



## USDA-CSREES 2007 National Water Quality Conference

### Phosphorus delivery from streams draining poultry operations in the upper Etowah River basin, Georgia

A CSREES-funded monitoring program was initiated in January 2005 to support watershed-scale modeling and evaluation of nutrient trading opportunities for phosphorus (P) in the upper Etowah River basin in Georgia. Twelve first-order streams were instrumented with H-flumes, autosamplers, and rain gages. Nine streams drain agricultural watersheds that are predominated by poultry operations but differ in terms of land use history, best management practices, soil test P concentrations, and other conditions. The remaining three streams drain forested watersheds. Monitoring consists of biweekly grab sampling coupled with stormchasing. Overall, median base flow and storm flow concentrations of dissolved reactive P (DRP) and total P (TP) in agricultural streams were roughly 7 and 28 times greater, respectively, than in forested streams. In agricultural streams, median base flow and storm flow concentrations of DRP and TP varied by as many as two and three orders of magnitude, respectively. During both base flow and storm flow conditions, DRP in agricultural streams constituted 3.0 to 90 percent of median TP concentrations. The highest TP concentrations in agricultural streams were observed in watersheds where the highest soil test P concentrations were observed. For a subset of agricultural streams where annual TP loads have been estimated, unit area loads range between 0.22 and 2.6 kg/ha/yr. When normalized by flow depth, these unit area loads convert to 0.004 and 0.034 kg/ha/yr/cm. Further P load estimation will be performed and related to variables including suspended sediment, antecedent moisture, time since poultry litter application, and water sample handling procedures.

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