

# Yukon Geological Survey

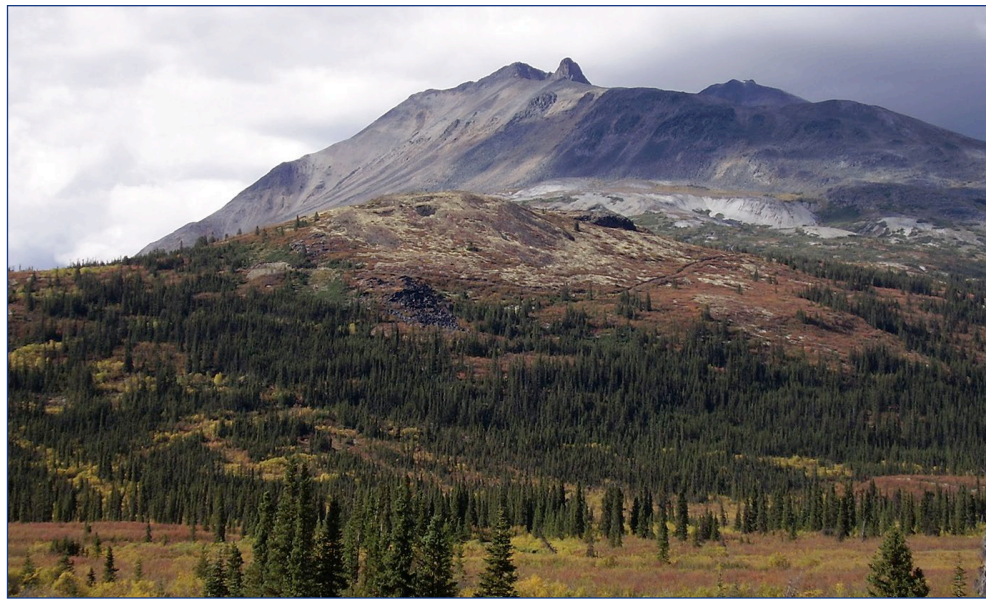


## Snap Shot

- Yukon Geological Survey needed to generate digital maps based on geochemical data
- CSA global was commissioned to the project, one of the biggest undertaken by the Yukon Geological Survey
- Maps are now available to the public [geology.gov.yk.ca](http://geology.gov.yk.ca)

## Customer Story

CSA Global was commissioned by the Yukon Geological Survey to generate a series of digital map products based on new geochemical data from the re-analysis of ~20,000 archived stream sediment samples covering ~290,000 km<sup>2</sup> of the northern Cordillera in Canada.



## About the Yukon Geological Survey

The Yukon Geological Survey (Department of Energy, Mines and Resources; Government of Yukon) generates, compiles, and provides geoscientific information pertaining to Yukon's geology, mineral deposits and hydrocarbons. Products released by the Yukon Geological Survey are used by industry for mineral exploration and also provide the basis for land use planning initiatives.

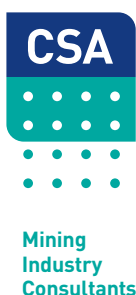
The release of custom map products based on new high-quality geochemical data will encourage mineral exploration and mining companies to explore in Yukon.

*"This project was conducted very professionally and CSA Global demonstrated a clear mastery of this work.*

*The products generated will be of great value to prospectors and mineral exploration companies exploring in the Yukon.*

*Thank you for CSA Global's important and very useful contribution to the Yukon's geoscience database.*

