Stratiform Potash Mineral Systems Prospectivity Analysis in an Andean Setting

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Mined potash contains various salts of potassium in water-soluble form, and over 95% of global production goes into fertilisers and other agricultural applications. Around 80% of the total global production within this US$23 billion industry (2022) is held by a small consortium of major companies in Canada, Russia, Belarus, and China. With the current geopolitical climate, potash is fast becoming a strategic mineral. A supply squeeze and a significant price increase in the last year has led to a focus on developing new long-term supplies for this vital commodity.

The application of mineral system analysis in mineral prospectivity modelling allows for the characterisation of a logical framework to define mineralisation potential. Using stratigraphical marker horizons coupled with improved geological mapping, it is possible to review the distribution of stratiform orebodies of bulk commodities within a given area. Using geospatial tools, we highlight areas of interest using a reducing gradational filter passed over the study area based on stratigraphical level and geographical distance away from target horizons. The approach aids the delineation of risk-reduced search spaces, which may include targets under cover.

As with most bulk commodities, environmental considerations and access to infrastructure are critical factors for the development of a project. In this study, we integrate environmental, infrastructural, and social data layers to define a holistic risk-mapping approach that transcends a typical mineral prospectivity model. This enables informed exploration decisions based on multiple non-geological data layers. The approach has promoted further research and development that includes workflow advancement and investigations into data-handling efficiency through automation.