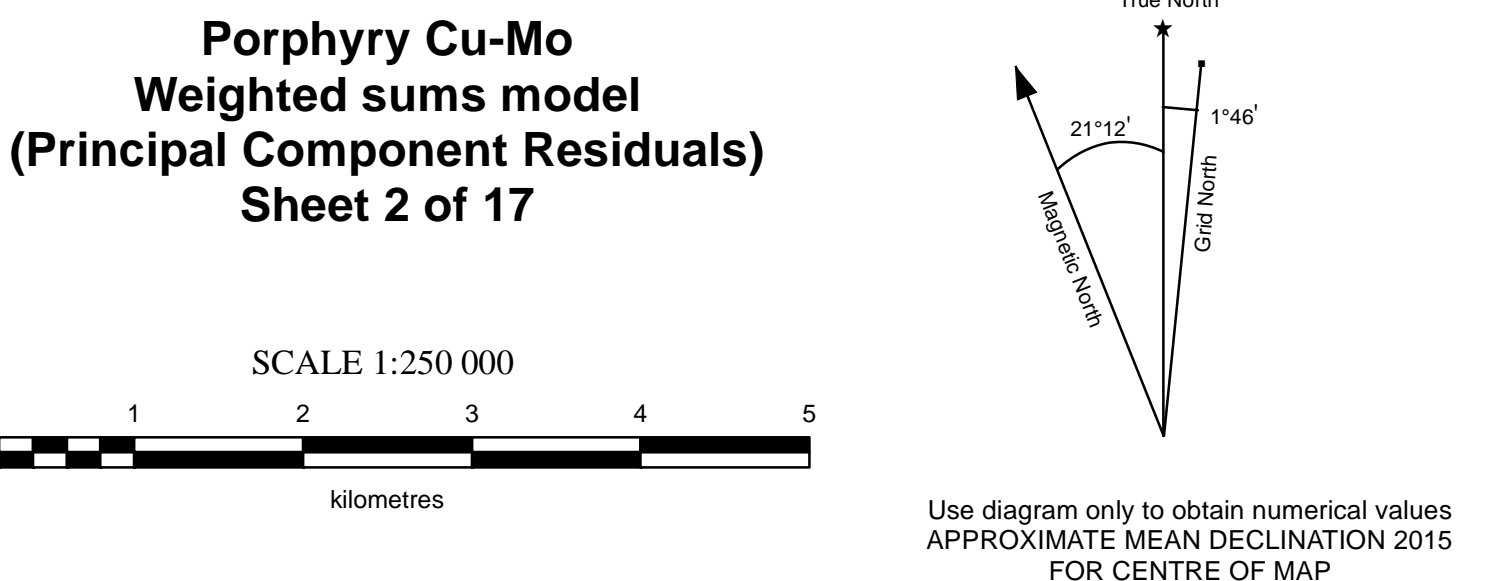


1:250 000-scale topographic base data produced by CENTRE FOR TOPOGRAPHIC INFORMATION, NATURAL RESOURCES CANADA. Copyright Her Majesty the Queen in Right of Canada. ONE THOUSAND METRE GRID. Universal Transverse Mercator Projection. North American Datum 1983. Zone 8. CONTOUR INTERVAL 100 FEET. Elevations in metres above Mean Sea Level.



Grid reference table showing coordinates for the map sheet. The map sheet is identified as 105K, located between 105E and 105I longitude and 105L and 105J latitude.

INTRODUCTION

New geochemical data from re-analysis of archived stream sediment samples have been assessed using weighted sums modeling and catchment basin analysis as described in the methodology report that accompanies this map (Mackie et al., 2015). Both commodity and pathfinder element abundances are evaluated to highlight areas that show geochemical responses consistent with a variety of base and precious-metal mineral deposit types. The results of modeling, completed using two approaches, are presented as a series of catchment maps and associated data files. This release is part of a regional assessment of stream sediment geochemistry that covers a large part of Yukon.

SAMPLING AND ANALYSIS PROGRAMS

Stream sediment and water samples from the Tay River map area (NTS 105K) were collected at a reconnaissance scale in 1988 and 1989 as part of the Canada-Yukon Mineral Development Agreement (Friske and Hornbrook, 1989; Friske et al., 1990). Field descriptions and initial geochemical data for 940 sites were released in Geological Survey of Canada ("GSC") open files 1961 (473 sites) and 2174 (467 sites). New geochemical data from the re-analysis of archived sample material were released in Yukon Geological Survey ("YGS") open files 2011-29 and 2012-7 (Jackman, 2011 & 2012). The reader is referred to these open files for detailed descriptions of sampling techniques, analytical procedures and quality control measures.

MINERAL OCCURRENCES

A variety of types of base and precious-metal mineralization are known to occur in the Tay River area as shown in Table 1 (Yukon MINFILE, 2015). These include sedimentary exhalative Zn-Pb-Ag (past-producing Faro, Vangorda and Grum mines); and Swim and Dy deposits and epithermal Au-Ag (Grew Creek) deposits. Polymetallic vein, Pb-Zn skarn, Cu skarn, intrusion-related Au and volcanogenic Zn-Pb-Ag-Cu-Au and Cu-Co massive sulphide mineralization are also documented within the map area. Along strike towards the southeast, in the Finalyson Lake district, numerous volcanic and sedimentary-hosted massive sulphide deposits occur, including Yukon Zinc Corporation's Wolverine mine (currently on care-and-maintenance).

