

OGC® Testbed-12 Arctic Spatial Data Infrastructure Engineering Report

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OGC Engineering Report

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Abstract

This engineering report captures use cases representative of the vision of the Arctic Spatial Data Infrastructure (ArcticSDI). The ArcticSDI is a cooperative initiative established between the eight National Mapping Agencies of Canada, Finland, Iceland, Norway, Russia, Sweden, USA and Denmark, with the aim of providing governments, policy makers, scientists, private enterprises and citizens in the Arctic with access to geographically related Arctic data, digital maps, and tools to facilitate monitoring and decision-making. The initiative will achieve this aim by providing a framework of spatial information resources, organizational structures, technologies of creation, processing and exchange of spatial data, that provides broad access and efficient use of spatial data for the Arctic. The engineering report provides a review of the policy drivers supporting the establishment of spatial data infrastructure (SDI) in each Arctic nation in order to improve understanding of the use cases, user groups and the impact an ArcticSDI may have on their day-to-day business. The engineering report presents lessons learnt along each of the components of SDI, for example, users, data, technology, standards, policy and others. A discussion is presented on how the technologies and standards already in use by the national mapping agencies relate to the technologies and standards implemented by the testbed, as well as how emerging geospatial standards could benefit the ArcticSDI.

Business Value

The establishment of the ArcticSDI is expected to offer the following benefits when the SDI is fully operational:

- users would have easy access to relevant and updated geographic and thematic information covering the entire region of interest;
- information management practices will be improved through the adoption of commonly accepted policies and technical standards;
- accessibility of spatial data infrastructure will be improved across borders, thereby allowing for cross-border solutions to be established to shared regional problems; and
- creation of a distributed infrastructure consisting of interlinked servers offering high quality geospatial data.

To realize these benefits, it is necessary to maintain an understanding of the users, their needs and their roles in the overall picture of relevant stakeholders. This engineering report is important because it advances understanding of the

use cases from which the aforementioned benefits will be derived.

What does this ER mean for the Working Group and OGC in general

This engineering report is important to the OGC Architecture Working Group because the ArcticSDI is one of the few initiatives that has attempted to build a multi-national SDI. The engineering report therefore presents a rare opportunity for the Architecture Domain Working Group to gain insight into the challenges and solutions encountered in establishing such an SDI.

Keywords

ogcdocs, testbed-12, spatial data infrastructure, SDI, web services, architecture, use cases, Arctic.

Chapter 1. Introduction

The Arctic region is of increasing interest to the whole world as a result of its linkage to the global climate system, opportunities for economic development, geo-political strategic importance, sensitive ecosystems and social significance as home to Indigenous populations and other residents.

Arctic data are required by the scientific community to support research on topics such as climate, atmosphere, land, oceans, ecosystems, ice, snow, permafrost, and social systems; and by the local community to support impact assessments, engineering design, safe navigation and operations, risk management, emergency response, weather forecasting, and climate change adaptation. Over the past decade, advances in data collection and publication technologies have led to an unparalleled increase in the amount of geospatial data that are available on the World Wide Web.

An Arctic data infrastructure is evolving from a system where data are discovered in data catalogues and downloaded to the local machines of users, to a system of distributed data made interoperable using standards and providing users with storage and computational capacity close to large repositories of data. Interoperability and open standards are core to any spatial data infrastructure for the Arctic, as they enable the most efficient exchange of data, and the use of processing, visualization, and representation services in distributed systems.

1.1. Scope

The Arctic Spatial Data Infrastructure (ArcticSDI) is a cooperative initiative established between the eight National Mapping Agencies of Canada, Finland, Iceland, Norway, Russia, Sweden, USA and Denmark (including the administrations of the Faroe Islands Home Rule and the Greenland Self-Government). The initiative was established through a Memorandum of Understanding (MoU) which expressed the intention of the signatories to collaborate in implementing a framework of spatial information resources, organizational structures, technologies of creation, processing and exchange of spatial data, that provides broad access and efficient use of spatial data for the Arctic.

This OGC® document captures use cases representative of the vision of the ArcticSDI. The report presents a review of the policy drivers supporting the establishment of spatial data infrastructure (SDI) in each Arctic nation and discusses the impact an ArcticSDI may have on their day-to-day business. The engineering report also presents lessons learnt along each of the components of SDI: users, data, technology, standards, policy and others. A discussion is presented on how the technologies and standards already in use by the national mapping agencies relate to the technologies and standards implemented by the testbed, as well as how emerging geospatial standards could benefit the ArcticSDI.

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1.3. Future Work

No future work is planned to this document.

1.4. Foreword

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium shall not be held responsible for identifying any or all such patent rights.

Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.

Chapter 2. References

The following documents are referenced in this report.

- Arctic SDI: Arctic SDI Framework document (2015)
- Arctic SDI: Arctic SDI – Geoportal (2016), [online] <http://geoportal.arctic-sdi.org/> [Accessed 11 Jul. 2016]
- GSDI: SDI Cookbook (2009)
- Whiteside, A., Greenwood, J.: OGC 06-121r9, OGC® Web Services Common Standard (2010)
- OGC: Phase 1 Report: Spatial Data Sharing for the Arctic (2016), [online] <http://www.opengeospatial.org/projects/initiatives/arcticsdp> [Accessed 11 Jul. 2016]

Chapter 3. Terms and definitions

For the purposes of this report, the definitions specified in Clause 4 of the OWS Common Implementation Standard [OGC 06-121r9] shall apply. In addition, the following terms and definitions apply.

3.1. metadata

data about data

3.2. model

abstraction of some aspects of a universe of discourse [ISO 19109]

3.3. interoperability

capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units [ISO 19119]

3.4. syntactic interoperability

the aspect of interoperability that assures that there is a technical connection, i.e., that the data can be transferred between systems

3.5. semantic interoperability

the aspect of interoperability that assures that the content is understood in the same way in both systems, including by those humans interacting with the systems in a given context

Chapter 4. Conventions

4.1. Abbreviated terms

The abbreviated terms clause gives a list of the abbreviated terms and the symbols necessary for understanding this document.

- eb-RIM electronic business Registry Information Model
- CSW Catalogue Service for the Web
- OGC Open Geospatial Consortium
- OWS OGC Web Services
- SDI Spatial Data Infrastructure
- UML Unified Modeling Language
- WFS Web Feature Service
- WMS Web Map Service

Chapter 5. Overview

The rest of this engineering report is organized into sections for the Status Quo & New Requirements Statement, Solutions and Recommendations.

The Status Quo & New Requirements Statement section describes the status quo of the ArcticSDI. The section describes what capabilities currently exist within the ArcticSDI and how the ArcticSDI relates to associated initiatives such as the US NSDI, EU INSPIRE and GEOSS. The section also describes the issues and problems that are known to affect the ArcticSDI and have been addressed in this engineering report. The section also presents the requirements that need to be fulfilled in order to address the issues and problems identified.

The Solutions section describes the solutions that were designed at the beginning of the testbed, experimented with during the testbed and lessons learnt during the implementation and testing of the solutions.

The Recommendations section summarizes the solution recommended as a result of the experimentation carried out during the testbed.

5.1. Spatial Data Infrastructure

The fundamental aim of a Spatial Data Infrastructure (SDI) is to efficiently support decision making from the local to the global level for all involved stakeholders through the publication and dissemination of geographic data and geographic services. This is accomplished by the definition of a wide range of agreements, standards, protocols, technologies and procedures, and perhaps most importantly by the active involvement of the interested parties. The SDI Cookbook (GSDI, 2015) denotes an SDI as "the relevant base collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data".

The principle components of an SDI are as follows:

1. **Technology** The technologies required for the SDI to exist enable not only the simple visualization of geospatial information (typically as a web map) but provide all necessary functionality such as metadata management, data warehousing, mobile apps, data dashboards, advanced analytic processes and so on.
2. **People** The stakeholders of an SDI are broad in range and function; they may be in the form of international bodies or in the form of individual citizens or somewhere between. The stakeholders will be the entities which not only provide and process data but most importantly will consume data with a view to enhancing decision making. People are the key to setting the goals of the SDI, the policies of the SDI, and guiding future development.
3. **Policies** Organizational policies dictate the management of spatial data vis-à-vis managing the legal and administrative requirements: for example defining data security, licensing, liability, intellectual property and privacy. Economic policy will drive funding and therefore define the requirements for data capture, focusing aims on how data is to be processed and presented.
4. **Standards** The harmonization of standards is essential for a coherent SDI. An SDI will catalogue data and services from disparate sources and outwardly present one or more interfaces potentially using disparate technologies; in order to achieve this, rigorous standards

must be followed to ensure seamless interoperability. If rigorous standards are followed then users may efficiently interrogate disparate data catalogues to extract the data of pertinence to the project in hand. If standards are followed, then the SDI essentially tends toward platform agnosticism thus increasing robustness and futureproofing levels.

The advantages of an SDI are manifold: reduction of data duplication, preservation of data, ease of access to multiple data sources, integration of data for use in disparate tools, facilitates database maintenance, promotes institutional cooperation and general promotion of awareness of spatial data.

5.2. The Arctic Spatial Data Pilot

The OGC Arctic Spatial Data Pilot (SDP), supported by the US Geological Survey and Natural Resources Canada, has the stated purpose of how to best support the development of an SDI for the Arctic (OGC, 2016). This is not in competition with the existing Arctic SDI (Arctic SDI, 2016), but rather is to support and demonstrate its value to stakeholders, thus increasing involvement and ultimately usefulness by further integration and availability of data and services.

Stakeholders for the Arctic SDI include, but are not limited to, indigenous communities, national and local government, commercial interests such as shipping and resources, emergency services, scientific institutions and the geospatial services sector. The role of each stakeholder may fall into one or more category; for example, an organization may be both a data producer and a data consumer.

The Arctic SDP features several challenges, some of which are perhaps unique; in particular, the requirements of a dynamic SDI environment due to the changing availability of data has the potential for conflicts with the requirement to be operable in zero bandwidth locations. At minimum it may be expected that lagging may occur.

Concluded by the Arctic SDP Phase 1 report is that value may be demonstrated to stakeholders by the development of a number of use cases. By the demonstration of such value, critical momentum may be built such that involvement is maximized and the impact of the Arctic SDI is assured. The Phase 1 report recommends a number of such use case scenarios to be further investigated for the following second phase of the pilot. The goal of this document therefore is to formalize the testbed scenarios by the definition of business use cases. Each scenario is defined by the following:

1. **Identifier** (identification code for current use case)
2. **Description** (overall description of the scope)
3. **Actors** (stakeholders involved in the use case)
4. **PreConditions** (actions and statuses assumed as existent at start of the process)
5. **Basic Path** (step by step description of the expected process)
6. **PostConditions** (existent statuses at the end of the process)

Use case scenarios initially proposed in the Phase 1 report featured a broad range: including such domains as indigenous naming to flora and fauna tracking and climate change scenarios. The proposals herewith are based therefore on these use cases; it is noted however that the use cases are considered as a first stage and from a practical viewpoint it is necessary to assess against the set

of available data.

5.3. Scenarios

The goal of the Arctic SDI is to demonstrate the value of an SDI to the Arctic. Representative scenarios and use cases have been identified, supported by a large number of datasets available online and provided by organizations, research centers, government agencies and other data providers. In order to be able to exploit these datasets, users must be able to discover them in the Arctic SDI and visualize them by Arctic SDI client component software. Both static maps served via WMS and coverage data provided via WCS will be exportable by users. Climate change is one of the most prominent scientific fields of research in the Arctic. A typical scenario would include aspects such as the monitoring of sea ice change including evaluation of areas that are suffering the worst impacts, and the estimation of damage to infrastructure; or the status and condition of the permafrost layer including the evaluation of impact to existing infrastructure with projections of future conditions (Simonis, 2016).

5.3.1. Scenario 1 – Melting Sea Ice

Arctic sea ice cover reached the second lowest point on record in September 2016 according to the National Snow & Ice Data Center (NSIDC) Sea Ice Data Index (NSIDC, 2016). The reported ice covered 1.6 million square miles of the Arctic, the lowest point of 2016. The low sea ice has an adverse impact on global climate, Arctic infrastructure, vessel routes, ecosystems and wildlife. Supported types of research activities include: -Research on the nature of changes in sea ice distribution and mass balance in response to climate change and variability -Improving understanding of the impacts of a changing sea ice regime on coastal stability and communities - Improving understanding of how a thinner and weaker ice cover responds to wind and precipitation

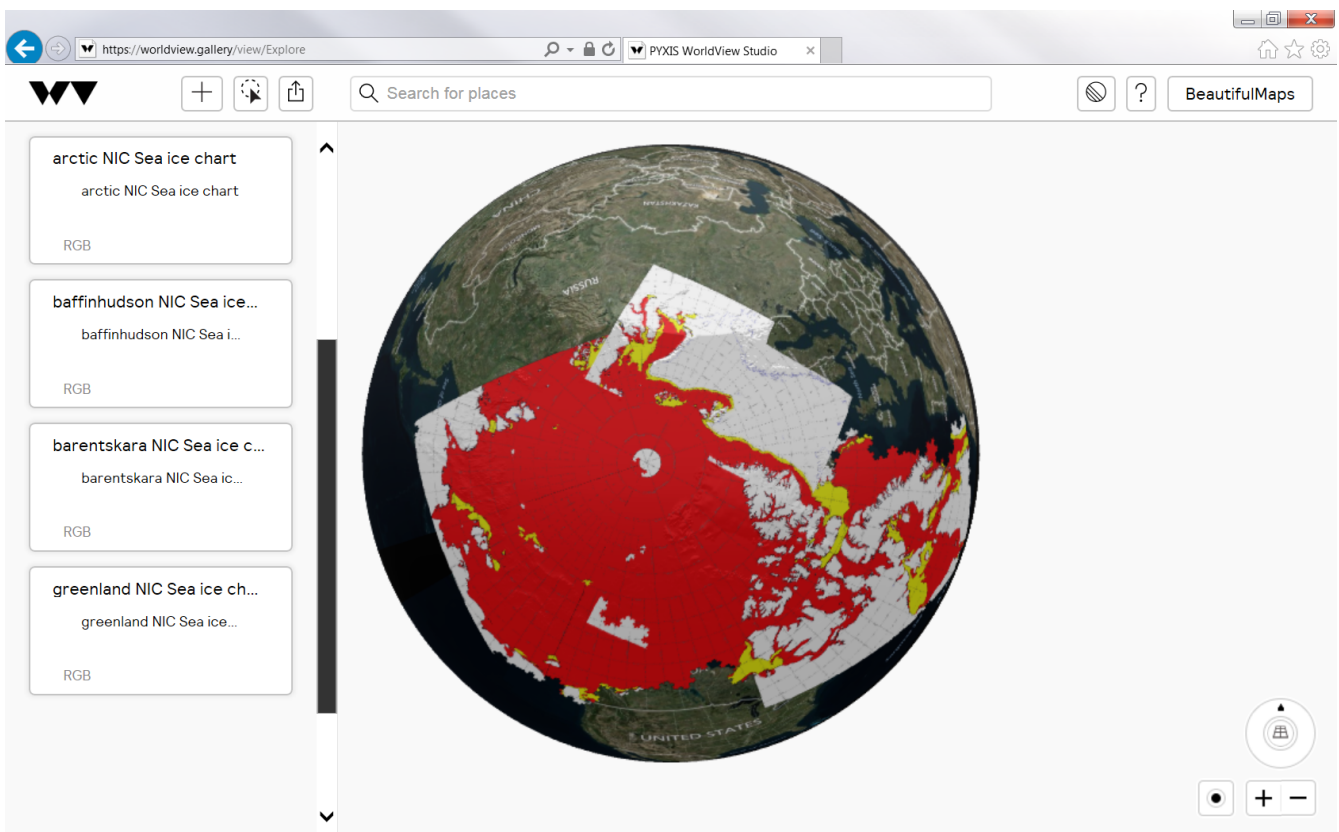


Figure 1. Screenshot of sea ice data viewed using Pyxis WorldView client

5.3.2. Scenario 2 - Thawing Permafrost

Permafrost is permanently frozen soil, sediment or rock. Its classification is solely based on temperature which must remain below 0°C for at least two years (Permafrost Subcommittee, 1988). Due to climate change and rising temperature, permafrost could thaw, impacting the immediate land above. This changing shape of the land may damage buildings and infrastructure such as roads, airports, and water as well as affecting ecosystems. Another reason for concern is that permafrost is a large storage of carbon, which may be released to the atmosphere in the form of methane, a powerful greenhouse gas. This process leads to more climate change and is an example of a cycle which happens when warming causes changes that lead to even more warming. Supported types of research activities include: -Research on the impact of rising temperatures on the extent and depth of permafrost -Understanding the impact of the loss of permafrost on infrastructure, ecosystems, climate and people

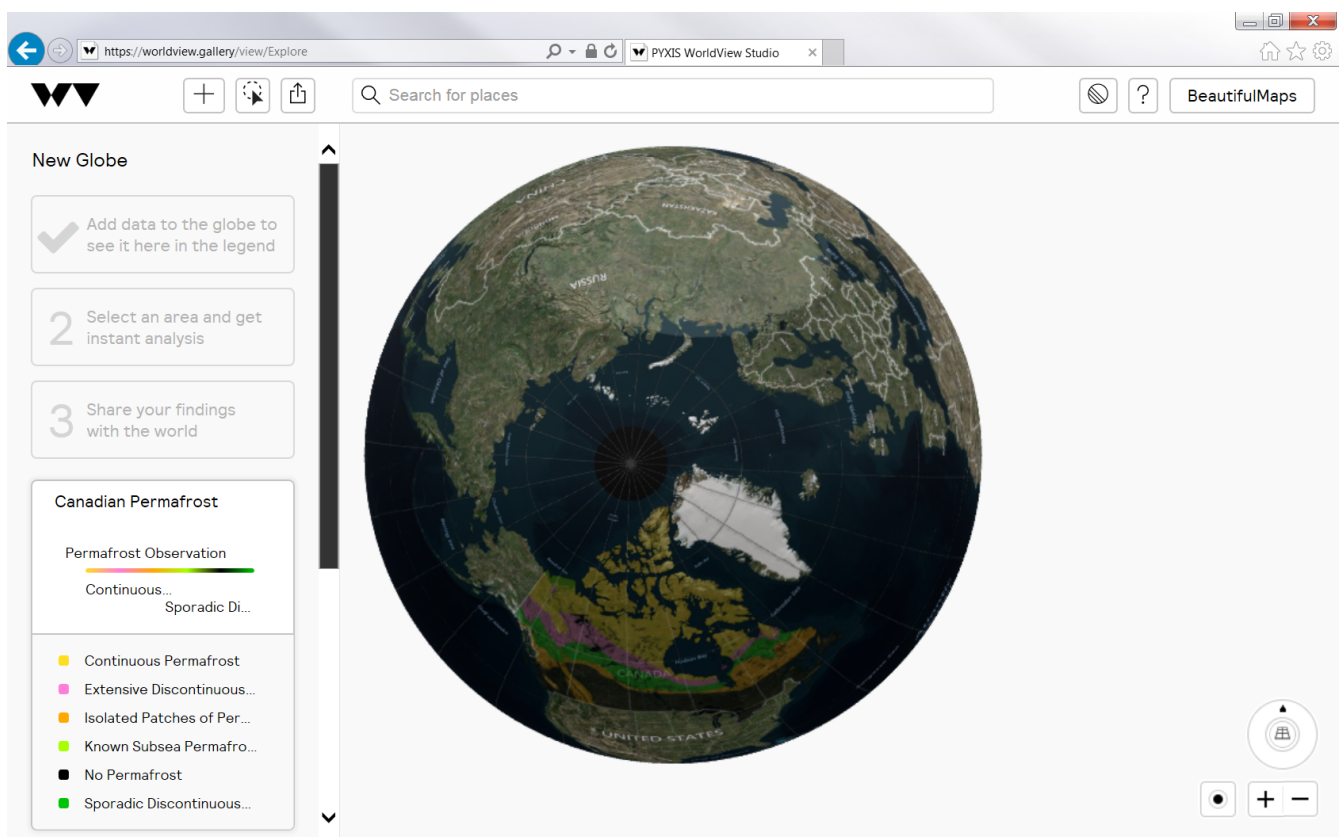


Figure 2. Screenshot of permafrost data viewed using Pyxis WorldView client

5.4. Use Case Summary

The following table provides a summary of the identified use cases, their feasibility and priority. A detailed description of each individual use case is provided in Annex A.

