

Geoscience BC's

# Explorer

Annual Information Update

Annual Report 2010



Porphyry Integration Project

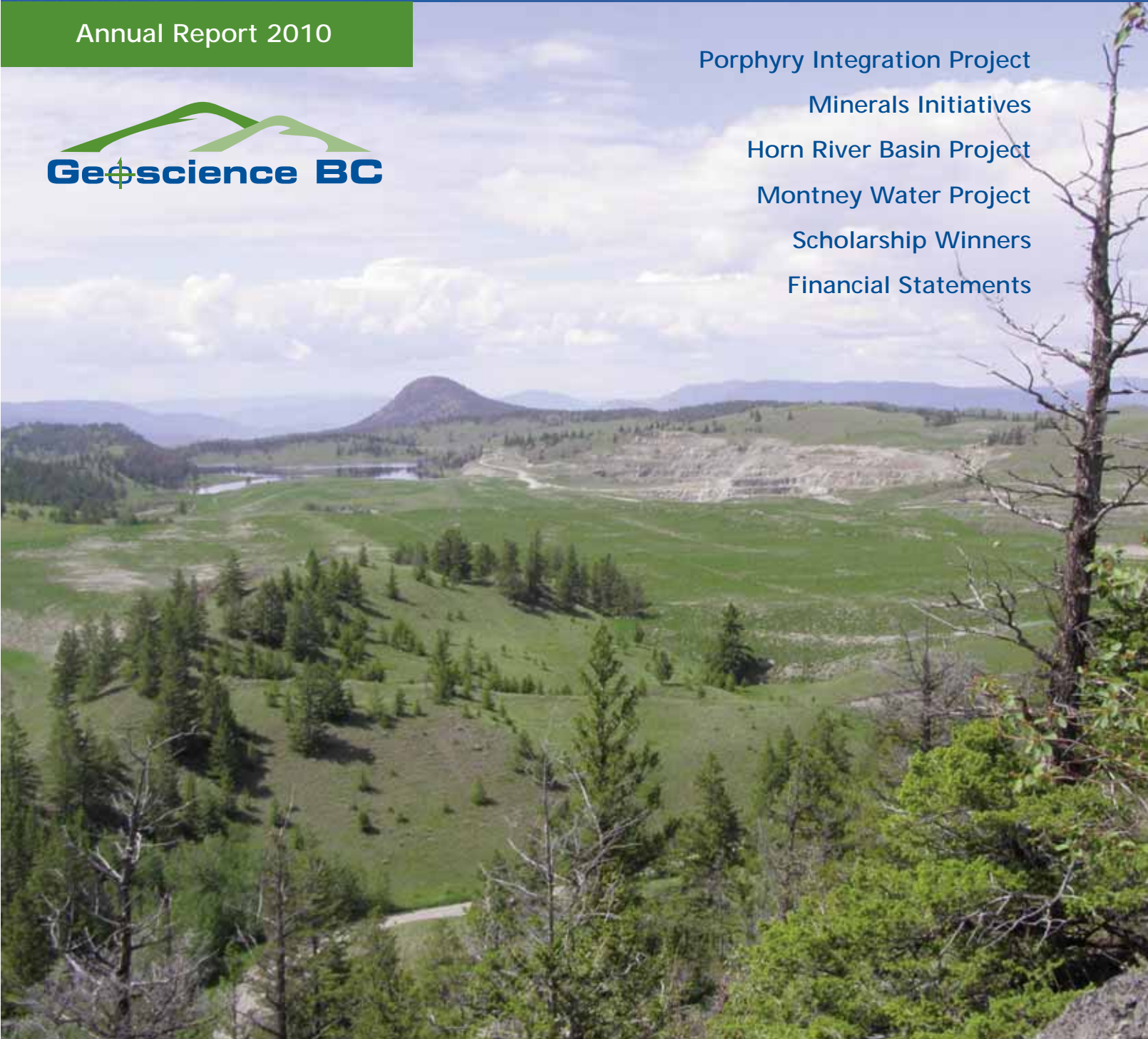
Minerals Initiatives

Horn River Basin Project

Montney Water Project

Scholarship Winners

Financial Statements



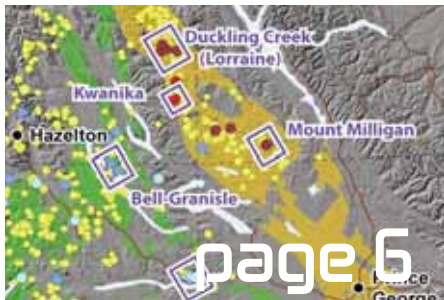




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## Annual Information Update

# Features



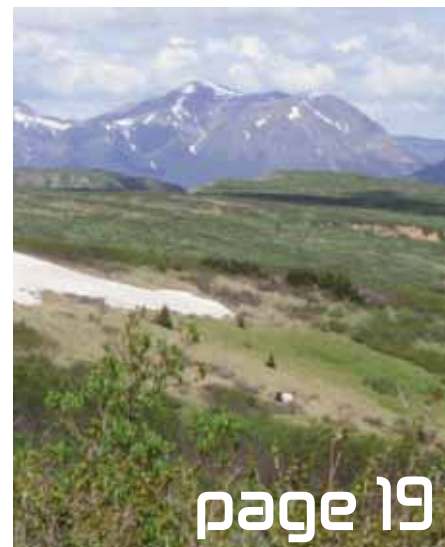
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Published by Geoscience BC

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Editor: Christa Sluggett  
Design & Layout: XY3 Design

PRINTED IN CANADA  
2011

# Message from the Chair

On behalf of the Board of Directors, the staff of Geoscience BC, and all of our partners and volunteers it once again gives me great pleasure to present our Explorer Magazine and Annual Report for 2010.

The past year has been another interesting and exciting one for Geoscience BC (GBC).

The Province is poised for growth in both the minerals and natural gas sectors. From intriguing new mineral exploration discoveries in northern BC, to advances in our understanding of sources of subsurface aquifers available to support development of the enormous shale gas resource in northeast BC, GBC continues to generate and deliver geoscience data that attracts investment in both minerals and oil & gas to British Columbia.

GBC concentrates on supporting a variety of leading-edge projects to generate high quality data and attract attention to British Columbia, facilitating partnerships with a broad range of clients, stakeholders and researchers, communicating with both technical and community-based groups, and investing in the development of the next generation of highly qualified geoscientists.

Partnerships continue to be a key element of GBC's approach and success. Highlights in 2010 include the completion of the first phase of the Horn River Basin Subsurface Aquifer study in collaboration with the Horn River Basin Producers Group of companies, and the launch of the Montney Water Project collaborative study in partnership with seven producing companies and government, with involvement of university and community partners. Our projects also continue to complement and augment the work of other geoscience providers, particularly those of our partners in government geological surveys.

In addition, GBC continues to enjoy tremendous support for our projects from community groups in northern BC. We interact regularly with communities to discuss potential projects and present results. An indication of community interest comes from recent invitations to present on our water-related studies to communities in

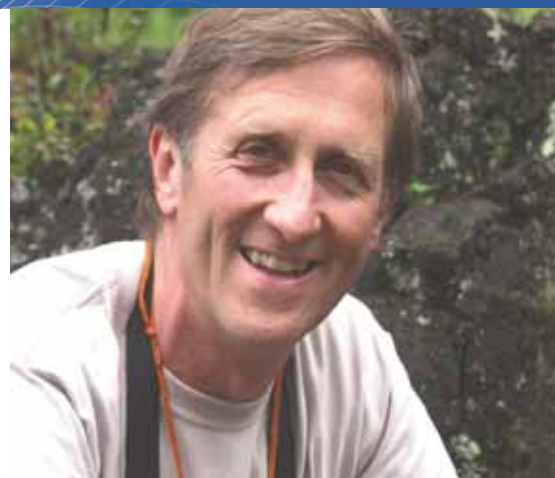
northeast BC, and supporting letters from Mayors and Regional Districts and economic development organizations in support of our new proposed Data for Discovery Initiative, our strategic plan for the next 5 years.

With the help of Technical Committees, and interaction with the broader community, GBC continues to develop new programs to address some of the key issues facing the exploration community. In late 2010 we launched our "Porphyry Integration Project" which seeks to integrate the latest geological, geophysical and geochemical knowledge of porphyry deposits in BC to develop new ideas and approaches to explore these important deposits. The need for to maintain the human resource capacity and expertise in BC's industry continue to be important goal, and as in past years, GBC has provided scholarships and research project support to a number of talented young geoscientists undertaking BC-focused graduate research on mineral exploration, oil and gas, and related topics.

In 2010 we published a number of reports and data sets, including the QUEST-South airborne gravity and regional geochemistry survey data. We also delivered or sponsored numerous workshops and technical talks, to both assist the mineral industry in familiarizing them with the application of our new data sets, and to market the data to a broader audience within and outside of BC. We also presented a number of technical talks, and participated in community information sessions on the water studies we undertook in the Horn River Basin.

GBC is very pleased to be contributing to the advancement of BC's geoscience knowledge base and the Province's capacity to capitalize on its resources. We couldn't do this without tremendous support from our volunteers and partners. I would like to take this opportunity to once again sincerely thank all those volunteers who contribute to our success through generously providing us with their time, knowledge, expertise and financial resources.

In particular, our Directors volunteer their time to provide us with excellent leadership and governance and our



*Dr John Thompson  
Chairman of the Board of Directors,  
Geoscience BC*

volunteer Technical Advisory Committees provide outstanding technical guidance for our research activities and recommendations to the Board for funding. In addition, the staff and consultants working for GBC continue to contribute valuable expertise in project design, implementation, and delivery of results on minimal resources. Lastly, but by no means least, our partners in industry, government surveys, and academia all provide ideas, assistance and a wealth of expertise. The combination of all these represent the strength of the BC geoscience community that collectively allow GBC to "punch above its weight". BC's geoscience community is much greater than the sum of its parts and GBC is the beneficiary of this extraordinary effort.

Once again, the last word goes to acknowledging the Province of BC, and the innovative approach that the BC government has taken to invest in applied geoscience through the creation of Geoscience BC. We are a leading-edge organization in Canada, the envy of many other jurisdictions, providing a unique link between government and industry in the delivery of effective and timely applied geoscience to attract investment to BC.

A handwritten signature in black ink, appearing to read 'John Thompson', with a long horizontal line extending to the right.

**Dr John Thompson**  
VP Technology and Development,  
Teck Resources Limited  
and Chairman of the Board of Directors,  
Geoscience BC



## Geoscience BC in 2010

This has been another very successful year for Geoscience BC (GBC) marked by a number of exciting data releases and reports, and the launch of several new projects both in minerals and oil and gas geoscience.

*Riske Creek area, Nechako Basin.*  
Photo by E. Bordet.



*Eocene volcanic rocks in the Nazko River valley*

Photo by E. Bordet.

## Geoscience Data Delivery

In 2010, GBC published another 16 reports and maps, including our annual Summary of Activities volume. A number of the papers in this volume and the reports released throughout the year have been linked to generating new staking and/or exploration expenditures in the province. Recent follow-up on the 2009 QUEST-West data releases includes new drilling at an existing mining operation in the QUEST-West area that has led to the identification of new mineralization and subsequent drilling.

In addition to conventional data releases and publications, GBC continues to invest in data delivery through workshops and short courses (see pages 16-17). Of particular note was a short course delivered as part of the Society of Exploration Geologists 2010 Conference in Colorado in October. The short course "Exploration in 2010 – Tools and Techniques to Explore Under Cover" was organized by Ken Witherly of Condor Consulting Inc and Tom Lane of CAMIRO.

GBC's QUEST geophysical and geochemical data, and bedrock geology from the BCGS, provided the hands on material for this short course, and GBC provided significant technical support and presenters for the course. GBC is presently working with the course organizers to see if we can bring a similar course to BC.

We also continue to co-sponsor a talk series with MDRU in downtown Vancouver, provide support to regional exploration conferences, and participate in community information sessions, to help ensure that

BC's exploration community has the most up-to-date information on geoscience data and technology available, and that BC's communities have answers to their questions on geoscience-related research being carried out in their regions and the implications of this research to exploration and development.

## Major New Initiatives

In addition to a number of ongoing projects (see pages 8-10 and pages 14 to 15) GBC has recently launched two major new initiatives: the Montney Water Project and the Porphyry Integration Project. The Montney Water Project (highlighted on page 12-13) is a partnership with seven producer companies active in the Montney Gas Play in northeast BC. The companies, and the Canadian Association of Petroleum Producers Science and Community Environmental Knowledge Fund (managed by the BC Oil and Gas Commission), are providing matching financial support to GBC's investment.

This project is also providing some support to a research project being undertaken at UNBC and supported by the City of Dawson Creek and a number of companies.

The new Porphyry Integration Project (see pages 5-7) was launched in the fall of 2010. This project aims to add value for porphyry exploration to the new datasets collected as a part of GBC's series of QUEST projects.

