

ARCTIC SPATIAL DATA
INFRASTRUCTURE
STRATEGIC PLAN
2015-2020

Implementation Plan

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Implementation Plan Overview

Six long-term strategic objectives were identified in the Arctic Spatial Data Infrastructure Strategic Plan 2015-2020, with anticipated outcomes to be achieved for each. Each objective is detailed as a separate item in this *Strategic Plan 2015-2020 Implementation Plan*. Arctic SDI Working Group Activity Plans detailing specific tasks to be undertaken in each Working Group will be created yearly and aligned with the details noted in this Implementation Plan. The *Arctic SDI Roadmap Document* contains additional information regarding the strategic objective actions that cross-cut Arctic SDI Working Groups and specifics regarding participant National Mapping Agency involvement in the actions taken to implement the strategic objectives.

Key Performance Indicators

Several key performance indicators will be measured over the time period from 2015 to 2020 to gauge the effectiveness of the implementation of the *Arctic SDI Strategic Plan 2015-2020*, as well as the effectiveness of the Arctic SDI itself. The methods used to measure each key performance indicator will be detailed in a separate *Arctic SDI Key Performance Indicators Document* developed in the Strategy Working Group and coordinated with all other Working Groups. These will be measured, assessed and tracked yearly over the 2015-2020 timeframe with regular reports to the Arctic SDI Board.

Key performance indicators will include qualitative or quantitative metrics on:

- User satisfaction of authoritative reference and thematic data and services
- Relevance of Arctic SDI reference and thematic data to users
- The use of the Arctic SDI Geoportal, web services and metadata
- Known applications based on the Arctic SDI and their relevance
- Arctic SDI Operational Policies influence on the development of Arctic Council information management policies

Objective Implementation

This plan contains key information regarding how the strategic objectives will be implemented within the Arctic SDI including the overall Arctic SDI Working Group involvement, context, anticipated outcomes, approach, and a table of actions including a general timeline and specific Arctic SDI Working Groups involved. In addition, general key performance indicators are outlined in the six objectives described below.

Objective 1. User and Stakeholders Needs and Requirements

Working Group Involvement

Lead: Strategy Working Group

Supporting: Communication Working Group, Technical Working Group

Context

Addressing the needs of the Arctic Council, including Arctic Council Working Groups, and other relevant Arctic SDI users and stakeholders is key to the creation and implementation of the Arctic SDI.

Anticipated Outcomes

The anticipated outcomes for this objective are 1) an understanding of the primary Arctic SDI users and stakeholders, their needs and role in the Arctic SDI, and 2) evaluation and prioritization of available, relevant datasets and services for inclusion into the Arctic SDI.

Approach

The primary approach to this objective is identifying and tracking the spatial data needs and requirements of the Arctic Council and their Working Groups, as well as other Arctic SDI users and stakeholders over time. This includes their current and future needs for reference and thematic data and the services, tools needed to efficiently utilize those data, as well as data they may be able to provide. This process will be iterated as we learn from the data, our users and stakeholders, and it will be achieved by informal and formal outreach meetings. Analysis of the information gathered will be used to prioritize available datasets and the activities which will be undertaken in Objectives 2, 3, 4, 5 and 6.

Items to be considered in this work include:

- What reference and thematic data are the most useful for different types of users and at what geographic extent, spatial scale and time scale
- How existing reference and thematic data are used and accessed, and from where can it be accessed
- What data products might be available from providers or stakeholders
- The scope of general knowledge about information management policies, geoportals, SDIs and their benefits
- What operational policies and guidance (standards, technology, procedures, etc.) are required to enable the data providers to participate in the Arctic SDI
- The level of effort required by data providers and staff of the participating National Mapping Agencies to incorporate data into the Arctic SDI
- What types of future requirements would be needed to better accomplish user work in the Arctic

Actions

The actions for this objective are focused on enhancing and developing the Arctic SDI's capabilities based on increased data availability and services that meets user and stakeholder needs and requirements. The work will be cyclic in nature and will inform the Arctic SDI, relevant Arctic SDI users and stakeholders through continual improvement of capabilities and data availability.

