



NATURAL RESOURCES CANADA - INVENTIVE BY NATURE

Evergreen Spatial Data Infrastructure Catalogues: A Novel Approach

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Natural Resources
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Ressources naturelles
Canada



Spatineo

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Catalogues are essential for SDIs

Aggregating information about services and data is essential:

- Reduce duplicated effort, in both data collection and distribution
- Understand what information is available and what needs further collecting / research
- Discovery of relevant data provided outside of the SDI

Without a catalogue, an SDI cannot reach its full potential



Cataloguing the Canadian SDI

The GeoConnections Discovery Portal was a catalogue of the Canadian SDI services.

It was however decommissioned due to high cost.

The screenshot displays the GeoConnections - Discovery Portal interface. At the top, there is a navigation bar with links for Home, Search Catalogue, Show Map, Publish Content, and Help. Below this is a search area with a text input field and a Search button. The search results are displayed in a table-like format with columns for Resource Type, Location, and Categories. The first result is 'Nova Scotia Geoscience Digital Products' with a date of 2005-04-05 and a data scale of N/A. The second result is 'British Columbia Geological Survey CGKN Metadata Catalogue' with a date of 2011-04-26 and a data scale of N/A. The interface also includes a sidebar with filters for Resource Types, Location, and Categories, and a search bar at the bottom.

Catalogue maintenance



A catalogue not only needs to be built, but it needs to be maintained. The question of quality & sustainability arises:

- Records need to be added, updated, removed per request
- However not all changes are reported: active maintenance
- Assessment of other factors: QoS, relevancy to the SDI

This type of job is typically better suited for automation instead of humans

A new catalogue for Canadian SDI

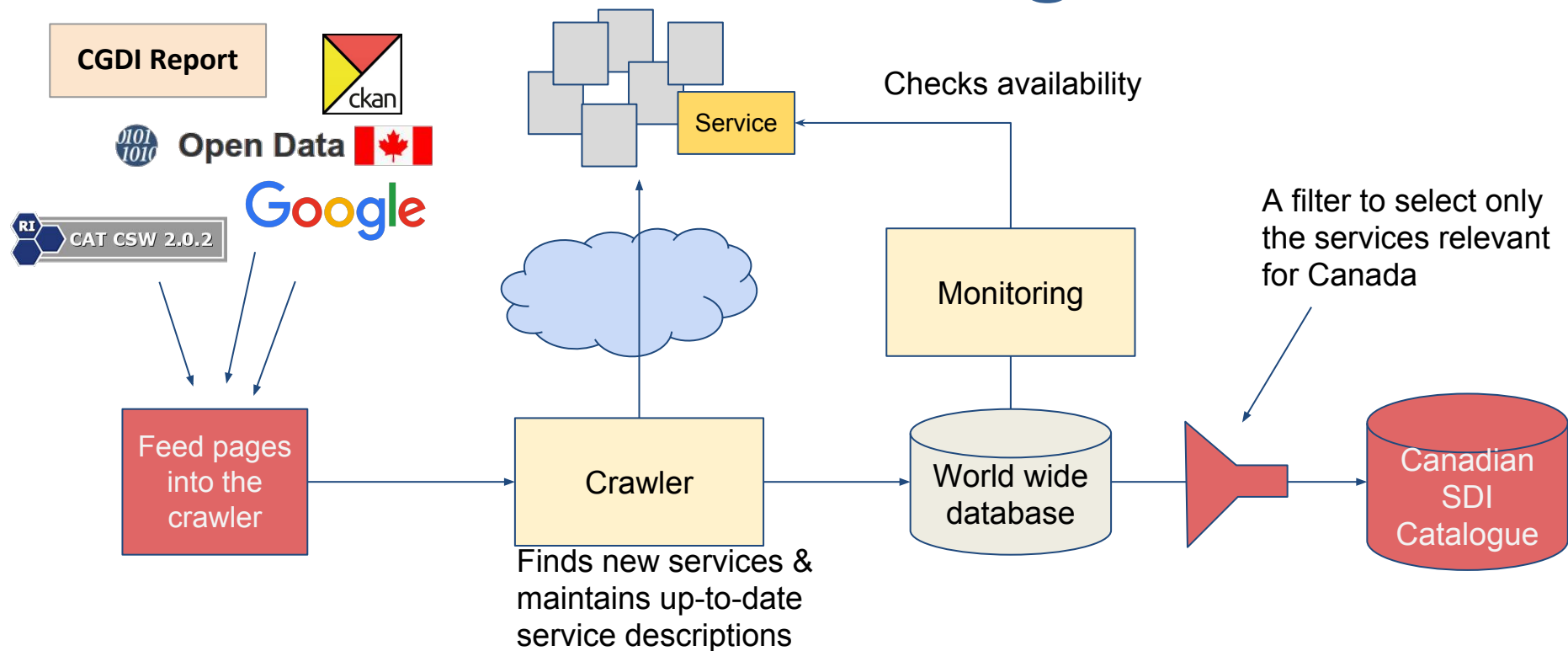
New approach: Harvester project
2016

- Based on automated processes
- Contractor with existing infrastructure for discovery, Spatineo

