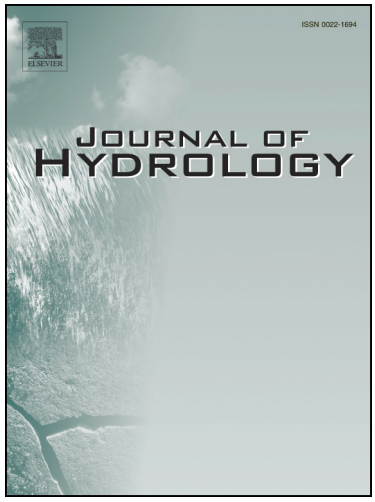

Research papers

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Using solute and heat tracers for aquifer characterization in a strongly heterogeneous alluvial aquifer

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Abstract

A test using Rhodamine WT and heat as tracers, conducted over a 78 day period in a strongly heterogeneous alluvial aquifer, was used to evaluate the utility of the combined observation dataset for aquifer characterization. A highly parameterized model was inverted, with concentration and temperature time-series as calibration targets. Groundwater heads recorded during the experiment were boundary dependent and were ignored during the inversion process. The inverted model produced a high resolution depiction of the hydraulic conductivity and porosity fields. Statistical properties of these fields are in very good agreement with estimates from previous studies at the site. Spatially distributed sensitivity analysis suggests that both solute and heat transport were most sensitive to the hydraulic conductivity and porosity fields and less sensitive to dispersivity and thermal distribution factor, with sensitivity to porosity