



# British Columbia Geological Survey

British Columbia Geological Survey  
Mines and Mineral Resources Division  
Ministry of Energy and Mines

[www.em.gov.bc.ca/geology](http://www.em.gov.bc.ca/geology)





## The Survey

Founded in 1895, the British Columbia Geological Survey is the oldest scientific agency in the province. The Survey is responsible for assessing British Columbia's geology and related coal and mineral resources. The Survey provides pre-competitive raw data, historical information, and new concepts to guide geological, mineral resource, and environmental decisions.



## Structure of the British Columbia Geological Survey

*Cordilleran  
Geoscience  
Section*

*Resource  
Information  
Section*

*Mineral  
Development  
Office*



The British Columbia Geological Survey strives to be a leader in public government geoscience, providing data and knowledge to diverse stakeholders. MapPlace, the Survey's online digital delivery system, enables easy access to public geoscience data, ensuring that British Columbia remains a preferred destination for investment in mineral exploration.





# Survey Activities

**Generates  
pre-competitive  
geoscience data**



**Custodian of  
geoscience  
data for BC**



**Advises  
government**



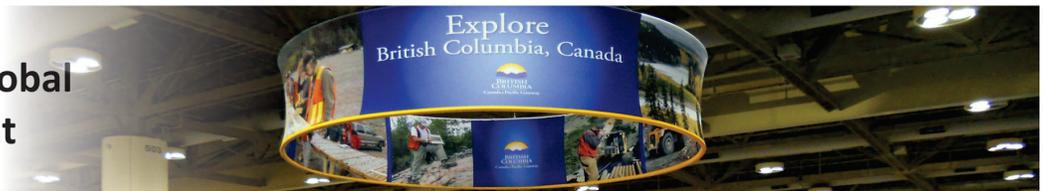
**Provides  
confidential  
expertise**



**Monitors industry  
activity**



**Attracts global  
investment**





## Role of Public Government Geoscience

Developed nations around the world have publically funded geological surveys that provide geoscience information to support responsible resource development and encourage investment, thus stimulating economic growth. Geoscience information is used by government to make informed decisions and create effective policy on resource development, land use, and environmental stewardship.

### *Public Government Geoscience*

***“Our investment in resource exploration will continue to unlock the full economic, mineral and energy potential of the region, while generating new government revenues, private sector investment and jobs.”***

***- Prime Minister of Canada, August 2013***

Exploration and mining is critical to British Columbia’s economy. In 2013, the total value of mine production in the province was nearly \$8 billion, and the total expenditure for evaluation and advanced-stage metal and coal projects was \$476 million.

Global equity markets have become depressed recently, and exploration companies are challenged to raise capital. The role of the British Columbia Geological Survey is becoming more important than ever in stimulating activity, attracting investment, and providing continuous research based on a corporate memory that extends back over 100 years.





## Public Government Geoscience in the Exploration Industry

Public government geoscience from the British Columbia Geological Survey benefits the exploration industry by

- providing the geological framework to identify areas with high mineral potential and reduce the cost of exploring unprospective ground
- increasing exploration efficiency by gathering regional information useful for property-scale evaluation
- archiving exploration results and activities so that explorationists can advance projects without duplicating previous work



### *Impact of Public Government Geoscience*

*“On balance, the evidence indicates that the “Rule of Thumb” that \$1 spent on government geoscience will stimulate \$5 in private sector exploration is reasonable...”*

*- J.M. Duke (Prospectors and Developers Association of Canada presentation, 2010)*





## Cordilleran Geoscience Section

The Cordilleran Geoscience Section is responsible for generating new, pre-competitive geoscience knowledge through regional, field-based geological mapping programs. This information provides the geological framework that reduces investment risk.





