

**Use and Assessment of data integration and spatial analysis in mineral
research applied in Poços de Caldas Plato.**

ABSTRACT

This work compared the performance of 8 methods of multi-criteria analysis of geological and radiometric data, in the prediction of potential areas for radioactive mineral deposits in the Poços de Caldas alkaline complex, Brazil. The used methods (Boolean, Logic Weighed Means, Minimum-Maximum Fuzzy, Mean Fuzzy, Weighted Fuzzy, Gamma Fuzzy, Bayes and Artificial Neural Network) were applied according to a empiric prospecting model, which generated scenarios with different priority levels for mineral prospecting. The *Boolean* procedure produced binary thematic maps indicating areas as favorable and not favorable for mineral prospecting. In the others methods, results were produced in numeric format and sliced in 4 potential classes (null, low, medium, high). In the map evaluation were used 48 mineral occurrences that were overlaid for visual assessment and cross-tabulated to calculate the conditional probabilities, used in the confident parameter. The produced scenarios showed different performances. The Weighted *Fuzzy* map showed the best performance among others, followed by Artificial Neural Network and Weighted means maps. The *Boolean* and Gamma Fuzzy models showed be unsuitable for similar studies. The others models showed moderate performances.