GeoConnections

Geomatics and public safety and security

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Canadian Geospatial Data Infrastructure

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Canada

Applying location-based tools to public safety and security in the 21st century

Today, the public safety and security community can take advantage of the kinds of technologies that underpin Google Earth™ and other popular online mapping applications and services.

Known as geomatics, these underlying technologies bring together surveying, mapping, remote sensing, geographic information systems and the Global Positioning System. Geomatics allows you to create a detailed picture of the physical world and your place in it.

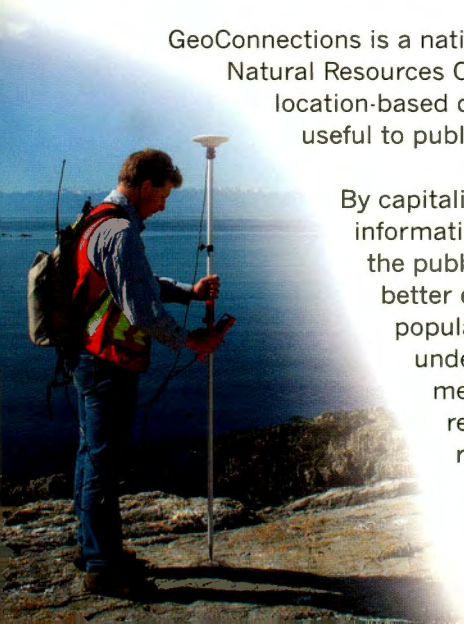
To protect Canadians, the public safety and security community needs to

1. recognize and identify potential threats and risks
2. know what resources are available to deal with those risks
3. know where these resources are located so it can respond to an emergency effectively

Geomatics plays a vital role in building this knowledge base.

GeoConnections is a national partnership program led by Natural Resources Canada. It focuses on helping make location-based data and technologies accessible and useful to public safety and security decision-makers.

By capitalizing on location-based (or geospatial) information, such as maps and satellite images, the public safety and security community is better equipped to identify threats to Canada's population, infrastructure and environment; undertake preventative and mitigative measures; coordinate emergency resources; and respond to and recover from disasters.



"There is an increasing need for inter-jurisdictional co-operation and information sharing when managing threats and hazards. Location-based information provides the basis for information exchange, shared situational awareness, interoperability and integration of effort across mandates and jurisdictional boundaries."

Ernie MacGillivray, Director, New Brunswick Emergency Measures Organization

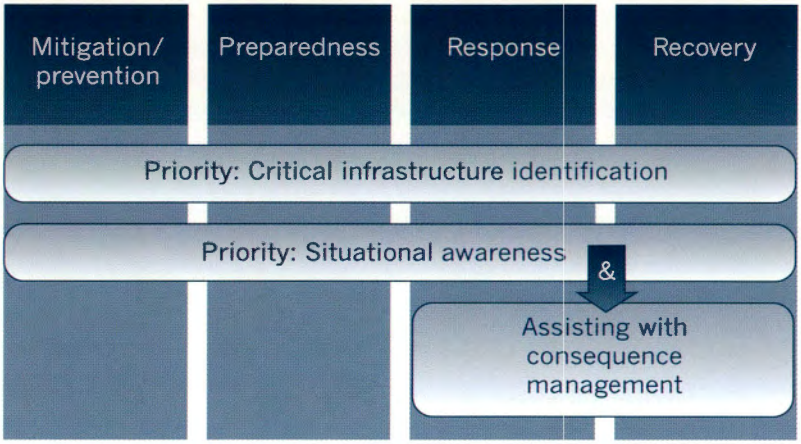
Location-based information assists emergency management

To support the public safety and security community, GeoConnections is focusing on the following two emergency management priorities:

- critical infrastructure identification
- situational awareness and assisting with consequence management

As Figure 1 illustrates, these priorities span the four phases of emergency management: mitigation/prevention, preparedness, response and recovery. Location-based information helps the public safety and security community anticipate problems and implement preventative measures, better prepare for emergencies, respond quickly and effectively when emergencies arise, and manage recoveries efficiently.

Figure 1: Addressing the four phases of emergency management



Critical infrastructure identification

Canadians rely on highly connected and interdependent infrastructures, such as pipelines, transportation networks and electrical power networks – infrastructures increasingly at risk from human-induced threats and natural disasters. To plan responses and manage emergencies, the public safety and security community needs location-based information about critical infrastructures. And public authorities with protection responsibilities need this information to effectively address security and emergency management priorities.

Numerous government agencies and private companies hold information about Canada's energy, transportation, water and other infrastructures. However, this information is not easily accessed and shared. GeoConnections is working with the public safety and security community to ensure that it has access to the kind of location-based critical infrastructure information it needs.

GeoConnections has developed standardized methods of exchanging, merging and mapping location-based infrastructure data. These methods use the Internet without the need for a centralized database. Based on the recommendations of emergency management agencies and private infrastructure operators across Canada, GeoConnections has initiated a national approach to exchanging location-based information – information that describes Canada's infrastructure within the public safety and security community.

With access to this data, emergency managers can obtain valuable information from the owners of critical infrastructure. This information helps them carry out their protection responsibilities, improve their situational awareness and better understand the interdependencies and interconnections of the infrastructure.

