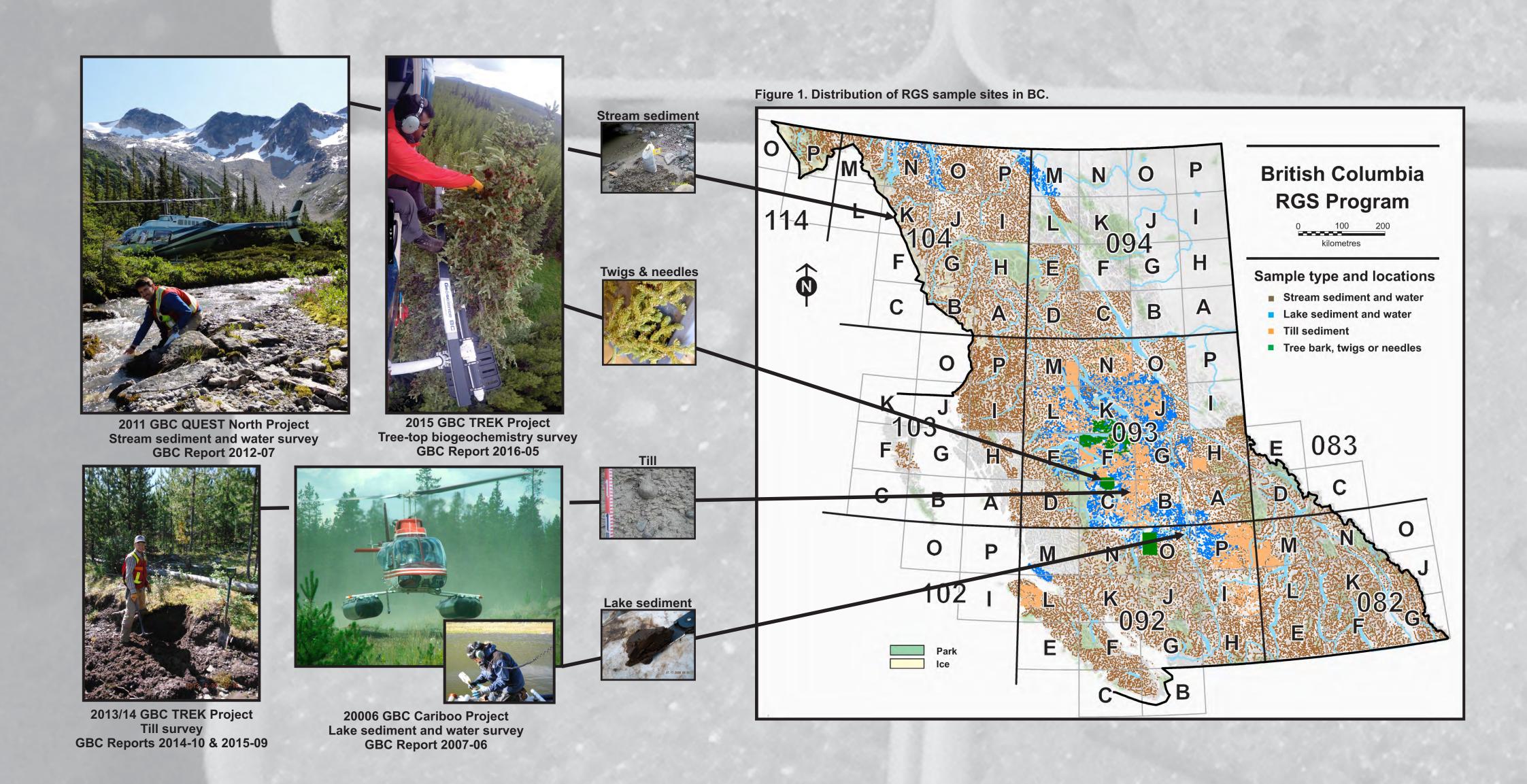
REGIONAL GEOCHEMICAL SURVEYS

Reconnaissance-scale regional geochemical surveys (RGS) are designed to produce high-quality information that can be used to guide mineral exploration activities.

More than 100 reconnaissance-scale regional geochemical surveys have been conducted in BC since 1976. These projects included the collection of stream and lake sediments, stream and lake water, till and biogeochemical material.

Results of the RGS program have been compiled into publicly available digital databases that provide site descriptions, details on sample constituents plus analytical determinations for a range of trace metals.

