

# Consolidating Canada's Geoscience Knowledge Program - Contributions to the Canadian Geoscience Knowledge Network

---

by *E.C. Grunsky, J.D. Rupert and M.A. Williamson*

## INTRODUCTION

Two critical factors influence Canada's global competitiveness for mineral and energy exploration and the soundness of its sustainable development decisions. These include the nature and scope of partnerships it develops with the provinces and territories, industry, academia and the public; and access to its comprehensive resource geoscience knowledge base. The program, Consolidating Canada's Geoscience Knowledge (CCGK) contributes to these factors through establishing and promoting mechanisms for more efficient and effective discovery, access, delivery and management of the federal components of Canada's resource geoscience data, information and knowledge. As part of its mandate, the CCGK program is jointly developing an implementation plan for the Co-operative Geological Mapping Strategies (CGMS). The CGMS seeks to define new partnerships between federal, provincial and territorial agencies, industry and universities to jointly deliver geoscience knowledge as the basis for fact-based decision making which impact on social, economic, environmental and policy sector needs and priorities.

The Canadian Geoscience Knowledge Network (CGKN <http://cgkn.net>) is an initiative of the National Geological Surveys Committee (NGSC) that provides an Internet portal to Canadian geoscience information. The CGKN is based on the concepts of information discovery and access of geoscience information using protocols developed for access to information using the world wide web. The NGSC have

coordinated partnerships with the federal, provincial, and territorial government agencies, as well as private-sector organizations establishing a nationally comprehensive network in CGKN. The CGKN is partnered with GeoConnections, which is responsible for the Canadian Geospatial Data Infrastructure (CGDI). The CGDI defines the standards, protocols and infrastructure by which geospatial information is managed and delivered using the world wide web. Using the analogy of a motor vehicle highway, the CGDI has built the highway and written the traffic rules. The CCGK and CGKN are the transport trucks that use the highway to deliver the goods and inevitably need to operate using agreed to protocols and standards.

Both the CCGK program and the CGKN operate on the principles of providing access to geoscience information through a distributed network of internet servers. For the CCGK, the Geoscience Data Repository (GDR) suite of projects is the primary mechanism for delivering distributed data. Data standards and delivery protocols have been defined within the GDR and closely adhere to those established for the CGKN.

The early developments of the federal components of the CGKN were based on the initial success of the Canadian Geoscience Publications Directory. The Ressources GSC program (1998 to 2001) supported initial efforts to deliver geoscience data and information over the world wide web. During this early development the standards and tools used for the Ressources program were closely matched by those of the CGKN. Similar activities were being car-

ried out by other provinces including British Columbia, Ontario and Newfoundland. It was recognized early on, that a coordinated development of web sites from the provinces and territories and the federal government would provide maximum benefit to stakeholders and clients by minimizing gaps and obstacles when searching, querying and viewing geoscience data from a number of websites across several levels of government.

The primary goals of the CGKN are to:

- ◇ provide a single Internet portal for the discovery and evaluation of geoscience data,
- ◇ link the client to the data provider,
- ◇ provide the infrastructure, tools and standards for the integration and use of geoscience knowledge,
- ◇ establish national standards for terminology and exchange of geoscience data that are compatible with the Canadian Geospatial Data Infrastructure (CGDI) as defined by GeoConnections,
- ◇ allow agencies to exchange and access consistent, standardized information,
- ◇ provide national coverage of regional scales for key data types,
- ◇ allow access to NGSC data holdings through CGKN and CGDI services,
- ◇ enable NGSC members to deliver geoscience information independently or within CGKN,

A number of working groups have been established to meet these goals. The working groups are composed of provincial/territorial/federal representatives who are developing standards and tools for key geoscience data types. National coverage for these key data types include bedrock geology, surficial geology geochemistry, geophysics, geochronology, mineral deposits, a stratigraphic lexicon and a metadata catalogue. Access to these data will be provided through the CGKN portal. Federated data schemas are initially used to view several key data types for the whole of Canada. When a client requests to view key data at the provincial/territorial level, they are automatically directed to the provincial/territorial host server, which provides more detailed information.

Many of the activities underway in the CCGK therefore work toward the federal contribution to the CGKN. Current projects are aimed at updating information and providing web-based access to data and knowledge that complements the goals of the CGKN. Some current CCGK projects include:

- ◇ Achieving appropriate levels of governmental geoscience through cooperative geological map-

ping. This is the project seeking to develop a joint implementation plan for the Cooperative Mapping Strategies.

