

**An evaluation of Geographical Information Systems
for
surface water studies in the Badia region of Jordan**

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Abstract

Three applications of Geographical Information Systems for surface water studies in the Badia region of Jordan are presented. In the first application, a Digital Elevation Model (DEM) of the study area was generated from the available contour maps. The channel drainage network was enforced into the created DEM to ensure accurate emplacement of the extracted drainage network. The channel drainage network was extracted from the DEM at a threshold value of 250 pixels. At this threshold, the drainage density of the extracted channel network is equivalent to the wadis network on the topographic maps

In the second application, a hydrologically-oriented GIS database was developed. The database aimed to provide detailed description of the watershed characteristics and the hydrological processes relevant to surface water studies. A menu-driven application was built on the database to extract and analyse the database information at the sub-watershed level.

The third application involved building a spatial model for generating surface runoff hydrographs from the rainfall data. The model applies GIS data structure and the raster processing techniques to simulate the rainfall-excess generation and flow routing processes. The distributed structure of the model allows for representing the hydrological processes and modelling the watershed response at the level of details that fits the resolution of the available data.