

Flash Flood Analysis and Risk Assessment of Wadi El-Ibrahimi using GIS, Eastern of Assiut City, Egypt

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Flash flood is an example of the unfortunate coincidence of environmental extremes (extremely intensive precipitation). It could be defined as a rapid flooding of low-lying areas that is caused by the intense rainfall associated with a thunderstorm, or multiple training thunderstorms. Runoff is the one of the components forming the water cycle and might be useful water resource to sustain human life. There have been efforts to estimate, analyze, and predict the runoff to make stable water use and flash flood control. Runoff estimation in ungauged catchments is a challenge for the hydrological engineers and planners. For any hydrological study on an ungauged watershed, a methodology has to be appropriately selected for the determination of runoff at its outlets. Several methods have been used to estimate the runoff from a watershed. Geographic Information System (GIS) and Remote Sensing techniques seem to be accurate and sensitive when together are been used in this approach. This study employed grid-based Curve Number (CN) method through the GIS drainage analysis operating on DEM to estimate surface runoff depth in Wadi El-Ibrahimi catchment, Assiut, Egypt. The CN is a key factor in determining runoff in the SCS (Soil Conservation Service) based hydrologic modeling method. It considers parameters like slope, vegetation cover, and area of catchments. The curve number values from NRCS standard tables were assigned to the intersected hydrologic soil groups and land use maps to generate CN values map. Effect of slope on CN values and runoff depth was determined. Topographic map, soil map and land use map data were used. These collected data were used in preprocessing in the Arc GIS 9.3 and Arc Hydro 9 for computing Hydrologic parameters. GIS software was used for data generation, storage, manipulation and integration to estimate the curve number from which the daily runoff was estimated. Surface storage volume and initial abstraction were also calculated.