

British Columbia Geological Survey Activities in 2008

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INTRODUCTION

This report is an overview of the operations of the British Columbia Geological Survey (BCGS) in 2008, prepared by the Chief Geologist and management team. The BCGS is committed to supporting a thriving, safe and responsible mining industry for the benefit of all British Columbians. We accomplish this by providing globally competitive geoscience expertise and data to attract mineral industry investment, advice to government on land-use decisions and geoscience information to the public.

The BCGS had another active year with 11 separate crews in the field; ongoing progress in delivering geoscience data to industry, government and other clients; and significant collaboration and interaction with other agencies. We completed aggregate and geoscience database projects with the Resource Development and Geoscience Branch, Ministry of Energy, Mines and Petroleum Resources (MEMPR). Many of our programs involve co-operative partnerships with universities, other government agencies, First Nations, local communities and industry.

Geoscience BC, a key partner of the BCGS, has become an increasingly active organization that is generating abundant new geophysical, geochemical and other geoscience data. Specific projects involving both Geoscience BC and the BCGS in partnership during 2008 are till sample reanalysis near Babine Lake, regional geochemical sample reanalysis in the Terrace area and uploading all Geoscience BC data on MapPlace.

The BCGS continued its long collaboration with the Geological Survey of Canada (GSC) in a number of field programs, including technical assistance to the Targeted Geoscience Initiative in southern and central B.C. The BCGS also continued its active support of the National Geological Surveys Committee and the Committee of Provincial Geologists.

2008 GEOLOGICAL FIELDWORK VOLUME

The locations of field projects in the province are shown in Figure 1. In addition to the continuing multiyear projects, new projects initiated in 2008 include surficial mapping in the Chilcotin region (Ferbey et al., 2009)¹ bedrock mapping near Princeton (Massey et al., 2009) and studies related to geochemistry (Lett and Doyle, 2009; Patterson et al., 2009) and industrial minerals (Simandl and Paradis, 2009).

The BCGS continues to address the impact of the mountain pine beetle infestation in the central interior of the province by expanding its 2006–2008 map coverage in this region. Despite its untested mineral potential, B.C.'s central interior has been underexplored in part due to widespread glacial deposits and young volcanic cover rocks blanketing the area. Our objective is to help diversify local economies by attracting mineral exploration activity, which can lead to potential new mines. In other parts of the province, both mineral exploration and mining are essential drivers of local employment and tax revenue, and directly support the development of regional infrastructure.

MAPPLACE AND DATABASE ACTIVITIES

MapPlace

MapPlace, our internet portal and one of the most effective geoscience online map systems globally, continues to improve with the addition of new data layers and improved interface tools. Data themes and applications available on MapPlace include mineral potential, bedrock and surficial geology, publications, mineral and petroleum tenure, MINFILE, assessment reports, geochemical and geophysical surveys, among others.

New maps and data layers on MapPlace include Nechako NATMAP Project digital geoscience information for central B.C. in the following NTS map areas: Manson River (093N), Fort Fraser (093K), Nechako River (093F), Prince George (093G/W), Smithers (093L/09, 16) and Hazelton (093M/01, 02, 07, 08). The data are from the GSC (Open File 5623), the BCGS (Open File 2007-10), universities and industry. The thematic MapPlace map related to this project can be found at <http://www.empr.gov.bc.ca/Mining/Geoscience/MapPlace/thematicmaps/Pages/nechakoNATMAP.aspx>; and

a Terrace geology and metallogeny compilation map, released as GeoFile 2008-11, which includes ESRI shape files, original Manifold map files and KML files for display in Google Earth. The interactive map for

¹ All reference citations are to other papers in this volume.

This publication is also available, free of charge, as colour digital files in Adobe Acrobat® PDF format from the BC Ministry of Energy, Mines and Petroleum Resources website at <http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/Fieldwork/Pages/default.aspx>.

GeoFile 2008-11 can be found at <http://www.empr.gov.bc.ca/Mining/Geoscience/MapPlace/hematicmaps/Pages/Terrace.aspx>.

Geoscience BC data added to MapPlace in 2008 include

- QUEST and QUEST-West airborne gravity data;
- a reanalysis of 2253 stream sediment pulps from a 1978 BCGS survey of the Terrace and Prince Rupert map areas (NTS 103I and part of 103J);
- stream sediment and water geochemical data for 906 samples from the Pine Pass map area (NTS 093O);
- infill lake sediment and water survey data from more than 1800 sites in NTS map areas 093G, J, N and O, and part of 093K;
- a reanalysis of 3976 stream sediment pulps from NTS map areas 093A, B, G, H, N and K;
- rock property data for 11 582 sites, displaying magnetic susceptibility, density and electrical conductivity measurements; and
- SpecTIR hyperspectral imagery and new tools for the Image Analysis Toolbox, which can be found at <http://www.empr.gov.bc.ca/Mining/Geoscience/MapPlace/MainMaps/Exploration/Pages/IAT.aspx>.

