Arctic SDI

Arctic Spatial Data Infrastructure

- A circumpolar mapping initiative -

NORWEGIAN MAPPING AND CADASTRE AUTHORITY

EPPR II and UAS Workshop
Seattle

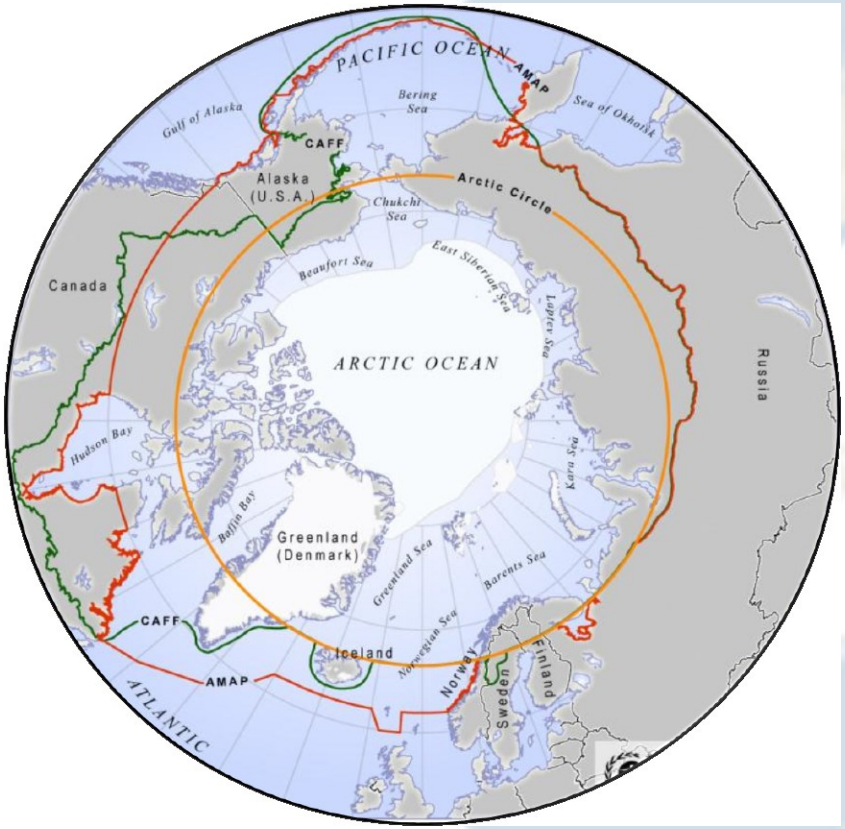
USGS science for a changing world

Martin Skedsmo

Becci Anderson

www.arctic-sdi.org

The Arctic



- 1/6 of the earth´s landmass
- More than 30 million km^2
- 8 countries
- 24 hours- all time zones

What is a Spatial Data Infrastructure?

is a ***coordinated series of agreements*** on technology standards, institutional arrangements, and policies that ***enable*** the ***discovery and use*** of ***geospatial information*** by ***users*** and for purposes other than those it was created for

Kuhn, W. (2005) presentation "Introduction to Spatial Data Infrastructures".

Spatial Data Infrastructure Basics

- Data and metadata are managed by the ***data originator and/or owner***
- Tools and services connect via computer networks to the various sources through a ***common end point***

To achieve the objectives

- ***coordination*** is necessary
- ***standards*** are essential

Steiniger, S., and Hunter, A.J.S. (2012) preprint "Free and open source GIS software for building a spatial data infrastructure".

