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# ICE BREAKER

## HELI URSIN REPORTS ON SOME OF THE PROJECTS THAT ARE COMING OUT OF THE ARCTIC SDI COLLABORATION, INCLUDING A GEOPORTAL, DEM, PILOT AND MANUAL

Understanding and responding to the impacts of climate change and human activities in the Arctic, a unique area among the Earth's ecosystems, requires accessible and reliable data to facilitate monitoring, management, emergency preparedness and decision-making. Often, it is difficult and costly to find, access and combine useful datasets for a project since they are collected and managed by many different organisations.

The Arctic Spatial Data Infrastructure (Arctic SDI) provides methodology for sharing data at all levels: local, national, regional and global. It documents and applies information management best practices, based on open international standards, to build communities of practice to share data. Adoption of SDI best practices builds interoperability that breaks down data silos in support of multi-disciplinary, ecosystem-based research.

Arctic SDI was established to address the need for readily available spatial data in the northern areas of the globe. The Arctic SDI is working with stakeholder organisations to make their key data accessible, with a focus on the Arctic Council and its working groups. It is a collaboration between the eight national mapping agencies of Canada, Finland, Iceland, Norway, Russia, Sweden, USA and Denmark, based on a voluntary multilateral cooperation and focused on accessible

authoritative geospatial reference data. There is a signed Memorandum of Understanding towards collaborative development 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
- An openly searchable metadata catalogue
- An authoritative reference map as a web map tile service (WMTS)
- A gazetteer search API
- Thematic data from various organisations operating in the Arctic
- Easy-to-use tools for disseminating data

### Arctic SDI Geoportal

The Arctic SDI Geoportal is based on Oskari ([www.oskari.org](http://www.oskari.org)), which is an open source framework originally developed in the National Land Survey of Finland for browsing, sharing and analysing geographic information, using distributed SDIs. The framework is used as a basis of the Arctic SDI Geoportal as well as a significant number of other geoportals, web GIS applications and e-government services.

Key functionalities include the ability to search for metadata, place names and coordinates; a map marker tool; a map legend display; a user guide; and a quick start guide, along with common map GUI tools.

The Geoportal allows for the animation of data that has a time dimension and the ability for users to create dynamic embedded maps that can be displayed and interacted with on their own web pages. Embedded maps are a powerful tool for disseminating the information from SDIs without any programming skills. Geoportal users can combine map layers to visualise the phenomena of their choice and choose from a variety of tools to be added on the map. The fully functional map client can be placed on any website with context-related information by copy-pasting the map URL into the website content management system. If any data source gets updated, the latest data is readily shown on in the embedded map without user intervention.

Oskari is currently in incubation to become an Open Source Geospatial Foundation (OSGeo) project. It is under constant development by National Land Survey of Finland, as well as several other organisations.

### Pan-Arctic DEM

Pan-Arctic Digital Elevation Map (Pan-Arctic DEM) is a response to the need for high quality elevation data in remote locations, the availability of technology to process big data, and the need for accurate measurement of topographic change.

Pan-Arctic DEM is an activity under the US Arctic Council Chairmanship, implemented through the Polar Geospatial Center (PGC) at the University of Minnesota. It is a public-private initiative between the US's National Geospatial-Intelligence Agency (NGA) and National Science Foundation (NSF) to automatically produce a high-resolution, high-quality, digital surface model (DSM) of the Arctic using optical stereo imagery, high-performance computing and open source photogrammetry software.

When ready, the Pan-Arctic DEM will cover the entire Arctic. Data users should anticipate quarterly deliveries from this summer until initial project delivery is complete.

All Arctic DEM data are available free to the public for any use. Links to download Arctic DEM data are found on PGC's ArcticDEM website (<http://pgc.umn.edu/arcticdem>).

### Arctic Spatial Data pilot

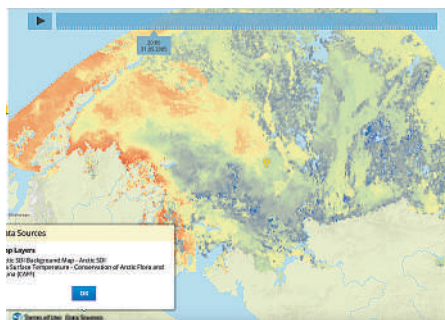
The Open Geospatial Consortium (OGC)-led Arctic Spatial Data pilot was initiated to demonstrate the diversity, richness and value of providing geospatial data using international standards in support of SDIs. Started on December 3 2015, the Arctic Spatial Data Pilot was sponsored by US Geological Survey and Natural Resources Canada, in collaboration with the Arctic SDI participants. This pilot demonstrates the value of standards in an environment principally built as a system of systems – that is, an SDI that integrates several existing systems as well as individual



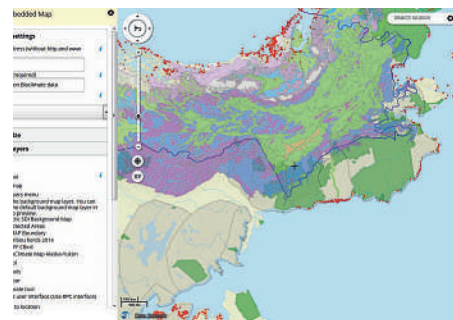
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The Geoportal features a time series tool, which can be used to visualise temporal data and display change over time, such as sea surface temperature. This sea surface temperature data is obtained from MODIS satellite data



The Arctic SDI Geoportal can be used to create embedded maps on other websites without programming

services and data repositories. Results are to be communicated via tutorials, technical documentation, and a story-based video: [www.opengeospatial.org/projects/initiatives/arcticspd](http://www.opengeospatial.org/projects/initiatives/arcticspd)

For further information, see GeoConnexion International June 2016.

### Arctic SDI Manual

The goal of the SDI Manual for the Arctic is to provide information and guidance on the planning, management, development and maintenance of the Arctic SDI to the various involved groups, to provide best data management practices, to identify policy and guideline requirements, and to demonstrate the value and benefits of using a SDI for efficient monitoring and decision-making in the Arctic. The manual addresses the needs of three different audiences: high-level strategic decision makers; Arctic data providers; and distributors as well as end users of Arctic data.

The manual is a dynamic document that will be continually edited and updated to reflect the evolution of SDI components, as well as the changing information requirements of the Arctic stakeholders.

Cooperation is key to SDIs. Most recent activity in Arctic cooperation was a joint meeting of Arctic SDI and the Arctic Regional Marine Spatial Data Infrastructures Working Group (ARMSDIWG) of the International Hydrographic Organization, where very good opportunities for cooperation were found.

For more information, please look at Arctic SDI (<http://arctic-sdi.org/>)

## ARCTIC SDI WAS ESTABLISHED TO ADDRESS THE NEED FOR READILY AVAILABLE SPATIAL DATA IN THE NORTHERN AREAS OF THE GLOBE

*Heli Ursin is part of the local organising committee for FIG Working Week 2017 ([www.fig.net/fig2017](http://www.fig.net/fig2017))*

### FIG WORKING WEEK 2017 IN HELSINKI, FINLAND

Finland, through National Land Survey, Finland is part of the Arctic Project. Finland is also the host of FIG Working Week 2017 from 29 May-2 June 2017 in Helsinki. This Arctic project will be presented together with many other papers and projects, within the overall theme 'Surveying the world of tomorrow – From digitalisation to augmented reality'. Visit: [www.fig.net/fig2017](http://www.fig.net/fig2017)