



British Columbia Geological Survey



Ministry of
Energy, Mines and
Low Carbon Innovation

Information Circular 2023-02

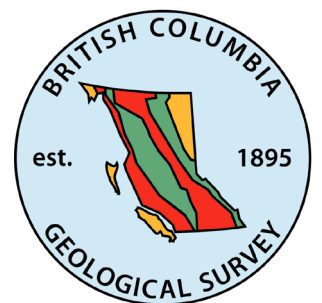


The Survey

Founded in 1895, the British Columbia Geological Survey is the oldest scientific agency in the province. The Survey conducts research to establish the geological evolution and mineral resources of the province. Drawing on continuously advancing concepts and technologies, the Survey creates knowledge to guide societal decisions centred on the Earth sciences.

Survey maps, reports, and databases are freely available online, connecting the public, First Nations, local communities, the minerals industry, public safety agencies, environmental scientists, other research organizations, and government to the province's geology and mineral resources.

This information benefits decisions that balance the economy, the environment, and community interests.



Mapping is the most fundamental form of geoscience research

British Columbia Geological Survey geoscientists undertake field mapping and laboratory projects to document, assess, and better understand the land base of the province.

Bedrock geology, surficial geology, geochemistry, and geophysical maps are used to

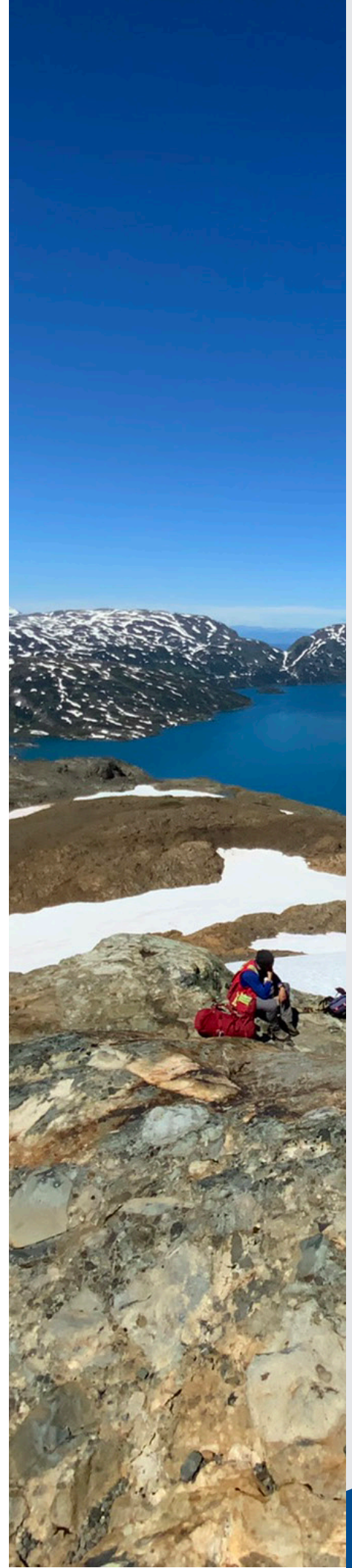
- estimate mineral and aggregate potential
- document geochemical patterns in rocks, soils, sediments, and waters
- unravel the geological evolution of the province to guide mineral exploration
- evaluate risks posed by natural hazards
- determine groundwater sources and flow paths
- establish geotechnical properties for construction and engineering projects

Survey structure

Survey geologists conduct research, curate historical data, provide easy online access to information, monitor industry activity, aid mineral exploration, attract global investment, and train the next generation of geoscientists.

The Survey is structured into three working groups.

- Cordilleran Geoscience Section
- Resource Information Section
- Mineral Development Office





Cordilleran Geoscience Section

The Cordilleran Geoscience Section generates new geoscience with field-based bedrock and surficial geology mapping programs, regional geochemical surveys, targeted mineral deposit studies, and emerging technologies.

The Section manages the Survey's laboratory facilities. It also curates the provincial archive of field samples, permitting the Survey and its partners to re-examine legacy specimens as analytical techniques evolve.