Table 2. Use Case Summary

Category	Group	ID	Arctic SDI - Use Cases	FCode
General	General	1	Provide resource	1
		2	Publish metadata	1
		3	Search and find	1
		4	Bind to service	1
		5	Consume resource	1
Detailed (Arctic SDP)	Indigenous Knowledge	1S	Crowdsourcing of indigenous knowledge	2
		2S	Gazetteer of indigenous names	2
	Geohazards and Weather	3S	Offshore geohazards	3
		4S	Geohazards risk assessment	4
		5S	Underground utilities	5
	Marine Use Cases	6S	Arctic disaster management (marine)	3
		7S	Iceberg tracking	3
		8S	Iceberg warning	3
		9S	Iceberg path prediction	5
		10S	Arctic resource exploitation monitoring	4
		11S	Arctic sanctuaries intrusions	3
	Terrestrial Use Cases	12S	Mammal migration	3
		13S	Arctic disaster management (terrestrial)	3
		14S	Water management at the catchment scale	4
		15S	Ecosystem changes	4
	Climate Change	16S	Sea level rise	4
		17S	Glacier movements	3
		18S	Permafrost monitoring	4
	Other	19S	Pan-arctic ice charts	3

FCodes are informed estimates of the feasibility and priority of each scenario from 1 (high priority/simple to achieve) to 5 (low priority/difficult to achieve).

Chapter 6. Status Quo & New Requirements Statement

6.1. Status Quo

The current implementation of the ArcticSDI includes a web-deployed portal and a variety of services based on OGC standards.

The portal allows for searching and publishing data and services. The search facility offered by the portal allows for the specification of search criteria by resource type, resource name, responsible party, keyword, topic category, metadata language, resource language and geographic extent. A screenshot of the current portal is shown in Figure 3.

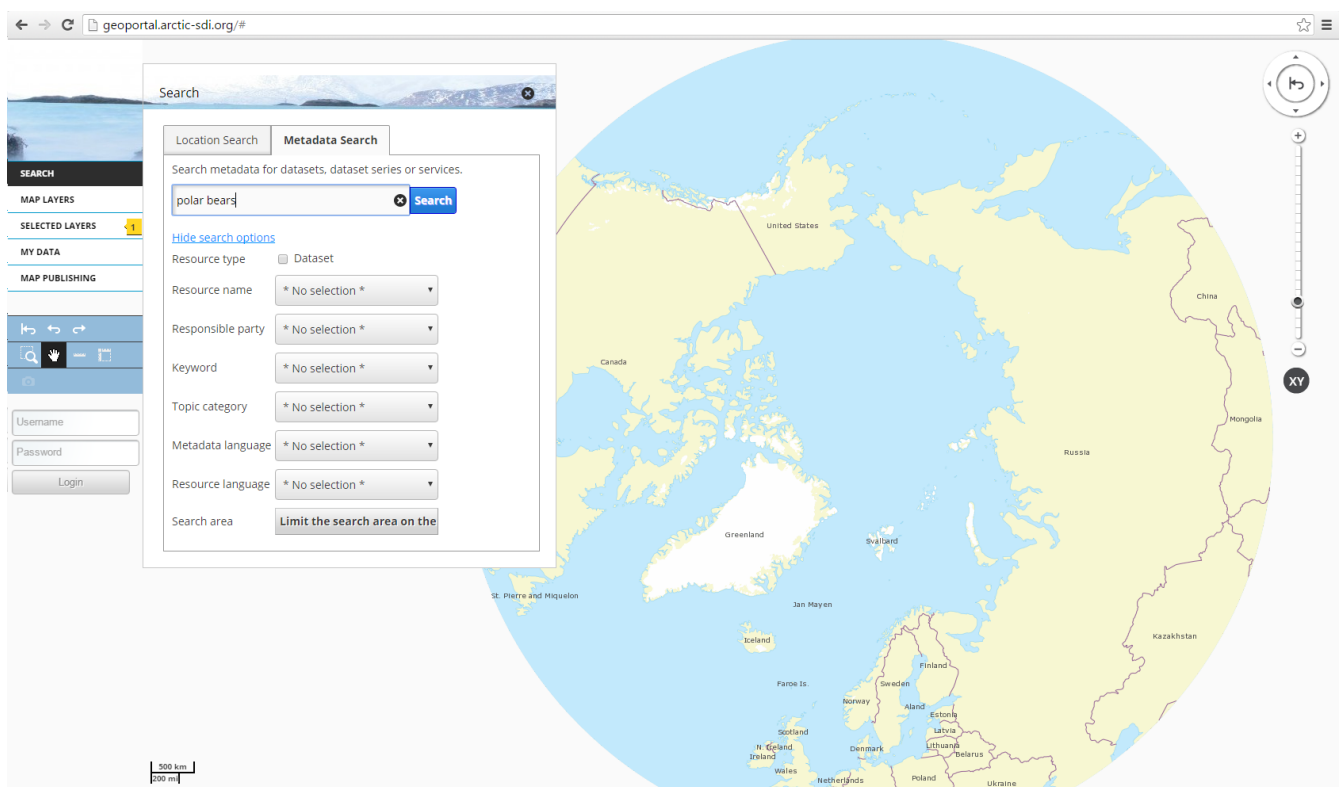


Figure 3. A screenshot of the current ArcticSDI portal.

The portal serves ISO 19139 XML-encoded metadata retrieved from a web service based on version 2.0.2 of the Catalogue Service for the Web (CSW). The CSW is implemented using an instance of the GeoNetwork.

The mapping presented on the portal is provided through a Web Map Tiling Service (WMTS) and several of the services advertised in the metadata are WMS.

6.2. Requirements Statement

Testbed-12 was tasked with addressing the following work items in relation to the ArcticSDI.

- Provision of Arctic data that is currently served at WMS interfaces as images only. The data

shall be made available using WCS.

- Implementation of a client application that can demonstrate the usage of ArcticSDI data, including data that is served at WMS and WCS interfaces.
- Analysis of whether the current Earth Observation profile serves all needs to access ArcticSDI data.
- Analysis of how data served as OPeNDAP can be integrated.
- Analysis of how netCDF data can be served efficiently.
- Discussion of interoperability issues that are specific to the ArcticSDI.

Chapter 7. Solutions

7.1. Targeted Solutions

This section presents all of the solutions that the testbed targeted for investigation.

7.1.1. Provision of Arctic data using WCS

The testbed implemented several different geospatial web services providing Arctic data, including WFS, WMS and WCS. In addition to implementing services offering Arctic data, the testbed also identified third party services offering data covering parts of or the entire Arctic. All of the services are presented in Annex B. This section describes how the requirement to provide Arctic data using WCS was addressed.

The following WCS were implemented to show usage of WCS for delivering Arctic data: * ESRI WCS (Arctic Digital Elevation Model); and * Compusult WCS (Canadian Ice Edge and Iceberg Observations).

The following additional WCS were identified as offering data relating to the Arctic:

- National Sea Ice Data Centre (NSIDC) Northern Hemisphere WCS; and
- National Sea Ice Data Centre (NSIDC) Southern Hemisphere WCS.

7.1.2. Implementation of a client application that can demonstrate the usage of ArcticSDI data

Typically global maps use cylindrical or pseudo-cylindrical projections that are aligned with the Equator. Whereas this works well for most parts of the Earth, such projections are well known for exhibiting extreme distortion in or near the polar regions.

Two of the approaches for addressing this are:

- Use of a polar-oriented projection such as the North Pole Lambert Azimuthal Equal-Area (LAEA; e.g. EPSG:3571-3576); or
- Use of an interactive 3D globe.

Testbed-12 focused on the second of the above listed approaches. Within the testbed the Pyxis WorldView browser, which supports WMS and WCS interfaces, was deployed. The browser was configured to access a series of WMS, WCS and other services offering Arctic data as shown in Figure 4.

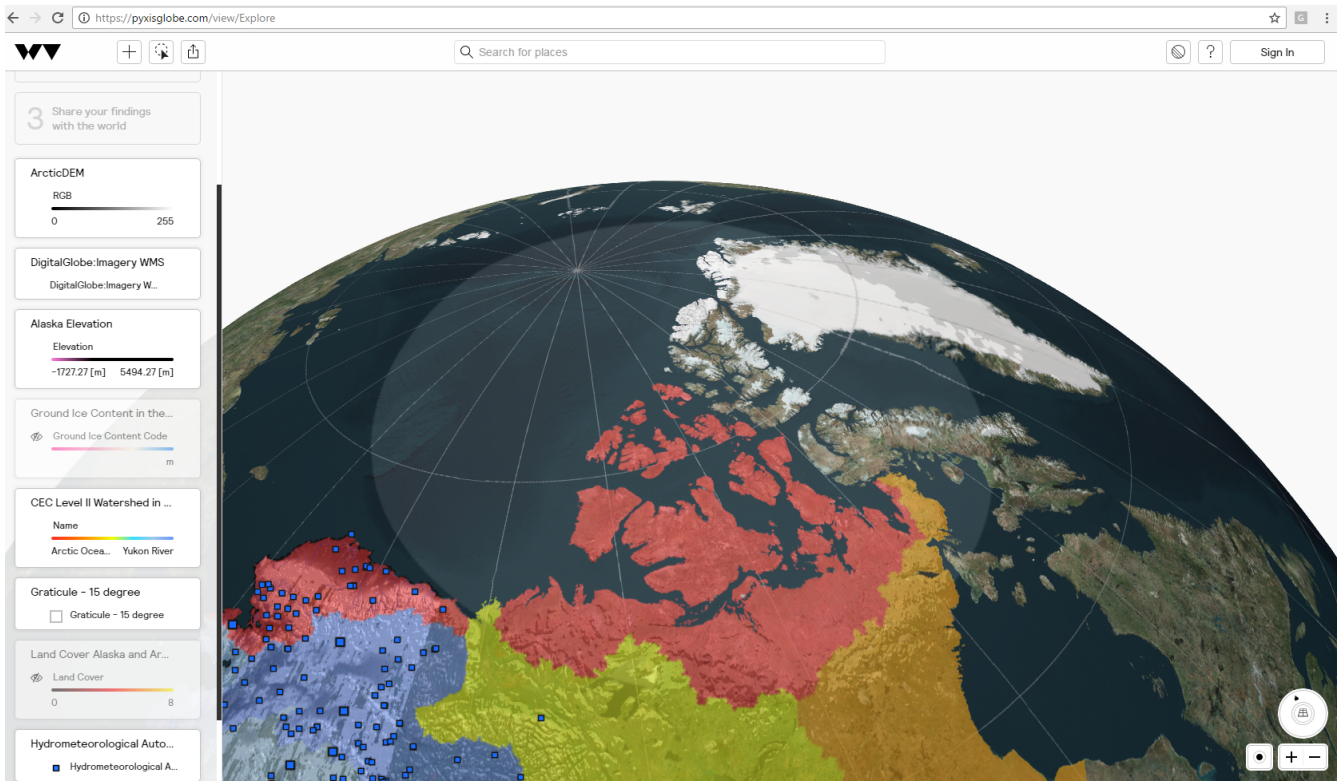


Figure 4. Pyxis WorldView client solution.

The ArcticSDP Phase 1 report states that "Important projections and corresponding datums for the North American part of the Arctic include Yukon Albers using NAD83, UTM Zone 7N to 10N using NAD83, GCS CSRS using NAD83. An earlier study by FGDC identified that most Web mapping services for the Arctic countries support EPSG:4326, with EPSG:4269 and EPSG:4267 being also popular projections and EPSG:32633 being well supported by services from Norway and Sweden. The use of Web Mercator (Auxiliary Sphere) WGS84, though often used in Web applications, has some serious precision implications and should be avoided." The approach adopted in Testbed-12 was therefore consistent with recommendations from the ArcticSDP Phase 1 report.

7.1.3. Analysis of the current Earth Observation profile for serving ArcticSDI data needs

The OGC Web Coverage Service (WCS) Application Profile – Earth Observation, defines a profile of WCS 2.0 for use on Earth Observation (EO) data. The profile provides the following:

- Definition of specific EO coverages with spatial and temporal extent options;
- Definition of a hierarchical approach for grouping coverages such that they can be retrieved efficiently;
- Datasets as plain two-dimensional (2-D) EO Coverages;
- Mosaics of spatially non-overlapping subsets of datasets, accessible themselves as coverages;
- Dataset series as collections of stitched mosaics, datasets, and/or series of datasets; and
- Bundling of several mandatory and optional WCS extensions for EO-WCS implementations.

The ArcticSDP Phase 1 report identified data requirements for the Arctic. The following table identifies example data that is publishable through services conforming to the EO WCS profile.

ID	Data required	Example data publishable through the EO WCS profile
1	Hydrographic data	Bathymetry, geology, sea ice presence, sea ice thickness, sea ice velocity, water temperature, salinity, fluorescence, turbidity, dissolved oxygen, chlorophyll, suspended material, chromophoric and dissolved organic matter
2	Land and coast data	Land cover, flood hazards, optical imagery, radar imagery, high resolution map of Arctic permafrost
3	Cryosphere	Snow, ice and frozen ground
4	Vessel tracking	Typically presented as vector data therefore not appropriate for WCS. However, where this uncertainty about the location of a vessel, a coverage can be used to present a continuous representation of the likelihood of a vessel being in a certain spatial extent.
5	Terrestrial ecosystems data	Collections of all other coverage data
6	Wildlife	Wildlife population density
7	Communities	Human population density

At the core of the data model of the EO WCS profile is the data structure of an Earth Observation coverage (EO Coverage), which is a location-bound coverage that is extended with EO metadata as described in OGC document 10-157r3. This characteristic of the EO WCS profile makes it suitable for the Arctic as it allows coverages to be centered around the Arctic.

Dataset series as defined by the EO WCS profile allow for multiple datasets to be grouped together and delivered as a single artifact. This capability is particularly suitable for the ArcticSDI because it allows for the creation of virtual datasets that are composed of datasets, dataset series and stitched mosaics. So a dataset series could be created from datasets provided by two or more Arctic nations.

7.1.4. Analysis of how data served as OPeNDAP can be integrated

OPeNDAP provides software that allows access to data over the internet through the Data Access protocol (DAP) - a NASA community standard. This section describes key OPeNDAP operations and relates them to WCS operations for comparison. The starting point for an OPeNDAP service is the dataset URL, for example.

<http://test.opendap.org/dap/data/nc/sst.mnmean.nc.gz>

A description of a published dataset can be obtained by appending .dss to the OPeNDAP URL. This returns the data's Dataset Descriptor Structure (DDS). This provides a description of the data, including a high level schema. An example URL for retrieving a DDS is shown below.

<http://test.opendap.org/dap/data/nc/sst.mnmean.nc.gz.dds>

A more detailed description of the data can be obtained from the Data Attribute Structure (DAS) which contains metadata such as units and the name of the variables. The metadata provided by the DAS is specified at an implementor's discretion and thus is less consistent across different implementations than the metadata provided by the DDS. An example URL for retrieving a DAS is shown below.

<http://test.opendap.org/dap/data/nc/sst.mnmean.nc.gz.das>

All of the information from the DAS and the DDS can be obtained from the info service by appending .info to the OPeNDAP URL. An example URL for accessing the info service is shown below.

<http://test.opendap.org/dap/data/nc/sst.mnmean.nc.gz.info>

Having determined the structure of the data from the DAS and DDS. It is then possible to retrieve data by appending query parameters to the URL. An example URL for retrieving data is shown below.

<http://test.opendap.org/dap/data/nc/sst.mnmean.nc.gz.ascii?sst%5b0:1%5d%5b13:16%5d%5b103:105%5d>

The OPeNDAP group has developed a server called Hyrax. The server supports access to geo-referenced data using geographic coordinates (latitude and longitude).

The following table associates OPeNDAP operations to those of WCS to indicate how the two types of services could be integrated. Within an ArcticSDI context, WCS would act as a proxy to OPeNDAP (meaning that OPeNDAP would act as a data source to WCS).

OPeNDAP operation	WCS operatiion
DDS	DescribeCoverage
DAS	DescribeCoverage
Info	GetCapabilities
dataset URL	GetCoverage
dataset URL and query parameters	GetCoverage with request parameters

7.1.5. Analysis of how netCDF data can be served efficiently

NetCDF is a data model for array-oriented scientific data. NetCDF datasets are self-describing as they provide descriptive information about the data they contain. The format allows computers with different ways of storing integers, characters, and floating point numbers to access such data in netCDF files consistently. For large raster coverage datasets, netCDF offers a means of efficiently

accessing small subsets of such datasets without needing to read the complete dataset first. This capability aligns well with the subsetting and slicing capability offered by WCS.

NetCDF has two data models. The classic model is used by netCDF-1, netCDF-2, and netCDF-3. The enhanced model is used by netCDF-4.

A netCDF classic dataset is stored as a single file comprising of the following parts:

- A header that provides information about dimensions, attributes, and variables; and
- A data part that provides variable data.

The netCDF-4 format is based on HDF5. It therefore offers elements such as groups, dimensions, variables and attributes. The enhanced model adopted by netCDF-4 supports user defined types, in addition to primitive data types.

Amongst netCDF utilities available is the [nccopy](#) tool, which allows for creating copies of netCDF files. The nccopy tool offers an option for compressing netCDF files with different levels of compression. The options supported by nccopy are shown below.

```
nccopy [-k output_kind] [-d level] [-s] [-c chunkspec]
      [-u] [-m n] [-h n] [-e n] input output

[-k output_kind] kind of output netCDF file
                  omitted => same as input
                  '1' or 'classic' => classic file format
                  '2' or '64-bit-offset' => 64-bit offset format
                  '3' or 'netCDF-4' => netcdf-4 format
                  '4' or 'netCDF-4 classic model' => netCDF-4 classic model
[-d level] deflation level, from 1 (faster but lower compression)
           to 9 (slower but more compression)
[-s]      shuffling option, sometimes improves compression
[-c chunkspec] specify chunking for dimensions, e.g. "dim1/N1,dim2/N2,..."
[-u]      convert unlimited dimensions to fixed size in output
[-m n]    memory buffer size (default 5 Mbytes)
[-h n]    set size in bytes of chunk_cache for chunked variables
[-e n]    set number of elements that chunk_cache can hold
input     name of input file or OPeNDAP URL
output    name of output file
```

Note that the higher the compression level, the longer it takes to compress a netCDF file. [1: http://www.unidata.ucar.edu/blogs/developer/entry/netcdf_compression]. In a web environment, this suggests the need to consider timeout limits for generating responses.

To allow WCS to efficiently transmit netCDF files, future versions of the EO WCS should provide client applications with the option of compressing netCDF files on retrieval, supported for example by the nccopy tool or an equivalent facility. Such a capability could also be useful for other WCS profiles.