Arctic SDI

A cooperation between the mapping agencies of

Canada

Denmark including Greenland and Faroe Island

Finland

Iceland

Russia

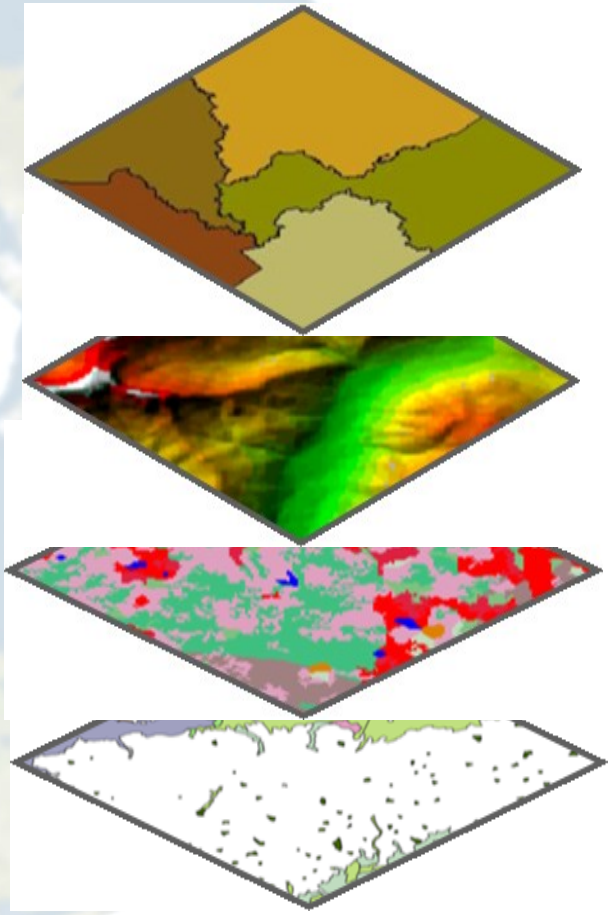
Sweden

USA

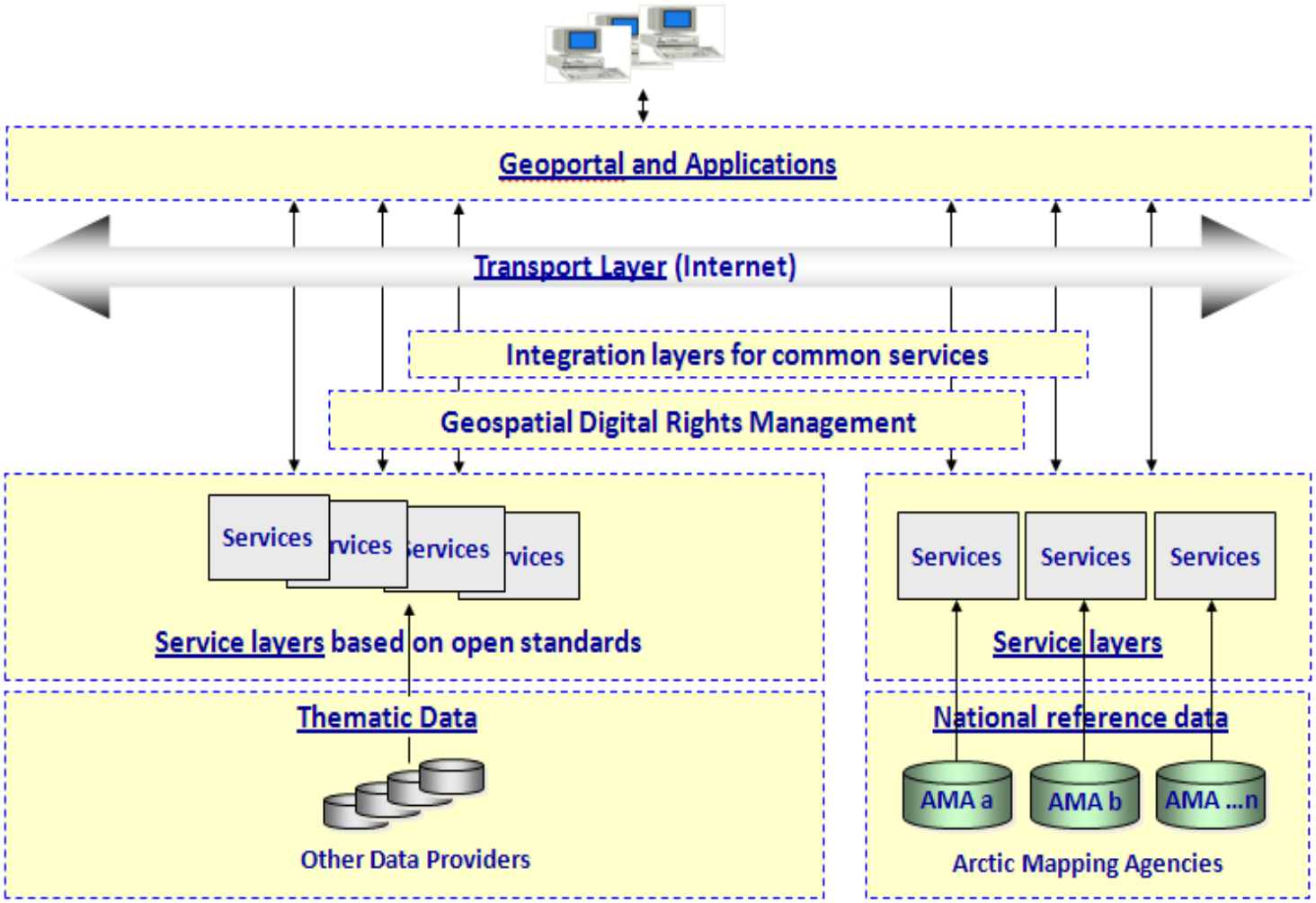
Main Content of the Artic SDI

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

