

British Columbia Geological Survey Publications 2022 including peer-reviewed external papers co-authored by BCGS staff

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Papers

Paper 2022-01

Geological Fieldwork 2021, a summary of field activities and current research. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, 141 p.

Wildgust, N., Cui, Y., Clarke, G., and Hickin, A.S., 2022. British Columbia Geological Survey annual program review 2021-2022. In: Geological Fieldwork 2021, Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 1-15.

Schiarizza, P., Orchard, M.J., and Friedman, R.M., 2022. Conodonts and detrital zircons from Triassic and Jurassic rocks above the Salmon River unconformity, Thompson Plateau, south-central British Columbia. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 17-30.

Ootes, L., Ferri, F., Milidragovic, D., and Wall, C., 2022. The age and provenance of the Lay Range assemblage provides an indirect record of basement to north-central Quesnellia, British Columbia. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 31-44.

Van Wagoner, N., and Ootes, L., 2022. Geology and geochemistry of the Kamloops Group (Eocene) in its type area, Kamloops, British Columbia. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 45-62.

Hunter, R.C., Sebert, C.F.B., Friedman, R., and Wall, C., 2022. Revised stratigraphy and geochronology of the Hazelton Group, host rocks for volcanogenic mineralization in the Kitsault River area, northwest British Columbia. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 63-81.

Stanley, B., and Nelson, J., 2022. Revised stratigraphy of the Stuhini and Hazelton groups and LA-ICP MS zircon geochronology of the Scottie gold mine area, northwestern British Columbia. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 83-102.

Spence, D.W., Crawford, H., Scoates, J.S., Nott, J.A., Nixon, G.T., and Milidragovic, D., 2022. Mapping ultramafic cumulates at the Tulameen ultramafic-mafic Alaskan-type intrusion, south-central British Columbia, aided by remotely piloted aircraft system photogrammetry. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 103-122.

Rukhlov, A.S., Mashyanov, N.R., Pitirimov, P.V., Hickin, A.S., Golovetsky, M., and Coats, B., 2022. Gaseous elemental mercury (GEM) response from sediment-covered, volcanogenic massive sulphide mineralization on southern Vancouver Island. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 123-135.

Appendix: British Columbia Geological Survey Publications 2021, including peer-reviewed external papers co-authored by BCGS staff, pp. 137-141.

Geoscience Map

van Straaten, B.I., Logan, J.M., Nelson, J.L., Moynihan, D.P., Diakow, L.J., Gibson, R., Bichlmaier, S.J., Wearmouth, C.D., Friedman, R.M., Golding, M.L., Miller, E.A., and Poulton, T.P., 2022. Bedrock geology of the Dease Lake area. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Geoscience Map 2022-01, 1:100,000 scale.

Open Files

OF 2019-09

Angen, J.J., Hart, C.J.R., Nelson, J., and Rahimi, M., 2022. Geology and mineral potential of the western Skeena arch: Evolution of an arc-transverse structural corridor, west-central British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Open File 2019-09, Geoscience BC Report 2022-09, MDRU Publication 458, 47 p.

OF 2022-01

Clarke, G., Northcote, B., Corcoran, N.L., and Hancock, K., 2022. Mines, mine development, selected proposed mines, and selected exploration projects in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Open File 2022-01.

OF 2022-02

Mihalynuk, M.G., Milidragovic, D., Tsekhmistrenko, M., and Zagorevski, A., 2022. Turtle Lake area geology (NTS 104M/16). British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Open File 2022-02, Geological Survey of Canada Open File 8757, 1:50,000 scale.

OF 2022-03

Schiarizza, P., 2022. Bedrock geology, Stump Lake-Salmon River, parts of NTS 82L/05 and 92/I/08. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Open File 2022-03, 1:50,000 scale.

GeoFiles

GF 2020-11 (updated)

Lefebvre, D.V., and Jones, L.D., (compilers) 2022. British Columbia Geological Survey mineral deposit profiles, 1995 to 2012; updated with new profiles for VMS, porphyry, and nickel deposits. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2020-11, 635 p.

GF 2022-01

Clarke, G., Northcote, B., Corcoran, N.L., and Hancock, K., 2022. Exploration and mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2021-01 (poster).

GF 2022-02

Clarke, G., 2022. Exploration and mining highlights, Northwest Region, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-02 (poster).

