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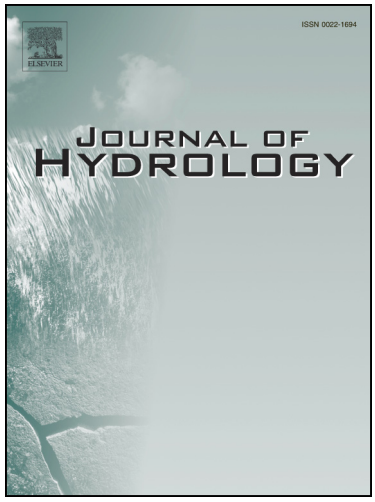

Research papers

Estimating anisotropic heterogeneous hydraulic conductivity and dispersivity in a layered coastal aquifer of dakshina kannada district, karnataka

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ACCEPTED MANUSCRIPT

ESTIMATING ANISOTROPIC HETEROGENEOUS HYDRAULIC CONDUCTIVITY AND DISPERSIVITY IN A LAYERED COASTAL AQUIFER OF DAKSHINA KANNADA DISTRICT, KARNATAKA

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Abstract

The solution for the inverse problem of seawater intrusion at an aquifer scale has not been studied as extensively as forward modeling, because of the conceptual and computational difficulties involved. A three-dimensional variable-density conceptual phreatic model is developed by constraining with real-field data such as layering, aquifer bottom topography and appropriate initial conditions. The initial aquifer parameters are layered heterogeneous and spatially homogeneous that are based on discrete field measurements. The developed conceptual model shows poor correlation with observed state variables (hydraulic head and solute concentration), signifying the importance of spatial heterogeneity in hydraulic conductivity and dispersivity of all the layers. The conceptual model is inverted to estimate the anisotropic spatially varying hydraulic conductivity and the longitudinal dispersivity at the pilot points by minimizing the least square error of state variables across the observation wells. The inverse calibrated model is validated for the hydraulic head at validation wells and the solute concentration is validated with equivalent

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