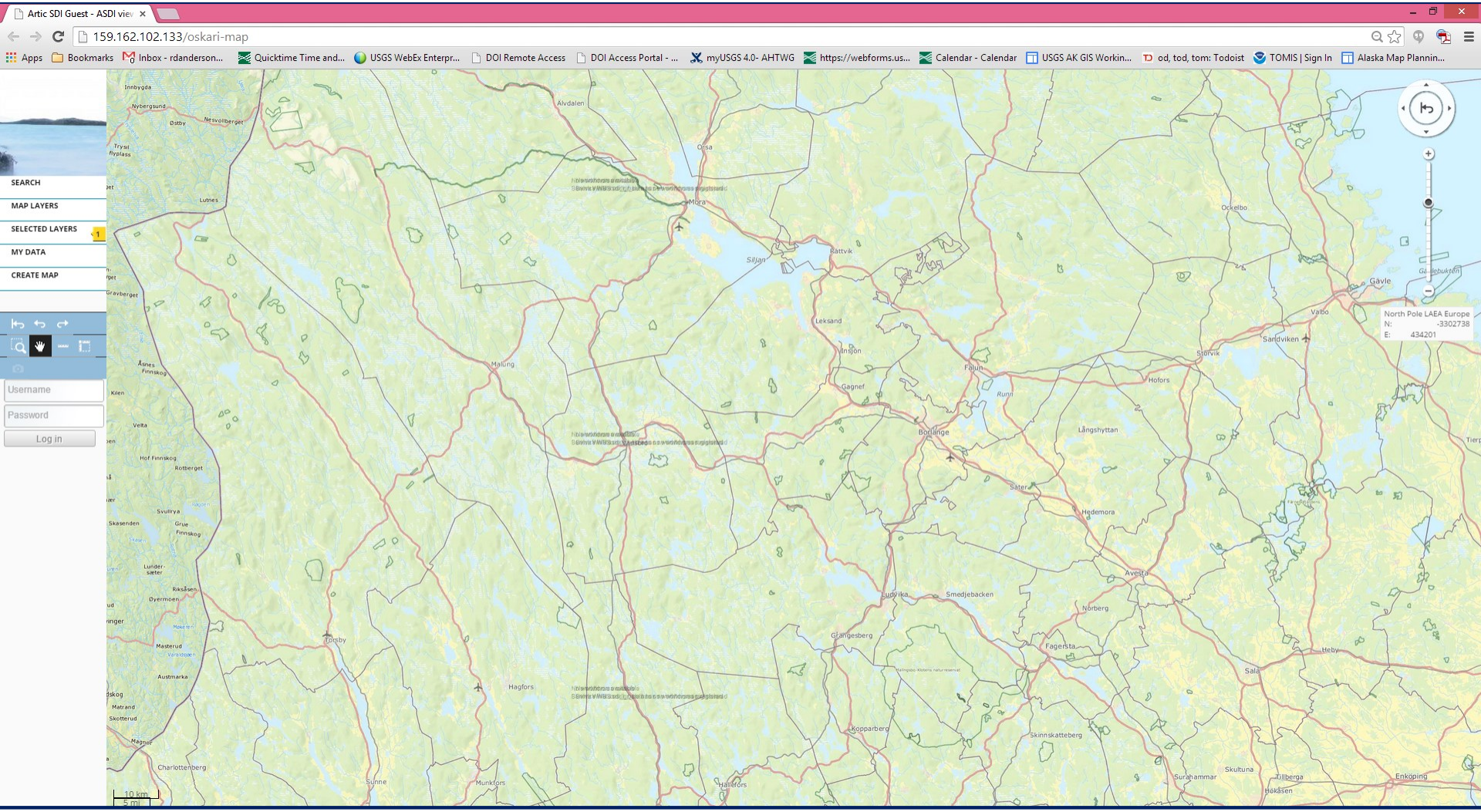
- A geoportal for geospatial data viewing and discovery
- A searchable metadata catalogue
- Authoritative reference data as a Web Map Service (WMS)
- Thematic data (birds, icecover, ship routes, land cover change, flora etc.)



