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Canada

Ressources naturelles  
Canada



# Geological Survey of Canada

## Lands and Minerals Sector

### Natural Resources Canada

OneGeology, June 2018

# Geological Survey of Canada



## Mission

*“The Geological Survey of Canada provides public geoscience knowledge to sustain the exploration effectiveness and international competitiveness of the mineral and energy sectors, inform the stewardship of onshore and offshore lands, and increase the safety and security of Canadians.”*

## Vision

*“To sustain and extend Canadian prosperity and well-being through internationally authoritative and accessible geoscience, anchored in a continuously improved understanding of earth dynamics and natural resources.”*

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# GSC offices across Canada

Over 400 employees, in six Divisions across Canada – A networked organisation connected to P/T, Academia, Industry, NGOs

Leverages a wide range of HQP geoscience expertise and fixed S&T assets: offices, laboratories, curation, libraries, IT/IM, to carry its work across the nation.



- GSC-Pacific**
- Vancouver
  - Sidney

**GSC-Calgary**

 Canada- Nunavut Geoscience Office in Iqaluit (Part of Northern Division)

- GSC\_Atlantic**
- Halifax

**UNCLOS Program**

**GSC-Quebec**

- Québec City

**GSC-Central**

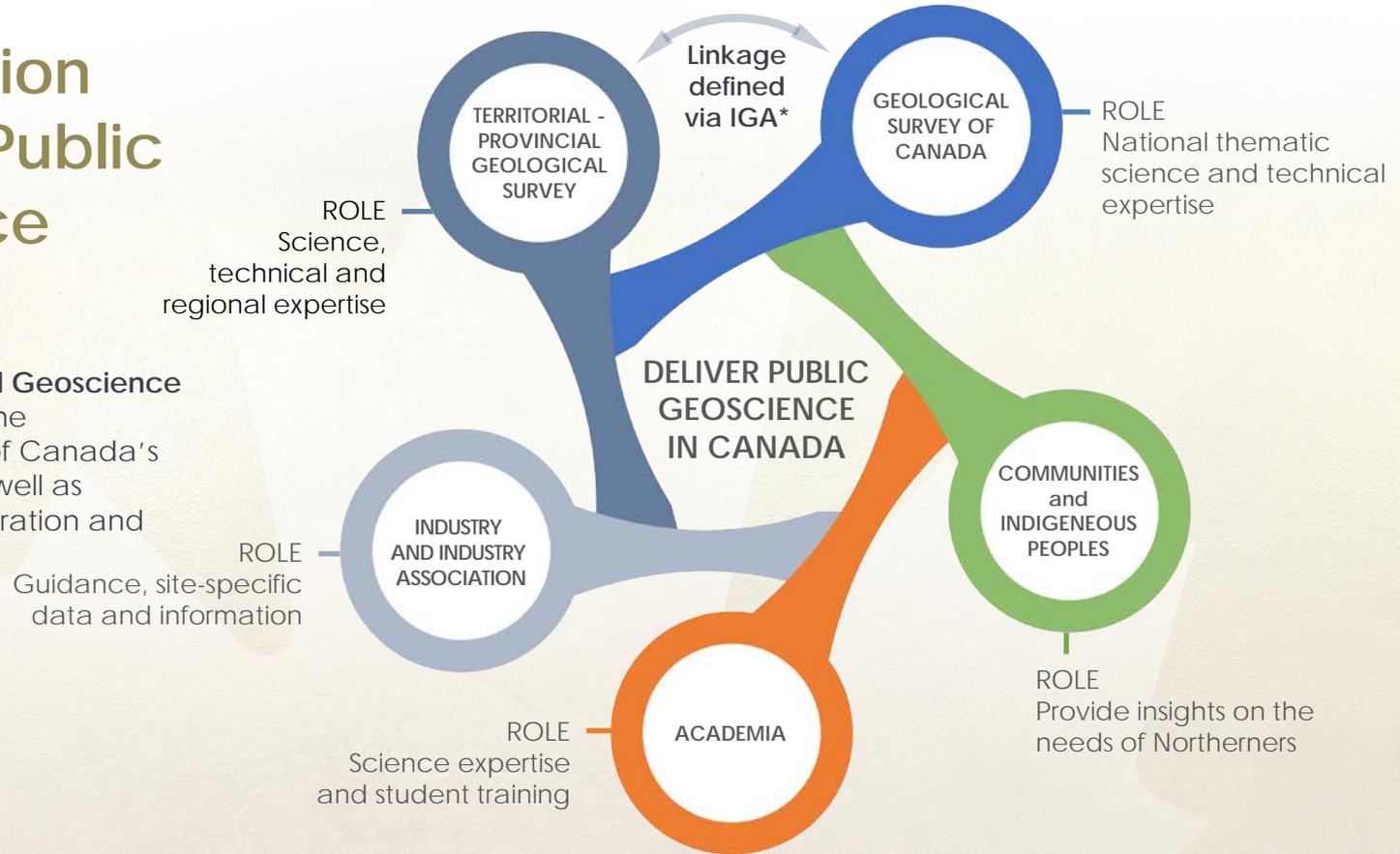
**GSC-Northern**

- Ottawa

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# Collaboration to Deliver Public Geoscience in Canada

\*The **Intergovernmental Geoscience Accord (IGA)** defines the complementary roles of Canada's geological surveys, as well as mechanisms for cooperation and collaboration



# Geoscience Directions to set us on the path to 2023



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# Geoscience Directions to set us on the path to 2023



## Public geoscience gearing up

- for decision making through policy **INTEGRATION**
- for consensus building through scientific **INTEGRITY**
- for socio-economic-environmental dividends through technological **INNOVATION**