Cordilleran Geoscience Section geologists conduct field-based projects

- regional bedrock mapping with ancillary geochemical, geochronologic, and isotopic studies
- tectonics and metallogeny
- Quaternary and surficial geology; drift prospecting, till geochemistry, and indicator minerals
- deposit studies and mineral potential evaluations
- exploration methods, models, and predictive tools





Resource Information Section

The British Columbia Geological Survey is the custodian of all provincial public geoscience data. It preserves, archives, and provides free web-based access to information gathered for more than 125 years. Since 1995, MapPlace, our database-driven geospatial web service, has provided open geoscience data and custom map-making tools to help decision makers from diverse disciplines reduce the costs of accessing and analyzing information.

The Survey is modernizing information systems to improve the operation of databases, applications, and geospatial web services. The modernization is part of transformation efforts to improve digital capabilities by completing a geoscience Spatial Data Infrastructure (SDI).



Mineral Development Office

The Mineral Development Office (MDO) is the Vancouver base of the British Columbia Geological Survey. It links the more than 1100 global exploration and mining companies headquartered in Vancouver to provincial mineral and coal information.

The MDO distributes British Columbia Geological Survey data and provides technical information and expertise about mineral opportunities to the investment community. It also produces the annual Provincial Overview of Mining and Exploration volume.

Exploration and mining

Exploration and mining are important to the provincial economy. In 2022, total exploration expenditures are estimated \$740.4 million and the total forecast of mine production is estimated at \$18.2 billion.

As the steward of mineral and coal resources in the province, the Survey has an important role in stimulating activity, attracting investment, and providing continuous research based on a corporate memory that extends back more than 125 years.

The Survey reduces exploration costs by: providing the geological framework to identify areas with high mineral potential; increasing exploration efficiency by gathering regional information used for property-scale evaluation; and archiving exploration results so that projects can be advanced without duplicating previous work.

Regional Geologists

Based in Smithers, Prince George, Cranbrook, Kamloops, and Vancouver, the Regional Geologists monitor exploration and mining activities in their jurisdictions.

The Regional Geologists also provide information on exploration trends, possible investment opportunities, land-use processes, First Nation capacity building, and public outreach.





Mineral potential modelling and land use

Modernized mineral potential modelling at the Survey identifies areas of high prospectivity for key mineral systems across the province. This modelling assists government with land-use planning and delivers pre-competitive geoscience data to the mineral exploration industry. A pilot study, which produced data-driven mineral potential maps for three mineral systems (volcanic massive sulphide, copper-lead-zinc, magmatic nickel), now continues into new areas and will be applied to the Survey's province-wide critical minerals assessment.

Critical minerals

Low-carbon energy technologies demand critical minerals. British Columbia is Canada's largest producer of copper and only producer of molybdenum, and mines manganese and zinc, all of which are on Canada's critical minerals list. British Columbia has near-term potential to contribute significantly to producing other critical metals required for a green economy including nickel, rare earth elements, niobium, tantalum, tungsten, and cobalt.