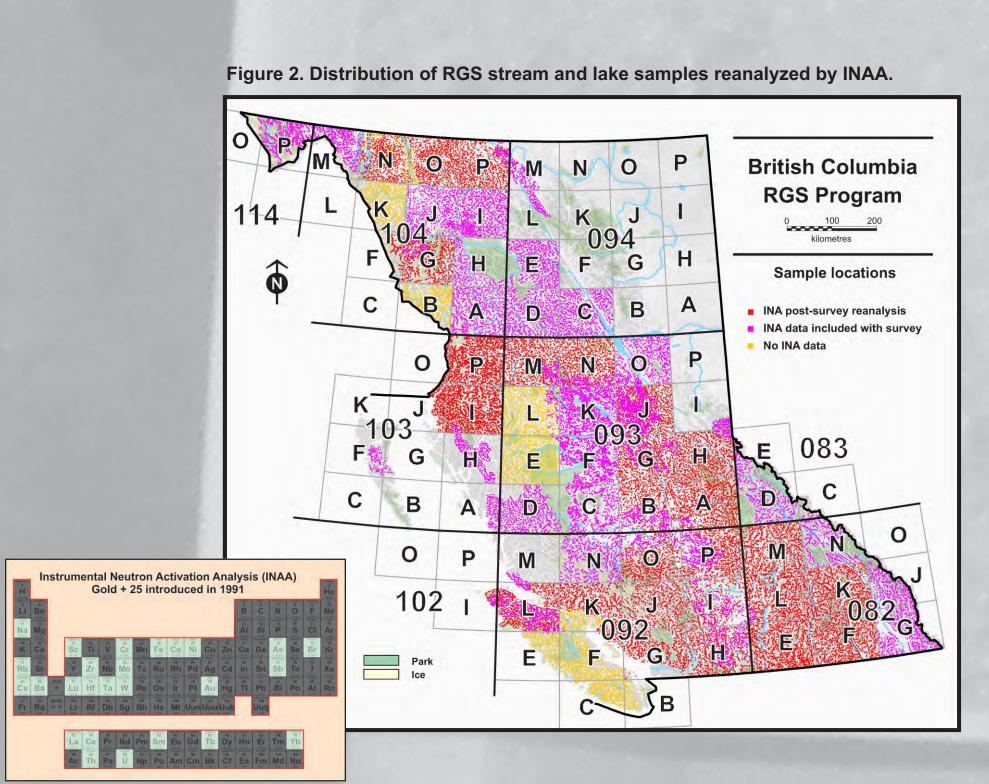
Figure 1 shows the provincial distribution of the more than 76,000 samples that have been collected to date. The surveys cover close to 75% of the province at sample-site densities that average from one site per 5 km2 to one site per 14 km2.

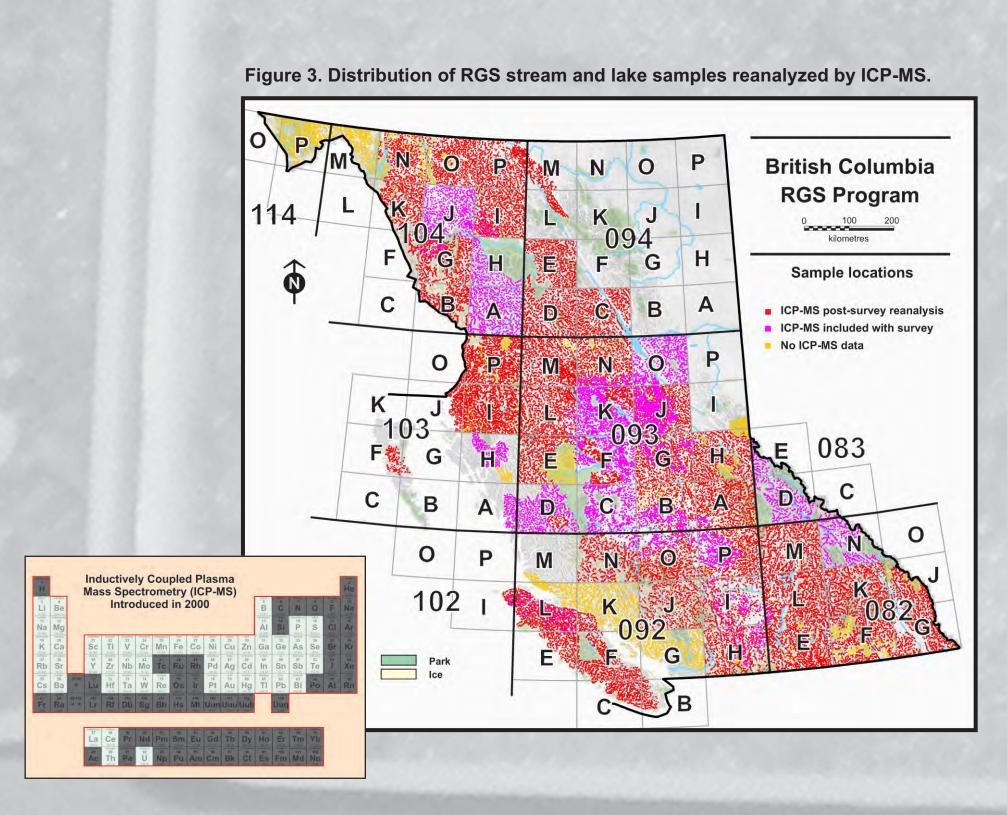


RGS SAMPLE REANALYSIS

Opportunely, the original survey design included archiving representative splits of all samples collected. Having access to these materials saved from previous RGS field programs has contributed to the long-term viability and utility of the database.

To date, thousands of archived samples have been successfully reanalyzed using modern analytical techniques (Figure 2 and 3) such as instrumental neutron activation analysis (INAA) and by inductively coupled plasma-mass spectrometry (ICP-MS). The methods are cost effective and provide significant upgrades to original analytical data reports (McCurdy et al., 2015). They provide lower detection levels for base and precious metals as well as pathfinder and rare-earth elements. They also generate improved data continuity between surveys completed at different times and samples analyzed by different commercial laboratories.



