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Dublin Core Metadata Initiative 2020

Harmonizing Canada's Geospatial Metadata: Implementing ISO 19115 Metadata Standard in Canada's Federal Government

Cindy Mitchell, Natural Resources Canada,
September 22, 2020

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Presentation overview

- Beginnings
 - Canadian Geospatial Data Infrastructure
 - TBS Standard on Geospatial Data
- A Changing Digital Landscape
 - Canada's commitment to Open Government
 - Federal Geospatial Platform and Open Maps
- A Harmonized North American Profile
 - Why and how we harmonized geospatial metadata across the Government of Canada
- Looking Forward
 - Leveraging what we've built in new ways



Heart Lake, Ontario, Canada
43.7410° N, 79.7954° W





Haida Gwaii, British Columbia, Canada
53°00'0.00" N -132°00'0.00" W

Beginnings

Canadian Geospatial Data Infrastructure and Standard on Geospatial Data

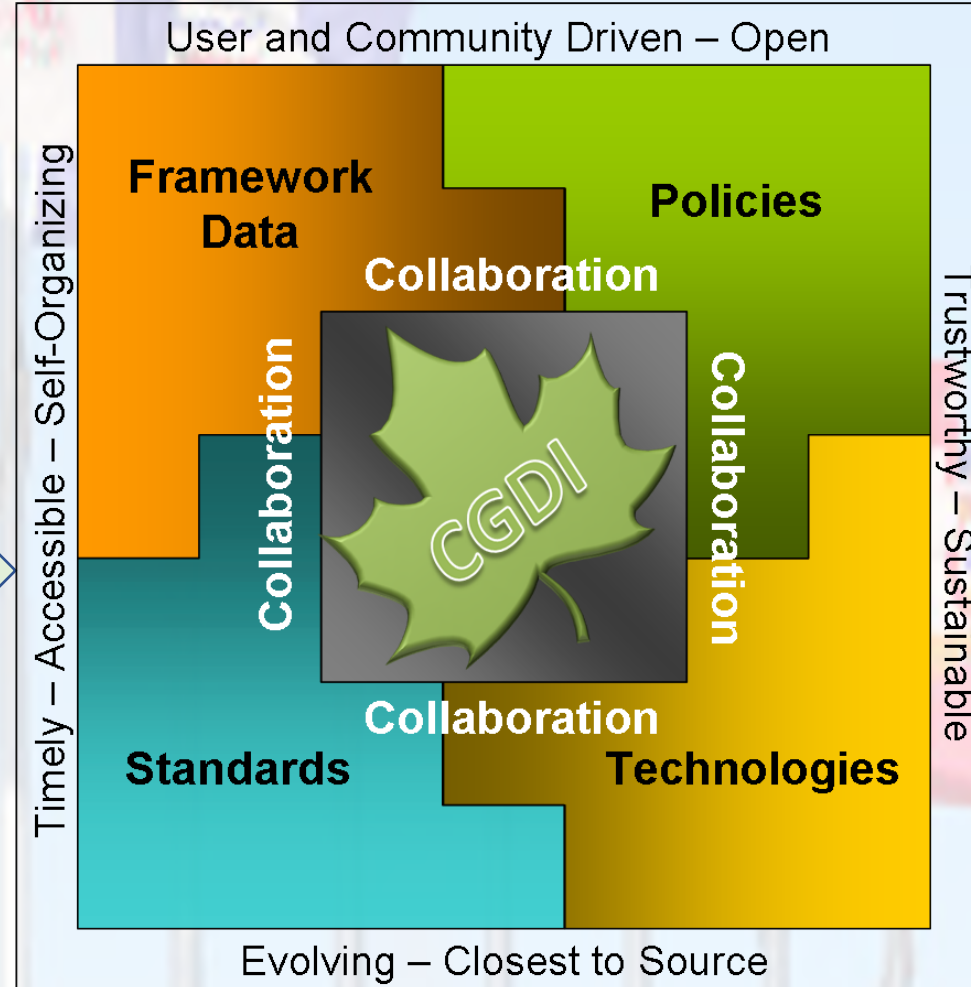
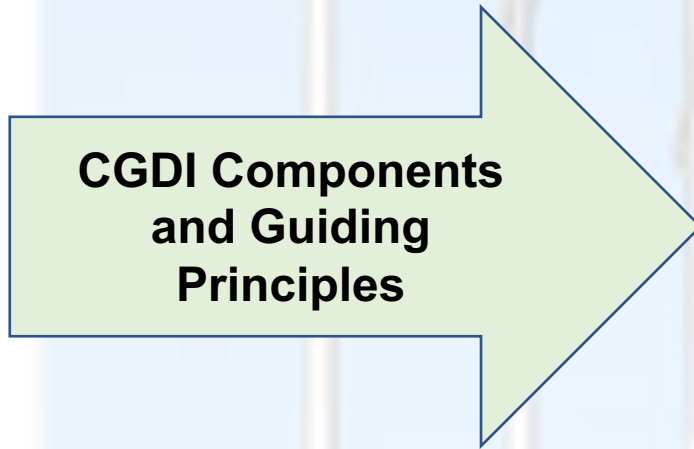