Databases

In 2007 and 2008, considerable progress was made in populating the Property File database, which includes doc-

uments donated to the MEMPR by individuals and companies that span more than 150 years. There are about 100 000 documents available in hard copy and many of these are the only copy in existence. Approximately 25 000 of these have now been indexed and scanned. Documents currently available on the Property File search application (<http://propertyfile.gov.bc.ca>) include 400 items from the Falconbridge collection, 1800 from the Library collection and 3000 mine plans.

Users can now access 100% of company mineral assessment reports using the Assessment Report Indexing System (ARIS) database over the web. The number of off-confidentiality assessment reports for 2008 was 796.

Mineral Resource Evaluations

The Integrated Land Management Bureau of the Ministry of Agriculture and Lands asked the BCGS to undertake a Level 2 Mineral Resource Assessment of the Atlin-Taku land-use planning area in 2008. This area encompasses approximately 4 million hectares in northwest B.C. The resource assessment was carried out by experts in September 2008 (Figure 2) and final results were presented at a land-use planning workshop held in Atlin in November 2008.

Over the past year, BCGS staff provided assessments of the mineral resource potential of different areas of B.C. for the Ministry of Aboriginal Relations and Reconciliation to assist with treaty negotiations.

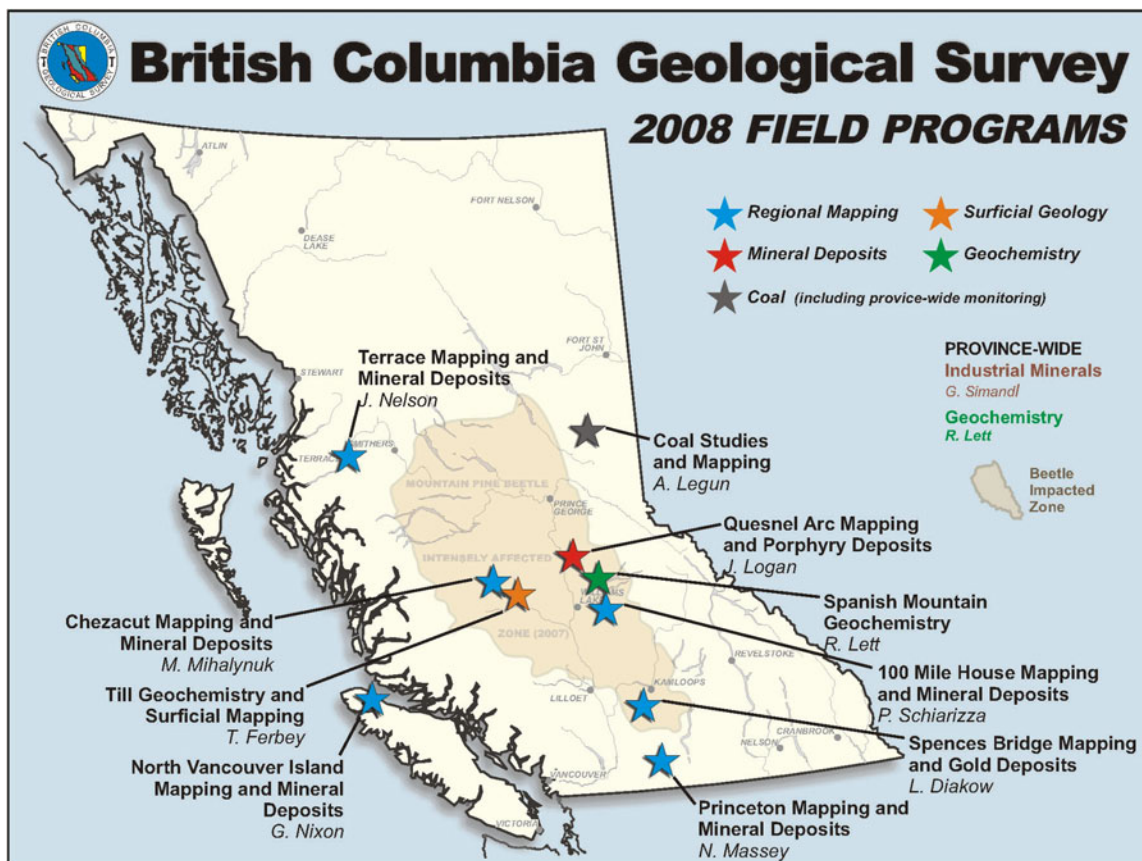


Figure 1. British Columbia Geological Survey 2008 field program areas.

