



2015 ANNUAL REPORT



WHAT IS GEOSCIENCE?

Geoscience is the study of the earth, including its natural mineral and energy resources.

WHO WE ARE

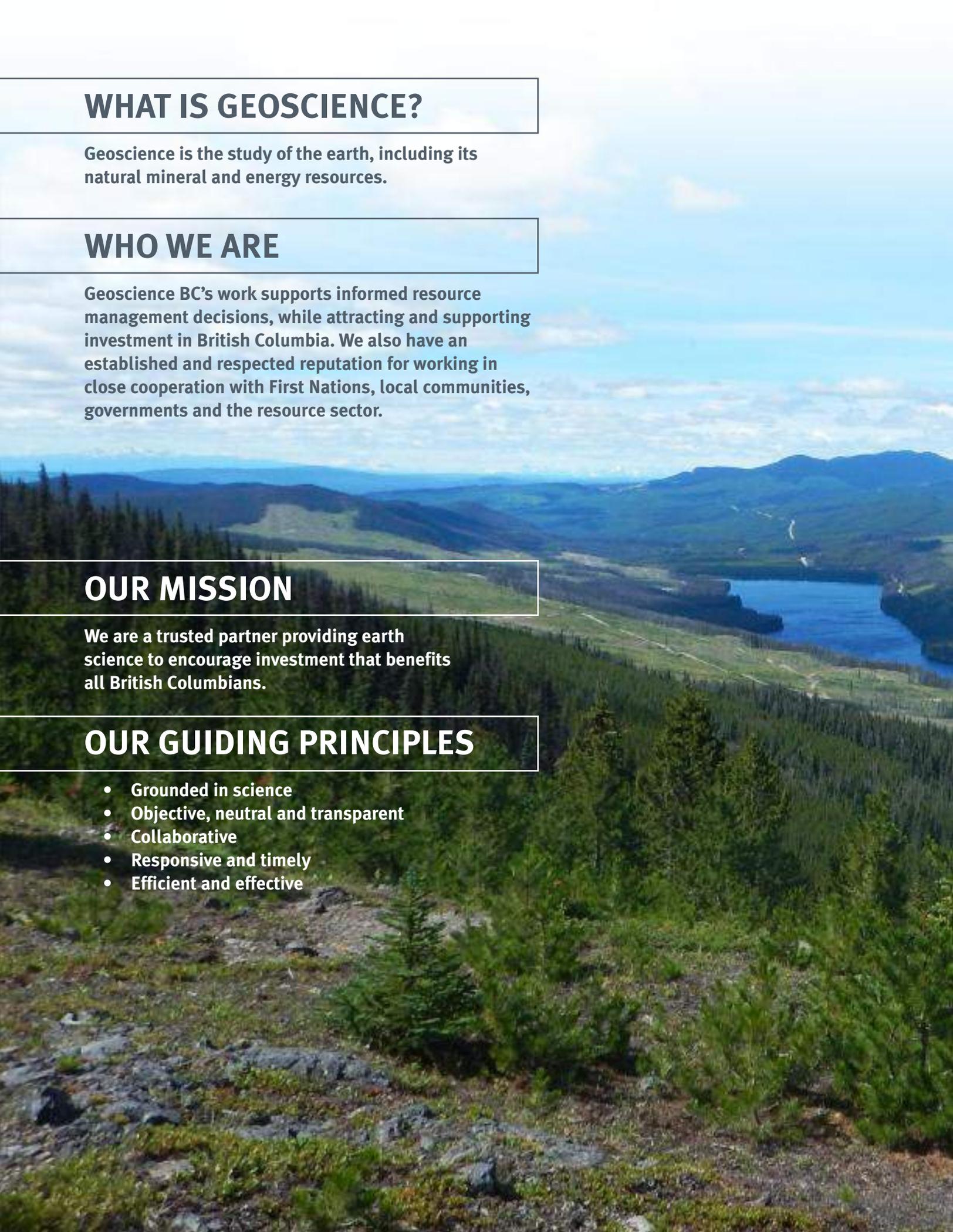
Geoscience BC's work supports informed resource management decisions, while attracting and supporting investment in British Columbia. We also have an established and respected reputation for working in close cooperation with First Nations, local communities, governments and the resource sector.

OUR MISSION

We are a trusted partner providing earth science to encourage investment that benefits all British Columbians.

OUR GUIDING PRINCIPLES

- Grounded in science
- Objective, neutral and transparent
- Collaborative
- Responsive and timely
- Efficient and effective



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earth science for everyone

MESSAGE FROM THE CHAIR



*Michael Cathro
Chair of the Board,
Geoscience BC*

As Geoscience BC celebrates the start of its second decade, I am pleased to report the organization is very healthy, and we continue to deliver quality independent geoscience products for the benefit of all British Columbians. With the downturn in the prices of BC's key energy and mineral commodities, the work of Geoscience BC is more important than ever, helping to generate new economic activity. As always, the information we generate is accessible to everyone, at no charge.

In June 2015 we were pleased to receive \$5 million in interim funding from the Provincial Government. Given the current climate of fiscal restraint, this funding is a strong vote of confidence in the work of our organization. We will continue to work with the government to achieve their commitment of long-term predictable funding for Geoscience BC, and endeavor to lever that funding through partnerships.

As incoming Chair of the Board, I wish to thank all of our partners, staff, Technical Advisory Committees and Board members for all their hard work, passion and dedication to the organization. In particular, I would like to acknowledge the service and leadership of John Thompson and Jim Gray who have served tirelessly as Chair and Treasurer of Geoscience BC since its inception 10 years ago. I wish to also thank retiring Directors Geoff Freer and Calvin Helin for their hard work and guidance, and welcome our new Directors Nalaine Morin and Doug Konkin.

The organization is strong and we look forward to another decade of attracting private sector investment to BC.

A handwritten signature in black ink, appearing to read "Michael Cathro".

Michael Cathro
Chair of the Board
Geoscience BC



*Dr. John Thompson
Chair of the Board,
Geoscience BC*

British Columbia employs a globally unique model for understanding the rocks beneath our feet, and making use of this knowledge to support sustainable resource development. We generate geoscience data through government agencies, such as the BC Geological Survey and the Geological Survey of Canada, and independently through Geoscience BC and collaborators, and disseminate it publicly. The combined effort is complimentary and adds tremendous value and appeal to British Columbia.

The independent governance model, involvement of numerous volunteers, and extensive engagement characterize Geoscience BC making it a trusted source of earth science information for all British Columbians. It gives our province a significant advantage, both in the tough times we are facing now and in the good times that will return. The data and our

efforts to explain it benefit First Nations, local communities, all levels of government and the resource sector.

In September 2015, I stepped down as Chair of the Geoscience BC Board after ten very enjoyable years. I am immensely proud of Geoscience BC's achievements and although leaving was a tough decision, I look forward to supporting the organization in the background in the coming years. Under Mike Cathro's capable guidance, Geoscience BC will continue to generate quality data and provide explanation of the value of the data for investment and responsible resource decisions.

A handwritten signature in black ink, appearing to read "John Thompson".

Dr. John Thompson
Chair of the Board
April 2005 – September 2015
Geoscience BC



*Robin Archdekin
President & CEO
Geoscience BC*

MESSAGE FROM THE PRESIDENT & CEO

2015 marked an important milestone as we celebrated Geoscience BC's 10th anniversary. Over the past decade, we have cemented our reputation as a respected, independent, objective earth science provider. Geoscience BC is well-positioned to help the people of British Columbia make knowledgeable and informed decisions about our environment and resources, which is especially important during these challenging times.

The value of public geoscience is greater than ever, even as we ride the current lows in the commodity and energy economic cycles. Our responsive, respected and transparent earth science plays an even more important role in land use management decisions and encouraging investment that promote jobs in BC. As an independent, trusted organization, Geoscience BC delivers the knowledge to help British Columbia remain prosperous and attract investment to BC in an increasingly competitive global market.

Our work in the energy sector continues to grow as we collaborate closely with First Nations, local communities, governments to provide vital earth science research that assists address concerns related to water and induced seismicity. In March 2015, we launched our Peace Project, the largest airborne groundwater mapping project in B.C. history with over 8,000 square kilometers in the Peace region of B.C.

Geoscience BC continues to fund a wide range of mineral projects that play a strategic and important role in attracting global interest in exploration investment. Our work has focused on under-explored regions; areas with high mineral potential, but with complicated geology, thick overburden or other complexities. Over the past decade we have delivered projects covering over half the province, and much work remains. TREK, one of Canada's largest multi-disciplinary geoscience projects, is in its third year and producing massive new data sets and new geological understanding in the

highly prospective central region of B.C. In September 2015 we launched the large multi-year Search project, which focussed this year on generating new high definition magnetic data around the communities of Terrace, Kitimat and Smithers.

Geothermal energy is an area of growing interest in B.C. First Nations and local communities have expressed strong interest. Geoscience BC has partnered with BC Hydro and others to study the economic and technical viability of direct use and electrical generation from geothermal sources. A direct-use project is developing a "road map" for those considering geothermal energy as an alternative and complimentary energy source.

Geoscience BC is guided by First Nations, all levels of government and resource sector experts who volunteer their time to our exemplary Board of Directors and three Technical Advisory Committees for Minerals, Oil & Gas and Geothermal research. I'd like to acknowledge the B.C. government's ongoing support of Geoscience BC and their continued commitment to explore options and opportunities to create long term predictable funding to enable our independent, valuable work to continue.

Finally, my sincere thanks to John Thompson for his 10 years of dedicated service and tireless leadership as Chair of the Geoscience BC Board. I'm excited about the year ahead and look forward to working with our new Board Chair, Mike Cathro.