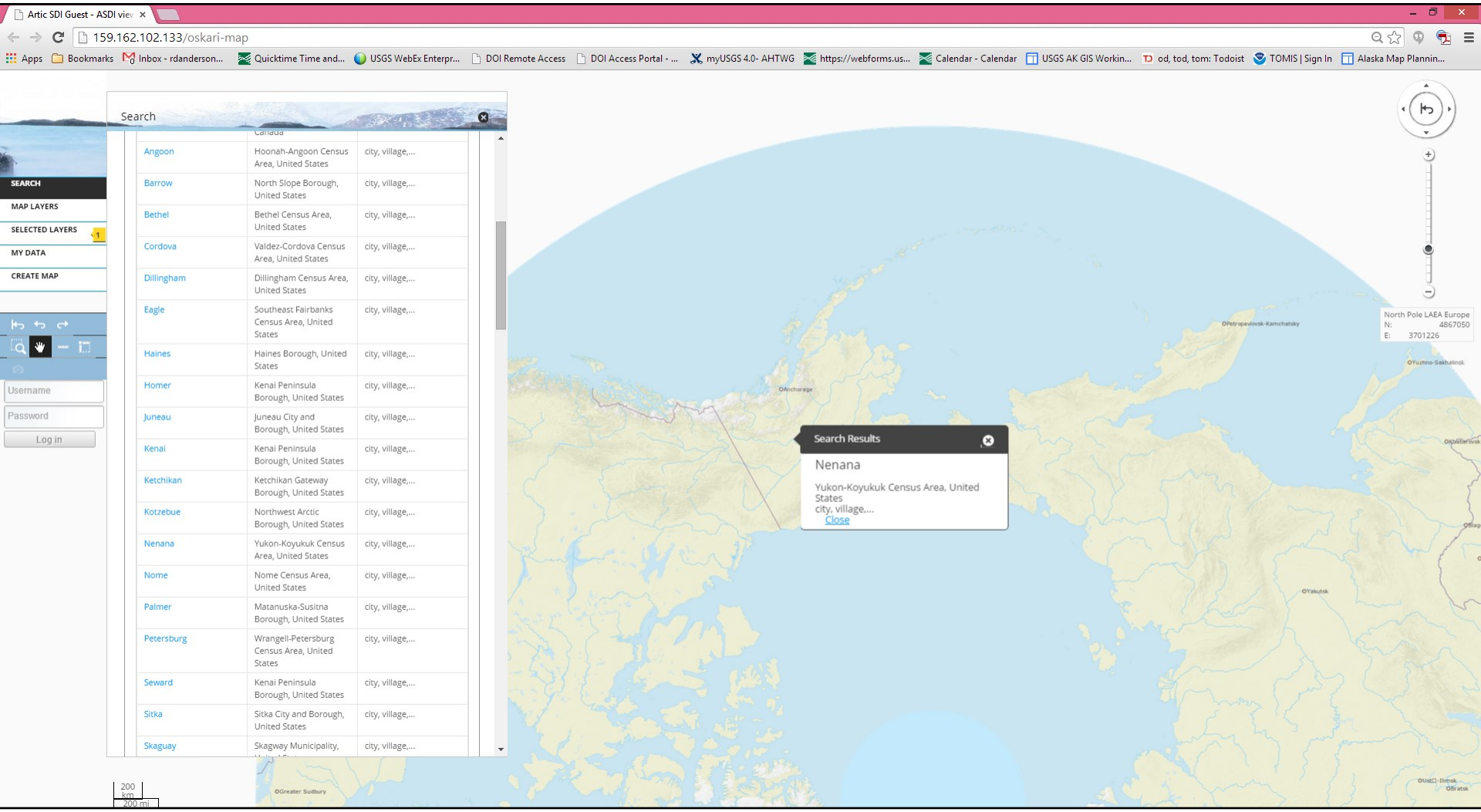
Architecture of the Arctic SDI



1:250k Basemap from National Mapping Agencies

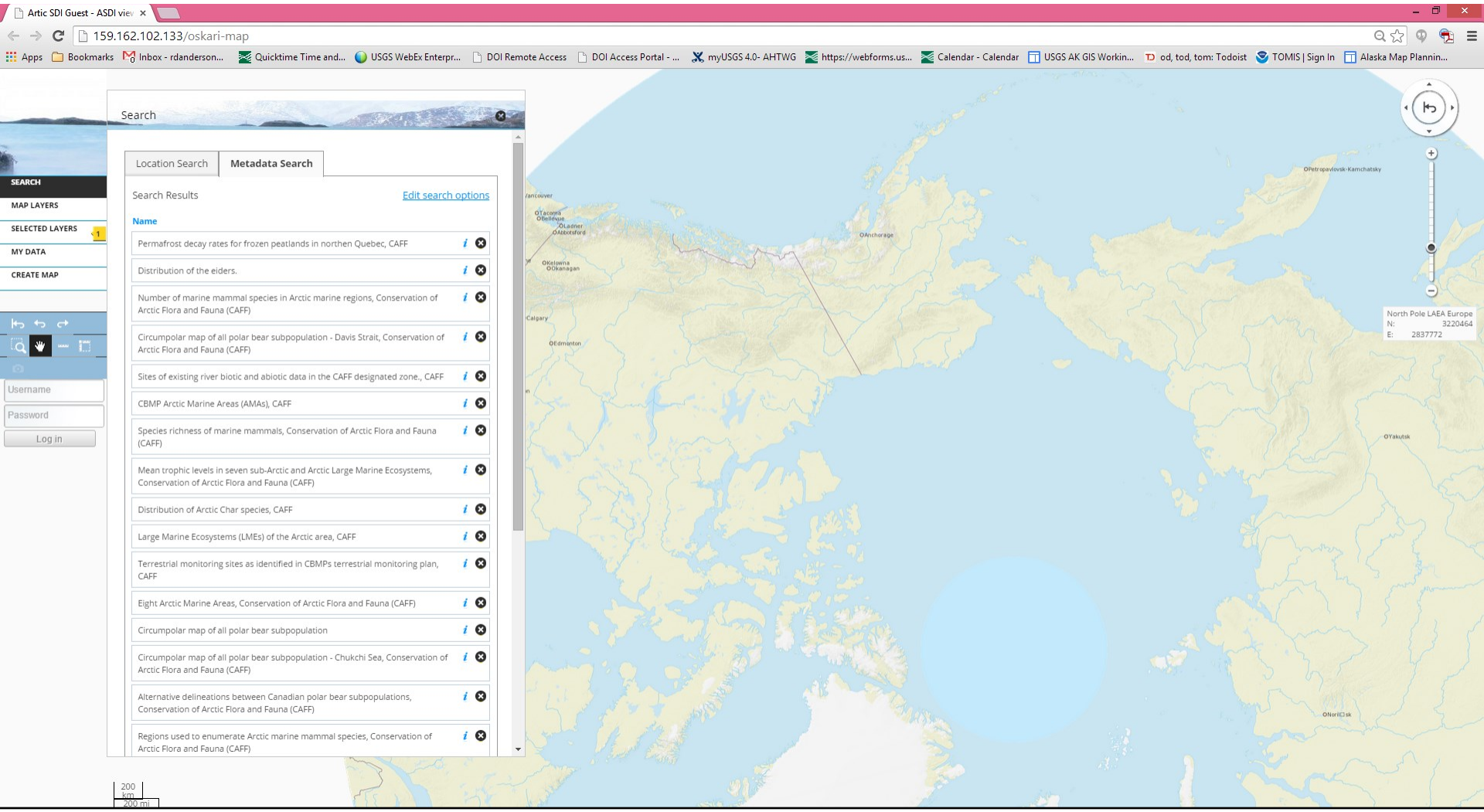


Location Search



Arctic SDI

Metadata Search



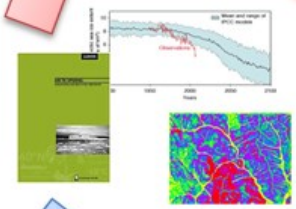
Arctic SDI

Dataflow

"Full" Arctic SDI

Action

Decision support



Visualization

Data Collection (Feeds)