**Cordilleran Geoscience Section geologists conduct field-based projects directed at**

- regional bedrock mapping, stratigraphy, litho geochemistry, and geochronology
- mineral deposit studies
- establishing the tectonic evolution of the Cordillera
- developing exploration methods
- Quaternary and surficial geology
- drift prospecting, till geochemistry, and indicator minerals





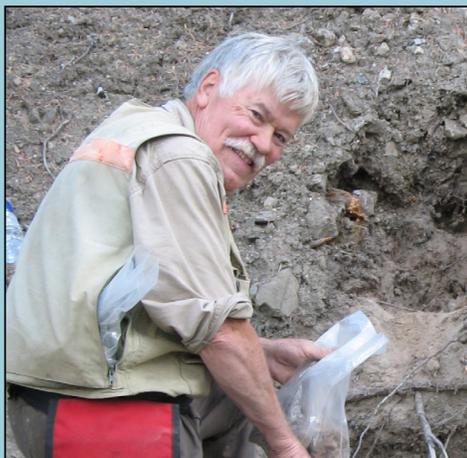
## Laboratory and Sample Archive



The British Columbia Geological Survey maintains geochemical databases containing multi-element analyses from rock, till, stream sediment, and water surveys. Accessible to the public, these data are used to evaluate mineral deposits and to identify new exploration targets.

*In 2012, the geochemical and rock archive was upgraded with a new storage library to accommodate over 600,000 geochemical samples collected by the Survey since the 1970s.*

The Survey recently refurbished and modernized its geochemical laboratory. New equipment includes rock saws, disc pulveriser, fluid inclusion stage, bench top XRF, Wilfley mineral separation table, ultra pure water system, and mineral separation fume hood.



*In 2012, the Province recognized Emeritus Scientist Dr. Ray Lett as a Premier's Award Finalist in the Legacy category for his contribution in developing British Columbia's geochemical database.*





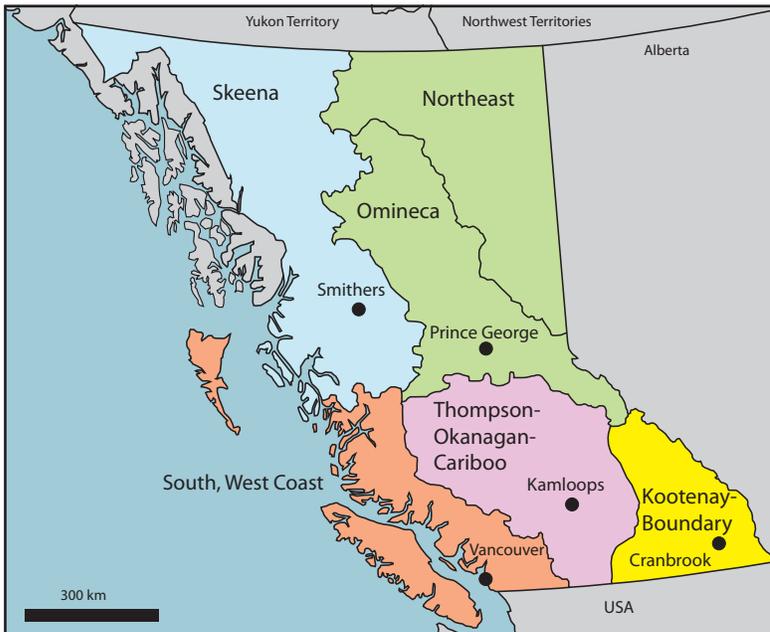
## Mineral Development Office (MDO)

The Mineral Development Office (MDO) is the Vancouver base of the British Columbia Geological Survey. The MDO links the Survey with the more than 800 global exploration and mining companies headquartered in Vancouver.

The Mineral Development Office distributes British Columbia Geological Survey data and provides technical information and expertise about mineral opportunities to the investment community. It also coordinates the exploration and mining reviews produced each year by the Regional Geologists.

