

“A comparison of Krigging Methods for well contaminates in the Tampa Bay region of Florida”

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Abstract

Kriging is a statistical technique that uses semi-variograms to produce a continuous surface from point data and provide an estimate for unsampled locations. Kriging will provide a means of interpolating water quality values for locations not sampled using knowledge about the underlying spatial relationships in a data set. This study aims to predict contamination wells using different kriging methods such as block, universal, ordinary, disjunctive, probability, indicator, co-kriging, and simple kriging to determine which method is optimal in predicting contamination of wells. Each Methods performance was assessed by calculating the proportion of sites that were misclassified as non-contaminated when they were actually contaminated and vice-versa. The methods were validated with a subset of wells not included in the original simulation. The study looked at nine organic and inorganic contaminates (viz: Benzene, EDB, MTBE, DBCP, Bromacil, Arsenic, Nitrates, PCE and TCE) found in various types of wells in the Tampa Bay region. Comparisons of the various methods were made using ArcGIS, JMP, GS+, and MAPCALC. Preliminary results show that there are considerable differences in prediction of contaminate potential when different kriging methods were used. This study will provide a basis for future comparisons of vulnerability maps to the well contamination.