

Ore-related anomalies identification based on spatial statistical analysis

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Spatial Statistical Analysis

Local statistical analysis is better suited for data processing because of the spatially variability and autocorrelation of geochemical data[1,2]. In this research, the concentrations of rockforming oxides, lithophile elements, organic carbon and total carbon are taken as proxies for parent lithology and regolith type to adjust for variations in backgrounds of metallogenic element geochemical patterns, and then geographically weighted regression is applied to identify geochemical ore-related anomalies in stream sediments of boundary area across China and Mongolia. The geochemical residuals, subtracting the predicted values from measured values, are used to indicate abnormal areas, the greater the residuals, the stronger the anomalies.

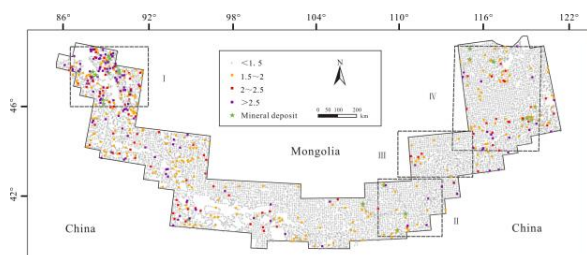


Figure 1 Anomaly maps obtained using GWR method (Pb)

Discussion of Results

In this research, a method was proposed to eliminate the influence of lithological background and geographic landscapes to identify local anomalies rather than global anomalies by using geographically weighted regression with various proxies for parent lithology and regolith type to adjust for variations of trace element background. In addition, the method can accurately identify the anomalies related to mineralization and eliminate the meaningless anomalies, showing better associations with the known deposits.

[1]Zhang (2008). *Geoderma* 146 (1–2), 378–390.

[2]Zhang (2009). *Environ. Pollut.* 157 (11), 3083–3090.