The project will be focused on compiling all available public data (and some private industry data if possible) and integrating the

data sets at district scales to help identify new exploration tools or targeting techniques for these key exploration targets in BC.

## The Next Generation of Geoscientists

In the past year, GBC has supported many students through both project funding and scholarships. The nine 2010 Exploration Geoscience Graduate Scholarship winners are highlighted on pages 20-21 of this magazine. This is another outstanding crop of young geoscientists who are working on exploration-related projects in BC and represent the bright future of the mineral and oil and gas industries in BC and in Canada. GBC's scholarship program is designed to attract students working on exploration-related projects, and considering exploration-related careers.

## The Contributions of Volunteers

GBC's success is largely due to the significant contributions of ideas and expertise gleaned through our volunteer Technical Advisory Committees (TAC) and project Technical Advisory Groups. Our Minerals TAC, Oil and Gas TAC, and Horn River Basin and Montney Water project Advisory Groups consist of volunteers from industry, plus government and university representatives in most cases. The contributions that these advisory groups make to GBC by providing input on prioritizing projects, designing studies, monitoring progress and reviewing results, is invaluable.





Photo by E. Bordet.



Jim Logan (BCGS) examines a silicified Quartz/chert pebble conglomerate near Prince George.

Photo by T. Bissig.

## The Importance of Partnerships

GBC continues to deliver geoscience research and data collection, integration and marketing, through partnerships with industry, university, government, First Nations and communities. The Horn River Basin Aquifer Project and Montney Water Project (see pages 11-13) are both examples of GBC's ongoing collaborative work with the oil and gas industry on water issues in northeast BC.

GBC also continues to partner with the provincial and federal geological governments. Partnerships with the provincial government include a till geochemistry program led by Travis Ferbey of the BC Geological Survey, and the Montney Water Project, in which GBC collaborates with three provincial ministries. GBC's Nechako Basin project has also benefitted from significant contributions from Ministry of Energy staff.

An important ongoing partnership with the Earth Sciences Sector in Natural Resources Canada (NRCan) has allowed GBC to access, and subsample for reanalysis, the regional drainage sediment samples from BC in the National Geochemical Reconnaissance archives in Ottawa.

This year GBC is sharing with NRCan the costs of re-packaging and re-archiving a significant suite of BC samples that were removed from the archives for a study a number of years ago that were never properly returned to the archives.

In addition, GBC is providing funding to have GBC's entire regional drainage sample suite properly archived with the samples in Ottawa. This project has also received strong support from the BC Geological Survey.

## The Next Five Years: Data for Discovery

In fall of 2010, GBC developed and distributed to communities, politicians and First Nations a brochure entitled "Geoscience: The Roadmap to Economic Strength". This brochure outlines the value of geoscience to supporting sustainable resource development in BC, highlights some of GBC's successes, and introduces our "Data for Discovery" Initiative, which is our plan for the next five years, pending new funding from the BC government.

Our next big initiative, which is the top priority of our Minerals Technical Advisory Committee, is an integrated minerals geoscience program centered on the Highway 37 corridor. Named "QUEST-Northwest", we plan to launch this project in early 2011. We hope to continue this project over two years into 2012, but the second year will require additional funding to GBC.

In addition, GBC is interested in supporting the Stimulating Exploration in the East Kootenays (SEEK) proposal developed by the East Kootenays Chamber of Mines. This project will also require new funding to GBC.

## The Support of Communities and Industry Associations

Over the first five years of operations, GBC has enjoyed significant support from communities and community-based organizations. We are particularly grateful for the support for our QUEST series of projects and our Nechako seismic project, from organizations including the Northern Development Initiative Trust, Regional District of Bulkley-Nechako, Regional District of Kitimat-Stikine, Terrace Economic Development Authority and First Nations partnership contributions from the Nazko First Nation the Whispering Pines-Clinton Indian Band.

In response to our "Geoscience: The Roadmap to Economic Strength" and our Data for Discovery initiative, we have received numerous letters of support and endorsements from communities and industry associations, which we believe shows the strong support for the mineral and oil and gas industries in BC. GBC hopes that we will be able to continue to contribute to the success of these industries, and the opportunities that they bring to communities throughout BC, for the foreseeable future.





Photo by D. Mitchinson.



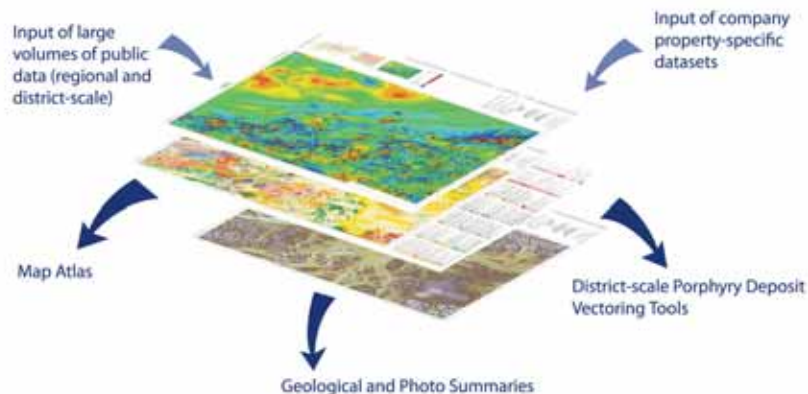


Image courtesy of F. Devine.

# Porphyry Integration Project

In October 2010, Geoscience BC (GBC) launched the Porphyry Integration Project. Designed to build upon GBC's QUEST projects (QUEST-, QUEST-West and QUEST-South) and recent porphyry research projects, the goal of the Porphyry Integration Project is to determine geochemical, geophysical and geological signatures for select BC alkalic and calc-alkalic porphyry districts through the compilation, interrogation and interpretation of public and, where possible, company datasets.

The Porphyry Integration Project is based on a 'porphyry signature' concept. The intention is to identify geological characteristics at the district scale that will help lead industry to new deposits as they follow up on regional-scale targeting programs. Potential porphyry districts of interest are shown on the opposite page.

The first step for the project is to compile existing public datasets into a digital database. Datasets currently being compiled include:

- geological mapping (BC Geological Survey and Geological Survey of Canada regional mapping; property-scale mapping);
- BC MINFILE mineral occurrences;
- remote-sensing data;
- regional geophysical surveys, including recent regional GBC and Natural Resources Canada airborne gravity and magnetic surveys;
- property-scale geophysical surveys, including induced-polarization, EM and magnetic datasets;
- regional geochemical surveys;
- soil surveys using various extraction techniques;
- stream-sediment surveys;
- whole-rock geochemistry; and
- detailed deposit research, including isotope and mineral-chemistry studies.

Once these datasets are compiled for a district, the Project Team (see next page) will evaluate the datasets to develop a set of geological, geochemical and geophysical exploration tools and techniques that can be applied to other porphyry districts in BC.

Planned products of the project include an atlas of maps (hard-copy and digital) for each district selected and guides to deposit characteristics, as well as recommendations on exploration tools and techniques. Dataset development will continue through 2011, with all products to be released in 2012.

For additional details on this project, pick up a copy of Geoscience BC's Summary of Activities 2010, featuring:

- Porphyry Integration Project: Combining British Columbia's Wealth of Datasets with Modern Exploration Geoscience at the District Scale to Provide New Insight into Porphyry-Deposit Exploration Strategies;  
*by F. Devine*

FOR MORE INFORMATION ON THE PORPHYRY INTEGRATION PROJECT, PLEASE CONTACT:

**Geoscience BC**  
info@geosciencebc.com  
www.geosciencebc.com/s/Porphyry.asp

## Did you know?

Since 2005, Geoscience BC has led 6 major projects and supported 86 partnership projects. Through these projects, Geoscience BC has worked with over 100 partners, from industry, communities, universities and government.



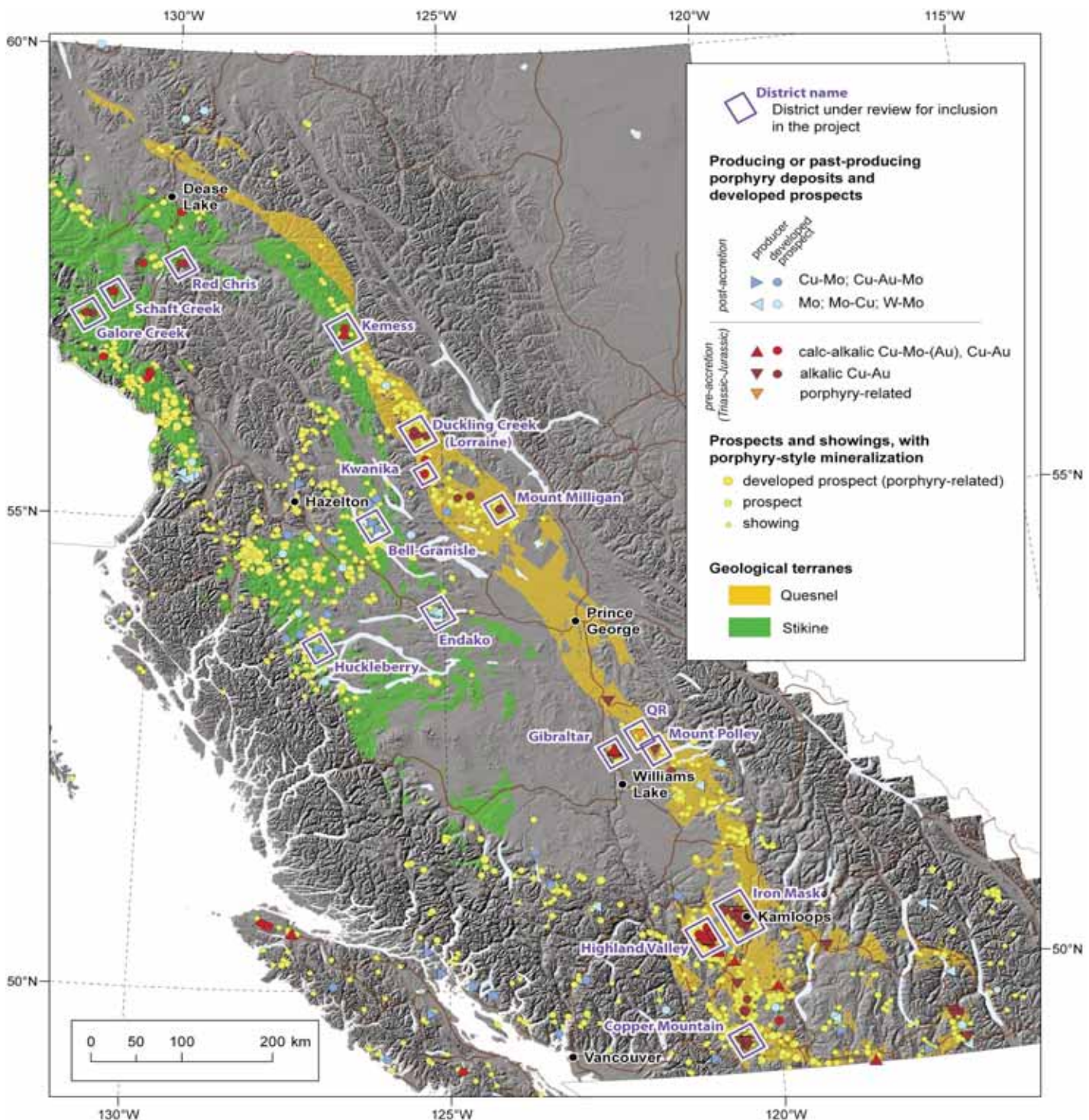
## Porphyry Integration Project Team

The GBC Porphyry Integration Project team is led by three principal members: Dave Heberlein (geochemistry module), Peter Kowalczyk (geophysics module) and Fionnuala Devine (geology module, and overall project co-ordination). Fionnuala, Dave and Peter will be coordinating the data compilation and interpretation of the datasets.

The Mineral Deposit Research Unit (MDRU) at the University of British Columbia is also collaborating on the project. Fred Blaine is leading a joint GBC-MDRU project developing geochemical models for BC porphyry deposits. Dianne Mitchinson is completing a joint GBC-MDRU post-doc project working on geophysical inversions of select BC porphyry deposits. Thomas Bissig (joint MDRU-GBC post-doc) helped lead the MDRU alkalic porphyry project, and is currently working on a GBC-sponsored project investigating geological characteristics indicative of proximity to porphyry deposits. Dianne, Fred and Thomas' experience and new project results will be strongly linked in to this project.

Map below:

Location of producing porphyry deposits and 'porphyry-style' mineralization in BC. Blue outlines correspond to the porphyry districts of interest that are currently under consideration by Geoscience BC's porphyry project team. Ultimately, districts will be chosen to represent the spectrum of BC porphyry-deposit types (not all districts outlined above will be included in the final project). Figure reproduced from Devine (2011), Geoscience BC Summary of Activities 2010.





# Ongoing Minerals Initiatives in 2010

Geoscience BC (GBC) has many active Minerals partnership projects throughout the province. The following pages briefly describe some of the active or recently completed projects that are releasing new geoscience information in early 2011.

