

عنوان مقاله:

Spatially weighted singularity mapping in conjunction with random forest algorithm for mineral prospectivity modeling

محل انتشار:

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خلاصه مقاله:

Geochemical exploration data play a vital role in mineral prospectivity modelling (MPM) for discovering unknown mineral deposits. In this study, the improved spatially weighted singularity mapping (SWSM) method is used to improve the practice of identifying geochemical anomalies related to copper mineralization in the Sarduiyeh district, Iran. Then, the random forest algorithm (RF) and geometric average function (GA) are used to integrate the resulting geochemical predictor map with other predictor maps. As demonstrated by the high area under the curve (AUC) values, this approach can effectively delineate prospective areas with RF and GA. However, compared to the GA approach ($AUC=0.78$), the RF technique ($AUC = 0.98$) offers superior prediction capabilities due to its enhanced ability to capture spatial correlations between predictive maps and known mineral deposits. The proposed procedure, a hybrid of the improved SWSM and RF has outstanding predictive capabilities for identifying prospective areas. A case in point is the new, highly prospective areas identified in this study, which present priority targets for future exploration in the Sarduiyeh district.

کلمات کلیدی:

Anisotropic singularity, Geochemical signature, Mineral prospectivity modeling, Sarduiyeh

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