

Southeastern Section—56th Annual Meeting (29–30 March 2007)

Paper No. 3-2

Presentation Time: 8:20 AM-8:40 AM

STREAM CHANNEL RESPONSES TO URBANIZATION IN UPSTATE OF SOUTH CAROLINA

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The stream channel morphology in an area depend on several factors including the land cover, amount of impervious surface area, slope, climate, precipitation, and type of vegetation that make up the watershed. Most urban areas today experience severe flooding problem in response to even small rainfall events resulting in severe bank erosion that directly affects home owners as well as in-stream aquatic organisms equally. Other common problems observed include changes in in-stream nutrient dynamics, increased sediment load, poor water quality, and degradation and eventual loss of habitat and riparian vegetation. In order to understand how urbanization affects the stream geomorphology, a total of eleven stream-reaches that were at different stages of urbanization were selected from within Enoree River Basin in the Piedmont region of South Carolina. The drainage areas of these stream reaches fall within Greenville County, with the city of Greenville experiencing more than doubling of population within the last 50 years. These watersheds also range in characteristics from nearly completely forested to nearly completely urbanized. At each stream reach, measurements of detailed channel cross section at bank-full and flood levels and riparian and buffer vegetation characteristics were made. Because of variations in watershed sizes, we used three ratios: incision ratio, width/depth ratio, and entrenchment ratio to study the streams. These ratios were then plotted against percentage of imperviousness in the watershed. The results show that the relationship is not always straight forward as expected (positive/negative correlation). Several factors such as presence or absence of rip-raps, bank stabilization, lakes/dams, and woody debris modify the channel responses. The role of historic landuse practices in this area also seems to be very important and needs to be taken in to account in order to completely explain the channel behavior observed today.

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[General Information for this Meeting](#)

Session No. 3

[Fluvial Geomorphology and Watershed Studies in the Eastern United States](#)

Hyatt Regency Savannah on the Historic Riverfront: Scarborough 4

8:00 AM-12:00 PM, Thursday, 29 March 2007

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