The testbed found that a number of WCS are able to support netCDF. The Rasdaman WCS which

was deployed within the testbed allowed for retrieval of netCDF data. Another example is GeoServer, which offers a netCDF plugin extension for enable coverages published through the web service to be retrievable encoded in netCDF.

An example request to obtain a netCDF data from the Rasdaman WCS is <http://ows.rasdaman.org/rasdaman/ows?service=WCS&Request=GetCoverage&version=2.0.1&CoverageId=multiband&format=application/netcdf&>

Reviewing the literature for both Rasdaman and GeoServer, the testbed found that netCDF has different MIME types for different versions and data models, for example application/x-netcdf, application/netcdf, and application/x-netcdf4. The EO WCS profile and the OGC netCDF do not explicitly state which netCDF version is recommended and what MIME type is to be specified in requests. To improve interoperability, future versions of the EO WCS profile and the OGC netCDF standard should explicitly state which MIME types are to be used with which versions.

7.1.6. Discussion on interoperability issues that are specific to the ArcticSDI

As shown in Appendix B, most of the services identified as providing Arctic-related data were either WMS or WFS. Whereas this addresses some of the key issues relating to service interoperability when publishing vector data and rendered maps, there still remains a need for WCS to be used to publish the vast amounts of coverage data available. The EO WCS profile will help address this need. Another emerging WCS profile that could potentially facilitate the publication of Arctic-related coverage data is the MetOcean Application Profile for WCS 2.1 (OGC Document 15-045).

The variety of information published by the services identified in this testbed suggests that there is a need to consider data interoperability. An ArcticSDI domain information model developed through harmonization of member states information models would facilitate data interoperability. Such harmonization could potentially be expanded to include metadata harmonization as well.

Chapter 8. Recommendations

Having considered the Arctic data needs, potential benefits of netCDF and those of openDAP, the testbed makes the following recommendations.

1. Arctic nations should use dataset series on EO WCS to create joint virtual datasets that consist of coverages from their individual products.
2. Future versions of the EO WCS profile and OGC netCDF standard should recommend MIME types for use with specific versions and data models of netCDF.
3. Future versions of the EO WCS should provide client applications with the option of compressing netCDF files on retrieval, supported for example by the nccopy tool or an equivalent facility.

Appendix A: Appendix A - Use Cases

This section presents the ArcticSDI use cases and their scenarios in tabular form. The UML diagram of the use cases is presented in Figure A.1

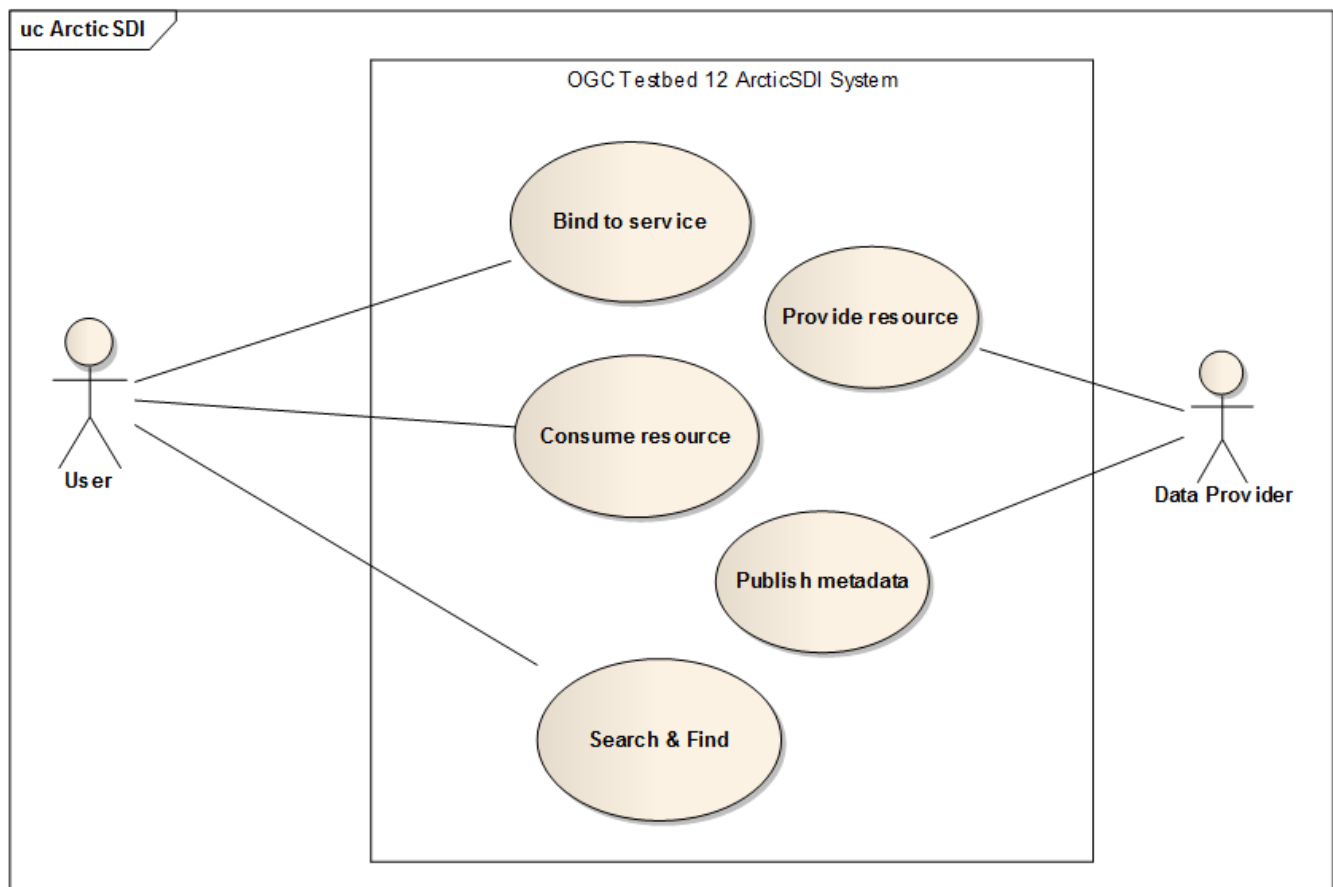


Figure A.1. General SDI use cases.

Table 3. A.1 Provide Resource Use Case Scenario

identifier	1
Description	The Arctic SDI Pilot will provide the ability for the publication of resources.
Actors:	*Data Provider
PreConditions:	
Basic Path:	1. Data Provider creates a resource 2. Data Provider publishes resources to the Portal 3. Portal adds resource to the catalogue 4. Portal confirms that the resource has been catalogued
PostConditions:	*Resource is catalogued

Table 4. A.2 Publish Metadata Use Case Scenario

identifier	2
Description	The Arctic SDI Pilot will provide the ability for the publication of metadata.
Actors:	*Data Provider

PreConditions:	*1 Provide Resource Use Case Scenario
Basic Path:	1. Data Provider enters metadata into the Portal 2. Data Provider associates metadata with resource 3. Portal confirms that the metadata has been catalogued
PostConditions:	*Metadata for resource is catalogued

Table 5. A.3 Search and Find Use Case Scenario

identifier	3
Description	The Arctic SDI Pilot will provide the ability for users to search for, and find, resources.
Actors:	*User
PreConditions:	*2 Publish Metadata Use Case Scenario
Basic Path:	1. User requests a description of the system search capabilities from the portal. 2. Portal presents the User with search options consisting of spatial, temporal and thematic fields. 3. User sends their search criteria to the portal. 4. Portal returns a list of resources that match the search criteria to the User
PostConditions:	*User is presented with query results

Table 6. A.4 Bind-to-Service Use Case Scenario

identifier	4
Description	The Arctic SDI Pilot will provide the ability for users to invoke and link to a resource service.
Actors:	*User *Data Provider
PreConditions:	*1 Provide Resource Use Case Scenario *3 Search and Find Use Case Scenario
Basic Path:	*User discovers a resource * User links to resource in anticipation of consumption
PostConditions:	*The provider and consumer are linked independently of the broker

Table 7. A.5 Consume Resource Use Case Scenario

identifier	5
Description	The Arctic SDI Pilot will provide the ability for users to consume a resource
Actors:	*User
PreConditions:	*4 Bind-to-Service Use Case Scenario
Basic Path:	*User links to resource * User consumes resource through: visualisation/interrogation/analysis/download
PostConditions:	*Resource is provided to user in required format

Table 8. A.1S Crowdsourcing of Indigenous Knowledge

identifier	1S
Description	The Arctic SDI Pilot will provide the capability to link Indigenous and Scientific Knowledge by enabling Indigenous communities to provide geotagged items (pictures, animals and plants sights, etc.) which are of interest to them.
Actors:	*Data Producer (Indigenous People) *Data Provider
PreConditions:	*Data Producer must have signed in to their account to contribute to the Indigenous Knowledge section.
Basic Path:	*1. Data Producer provides a geotagged item (picture, animal or plant sights, etc.) for a specific location. * 2. The Data Producer fills in the metadata with information about the submitted item. *3. Data Provider makes the new item available to use and download.
PostConditions:	*The new geotagged item is available in the system.

Table 9. A.2S Gazetteer of Indigenous Names

identifier	2S
Description	The Arctic SDI Pilot will provide the capability to crowdsource Indigenous Knowledge by enabling Indigenous communities to provide place naming. Place names are extremely important to Indigenous Peoples as a reflection of their culture and heritage, and also as a tool for language preservation.
Actors:	*Data Producer (Indigenous People) * Data Administrator (human or system) *Data Provider
PreConditions:	*Data Producer must have signed in to their account to contribute to the Gazetteer of Indigenous Names.
Basic Path:	*1. Data Producer submits an Indigenous name for a specific location. *2. Data Administrator checks that the submitted name is not already included in the Gazetteer for that specific location. *3a. If the submitted name is not present in the Gazetteer, Data Administrator accept it as a new location with its indigenous name. *3b. If the submitted name is already present in the Gazetteer, Data Administrator refuses it as an already existing name. * 4. Data Provider makes the Gazetteer of Indigenous Names available to use and download.
PostConditions:	*The new Indigenous name is available in the Gazetteer of Indigenous Names.

Table 10. A.3S Offshore geohazards

identifier	3S
Description	The Arctic SDI Pilot will provide the capability to make available marine research cruises data (seismic, core samples, video, multibeam bathymetry and water samples) to support the safe development of infrastructure by improving the understanding of offshore geology and slope stability issues due to permafrost degradation.
Actors:	*Data Producer (Marine Researchers) *Data Provider

PreConditions:	
Basic Path:	*1. Data Producer submits the results of available marine research cruises data (seismic, core samples, video, multibeam bathymetry and water samples). * 2. The Data Producer fills in the metadata with information about the submitted marine research cruises data. * 3. Data Provider makes the data available to use and download if this is allowed by the Data Producer (according to copyright restrictions).
PostConditions:	*The new marine research cruises data is available in the system.

Table 11. A.4S Geohazards risk assessment

identifier	4S
Description	The Arctic SDI Pilot will provide the capability to combine knowledge about geohazards (in this case earthquakes and/or floods) and the built environment and demographics in order to assess the risk and potential losses and consequences that could be generated.
Actors:	* User *Data Producer
PreConditions:	*Data Producer submits geospatial data about geohazards (in this case earthquakes and/or floods).
Basic Path:	* 1. User submits a query regarding the geohazard risk (in this case earthquakes and/or floods) for a location of interest (place name, coordinates, bounding box, polygon, etc.). *2. The system delivers a risk assessment for the submitted location of interest by providing the combined geohazards (in this case earthquakes and/or floods) impacting that area. * 3. User can then save the risk assessment as a PDF report.
PostConditions:	

Table 12. A.5S Underground utilities

identifier	5S
Description	The Arctic SDI Pilot will provide the capability to assess geohazards risk (in this case earthquakes and/or floods) on domestic utilities combining publicly collected data and privately held data.
Actors:	* User *Data Producer
PreConditions:	*Geospatial data about geohazards (in this case earthquakes and/or floods) is available in the system. *Publicly collected data on the geohazard risk of underground utilities (in this case earthquakes and/or floods) is available in the system. *Privately held data on the geohazard risk of underground utilities (in this case earthquakes and/or floods) is available in the system.

Basic Path:	* 1. User submits a query on the geohazard risk of underground utilities (in this case earthquakes and/or floods) for a location of interest (place name, coordinates, bounding box, polygon, etc.). *2. The system delivers a risk assessment for the submitted location of interest by combining public and private data of geohazards (in this case earthquakes and/or floods) impacting the underground utilities in that area. * 3. User can then save the risk assessment as a PDF report.
PostConditions:	

Table 13. A.6S Arctic disaster management (marine)

identifier	6S
Description	The Arctic SDI Pilot will provide the capability to quickly obtain marine data in support of a disaster situation. This emergency scenario will likely include vessel groundings, oil spills, danger to wildlife and human catastrophe (disease).
Actors:	* User
PreConditions:	*Common Operating Pictures (COP) for different roles are available in the system.
Basic Path:	* 1. User searches for available COP specifications covering disaster management. *2. System returns a list of the available COP specifications. * 3. User selects a COP to export, suitable to the marine environment. * 4. System exports a context document for the selected COP.
PostConditions:	

Table 14. A.7S Iceberg tracking

identifier	7S
Description	The Arctic SDI Pilot will provide the capability to track icebergs using available space based imagery. The analysis of imagery data to track ice would allow projection of future ice movement into shipping lanes indicated by regular AIS vessel routes.
Actors:	* User
PreConditions:	
Basic Path:	* 1. User selects the ice tracking option. * 2. User submits a query selecting an area of interest (coordinates, bounding box, polygon, etc.). *3. The system determines satellite imagery of the Arctic region to identify icebergs. *3. User selects shipping lanes to identify icebergs encroachments. * 4. The system identifies icebergs which could potentially threaten vessels in the selected shipping lanes. * 5. The system makes the iceberg tracking information available for download to the User.
PostConditions:	

Table 15. A.8S Iceberg warning

identifier	8S
Description	The Arctic SDI Pilot will provide the capability to track icebergs using available space based imagery. The analysis of imagery data to track ice would allow projection of future ice movement into shipping lanes indicated by regular AIS vessel routes. Allowing the system to warn specific vessels.
Actors:	* User
PreConditions:	*User is registered to the iceberg warning system.
Basic Path:	*1. Via regular AIS messages the system keeps track of the movement of vessels within Arctic shipping lanes. * 2. The system, at predetermined intervals, determines satellite imagery of the Arctic region to identify icebergs. * 3. By using AIS messages, the system infer, which vessels are going to be affected by the crossing of icebergs into the shipping lanes. * 4. The system makes iceberg warning available to vessels approaching icebergs within shipping lanes.
PostConditions:	

Table 16. A.9S Iceberg Path Prediction

identifier	9S
Description	The Arctic SDI Pilot will provide the capability to model and predict the path of icebergs.
Actors:	* User * Data Provider (Iceberg) * Data Provider (current predictions)
PreConditions:	*A.8S: iceberg tracking using space based imagery
Basic Path:	* The system tracks all known iceberg locations. * The system accesses ocean current predictions. * The user enters a region and selects a prediction epoch using a slider. * The system provides a processing service to model the expected iceberg path. * The system makes available for display and download, current iceberg location and projected iceberg location and expected ground path along with a confidence envelope.
PostConditions:	*The same theory may be applied to oil spill forecasting.

Table 17. A.10S Arctic sanctuaries intrusions

identifier	10S
Description	The Arctic SDI Pilot will provide the capability to monitor the regional exploitation of natural resources, in particular oil and gas.
Actors:	* User (Environmental Agencies) * Data Producer
PreConditions:	*Construction of a database of offshore vessels involved in resource exploration and extraction, subdivided into type and activity. Of particular interest are rigs and seismic research vessels.

Basic Path:	*Via regular AIS messages the system tracks the position of vessels in the Arctic region. By cross-reference against the database of involved entities a service can derive information concerning foci for exploration and exploitation. * User selects a type of activity (i.e. rigs, seismic vessels etc.) along with a region of interest and time span. * The system makes available all relevant activity, including options for generalization and aggregation.
PostConditions:	*The database of known activities is available for display in a web map and for download for further analysis.

Table 18. A.11S Arctic sanctuaries intrusions

identifier	11S
Description	The Arctic SDI Pilot will provide the capability to monitor the intrusion of vessels into environmentally sensitive areas. The ship identification from the AIS MMSI information and location of the intrusion will be provided as a reporting service to the requesting agency. It would also be possible to maintain a database of all intrusions and allow a generation of historic patterns of intrusion that require action.
Actors:	* User (Environmental Agencies)
PreConditions:	
Basic Path:	*1. Via regular AIS messages the system keeps track of the movement of vessels within Arctic shipping lanes. * 2. The system, at predetermined intervals, computes intrusions of vessels into environmentally sensitive areas by tracking vessels outside of shipping lanes. * 4. The system records the infraction and populates a database with relevant details (vessel code, time, route, etc.).
PostConditions:	*The infraction database is available to User (Environmental Agencies) to access and download.

Table 19. A.12S Mammal migration

identifier	12S
Description	The Arctic SDI Pilot will provide the capability to monitor the migration of important terrestrial mammals (Caribou or others) in order to support habitat management activities (e.g. Boreal Caribou Recovery Strategy).
Actors:	* User *Data Producer
PreConditions:	*Data Producer submits geospatial data about the migration of important terrestrial mammals (Caribou or others).
Basic Path:	* 1. User selects the mammal migration option. *2. The system displays the available geospatial data. * 3. User selects the geospatial data of interest. * 4. The system makes the selected geospatial data available to the User for download.
PostConditions:	

Table 20. A.13S Arctic disaster management (terrestrial)

identifier	13S
Description	The Arctic SDI Pilot will provide the capability to quickly obtain terrestrial data in support of a disaster situation.
Actors:	* User
PreConditions:	*Common Operating Pictures (COP) for different roles are available in the system.
Basic Path:	* 1. User searches for available COP specifications covering disaster management. *2. System returns a list of the available COP specifications. * 3. User selects a COP to export suitable to the terrestrial environment. * 4. System exports a context document for the selected COP.
PostConditions:	

Table 21. A.14S Water management at the catchment scale

identifier	14S
Description	The Arctic SDI Pilot will provide the capability to integrate trans-boundary watersheds data allowing water management at the catchment scale.
Actors:	* User
PreConditions:	
Basic Path:	* 1. User queries the system about water management. *2. User submits a query selecting a location of interest (place name, coordinates, bounding box, polygon, etc.) across a trans-boundary location. * 3. The system displays the available geospatial data about water management at the location of interest on both sides of the boundary. * 4. User selects the geospatial data of interest (rivers, drainage, rainfall, etc.). * 5. The system displays the selected data
PostConditions:	

Table 22. A.15S Ecosystem changes

identifier	15S
Description	The Arctic SDI Pilot will provide the capability to assess the cumulative impact of human induced and naturally occurring ecosystem changes. In particular, the changes on Arctic biodiversity including the northward movement of more southern species, shrubbing and greening of the land, etc.
Actors:	* User *Data Producer *Data Provider
PreConditions:	*Data Producer submits geospatial data about ecosystem changes (northward movement of more southern species, shrubbing and greening of the land, etc.).

