joint conceptual architecture
- Possibility of running pilots under the SDI framework involving stakeholders

Data Resources

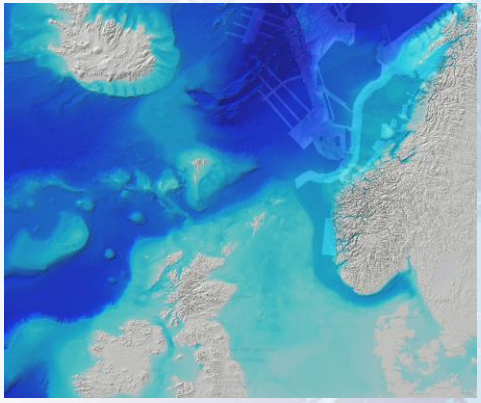
- Pan-Arctic Digital Elevation Map
- Marine Data
- Gazetteer Database and Search
- Arctic Reference Basemap



Pan-Arctic DEM



Gazetteer search



Shaded relief for depths

Arctic SDI provides an **Authoritative Reference Basemap** produced by the 8 Arctic National Mapping Agencies

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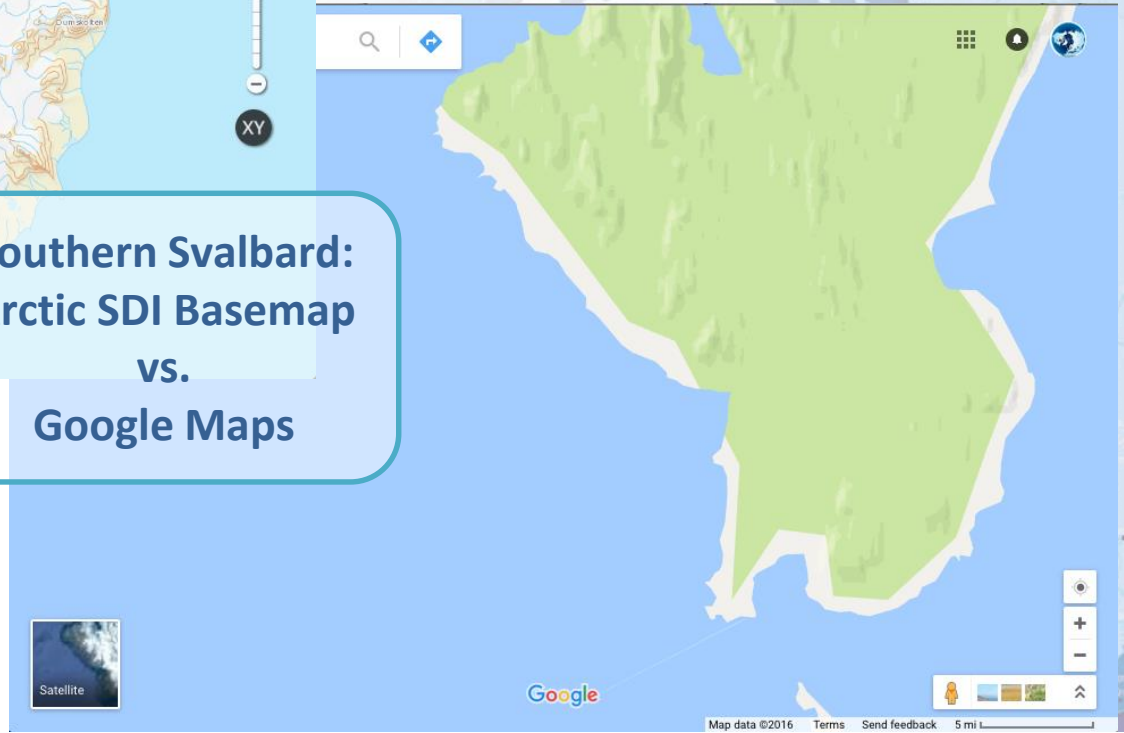
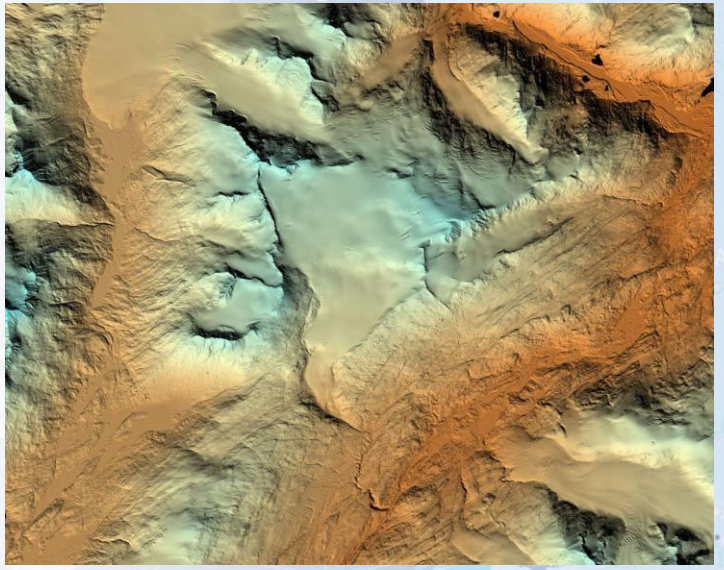
Southern Svalbard: Arctic SDI Basemap vs. Google Maps