Result: broader and more up to date catalogue with QoS information



How the harvesting works



Original project results

The decommissioned catalogue had approximately 350 services

After the project harvesting produced 728, end of 2016: **1722**

Service type	Services	Layers	Availability 2016 <u>average</u>	Availability 2016 <u>median</u>
<i>WFS</i>	141	2710	91.69%	95.33%
<i>WMS</i>	408	22263	93.88%	97.46%
<i>WMTS</i>	19	382	*59.84%	99.12%
<i>ArcGIS MapServer REST</i>	1154	16642	93.45%	99.20%
<i>Total</i>	1722	41997	93.29%	98.84%

* Average WMTS availability is low due to ArcGIS WMTS compatibility issue




 Search

- Energy ▾
- Mining/Materials ▾
- Forests ▾
- Earth Sciences ▾
- Hazards ▾
- Explosives ▾
- The North ▾
- Climate Change ▾

Home → Earth Sciences → Geomatics → [Canada's Spatial Data Infrastructure](#) → Geospatial Web Services

Earth Sciences

Sciences

Geomatics

Canada Lands Surveys

Geodetic Reference Systems

Satellite Imagery and Air Photos

Canada's Spatial Data Infrastructure

CGDI Initiatives

Geospatial Communities and the Canadian GeoSecretariat

Geospatial Standards and Operational Policies

CGDI Resource Centre

Geospatial Web Services

This is a list generated from a geospatial web services harvester developed for the Canadian Geospatial Data Infrastructure. It is in continual development and updated weekly. You can also download a [xlsx](#) or the source [json](#) file.

Find: Showing 101 to 110 of 1,876 entries | Show **10** entries

Host	URL	Title	Service Interface Type	Layer Count	Week availability	Year availability
cartes.geogratis.gc.ca	URL	Stations de génération d'électricité	WMS	10	100	99.6
cartes.geogratis.gc.ca	URL	Service de cartographie Web (WMS) de GéoBase	WMS	34	100	99.9
cartes.geogratis.gc.ca	URL	SCW-Toporama	WMS	17	100	99.4
cartes.ville.sherbrooke.qc.ca	URL		ESRI_MapServer	1	100	100
cartes.ville.sherbrooke.qc.ca	URL		ESRI_MapServer	5	100	100
cartes.ville.sherbrooke.qc.ca	URL	BaseMap	ESRI_MapServer	75	100	88.4
cartes.ville.sherbrooke.qc.ca	URL	BaseMap	ESRI_MapServer	75	100	100
cartes.ville.sherbrooke.qc.ca	URL	BaseMap	ESRI_MapServer	78	100	100

<http://www.nrcan.gc.ca/earth-sciences/geomatics/canadas-spatial-data-infrastructure/19359>