Basic Path:	* 1. User selects the ecosystem changes option (northward movement of more southern species, shrubbing and greening of the land, etc.). * 2. User submits a query selecting a location of interest (place name, coordinates, bounding box, polygon, etc.). *3. The system determines satellite imagery of the Arctic region to calculate radiometric indexes (Normalized Difference Vegetation Index) for the area of interest. * 4. The User compares the resulting NDVI map with historic imagery or surface measurements to assess ecosystem changes. * 5. The system makes the NDVI data available for downloads and the comparison results available as a PDF report.
PostConditions:	

Table 23. A.16S Sea level rise

identifier	16S
Description	The Arctic SDI Pilot will provide the capability to gather geospatial information about sea level rise including the evaluation of areas that might suffer the worst impacts and the estimation of damage to infrastructure.
Actors:	* User *Data Producer *Data Provider
PreConditions:	*Data Producer submit geospatial data about sea level rise.
Basic Path:	* 1. User selects the sea level rise option. *2. User submits a query selecting a location of interest (place name, coordinates, bounding box, polygon, etc.). * 3. The system overlays the Digital Elevation Model of the area of interest with historic and current sea level contour lines. * 4. The system provides a slider to the User to access sea level rise predictions based on scientific models of future climate change. * 5. The system also makes available other geospatial data on infrastructure in order to estimate the damage of sea level rise at the selected prediction level. * 6. User can then save the estimate as a pdf report.
PostConditions:	

Table 24. A.17S Glacier movements

identifier	17S
Description	The Arctic SDI Pilot will provide the capability to gather geospatial information about glacier movements including the evaluation and estimation of potential impact to shipping lanes or costal infrastructure and the projection of future conditions.
Actors:	* User *Data Producer *Data Provider
PreConditions:	*Data Producer submits geospatial data about sea glacier movements.

Basic Path:	* 1. User selects the glacier movements option. * 2. User submits a query selecting a location of interest (place name, coordinates, bounding box, polygon, etc.). * 3. The system overlays the Digital Elevation Model of the area of interest with historic and current glacier presence. * 4. The system provides a slider to the User to access glacier movements predictions based on scientific models of future climate change. * 5. The system also makes available other geospatial data on shipping lanes and costal infrastructure in order to estimate the damage of glacier movements predictions. * 6. User can then save the estimate as a PDF report.
PostConditions:	

Table 25. A.18S Permafrost monitoring

identifier	18S
Description	The Arctic SDI Pilot will provide the capability to gather geospatial information about the status and condition of the Arctic permafrost layer, including the evaluation of impact to existing infrastructure with projections of future conditions.
Actors:	* User *Data Producer *Data Provider
PreConditions:	*Data Producer submits geospatial data about Arctic permafrost conditions.
Basic Path:	* 1. User selects the Arctic permafrost conditions option. *2. User submits a query selecting a location of interest (place name, coordinates, bounding box, polygon, etc.). * 3. The system overlays the Digital Elevation Model of the area of interest with historic and current glacier presence. * 4. The system provides a slider to the User to access Arctic permafrost layer predictions based on scientific models of future climate change. * 5. The system also makes available other geospatial data on infrastructure in order to estimate the damage of Arctic permafrost layer predictions. * 6. User can then save the estimate as a PDF report.
PostConditions:	

Table 26. A.19S Pan-arctic ice charts

identifier	19S
Description	The Arctic SDI Pilot will provide the capability to obtain ice charts from multiple agencies. Currently ice charts need to be gathered from different agencies depending on the study area. The various ice charts cover different areas and can have widely different data formats, file formats, and accuracies.
Actors:	* User *Data Producer *Data Provider
PreConditions:	

Basic Path:	* 1. User queries the system about ice charts. *2. User submits a query selecting a location of interest (place name, coordinates, bounding box, polygon, etc.) across a trans-boundary location. * 3. The system displays the available geospatial data about ice charts at the location of interest provided by different agencies. * 4. User selects the geospatial format of interest. * 5. The system offers a format conversion service to convert the selected data to the format of interest. * 6. User selects the conversion technique and starts the process. * 7. The system makes the ice charts data available to download to the User in the chosen format.
PostConditions:	

Appendix B: Appendix B - Arctic Datasets and Services

The following are datasets and services, relating to the Arctic, that have been identified by participants during the testbed.

ID	Description	URL
1	Arctic Biodiversity Data Service	http://abds.is
2	National Sea Ice Data Centre (data only)	https://nsidc.org
3	Compusult WMS 1 (Includes Latest Ice-Free Open water, Latest Ice Concentrations, Iceberg Individual Observations)	http://wms-icebergs.compusult.net/ServiceDBWMS/DBWMS/ICEBERGS?&SERVICE=WMS&VERSION=1.3.0&REQUEST=GetCapabilities
4	Compusult WMS 2 (Includes Aviation Routine Weather Reports (METAR))	http://wms-faa.compusult.net/ServiceDBWMS/DBWMS/FAA?&SERVICE=WMS&VERSION=1.3.0&REQUEST=GetCapabilities
5	Compusult WCS (Canadian Ice Edge and Iceberg Observations)	http://ogc-testbed12.compusult.net/cgi-bin/mapserv?map=/ms4w/apps/ms_ogc_workshop/service/ICE.map&version=1.0.0&service=WCS&request=GetCapabilities
6	ESRI WCS (Arctic Digital Elevation Model)	http://elevation2.arcgis.com/arcgis/services/Polar/ArcticDEM/ImageServer/WCSServer?request=GetCapabilities&service=WCS
7	ESRI WMS (Arctic Digital Elevation Model)	http://elevation2.arcgis.com/arcgis/services/Polar/ArcticDEM_map/MapServer/WMServer?request=GetCapabilities&service=WMS
8	PYXIS WCS Arctic Data Access	https://worldview.gallery/download for downloadable client https://pyxisglobe.com/view/Arctic for web client
9	Flood Hazard Mapping (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/FHM_DRAFT-LayersWBase/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
10	Flood Hazard Mapping (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/FHM_DRAFT-LayersWBase/20150626/MapServer/WMServer?request=GetCapabilities&service=WMS
11	National Sea Ice Data Centre (NSIDC) Northern Hemisphere WMS	http://nsidc.org/cgi-bin/atlas_north?service=WMS&request=GetCapabilities&version=1.1.1

ID	Description	URL
12	National Sea Ice Data Centre (NSIDC) Southern Hemisphere WMS	http://nsidc.org/cgi-bin/atlas_south?service=WMS&request=GetCapabilities&version=1.1.1
13	National Sea Ice Data Centre (NSIDC) Northern Hemisphere WFS	http://nsidc.org/cgi-bin/atlas_north?service=WFS&request=GetCapabilities&version=1.1.0
14	National Sea Ice Data Centre (NSIDC) Southern Hemisphere WFS	http://nsidc.org/cgi-bin/atlas_south?service=WFS&request=GetCapabilities&version=1.1.0
15	National Sea Ice Data Centre (NSIDC) Northern Hemisphere WCS	http://nsidc.org/cgi-bin/atlas_north?service=WCS&request=GetCapabilities&version=1.1.1
16	National Sea Ice Data Centre (NSIDC) Southern Hemisphere WCS	http://nsidc.org/cgi-bin/atlas_south?service=WCS&request=GetCapabilities&version=1.1.1
17	Environmentally Significant Areas of Alberta (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Environmentally_Significant_Areas_of_Alberta/20151204/MapServer/WMSServer?request=GetCapabilities&service=WMS
18	Seamless Legal SubDivision Grid (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/CT-Seamless_Legal_SubDivision_Grid/Latest/MapServer/WMSServer?request=GetCapabilities&service=WMS
19	Seamless Legal SubDivision Grid (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/CT-Seamless_Legal_SubDivision_Grid/20160311/MapServer/WMSServer?request=GetCapabilities&service=WMS
20	Historic Resources Management Data (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/CT-Listing_of_Historic_Resources_Public/Latest/MapServer/WMSServer?request=GetCapabilities&service=WMS
21	Historic Resources Management Data (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/CT-Listing_of_Historic_Resources_Public/20160324/MapServer/WMSServer?request=GetCapabilities&service=WMS
22	Cadastral and Land Ownership (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/CT-Cadastral_Mapping_Cache/Latest/MapServer/WMSServer?request=GetCapabilities&service=WMS
23	Cadastral and Land Ownership (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/CT-Cadastral_Mapping_Cache/20160513/MapServer/WMSServer?request=GetCapabilities&service=WMS

ID	Description	URL
24	Benchmarks (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Benchmarks/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
25	Benchmarks (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Benchmarks/20140616/MapServer/WMServer?request=GetCapabilities&service=WMS
26	Base Water Feature (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Base_Water_Feature/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
27	Base Water Feature (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Base_Water_Feature/20140528/MapServer/WMServer?request=GetCapabilities&service=WMS
28	AWWID/BWWT Map Application Operational Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AWWID_BWWT_UAT-Layers/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
29	AWWID/BWWT Map Application Operational Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AWWID_BWWT_UAT-Layers/20160823/MapServer/WMServer?request=GetCapabilities&service=WMS
30	AWWID/BWWT Map Application Operational Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AWWID_BWWT_UAT-Layers/20150810/MapServer/WMServer?request=GetCapabilities&service=WMS
31	AWWID/BWWT Map Application Operational Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AWWID_BWWT-Layers/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
32	AWWID/BWWT Map Application Operational Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AWWID_BWWT-Layers/20160823/MapServer/WMServer?request=GetCapabilities&service=WMS
33	AWWID/BWWT Map Application Operational Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AWWID_BWWT-Layers/20151021/MapServer/WMServer?request=GetCapabilities&service=WMS
34	ASRD Administrative Area (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/ASRD_Administrative_Area/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
35	ASRD Administrative Area (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/ASRD_Administrative_Area/20120504/MapServer/WMServer?request=GetCapabilities&service=WMS

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36	Air Quality Health Index Base Map With Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AQHI-LayersWBase/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
37	Air Quality Health Index Base Map With Layers (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AQHI-LayersWBase/20140626/MapServer/WMServer?request=GetCapabilities&service=WMS
38	Alberta Watersheds 2011 (GoA) (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AlbertaWatersheds-Layers/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
39	Alberta Watersheds 2011 (GoA) (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AlbertaWatersheds-Layers/20140619/MapServer/WMServer?request=GetCapabilities&service=WMS
40	Alberta Township system (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Alberta_Township_System/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
41	Alberta Township system (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Alberta_Township_System/20130906/MapServer/WMServer?request=GetCapabilities&service=WMS
42	Alberta Township system (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Alberta_Township_System-View_Only/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
43	Alberta Township system (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Alberta_Township_System-View_Only/20130726/MapServer/WMServer?request=GetCapabilities&service=WMS
44	Air (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Air-Layers/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
45	Air (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Air-Layers/20140620/MapServer/WMServer?request=GetCapabilities&service=WMS
46	AESRD Administrative Area (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AESRD_Administrative_Area/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS

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47	AESRD Administrative Area (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AESRD_Administrative_Area/20130625/MapServer/WMServer?request=GetCapabilities&service=WMS
48	AER Administrative Area (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AER_Administrative_Area/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
49	imagery/Orthos2013_30cm (WMS)	https://mapservices.crd.bc.ca/arcgis/services/imagery/Orthos2013_30cm/ImageServer/WMServer?request=GetCapabilities&service=WMS
50	AER Administrative Area (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/AER_Administrative_Area/20131125/MapServer/WMServer?request=GetCapabilities&service=WMS
51	Access (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Access/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
52	imagery/Hartland2016_20cm (WMS)	https://mapservices.crd.bc.ca/arcgis/services/imagery/Hartland2016_20cm/ImageServer/WMServer?request=GetCapabilities&service=WMS
53	Access (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Access/20141203/MapServer/WMServer?request=GetCapabilities&service=WMS
54	imagery/Hartland2016_10cm (WMS)	https://mapservices.crd.bc.ca/arcgis/services/imagery/Hartland2016_10cm/ImageServer/WMServer?request=GetCapabilities&service=WMS
55	ABWRET - Estimate of Relative Wetland Valuer By Section (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/ABWRET-Relative_Wetland_Value_Estimator_By_Section/Latest/MapServer/WMServer?request=GetCapabilities&service=WMS
56	ABWRET - Estimate of Relative Wetland Valuer By Section (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/ABWRET-Relative_Wetland_Value_Estimator_By_Section/20150710/MapServer/WMServer?request=GetCapabilities&service=WMS
57	WaterSources (WMS)	https://mapservices.crd.bc.ca/arcgis/services/WaterSources/MapServer/WMServer?request=GetCapabilities&service=WMS
58	Regional Parks Trail (WMS)	https://mapservices.crd.bc.ca/arcgis/services/Trails/MapServer/WMServer?request=GetCapabilities&service=WMS
59	Service Areas (WMS)	https://mapservices.crd.bc.ca/arcgis/services/ServiceAreas3/MapServer/WMServer?request=GetCapabilities&service=WMS

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60	Parks (WMS)	https://mapservices.crd.bc.ca/arcgis/services/Parks/MapServer/WMServer?request=GetCapabilities&service=WMS
61	Orthophoto Imagery (WMS)	https://mapservices.crd.bc.ca/arcgis/services/Ortho2015/MapServer/WMServer?request=GetCapabilities&service=WMS
62	Natural Areas Atlas (WMS)	https://mapservices.crd.bc.ca/arcgis/services/NaturalAreas/MapServer/WMServer?request=GetCapabilities&service=WMS
63	Land Management (WMS)	https://mapservices.crd.bc.ca/arcgis/services/LandManagement/MapServer/WMServer?request=GetCapabilities&service=WMS
64	Contours (WMS)	https://mapservices.crd.bc.ca/arcgis/services/Contours2/MapServer/WMServer?request=GetCapabilities&service=WMS
65	Capital Regional District Base Map (WMS)	https://mapservices.crd.bc.ca/arcgis/services/Boundaries/MapServer/WMServer?request=GetCapabilities&service=WMS
66	Capital Regional District Base Map (WMS)	https://mapservices.crd.bc.ca/arcgis/services/BaseWMS/MapServer/WMServer?request=GetCapabilities&service=WMS
67	Capital Regional District Base Map (WMS)	https://mapservices.crd.bc.ca/arcgis/services/BaseMap1/MapServer/WMServer?request=GetCapabilities&service=WMS
68	Orthophoto Imagery (WMS)	https://mapservices.crd.bc.ca/arcgis/services/Aerial/MapServer/WMServer?request=GetCapabilities&service=WMS
69	Public/ReferenceLayers (WMS)	https://restgeo.grey.ca/arcgis/services/Public/ReferenceLayers/MapServer/WMServer?request=GetCapabilities&service=WMS
70	Public/GCTourism (WMS)	https://restgeo.grey.ca/arcgis/services/Public/GCTourism/MapServer/WMServer?request=GetCapabilities&service=WMS
71	Public/GC_RoadSensorData (WMS)	https://restgeo.grey.ca/arcgis/services/Public/GC_RoadSensorData/MapServer/WMServer?request=GetCapabilities&service=WMS
72	WPSGN/WPSGN_Layers (WMS)	http://www.wpsgn.ca/arcgis/services/WPSGN/WPSGN_Layers/MapServer/WMServer?request=GetCapabilities&service=WMS
73	WPSGN/PARCELS_PUBLIC (WMS)	http://www.wpsgn.ca/arcgis/services/WPSGN/PARCELS_PUBLIC/MapServer/WMServer?request=GetCapabilities&service=WMS

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74	Public/AirPhotos2010TilesWEB (WMS)	https://restgeo.grey.ca/arcgis/services/Public/AirPhotos2010TilesWEB/ImageServer/WMServer?request=GetCapabilities&service=WMS
75	World Cities (WMS)	https://restgeo.grey.ca/arcgis/services/SampleWorldCities/MapServer/WMServer?request=GetCapabilities&service=WMS
76	Public_v01 (WMS)	http://www.wpsgn.ca/arcgis/services/WPSGN/BASEDATA_WhiteBackground/MapServer/WMServer?request=GetCapabilities&service=WMS
77	Public_v01 (WMS)	http://www.wpsgn.ca/arcgis/services/WPSGN/BASEDATA/MapServer/WMServer?request=GetCapabilities&service=WMS
78	wms/Uprp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Uprp/MapServer/WMServer?request=GetCapabilities&service=WMS
79	Uprp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Uprp/MapServer/0
80	wms/Uprp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Uprp/MapServer
81	wms/Uarp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Uarp/MapServer/WMServer?request=GetCapabilities&service=WMS
82	Uarp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Uarp/MapServer/0
83	wms/Uarp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Uarp/MapServer
84	wms/Ssrp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Ssrp/MapServer/WMServer?request=GetCapabilities&service=WMS
85	SSRP LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Ssrp/MapServer/0
86	wms/Ssrp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Ssrp/MapServer
87	SREM_SMA (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_SMA/MapServer/WMServer?request=GetCapabilities&service=WMS
88	Imagery/ap_2013cache (WMS)	http://www.wpsgn.ca/arcgis/services/Imagery/ap_2013cache/MapServer/WMServer?request=GetCapabilities&service=WMS
89	SURFACE MINEABLE AREA	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_SMA/MapServer/0

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90	SREM_SMA	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_SMA/MapServer
91	SREM_Restrictions (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_Restrictions/MapServer/WMServer?request=GetCapabilities&service=WMS
92	MINERAL RESTRICTIONS	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_Restrictions/MapServer/0
93	SREM_Restrictions	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_Restrictions/MapServer
94	Imagery/ap_2011cache (WMS)	http://www.wpsgn.ca/arcgis/services/Imagery/ap_2011cache/MapServer/WMServer?request=GetCapabilities&service=WMS
95	SREM_Coal (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_PNG/MapServer/WMServer?request=GetCapabilities&service=WMS
96	PNG AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_PNG/MapServer/0
97	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_PNG/MapServer
98	SREM_PNF (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_PNF/MapServer/WMServer?request=GetCapabilities&service=WMS
99	PLAINS, NORTHERN, FOOTHILLS BOUNDARY	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_PNF/MapServer/0
100	Imagery/ap_2008cache (WMS)	http://www.wpsgn.ca/arcgis/services/Imagery/ap_2008cache/MapServer/WMServer?request=GetCapabilities&service=WMS
101	SREM_PNF	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_PNF/MapServer
102	SREM_OSArea (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_OSArea/MapServer/WMServer?request=GetCapabilities&service=WMS
103	OIL SANDS AREA	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_OSArea/MapServer/0
104	SREM_OSArea	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_OSArea/MapServer
105	Imagery/ap_2004cache (WMS)	http://www.wpsgn.ca/arcgis/services/Imagery/ap_2004cache/MapServer/WMServer?request=GetCapabilities&service=WMS

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106	SREM_Coal (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_OS/MapServer/WMServer?request=GetCapabilities&service=WMS
107	OS AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_OS/MapServer/0
108	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_OS/MapServer
109	SREM_Coal (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_Metallic/MapServer/WMServer?request=GetCapabilities&service=WMS
110	Imagery/ap_2004 (WMS)	http://www.wpsgn.ca/arcgis/services/Imagery/ap_2004/MapServer/WMServer?request=GetCapabilities&service=WMS
111	METALLIC AND INDUSTRIAL MINERALS AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_Metallic/MapServer/0
112	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_Metallic/MapServer
113	SREM_Coal (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/SREM_Coal/MapServer/WMServer?request=GetCapabilities&service=WMS
114	COAL AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_Coal/MapServer/0
115	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/SREM_Coal/MapServer
116	wms/Rdrp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Rdrp/MapServer/WMServer?request=GetCapabilities&service=WMS
117	Rdrp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Rdrp/MapServer/0
118	wms/Rdrp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Rdrp/MapServer
119	wms/Nsrp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Nsrp/MapServer/WMServer?request=GetCapabilities&service=WMS
120	Nsrp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Nsrp/MapServer/0
121	wms/Nsrp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Nsrp/MapServer

