



Natural Resources
Canada

Ressources naturelles
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Clean Growth Program

Geological Survey of Canada (Calgary)

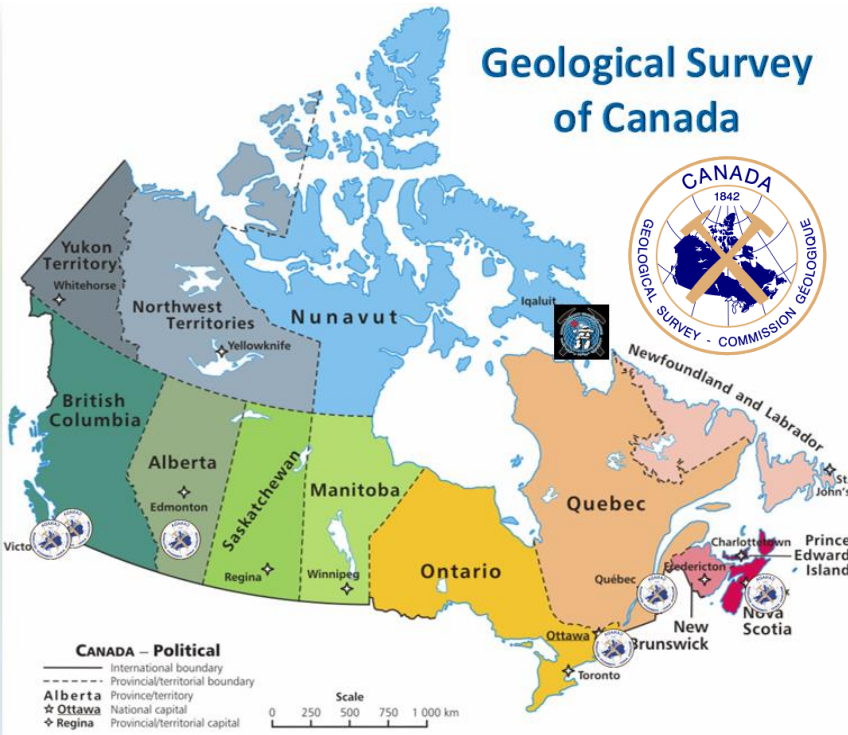
Sonya Dehler, PhD
Director

NATURAL RESOURCES CANADA



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Geological Survey of Canada



IQALUIT

- Canada–Nunavut Geoscience Office

HALIFAX

- GSC-Atlantic

QUÉBEC

- GSC-Québec

OTTAWA

- GSC-Central
- GSC-Northern

CALGARY

- GSC-Calgary

VANCOUVER

SIDNEY

- GSC-Pacific

- GSC Shared Lab Network (SLN)
 - Science laboratory facilities are shared and optimized amongst the 7 GSC Divisions
 - Provides efficient access to a wide variety of laboratory analyses and tests
- National Programs access GSC expertise as required from any of the 7 GSC Divisions

**Total of 400 staff, in seven
locations across Canada**

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Geological Survey of Canada in Calgary

Mandate: To provide public geoscience knowledge to **advance sustainable resource development**, enable **competitive mineral and energy resource sectors**, promote **clean and healthy environment** and **keep Canadians safe**.

Science & Policy Integration

- Coordination on Key Government Priorities: Lands Governance, Protecting Canadians, Sustainable Resource Development, Horizontal Priorities
 - Strategic Partnerships Management: AB, SK, CAPP, NEB
- Stakeholder Engagement: Internal/External (national and international)
Science Planning Officer: Barbara Medioli

Earth Information Subdivision

Head: Dr. Carl Ozyer

Energy Geoscience Subdivision

Head: Dr. Edward (Ted) Little

Operations

- Technical Services: building ops, training, OH&S
A/Manager: Isabelle Blanchette