	Actions	2015	2016	2017	2018	2019	2020	Lead Working Group - Supporting Working Group
1.1	Develop a set of questions to be used to document user and stakeholder needs and requirements							Strategy / Communication
1.2	Gather needs and requirements from Arctic Council Working Groups							Strategy / Communication
1.3	Gather needs and requirements from additional users and stakeholders							Strategy / Communication - Technical
1.4	Capture user and stakeholder needs and requirements, including into a user needs matrix							Strategy / Communication - Technical
1.5	Analyze and prioritize user requirements for Objectives 2, 3, 4, 5 and 6 implementation using an iterative workflow							Strategy / Communication
1.6	Communicate documented user needs to other Arctic SDI Working Groups for Objectives 2, 3, 4, 5 and 6							Strategy / Communication

Objective 2. Reference Datasets

Working Group Involvement

Lead: Technical Working Group

Supporting: Cloud and Cascading Service Working Group, Geoportal Working Group

Context

This objective concerns primarily reference data provided by the eight National Mapping Agencies involved in the Arctic SDI to provide a seamless basemap of reference geographic information for the Arctic through a Tiled Web Mapping Service (WMTS), or other appropriate technology. The participating National Mapping Agencies will also supply other discreet reference geospatial datasets as needed, available and authorized, as well as look into identified user needs for the development of the basemap services. As relevant, useful and necessary, reference datasets from sources other than the participating National Mapping Agencies may be made available through the Arctic SDI.

Anticipated Outcomes

The anticipated outcome for this objective is to ensure reference datasets are available through the Arctic SDI and its Geoportal to provide easy access to available, authoritative Arctic reference datasets.

Approach

The approach to this objective is to work with the Strategy WG and Communication WG through Objective 1 to understand and address user and stakeholder needs and requirements for reference geodata of the Arctic and supporting services. Work on specific projects will be distributed to Technical Working Group members voluntarily as needed and as available.

Actions

The actions for this objective are focused on six major activities. The primary activities are focused on maintaining and expanding access to authoritative reference data of the Arctic.

	Actions	2015	2016	2017	2018	2019	2020	Lead Working Group - Supporting Working Group
2.1	Address user needs for reference data							Technical
2.2	Update, maintain and improve the Arctic SDI reference dataset tiled Web Map Service (WMTS)							Cloud and Cascading Service - Technical, Geoportal
2.3	Harvest or provide access to reference dataset metadata in catalogue							Technical
2.4	Review and, as needed, refine the Arctic SDI list of reference datasets							Strategy
2.5	Work with reference data providers to determine efficient means to interact with their reference datasets and metadata							Technical
2.6	Develop enhanced access to reference data (e.g. place names)							Technical

Objective 3. Thematic Datasets

Working Group Involvement

Lead: Technical Working Group

Supporting: Strategy Working Group, Communication Working Group

Context

Thematic data are non-reference (i.e. non-basemap) datasets related to a theme of physical or human geographies, such as transportation, flora or fauna species mapping, ice extent predictions, etc., organized as thematic layers. Dataset providers may be governmental or interest organizations, companies, etc., or the eight participating National Mapping Agencies themselves. These datasets and metadata may be delivered and harvested using the same service alternatives as described for the reference data.

For end users, Arctic SDI applications provide access to discover, view and download the underlying thematic datasets. The searchable metadata catalog is a central part of the Arctic SDI applications, and thematic data from external partners can be viewed on the Arctic SDI Geoportal Viewer. In the future, data processing and overlay analysis of thematic data could also be combined with the existing datasets as an application in the Arctic SDI Geoportal.

Anticipated Outcomes

The anticipated outcome for this objective is to facilitate delivery and user access to thematic geospatial data of the Arctic, from a variety of sources, through the Arctic SDI using accepted standards.

Approach

To accomplish this objective, information from Objective 1 documenting the thematic data needs of users will be reviewed. The role data providers play will then be documented, along with the level of effort required to fulfill those needs. Then, based on unique user needs, engage with data providers to facilitate data publication via ISO standards, OGC specifications and common operational policies. The Arctic SDI establishes collaboration based on guiding operational principals that focus on sustaining and growing the data available through the Arctic SDI, and other spatial data infrastructures. This is a part of the iterative process described in Objective 1 aimed to prioritize data sets for incorporation.

- Under Objective 1, the Strategy Working Group in concert with the Communication Working Group will further define, refine and prioritize which thematic datasets are requested and will identify the data providers. The Strategy Working Group and Communication Working Group will engage with the Technical Working Group to investigate and document thematic data.
- Under Objectives 4 and 5, the Technical Working Group will reach out to the data providers to identify which operational policies are needed to facilitate an efficient and standardized way to establish access.

