

Regional gold potential mapping in Kelantan (Malaysia) using probabilistic based models and GIS

ABSTRACT

The aim of this study is to test and compare two probabilistic based models (frequency ratio and weights-of-evidence) with regard to regional gold potential map-ping at Kelantan, Malaysia. Until now these models have not been used for the purpose of mapping gold potential areas in Malaysia. This study analyzed the spatial relation-ship between gold deposits and geological factors such as lithology, faults, geochemical and geophysical data in geographical information system (GIS) software. About eight (8) gold deposits and five (5) related factors are identified and quantified for their spatial relationships. Then, all factors were combined to generate a predictive gold potential map. The predictive maps were then validated by com-paring them with known gold deposits using receiver operating characteristics (ROC) and “area under the curve” (AUC) graphs. The results of validation showed accuracies of 80% for the frequency ratio and 74% for the weights-of-evidence model, respectively. The results demonstrated the usefulness of frequency ratio and weights-of-evidence modeling techniques in mineral exploration work to dis-cover unknown gold deposits in Kelantan, Malaysia.

Keyword: Gold potential mapping; Remote sensing; Frequency ratio; Weights-of-evidence; GIS; Kelantan; Malaysia