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What is the Canadian Geospatial Data Infrastructure (CGDI)?



Participants:

- Federal
- Provincial/territorial
- Municipal
- Indigenous/First Nations
- Academia
- Private sector
- NGOs
- Citizens

Standards:

- ISO
- Open Geospatial Consortium
- World Wide Web Consortium
- International Hydrographic Organization

Benefits

Environmental

Social

Economic



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Standard on Geospatial Data: Raison d'être

- Supports sound information management within the Government of Canada
- Enables efficient and effective management and discovery of geospatial data for evidence-based decision-making
- Supports Government of Canada interoperability goal of “ensuring digital information is accessible, shareable, and usable over time and through technological change”
- Creates mandate for departments to produce ISO19115 compliant metadata and ISO 19128 web mapping services: codifies CGDI standards within Treasury Board Secretariat policy suite

Standard on Geospatial Data

Supports stewardship and interoperability of information by ensuring that departments and agencies access, use and share geospatial data efficiently and effectively in order to support program and service delivery.

Date modified: 2012-04-01

Expand all Collapse all

- ▼ 1. Effective date
 - 1.1 This standard will take effect on June 1, 2009. Departments will have until May 31, 2014 to fully implement section 6.1 of this standard.
 - 1.2 This version of the standard incorporates updates effective April 1, 2012.
- ▼ 2. Application
- ▼ 3. Context
 - 3.1 Geospatial data is defined as data with implicit or explicit reference to a location relative to the Earth. This standard establishes the information infrastructure to support the discovery and use of geospatial information and to enable information sharing among departments, with other jurisdictions, and with the private sector.
 - 3.2 Geospatial data important to social, economic and cultural well-being is produced or used by federal departments, the provinces, territories, and others. This includes mapping products to support activities such as search and rescue, geospatial intelligence, and fire fighting. Standardization is essential in this context. It allows data from one source to be easily used with those from another source to create a richer and more useful product. The Standard on Geospatial Data adopts measures that have been endorsed by federal departments, provincial and territorial governments, as well as by academic and private sector participants in the Canadian Geospatial Data Infrastructure.

▼ More information ⓘ

Terminology:

- [Glossary](#)

Topic:

- [Service and digital](#)

▼ Archives ⓘ

This standard replaces:

- [Geospatial Data Standard on \[2012-03-31\]](#)

View all inactive instruments

Print-friendly XML

<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=16553>



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A Changing Digital Landscape

Canada's Commitment to Open Government and the Federal Geospatial Platform



Nahanni National Park, NWT, Canada
61.5007° N, 125.5005° W



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Canada's digital data landscape evolved...

