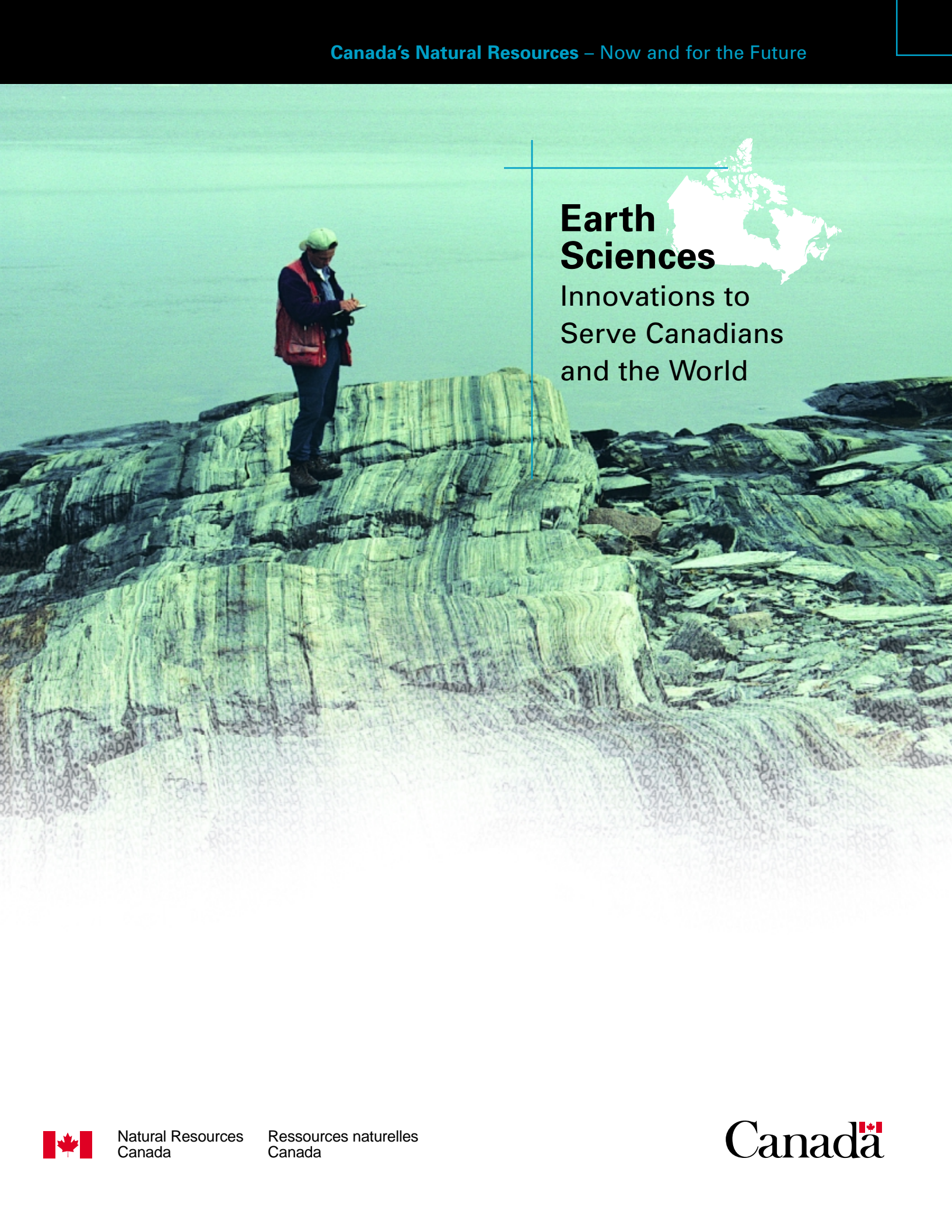


Earth Sciences

Innovations to
Serve Canadians
and the World



Natural Resources
Canada

Ressources naturelles
Canada

Canada 

Earth Sciences @ Natural Resources Canada



Natural Resources Canada (NRCan) is a world leader in geoscience, geodesy, mapping, surveying and remote sensing. It works in partnership with governments at all levels across the country, and with Canadian industry and universities to provide the earth sciences knowledge base and expertise needed to manage Canada's rich resources and environment for the benefit of present and future generations.

NRCan has three world-renowned organizations working in the earth sciences:

- The Geological Survey of Canada, Canada's national agency for geoscience information and research, is a key player in building a comprehensive geoscience knowledge base about Canada's landmass and offshore.
- Geomatics Canada provides spatial positioning, legal surveys, maps, remotely sensed data and geographically referenced information describing the Canadian landmass and offshore.
- Polar Continental Shelf Project operates a logistics support network for scientists conducting a wide variety of research in the Canadian Arctic.



Doing Business with NRCan

The Canadian earth sciences community is a major contributor to the Canadian economy and a respected and competitive player in international markets. "Made in Canada" earth sciences products and services are used throughout the world.