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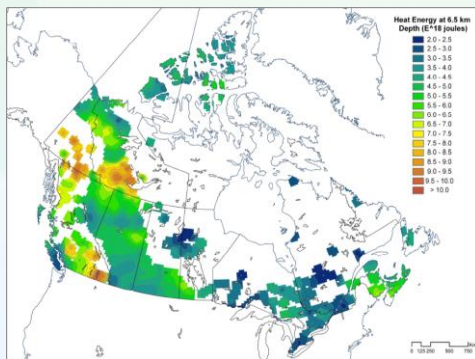
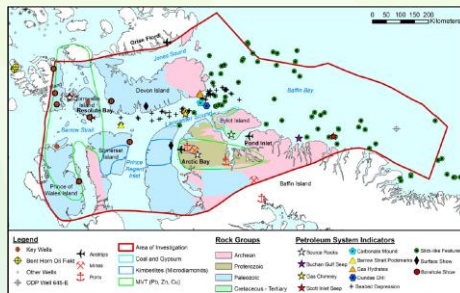
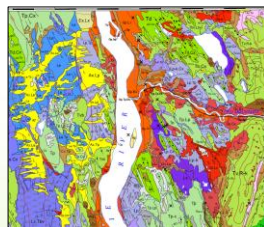
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Earth Information Subdivision

Areas of Expertise

- Stewardship of GSC databases
- GSC surface collections
- Northern Canada geologic core and washed cuttings repository
- Bedrock and Surficial Geology
- Structural and Stratigraphic mapping
- Thermochronological/
Denudation Modelling
- Basin-scale Hydrocarbon
Assessments



Energy Geoscience Subdivision

Areas of Expertise

- Clean energy geoscience
- Paleontology and biostratigraphy
- Basin modeling for fluid distribution/
movements, and geothermal
subsurface conditions
- Geophysical & seismic interpretation
- Energy Resource Assessments
(conventional and unconventional)
- Groundwater chemistry
- Geothermal energy R&D
- Organic Petrology and Geochemistry

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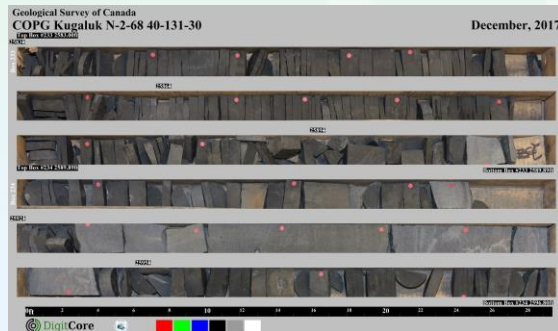
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GSC Calgary: Data & Sample Management

Corporate Data Management

- 19 GSC corporate managed databases
- Sample information system (SMS/SAMS)
- Oil/gas well information system with fluid analysis data, well logs & directional surveys
- Laboratory information management systems - Rockeval, Xtract, Pellet, Paleontology Reports
- Lexicon of Canadian geological names database
- Geophysical reports management system



GSC Well Core and Sample Repository

- 4630 m² of geological core and sample storage
- Storage and access to well samples from across western and northern Canada including BC, AB, SK, MB, YK, NT and East Coast Offshore.
- The total core collection represents roughly 107,000 wells with an additional 2500 awaiting processing and storage.



