The Canadian Geospatial Data Infrastructure

Building on Success

Ressources naturelles Canada
Natural Resources Canada

Canada

Agenda

- Introduction to GeoConnections
- Introduction to the Canadian Geospatial Data Infrastructure
- Geospatial Standards and CGDI
- Emerging Trends in Geospatial Data
- CGDI Example Projects
- Get Involved: The Canadian Geospatial Community Round Table
- Questions

Introduction to GeoConnections

GeoConnections Program

The GeoConnections program is a national initiative, led by Natural Resources Canada, designed to facilitate access to and use of authoritative geospatial information in Canada. GeoConnections supports the integration and use of the Canadian Geospatial Data Infrastructure (CGDI).

Key Program Activities:

Geospatial Strategy and Leadership – continued coordination of geomatics activities in Canada, requiring the development and implementation of long-term national geomatics strategies and policies, in partnership with CGDI stakeholders.

Canadian Geospatial Data Infrastructure – work with the geomatics community to advance the operational policies and standards needed to complete the CGDI and support the use of geospatial information.

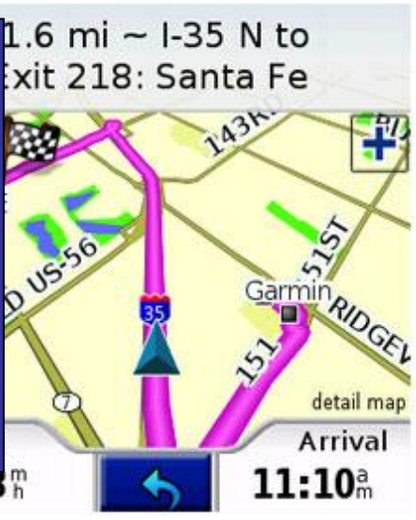
GeoConnections: A History

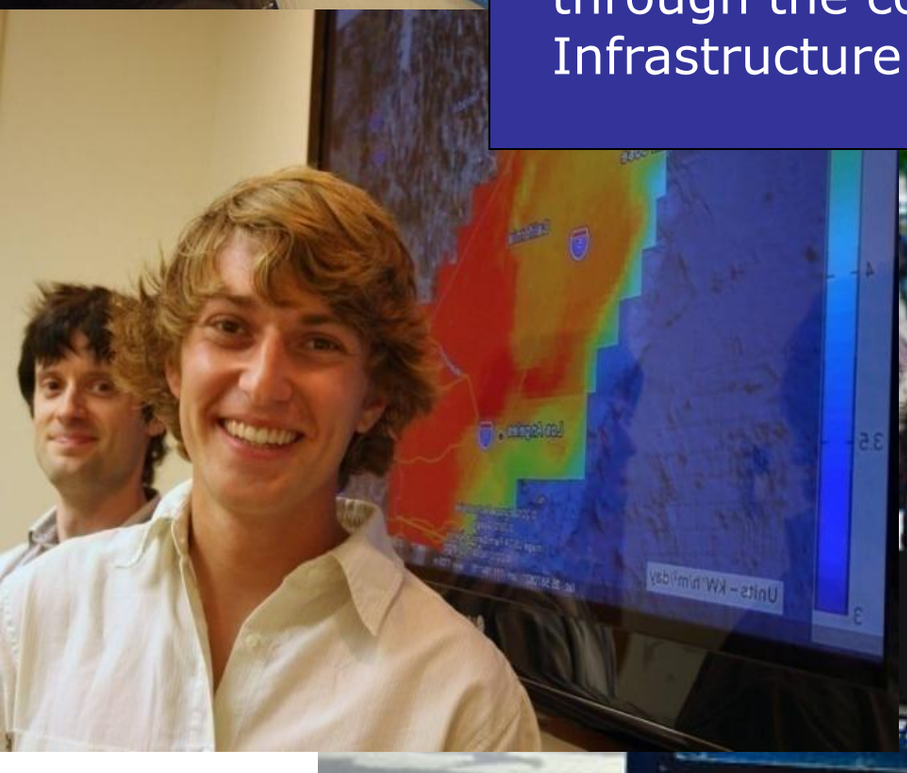
1999-2004	2005-2009	2010-2015
Establish and build the CGDI	Evolve and expand the CGDI for end-users	Strategic and operational policy, standards, outreach, and CGDI integration
The supply side	**The demand side**	**Tying it all together**

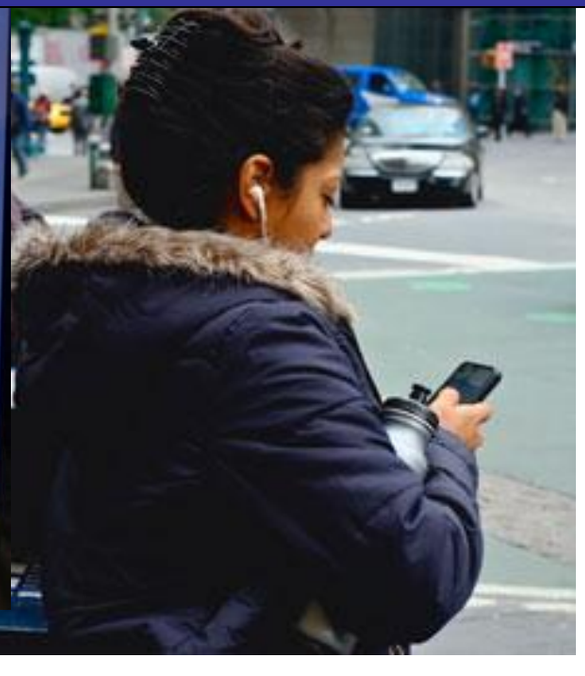
GeoConnections III: In a word,
“INTEROPERABILITY”

Our Vision For CGDI

Canadians have open, secure and continually available access to comprehensive location-based information about Canada through the community-sustained Canadian Geospatial Data Infrastructure in support of prosperity and well-being for all.







GeoConnections Objectives

- Create increased awareness of the benefits of using geospatial data and tools to achieve goals for social, economic and environmental priorities.

- Facilitate the integration and use of geospatial data to support effective decision making.

- Coordinate the development of national policies, standards and mechanisms and support their implementation to ensure maintenance and updating of geospatial data and compatibility with global standards.

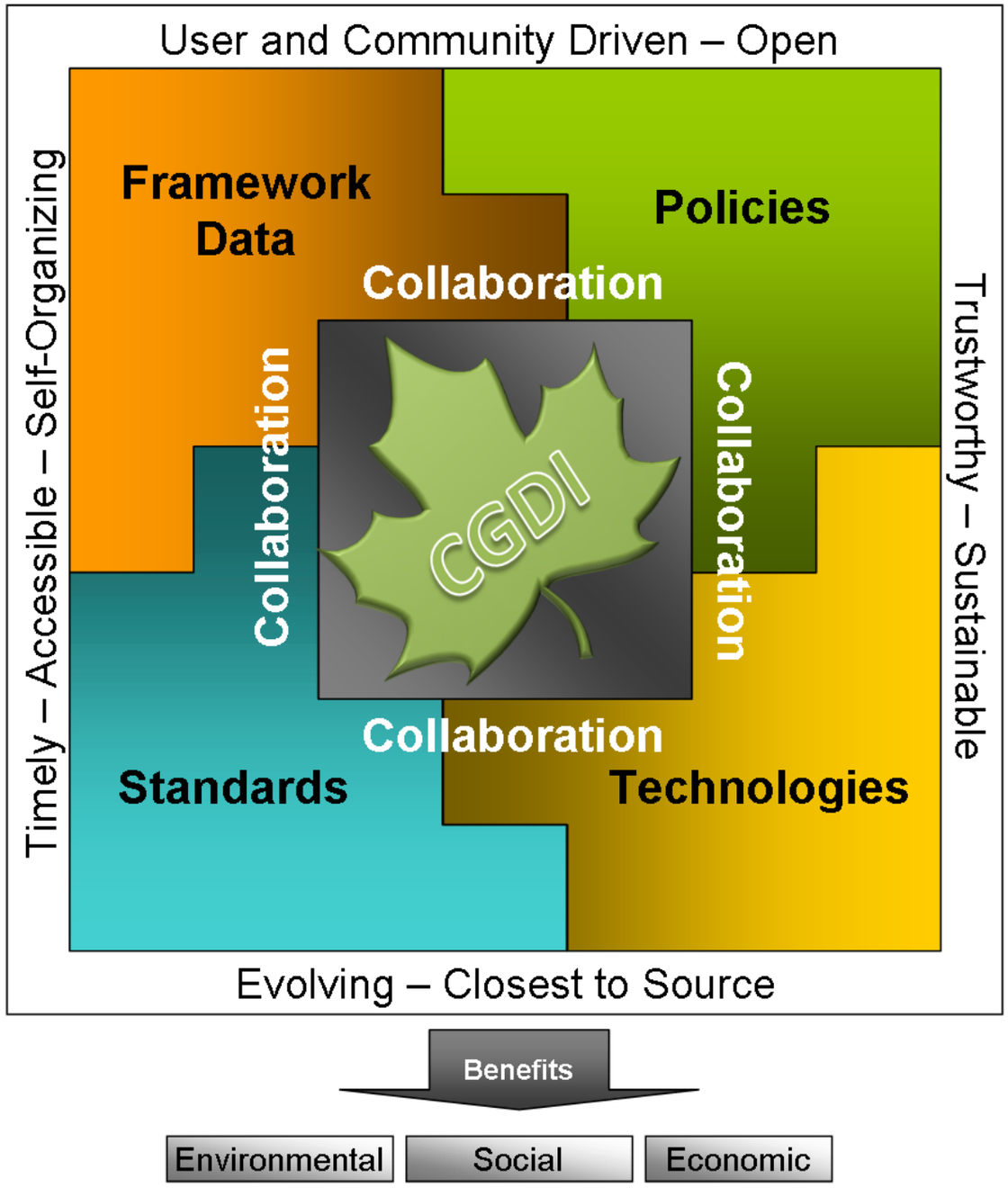
- Keep Canada at the leading edge of accessing, sharing and using geospatial information via the Internet.

The Canadian Geospatial Data Infrastructure (CGDI)

What is the CGDI?

- The CGDI is an **online network of resources** that improves the sharing, use and integration of information tied to geographic locations in Canada.
- In essence, via **collaboration,** the CGDI is the convergence of **policies, standards, technologies, and framework data** necessary to harmonize all of Canada's location-based information.
- Through the CGDI, **Canadians** can discover, access, visualize, integrate, apply and share quality location-based information. The CGDI allows citizens to **gain new perspectives** into social, economic, and environmental issues and make effective decisions.

CGDI Components and Guiding Principles



CGDI – Overview; CGDI Vision, Mission and Roadmap:
http://geoconnections.nrcan.gc.ca/18

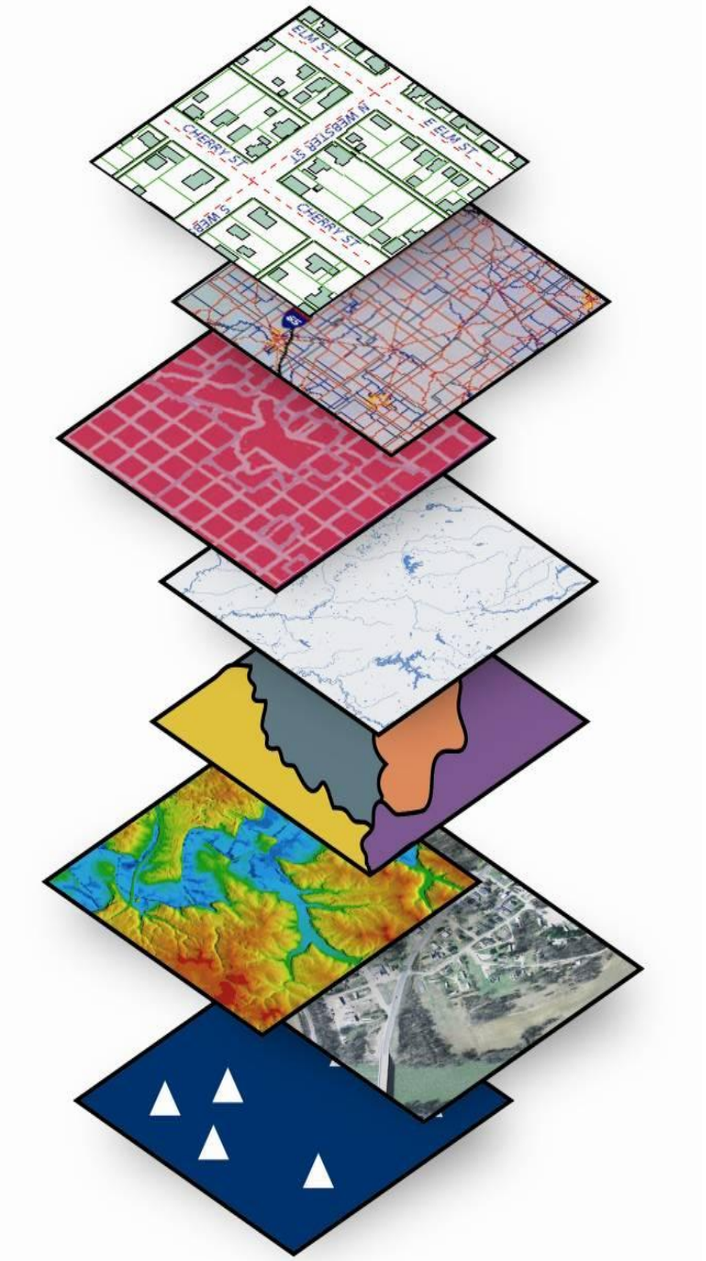
What is Framework Data?

- The core data of the CGDI, framework data is the common, up-to-date, and maintained base of quality location-based data for all of Canada.

- Framework data provides context and reference to physical features and other types of information linked to geography. These datasets are the base mapping layers required to develop applications and are freely available for reuse.