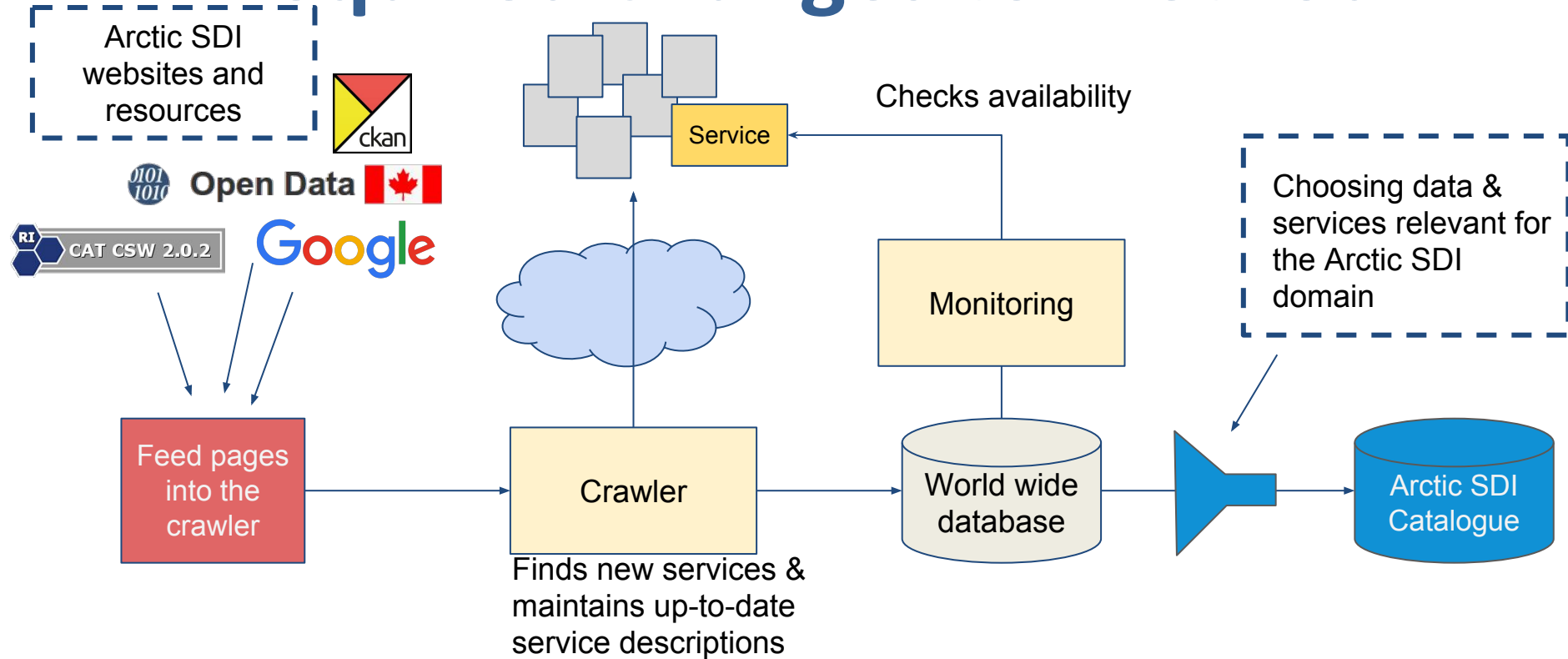


Arctic Spatial Data Infrastructure (Arctic SDI)

“The Arctic SDI joint effort aims at creating a spatial data infrastructure for the Arctic region. It’s a cooperation network of National mapping agencies in Norway, Denmark, Sweden, Finland, Iceland, Russia, Canada and USA. It’s goal is to create an easy-to-use single point access for map and other geographic data of the Arctic region from various producers.”



Required changes to method



Selecting relevant services

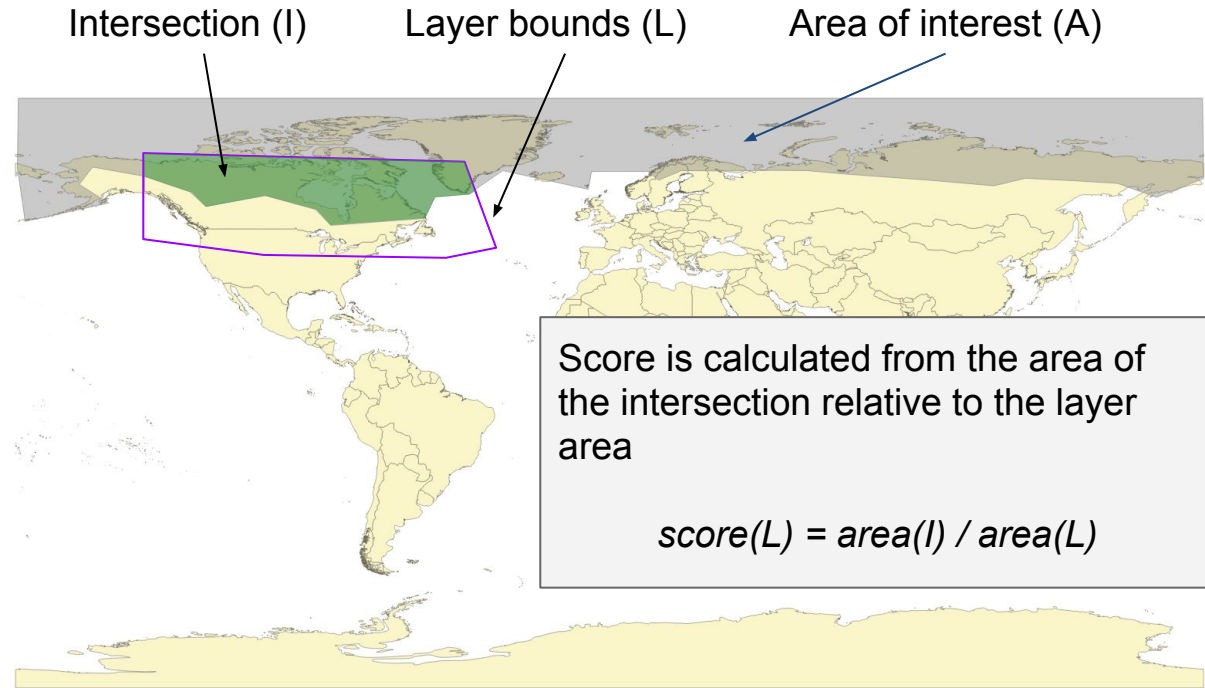
Services are chosen based on a scoring scheme:

