TI: Hydraulics of a Catastrophic Flood in a Small Central Appalachian Watershed

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AB: An orographic thunderstorm on 9 August 2003 produced catastrophic flooding in the 2.1 square kilometer Saul's Run watershed in the Valley and Ridge physiographic province of West Virginia. Hydraulic studies of the Saul's Run flood are based on a detailed survey of high-water marks (HWM) and analyses using a 2-D, depth-averaged unsteady flow model (Telemac 2-D). Estimated peak discharge of the 9 August 2003 Saul's Run flood at 1 sq. km. spatial scale was approximately 20 cms, resulting in a unit discharge peak of 20 cms per sq. km. Peak discharge analyses in small, high-gradient streams, like Saul's Run, are complicated by variability in the free water surface at peak discharge in both longitudinal and cross-sectional directions. Model analyses and analyses of HWM are used to characterize the longitudinal variation of 2-D flow features of the Saul's Run flood and develop procedures for rapid response monitoring of extreme floods. Model analyses are also used to examine the longitudinal variation in shear stress and unit stream power and their relation to fluvial impacts of the flood.

DE: 1821 Floods
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