



# **GEOSCIENCE BC SUMMARY OF ACTIVITIES 2016**

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**Cover photo:** Installing piezometers near Coles Lake, northeastern British Columbia

**Photo credit:** S. Abadzadesahraei, 2016

## Acknowledgments

I would 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. I would also like to thank the Province of British Columbia for its ongoing support of Geoscience BC and recognize the \$5 million investment made in 2016, enabling our continued delivery of projects that generate new earth science information for everyone.

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## Foreword

Geoscience BC is pleased to present results from several of our ongoing geoscience projects in our tenth edition of the *Geoscience BC Summary of Activities*. The volume is divided into two sections, 'Energy' and 'Minerals', and contains a total of 33 papers from Geoscience BC-funded projects and 2016 scholarship winners.

The 'Energy' section contains 14 papers from oil and gas and geothermal projects in northeastern British Columbia (BC). Three papers, by Bustin and Bustin, Babaie Mahani et al. and Wang et al., examine the monitoring and impact of induced seismicity due to hydraulic fracturing. Hayes et al. provide an update on a new project examining resource oil plays, and petroleum systems analyses are presented for the Doig Formation by Silva and Bustin, and Upper Devonian shales of the Horn River and Liard basins by Wilson and Bustin. Vaisblat et al. present a diagenetic model for the Montney Formation.

Water is once again a key focus of Geoscience BC Energy projects. Two papers, by Morgan et al. and Abadzadesahraei et al., highlight research aimed at increasing the regional understanding of groundwater in northeastern BC. Owen and Bustin discuss the geochemistry of flowback waters from hydraulic fracturing, Gupta et al. examine the uptake of water by Horn River basin shales during hydraulic fracturing and the resulting hydration-induced stress and strain, and Quinton et al. provide an update on permafrost and hydrological monitoring and modelling in northeastern BC.

Evans and Whiticar introduce a new project aimed at geochemically 'fingerprinting' natural gas in northeastern BC and compiling the results into a publicly available database. Finally, Palmer-Wilson et al. introduce a new project aimed at the development of a methodology for assessing geothermal potential of sedimentary basins by using data from oil and gas exploration.

The 'Minerals' section contains 19 papers from minerals geoscience projects throughout BC. Madu provides an update of the Search project, which has now completed a second phase of airborne magnetic data collection.

Geochemistry is once again a main focus of Geoscience BC projects. Sacco et al., Geffen and Bluemel, and Bluemel and Geffen highlight advances in analyzing and interpreting TREK project till geochemical data, and Jackaman summarizes Geoscience BC's ongoing updates to the provincial RGS databases. Three papers, one by Yehia et al. and two by Heberlein and Dunn, highlight the ongoing development of new geochemical techniques in BC (using a field-portable photometer and voltammeter, and through the analysis of halogen and other volatile compounds, respectively). Hart and Jenkins present a summary of a recently completed Mineral Deposit Research Unit project focused on compiling and interpreting surficial geochemistry around BC porphyry deposits.

Four student papers are focused on important mineral deposits or mining districts in BC: Highland Valley (Chouinard et al. and Byrne et al.), Brucejack (McLeish et al.) and Kerr-Sulphurets-Mitchell (Campbell and Dilles). South-central BC is the focus of Mortensen et al. and Bouzari et al., who characterize the basement of the Quesnel terrane and porphyry-fertile plutons in the region, respectively. Chapman et al. provide an update on using detrital gold as an indicator mineral in central BC.

Two papers, by Hoy et al. and Cook, describe new mapping and geophysical interpretation being produced in southeastern BC. Finally, Flynn and Madu highlight an innovative partnership between Geoscience BC and the Canada Mining Innovation Council aimed at compiling and disseminating key water quality data related to the mining sector.

### Geoscience BC Publications 2016

In addition to this *Summary of Activities* volume, Geoscience BC releases interim and final products from our projects as Geoscience BC reports. Highlights from 2016 include the Search Phase I airborne survey data in west-central BC, a new airborne EM survey in northeastern BC, a tree-top biogeochemical survey in central BC and a report highlighting direct-use geothermal resources in BC.

The most up-to-date listing of all Geoscience BC data and reports can be accessed through our website at [www.geosciencebc.com/s/DataReleases.asp](http://www.geosciencebc.com/s/DataReleases.asp). Most final reports and data can be viewed through our Earth Science Viewer at <http://www.geosciencebc.com/s/WebMaps.asp>.

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](mailto:info@geosciencebc.com).



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