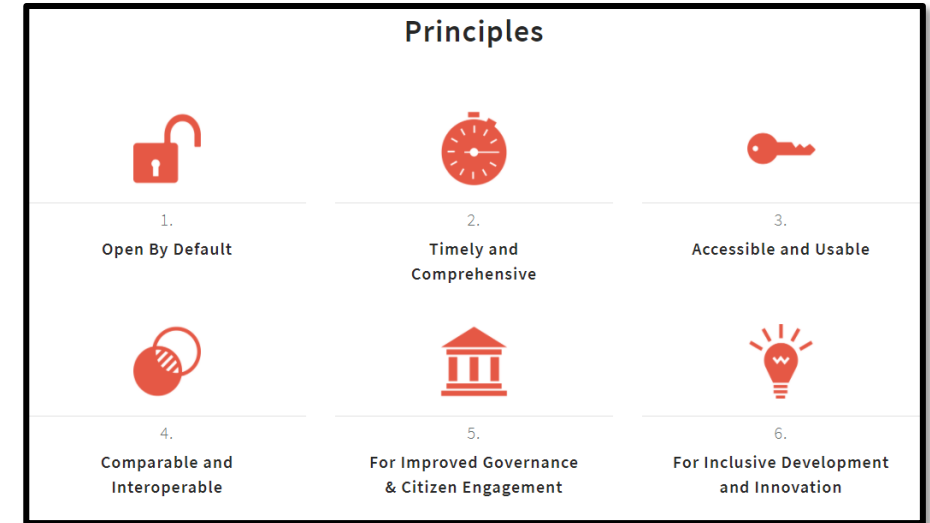
[Open Government Partnership](#)

Canada charter member 2011
Completing our 4th Action Plan; public consultations for the 5th

[G8/International Open Data Charter](#)

[Canada's Policy on Service and Digital](#)

Effective as of April 1, 2020, the policy articulates how Government of Canada organizations manage service delivery, information and data, information technology, and cyber security in the digital era



International Open Data Charter Principles



FGP: An enterprise approach to Canada's geo-data

fGp Federal Geospatial Platform

Search | Map gallery | Resources | Help | Sign in

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Search

Sort by: Relevance | View: 10 | 1-10 of 156

1- Fire season length across Canada

Fire weather refers to weather conditions that are conducive to fire. These conditions determine the fire season, which is the period(s) of the year during which fires are likely to start, spread and...

2- Fire season length - Reference Period (1981-2010)

Fire weather refers to weather conditions that are conducive to fire. These conditions determine the fire season, which is the period(s) of the year during which fires are likely to start, spread and...

3- Difference in fire season length - Short-term (2011-2040) under RCP 8.5 compared to reference period

Fire weather refers to weather conditions that are conducive to fire. These conditions determine the fire season, which is the period(s) of the year during which fires are likely to start, spread and...

Federal and Provincial/Territorial Organization

- Agriculture and Agri-Food Canada (53)
- Environment and Climate Change Canada (35)
- Fisheries and Oceans Canada (6)
- Government of Alberta (12)
- Government of British Columbia (25)

Viewable on a map?

- Items that are not viewable on a map (69)
- Items that are viewable on a map (87)

Subject

- Afforestation (2)
- Agricultural assistance (2)
- Agriculture (54)
- Agriculture statistics (2)
- Aquatic wildlife (1)

fGp Federal Geospatial Platform

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Tribal Councils Location

Description

A tribal council is a grouping of First Nations with common interests who voluntarily joined together to provide services to member First Nations. The tribal council geographic location dataset contains the geographic location of all tribal councils in Canada as points as well as basic attributes data. Each tribal council point represents its address as it is registered in Indigenous and Northern Affairs Canada (INAC) Indian Government Support System (IGSS). A connection with the IGSS is in place to ensure that any update to the system is reflected in the attributes data associated with the geography of each tribal council. This dataset is Indigenous and Northern Affairs Canada (INAC) primary source for Tribal Councils geographic location on maps.

fGp Federal Geospatial Platform

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Oceans Act Marine Protected Areas