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122	wms/Lprp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Lprp/MapServer/WMServer?request=GetCapabilities&service=WMS
123	Lprp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Lprp/MapServer/0
124	wms/Lprp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Lprp/MapServer
125	wms/Larp (WMS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wms/Larp/MapServer/WMServer?request=GetCapabilities&service=WMS
126	Larp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Larp/MapServer/0
127	wms/Larp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wms/Larp/MapServer
128	TRNS/TRNS_TIR_LOS_UT83 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/TRNS/TRNS_TIR_LOS_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
129	TRNS/TRNS_Routing_UT83 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/TRNS/TRNS_Routing_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
130	NSCAF roads simplified (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/TRNS/TRNS_NSRN_Addressed_Roads_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
131	Polling_is45 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/STRU/STRU_HistoricPolls_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
132	Calculation_is45 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/SOC/SOC_PopulationCalculation_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
133	PLAN/PLAN_CrownLandsWM84V1 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/PLAN/PLAN_CrownLandsWM84V1/MapServer/WMServer?request=GetCapabilities&service=WMS
134	PLAN_CrownHarvestPlans_UT83.mxd (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/PLAN/PLAN_CrownHarvestPlans_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
135	PLAN_CrownHarvestPlans_UT83.mxd (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/PLAN/PLAN_CrownHarvestPlans_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
136	NSCRS Stations (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/LOC/NSCRS_Stations_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS

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137	Wet Areas Mapping (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_WetAreasMapping_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
138	Wet Areas Mapping (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_WetAreasMapping_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
139	Road Index (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_RoadIndex_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
140	Road Index (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_RoadIndex_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
141	Provincial Landscape Viewer - ELC and Forestry data (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_ProvLandscapeViewer_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
142	Provincial Landscape Viewer - ELC and Forestry data (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_ProvLandscapeViewer_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
143	Old Forest Policy (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_OldForestPolicy_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
144	Old Forest Policy (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_OldForestPolicy_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
145	Forest Treatment Data (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_ForestTreatment_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
146	Forest Treatment Data (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_ForestTreatment_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
147	Forest (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_Forest_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
148	Forest (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_Forest_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
149	Ecological Land Classification (ELC) (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_EcologicalLandClassification_2007_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
150	Ecological Land Classification (ELC) (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_EcologicalLandClassification_2007_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS

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151	Crown Lands Forest Model (CLFM) Ecological Indicators (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_EcoIndicators_2014v4_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
152	Crown Lands Forest Model (CLFM) Ecological Indicators (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/FOR/FOR_EcoIndicators_2014v4_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
153	ENV/ENVWAandNRWM84V1 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/ENV/ENVWAandNRWM84V1/MapServer/WMServer?request=GetCapabilities&service=WMS
154	CLO_GPTools/UploadShapefile (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/CLO_GPTools/UploadShapefile/MapServer/WMServer?request=GetCapabilities&service=WMS
155	BND/BND_SIGDemonstration2 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BND/BND_SIGDemonstration2/MapServer/WMServer?request=GetCapabilities&service=WMS
156	ENS_Polling_Divisions (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BND/BND_PollingDivisions_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
157	NS Community Boundaries (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BND/BND_NS_Community_Bndys_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
158	BND/BND_ElectoralBoundaries_UT83 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BND/BND_ElectoralBoundaries_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
159	Wildlife Provincial Landscape Viewer (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BIO/WLD_ProvLandscapeViewer_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
160	Wildlife Provincial Landscape Viewer (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BIO/WLD_ProvLandscapeViewer_UT83/MapServer/WMServer?request=GetCapabilities&service=WMS
161	NSTDB Water theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Water_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
162	NSTDB Structures theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Uilities_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
163	NSTDB Structures theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Structures_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
164	NSTDB Roads theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Roads_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS

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165	NSTDB Landform theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Landforms_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
166	NSTDB Land Cover theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Land_Cover_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
167	NSTDB Grey-scale (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Grey_WithRoads_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
168	NSTDB Grey-scale (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Grey_WithGeonameLabels_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
169	NSTDB Grey-scale (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Grey_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
170	NSTDB Grey-scale (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Grey_NoRoadsLabels_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
171	NSTDB DTM theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_DTM_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
172	NSTDB Designated Areas theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Designated_Areas_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
173	NSTDB Delimiter theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Delimiters_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
174	NSTDB (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Delimiter_Boundaries_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
175	NSTDB Delimiter theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Delimiter_Boundaries_NoLabels_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
176	NSTDB (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Colour_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
177	NSTDB (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSTDB_10k_Colour_NoGeoNames_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS

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178	NSODB (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSODB_10k_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
179	NSCAF roads simplified (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NSCAF_Roads_Simplified_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
180	NSGNDB Geonames (Gazetteer) theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NS_Gazetteer_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
181	NS Community Boundaries (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/NS_Community_Boundaries_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
182	BASE/Index_NSTDB_10k_WebMercator_WGS84 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/Index_NSTDB_10k_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
183	NSODB Index (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/Index_NSODB_10k_WebMercator_WGS84/MapServer/WMServer?request=GetCapabilities&service=WMS
184	NSGNDB Geonames (Gazetteer) theme (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/BASE_NS_GeoNames_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
185	BASE/BASE_NS_CivicAddress_File_WM84 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/BASE_NS_CivicAddress_File_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
186	BASE/BASE_Index_NSTDB_10k_WM84 (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/BASE_Index_NSTDB_10k_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
187	NSODB Index (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/BASE_Index_NSODB_10k_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
188	1:50,000 Sheet Index (WMS)	https://nsgiwa.novascotia.ca/arcgis/services/BASE/BASE_Index_50k_WM84/MapServer/WMServer?request=GetCapabilities&service=WMS
189	Utilities and Communications service (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_UtilitiesCommunications/MapServer/WMServer?request=GetCapabilities&service=WMS
190	Yukon Transportation Infrastructure (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Transportation/MapServer/WMServer?request=GetCapabilities&service=WMS
191	GeoYukon - Reference Information (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Reference/MapServer/WMServer?request=GetCapabilities&service=WMS

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192	Yukon Parks and Protected Areas (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_ParksProtectedAreas/MapServer/WMServer?request=GetCapabilities&service=WMS
193	Yukon Oil and Gas (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_OilGas/MapServer/WMServer?request=GetCapabilities&service=WMS
194	Yukon Mining Tenure (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Mining/MapServer/WMServer?request=GetCapabilities&service=WMS
195	SaskDIP (WMS)	http://www.envgis.gov.sk.ca/arcgis/services/SaskDIP/MapServer/WMServer?request=GetCapabilities&service=WMS
196	Yukon Land Tenure (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_LandTenure/MapServer/WMServer?request=GetCapabilities&service=WMS
197	Yukon Land Planning (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_LandPlanning/MapServer/WMServer?request=GetCapabilities&service=WMS
198	Yukon Geological Information (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Geological/MapServer/WMServer?request=GetCapabilities&service=WMS
199	Yukon Forestry (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Forestry/MapServer/WMServer?request=GetCapabilities&service=WMS
200	Yukon First Nation Land (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_FirstNations/MapServer/WMServer?request=GetCapabilities&service=WMS
201	Hydrography (WMS)	http://www.envgis.gov.sk.ca/arcgis/services/Hydrography/MapServer/WMServer?request=GetCapabilities&service=WMS
202	GeoYukon/GY_EnvironmentalMonitoring (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_EnvironmentalMonitoring/MapServer/WMServer?request=GetCapabilities&service=WMS
203	Yukon Elevation (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Elevation/MapServer/WMServer?request=GetCapabilities&service=WMS
204	FireHistory (WMS)	http://www.envgis.gov.sk.ca/arcgis/services/FireHistory/MapServer/WMServer?request=GetCapabilities&service=WMS
205	GeoYukon/GY_CultureHeritage (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_CultureHeritage/MapServer/WMServer?request=GetCapabilities&service=WMS

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206	Yukon Biophysical Information (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Biophysical/MapServer/WMServer?request=GetCapabilities&service=WMS
207	Yukon Wildlife Key Areas (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Biological/MapServer/WMServer?request=GetCapabilities&service=WMS
208	AboriginalLands (WMS)	http://www.envgis.gov.sk.ca/arcgis/services/AboriginalLands/MapServer/WMServer?request=GetCapabilities&service=WMS
209	Yukon Base Map - dynamic base map (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_Base/MapServer/WMServer?request=GetCapabilities&service=WMS
210	Yukon Administrative Boundaries (WMS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_AdministrativeBoundaries/MapServer/WMServer?request=GetCapabilities&service=WMS
211	Public/Ortho_2012_Cache (WMS)	http://maps.simcoe.ca/arcgis/services/Public/Ortho_2012_Cache/MapServer/WMServer?request=GetCapabilities&service=WMS
212	2007/2008 Aerial Photography (WMS)	http://maps.simcoe.ca/arcgis/services/Public/Ortho_2008_Cache/MapServer/WMServer?request=GetCapabilities&service=WMS
213	2002 Aerial Photography (WMS)	http://maps.simcoe.ca/arcgis/services/Public/Ortho_2002_Cache/MapServer/WMServer?request=GetCapabilities&service=WMS
214	Agricultural Extent in Canada (WMS)	http://www.agr.gc.ca/atlas/services/app_agrimap_agricarte/agrimap_canada_agricultural_extent_slc/MapServer/WMServer?request=GetCapabilities&service=WMS
215	AAFC Agri-Environmental Indicators - Time Series, Web Optimized (WMS)	http://www.agr.gc.ca/atlas/services/app_aei_iae/aafc_app_aei_iae_rpt4_time/MapServer/WMServer?request=GetCapabilities&service=WMS
216	AAFC Agri-Environmental Indicators - Change Datasets, Web Optimized (WMS)	http://www.agr.gc.ca/atlas/services/app_aei_iae/aafc_app_aei_iae_rpt4_change/MapServer/WMServer?request=GetCapabilities&service=WMS
217	Yukon Base Map (WMS)	http://mapservices.gov.yk.ca/arcgis/services/BaseMap_Cache/MapServer/WMServer?request=GetCapabilities&service=WMS
218	wms/Uprp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Uprp/MapServer/WMServer?request=GetCapabilities&service=WMS
219	Uprp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Uprp/MapServer/0

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220	wms/Uprp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Uprp/MapServer
221	wms/Uarp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Uarp/MapServer/WMServer?request=GetCapabilities&service=WMS
222	Uarp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Uarp/MapServer/0
223	wms/Uarp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Uarp/MapServer
224	wms/Ssrp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Ssrp/MapServer/WMServer?request=GetCapabilities&service=WMS
225	SSRP LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Ssrp/MapServer/0
226	wms/Ssrp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Ssrp/MapServer
227	SREM_SMA (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_SMA/MapServer/WMServer?request=GetCapabilities&service=WMS
228	SURFACE MINEABLE AREA	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_SMA/MapServer/0
229	SREM_SMA	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_SMA/MapServer
230	SREM_Restrictions (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_Restrictions/MapServer/WMServer?request=GetCapabilities&service=WMS
231	MINERAL RESTRICTIONS	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_Restrictions/MapServer/0
232	SREM_Restrictions	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_Restrictions/MapServer
233	SREM_Coal (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_PNG/MapServer/WMServer?request=GetCapabilities&service=WMS
234	PNG AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_PNG/MapServer/0
235	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_PNG/MapServer
236	SREM_PNF (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_PNF/MapServer/WMServer?request=GetCapabilities&service=WMS
237	PLAINS, NORTHERN, FOOTHILLS BOUNDARY	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_PNF/MapServer/0

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238	SREM_PNF	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_PNF/MapServer
239	SREM_OSArea (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_OSArea/MapServer/WMServer?request=GetCapabilities&service=WMS
240	OIL SANDS AREA	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_OSArea/MapServer/0
241	SREM_OSArea	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_OSArea/MapServer
242	SREM_Coal (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_OS/MapServer/WMServer?request=GetCapabilities&service=WMS
243	OS AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_OS/MapServer/0
244	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_OS/MapServer
245	SREM_Coal (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_Metallic/MapServer/WMServer?request=GetCapabilities&service=WMS
246	METALLIC AND INDUSTRIAL MINERALS AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_Metallic/MapServer/0
247	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_Metallic/MapServer
248	SREM_Coal (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/SREM_Coal/MapServer/WMServer?request=GetCapabilities&service=WMS
249	COAL AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_Coal/MapServer/0
250	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/SREM_Coal/MapServer
251	wms/Rdrp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Rdrp/MapServer/WMServer?request=GetCapabilities&service=WMS
252	Rdrp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Rdrp/MapServer/0
253	wms/Rdrp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Rdrp/MapServer
254	wms/Nsrp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Nsrp/MapServer/WMServer?request=GetCapabilities&service=WMS

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255	Nsrp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Nsrp/MapServer/0
256	wms/Nsrp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Nsrp/MapServer
257	wms/Lprp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Lprp/MapServer/WMServer?request=GetCapabilities&service=WMS
258	Lprp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Lprp/MapServer/0
259	wms/Lprp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Lprp/MapServer
260	wms/Larp (WMS)	http://gis.energy.gov.ab.ca/arcgis/services/wms/Larp/MapServer/WMServer?request=GetCapabilities&service=WMS
261	Larp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Larp/MapServer/0
262	wms/Larp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wms/Larp/MapServer
263	tides_marees/labels (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/tides_marees/labels/MapServer/WMServer?request=GetCapabilities&service=WMS
264	tides_marees/labels (WMS)	http://geoportal.gc.ca/arcgis/services/tides_marees/labels/MapServer/WMServer?request=GetCapabilities&service=WMS
265	tides_marees/central_centre (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/tides_marees/central_centre/MapServer/WMServer?request=GetCapabilities&service=WMS
266	tides_marees/central_centre (WMS)	http://geoportal.gc.ca/arcgis/services/tides_marees/central_centre/MapServer/WMServer?request=GetCapabilities&service=WMS
267	Tide and Water Level stations in Canada - Les stations de marées et de niveau d'eau au Canada (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/tides_marees/allstations_toutestations/MapServer/WMServer?request=GetCapabilities&service=WMS
268	Tide and Water Level stations in Canada - Les stations de marées et de niveau d'eau au Canada (WMS)	http://geoportal.gc.ca/arcgis/services/tides_marees/allstations_toutestations/MapServer/WMServer?request=GetCapabilities&service=WMS

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269	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/SpeciesatRisk/MPOHabitatEssentiel_FR/MapServer/WMSServer?request=GetCapabilities&service=WMS
270	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal.gc.ca/arcgis/services/SpeciesatRisk/MPOHabitatEssentiel_FR/MapServer/WMSServer?request=GetCapabilities&service=WMS
271	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/SpeciesatRisk/DFOCriticalHabitat_EN/MapServer/WMSServer?request=GetCapabilities&service=WMS
272	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal.gc.ca/arcgis/services/SpeciesatRisk/DFOCriticalHabitat_EN/MapServer/WMSServer?request=GetCapabilities&service=WMS
273	FGP2/ARGO_Locations (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP2/ARGO_Locations/MapServer/WMSServer?request=GetCapabilities&service=WMS
274	FGP/Tides_WaterLevels_EN (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/Tides_WaterLevels_EN/MapServer/WMSServer?request=GetCapabilities&service=WMS
275	FGP2/ARGO_Locations (WMS)	http://geoportal.gc.ca/arcgis/services/FGP2/ARGO_Locations/MapServer/WMSServer?request=GetCapabilities&service=WMS
276	FGP/Tides_WaterLevels_EN (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/Tides_WaterLevels_EN/MapServer/WMSServer?request=GetCapabilities&service=WMS
277	FGP/StationsMaregraphiques_FR (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/StationsMaregraphiques_FR/MapServer/WMSServer?request=GetCapabilities&service=WMS
278	FGP/StationsMaregraphiques_FR (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/StationsMaregraphiques_FR/MapServer/WMSServer?request=GetCapabilities&service=WMS
279	FGP/SHC_Series_de_CD_Cartes_FR (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/SHC_Series_de_CD_Cartes_FR/MapServer/WMSServer?request=GetCapabilities&service=WMS
280	FGP/SHC_Series_de_CD_Cartes_FR (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/SHC_Series_de_CD_Cartes_FR/MapServer/WMSServer?request=GetCapabilities&service=WMS

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281	FGP/SHC_S57CEN_Cartes_Individuelles_FR (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/SHC_S57CEN_Cartes_Individuelles_FR/MapServer/WMServer?request=GetCapabilities&service=WMS
282	FGP/SHC_S57CEN_Cartes_Individuelles_FR (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/SHC_S57CEN_Cartes_Individuelles_FR/MapServer/WMServer?request=GetCapabilities&service=WMS
283	FGP/SHC_CartesPapier_FR (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/SHC_CartesPapier_FR/MapServer/WMServer?request=GetCapabilities&service=WMS
284	FGP/NAFO_Zones (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/NAFO_Zones/MapServer/WMServer?request=GetCapabilities&service=WMS
285	FGP/SHC_CartesPapier_FR (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/SHC_CartesPapier_FR/MapServer/WMServer?request=GetCapabilities&service=WMS
286	FGP/NAFO_Zones (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/NAFO_Zones/MapServer/WMServer?request=GetCapabilities&service=WMS
287	FGP/Marine_Protected_Areas_National (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/Marine_Protected_Areas_National/MapServer/WMServer?request=GetCapabilities&service=WMS
288	FGP/Marine_Protected_Areas_National (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/Marine_Protected_Areas_National/MapServer/WMServer?request=GetCapabilities&service=WMS
289	FGP/Marine_Bioregions_National (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/Marine_Bioregions_National/MapServer/WMServer?request=GetCapabilities&service=WMS
290	FGP/Marine_Bioregions_National (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/Marine_Bioregions_National/MapServer/WMServer?request=GetCapabilities&service=WMS
291	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/LHabitatEssentiel_Polygones_FR/MapServer/WMServer?request=GetCapabilities&service=WMS
292	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/LHabitatEssentiel_Polygones_FR/MapServer/WMServer?request=GetCapabilities&service=WMS

ID	Description	URL
293	FGP/Large_Ocean_Management_Areas_National (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/Large_Ocean_Management_Areas_National/MapServer/WMServer?request=GetCapabilities&service=WMS
294	FGP/Large_Ocean_Management_Areas_National (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/Large_Ocean_Management_Areas_National/MapServer/WMServer?request=GetCapabilities&service=WMS
295	FGP/Ecologically_Biologically_Significant_Areas_National (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/Ecologically_Biologically_Significant_Areas_National/MapServer/WMServer?request=GetCapabilities&service=WMS
296	FGP/Ecologically_Biologically_Significant_Areas_National (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/Ecologically_Biologically_Significant_Areas_National/MapServer/WMServer?request=GetCapabilities&service=WMS
297	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/CriticalHabitat_Polygons_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
298	Aquatic Species at Risk Critical Habitat (FGP) (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/CriticalHabitat_Polygons_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
299	FGP/CHS_S57ENC_Individual_Charts_EN (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/CHS_S57ENC_Individual_Charts_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
300	FGP/CHS_S57ENC_Individual_Charts_EN (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/CHS_S57ENC_Individual_Charts_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
301	FGP/CHS_PaperChartLimits_EN (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/CHS_PaperChartLimits_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
302	FGP/CHS_PaperChartLimits_EN (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/CHS_PaperChartLimits_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
303	FGP/CHS_CD_Collections_ChartLimits_EN (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/CHS_CD_Collections_ChartLimits_EN/MapServer/WMServer?request=GetCapabilities&service=WMS
304	FGP/CHS_CD_Collections_ChartLimits_EN (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/CHS_CD_Collections_ChartLimits_EN/MapServer/WMServer?request=GetCapabilities&service=WMS

