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Evaluating the influence of water chemistry on the fishes of the Broad River
basin.

Previous research in the Broad River basin of upstate South Carolina has suggested that changes in water chemistry associated with urban sprawl and human land use may significantly impact the diversity and abundance of the biota found in this habitat. In this study, we examined multiple aspects of the relationship between changes in water chemistry and changes in fish biota. We first compared species abundance, richness and diversity data with water chemistry data at a number of sites in the Broad River basin. Secondly, we investigated the effect of wastewater treatment plants (WWTP) located along these streams on water chemistry and the biota. Results indicated that dissolved oxygen (DO), PO₄, NO₃, and SO₄ appear to be the major factors that affect diversity at sites in the Broad River basin. We then studied the effect of naturally occurring low DO conditions. Hypothesizing that the morphology of the species would affect its ability to utilize surface oxygen in a low DO environment, two species exhibiting different head morphology were chosen for this part of our study. *Nocomis leptcephalus*, a commonly found species with a subterminal mouth, and *Clinostomus funduloides*, a species with a superior mouth, were collected from relatively pristine sites with high DO levels and transplanted to sites with high (6.5-8.3 mg/l), medium (6-6.5 mg/l), or low (0.9-1.6 mg/l) levels of DO. The low DO treatment resulted in significant mortality in both species. However, at more moderate levels of DO a trend was seen towards greater survivorship in *C. funduloides*.