Description

Marine protected areas (MPA) are one among a number of spatial management tools that contribute to the improved health, integrity and productivity of our marine ecosystems and help advance integrated ocean management. As planning Canada's marine protected area network moves forward, the locations of future Oceans Act Marine Protected Areas will be selected based on a systematic and collaborative approach described in the National Framework for Canada's Network of Marine Protected Areas (2011). Currently, Fisheries and Oceans Canada has a number of Marine Protected Areas designated under the Oceans Act and Areas of Interest for new Marine Protected Areas at various stages of progress towards designation. These areas are ecologically significant, with species and/or properties that require special management consideration. An Oceans Act Marine Protected Area (http://www.dfo-mpo.gc.ca/conservation-eng/hntp) is an area of the sea that forms part of the internal waters of Canada, the territorial sea of Canada or the exclusive economic zone of Canada designated for the conservation and protection of commercial and non-commercial fishery resources, including marine mammals, and their habitats.

fGp Federal Geospatial Platform

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Air pollutant emissions - Total particulate matter emissions by facility, Canada

Description

The Canadian Environmental Sustainability Indicators (CESI) program provides data and information to track Canada's performance on key environmental sustainability issues. The Air pollutant emissions indicators track emissions from human activities of 6 key air pollutants: sulphur oxides, nitrogen oxides, volatile organic compounds, ammonia, carbon monoxide and fine particulate matter. For each air pollutant, the indicators are provided at the national and provincial/territorial levels. They also identify the major sources of emissions and provide links to detailed information on air pollutant emissions from facilities. The Air pollutant emissions indicators are intended to inform Canadians and decision makers about progress made towards reducing emissions from human-related sources of air pollutants and about the effectiveness of emission reduction measures implemented to improve ambient air quality in Canada. Information is provided to Canadians in a number of formats including static and interactive maps, charts and graphs, HTML, and CSV data tables and downloadable reports. See supplementary documentation for data sources and details on how those data were collected and how the indicator was calculated.

FGP's public face: Open Maps

fGp Federal Geospatial Platform

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Home → Search

Search Enter keywords [Search] [Cart] [View map]

Department or agency

- Agriculture and Agri-Food Canada (268)
- Canadian Environmental Assessment Agency (1)
- Canadian Food Inspection Agency (1)
- Canadian Northern Economic Development Agency (2)
- Canadian Space Agency (1)

Show all...

Viewable on a map?

- Items that are not viewable on a map (264)
- Items that are viewable on a map (702)

Subject

- Aboriginal peoples (21)
- Aerial photography (20)
- Agriculture (79)
- Agriculture statistics (16)
- Air pollution (8)

Show all...

Sort by: Relevance | View: 10 | 1-10 of 966

1- **Qu'Appelle Valley Lakes system – Flight Line 2008**
Flight lines for the Pasqua, Crooked, Echo, and Round Lakes area within the Qu'Appelle Valley River system in Saskatchewan
Add to Map Cart

2- **Redberry Lake Biosphere Reserve – 1 meter Full Feature Hillshade**
One meter hillshade generated from full feature DEM. LIDAR Services International (LSI), a Calgary-based LIDAR company completed an airborne LIDAR survey for the Redberry Lake Biosphere Reserve (RLBR...)
Add to Map Cart

3- **Interpolated Census of Agriculture by Major drainage area**
The Census of Agriculture is disseminated by Statistics Canada's standard geographic units (boundaries). Since these census units do not reflect or correspond with biophysical landscape units (such a...

Government Access

Open Government Portal

Clear all choices

Download Search Results

Open Data Portal Catalogue Dataset

Suggest a Dataset

Organization

- Agriculture and Agri-Food Canada (12)

Portal Type

Collection Type

- Open Maps (12)

Jurisdiction

- Federal (12)

Open Maps

Search for geospatial data or click **Add to cart** to select multiple datasets to plot on a single map. Click **View on Map** to visualize and overlay the datasets using a geospatial viewer

Found 12 records

interpolated census agriculture [Search] Order By Best match

Interpolated Census of Agriculture Federal

The **Census** of **Agriculture** is disseminated by Statistics Canada's standard geographic units (boundaries). Since these **census** units do not reflect or correspond with biophysical landscape units (such as ecological regions, soil landscapes or drainage areas), **Agriculture** and Agri-Food Canada in collaboration with Statistics Canada's **Agriculture** Division, have developed a process for **interpolating** (reallocating or proportioning) **Census** of **Agriculture** information from **census** polygon-based units to biophysical polygon-based units.