WEIGHTED SUMS MODELING

As described in the methodology report (Mackie et al., 2015), two approaches have been used to subdue the influence of background lithological variation and secondary absorption on the composition of stream sediments. One uses data levelled by the dominant geology mapped within each catchment, while the other uses residuals calculated from

regression against selected principal components. Weighted sums models (WSM) have been generated using the processed data. The importance rankings used in WSMs are summarized in Table 2 for a variety of deposit types. Each model is optimized for a target deposit type however other deposit types may be represented in a given model due to similarities in elemental abundances and associated patterns.

For certain pathfinder elements (e.g., As, Sb and Cd) levelling by dominant lithology did not fully subdue the interpreted stratigraphic control on the spatial distribution of these elements. In order to reduce this impact on the WSM these elements were given low importance rankings (or were omitted) for certain deposit types. Additionally, strong responses for Zn, Pb and Ag related to SEDEX and polymetallic vein mineralization prevented using these elements as pathfinders for other deposit types. For example, negative rankings for Pb and Zn are used in the WSM for epithermal Au-Ag in order to reduce the contribution of Ag related to SEDEX mineralization. In the case of the WSM for porphyry copper, a negative ranking was assigned to Cd in order dampen a terrane effect (high Ag) in the north part of the map area.

The first principal component, accounting for ~34% of the total variation, shows high loadings for Se, S, Mo, Cd, Sb, Hg, Ag, Ba and Zn and forms a spatial trend that matches the distribution of the Road River and Earn Groups which contain shale horizons that are likely to be elevated in these metals. Similarly the second principal component, accounting for ~12% of the total variation, shows high loadings for Sb, As, Pb, Ni, Mo and Ag and forms a spatial trend matching the distribution of Tay, Mount Christie and Jones Lake formations which also contain shale. Regression analysis of these metals against the relevant principal component effectively subdued these terrane-effects while preserving, and in some cases enhancing, responses related to known occurrences. As above, negative rankings were used to differentiate deposit types with similar metal associations.

The effectiveness of historical sampling coverage has been assessed empirically using graphs of WSMs plotted against catchment surface area to determine the ideal maximum catchment size (10 km²). Catchments that cover larger areas (shown on the map with bold outlines) are interpreted to have been under-sampled and thus require further sampling to properly evaluate the area for geochemical anomalism. Given the likelihood that a mineralization 'signal' would be progressively diluted with increase in catchment size, marginally high WSM scores in large catchments could also be of interest.

Table 2: Importance rankings for weighted sums models using residuals on principal components. The table lists target deposit types and their importance scores for various elements (Mn, Fe, Co, Ni, Cu, Mo, Zn, Pb, Ag, Au, As, Ba, Cd, Sn, Sb, Te, Hg, Ti, Bi, W). It also includes a section for 'Other Deposit Types' and 'Hydrothermal Anomaly'.

Table 1: List of Mineral Occurrences for NTS map sheet 105K (Yukon MINFILE, 2015). The table lists the number, name, type, status, and commodities for 115 different mineral occurrences in the area.

REFERENCES

Friske, P.W. and Hornbrook, E.H., 1989. National Geochemical Reconnaissance Stream Sediment and Water Geochemical Data, Central Yukon (105K and 105L). Geological Survey of Canada, Open File 1961.
Friske, P.W.B., Hornbrook, E.H.W., Lynch, J.J., McCurdy, M.W., Gross, H., Galletta, A.C., and Durham, C.C., 1990. National Geochemical Reconnaissance Stream Sediment and Water Geochemical Data, Central Yukon (105K/E). Geological Survey of Canada, Open File 2174.
Jackman, W., 2011. Regional Stream Sediment Geochemical Data, Tay River Area, Central Yukon (NTS 105K East). Yukon Geological Survey, Open File 2011-29.
Jackman, W., 2012. Regional Stream Sediment Geochemical Data, Glenlyon Area, Central Yukon (NTS 105K west & 105L). Yukon Geological Survey, Open File 2012-7.
Mackie, R., Arne, D. and Brown, O., 2015. Enhanced interpretation of regional stream sediment (RGS) geochemical data from Yukon: catchment basin analysis and weighted sums modeling. Yukon Geological Survey, Open File Report 2015-10.
Yukon MINFILE, 2015. Yukon MINFILE - A database of mineral occurrences. Yukon Geological Survey, www.data.geology.gov.yk.ca, accessed May 2015.

RECOMMENDED CITATION

MACKIE, R., ARNE, D. AND BROWN, O., 2015. Weighted sums model for Porphyry Cu-Mo deposits using principal component residuals. In: Enhanced interpretation of stream sediment geochemical data for NTS 105K. Yukon Geological Survey, Open File 2015-25, scale 1:250 000, sheet 2 of 17.
Catchment basin polygons generated by the Yukon Geological Survey (J. O. Bruce).
Any revisions or additional geological information known to the user would be welcomed by the Yukon Geological Survey.
Paper copies of this map and the accompanying report may be purchased from the Yukon Geological Survey, Energy, Mines and Resources, Government of Yukon, Room 102-300 Main St., Whitehorse, Yukon, Y1A 2B5. Ph. 867-667-3201, Email geology@gov.yk.ca.
A digital PDF (Portable Document File) file of this map may be downloaded free of charge from the Yukon Geological Survey website: http://www.geology.gov.yk.ca.

Table 1: List of Mineral Occurrences for NTS map sheet 105K (Yukon MINFILE, 2015). This is a detailed table listing 115 mineral occurrences, including their names, types, statuses, and associated commodities.