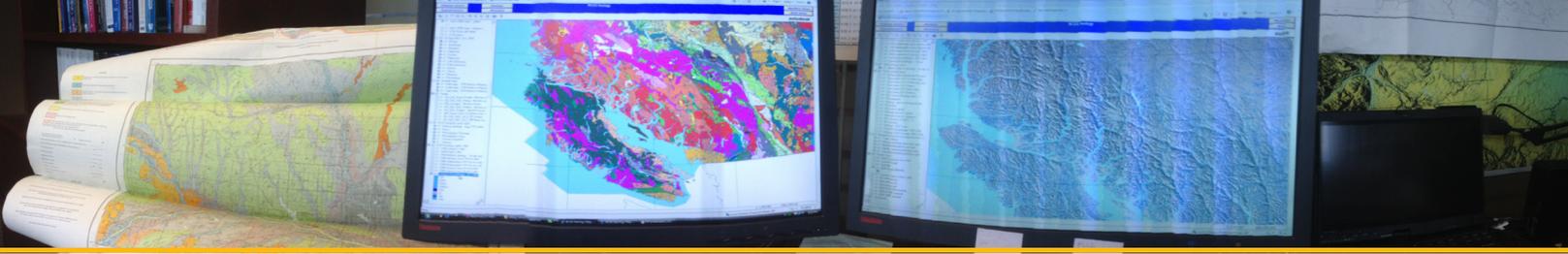


## Regional Geologists Program



Regional Geologists are based in Smithers, Prince George, Kamloops, Cranbrook, and Vancouver. They monitor exploration and mining activities, and provide expertise to prospectors and mineral exploration companies. They also work in their communities to enhance understanding of local geoscience and to foster a healthy and prosperous minerals sector.





## Resource Information Section

The British Columbia Geological Survey preserves, archives, and