For a complete listing of all GBC-supported projects, go to [www.geosciencebc.com/s/Projects.asp](http://www.geosciencebc.com/s/Projects.asp), and search by mining region, project type or NTS sheet.



Photo by T. Bissig





Photo by A. Stumpf.

## Geochemical Projects

### **A Biogeochemical and Follow-up Study to Investigate the Effectiveness of MMI, Ionic Leach and Deionised Water Extractions on Ah Horizon Samples at Kwanika**

Following up on soil orientation surveys completed as part of an earlier GBC project designed to test the effectiveness of commonly used chemical digestions and sample media, this project (led by Dave Heberlein of Heberlein Geoconsulting) is testing the geochemical response to the Kwanika Central zone in surficial organic materials. A Summary of Activities 2010 paper, final report and Roundup presentation are scheduled for early 2011.

### **BC Regional Geochemical Survey Program: New Analytical Data and Sample Archive Upgrades**

Three regional geochemical initiatives are currently active, all led by Wayne Jackaman of Noble Exploration Services Ltd. Two projects involve reanalyzing previously collected samples from Vancouver Island and Northern BC. A third project, with additional support from Natural Resources Canada and the BC Geological Survey, is focused on updating the BC regional geochemical sample archive in Ottawa by repackaging existing samples and adding GBC and BCGS samples that were stored separately into the existing archive. See the Summary of Activities 2010 volume for more information.

### **Geochemical Models for BC Porphyry Deposits**

This project, led by Fred Blaine at MDRU, is investigating the surficial geochemical expressions of a number of porphyry deposits in BC. BC's highly variable surface environment leads to the development of variable geochemical signatures from one deposit to another, which has significant implications for exploration. To gain an understanding of the effects and optimize exploration techniques, Fred is currently compiling geochemical data for many of BC's porphyry deposits. A poster at Roundup will highlight his work to date.

## Geophysics and Rock Property Projects

### **Integrated Geological & Geophysical Porphyry Models: Adding Value to Geoscience BC Geophysical Data**

This project, led by joint MDRU-GBC post-doc Dianne Mitchinson, is defining relationships between porphyry deposit geology and deposit-scale geophysical surveys. Dianne's work over the last year has continued to examine the Mount Milligan, Endako and Huckleberry deposits, while also adding the Morrison, Bell and Granisle properties to the project. Interim results from Dianne's project are found in the Summary of Activities 2011 volume, and a final report will be released in mid-2011.

### **Regional 3-D Inversion Modeling of Airborne Gravity, Magnetic, and Electromagnetic Data: QUEST-West and QUEST-South**

Following up on their 2009 inversion modelling project in the QUEST area, Nigel Phillips and his team at Mira Geoscience are completing 3-D inversion modelling of regional magnetic and gravity data in the QUEST-West and QUEST-South project areas, and regional electromagnetic data in the QUEST-West project area. Final datasets should be available in early 2011, and a Roundup 2011 talk will highlight the projects.

### **Mineral Deposit and Mineral Potential Studies:**

#### **Defining the Upper Parts of an Alkalic Porphyry Copper-Gold Deposit: The Evolution of the Porphyry Copper-Gold Deposit at Red Chris, Northern BC**

This M.Sc. project, led by Jessica Norris and Craig Hart of MDRU, focuses on Imperial Metals' Red Chris deposit in northwestern BC. Now into its second year, the project has recently focused on increasing the understanding of the magmatic evolution, mineralization styles and alteration of the deposit, with a particular focus on the East zone. A paper on recent fieldwork and findings is published in the Summary of Activities 2010 volume.

## Carbonate Alteration as an Indicator of Proximity to Eskay Creek-Type Deposits

Eskay Creek (northwestern BC) is among the most precious metal-rich VMS deposits in the world. This project, led by Thomas Monecke and Ph.D. candidate Tom Meuzelaar at the Colorado School of Mines, aims to identify a set of geochemical vectors that can be used in exploration for this deposit type. Initial results of a comprehensive mineralogical and geochemical study of the ore-hosting mudstone are reported in the Summary of Activities volume, and demonstrate that hydrothermal alteration can be recognized up to tens to hundreds of metres from the orebodies.

### **Geochemistry, Volcanology and Physical Properties of the Late Triassic Nicola Arc and its Metallogenic Implications**

This project, led by Thomas Bissig and M.Sc. student Santiago Vaca at MDRU, is investigating the geochemical and physical characteristics along and across the Late Triassic volcanic-arc components of the Quesnel terrane, which host porphyry Cu-Au mineralization. Recent work, reported in Summary of Activities 2010, focuses on the petrography and geochemistry of the Nicola Group, as well the results of a carbon and oxygen isotope study.

### **Implications for Geology, Metallogeny and Mineral Potential of the Basement of Quesnellia in southern BC**

To compliment GBC's 2009 QUEST-South project, this project was undertaken by Jim Mortensen and M.Sc. student Kathryn Lucas at UBC. The project aims to increase our knowledge of the pre-Mesozoic basement assemblages in the southern Quesnel terrane, which will provide a basis for better understanding the nature and controls on the younger intrusion-related mineralization in the region. Preliminary results from this project are presented in the Summary of Activities 2010 volume.



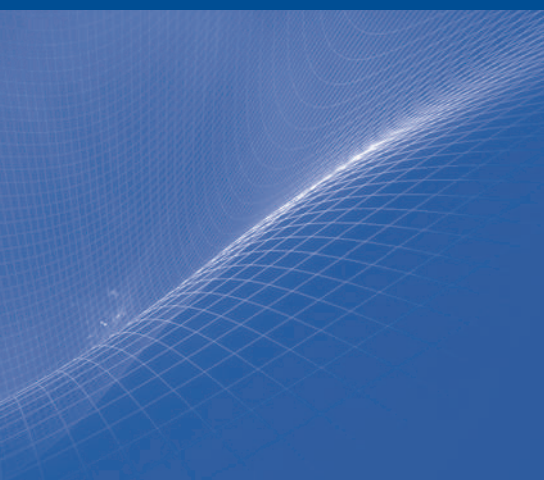


Photo by D. Mitchinson

**Geological, mineralogical, geochemical and physical characterization of carbonate-hosted nonsulphide Zn-Pb mineralization in southern BC**

This project, led by Suzanne Paradis (NRCan) and George Simandl (BCGS) is characterizing carbonate-hosted Zn-Pb mineralization in BC. Two papers in the Summary of Activities 2010 volume focus on the geology, mineralogy and physical properties of these deposits. The project is also supporting an undergraduate thesis project at UBC.

**Structural, Geochronological and Isotopic Investigations of Orogenic Gold Deposits in the Cariboo Gold District and Characterization of Placer and Lode Gold Grains as an Exploration Tool in East-Central BC**

These complementary projects, both led by Jim Mortensen (UBC), wrapped up in late 2010, with final reports published in Summary of Activities 2010. Among the many interesting findings, the results suggest that there is potential for important mineralization to be discovered in east-central BC.

**Porphyry Indicator Minerals (PIMs): Exploration for Concealed Deposits in QUEST, Central BC**

PIMs are minerals, such as apatite, rutile, garnet and titanite, that form during porphyry copper deposit formation and are resistant to weathering. The aim of this project, which is led by Farhad Bouzari at MDRU, is to establish a methodology using PIMs that can effectively evaluate existing geochemical and geophysical targets, and identify new targets and define vectors to source, in highly prospective, but till-covered areas of British Columbia. A poster highlighting new results will be on display at Roundup 2011.

**Quaternary Geology Projects**

**Glacial Geologic Framework and Drift Prospecting for a Portion of the QUEST Project Area**

Mineral exploration activity in the central QUEST Project area has been hindered in the past due to the thick surficial deposits. This project, led by Brent Ward at SFU, has spent the last couple of years updating the understanding of ice-flow history and drift thickness in the region. The Summary of Activities 2010 volume includes new till geochemical data and interpretations that will be of interest to the exploration industry.

**Surficial Geochemistry and Lithology of the Bulkley River Valley, Central BC**

This project, which is focused on the Quaternary geology and till geochemistry of the Bulkley River Valley, aims to provide the mineral exploration community with additional information characterizing the glacial materials, which in this region form a near-continuous cover masking the bedrock surface. Till geochemical data and pebble lithology data from the project will be released next year. This project is led by Andrew Stumpf (University of Illinois).

**Till Geochemistry of Tahtsa Lake District North and Adjacent Areas, West-Central BC – A Key Ingredient for the Discovery of New Porphyry, VMS, and Polymetallic Vein Mineralization**

This two-year project, a joint GBC-BCGS effort and led by Travis Ferbey (BCGS), aims to characterize the Quaternary materials and assess the economic potential of covered bedrock in the Tahtsa Lake district by conducting till geochemistry surveys. Fieldwork in 2010 was conducted southeast of Houston, BC in the Colleymount Map area, and preliminary results are presented in Summary of Activities 2010. A full report and dataset should be available in mid-2011.



Photo by D. Yang



Photo by J. Norris



# Horn River Basin Aquifer Characterization Project

In 2008, Geoscience BC secured \$5 million in funding from the BC Ministry of Energy, Mines and Petroleum Resources dedicated to geoscience studies supporting timely and efficient development of the shale gas resource of the Horn River Basin.

In consultation with the Horn River Basin Producers Group, Geoscience BC identified characterization of sub-surface aquifers as a key priority for collaborative geoscience research in the basin. The primary research goals included identifying aquifers capable of producing large volumes of water to support completions (fracing) operations, and also those capable of accepting disposal of large volumes of spent frac fluids. The Horn River Basin Aquifer Characterization Project, a cooperative effort between Geoscience BC and the Horn River Basin Producers Group, was conceived as a result.

In a series of meetings commencing November 2008, the primary project objectives of Phase 1 were defined:

- Synthesize available geological information to produce a stratigraphic framework for hydrogeological/aquifer analysis.
- Facilitate collection of aquifer and fluid data from new Producer Group wells, particularly those being drilled for water supply and disposal.
- Undertake a systematic hydrogeological investigation of potential aquifers in the Horn River Basin in order to quantify and map reservoir capacity and productivity/injectivity potential.

The \$3.5 million Phase 1 research was supported by \$5 million of in-kind contributions from the Horn River Basin Producers Group, who provided confidential data from their drilling activities for Geoscience BC to analyze and interpret.

Geoscience BC worked with consultants at Petrel Robertson Consulting Ltd., Canadian Discovery Ltd. and JC Consulting Inc. to carry out this project.

Results from Phase 1 of the project were released in April 2010 as Geoscience BC Report 2010-11, and can be downloaded from Geoscience BC's website. Key results include:

1. A Horn River Basin stratigraphic framework for hydrogeological and deep aquifer analysis.
2. Aquifer and fluid data from deep water wells that may be used for water source and fluid disposal.
3. Systematic hydrogeological investigation of potential aquifers in the Horn River Basin to quantify and map reservoir capacity and productivity/injectivity potential.

FOR MORE INFORMATION ABOUT THE HORN RIVER BASIN AQUIFER PROJECT, PLEASE CONTACT:

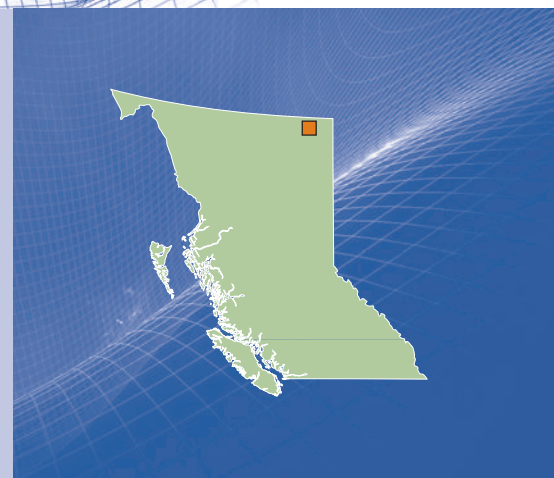
Geoscience BC  
info@geosciencebc.com  
[www.geosciencebc.com/s/HornRiverBasin.asp](http://www.geosciencebc.com/s/HornRiverBasin.asp)

## Horn River Basin Aquifer Project – Phase 2

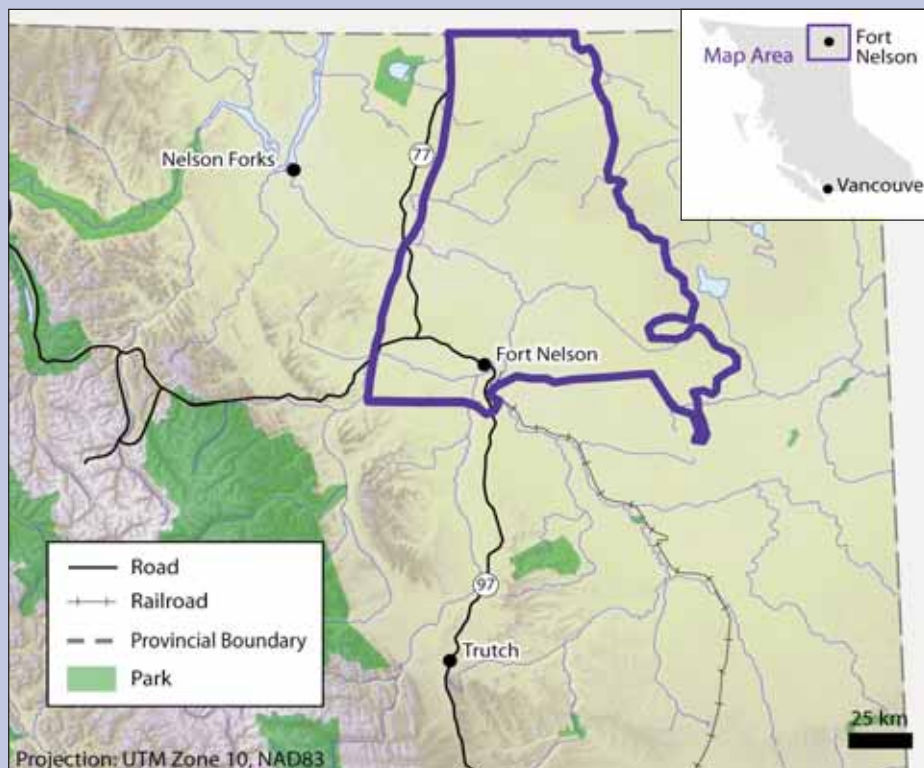
Phase 2 of the Horn River Basin Project is now in development. Project plans will be released shortly through Geoscience BC's website.