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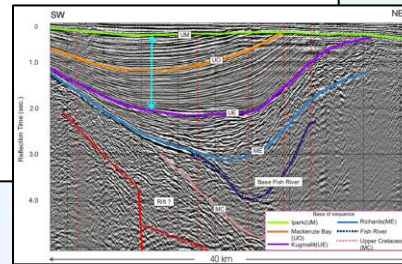
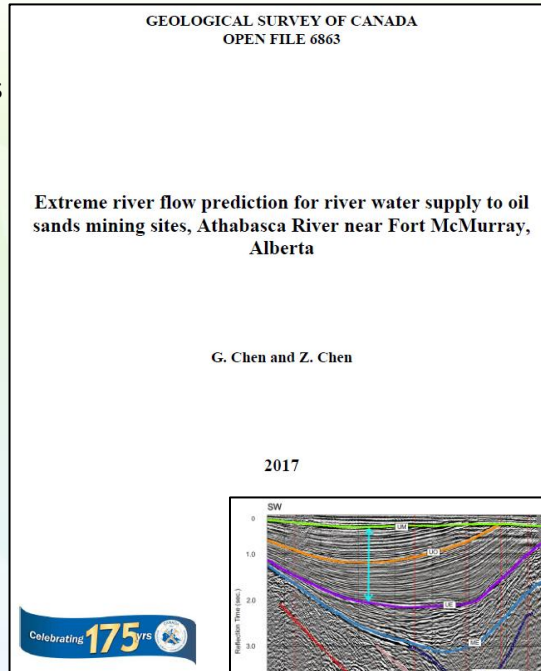
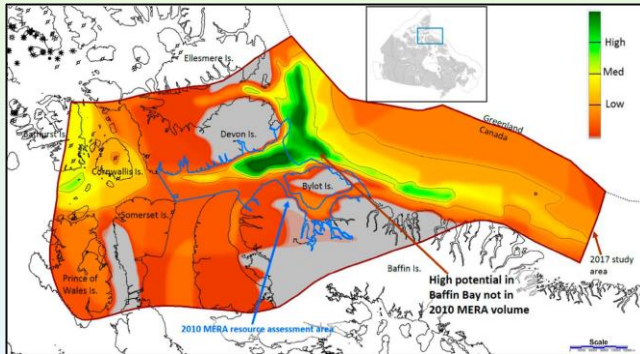
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GSC Calgary Resource Assessment Capacity

- Energy Resource Assessments
 - Unconventional petroleum resources
 - Geothermal energy resource
 - Biogenic gas resource



Capacities

- Energy Resource
 - Volumetric calculation
 - Production decline modeling
 - Production growth forecasting
 - Energy resource sweet-spot mapping
 - Spatial modeling of resources
 - Risk-analysis
 - Demand-supply modeling
- Water Resource Assessments
 - Groundwater Modeling
 - level modeling from climate variables
 - Groundwater recharge modeling
 - Surface Water Modeling
 - River discharge modeling
 - Water demand and supply modeling

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GSC Calgary: Selected Standard & Advanced Characterization Laboratory Capabilities

GSC Calgary Organic Geochemistry and Petrology Labs

- **Source rock evaluation**

- ✓ Rock-Eval analysis for S1, S2, S3, TOC, Tmax, HI, OI and MinC parameters
- ✓ LECO combustion for total sulfur content analysis
- ✓ TD/Py-GC-MS/FID analysis of source and reservoir rock for their hydrocarbon character and potential
- ✓ Petrographic observation of source and reservoir for thermal maturity and organic facies
- ✓ Fluid inclusion analysis for paleo temperature and fluid composition

- **Crude hydrocarbon composition characterization**

- ✓ Open column chromatography separation for SARA
- ✓ SPE fraction of whole oil for total hydrocarbon fractions
- ✓ Solvent extraction of water samples petroleum hydrocarbons
- ✓ GC-FID analysis of whole oils and saturated fractions
- ✓ GC-MS analysis of saturated and aromatic fractions
- ✓ GC-MS/MS analysis for petroleum biomarkers
- ✓ High Resolution GC-MS analysis of total hydrocarbons
- ✓ GCxGC-ToFMS analysis of crude oils and source rock extracts

- **Isotopic composition of hydrocarbons**

- ✓ Partner with UoC and GSC-Quebec



Other GSC Calgary Labs

- **Paleontology Labs**

- ✓ Conodont
- ✓ Palynology
- ✓ Invertebrate paleontology

- **Geothermal and Groundwater Geochemistry**

- **GIS and Cartography**

- **Lapidary Services**



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NRCan Contact Information

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