Robin Archdekin
President & CEO
Geoscience BC

GEOSCIENCE BC IN 2015

In 2015, Geoscience BC received \$5 million dollars from the provincial government and launched two major projects: the Peace groundwater mapping project and the Search mineral exploration project. We also celebrated our 10th anniversary with Geoscience BC Day, including a full-day technical session celebrating a decade of earth science research, and the Decade Dinner with keynote speaker, The Honorable Minister Bill Bennett.

\$5 million investment

In June 2015, the Honourable Bill Bennett, Minister of Energy and Mines and Minister Responsible for Core Review, committed to supporting Geoscience BC with a \$5 million investment to support mineral, water and energy earth science in British Columbia. The Hon Bennett said the investment recognised the “outstanding contribution to the economic health of BC” Geoscience BC makes.



Photo by Maja Images

Two major projects launched

Peace Project

Geoscience BC launched the Peace Project in March 2015 to generate sound technical knowledge of the shallow aquifers in the Peace Region of northeast British Columbia. The Peace project is one of many separate water stewardship efforts that feed into the BC Government’s Northeast Water Strategy (NEWS), designed as a single blueprint for monitoring and managing water resources for all users in the Northeast. In summer 2015, an 8,000 square kilometre airborne electromagnetic survey was over the Peace Region measure the resistivity of the materials below the surface. Read more about this project on pages 6-7.

Search Project

Geoscience BC launched the \$2.415 million multi-year Search project in September 2015 to help explorers to focus their efforts in west central British Columbia. By November 2015, a 6,700 square kilometre airborne magnetic survey between Terrace, Kitimat and Smithers was completed at a 250 meter line spacing providing new, detailed data. The magnetic survey data will be released to the public in early 2016, and planning is underway for 2016 activities which will include more airborne surveying, community outreach and possible fieldwork. Read more about this project on pages 8-9.

New data and reports

Geoscience BC published 15 new datasets and reports in 2015. There were maps of prospective areas around the province, interpretations of new and existing data, reviews of potential geothermal sites, and new methods for mineral explorers and the energy sector. See pages 23-24 for a full list of data releases and publications from Geoscience BC for 2015.

Geoscience BC Day

On 8 October 2015, we celebrated a decade of earth science with Geoscience BC Day. The day began with a Technical Session featuring 18 speakers presenting a snapshot of the 132 projects Geoscience BC have funded since our inception in 2005.

In the evening, over 150 people, including many past and present board members responsible for the formation of Geoscience BC 10 years ago, gathered for The Decade Dinner. Visit pages 16-17 for a photo essay of the event.

Earth Science Viewer launched

Our Earth Science Viewer (ESV) was officially launched during the Geoscience BC Day Technical Session on October 8. The ESV is our new, web-based map and data delivery service: a single place to access the earth science information we generate and make available to everyone. Read more on page 13.



Photo by Russell Eggleston Photography



Photo by Cara Devaney Photography

New staff

Three new staff joined the Geoscience BC team in 2015. Kylie Williams, a geologist and communications specialist, took on the role of Communications Manager in September 2015. Her role is to raise the profile and promote the achievements of Geoscience BC across a range of online, social and traditional media.

Janice Fingler assumed the responsibilities of Christa Pellett as Project Manager for Geoscience BC during a 15-month contract starting in July 2015. Janice brings over 25 years of experience as a professional geologist and seasoned project manager to Geoscience BC.

Candice Ridyard, an experienced communications and administration professional for mining and junior exploration companies, joined the Geoscience BC team in July 2015 as Office Administrator and Executive Assistant.



Kylie Williams



Janice Fingler



Candice Ridyard

Online community

There are now several ways to connect with Geoscience BC online.

In addition to our website, we are active on LinkedIn, Facebook and Twitter, and in late 2015 we launched a YouTube video channel too, featuring many of the presentations recorded at the Geoscience BC Day Technical Session.

Follow, share and like us on social media and visit www.geosciencebc.com to join our growing mailing list for all the latest news and data releases.



We have moved!
In August 2015, the
Geoscience BC team
moved to new offices.
Our address is:

1101 – 750 West Pender Street,
Vancouver, BC V6C 2T4



Photo by SkyTEM



Photo by Russell Eggleston Photography

THE PEACE PROJECT

Mapping northeast BC's groundwater resources



Geoscience BC launched the Peace Project in March 2015 to map and characterize groundwater aquifers in the Peace Region of northeast British Columbia

Working together to protect and manage water in BC

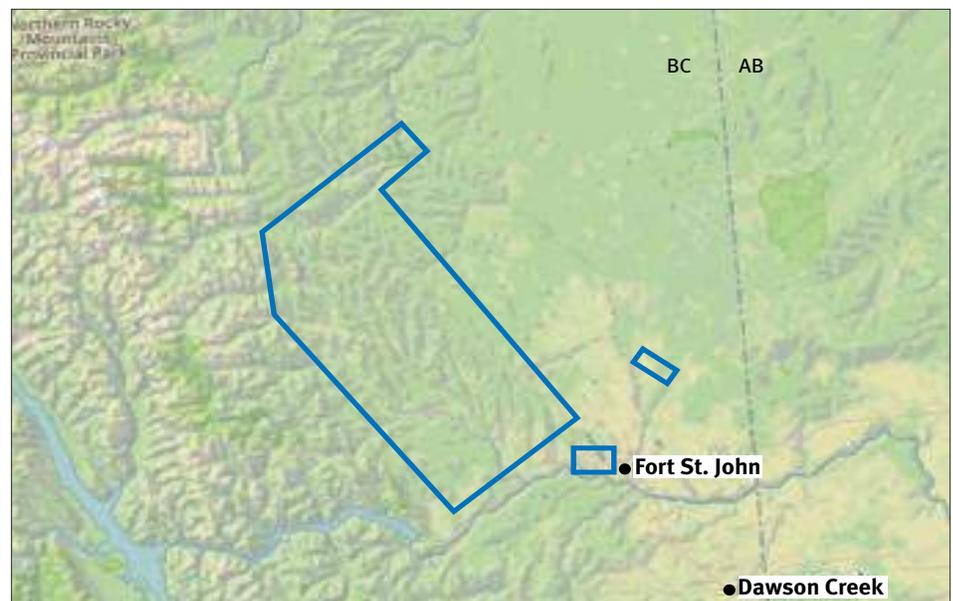
In May 2014, the BC Government passed a new *Water Sustainability Act* to regulate groundwater usage throughout the province. The Act will come into effect in 2016. In order to adequately protect shallow aquifers and sustainably use groundwater resources, we first need to know where the individual aquifers are and the quality and quantity of water in them.

To achieve this goal, together with a host of project partners, Geoscience BC launched the Peace Project in March 2015 to generate sound technical knowledge of the region's shallow aquifers.

The Peace projects is one of many separate water stewardship efforts that feed into the BC Government's *Northeast Water Strategy (NEWS)*, designed as a single blueprint for monitoring and managing water resources for all users in the Northeast.

Mapping groundwater from above and below

Airborne geophysics has been used to map, classify and protect groundwater for decades in many countries around the world. SkyTEM Canada Inc. was selected by Geoscience BC to fly



“Our region is home to many competitors for water therefore the value of water is clearly understood. We are very pleased to support this initiative.”

**Lori Ackerman, Mayor of Fort St. John
and former Chair of the Peace River Regional District**

an airborne electromagnetic survey over the Peace Region in summer 2015. The survey, flown in just 43 days, covered an area of 8,000 square kilometres stretching northwest from Hudson’s Hope and Fort St. John to past Pink Mountain.

The survey measured the resistivity of the materials below the surface, and processing and modelling of this data will create useful maps of individual groundwater aquifers and the structures which control their location. This work is being undertaken by Aarhus Geophysics.

Another key component to this project involves mapping the Quaternary, or recently deposited, sediments found below the surface by surveying existing petroleum boreholes. This work, undertaken by Petrel Robertson Consulting Ltd. and Quaternary Geosciences Inc., will provide information about the depth to bedrock and will be used to constrain the geophysical models of the area.

Who will use the results?

Initial results from Phase I of the Peace Project will be delivered in early 2016. These

preliminary maps of the shallow aquifers and groundwater resources in the Peace Region will be available to everyone, including First Nations, government, local communities and the energy sector.

Community

Geoscience BC staff visited Fort St John in July 2015 to kick-off the Peace Project and answer questions from the community about the airborne geophysical survey. The BBQ, co-hosted by SkyTEM and Bailey Helicopters, was well-attended by interested members of the community who enjoyed an up-close look at the technology used to map aquifers from the air.

After a visit and discussions with the Doig River First Nation in August 2015, Geoscience BC agreed to include additional areas to the original survey plan to map potential groundwater resources over Doig River First Nations traditional lands. First Nations communities, like Doig River, use our earth science data to assist and guide local land use decisions and gain important insight to potential interests of the resource sector.



