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CARLA MEJIAS[1], VALERIE NIEVES[1], ERESHA DESILVA[2], ALLISON BABELAY[3], GREGORY P. LEWIS[3], AND C. BRANNON ANDERSEN[3]. Universidad Metropolitana[1], Texas A&M University[2], and Furman University[3]-Spatial variations of stream chemistry in three watersheds of varying urban land cover in northwestern South Carolina.

The piedmont of the southeastern United States is experiencing rapid urban development, which is likely to influence the biogeochemistry of streams and rivers. We examined relationships between stream chemistry and land cover in three sub-watersheds of the Enoree River in the upper piedmont of South Carolina. Percent land cover in these sub-watersheds ranged from minimal (3.7%) to moderate (50%). In two of the sub-watersheds (Beaverdam Creek and Rocky Creek), urban land cover was concentrated in the headwaters, while the third sub-watershed (Buckhorn Creek) was mostly forested with some residential areas at lower elevations. During summer 2005, we collected water samples for chemical analyses from over 40 locations in the Rocky Creek watershed, 20 locations in the Beaverdam Creek watershed and from 7 locations in the Buckhorn Creek watershed. In the Beaverdam and Rocky Creek watersheds, the highest total dissolved nitrogen, nitrate, ammonium, sulfate, and chloride concentrations occurred in the urbanized headwaters. In contrast, the Buckhorn Creek watershed had low solute concentrations in the forested headwaters and higher concentrations in downstream residential areas. Overall, nitrate concentrations were highest in the Rocky Creek watershed (up to 7.2 mg/L), lower in the Beaverdam Creek watershed (<3.2 mg/L), and lowest (<0.60 mg/L) in the Buckhorn Creek watershed. In all three watersheds, the lowest nitrate concentrations occurred downstream of artificial ponds (impoundments), and phosphate concentrations (typically <0.10 mg/L) were not significantly higher in urban than rural areas. In the future, we will examine causes of high solute concentrations in urban streams in the southeastern piedmont.