

Ribeira Valley District gold potential, estimated by GIS-based weights of evidence model.

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The gold potential of a region in the Ribeira Valley district, São Paulo State, was estimated in a Geographic Information System. The dataset included geologic map, geochemistry of stream sediments, gamma-ray and magnetic airborne data, LANDSAT data, and gold occurrences data. The most widespread mineralized unit is a metavolcanic sedimentary sequence of deep-water carbonaceous phyllites, grading up to shallow-water carbonate-bearing phyllites associated to basanite volcanism of a distensive tectonic regime. The gold potential was estimated by the index overlays model, like the linear addition of maps, which involves a subjective choice of map weights, and by the weights of evidence model, which is objective in that it statistically determines the weight of each evidence according to its spatial association to the known occurrences. These analyses generated two similar gold potential maps having as positive evidence the presence of the mineralised unit and correlative sequences, Ca-phyllites and ultrabasic metavolcanic rocks; the proximity to basanite metavolcanic rocks, northeast brittle-ductile strike-slip or normal shear zones and north-south fractures; geochemical anomalies of silver, arsenic, lead, copper, chromium and nickel; and the presence of gamma-ray U/K ratio signatures between 0.105 and 0.151.