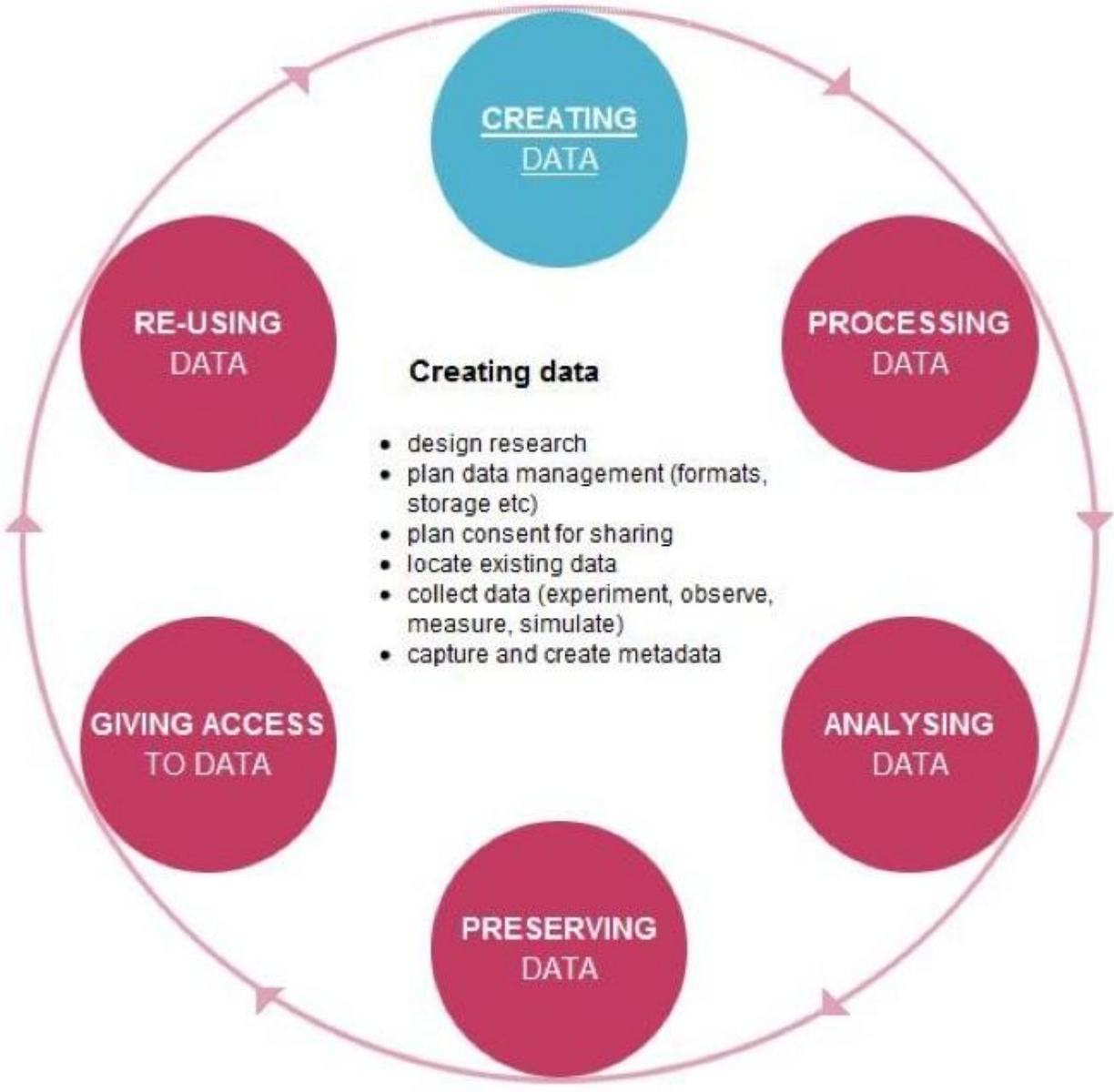
- Framework data is the foundation upon which location-based information becomes spatially relevant to users.

- Through the GeoBase portal (www.GeoBase.ca). Users have access to this quality framework data at no cost, without restrictions, under a common licence agreement.



What are Operational Policies?

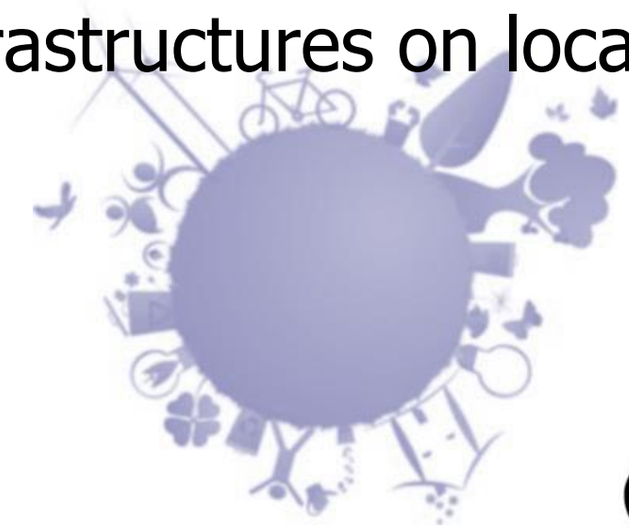
- Address topics related to the lifecycle of data (i.e. collection, management, dissemination, use).
- Apply to the day-to-day business of organizations.
- Include guidelines, directives, procedures and manuals that help facilitate access to and use of information.
- Are distinct from Strategic Policies, which address high level strategic issues and set high level directions for organizations.



What are Geospatial Standards?

Community-defined it as: documented norms that establish uniform criteria, methods, processes, and practices that are directly, or indirectly, associated with a location relative to the Earth.

- **Support** the understanding and usage of geographic information.
- **Increase** the availability, access, integration, and sharing of geographic information… and enable interoperability between geographic information systems.
- **Ease** the establishment of geospatial infrastructures on local, regional and global level.
- **Contribute** to sustainable development.



And the Technologies?

- Today's innovative geospatial and IT tools and technologies (GPS, mobile technology, imagery, sensor webs, unmanned aerial vehicles (UAV's) provide an environment in which systems and applications integrating location-based information are used by millions.

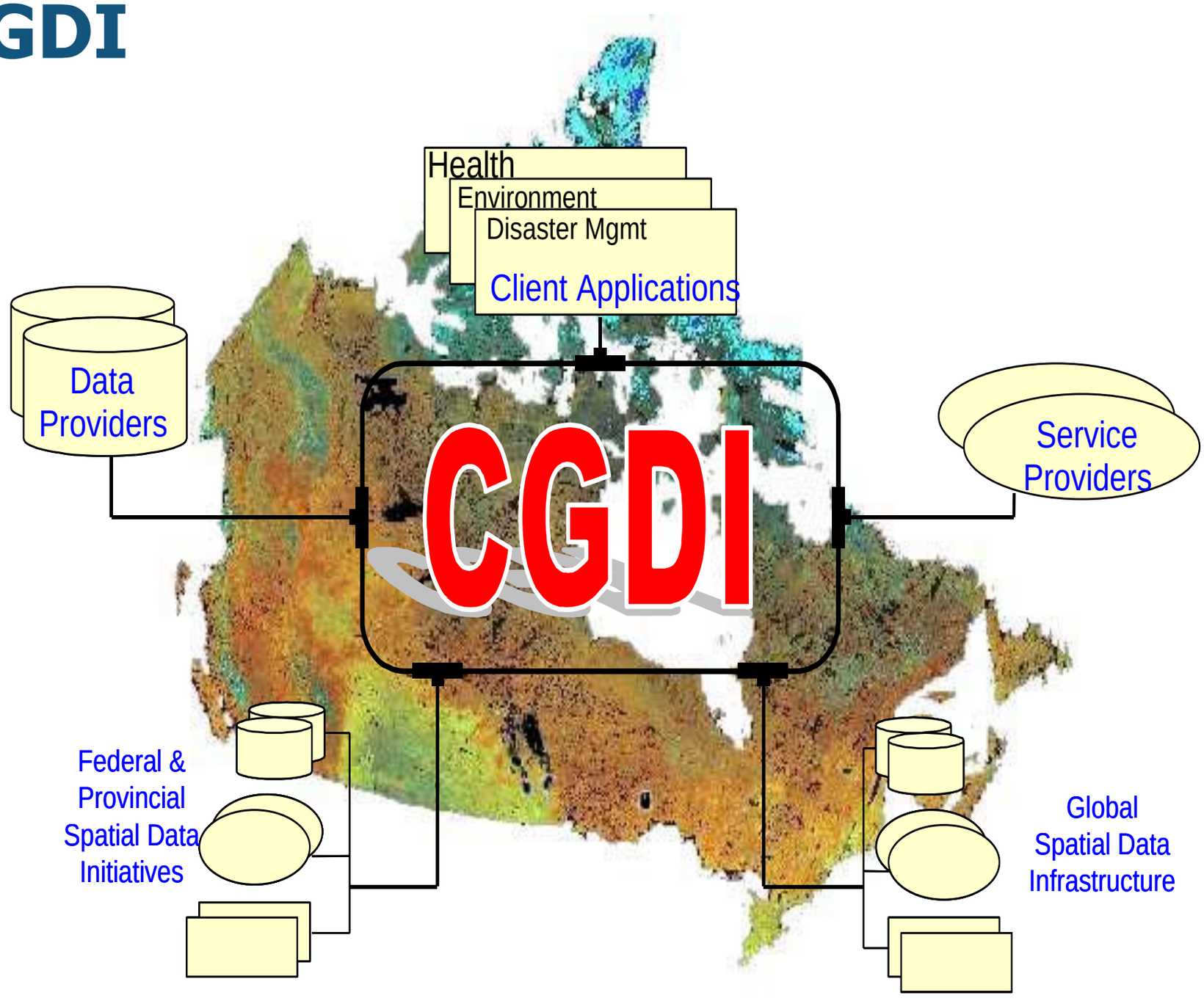
- The CGDI's open and flexible architecture continually adapts to the rapidly evolving internet platform.

Collaboration and Interoperability

Collaboration, partnerships and a common way forward between federal, provincial, territorial and regional governments; the private sector; and academia ensure interoperability for the CGDI.

Interoperability is achieved by the convergence of framework data, policies, standards and technologies necessary to harmonize Canada's location-based information.

The CGDI



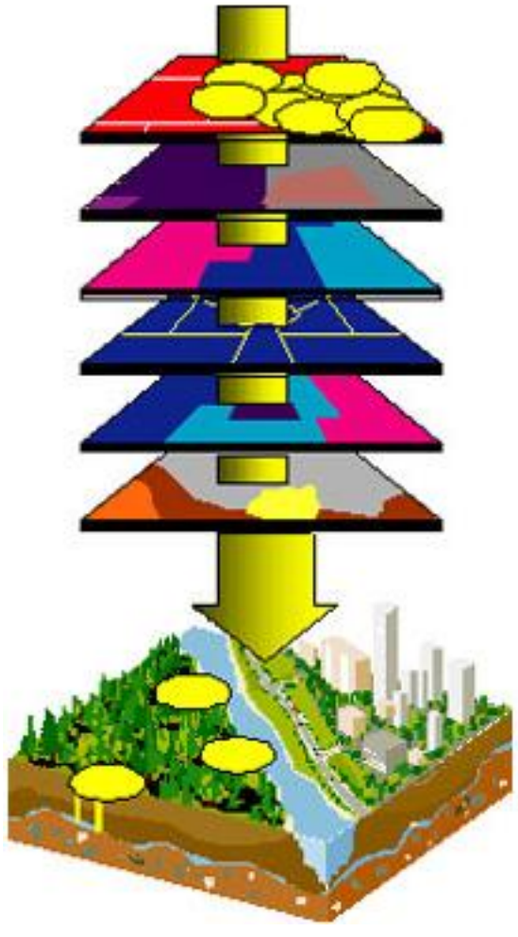
… a distributed system of systems.

SDI Example: DataBC

The Province has created a Spatial Data Infrastructure to:

- Be the central source for authoritative geographic data discovery, data access, data download and location services;
- Present integrated views of information from reliable sources to improve decision making;
- Support cost effective electronic service delivery and improved data sharing; and
- Foster development of location based services to support social and economic development.

http://www.data.gov.bc.ca/dbc/about/index.page



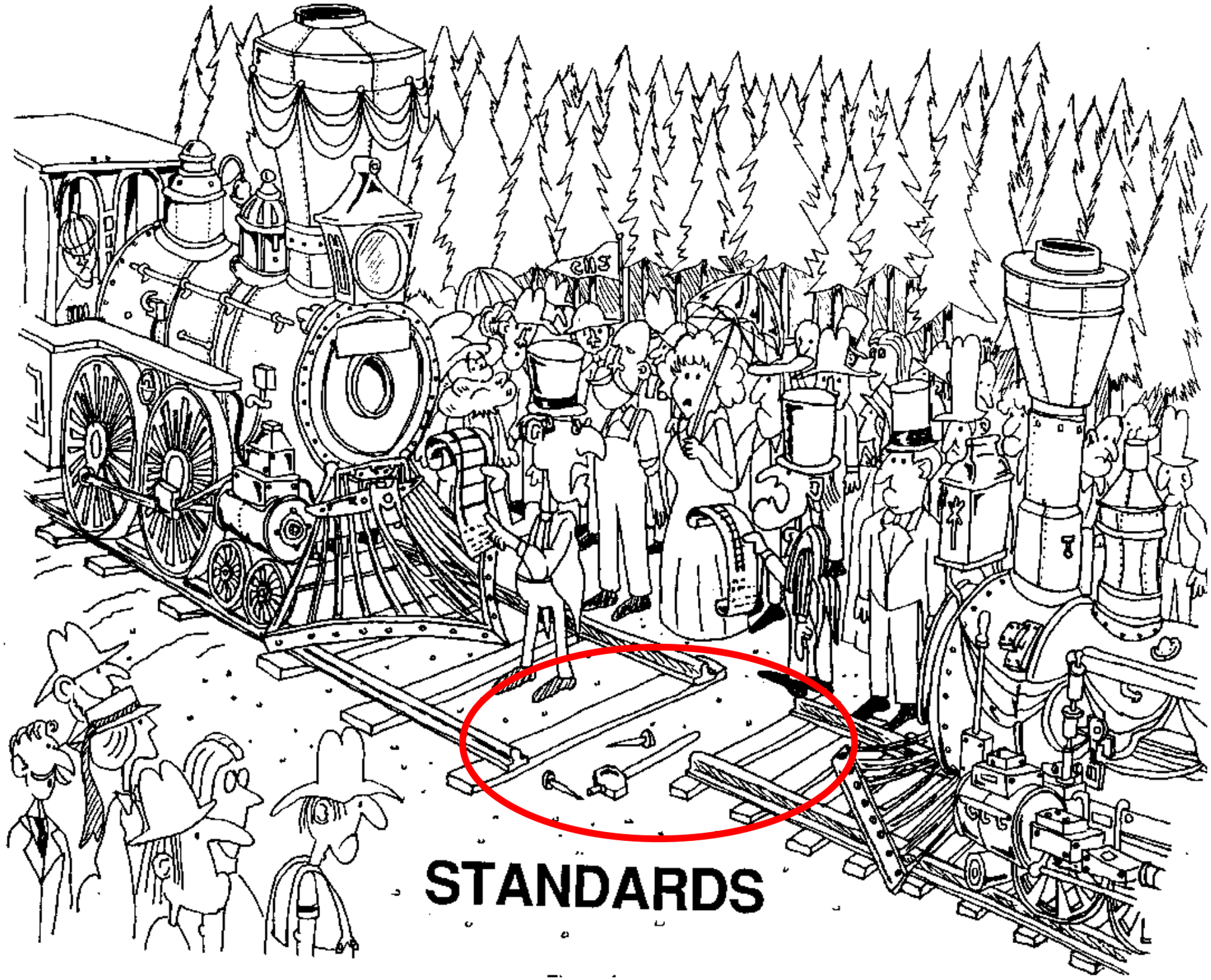
SDI Example: Arctic Spatial Data Infrastructure

Global	**Application Frameworks**	Oskari, ArcGIS Online, GeoPortals, Thematic Portals , OSM
	Infrastructures	GSDI, INSPIRE/ELF, NSDI, CGDI, FGP
	Operational Policies	Intellectual Property, Private Information, Data Sharing, VGI, Cloud Computing, Open Source, Licencing, Archiving
	Standard Bodies	ISO, OGC
	Technology Frameworks	Operations, Success Metrics, GeoPortal Cloud, Architecture
National	**National Base Map Data**	Russia, Finland, Sweden, Norway, Kingdom of Denmark, Iceland, Canada, USA
Local Data Sources	**State/ Province/ Canton/ Territory**	Examples Include: Real Time Feeds, Vector, Hydrographic Data Series, Raster Sensor Data (satellite imagery), research documentation
	Municipality	
	Private Sector	
	Open Street Map	

SDI Components Summary

	Application Framework	Standard Bodies	Data	Technology	Geospatial Policies
International Arctic SDI	OSKARI Cloud GeoPortal	INSPIRE OGC Open Geospatial Consortium, Inc. ISO	Imagery, sensors, data models, reference data, hydrographic, etc.	Operations, Success Metrics, Cloud, Architecture	Privacy, Intellectual Property, Copyright, Licensing, Data Sharing, etc
National CGDI Canada	GeoPortals GeoBase GeoGratis | GéoGratis	OGC Open Geospatial Consortium, Inc. ISO	Imagery, sensors, data models, reference data, hydrographic, etc.	Architecture, operations	Open Data, Volunteered Geographic Information (VGI), Big Data, etc
Regional Provincial and Territory SDI's	Regional GeoPortals: GeoBC Alberta Government GeoDiscover Alberta	ISO	Imagery, sensors, data models, reference data, hydrographic, etc.	Architecture, operations	Privacy, Intellectual Property, Copyright, Licensing, Open Data, etc

Geospatial standards and the role they play in a spatial data infrastructure


STANDARDS

Why are Standards Important?

