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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

Canada

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

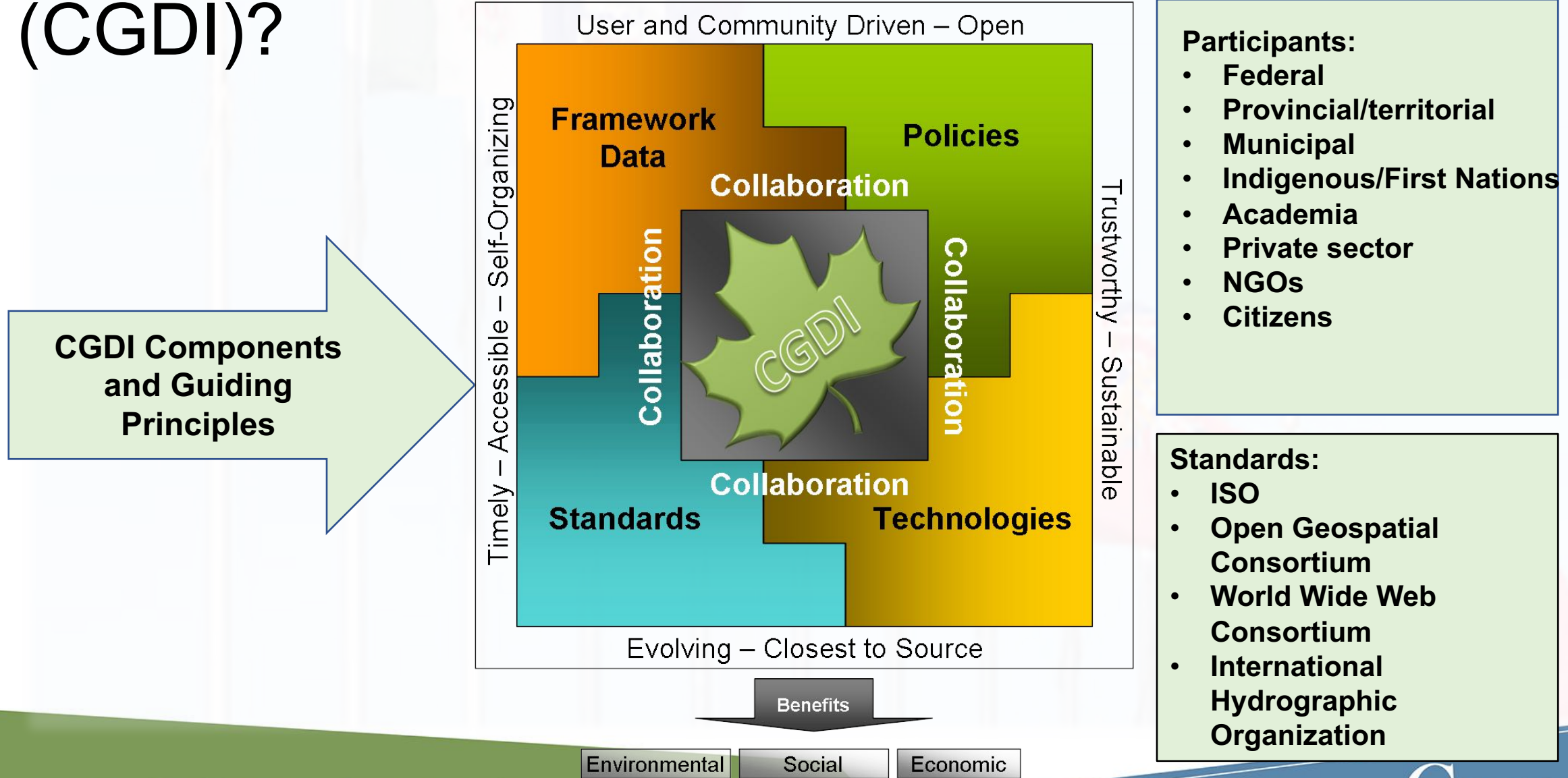


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What is the Canadian Geospatial Data Infrastructure (CGDI)?