Last Updated: Jul. 20, 2018 **Date Published:** May 14, 2013

Organization: Agriculture and Agri-Food Canada

Formats: [GML](#) [WMS](#) [FGDB/GDB](#) [PDF](#) [CSV](#) [ESRI REST](#)

Public Access

Harmonizing our Metadata

Harmonized North American Profile of ISO 19115:2003 (HNAP)



Prince Edward Island, Canada
46.5107° N, 63.4168° W



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Why harmonize further on a standard?

- In an enterprise platform, inconsistencies in NAP metadata would be clearly perceived
- Increased semantic normalization enables better searching and sharing
- Entirely compliant with the base standard (ISO 19115:2003)
- Increased adherence to other standards (ISO date, country code, language codes, etc.)
- HNAP is able to crosswalk successfully to the Open Government Portal CKAN metadata profile

A multi-departmental team collaborated to compare departmental implementations and identify best practice opportunities to improve enterprise implementation

Result: Increased consistency in metadata content; increased usability for end-users; interoperability by design with Open Government metadata standard



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“Harmonized” North American Profile: HNAP

Consists of:

- Minimum mandatory (M) requirements from ISO 19115:2003 as defined by North American Profile of ISO 19115:2003 – Geographic Information – Metadata, Minimum mandatory set of metadata items – Dataset”
- Additional minimum mandatory (M) requirements from ISO 19115:2003 for consistency within Government of Canada departmental and Open Government metadata
- HNAP conditions, guidance and examples.
- [Available online](#) (with registration on GCCollab)

Government of Canada / Gouvernement du Canada | GCaccount | GCwiki | GCmessage (Pilot) | Français

GCcollab | Search GCCollab | Invite

Home | Communities | The Wire | Groups | Members | Career | More

Home → Files → Interprovincial Data Pilot → Guide to Harmonized ISO 19115:2003 North American Profile Metadata for Government of Canada

Interprovincial Data Pilot
Sub-Group | Owner: Steven Dunning | Group members: 5 | + Invite

Activity | Discussion | Files | Blog | More-

Guide to Harmonized ISO 19115:2003 North American Profile Metadata for Government of Canada | Download

[Guide to Harmonized ISO 19115:2003 North American Profile Metadata for Government of Canada](#)
By [Cindy Mitchell](#) 19 March 2018 @ 8:15pm

This document is the result of a multi-departmental effort to compare metadata files and identify discrepancies in interpretation and harmonize the Government of Canada implementation of the NAP. This document builds upon the “North American Profile ISO 19115:2003 – Geographic Information – Metadata, NAP Metadata, Minimum mandatory set of metadata items – Dataset” document and is intended to guide federal departments in completing metadata in a manner that is consistent between departments and compliant with the Treasury Board Secretariat Standard on Geospatial Data.



A few examples...

- File Identifier
 - NAP requires a unique file identifier for each metadata record
 - HNAP guidelines indicate ISO/IEC 9834-8:2005 compliant UUID
 - Identifier is key pivot for machine based interactions with metadata
- Language
 - HNAP guidelines indicate bilingual (ENG/FRA) content for all free text fields
 - HNAP elevates Locale element to mandatory
 - Standardized (ISO) country and language codes are used to indicate locale