Doig River First Nation visit, August 2015
Photo by Andrea Clifford

Partners



Peace Project kick-off event in Fort St John, July 2015
Photo by Russell Eggleston Photography



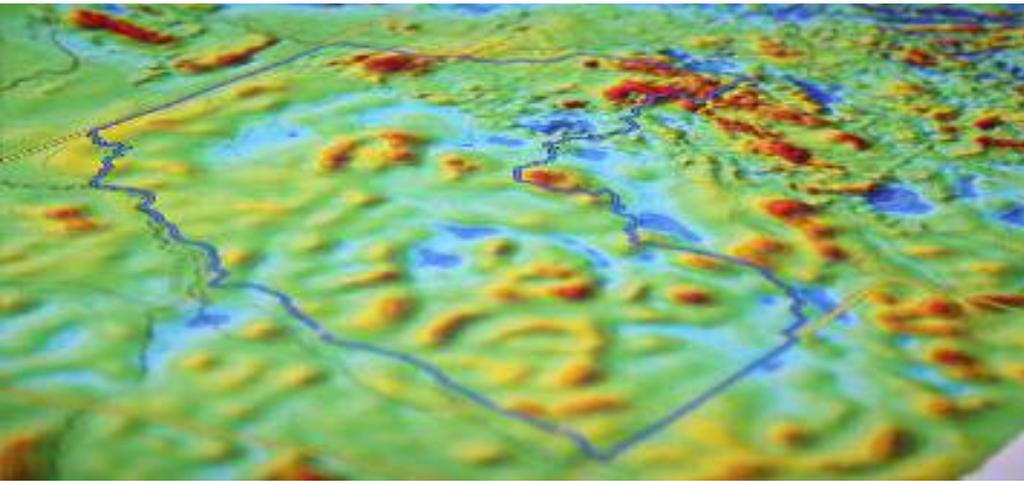


Photo by Cara Devaney Photography



Photo by Cara Devaney Photography

THE SEARCH PROJECT

Supporting mineral exploration investment in west-central British Columbia



The Search Project was launched by Geoscience BC in September 2015 and will encourage exploration in under-explored terrains of west-central British Columbia.

In September 2015, Geoscience BC launched Phase I of the \$2.415M multi-year Search project by announcing an airborne magnetic survey.

The Phase I survey area extends east of Terrace to Smithers and south to Kitimat and will guide mineral exploration efforts in the region. The data generated is expected to attract new investment to west-central BC.

Measuring the magnetic signature of bedrock

The 2015 Phase 1 component of the Search Project involved a 6,700 square kilometer airborne magnetic survey at a 250 m line spacing, much closer line spacing than previous surveys. The survey will complement gravity and electromagnetic (EM) data measured with 2- and 4- km line spacing obtained by Geoscience BC in 2008.

Rock-forming and mineralizing processes in the earth's upper crust can concentrate or redistribute magnetic minerals. These create magnetic anomalies that can be mapped using an airborne magnetometer carried by a helicopter.

“This high-resolution airborne magnetic survey will provide the public with much more detailed information about the area's mineral potential compared to the data that are currently available.”

Robert Quartermain, Chair and CEO of Pretium Resources,
Geoscience BC Board Member





Details of the 6,700 square kilometer airborne magnetic sensor survey were unveiled at the survey base at a media event held at the Northwest Regional Airport in Terrace on 8 September 2015.

Photo by Cara Devaney Photography



Photo by Bruce Madu

In May 2015, BC-based Precision GeoSurveys Inc. was selected to fly the survey. The company's experience in flying challenging mountainous terrain proved essential to accurately complete the pre-planned drape surface that averaged 80m above the ground surface.

Two person crews shared responsibilities for navigation, flying and wildlife observation. The development of an ungulate management plan as part of the operation was important to ensure the aircraft activities minimized impacts on goats and caribou.

Challenging weather conditions – including many days of fog and weather that grounded operations – meant that the survey took longer than expected; however, it was completed in its entirety and within budget.

Results available in 2016

The results of the survey are expected in early 2016 and will be freely available to land-users, area communities and the resource sector alike. The narrow spacing of the survey lines (250 m) for this project will be a significant improvement and become the highest resolution data of the area currently in the public domain.

Ultimately, the project will provide a wealth of new geophysical information and help identify previously overlooked geological features and structural features. Consequently the reduction in exploration risk is expected to attract investment and boost the economic opportunities for First Nations and regional BC communities.

Airborne geophysical survey data released by Geoscience BC has traditionally stimulated renewed exploration interest evidenced in part by jumps in mineral tenure acquisition. On-the-ground exploration activities lead to local procurement of goods and services to help stimulate and diversify local economies.

Ahead to 2016

In the coming year, the Search Project activities will involve geophysical surveys of adjoining areas to the east and southeast of the 2015 survey. The goal will be to join this survey to the 2013 TREK survey to provide a contiguous survey of high quality magnetic data almost 250 kilometers wide and 350 kilometers long.

For more information about the Search project, please visit www.geosciencebc.com.

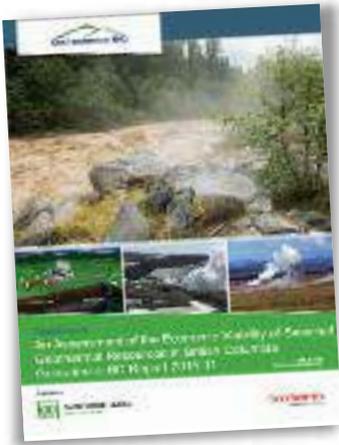
First Nations

Geoscience BC recognizes its large geoscience programs often occur over traditional territories of numerous First Nations. Many First Nations recognize the information from these programs may assist them in making decisions around land use within their traditional territories. In keeping with the organization's mission of providing earth science to all British Columbians, Geoscience BC maintains regular communications with First Nations about programs in their area.

Photo by Harmen Keyser



GEOTHERMAL PROJECTS



Geothermal energy is a clean, renewable, sustainable source of power used in over 20 countries. Geoscience BC supported a number of projects in 2015 exploring the potential of geothermal sites in British Columbia.

Economic Viability of BC's Geothermal Resources

Together with partner BC Hydro, Geoscience BC released a technical and economic assessment of 18 geothermal sites in British Columbia in July 2015.

The study was undertaken by Kerr Wood Leidal Associates Ltd. (KWL) and their partner GeothermEx Inc. They used publicly-available information and the Geothermal Electricity Technology Evaluation Model developed by US Department of Energy, to rank 18 sites throughout BC using a range of infrastructure, technical and economic considerations.

The results are presented as cents per kilowatt-hour (kWh), the most common billing unit for energy delivered to consumers. Using the levelized cost of electricity (or LCOE) to compare different methods of electricity generation, they were able to identify the top nine geothermal sites in BC.

The LCOE from the nine most promising sites identified in this study range from 6.9-7.1 CAD ¢/kWh for Pebble Creek/Meager Creek to 17.6 CAD ¢/kWh for Clarke Lake. For a thorough analysis, these number include a 5% discount rate.

Direct-Use Geothermal Resources in BC

Geothermal energy is commonly used as a local, direct-use resource used for heating and therapeutic purposes. In addition to hot springs, various uses of geothermal heat exchange are used around British Columbia to heat subdivisions, arenas, houses and even the new Surrey City Hall in the Lower Mainland. Worldwide it is used for heating, agricultural, industrial, commercial, snow clearing and recreational purposes, and more opportunities exist for British Columbia.

In September 2015, Geoscience BC announced a new project to identify and evaluate direct-use geothermal energy opportunities for BC communities, to potentially help reduce greenhouse gas emissions and drive economic development.

The project, led by BC-based Tuya Terra Geo Corp in collaboration with Geothermal Management Company Inc., is building on the economic viability study mentioned above, and other publicly-available information.

A Geothermal Direct-Use Road Map will be produced for the communities, providing guidelines for surface exploration, land acquisition and permitting, drilling and testing wells.

This project is jointly funded by Geoscience BC and the BC government's Innovative Clean Energy (ICE) Fund.

Surrey City Hall uses geothermal heat
Photo credit: City of Surrey



Geothermal potential of the Nazko area

One aspect of our multidisciplinary TREK (Targeting Resources through Exploration and Knowledge) project examined in detail a potential geothermal source area about 10 km southwest of the First Nation community of Nazko, west of Quesnel in central British Columbia.

The project focused on the North and South bogs northwest of the 120 m high Nazko basalt cinder cone, which last erupted about 7,200 years ago. It is the youngest in a belt

of volcanoes that runs 600 km from the north of Vancouver Island and east to Quesnel.

Researchers Ray Lett and Wayne Jackaman determined that deep-seated magmatism generated the geothermal activity responsible for some subtle geothermal signs identified at the sites in 2012. Deposits of travertine, a white calcium carbonate mineral known to form at hot springs, soil gas seepage and the mixture of organic soil and calcium carbonate occurring in the wetland areas are known to be indicators of geothermal activity.

Bog water, soil, rock, gases and local vegetation were geochemically analyzed and the study concluded that the trace helium signature found within the CO₂ gas seepage at the surface originates from a mantle magma dyke or sill swarm at ~27 km depth. Elevated lithium and boron levels in groundwater and soil suggest the presence of a deeper, warmer fluid at depth although evidence of upwelling and discharge has not been observed. Mercury levels further indicate that the area may have experienced geothermal activity for more than 2.5 million years.

Photo by Wayne Jackaman





iStock

BRITISH COLUMBIA GAS ISOTOPE ATLAS

Fingerprinting natural gas for improved monitoring and identification of value-add gas streams in northeast British Columbia

In late 2015, Geoscience BC launched a new project to systematically sample, analyze and catalogue carbon isotope and standard molecular data from active natural gas operations and producing gas wells in northeastern BC. Such a systematic cataloguing of the geochemical ‘fingerprint’ of natural gases has not been attempted before in BC and will not only be beneficial for the responsible development of these resources, it will also allow natural gas operators to optimize their drilling for higher value natural gas liquids gas streams.

Natural gas in British Columbia

Natural gas has been produced for over 60 years in northeast British Columbia. With new drilling and extraction techniques, BC is experiencing a natural gas development renaissance. Extensive drilling will be needed to support a nascent LNG industry on the west coast of British Columbia.

The formation of most natural gas begins with the burial of plant-rich habitats without oxygen. Continued burial increases the temperature and pressure that breaks down the decomposed organic material into a range of hydrocarbons. The majority of natural gas, which is mostly methane, is formed when subsurface temperatures exceed 150°C, where oil becomes destabilized and ‘cracks’ to natural gas.

