Probabilistic mineral potential mapping of vein-type gold deposits in the Zaamar district, Mongolia

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Mineral resource potential mapping is an important procedure in mineral resource assessment. The aim of this study is to analyze relationships between vein-type gold deposits and related geological factors and integrate the relationships using statistical model in a Geographic Information System (GIS). A variety of spatial geological data were compiled, evaluated and integrated to produce a map of potential gold deposits in the Zaamar district, Mongolia. A spatial database including vein-type gold deposits, geologic, and geochemical data was constructed for the study area using a GIS. The factors relating to 105 gold deposits were the geological data such as lithology and fault structure, geochemical data including Ag, Co, Cu, Mo, Ni, Pb, Sn, and Zn. By using the constructed spatial database, the relationships between mineral deposit areas and 10 related factors were identified and quantified by logistic regression model. All the factors were combined to produce a map of the regional mineral potential using the overlay method in a GIS environment. The mineral potential map was then verified by comparison with known mineral deposits. The verification result gave accuracy of 86.00% for the logistic regression model. The mineral potential map can be used as a source of basic information for mineral resources development.