

GIS TECHNIQUES APPLIED TO FAVORABILITY ANALYSIS OF LEAD,COPPER AND ZINC MINERALIZATIONS IN THE RIBEIRA VALLEY, BRAZIL

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GIS techniques were used in the evaluation of favorability of base-metal mineralizations in the Ribeira Valley mineral province, southeastern Brazil, in a project with financial support of the Foundation for Support of Research of the State of São Paulo. The studied area comprises the Cerro Azul and Apiaí quadrangles (SG.22-X-B-IV and V, 1:100,000 scale), São Paulo and Paraná. The method adopted is based on selection, weighting and application of exploration parameters using GIS techniques, to a digital database, composed of map and attribute geological, geochemical and airborne geophysics data and mineral occurrences. Exploration parameters selection and analysis followed a knowledge-based approach based on two mineralization models: the vein-type carbonate hosted (Panela type), and the sedimentary-exhalative (Perai type). The analysis was done by map overlay, using boolean, weighted linear combination and ordered weighted averaging methods. The boolean method was not considered suitable for this kind of favorability analysis, whereas the weighted linear combination and the ordered weighted averaging methods, yielded similar results, adequate for the studied area. The ordered weighted averaging analysis gave the best results, with the favorability maps presenting a large number of classes in smaller areas. In comparison, the weighted linear combination analysis showed more coherent results, but without detailing the smaller areas. The developed exploration parameters proved suitable for both Perai and Panela models. Thus, these methods are suitable for selection of prospecting areas for detailed geological survey, at low cost, in areas similar to the one studied.