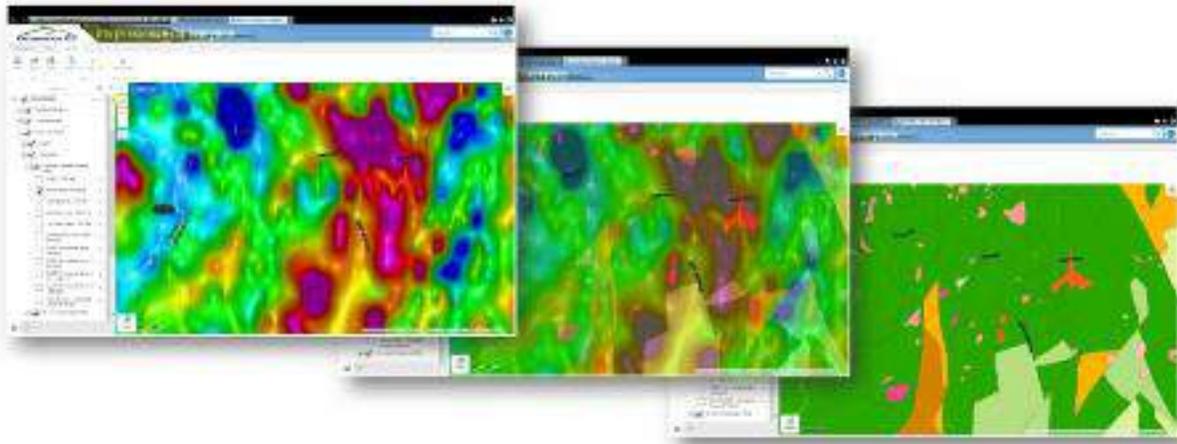
Each step in this process affects gas formation, and potentially, gas production. And whether it is a variation in the source material, or the microbial activity or the maturation history of the source rock, each step has an identifiable molecular and isotopic fingerprint. Geochemical analysis can therefore help unravel gas play history and identify the source location of gas samples, each with their own subtly different fingerprint.

A Natural Gas Atlas

The BC Natural Gas Atlas (BC-NGA) is a Geoscience BC supported, 3-year project led by Dr. Michael Whiticar of the University of Victoria. The project has two major goals: 1) to aid the understanding and prediction of hydrocarbon-type occurrences, maturation histories and production prediction of natural gas in BC; 2) create a carbon isotope/geochemical baseline which can be used to discern potential fugitive emitters into groundwater and/or the atmosphere.

The BC-NGA will be available as an open-access comprehensive geochemical database (with mapping capabilities) of the major natural gas pools/fields in northeast BC.

For more information, visit www.geosciencebc.com.



A NEW VOICE FOR GEOSCIENCE BC

“The Earth Science Viewer is absolutely a powerful tool for exploring British Columbia, especially in the early stages of a desktop research or targeting project.”

Farshad Shirmohammad, Business Development, Hunter Dickinson Inc.

Earth Science Viewer (ESV) is our new, web-based map and data delivery service: a single place to access the earth science information we generate and make available to everyone.

After several months of testing in early 2015, the ESV was officially launched by Bruce Madu, our VP for Minerals and Mining, on October 8, 2015 at Geoscience BC Day. In his presentation, he explained how the ESV is ‘democratizing’ science by making it available to the widest audience possible without the need for specialist software or licences.

Our customized ESV is an online tool built by Geoscience BC GIS Specialist Jeff Hamilton that consolidates all project and report data released through Geoscience BC and its project proponents. It is built using Geocortex Essentials software, created by Victoria-based company, Latitude Geographics. It meets our need to make reports and data easily available to everyone.

The concept of putting earth science in the hands of all British Columbians via the internet started with the development of the BC Geological Surveys ‘MapPlace’ in the early 1990s. Our ESV is inspired by MapPlace and developed using the latest technology.

Access the Earth Science Viewer via our homepage at www.geosciencebc.com.





TREK Project
Photo by Bruce Madu

ONGOING PROJECTS

In addition to the new projects announced in 2015, Geoscience BC has a number of ongoing projects, many of which achieved major milestones during the year. Some are partnerships generated through our request for proposals process, typically led by consultants and university researchers, while others are projects initiated and led by Geoscience BC. Information about all of our new and ongoing projects can be found on www.geosciencebc.com and a few are highlighted here.

Minerals and mining projects

TREK

Summer 2015 marked the third field season for the multidisciplinary Targeting Resources through Exploration and Knowledge (TREK) project. Developed by Geoscience BC and initiated in 2013, the \$4.1 million project is generating new information in an underexplored yet highly prospective area for mineral resources like gold and silver. The 24,000-square-kilometre project area covers much of BC's Interior Plateau, stretching south from Vanderhoof and Fraser Lake and west from Quesnel, and includes the well-known Blackwater Gold District.

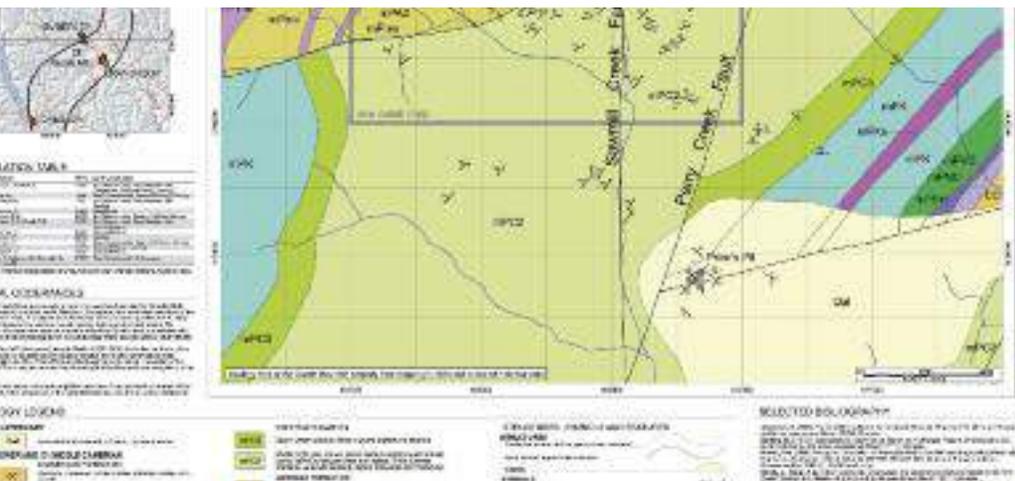
In May 2015, results from the 2014 till sampling project were released. A total of 1456 archive till samples plus quality control samples were analyzed for minor and trace elements by ICP-MS, and 873 archive till samples plus quality control samples were also analysed for major and minor elements by ICP-ES following a lithium borate fusion and dilute acid digestion.

As part of the TREK Geochemistry project component, a previously unsampled area was surveyed using biogeochemical methods. The 1,000 square kilometre Blackwater Grid has limited road access and few lakes exist, restricting traditional sampling options. 421 tree-top twig, needle and cone samples were collected from 401 healthy Spruce trees using a helicopter and analyzed for elements such as gold, copper, silver and molybdenum.

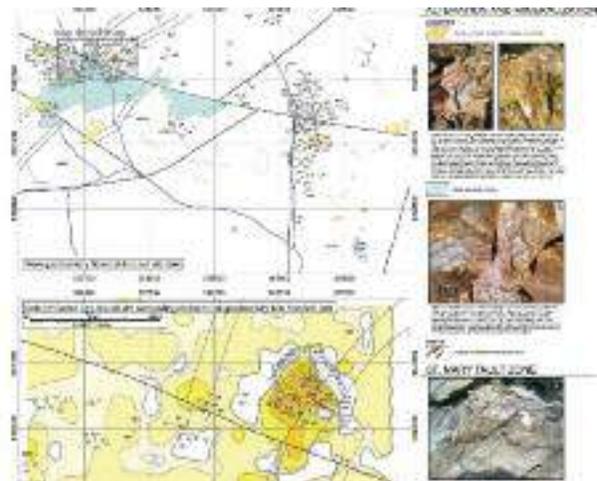
Fieldwork for the TREK Geology and Integration program continued in 2015 and is expected to be complete by March 2017.



Photo by Bruce Madu



SEEK Project MAP_GM2015-13-02



SEEK

The Stimulating Exploration in the East Kootenays (SEEK) program was initiated by Geoscience BC and the East Kootenay Chamber of Mines in 2011 to bring the region’s rich exploration history into the public domain to encourage continued exploration for economic mineral deposits in southeast BC.

In November 2015, Geoscience BC released a series of new geological maps and a compilation of valuable historical data for mineral explorers seeking the elusive source of the gold found in the streams around the Purcell Mountains near Cranbrook in southeastern British Columbia.

The main map covers the Kimberly Gold Trend, a prospective area between Cranbrook, Kimberly and Creston that hosts four gold-rich streams mined since the 1800s and many small gold deposits. Within this area the researchers chose three properties - the Quartz Mountain, Eddy and David properties - to create more detailed maps.

To date, most of the large scale, publicly funded, geological research projects have focused on the lead and zinc occurrences in the area, due to the attraction of the Sullivan mine near Kimberly. The purpose of this project is to identify important structural features that could control the location of the gold occurrences and to develop a model for the emplacement of gold within the Kimberly Gold Trend.

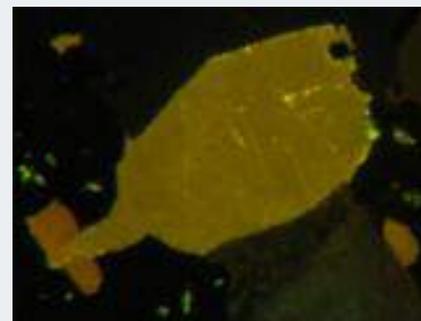
Almond Mountain

The Almond Mountain project involves geological mapping and compilation of data across a large part of the 1:50,000 scale Almond Mountain map area, located in the Monashee Mountains of southern British Columbia. Geological mapping in 2014 and 2015 focused on the Kettle River area, along the western margin of the Almond Mountain map sheet, where a number of base and precious mineral veins are found.

