

Southeastern Section - 57th Annual Meeting (10–11 April 2008)

**Paper No. 31-10**

**Presentation Time:** 1:30 PM-5:30 PM

**A STUDY OF HYDROLOGICAL IMPACTS OF LAND COVER CHANGE  
USING NLCD - EFFECT OF STUDY AREA SCALE ON THE MAGNITUDE  
OF IMPACTS**

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Land use change profoundly affects ecosystem health, particularly in increasingly urbanizing watersheds. The percentage of change as well as the spatial distribution of different types of land cover within the watershed greatly impacts runoff volume. Although the relationship between surface runoff and urban cover has received considerable attention, the Piedmont region of South Carolina is of particular interest because of the higher intensity of development at the headwaters. Higher amount of headwater imperviousness and the loss of riparian buffer cause major flooding downstream. Hydrological impacts of these changes on the river basin scale may seem relatively insignificant, but impacts become more pronounced and dramatic at sub-watershed scale. This project examines the impact of land use change on runoff volume as well as the impact of study area scale on the magnitude of impacts in the Enoree River Basin, South Carolina. The National Land Cover Data (NLCD) for 1992 and 2001 were used in a Long-Term Hydrologic Impact Assessment (L-THIA) model to calculate the runoff values. Runoff volumes and land use data from 1992 and 2001 were analyzed at three different spatial scales: The entire river basin scale; the sub-watershed scale; and 100m riparian buffer zone scale. Mountain, Brushy, Rocky, and Gilder Creek watersheds located within the Enoree River Basin were chosen for this study since they represent varying levels of urban development for the duration of the study. The land cover of Brushy Creek is primarily urban, showing little change from 1992-2001. At the sub-watershed scale, the land cover has become increasingly urban in Mountain Creek, Gilder Creek, and Rocky Creek watersheds, in ascending order. Results show major trends towards urbanization: decreases in forested, moderate increases in high-density residential and large increases in low-density residential land. Average annual runoff volume increases with the changes in land use.

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[General Information for this Meeting](#)

Session No. 31--Booth# 21

[Undergraduate Research Session \(Posters\) II](#)

Hilton Charlotte University Place: University Lake Ballroom Suites A, B, C

1:30 PM-5:30 PM, Friday, 11 April 2008

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