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](#)

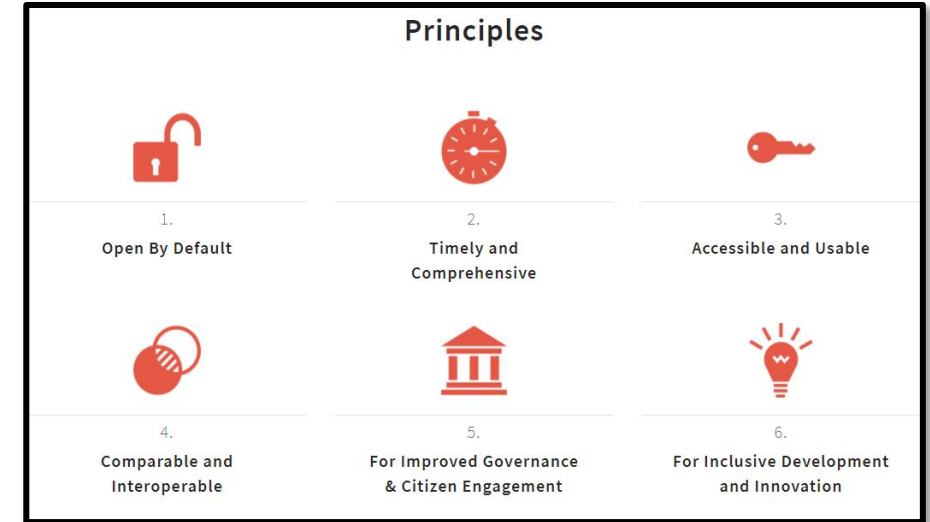
Canada charter member 2011

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



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

The collage displays four different views of the Federal Geospatial Platform (FGP) interface:

- Top Left:** The main FGP homepage. It features a search bar with the text "fire season", a sidebar with navigation links for "Federal and Provincial/Territorial Organization" (including Agriculture and Agri-Food Canada, Environment and Climate Change Canada, Fisheries and Oceans Canada, Government of Alberta, and Government of British Columbia) and "Viewable on a map?" (listing items not viewable on a map and items viewable on a map). The main content area shows a map of Canada with a "Fire season length across Canada" layer selected, displaying a color-coded map of fire season length.
- Top Right:** A detailed view of the "Oceans Act Marine Protected Areas" layer. It includes a description of Marine Protected Areas (MPAs) and a map showing the locations of these areas along the coast of Canada.
- Bottom Left:** A detailed view of the "Tribal Councils Location" layer. It includes a description of the Tribal Councils Location dataset and a map showing the locations of tribal councils across Canada.
- Bottom Right:** A detailed view of the "Air pollutant emissions - Total particulate matter emissions by facility, Canada" layer. It includes a description of the Canadian Environmental Sustainability Indicators (CESI) program and a map showing the locations of facilities emitting air pollutants across Canada.



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FGP's public face: Open Maps

9

The screenshot shows the FGP homepage with a search bar and navigation tabs. The search results are filtered by 'Department or agency' and 'Viewable on a map?'. The first result is '1- Qu'Appelle Valley Lakes system – Flight Line 2008'. The second result is '2- Redberry Lake Biosphere Reserve – 1 meter Full Feature Hillshade'. The third result is '3- Interpolated Census of Agriculture by Major drainage area'. The interface includes a sidebar with filters and a main content area with map thumbnails and descriptions.

Government Access

Open Government Portal

The screenshot shows the Open Government Portal interface with a search bar and navigation tabs. The search results are filtered by 'Organization' and 'Collection Type'. The first result is '1- Qu'Appelle Valley Lakes system – Flight Line 2008'. The second result is '2- Redberry Lake Biosphere Reserve – 1 meter Full Feature Hillshade'. The third result is '3- Interpolated Census of Agriculture by Major drainage area'. The interface includes a sidebar with filters and a main content area with map thumbnails and descriptions.

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 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



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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)

The screenshot shows the GCCollab website interface. At the top, there are logos for the Government of Canada and the Government of Canada in French, along with links for GCaccount, GCwiki, and GCmessage (Pilot). The main navigation bar includes Home, Communities, The Wire, Groups, Members, Career, and More. A search bar is located in the top right corner. Below the navigation bar, the breadcrumb trail reads: Home → Files → Interprovincial Data Pilot → Guide to Harmonized ISO 19115:2003 North American Profile Metadata for Government of Canada. The main content area features a header for the 'Interprovincial Data Pilot' group, with the owner listed as Steven Dunning and 5 group members. Below this, there are tabs for Activity, Discussion, Files, Blog, and More. A document titled 'Guide to Harmonized ISO 19115:2003 North American Profile Metadata for Government of Canada' is displayed, with a 'Download' button. The document is attributed to Cindy Mitchell and dated 19 March 2018 at 8:15pm. The document text states: '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.'



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A few examples...

