6to CONVERSATORIO VIRTUAL
6th VIRTUAL WEBINAR

UN-GGIM:Americas
REGIONAL COMMITTEE OF UNITED NATIONS ON GLOBAL GEOSPATIAL INFORMATION MANAGEMENT FOR THE AMERICAS

UN·IGIF
INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK

CONVERSEMOS SOBRE EL MARCO INTEGRADO DE INFORMACIÓN GEOESPACIAL (UN-IGIF)
CONVERSATIONS ON THE INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK (UN-IGIF)

Lessons learned from Canada's UN-IGIF Implementation: **"Unlocking" Innovation Through a Collaborative Geospatial Strategy for Canada**

Natural Resources Canada
Ressources naturelles Canada

16 de septiembre de 2026
September 16, 2025

Online Transmission
Via Zoom

Vía Estratégica N°5: Innovación
Strategic Pathway No. 5: Innovation

Adapting the UN-IGIF for the Canadian Context

The United Nations Integrated Geospatial Information Framework and assessment process provides a structured approach to elaborate on Data Strategy elements focused on location data and their supporting environment.

Canada

Federal Data Strategy

Governance

Governance is effective and ensures that data is managed horizontally and holistically as a strategic asset.

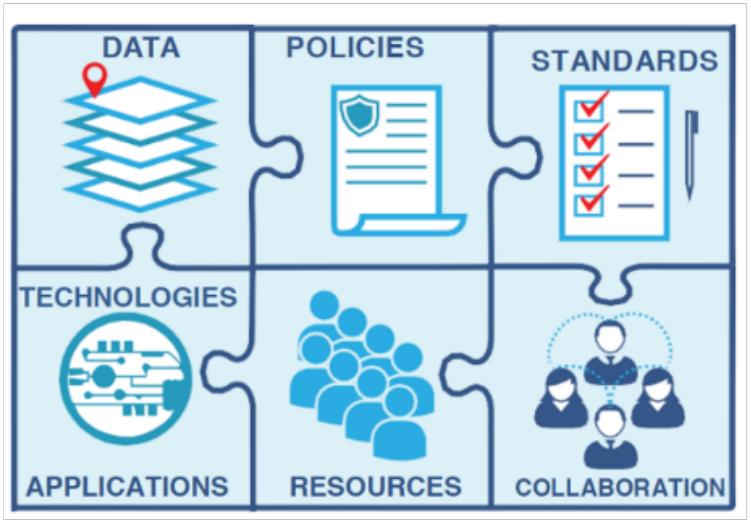
Processes and tools

Processes and digital infrastructure enable secure cross-governmental integration and the use of data for the benefit of Canadians.

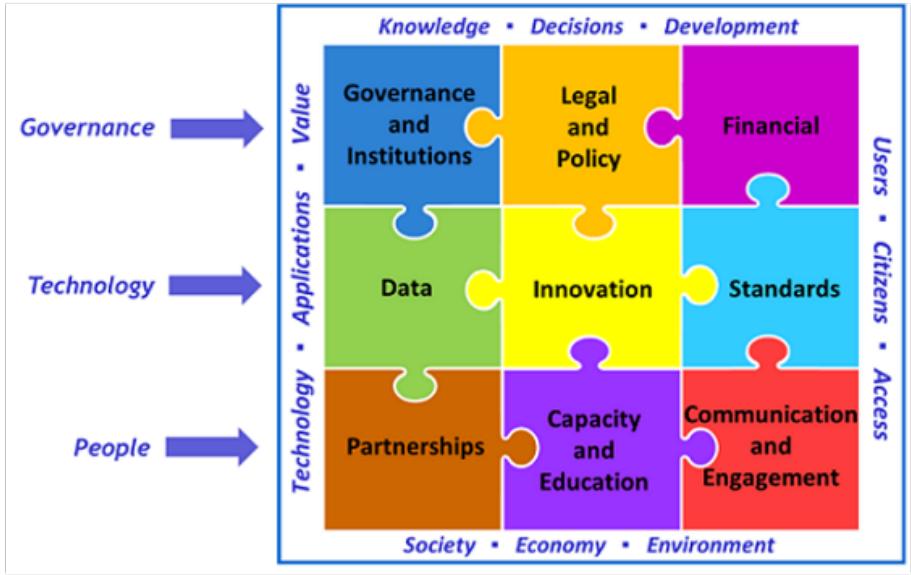
Talent

The government has the talent and capacity it needs to leverage data to inform its decisions.