provides free web-based access to over a century's worth of geoscience information. Since 1995, MapPlace, our database-driven web service, has provided open geoscience data and custom map-making tools to aid in the discovery of deposits and the assessment of mineral potential in British Columbia.



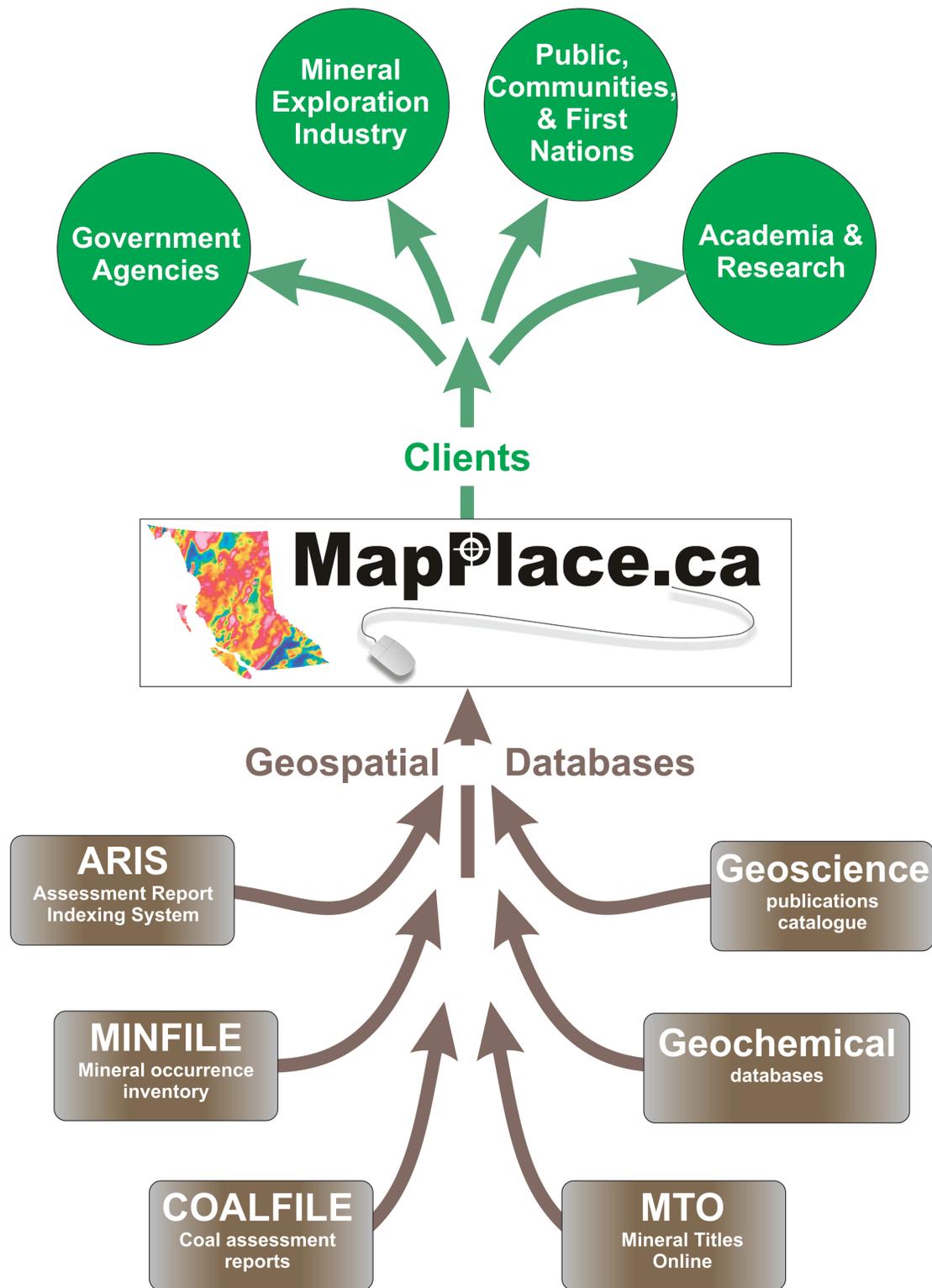
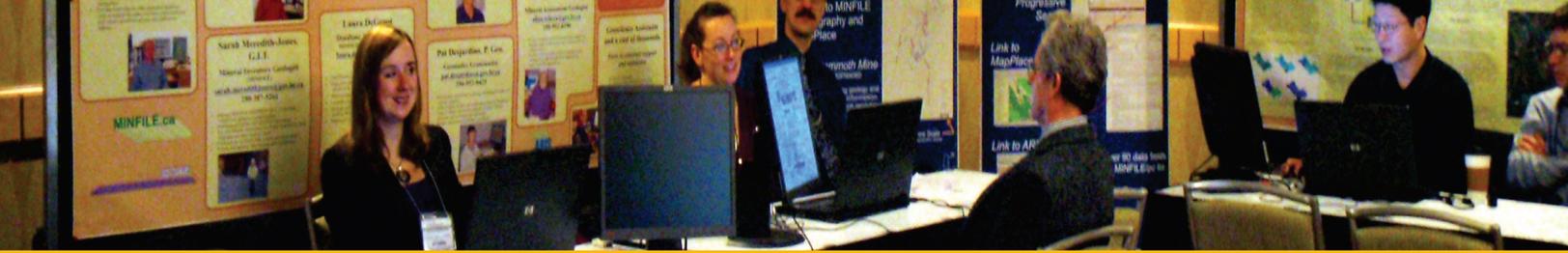
*In 2012, thirteen Survey staff who contributed to MapPlace were selected as finalists for a Premier's Award in the Innovation category.*