The Horn River Basin Producers Group consists of Apache, ConocoPhillips, Devon, Encana, EOG Resources, Imperial Oil, Nexen, Pengrowth, Quicksilver and Stone Mountain Resources.

The purpose of the Horn River Basin Producers Group is to facilitate cooperation and communication between major industry players, key stakeholders and First Nations in the area.



Location of the Horn River Basin (blue outline) in Northeast BC.



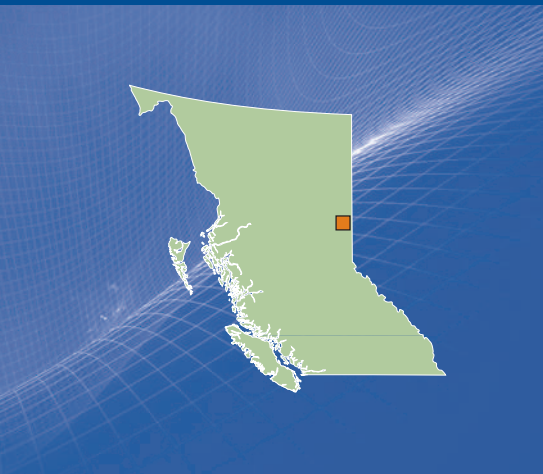


Photo courtesy of Shell Canada.

# The Montney Water Project:

## Collaborative Geoscience for Resource Development and Management



Photo by A. Hickin.

**The Montney Shale Gas Play in northeast British Columbia is a world-class unconventional natural gas resource. Operations in the Montney are moving into development drilling, which will increase the demand for water and deep sites for the disposal of fluids.**

Provincial, First Nations and local governments, industry, communities, and environmental groups all want to ensure that water sources are carefully managed during natural gas development.

Geoscience BC met with industry and government in early 2010 and began planning for a collaborative project to undertake water studies in the Montney area. The project directly follows a joint Geoscience BC-industry study looking at deep subsurface aquifers in the Horn River basin (*see page 11*).

The Montney Water Project is designed to provide a comprehensive inventory of water sources in the Montney Gas Play and examine the potential for deep geological disposal sites in the area.

Phase I of the project focuses on collecting, analyzing and interpreting available water information in the Montney region. This phase includes three components:

1. **Surface Water:** This component will assess the surface water resource through the compilation of a variety of publicly available data, including climate and precipitation data, stream flow, lake volume and related hydrometric information at the watershed level. This information will aid in determining surface water availability, seasonal changes in these volumes and recharge rates on a drainage sub-basin and basin (watershed) level.

2. **Near-surface Water:** Unconsolidated sediments that vary greatly in thickness cover most of the Montney area. Since much of the unconsolidated material is of glacial origin, the first priority of this component is to compile existing Quaternary mapping and data in the Montney area. A summary report describing which deposits hold the best potential for sourcing water in unconsolidated sediments will be produced.
3. **Sub-surface Water:** This component is designed to assess the availability of non-potable water from deep saline aquifers (this is a water source that is not suitable for other uses such as drinking water or agriculture), and the usefulness of these aquifers for disposal of fluids.

Data and results from this project will be made publicly available in 2011. For additional details on this project, pick up a copy of Geoscience BC's Summary of Activities 2010, featuring:

- Overview of the Montney Water Project: A New Geoscience BC Initiative in Northeastern British Columbia (NTS 093P, 094A, B); *by D. Brown*
- Deep Aquifer Characterization in Support of Montney Gas Development, Northeastern British Columbia (Parts of NTS 093, 094): Progress Report; *by B. Hayes et al.*

FOR MORE INFORMATION ON THE MONTNEY WATER PROJECT, PLEASE CONTACT:

**Geoscience BC**  
[info@geosciencebc.com](mailto:info@geosciencebc.com)  
[www.geosciencebc.com/s/Montney.asp](http://www.geosciencebc.com/s/Montney.asp)

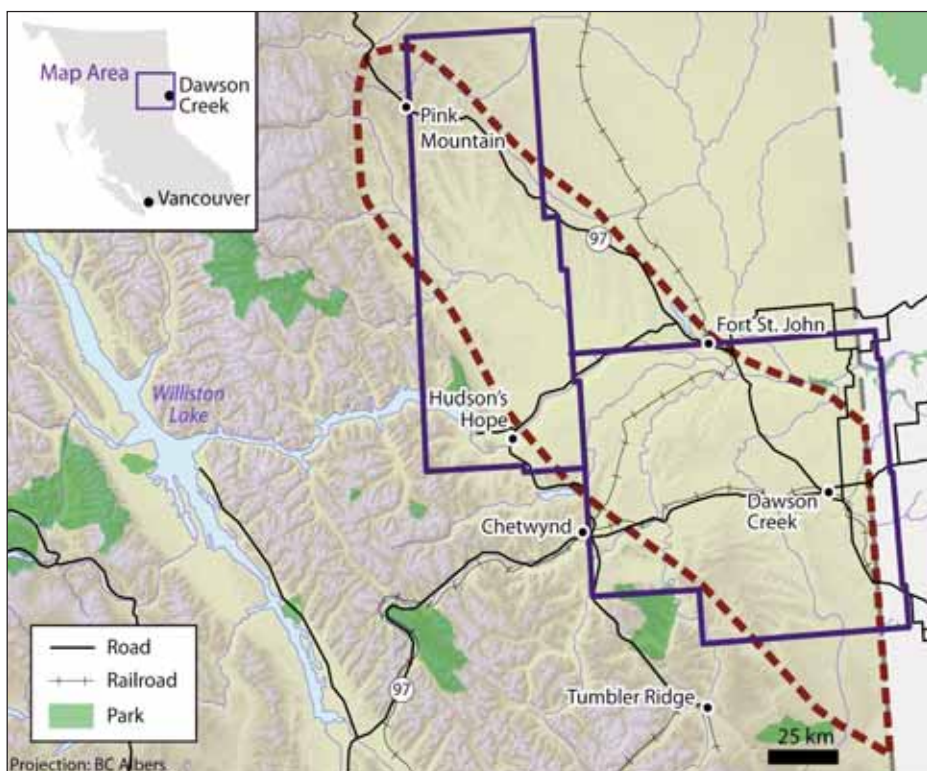




Photo by A. Hickin.



Photo courtesy of Shell Canada.



Location of the Montney Water Project study area. The dashed brown line outlines the surface and near-surface study area, and the two boxes outlined in dark blue show the extent of the sub-surface study area.

## Montney Water Project Partners

The Montney Water Project is a collaborative effort by Geoscience BC in partnership with seven companies active in the Montney Play. In addition, this project has support from the BC Oil & Gas Commission's SCEK Fund, BC Ministry of Energy, Ministry of Environment, Ministry of Health Services and the Northern Health Authority and contributions from the Kiskatinaw River Watershed Project being undertaken at the University of Northern British Columbia in partnership with the City of Dawson Creek.



## Kiskatinaw River Watershed Research Project

The Kiskatinaw River Watershed Research Project is a collaborative research project developed jointly between the City of Dawson Creek, University of Northern British Columbia and Ministry of Environment. The project is also receiving some financial support from Geoscience BC and industry, and forms an important partner-project within the Montney Water Project area.

The goal of the project is to be able to obtain sufficient scientific information to successfully manage the watershed and thereby reduce conflict and uncertainty between water users.

The Kiskatinaw River watershed (drainage basin) provides community water supply and supports various other values such as timber harvesting, agriculture, oil and gas, wildlife and recreation. The Kiskatinaw watershed's hydrology is currently poorly understood and has proven to be intermittent in terms of water supply.

Two Ph.D. candidates, F. Hirshfield and G. Saha, are conducting the project as part of their Ph.D. dissertations. The project includes six main tasks:

1. investigating the contribution of discharge and sediment levels (sediment yield) from each tributary to the main stem of the Kiskatinaw River;
2. selecting a hydrological model for watershed modeling;
3. examining the impacts of future climate changes on the snowmelt processes and discharge;
4. identifying the impacts of oil and gas activities on discharge in each tributary and main stem;
5. investigating the surface water-ground water (SW-GW) interaction and quantification of groundwater contribution to river flow; and
6. modeling of water quality in the Kiskatinaw River and its tributaries.



# Oil & Gas Partnership Projects in Northeast BC and the Nechako Basin

In addition to the Horn River Basin Aquifer Project and Montney Water Project (see pages 11–13), Geoscience BC is supporting the following partnership projects in Northeast BC and the Nechako Basin (central BC, west of Quesnel and Williams Lake).

Information on all of Geoscience BC's current and completed oil and gas projects can be found at [www.geosciencebc.com/s/SearchType.asp#og](http://www.geosciencebc.com/s/SearchType.asp#og). This page links to the project webpage for each the projects mentioned below, each of which have project abstracts, posters and technical articles.



## Northeast BC Projects

### Quantification of the Gas in Place and Flow Characteristics of Tight Gas Charged Rocks and Gas Shale Potential in BC

Led by Dr. Marc Bustin at the University of British Columbia, this new project aims to develop better methodologies for determining gas-in-place capacity in Northeast BC gas shales. The project will also try to quantify the gas-in-place and flow capacities of several of Northeast BC's gas shales, including those in the Horn River Basin and Montney area. Early results and planned future work are presented in Geoscience BC's Summary of Activities 2010 volume.

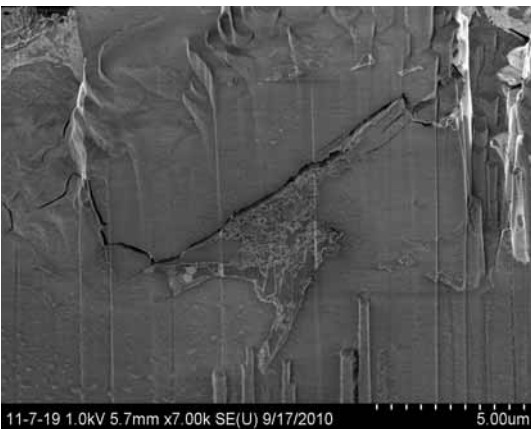
### Upper Paleozoic to Lowest Triassic Succession: Sukunka-Kakwa area, BC

Although northeastern BC has experienced high growth in oil & gas exploration recently, many parts of the region remain significantly under-explored. This project, led by Dr. Charles Henderson at the University of Calgary, is focused around Tumbler Ridge, BC. Now in its second year, the project has produced new information on the tectonic evolution and stratigraphy of the region, which is published in two papers in the Summary of Activities 2010 volume.

### Biostratigraphic and Sedimentological Studies of Natural Gas-Bearing Triassic Strata in the Halfway River Map Area, Northeast BC

This project, led by Ph.D. candidate Martyn Golding and Dr. Jim Mortensen (UBC), is studying natural gas-bearing rocks west of Fort St. John. Recent work has focused along Peace Reach, the eastern extension of Williston Lake. The descriptions and ages of examined sections along Peace Reach, as well as future project goals, are published in the Summary of Activities 2010 volume.

*Field emission scanning electron microscope image illustrating the micro-fractures and very fine pore structures that develop in gas shales.*  
Image by G. Chalmers.