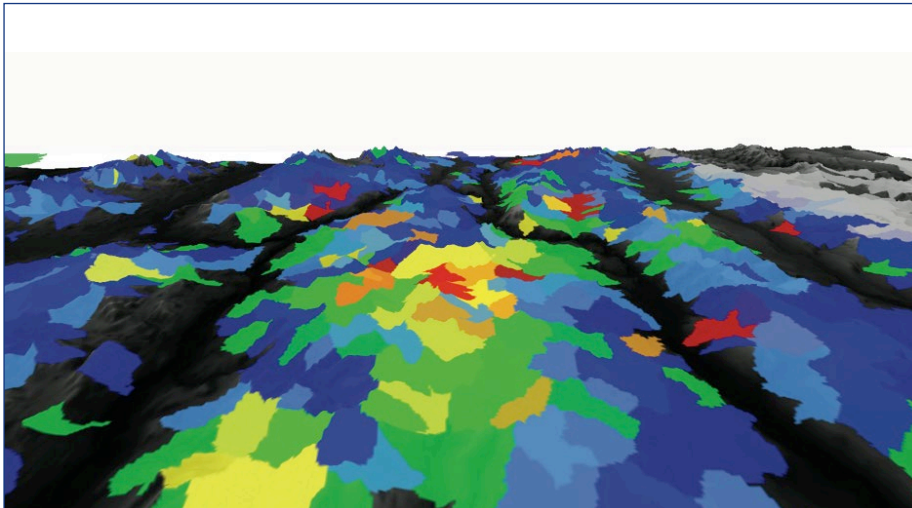
Mike Power, Chairman, Technical Liaison Committee  
to the Yukon Geological Survey



## The Challenge

When interpreting regional stream sediment data, it is important to consider that lithological variation, scavenging of metal ions by secondary minerals and particles, and dilution can mask signals related to mineralisation.

For instance, anomalous copper values in a given area could be entirely related to high background copper values in barren mafic volcanic rocks. Similarly, high arsenic values may simply reflect the amount of secondary Fe-Mn oxides at the sample site rather than an indication of near-by bedrock mineralisation.



An oblique view of 3D image showing sample catchments draped on topography.

## Solution

Based on exploratory data analysis, the extent to which different elements are affected by unwanted effects is assessed. Elements strongly controlled by lithology are processed using two approaches. One approach uses data leveled by mapped geology and the other uses residuals calculated from regression against selected components derived from Principal Component Analysis. Elements strongly controlled by scavenging are filtered using regression analysis against elements or principal components that represent proxies for the amount of clays, organic material, and/or Fe-Mn oxides.

Geochemical indices are generated for different deposit types using weighted sums modeling based on signatures of known occurrences and published commodity-pathfinder element associations. The models are displayed as thematically coloured catchment maps, with warmer colours highlighting areas that best match the expected geochemical signature of given deposit type.

## Yukon Geological Survey Approach

- Analysis of 20,000 archived stream sediment samples
- Area covered 290,000km<sup>2</sup> of the northern Cordillera in Canada

*“The twin track approach to quantifying the effects of lithology on overall geochemical response using predictive and statistical approaches was noted as very useful in allowing target responses to be filtered from responses likely due solely to variations in bedrock lithology.”*

Mike Power,  
Chairman, Technical Liaison  
Committee to the Yukon  
Geological Survey



