

Project Information

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Research Administration

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<http://www.scdot.scltap.org/>

This final report is available online at:
<http://www.scdot.scltap.org/projects/completed/>

South Carolina Unit Hydrograph Method Applications Manual

The need for improved hydrologic methods is well recognized in the profession. Issues come from over prediction and modifications made to simplify calculations. The SC UH Method deals with these issues. The inclusion of unit hydrograph Peak Rate Factors based on land use in the watershed and curve number modification for rainfall duration less than 24 hours gives this method an advantage in determining design flows and volumes.

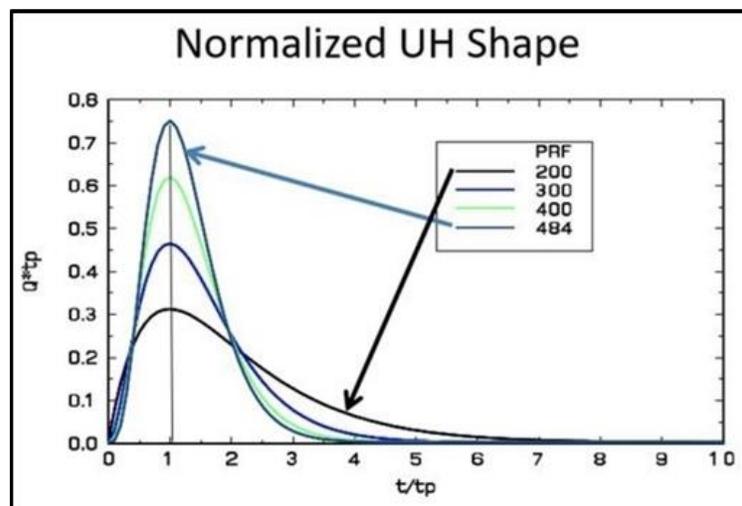


Figure 1. Variation of UH Shape with Different PRF Values

Problem

Dr. Michael E. Meadows at the University of South Carolina developed the South Carolina Unit Hydrograph Method (SC UH Method) and documented the method in a series of three reports that were published in 1991. This method was developed from field data in South Carolina and provided an improved technique for estimating peak flows and hydrographs in South Carolina. The method is particularly suitable for small to medium sized drainage basins where the Rational Method and USGS regression equations are not always applicable. Since the original publications (1991) Dr. Meadows has made improvements and updates to this method that have yet to be documented in a publication. To

assure that the South Carolina Unit Hydrograph Method can be appropriately applied there is a need to develop a guidance manual that includes the latest updates and improvements.

Research

This project updates and illustrates the South Carolina Synthetic Unit Hydrograph Method (SC UH Method). A key parameter is the peak rate factor (PRF) that relates to UH shape and proportion of runoff volume under the rising limb. Land use specific values for PRF resulted from multiple stormwater management studies that verified the SC UH Method and PRF values. At each study watershed, rainfall and streamflow data were collected and used to calibrate model parameters by adjusting UH PRF and time