## Nechako Basin Projects

### Nature, Distribution, Thickness and Regional Structural Framework of Eocene Volcanic Centres in the Nechako Basin, South-central BC

This project, which commenced in 2010, is evaluating the distribution, nature and thickness of Eocene volcanic rocks in the Nechako Basin, which have extensively modified and complicated the older geology. The project has implications for both the mineral and oil & gas exploration industries, as the Eocene rocks have mineral potential, and the older rocks they cover have hydrocarbon potential. This project is led by and Ph.D. candidate Esther Bordet and Dr. Craig Hart (UBC, MDRU). The results of Esther's first summer of fieldwork are published in Summary of Activities 2010.

### Enhanced Velocity Structure from Waveform Tomography of Seismic First-Arrival Data: Application to the Nechako Basin

This project, led by Ph.D. candidate Brendan Smithyman and Dr. Ron Clowes (UBC), is processing first-arrival data from the 2008 Geoscience BC Nechako Seismic survey to produce an improved near-surface velocity model. Recent work has focused on Line 10 of the seismic survey, and suggests the presence of shallow sub-basins in the region. The results and future project goals are discussed in the Summary of Activities 2010 volume.

### Integrated Interpretation and First Arrival Tomography of Reflection Surveys in the Nechako Basin

The goal of this project is to better understand the structure and hydrocarbon potential of the Nechako Basin by producing velocity models from the 2008 Nechako Seismic survey. Recent work by Drs. Draga Talinga and Andrew Calvert at SFU (published in the Summary of Activities 2010 volume) focuses on velocity models obtained from 3-D tomographic inversions on two of the seismic lines.

### Modeling and Investigation of Airborne Electromagnetic Data, and Reprocessing of Vibroseis Data, from Nechako Basin, BC, Guided by Magnetotelluric Results

This new project, under the supervision of Dr. Colin Farquharson at Memorial University of Newfoundland, will be conducting numerical modeling and inversion studies to assess what might be expected from a ZTEM survey of the Nechako Basin. The project will also utilize the Nechako Basin magnetotelluric dataset collected in a previous joint Geoscience BC-Natural Resources Canada project to guide a reprocessing of the 2008 Nechako Basin Seismic survey dataset. Further details are presented in the Summary of Activities 2010 volume.

### Gravity and Magnetic Inversion Modeling: Nechako Basin, BC

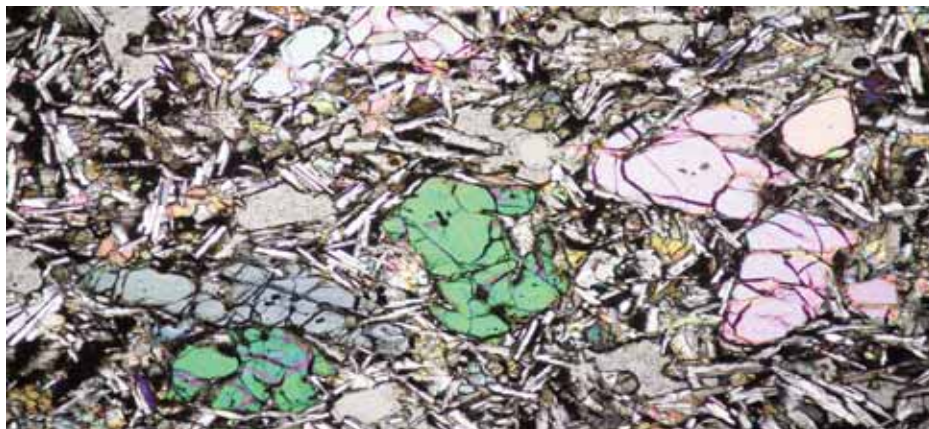
In order to better understand the geometry of the Nechako Basin for future exploration, the Mira Geoscience Advanced Geophysical Interpretation Centre (AGIC) is conducting 3-D constrained inversion modeling of airborne gravity and magnetic data. The constrained gravity inversion modeling will incorporate existing processed seismic lines, wells, geologic mapping, test MT lines, and density measurements to guide the solution of a depth to basement model. Results will be available in early 2011.

### Rock Physical Property Measurements for Modeling Geophysical Datasets

Dr. Kelly Russell of UBC is leading this project, which is designed to help interpret variations in geophysical signals by directly measuring the geophysical properties (e.g., magnetic properties, density, porosity, electrical conductivity, and VP & VS) of key lithologies within the Nechako Basin.

For additional details on many of these projects, pick up a copy of Geoscience BC's Summary of Activities 2010 (see page 19 for more details).

Photo by E. Bordet.







## Workshops in 2010 Spreading Geoscience Knowledge

Workshops and conferences kept Geoscience BC (GBC) busy in 2010. Staff and consultants helped put on five workshops, and are already planning for another set in 2011. GBC, in partnership with MDRU (Mineral Deposit Research Unit, UBC), also hosted three geoscience talks in downtown Vancouver (see sidebar).

The following is a summary of workshops GBC sponsored and/or delivered over the last year. For more details on any of these workshops (including PDF files of the presentations when available) go to [www.geosciencebc.com/s/Workshops.asp](http://www.geosciencebc.com/s/Workshops.asp).

**QUEST-West Workshops**  
(Smithers Exploration Group Rock Talk on February 8th, Smithers BC, and the Minerals North 2010 Conference on April 21st, Prince George BC)

These workshops presented an overview of GBC's QUEST, QUEST-West and QUEST-South projects, with a focus on how they support successful mineral exploration in British Columbia. Particular emphasis was placed on data released as part of the QUEST-West project.

The presenters reviewed the results of airborne electromagnetic, magnetic and gravity surveys and showed how this data helps geologists identify geologic features that may be important to finding new mineral resources. New lake, silt and till geochemical data was also reviewed, and several examples of how this data can help identify new target areas were presented.

Presenters included Don MacIntyre, Wayne Jackaman and Peter Kowalczyk (all geoscience consultants who developed the QUEST-West project for GBC), as well as Travis Ferbey (British Columbia Geological Survey) and Peter Ogryzlo (Lions Gate Metals).

**Data for Discovery – An Innovative Approach to Increase Exploration Success in British Columbia**  
(Prospectors and Developers Association of Canada (PDAC) Conference, March 8th, Toronto ON)

With the goal of promoting GBC's wealth of new geoscience information, GBC hosted a three-hour presentation room at PDAC. Presentation topics included:

- Characteristics and setting of alkalic porphyry Cu-Au deposits of British Columbia
- New insights into geochemical exploration for porphyry Cu-Au deposits through thick surficial cover
- Effective use of regional geophysical data in exploration
- Important implications of integrating geology and rock properties with geophysics to better constrain porphyry system
- Innovative use of surficial geochemistry to identify anomalies and targets in regional datasets
- The impact on exploration in investment of public geoscience – an industry perspective



*Peter Kowalczyk presents at the QUEST-West workshop in Smithers, BC.*  
Photo by D. MacIntyre.

*Photo above: SEG workshop participants complete their hands-on exploration exercise using the QUEST datasets.*  
Photo by K. Witherly.





SEG workshop participants  
Photo by K. Witherly.

Speakers included the Honourable Randy Hawes (BC Minister of State for Mining); Lena Brommeland (Hunter Dickinson and Chair, AME BC Board); John Thompson (Teck Resources and Chair, GBC Board); Mark Rebagliati (Hunter Dickinson); Craig Hart, Thomas Bissig and Dianne Mitchinson (MDRU); Dave Heberlein (Heberlein Geoconsulting) and Stephen Fraser (CSIRO).

### **Economic Geology for Geophysicists** (coordinated by the BC Geophysical Society, May 6th, Vancouver BC)

GBC, in partnership with MDRU and the BC Geophysical Society, co-sponsored this one-day workshop aimed at providing an introductory economic geology background for geophysicists and exploration geoscientists.

Topics included: ore deposit tectonic settings, host rocks, structure, emplacement, alteration, mineralization and the relation and comparison between various deposit models. Deposit types discussed included porphyry deposits, Archean gold, intrusion-related gold, epithermal gold, VMS, SEDEX/MVT/ sediment-hosted copper, IOCG deposits, and physical properties.

Course presenters included Thomas Bissig (MDRU and GBC), Craig Hart (MDRU), Dianne Mitchinson (MDRU and GBC), Steve Rowins (BCGS), Claire Chamberlain (Teck), Lucas Marshall (Teck), and Sean McKinley (Cambria Geosciences Inc).

### **Exploration in 2020 – Tools and Techniques to Explore Under Cover** (coordinated by Ken Witherly (Condor Consulting Inc.) and Tom Lane (CAMIRO) for the Society of Economic Geologists 2010 Conference, October 6-7th, Golden CO)

Discovery of new mineral resources faces challenges in many parts of the world, with the increased likelihood that new discoveries will be non-outcropping. Moving exploration under cover requires new approaches in the way prospective areas are selected; target models are defined, and geoscience data are acquired, processed and interpreted, with increased emphasis on modeling geology and geophysics in a 3-D GIS environment.

This 2-day workshop reviewed the strategic and tactical issues associated with exploring under cover, with the QUEST Project datasets used to guide the presentations. Day 1 included introductions to the QUEST area and GBC datasets. Day 2 was dedicated to a hands-on workshop, with participants asked to review the QUEST and other relevant datasets and select areas for follow-up that they felt are prospective.

Presenters included Lyn Anglin (GBC), Thomas Bissig (GBC and MDRU), John Holliday (Newcrest Mining Ltd), Peter Kowalczyk (GBC), Dianne Mitchinson (GBC and MDRU), James Siddorn (SRK Consulting), Neil Williams (University of Wollongong) and Ken Witherly (Condor Consulting). Fion Ma (GBC) provided GIS support prior to and during the workshop, and Colorado School of Mines graduate students provided support as "data guides" during the Day 2 exercise.

## **GBC – MDRU Joint Talk Series**

In October 2009, GBC and MDRU launched a joint speaker series, with the goal of hosting talks of interest to the mineral exploration community in downtown Vancouver. This talk series continued in 2010, with presentations given by the following:

- **Dave Lawie** (ioGlobal) – "Applied Economic Geochemistry – from Greenfields to Production" (April 30th, 2010)
- **Dr. Dan Marshall** (Simon Fraser University, and the Geological Association of Canada 2009-2010 H.S. Robinson Lecturer) – "Melt inclusions of native-silver and native-bismuth at Cobalt, Ontario: An example of native-metal enrichments in five-element deposits" (November 25, 2010)
- **Dr. Steven Scott** (University of Toronto) – "Seafloor massive sulfide mining - The dawning of a new industry" (November 30th, 2010)

For upcoming 2011 talks, stay tuned to GBC and MDRU websites and e-mail notices. To be added to GBC's contact list, please e-mail [info@geosciencebc.com](mailto:info@geosciencebc.com).



# Geoscience BC Data and Publications 2010

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).

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

## Geoscience Report 2010-1

Geoscience BC Summary of Activities 2009 (contains 25 technical papers on Geoscience BC project activities in 2009, *various authors*)

## Geoscience BC Map 2010-2-1 (GSC Open File 6344)

Distribution of the Chilcotin Group, Taseko Lakes and Bonaparte Lake map areas, British Columbia, by *J. Dohaney, G.D.M. Andrews, J.K. Russell and R.G. Anderson*

## Geoscience BC Report 2010-3

An Assessment of Soil Geochemical Methods for Detecting Copper-Gold Porphyry Mineralization through Quaternary Glaciofluvial Sediments at the Kwanika Central Zone, North-Central British Columbia (NTS 93N), by *D.R. Heberlein and H. Samson*

## Geoscience BC Report 2010-4

QUEST-South Project Sample Reanalysis, by *W. Jackaman*

## Geoscience BC Report 2010-5 (BCGS Geoscience Map 2010-01 & GSC Open File 6476)

Bedrock Geology of the QUEST map area, central British Columbia, by *J.M. Logan, P. Schiarizza, L.C. Struik, C. Barnett, J.L. Nelson, P. Kowalczyk, F. Ferri, M.G. Mihalynuk, M.D. Thomas, P. Gammon, R. Lett, W. Jackaman and T. Ferbey*

## Geoscience BC Report 2010-6

Airborne Gravity Survey, QUEST-South, British Columbia – 2009, by *Sander Geophysics Ltd.*

## Geoscience BC Map 2010-7-1

Geology of the Deer Park Map Sheet (NTS 082E/08), by *T. Höy and W. Jackaman*

## Geoscience BC Report 2010-8

An Assessment of Soil Geochemical Methods for Detecting Copper-Gold Porphyry Mineralization through Quaternary Glaciofluvial Sediments at the WBX-MBX and 66 Zones, Mt. Milligan, North-Central British Columbia, by *D.R. Heberlein*

## Geoscience BC Report 2010-9

QUEST Project Compilation, by *S.P. Williams and F. Ma*

## Geoscience BC Report 2010-10 (BCGS Open File 2010-07)

Till Geochemistry of the Nadina River Map Area (093E/15), West-Central British Columbia, by *T. Ferbey*

## Geoscience BC Report 2010-11

Horn River Basin Subsurface Aquifer Project – Phase 1 Data, by *Petrel Robertson Consulting Ltd.*

## Geoscience BC Report 2010-12

QUEST-West Compilation Maps, by *Geoscience BC*

## Geoscience BC Report 2010-13

QUEST-South Regional Geochemical Data, Southern British Columbia, by *W. Jackaman*

## Geoscience BC Report 2010-14

Relative Drift Thickness Map, North-Central British Columbia, by *D.M. Maynard, B.C. Ward, M. Geertsema, N. Roberts and D. Sacco*

## Geoscience BC Map 2010-15-1 (GSC Open File 6657)

Bedrock Cross-Sections in Chasm Provincial Park, by *R-E. Farrell, J.K. Russell and K.A. Simpson*

## Geoscience BC Report 2010-16

2-D Land Joint Inversion of Seismic, Magnetotelluric and Gravity for Pre-Stack Depth Migration Imaging, by *Western GeCo MDIC*





Photo by J. Norris

# Summary of Activities

Released every January at Mineral Exploration Roundup, Geoscience BC's Summary of Activities is our annual scientific volume, composed of technical papers from our ongoing and recently completed projects.