Metadata class	Clause	Metadata item	Reference	Notes
Metadata Record Information (MD_Metadata)	5.2.1	<u>fileIdentifier*</u>		
		<p>HNAP Guideline: Each metadata record shall have a universal unique identifier (UUID) to distinguish it from others. UUID will be generated according to ISO/IEC 9834-8:2005 using version 4 (random) or version 5 (SHA-1 hash) variants. Single or bulk version 4 (random) UUIDs can be generated at https://www.uuidgenerator.net/version4.</p> <p>Example: <gmd:fileIdentifier> <gco:CharacterString>c959fb7e-6bac-41dd-a881-582332</gco:CharacterString> </gmd:fileIdentifier></p>		
	5.2.2	<u>language*</u>		Language code and country code: <u>fra</u> : CAN or <u>eng</u> : CAN of the initial metadata language
	<p>HNAP Guideline: Each metadata record shall be provided in a bilingual format with both Official Languages provided. NAP registered code lists based on ISO 639.2 alpha-3 codes for language and ISO 3166-1 alpha-3 codes for countries shall be used to describe language.</p> <p>Example: <gmd:language> <gco:CharacterString>eng: CAN</gco:CharacterString> </gmd:language></p>			
	5.2.3	<u>characterSet*</u>		The character set for the metadata representation is restricted to "utf8," as used for ISO/TS 19139:2007 compliant XML encoding.



- Keywords

- HNAP elevates Keyword element to mandatory
- HNAP guidance indicates mandatory use of at least one term from the [GoC Core Subject Thesaurus](#)
- Thesaurus citation elevated to mandatory
- HNAP specifies encoding for keywords based on Library and Archives Canada best practices

Metadata class	Clause	Metadata item	Reference	Notes
Keywords (<i>MD_Keywords</i>)	5.3.6.1	keyword**		Applies to dataset not metadata.
	<p>HNAP Guideline: The <i>MD_Keywords</i> category of metadata elements shall be mandatory. At a minimum, one keyword must be supplied from the Government of Canada Core Subject Thesaurus. Only the preferred terms can be used. Do not create a hierarchical string of general to preferred terms.</p> <p>Library and Archives Canada best practices: Specificity: Choose the most specific term(s) available when describing the subject of a resource. As a general rule, do not index a resource with both broad and narrow terms (i.e., birds; migratory birds), unless a resource specifically addresses topics in this way. Exhaustivity: As far as possible, every essential concept dealt with in a resource should be represented with the appropriate term(s). This does not mean more is better. Remember the first rule: be specific. Consistency: Keep a consistent form to terms. In English, count nouns are generally in the plural form, while non-count nouns, as well as abstract concepts, are in the singular form. In French, most terms are in the singular form.</p> <p>(Source LAC: http://www.thesaurus.gc.ca/default.asp?lang=En&n=EF4A5555-1.)</p>			
	5.3.6.3	thesaurusName (C)**		
<p>HNAP Guideline: Where keywords come from a controlled source, the thesaurus name along with its creation date, publication date and organization name will be cited. Ensure latest publication date is referenced at time of metadata creation.</p> <p>(C)** thesaurusName is mandatory when using a controlled vocabulary, such as the Government of Canada Core Subject Thesaurus. If the keyword does not come from a thesaurus (i.e. a free text, user defined keyword), then only the keyword element is mandatory.</p> <p>NOTE: FGP Catalogue automatically supplies the latest version and latest publication date for the Government of Canada Core Subject Thesaurus.</p>				



- Responsible Party

- HNAP elevates Organization to mandatory; organizationName, not individual or position, is always cited
- HNAP guidance indicates Federal Identity Program list for federal department and agencies names and acronyms must be used

Metadata class	Clause	Metadata item	Reference	Notes
	5.16.2	organizationName**		
		HNAP Guideline: organizationName shall be mandatory. Federal department and agency titles will conform to Federal Identity Program policy and use the Applied Title for their department or agency as defined at http://www.tbs-sct.gc.ca/fip-pcim/reg-eng.asp . 5.16.2 organizationName will conform to the format: Government of Canada; AppliedTitle. Sub-organizations (sectors, branches, etc.) may be included at the option of the department. See Responsible Party example below.		