TECHNICAL MARKETING AND THE BC MINERAL DEVELOPMENT OFFICE

The staff of the BCGS played active roles as presenters and organizers at conferences and events showcasing B.C.'s mineral potential. This included presentations, posters and booths at the Mineral Exploration Roundup, the Kamloops Exploration Group Conference, and the Minerals North and Minerals South conferences. The BCGS staff played key technical and organizational roles for the Ministry-led Asia trade mission in November. The BCGS staff also contributed to the organizing and presentations at a mountain pine beetle Geoscience Workshop in Kamloops and a till prospecting workshop in Smithers (Figure 3). A field trip across northern Vancouver Island was organized as part of the 2008 Goldschmidt Geochemistry Conference in Vancouver.

The role of the BC Mineral Development Office (MDO) in Vancouver is to promote investment in the province's mineral exploration and mining, both domestically and internationally. This includes delivering a multifaceted technical campaign to highlight the province's superior mineral potential and user-friendly geoscience databases. The MDO interacts with decision-makers in industry, including executive management, geologists and prospectors, and forms part of the wider marketing efforts of the MEMPR. The MDO also hosts incoming national and international companies and government representatives and provides leadership in government-mineral-industry trade missions.

PUBLICATIONS

Over the past year, the BCGS published *Geological Fieldwork 2007*, 10 Open File maps and reports, 1 Geoscience Map, 13 GeoFile maps, reports and data files and 2 Information Circulars. Staff also published articles in external journals. The BCGS processed more than 600 assessment reports for tenure maintenance.

With the Regional Geologists as principal authors, the BCGS published *Exploration and Mining in British Columbia 2007* and *British Columbia Mines and Mineral Exploration Overview 2007* and co-ordinated articles on provincial industry activities in the Canadian Institute of Mining, the Mineral Exploration Review and The Northern Miner.

All geoscience publications are available online at the BCGS website: <http://www.empr.gov.bc.ca/Mining/Geoscience>.

STAFF UPDATE

In 2008, three professional staff with long careers at the BCGS left to pursue other opportunities. Dani Alldrick retired after more than 24 years as a regional mapper and mineral deposits senior geologist. The Director of Geoscience Initiatives, Brian Grant, became President of Goldbrook Ventures Inc. The Director of Resource Information, Gib McArthur, retired after making numerous contributions to the provincial geoscience database and related tools.

New staff members hired for the BCGS in late 2007 and in 2008 are



Figure 2: Experts discussing the mineral resource potential of a tract in the Atlin-Taku land-use planning area.

Tania Demchuk, who is taking on the new position of Manager, Geoscience Marketing and Partnerships; Philippe Erdmer, who joined us as interim Director, Geoscience Initiatives Section; Travis Ferbey, who joined us as Quaternary Geologist; Jay Fredericks, who is the new Director, BC Mineral Development Office in Vancouver; and Tasneem Pirani, who works as Finance and Management Administrative Assistant.

Staff promotions were

Larry Jones, who is now Director, Resource Information; and

Kirk Hancock, who became MapPlace Resource Geoscientist.

GEOSCIENCE ASSISTANT PROGRAM

The MEMPR has partnered with universities and colleges since the 1940s to educate and inspire geoscience students and recent graduates. With its 23 permanent staff as professional mentors, the BCGS hired a total of 61 students and recent graduates over the past two years (Figure 4). These professionals in training have allowed us to deliver a



Figure 3. Field trip stop for the Smithers till prospecting workshop led by BCGS and GSC staff.

considerably enhanced geoscience program. The MEMPR geologists play a key role in helping the students develop awareness of their profession, workplace and expected standard of excellence.

As in past years, some students use geoscience data collected during fieldwork to complete a bachelor's or master's thesis. This maintains the ongoing partnership among BCGS staff, students and university researchers, which positively impacts the training and mentorship experience for the students.

The MEMPR offers one of the best career-oriented student employment programs in the province in any field. It incorporates a full circle of learning in which leading geoscientists share their passion, dedication and commitment with junior colleagues in the service of British Columbians. Previous generations of government geologists similarly helped today's mentors train for their own careers.

MOVING FORWARD: HIGHLIGHTS

The BCGS will continue field and database projects in the coming year, including an emphasis on progressing with Property File and continuing to support MEMPR's Asia-Pacific initiative. New projects are being started with partner organizations to collect and distribute geoscience information about the province, including the EDGES project and an updated geology map for the Beetle-Impacted Zone in central B.C. between Williams Lake and Mackenzie.