Geoscience BC Summary of Activities 2010 is the fourth in the series (Geoscience BC technical papers were also published in the BC Geological Survey Fieldwork 2005 and 2006 volumes). Printed in full colour, and available digitally through Geoscience BC's website, the Summary of Activities 2010 includes 278 pages of new information on Geoscience BC-funded projects.

Highlights of the volume include:

- An introduction to Geoscience BC's new Porphyry Integration Project
- 2 papers describing new geochemical projects
- 2 papers on mineral deposits in Northwest BC (Red Chris and Eskay Creek deposits)
- 1 paper focused on an ongoing study on enhancing geophysical interpretations with rock property data
- 3 papers on surficial geology studies in central BC
- 2 papers on new projects focused on the geology and porphyry deposits of the Quesnel terrane
- 2 final papers on orogenic gold studies in the Cariboo region
- 2 papers on carbonate-hosted zinc-lead mineralization in BC
- 2 papers focused on Geoscience BC's Montney Water Project in northeast BC
- 4 papers on Geoscience BC hydrocarbon initiatives in northeast BC
- 4 papers highlighting ongoing work in the Nechako Basin, which will benefit both mineral and hydrocarbon exploration

FOR MORE INFORMATION ON GEOSCIENCE BC'S SUMMARY OF ACTIVITIES VOLUMES, PLEASE CONTACT:

Geoscience BC  
[info@geosciencebc.com](mailto:info@geosciencebc.com)  
[www.geosciencebc.com/s/Publications.asp](http://www.geosciencebc.com/s/Publications.asp)





# Scholarship Winners

## Exploration Geoscience Graduate Students Working in BC

In 2010, Geoscience BC awarded nine graduate scholarships of \$5,000 each to students working on a BC-based mineral or oil and gas exploration project.

The scholarships were open to students registered in a Masters or Doctorate program working on an exploration-related topic in British Columbia. Applicants were scored based on their education and work experience, thesis project, career goals and aspirations, and remarks from their references. Preference was given to applicants whose projects were deemed to have the greatest potential benefit to exploration in BC, and whose research and career interests are primarily directed towards the exploration sector, either mineral or oil and gas.

For more information about the Geoscience BC scholarship, and information on past scholarship winners and their respective projects, please visit [www.geosciencebc.com/s/Scholarships.asp](http://www.geosciencebc.com/s/Scholarships.asp).



**Tatiana Alva-Jimenez**  
MSc student, University of British Columbia

To date, there is little information about chemical variations in alteration minerals within porphyry Cu deposits. Located in BC's southern interior, the Highland Valley porphyry Cu-Mo district represents an excellent opportunity to examine the range of white mica and chlorite compositions associated with large scale magmatic hydrothermal alteration affecting host rocks of limited compositional variability. The ultimate goal of Tatiana's project is to expand the alteration footprint for porphyry Cu deposits and establish exploration vectors. These results are expected to aid exploration for around the world.



**Edwin Egbobawaye**  
PhD student, University of Alberta

The Montney and Doig Formations are a primary focus of tight gas exploration in the Province of British Columbia. Despite strong economic interest in shale and silt-hosted hydrocarbons in Montney and Doig formations their geology, geochemistry, and optimum reservoir lithologies are contentious and poorly understood, and have not been adequately characterized. Edwin's work aims to characterize the Montney and Lower Doig formations in terms of its geochemistry, and the stratigraphic interval with the optimum reservoir lithologies in northeastern BC. The results of his study will hopefully increase investment in shale gas/tight gas exploration in BC.



**Esther Bordet**  
PhD student, University of British Columbia

The objective of Esther's project is to provide a regional structural framework and evolution of the Nechako basin during the Eocene to allow better identification of pre-Eocene hydrocarbon bearing features, and to help constrain the metallogenic impact and potential of the Eocene volcanic rocks. Overall, the outcome of this study will be applicable to both hydrocarbon and mineral exploration industries in British Columbia, by allowing improved reconstruction of the basin architecture and better assessment of resource potential.



**Duncan McLeish**  
MSc student, University of Victoria

Duncan's project focuses on the tectonic controls on emplacement of the Aley Carbonatite Complex, Northeastern BC Rocky Mountains, and its implications for niobium (Nb) and Rare Earth Element (REE). As global economic interest in Nb and REEs continues to grow at a rapid pace, largely due to their use in industrial and personal high-tech electronic devices, a better understanding of carbonatites in the Canadian Cordillera is poised to advance exploration and development of these important commodities in BC.

### Did you know?

Since 2005, Geoscience BC scholarships and project funding have supported over 50 graduate students working on BC-based projects.





**Tom Meuzelaar**  
PhD student, Colorado School of Mines

Tom's project uses textural evidence and geochemical modeling to define the nature and origin of carbonate alteration at the Essay Creek Massive Sulfide deposit, located in the Iskut River area of northwestern BC. Preliminary investigations show that the carbonaceous mudstone hosting the stratiform sulfide mineralization has been affected by widespread carbonate alteration. A set of guidelines will be formulated that will permit interpretation of carbonate alteration halos recognizable in the field by simple and readily applicable exploration techniques. This is the second year Tom has received this award.



**David Sacco**  
MSc student, Simon Fraser University

Central British Columbia has highly prospective bedrock geology but mineral exploration has been limited in some areas due to the thick cover of quaternary glaciogenic material. Dave's project will provide information on the Quaternary history, specifically the distribution of surface materials and ice flow history, which are vital for the planning and interpretation of geochemical surveys used in drift prospecting. This will be accomplished through the mapping of surficial deposits, landforms and the interpretation of stratigraphic sections ice flow data.



**Dikun Yang**  
PhD student, University of British Columbia

Time domain electromagnetic (TEM) data provides unique information about the ground conductivity which is directly associated with minerals and their geologic signatures. However, because of the complexity of numerical modeling and the cost of computation, three-dimensional TEM data inversion that reveals realistic distribution of subsurface conductivity has not been fully developed. Dikin's PhD thesis focuses on the practical inversions of two types of TEM data: airborne TEM and inductive source resistivity. This is the second year Dikun has received this award.



**Jessica Norris**  
MSc student, University of British Columbia

The Red Chris Cu-Au porphyry deposit is located in northwestern British Columbia near the northern extent of the Stikine terrane. This silica-saturated alkalic porphyry contains several generations of carbonate material, an unusual occurrence in such a deposit. The main objective of Jessica's study is to examine the relationship between mineralization and alteration assemblages at the deposit with the goal of developing and applying exploration vectors to find similar deposits in the region.



**Santiago Vaca**  
MSc student, University of British Columbia

Santiago's project is investigating the nature of volcanic rocks associated with coeval alkalic Cu-Au porphyry development, and their spatial distribution in the Quesnel Terrane. Geochemistry, petrography and scanning electron microscopy is being used to document zoned pyroxenes, as well as presence or absence of inclusions such as magnetite and apatite. The results show changes in the oxidation state and halogen contents during the evolution of the arc, and will be synthesized into a map showing areas within the Quesnel Terrane prospective for coeval Cu-Au porphyry mineralization.



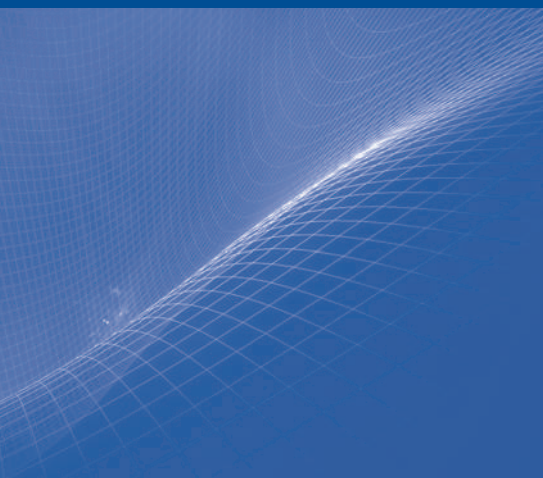


Photo by T. Bissig.

# The Geoscience BC Team in 2010

## Board of Directors

**John Thompson, Chairman of the Board**  
VP Technology & Development,  
Teck Resources Limited

**C.D. ('Lyn') Anglin**  
President & CEO, Geoscience BC

**David Caulfield**  
Co-Chairman & Director of Business  
Development, Kiska Metals Corporation

**Richard Dunn<sup>+</sup>**  
VP, Regulatory & Government Relations  
Canadian Division, Encana Corporation

**Tony Fogarassy**  
Principal, Dunbar Law Corporation

**Geoff Freer<sup>+</sup>**  
CEO, Firth Group

**Byng Giraud<sup>+</sup>**  
VP Corporate Affairs, Imperial Metals Corporation

**James Gray**  
Partner, De Visser Gray LLP  
Chartered Accountants

**Calvin Helin**  
President & CEO, Eagle Group of Companies, LLC,  
and President, Native Investment and Trade  
Association

**David James**  
Independent Consultant

**Stephanie Killam<sup>+</sup>**  
Mayor, District of Mackenzie

**Dan Miller<sup>\*</sup>**  
Independent Consultant

**Greg Reimer<sup>°</sup>**  
Executive VP, Transmission & Distribution,  
BC Hydro

**David Strong**  
Independent Consultant

**David Taylor**  
VP, Business Development & Exploration,  
Parex Resources Inc.

<sup>+</sup> Appointed in 2010

<sup>\*</sup> Term completed in 2010

<sup>°</sup> Resigned in 2010

## Staff

**C.D. ('Lyn') Anglin**  
President and CEO

**Garth Kirkham**  
VP Industry Liaison

**Kirstie Simpson**  
VP Minerals Research

**Christa Sluggett**  
Project Geologist and Communications  
Coordinator

**Fion Ma**  
GIS Specialist

**Rhonda Schultz**  
Accountant and Corporate Secretary

**Angel Sit**  
Office Manager and Executive Assistant

**Diane Hanano<sup>\*</sup>**  
Office Manager and Executive Assistant

<sup>\*</sup> left GBC in 2010

## Primary Consultants and Research Associates

**Thomas Bissig**  
UBC – MDRU

**Fred Blaine**  
UBC – MDRU

**Derek Brown**  
Strategic West Energy Ltd.

**Andy Calvert**  
Simon Fraser University

**Fionnuala Devine**  
Merlin Geosciences Inc.

**Dan Jepsen**  
C3 Alliance Corporation

**Brad Hayes**  
Petrel Robertson Consulting Ltd.

**Dave Heberlein**  
Heberlein Geoconsulting

**Wayne Jackaman**  
Noble Exploration Services Ltd.

**Peter Kowalczyk**  
PK Geophysics

**Gordon Loverin**  
T'senaglobe Communications

**Don MacIntyre**  
D.G. MacIntyre & Associates Ltd.

**Dianne Mitchinson**  
UBC – MDRU

**David Molinski**  
OnPoint Consulting

**Stephen Williams**  
Natural Resources Canada



Photo by T. Bissig.



Photo by T. Bissig.