- “Arctic SDI” appearing in service description
- Geographic names associated with the arctic
- Support for arctic polar projections
- Spatial relevancy

.. and choose appropriate weights for the above

Scoring spatial relevancy

Relevancy is calculated from the portion of the layer extent within an area of interest.



Example scoring

Endpoint	Spatineo Directory	“Arctic SDI”	Geo names	Polar prj	BBOX prot. areas	BBOX treeline	Score
http://willem2.npolar.no/arcgis/services/inspire1/NP_TopoSvalbard_ArcticSDI/MapServer/WmsServer?	9452	1.0	1.0	1.0	0.0	1.0	12.0
http://kortforsyningen.kms.dk/asdi_gr_beta?	41972	0.938	0.0	1.0	0.154	0.704	11.348
https://security.locationframework.eu/wss/service/CIM-IS/httpauth	44707	1.0	0.0	0.158	0.053	0.55	10.891
http://opencache.statkart.no/gatekeeper/gk/gk.open_wmts?	9778	1.0	0.0	0.0	0.013	0.14	10.204
http://gis.lmi.is/geoserver/ows?SERVICE=WMS&	27413	1.0	0.0	0.155	0.0	0.0	10.073
http://dev.caff.is:8080/geoserver/arctic_sdi/ows?SERVICE=WMS&	35194	1.0	0.0	0.0	0.0	0.0	10.0
http://dev.caff.is:8080/geoserver/arctic_sdi/wfs	35198	1.0	0.0	0.0	0.0	0.0	10.0
http://gis.lmi.is/geoserver/LMI_vektor/ows?SERVICE=WMS&	27585	0.938	0.0	0.225	0.0	0.0	9.487
http://opencache.statkart.no/gatekeeper/gk/gk.open?SERVICE=WMS&	8682	0.75	0.0	0.345	0.0	0.0	7.672
https://www.sciencebase.gov:443/catalogMaps/mapping/ows/5399606fe4b0a59b26496866	22716	0.0	0.0	0.0	1.0	1.0	6.0
https://www.sciencebase.gov:443/catalogMaps/mapping/ows/5399606fe4b0a59b26496866?SERVICE=WMS&	22715	0.0	0.0	0.0	1.0	1.0	6.0
http://wms.proto.gina.alaska.edu/wms/aea?	35156	0.0	0.0	0.0	0.997	1.0	5.984
https://www.sciencebase.gov:443/catalogMaps/mapping/ows/5399609ee4b0a59b2649690c?SERVICE=WMS&	22723	0.0	0.0	0.0	0.595	1.0	3.977

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Value for Arctic SDI

Provide a catalogue of services and data for Arctic SDI

- Helps users find data for research, applications, etc.
- Reduce duplicate data as well as identify gaps
- Gives evidence for evaluating Arctic SDI KPIs

➤ Increase impact and visibility of the work done by the Arctic SDI community



Current status

Continuous data delivery to Arctic SDI in fall 2017

- Produce ISO 19139 compliant metadata to GeoNetwork

Arctic SDI will then start using the data

- Create a feedback loop to improve quality of filtering

Arctic Spatial Data Pilot OGC

Sponsored by USGS and Natural Resources Canada

- Test interoperability and data sharing across a global network of partners
- One key finding: discovery of relevant data is still problematic
- They produced a catalog from known sources (major companies and agencies)
- No plans to maintain the catalogue after the pilot

It would be valuable to test whether our approach could be used to maintain such a catalogue.



Key takeaways

- Catalogues can be built and maintained using automated mechanisms
- Achieve better coverage with less resources
- Critical tasks:
 - Maintain global directory of services and availability information
 - Design filtering method for the catalogue domain
 - Feedback loop for ensuring filtering quality



Thanks!

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