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Research article

Mineral Prospectivity Mapping of the Hidden Cu-Au Porphyry Mineralization in the Basiran and Kodegan 1:100,000 Sheets

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English Extended Abstract

Summary

This study was carried out in the eastern area of the Lut block and sheets of Basiran and Kodegan. Due to the existence of numerous vein copper deposits in this area, the possibility of porphyry copper mineralization was evaluated by using the zonality indicators related to porphyry copper deposits and the singularity method, and tectonic and geological maps. In this research, after modifying the censored data, the histogram of the abundance of elements related to the used zonality index, including copper, lead, zinc, and molybdenum, was drawn, and after software processing of the data using logarithmic images of grade-area, the amount of anomalous grade and background. is identified. The dispersion map of lead, zinc, and copper elements was prepared and analyzed, and the dispersion elements were used as one of the weighting layers in the hierarchical integration method of AHP. Also, the distribution map of the index of supra-mineral and sub-mineral zonality was prepared, and by combining the two maps, the layer of areas rich in lead, zinc, copper, and molybdenum was obtained and used in the AHP method. The singularity method related to the surface production of the zonality index in windows with an area of 2,500 square meters was used to prepare one of the weighting layers in the hierarchical method. In the geological map of the region, the Oligo-Miocene intrusive masses were integrated as a suitable substrate for hosting copper deposits with the tectonic evidence layer and were used as one of the main weighting parameters in the AHP method. The use of the geological layer in the AHP matrix led to the removal of alluvial areas or Quaternary sediments in the detection of promising porphyry copper mineralization areas. The desired layers were combined with each other in the GIS software environment by the AHP add-on, and a favorable potential map for porphyry copper mineralization was prepared. In the final result of hierarchical integration, the area of 490 square kilometers out of 5200 square kilometers of the investigated area was introduced as a promising area. In this research, using quantitative variables, a qualitative and functional map was prepared to advance the preliminary explorations of the region. In order to validate the processing, 22 known mineral indices related to copper mineralization were used, of which 17 indices, equivalent to 77% of them, were found in the areas identified in this study.

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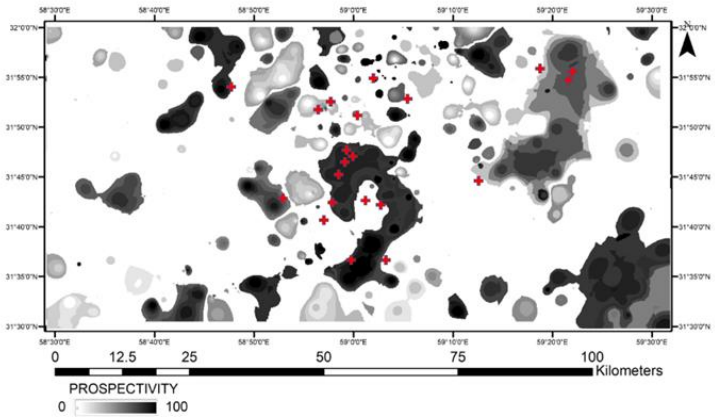

Fig. 18 . Map of the optimal potential of copper-gold mineralization by the AHP method along with mineral indices of the area.

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