



## Extreme Flooding in Urban Environments: Analyses from the Baltimore Ecosystem Study

K.L. Meierdiercks (1), J.A. Smith (2), G. Villarini (1), A.J. Miller (3), and M.L. Baeck (1)

(1) Princeton University, Civil and Environmental Engineering, Princeton, United States, (2) Princeton University, Civil and Environmental Engineering, Princeton, United States (jsmith@princeton.edu), (3) University of Maryland Baltimore County, Department of Geography and Environmental Systems, Baltimore, Maryland, U.S.A.

Empirical and modeling studies of extreme flooding for small urban watersheds are carried out for the experimental watersheds of the Baltimore Ecosystem Study, a component of the US National Science Foundation's Long-Term Ecological Research (LTER) program. Analyses focus on the densely monitored Dead Run watershed, which has a drainage area of 14.3 km<sup>2</sup>. Modeling analyses utilize comprehensive digital data sets characterizing urban infrastructure of the watershed, including the storm drain network and stormwater detention facilities, as well as high-resolution data sets on impervious cover. Three major flood events in Dead Run are analyzed to characterize the role of urbanization for extreme flood response. Two of these events (7 July 2004 and 28 June 2005) are produced by organized thunderstorm systems and one (18 September 2003) is produced by Hurricane Isabel. Weather radar observations, storm total rainfall observations from a dense urban rain gage network, and disdrometer observations of raindrop size distributions are used to examine the spatial and temporal heterogeneity of flash flood producing rainfall.