Property File

The Property File documents and database will be a priority for the BCGS Resource Information Section for the next several years, with all documents planned to be indexed, scanned and posted to the Internet. The documents will be linked to MINFILE through the MINFILE bibliography. The MEMPR library holdings will be included, as well as the following collections (year acquired, number of items where known are shown in parentheses): Starr (1999, 159), Placer Dome (1999, 1433), Prospector's Pit (1994–2001, 406), Chevron (2001, 1107), Cyprus-Anvil (2004, 1100), Sherwin Kelly (2004), Rimfire (2006, 2500),



Figure 4. Geoscience assistant, April Barrios, from field crews working in the Beetle-Impacted Zone (BIZ) near Merritt.

Samatosum mine (2008, 400), Eskay Creek mine (2008, 520) and J. Cam Stephen (2008, 50 uncatalogued office boxes). When completed, this project will place approximately 100 000 documents online for free access by users such as prospectors, exploration geologists, researchers, geoscientists and others.

Marketing Coal and Minerals to the Asia-Pacific Region

The MEMPR implemented an active Asia-Pacific marketing strategy to attract direct investment from Asian investors to exploration and mining projects in B.C. Key selling points are B.C.'s rich geology, expert geoscience information, user-friendly online databases, continuing demand for commodities such as copper and coal, a Pacific Rim gateway, modern infrastructure and a skilled workforce. The BCGS provides the MEMPR with most of the technical expertise and professional delegates for international presentations and meetings with Asian companies. It is the point of contact for incoming international investors through the BC Mineral Development Office in Vancouver.

Asian countries are leading consumers of the province's coal and metal ores and have a record of investment in B.C.'s mineral industry. The BCGS is a continuing part of the MEMPR Asia-Pacific initiative. Against the backdrop of current global financial volatility, countries such as the People's Republic of China, Korea and Japan are more important than ever as business partners.

EDGES: Modelling the Evolution of the Northern Cordillera Resource Environment from the Edges of Exotic Terranes

The Geoscience for Energy and Minerals (GEM) EDGES project is a highly focused, multiyear geological mapping initiative involving formal collaboration at the working level between the Government of Canada, the Province of British Columbia, the Yukon Territory, Geoscience BC, the United States Geological Survey and the Alaska Department Geological and Geophysical Surveys. It began field operations in 2008 in the Yukon, it will last until 2013, and it is partially funded by the federal GEM program. Support is being contributed by all participating agencies.

The goal is to improve the effectiveness of resource exploration and discovery in the northern Cordillera by outlining resource-rich environments in B.C., the Yukon and Alaska. The geological targets are the exotic outer terranes with their enclosed preaccretionary syngenetic and epigenetic deposits and the metal-rich Triassic through Paleogene magmatic arcs and associated accretion zones that resulted from interaction of the terranes with the western margin of ancient North America.

The target areas include parts of northern and central B.C. where the geological map base is either several decades out of date or at a large scale that is insufficient to evaluate mineral potential using modern tectonic interpretations. The BCGS will start its field programs in conjunction with the GSC and Geoscience BC in 2009.

Beetle-Impacted Zone BC GeoMap Update

Geologists from the BCGS (Jim Logan, Mitch Mihalynuk, JoAnne Nelson and Paul Schiarizza) and Fil Ferri (Resource Development and Geoscience Branch of MEMPR) will update the provincial digital geological map coverage at 1:100 000 scale for the Quesnel Trough area in 2009. They will collaborate with the Geological Survey of Canada (Bert Struik and others) to integrate all bedrock mapping and geophysical and geochemical data to interpret bedrock geology in areas with significant glacial overburden.

The Quesnel Trough has been heavily impacted by the mountain pine beetle infestation and is part of the Beetle-Impacted Zone (BIZ) that has been targeted by the BCGS with field programs for the last three years. The province's digital geology map (BC GeoMap) is used by numerous industry and government clients.

Geoscience BC is an active partner on this project. Their new databases for the QUEST project will play a key role in updating the BC GeoMap, as will their staff and contractors.

NEED MORE INFORMATION? WANT TO COMMENT?

The BCGS staff has considerable expertise and welcome the chance to share it. Our contact list is online at: <http://www.empr.gov.bc.ca/Mining/Geoscience/Staff/Pages/default.aspx>.

We always appreciate your input regarding our many programs and activities. Please email us at Geological.Survey@gov.bc.ca or call us at (250) 952-0429.

