Natural Resources Canada’s Earth Sciences Sector

- Expertise at the service of Canadians to access, understand, and use Earth science information to deal with economic, environmental, and social changes.
  - Geological Survey of Canada… *Canada’s National Geoscience Agency since 1842*
  - Geomatics Canada … *provides maps of, and geographic information on, Canada’s landmass and offshore*
  - Polar Continental Shelf Project … *support arctic research*
ESS Offices

EARTH SCIENCES SECTOR COMPONENTS
- Geological Survey of Canada
- Geomatics Canada
- Polar Continental Shelf Project

Natural Resources
Canada

Ressources naturelles
Canada

Canada
ESS contributes to all three of NRCan’s Strategic Outcomes

- **Economic Development**
  - Geoscience is used to help stimulate the exploration and development of new energy and mineral resources

- **Environment Responsibility**
  - Geoscience is used to understand environmental issues and reduce risks to the environment

- **Safety Security and Governance**
  - ESS science and knowledge are used to help Canada adapt to a changing climate, the risks of natural and man-made hazards are reduced, and basic infrastructure is provided to support the governing of Canada.
ESS has a key role to play in NRCan’s Priorities

PROGRAMS AND ACTIVITIES

- Legislated Environmental and Resource Assessments (LERA)
- Environmental Geoscience program
- Green Mining Initiative
- Targeted Geoscience Initiative (TGI)
- Offshore Geoscience Program
- Gas Hydrates Program
- Groundwater Geoscience Program
- Polar Continental Shelf Program (PCSP)
- Geo-mapping for Energy and Minerals (GEM)
- UN Convention on Law of the Sea (UNCLOS)

DEPARTMENT PRIORITIES

- Regulatory System
- Competitive Resource Sectors
- Development in the North
Economic Development

Geoscience is used to help stimulate the exploration and development of new energy and mineral resources.
Economic Development

Geoscience Exploration
- Targeted Geoscience Initiative
- Offshore Geoscience
- Gas Hydrates

Northern Development
- Geo-mapping for Energy and Minerals
- Polar Continental Shelf Project
- Canada-Nunavut Geoscience Office
Targeted Geoscience Initiative 4: Objectives

- Improved exploration models where gaps exist in our understanding of Canada’s major mineral systems
- Improved methods for detecting buried mineral deposits
TGI4 – An Ore Systems Approach

- Allows the consideration of all scales of processes that control the development of a mineral district.
- More than one mining camp can be included within a single ore system study in order to use optimum examples from across Canada.
- Develop multi-disciplinary expert teams from across Canada to focus on specific ore systems.
TGI4 Framework

- Create knowledge and techniques to better understand, model and detect Canada’s major mineral systems
- Focus on areas of highest mineral potential as defined by established and emerging mineral districts
- Include all non-ferrous commodities, i.e. base, precious and rare metals
- Program focus influenced and defined by the research needs of national and international exploration and mining companies (e.g. CMIC).
- High priority on partnering: provinces/territories and academia; training of students
Offshore Geoscience

- Facilitate offshore development activities through provision of geological information about the seafloor
  - Seafloor environment
  - Seafloor hazards to built infrastructure
  - Seafloor marine benthic habitat
  - Collaborations with Ocean Networks Canada on NEPTUNE and VENUS
Gas Hydrates

- Evaluate the feasibility of producing land-based gas hydrates resources by depressurization
- Test well at Mallik, NWT
- Future steps: possible long-term production tests.

- Natural gas contained in Canadian gas hydrate deposits: ~1755 to 25,836 TCF* (Majorowicz and Osadetz, 2002; Ossetz and Chen, 2005)
Geo-Mapping for Energy and Minerals (GEM)

- Increase the economic prosperity of Northern Canada through stable, long-term investment in natural resources development
- Mapping 60% of the North to modern standards over 10 years - with approval received for first five years
- Multi-metals, diamonds, conventional petroleum
- Major, multi-year field work, massive data acquisition
- Training for the next generation of highly-qualified geoscientists
- Catalyst for developing and adopting new approaches to managing information throughout its life cycle
GEM Knowledge Management

Field Project Process
Information Mgmt

Geoscience

Knowledge Information
Data Collections

Discovery - Access
Application - Use Understanding
Polar Continental Shelf Project

- Provide logistical coordination and a northern base to support Arctic research
Groundwater Mapping

- Complete assessment of 30 key regional aquifers
  - Aquifer assessments
  - Data and information integration and dissemination
- Integration with the Provinces and Territories
- Methodologies for aquifer assessment
Public Safety Geoscience and Hazards

The risks of natural and man-made hazards are reduced

- Public Safety Geoscience Program
- Canadian Hazard Information Service
Opportunities for Collaboration

- Geological mapping: boots on the ground, knowledge management
- Methodologies for pre-competitive mineral exploration
- Environmental geology
- Gas hydrates
- Developing the next generation of highly-qualified Canadian Geologists (RAP, FSWEP, PDF)