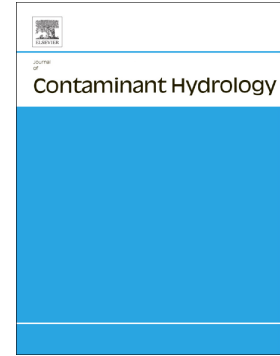


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# A DATA PARSIMONIOUS MODEL FOR CAPTURING SNAPSHOTS OF GROUNDWATER POLLUTION SOURCES

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## ABSTRACT

Presented herein is a data parsimonious model for identification of regional and local groundwater pollution sources at a reference time employing corresponding fields of head, concentration and its time derivative. The regional source flux, assumed to be uniformly distributed, is viewed as the causative factor for the widely prevalent background concentration. The localized concentration-excesses are attributed to flux from local sources distributed around the respective centroids. The groundwater pollution is parameterized by flux from regional and local sources, and distribution parameters of the latter. These parameters are estimated by minimizing the sum of squares of differences between the observed and simulated concentration fields. The concentration field is simulated by a numerical solution of the transient solute transport equation. The equation is solved assuming the temporal derivative term to be known a priori and merging it with the sink term. This strategy circumvents the requirement of dynamic concentration data. The head field is generated using discrete point head data employing a specially devised interpolator that controls the numerical-differentiation errors and simultaneously ensures micro-level mass balance. This measure eliminates the requirement of flow modeling without compromising

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