



**CANADIAN GEOSPATIAL DATA INFRASTRUCTURE  
INFORMATION PRODUCT 7**

**Building and Sustaining the Canadian Geospatial Data  
Infrastructure**

**GeoConnections**

**2008**

# GeoConnections

## Building and Sustaining the Canadian Geospatial Data Infrastructure

Canadian  
Geospatial  
Data  
Infrastructure



Infrastructure  
canadienne  
de données  
géospatiales

Canada 

## An overview for developers

One could call developers the unsung heroes of Canada's geomatics sector.

Developers often work behind the scenes with software, development tools and data standards. They create applications that blend computer technology, online mapping and location-based, or geospatial, data.

And in many cases, developers forge new paths – conceiving and developing innovative applications that have cemented Canada's reputation as an international geomatics leader.

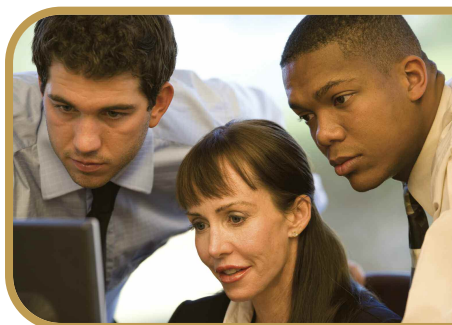
Geomatics technologies bring together surveying, mapping, remote sensing and geographic information. They allow us to create a detailed picture of our physical world and our place in it. Location-based information, such as maps and satellite images, helps many government and non-government organizations plan and operate more efficiently and productively.



## GeoConnections – tying it all together

The national partnership program called GeoConnections can help you bring new geomatics innovations to market . . . or enhance existing applications to take full advantage of the latest technologies or approaches. It also offers you membership in a network of geomatics developers that can help you gain feedback on new ideas or explore solutions to the issues that stymie you.

First launched in 1999 as a national funding and partnership initiative led by Natural Resources Canada (NRCan), GeoConnections was formed to provide Canadians with location-based data, tools and services over the Internet. To accomplish this mandate, GeoConnections helped co-ordinate the development of an online resource known as the Canadian Geospatial Data Infrastructure (CGDI).



In Canada's 2005 federal budget, GeoConnections was renewed for an additional five years to maintain, operate and expand the CGDI in four key areas:

- public health
- public safety and security
- environment and sustainable development
- matters of importance to Aboriginal people

Today, GeoConnections works with developers to ensure that CGDI technology is up to date and that users have the applications and services they need to get the most out of the CGDI. For example, GeoConnections works with developers by funding or co-funding projects and by promoting partnerships between Canada's geomatics sector and those who use the CGDI.

## The CGDI: a foundation for data sharing and improved decision making

The CGDI consists of the technologies, policies, applications, services and tools needed to share and merge location-based data over the Internet. This data can be exchanged between and throughout all levels of government, the private and non-profit sectors and the academic community.

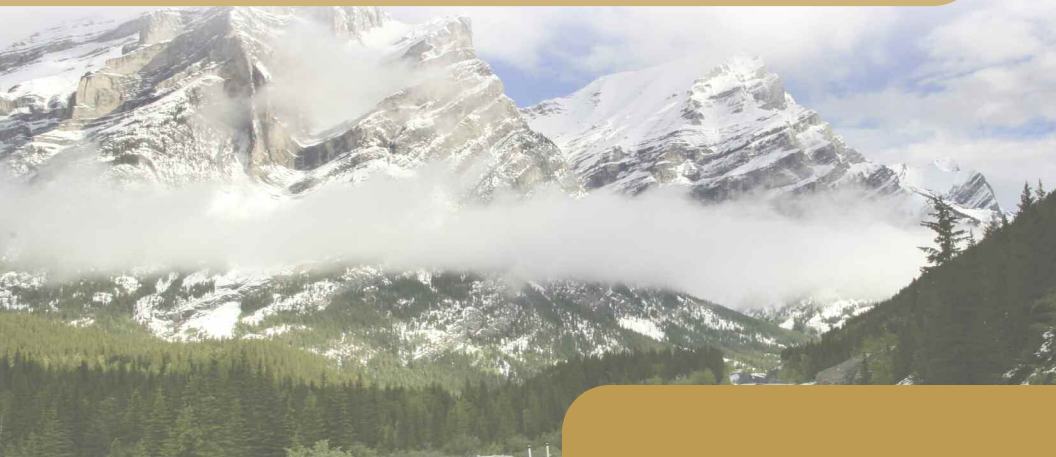
GeoConnections' goal is to grow the CGDI into an effective resource for day-to-day planning, so decision-makers in the four key areas (described on the previous page) can use it to tackle some of Canada's most pressing challenges.

