

Abstract

Rainfall events recorded in the last decade in arid areas have created deadly torrential floods. Climate change combined with anthropic actions has increased surface runoff, causing considerable human and material damages. The arid areas Characterizing southern Algeria have few hydrometric information to quantify the phenomenon. It is in this specific context, based on sparse information we will approach the phenomenon by a suitable modeling.

This work is used to quantify the flooding hazard by the hydrological approach modeling through the case of the wadi Deffa watershed that splits the town of El Bayadh by pressing the construction of intensity-duration-frequency curves. In the lack of flow data the modeling IDF curves was made for two groups of data: the annual maximum series (SMA) and partial duration series (SDP). After calculating the probability given rain and study the morphological properties of the basin, the transformation of the runoff at the outlet of the watershed goes through two levels. The first is the runoff production and the second is the transfer of this runoff through the basin, the lack of hydrometric measurements (real flows) necessary to look for models require no calibration, the SCS-CN model is retained for the production function and the SCS Unit hydrograph model, Clark Unit hydrograph for the transfer function. The second estimate is made by the method of synthetic hydrogramme also called isochronous method.

The second allows the construction hydrographs flood of different frequencies. Its application requires three important parameters called climate exponent from a study of short duration rainfall, the maximum daily rainfall and flow deficit.

Keywords: floods, Watershed, wadi Deffa, IDF curves, rainfall-runoff modeling, SCS-CN, SCS Unit hydrograph, Clark Unit hydrograph, synthetic hydrograph method.