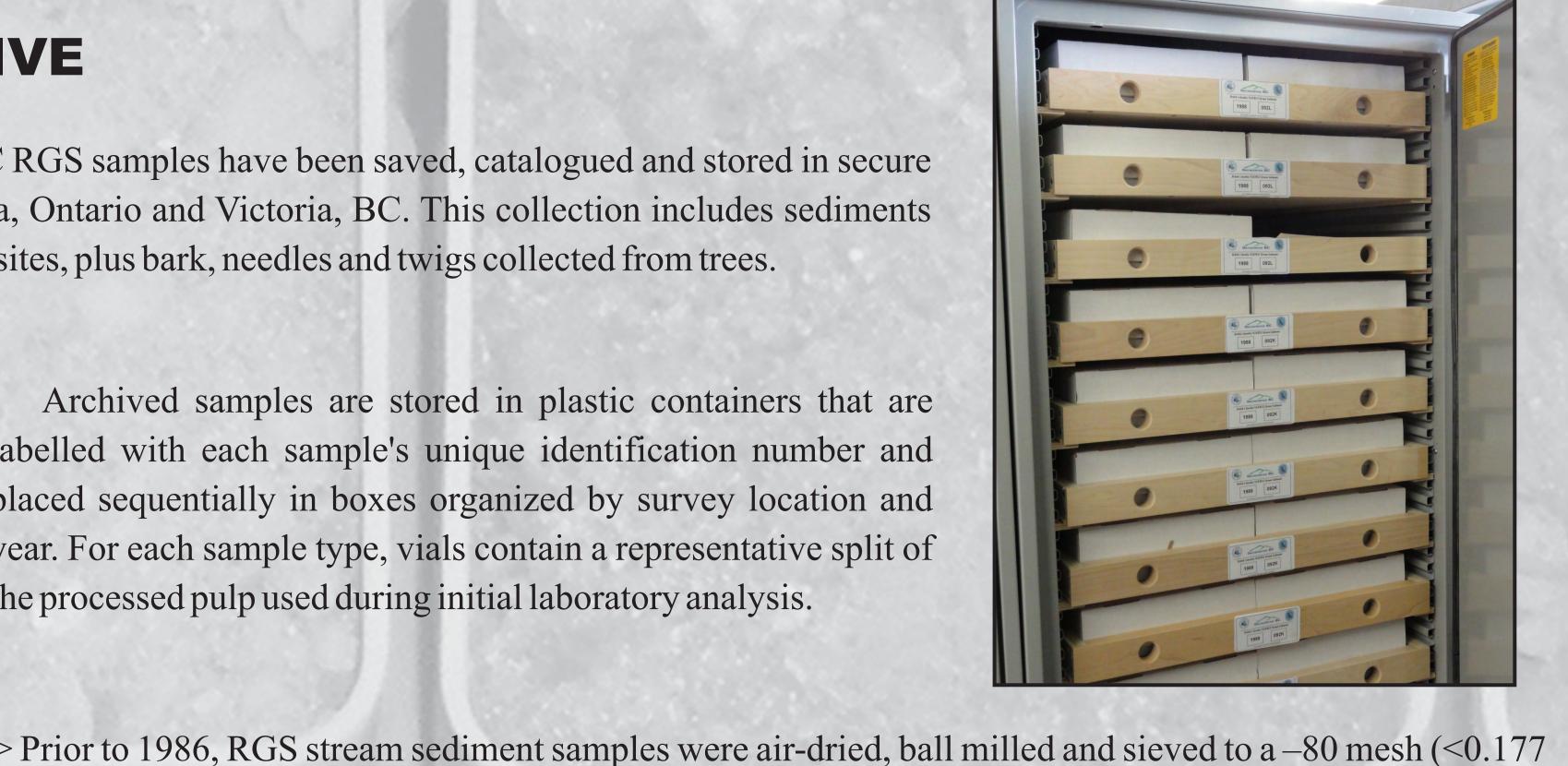


RGS SAMPLE ARCHIVE

Material from more than 76,000 BC RGS samples have been saved, catalogued and stored in secure government facilities located in Ottawa, Ontario and Victoria, BC. This collection includes sediments acquired from stream, lake and till field sites, plus bark, needles and twigs collected from trees.