### Technical Advisory Committees

Geoscience BC has two Technical Advisory Committees (TACs), a Minerals TAC and an Oil & Gas TAC. 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 setting 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

**Henry Awmack**  
Equity Exploration Consultants Ltd.

**Lindsay Bottomer**  
Entrée Gold Ltd.

**Peter Bradshaw**  
First Point Minerals Corporation

**Andrew Calvert\***  
Simon Fraser University

**Rob Cameron**  
Valley High Ventures Ltd.

**Stephen Cook**  
Teck Resources Ltd.

**Andrew Davies**  
Teck Resources Ltd.

**Rob Duncan**  
Evrin Resources Corp.

**Carl Edmunds\***  
Northgate Minerals Corporation

**Craig Hart**  
UBC – MDRU

**Jacques Houle**  
Consultant

**Ward Kilby**  
Cal Data Ltd.

**Jules Lajoie**  
Consultant

**Bob Lane**  
Plateau Minerals Corporation

**Rob Pease**  
Terrane Metals Corporation

**Mark Rebagliati**  
Hunter Dickinson Inc.

**Wayne Roberts**  
Manex Resource Group/Rockex Consulting

**Steve Robertson**  
Imperial Metals Corporation

**H. Paul Wilton\***  
Chamber of Mines of Eastern BC

### Non Voting Members

**Garth Kirkam, Past-Chair**  
Geoscience BC

**Carmel Lowe**  
Natural Resources Canada

**Bruce Northcote**  
BC Ministry of Forests, Mines and Lands,  
Mineral Development Office

**Steve Rowins**  
BC Geological Survey

**Kirstie Simpson, Chair**  
Geoscience BC

**Christa Sluggett, Co-Chair**  
Geoscience BC

\*resigned from TAC in 2010

### Oil & Gas Technical Advisory Committee

**Andrew Calvert, Chair**  
Simon Fraser University

**Brad Hayes**  
Petrel Robertson Consulting Ltd.

**John Hogg**  
MGM Energy Corporation

**Richard Kellett**  
Sherritt International Corporation

**Grant Knowles**  
EnCana Corporation

**Don Lawton**  
University of Calgary

**Lavern Stasiuk**  
Shell Canada Ltd.

### Non Voting Members

**Christa Sluggett, Co-Chair**  
Geoscience BC

**Fil Ferri**  
BC Ministry of Energy

**David James**  
Independent Consultant

**Peter Kowalczyk**  
PK Geophysics Inc.

**Carmel Lowe**  
Natural Resources Canada

**David Taylor**  
Parex Resources Inc.



# Financial Statements

March 31, 2010





# Auditors' Report

## To the Members of Geoscience BC Society

We have audited the statement of financial position of Geoscience BC Society as at March 31, 2010 and the statements of revenues and expenditures, cash flows, and changes in net assets for the year then ended. These financial statements are the responsibility of the society's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the society as at March 31, 2010 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles. As required by the Society Act (British Columbia), we report that, in our opinion, these principles have been applied on a basis consistent with that of the preceding year.

Vancouver, British Columbia  
September 3, 2010

*"Beauchamp & Company"*  
Chartered Accountants

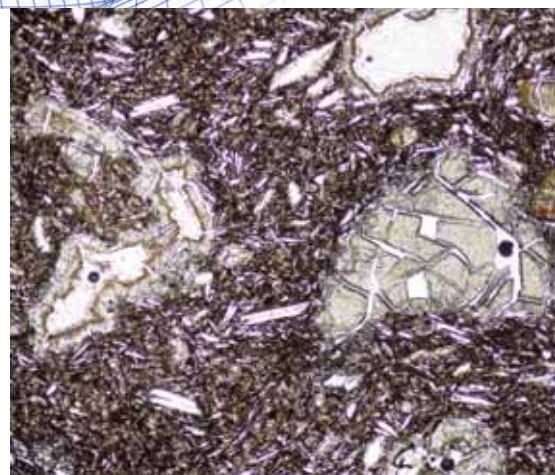


Photo by T. Bissig.





## Geoscience BC Society

# Statements of Financial Position

As at March 31, 2010 and 2009

	2010	2009
<b>ASSETS</b>		
<b>Current Assets</b>		
Cash and cash equivalents (Note 2)	\$ 206,012	\$ 554,786
Investments (Note 4)	11,951,266	16,991,131
Accrued interest receivable	1,140	202,990
Amounts receivable	196,516	1,695,182
Prepaid expenses and deposits	8,756	13,500
	12,363,690	19,457,589
<b>Capital Assets (Note 7)</b>	23,637	30,787
	<b>\$ 12,387,327</b>	<b>\$ 19,488,376</b>
<b>LIABILITIES</b>		
<b>Current Liabilities</b>		
Accounts payable and accrued liabilities	\$ 66,506	\$ 115,638
<b>NET ASSETS</b>		
Net Assets Invested In Capital Assets	23,637	30,787
Net Assets Restricted For Approved Programs (Note 3)	3,272,410	4,142,621
Unrestricted Net Assets	9,024,774	15,199,330
	12,320,821	19,372,738
	<b>\$ 12,387,327</b>	<b>\$ 19,488,376</b>

Nature Of Operations And Going Concern (Note 1)  
Subsequent Events (Note 10)

Approved By The Board:

*"C.D. ('Lyn) Anglin"*  
Director

*"James D. Gray"*  
Director

See accompanying notes.

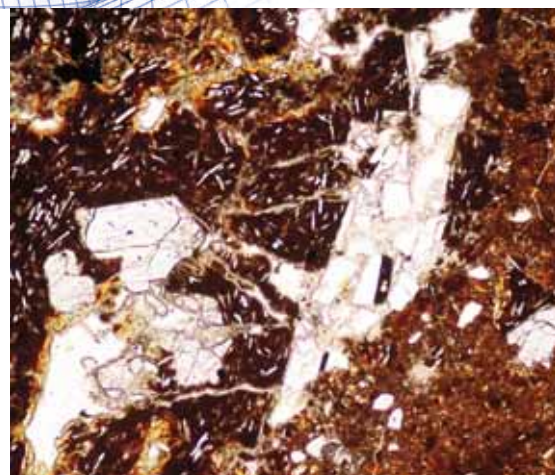
## Geoscience BC Society

# Statements of Revenues and Expenditures

For the years ended March 31, 2010 and 2009

	2010	2009
<b>Revenues</b>		
Grants and program reimbursements	\$ 51,486	\$ 1,680,580
Investments (Note 4)	260,305	527,685
Funding recoveries (Note 3)	22,548	12,053
Sublease rent and other	16,420	8,400
	350,759	2,228,718
<b>Expenditures – Programs</b>		
Program costs incurred	7,385,757	8,327,397
Program costs incurred, approved in principal	–	31,471
Project GST, non-refundable portion	131,681	168,365
Publishing costs	37,816	25,224
	7,555,254	8,552,457
<b>Expenditures – Administration</b>		
Amortization of capital assets	16,940	16,486
Communications and marketing	50,547	64,061
Consulting	90,765	154,859
Gifts and promotion	6,102	5,365
Dues and memberships	3,194	6,490
Equipment lease (Note 8)	3,426	3,226
First Nations and community engagement	300	4,301
GST, non-refundable portion	12,196	12,800
Insurance	5,407	5,388
Investment management fees	52,032	56,699
Office and sundry	47,247	23,658
Professional fees	56,579	51,014
Recruitment	3,000	–
Rent and utilities (Note 8)	125,589	100,877
Salaries and benefits	546,564	374,445
Scholarship awards	50,000	55,000
Sponsorship	17,842	17,653
Travel, conferences and meetings	99,265	119,345
Website, internet and e-mail	4,474	5,772
Workshops	4,919	4,965
	1,196,388	1,082,404
<b>Excess Of Expenditures Over Revenues</b>	<b>\$ (8,400,883)</b>	<b>\$ (7,406,143)</b>

See accompanying notes.







## Geoscience BC Society

# Statements of Cash Flows

For the years ended March 31, 2010 and 2009

	2010	2009
<b>Cash Provided By (Used For):</b>		
<b>Operating Activities</b>		
Grants and program reimbursements	\$ 1,503,523	\$ 12,015,320
Investments	722,270	673,776
Funding recoveries	31,374	3,227
Sublease rent and other	16,420	8,400
Payments for program expenditures	(7,514,098)	(8,675,351)
Payments for administration expenditures	(1,264,802)	(1,006,004)
Payments of refundable portion of GST	(144,951)	(182,564)
Receipt of refundable GST	182,564	102,653
Cash (used for) provided by operating activities	(6,467,700)	2,939,457
<b>Investing Activities</b>		
Purchase of investments (Note 4)	-	(11,000,000)
Redemption of investments (Note 4)	6,786,915	9,006,977
Reinvestment of investment distributions, net	(658,199)	(604,127)
Purchase of capital assets	(9,790)	(14,996)
Cash provided by (used for) investing activities	6,118,926	(2,612,146)
(Decrease) Increase In Cash And Cash Equivalents	(348,774)	327,311
Cash And Cash Equivalents, Beginning Of Year	554,786	227,475
<b>Cash And Cash Equivalents, End Of Year</b>	<b>\$ 206,012</b>	<b>\$ 554,786</b>
<b>Cash And Cash Equivalents</b>		
Funds held in treasury account	\$ 206,012	\$ 4,786
GIC investments due within one year	-	550,000
<b>Cash And Cash Equivalents, End Of Year</b>	<b>\$ 206,012</b>	<b>\$ 554,786</b>

See accompanying notes.

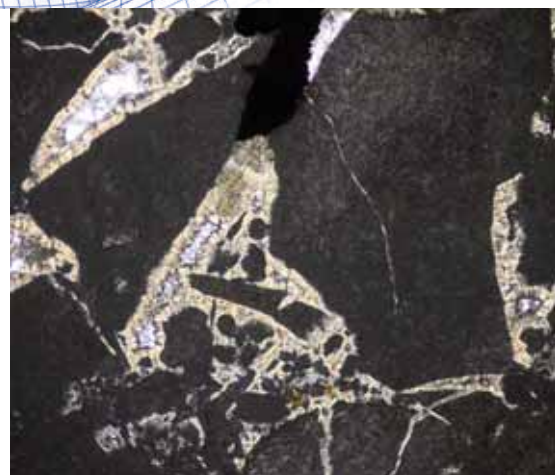
## Geoscience BC Society

# Statements of Changes in Net Assets

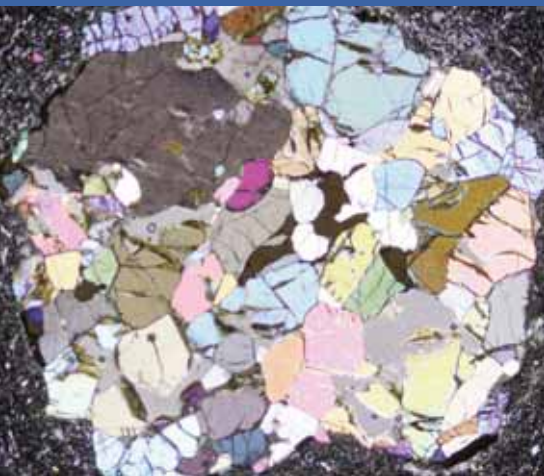
For the years ended March 31, 2010 and 2009

	Investment In Capital Assets	Restricted For Approved Programs	Unrestricted	Total
Balance, March 31, 2008	\$ 32,277	\$ 2,207,675	\$ 25,543,454	\$ 27,783,406
(Deficiency) Excess of revenues over expenditures	(16,486)	(8,550,762)	1,161,105	(7,406,143)
Unrealized loss on investments	–	–	(1,004,525)	(1,004,525)
Investment in capital assets	14,996	–	(14,996)	–
Internally imposed restrictions	–	10,485,708	(10,485,708)	–
Balance, March 31, 2009	30,787	4,142,621	15,199,330	19,372,738
Excess of expenditures over revenues	(16,940)	(7,567,438)	(816,505)	(8,400,883)
Unrealized gain on investments	–	–	1,348,966	1,348,966
Investment in capital assets	9,790	–	(9,790)	–
Internally imposed restrictions	–	6,697,227	(6,697,227)	–
Balance, March 31, 2010	\$ 23,637	\$ 3,272,410	\$ 9,024,774	\$ 12,320,821

See accompanying notes.







## Geoscience BC Society

# Notes

## to Financial Statements March 31, 2010 and 2009

### 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 Section 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 the \$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 ("AME BC") 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, 2010 the Society expects to maintain operations for a minimum period of two years based on its existing commitments to fund projects and its related liquid asset balances on hand. Refer to note 5.

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 financial statements, and these adjustments could be material.

### 2. Significant Accounting Policies

#### Current changes in accounting policies

During the years ended March 31, 2010 and 2009, the Society adopted the following accounting standards issued by the Canadian Institute of Chartered Accountants (the "CICA"):

- **Going concern**  
CICA Handbook Section 1400, General Standards of Financial Statement Presentation, was amended to include requirements to assess and disclose the Society's ability to continue as a going concern. This standard is effective for the Society for interim and annual periods relating to fiscal years beginning on or after April 1, 2008. Disclosures required pursuant to this standard are found in note 1 to the financial statements.
- **Capital disclosures**  
Effective April 1, 2008, the Society adopted CICA Handbook Section 1535, Capital Disclosures. This standard requires disclosure of the Society's objectives, policies and processes for managing capital, quantitative data about what the Society regards as capital and whether the Society has complied with any capital requirements and, if it has not complied, the consequences of such non-compliance.

# Notes

## to Financial Statements March 31, 2010 and 2009

(cont'd)

### 2. Significant Accounting Policies (Cont'd)

#### Current changes in accounting policies (cont'd)

- **Capital disclosures (cont'd)**

The Society's objectives when managing capital are to safeguard its ability to continue as a going concern, and to maintain a flexible capital structure which optimizes the costs of capital at an acceptable risk.

