

# **The Role of Multidisciplinary Interpretation for Porphyry Copper Targeting in the South American Andes**

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## **ABSTRACT**

In recent years, decreasing data acquisition costs as well as increasing availability of public domain data for the earth sciences have converged to create data-rich mineral exploration environments in many parts of the globe. In parallel, computational processing power and increasingly user-friendly software has advanced to the extent that this information can be accessed and interrogated by the masses. These trends are set to continue, implying that the challenge to gather and generate information will shift toward a struggle to incorporate and utilize a wealth of information.

Considering the above, and the maturity of general porphyry copper exploration models, such as Richards' perspective on large scale requirements for Tier 1 deposit formation (Richards, 2013), and Sillitoe's take on system-scale zonation (Sillitoe, 2010), the successful explorer of the future must position itself to derive and evaluate porphyry copper targets in terms of geological processes and criteria evaluated holistically using multiple data sources rather than isolated indications provided by standalone techniques. For instance, assessing that an area represents the pyrite halo of a hydrothermal center, supported by geophysical, geological, and geochemical criteria, is a more robust vector to a drill target than simply chasing chargeability anomalies above a certain threshold.

The discussion herein revolves around incorporating this paradigm into active exploration processes to derive robust targets faster through maximization of available information of varying sub-disciplines.

Examples from Andean porphyry copper deposits and exploration plays are utilized to illustrate concepts.

Ultimately, this is a generalist perspective on maximization of available information to evaluate key geological processes and features required for Tier 1 porphyry copper deposit formation.