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Soil susceptibility mapping as a proxy for exploration

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Within the framework of a Eu funded geological mapping program in Ghana, hand field magnetic susceptibility measurements have been performed to allow petrographical comparison between similar outcrop facies. This method allowed identifying varying lithologies of similar facies in north-western Ghana (Bole area). It completed geological observations, petrographical and geochemical analyses to facilitate geological mapping.

Another experiment was tested on a more weathered area in the southwestern zone of Bogoso marked by a more tropical climate. Susceptibility measurements revealed only the level of weathering. We therefore replaced such method by applying hand field susceptibility measurements on collected soil samples for soil geochemistry.

Around 3000 measurements were done on a 0.5° square map. Magnetic susceptibility signal was therefore used as a proxy for mapping and showed more consistency with radiometric images rather than aeromagnetic images. This method revealed a good agreement with petrographical, even though on weathered rocks, field observations.

Comparison of these results with soil geochemical analyses also revealed good consistency with the main mineral anomalies offering the possibility to use such tool as a proxy for mineral exploration.