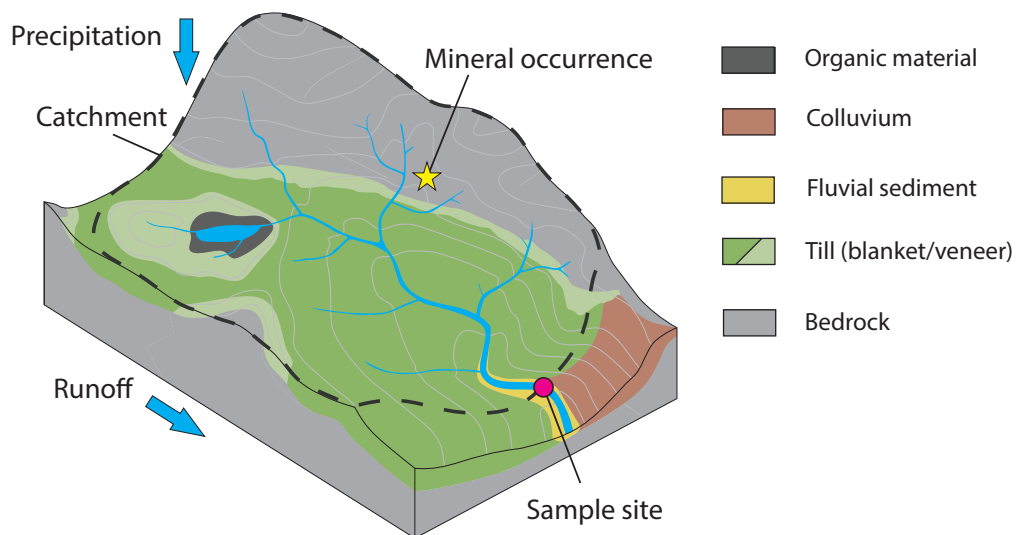
The Survey is preparing an inventory of British Columbia's critical minerals, assessing geological settings most favourable to host deposits, and developing exploration techniques that would enhance discovery of new deposits.



Laboratory, sample archive, geochemical databases, geochronologic database

Survey staff work with field samples at our in-house laboratory.

In 2022, the Provincial Sample Archive was relocated to 1810 Blanshard St. This move was accompanied by a major cataloguing upgrade and will open opportunities for future collaborations to re-analyze samples using modern techniques.



The Survey maintains geochemical databases that include about 5 million determinations from more than 86,000 samples, and has a geochronologic database with almost 8,300 age determinations.



Geological Fieldwork 2022

A Summary of Field Activities and Current Research

Publications

The British Columbia Geological Survey publishes Papers, Geoscience Maps, Open Files, GeoFiles, Information Circulars, and Digital Geoscience Data. All publications are available online, free of charge.

Geological Fieldwork, published each January, includes papers highlighting current field activities and research. The Provincial Overview of Exploration and Mining in British Columbia, also published each January, summarizes industry activities in the previous year.