Canadian Geospatial Data Infrastructure (CGDI)



United Nations Integrated Geospatial Information Framework (UN-IGIF)



Key Lessons from the Adaptation Process

Questions guiding UN-IGIF adaptation for Canadian context:

- Which concepts are not applicable or have limited applicability to the **Canadian context**, given Canada's **federated** governance and **distribution of authorities** across federal/provincial/ territorial governments?
- What **jurisdictional perspective** does the question seek? Does it make sense to explore the question from a national and/or **federal** level perspective or a **provincial/territorial** perspective?
- What types of adaptations to the diagnostic tool can help address **Canada's policy objectives**?
- Who are the targeted **stakeholders** and **partners** for each question?

Example: SP5-Innovation

Original question from World Bank IGIF tool

Does the government have an organization responsible for innovation? Is geospatial data and technology included in the government's innovation efforts?

Adapted Version included in CDGI Stock-take

*Does the **national** government have an organization responsible for innovation? Is geospatial data and technology included in the government's innovation efforts?*

What about other levels of government?

List and describe any known geospatial data and technology included in the innovation efforts at any level of government.



Question Number	Desk Study (3rd party consultant)	Interview (NRCan, FPT)	Inventory (NRCan, FPT)
1.1			
1.2			
1.3			
1.4			
1.5			
1.6			
1.7			
1.8			
1.9	n/a	n/a	n/a
1.10			
2.1			
2.2			
2.3			
2.4			
2.5			
2.6			
2.7			
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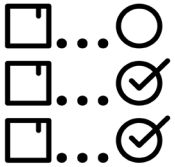
Implementing a collaborative UN-IGIF stock-take in Canada

UN-IGIF Stock take of the Canadian Geospatial Data Infrastructure (CGDI)



Interviews

- Government partners familiar with CGDI
- 7 participants from 6 provinces/territories
- 24 federal participants representing 10 departments



Inventory/Survey

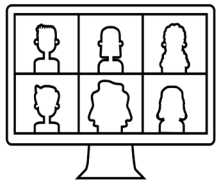
- Government partners familiar with CGDI
- 37 inventories representing 5 provinces/ territories and 6 federal departments



Desk Study

- Research-based third-party assessment
- Literature and Internet search
- Environmental scan, including global approaches

Engagement on CGDI future state



Virtual Round Tables (completed)

- Targeted non-government partners and stakeholders
- 8 round tables with 116 participants
- 40% private sector; 21% academia; 21% federal government; 9% provincial/ territorial government; 4% local government; 5% varia



Online Engagement Platform (closed)

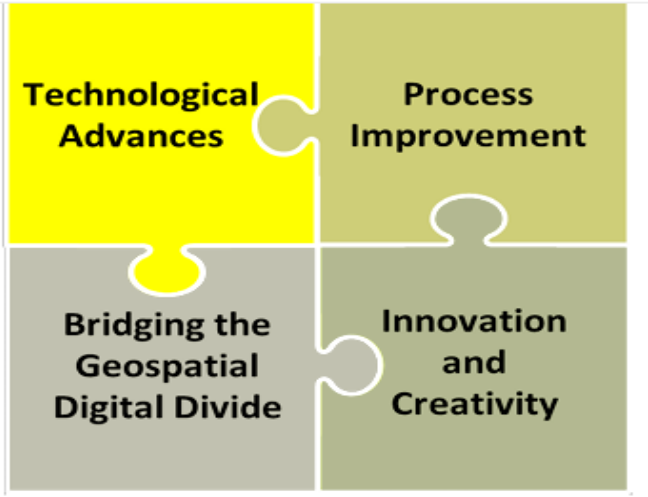
- 700 visits, 32 engagements on tools:
  - Complete a Questionnaire
  - Share your Story
  - Discussion Forum