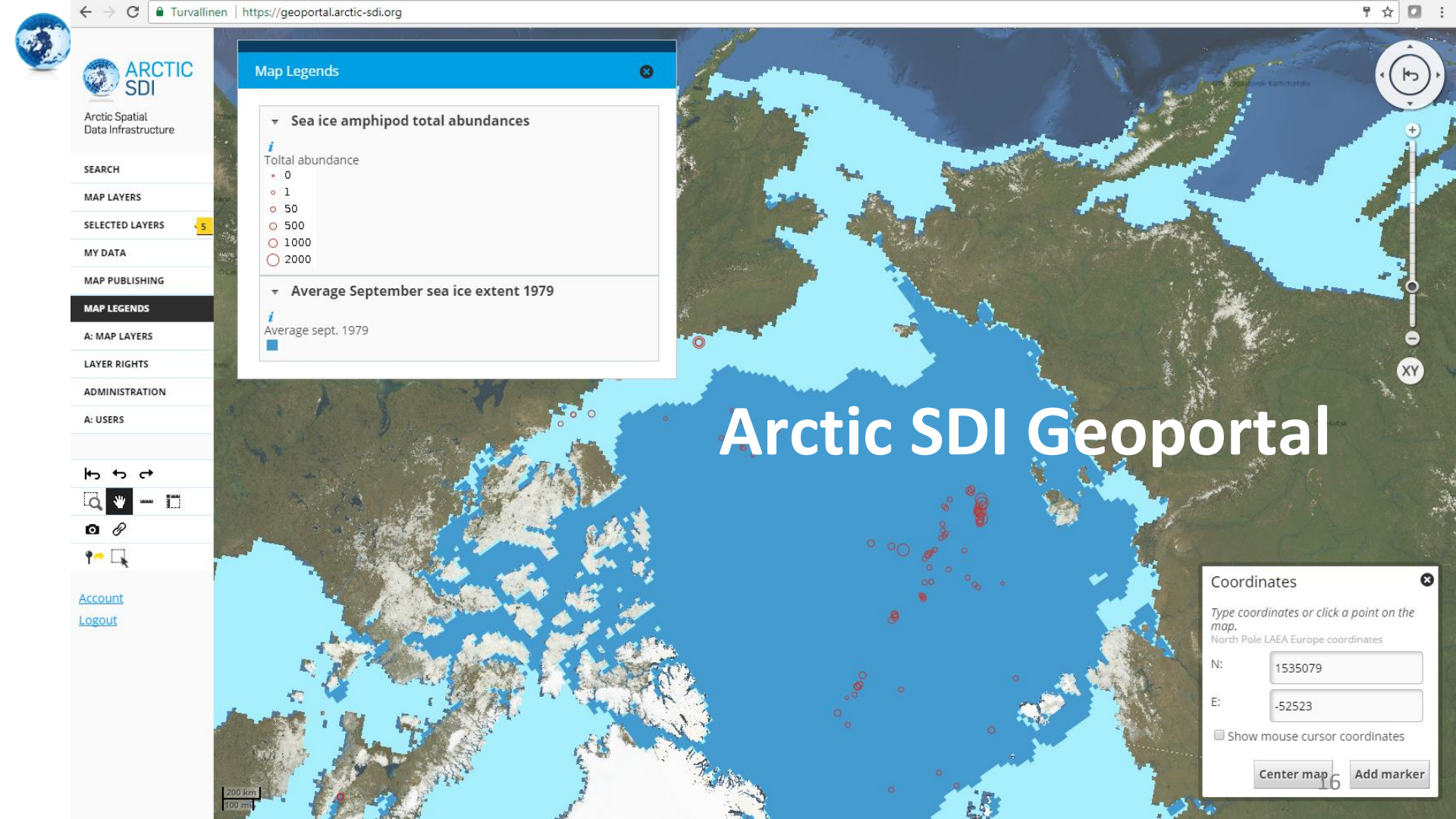


Arctic SDI provides access to authoritative data

Pan-Arctic Digital Elevation Map

- Funded by the US National Science Foundation
- Arctic SDI Board provided elevation experts to review and increase product accuracy
- Arctic SDI published a position statement providing enthusiastic support
- National Mapping Authorities provide sustainable support of elevation models and continuous improvement as part of their operations
- Available in a number of visualizations at the Arctic SDI Geoportal




Turvallinen | https://geoportal.arctic-sdi.org
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SEARCH
MAP LAYERS
SELECTED LAYERS 5
MY DATA
MAP PUBLISHING
MAP LEGENDS
A: MAP LAYERS
LAYER RIGHTS
ADMINISTRATION
A: USERS
Account
Logout
Map Legends
Sea ice amphipod total abundances
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Average September sea ice extent 1979
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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
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200 km
100 mi