Download

Registries

View

Processing

Services

Data Storage

Arctic SDI

A Short History

Arctic SDI discussions have been ongoing for a number of years

1990s **GITBarents**, Finland, Norway, Russia and Sweden

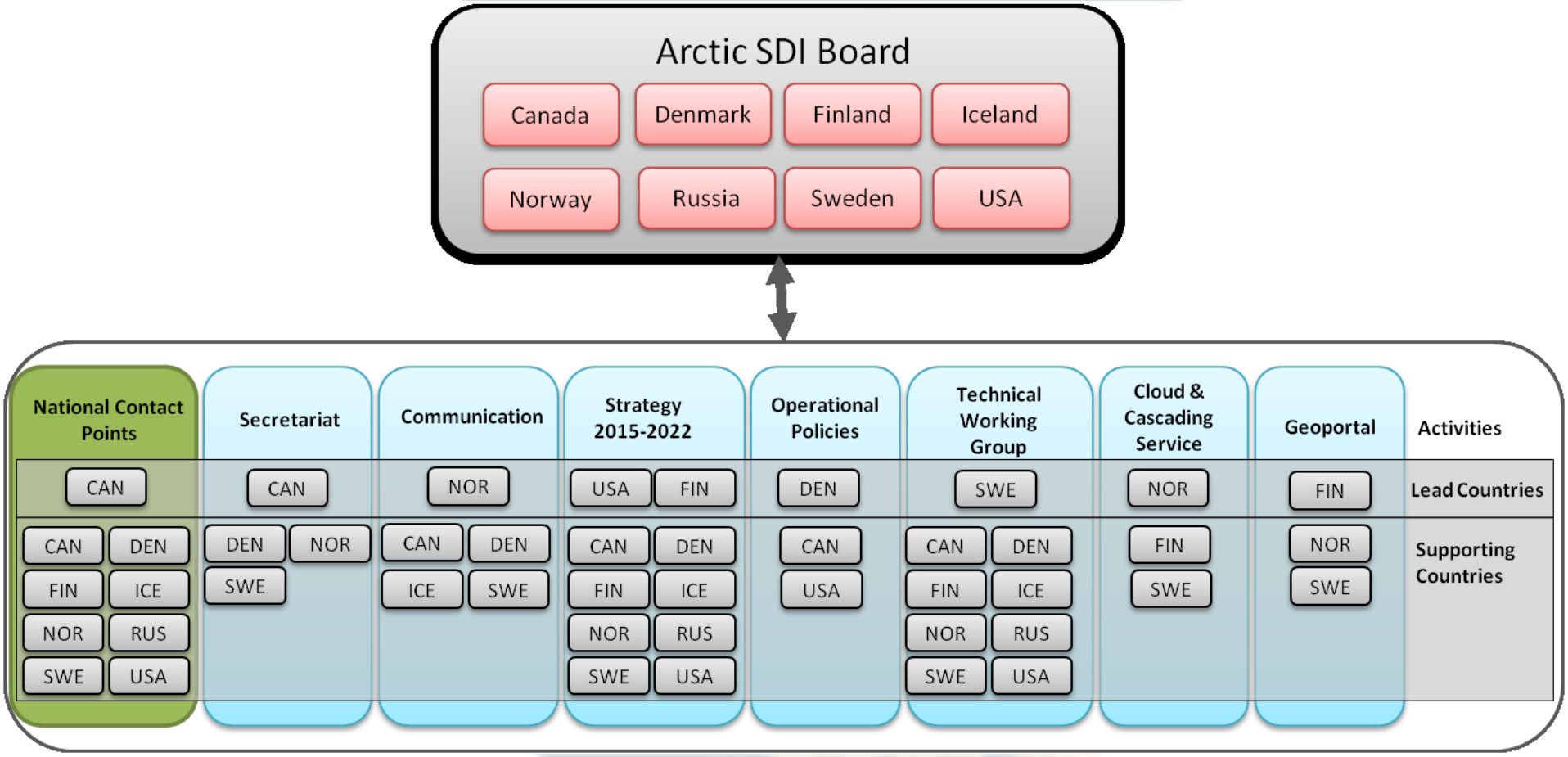
2007 **Yellowknife Declaration** - GeoNorth Conference

2009 Formal **Arctic Council** support – SAO meeting

2011- the Arctic SDI project launched by the 8 National Mapping Agencies with CAFF acting as a link to the SAOs

The foundation for the Arctic SDI is the legally non-binding "Memorandum of Understanding" (MOU) signed by participating NMAs in 2014

Arctic SDI Organizational Structure



Aim and Vision of Arctic SDI

Aim: ***To provide*** politicians, governments, policy makers, scientists, private enterprises and citizens in the Arctic ***access to geographically related Arctic data***, digital maps and tools to facilitate monitoring and decision making

Vision: An Arctic SDI – based on sustainable co-operation between mandated national mapping organizations – which will ***provide*** for ***access to spatially related*** reliable ***information over the Arctic*** to facilitate monitoring and decision making

Arctic SDI

Users, Stakeholders and Data Providers

- Arctic Council
- Working Groups: CAFF, EPPR, PAME, AMAP
- Academic institutions in the Arctic
- Government and governmental authorities
- Media, citizens, NGOs,…

Benefits

How can the Arctic SDI serve the AC WGs?

- Can be used for visualizing the work of the Arctic Council and their WG
- Supporting stakeholders in meeting their goals and objectives by using reliable, interoperable, authoritative geospatial reference data from the National Mapping Agencies of the Arctic
- Provides a reference data basemap for viewing thematic datasets
- Providing stakeholders with a tool for more robust management and manipulation of data thus supporting monitoring and decision making
- Can be used to provide access to WG data through both the geoportal and metadata catalog

Project Framework and Phases

Structuring Phase 2010/2011

- Arctic Council Links
- Project Management
- Technical Group
- Steering Committee

Establishing Phase 2011/2014

- Memorandum of Understanding, 2014
- Simplified Governance
- Reference Model
- Working Groups Established

Operational Phase 2014/2015

- Geoportal
- Metadata Catalogue
- Web Map Service- National Mapping Data
- Thematic Data Provider Partnerships- CAFF

