



GEOSCIENCE BC SUMMARY OF ACTIVITIES 2014



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Cover photo: M. Sánchez measuring structures and orogenic quartz veins near Barkerville, central British Columbia
Photo credit: T. Bissig



Acknowledgments

I would like to thank the government of British Columbia for its ongoing support of Geoscience BC and recognize the \$3 million investment made in 2014, allowing for our continued delivery of projects that generate new earth science information for everyone. I would also like to express appreciation for the leaders in British Columbia's mineral exploration, mining and energy sectors who support our organization through their guidance, use and recognition of the information that we collect and distribute.

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Foreword

Geoscience BC is pleased to present results from several of our ongoing geoscience projects in this, our eighth edition of the *Geoscience BC Summary of Activities*. The volume is divided into three sections, 'Minerals', 'Oil and Gas' and 'Scholarship Recipients', and contains a total of 21 papers.

The 'Minerals' section contains 12 papers from Geoscience BC minerals geoscience projects throughout BC. The first four papers highlight ongoing work in the TREK (Targeting Resources through Exploration and Knowledge) project area. Sacco and Jackaman summarize a second year of targeted geochemical and mineralogical studies in the region that focused on basal till sampling. Lett and Jackaman discuss tracing anomalous geochemical patterns in bog soils near the Nazko volcanic cone and their relationship to geothermal potential. This is a continuation of a study examining carbon dioxide seepages in the region, which was released in an initial report in 2014 (see below). Angen et al. and Kim et al. each summarize results from their first year of a three-year targeted bedrock geology mapping initiative in the TREK project area.

Two papers present advances in geochemistry in BC. Arne and Brown discuss using catchment basins to further the interpretation of geochemical data collected as part of Geoscience BC's Northern Vancouver Island Exploration Geoscience project. Yehia and Heberlein introduce a test of the use of a portable photometer for field-based rapid geochemical analysis of stream- and springwaters. Field photometer results will be compared to traditional laboratory analyses later in the project.

Two papers focus on the Quesnel terrane in central BC. Sánchez et al. are working toward improving the understanding of the Quesnel terrane geology beneath Quaternary cover by completing a structural interpretation of existing geophysical and geological datasets in the QUEST project area. Bouzari et al. discuss a new project that will examine field, mineralogical and geochemical characteristics of known porphyry-fertile plutons, and then develop exploration tools that will aid in future discovery.

Three papers focus on the mineral potential in southeastern BC. Höy and Jackaman introduce a new multiyear phase of mapping in the eastern half of the Penticton (NTS 082E) map area, which expands on their previous work for Geoscience BC in the Deer Park and Burrell Creek map areas. Seabrook and Höy and Kennedy and Höy present new initiatives within Geoscience BC's SEEK (Stimulating Exploration in the East Kootenays) project, examining structural controls on the Kimberley gold trend, and the relevance of mud volcanoes to massive-sulphide mineralization in the Purcell Basin, respectively.

Finally, Kilby and Fournier highlight a new Geoscience BC pilot project to extract analogue historical exploration data contained in the Assessment Report Indexing System (e.g., geochemical data, geology and geophysical maps) and convert it into a format that can be integrated into both a GIS and web mapping system. The pilot project focuses on the NTS 093L map area in central BC.

The 'Oil and Gas' section contains two papers from ongoing Geoscience BC projects. Hayes et al. describe detailed mapping and characterization of the Belloy, Kiskatinaw and Debolt deep saline aquifers to determine their potential as disposal zones in the Montney play fairway. Results will be publicly available in early 2015. Bustin et al. highlight continuing work quantifying the gas- and liquid-in-place and flow capacity of important shales in northeastern BC.

The new 'Scholarship Recipients' section presents papers from Geoscience BC's 2014 seven student scholarship winners. The scholarships are awarded annually to post-graduate students working on thesis topics relevant to supporting mineral or oil and gas exploration and development in BC.

Cook and Hart examine carbonate-hosted zinc-lead deposits in southeastern BC by applying carbon and oxygen isotopes. D'Souza and Canil focus on amphibole-cumulate rocks from the Bonanza Group on Vancouver Island, examining if amphibole is controlling magma evolution in the lower crust as well as contributing to the understanding of why select arcs are prospective for porphyry copper deposits.