### The role of developers in the CGDI's creation and growth

Developers create the software applications that allow the core CGDI components, interfaces and services to benefit Canadians. And by helping decision-makers integrate location-based data from diverse sources, developers enable Canadians to understand issues concerning our health, environment, safety and Aboriginal communities more clearly than before.

## The Canadian Geospatial Data Infrastructure (CGDI)

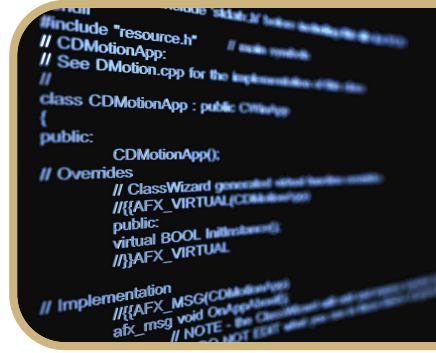
*“Better knowledge for better decisions”*



## CGDI guiding principles

The following main principles guide the way in which the CGDI is developed, operated and maintained:

1. The CGDI will be open, transparent, co-operative, evolving, timely, self-sustaining, self-organizing, user-driven, close to the source and secure.
2. The CGDI will be based on open and interoperable standards and specifications for operations and information exchange, and users will be allowed to seamlessly access data and services.
3. The CGDI will seek to co-operate and collaborate with participating organizations and address new information and service-delivery requirements and business applications.
4. The CGDI will be based on technologies and services that support timely or real-time access to information.
5. The CGDI will be sustained through the contributions of participating organizations and the broader user community and through its relevance to these groups.
6. The CGDI will allow participating organizations to contribute geospatial information, metadata, services and applications.
7. The CGDI will emphasize the nurturing of and service to a broad user community, and users will drive the future development of the CGDI.
8. The CGDI will encourage organizations closest to the source to provide data and to increase quality and efficiency by eliminating duplication and overlap.
9. The CGDI will be secure and protect sensitive or proprietary data.







## **Get connected! CGDI architecture, standards and technology solutions**

The CGDI building blocks are architecture, standards and specifications, and technology solutions.

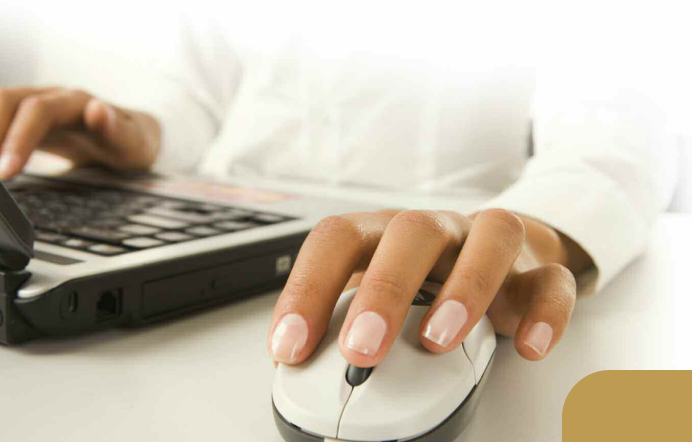
### **Architecture**


The CGDI architecture comprises four main elements: data, services, applications and users. Conceptually, on one hand, the architecture consists of data and service providers. On the other hand, it consists of consumers who use applications to access location-based information.