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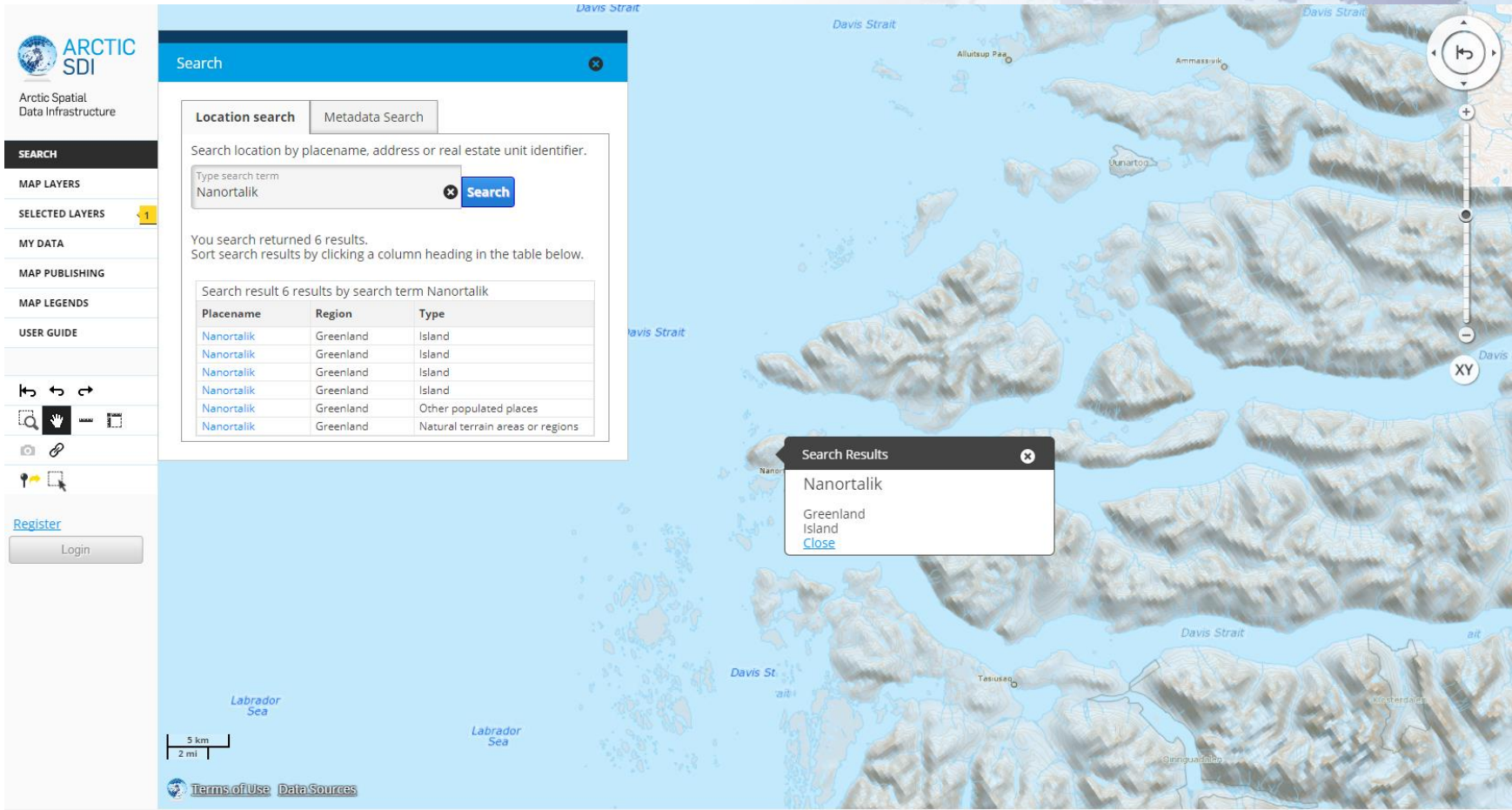
