

ABSTRACT

Rainfall-Runoff models such as Hydrologic Modeling System (HEC-HMS), Stormwater Management Model (SWMM), etc., are used for predicting the hydrologic response of watersheds. An important issue that must be addressed by all users of these models is the estimate of an appropriate level of watershed subdivision for simulating runoff. The size and number of subwatersheds can affect a watershed modeling process and subsequent results. The objective of this research herein, in response to TxDOT Problem Statement 0-5822, "Subdivision of Watershed for Modeling," is to evaluate the effect of various levels of watershed subdivision on simulated runoff hydrographs. HEC-HMS program was applied to five watersheds in Central Texas that varied from 12.3 to 166 square miles. They are divided into location modules: Austin, Dallas, Fort Worth, San Antonio, and Smallrural areas. In this study, the models were intentionally left uncalibrated, thus the subdivision specification is the result of application of engineering hydrologic modeling practice, as would occur when modeling ungaged watersheds. The results of the HEC-HMS analysis indicated that variation in the total number of subwatersheds had very little effect on runoff hydrographs. Also, there is no consistent pattern on whether lumped or multiple subbasins produce superior results; thus, the appropriate level of subdividing a watershed is difficult to determine.