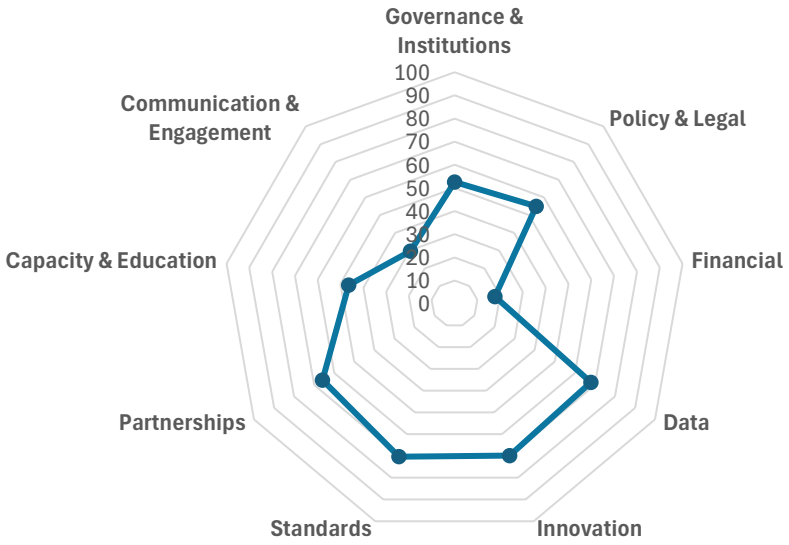
Scoping & Socializing → Stocktaking → Visioning & Gap Analysis → Validating and Finalizing

