Abstract

Surface runoff is a major problem in urban catchments; its generation is always related to the amount of effective rainfall dropped over the surface, however in urban catchments the process is considerably altered by the emergence of impervious areas. In this study the Soil Conservation Service – curve number (SCS-CN) and the Green–Ampt loss methods were used in rainfall-runoff modelling in the Zaafrania urban catchment which is located in Annaba city in the north east of Algeria. The two loss methods were carried out within Hydrologic Engineering Center – Hydrologic Modelling System (HEC-HMS), the choice of the appropriate method for simulating runoff hydrographs in the study area was made by comparing the simulated hydrographs versus observed data using visual inspection and statistical analysis. The results indicate that SCS-CN loss method fit better in the case of 100 years return period $NSE$ (0.462) than in 10 years $NSE$ (0.346) and the results of calibration of Green–Ampt loss method for the 100 years return period $NSE$ (0.417) provide best fit than the case of 10 years $NSE$ (0.381). Furthermore, the results of both return periods (10 and 100 years) of SCS-CN loss method provide best fit than the results of return periods (10 and 100 years) of Green–Ampt loss method. It could be concluded that SCS-CN method is preferred to the Green–Ampt method for event based rainfall-runoff modelling.

Key words: Green–Ampt method, HEC-HMS method, rainfall-runoff modelling, SCS-CN, surface runoff, urban catchment