SDI Engagement Phase 2015/2020

- Leverage Global/National SDI Communities
- Stakeholder Engagement and Requirements
- From Strategy to Roadmap to Projects
- SDI Interoperability
- Resource Allocation and Business Models
- Voluntary Resource Commitment to Tasks
- Performance Metrics
- Standards Coordination

Arctic SDI

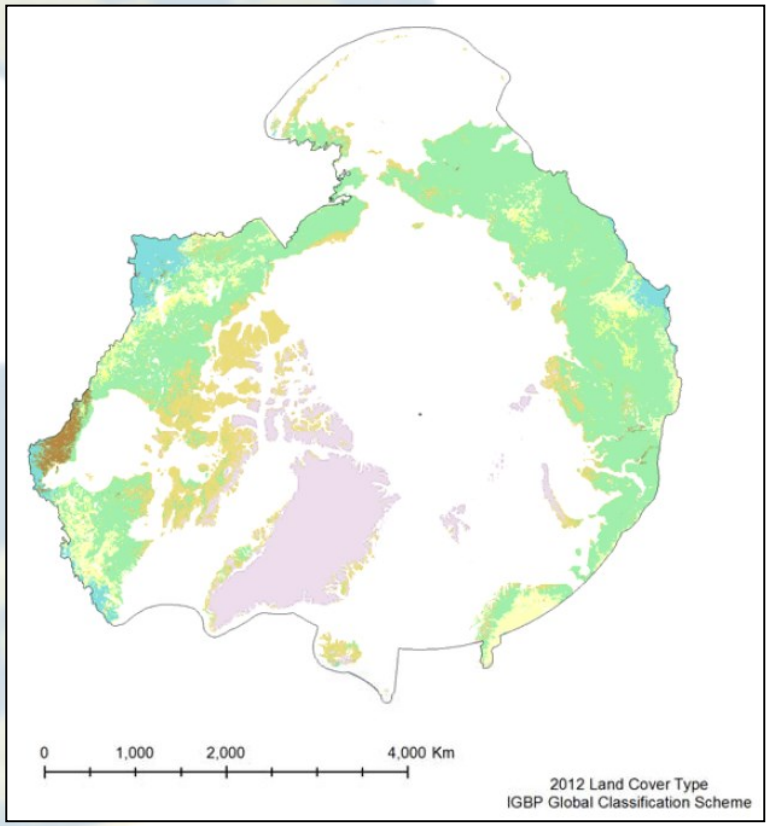
2014 – Status

- Geoportal
- Metadata Catalogue
- Web Map Reference Data Service 1:250.000
- CAFF thematic data
- Strategic Plan 2015 – 2020
- Senior Arctic Official - invitation to start dialogue with all Arctic Council Working Groups

WG Example:
CAFF - Earth Observation Products

CAFF commissioned Michigan Tech to develop circumpolar earth observation products from MODerate resolution Imaging Spectroradiometer (MODIS) sensor

- Approximately 6,000 files across 12 products
- Time-series from 2002
- 36 spectral bands
- 250, 500, 1000m resolutions
- 55 tiles at 250m to cover CAFF defined pan-Arctic extent
- Lambert Azimuthal Equal Area Polar Projection

