Optimization of Exploration Targets on Mineral Prospectivity Maps

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Abstract

We present a quantitative method for optimally locating exploration targets based on a probabilistic mineral prospectivity map, which was created by means of weights-of-evidence (WofE) modeling. Locations of discovered mineral occurrences were used as a training set and a map of distance to faults/fractures and three channel ratio images of HyMap hyperspectral data were used as evidences. The WofE posterior probability map was input to an objective function that optimized location of exploration targets. The method was applied to the Rodalquilar mineral district (SE Spain). Optimized exploration target zones coincide spatially with undiscovered mineral occurrences, namely, those not used to train the WofE model, and show other zones without mineral occurrences within delineated prospective ground. The results indicate usefulness of the described optimization method to allocate exploration targets for undiscovered mineral occurrence based on probabilistic mineral prospectivity maps.