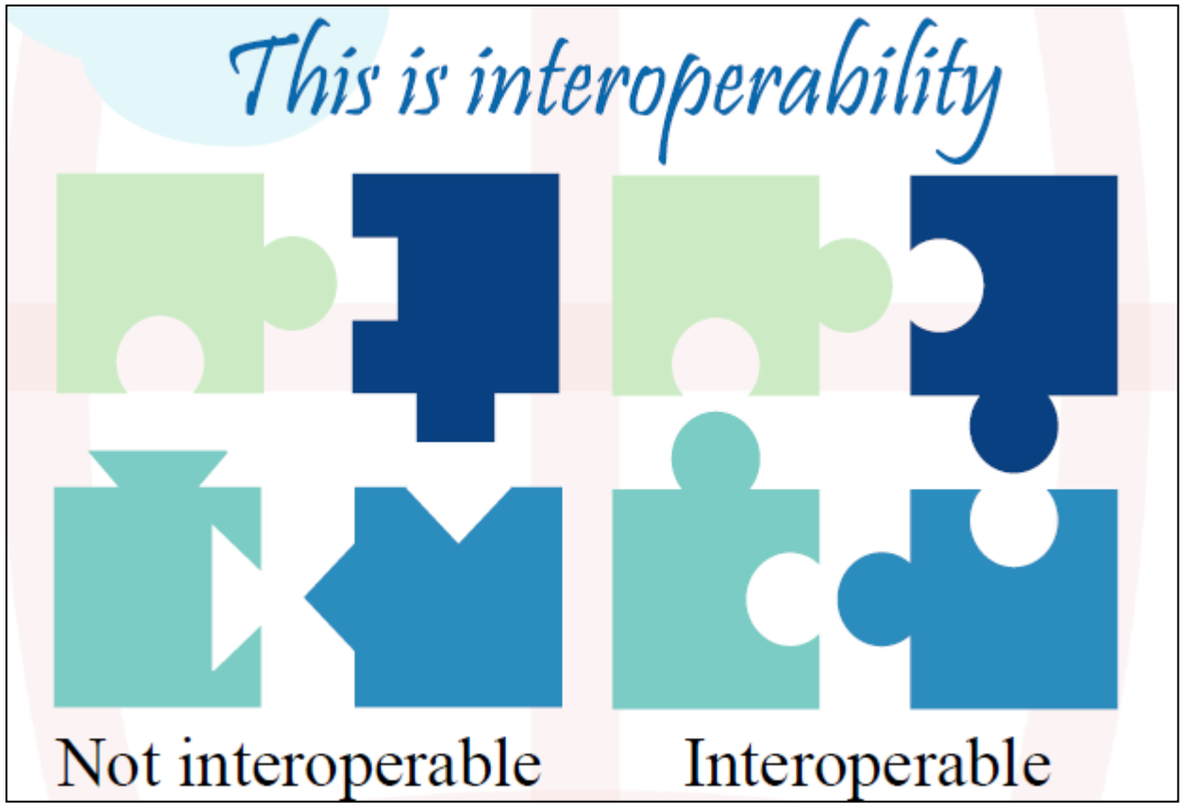
By focussing on standards, contributions can be made to:

- Innovation
- Competitiveness
- Productivity
- Efficiencies
- Openness

through…

Interoperability
Global compatibility

Standards allow diverse data sources, services, systems and applications to work seamlessly with each other.



How do standards affect geographic information?

Acquisition

Imagery and gridded data (ISO/TR 19121:2000)

- GIS, vectorization and imaging

Management

Metadata (ISO 19115:2003/Cor 1:2006)

- Description, metadata and storage

Access

Encoding (ISO 19118:2011)

- Coding, delivery, access, research and discovery

Use

Services (ISO 19119:2005)

- Application services, analysis, treatment and presentation

Standards Catalogue:

Source: http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=54904

Canada's Approach to Geospatial Standards

Now, Canada supports development and adoption of geospatial standards through national and international standardization activities, building a common, interoperable base that allows convergence of many sources of geographic data for the CGDI.

The GeoConnections approach has evolved since 1999 from endorsing specific standards to a more open stance of promoting general use of common standards to enable interoperability.

Leadership Influence Expertise Implementation

Strategies, Goals and Initiatives (2010-2015)

Strategy 1

Increase Awareness, Understanding of Geospatial Standards

- Goal: Increase standards awareness, understanding and implementation in Canada

Strategy 2

Accelerate Adoption and Adaptation of National and International Standards

- Goal: Make GeoConnections the catalyst to accelerate adoption and adaptation of standards that enable the CGDI

Strategy 3

Evolve International Standards and Relationships

- Goal: Evolve CGDI geospatial standards in a structured and sustainable program

Emerging Trends in Geospatial Data

Geosemantic Interoperability in Today's Society

- Systems on the Web must understand each other
  - Smart devices are connected to the Internet (Internet of Things)
  - Millions of people are becoming data generators (i.e. social networks, crowdsourcing)
  - Governments are adopting open data policies
  - The Semantic Web is replacing the document-centric Web, …
- These systems need to interoperate semantically
- High quality semantic and geosemantic interoperability is necessary
- Geosemantic interoperability is a fundamental notion for applications using web-based geospatial data and services

27

Geosemantic Interoperability and the CGDI…

What is the connection?

- GeoConnections is working on integrating the components of the CGDI. A complete CGDI includes a comprehensive suite of geospatial operational policies and standards, fully supported and available for adoption and implementation by CGDI's national stakeholders.

- Central to successful interoperability is how the **semantics** (i.e. the meaning and structure of concepts used to represent various geographic features) is carried over. Geographic features are often represented differently according to the context in which they are perceived.

- **Geosemantic interoperability** provides solutions that solve these differences and ambiguities, and facilitates better communication between people, machines and systems for the sharing of geospatial data. To do so, it relies on formal languages, ontologies and **standards**.

- Understanding and implementing the principles of geosemantic interoperability offers benefits to improve the exchange of geospatial information within spatial data infrastructures.

Geosemantic Interoperability - Backgrounder

- Provides an update on geosemantic interoperability research and development.
- Introduces technologies and standards supporting geosemantic interoperability.
- Presents a case study based on the Ordnance Survey experience.
- Discusses the challenges of geosemantic interoperability.

Big Data in Geomatics

- The Contribution of Geomatics to Big Data:
  - More Powerful Analytics
  - Integration of Unlinked Big Data
  - Enriched Data Visualization
- Challenges of Big Geospatial Data:
  - Location privacy concerns raise to a level never reached before
  - Required cultural changes are important
  - Insufficient workforce with the necessary skills
  - Facilitate interoperability between Big Geospatial Data systems
  - Improve technology
- Major opportunities for the Canadian geomatics industry, government and universities

=> Big Data is here to stay and geospatial information technologies will play a central role in its success and usefulness

Big Data - Backgrounder

- Provides an comprehensive overview of what Big Data and related analytics activities and outputs are.
- Introduces related technologies and usages.
- Presents how geospatial information technologies contribute to the Big Data phenomenon and vice versa.
- Discusses the opportunities and challenges for the geomatics community working with Big Data.

Unmanned Aerial Vehicles (UAVs)

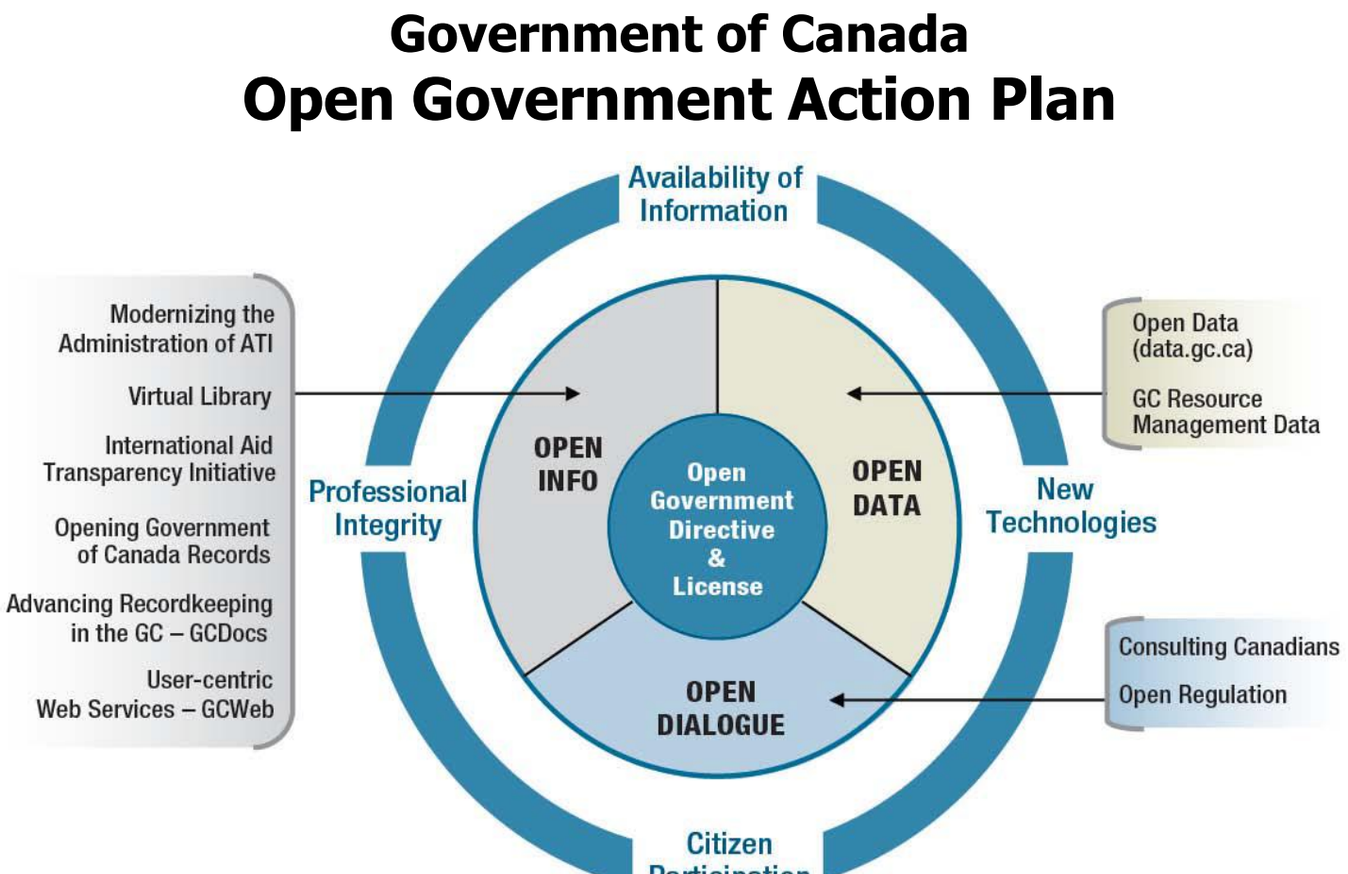
- UAV demand is increasing in both the public and private sectors because of the new opportunities they enable.
- Policy related concerns:
  - Privacy
  - Regulation
  - Safety
- Clearer policies must be implemented to address the major concerns before UAV's can be deployed and used for geomatics.

UAV - Backgrounder

- Provides an introduction and overview on UAV's including the different types and usages.
- Introduces how UAV's are used in Canada and different UAV remote sensing applications.
- Presents how UAV's are currently regulated in Canada and the operational policies that are needed.
- Discusses the issues and challenges for regulating UAV use in Canada and the impacts that it has on remote sensing applications.

Open Data and Open Government

- Rapid shift in the public sector to free and open data
- Meeting public demand
- Changing operational policies



VILLE DE QUÉBEC

TORONTO

THE CITY OF CALGARY

CITYonline™ information • products • services

OPEN DATA OTTAWA

CITY OF VANCOUVER

HALIFAX REGIONAL MUNICIPALITY

OPEN DATA WATERLOO
Opening government data to benefit the community

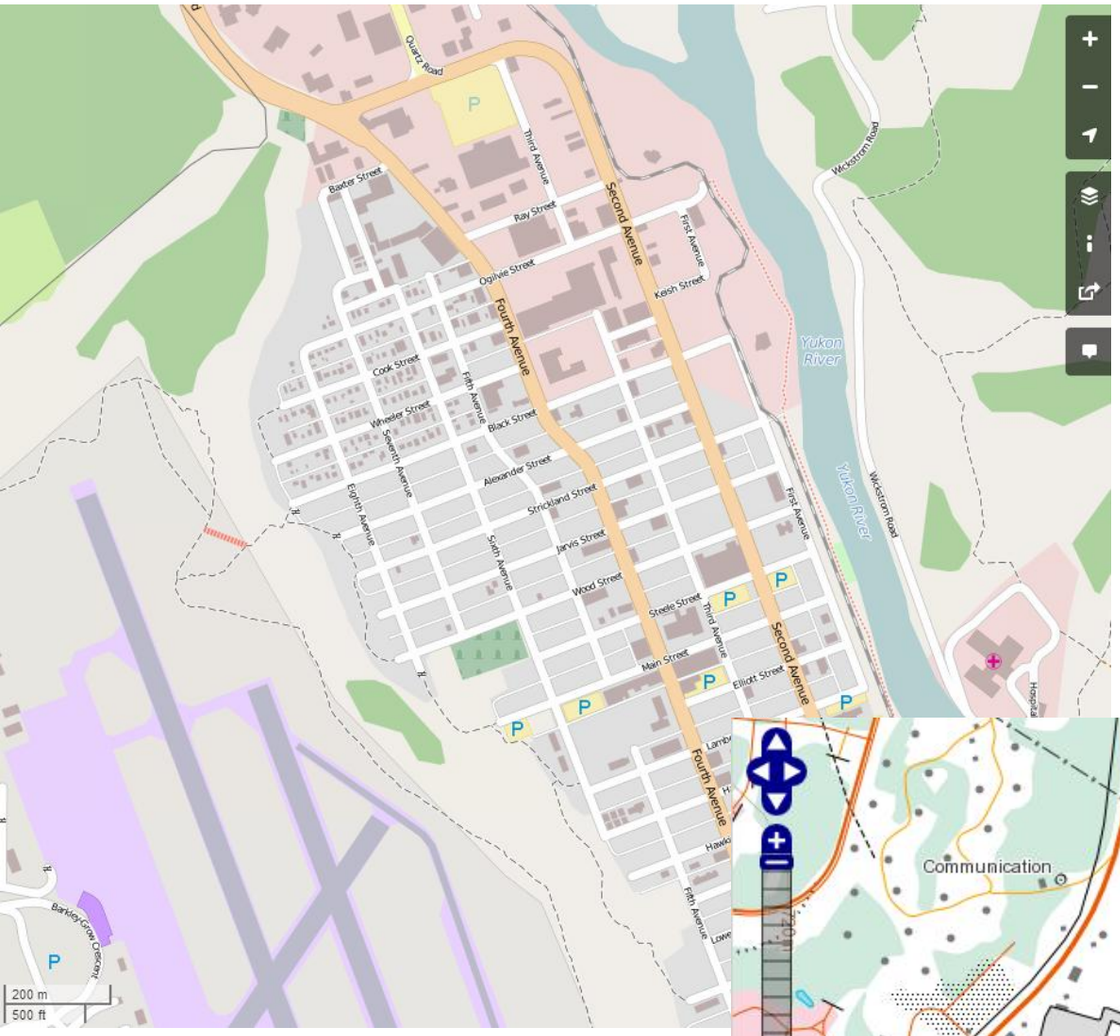
Natural Resources Canada | Ressources naturelles Canada

