

GIS-Finite Source Contaminant Migration Model (GIS-FiSCOMM)

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Abstract. Although surface water has been the primary source of drinking water in the United States, the population growth in urban centers is causing the demand for water to grow closer to surface water supply capacity. Many urban areas in this situation are becoming dependent on groundwater. This fact has attracted the attention of water suppliers and policy-makers to the need to protect groundwater resources, which implies that contaminant sources have to be identified and characterized. Then there is the need for quantitative estimation of the transport and fate of contaminants to sensitive locations. Herein, a newly developed GIS-Finite Source Contaminant Migration Model (GIS-FiSCOMM) is proposed as an additional response to this need. Through the use of GIS, the methodology introduces spatial variability of groundwater movement and geological characteristics, to an analytical solution of the advection-dispersion equation (ADE) for instantaneous parallelepiped sources. Results of the model from four different study sites in California indicate not only the reliability of the methodology but its easy-to-use GIS-interface. GIS-FiSCOMM, which is completely developed in ArcGIS, will enhance the ability to analyze the impacts and risks from groundwater contamination.

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