Actions

The actions for this objective are focused on six major activities, with each stage providing information that leads to enhanced data gathering on the needs and uses of Arctic SDI information.

	Actions	2015	2016	2017	2018	2019	2020	Lead Working Group - Supporting Working Group
3.1	Conduct a survey of datasets available from the Arctic area through Web services							Technical
3.2	Perform integration pilots using various software to demonstrate the breadth of thematic data available through services							Technical
3.3	Provide advisory role to with Arctic Council WGs (e.g. CAFF) and additional stakeholders to publish data via open data standards							Technical - Communication
3.4	Create and maintain links in the metadata catalogue to thematic datasets							Technical
3.5	Make thematic data layers accessible in the Geoportal Web Map Viewer							Geoportal - Technical
3.6	Assess the feasibility to include additional stakeholder thematic datasets (e.g. Int. Hydrographic Org (IHO) data)							Strategy / Technical

Objective 4. Data and Technical Interoperability

Working Group Involvement

Lead: Technical Working Group

Supporting: Cloud and Cascading Service Working Group, Geoportal Working Group

Context

Geospatial standards enable integration of geospatial services into IT infrastructures and solutions, reducing costs, adding flexibility and speed and making way for innovation in the process. Interoperability describes the extent to which systems and devices can exchange data, and interpret that shared data. For two systems to be interoperable, they must be able to exchange data and subsequently present that data such that a user can understand it.

Interoperability is a function of the desire to share data, organizational constructs and procedures, operational policies and current practices as well as technical arrangements. Hence, this interoperability objective is intrinsically tied to operational policies and communications with the Arctic Council at all levels. The scope of interoperability is the standards and technologies that enable data flow.

Articulating the value of interoperability across the SDI community is accomplished through a suite of operational policies. These policies and procedures provide details on how to consume data and services from the Arctic SDI and how to provide access to data and services for ingestion by the Arctic SDI Geoportal, as well as other SDIs.

Anticipated Outcomes

The anticipated outcome for this objective is the application of open geospatial standards and technologies within the Arctic SDI in a manner that supports interoperability, and remains current with emergent and accepted standards and technologies, and allows users to easily access and participate in the Arctic SDI.

Approach

The approach used in this objective is predicated on a user-centric design methodology that 1) leverages our memberships in standards organizations and investments in our respective national infrastructure implementations, services and data through iterative development, and 2) engages with data providers and stakeholders to ensure interoperable access to data about the Arctic across infrastructures and technical environments.

Items to be considered in this work include:

- Each participating National Mapping Agency is a member with a variety of standards bodies, projects and other initiatives including OGC, ISO, INSPIRE and ELF. These memberships will be leveraged in accomplishing this objective
- Leverage existing technology platforms: e.g. Oskari.org, GeoNetwork, applications etc.
- Use case refinement and application development through pilots and testing activities
- Pilot activities that are well communicated. A component of circumpolar OGC pilot includes the production of a video for Arctic Council audience
- Work with Arctic Council Working Groups to educate and inform around adoption of a policy on data standards

Actions

The actions for this objective are focused on six major activities. The primary activities include increasing awareness of the importance of standards and refinement of user requirement needs, identification of technology gaps, building new tools and engagement through piloting and videos.

	Actions	2015	2016	2017	2018	2019	2020	Lead Working Group - Supporting Working Group
4.1	Use case evaluation and engineering refinement							Technical - Strategy
4.2	Explore and employ new geoportal and showcase technologies and standards as needed							Technical - Geoportal, Cloud & Cascading Service
4.3	Support stakeholder application development, specifically Arctic Council Working Groups							Technical
4.4	Identify and address technology gaps							Technical
4.5	Undertake an Open Geospatial Consortium pilot and video							Technical
4.6	Address user needs regarding standardized cartographic representations (e.g. SLD and Context Document Library)							Technical

Objective 5. Spatial Operational Policies

Working Group Involvement

Lead: Operational Policies Working Group

Supporting: Strategy Working Group, Technical Working Group, Communication Working Group

Context

Operational policies are key to addressing the needs of the Arctic SDI infrastructure stakeholders, enabling data owners to engage with the Arctic SDI and encouraging data management for the benefit of all data users. Operational Policies represent practical instruments such as guidelines, best practices, procedures and manuals that address topics related to the lifecycle of geospatial information (i.e., collection, management, dissemination, and use) and help facilitate delivery, access and use of relevant geospatial data. They apply to the day-to-day business of organizations and address technical and administrative requirements. Operational Policies also address the legal issues relevant to the operation of the Arctic SDI Geoportal and services.