source: http://data.gc.ca

Canada

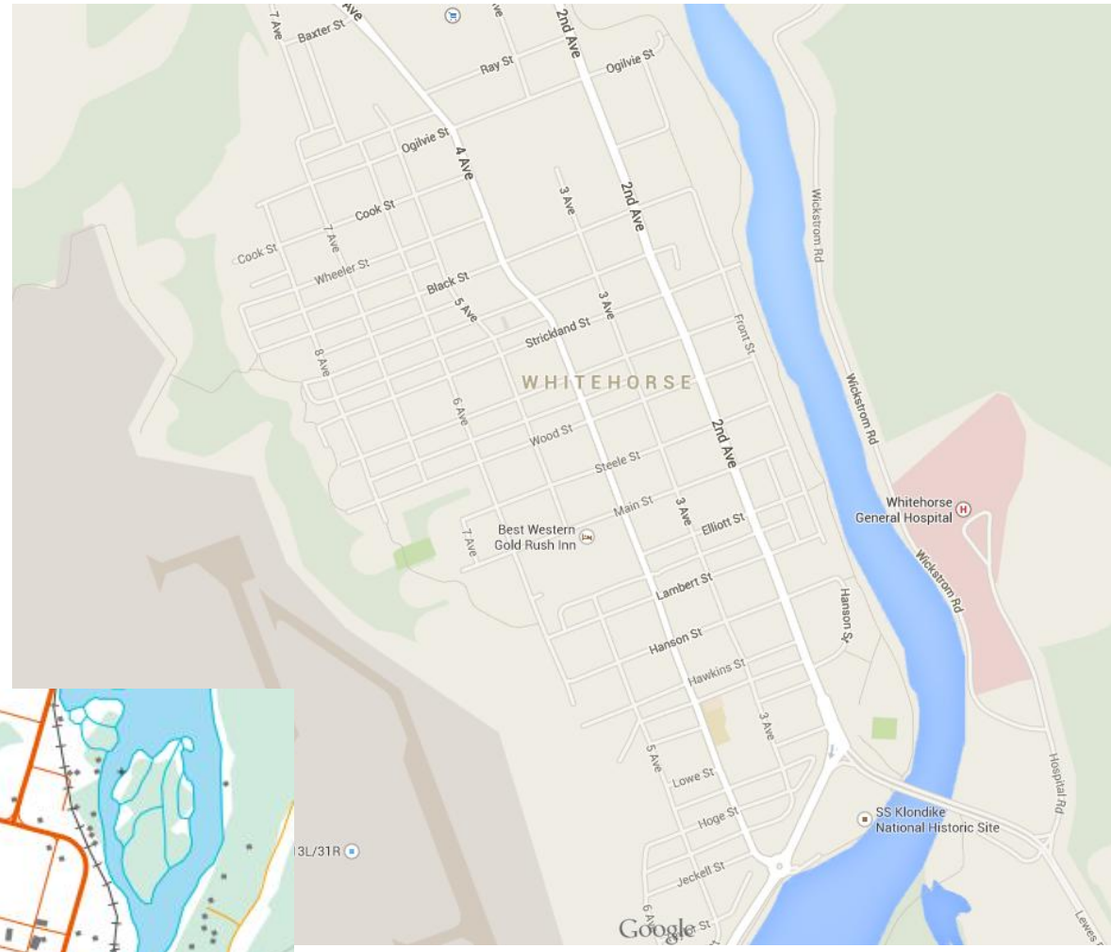
Open Government Licence Primer

- Provides a descriptive overview and background of the Open Government License.
- Introduces key components of the Open Government License including scope, rights, obligations, exemptions, governing law and definitions.
- Presents three example scenarios of different ways users can use and interact with federal datasets under the OGL-C.



Open Street Map

The Atlas of Canada - Toporama



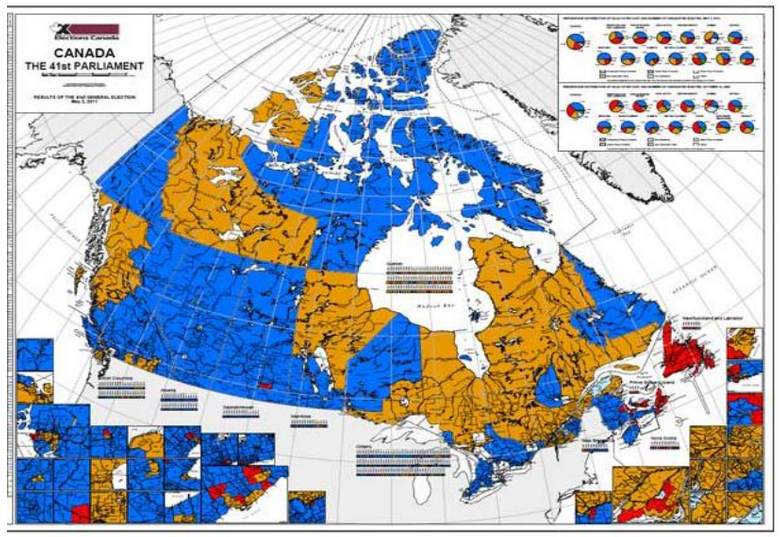
Google Maps

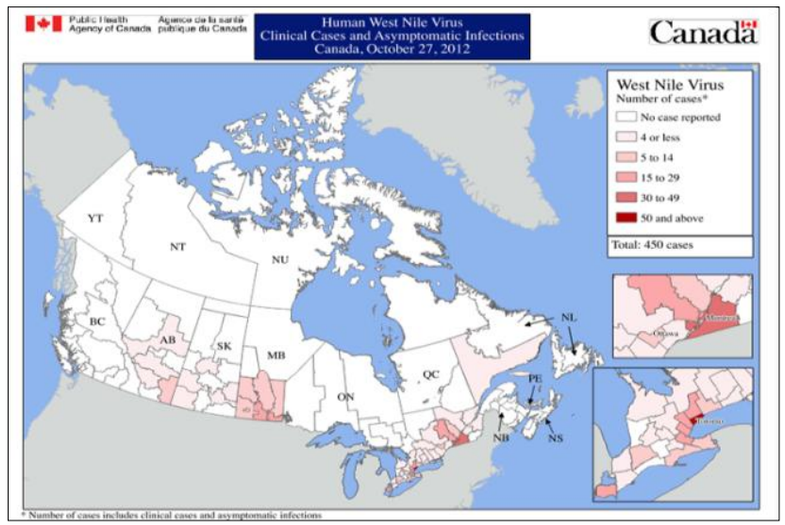
The Federal Geospatial Platform: Enabling Open Government

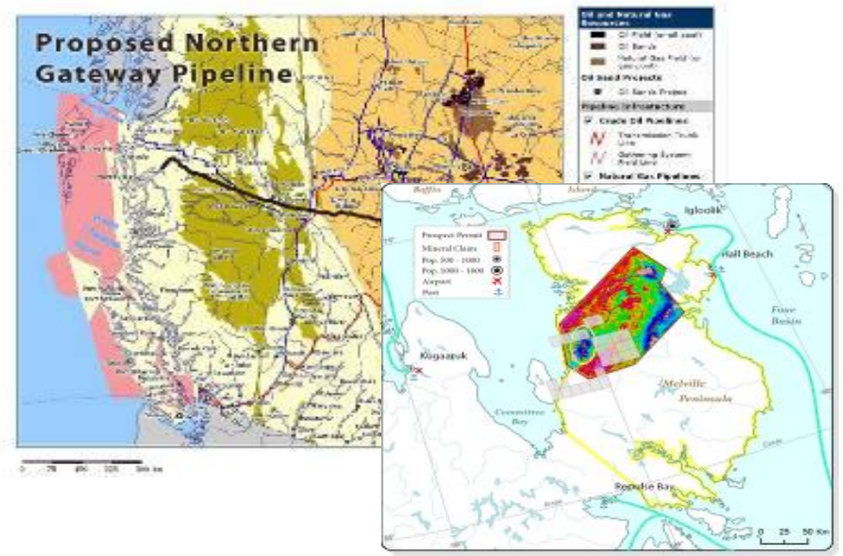
Ressources naturelles Canada
Natural Resources Canada

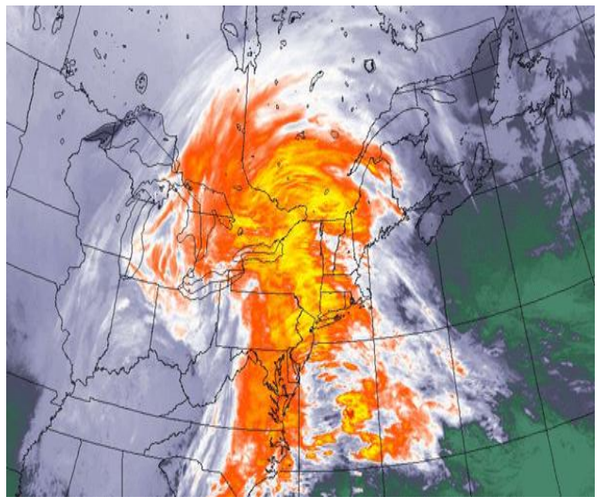
Canada

Geospatial data are widely used across the federal government…









Geospatial data – Data with explicit geographic positioning information included. The position is defined using point, point cloud, line, area or volume constructs that are positionally referenced to the earth.

…to support broad national objectives such as economic growth, social cohesion and well-being, and environmental management

The Federal Geospatial Platform is an enterprise solution that…

- brings together geospatial data from 21 participating departments to be viewed and accessed through a single window
- will scale up the best existing departmental technologies/investments for use by all
- enables rapid access to all federal geospatial data, searching once and finding what you need
- is accessible online to Canadians, governments, and industry, to support innovation and local decision-making

Online Access, Viewing & Analysis through Open Government Portal, enabling easy-view and analytical tools for non-technical users, enabled by Web services

FGP Catalogue organizes the information for easier searching

Data Repository stores data from multiple departments

IT Supported by SSC servers and networkis

…will transform the way in which the federal government manages geospatial information and uses location in decision-making

The FGP would allow for integration, viewing and analysis of multiple layers of Triple "A" geospatial information…

Accurate

AANDC – Northern community and land claim information

NRCan – Resource development info (e.g. mining starts)

TC – Infrastructure

AAFC – Soil information, crop reports

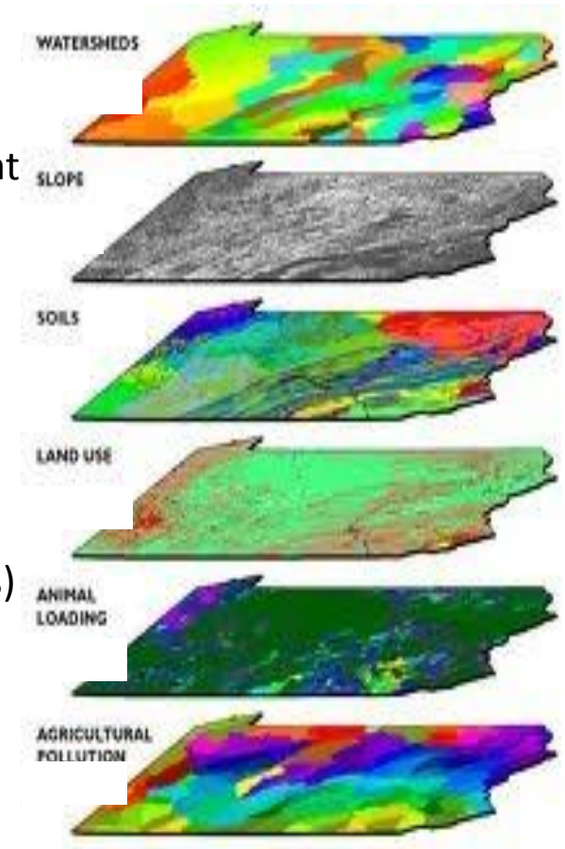
EC – Conservation + sensitive ecosystems (e.g. Caribou areas)

STC – Census, Population

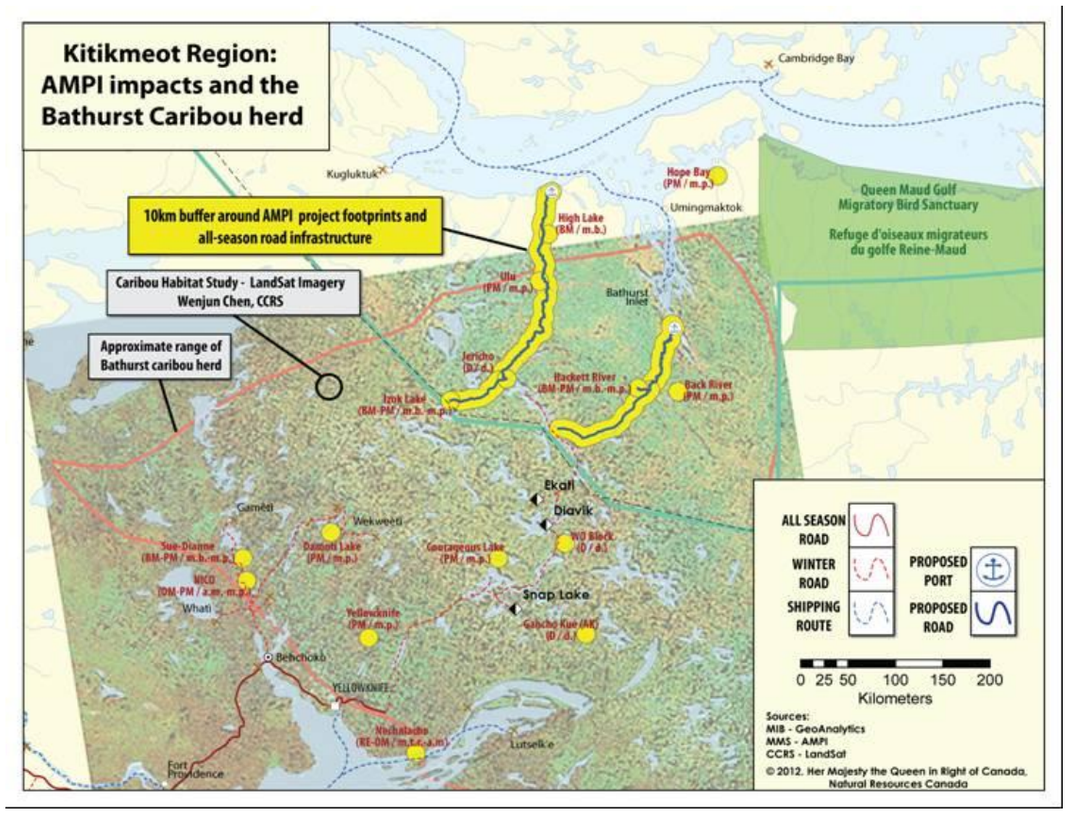
NRCan – Base map

(Road, Rail, Hydro Networks)
(Administrative Boundaries, Borders)