Trends in Innovation Across the Canadian Geospatial Data

SP5: Innovation

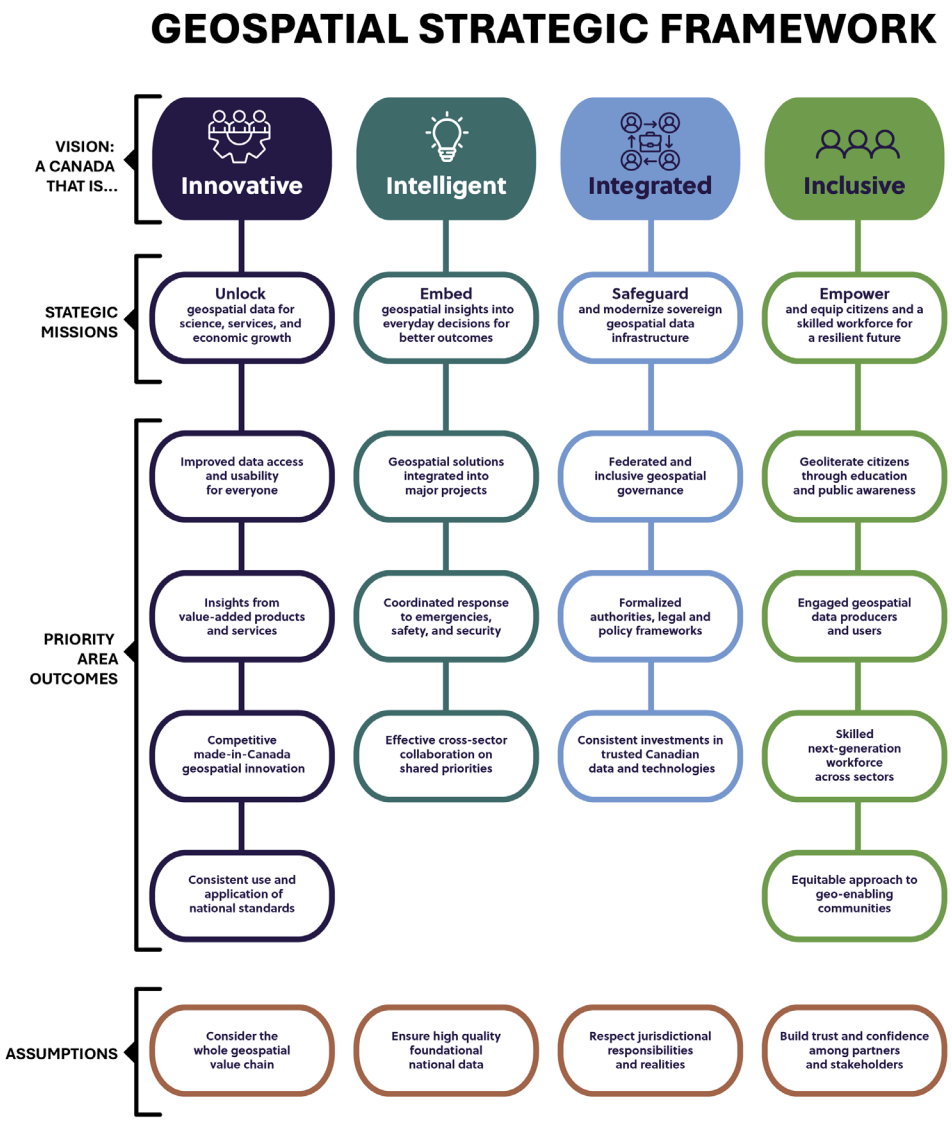
IGIF Score = 70





- Innovation is an area of **strength** for the Canadian geospatial sector, driven by **public-private partnerships** and **academic collaborations** promoting the adoption of new technologies.
- The majority of provincial/territorial and federal agencies have a **geoportal** supporting the sharing, viewing, accessing and use of geospatial data.
- Investment areas include **machine learning** and **artificial intelligence**, cloud-based data services, data visualization tools, automated data extraction, and advanced quantitative risk assessment.
- Findings suggest that introducing a **comprehensive national strategy** could help to promote geospatial innovation and reduce bureaucratic hurdles to promote the continued adoption of emerging technologies.

"Unlocking" Innovation through A Collaborative Geospatial Strategy for Canada



- The Collaborative Geospatial Strategy envisions a Canada that is:
- **Innovative** in developing and applying emerging geospatial technologies, creative partnerships, and new ways of working to unlock the full potential of geospatial data to drive economic growth, environmental stewardship, and social benefits
- **Intelligent** in embedding insights from high-quality, trusted geospatial data into decision-making, policy guidance, investment considerations, and risk management across all sectors, enabled by a geo-literate workforce and public
- **Integrated** in our efficient and collaborative response to shared challenges through sovereign infrastructure and geospatial solutions that connect data, governance, and tools seamlessly across jurisdictions, sectors, and borders
- **Inclusive** in better serving and empowering all data users, including Indigenous and under-represented communities, by embedding diverse perspectives and knowledge systems into Canada's geospatial governance and services.



GeoAI Data Series: Victoria, BC 2023



GeoAI Data Series: Quebec City 2002 / 2022 urban change detection. Produced by the Canada Centre for Mapping and Earth Observation, Natural Resources Canada, ©2025.





GeoAI for extracting foundational layers: North Vancouver, Automatically segmented buildings, 1967 and 2019. Produced by Canada Centre for Mapping and Earth Observation, Copyright (c) His Majesty the King in Right of Canada, as represented by the Minister of Natural Resources, 2025

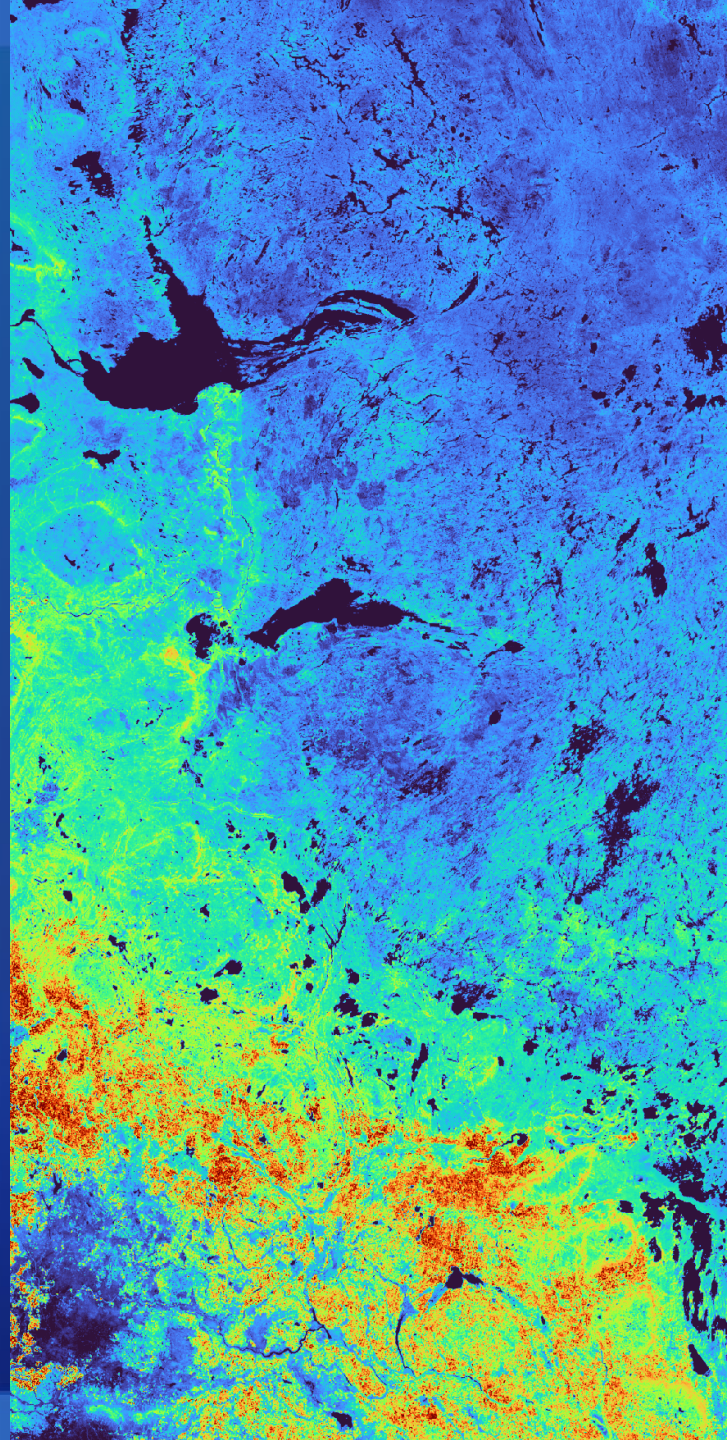
"Unlocking" Innovation through A Collaborative Geospatial Strategy for Canada

