BC Regional Geochemical Survey: New Analytical Data & Sample Archive Upgrades

Geoscience BC Roundup 2011

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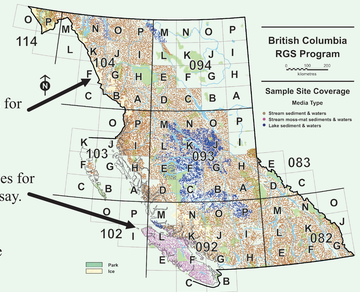
BC RGS PROGRAM

Government-funded reconnaissance-scale regional geochemical surveys have been conducted in British Columbia since 1976. Currently, more than 62,700 drainage sediment and water samples have been collected and sample sites cover approximately 77% of BC at an average density of one sample for every 12 km^2 (Figure 1). Compiled results from these surveys have provided a comprehensive multi-element geochemical database that delineates regional geochemical patterns and provides baseline information that is being used to guide and support mineral exploration activities. Efforts to maximize the utility of the regional geochemical database are ongoing and include both new sampling and enhancements to available analytical information.

In 2010, Geoscience BC supported the following database upgrade projects:

- Reanalysis of 7,651 northern BC drainage sediment samples for 53 elements by aqua-regia ICP-MS.
- Reanalysis of 3,020 Vancouver Island moss sediment samples for 51 elements by aqua-regia ICP-MS plus Pt and Pd by fire assay.
- Sample archive storage upgrades and amalgamation with the NGR collection in Ottawa.

Figure 1. BC RGS program coverage.



Sample Archive Upgrade

Drainage sediment material collected during RGS programs are saved and stored at facilities in Ottawa and Victoria. The value of this collection is estimated at more than $10 million and access to the material has supported valuable reanalysis initiatives. Unfortunately as the collection ages, it has become fractured and existing storage containers have weakened (Figure 2). In an effort to revitalize the storage situation, a co-operative effort between NRCan, the BCGS and Geoscience BC has been initiated.

The goal of the Archive Upgrade Project is to repackage the samples to current storage standards and amalgamate all BC samples with the main collection in Ottawa as part of the NRCan's Earth Material Collection (Figure 3). To date, approximately 20,000 samples that were stored in Victoria have been repackaged and delivered to the archive facility in Ottawa and the remaining samples will be transferred in 2011.

Figure 2. Original storage of BC RGS samples.

Figure 3. New storage of BC RGS samples.

Northern BC Reanalysis

>>> RESULTS AVAILABLE ROUNDUP 2011 <<<

Geoscience BC Report 2011-02

The Northern BC Reanalysis Project is a continuation of a series of large-scale ICP-MS reanalysis initiatives that have been sponsored by Geoscience BC since 2007 (Figure 4). These programs have significantly enhanced the BC geochemical database by providing a wide range of new analytical information at improved detection levels.

- New 53-element ICP-MS data for 7,651 drainage sediment samples.
- Results include base and precious metals, pathfinder elements and REEs.
- Survey areas include Stewart, Toodoggone and Cassiar mining camps.

Figure 4. ICP-MS reanalysis projects.

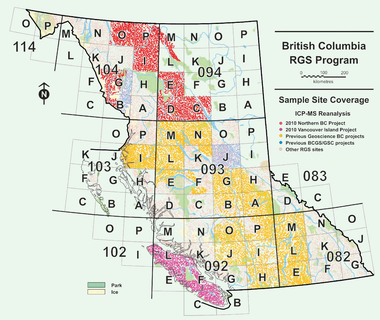


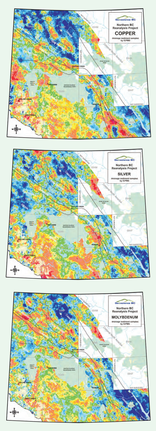
Figure 5. Northern BC surveys included in reanalysis project.

Map	Name	Type	Samples	Original Analytes	INAA	ICPMS
094C	Mesilinka River	stream	1188	1998: AAS2 plus INAA	1998	2011
094D	McConnell Creek	stream	1150	1997: AAS2 plus INAA	1997	2011
094E	Toodoggone River	stream	1071	1997: AAS2 plus INAA	1997	2011
104B	Iskut River	stream	235	1987: AAS3	none	2011
104F	Sundum	stream	168	1987: AAS3	none	2011
104G	Telegraph Creek	stream	719	1987: AAS3	none	2011
104I	Cry Lake	stream	1136	1996: AAS2 plus INAA	1996	2011
104O	Jennings River	stream/lake	999	1979: AAS1	2000	2011
104P	McDame	stream	944	1979: AAS1	2000	2011
104P/094M	Kechika Trough	lake	531	1996: AAS2 plus INAA	1996	2011
094L	Gataga Mountain	stream	205	1995: AAS2 plus INAA	1995	2011

AAS1: Ag, Cu, Co, Fe, Mn, Mo, Ni, Pb, U, W, Zn AAS2: Ag, As, Bi, Cd, Co, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Sb, V, Zn
AAS3: Ag, As, Ba, Cd, Co, Cu, Fe, Hg, Mn, Mo, Ni, Pb, Sb, Sn, U, V, W, Zn plus As by fire assay
INAA: As, Sb, As, Ba, Br, Ce, Co, Cr, Cs, Hf, Fe, La, Lu, Mo, Ni, Rb, Sm, Sc, Na, Ta, Th, Ti, W, U, Yb, Zr

Figure 6. ICP-MS suite of elements.