This project, and the continuation to the north in the Christian Valley map sheet in 2016, explores the structural, stratigraphic and magmatic controls of precious and base-metal mineralization in these areas. Further mapping and identification of these structures in the Pentiction map sheet will help direct and focus future mineral exploration throughout the southern Monashee Mountains and Okanagan Highlands of southern British Columbia.

Porphyry Indicator Minerals

This project examines PIMs from the alkalic Mount Polley, Mount Milligan and Copper Mountain deposits in BC. Mineral Deposit Research Unit scientists are using Porphyry Indicator Mineral (PIM) assemblages and diagnostic parameters to establish criteria for their use in BC mineral exploration. Results from this project are expected in early 2016.



Bouzari-Magma Whale



Oil and gas projects

Induced Seismicity Monitoring

In February 2015, Dr. Alireza Babaie Mahani began working closely with other seismology experts from Natural Resources Canada (NRCan)'s Pacific Geoscience Centre and the BC Oil & Gas Commission (BCOGC) to monitor induced seismicity from natural gas development in northeast BC. Geoscience BC hired Dr. Mahani on behalf of the Induced Seismicity Monitoring Network Consortium made up of Geoscience BC, NRCan, BCOGC, the Canadian Association of Petroleum Producers, and the Science and Community Environmental Knowledge Fund to study the relationship between fluid injection and potential large-magnitude seismic events, on a two-year assignment.

The consortium initiated the Induced Seismicity Monitoring Project in late 2012 to monitor seismic events created by oil and gas operations related to hydraulic fracturing and fluid disposal to help reduce the risk of inducing low-magnitude earthquakes.

Work began in March 2013 with the installation of six state-of-the-art seismograph stations in key areas of northeast B.C. to complement the previously-existing two stations of the Canadian National Seismographic Network (CNSN). The six new stations were integrated into the CNSN by August of that year. In November 2014, two more stations were brought online by NRCan and the BCOGC to further enhance the resolution of the CNSN. In late 2015, a seventh seismograph station was added and monitoring continues.

Natural Gas Liquids

In 2013, Geoscience BC started a three-year project with the University of British Columbia (UBC) and industry partners to quantify gas and natural gas liquids (NGLs) and flow characteristics in unconventional reservoirs. "Unconventional" reservoirs are those in which oil and/or gas do not flow naturally through the rock and require non-traditional ways of unlocking the hydrocarbons. In northeast B.C., these are the shale gas reservoirs, where the process of hydraulic fracturing is necessary to access the natural gas locked within the highly compact shale source rocks.

Ongoing Projects Map





10TH ANNIVERSARY CELEBRATION



Event photos by Vision Event Photography

Geoscience BC Day Technical Session

The Geoscience BC Technical Session was a celebration of the earth science knowledge we have generated and disseminated over the last decade. We support projects that combine existing data, explore innovative technologies and methods, and collect new information over broad areas of British Columbia.

Since 2005, we have funded 132 projects and collected new information over more than 529,500 square kilometres of the province, including vast airborne surveys and thousands of till, soil, sediment and surface water samples.

Our VP for Minerals and Mining, Bruce Madu, and our VP for Energy, Carlos Salas, assembled 18 of the many researchers we have supported over the last decade, to present a snapshot of what Geoscience BC has achieved in a full day technical session on October 8, 2015.

We would like to personally thank each of the speakers for the time and thought they put into their presentations and extend a special thank you to our session chairs - Peter Bradshaw, Henry Awmack, James Barr and Garth Kirkham - for guiding the technical sessions.





“British Columbia is a large province with remarkable and beautiful physiography. We have islands and fjords, mountains and plateaus, lakes and rivers, and fantastic geology: rocks that provide incredible value and also support other surface activities, from forestry to agriculture to tourism.

This combination drives the economy of the province and the welfare of all the people in BC – First Nations, rural communities and, although not always appreciated, city dwellers.

Understanding the rocks beneath our feet is the first critical step to delivering that value in a responsible and environmentally sound manner.”

An extract from Dr. John Thompson’s speech at Geoscience BC’s 10th Anniversary Decade Dinner. John was Chair of the Geoscience BC Board from April 2005 to September 2015



Geoscience BC Decade Dinner

On 8 October 2015, Geoscience BC hosted a dinner to celebrate our 10th anniversary. Over 130 guests, including ministers, past and present board and technical advisory committee members, project proponents and supporters of Geoscience BC, gathered to share stories from the past 10 years. Minister Bill Bennett shared his memories from the early days of Geoscience BC’s formation.



SCHOLARSHIP RECIPIENTS



In July 2015, Geoscience BC awarded ten scholarships of \$5,000 each to graduate students working on earth science projects in British Columbia. Since 2007, Geoscience BC has awarded 73 graduate student scholarships of \$5,000 each, representing a total investment of \$365,000 into graduate research and education of our future geoscientists.

Each year, applicants are evaluated on their project's technical merit and ability to attract investment to BC, and their academic qualifications and work experience. Preference is given to applicants whose projects show the greatest potential to benefit the BC resource sector, and whose research and career interests are primarily focused toward the mineral exploration and energy sectors.

For more information on the Geoscience BC graduate scholarship program, including past projects and how to apply, visit www.geosciencebc.com.

Sina Abadzadesahraei

MSc student
University of Northern British Columbia

Quantifying the water budget of Coles Lake, Northeastern British Columbia

Finding the balance between sustainable water resource use and the substantial economic benefits brought to an area by the oil and gas industry is vital. Northeastern BC provides the majority of oil and gas produced in BC but climate change evidence suggests an increased rate of warming may be adversely affecting the region's hydrological cycle.

With Geoscience BC's support, Sina, a University of Northern British Columbia PhD student, is combining fieldwork, observational data analysis, and numerical modeling to quantify the volume of water that may be safely diverted from Coles Lake in northeastern BC for hydraulic fracturing while still protecting the lake environment.

Sina is currently a member of the Northern Hydrometeorology Group at the University of Northern BC with research interests in hydrology, watershed management and surface and ground water modeling. His project is run in collaboration with Quicksilver Resources (a natural gas and oil company) and the BC Ministry for Forests, Lands, and Natural Resource Operations.

Matt Bodnar

PhD student
University of British Columbia

Modeling surface geochemical responses in transported overburden above a VMS deposit

Surficial cover, such as glacial till, can significantly lessen the ability of conventional mineral exploration techniques to identify even high-grade ore deposits in bedrock. Matt's project aims to increase the utility and cost effectiveness of geochemical sampling programs in covered terrain. His MSc research, guided by Prof. Peter Winterburn at the University of British Columbia and supported by a Geoscience BC scholarship, is studying the Lara polymetallic Volcanic Massive Sulphide deposit on Vancouver Island. The deposit is covered by up to 15 m of basal till and colluvium so Matt is studying the distribution of elements at the surface to assess the relationship of surficial geochemical anomalies to bedrock mineralization.



Aimee Geglick

MSc student
University of Alberta

Sedimentology, Ichnology and Reservoir Characteristics of the Upper Montney Formation in Northeast British Columbia

Undeveloped conventional gas plays are now scarce due to decades of gas production. As a result, unconventional gas sources in tight, low permeability rock are increasingly being investigated.

Aimee's MSc project at the University of Alberta is supported by Geoscience BC and focuses on the Upper Montney Formation in Northeastern British Columbia. Although the Montney Formation is well-researched, the processes controlling the reservoir characteristics of the heterogeneously distributed siltstone are still poorly constrained.

The aim of this project is to develop predictive stratigraphic and sedimentologic models to identify 'sweet spots' within siltstones of the Upper Montney. This requires detailed descriptions of the lithology, physical and biogenic sedimentary structures, and body fossils. For example, identifying bioturbation is crucial to understanding reservoir permeability and the depositional environment. Aimee will determine the lithofacies using petrography, petrophysical analysis, SEM and geochemical analysis.



Justin Granek

PhD student
University of British Columbia

Advanced Geoscience Targeting via Focused Machine Learning

With the majority of the easy mineral resource targets having already been found, the mining industry is being forced to re-think exploration programs. Future targets are likely to be deeper, with little or no surface expression, and may be concealed from conventional exploration techniques by overburden, permafrost or other geologically complex environments.

To find new targets, a holistic approach is required to identify trends from multiple sources, including geology, geophysics and geochemistry. Quantifying and correlating georeferenced features from such a wide array of data types can be best handled using machine learning algorithms.

Justin's PhD research, under the guidance of Prof. Eldad Haber at the University of British Columbia, is working on tailoring such algorithms to this specific application. This work requires an understanding of both the data, as well as the theory supporting machine learning. Such a marriage of expertise can lead to vast improvements in performance and a more reliable outcome in predicting future mineralization zones.



Nicolas Harrichhausen

MSc student
McGill University

Role of colloidal transport in the formation of high-grade gold veins at Brucejack, British Columbia

Understanding the processes that cause mineralization is fundamental to the success of mineral exploration programs and ore processing. Quartz-carbonate veins at the Jurassic Brucejack deposit in northern British Columbia contain as much as 41,500 g/t Au; these grades cannot be explained by current theories.

Nicholas developed his MSc project with Dr. Christie Rowe of McGill University after working at the Brucejack deposit for Previtm Resources. With support from Geoscience BC and Previtm Resources, Nicholas will investigate how gold and electrum are transported and whether these process can explain the grades seen at Brucejack. This project will look at the textures of the minerals associated with gold deposition at Brucejack and make comparisons with similar systems in the Dixie Valley, Nevada.