Borrowing the UN-IGIF Framework adapted to the Canadian context, the Collaborative Geospatial Strategy for Canada aims to:

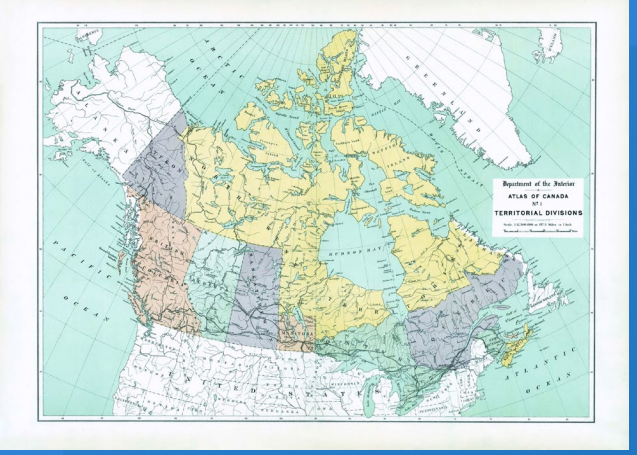
- Create conditions across the nine strategic pathways, for Canada's Spatial Data Infrastructure to deliver more efficient government, economic growth, and citizen benefits, and to address critical – and changing – priorities with:
  - Clearly defined and recognized geospatial authorities within a whole-of-government and intergovernmental approach
  - Strengthened national and provincial geospatial assets and geo-enabled workforce
  - Improved accountabilities, efficiencies, and management of geospatial data
  - Effective deployment of new technologies to support decision- and policy-making aligned with and responsive to user needs, with actionable insights
  - Defined, coordinated, and scalable actions the federal-provincial-territorial governments need to take, in collaboration with external partners, to maintain and advance SDI development
- Ultimately, reinforce federal-provincial/territorial government vision and missions in support of better outcomes through geospatial data



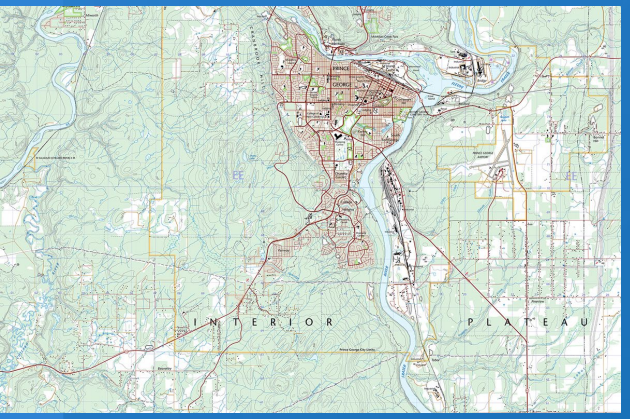
Unlocking Innovation: GeoAI at the Canada Centre for Mapping and Earth Observation