*In 2013-2014, the Fraser Institute's Global Ranking of Geological Databases ranked British Columbia third. Since 2005, the province has consistently been ranked in the top ten, including two number one placements.*

**MapPlace allows users to generate custom maps online by querying**

- **our mineral occurrence inventory (MINFILE)**
- **our mineral assessment report database (ARIS)**
- **our coal assessment report database (COALFILE)**
- **our archive of donated industry, personal, government, and university documents (Property File)**
- **our geochemical databases**
- **the Mineral Titles Online (MTO) database**
- **all Survey publications**
- **our extensive collection of bedrock and surficial geology maps**







# Publications

The British Columbia Geological Survey publishes geological Papers, Open Files, GeoFiles, and Information Circulars that are available online free of charge. Geological Fieldwork, published annually in January, includes technical papers that highlight current Survey activities.

BRITISH COLUMBIA Ministry of Energy and Mines  
BRITISH COLUMBIA GEOLOGICAL SURVEY  
Geological Survey *E-newsletter*

All our publications can be downloaded at:  
[www.empr.gov.bc.ca/Geology](http://www.empr.gov.bc.ca/Geology)

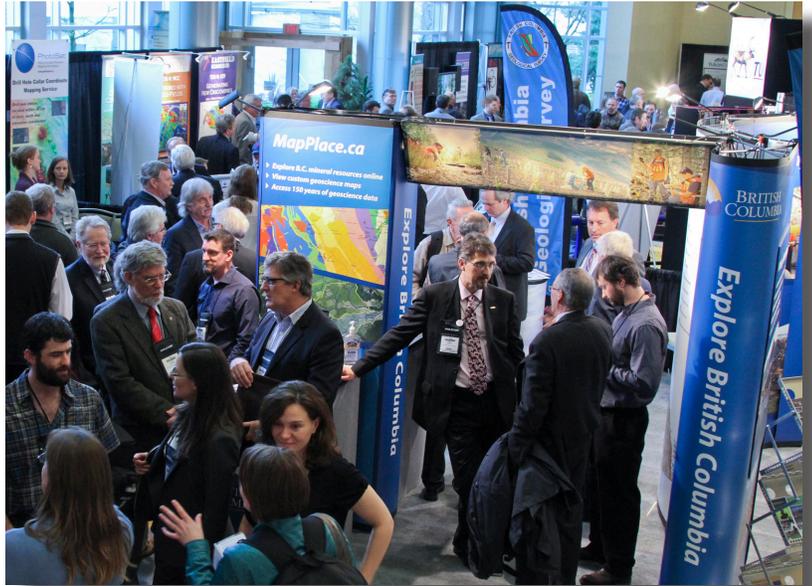
To receive notification of our latest releases  
email: [Geological.Survey@gov.bc.ca](mailto:Geological.Survey@gov.bc.ca)





## Meetings

The British Columbia Geological Survey distributes maps and reports at regional, national, and international meetings. Survey staff regularly give presentations highlighting new developments in Cordilleran geology. Look for the BCGS booth at the Kamloops Exploration Group (KEG) meeting in Kamloops, the Minerals South meeting in Nelson or Cranbrook, the Mineral Exploration Roundup in Vancouver, and the Prospectors and Developers Association of Canada (PDAC) meeting in Toronto.



*The British Columbia Geological Survey invites 2015 Mineral Exploration Roundup delegates to visit our new home in the BC Pavilion at Canada Place in the Vancouver Convention Centre.*



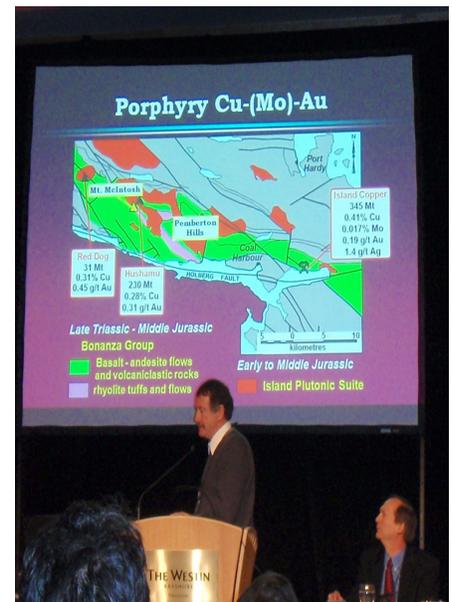


# Skills Training

The British Columbia Geological Survey invests in the next generation of exploration geologists by hiring and training student assistants, supporting graduate students, and mentoring student research.



The Survey helps exploration geoscientists, prospectors, and professionals learn new exploration skills and better understand Cordilleran Geology by providing presentations, short courses, workshops, and field trips.





# Partnerships

The British Columbia Geological Survey is a collaborative agency.

We partner with federal, provincial, and territorial governments, other national and international organizations, and the mineral exploration and mining industry to develop and deliver geoscience projects.



*The Survey is collaborative and continues to develop partnerships with industry, academia, and other geoscience agencies. If you are interested in the British Columbia Geological Survey - Industry Partnership Program please contact:*

**Adrian Hickin, Director, Cordilleran Geoscience**  
**[Adrian.Hickin@gov.bc.ca](mailto:Adrian.Hickin@gov.bc.ca)**

## 2014 Partners



**GEM-2**



Ministry of Energy and Mines



**University of Victoria**

MEM-UVic Partnership Energy and Minerals Projects





# 2014 Projects

For 2014, the British Columbia Geological Survey's core program focuses on porphyry Cu-Au ± Ag-Mo deposits, which make up a significant component of the province's mineral wealth. Other important themes include: orogenic Ni-Cu-PGE deposits; specialty metals; developing new geochemical and isotopic tools for exploration; Quaternary geology studies; and province-wide coal field compilation mapping.



