

Categorical and multiple indicator kriging – are we ignoring the geology?

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ABSTRACT

The binary indicator coding of assay and lithological data according to a single criterion or multiple criteria is a powerful technique for representing mineralised shapes through the modelling of probabilities. This can be as simple as using a single indicator to model the probability of occurrence of a condition, usually a grade threshold or a lithology, but it can also be used with a number of categories. Case studies are presented to show the power of this approach, where the geological controls on mineralisation or on the distribution of a rocktype or alteration, often coupled with mineralisation, are unclear. The categorical approach is often used as a de facto grade filter in disseminated or stockwork mineralisation. The ultimate expression of the indicator formalism is in multiple indicator kriging (MIK) where a conditional distribution of probabilities is generated for each estimation panel. This has applications in recoverable resource estimation, as the input for continuous or categorical simulation, where the distribution of sample grades is multimodal, or when there are superimposed mineralisation events with different orientations. However, in some cases MIK is being used as an excuse for ignoring a quality geological interpretation. Examples from the public domain show the abuse of the categorical and MIK approaches to modelling probabilities, together with a plea for greater consideration of the geology.