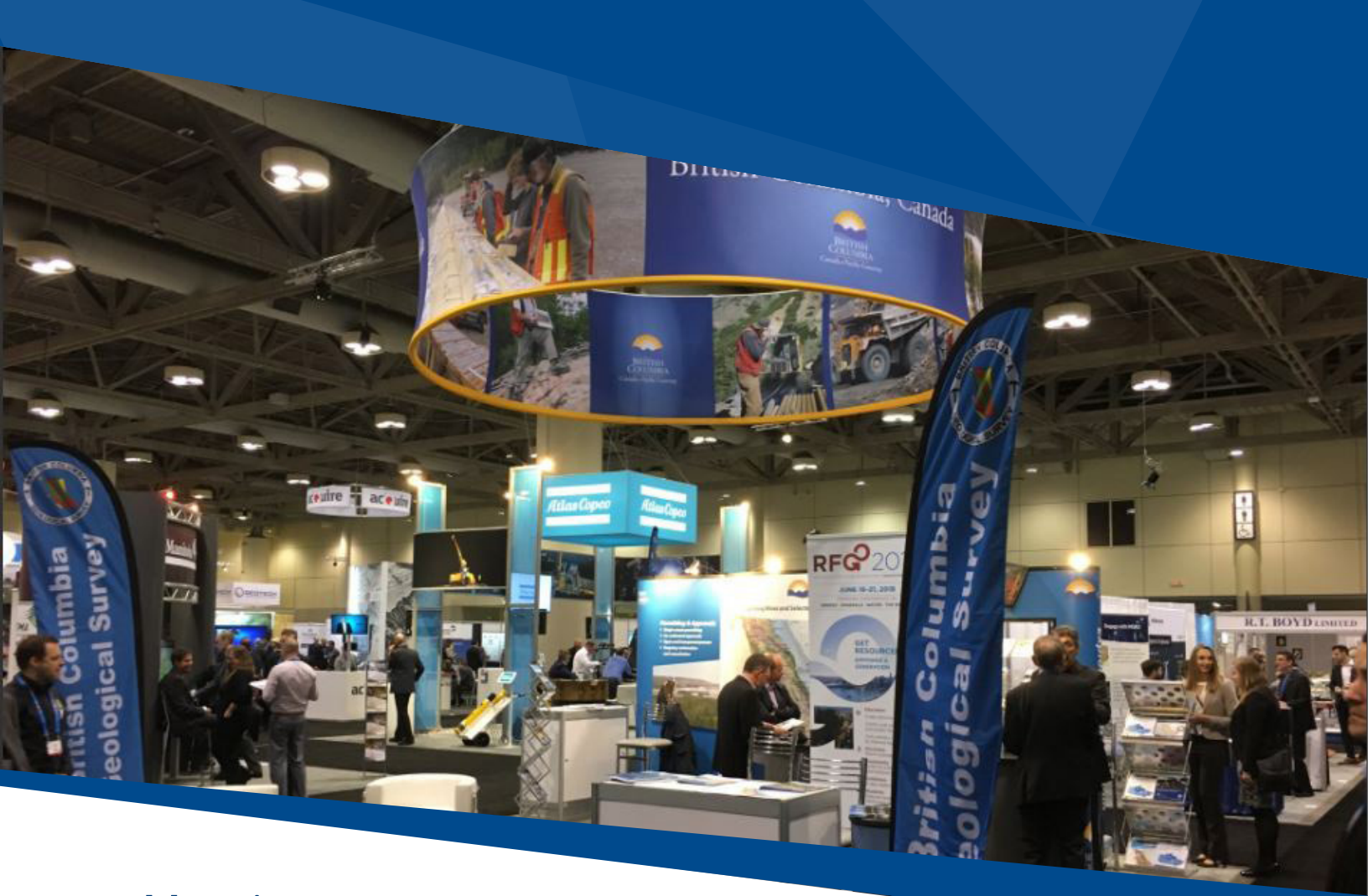
Partnerships

The Survey works to make best use of limited resources. We partner with federal, provincial, and territorial governments, universities, other national and international geoscience organizations, and the mineral exploration and mining industry. Please contact us to ask about partnerships.

Skills training

The Survey invests in the next generation of geoscientists by hiring and training student assistants, supporting graduate students, and mentoring student research.

It also helps geoscientists learn new skills and better understand Cordilleran geology by providing presentations, short courses, workshops, and field trips.



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.