## British Columbia Geological Survey



### 2014 Field Projects

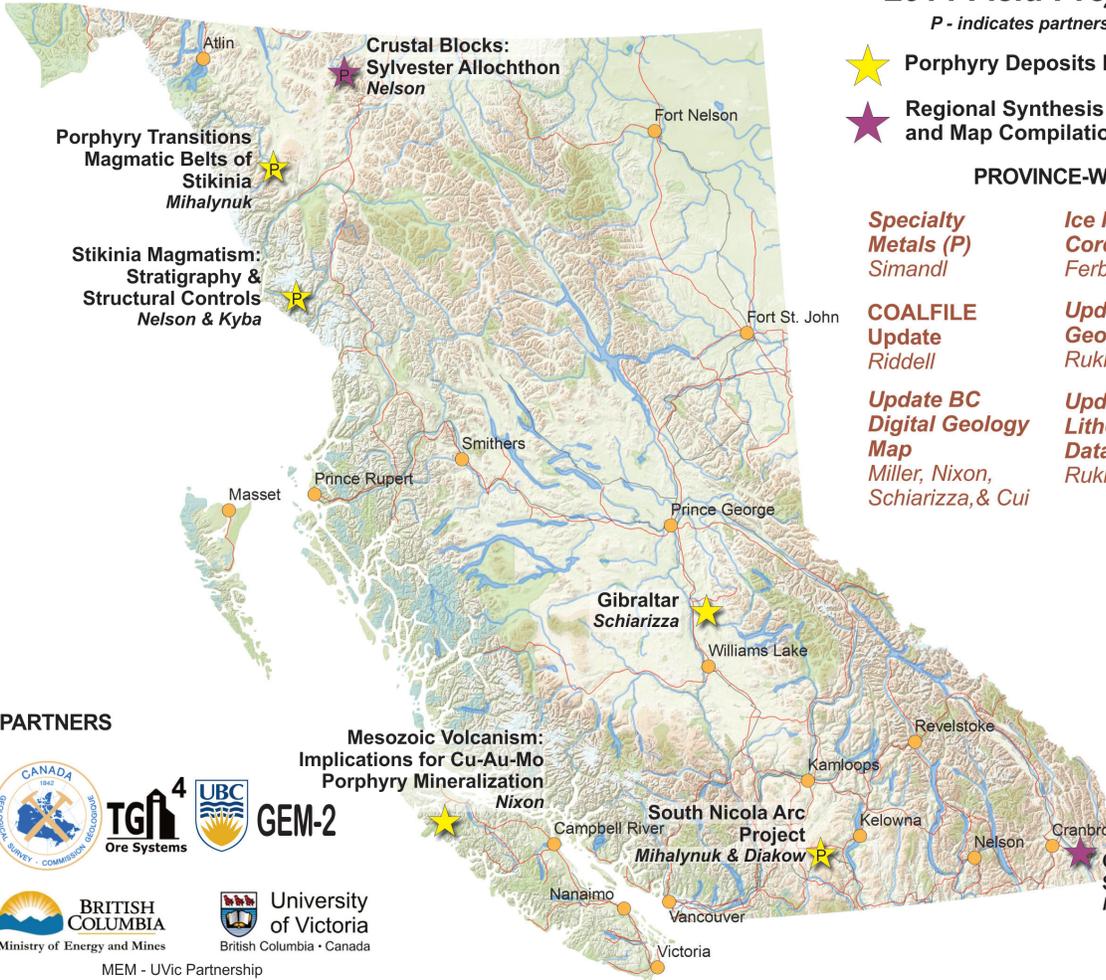
*P - indicates partnership*

 **Porphyry Deposits Initiative**

 **Regional Synthesis and Map Compilation**

**PROVINCE-WIDE PROJECTS**

<p><i>Specialty Metals (P)</i> Simandl</p> <p><b>COALFILE Update</b> Riddell</p> <p><i>Update BC Digital Geology Map</i> Miller, Nixon, Schiarizza, &amp; Cui</p>	<p><i>Ice Flow Indicators Map Cordilleran Ice Sheet (P)</i> Ferbey &amp; Arnold</p> <p><i>Update BC Regional Geochemical Database</i> Rukhlov</p> <p><i>Update BC Lithochemical Database</i> Rukhlov &amp; Han</p>
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**PARTNERS**