In the management of capital, the Society includes the components of net assets as well as its cash and cash equivalent and investment balances.

The Society manages its capital structure and makes adjustments to it in light of changes in economic conditions and the risk characteristics of the underlying assets. To maintain or adjust its capital structure, the Society may attempt to decrease its program approvals or adjust the amount of its cash and cash equivalent and investment balances.

The Society's investment policy is to invest its cash in highly liquid investments which are readily convertible into cash, selected with regard to the expected timing of expenditures from continuing operations. Refer to note 6.

- **Financial instruments**

The Society previously adopted CICA Handbook Section 3855, Financial Instruments-Recognition and Measurement, and Section 3861, Financial Instruments – Disclosure and Presentation. These accounting standards provide comprehensive requirements for the recognition and measurement of financial instruments. Pursuant to these standards, financial instruments are classified as one of the following: loans and receivables, held-to-maturity, held-for-trading, available-for-sale and other financial liabilities. Financial instruments are measured on the statement of financial position at amortized cost or fair value depending on the classification. Loans and receivables, held-to-maturity financial instruments and other financial liabilities are accounted for at amortized cost. Held-for-trading and available-for-sale financial instruments are recorded at fair value on the Society's statement of financial position. Changes in fair value of held-for-trading financial instruments are recognized in the Society's statement of revenues and expenditures while changes in fair value of available-for-sale financial instruments are initially recorded in the Society's statement of changes in net assets.

Effective April 1, 2009, the Society adopted CICA Handbook Sections 3862 Financial Instruments – Disclosure and 3863 Financial Instruments – Presentation. Refer to notes 4 and 5.

These standards replace CICA Handbook Section 3861, Financial Instruments – Disclosure and Presentation. They increase the disclosures previously required, which will enable users to evaluate the significance of financial instruments for the Society's financial position and performance, including disclosures about fair value. In addition, disclosure is required of qualitative and quantitative information about exposure to risks arising from financial instruments, including specified minimum disclosures about credit risk, liquidity risk, currency risk, interest rate risk, and market risk. The quantitative disclosures must provide information about the extent to which the Society is exposed to risk, based on information provided internally to the Society's key management personnel.







## Geoscience BC Society

# Notes

## to Financial Statements March 31, 2010 and 2009

(cont'd)

### 2. Significant Accounting Policies (Cont'd)

#### Current changes in accounting policies (cont'd)

- **EIC 173 – Credit risk and the fair value of financial assets and financial liabilities**  
In January 2009, the CICA approved EIC – 173 Credit Risk and the Fair Value of Financial Assets and Financial Liabilities. This guidance clarified that the Society's credit risk and the credit risk of the counter party should be taken into account in determining the fair value of financial assets and financial liabilities including derivative instruments. This guidance is applicable to fiscal periods ending on or after January 12, 2009. The Society adopted this standard on January 12, 2009. The adoption of this Handbook EIC had no impact on the Society's financial statements.

#### Measurement uncertainty

These financial statements have been prepared in accordance with Canadian generally accepted accounting principles, which necessarily involves the use of estimates. The preparation of financial statements requires management to make estimates and assumptions which affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements as well as the reported amounts of revenues earned and expenditures incurred during the year reported. Actual results could differ from those estimates. The financial statements of the Society have, in management's opinion, been properly prepared within reasonable limits of materiality, and within the framework of the significant accounting policies disclosed below.

#### Revenue recognition

The Society follows the deferral method of accounting for contributions. Restricted contributions are recognized as revenue in the year in which the related expenditures are incurred. Unrestricted contributions are recognized as revenue when received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured. Endowment contributions are recognized as direct increases in net assets. Restricted investment income is recognized as revenue in the year in which the related expenditures are incurred. Unrestricted investment income is recognized as revenue when earned.

#### Donated materials and services

Donated materials and services are recorded only when a fair value can be reasonably estimated and when they would be paid for by the Society if they had not been donated.

#### Contributed services

Significant volunteer labour is contributed to assist the Society in carrying out its activities, but is not recorded in the Society's financial statements due to the difficulty of determining the fair value of those services.

#### Cash and cash equivalents

Cash and cash equivalents consist of cash on deposit with banks and other financial institutions, and highly liquid short-term interest bearing securities that are readily convertible to known amounts of cash.

#### Capital assets

Capital asset purchases made by the Society are capitalized and are recorded at cost less accumulated amortization. Amortization is recorded as disclosed in note 7 on a straight-line basis, commencing in the quarter of acquisition, as follows:

Computer equipment	3 years
Furniture and office equipment	5 years

# Notes

## to Financial Statements March 31, 2010 and 2009

(cont'd)

### 3. Restricted Net Assets

At March 31, 2010, the Society's net assets are subject to future obligations aggregating \$3,272,410 (2009 – \$4,142,621), representative of undisbursed but approved funding commitments, payment of which is contingent upon the Society receiving acceptable deliverables from these programs in accordance with executed agreements. These internally restricted amounts are not available for other purposes without the approval of the Society's Board of Directors.

Recipients of funding from Geoscience BC are required to account for the expenditure of all monies received, and Geoscience BC reserves the right to request documentation to support the reported expenditure breakdowns. Unspent funds, including GST input tax credits subsequently recovered by recipients but based on the expenditure of Geoscience BC grants, are to be returned to the Society. During the fiscal year ended March 31, 2010, the Society received an aggregate of \$22,548 (2009 – \$12,053) of such recoveries, which are included within the Society's unrestricted net assets. No predictions of future recoveries can be accurately made at this time and therefore funding recoveries are recorded at the earlier of the date of receipt and the date that a recovered amount becomes determinable.

During the year ended March 31, 2010, Geoscience BC recovered \$nil (2009 – \$96,945) from third parties in connection with the partial reimbursement of program expenditures incurred by the Society.

Refer to Note 10.

### 4. Investments

During the year ended March 31, 2007, the Society's Board elected to invest an aggregate of \$18.0 million in short term investments other than cash. A further \$11.0 million was invested by the Society during the year ended March 31, 2009.

During the year ended March 31, 2010, \$nil (2009 – \$6.0 million) was invested in either banker's acceptances or guaranteed income certificates issued by Canadian financial institutions which are readily convertible to cash at any time at market values. A further \$nil (2009 – \$5 million) was invested in various pooled funds under the discretionary management of Connor, Clark and Lunn Private Capital Ltd ("CC&L"), and subject to a Statement of Investment policy between the Society and CC&L. These monies are also readily convertible to cash at any time without penalty.

During the year ended March 31, 2010, the Society drew \$6.79 million (2009 – \$4.01 million) from amounts invested in banker's acceptances, and \$nil (2009 – \$5.0 million) from amounts invested under CC&L's management.







## Geoscience BC Society

# Notes

## to Financial Statements March 31, 2010 and 2009

(cont'd)

### 4. Investments (Cont'd)

	March 31, 2010 Market Value \$	March 31, 2010 Cost \$
Dundee Investment Savings Account	501,427	501,427
Renaissance High Interest Savings Account	1,004,659	1,004,659
0.6% GIC, Advisor's Advantage Trust, due December 1, 2010	573,153	573,153
	2,079,239	2,079,239
CC&L aggregate portfolio	9,872,027	9,923,086
	11,951,266	12,002,325

Investment revenue is comprised of the following:

	2010 \$	2009 \$
Interest earned on GIC's/banker's acceptances	67,887	345,134
Reinvested distributions	452,531	533,382
Realized investment losses	(260,113)	(350,831)
Unrealized investment gains (losses)	1,348,966	(1,004,525)
Aggregate investment revenue (loss)	1,609,271	(476,840)
Add: unrealized (gains) losses reported in Statements of Changes in Net Assets	(1,348,966)	1,004,525
Revenue disclosed in Statements of Revenues and Expenditures	260,305	527,685

### 5. Financial Instrument Risk

The Society's financial instruments are exposed to market price volatility, particularly in respect to the value of the \$9.9 million currently invested in the CC&L portfolio of pooled private equity funds. During the year ended March 31, 2010 the Society recorded a realized loss of \$260,113 (2009 – \$350,831) and an unrealized gain of \$1,348,966 (2009 – loss of \$1,004,525) in respect of its aggregate investment in the CC&L portfolio.

Related to the general price risk discussed above, a small portion of the underlying assets comprising the CC&L portfolio are denominated in foreign currencies and accordingly the portfolio is exposed to foreign exchange fluctuations to this extent.

The Society's investments in highly liquid near cash instruments, excluding the CC&L portfolio, currently consist of Guaranteed Investment Certificates issued by Canadian commercial banks and funds on treasury deposit with such institutions. The Society considers the credit risk associated with such investments to be minimal.

## Notes

### to Financial Statements March 31, 2010 and 2009

(cont'd)

#### 6. Capital Management

The Society's objectives for the management of capital are to safeguard its ability to continue as a going concern, specifically the preservation of capital, and to achieve reasonable returns on invested cash after satisfying this first objective. Until January 2010, the Society's CC&L portfolio was subject to a Statement of Investment Policy ("SIP") which prescribed an overall fixed income weighting of 75% relative to an equity weighting of 25%. During January 2010 the Society elected to alter this SIP whereby the fixed income weighting of the portfolio was increased to 100%. These monies do not represent direct holdings of securities in specific entities but rather investments in units of CC&L funds which themselves hold widely diversified positions and which are managed on a pooled basis generally with a view to limiting the overall volatility of a given fund.

To date the Society has generated cash to meet its expenditure requirements by liquidating funds from its various investments on a discretionary basis. During the 2008-2009 downturn in financial markets, the Society generally elected to avoid crystallizing losses by obtaining cash from the liquidation of the cash equivalent elements of its investment portfolio. However, there can be no assurance that such losses will be avoided in the future as the Society expects to ultimately be required to draw on all of its investment portfolio to fund its ongoing operations.

The Society currently has no externally-imposed capital requirements.

#### 7. Capital Assets

	Cost	Accumulated Amortization	Net Book Value at March 31,	
			2010	2009
Computer equipment	\$ 39,666	\$ 21,326	\$ 18,340	\$ 21,848
Furniture and office equipment	21,836	16,539	5,297	8,939
	\$ 61,502	\$ 37,865	\$ 23,637	\$ 30,787

#### 8. Contractual Obligations

As at March 31, 2010, the Society has a base rental commitment relating to the lease of its office premises, inclusive of monthly charges in respect to operating and common area costs and property taxes, totalling approximately \$267,000 (2009 – \$378,000) to July 31, 2012. The Society also has a commitment relating to the lease of its photocopy equipment totalling \$2,156 (2009 – \$5,023) to February 5, 2011.

Pursuant to a contract of employment with its President and Chief Executive Officer, the Society would be committed, in the event that it terminates its employment of this individual without cause, to pay \$170,000 in termination benefits. In addition, the President and Chief Executive Officer may terminate employment with the Society at any time by providing three months written notice.







## Geoscience BC Society

# Notes

## to Financial Statements March 31, 2010 and 2009

(cont'd)

### 9. Related Party Transactions

These related party transactions were in the normal course of operations and are measured at fair value as determined by management.

During the year ended March 31, 2010, the Society paid or accrued an aggregate of \$41,285 (2009 – \$24,280) to entities controlled by Directors of the Society for community engagement, communications and administrative services.

### 10. Subsequent Events

During the period subsequent to March 31, 2010:

- The Board of Directors of the Society approved an additional \$1,207,932 in program funding, of which \$450,000 of this additional approved funding is subject to the receipt of \$705,000 in contributions from unrelated third party participants.
- The Society approved and disbursed 9 scholarships of \$5,000 each.

### 11. Future Changes In Accounting Policies

Recent CICA accounting pronouncements that have been issued but are not yet effective, and have a potential implication for the Society are as follows:

#### Financial statements concepts

CICA Handbook Section 1000, Financial Statement Concepts, which describes the concepts underlying the development and use of accounting principles in general purpose financial statements, has been amended to focus on the capitalization of expenditures that truly meet the definition of an asset and de-emphasize the matching principle. The revised requirements are effective for annual and interim financial statements relating to the Society's fiscal year beginning April 1, 2010.

#### Financial statement presentation by not for profit organizations

CICA Handbook Section 4400, Financial Statement Presentation by Not For Profit Organizations, has been amended with respect to the treatment of net assets invested in capital assets and for the disclosure of revenues and expenditures related to capital assets. The new standard is effective for interim and annual financial statements relating to the Society's fiscal year beginning April 1, 2010.

#### Disclosure of allocated expenditures by not for profit organizations

The CICA has amended Handbook Section 4470 which establishes disclosure standards for Not For Profit Organizations that choose to classify their expenditures by function and allocate expenditures from one function to another. The changes are effective for interim and annual financial statements of the Society's fiscal year beginning April 1, 2010.

The Society is currently evaluating the impact of the adoption of these changes on the disclosure and presentation within its financial statements.





*Geoscience BC is an industry-led, industry-focused not for profit society that works to attract mineral and oil and gas investment to British Columbia through collection and marketing of geoscience data.*





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