

## What can we learn from GIS-based prospectivity mapping in mature terranes?

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This study used robust spatial statistics to systematically examine regional-scale targeting criteria that have been suggested for orogenic gold mineralization in the Yilgarn Craton. The spatial relationships between known orogenic gold mineralization and a series of targeting criteria were examined using both the number and endowment of the deposits. Both proximity and containment analyses were performed and a series of measures used to assess whether the geological feature being tested could be considered a good regional-scale targeting criteria.

Spatial analysis indicated the best targeting criteria for orogenic gold mineralization in the Yilgarn Craton are: containment within greenstones, proximity to mafic group granite intrusions, proximity to regional-scale fault bends, and regional fault density.

Using these targeting criteria, a fuzzy logic prospectivity map was generated. Fuzzy membership values were derived using the %endowment/%area statistic and the proximity and density threshold values set from the class at which the maximum %endowment/%area statistic was observed.

The spatial analysis revealed some surprising results, with several targeting criteria that were thought to have a strong relationship with orogenic gold mineralization in the Yilgarn craton shown to have weak relationships when a robust statistical analysis was performed. Due to the analysis focussing on the relationship between endowment and the geological features, it raised the question as to how much influence the Golden Mile had on the results. Separate analysis of the super-giant and giant deposits compared to the remaining smaller deposits indicated that controls on the large deposits may differ to the controls on smaller deposits.