Situational awareness and assistance with managing consequences

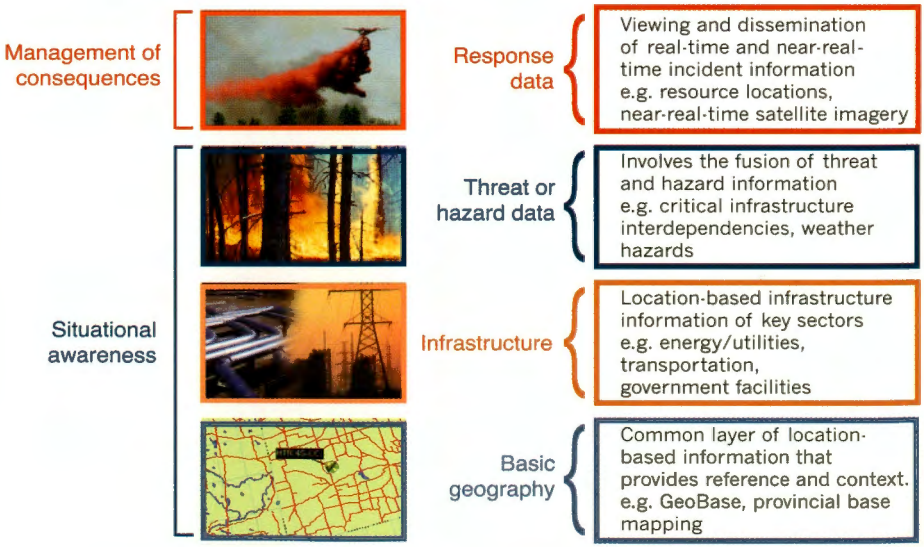
To manage and respond to threats and hazards, the public safety and security community needs to be aware of the situations it faces. By equipping itself with location-based information that improves this awareness, it can better predict, detect, prepare for and respond to public safety threats.

Emergency management organizations from different jurisdictions also need to co-operate and share information. Location-based information can give the public safety and security community a common operating picture – a common perspective that helps multiple agencies collaborate while planning for and responding to threats and disasters.

GeoConnections is working with the public safety and security community to increase situational awareness using location-based information.

As Figure 2 reveals, situational awareness requires analysing location-based information about basic geography, infrastructure, and threats and hazards. Managing the consequences of a disaster requires accessing and disseminating incident information in real time. Geomatics enables the public safety and security community to merge or overlay these types of information. This capability equips Canada's public safety and security community with the ability to better understand threats and then to react swiftly and effectively when emergencies strike.

Figure 2: Key elements of building situational awareness



Situational awareness projects

To manage emergencies, the public safety and security community needs to know what information is available for sharing. And it needs to share this information easily. To support GeoConnections' priorities – situational awareness and assistance with managing consequences – the program co-funds projects geared toward accomplishing these goals. Two such projects are described below.

Public Safety Canada Multi-Agency Situational Awareness System

The Multi-Agency Situational Awareness System will allow the public safety community to share and access location-based information. The project provides a common operating picture of the public safety and security environment. It also enables the public safety and security community to share plans, procedures, data, information, services and technologies held in various locations and departments. This capability will help this community to better coordinate emergency responses and make more appropriate decisions. Delivered over the Internet, the location-based information will help the public safety and security community better predict, detect, assess and respond to threats.

The Saskatchewan Situational Awareness Application for Coordinated Emergency Response

The Saskatchewan Situational Awareness Application for Coordinated Emergency Response project will develop a public safety and security location-based system for Saskatchewan and its local, regional and provincial/territorial partners. The location-based system will enable these partners to better manage emergencies and reduce the threat to people, property and infrastructure. This project is built on standards endorsed by the Canadian Geospatial Data Infrastructure (CGDI). As such, the project offers an approach that is applicable to the public safety and security community across Canada.

This community needs to co-operate closely and access location-based data during emergencies. This project will enable them to do so. Several departments and Crown corporations have location-based information of value to others in the public safety and security community, but it is often available only internally. This project will develop a province-wide system to enable the public safety and security community to access all of this information in a Web-based environment during emergencies.

GeoConnections – tying it all together

GeoConnections is a national partnership and funding initiative led by Natural Resources Canada. This program provides Canadians with location-based data, tools and services over the Internet.

First launched in 1999, GeoConnections was formed as a national collaboration to develop an online resource called 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 safety and security
- public health
- environment and sustainable development
- matters of importance to Aboriginal peoples

GeoConnections meets its objectives largely by co-funding projects. The projects encourage the program's four key audiences to collaborate with the Canadian geomatics community in developing solutions for decision-makers.

For more information about GeoConnections funding opportunities, visit ***www.geoconnections.org.***

Did you know?

GeoConnections has established an advisory committee of senior officials to ensure that the program helps meet the planning and decision-making needs of the public safety and security community. The committee represents the sectors for critical infrastructure protection; federal, provincial/territorial and local government emergency management; natural hazards; and academic research.

The CGDI – a foundation for data sharing

The CGDI consists of the technologies, policies, applications, services and tools needed to promote the sharing of location-based data. These data may be exchanged between and throughout all levels of government, the private and non-profit sectors, and the academic community.

Today, GeoConnections' goal is to grow the CGDI into an effective resource that helps decision-makers in its four key areas tackle some of Canada's most pressing challenges. To that end, the program is striving to ensure that the public safety and security community can take full advantage of the CGDI for emergency management.

How can you take advantage of the Canadian Geospatial Data Infrastructure?

This online resource lets you discover, access, map and share interoperable location-based data. For example, the public safety and security community can use the CGDI to

- **seamlessly share location-based information with other agencies during emergencies to support a coordinated response to incidents**
- **instantly integrate situational awareness data – including such real-time data as weather information – to make strategic decisions in response to emergencies, such as notifying and evacuating neighbourhoods in the event of a chemical spill or forest fire**
- **access information depicting critical facilities, communications and utilities systems, and vital government resources**

Contact us

If you have questions, e-mail **info@geoconnections.org**.

All funding opportunities are listed at **www.geoconnections.org**.

You can also sign up for the electronic mailing list at **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!

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