**TGI**  
Ore Systems



**GEM-2**



MEM - UVic Partnership



University of Victoria  
British Columbia - Canada





## Porphyry Deposits in BC

### Nicola Arc - North

*Is the Gibraltar Cu-Mo mine a Late Triassic porphyry deposit in Cache Creek terrane or a younger shear zone deposit in Quesnel terrane?*

Contact: paul.schiarizza@gov.bc.ca

### Nicola Arc - North

*Porphyry indicator minerals in till, central British Columbia (TGI-4)*

Contact: travis.ferbey@gov.bc.ca

### Nicola Arc - South

*Regional Mapping and porphyry Cu-Au between Princeton and Merritt*

Contact: mitch.mihalynuk@gov.bc.ca

### Northwest BC

*Structural and stratigraphic controls on porphyry and porphyry-related mineralization, Iskut region*

Contact: joanne.nelson@gov.bc.ca

### Northwest BC

*Porphyry transitions and Triassic-Jurassic magmatic arc axes in Stikine terrane (GEM-2)*

Contact: mitch.mihalynuk@gov.bc.ca

## Mineral deposit studies

*Orogenic Ni-Cu-PGE at Giant Mascot and Turnagain deposits, British Columbia (TGI-4)*

Contact: graham.nixon@gov.bc.ca

*Specialty metals (TGI-4)*

Contact: george.simandl@gov.bc.ca

## Quaternary Geology

*Ice-flow indicators for the Canadian Cordilleran Ice Sheet (GEM-2)*

Contact: travis.ferbey@gov.bc.ca

## Methods

*Trace element systematics in apatite and other resistate minerals (MEM-UVic Partnership)*

Contact: alexei.rukhlov@gov.bc.ca

*Lead isotopes and trace element geochemistry of till near volcanogenic massive sulphides, Chehalis River*

Contact: alexei.rukhlov@gov.bc.ca

## Coal Geology

*British Columbia coalfield map compilation*

Contact: janet.riddell@gov.bc.ca

## Regional Syntheses and Map Compilation

*BC Digital Geology*

Contact: yao.cui@gov.bc.ca

*Northern Vancouver Island digital geology update*

Contact: graham.nixon@gov.bc.ca

*Carlin-type Au in north-central British Columbia?*

Contact: alexei.rukhlov@gov.bc.ca

*Sylvester allochthon ophiolites of the Slide Mountain terrane (GEM-2)*

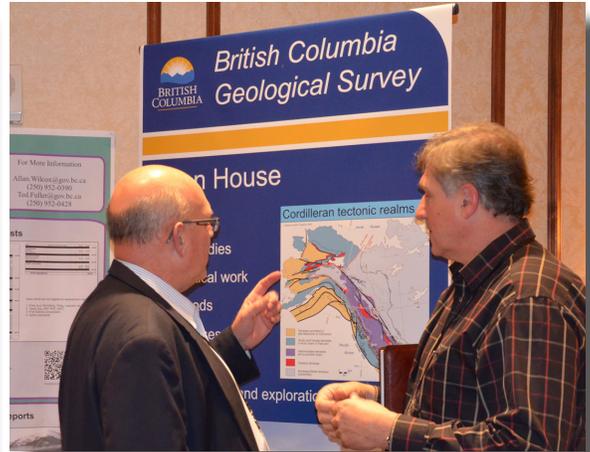
Contact: joanne.nelson@gov.bc.ca





# British Columbia Geological Survey Open House

Each year in Victoria, the British Columbia Geological Survey holds an Open House. Co-sponsored with the Pacific Section of the Geological Association of Canada, the Open House features talks, posters, and fieldtrips devoted to Cordilleran geoscience.





# British Columbia Geological Survey

## Contacts:

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### Mineral Development Office

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