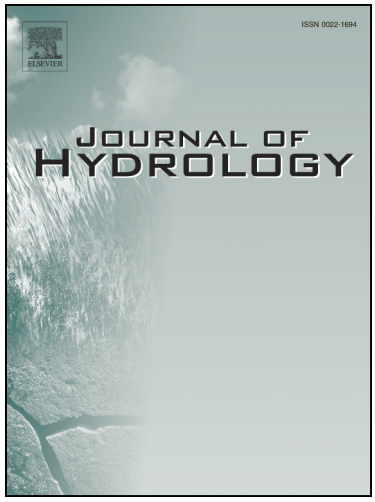

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Including Land Use Information for the Spatial Estimation of Groundwater Quality Parameters – 2. Interpolation Methods, Results, and Comparison.

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Abstract

Two dominant processes determine solute concentration in groundwater: vertical infiltration and horizontal advection. The goal of this paper is to incorporate both processes into a geostatistical model for spatial estimation of solute concentrations in groundwater. A multivariate copula-based methodology is demonstrated that considers infiltration via the marginal distribution and solute transport via the multivariate spatial dependence structure.

The novel approach is compared to traditional methods as Ordinary- and External Drift Kriging. Leave-one-out cross-validation demonstrates that the novel approach estimates better both in concentration and in probability space, and improves the quantification and quality of uncertainty. The gain in uncertainty reduction is equivalent to at least a few hundred additional observations when Ordinary Kriging was used.

Both censored and not-censored measurements are included. An ideal neighborhood size is estimated via cross-validation. The methodology is general and can incorporate other kinds of secondary information. It can be

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