GF 2022-03

Corcoran, N.L., 2022. Exploration and mining highlights, North Central and Northeast regions, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-03 (poster).

GF 2022-04

Northcote, B., 2022. Exploration and mining highlights, Southwest and South Central regions, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-04 (poster).

GF 2022-05

Hancock, K., 2022. Exploration and mining highlights, Southeast Region, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-05 (poster).

GF 2022-06

Norris, J., and Wallace, B., 2022. Assessment report summary: Expenditures and activities 2020. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-06 (poster).

GF 2022-07

Rukhlov, A.S., Mashyanov, N.R., Pitirimov, P.V., Hickin, A.S., Golovetsky, M., and Coats, B., 2022. Real-time air mercury guide to discovery. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-07 (poster).

GF 2022-08

Stanley, B., Nelson, J.L., and Friedman, R., 2022. LA-ICP-MS U-Pb data files, detrital zircon geochronology, and geochemistry of the Stuhini and Hazelton groups, Scottie gold mine area, northwestern British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-08, 5 p.

GF 2022-09

Jones, G., Ootes, L., Luo, Y., Stern, R., Vezinet, A., and Pearson, D.G., 2022. In situ zircon U-Pb, Lu-Hf, $\delta^{18}\text{O}$, and trace elements from intrusive units in northern Hagem batholith, Quesnel terrane, north-central British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-09, 19 p.

GF 2022-10

Lett, R.E., Friske, P.W.B., and McClenaghan, M.B., 2022. Heavy mineral and geochemical data from detailed stream-sediment, stream-water, and moss-mat sampling in northwestern British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-10, 7 p.

GF 2022-11

Northcote, B., 2022. Volcanogenic massive sulphide (VMS) deposits in British Columbia: A review. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-11, 30 p.

GF 2022-12

van Straaten, B.I., Logan, J.M., Hunter, R.C., Nelson, J.L., and Miller, E.A., 2022. Igneous lithogeochemistry data for the Dease Lake, Kitsault River, Galore Creek, Telegraph Creek, Foremore, and other areas in northwestern British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-12, 14 p.

GF 2022-13

Hunter, R.C., Sebert, C.F.B., Friedman, R., and Wall, C., 2022. Geochronologic data from the Kitsault River area, northwest British Columbia. Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-13, 4 p.

GF 2022-14

Van der Vlugt, J., Rukhlov, A.S., and van Straaten, B.I., 2022. Lithogeochemical re-analysis of British Columbia Geological Survey archived rock samples from northwestern British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2022-14, 15 p.

Information Circulars

IC 2022-01

Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, 129 p.

Clarke, G., Northcote, B., Corcoran, N.L., and Hancock, K., 2022. Exploration and Mining in British Columbia, 2021: A summary. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, pp. 1-42.

Clarke, G., 2022. Exploration and mining in the Northwest Region, British Columbia. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, pp. 43-65.

Corcoran, N.L., 2022. Exploration and mining in the North Central and Northeast regions, British Columbia. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, pp. 67-83.

Northcote, B., 2022. Exploration and mining in the South Central Region, British Columbia. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, pp. 85-104.

Hancock, K., 2022. Exploration and mining in the Southeast Region, British Columbia. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, pp. 105-116.

Northcote, B., 2022. Exploration and mining in the Southwest Region, British Columbia. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-01, pp. 117-129.

IC 2022-02

British Columbia Geological Survey, 2022. British Columbia Geological Survey. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-02, 14 p. (brochure)

IC 2022-03

British Columbia Geological Survey, 2022. Mineral Development Office. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-03, 4 p. (brochure)

IC 2022-04

British Columbia Geological Survey, 2022. Online databases at the British Columbia Geological Survey. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2020-04, 14 p. (brochure)

IC 2022-05

British Columbia Geological Survey, 2022. The Golden Triangle of northwestern British Columbia. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey, Information Circular 2022-05, 6 p. (brochure)

Contributions to partner publications

Paradis, S., Simandl, G.J., Drage, N., D'Souza, R.J., Kontak, D.J., and Waller, Z., 2022. Carbonate-hosted deposits (Mississippi Valley-type, magnesite, and REE-F-Ba) of the southeastern Canadian Cordillera: A review and isotopic data comparison. In: Peter, J.M., and Gadd, M.G., (Eds.), Targeted Geoscience Initiative 5: Volcanic- and Sediment-Hosted Massive Sulphide Deposit Genesis and Ore Systems. Geological Survey of Canada Bulletin 617, pp. 39-87. <<https://doi.org/10.4095/327995>>