Authoritative



Accessible



…to support decision-making *within* and *across* departments, and among stakeholders, and stimulate downstream applications development

The FGP will support Canada's Action Plan on Open Government…

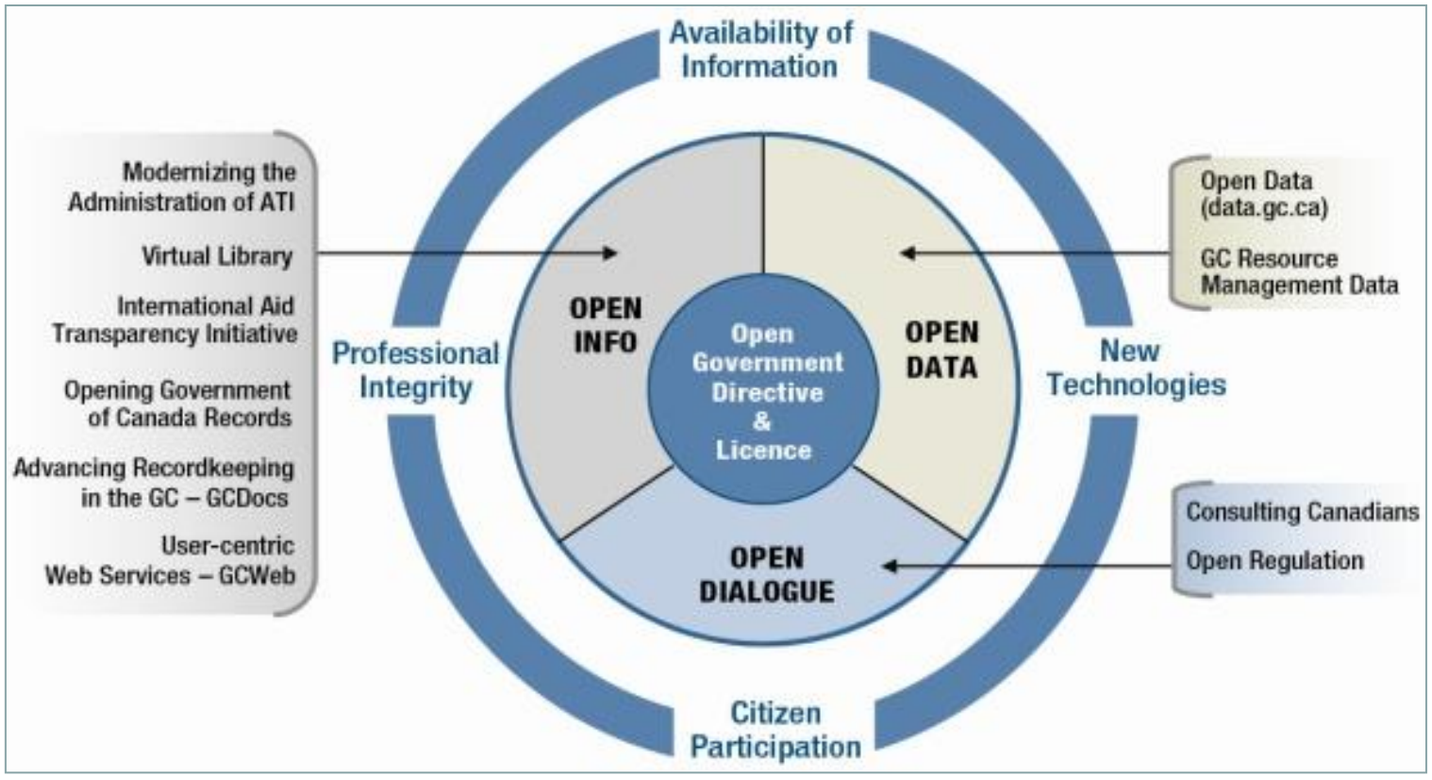
- Making the government's wealth of geospatial data available through an organized and **accessible web presence**

- Providing value-added **visualization and analytical** capabilities to data.gc.ca

- Ensuring data and tools are **interoperable** to support policy and decision-making

- Leveraging the government's significant investments in data to foster **innovation** and **productivity**

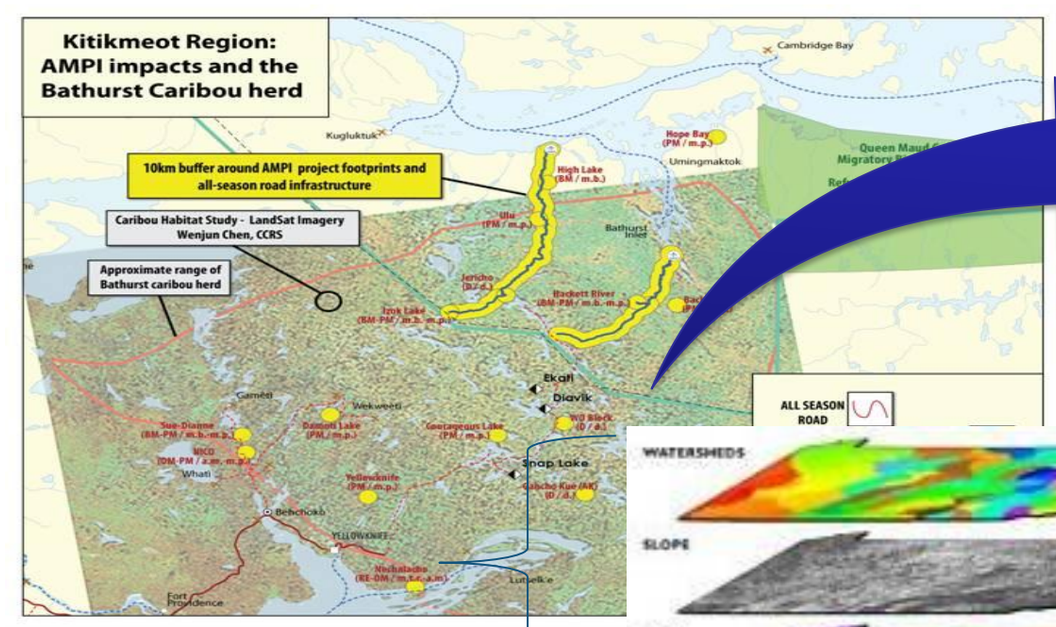
- Giving access to latest "**big data**" coming online, e.g. Inuvik Satellite Station

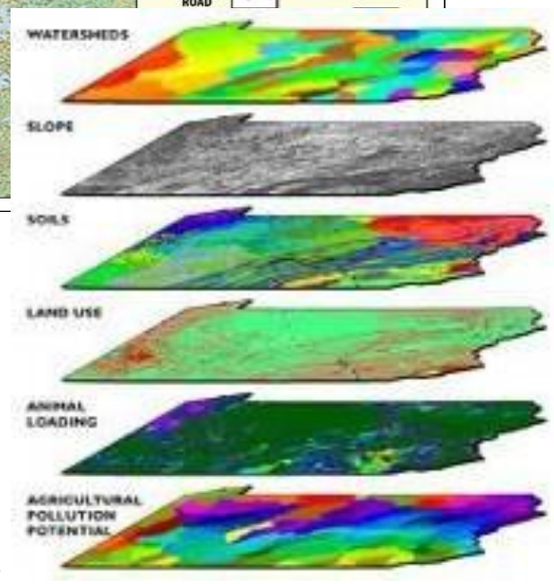


…and will enable "Big Data" by serving as the core integration platform for data.gc.ca

FGP in Action - Responsible Resource Development

Strong Economic Growth





Trusted data, visualized together for faster and more accurate decision-making

AANDC – Northern community and land claim information

NRCan: Resource development info (e.g. mining starts)

TC – Infrastructure

EC – Conservation + sensitive ecosystems (e.g. Caribou areas)

EC – Species at Risk distributions

CMN/AAFC/others- accurate taxonomic identifications

NRCan – Atlas base map

Outcomes

- **streamlined** review process
- **strengthened** environmental protection
- **holistic** consultations with Aboriginal peoples
- **stronger** economy – job creation

FGP: Data Repository, Catalogue, Web Services

Policies & Standards | **Interoperability** | **Authoritativeness**

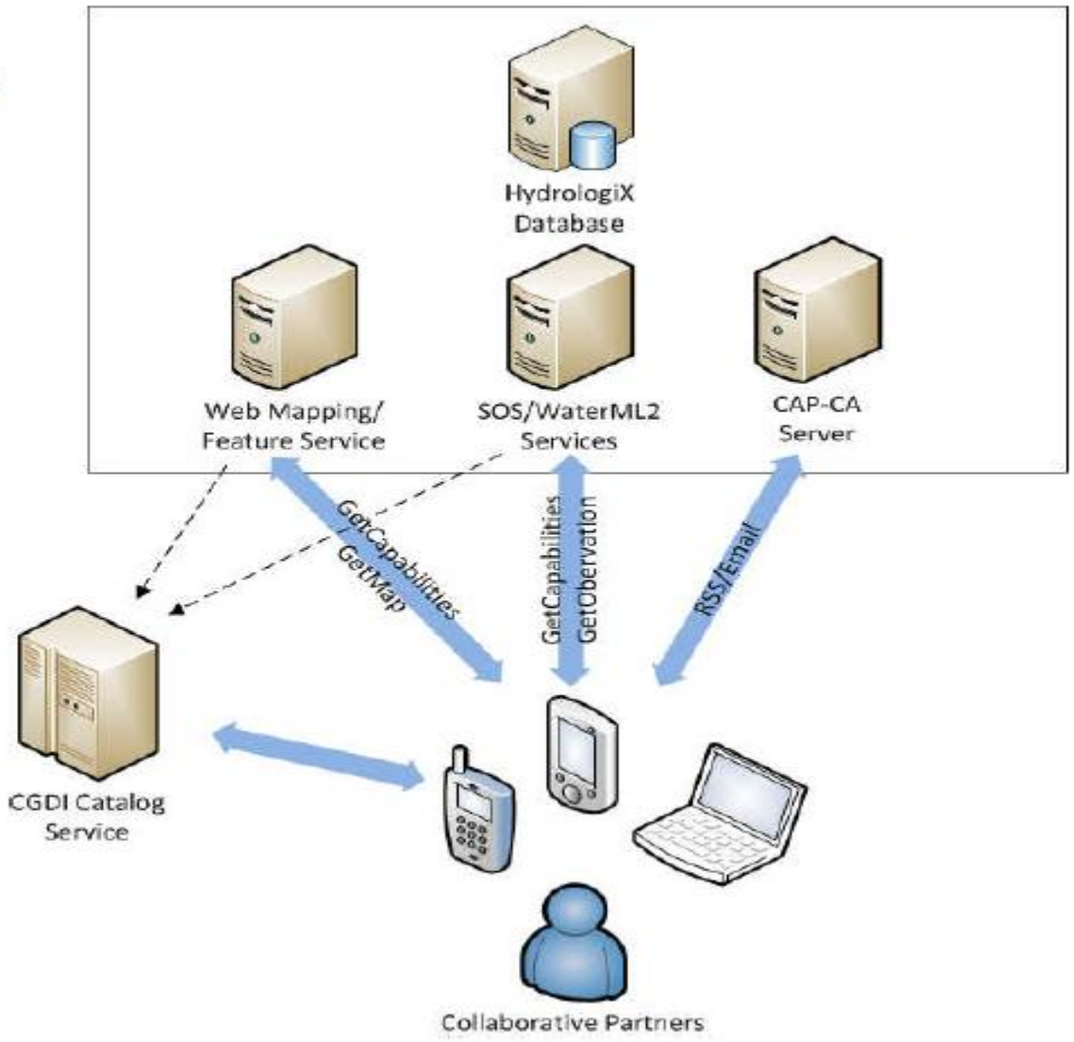
CGDI Project Examples

4DM River Forecasting System

- Purpose is to implement interoperable and seamless sharing of information by establishing a data sharing model and CGDI endorsed standards and technology

- The forecasted streamflows are compared with flow threshold values and trigger notification messages via OGC Web Mapping Service (WMS), email, web RSS feed

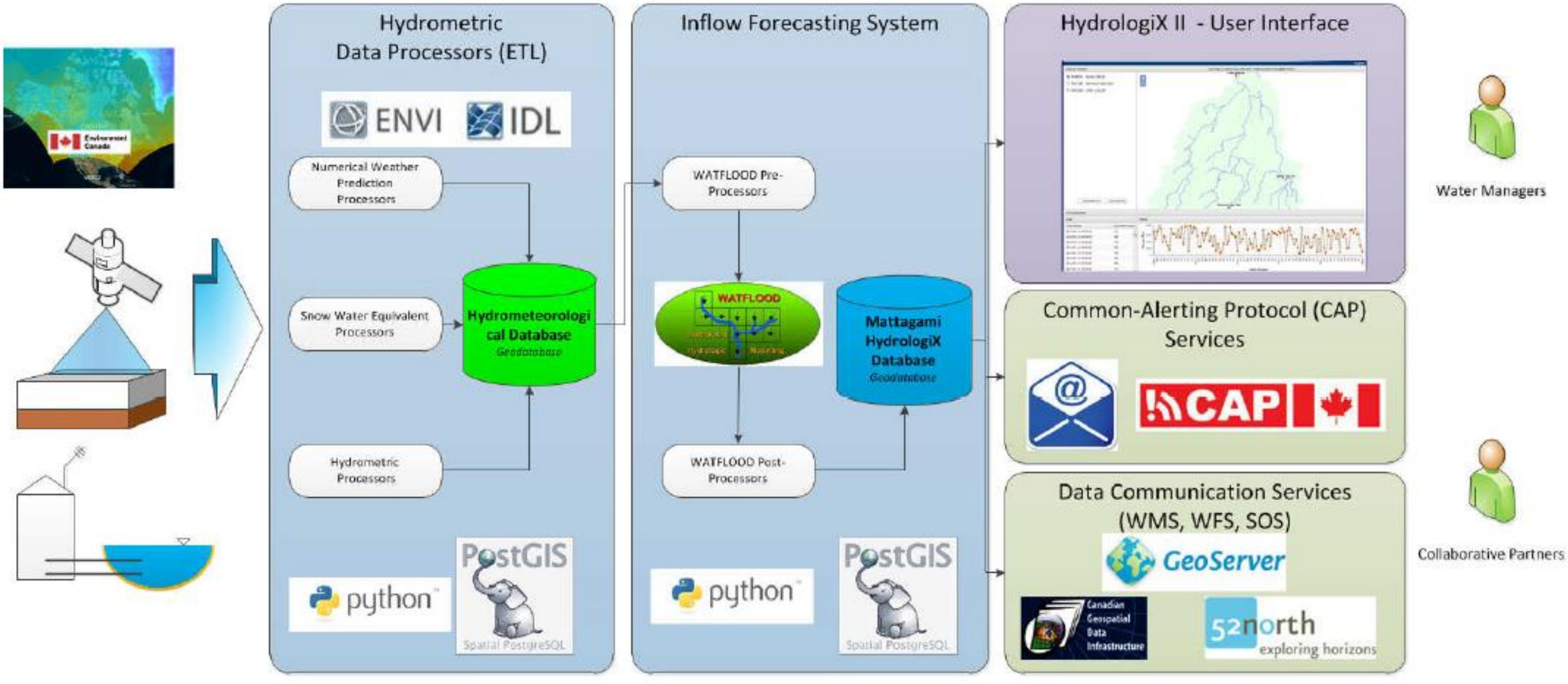
- Observed/forecasted flows distributed based on SOS/WaterML2 standards.