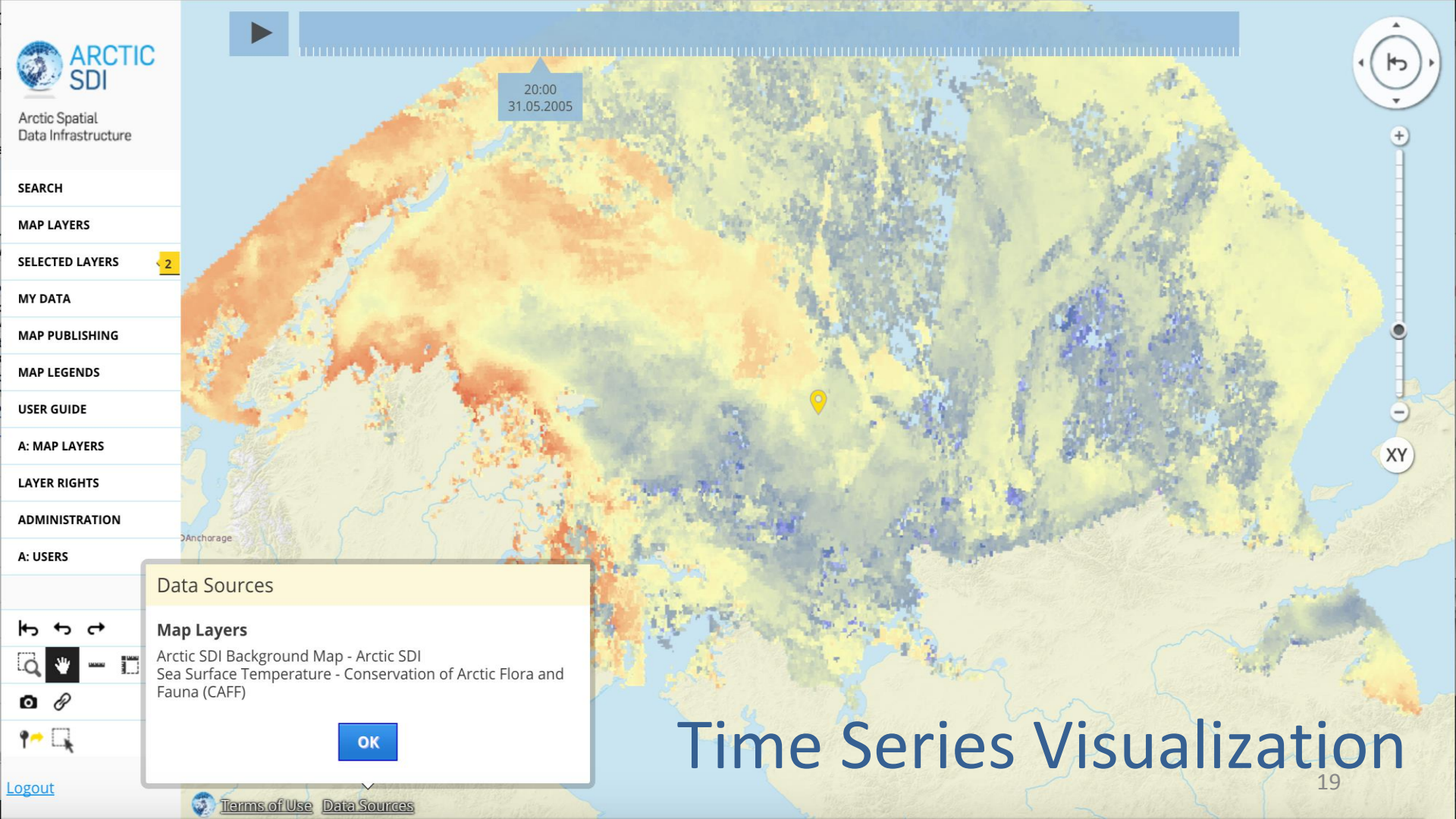
Pan-Arctic Gazetteer Search