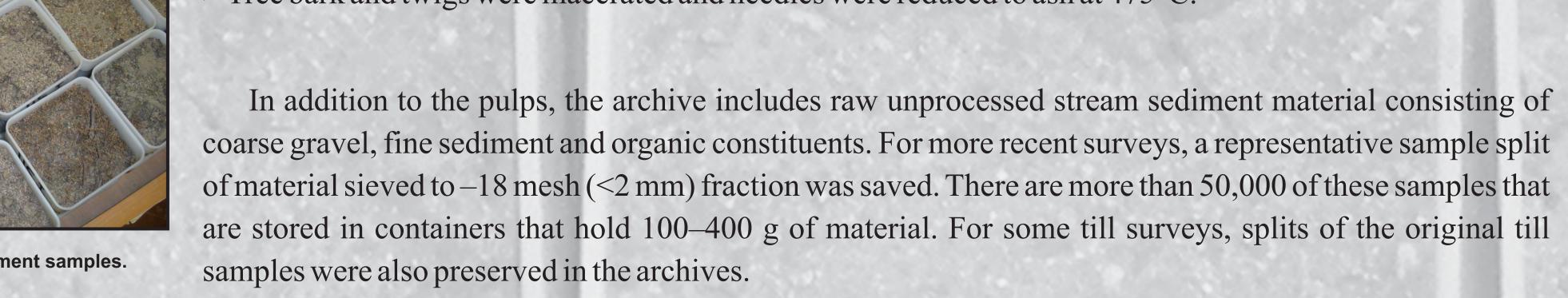


Archived samples are stored in plastic containers that are labelled with each sample's unique identification number and placed sequentially in boxes organized by survey location and year. For each sample type, vials contain a representative split of the processed pulp used during initial laboratory analysis.



- sieved through an -80 mesh screen (<0.177 mm)
- mm) fraction, after 1986 the samples were air-dried and sieved through an -80 mesh screen (<0.177 mm). > Lake sediment samples were air-dried and then crushed using a ceramic puck mill and sieved through an
 - -80 mesh screen (<0.177 mm). Till-sample pulps were air-dried, crushed and sieved to produce splits of the silt plus clay-sized (<0.063
 - Tree bark and twigs were macerated and needles were reduced to ash at 475°C.

mm) fraction and in some cases a clay-sized fraction (<0.002 mm).

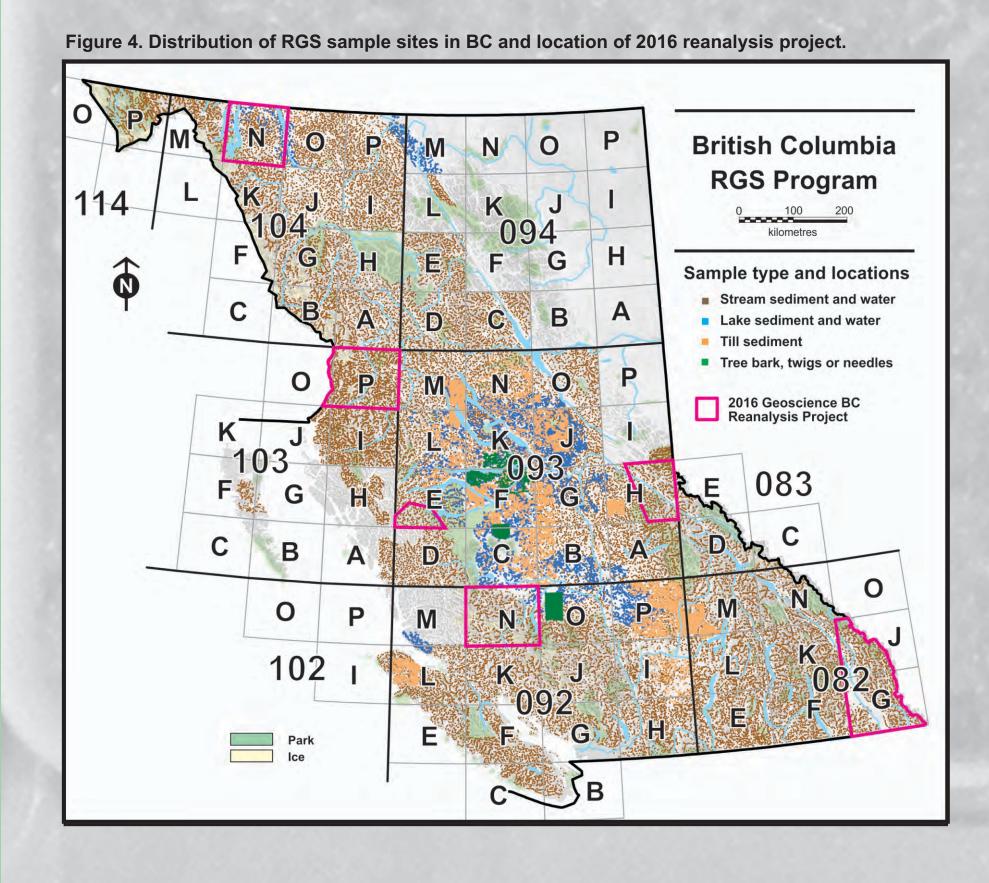


2016 SAMPLE REANALYSIS PROJECT - ROUNDUP 2017 DATA RELEASE

Geoscience BC Report 2017-04 presents results of a Geoscience BC-funded reanalysis project that was conducted in 2016. The samples equired for reanalysis originated from surveys conducted in NTS map areas 082G, 082J, 092N, 093E, 093H, 103O, 103P and 104N (Figure 4; Tables 1 and 2).

Original sample pulps that were air-dried and sieved through an -80 mesh screen (<0.177 mm) are maintained in storage facilities in Ottawa, Ont. Permission to access and recover a portion of the saved material was provided by Natural Resources Canada (NRCan). A total of 5547 pulps were successfully acquired for this reanalysis project.

