

Septic Systems' Effect on Stream Nitrogen and Fecal Bacteria Concentrations in Metropolitan Atlanta

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Twenty four watersheds with varying septic density ranging from 8 – 373 septic systems/km² were monitored for nitrogen and bacteria concentrations under baseflow conditions over a three-year period. Total nitrogen and nitrate concentrations increased linearly with increasing OWTS density above a threshold of about 75 OWTS km⁻². Dual-isotope analysis of NO₃⁻ revealed that stream NO₃⁻ originated predominately from septic systems in high-density watersheds and from a combination of animal waste and perhaps organic nitrogen in low-density watersheds. The levels of human-associated HF183 marker, as well as total and ruminant *Bacteroidales*, were quantified using quantitative polymerase chain reaction. Human-associated *Bacteroidales* yield was significantly higher in high-density watersheds compared to low-density watersheds and was significantly correlated with septic density in spring and summer seasons. The human marker was also positively correlated with the total *Bacteroidales* marker, suggesting that the human source input was a significant contributor to total fecal pollution in the study area.