Frontier geoscience

Geoscience to inform  
land use decisions

Understanding  
Hazards

Understanding risk

Continued science  
excellence

Contribute to  
indigenous  
reconciliation

Authoritative &  
accessible  
geoscience  
knowledge

Geoscience  
supporting innovation  
to discover new  
mineral resources

Geoscience for low-  
carbon resource dev't

Technologies for early  
warning and  
operational response

Disaster risk reduction  
& climate change  
adaptation

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# Current Programs



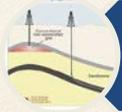
## Geo-Mapping of Energy and Minerals

Complete modern regional-scale geological maps and data sets for Canada's North



## Targeted Geoscience Initiative

Generating geoscience to enhance effectiveness of deep exploration for Canada's key economic minerals



## Geoscience for New Energy Supplies

Using data collected from other programs perform analyses & assessments of energy resources in Canada's frontier basins



## Environmental Geoscience Studies & Assessments

Targeted studies to understand geochemical cycles in the environment (air-soil-rock-water), and technical expertise for assessments



## Climate Change Geoscience

Studies to understand climate change risk to land-based and coastal infrastructure in the North

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# Current Programs



## Groundwater Geoscience

Targeted field work and analyses to assess 30 key aquifers (transboundary, or archetypical)



## Public Safety Geoscience

Underlying causes and impacts of geohazards and their probability of occurrence in Canada's onshore and offshore lands



## UNCLOS: Extended Continental Shelf Program

Mapping the continental shelf beyond 200 nautical miles as an obligation UCLOSE.



## Open Geoscience

Ensures Canadians have freely available access to our geoscience data, information, and knowledge



## Canada in 3D Project

A 3-D compilation of the geology of Canada, and analysis of multilayers of information