The sample splits plus inserted quality-control reference materials were delivered to Bureau Veritas Minerals (Vancouver, BC), where they were analyzed for 56 minor and trace elements by ICP-MS following aqua regia digestion (Figure 3).

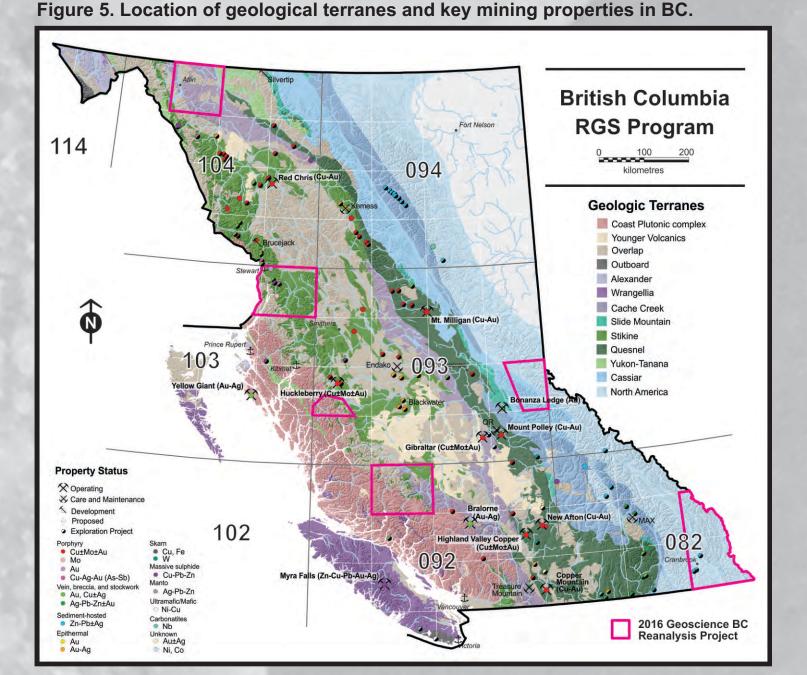


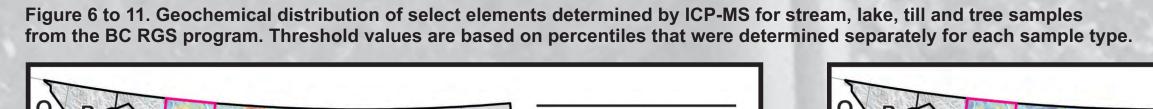
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5 - 03								AQ25	0 - Oltratrace by ICF	iviass opec.			
rvey Name	NTS M ap Sheet	Collection Year	Total Samples	2016 ICP-MS Pulps	Previous ICP-MS	Samples in Park	Missing Samples	EL	AQ250 MENT DETECTION	UPPER LIMIT	ELEMENT	AQ250 DETECTION	
Fernie	082G	1990	978	963	0	13	2	Ag	2 ppb	100000 ppb	Sc	0.1 ppm	
anaskis Lakes	082J	1990	623	515	0	106	2	Al	0.01 %	10 %	Se	0.1 ppm	
					0			As	0.1 ppm	10000 ppm	Sr	0.5 ppm	2
Waddington	092N	1991	868	683		155	30	Au	0.2 ppb	100 ppm	Te	0.02 ppm	1
hitesail Lake	093E	1986	951	224	436	288	3	B'	20 ppm	2000 ppm	Th	0.1 ppm	20
McBride	093H	1984\85	1185	643	357	179	6	Ba	0.5 ppm	10000 ppm	Ti	0.001 %	
kass River	103O/P	1978	1880	1692	0	112	76	Bi	0.02 ppm	2000 ppm	TI	0,02 ppm	1
Atlin	104N	1977	933	827	0	73	33	Ca	0.01 %	40 %	U	0.1 ppm	2
1100	500000				100000-27	AND LOCAL		Co	0.01 ppm	2000 ppm	V	2 ppm	10
								Co	0.1 ppm	2000 ppm	W	0.1 ppm	
								Cc Cr	0.1 ppm 0.5 ppm	2000 ppm 10000 ppm	W Zn	0.1 ppm 0.1 ppm	
									0.5 ppm		100	33.7.4.4.4	10
								Cr	0.5 ppm	10000 ppm	Zn	0.1 ppm	10
ble 2. Lis	t of strean	n sedime	ent regio	onal geoch	emical s	urveys taı	rgeted	Cr Cu	0.5 ppm 0.01 ppm	10000 ppm 10000 ppm	Zn Be	0.1 ppm 0.1 ppm	10 1
								Cr Cu Fe	0.5 ppm 0.01 ppm 0.01 %	10000 ppm 10000 ppm 40 %	Zn Be Ce Cs Ge	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm	10 1 2
	6 reanalys	s projec	t, year o	of data rele	ases and			Cr Cu Fe Ga Hg K	0.5 ppm 0.01 ppm 0.01 % 0.1 ppm	10000 ppm 10000 ppm 40 % 1000 ppm	Zn Be Ce Cs Ge Hf	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.02 ppm	100 1 2 2
	6 reanalys	s projec	t, year o		ases and			Cr Cu Fe Ga Hg K	0.5 ppm 0.01 ppm 0.01 % 0.1 ppm 5 ppb	10000 ppm 10000 ppm 40 % 1000 ppm 50000 ppb	Zn Be Ce Cs Ge Hf	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.02 ppm 0.02 ppm	100 1 2 2 1
