

GIS를 이용한 기저-유출 바탕의 수문모델

Store-Release based Distributed Hydrologic Model with GIS

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요 지

Most grid-based distributed hydrologic models are complex in terms of data requirements, parameter estimation and computational demand. To address these issues, a simple grid-based hydrologic model is developed in a geographic information system (GIS) environment using storage-release concept. The model is named GIS Storage Release Model (GIS-StoRM). The storage-release concept uses the travel time within each cell to compute howmuch water is stored or released to the watershed outlet at each time step. The travel time within each cell is computed by combining the kinematic wave equation with Manning's equation. The input to GIS-StoRM includes geospatial datasets such as radar rainfall data (NEXRAD), land use and digital elevation model (DEM). The structural framework for GIS-StoRM is developed by exploiting geographic features in GIS as hydrologic modeling objects, which store and process geospatial and temporal information for hydrologic modeling. Hydrologic modeling objects developed in this study handle time series, raster and vector data within GIS to: (i) exchange input-output between modeling objects, (ii) extract parameters from GIS data; and (iii) simulate hydrologic processes. Conceptual and structural framework of GIS StoRM including its application to Pleasant Creek watershed in Indiana will be presented.

Keywords : Distributed hydrologic models, GIS, GIS-StoRM, DEM, NEXRAD

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