Project Outputs (March 31, 2015)

- Requirements analysis and documented user requirements;
- Consensus-based data sharing model and data sharing agreement;
- Data viewing services, data delivery services, notification services, discovery services;
- Web-based, CGDI-enabled, user-centric river forecasting system fully deployed and tested in Ontario Power Generation IT infrastructure.
- Final report and presentation to GeoConnections.

4DM – System Architecture



4DM – Contact Information

Steve McArdle

President, 4DM

671 Danforth Avenue, Suite 305

Toronto, ON

416-410-7569

smcardle@4dm-inc.com

http://www.4dm-inc.com/index.php/about-4dm/

Climatology - Hydrology Information Sharing Pilot (CHISP) Phase-1 Pilot Objectives

- Create a virtual observatory system for surface and subsurface water resources observations in parts of the U.S. and Canada, building on current networks and capabilities
- Link observations data to the stream network, enabling queries of conditions upstream from a given location to return all relevant gages and well locations.

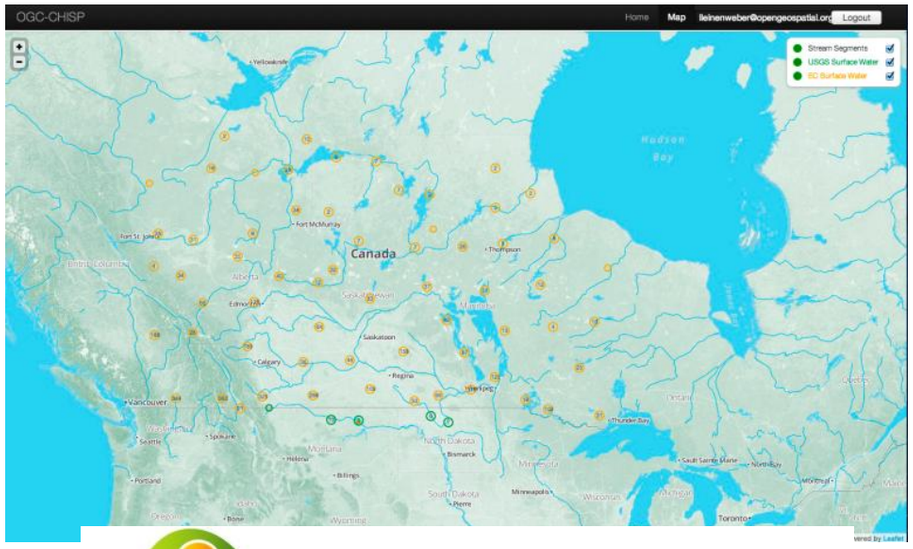
The OGC Interoperability Program (IP)

- A global, collaborative, hands-on engineering, prototyping and testing designed to rapidly deliver
  - Running code implementations
  - Engineering Reports
  - Change Requests
  - Demonstration in real world scenarios

- Sponsors and Participants work together.
  - Sponsors provide requirements, ***use / business cases*** and funding
  - Participants work with sponsors to define and/or refine standards to solve a given interoperability problem

CHISP-1 Functions

- Alerting system for historical and current stream flow and groundwater conditions & simulations of past flooding events.

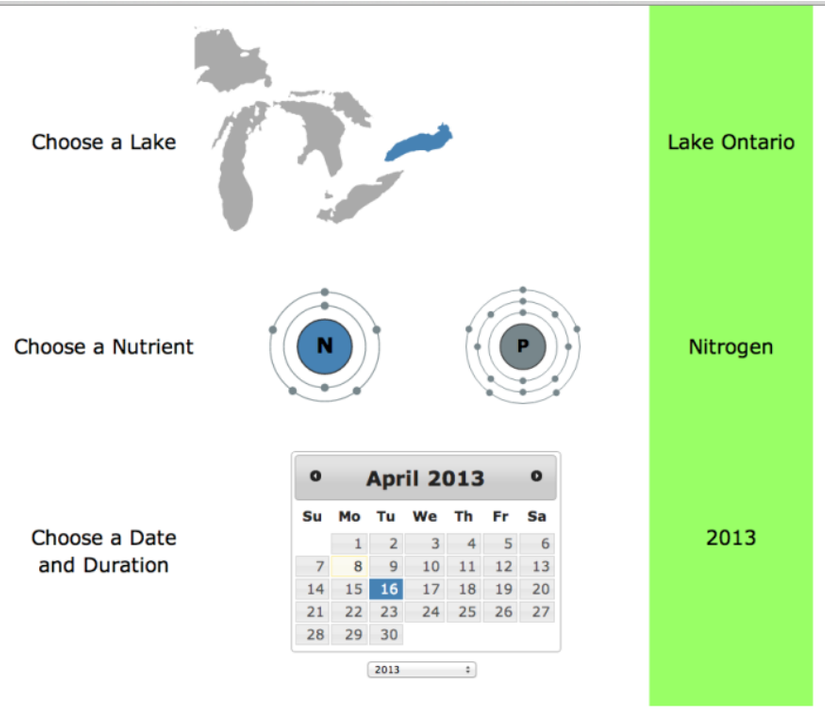


EXPLORUS INC.

RPS asa

GIS.FCU

- Modeling and assessment of nutrient loads into the Great Lakes.



RPS asa

Ressources naturelles Canada

Natural Resources Canada

Canada

OGC CHISP-1 – Contact Information

Lew Leinenburg

Director, OGC Interoperability Program

35 Main Street, Suite 5

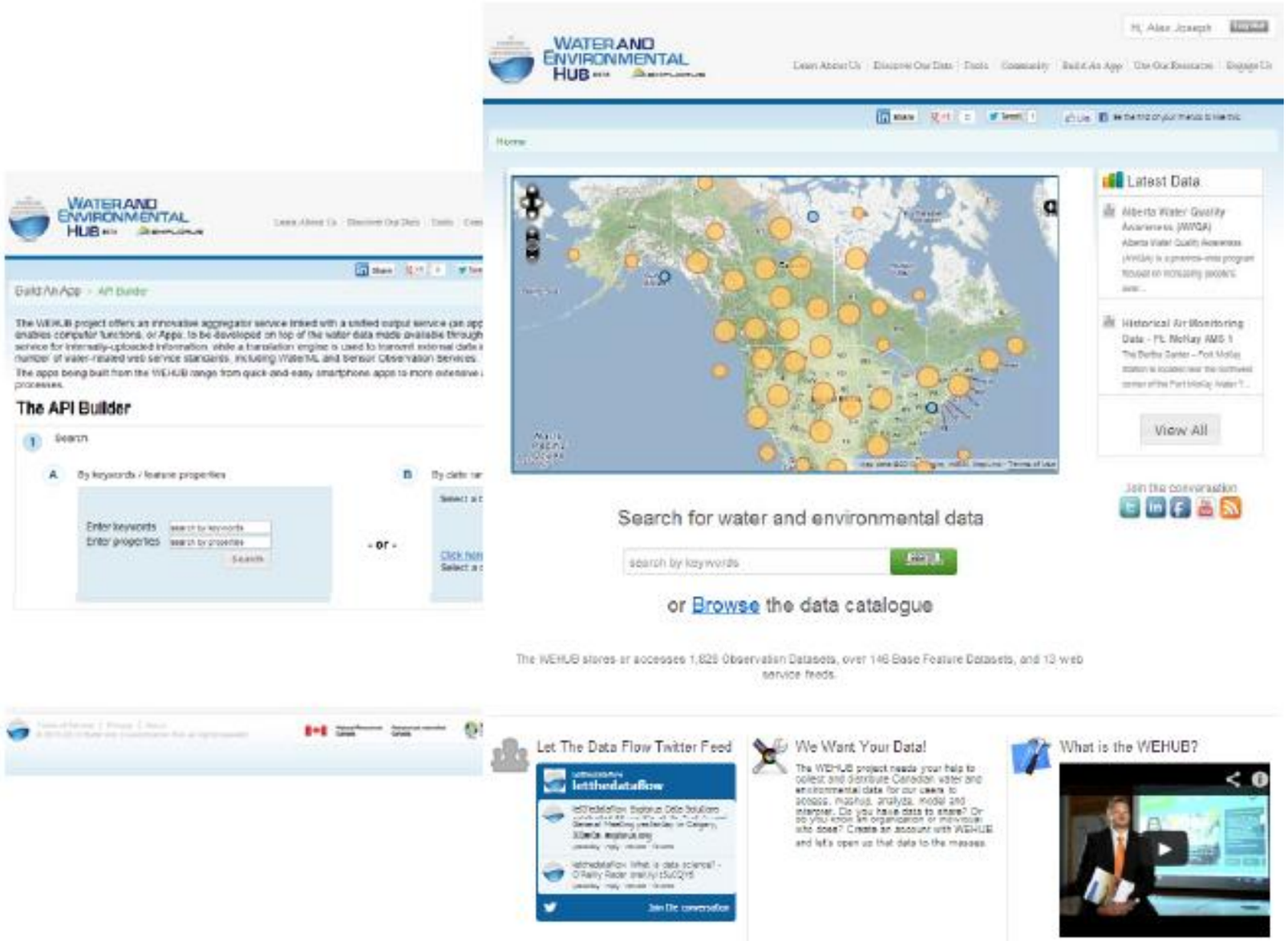
Wayland, MA, USA

240 399-0514

lleinenweber@opengeospatial.org

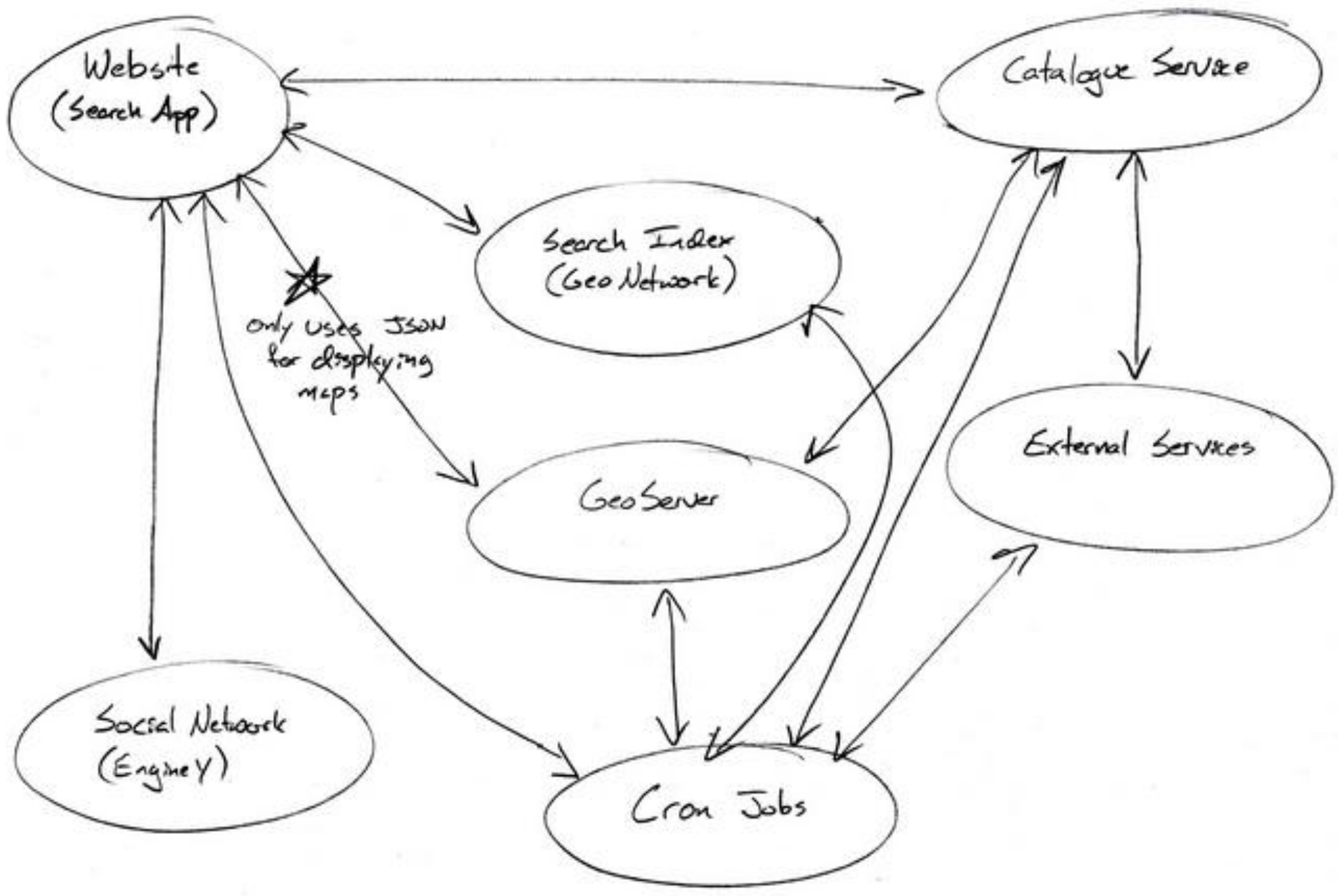
http://www.opengeospatial.org/projects/initiatives/chisp-1

Water and Environmental Hub (WEHUB)

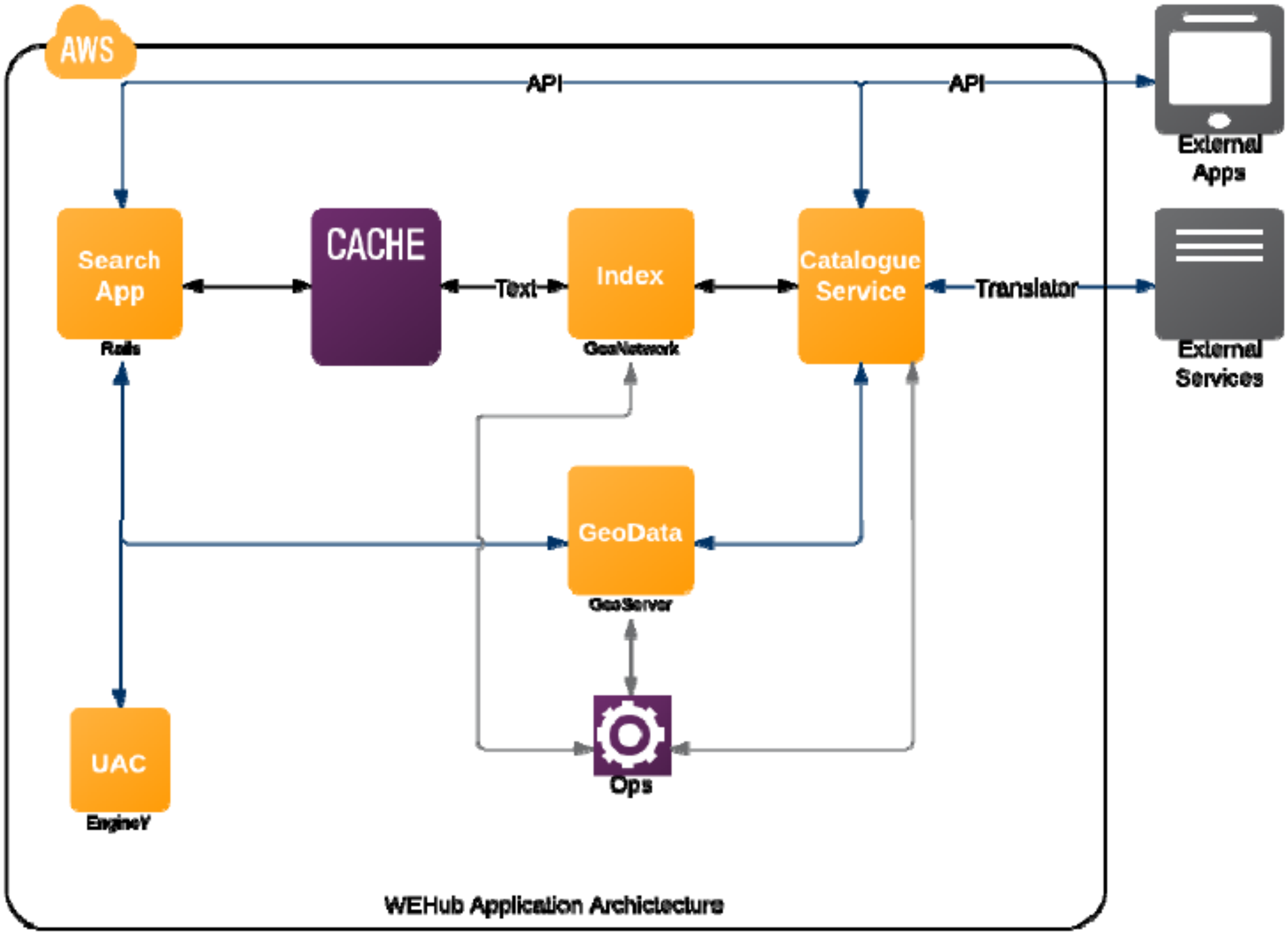


https://github.com/ExplorusDataSolutions/WaterEnvironmentalHub-WEHUB/wiki

WEHUB: System Architecture



Water and Environmental Hub (WEHUB)