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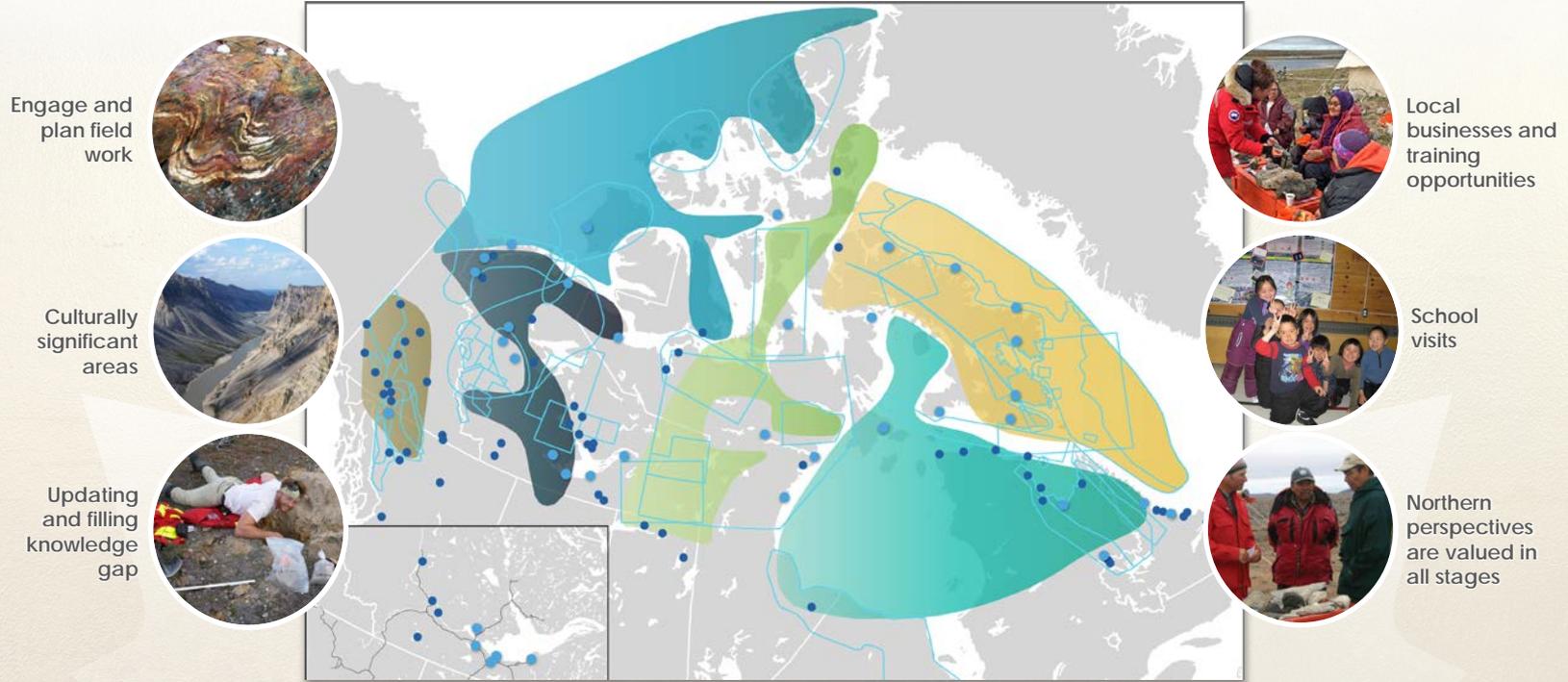


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# Combining science and engagement



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PERMAFROST AND GROUND ICE

- GLACIERS
- CONTINUOUS
- EXTENSIVE DISCONTINUOUS
- SPORADIC DISCONTINUOUS
- ISOLATED PATCHES
- NO PERMAFROST

Permafrost map of Canada  
(Data courtesy of National Snow and Ice Data)



**CLIMATE CHANGE**

Economic development in a changing climate and changing land



**HOLISTIC RESEARCH**

Arctic Science and Traditional knowledge  
Co-development

**INFRASTRUCTURE**

Resiliency  
Transportation  
Reducing risks



**COMMUNITIES**

Building capacity  
Housing



**CLEAN ENERGY**

Reduce dependence on diesel



\$39B

\$631B

# Challenges and Opportunities to Northern Development



# Northern & Arctic Policy Framework



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A plan that helps position Canada as the leading mining nation and lay the foundation for lasting success at home and abroad.



# Next Generation Geoscience



Credit: Canadian Space Agency, 2015



Survey drone Photo Credit: Detour Gold

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# In Canada-3D (C3D) aims to be the national compilation of the geology of Canada

- Authoritative evergreen **synthesis** of CAN geology
- One-stop **web access** to CAN geology
- Integrating data and knowledge from multiple sources



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An international collaboration agreement was initiated between GSC and the Australian ARC LINKAGE project, under the auspice of OneGeology in order to advance 3-D modelling

Joining resources and leveraging technology and expertise will contribute to

- Accelerate and improve efficiency in national efforts
- Facilitate the establishment of common framework and standards, and of decision support tools for the development of mineral and energy resources
- Broaden the audience of national projects, such as Canada in 3-D ,by integrating C3-D mapping with OneGeology web-portal thereby increasing the impact of GSC research
- Broaden open data and access benefits for Open Science

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