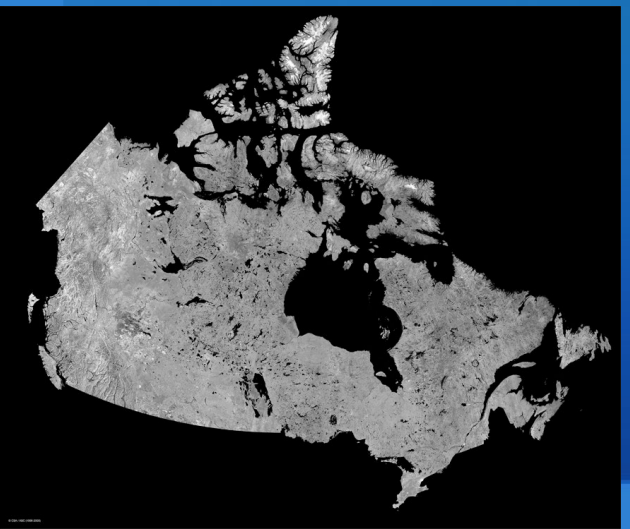
100+ Years of Data and Expertise: The Backbone of Geospatial AI



The Atlas of Canada



National Topographic System

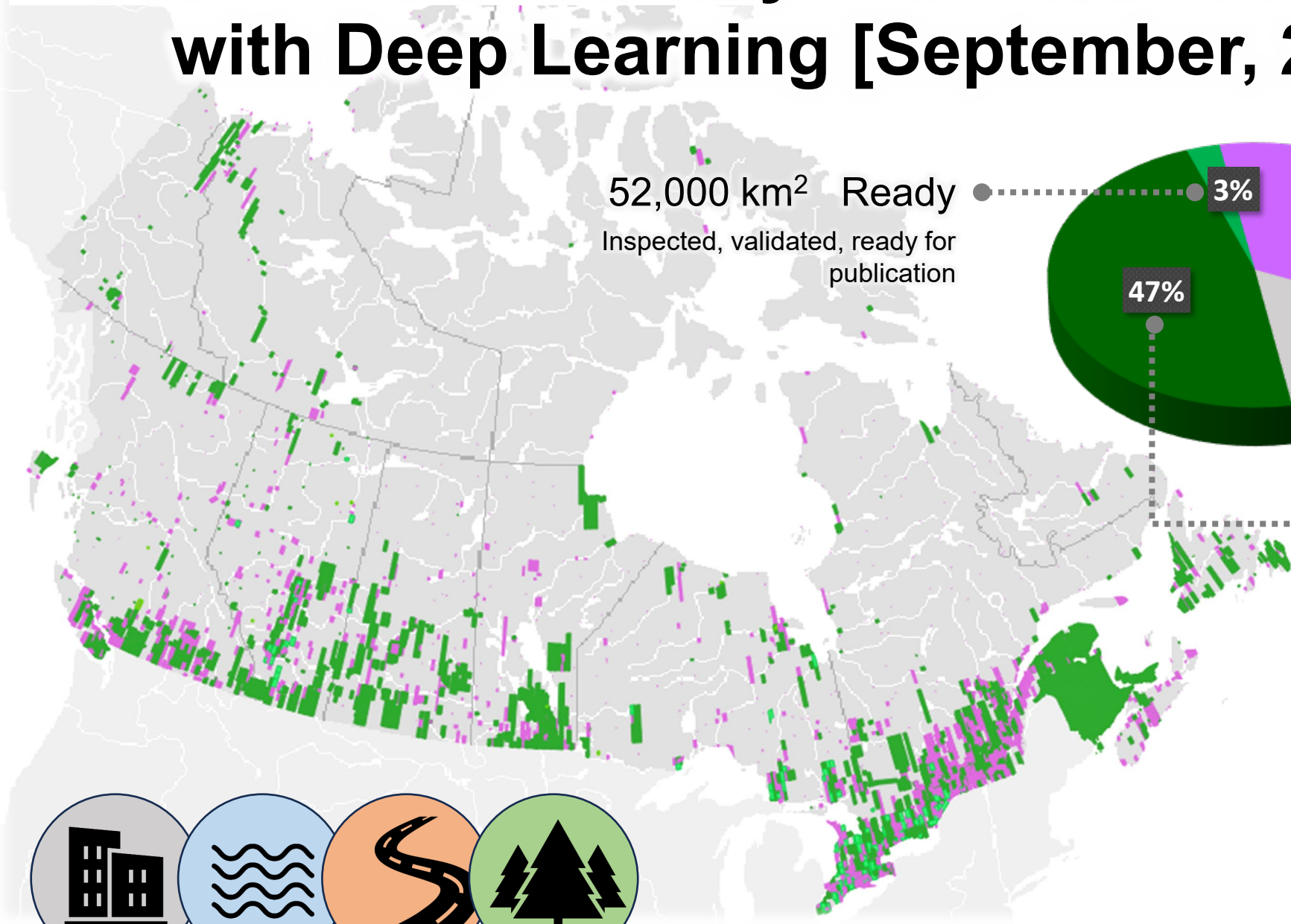


Earth Observation

CCMEO's unparalleled geospatial resources empower AI capabilities:

- 100+ years of national mapping
- 3 satellite receiving stations
- Canada's largest remote sensing archive
- 6M historical air photos 1928-2012
- High-resolution and high-frequency satellite imagery subscriptions accessible to the GC
- High-performance computing, massive data management infrastructure and services
- Accord with Canadian Provinces and Territories
- Ongoing commitment to Open Government
- Most critically, the **dedicated contribution of our people**: 150 scientists and experts in Earth observation, photogrammetry, engineering, data science, and AI

GeoAI: Automatically Extracted Features with Deep Learning [September, 2026]



659,000 km² Backlog

Extracted, awaiting inspection

52,000 km² Ready

Inspected, validated, ready for publication

~300,000 km² Planned

Planned acquisitions for 2026-27

904,000 km² Published

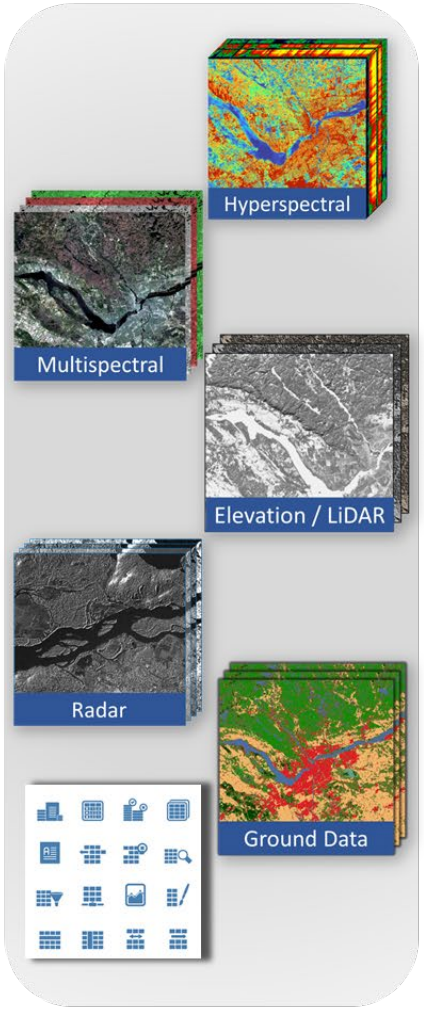
GeoAI – GeoBase Series

geo.ca

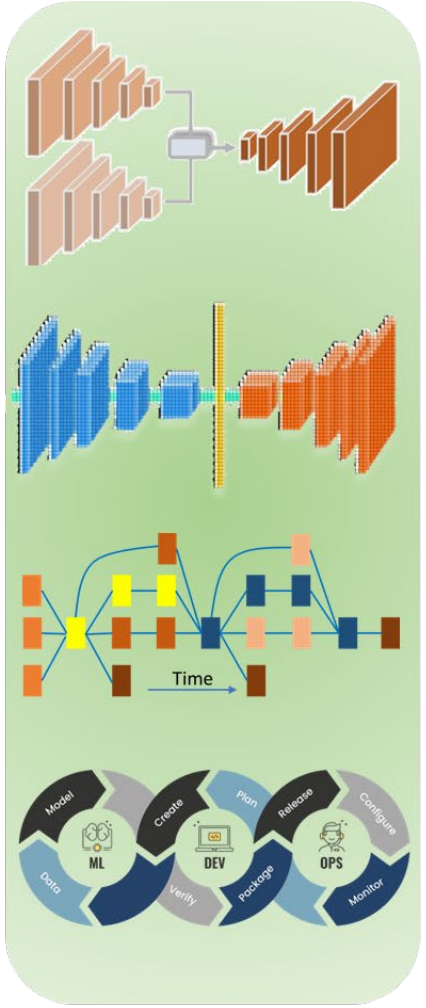
Geo-AI and EO-AI across the organization



