British Columbia Geological Survey

GeoFile 2010-14

QUEST South Regional Geochemical Survey: catchment basins for 2009 stream sample sites

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Introduction

As part of the QUEST South regional geochemical studies sponsored by Geoscience BC, a total of 785 stream samples were collected in southern British Columbia in 2009, with analytical results published in 2010 (Jackaman, 2010).

BC Geological Survey (BCGS) recently delineated catchment basins for these new infill stream sample sites (Figure 1), to complement and enhance the values of these new and high quality geochemical results to the mineral exploration community. Detailed methodology on the delineation of catchment basins was described and published by Cui et al. (2009).

Benefits of Catchment Basins

Regional Geochemical Survey (RGS) of stream sediment, water and moss samples offers an effective means of detecting geochemical anomalies in a large area by using minimal number of samples at point locations on streams.

Since the geochemical data of these samples reflect the geology and mineralization in the upstream drainage area, delineating catchment basins for the sample sites is the first step to define the zones of influence. With the catchment basin polygons as filters, it is possible to gather other relevant information and generate statistical results on bedrock geology, differential weathering of bedrocks, slope, aspect, vegetation, rainfall, wildlife, and other physical variations in the catchment basins. This leads to the evaluation and ranking of the significance of any detected geochemical anomalies, in searching and selecting target area for mineral exploration.

In order to produce catchment basins with boundaries compatible to the most detailed and standard heights of land in the province of BC, the stream sample locations were adjusted to the nearest TRIM streams at a scale of 1:20 000. The validation of the original sample locations and location adjustment or refitting to TRIM streams followed a rigorous data quality assurance process developed by BCGS and part of the work was carried out in collaboration with Sophie Alexander from ioGlobal (http://www.ioglobal.net/).

The validated and adjusted sample locations to TRIM streams also provide better geo-referencing to applications that require finer granularity.

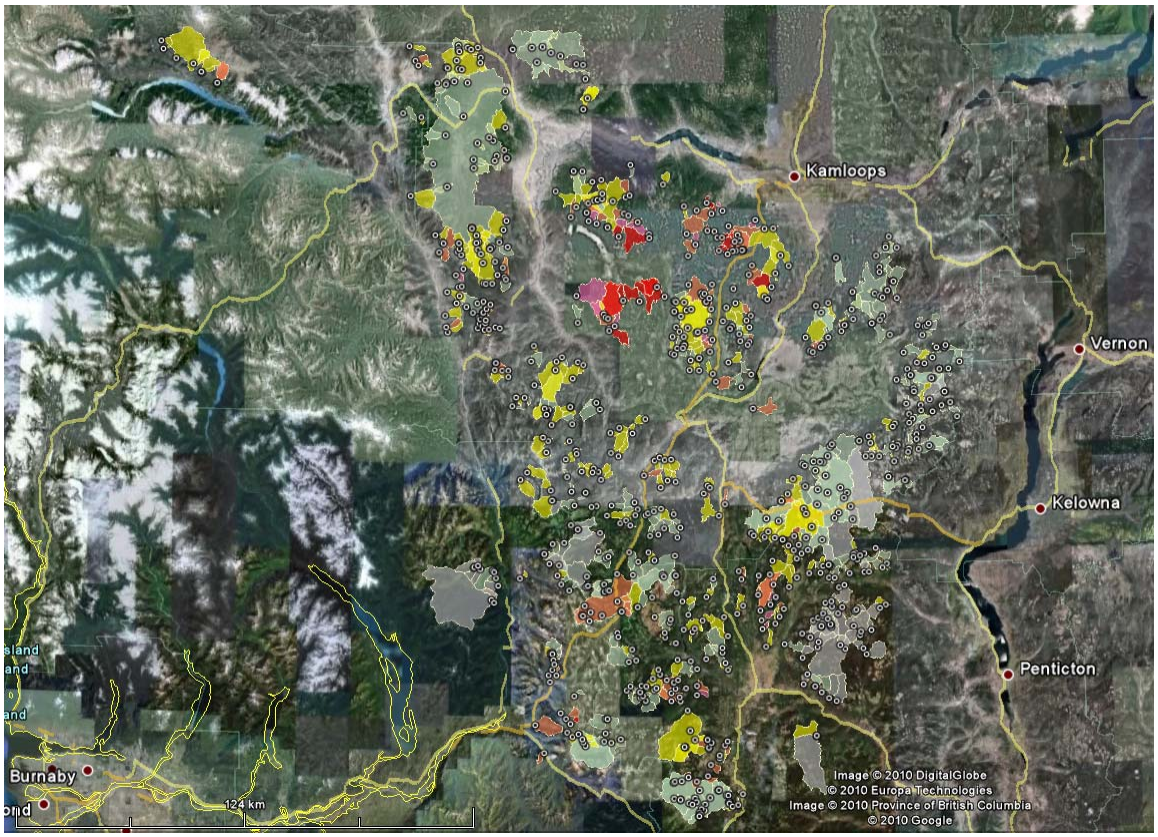

Figure 1. Sample sites and catchment basins for 2009 QUEST South geochemical survey.

Data Description

Data files as shapefile and KML for the catchment basins and sample sites adjusted to the 20k TRIM streams are available for download at the following link: http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/GeoFiles/Pages/GF2010-14.aspx.

Table 1 and Table 2 contain descriptions of the columns in the dBase tables as part of the shapefiles.

Table 1. Column descriptions for the table on sample sites adjusted to TRIM streams.

Column	Description
master_id	RGS sample ID
lat_20k	Latitude of sample location adjusted to 20k stream
lon_20k	Longitude of sample location adjusted to 20k stream
lat_50k	Latitude of original sample location on 50k NTS map
lon_50k	Longitude of original sample location on 50k NTS map
adj_dist	Adjusted geometric distance (in metres) from the original 50k location to the adjusted 20k location
order_20k	20k stream order
adj_meth	Adjustment method: • Auto: adjusted automatically based on defined algorithm and a set of criteria, e.g., stream orders, distances to nearest streams • Manual: adjusted manually after verification of the site on other data sources such as orthophotos and field data
confidence	Confidence level of location adjustment: • 1 to 5: low to high confidence • 0: location not adjusted or unable to validate

Table 2. Column descriptions for the table on catchment basins.

Column	Description
master_id	RGS sample ID
Area	Area size of the catchment basin in m^3
watersheds	Number of watershed units in the catchment basin
delin_meth	Method of delineating a catchment basin: • Auto: root edge – based on nearest TRIM stream and using Graph upstream query (Cui et al., 2009) • Auto: root watershed – based on underlying watershed and using Graph upstream query (Cui et al., 2009) • Manual: based on stream and TRIM DEM
Confidence	Confidence level of location adjustment: • 1 to 5: low to high confidence • 0: location not adjusted or unable to validate

References

Cui, Y. Eckstrand, H., and Lett, R.E. (2009): Regional Geochemical Survey: delineation of catchment basins for sample sites in British Columbia; *in* Geological Fieldwork 2009, *BC Ministry of Energy, Mines and Petroleum Resources*, Paper 2009-1, pages 231-238.

Jackaman, W. (2010): QUEST South geochemical data, Southern British Columbia; *Geoscience BC* Report 2010-13, 153 pages.