Rachel Kim

MSc student
University of British Columbia

Characterization of the Late Cretaceous Kasalka Group in North-Central British Columbia

Geoscience BC’s TREK (Targeting Resources for Exploration and Knowledge) project aims to facilitate mineral exploration in the northern Interior Plateau in central British Columbia. There are several important mineral deposits in the TREK area that are hosted by a package of rocks of Late Cretaceous age called the Kasalka Group, including New Gold’s Blackwater gold-silver epithermal deposit.

Under the guidance of Dr. Craig Hart at the Mineral Deposit Research Unit at UBC, Rachel’s MSc project is studying the Late Cretaceous Kasalka Group volcanic rocks in north-central British Columbia; a group of poorly understood due to limited exposure at the surface. With the support of Geoscience BC, Rachel will use geochronology, geochemistry and regional mapping to characterise and constrain the Late Cretaceous volcanism for mineral explorers in the region.



Siobhan McGoldrick

MSc student
University of Victoria

Awaruite occurrence and distribution in ultramafic rocks of the Cache Creek Terrane, northwestern BC

Awaruite is a naturally occurring nickel-iron alloy derived from ophiolites, the fault-bound remnants of extinct oceanic basins with potential for Ni-mineralization. Siobhan’s MSc research, under the guidance of Prof. Dante Canil, focuses on the Nahlin ultramafic body in northwestern British Columbia. Siobhan’s project is looking at where the ophiolitic mantle rocks come in contact with other rocks, how they are altered and their structure and distribution.

During the 2015 field season Siobhan mapped several peaks and ridges of the Nahlin ultramafic body, assisted in part by the TGI4/GEMS program of the Geological Survey of Canada. She is currently undertaking geochemical, petrographic, and mineral studies using XRF, ICP-MS, SEM analyses at the University of Victoria.



Donald Prenoslo

MSc student
University of Alberta

Unconventional Gas Potential of the Lower Triassic Montney Formation, Pouce-Coupe-Dawson Area, Northeastern British Columbia

Understanding the depositional setting and the petrophysical properties of potential oil and gas plays reduces exploration risk. Donald’s MSc research, under the guidance of Professors J.P. Zonneveld and Murray Gingras at the University of Alberta, will study an important but poorly understood stratigraphic interval of the Lower Triassic Montney Formation around the Pouce-Coupe-Dawson area on the border of Alberta and British Columbia near Dawson Creek.

The objective of Donald’s research, which is supported by Geoscience BC, is to investigate the influence of bioturbation on reservoir quality, characterize the depositional setting, develop a stratigraphic framework, refine models used for defining reservoir units, reservoir correlations and properties important to reservoir quality and develop predictive models to help decrease exploration risk.

Observations to date include common cryptic bioturbation, recognized throughout the interval that has altered much of the rock fabric and appears to have affected resource storativity and deliverability.



Shane Rich

MSc student
University of British Columbia

Geochemical Mapping of Porphyry Deposits and Associated Alteration through Transported Overburden

The accurate interpretation of geochemical soil surveys requires consideration of the geology of the sampled material; the relative age of the land surface; and the geomorphological setting. For example, simple changes in organics and Fe-Mn-oxide contents as well as clay content and type can introduce considerable natural background variation, swamping anomalous responses from the mineralization. Understanding whether the surface material is being re-worked, either by natural processes or human intervention; being re-deposited; or in-situ following the final ice regression is essential to evaluating the level of expected response.

Shane Rich's MSc project guided by Dr. Peter Winterburn at the University of British Columbia will integrate multi-element geochemistry, geophysics (self-potential survey) and hydrocarbon analyses over the Deerhorn Cu-Au porphyry deposit, north-east of Williams Lake, to delineate the mineralization through young glacial cover. This study with the support of Geoscience BC will help develop robust models that will aid in positive anomaly recognition over deposits covered with till.



Sandra Rosset

MSc student
University of British Columbia

Hydrothermal Alteration at the Kerr Cu-Au Porphyry Deposit, KSM Project, Northwestern British Columbia

Mesozoic Cu-Au, Mo porphyry deposits associated with volcanic arcs accreted to the western margin of North America can be difficult exploration targets. Complications arise from complex alteration and metal zonation, and post-emplacment deformation that hamper mineral exploration decision-making.

The KSM (Kerr-Sulphurets-Mitchell) property in northwestern British Columbia, is one of the largest undeveloped gold projects in the world with proven and probable reserves of 38.2 million ounces Au and 9.9 billion pounds Cu.

Sandra Rosset's MSc research, initiated by the Mineral Deposit Research Unit at the University of British Columbia and Seabridge Gold Inc., will characterize and map alteration assemblages from the KSM Project and correlate their occurrence with mineralization.

This study, with support from Geoscience BC, will improve our understanding of complex hydrothermal alteration associated with porphyry deposits. It will integrate observations of vein paragenesis with petrographic analyses, sulfur isotopes, SWIR, SEM, XRD and EPMA analyses, to develop a hydrothermal alteration cross-sectional model of the area.

My PhD research is exploring the application of machine learning algorithms for mineral resource exploration. The financial support from Geoscience BC allowed me to attend conferences to learn about new computational techniques and technologies for the mining sector."

Justin Granek, UBC PhD Student

WHERE ARE THEY NOW?

Since 2007, Geoscience BC has awarded up to ten scholarships annually to graduate students working on BC-based projects relevant to the mineral, oil & gas and geothermal exploration industries.

Many of these students continue to work in the BC exploration industry after graduation, while others move on to work internationally.

Tom Meuzelaar 2009 Scholarship Recipient

Tell us about your project.

The day I walked into Thomas Monecke's office at the Colorado School of Mines and indicated that I wanted to embark on a PhD program, he handed me this amazing geochemical dataset from the Eskay Creek gold deposit. I didn't realize it then, but I had literally struck gold.

I spent six great years trying to identify vectors to ore and unlock the keys to understanding the footprint of this incredibly rich, hybrid volcanogenic massive sulfide and low sulfidation epithermal gold deposit, which is hosted in very fine-grained, organic rich mudstones. We ran some multivariate statistics, completed a lot of micro-analytical work, and finished with geochemical modeling.

It was a wonderful opportunity, and I learned a great deal.

How did winning a Geoscience BC scholarship support you and your research?

I could not have completed my mid-career PhD without Geoscience BC's generous support. Although I was a professional student, and remained employed as a consultant throughout my program, my two sons were born right after I started, and we were just keeping our heads above water as a single income family.

The Geoscience BC scholarship made the Eskay Creek project possible, which in turn became the focus of my PhD program. The detailed bulk elemental and mineralogical work paved the way for my statistical evaluation, which eventually led to the equilibrium geochemical modeling. I will always be grateful for the opportunity that Geoscience BC provided.

Tell us about your career since finishing your degree.

I am a senior consultant at Golder Associates specializing in geology and geochemistry. I provide solutions to clients in both the mining and oil and gas sectors.

Much of the work I do for them focuses on how rock and fluids interact, in order to help clients develop resources, solve operational problems, obtain regulatory approval, and address post-closure issues. I am currently trying to diversify my consulting portfolio into mineral exploration, which remains my core passion. At Golder I have opportunities to manage large projects, lead technical teams, mentor junior staff, engage clients and stakeholders, and solve difficult technical problems, each of which present rewarding new challenges every day.





2007

Scott Blevings 2007 Scholarship Recipient

Tell us about your project.

My thesis project was a regional study of the Taseko Lakes region, located 240km north of Vancouver. The region straddles the boundary between the Coast Plutonic Complex and the Southeast Coast Belt.

The study established a broad geological and temporal framework for known porphyry and epithermal mineralization in the region with respect to the regional stratigraphy, various intrusive phases and three phases of transpressional deformation. It included the characterization of alteration and mineralization of three known copper and gold prospects, and discussed the reasons for the varying styles of mineralization and spatial distribution of the prospects within the established geological framework.

How did winning a Geoscience BC scholarship support you and your research?

Once housing costs and tuition had been paid, there was very little leftover from the graduate student stipend for other living expenses. Scholarships such as the Geoscience BC scholarship really provided the financial support I needed to get through my degree while being able to focus on my research, coursework and teaching without having to take on additional debt or part-time jobs.

Tell us about your career since finishing your degree.

I started working for Rio Tinto Exploration Inc. just prior to finishing my degree in 2008. I worked on metallurgical coal and nickel projects before leaving Rio Tinto at the end of 2009 to go travelling in Asia.

When I returned, I found employment with Teck Resources Ltd. on the Red Dog exploration program in Alaska. I spent most of the next four and a half years working on Red Dog where I gradually took on more responsibility, eventually co-managing the regional and mine exploration programs in 2014.

It was a great learning experience to practice all stages of exploration simultaneously and I would recommend a similar posting to any young geologist. After briefly working on third party evaluations for Zn and Cu projects, I transferred to the Lima office in September 2015, where I am currently providing technical leadership for the greenfields Cu and Au projects in Peru.



2015



Photo by Cara Devaney Photography

2015 DATA AND PUBLICATIONS

All Geoscience BC data and reports can be accessed through our website at www.geosciencebc.com/s/DataReleases.asp.

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

Geoscience BC Report 2015-01

Summary of Activities 2014, Geoscience BC Report 2015-01 (*contains 21 technical papers on Geoscience BC project activities in 2014, various authors*)

Geoscience BC Report 2015-02

Investigation of Tree Sap as a Sample Medium for Regional Geochemical Exploration in Glacial Sediment Covered Terrains: A Case History from the Endako area, North-Central BC ((NTS 093F/14 & /15 and 093K/02 & /03) by D.R. Heberlein, C.E. Dunn and E. Hoffman

Geoscience BC Report 2015-03

Characterization of Belloy and Debolt Water Disposal Zones in the Montney Play Fairway, Northeast BC by Petrel Robertson Consulting Ltd.