Mining  
Industry  
Consultants



## The Results

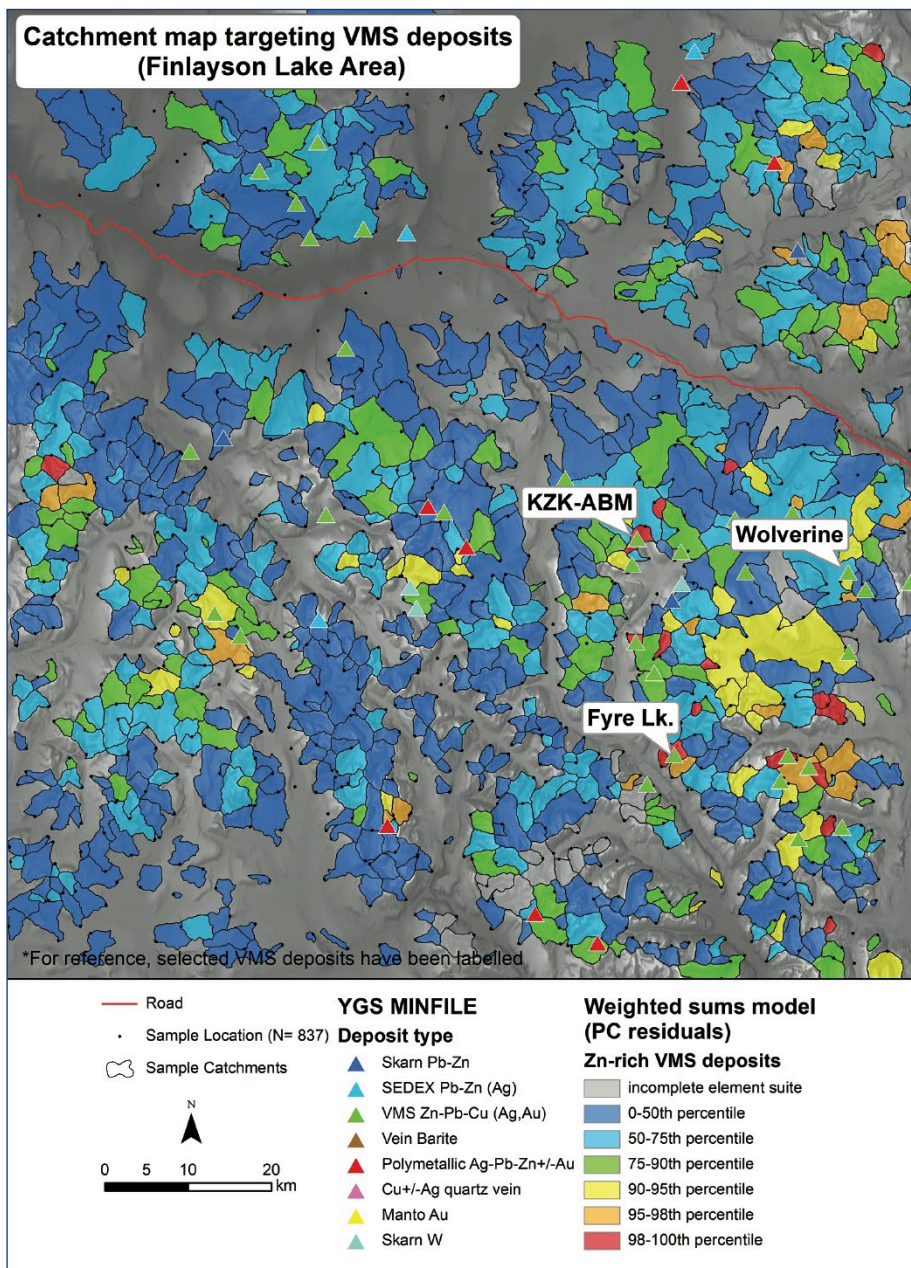
For a region covering approximately 2/3 of the Territory the Yukon Geological Survey now has specialised map products that highlight specific drainages that are prospective for a variety of deposit types. They have generated new geochemical exploration targets that can be further evaluated by prospectors and mineral exploration companies.

The release of custom map products based on new high-quality geochemical data will encourage mineral exploration and mining companies to explore in Yukon.

These maps are being released to the public on the YGS website ([www.geology.gov.yk.ca/](http://www.geology.gov.yk.ca/)).

## Results

- The digital map products present the findings in a clear and effective manner
- Fulfilled objective to entice exploration work in the Yukon
- Digital map products released to the public and now available [www.geology.gov.yk.ca](http://www.geology.gov.yk.ca)



*“The products present the findings in a clear, effective and professional manner, further optimising their utility to the exploration community.”*

Mike Power,  
Chairman, Technical Liaison  
Committee to the Yukon  
Geological Survey

More Case Studies



[www.csaglobal.com](http://www.csaglobal.com)