Rocher Percé, Quebec, Canada
48.5330 ° N -64.2160 ° W

Looking Forward

Leveraging what we have built



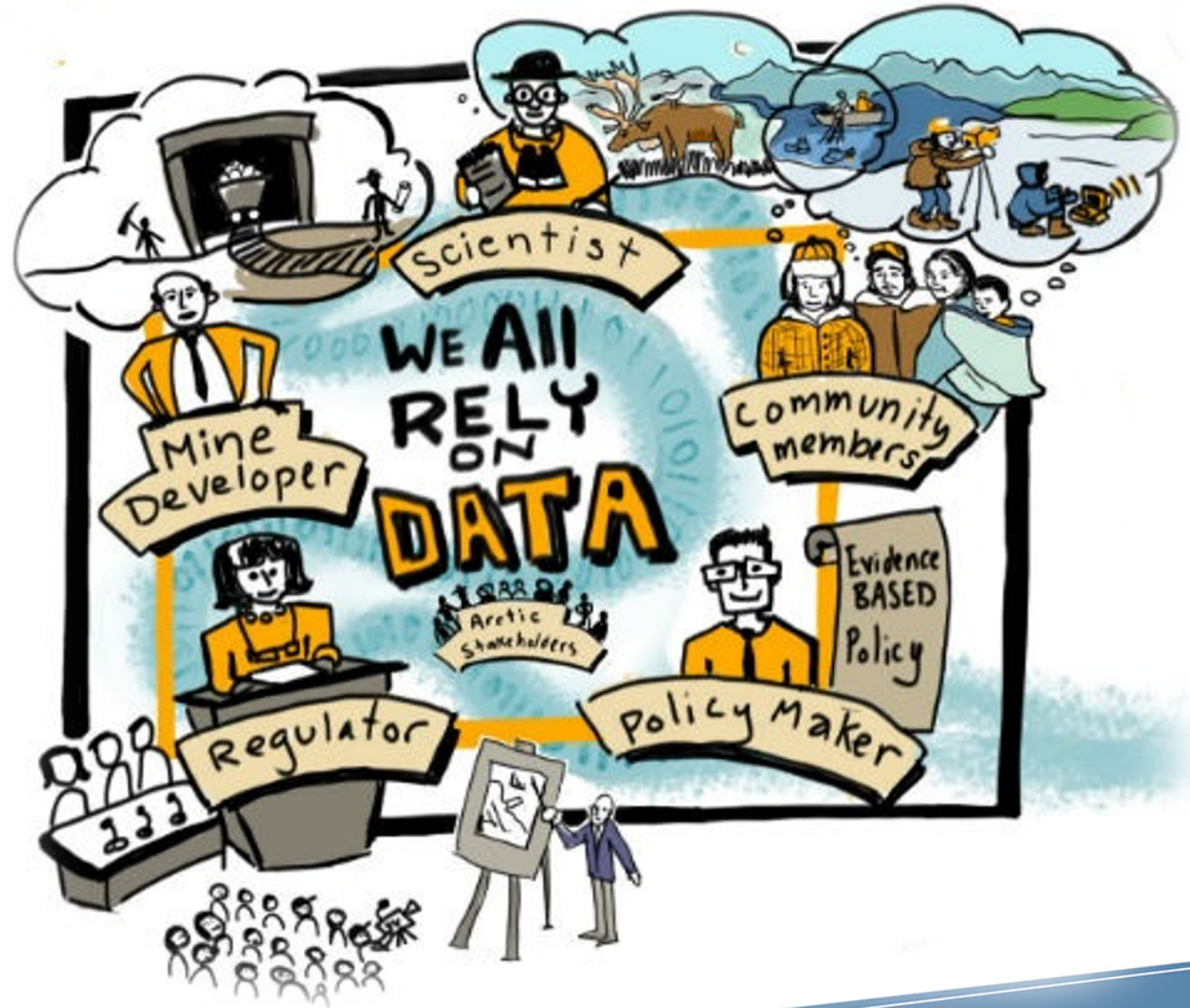
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Looking Forward...

- Cloud-based metadata lake
- Geospatial-first searching
- Flattening the schema
- Self-describing data





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