

# Tracking the Influence of Septic Systems on Microbial Water Quality in Suburban Watersheds of Georgia

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**Abstract.** Fecal pollution of surface waters is a critical public health concern, especially in areas where surface water serves as the primary source of drinking water. Non-point sources of fecal pollution such as septic systems, agricultural runoff and wildlife have come under scrutiny due to the widespread nature of pollution incidents and overall stricter controls over point sources. There is a growing urgency to identify significant sources of fecal inputs to streams to inform watershed management efforts. The goal of this study was to determine the contribution of septic systems to fecal pollution loads in urbanizing watersheds. Water samples, collected from 24 well characterized watersheds with varying septic system density, were analyzed for fecal indicator bacteria to quantify pollution levels and identify seasonal trends. Pollutant sources were then tracked using *Bacteroides* sp. genetic markers to isolate and quantify the contributions of septic systems (humans), livestock and wildlife to fecal pollution. Results indicate statistically significant interaction between septic density and season for enterococci count ( $p = 0.005$ ) and stream yield ( $p = 0.04$ ). In general, the frequency of detection of human specific marker, which represents inputs from septic systems, was significantly greater in high density septic impacted watershed than low density watershed. Also, human marker abundance was statistically different between high density and low density watershed, indicating the influence of septic systems in high density watershed. This study will aid efforts to account for the influence of septic systems at the watershed level.