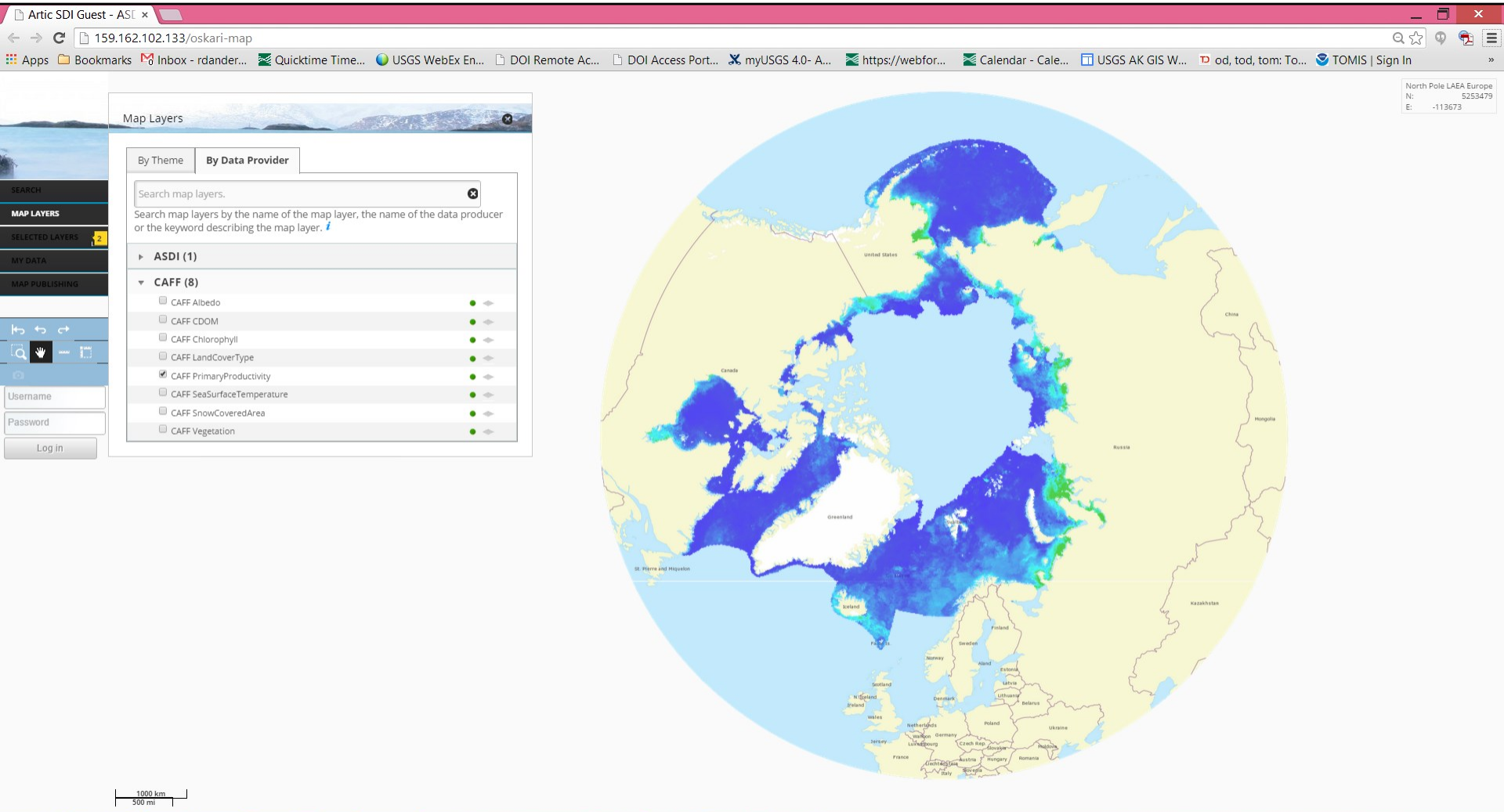


Product	Resolution	Time Series
Normalized Difference Vegetation Index and Enhanced Vegetation Index	0.05 deg (~5600 m)	16-day; May-September, 2000-2013
Land Cover Dynamics (Vegetation Phenology)	500m	2001 - 2010
Land Cover Type	0.05 deg (~5600 m)	2001 - 2012
Land Surface Temperature	0.05 deg (~5600 m)	Monthly; Feb. 2000 - present
Albedo	0.05 deg (~5600 m)	16-day; Feb. 2000 - present
Snow Covered Area	0.05 deg (~5600 m)	Monthly; March 2000 - present
Land Water Mask	0.05 deg (~5600 m)	Monthly; March 2000 - present
Sea Surface Temperature, Nighttime	4 km	Monthly; June 2002 - present
Marine Chlorophyll a	4 km	Monthly; June 2002 - present
Coloured Dissolved Organic Matter	4 km	Monthly during March to Oct. period; Jun 2002 - present
Marine Primary Productivity	9 km	Monthly; July 2002 - present

Arctic SDI Role in CAFF Project

- Arctic Spatial Data Infrastructure (Arctic SDI) enables geospatial data discovery and sharing through Geoportal and Metadata Catalogue
- Data are housed and Web Mapping Services (WMS) are served from CAFF
- WMS were added to Arctic SDI Geoportal and dataset metadata were harvested into the Arctic SDI Metadata Catalogue
- Distributed Artic SDI effort supporting all project components including assistance from Canada, Iceland, Sweden, Finland and Norway

CAFF – EOP Available on Arctic SDI Geoportal



Future Examples

- Access to relevant and updated ***thematic geospatial*** information covering the entire circumpolar region
- Visualizing the work of the Arctic Council and its WGs
- Possibilities for governmental authorities and decision makers to always have access to receive relevant and updated information
- Daily use of the project's web map services in schools and universities in the Arctic and elsewhere.
- Possibilities for media to receive relevant and updated information
- Possibilities to foster cooperation with industry on Arctic issues

How Can You Contribute ?

- Provide digital access to your thematic data
- Manage your data according to international standards for data
- Demand standards to be applied by partners producing or distributing your data
- Update the metadata information for your data in the metadata catalogue
- Visit the Arctic SDI website to learn more

Thank You!!

www.arctic-sdi.org

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