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The effects of beaver dams on nutrient transport in urban streams

Many urban streams, including those in the Atlanta area, suffer from high inputs of nutrients and highly labile bioavailable dissolved organic carbon (BDOC) from stormwater runoff and human and animal waste. These nutrients and carbon are easily used by microbes and can fuel ongoing problems with microbial growth in urban streams, including that of human pathogens. Beaver populations are rebounding throughout the US and seem well adapted to living in urban streams. Beaver-created ponds and wetlands provide ideal sites for microbial processes that could take up, transform, and remove nutrients and labile organic carbon from urban streams, reducing the risks of higher microbial loads and pathogens. We have completed monthly longitudinal sampling through urban beaver wetlands for over 3 years. We saw signals of nitrogen transformation or removal through the beaver ponds on many days at these sites. We saw consistently high BDOC in the upstream samples, consistent with patterns seen in other urban streams, and a decrease of BDOC in the downstream samples, suggesting removal of labile organic carbon can occur in beaver ponds or wetlands. These patterns demonstrate the potential for beaver activity to help restore water quality in urban streams and suggest that urban watershed managers should consider allowing beavers to remain in these systems or even fostering their colonization of impacted streams.