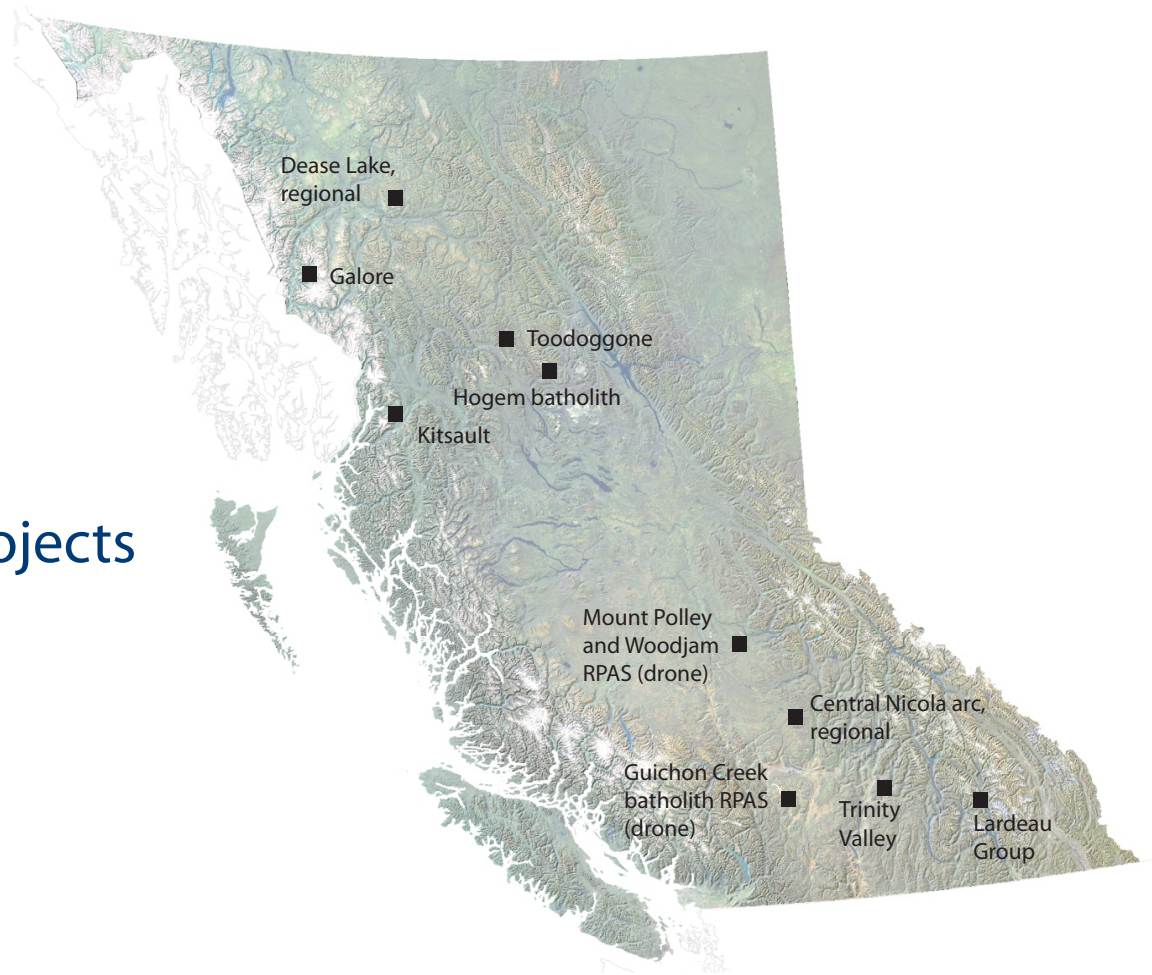
Look for the Survey booth at the Kamloops Exploration Group (KEG) meeting in Kamloops, the Minerals South meeting in Nelson, Cranbrook, or Trail, the Mineral Exploration Roundup in Vancouver, and the Prospectors and Developers Association of Canada (PDAC) meeting in Toronto.

British Columbia Geological Survey Open House

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

In November 2022, the Survey held a forum including speakers from the Association for Mineral Exploration, the Geological Survey of Canada, the Mineral Deposit Research Unit (UBC), Simon Fraser University, University of Victoria, and Geoscience BC as a networking event to explore shared, overlapping, or cross-disciplinary research, promote avenues for cross-institution collaborative research and funding, and provide a venue for graduate students to meet other researchers.

2022 projects



Framework geoscience

Bedrock geology and minerals synthesis

- Dease Lake

Bedrock geology and minerals

- Llewellyn geochronology
- Galore Creek
- Kitsault
- Toodoggone
- Hogem batholith geochronology
- Kamloops Group
- Central Nicola arc
- Lardeau Group
- Trinity Valley
- Till dispersal, Interior Plateau

Lithogeochemistry

- Northwestern British Columbia
- Relocation, upgrade provincial sample archive

Deposit studies

Critical minerals

Information management

BC digital geology, regional map integration

Information systems transformation to improve digital capabilities by completing a geoscience Spatial Data Infrastructure

Geochronologic database

Geochemical database

Assessment report-sourced databases

MapPlace for mobile devices

MINFILE, COALFILE, Assessment Report Index System (ARIS), Property File

Mineral potential: the next generation

Major re-cataloguing of Provincial Sample Archive with move to 1810 Blanshard St.

Emerging technology

Drone (RPAS) magnetic, radiometric, lidar, air photo surveys



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