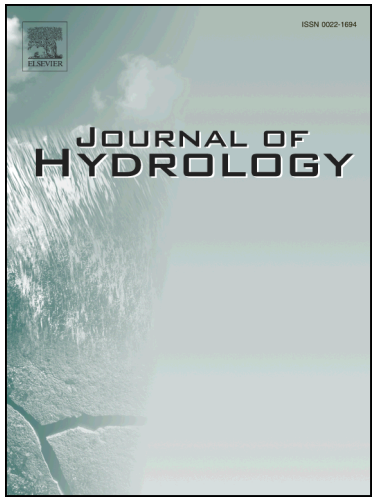

Research papers

Quantifying rainfall-derived inflow and infiltration in sanitary sewer systems based on conductivity monitoring

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Quantifying rainfall-derived inflow and infiltration in sanitary sewer systems based on conductivity monitoring

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Abstract: Quantifying rainfall-derived inflow and infiltration (RDII) in a sanitary sewer is difficult when RDII and overflow occur simultaneously. This study proposes a novel conductivity-based method for estimating RDII. The method separately decomposes rainfall-derived inflow (RDI) and rainfall-induced infiltration (RII) on the basis of conductivity data. Fast Fourier transform was adopted to analyze variations in the flow and water quality during dry weather. Nonlinear curve fitting based on the least squares algorithm was used to optimize parameters in the proposed RDII model. The method was successfully applied to real-life case studies, in which inflow and infiltration were successfully estimated for three typical rainfall events with total rainfall volumes of 6.25 mm (light), 28.15 mm (medium), and 178 mm (heavy). Uncertainties of model parameters were estimated using the generalized likelihood uncertainty estimation