	6 reanalys	s projec ata com	t, year o	of data rele r each surv	ases and			Cr Cu Fe Ga Hg K	0.5 ppm 0.01 ppm 0.01 % 0.1 ppm 5 ppb 0.01 % 0.5 ppm	10000 ppm 10000 ppm 40 % 1000 ppm 50000 ppb 10 %	Zn Be Ce Cs Ge Hf	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.02 ppm 0.02 ppm 0.02 ppm	100 1 2 2 1 1 1
n the 2010	Original Data	s projec ata com	t, year o	of data rele r each surv	eases and vey.			d Package W W W W W W	0.5 ppm 0.01 ppm 0.01 % 0.1 ppm 5 ppb 0.01 % 0.5 ppm 0.01 %	10000 ppm 10000 ppm 40 % 1000 ppm 50000 ppb 10 % 10000 ppm	Zn Be Ce Cs Ge Hf In Li Nb	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.02 ppm 0.02 ppm 0.02 ppm 0.1 ppm 0.02 ppm	100 1 2 2 2 1 1 1 2 2
n the 2010	Original Data Release	s projec ata com INAA Da Releas	t, year o piled for ta ICP- e Re	of data rele r each surv -MS Data elease	eases and vey.	d the sour		d Package W W W W W W	0.5 ppm 0.01 ppm 0.01 % 0.1 ppm 5 ppb 0.01 % 0.5 ppm 0.01 % 1 ppm	10000 ppm 10000 ppm 40 % 1000 ppm 50000 ppb 10 % 10000 ppm	Zn Be Ce Cs Ge Hf In Li Nb	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.02 ppm 0.02 ppm 0.1 ppm 0.1 ppm 0.1 ppm	100 1 2 2 1 1 1 2 2 2
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urvey Name Fernie anas kis Lakes . Waddington Thites ail Lake	Original Data Release 1991 1991 1992 1987	s project ata com INAA Da Releas 1991 1991 1992 N/A	piled for	of data rele reach surv -MS Data elease 2017 Rukhl 2017 Rukhl 2017 Rukhl 09/2017 Jacka	ov and Naziri, 2 ov and Naziri, 2 ov and Naziri, 2 ov and Naziri, 2 man, 2009; Ruk	data Sources 015 015 015 015 hlov and Naziri, 2	o15	Standard Package W W W SP La	0.5 ppm 0.01 ppm 0.01 % 0.1 ppm 5 ppb 0.01 % 0.5 ppm 0.01 % 1 ppm 0.01 ppm 0.01 ppm 0.001 % 0.1 ppm 0.001 % 0.1 ppm	10000 ppm 10000 ppm 40 % 1000 ppm 50000 ppb 10 % 10000 ppm 30 % 10000 ppm 2000 ppm 5 % 10000 ppm 5 % 10000 ppm	Extended Dackage Ce Cs Ge Hf In Li Pd Pd Re Sn Ta	0.1 ppm 0.1 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.02 ppm 0.02 ppm 0.02 ppm 0.1 ppm 0.02 ppm 0.1 ppm 0.1 ppm 0.01 ppb 10 ppb 2 ppb 0.1 ppm 1 ppb 0.1 ppm 1 ppb 0.1 ppm	100 11 22 22 11 11 22 1000 1000 2 100 2 2 2