Paradis, S., Jackson, S.E., Petts, D., Simandl, G.J., D'Souza, R.J., and Hamilton, T., 2022. Distribution of trace elements in pyrite from carbonate-hosted sulfide deposits of southern British Columbia, Canada. In: Peter, J.M., and Gadd, M.G., (Eds.), Targeted Geoscience Initiative 5: Volcanic- and Sediment-Hosted Massive Sulphide Deposit Genesis and Ore Systems. Geological Survey of Canada Bulletin 617, pp. 129-163. <<https://doi.org/10.4095/328002>>

Simandl, G.J., D'Souza, R.J., Paradis, S., and Spence, J., 2022. Rare-earth content of carbonate minerals in sediment-hosted Pb-Zn deposits, southern Canadian Rocky Mountains. In: Peter, J.M., and Gadd, M.G., (Eds.), Targeted Geoscience Initiative 5: Volcanic- and Sediment-Hosted Massive Sulphide Deposit Genesis and Ore Systems. Geological Survey of Canada Bulletin 617, pp. 165-201. <<https://doi.org/10.4095/328001>>

External peer-reviewed journal and volume publications (access may be limited by publisher)

Araoka, D., Simandl, G.J., Suzanne Paradis, S., Yoshimura, T., Hoshino, M., and Kon, Y., 2022. Formation of the Rock Canyon Creek carbonate-hosted REE-F-Ba deposit, British Columbia, Canada: Constraints from Mg-Sr isotopes of dolomite, calcite, and fluorite. *Journal of Geochemical Exploration*, 240, 107045. <<https://doi.org/10.1016/j.gexplo.2022.107045>>

Cerpa, N., Sigloch, K., Garel, F., Heuret, A., Rhodri Davies, D., and Mihalyuk, M.G., 2022. The effect of a weak asthenospheric layer on surface kinematics, subduction dynamics and slab morphology in the lower mantle. *Journal of Geophysical Research: Solid Earth*. <<https://doi.org/10.1029/2022JB024494>>

Jones, C.L., Orovan, E.A., Meffre, S., Thompson, J., Belousova, E.A., Cracknell, M.J., Everard, J., Bottrill, R., Bodorkos, S., and Cooke, D.R., 2022. Zircon O and Lu-Hf isotope evidence of mantle and supracrustal origins of Tasmanian Devonian granites. *Gondwana Research*, 110. <<https://doi.org/10.1016/j.gr.2022.06.004>>

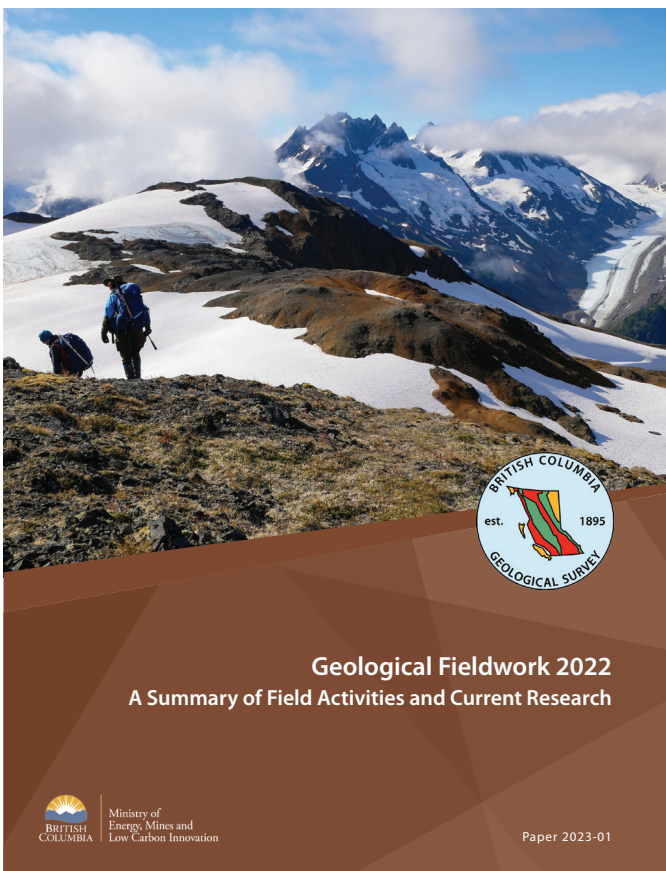
Nelson, J.L., van Straaten, B., and Friedman, R., 2022. Latest Triassic-Early Jurassic Stikine-Yukon-Tanana terrane collision and the onset of accretion in the Canadian Cordillera: Insights from Hazelton Group detrital zircon provenance and arc-back-arc configuration. *Geosphere*, 18. <<https://doi.org/10.1130/GES02444.1>>