Geoscience BC Report 2015-04

Catchment Analysis Applied to the Interpretation of New Stream Sediment Data, Northern Vancouver Island, Canada (NTS 102I and 92L) by D. Arne and O. Brown, CSA Global

Geoscience BC Report 2015-06

Historical Exploration Data Capture Pilot Project, Northwestern British Columbia (NTS 093L) by C.E. Kilby (Cal Data Ltd.)

Geoscience BC Report 2015-08

A Geo-exploration Atlas of the Endako Porphyry Molybdenum District (NTS 093K) by F.A.M. Devine, M. Pond, D.R. Heberlein, P. Kowalczyk, W. Kilby

Geoscience BC Report 2015-09

Geochemical Reanalysis of Archived Till Samples, TREK Project, Interior Plateau, Central BC (parts of NTS 093C, 093B, 093F & 093K) by W. Jackaman, D. Sacco and R.E. Lett

Geoscience BC Report 2015-10

Preliminary Geological Map of the TREK Project Area, Central British Columbia (parts of NTS 093B, C, F & G) by J.J. Angen, E. Westberg, C.J.R. Hart, R. Kim and M. Rahami

Geoscience BC Report 2015-11

Economic Viability of Selected Geothermal Resources in British Columbia by Kerr Wood Leidal Associates Ltd. and GeothermEx Inc.

Geoscience BC Report 2015-12

Regional Geochemical and Mineralogical Data, TREK Project - Year 2, Interior Plateau, British Columbia (parts of NTS 093B, C, F and G) W. Jackaman, D.A. Sacco and R.E. Lett

Geoscience BC Report 2015-13

The Structural Controls of the Kimberley Gold Trend, East Kootenay District, Southeast British Columbia (parts of 082F and 082G) by M. Seabrook and T. Höy

Geoscience BC Report 2015-14

Characterization of Belloy and Debolt Water Disposal Zones in the Montney Play Fairway, Northeast B.C., Phase 2 by Canadian Discovery Ltd.

Geoscience BC Report 2015-15

Toward an Improved Basis for Beneath-Cover Mineral Exploration in the QUEST Area, Central British Columbia: New Structural Interpretation of Geophysical and Geological Datasets (NTS 093A, B, G, H, J, K, N) by M. Sánchez, T. Bissig and P. Kowalczyk

Geoscience BC Report 2015-16

Tracing the Source of Anomalous Geochemical Patterns in Soil, Water and Seepage Gas near the Nazko Volcanic Cone, BC (NTS 93B/13) by R. Lett and W. Jackaman

Geoscience BC Report 2015-17

Use of a Field Portable Photometer for Rapid Geochemical Analysis of Stream and Spring Waters: A Case History from Poison Mountain, British Columbia (NTS 092O/02) by R. Yehia and D. Heberlein

SUMMARY OF ACTIVITIES 2015

Released every January at Mineral Exploration Roundup, Summary of Activities is Geoscience BC's annual technical volume. The volume is composed of scientific papers describing our new and ongoing projects and, since 2014, also includes project updates from Geoscience BC scholarship winners.

This year's Geoscience BC Summary of Activities is the ninth in the series (Geoscience BC technical papers were published in the BC Geological Survey Fieldwork volume in 2005 and 2006). Printed in full colour and available digitally through Geoscience BC's website, Summary of Activities 2015 features 22 articles over 162 pages of new information on Geoscience BC-funded projects.

Minerals Projects

TREK geological mapping project, year 2: update on bedrock geology and mineralization in the TREK project area, central British Columbia (parts of NTS 093B, C, F, G) by *J.J. Angen, J.M. Logan, C.J.R. Hart and R. Kim*

Mineralogical and geochemical characteristics of porphyry-fertile plutons: Guichon Creek, Takomkane and Granite Mountain batholiths, south-central British Columbia by *F. Bouzari, C.J.R. Hart, T. Bissig and G. Lesage*

Geology of the Kettle River area, Almond Mountain project, southern British Columbia (NTS 082E/07) by *T. Höy*

Reconnaissance biogeochemical survey using spruce tops in the West Road (Blackwater) River area, Fraser Plateau, central British Columbia (parts of NTS 093C/14, /15, 093F/02, /03) by *W. Jackaman and D.A. Sacco*

Search: Geoscience BC's new minerals project in west-central British Columbia (Phases I and II, covering NTS 093E, F, G, K, L, M, N, 103I) by *B.E. Madu*

Energy Projects

SkyTEM airborne electromagnetic systems for hydrogeological mapping in northeastern British Columbia by *B. Brown, P. Gisselø, and M. Best*

Potential for natural-gas liquid from western Canadian shales: regional variation in thermal maturity and gas composition, northeastern British Columbia by *R.M. Bustin and A.M.M. Bustin*

Apparent permeability effective stress laws: misleading predictions resulting from gas slippage, northeastern British Columbia by *E.A. Letham and R.M. Bustin*

Interpretation of Quaternary sediments and depth to bedrock, Peace project area, northeastern British Columbia: project update by *B.J.R. Hayes, V. Levson, J. Carey and Y. Mykula*

Investigating the potential for direct-use geothermal resources in British Columbia: a new Geoscience BC project by *C.J. Hickson, G. Hutter, T. Kunkel, J. Majorowicz, R. Yehia, J. Lund, K. Raffle, M. Moore, G. Woodsworth, T. Boyd, and L. Hjorth*

Regional monitoring of induced seismicity in northeastern British Columbia by *A. Babaie Mahani, H. Kao, D. Walker, J. Johnson and C. Salas*

Permafrost ecosystems in transition: understanding and predicting hydrological and ecological change in the southern Taiga Plains, northeastern British Columbia and southwestern Northwest Territories by *W.L. Quinton, J.R. Adams, J.L. Baltzer, A.A. Berg, J.R. Craig and E. Johnson*

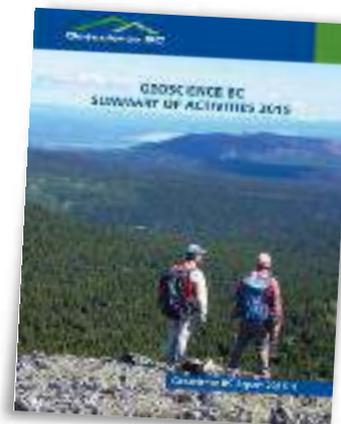
Scholarship Recipients

Quantifying the water budget for a Northern Boreal watershed: the Coles Lake study, northeastern British Columbia by *S. Abadzadesahraei, S.J. Déry, and J. Rex*

Integration of surface regolith mapping and soil field measurements with geochemistry in a till-covered terrain, Lara volcanogenic massive-sulphide deposit, southern Vancouver Island (NTS 092B/13) by *M.M. Bodnar and P.A. Winterburn*

Facies analysis and ichnology of the upper Montney Formation in northeastern British Columbia by *A.E. Gogolick, C.M. Furlong, T.L. Playter, D.T. Prenoslo, M.K. Gingras and J.-P. Zonneveld*

Advanced geoscience targeting via focused machine learning applied to the QUEST project dataset, British Columbia by *J. Granek and E. Haber*



Structure of a high-grade, electrum-bearing quartz-carbonate vein stockwork at the Brucejack deposit, northwestern British Columbia (NTS 104B) by *N.J. Harrichhausen, C.D. Rowe, W.S. Board, and C.J. Greig*

Stratigraphic and lithological constraints of Late Cretaceous volcanic rocks in the TREK project area, central British Columbia (NTS 093E) by *R.S. Kim, C.J.R. Hart, J.J. Angen and J.M. Logan*

Geology of the Cache Creek terrane in the Peridotite Peak–Menatatuline Range area, northwestern British Columbia (parts of NTS 104K/15, /16) by *S. McGoldrick, A. Zagorevski, D. Canil, A.-S. Corriveau, S. Bichlmaier and S. Carroll*

Preliminary report: biogenic controls on reservoir properties in the Lower Triassic Montney Formation, Dawson Creek area, northeastern British Columbia and northwestern Alberta by *D.T. Prenoslo, A.E. Gogolick, M.K. Gingras and J.-P. Zonneveld*

Geochemical mapping of the Deerhorn copper-gold porphyry deposit and associated alteration through transported cover, central British Columbia (NTS 093A/03) by *S.D. Rich and P.A. Winterburn*

Hydrothermal alteration and mineralization at the Kerr and Deep Kerr Cu-Au porphyry deposits, northwestern British Columbia (parts of NTS 104B/08) by *S. Rosset and C.J.R. Hart*

THE GEOSCIENCE BC TEAM

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(as of December 2014)

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Technical Advisory Committees

(as of December, 2015)

Geoscience BC has three Technical Advisory Committees (TACs) for Minerals, Oil & Gas and Geothermal projects. Individuals on these committees represent a range of expertise in industry, academia and government. The TACs are tasked with reviewing and recommending proposals under consideration by Geoscience BC, and guiding Geoscience BC's technical priorities. The TAC's recommendations are presented to Geoscience BC's Board of Directors for final funding approval.

Minerals Technical Advisory Committee

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Retired

James Barr
Tetra Tech EBA Inc.

Tim Baker
Eldorado Gold Corp.

Lindsay Bottomer
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Peter Bradshaw
Exploration Geophysics

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– BC Geological Survey

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– BC Geological Survey

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Canadian Society of
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Encana Corp.

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Clint Tippett
Shell Canada Ltd.

Non-Voting Members

Allan Chapman
BC Oil & Gas Commission

Fil Ferri
BC Ministry of Natural Gas
Development

Jeff Johnson
BC Oil & Gas Commission

Carlos Salas, Chair
Geoscience BC

Geothermal Technical Advisory Committee

Grant Ferguson
University of Saskatchewan

Jasmin Raymond
INRS-ETE

Sarah Kimball
BGC Engineering Inc.

Tim Sadlier-Brown
Sadlier-Brown Consulting Ltd.