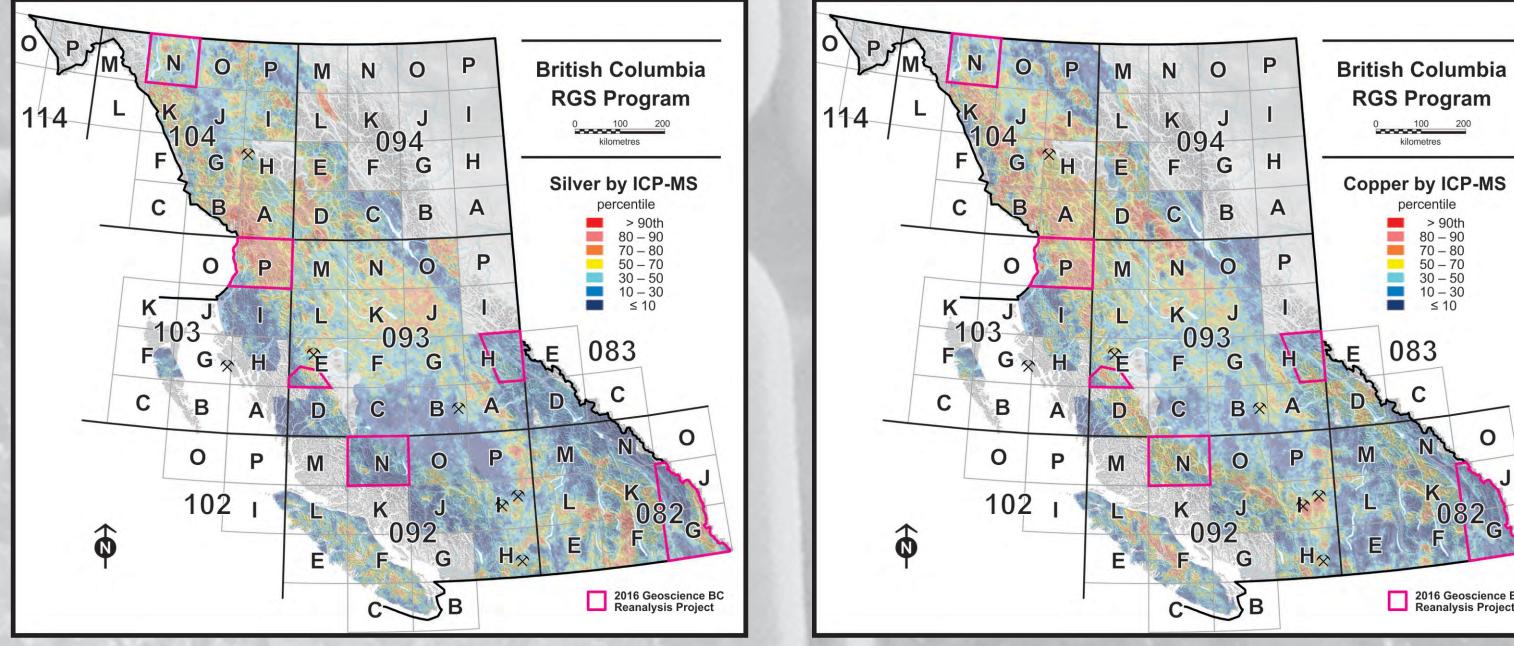
SUMMARY

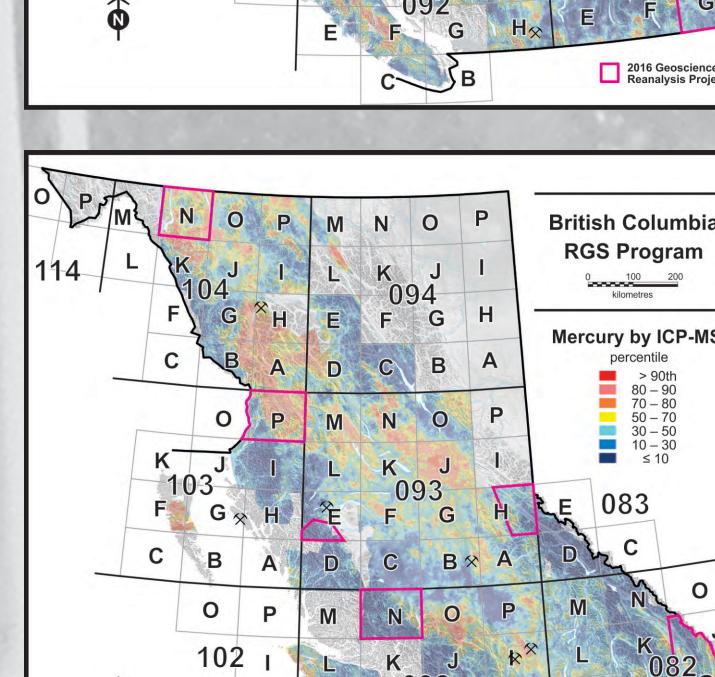
During the last decade, Geoscience BC-funded projects have established the agency as a leader in the development and maintenance of the BC RGS database. Building on the significant contributions by the Geological Survey of Canada (GSC) and the BC Geological Survey (BCGS), Geoscience BC has upgraded the geochemical resource through new field surveys and sample reanalysis initiatives.

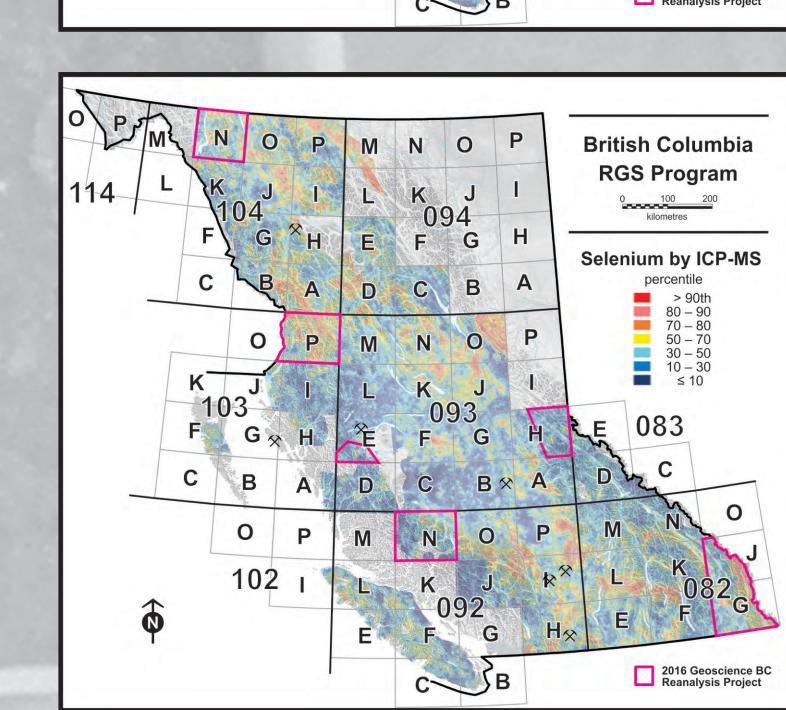
Reanalysis initiatives have helped produce a multi-element geochemical database that offers contiguous provincial coverage (Figures 6 to 11). This coverage further promotes the utility of the information to assist in the identification of new areas of mineral potential, reassess known mining camps and support other exploration work such as geophysical surveys, geological mapping and environmental evaluations.