ID	Description	URL
305	FGP/Areas_of_Interest_National (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/Areas_of_Interest_National/MapServer/WMServer?request=GetCapabilities&service=WMS
306	FGP/Areas_of_Interest_National (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/Areas_of_Interest_National/MapServer/WMServer?request=GetCapabilities&service=WMS
307	Communications Utility (WMS)	http://gis.coquitlam.ca/ArcGIS/Services/DynamicServices/Communications/MapServer/WMServer?request=GetCapabilities&service=WMS
308	FGP/500m_Gridded_Bathymetry_Index (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/500m_Gridded_Bathymetry_Index/MapServer/WMServer?request=GetCapabilities&service=WMS
309	FGP/500m_Gridded_Bathymetry_Index (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/500m_Gridded_Bathymetry_Index/MapServer/WMServer?request=GetCapabilities&service=WMS
310	FGP/500m_Gridded_Bathymetry (WMS)	http://geoportal.gc.ca/arcgis/services/FGP/500m_Gridded_Bathymetry/MapServer/WMServer?request=GetCapabilities&service=WMS
311	FGP/500m_Gridded_Bathymetry (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/FGP/500m_Gridded_Bathymetry/MapServer/WMServer?request=GetCapabilities&service=WMS
312	Basemap/Reference_Overlay (WMS)	http://geoportal.gc.ca/arcgis/services/Basemap/Reference_Overlay/MapServer/WMServer?request=GetCapabilities&service=WMS
313	Basemap/42304_SIMPLE_BIL (WMS)	http://geoportal.gc.ca/arcgis/services/Basemap/42304_SIMPLE_BIL/MapServer/WMServer?request=GetCapabilities&service=WMS
314	Basemap/Reference_Overlay (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Basemap/Reference_Overlay/MapServer/WMServer?request=GetCapabilities&service=WMS
315	Tidal_Stations_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Tidal_Stations_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
316	Sportfishing_BC_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Sportfishing_BC_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
317	Service hydrographique du Canada - Normes de service (WMS)	http://geoportal.gc.ca/arcgis/services/SHC_Normes_de_service_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS

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318	Basemap/42304_SIMPLE_BIL (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Basemap/42304_SIMPLE_BIL/MapServer/WMServer?request=GetCapabilities&service=WMS
319	Search_For_Franklin_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Search_For_Franklin_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
320	Reported_Observations_Aquatic_Invasive_Species_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Reported_Observations_Aquatic_Invasive_Species_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
321	capProj/Capital_Project_Planning (WMS)	http://gis.brandon.ca/arcgis/services/capProj/Capital_Project_Planning/MapServer/WMServer?request=GetCapabilities&service=WMS
322	Tidal_Stations_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Tidal_Stations_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
323	Sportfishing_BC_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Sportfishing_BC_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
324	Service hydrographique du Canada - Normes de service (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/SHC_Normes_de_service_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
325	Search_For_Franklin_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Search_For_Franklin_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
326	Peches_sportive_CB_FRA (WMS)	http://geoportal.gc.ca/arcgis/services/Peches_sportive_CB_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
327	Observations_signalees_sur_les_especes_aquatiques_FRA (WMS)	http://geoportal.gc.ca/arcgis/services/Observations_signalees_sur_les_especes_aquatiques_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
328	Reported_Observations_Aquatic_Invasive_Species_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Reported_Observations_Aquatic_Invasive_Species_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
329	NRM_Index (WMS)	http://geoportal.gc.ca/arcgis/services/NRM_Index/MapServer/WMServer?request=GetCapabilities&service=WMS
330	NAFO_Divisions (WMS)	http://geoportal.gc.ca/arcgis/services/NAFO_Divisions/MapServer/WMServer?request=GetCapabilities&service=WMS

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331	Peche_sportive_CB_FRA (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Peche_sportive_CB_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
332	Marine_Protected_Areas_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Marine_Protected_Areas_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
333	Observations_signalees_sur_les_especes_aquatiques_FRA (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Observations_signalees_sur_les_especes_aquatiques_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
334	LancasterSound (WMS)	http://geoportal.gc.ca/arcgis/services/LancasterSound/MapServer/WMServer?request=GetCapabilities&service=WMS
335	Hydrographic_Charts_Outline_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Hydrographic_Charts_Outline_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
336	Hydrographic_Charts_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Hydrographic_Charts_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
337	Guide_de_planification_de_navigation_en_Arctique_FRA (WMS)	http://geoportal.gc.ca/arcgis/services/Guide_de_planification_de_navigation_en_Arctique_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
338	NRM_Index (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/NRM_Index/MapServer/WMServer?request=GetCapabilities&service=WMS
339	NAFO_Divisions (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/NAFO_Divisions/MapServer/WMServer?request=GetCapabilities&service=WMS
340	Marine_Protected_Areas_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Marine_Protected_Areas_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
341	LancasterSound (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/LancasterSound/MapServer/WMServer?request=GetCapabilities&service=WMS
342	Canadian Hydrographic Service - Levels of Service (WMS)	http://geoportal.gc.ca/arcgis/services/CHS_Levels_of_Service_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
343	Hydrographic_Charts_Outline_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Hydrographic_Charts_Outline_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS

ID	Description	URL
344	CHS_Charts_Source_Outline (WMS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_Source_Outline/MapServer/WMSServer?request=GetCapabilities&service=WMS
345	CHS_Charts_Source_Filled (WMS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_Source_Filled/MapServer/WMSServer?request=GetCapabilities&service=WMS
346	CHS_Charts_ENCs_Outline (WMS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_ENCs_Outline/MapServer/WMSServer?request=GetCapabilities&service=WMS
347	Hydrographic_Charts_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Hydrographic_Charts_ENG/MapServer/WMSServer?request=GetCapabilities&service=WMS
348	CHS Charts ENCs Filled (WMS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_ENCs_Filled/MapServer/WMSServer?request=GetCapabilities&service=WMS
349	Guide_de_planification_de_navigation_en_Arctique_FRA (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Guide_de_planification_de_navigation_en_Arctique_FRA/MapServer/WMSServer?request=GetCapabilities&service=WMS
350	JOSM/Oilsands (WMS)	http://ec.gc.ca/arcgis/services/JOSM/Oilsands/MapServer/WMSServer?request=GetCapabilities&service=WMS
351	Cartographie_hydrographique_FRA (WMS)	http://geoportal.gc.ca/arcgis/services/Cartographie_hydrographique_FRA/MapServer/WMSServer?request=GetCapabilities&service=WMS
352	data_donnees/f65ccac2-275f-4b5e-913e-c468fec1f203 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/f65ccac2-275f-4b5e-913e-c468fec1f203/MapServer/WMSServer?request=GetCapabilities&service=WMS
353	Cartographie_hydrographique_contour_FRA (WMS)	http://geoportal.gc.ca/arcgis/services/Cartographie_hydrographique_contour_FRA/MapServer/WMSServer?request=GetCapabilities&service=WMS
354	data_donnees/d6f2b488-20dd-4551-af8e-51dc76b57b9f (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/d6f2b488-20dd-4551-af8e-51dc76b57b9f/MapServer/WMSServer?request=GetCapabilities&service=WMS
355	Canadian Hydrographic Service - Levels of Service (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Levels_of_Service_ENG/MapServer/WMSServer?request=GetCapabilities&service=WMS

ID	Description	URL
356	data_donnees/bf655a50-96c8-4126-9ddf-a49174106c3f (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/bf655a50-96c8-4126-9ddf-a49174106c3f/MapServer/WMServer?request=GetCapabilities&service=WMS
357	CHS_Charts_Source_Outline (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_Source_Outline/MapServer/WMServer?request=GetCapabilities&service=WMS
358	Bathymetry_500m_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Bathymetry_500m_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
359	data_donnees/be12386d (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/be12386d/MapServer/WMServer?request=GetCapabilities&service=WMS
360	CHS_Charts_Source_Filled (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_Source_Filled/MapServer/WMServer?request=GetCapabilities&service=WMS
361	data_donnees/be0a3350-f755-418e-b04b-7ff9fd2ebeac (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/be0a3350-f755-418e-b04b-7ff9fd2ebeac/MapServer/WMServer?request=GetCapabilities&service=WMS
362	Arctic_Voyage_Planning_Guide_ENG (WMS)	http://geoportal.gc.ca/arcgis/services/Arctic_Voyage_Planning_Guide_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
363	CHS_Charts_ENCs_Outline (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_ENCs_Outline/MapServer/WMServer?request=GetCapabilities&service=WMS
364	data_donnees/bd7fd3d4-63d7-4485-9399-a55fdae9e399 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/bd7fd3d4-63d7-4485-9399-a55fdae9e399/MapServer/WMServer?request=GetCapabilities&service=WMS
365	data_donnees/b84494fe-4843-484c-8c83-1d510d244a4c (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/b84494fe-4843-484c-8c83-1d510d244a4c/MapServer/WMServer?request=GetCapabilities&service=WMS
366	data_donnees/6796dbcb-abab-4a8e-a211-4b49f5b45273 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/6796dbcb-abab-4a8e-a211-4b49f5b45273/MapServer/WMServer?request=GetCapabilities&service=WMS

ID	Description	URL
367	CHS Charts ENC's Filled (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_ENC's_Filled/MapServer/WMServer?request=GetCapabilities&service=WMS
368	data_donnees/56bdd628-5e1d-4759-949b-616ef9bdc3e0 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/56bdd628-5e1d-4759-949b-616ef9bdc3e0/MapServer/WMServer?request=GetCapabilities&service=WMS
369	data_donnees/4cdeec34-30e7-4070-8362-ae5bac21376b (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/4cdeec34-30e7-4070-8362-ae5bac21376b/MapServer/WMServer?request=GetCapabilities&service=WMS
370	data_donnees/4a2929ce-d6b1-49b0-b520-63be0859c552 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/4a2929ce-d6b1-49b0-b520-63be0859c552/MapServer/WMServer?request=GetCapabilities&service=WMS
371	Cartographie_hydrographique_FRA (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Cartographie_hydrographique_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
372	data_donnees/47cffe27-1a7a-4fe9-8a89-f33f9a632c71 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/47cffe27-1a7a-4fe9-8a89-f33f9a632c71/MapServer/WMServer?request=GetCapabilities&service=WMS
373	data_donnees/40777390-5f06-4bbb-82a4-53afe5254cd8 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/40777390-5f06-4bbb-82a4-53afe5254cd8/MapServer/WMServer?request=GetCapabilities&service=WMS
374	Cartographie_hydrographique_contour_FRA (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Cartographie_hydrographique_contour_FRA/MapServer/WMServer?request=GetCapabilities&service=WMS
375	Polling Divisions Boundaries (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/polling_divisions_boundaries_2015_en/MapServer/WMServer?request=GetCapabilities&service=WMS
376	data_donnees/2f0d80a1-5085-4639-94af-49e43cf81942 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/2f0d80a1-5085-4639-94af-49e43cf81942/MapServer/WMServer?request=GetCapabilities&service=WMS
377	FGP/number_of_forest_fires_en (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/number_of_forest_fires_en/MapServer/WMServer?request=GetCapabilities&service=WMS

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378	data_donnees/24d700f2-d351-4893-8c46-dc8602ec4790 (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/24d700f2-d351-4893-8c46-dc8602ec4790/MapServer/WMServer?request=GetCapabilities&service=WMS
379	Bathymetry_500m_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Bathymetry_500m_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
380	data_donnees/16074bd5-66ed-45a5-b9c3-a9c33cf58e6c (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/16074bd5-66ed-45a5-b9c3-a9c33cf58e6c/MapServer/WMServer?request=GetCapabilities&service=WMS
381	Arctic_Voyage_Planning_Guide_ENG (WMS)	http://geoportal-geoportail.gc.ca/arcgis/services/Arctic_Voyage_Planning_Guide_ENG/MapServer/WMServer?request=GetCapabilities&service=WMS
382	data_donnees/133994b0-ca21-4ae6-9cbf-57344662f01f (WMS)	http://ec.gc.ca/arcgis/services/data_donnees/133994b0-ca21-4ae6-9cbf-57344662f01f/MapServer/WMServer?request=GetCapabilities&service=WMS
383	FGP/forest_industry_hotspots_en (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/forest_industry_hotspots_en/MapServer/WMServer?request=GetCapabilities&service=WMS
384	data/fd3355a7-ae34-4df7-b477-07306182db69 (WMS)	http://ec.gc.ca/arcgis/services/data/fd3355a7-ae34-4df7-b477-07306182db69/MapServer/WMServer?request=GetCapabilities&service=WMS
385	FGP/fire_season_length_en (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/fire_season_length_en/MapServer/WMServer?request=GetCapabilities&service=WMS
386	data/e76205c3 (WMS)	http://ec.gc.ca/arcgis/services/data/e76205c3/MapServer/WMServer?request=GetCapabilities&service=WMS
387	Federal Electoral Districts Boundaries (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/federal_electoral_districts_boundaries_2015_en/MapServer/WMServer?request=GetCapabilities&service=WMS
388	data/e76205c3-23c2-4ea1-8bf5-df7e43462b94 (WMS)	http://ec.gc.ca/arcgis/services/data/e76205c3-23c2-4ea1-8bf5-df7e43462b94/MapServer/WMServer?request=GetCapabilities&service=WMS
389	Federal Electoral Districts Boundaries (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/federal_electoral_districts_boundaries_2013_en/MapServer/WMServer?request=GetCapabilities&service=WMS

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390	data/c9c6c6a1 (WMS)	http://ec.gc.ca/arcgis/services/data/c9c6c6a1/MapServer/WMServer?request=GetCapabilities&service=WMS
391	Limites de circonscriptions fñ@dñrales (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/federal_electoral_districts_boundaries_2003_fr/MapServer/WMServer?request=GetCapabilities&service=WMS
392	data/b17d5a29-84cd-4241-9459-36ac273a88ea (WMS)	http://ec.gc.ca/arcgis/services/data/b17d5a29-84cd-4241-9459-36ac273a88ea/MapServer/WMServer?request=GetCapabilities&service=WMS
393	data/a483c2e9 (WMS)	http://ec.gc.ca/arcgis/services/data/a483c2e9/MapServer/WMServer?request=GetCapabilities&service=WMS
394	FGP/climate_moisture_index_fr (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/climate_moisture_index_fr/MapServer/WMServer?request=GetCapabilities&service=WMS
395	data/98b6089a-389d-47f0-a461-4dfddfff8122 (WMS)	http://ec.gc.ca/arcgis/services/data/98b6089a-389d-47f0-a461-4dfddfff8122/MapServer/WMServer?request=GetCapabilities&service=WMS
396	Añroports Canadiens avec services de navigation añrienne (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/canadian_airports_with_air_navigation_services_fr/MapServer/WMServer?request=GetCapabilities&service=WMS
397	Canadian Airports with Air Navigation Services (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/canadian_airports_with_air_navigation_services_en/MapServer/WMServer?request=GetCapabilities&service=WMS
398	FGP/annual_area_burned_en (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/FGP/annual_area_burned_en/MapServer/WMServer?request=GetCapabilities&service=WMS
399	data/9729e977-9ac3-4064-aa96-e73c2f2214c6 (WMS)	http://ec.gc.ca/arcgis/services/data/9729e977-9ac3-4064-aa96-e73c2f2214c6/MapServer/WMServer?request=GetCapabilities&service=WMS
400	Energy/clean_energy_wind_potential (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/Energy/clean_energy_wind_potential/MapServer/WMServer?request=GetCapabilities&service=WMS
401	data/95d36af7 (WMS)	http://ec.gc.ca/arcgis/services/data/95d36af7/MapServer/WMServer?request=GetCapabilities&service=WMS
402	data/94a51051 (WMS)	http://ec.gc.ca/arcgis/services/data/94a51051/MapServer/WMServer?request=GetCapabilities&service=WMS
403	data/94a51051-ad11-499a-b5f1-8c97b29f695c (WMS)	http://ec.gc.ca/arcgis/services/data/94a51051-ad11-499a-b5f1-8c97b29f695c/MapServer/WMServer?request=GetCapabilities&service=WMS

ID	Description	URL
404	Energy/clean_energy_dams_reservoirs (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/Energy/clean_energy_dams_reservoirs/MapServer/WMServer?request=GetCapabilities&service=WMS
405	data/90be49bd-e492-4251-9082-b756434b8c45 (WMS)	http://ec.gc.ca/arcgis/services/data/90be49bd-e492-4251-9082-b756434b8c45/MapServer/WMServer?request=GetCapabilities&service=WMS
406	data/8c4f9a92-dfe7-4c9b-9e6e-10e66af9a769 (WMS)	http://ec.gc.ca/arcgis/services/data/8c4f9a92-dfe7-4c9b-9e6e-10e66af9a769/MapServer/WMServer?request=GetCapabilities&service=WMS
407	data/88976ac7 (WMS)	http://ec.gc.ca/arcgis/services/data/88976ac7/MapServer/WMServer?request=GetCapabilities&service=WMS
408	data/87bf8597-4be4-4ec2-9ee3-797f5eafb97 (WMS)	http://ec.gc.ca/arcgis/services/data/87bf8597-4be4-4ec2-9ee3-797f5eafb97/MapServer/WMServer?request=GetCapabilities&service=WMS
409	data/7ae4d24f-f2c8-4efe-bf22-230199a198ff (WMS)	http://ec.gc.ca/arcgis/services/data/7ae4d24f-f2c8-4efe-bf22-230199a198ff/MapServer/WMServer?request=GetCapabilities&service=WMS
410	Graticule (WMS)	http://geoappext.nrcan.gc.ca/arcgis/services/BaseMaps/Graticule/MapServer/WMServer?request=GetCapabilities&service=WMS
411	data/73865ed2-5063-4df8-803a-8e4204307758 (WMS)	http://ec.gc.ca/arcgis/services/data/73865ed2-5063-4df8-803a-8e4204307758/MapServer/WMServer?request=GetCapabilities&service=WMS
412	Canada Base Map - Transportation: text only, Lambert conformal conic projection	http://geoappext.nrcan.gc.ca/arcgis/rest/services/BaseMaps/CBMT_TXT_3978/MapServer
413	data/6ab784be-1197-4820-8bc2-fd20da32632c (WMS)	http://ec.gc.ca/arcgis/services/data/6ab784be-1197-4820-8bc2-fd20da32632c/MapServer/WMServer?request=GetCapabilities&service=WMS
414	data/65658050-7a80-4da3-9a09-da137c203a34 (WMS)	http://ec.gc.ca/arcgis/services/data/65658050-7a80-4da3-9a09-da137c203a34/MapServer/WMServer?request=GetCapabilities&service=WMS

