

Effects of Urbanization on Stream Flashiness in the I-85 Corridor of the Southeastern Piedmont

Eli B. Koslofsky

Affiliation: Master's Student, Georgia State University

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Abstract. Increased urbanization, and other changes in land-use, can have significant effects on stream hydrology within a watershed, including large fluctuations of flow in streams referred to as “stream flashiness”. Increased stream flashiness has numerous consequences, including water quality degradation and destruction of aquatic habitats. With the sprawled out suburban landscape which has come to characterize southeastern cities, investigation of these effects is increasingly important, especially in the expanding I-85 corridor of the Piedmont region. The concept that urban development has a significant effect on the hydrology of a watershed has been understood for quite some time, however the complexity of urban/suburban landscapes and the permeability of the different types of surfaces found within them makes it difficult to predict the exact effects. Additionally, actually defining what constitutes a flashy stream can also be ambiguous, as stream flashiness has no set definition. This paper explores how flashy the streams actually are, and to what extent the surrounding conditions (i.e. land-cover/impermeable surfaces) affect this. This was achieved by analyzing three aspects of flow regime that could be used to assess stream flashiness: magnitude, frequency, and rate of change. Preliminary results indicate that while several of our urbanized streams demonstrate increased stream flashiness than their more rural counterparts, it is clear that other factors have a large influence on streamflow dynamics. Examples of such factors may include connectivity of impervious surface or urban growth factors unique to individual cities.