Anticipated Outcomes

The anticipated outcome for this objective is a suite of operational policies that provide guidance supplementing development of Information Management Policies for Arctic SDI stakeholders, data providers and users, supporting sound implementation of and participation in the Arctic SDI infrastructure and that target legal and administrative issues needed for the operation of the Arctic SDI Geoportal and its services.

Approach

As an outcome of information gained through Objective 1, part of the Objective 5 approach will be the creation of a list of issues addressing the user and stakeholder needs for guidance and tools that will support their effort to deliver data and use and derive benefit from the infrastructure. This list will be the result of consultation with the stakeholders and will be the basis for identifying and prioritizing the first sufficient suite of operational policies. This includes recommendations to stakeholders on the compliance with standards and procedures concerning data, services, applications and tools.

Decisions to provide access to additional datasets based on prioritization of actions related to Objective 2, 3 and 4 can also trigger the need for Operational Policies that tackle associated legal, operational or administrative issues.

Actions

The actions for this objective are focused on four major activities including a list of potential Operational Policies, understanding user needs for guidance and manuals etc., and a recommended list of prioritized policies.

	Actions	2015	2016	2017	2018	2019	2020	Lead Working Group - Supporting Working Group
5.1	Develop a comprehensive inventory of potential Operational Policies based on the analysis and decisions deriving from Objective 1, 2, 3 and 4							Operational Policies - Strategy
5.2	Evaluate and analyze the Arctic Council Working Group CAFF/Arctic SDI experience to identify needs for guidelines for Arctic Council Working Groups							Operational Policies
5.3	Develop Operational Policies based on Arctic SDI Board direction							Operational Policies
5.4	Create an Arctic SDI manual containing Spatial Operational Policies including technical guidelines							Operational Policies - Technical, Communication

Objective 6. Communications

Working Group Involvement

Lead: Communication Working Group

Supporting: Technical Working Group, Strategy Working Group, Secretariat

Context

Communicating with and addressing the needs of the Arctic Council, Arctic Council Working Groups, other Arctic stakeholders and users of the Arctic SDI are key to the success and implementation of the Arctic SDI. This objective focuses on ensuring that a consistent message describing the strategies and goals for the Arctic SDI, presenting operational policies, and articulating user and data provider interaction with the Arctic SDI is available. This message will not be a single presentation or document, but a suite of materials that can be used by members of the Arctic SDI and provided as part of the Arctic SDI official Website.

Anticipated Outcomes

The anticipated outcome for this objective is to have a communication strategy and outreach plan to promote the benefits and use of the Arctic SDI, to explain the operation, organization and governance and to communicate data standards and availability along with the goals of the Strategic Plan.

Approach

The primary approach to accomplish this objective is to compile a communication strategy and outreach plan, in order to promote the Arctic SDI to the Arctic Council Working Groups and Arctic stakeholders including NGOs, research groups, universities, scientific communities, governments and governmental authorities, media and the public.

Actions

Communication and outreach is a continuous and ongoing activity affecting all Arctic SDI Working Groups due to its integrative nature. For this reason, the actions for this objective are broad and overarching.

	Actions	2015	2016	2017	2018	2019	2020	Lead Working Group - Supporting Working Group
6.1	Create an external general presentation to be used in multiple settings							Communication
6.2	Create external technical presentation to be used in multiple settings							Communication
6.3	Create an Arctic SDI fact sheet handout							Communication
6.4	Advise and educate data providers on requirements and standards for data acquisition and delivery							Technical
6.5	Coordinate outreach and act as point of contact for stakeholders, users and the public in general							Communication
6.6	Coordinate development of information and key messages							Communication
6.7	Coordinate information across NCPs, WG Leads and Arctic SDI Working Groups							Communication
6.8	Maintain the Calendar of Events							Secretariat - Communication, Strategy
6.9	Identify and coordinate representation in international forums							Communication
6.10	Operate, update, edit and maintain the Arctic SDI official Website							Communication