MacKay et al. evaluate the use of a Mozley C800 laboratory mineral separator to produce heavy mineral concentrate for specialty metal exploration using indicator minerals, in this case examining Aley carbonatite stream sediments. This work is part of the larger Targeted Geoscience Initiative 4 to develop simpler, less expensive methods to explore for rare earth elements, niobium and possibly tantalum deposits.

Mak et al. examine historical geomechanical and hydrogeological data collected from the Mount Meager area to assess the natural fracture connectivity of the reservoir rocks that host the geothermal resource at the Meager Creek site. Mostaghimi et al. examine the structural geology of the Granite Lake pit at the Gibraltar copper-molybdenum mine, in part to determine the temporal relationship between mineralization and structural modification.

The use of magnetite as a porphyry copper indicator mineral in tills, with a focus on the Mount Polley deposits, is examined in Pisiak et al. Finally, Theny et al. discuss preliminary results of a study aimed at understanding the age, mineralization and structural history of the Ruddock Creek deposit and its relationship to the metallogenic evolution of the Canadian Cordillera.

Readers are encouraged to visit our website for additional information on all Geoscience BC-funded projects, including project descriptions, posters and presentations, previous *Summary of Activities* and *Geological Fieldwork* papers, and final datasets and reports. The website is launching an interactive web-mapping portal, which readers can use to explore all of Geoscience BC's public datasets, as well as select public geoscience databases.

All papers in this and past volumes are available for download through Geoscience BC's website (www.geosciencebc.com). Limited print copies of past volumes are also available from the Geoscience BC office.

Geoscience BC Publications 2014

In addition to this *Summary of Activities* volume, Geoscience BC releases interim and final products from our projects as Geoscience BC reports. All Geoscience BC data and reports can be accessed through our website at www.geosciencebc.com/s/DataReleases.asp. Geoscience BC datasets and reports released in 2014 are:

- 14 technical papers in the *Geoscience BC Summary of Activities 2013* volume
- **Subsurface Aquifer Study to Support Unconventional Gas and Oil Development, Liard Basin, Northeastern British Columbia**, by Petrel Robertson Consulting Ltd. (Geoscience BC Report 2014-02)
- **Regional Stream Sediment Geochemical Data, Sample Reanalysis (INAA), Northern Vancouver Island, British Columbia**, by W. Jackaman (Geoscience BC Report 2014-03)
- **Fixed Wing Magnetic Geophysical Survey, TREK Project, Interior Plateau/Nechako Region, British Columbia, Canada**, by Aeroquest Airborne Ltd. (Geoscience BC Report 2014-04)
- **Acquired Heliborne High Resolution Aeromagnetic Surveys in the Blackwater District, TREK Project Area, British Columbia**, by Geoscience BC (Geoscience BC Report 2014-05)
- **Basal Till Potential Maps for the Interior Plateau, TREK Project, British Columbia**, by D. Sacco, T. Ferbey and W. Jackaman (Geoscience BC Maps 2014-06-01 to -10; British Columbia Geological Survey Open Files 2014-06 to -15)
- **Geology of the Mount Polley Intrusive Complex (Final Version)**, by C. Rees, G. Gillstrom, L. Ferreira, L. Bjornson and C. Taylor (Geoscience BC Report 2014-08)
- **Surficial Geology of the Nadina River Map Area (NTS 093E/15), British Columbia**, by T. Ferbey (Geoscience BC Map 2014-09-01 and British Columbia Geological Survey Geoscience Map 2014-01)
- **Surficial Geology of the Colleymount Map Area (NTS 093L/01), British Columbia**, by T. Ferbey (Geoscience BC Map 2014-09-02 and British Columbia Geological Survey Geoscience Map 2014-02)
- **Geochemical and Mineralogical Data, TREK Project, Interior Plateau, British Columbia**, by W. Jackaman and D. Sacco (Geoscience BC Report 2014-10)
- **Geochemical Expression in Soil and Water of Carbon Dioxide Seepages near the Nazko Volcanic Cone, Interior Plateau, Central BC, NTS 093B/13**, by R. Lett and W. Jackaman (Geoscience BC Report 2014-11)
- **Geologically-Constrained Gravity and Magnetic Earth Modelling of the Nechako-Chilcotin Plateau, British Columbia, Canada**, by Mira Geoscience Ltd. (Geoscience BC Report 2014-12)

All releases of Geoscience BC reports and data are announced through our website and e-mail list. If you are interested in receiving e-mail regarding these reports and other Geoscience BC news, please contact info@geosciencebc.com.

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