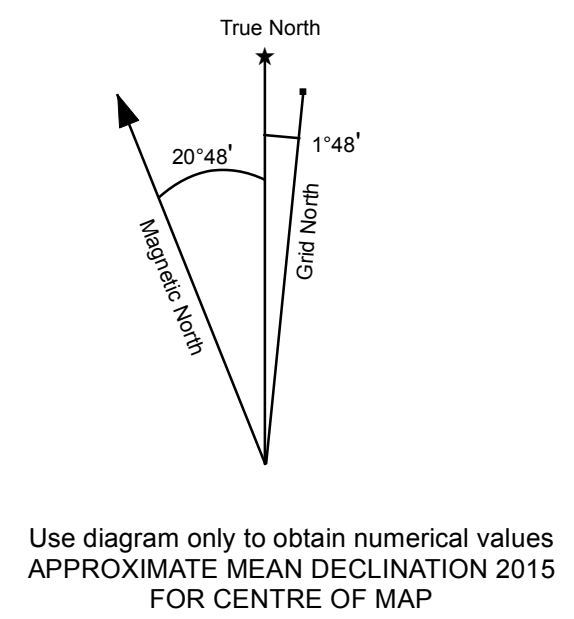
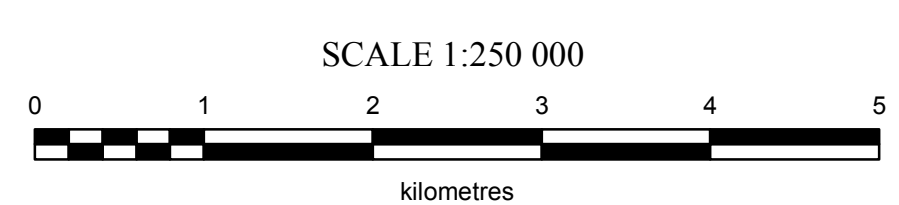


Iron-oxide Cu-Au Weighted sums model (Geology Levelled) Sheet 3 of 16



Grid reference table showing map sheet coordinates (116F, 116G, 116H, 116C, 116B, 116A, 115N, 115O, 115P).

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).

SAMPLING AND ANALYSIS PROGRAMS

Stream sediment and water samples from the Dawson area (NTS 116B and part of 116C) were collected as part of a reconnaissance program in 1976 as part of the Federal Uranium Reconnaissance Program (Geological Survey of Canada, 1977).

MINERAL OCCURRENCES

Various types of base and precious-metal mineralization have been identified in the Dawson area as listed in Table 1 (Yukon MINFILE, 2015). The most significant deposits are classed as intrusion-related Au (Brewery Creek deposit), Au skarn (Marm deposit), Mississippi valley-type Pb-Zn-Ag (Og and Tart prospects), iron oxide copper-gold (Lala and Wizard prospects) and polymetallic Ag-Pb-Zn-Cu (Spotted Fawn, Blackstone, Silvercity and Insect prospects).

WEIGHTED SUMS MODELING

As described in the methodology report (Mackie et al., 2015), two approaches have been used to subdivide 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. 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 associations. Exploratory data analysis using both raw element data and principal components indicates that lithological variation exhibits a significant control on the distribution of many commodity and pathfinder elements. Importantly, for this map area, much of the variability in the data can also be linked to mineralization. The first principal component accounts for ~27% of the total geochemical variation and shows high positive loadings for Al, Ce, Li, Co, La, Th, Ti, Cr, Sc and Fe; and high negative loadings for Cd, Zn, Mo, Se, Ag, Ti and Ba. Respectively, these groupings correspond to the mapped distribution of Hyland group sedimentary, Dempster formation volcanic rocks and Road River group sedimentary rocks. Mafic volcanic rocks of the Dempster formation are also represented in the second component which has high negative loadings in V, Ni, and Cr. The second component, with high positive loadings in Bi and Pb, shows a spatial match with several Pb-Zn-Ag occurrences and thus is interpreted to represent a mineralization signal. The third component has high positive loadings in Cu, Se, Mo, Ni and Ag; and high negative loadings in Mg and Ca. These groupings correspond to areas mapped as slate and dolomite, respectively.

Regression analysis of selected metals against the relevant principal components' effective filters the interpreted lithological control and consequently enhances responses related to known mineral occurrences. Leveling by mapped geology is less effective at filtering the lithological control for certain elements (e.g., Ag, Zn and Co). In order to reduce the impact this has on the WSM, certain elements were given low importance rankings for certain deposit types. Negative weightings are used to help distinguish between 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 (16 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 anomalies. Given the likelihood that a mineralization signal would be progressively diluted with increasing catchment size, marginally high WSM scores in large catchments may also be of interest.

Table 2: Importance rankings for weighted sums models using data levelled by mapped geology.

Table with columns: Target Deposit Type, Other Deposit Types, and elements Mn, Fe, Co, Ni, Cu, Mo, Zn, Pb, Ag, Au, As, Ba, Cd, Sn, Sb, Te, Hg, Tl, Bi, W. Rows include Poly metallic Ag-Pb-Zn, MVT Pb-Zn-Ag, IOCG, Porphyry Cu-Mo, Au Skarn, and Shale-hosted Ni-Zn.

*Polymetallic Ag-Pb-Zn type includes vein and manto styles; SEDEX = sedimentary exhalative; VMS = volcanic-hosted/associated massive sulphide; MVT = Mississippi valley type; IOCG = iron oxide copper gold. For heavily censored elements and those not strongly controlled by geology as interpreted from principal component analysis, raw data are used following a log10 transformation.

LEGEND

- Town, Mineral Occurrence, Road, Contour, River, NTS map sheet, Water Body, Wetland, Sample Location, Catchment > 16 km². Weighted sums model (Geology Levelled) Iron-oxide Cu-Au deposits: 0-50th percentile, 50-75th percentile, 75-90th percentile, 90-95th percentile, 95-98th percentile, 98-100th percentile.

RECOMMENDED CITATION

MACKIE, R., ARNE, D. AND PENNIMPEDE, C., 2016. Weighted sums model for iron-oxide Cu-Au deposits levelled by geology. In: Enhanced Interpretation of Stream Sediment Geochemical Data for NTS map sheet 116B & 116C. Yukon Geological Survey, Open File 2016-32, scale 1:250 000, sheet 3 of 16.

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 obtained 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.

REFERENCES

Friske, P.W.B., Hombrook, E.H.W., Lynch, J.J., McCurdy, M.W., Gross, H., Galletta, A.C. and Durham, C.C., 1991. National Geochemical Reconnaissance Stream Sediment and Water Geochemical Data, West Central Yukon (NTS 116B, parts of 116C, 116F and 116G). Geological Survey of Canada, Open File 2365. Geological Survey of Canada, 1977. Regional stream sediment and water geochemical reconnaissance data, Yukon Territory (NTS 116B, 116C, 116F and 116G). Geological Survey of Canada, Open File 520. Jackman, W., 2012. Regional Stream Sediment Geochemical Data, Dawson area, west central Yukon (NTS 116B and 116C). Yukon Geological Survey, Open File 2012-6. Mackie, R., Arne, D. and Brown, O., 2015. Enhanced interpretation of regional stream sediment geochemistry by 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.

Table 1: List of Mineral Occurrences for NTS map sheet 116B & 116C (Yukon MINFILE, 2015)

Table with columns: Number, Name, Type, Status, Commodities. Lists numerous mineral occurrences such as 116B 002 BERSON, 116B 004 GERMANE, 116B 005 COLLETT, etc.