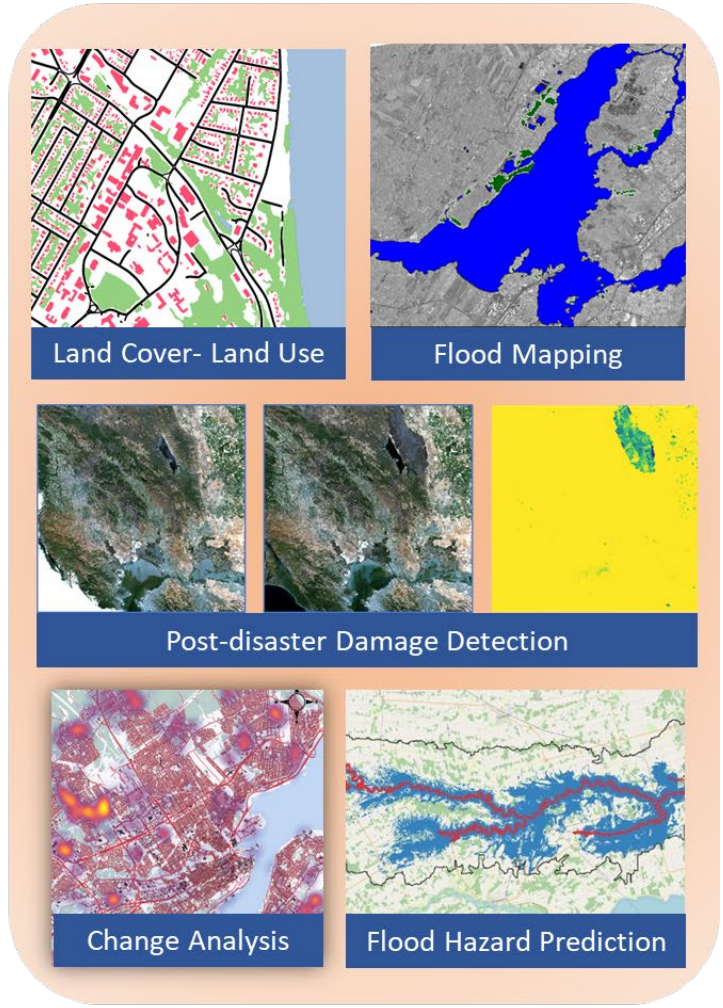
Observation Platforms



Multimodal - Multitemporal Data



Artificial Intelligence & Big Data Analytics



Mapping & Earth Observation Applications

The Canada Centre for Mapping and Earth Observation's GeoAI Journey

2017-2019
AI Pilot projects; Advocacy;

2019
GeoAI Framework and IT Infrastructure;

2020 -
Training Datasets (Ongoing)

2021-2022
Model & ML operations system development;

2023
Launch of GeoAI Series;

2024 -
Improvements & refinements;
New models

2024-
Partnerships
Using GeoAI for Priorities

Technical Foundation

- **Data:** Models trained from authoritative data
- **Metadata and Interoperability:** Find silo-ed data, ensure reuse
- **Infrastructure:** Big, intensive, consequential



Change Management

- Paradigm changes in both development and use

Use Case: Urban Sprawl



Use Case: Processing Historical Air Photos - Aligning Past and Present



Use Case: Digital twins to support flood risk mapping

Floods are Canada’s most frequent and costly disaster, causing over $2 billion in damages annually. Through partnerships with provinces and territories, FHIMP is updating high-quality flood maps to support emergency planning, land-use decisions, and climate adaptation.

- Variable water levels in real time (simulated, gauges or derived from EO)
- "What if" scenarios for municipalities and infrastructure managers
- Street-level flooding and first-floor height estimation



Reflections on GeoAI Innovation at CCMEO

GeoAI is data science

Mapping organizations have wealth of data and expertise prerequisite for training models

Authoritative data and human resources can be repurposed and adapted

Infrastructure

Capacity to transfer data to the right place and transfer processes to the data

Developing Geo AI Foundation Models

Foundation models provide opportunity to reduce infrastructure requirements for downstream applications.

Specializing / refining a foundation model is less computationally intensive.

Opportunity to pool resources nationally, regionally or partner internationally.

[Planaura Canadian geospatial foundation models]

More about GeoAI

- UN-GGIM: Americas GeoAI CoP modules available on YouTube in English and with Spanish Interpretation.
- Learning resources available on GitHub
  - Module #1: Introduction to ML/DL Theory
  - Module #2: Practical Training on Applications of ML/DL on Numerical, Non-Image Data
  - Module #3: Practical Training on Applications of GeoAI to High-Resolution Optical Imagery

https://www.youtube.com/@unggimamericas

https://github.com/geoaiclassroom/geoai_learning/

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