The CGDI is implemented as a network of co-operating physical servers. This network provides services and data that developers and technology integrators use to create geomatics applications. Having a network for these services and data saves development time and reduces operating costs by allowing an easy means to share data.

### **Standards and specifications**

The CGDI uses internationally endorsed standards. These standards offer an open and distributed network that can operate with other infrastructures around the world. The CGDI is built upon standards established by two leading standards organizations: the Open Geospatial Consortium, Inc.<sup>®</sup> and the International Organization for Standardization (ISO).





When you develop applications that use CGDI-endorsed standards, you gain in several ways:

- You get access to a wider array of data sets than you would have otherwise.
- You can share location-based information more efficiently – with clients, partners and suppliers.
- You can take full advantage of location-based hardware and software systems.
- Your data products and services will comply with international standards.




So what does complying with international standards mean to you? The main benefit is that you immediately gain a potential global market for your products and expertise. Moreover, Canadian developers in general will be better equipped to promote Canadian technology and find solutions for delivering location-based information around the world.

In addition, CGDI-endorsed standards reduce costs, minimize redundancies and give technology plug-and-play simplicity.

## The CGDI's three common standards

The CGDI owes part of its success to common standards. Although other standards exist and more are being developed, the CGDI uses three primary standards:

- **Data visualization with Web Map Service (WMS):** The WMS interface specification defines services to create and display superimposed map layers of geographic data from multiple sources.
- 



- **Encoding and transfer with Geography Markup Language (GML):** This XML coding for the transportation and storage of geographic information includes both the geometry and the properties of geographic features.
- **Data access with Web Feature Service (WFS):** The WFS specification defines data manipulation operations on geographic features, such as water bodies and infrastructures.

## Technology solutions


Showing practical examples and providing implementation in action – that is what the CGDI is all about. You can find examples of CGDI standards-based technology solutions by using the GeoConnections Discovery Portal search services at [geodiscover.cgdi.ca/gdp/](http://geodiscover.cgdi.ca/gdp/). The Atlas of Canada, GeoGratis and RésEau are among the suite of CGDI applications.

## The CGDI Development Network: your online community

By tapping into the CGDI Development Network – a special online community of developers – you can share ideas, ask questions, find answers, contribute knowledge and explore solutions for the technical components of the CGDI.

More than 200 geomatics members from industry, government, academia and not-for-profit associations have already joined the Network. You are encouraged to become a member, too.

The CGDI Development Network offers best practices, presentations, online training, dialogue between experts, and other resources. These offerings will help you create tools and applications based on the principles of CGDI architecture. You will also get information about relevant Web conferences and will gain membership on a mailing list that will keep you up to date with important CGDI news. More details can be found at [www.geoconnections.org/en/communities/developers/index.html](http://www.geoconnections.org/en/communities/developers/index.html).



To join the CGDI Development Network mailing list,  
just fill out the online form at  
**[lists.geoconnections.org/mailman/listinfo/cgdi-dev-net](http://lists.geoconnections.org/mailman/listinfo/cgdi-dev-net)**.

## For more information

If you have questions, e-mail **[info@geoconnections.org](mailto:info@geoconnections.org)**.

All funding opportunities are listed at **[www.geoconnections.org](http://www.geoconnections.org)**.

You can also sign up for the GeoConnections electronic mailing list at **[www.geoconnections.org/en/subscribeForm](http://www.geoconnections.org/en/subscribeForm)**. You will receive news about GeoConnections and the CGDI. You will also be informed about upcoming workshops and training sessions. Plus, you will be notified as soon as a new opportunity or other relevant item is posted. Subscribe today and stay in the know!

GeoConnections  
615 Booth Street  
Ottawa ON K1A 0E9  
Tel.: 1-877-221-6213  
Fax: 613-947-2410  
E-mail: [info@geoconnections.org](mailto:info@geoconnections.org)  
Web site: [www.geoconnections.org](http://www.geoconnections.org)

© Her Majesty the Queen in Right of Canada, 2008

Cat No. M4-61/2-2008 (Print)  
ISBN 978-0-662-05596-9



Recycled  
paper

