

GENERATING POTENTIAL MAPS FOR METALLIC MINERAL DEPOSITS IN SOLTANABAD AREA IN NORTHEAST IRAN IN A GIS

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Three mineral potential maps were generated in a GIS environment showing areas of interest for further exploration for metallic mineral deposits. Study area (Soltanabad) is located in northeastern Iran in Khorasan province. Geology, geochemistry, geophysics, tectonics and alteration from geology and satellite images (Landsat TM) were used as main types of factors to create mineral potential maps. Several evidence maps were generated for each of the above main factors. An inference network was designed for layer integration. At first, evidence maps of each category indicated above, were integrated to generate a factor map. Finally all factor maps were combined to create the potential map. By applying data-driven methods of weights of evidence, and logistic regression, based on the distribution of known mineral deposits and mines, posterior probabilities for occurrence of mineral deposits were calculated. Distribution of mines and known deposits were also used for comparing to potential map classes. A fuzzy logic approach was also applied as a knowledge-driven method for integration of information layers. All three final potential maps generated by different methods suggest mainly similar zones for potential mineral deposits in the area. Areas that have the highest classes of potential maps and there are no known mineral deposits, can be considered as locations for further mineral exploration.