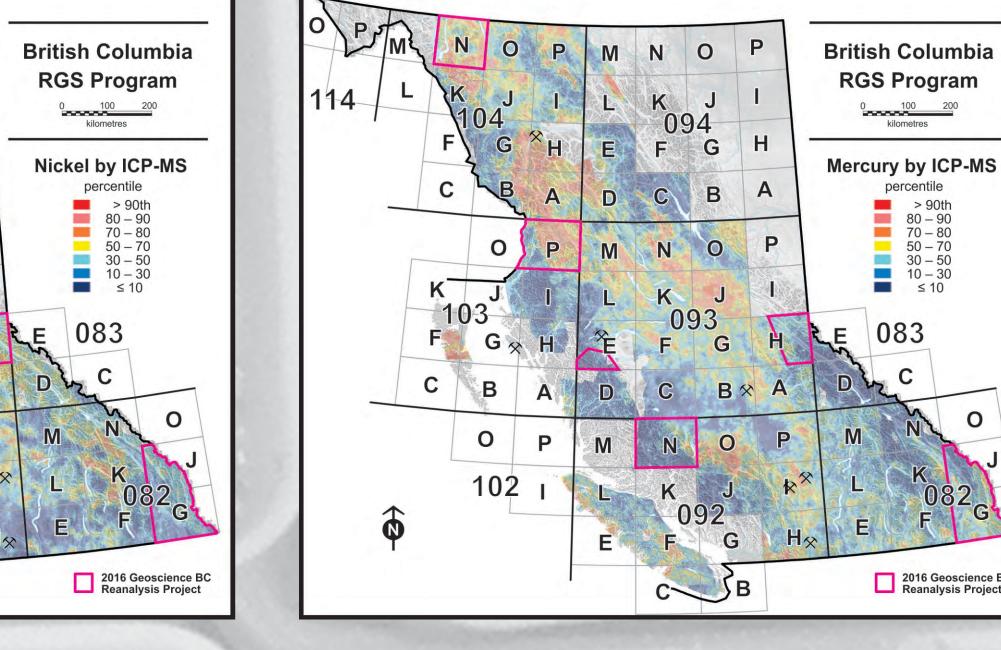












ACKNOWLEDGEMENTS

The ongoing maintenance and development of RGS databases and RGS sample storage facilities remains a challenge due to staff limitations and budget constraints. Agencies such as Geoscience BC, the BCGS and the GSC are commended for their ongoing efforts to protect the long-term security of this valuable geochemical resource. Thanks to M. McCurdy, S. Day, R. McNeil, A. Plouffe and A. Grenier of the GSC; A. Rukhlov, T. Ferbey and A. Hickin of the BCGS; and R. Lett (consultant, formally BCGS) for their efforts to promote and maintain the sample materials collections. This paper was much improved by the editing of R. Lett. Geoscience BC provided the funding for the 2016 reanalysis project.

Geoscience BC is an independent, non-profit organization that generates earth science in collaboration with First Nations, local communities, government, academia and the resource sector. Our independent earth science enables informed resource management decisions and attracts investment and jobs. Geoscience BC gratefully acknowledges the financial support of the Province of British Columbia.

REFERENCES

Jackaman, W. (2017): Ongoing development of British Columbia's regional geochemical database using material saved from previous field surveys; in Geoscience BC Summary of Activities 2016, Geoscience BC, Report 2017-1.

Jackaman, W. (2008): QUEST Project sample reanalysis; Geoscience BC, Report 2008-3, 4 p.

Jackaman, W. (2009): QUEST-West Project Sample Reanalysis; Geoscience BC, Report 2009-5, 4 p.

Lett, R.E.W. (2011): Regional geochemical survey database; BC Ministry of Energy and Mines, Geological Survey Branch, GeoFile 2011-07.

McCurdy, M.W., Spirito, W.A., Grunsky, E.C., Day, S.J.A., McNeil, R.J. and Coker, W.B. (2014): The evolution of the Geological Survey of Canada's regional reconnaissance geochemical drainage sediment and water surveys, Explore, no. 163, p. 1, 3–4, 6–10.

Rukhlov, A and Naziri, M. (2015): Regional geochemical survey database 2015; BC Ministry of Energy and Mines, Geological Survey Branch, Geofile