Arctic SDI Services and Geoportal Demonstration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SEARCH
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USER GUIDE
A: MAP LAYERS
LAYER RIGHTS
ADMINISTRATION
A: USERS
Logout
20:00
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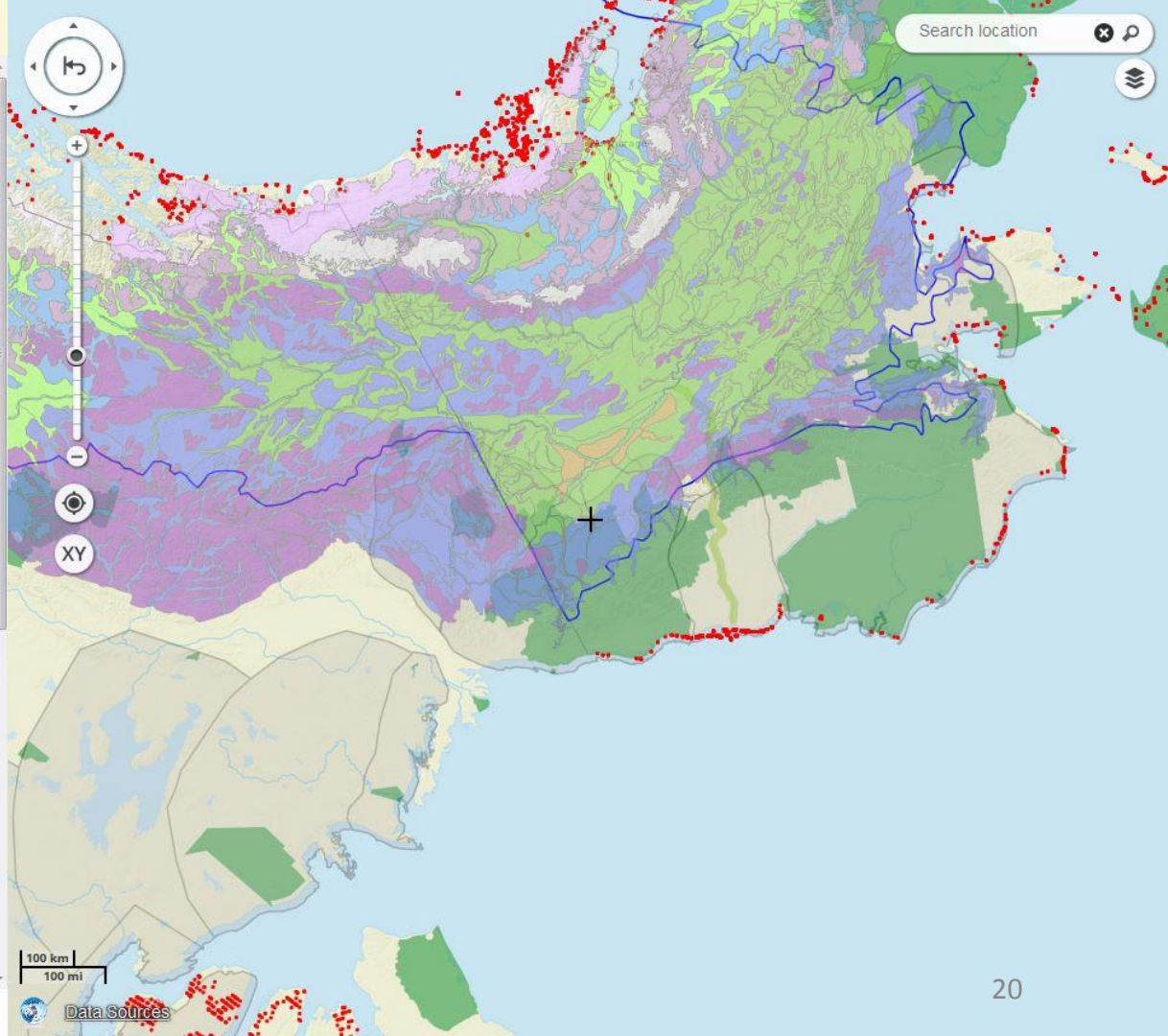
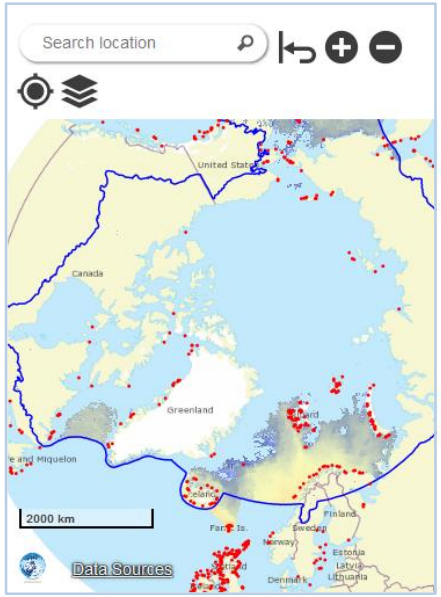
Anchorage
Data Sources
Map Layers
Arctic SDI Background Map - Arctic SDI
Sea Surface Temperature - Conservation of Arctic Flora and Fauna (CAFF)
OK
Terms of Use
Data Sources
Time Series Visualization