WEHUB: Semantic Data Modelling

Development of Semantic Data Model

- Created a translator to consume the CUAHSI HIS Ontology and load the data into the WEHUB
- Introduced a new step in the WEHUB upload process where a user can associate ontology terms
- Display associated Ontology terms on the dataset details page
- Exposed Ontology terms through the Advance Search page allowing users to search these terms
- Associate Ontology terms with other pre-existing relevant datasets
- API Search must allow users to search by Ontology terms

WEHUB – Contact Information

Alex Joseph
Sustainability Manager
Tesera Systems
70 Railway Street East, Cochrane AB
1-866-698-8789
alex.joseph@tesera.com

https://github.com/ExplorusDataSolutions/WaterEnvironmentalHub-WEHUB/wiki

Arctic SDI Working Group
Conservation of Arctic Flora and Fauna (CAFF)
http://www.caff.is/about-caff

Mandate is to address conservation of Arctic biodiversity and share the findings with ALL the Arctic jurisdictions.

- CAFF is a **biodiversity working group of the Arctic Council**
- Vehicle to cooperate on species and habitat management and use – to **share information on management techniques** and regulatory regimes (international network of scientists, governments, indigenous organizations and conservation groups)
- To facilitate **knowledgeable decision-making**
- Provide mechanisms to develop **common responses** on **issues of importance** to the Arctic ecosystem:
  - Development and economic pressures
  - Conservation opportunities
  - Political commitments
- By monitoring (CBMP) – assessment (using baseline data) – expert group participation

Earth Sciences Sector, NRCan – Mapping Disturbance and Land Cover Change in the Northwest Territories using the Landsat Satellite Records

- The Landsat series of satellites provides a powerful means of detecting land cover changes during the last 40 years.
- The landscape of the Northwest Territories (NWT) is changing in response to increasing development pressures, natural disturbances, and climate change.
- A team of NRCan, NWT Government, and university scientists are analyzing the 29-year archive of 30 m resolution Landsat satellite imagery as a cost-effective means for detecting land cover changes in subarctic environments over a large portion of NWT.

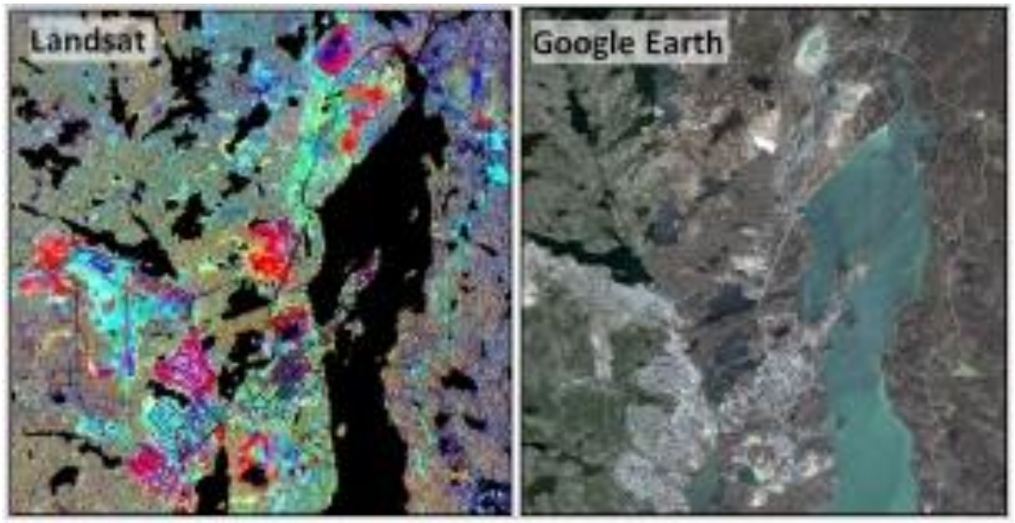


Figure 1– Change in the surface brightness, greenness, and wetness measured since 1985 using Landsat. The combination of changes in these three characteristics creates a set of unique colours when combined into a three channel red-blue-green composite image (left panel). Areas undergoing development since 1985 are brighter and less green, producing a red colour. Areas of recent vegetation regeneration are greener and less bright, producing a teal colour.

Canadian Geomatics Community Round Table
A way forward

COMMUNITY ALIGNMENT

ASSOCIATIONS / USER GROUPS / NPOS

GEOMATICS INDUSTRY

GOVERNMENT: CCOG, FCGEO, others

UNIVERSITIES, COLLEGES, K-12

PAN-CANADIAN STRATEGY

TEAM CANADA

A shared vision for the Geomatics Community in Canada

Canadian Geomatics Environmental Scan and Economic Value Study

CANADIAN GEOMATICS COMMUNITY ROUND TABLE: STRATEGIC DIMENSIONS

- **Identity** (profile of sector at home and abroad)
- **Market** (enabling industry to be more innovative, productive, and competitive)
- **Business Model** (defining optimal roles and relationships to support the Sector)
- **Leadership and Governance** (determining governance model needed to support sector)
- **Education and Capacity Building** (skills and training required for a sustainable work force)
- **Data Sources** (who has it, how is it being managed)
- **Legal & Policy Interoperability** (enhancement of legal and policy framework to support the Sector)

Canadian Geomatics Community Round Table (CGCRT)

Join the discussion

- The Round Table currently includes representatives from: federal and provincial governments, industry, educators, and not-for-profit organizations.
- Outreach is underway to: other associations, aboriginal, municipal, student representation, and new geo-industry representatives.

Round Table Steering Committee

Chaired by: James Boxall (Dalhousie University) and Peter Sullivan (NRCan)

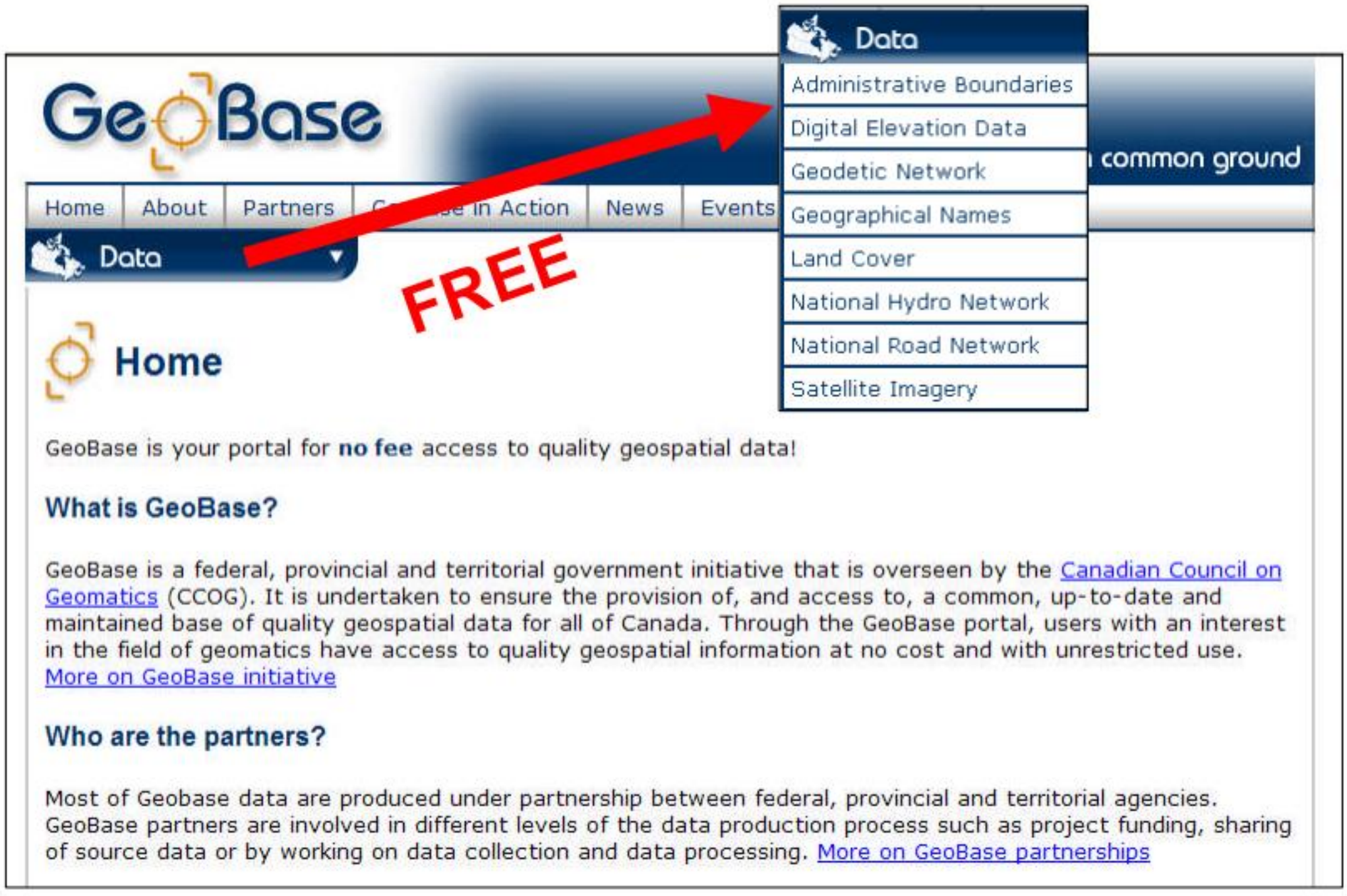
- Website www.cgcrt.ca – A "hub" for information and interaction
- Via the Canadian Geomatics Round Table LinkedIn page
- @CanGeoRT

How to Find CGDI Online Resources

GeoBase Portal

www.GeoBase.ca

"GeoBase is your portal for no fee access to quality geospatial data!"



SDI MANUAL FOR THE AMERICAS

http://geoscan.nrcan.gc.ca/cgibin/starfinder/0?path=geoscan.fl&id=fastlink&pass=&search=r=292897&format=FLFULL

CGDI Resource Center

geoconnections.nrcan.gc.ca

Natural Resources Canada

Canada

Search

Energy | Mining/Materials | Forests | Earth Sciences | Hazards | Explosives | The North | Environment

Home > Earth Sciences > Geomatics > Canada's Spatial Data Infrastructure > CGDI Resource Centre

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
    - CGDI in Action: Geomatics - Improving our everyday world - Video
    - CGDI Interoperability Pilot Demonstration - Video
  - GeoConnections

Geography

Earth Sciences Resources

CGDI Resource Centre

CGDI Foundation

Canadian Geospatial Data Infrastructure Performance Project - Overview

This document (2013) presents the Canadian Geospatial Data Infrastructure (CGDI) Performance Project, which has five phases planned over five years (2010-2015): 1) Modernize CGDI definition, 2) Update CGDI Vision, Mission and Roadmap, 3) Develop CGDI Assessment Framework, 4) 2012 CGDI Assessment, and 5) 2015 CGDI Assessment

Canadian Geospatial Data Infrastructure - Overview

This overview document (2012) describes the Canadian Geospatial Data Infrastructure (CGDI), its key components and guiding principles. The CGDI allows users to discover, evaluate and use a wide range of location-based information from various sources, which would have otherwise been difficult to find. It helps decision-makers from all levels of government, the private sector, non-government organizations and academia use location-based information to make effective decisions on social, economic and environmental priorities.

Canadian Geospatial Data Infrastructure Vision, Mission and Roadmap - The Way Forward

This document (2012) presents the updated Vision, Mission and Roadmap (VMR) for the Canadian Geospatial Data Infrastructure (CGDI). The VMR aims to guide the CGDI's direction for the next five to ten years and inspire the Canadian geomatics community to contribute to a thriving, sustainable and beneficial CGDI.

CGDI in Action (video)

This video (2009) describes the Canadian Geospatial Data Infrastructure (CGDI) developed by GeoConnections, a program led by Natural Resources Canada. The CGDI is a spatial data infrastructure that allows interoperability of all of Canada's geospatial databases and can make them available online. Duration: 9:35

CGDI Interoperability Pilot Project (video)

The CGDI Interoperability Pilot Project (2008) developed an OGC Web Feature / Web Map Service partnership network across Canada, demonstrating a variety of scenarios involving closest-to-source update, access and use of public geospatial data. This video highlights the collaboration, the concepts and the technology behind the network. Duration: 9:29

Other Tools and Resources for Operational Policy Development:

- Guide to User Needs Assessment and User Centred Design: http://geoconnections.nrcan.gc.ca/18

- Geospatial Data Policy Classification
  - Policy Instrument Classification Structure
  - Supports Inventory of Policy Instruments in use
  - User Guide

http://geoconnections.nrcan.gc.ca/18

THANK YOU !