Element		Detection Levels	Units	Element		Detection Levels	Units	Element		Detection Levels	Units
Gold	Au	0.2 to 10000	ppb	Manganese	Mn	1 to 10000	ppm	Zinc	Zn	0.1 to 10000	ppm
Silver	Ag	2 to 10000	ppb	Molybdenum	Mo	0.01 to 2000	ppm				
Aluminum	Al	0.01 to 10	%	Sodium	Na	0.001 to 5	%	Beryllium	Be	0.1 to 1000	ppm
Arsenic	As	0.1 to 10000	ppm	Nickel	Ni	0.1 to 10000	ppm	Cerium	Ce	0.1 to 2000	ppm
Boron	B	20 to 2000	ppm	Phosphorus	P	0.001 to 5	%	Cesium	Cs	0.02 to 2000	ppm
Barium	Ba	0.5 to 10000	ppm	Lead	Pb	0.01 to 10000	ppm	Germanium	Ge	0.1 to 100	ppm
Bismuth	Bi	0.02 to 2000	ppm	Sulphur	S	0.02 to 5	%	Hafnium	Hf	0.02 to 1000	ppm
Calcium	Ca	0.01 to 40	%	Antimony	Sb	0.02 to 2000	ppm	Indium	In	0.02 to 1000	ppm
Cadmium	Cd	0.01 to 2000	ppm	Scandium	Sc	0.1 to 100	ppm	Lithium	Li	0.1 to 2000	ppm
Cobalt	Co	0.1 to 2000	ppm	Selenium	Se	0.1 to 100	ppm	Niobium	Nb	0.02 to 2000	ppm
Chromium	Cr	0.5 to 10000	ppm	Strontium	Sr	0.5 to 10000	ppm	Rubidium	Rb	0.1 to 2000	ppm
Copper	Cu	0.01 to 10000	ppm	Tellurium	Te	0.02 to 1000	ppm	Rhenium	Re	1 to 1000	ppb
Iron	Fe	0.01 to 40	%	Thorium	Th	0.1 to 2000	ppm	Tin	Sn	0.1 to 100	ppm
Gallium	Ga	0.1 to 100	ppm	Titanium	Ti	0.001 to 5	%	Tantalum	Ta	0.05 to 2000	ppm
Mercury	Hg	5 to 50000	ppb	Thallium	Tl	0.02 to 1000	ppm	Yttrium	Y	0.01 to 2000	ppm
Potassium	K	0.01 to 10	%	Uranium	U	0.005 to 2000	ppm	Zirconium	Zr	0.1 to 2000	ppm
Lanthanum	La	0.5 to 10000	ppm	Vanadium	V	2 to 10000	ppm	Platinum	Pt	2 to 100000	ppb
Magnesium	Mg	0.01 to 30	%	Tungsten	W	0.05 to 100	ppm	Palladium	Pd	10 to 200000	ppb



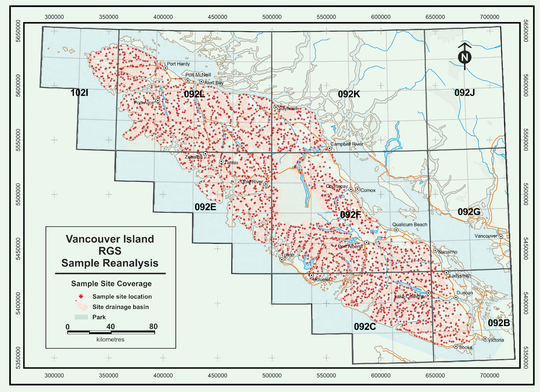
Vancouver Island Reanalysis

>>> SURVEY RESULTS AVAILABLE SPRING 2011 <<<

Regional geochemical surveys were originally conducted on Vancouver Island and the adjacent mainland in 1988 and 1989. The Vancouver Island portion of these surveys included the collection of 3138 moss-mat sediment samples (Figure 7) and covered an area of 31,000 km^2. The original sediment analytical package included Zn, Cu, Pb, Ni, Co, Ag, Mn, Fe, Mo, U, W, Sn, Hg, As, Sb, Cd, V, Bi and Cr by aqua-regia AAS and Au by fire assay.

This relatively limited database combined with the region's active mining and exploration history suggested that an enhanced analytical database would assist in the targeting of massive sulphide, porphyry, quartz vein and skarn deposits as well as ultramafic bodies that may host PGE sulphides. In 2010 Geoscience BC funded the following:

- Reanalysis of 3,020 moss-mat sediment samples for ***51 elements*** by aqua-regia digestion (0.5 g) ICP-MS/ICP-AES.
- Reanalysis of 3,020 moss-mat sediment samples for ***Pt and Pd*** by a lead fire assay (30 g) with ICP-MS finish.



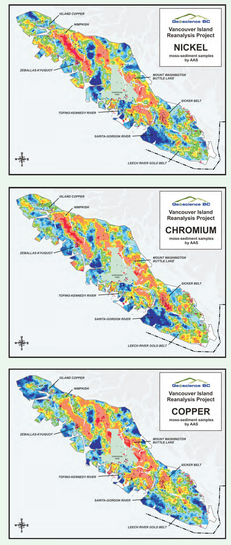
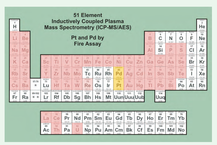


Figure 7. Moss-mat sediment sample.



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