Embedded Map Tool



Embedded Map on a Web Page



2012 Arctic Report Cards describe dramatic changes in the Arctic (December 4, 2012)

December 4, 2013, U.S.A.- The Arctic Council, through the Arctic Monitoring and Assessment Programme (AMAP) and the Conservation of Arctic Flora and Fauna's (CAFF) Circumpolar Biodiversity Monitoring Programme (CBMP), has contributed to the Arctic Report Card, an annual report released today by the National Oceanic and Atmosphere Administration (NOAA) that monitors the often-quickly changing conditions in the Arctic.

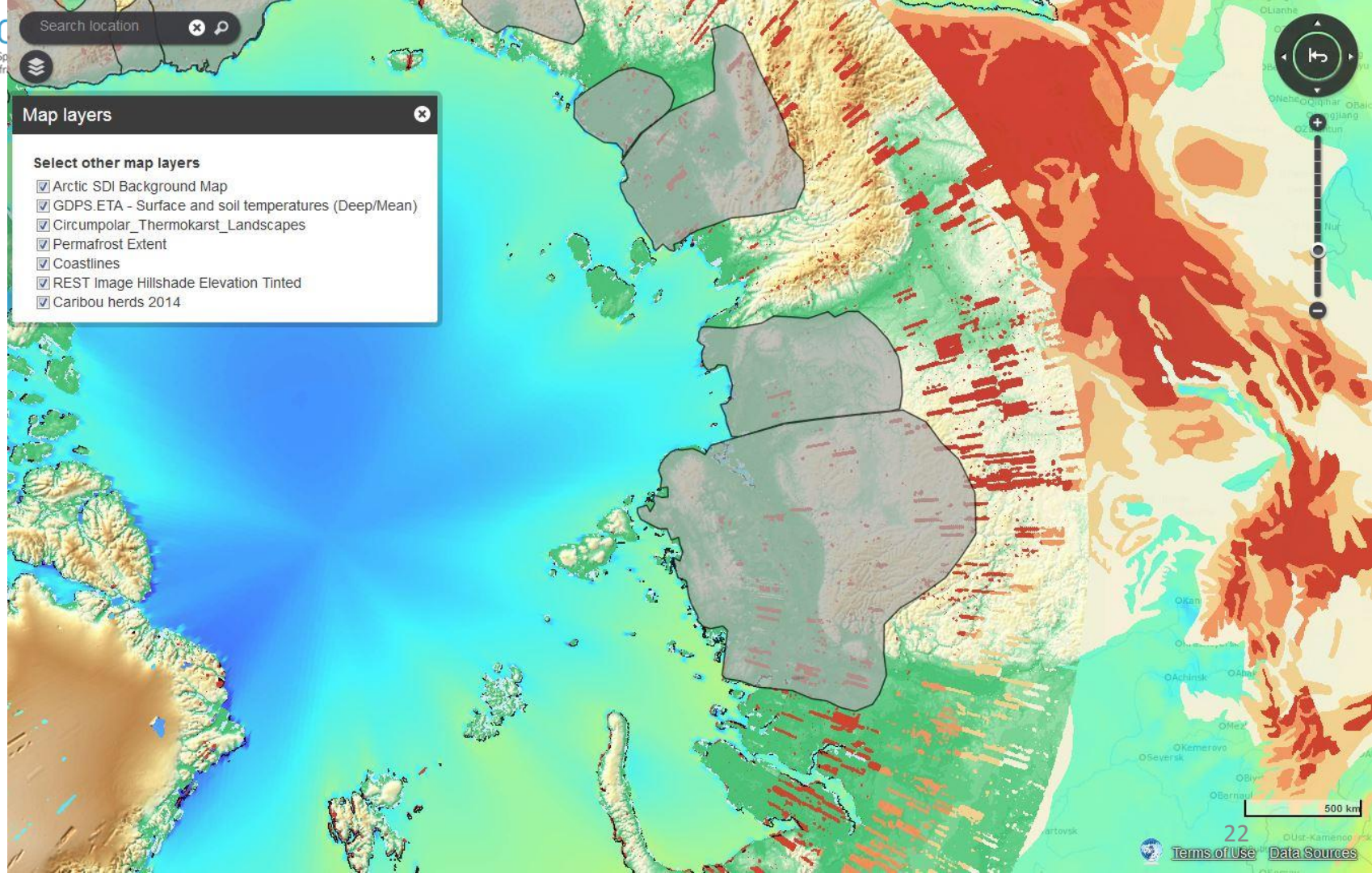
The peer-reviewed report contains contributions from 141 authors from 15 countries. For this year's issue CAFF's CBMP developed and edited the terrestrial and marine ecosystem chapters in cooperation with others, while AMAP organized an independent peer-review process involving international experts.