Cindy Mitchell
Advisor, Federal Geospatial Platform
Cindy.Mitchell@NRCan-RNCan.gc.ca

Anna Jasiak
Advisor, GeoConnections
Anna.Jasiak@NRCan-RNCan.gc.ca

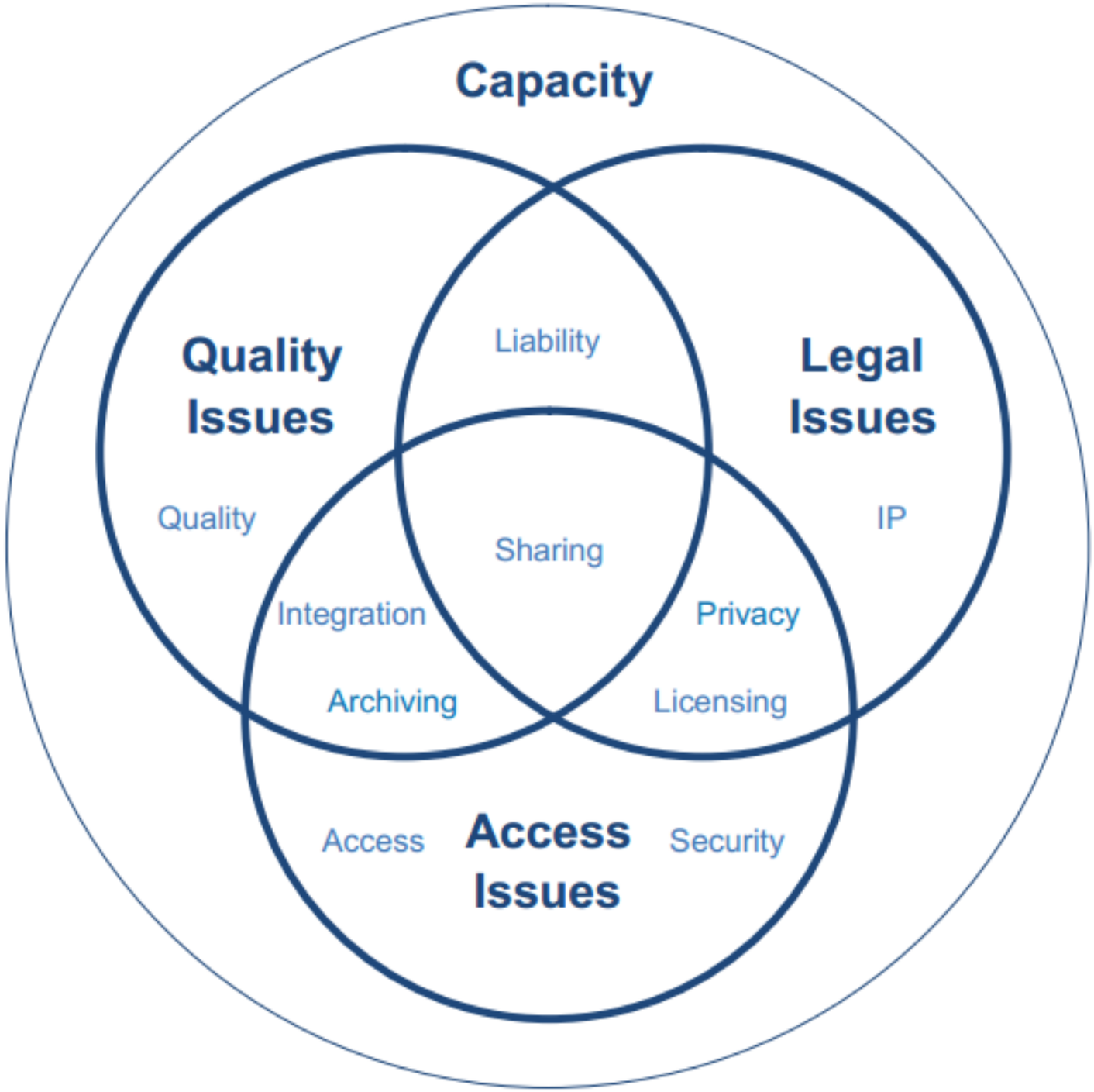
Annexes

Geospatial Operational Policies and the Role they Play in a Spatial Data Infrastructure

How to identify and develop Geospatial Policies for an SDI:

- Identifying and analysing issues pertaining to geospatial sharing and use.
- Conducting needs/requirements analysis specific to the jurisdiction for which the SDI is being developed.
- Consultation with and feedback from stakeholders, users.
- Promoting and raising awareness of geospatial policy issues, solutions and practices (Communication and information sharing is key).
- Working with stakeholders to develop new/ adapt to existing CGDI operational policies, tools and resources necessary to complete and sustain the SDI.
- Ensure policies are supported and reflect the current needs of the jurisdiction(s).

Issues and Needs



Identified Trends

Key policy topics that impact spatial data infrastructures

Legal/Administrative	Technological/Trends
▪ Ethical Legal Practices ▪ Confidentiality, Security, and Sensitive Information ▪ Privacy ▪ Intellectual Property ▪ Copyright ▪ Licensing ▪ Data Sharing ▪ Liability ▪ Archiving and Preservation ▪ Data Quality	▪ Open Data ▪ Volunteered Geographic Information (VGI) ▪ Open Source ▪ Web 2.0 and the GeoWeb ▪ Cloud Computing ▪ Mobile and Location-based Services ▪ High Resolution Imagery ▪ Mass Market Geomatics ▪ Data Integration ▪ Big Data ▪ Unmanned Aerial Vehicles (UAVs)

Privacy

Personal Information/ Personally Identifiable Information	Personal information contains identifiable information about a specific individual. It allows for the physical or online indentification of an individual based on the information. This includes phone numbers, full names, home address, medical records, etc. When this is linked to geospatial information, one's geospatial privacy is lost.
Private Information	Information about oneself that may be disclosed only with those deemed necessary. Private information may be considered slightly less personal than personal information, and may include credit card statements, vehicle registration plate, driver's license number, etc.
Privacy	Privacy is the ability of an individual to control what is shared about them and what it is used for.
Geospatial Privacy	Geospatial privacy is the ability to control data about one's self obtained through geographical services such as satellite, airborne or street-level imagery, GPS, or other location-based information.

Intellectual Property and Licensing

Intellectual Property 	Information that is useful and transferable, and in which someone has rights that give control over the information. Types of IP include: Invention, Copyright, Trade secrets, Trademark.
Copyright 	A temporary monopoly granted over a work. Copyright protects a number of different rights over a work, chief of which is the right to create copies. The creator (or "author") of a work retains rights to that work but can transfer some or all of their rights to others. To re-create a significant portion of a copyrighted work without permission is illegal.
Licensing	A legal agreement granting someone permission to use a resource for certain purposes or under certain conditions which would otherwise be disallowed or unlawful. A license does not constitute a change in ownership of the copyright. Includes Data licenses and Software licenses.

Data Sharing, Data Integration and VGI

Data Sharing	The transfer of location-based information between two or more organizations. Data sharing can take many forms, from sharing metadata (information about data), to sharing individual data layers, to sharing complete databases.
Data Integration	The combining, layering or otherwise employing one or more datasets from multiple data sources to meet a user requirements. ▪ Not only technical mechanisms, but includes appropriate institutional, policy, legal and social mechanisms to facilitate integration of multi-sourced spatial data. ▪ Best practices for data integration link policies such as privacy, liability, ethical practices, copyright and licensing, and VGI.
Volunteered Geographic Information (VGI)	"The widespread engagement of large numbers of private citizens, often with little in the way of formal qualifications, in the creation of geographic information" (Goodchild M. F., 2007).

Geospatial Data Archiving and Preservation

Data Archiving	The process of deliberately safeguarding data that is no longer actively used within a system or device developed expressly for its long-term retention and preservation
Data Preservation	Creating a collection of historical records (i.e., records that have been selected for permanent or long-term preservation on grounds of their enduring cultural, historical, or evidentiary value). Diligent preservation of geospatial data, along with the means of accessing and using it, is critical in preserving its inherent long-term value

Example Studies and Guides

- Archiving, Management and Preservation of Geospatial Data - Summary Report and Recommendations (2005)
- Geospatial Data Archiving and Preservation - Research and Recommendations Executive Summary (2011)
- Geospatial Data Archiving and Preservation Primer (2013)

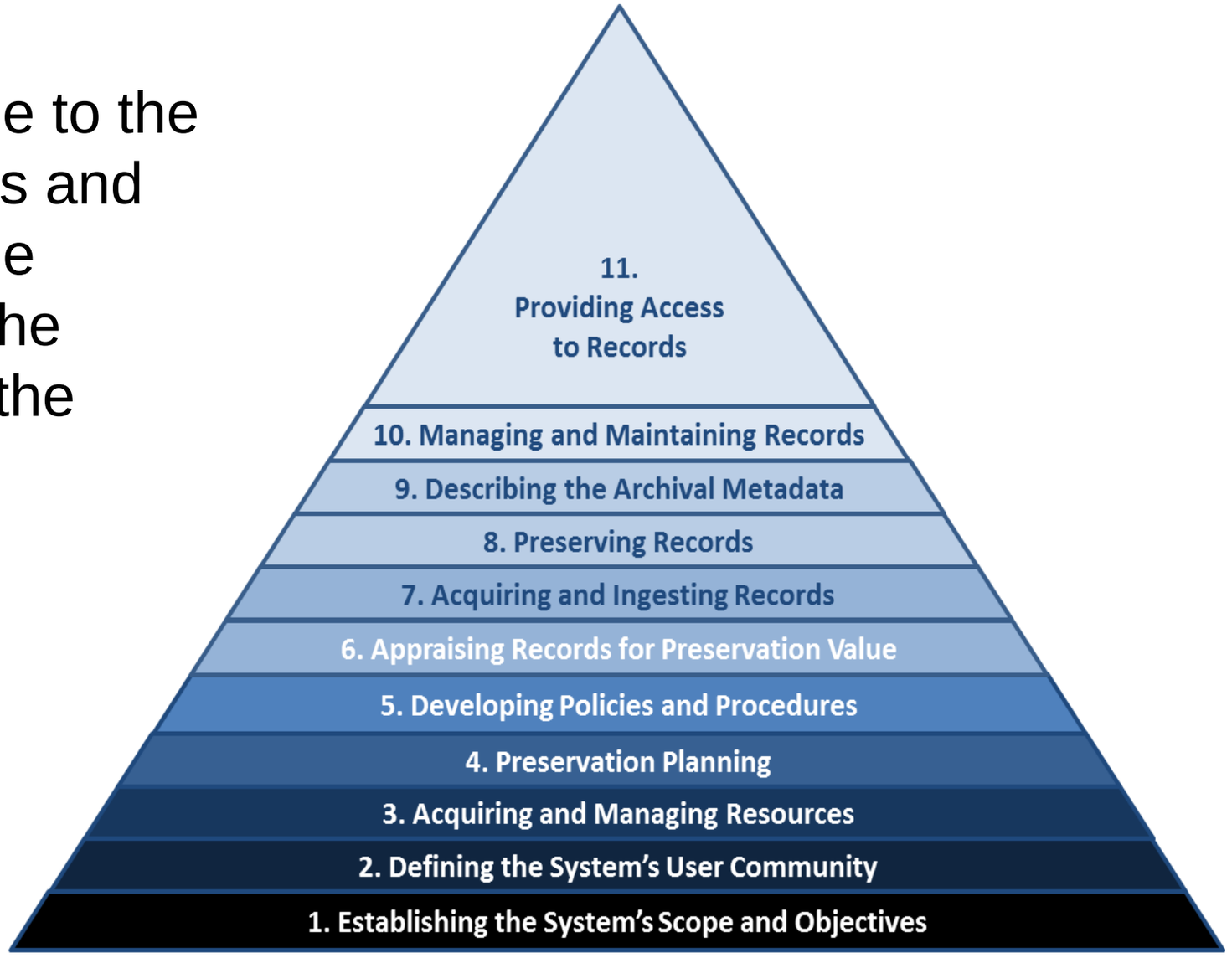
http://geoconnections.nrcan.gc.ca/18

Geospatial Data Archiving and Preservation

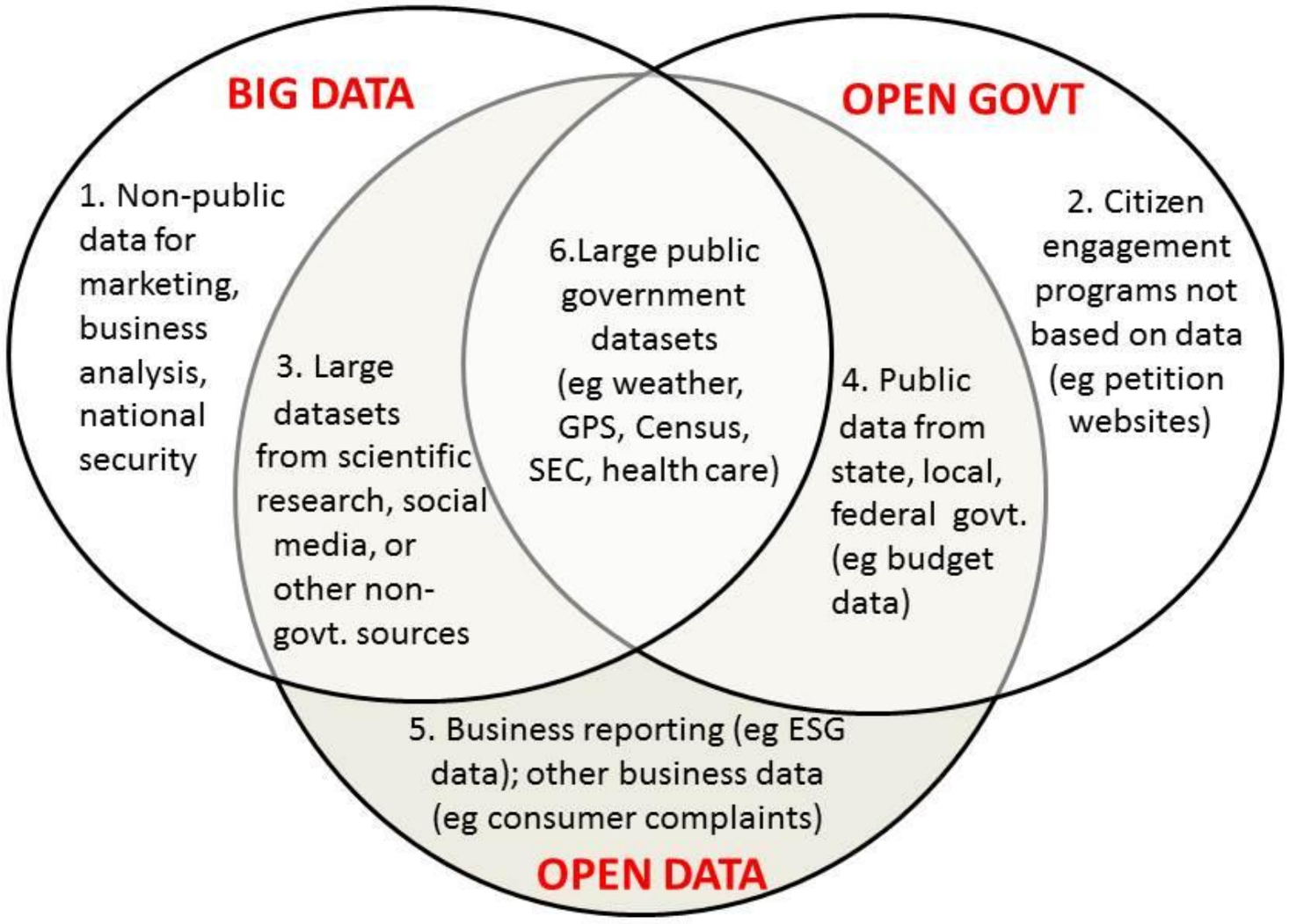
- The InterPARES 2 *Preserver Guidelines* inspired the logical structure of the process, while aspects of the *OAIS Reference Model*, *LTDP Guidelines* and the InterPARES 2 *Creator Guidelines* are also present.

- Reference is also made to the functionality, processes and documentation from the *TRAC Checklist,* and the guidance provided by the *GeoMAPP* tools.

- The Primer discusses 11 steps in the process.



Big Data vs Open Data: Mapping it Out ?



1

Source : http://www.opendatanow.com/2013/11/new-big-data-vs-open-data-mapping-it-out/

Technical interoperability: Reference Model