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415	Carte de Base du Canada - Transportation: texte seulement, projection conique conforme de Lambert	http://geoappext.nrcan.gc.ca/arcgis/rest/services/BaseMaps/CBCT_TXT_3978/MapServer
416	data/651aeb5f-e0f8-4a5f- 9f44-4343ed097fa5 (WMS)	http://ec.gc.ca/arcgis/services/data/651aeb5f-e0f8-4a5f-9f44-4343ed097fa5/MapServer/WMServer?request=GetCapabilities&service=WMS
417	data/6160669e (WMS)	http://ec.gc.ca/arcgis/services/data/6160669e/MapServer/WMServer?request=GetCapabilities&service=WMS
418	data/56ca16f7-2a72-4b2d- 9728-204fc4657381 (WMS)	http://ec.gc.ca/arcgis/services/data/56ca16f7-2a72-4b2d-9728-204fc4657381/MapServer/WMServer?request=GetCapabilities&service=WMS
419	data/49deb8b2-10a6-4b4a- ad7c-9cbc2eda260b (WMS)	http://ec.gc.ca/arcgis/services/data/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b/MapServer/WMServer?request=GetCapabilities&service=WMS
420	data/3b7dd693-52dc-4e55- 828f-37c8172f009b (WMS)	http://ec.gc.ca/arcgis/services/data/3b7dd693-52dc-4e55-828f-37c8172f009b/MapServer/WMServer?request=GetCapabilities&service=WMS
421	data/32219f6e-5e1b-4aa1- 81e8-5cfe4622160b (WMS)	http://ec.gc.ca/arcgis/services/data/32219f6e-5e1b-4aa1-81e8-5cfe4622160b/MapServer/WMServer?request=GetCapabilities&service=WMS
422	data/28cf0e45-2aa2-4015- a5a0-5808a98dfd95 (WMS)	http://ec.gc.ca/arcgis/services/data/28cf0e45-2aa2-4015-a5a0-5808a98dfd95/MapServer/WMServer?request=GetCapabilities&service=WMS
423	data/27cf03c0 (WMS)	http://ec.gc.ca/arcgis/services/data/27cf03c0/MapServer/WMServer?request=GetCapabilities&service=WMS
424	data/274ede77-27b9-46b8- 96c8-4d7d4a706f08 (WMS)	http://ec.gc.ca/arcgis/services/data/274ede77-27b9-46b8-96c8-4d7d4a706f08/MapServer/WMServer?request=GetCapabilities&service=WMS
425	data/22abff18 (WMS)	http://ec.gc.ca/arcgis/services/data/22abff18/MapServer/WMServer?request=GetCapabilities&service=WMS
426	D01/e23ce141-996e-4c98- b4a1-3141ce6095dd (WMS)	http://ec.gc.ca/arcgis/services/D01/e23ce141-996e-4c98-b4a1-3141ce6095dd/MapServer/WMServer?request=GetCapabilities&service=WMS

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427	D01/b6aee1d7-638c-4bf3-9d09-8db4243b81da (WMS)	http://ec.gc.ca/arcgis/services/D01/b6aee1d7-638c-4bf3-9d09-8db4243b81da/MapServer/WMServer?request=GetCapabilities&service=WMS
428	D01/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b (WMS)	http://ec.gc.ca/arcgis/services/D01/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b/MapServer/WMServer?request=GetCapabilities&service=WMS
429	D01/456ce087-4711-442c-8445-30520f96e98e (WMS)	http://ec.gc.ca/arcgis/services/D01/456ce087-4711-442c-8445-30520f96e98e/MapServer/WMServer?request=GetCapabilities&service=WMS
430	Water_Quality_Monitoring_Surveillance_dela_qualite (WMS)	http://ec.gc.ca/arcgis/services/Water_Quality_Monitoring_Surveillance_dela_qualite/MapServer/WMServer?request=GetCapabilities&service=WMS
431	SpeciesProtectRestore_Canada_CanadianWildlifeService (WMS)	http://ec.gc.ca/arcgis/services/SpeciesProtectRestore_Canada_CanadianWildlifeService/MapServer/WMServer?request=GetCapabilities&service=WMS
432	NPRI_FGP_All_Layers (WMS)	http://ec.gc.ca/arcgis/services/NPRI_FGP_All_Layers/MapServer/WMServer?request=GetCapabilities&service=WMS
433	CESI_FGP_All_Layers (WMS)	http://ec.gc.ca/arcgis/services/CESI_FGP_All_Layers/MapServer/WMServer?request=GetCapabilities&service=WMS
434	BC_CriticalHabitat_CB_HabitatEssentiel (WMS)	http://ec.gc.ca/arcgis/services/BC_CriticalHabitat_CB_HabitatEssentiel/MapServer/WMServer?request=GetCapabilities&service=WMS
435	Mosaics/NTEC_Taltson_Corridor_Mosaic (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/NTEC_Taltson_Corridor_Mosaic/MapServer/WMServer?request=GetCapabilities&service=WMS
436	Mosaics/NT_Sumps_MackenzieValley_Mosaic (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/NT_Sumps_MackenzieValley_Mosaic/MapServer/WMServer?request=GetCapabilities&service=WMS
437	Mosaics/MVAP_Mosaic_Combined_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/MVAP_Mosaic_Combined_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
438	Municipal and Community Affairs OrthoPhotos for NWT Communities (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/MACA_Community_OrthoPhotos_Mosaic_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
439	Mosaics/IRS_Dehcho_5m_Mosaic_Combined (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/IRS_Dehcho_5m_Mosaic_Combined/MapServer/WMServer?request=GetCapabilities&service=WMS

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440	Mosaics/GNWT_SPOT_Mosaic (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/GNWT_SPOT_Mosaic/MapServer/WMSServer?request=GetCapabilities&service=WMS
441	Mosaics/DOT_Combined_Transportation_Mosaic (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/DOT_Combined_Transportation_Mosaic/MapServer/WMSServer?request=GetCapabilities&service=WMS
442	Mosaics/CDED_50K (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/CDED_50K/MapServer/WMSServer?request=GetCapabilities&service=WMS
443	Mosaics/CDED_250K (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/CDED_250K/MapServer/WMSServer?request=GetCapabilities&service=WMS
444	NWT Aster DEM (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/Mosaics/Aster_DEM_Mosaic_LCC/MapServer/WMSServer?request=GetCapabilities&service=WMS
445	GNWT_Operational/HSS_PredictiveContaminants_Operational (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Operational/HSS_PredictiveContaminants_Operational/MapServer/WMSServer?request=GetCapabilities&service=WMS
446	GNWTBasemapLCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Basemaps/MinTenure_CDED_ShadedRelief_Basemap/MapServer/WMSServer?request=GetCapabilities&service=WMS
447	GNWTBasemapLCC	http://apps.geomatics.gov.nt.ca/arcgis/rest/services/GNWT_Basemaps/MinTenure_CDED_ShadedRelief_Basemap/MapServer
448	GNWTBasemapLCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Basemaps/GNWTBasemapLCC/MapServer/WMSServer?request=GetCapabilities&service=WMS
449	GNWT_Basemaps/GNWT_Simplified_Basemap (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Basemaps/GNWT_Simplified_Basemap/MapServer/WMSServer?request=GetCapabilities&service=WMS
450	GNWT_Basemaps/GNWT_Relief_Basemap (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Basemaps/GNWT_Relief_Basemap/MapServer/WMSServer?request=GetCapabilities&service=WMS
451	GNWT_Basemaps/GNWT_General_Basemap (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Basemaps/GNWT_General_Basemap/MapServer/WMSServer?request=GetCapabilities&service=WMS
452	GNWTBasemapLCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Basemaps/CDED_ShadedRelief_Basemap/MapServer/WMSServer?request=GetCapabilities&service=WMS
453	GNWTBasemapLCC	http://apps.geomatics.gov.nt.ca/arcgis/rest/services/GNWT_Basemaps/CDED_ShadedRelief_Basemap/MapServer

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454	NWT Aster DEM (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT_Base maps/Aster_DEM_Basemap/MapServer/WMServer?request=GetCapabilities&service=WMS
455	GNWT/UtilitiesCommunication_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/UtilitiesCommunication_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
456	Transportation_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Transportation_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
457	GNWT/Structure_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Structure_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
458	GNWT/SearchService (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/SearchService/MapServer/WMServer?request=GetCapabilities&service=WMS
459	PlanningCadastre_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/PlanningCadastre_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
460	GNWT/LocationReference_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/LocationReference_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
461	GNWT/InlandWater_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/InlandWater_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
462	ImageryBaseLandCover_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/ImageryBaseLandCover_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
463	NWT_MercuryInFishSamples_GNWTBasemapLCC_v2.mxd (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Health_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
464	Geoscientific_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Geoscientific_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
465	GNWT/Environment_NWTLCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Environment_NWTLCC/MapServer/WMServer?request=GetCapabilities&service=WMS
466	Conservation Areas Detailed Anno	http://apps.geomatics.gov.nt.ca/arcgis/rest/services/GNWT/Environment_NWTLCC/MapServer/31
467	Conservation Areas Basic Anno	http://apps.geomatics.gov.nt.ca/arcgis/rest/services/GNWT/Environment_NWTLCC/MapServer/1

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468	GNWT/Environment_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Environment_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
469	Conservation Areas Detailed Anno	http://apps.geomatics.gov.nt.ca/arcgis/rest/services/GNWT/Environment_LCC/MapServer/31
470	Conservation Areas Basic Anno	http://apps.geomatics.gov.nt.ca/arcgis/rest/services/GNWT/Environment_LCC/MapServer/1
471	Economy_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Elevation_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
472	Economy_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Economy_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
473	Boundaries_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Boundaries_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
474	GNWT/BiologicEcologic_LCC (WMS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/BiologicEcologic_LCC/MapServer/WMServer?request=GetCapabilities&service=WMS
475	Public/GC_RoadSensorData (WFS)	https://restgeo.grey.ca/arcgis/services/Public/GC_RoadSensorData/MapServer/WFSServer?request=GetCapabilities&service=WFS
476	wfs/Uprp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Uprp/MapServer/WFSServer?request=GetCapabilities&service=WFS
477	Uprp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Uprp/MapServer/0
478	wfs/Uprp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Uprp/MapServer
479	wfs/Uarp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Uarp/MapServer/WFSServer?request=GetCapabilities&service=WFS
480	Uarp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Uarp/MapServer/0
481	wfs/Uarp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Uarp/MapServer
482	wfs/Ssrp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Ssrp/MapServer/WFSServer?request=GetCapabilities&service=WFS
483	SSRP LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Ssrp/MapServer/0

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484	wfs/Ssrp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Ssrp/MapServer
485	SREM_SMA (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_SMA/MapServer/WFSServer?request=GetCapabilities&service=WFS
486	SURFACE MINEABLE AREA	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_SMA/MapServer/0
487	SREM_SMA	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_SMA/MapServer
488	SREM_Restrictions (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_Restrictions/MapServer/WFSServer?request=GetCapabilities&service=WFS
489	MINERAL RESTRICTIONS	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_Restrictions/MapServer/0
490	SREM_Restrictions	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_Restrictions/MapServer
491	SREM_Coal (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_PNG/MapServer/WFSServer?request=GetCapabilities&service=WFS
492	PNG AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_PNG/MapServer/0
493	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_PNG/MapServer
494	SREM_PNF (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_PNF/MapServer/WFSServer?request=GetCapabilities&service=WFS
495	PLAINS, NORTHERN, FOOTHILLS BOUNDARY	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_PNF/MapServer/0
496	SREM_PNF	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_PNF/MapServer
497	SREM_OSArea (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_OSArea/MapServer/WFSServer?request=GetCapabilities&service=WFS
498	OIL SANDS AREA	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_OSArea/MapServer/0
499	SREM_OSArea	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_OSArea/MapServer
500	SREM_Coal (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_OS/MapServer/WFSServer?request=GetCapabilities&service=WFS

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501	OS AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_OS/MapServer/0
502	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_OS/MapServer
503	SREM_Coal (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_Metallic/MapServer/WFSServer?request=GetCapabilities&service=WFS
504	METALLIC AND INDUSTRIAL MINERALS AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_Metallic/MapServer/0
505	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_Metallic/MapServer
506	SREM_Coal (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/SREM_Coal/MapServer/WFSServer?request=GetCapabilities&service=WFS
507	COAL AGREEMENT	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_Coal/MapServer/0
508	SREM_Coal	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/SREM_Coal/MapServer
509	wfs/Rdrp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Rdrp/MapServer/WFSServer?request=GetCapabilities&service=WFS
510	Rdrp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Rdrp/MapServer/0
511	wfs/Rdrp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Rdrp/MapServer
512	wfs/Nsrp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Nsrp/MapServer/WFSServer?request=GetCapabilities&service=WFS
513	Nsrp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Nsrp/MapServer/0
514	wfs/Nsrp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Nsrp/MapServer
515	wfs/Lprp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Lprp/MapServer/WFSServer?request=GetCapabilities&service=WFS
516	Lprp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Lprp/MapServer/0
517	wfs/Lprp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Lprp/MapServer

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518	wfs/Larp (WFS)	http://oipwb48v.energy.gov.ab.ca/arcgis/services/wfs/Larp/MapServer/WFSServer?request=GetCapabilities&service=WFS
519	Larp LAYER	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Larp/MapServer/0
520	wfs/Larp	http://oipwb48v.energy.gov.ab.ca/arcgis/rest/services/wfs/Larp/MapServer
521	SaskDIP (WFS)	http://www.envgis.gov.sk.ca/arcgis/services/SaskDIP/MapServer/WFSServer?request=GetCapabilities&service=WFS
522	GeoYukon/GY_EnvironmentalMonitoring (WFS)	http://mapservices.gov.yk.ca/arcgis/services/GeoYukon/GY_EnvironmentalMonitoring/MapServer/WFSServer?request=GetCapabilities&service=WFS
523	AboriginalLands (WFS)	http://www.envgis.gov.sk.ca/arcgis/services/AboriginalLands/MapServer/WFSServer?request=GetCapabilities&service=WFS
524	wfs/Uprp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Uprp/MapServer/WFSServer?request=GetCapabilities&service=WFS
525	Uprp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Uprp/MapServer/0
526	wfs/Uprp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Uprp/MapServer
527	wfs/Uarp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Uarp/MapServer/WFSServer?request=GetCapabilities&service=WFS
528	Uarp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Uarp/MapServer/0
529	wfs/Uarp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Uarp/MapServer
530	wfs/Ssrp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Ssrp/MapServer/WFSServer?request=GetCapabilities&service=WFS
531	SSRP LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Ssrp/MapServer/0
532	wfs/Ssrp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Ssrp/MapServer
533	SREM_SMA (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_SMA/MapServer/WFSServer?request=GetCapabilities&service=WFS
534	SURFACE MINEABLE AREA	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_SMA/MapServer/0
535	SREM_SMA	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_SMA/MapServer

ID	Description	URL
536	SREM_Restrictions (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_Restrictions/MapServer/WFSServer?request=GetCapabilities&service=WFS
537	tides_marees/labels (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/tides_marees/labels/MapServer/WFSServer?request=GetCapabilities&service=WFS
538	MINERAL RESTRICTIONS	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_Restrictions/MapServer/0
539	SREM_Restrictions	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_Restrictions/MapServer
540	tides_marees/labels (WFS)	http://geoportal.gc.ca/arcgis/services/tides_marees/labels/MapServer/WFSServer?request=GetCapabilities&service=WFS
541	SREM_Coal (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_PNG/MapServer/WFSServer?request=GetCapabilities&service=WFS
542	PNG AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_PNG/MapServer/0
543	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_PNG/MapServer
544	SREM_PNF (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_PNF/MapServer/WFSServer?request=GetCapabilities&service=WFS
545	PLAINS, NORTHERN, FOOTHILLS BOUNDARY	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_PNF/MapServer/0
546	tides_marees/central_centre (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/tides_marees/central_centre/MapServer/WFSServer?request=GetCapabilities&service=WFS
547	SREM_PNF	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_PNF/MapServer
548	SREM_OSArea (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_OSArea/MapServer/WFSServer?request=GetCapabilities&service=WFS
549	OIL SANDS AREA	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_OSArea/MapServer/0
550	SREM_OSArea	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_OSArea/MapServer
551	tides_marees/central_centre (WFS)	http://geoportal.gc.ca/arcgis/services/tides_marees/central_centre/MapServer/WFSServer?request=GetCapabilities&service=WFS

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552	SREM_Coal (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_OS/MapServer/WFSServer?request=GetCapabilities&service=WFS
553	OS AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_OS/MapServer/0
554	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_OS/MapServer
555	Tide and Water Level stations in Canada - Les stations de marées et de niveau d'eau au Canada (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/tides_marees/allstations_toutestations/MapServer/WFSServer?request=GetCapabilities&service=WFS
556	SREM_Coal (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_Metallic/MapServer/WFSServer?request=GetCapabilities&service=WFS
557	METALLIC AND INDUSTRIAL MINERALS AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_Metallic/MapServer/0
558	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_Metallic/MapServer
559	SREM_Coal (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/SREM_Coal/MapServer/WFSServer?request=GetCapabilities&service=WFS
560	COAL AGREEMENT	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_Coal/MapServer/0
561	SREM_Coal	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/SREM_Coal/MapServer
562	wfs/Rdrp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Rdrp/MapServer/WFSServer?request=GetCapabilities&service=WFS
563	Tide and Water Level stations in Canada - Les stations de marées et de niveau d'eau au Canada (WFS)	http://geoportal.gc.ca/arcgis/services/tides_marees/allstations_toutestations/MapServer/WFSServer?request=GetCapabilities&service=WFS
564	Rdrp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Rdrp/MapServer/0
565	wfs/Rdrp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Rdrp/MapServer

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566	Aquatic Species at Risk Critical Habiata (FGP) (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/SpeciesatRisk/MPOHabitatEssentiel_FR/MapServer/WFSServer?request=GetCapabilities&service=WFS
567	wfs/Nsrp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Nsrp/MapServer/WFSServer?request=GetCapabilities&service=WFS
568	Nsrp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Nsrp/MapServer/0
569	wfs/Nsrp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Nsrp/MapServer
570	wfs/Lprp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Lprp/MapServer/WFSServer?request=GetCapabilities&service=WFS
571	Lprp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Lprp/MapServer/0
572	wfs/Lprp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Lprp/MapServer
573	Aquatic Species at Risk Critical Habiata (FGP) (WFS)	http://geoportal.gc.ca/arcgis/services/SpeciesatRisk/MPOHabitatEssentiel_FR/MapServer/WFSServer?request=GetCapabilities&service=WFS
574	wfs/Larp (WFS)	http://gis.energy.gov.ab.ca/arcgis/services/wfs/Larp/MapServer/WFSServer?request=GetCapabilities&service=WFS
575	Larp LAYER	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Larp/MapServer/0
576	wfs/Larp	http://gis.energy.gov.ab.ca/ArcGIS/rest/services/wfs/Larp/MapServer
577	Aquatic Species at Risk Critical Habiata (FGP) (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/SpeciesatRisk/DFOCriticalHabitat_EN/MapServer/WFSServer?request=GetCapabilities&service=WFS
578	Aquatic Species at Risk Critical Habiata (FGP) (WFS)	http://geoportal.gc.ca/arcgis/services/SpeciesatRisk/DFOCriticalHabitat_EN/MapServer/WFSServer?request=GetCapabilities&service=WFS
579	Cadastral (WFS)	http://gis.coquitlam.ca/ArcGIS/Services/DynamicServices/Cadastral/MapServer/WFSServer?request=GetCapabilities&service=WFS
580	Basemap/Reference_Overlay (WFS)	http://geoportal.gc.ca/arcgis/services/Basemap/Reference_Overlay/MapServer/WFSServer?request=GetCapabilities&service=WFS

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581	Basemap/Reference_Overlay (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Basemap/Reference_Overlay/MapServer/WFSServer?request=GetCapabilities&service=WFS
582	Sportfishing_BC_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Sportfishing_BC_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
583	Service hydrographique du Canada - Normes de service (WFS)	http://geoportal.gc.ca/arcgis/services/SHC_Normes_de_service_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
584	Search_For_Franklin_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Search_For_Franklin_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
585	Reported_Observations_Aquatic_Invasive_Species_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Reported_Observations_Aquatic_Invasive_Species_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
586	Sportfishing_BC_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Sportfishing_BC_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
587	Service hydrographique du Canada - Normes de service (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/SHC_Normes_de_service_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
588	Search_For_Franklin_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Search_For_Franklin_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
589	Peches_sportives_CB_FRA (WFS)	http://geoportal.gc.ca/arcgis/services/Peches_sportives_CB_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
590	Observations_signalees_sur_les_especes_aquatiques_FRA (WFS)	http://geoportal.gc.ca/arcgis/services/Observations_signalees_sur_les_especes_aquatiques_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
591	Reported_Observations_Aquatic_Invasive_Species_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Reported_Observations_Aquatic_Invasive_Species_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
592	NRM_Index (WFS)	http://geoportal.gc.ca/arcgis/services/NRM_Index/MapServer/WFSServer?request=GetCapabilities&service=WFS
593	NAFO_Divisions (WFS)	http://geoportal.gc.ca/arcgis/services/NAFO_Divisions/MapServer/WFSServer?request=GetCapabilities&service=WFS

