

## **OPTIMAL SAMPLING USING GEOSTATISTICAL AND GEOMETRICAL TARGET FUNCTIONS**

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A method is presented for optimizing additional sampling locations to an existing set of sites. This is a common problem in environmental remediation scenarios: After an initial survey sampling campaign geostatistical methods can be applied to calculate and model variograms, to estimate contaminant concentration and give some quantitative measure of uncertainty. Various criteria can be defined for selecting additional sampling locations: reduction of estimation error, sampling subareas with high contents and/or high local variability, reduction of remediation costs and geometrical criteria which equalize the shape and range of influence of samples. Starting with a Voronoi-tessellation of an existing sample pattern a simulated annealing approach is proposed and demonstrated as a tool for optimizing the location of additional samples. Multiple optimization criteria are combined to create a target function which is has to be minimized. The method is illustrated by application to a contaminated industrial waste site.