Nathalie Vigouroux
Douglas College

Jeff Witter
Mira Geoscience

Non-Voting Members

Stephen Grasby
Natural Resources Canada

Warren Walsh
Ministry of Energy and Mines

Carlos Salas, Chair
Geoscience BC



Geoscience BC Society

MANAGEMENT'S RESPONSIBILITY FOR ONGOING FINANCIAL REPORTING

and the Accompanying Summary Financial Statements

The summary financial statements and the information contained in the annual report are the responsibility of the management of Geoscience BC Society (the "Society").

The summary financial statements have been prepared in accordance with Canadian accounting standards applicable to summary financial statements for not-for-profit organizations. As part of its responsibilities, the Society maintains systems of internal accounting and administrative controls of high quality, consistent with reasonable cost. Such systems are designed to provide reasonable assurance that the financial information is relevant, reliable and accurate, and that the Society's assets are appropriately accounted for and adequately safeguarded.

The Society carries out its responsibilities with regard to these summary financial statements and the audited financial statements upon which they are based mainly through its Finance Committee (the "Committee"). The Committee reviews the summary and annual financial statements and other information contained in the annual report and recommends these to the members of the Society for approval. The Committee meets periodically with management and the external auditors. Following these meetings, the Committee may meet privately with the auditors to ensure free and open discussion of any subject the Committee or the auditors wish to pursue. The Committee also recommends the engagement or re-appointment of the external auditors, reviews the scope of the audit and approves the fees of the external auditors for audit and non-audit services.

The accompanying summary financial statements, and the audited financial statements on which they are based, have been audited by Beauchamp & Company LLP Chartered Professional Accountants in accordance with Canadian generally accepted auditing standards, and have been approved by the Society on the recommendation of the Finance Committee.

XXX,2015



Director



Director

Geoscience BC Society

REPORT OF THE INDEPENDENT AUDITOR

on the Summary Financial Statements

To the Members of Geoscience BC Society

The accompanying Summary Financial Statements, which comprise the Summary Statements of Financial Position as at March 31, 2015 and the Summary Statements of Revenues and Expenditures and Changes in Net Assets for the year then ended, and related notes, are derived from the audited Financial Statements of Geoscience BC Society as at and for the year ended March 31, 2015. We expressed an unmodified audit opinion on those Financial Statements in our report dated September 8, 2015. Those Financial Statements, and the Summary Financial Statements, do not reflect the effects of events that occurred subsequent to the date of our report on those Financial Statements.

The Summary Financial Statements do not contain all the disclosures required by Canadian accounting standards for not-for-profit organizations as included in Parts II and III of the CPA Handbook. Reading the Summary Financial Statements, therefore, is not a substitute for reading the audited Financial Statements of Geoscience BC Society.

Management's Responsibility for the Summary Financial Statements

Management is responsible for the preparation of a summary of the audited Financial Statements in accordance with the Basis of Preparation disclosed in footnote 2 to the Summary Financial Statements.

Auditor's Responsibility

Our responsibility is to express an opinion on the Summary Financial Statements based on our procedures, which were conducted in accordance with Canadian Auditing Standards 810, 'Engagements to Report on Summary Financial Statements'.

Opinion

In our opinion, the Summary Financial Statements derived from the audited Financial Statements of Geoscience BC Society as at and for the year ended March 31, 2015 are a fair summary of those Financial Statements, in accordance with the criteria described in the Basis of Preparation.

CHARTERED PROFESSIONAL ACCOUNTANTS

Vancouver, British Columbia

XXX, 2015

Geoscience BC Society

Summary Statements of FINANCIAL POSITION

As at March 31, 2015 and 2014

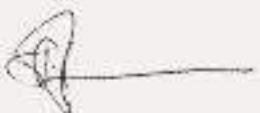
	2015	2014
ASSETS		
Current Assets		
Cash and cash equivalents	\$ 608,715	\$ 259,992
Investments	12,459,862	12,131,923
Accrued interest receivable	33,651	44,662
Amounts receivable	5,271,766	3,204,695
Prepaid expenses and deposits	80,742	72,662
	18,454,736	15,713,934
Capital Assets	16,012	22,005
	\$ 18,470,748	\$ 15,735,939
LIABILITIES		
Current Liabilities		
Accounts payable and accrued liabilities	\$ 437,418	\$ 325,930
Deferred revenue	125,308	-
	562,726	325,930
NET ASSETS		
Net Assets Restricted For Approved Programs	6,684,997	4,144,643
Unrestricted Net Assets	11,223,025	11,265,366
	17,908,022	15,410,009
	\$ 18,470,748	\$ 15,735,939

Nature Of Operations And Going Concern (Note 1)
Basis Of Preparation (Note 2)

APPROVED BY THE BOARD:



Director



Director

See accompanying notes to the summary financial statements

Geoscience BC Society

Summary Statements of REVENUES AND EXPENDITURES

For the years ended March 31, 2015 and 2014

	2015	2014
Revenues		
Grants – BC Ministry of Energy and Mines	\$ 5,000,000	\$ 3,000,000
Grants – BC Ministry of Jobs, Tourism and Skills Training	–	376,935
Grants – other, and program reimbursements	395,643	192,278
Investments	1,154,288	651,040
Sublease rent and other	14,104	19,914
	6,564,035	4,240,167
Expenditures – Programs		
Program costs incurred	2,215,120	3,194,858
Program management	380,979	303,405
GST/HST, non-refundable portion	16,436	40,737
GIS Server – implementation & maintenance	16,792	74,779
Publishing costs	40,312	27,217
	2,669,639	3,640,996
Expenditures – Administration		
Amortization of capital assets	10,911	8,077
Communications and marketing	50,915	55,008
Consulting	74,849	59,568
Gifts and promotion	14,534	16,078
Dues and memberships	12,557	6,619
Equipment lease	5,344	5,157
GST/HST, non-refundable portion	19,221	16,017
Insurance	5,426	3,130
Investment management fees	47,882	31,180
Office and sundry	21,169	18,368
Outreach – First Nations and Government Relations	105,206	90,096
Professional fees	108,725	86,730
Recruitment	–	35,725
Rent and utilities	131,183	132,372
Salaries and benefits	549,642	481,527
Scholarship awards	35,000	25,000
Sponsorship	15,720	18,174
Staff training and professional development	4,419	1,835
Travel, conferences and meetings	171,041	87,355
Website, internet and e-mail	12,639	9,581
Workshops	–	4,863
	1,396,383	1,192,460
Excess (Deficiency) Of Revenues Over Expenditures	\$ 2,498,013	\$ (593,289)

See accompanying notes to the summary financial statements

Geoscience BC Society

Summary Statements of CHANGES IN NET ASSETS

For the years ended March 31, 2015 and 2014

	Restricted For Approved Programs	Unrestricted	Total
Balance, March 31, 2013	\$ 6,878,829	\$ 9,124,469	\$ 16,003,298
Internally-imposed restrictions (Deficiency) Excess of revenues over expenditures	593,478 (3,327,664)	(593,478) 2,734,375	– (593,289)
Balance, March 31, 2014	4,144,643	11,265,366	15,410,009
Internally-imposed restrictions (Deficiency) Excess of revenues over expenditures	4,812,490 (2,272,136)	(4,812,490) 4,770,149	– 2,498,013
Balance, March 31, 2015	\$ 6,684,997	\$ 11,223,025	\$ 17,908,022

See accompanying notes to the summary financial statements

Geoscience BC Society

NOTES TO SUMMARY FINANCIAL STATEMENTS

March 31, 2015 and 2014

1. Nature Of Operations And Going Concern

Geoscience BC Society (“Geoscience BC” or “the Society”) was incorporated under the Society Act (British Columbia) on April 26, 2005 as a not for profit organization. The Society is exempt from taxation under subsection 149(1) of the Income Tax Act (Canada). The purpose of the Society is to promote, fund and otherwise support applied geoscience research in British Columbia. The Society had its genesis in a \$25 million funding commitment announced by the government of British Columbia in January 2005, which unrestricted funding was subsequently received and the Society incorporated. The Society has had certain members and directors in common with, and its creation was promoted by, both the Association for Mineral Exploration British Columbia and the Mining Association of British Columbia. However, the Society operates independently of both organizations and is controlled by a separate board of up to 13 directors, which also comprises the Society’s membership. Although it functions to complement the efforts of pre-existing provincial and federal agencies, Geoscience BC also operates on an arms-length basis from the governments of both British Columbia and Canada.

The Society has no source of operating revenue and its future operations are therefore dependent upon the receipt of continued unrestricted and non-repayable funding, anticipated to be from government sources. In the event such funding is not received, the Society would in due course deplete its cash reserves and be required to cease operations. At March 31, 2015 the Society expects to maintain operations for a period sufficient to complete all existing commitments to fund programs from liquid asset balances currently on hand.

Management believes that these actions make the use of the going concern basis appropriate; however, it is not possible at this time to predict the outcome of these matters. If the going concern basis is not appropriate, adjustments could be necessary to the carrying amounts and/or classification of assets, liabilities, revenues and expenditures in these summary financial statements, and these adjustments could be material.

2. Basis of Preparation

The Summary Statement of Financial Position and Summary Statements of Revenues and Expenditures and Changes in Net Assets are derived from, and are consistent with, the audited Financial Statements of Geoscience BC Society as at and for the year ended March 31, 2015. Omitted from this presentation are certain other financial statements and footnote disclosures, all of which are required in order for a complete and formal presentation pursuant to Canadian accounting standards for not-for-profit organizations. Accordingly, readers are directed to read the Summary Financial Statements in conjunction with these annual audited Financial Statements, available for viewing at <http://www.geosciencebc.com/s/FinancialStatements.asp>.

In the opinion of management, the Summary Financial Statements included herein faithfully reflect the financial information considered material to the expected users of the information, and accordingly the summarized presentation is not misleading in these circumstances.





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