- ◇ Energy Resources - Status of Knowledge and Consolidation and synthesis of mineral deposits knowledge. These two projects seek to establish and prioritize resource geoscience knowledge gaps.
- ◇ Co-ordination of the Geoscience Data Repository and the Earth Sciences Sector's contribution to the Canadian Geoscience Knowledge Network. This project and the 4 listed below are establishing the necessary infrastructure for the Geoscience Data Repository projects referred to earlier.
  - ✓ GDRIS for ESS Geophysical and Geochemical Data
  - ✓ Geoscience Information System for Energy and Mineral Resources
  - ✓ Geoscience Field-to-Curation Information Management System.
  - ✓ Integrated Information System for Bedrock, Surficial, Geochronological, Stratigraphic and Paleontological data

The investments made by the CCGK program towards providing effective and efficient access to federal geoscience data/information holdings should be viewed as a down payment toward an eventual system that will allow comprehensive integrated access. By March 2005, the CCGK Program anticipates the following to have been accomplished

- ◇ The Web services mentioned below (Web mapping and Z39.50) allow for the GDR information to be shared by other applications such as the GeoConnections Discovery portal and in the future the Atlas of Canada. This forms part of the federal contribution to the CGDI.
- ◇ A central portal to discover the information held within GDR databases and to direct clients to GDR applications and services,
- ◇ National Aeromagnetic Database - free on-line viewing and download of gridded datasets - Web mapping & Z39.50 services,
- ◇ National Gravity Database - free on-line viewing and download of gridded datasets - Web mapping & Z39.50 services,
- ◇ National Radiometric Database - free, on-line viewing and download of gridded datasets Web mapping & Z39.50 services,
- ◇ Access to Lithoprobe holdings. - Z39.50 services,
- ◇ Mirage - over 4000 geoscience map images available on-line for viewing and free download - Z39.50 service,
- ◇ On-line access to rock properties database,

- ◆ On-line internal publishing process for sign-off and metadata capture,
- ◆ On-line web access to consolidated energy data and information in BASIN and SWELLS and Coal inventory,
- ◆ On-line access to a database of well-studied Canadian deposits including information on deposit size range, quality, development footprints and life-span. This will provide a dynamic corporate data source that can be updated from minerals projects as new information is created and to support resource assessment,
- ◆ Direct database links to the Mines and Metals Sector databases of production and reserves to enhance classified deposits with the bases for value range analysis,
- ◆ A seamless CGKN view of provincial/territorial databases of mineral deposits and occurrences tailored for online discovery and interoperable access. ,
- ◆ Working version of Field Sample Data Capture Software (Quaternary),
- ◆ Working version of Field Sample Data Capture Software (Bedrock),
- ◆ Working version of LIMS field sample tracking system,
- ◆ Working version of field sample curatorial system,
- ◆ On line, Digital, spatially referenced indexes of bedrock and surficial geological maps published by the Geological Survey of Canada that will be searchable by author, scale, publication data, NTS sheet, geographic region, and a comprehensive indicators of the amount of information on each map,
- ◆ On line digital, spatially referenced index of the major Paleontological publications by the Geological Survey of Canada, and of previously lit-

tle known internal paleontological reports is being prepared for public Internet access. This index will be searchable by author, publication data, NTS sheet, geographic region, and comprehensive keyword sets of the type of information contained in each report (*e.g.*, major fossil group, stratigraphic units, time period),

- ◆ An on-line lexicon of Canadian geological units, compiled as a database from published and unpublished sources through the Canadian Geoscience Knowledge Network web site [www.CGKN.net](http://www.CGKN.net),
- ◆ Canadian Geochronological knowledgebase, about 95% complete for Canada

Canadian Paleontological knowledgebase, for selected areas of Canada where other Programs require this information,

- ◆ Extensive use by other Programs (such as GOM, NRD) of the GDR framework and capabilities to deliver maps and information sets,
- ◆ Recommendations to ESS management on the preferred options for ongoing development, operation and maintenance of the GDR as a multi-program IM tool and service.,
- ◆ Recommendations for ensuring ongoing Programs deliver consistently to GDR specifications.

Comprehensive review and recommendations of energy and mineral legacy data issues and priorities.

These projects all contribute to the goals of the CGKN and the requirement to provide public access to geoscience data and knowledge. An expected outcome for the CCGK will be the establishment of processes by which all federal resources geoscience information will be delivered using the principles set by the CGKN.