# LONG-TERM TRENDS IN THE UPPER OCONEE WATERSHED USING THE UPPER OCONEE WATERSHED NETWORK'S CITIZEN-SCIENCE DATA

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The Upper Oconee Watershed Network (UOWN) is an all-volunteer citizen-science organization that has monitored streams in the greater Athens, GA area for over 16 years. We measure a suite of chemical and biological parameters at up to 100 sites at least annually. In an effort to detect acute and chronic effects of stressors from development/urbanization we measure fecal coliform abundance (i.e. E. coli; acute stressors) and macroinvertebrate assemblages (chronic stressors) at a subset of these sites. Using data from 2001 to 2015, we assessed the trajectories and current status of biological integrity of streams in the Upper Oconee watershed. We evaluated potential long-term changes of a biotic index through time. In addition, we related chemical parameters that may be associated with observed changes in biotic indices for nine streams with varying degrees of impact from development throughout the Upper Oconee watershed. Overall, declines in the biotic index were evident for both the Middle Oconee and North Oconee watersheds. Six of the streams exhibited declining integrity scores; the remaining three streams exhibited slightly positive trajectories to no change over time. Poor biotic index scores were correlated with elevated nitrate and E. coli concentrations and specific conductance. Specific conductance was most strongly associated with declines in biotic index scores, suggesting that chemical pollution associated with urban environments is an important stressor of stream ecosystems. Streamwater pH was positively related to biotic index scores, indicating that lowered pH could negatively affect biotic communities. The trends in macroinvertebrate index scores suggest that stream health in the Upper Oconee watershed has generally declined since 2001. Though inferring the specific mechanisms driving decreased stream health with UOWN data is not possible, the patterns we found with nitrate, specific conductance, and E. coli suggest that chemical pollution is likely an important driver of these declines.

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