NRCan makes its earth sciences expertise available on a collaborative and cost-recovery basis. In the case of collaborative projects, it works closely with partners sharing costs and expertise on projects of mutual interest. A major goal is to help Canadian companies succeed internationally in the global market. Towards this end, NRCan makes its unique earth sciences expertise and facilities available on a cost-recovery basis.

For more information, contact:

Business Development Office
Earth Sciences Sector
Natural Resources Canada
615 Booth Street
Ottawa, Ontario K1A 0E9
Canada

Telephone: (613) 996-7643

Fax: (613) 995-8737

Email: business.ess@nrcan.gc.ca

Website: www.nrcan.gc.ca/ess/business

EARTH SCIENCES

Geomatics @ Natural Resources Canada

Geomatics is the science and technology of gathering, analyzing, interpreting, distributing and using geographical information. At NRCan, the organizations which make up Geomatics Canada are the Canada Centre for Remote Sensing, Mapping Services Branch, Geodetic Survey Division and Legal Surveys Division.

Geographic Information Systems (GIS) were developed and pioneered in Canada close to 30 years ago. GIS uses computer technology to integrate, manipulate and display a wide range of information and provides users with a powerful tool with which to archive, manipulate, integrate, analyze and visualize both the spatial and statistical characteristics of data. Many countries apply Canadian expertise in GIS to areas such as forestry, the environment and geoscience.

NRCan's mapping experts maintain the national topographic component of the Canadian Geospatial Data Infrastructure (CGDI) and provide access to it for all Canadians. They create quality topographic information to identify, represent and monitor changes to the landscape of Canada. These products, services and tools allow for the best use of Canada's topographic information by a wide range of clients.

NRCan is also the leading supplier of aeronautical geospatial information, offering complete national coverage and the highest



quality product to their customers. As the custodian of the National Air Photo Library, NRCan archives aerial photography and offers reproduction and distribution services. The Secretariat for the Geographical Names Board of Canada, the national place-naming authority, is provided by NRCan.

Global positioning technologies, such as the Global Positioning System (GPS), use a constellation of satellites whose signals have revolutionized the way we move people, goods and information; build communities; manage the environment; predict the weather and natural disasters; and respond to emergencies.



Partnerships for Geographic Information

GeoConnections is stimulating partnerships to develop the Canadian Geospatial Data Infrastructure (CGDI), a framework that will coordinate Canada's many geographic information databases and make them accessible through a common Internet window.

www.geoconnections.org



NRCan maintains the Canadian Spatial Reference System (CSRS), the national standard and foundation for precise positioning. Providing for high accuracy and global compatibility in positioning, the CSRS uses a leading-edge network of GPS tracking stations, quasar measurements and other advancing technologies, and is fundamental for the seamless and economical compatibility of spatially related information from diverse sources.

Global positioning technologies have many potential applications linked to natural resources, environmental monitoring, forest management, precision farming, and navigation.

NRCan is a recognized world-leader in remote sensing activities. Canada's earth observation satellite, RADARSAT-1, and two satellite receiving stations are used in a wide range of research to study environmental change and to support natural resource sustainability. NRCan is also leading an international pilot project for global observation of forest cover, and is carrying out research in forest biodiversity and forest health monitoring.

A Canadian program is building radar remote sensing capacity in participating countries, with a focus on training and technology for planning and resource management. Applications range from enhanced crop forecasting in Poland to

disaster monitoring in Bangladesh. These activities often lead to long-term research cooperation between Canada and participating countries.

Canada was one of the first nations to have a national atlas and the first to make it accessible on the World Wide Web. The National Atlas of Canada is a powerful communications tool describing the environmental, economic, social and cultural make-up of Canada.

NRCan establishes standards and maintains the high quality of legal surveys through the Canada Lands Survey Act and other legislation. This obligation is fulfilled by working in partnership with industry, and using the latest technologies. Such innovative approaches allow the Canadian government to respond to the needs of aboriginal groups, territorial governments, resource industries, and other government departments in defining and administering rights to property in Canada Lands. In cooperation with the provinces and the United States, Canada also maintains the demarcation of inter-provincial and international boundaries.

Visit www.nrcan.gc.ca/geocan/ for more information about Geomatics Canada programs and how to contact its offices.

EARTH SCIENCES



Geoscience @ Natural Resources Canada

The Geological Survey of Canada (GSC) has an extensive capability in onshore and offshore geoscience surveys and in interpreting and managing geoscience information. This expertise is applied to assessments of energy and mineral resources, natural hazards, and environmental issues such as climate change.

Deciphering and understanding the geology of the Canadian landmass and offshore is an immense task that no single agency in Canada can accomplish alone. Accordingly, the GSC works in close cooperation with partners at all levels of government across Canada, industry and the universities.

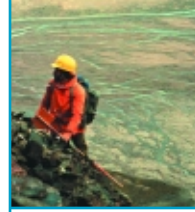
These networks provide the vital synergies that move Canadian geoscience research forward in a cost-effective and dynamic manner. Building on the strengths of many is the new standard for geoscience research. The driving force of the GSC's work is to provide national leadership and coordination in activities addressing major geoscientific questions that are national or broadly regional in scope.