Ootes, L., Milidragovic, D., Friedman, R., Wall, C., Cordey, F., Luo, Y., Jones, G., Pearson, D.G., and Bergen, A., 2022. A juvenile Paleozoic ocean floor origin for eastern Stikinia, Canadian Cordillera. *Geosphere*, 18. <<https://doi.org/10.1130/GES02459.1>>

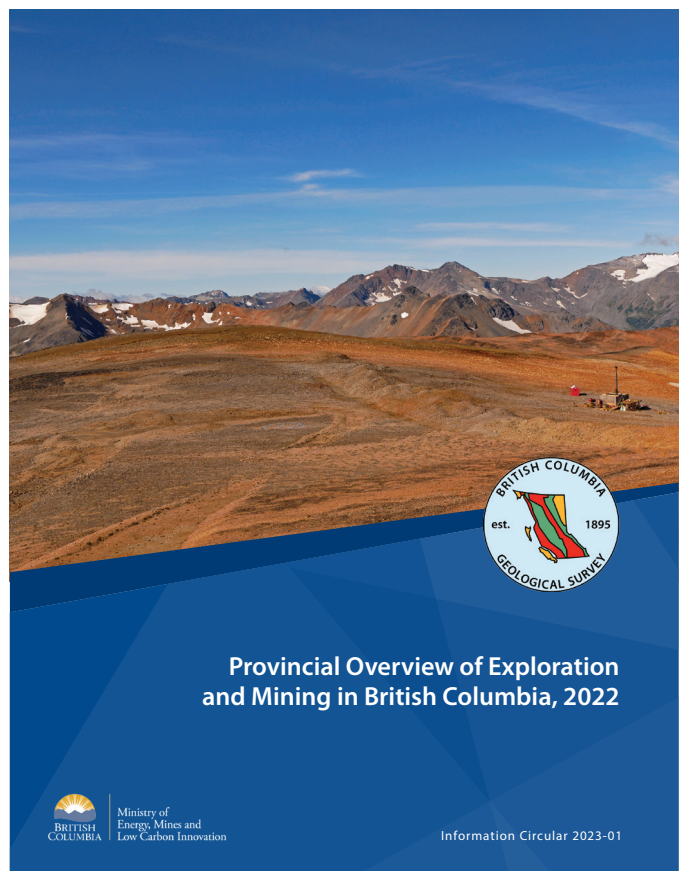
Plouffe, A., Kjarsgaard, I.M., Ferbey, T., Wilton, D.H.C., Petts, D.C., Percival, J.B., Kobylinski, C.H., and R. McNeil, R., 2022. Detecting buried porphyry Cu mineralization in a glaciated landscape: A case study from the Gibraltar Cu-Mo deposit, British Columbia, Canada. *Economic Geology*, 117, 777-799. <<https://doi.org/10.5382/econgeo.4891>>

Simandl, G.J., and Paradis, S., 2022. Vanadium as a critical material: economic geology with emphasis on market and the main deposit types. *Applied Earth Science*. <<https://doi.org/10.1080/25726838.2022.2102883>>

Each year, the British Columbia Geological Survey publishes *Geological Fieldwork*, a *Summary of Fieldwork and Current Research* (this volume), and the *Provincial Overview of Mining and Exploration in British Columbia*. All British Columbia Geological Survey publications can be downloaded, at no cost, from www.BCGeologicalSurvey.ca



Geological Fieldwork volume, British Columbia Geological Survey Paper 2023-01



Provincial Overview of Mining and Exploration in British Columbia volume, Information Circular 2023-01