The Arctic region continued to break records in 2012—among them the loss of summer sea ice, spring snow cover, and melting of the Greenland ice sheet. This was true even though air temperatures in the Arctic were unremarkable relative to the last decade, according to the report.

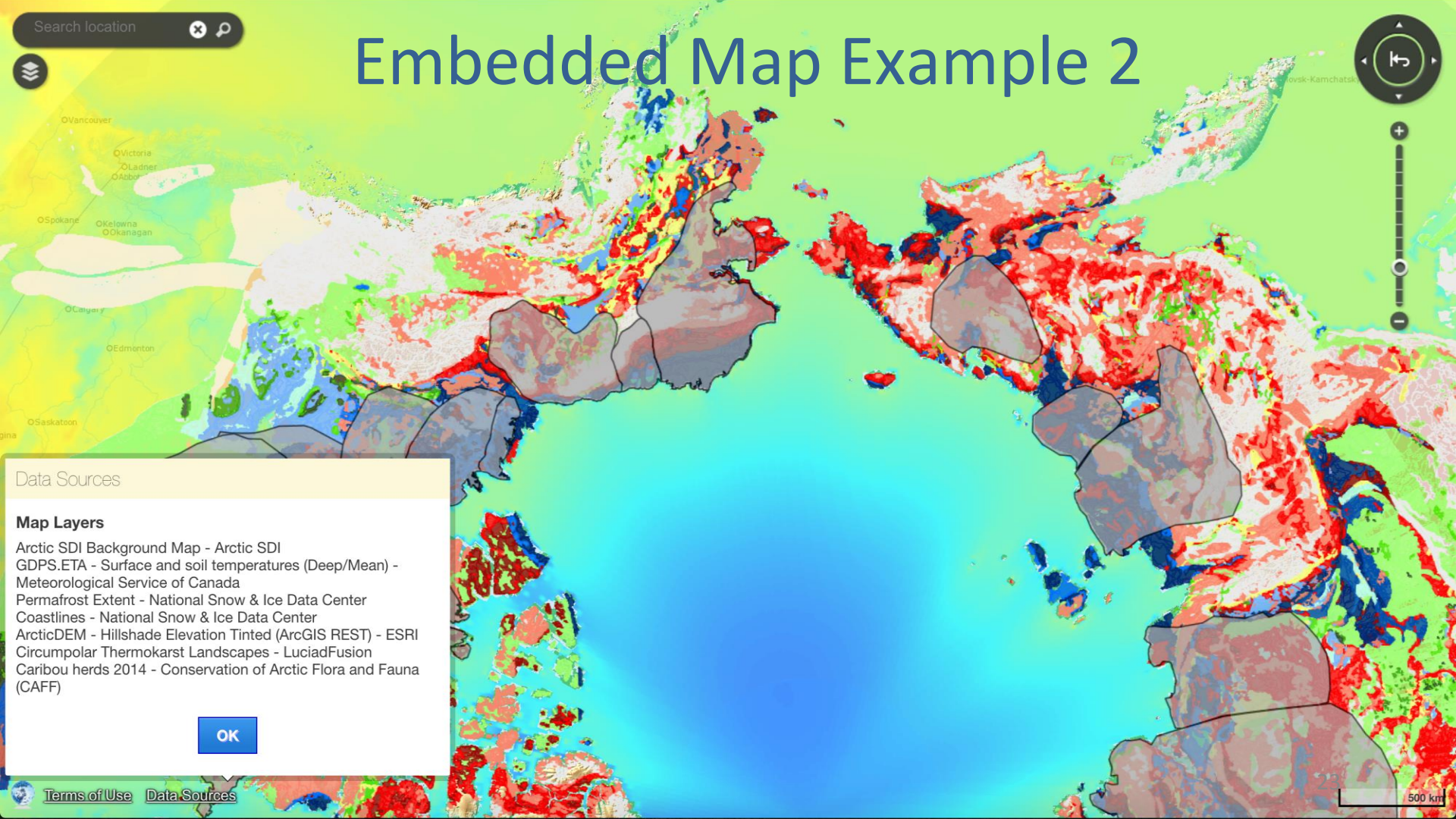
Major findings include:

- ***Snow cover***: A new record low snow extent for the Northern Hemisphere was set in June 2012, and a new record low was reached in May over Eurasia.
- ***Sea ice***: Minimum Arctic sea ice extent in September 2012 set a new all-time record low, as measured by satellite since 1979.
- ***Greenland ice sheet***: There was a rare, nearly ice sheet-wide melt event on the Greenland ice sheet in July, covering about 97 percent of the ice sheet on a single day.
- ***Vegetation***: The tundra is getting greener and there's more above-ground growth. During the period of 2003-2010, the length of the growing season increased through much of the Arctic.
- ***Wildlife and food chain***: In northernmost Europe, the Arctic fox is close to extinction and vulnerable to the encroaching Red fox. Additionally, massive phytoplankton blooms below the summer sea ice suggest estimates of biological production at the bottom of the marine food chain may be ten times too low.
- ***Ocean***: Sea surface temperatures in summer continue to be warmer than the long-term average at the growing ice-free margins, while upper ocean temperature and salinity show significant interannual variability with no clear trends.
- ***Weather***: Most of the notable weather activity in fall and winter occurred in the sub-Arctic due to a strong positive North Atlantic Oscillation. There were three extreme weather events including an unusual cold spell in late January to early February 2012 across Eurasia, and two record storms characterized by very low central pressures and

Embedded Map Example



Embedded Map Example 2



Finnish AC / ASDI Chairmanship Priorities

- More data - make climate change and other phenomena affecting the Arctic more prominent
- Identify potential data sets to publish and reuse
  - State of the Arctic Marine Biodiversity Report (SAMBR)
  - Arctic Biodiversity Assessment and Actions for Biodiversity
  - Circumpolar Biodiversity Monitoring Programme (CBMP)
  - Black Carbon and Methane Emissions
  - Transboundary Pollutants

Finnish AC / ASDI Chairmanship Priorities

- Identify potential data sets to publish and reuse (cont.)
  - Arctic Marine Strategic Plan 2015 -2025
  - Task Force on Marine Cooperation
  - Framework for a Pan-Arctic Network of Marine Protected Areas
  - Arctic Coast Guard Forum (with ARMSDIWG)
  - Satellites and Navigation (with ARMSDIWG)

In Summary, The Arctic SDI provides

- Authoritative data across the Arctic
- Capacity building materials on principles of (Arctic) SDI(s), how to bring your own data in and leverage from it
- Geoportal, Embedded maps and other and tools to help you achieve your mission

ASDI 💖 AC - The Way Forward

- How can Arctic SDI further assist AC working groups with
  - Spatial data related issues
  - Identifying potential data sets to be published through ASDI
  - Leveraging the Arctic SDI services
- Are the WGs able to make use of the data and tools Arctic SDI provides?
- What actions should be taken next?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