The work of the GSC and its partners supplies the national geoscience knowledge base required to support effective natural resource exploration and development across Canada. These efforts are essential to promoting the discovery of new mineral, energy and groundwater resources.

Partnerships for new applications

Geoinnovations, a partnership program with Canadian industry, brings together expertise and technology to spur the development of new applications, tools and services for the Canadian Geospatial Data Infrastructure (CGDI) and to promote the growth of Canada's geomatics sector.

www.geoconnections.org



Partnership bringing geoscience online

The **Canadian Geoscience Knowledge Network** is a major national partnership initiative to create a one-window portal to Canadian geoscience information and the data holdings of all Canada's geological survey agencies. An online Publications Directory provides an extensive catalogue of geoscience maps and publications.

CGKN.net

To promote new mineral discoveries, the GSC works with its partners to fill key gaps in geoscience knowledge, both at the regional scale and in specific mining districts. It also carries out thematic studies, with priority currently given to studying mineral deposits of particular significance to Canada, linking ore-forming processes to the tectonic setting, and post-mineralization processes.

In the realm of energy, the GSC's role lies in supporting improved efficiency of exploration and development in Canada's East Coast and the North. Effort is being brought to bear on alternate energy sources, with an emphasis on coal bed methane and gas hydrates.

Water resources are an area of increasing importance to the GSC. Programs focus on regional mapping of Canada's key aquifers with the goal of filling gaps in understanding how much groundwater is available, how it is stored, and how it moves in ecosystems. This work relies upon new networks that pull together scientists from geoscience and environmental agencies across Canada.

The work of the GSC and its partners also provides the geological basis necessary to understand and address health, safety and environmental issues. A major focus is to understand and support efforts to manage the risks posed by natural hazards in the environment such as earthquakes, landslides and volcanoes, and to provide information that underpins emergency preparedness efforts. The GSC is responsible, nationally, for monitoring earthquakes and geomagnetic storms,

and for compliance with the international nuclear test ban treaty.

The GSC is called upon to provide knowledge and expert advice concerning issues of environmental protection that fall under the jurisdiction of the Canadian Government. These include, for example, reviews of proposed resource and infrastructure development, and assessment of risks posed by toxic substances.

The GSC contributes to national priorities in climate change by providing geoscience information that supports policy and decision making related to the reduction of greenhouse gases and minimizing the impacts of climate change on Canada. It also contributes to the development of strategies to adapt to changes resulting from a warming climate.

Like all science agencies, the GSC is adjusting itself to times of fast-paced and dramatic change in terms of information delivery. An increasingly "plugged in" world requires that the GSC meet the challenge of handling many aspects of its scientific work through the Internet and other digital media. Current effort is focused on developing standards and the technological infrastructure needed for effective data management and delivery.

The GSC carries out its far-reaching and diverse portfolio of research with 550 employees working at six facilities across Canada.

Visit www.nrcan.gc.ca/gsc for more information about the GSC and how to contact its offices.

EARTH SCIENCES

Polar Operations @ Natural Resources Canada

Polar Continental Shelf Project (PCSP) provides coordinated logistics support and advice to Canadian government, independent and university groups, and on a cost recovery basis, to industry groups and those from outside of Canada undertaking scientific research in the Canadian Arctic.

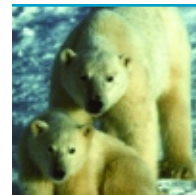
Since its creation in 1958, PCSP has helped thousands of scientists to work in otherwise inaccessible locations in the Canadian North and to learn about a region covering more than one-third of Canada's landmass and offshore. From its bases at Resolute Bay in Nunavut and Tuktoyaktuk in the Northwest Territories, PCSP coordinates aircraft and other field requirements for scientists conducting research into such disciplines as archaeology, anthropology, biology, botany, environment, oceanography and geology, among others.

The knowledge gained by scientists supported by PCSP has helped Canada establish claims to offshore hydrocarbon and mineral resources, identify safe

shipping routes into northern communities, establish National Wildlife Areas and Migratory Bird Sanctuaries, identify pollution sources and their effects on the northern food chain, and preserve the traditional knowledge of the North's aboriginal inhabitants.

PCSP supports researchers from a wide variety of circumpolar nations and other countries with Arctic and polar interests, many working in partnership with Canadian colleagues. On Canada's behalf, PCSP fosters collaborative research under the Arctic-Antarctic Exchange Program in order to encourage scientific exchanges between Canadians with Arctic and polar research interests and their Antarctic colleagues.

Visit polar.nrcan.gc.ca for more information about PCSP.



Opening doors to Earth Sciences Information

NRCan's **Earth Sciences Information Centre** has Canada's largest collection of books, journals, maps, atlases and photographs in the earth sciences, with world-wide coverage. Clients may access many products and services through the Internet, for example, the Library Catalogue, the GEOSCAN database with over 40,000 bibliographic records, reference services, and document delivery.

www.nrcan.gc.ca/ess/esic



www.nrcan.gc.ca

© Her Majesty the Queen in Right of Canada, 2001

Catalogue Number: M22-137/2001-2E

ISBN: 0-662-30031-9