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594	Peche_sportive_CB_FRA (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Peche_sportive_CB_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
595	Marine_Protected_Areas_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Marine_Protected_Areas_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
596	Observations_signalees_sur_les_especes_aquatiques_FRA (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Observations_signalees_sur_les_especes_aquatiques_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
597	Hydrographic_Charts_Outline_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Hydrographic_Charts_Outline_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
598	Hydrographic_Charts_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Hydrographic_Charts_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
599	Guide_de_planification_de_navigation_en_Arctique_FRA (WFS)	http://geoportal.gc.ca/arcgis/services/Guide_de_planification_de_navigation_en_Arctique_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
600	NRM_Index (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/NRM_Index/MapServer/WFSServer?request=GetCapabilities&service=WFS
601	NAFO_Divisions (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/NAFO_Divisions/MapServer/WFSServer?request=GetCapabilities&service=WFS
602	Marine_Protected_Areas_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Marine_Protected_Areas_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
603	Canadian Hydrographic Service - Levels of Service (WFS)	http://geoportal.gc.ca/arcgis/services/CHS_Levels_of_Service_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
604	Hydrographic_Charts_Outline_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Hydrographic_Charts_Outline_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
605	CHS_Charts_Source_Outline (WFS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_Source_Outline/MapServer/WFSServer?request=GetCapabilities&service=WFS
606	CHS_Charts_Source_Filled (WFS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_Source_Filled/MapServer/WFSServer?request=GetCapabilities&service=WFS

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607	CHS_Charts_ENCs_Outline (WFS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_ENCs_Outline/MapServer/WFSServer?request=GetCapabilities&service=WFS
608	Hydrographic_Charts_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Hydrographic_Charts_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
609	CHS_Charts_ENCs_Filled (WFS)	http://geoportal.gc.ca/arcgis/services/CHS_Charts_ENCs_Filled/MapServer/WFSServer?request=GetCapabilities&service=WFS
610	Guide_de_planification_de_navigation_en_Arctique_FRA (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Guide_de_planification_de_navigation_en_Arctique_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
611	Cartographie_hydrographique_FRA (WFS)	http://geoportal.gc.ca/arcgis/services/Cartographie_hydrographique_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
612	data_donnees/f65ccac2-275f-4b5e-913e-c468fec1f203 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/f65ccac2-275f-4b5e-913e-c468fec1f203/MapServer/WFSServer?request=GetCapabilities&service=WFS
613	Cartographie_hydrographique_contour_FRA (WFS)	http://geoportal.gc.ca/arcgis/services/Cartographie_hydrographique_contour_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
614	data_donnees/d6f2b488-20dd-4551-af8e-51dc76b57b9f (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/d6f2b488-20dd-4551-af8e-51dc76b57b9f/MapServer/WFSServer?request=GetCapabilities&service=WFS
615	Canadian Hydrographic Service - Levels of Service (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Levels_of_Service_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
616	data_donnees/bf655a50-96c8-4126-9ddf-a49174106c3f (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/bf655a50-96c8-4126-9ddf-a49174106c3f/MapServer/WFSServer?request=GetCapabilities&service=WFS
617	CHS_Charts_Source_Outline (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_Source_Outline/MapServer/WFSServer?request=GetCapabilities&service=WFS
618	Bathymetry_500m_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Bathymetry_500m_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS

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619	data_donnees/be12386d (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/be12386d/MapServer/WFSServer?request=GetCapabilities&service=WFS
620	CHS_Charts_Source_Filled (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_Source_Filled/MapServer/WFSServer?request=GetCapabilities&service=WFS
621	data_donnees/be0a3350-f755-418e-b04b-7ff9fd2ebeac (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/be0a3350-f755-418e-b04b-7ff9fd2ebeac/MapServer/WFSServer?request=GetCapabilities&service=WFS
622	Arctic_Voyage_Planning_Guide_ENG (WFS)	http://geoportal.gc.ca/arcgis/services/Arctic_Voyage_Planning_Guide_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
623	data_donnees/bd7fd3d4-63d7-4485-9399-a55fdae9e399 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/bd7fd3d4-63d7-4485-9399-a55fdae9e399/MapServer/WFSServer?request=GetCapabilities&service=WFS
624	CHS_Charts_ENCs_Outline (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_ENCs_Outline/MapServer/WFSServer?request=GetCapabilities&service=WFS
625	data_donnees/b84494fe-4843-484c-8c83-1d510d244a4c (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/b84494fe-4843-484c-8c83-1d510d244a4c/MapServer/WFSServer?request=GetCapabilities&service=WFS
626	data_donnees/6796dbcb-abab-4a8e-a211-4b49f5b45273 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/6796dbcb-abab-4a8e-a211-4b49f5b45273/MapServer/WFSServer?request=GetCapabilities&service=WFS
627	CHS_Charts_ENCs_Filled (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/CHS_Charts_ENCs_Filled/MapServer/WFSServer?request=GetCapabilities&service=WFS
628	data_donnees/56bdd628-5e1d-4759-949b-616ef9bdc3e0 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/56bdd628-5e1d-4759-949b-616ef9bdc3e0/MapServer/WFSServer?request=GetCapabilities&service=WFS
629	data_donnees/4cdeec34-30e7-4070-8362-ae5bac21376b (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/4cdeec34-30e7-4070-8362-ae5bac21376b/MapServer/WFSServer?request=GetCapabilities&service=WFS

ID	Description	URL
630	data_donnees/4a2929ce-d6b1-49b0-b520-63be0859c552 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/4a2929ce-d6b1-49b0-b520-63be0859c552/MapServer/WFSServer?request=GetCapabilities&service=WFS
631	Cartographie_hydrographique_FRA (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Cartographie_hydrographique_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
632	data_donnees/47cffe27-1a7a-4fe9-8a89-f33f9a632c71 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/47cffe27-1a7a-4fe9-8a89-f33f9a632c71/MapServer/WFSServer?request=GetCapabilities&service=WFS
633	data_donnees/40777390-5f06-4bbb-82a4-53afe5254cd8 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/40777390-5f06-4bbb-82a4-53afe5254cd8/MapServer/WFSServer?request=GetCapabilities&service=WFS
634	Cartographie_hydrographique_contour_FRA (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Cartographie_hydrographique_contour_FRA/MapServer/WFSServer?request=GetCapabilities&service=WFS
635	data_donnees/2f0d80a1-5085-4639-94af-49e43cf81942 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/2f0d80a1-5085-4639-94af-49e43cf81942/MapServer/WFSServer?request=GetCapabilities&service=WFS
636	data_donnees/24d700f2-d351-4893-8c46-dc8602ec4790 (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/24d700f2-d351-4893-8c46-dc8602ec4790/MapServer/WFSServer?request=GetCapabilities&service=WFS
637	Bathymetry_500m_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Bathymetry_500m_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
638	data_donnees/16074bd5-66ed-45a5-b9c3-a9c33cf58e6c (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/16074bd5-66ed-45a5-b9c3-a9c33cf58e6c/MapServer/WFSServer?request=GetCapabilities&service=WFS
639	Arctic_Voyage_Planning_Guide_ENG (WFS)	http://geoportal-geoportail.gc.ca/arcgis/services/Arctic_Voyage_Planning_Guide_ENG/MapServer/WFSServer?request=GetCapabilities&service=WFS
640	data_donnees/133994b0-ca21-4ae6-9cbf-57344662f01f (WFS)	http://ec.gc.ca/arcgis/services/data_donnees/133994b0-ca21-4ae6-9cbf-57344662f01f/MapServer/WFSServer?request=GetCapabilities&service=WFS

ID	Description	URL
641	data/fd3355a7-ae34-4df7-b477-07306182db69 (WFS)	http://ec.gc.ca/arcgis/services/data/fd3355a7-ae34-4df7-b477-07306182db69/MapServer/WFSServer?request=GetCapabilities&service=WFS
642	data/e76205c3 (WFS)	http://ec.gc.ca/arcgis/services/data/e76205c3/MapServer/WFSServer?request=GetCapabilities&service=WFS
643	data/e76205c3-23c2-4ea1-8bf5-df7e43462b94 (WFS)	http://ec.gc.ca/arcgis/services/data/e76205c3-23c2-4ea1-8bf5-df7e43462b94/MapServer/WFSServer?request=GetCapabilities&service=WFS
644	data/c9c6c6a1 (WFS)	http://ec.gc.ca/arcgis/services/data/c9c6c6a1/MapServer/WFSServer?request=GetCapabilities&service=WFS
645	data/b17d5a29-84cd-4241-9459-36ac273a88ea (WFS)	http://ec.gc.ca/arcgis/services/data/b17d5a29-84cd-4241-9459-36ac273a88ea/MapServer/WFSServer?request=GetCapabilities&service=WFS
646	data/a483c2e9 (WFS)	http://ec.gc.ca/arcgis/services/data/a483c2e9/MapServer/WFSServer?request=GetCapabilities&service=WFS
647	data/98b6089a-389d-47f0-a461-4dfddfff8122 (WFS)	http://ec.gc.ca/arcgis/services/data/98b6089a-389d-47f0-a461-4dfddfff8122/MapServer/WFSServer?request=GetCapabilities&service=WFS
648	data/9729e977-9ac3-4064-aa96-e73c2f2214c6 (WFS)	http://ec.gc.ca/arcgis/services/data/9729e977-9ac3-4064-aa96-e73c2f2214c6/MapServer/WFSServer?request=GetCapabilities&service=WFS
649	data/95d36af7 (WFS)	http://ec.gc.ca/arcgis/services/data/95d36af7/MapServer/WFSServer?request=GetCapabilities&service=WFS
650	data/94a51051 (WFS)	http://ec.gc.ca/arcgis/services/data/94a51051/MapServer/WFSServer?request=GetCapabilities&service=WFS
651	data/94a51051-ad11-499a-b5f1-8c97b29f695c (WFS)	http://ec.gc.ca/arcgis/services/data/94a51051-ad11-499a-b5f1-8c97b29f695c/MapServer/WFSServer?request=GetCapabilities&service=WFS
652	data/90be49bd-e492-4251-9082-b756434b8c45 (WFS)	http://ec.gc.ca/arcgis/services/data/90be49bd-e492-4251-9082-b756434b8c45/MapServer/WFSServer?request=GetCapabilities&service=WFS
653	data/8c4f9a92-dfe7-4c9b-9e6e-10e66af9a769 (WFS)	http://ec.gc.ca/arcgis/services/data/8c4f9a92-dfe7-4c9b-9e6e-10e66af9a769/MapServer/WFSServer?request=GetCapabilities&service=WFS

ID	Description	URL
654	data/88976ac7 (WFS)	http://ec.gc.ca/arcgis/services/data/88976ac7/MapServer/WFSServer?request=GetCapabilities&service=WFS
655	data/87bf8597-4be4-4ec2-9ee3-797f5eafbd97 (WFS)	http://ec.gc.ca/arcgis/services/data/87bf8597-4be4-4ec2-9ee3-797f5eafbd97/MapServer/WFSServer?request=GetCapabilities&service=WFS
656	data/7ae4d24f-f2c8-4efe-bf22-230199a198ff (WFS)	http://ec.gc.ca/arcgis/services/data/7ae4d24f-f2c8-4efe-bf22-230199a198ff/MapServer/WFSServer?request=GetCapabilities&service=WFS
657	data/73865ed2-5063-4df8-803a-8e4204307758 (WFS)	http://ec.gc.ca/arcgis/services/data/73865ed2-5063-4df8-803a-8e4204307758/MapServer/WFSServer?request=GetCapabilities&service=WFS
658	data/6ab784be-1197-4820-8bc2-fd20da32632c (WFS)	http://ec.gc.ca/arcgis/services/data/6ab784be-1197-4820-8bc2-fd20da32632c/MapServer/WFSServer?request=GetCapabilities&service=WFS
659	data/65658050-7a80-4da3-9a09-da137c203a34 (WFS)	http://ec.gc.ca/arcgis/services/data/65658050-7a80-4da3-9a09-da137c203a34/MapServer/WFSServer?request=GetCapabilities&service=WFS
660	data/651aeb5f-e0f8-4a5f-9f44-4343ed097fa5 (WFS)	http://ec.gc.ca/arcgis/services/data/651aeb5f-e0f8-4a5f-9f44-4343ed097fa5/MapServer/WFSServer?request=GetCapabilities&service=WFS
661	data/6160669e (WFS)	http://ec.gc.ca/arcgis/services/data/6160669e/MapServer/WFSServer?request=GetCapabilities&service=WFS
662	data/56ca16f7-2a72-4b2d-9728-204fc4657381 (WFS)	http://ec.gc.ca/arcgis/services/data/56ca16f7-2a72-4b2d-9728-204fc4657381/MapServer/WFSServer?request=GetCapabilities&service=WFS
663	data/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b (WFS)	http://ec.gc.ca/arcgis/services/data/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b/MapServer/WFSServer?request=GetCapabilities&service=WFS
664	data/3b7dd693-52dc-4e55-828f-37c8172f009b (WFS)	http://ec.gc.ca/arcgis/services/data/3b7dd693-52dc-4e55-828f-37c8172f009b/MapServer/WFSServer?request=GetCapabilities&service=WFS
665	data/32219f6e-5e1b-4aa1-81e8-5cfe4622160b (WFS)	http://ec.gc.ca/arcgis/services/data/32219f6e-5e1b-4aa1-81e8-5cfe4622160b/MapServer/WFSServer?request=GetCapabilities&service=WFS

ID	Description	URL
666	data/28cf0e45-2aa2-4015-a5a0-5808a98dfd95 (WFS)	http://ec.gc.ca/arcgis/services/data/28cf0e45-2aa2-4015-a5a0-5808a98dfd95/MapServer/WFSServer?request=GetCapabilities&service=WFS
667	data/27cf03c0 (WFS)	http://ec.gc.ca/arcgis/services/data/27cf03c0/MapServer/WFSServer?request=GetCapabilities&service=WFS
668	data/274ede77-27b9-46b8-96c8-4d7d4a706f08 (WFS)	http://ec.gc.ca/arcgis/services/data/274ede77-27b9-46b8-96c8-4d7d4a706f08/MapServer/WFSServer?request=GetCapabilities&service=WFS
669	data/22abff18 (WFS)	http://ec.gc.ca/arcgis/services/data/22abff18/MapServer/WFSServer?request=GetCapabilities&service=WFS
670	D01/e23ce141-996e-4c98-b4a1-3141ce6095dd (WFS)	http://ec.gc.ca/arcgis/services/D01/e23ce141-996e-4c98-b4a1-3141ce6095dd/MapServer/WFSServer?request=GetCapabilities&service=WFS
671	D01/b6aee1d7-638c-4bf3-9d09-8db4243b81da (WFS)	http://ec.gc.ca/arcgis/services/D01/b6aee1d7-638c-4bf3-9d09-8db4243b81da/MapServer/WFSServer?request=GetCapabilities&service=WFS
672	D01/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b (WFS)	http://ec.gc.ca/arcgis/services/D01/49deb8b2-10a6-4b4a-ad7c-9cbc2eda260b/MapServer/WFSServer?request=GetCapabilities&service=WFS
673	D01/456ce087-4711-442c-8445-30520f96e98e (WFS)	http://ec.gc.ca/arcgis/services/D01/456ce087-4711-442c-8445-30520f96e98e/MapServer/WFSServer?request=GetCapabilities&service=WFS
674	Water_Quality_Monitoring_Surveillance_dela_qualite (WFS)	http://ec.gc.ca/arcgis/services/Water_Quality_Monitoring_Surveillance_dela_qualite/MapServer/WFSServer?request=GetCapabilities&service=WFS
675	SpeciesProtectRestore_Canada_CanadianWildlifeService (WFS)	http://ec.gc.ca/arcgis/services/SpeciesProtectRestore_Canada_CanadianWildlifeService/MapServer/WFSServer?request=GetCapabilities&service=WFS
676	NPRI_FGP_All_Layers (WFS)	http://ec.gc.ca/arcgis/services/NPRI_FGP_All_Layers/MapServer/WFSServer?request=GetCapabilities&service=WFS
677	CESI_FGP_All_Layers (WFS)	http://ec.gc.ca/arcgis/services/CESI_FGP_All_Layers/MapServer/WFSServer?request=GetCapabilities&service=WFS
678	BC_CriticalHabitat_CB_HabitatEssentiel (WFS)	http://ec.gc.ca/arcgis/services/BC_CriticalHabitat_CB_HabitatEssentiel/MapServer/WFSServer?request=GetCapabilities&service=WFS

ID	Description	URL
679	NWT_MercuryInFishSamples_GNWTBasemapLCC_v2.mxd (WFS)	http://apps.geomatics.gov.nt.ca/arcgis/services/GNWT/Health_LCC/MapServer/WFSServer?request=GetCapabilities&service=WFS
680	Flood Hazard Mapping (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/FHM-LayersWBase/Latest/MapServer/WMSServer?request=GetCapabilities&service=WMS
681	Flood Hazard Mapping (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/FHM-LayersWBase/20160119/MapServer/WMSServer?request=GetCapabilities&service=WMS
682	Federal Land (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Federal_Land/Latest/MapServer/WMSServer?request=GetCapabilities&service=WMS
683	Federal Land (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Federal_Land/20160121/MapServer/WMSServer?request=GetCapabilities&service=WMS
684	Federal Land (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Federal_Land/00010101/MapServer/WMSServer?request=GetCapabilities&service=WMS
685	Environmentally Significant Areas of Alberta (WMS)	https://genesis.srd.alberta.ca/genesis_tokenauth/Services/Environmentally_Significant_Areas_of_Alberta/Latest/MapServer/WMSServer?request=GetCapabilities&service=WMS

Appendix C: Appendix C - Change Requests

Chapter 9. CR 402: Explicitly state the supported netCDF MIME types in the EO WCS

Reviewing the literature for both Rasdaman and GeoServer, the testbed found that netCDF has different MIME types for different versions and data models, for example application/x-netcdf, application/netcdf, and application/x-netcdf4. The EO WCS profile and the OGC netCDF do not explicitly state which netCDF version is recommended and what MIME type is to be specified in requests. To improve interoperability, future versions of the EO WCS profile and the OGC netCDF standard should explicitly state which MIME types are to be used with which versions.

The change request can be found at the following location:
http://ogc.standardstracker.org/show_request.cgi?id=402

Chapter 10. CR 403: Include options for compressing netCDF files in the EO WCS

To allow WCS to efficiently transmit netCDF files, future versions of the EO WCS should provide client applications with the option of compressing netCDF files on retrieval, supported for example by a facility modeled on the nccopy tool. The nccopy tool offers an option for compressing netCDF files at different levels of compression. Such a capability could also be useful for other WCS profiles.

The change request can be found at the following location:
http://ogc.standardstracker.org/show_request.cgi?id=403

Appendix D: Revision History

Table 27. Revision History

Date	Release	Editor	Primary clauses modified	Descriptions
2016-09-20	S. Cavazzi	1.1	various	first complete draft
2016-09-30	G. Hobona	1.2	various	second iteration of the complete draft
2016-10-31	G. Hobona	1.3	various	final complete draft based on feedback from OGC IP team
2017-03-07	S. Simmons	1.4	various	prepare for publication