- File Identifier

- NAP requires a unique file identifier for each metadata record
- H NAP guidelines indicate ISO/IEC 9834-8:2005 compliant UUID
- Identifier is key pivot for machine based interactions with metadata

- Language

- H NAP guidelines indicate bilingual (ENG/FRA) content for all free text fields
- H NAP 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>		
		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 <u>can be generated at https://www.uuidgenerator.net/version4</u>		
		Example: <gmd:fileIdentifier> <gco:CharacterString>c959fb7e-6bac-41dd-a881-582332</gco:CharacterString> </gmd:fileIdentifier>		
	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
		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.		
		Example: <gmd:language> <gco:CharacterString>eng: CAN</gco:CharacterString> </gmd:language>		
	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 (MD_Keywords)	5.3.6.1	keyword**		Applies to dataset not metadata.
		<p>HNAP Guideline: The MD_Keywords 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



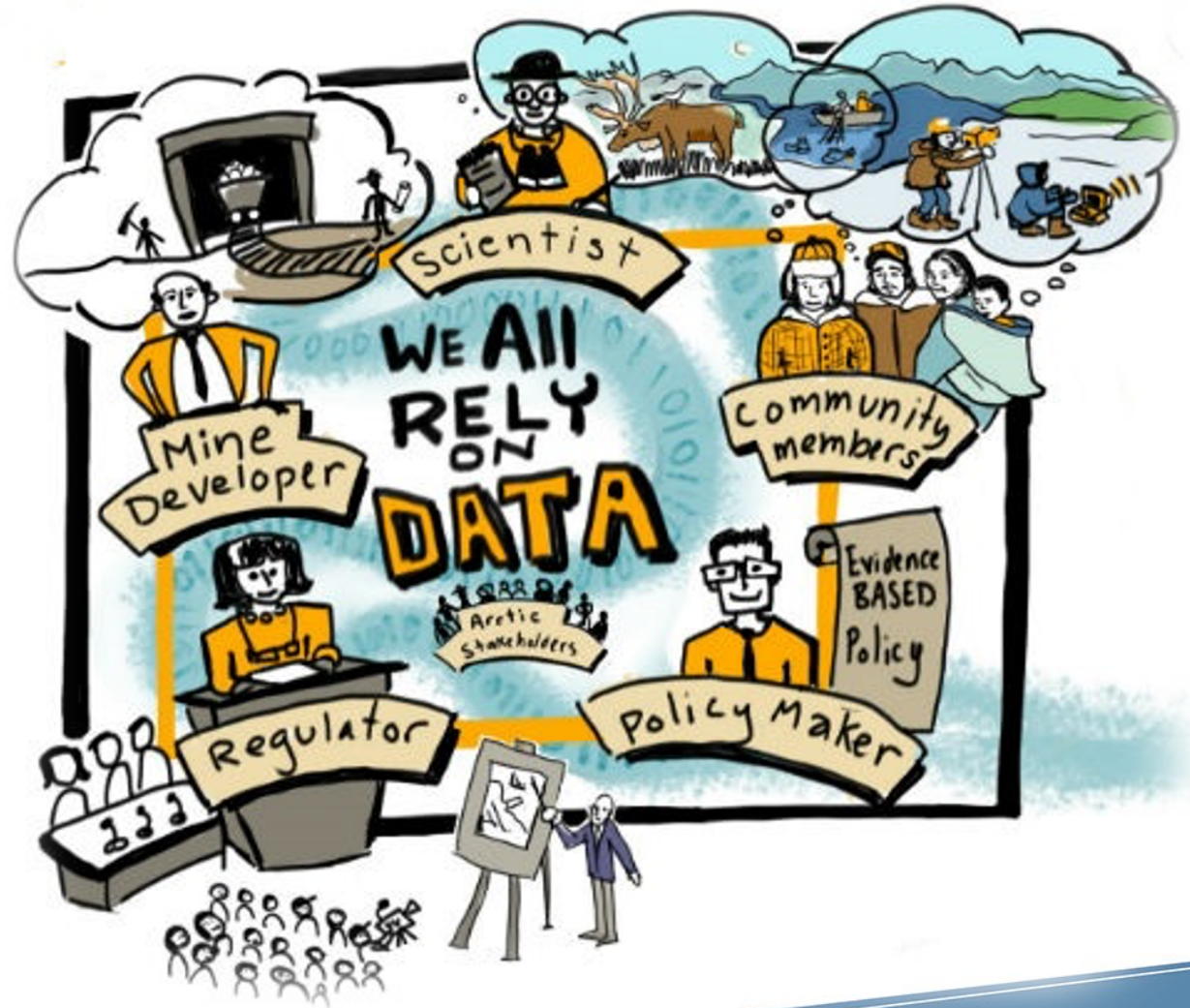
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Looking Forward...

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





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