

Effects of nutrients and riparian land use on algal and invertebrate communities in Coastal Plain streams of the Southeastern U.S.

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In 2001, the U.S. Geological Survey's National Water-Quality Assessment (NAWQA) Program began a series of eight ecological studies to characterize streams along gradients of agricultural land use across varied ecoregions. Twenty-nine Coastal Plain streams of the Southeastern U.S., were assessed as a part of the study in 2004 including the collection of water-quality, algal and invertebrate community, stream habitat, and basin and riparian land-use data. Multivariate analysis of biotic communities and correlational analysis of explanatory variables using the Primer statistical routine RELATE indicates that nutrient concentrations best explain the structure of algal communities collected from submerged woody debris (RTH) and fine-grained substrate (DTH). Invertebrate communities were best explained by geographic position of sampling location across the study area. Analysis of individual variables using the Primer routine BVSTEP found that nitrate nitrogen was the most explanatory of the nutrients analyzed ( $Rho = 0.46$ ;  $p < 0.001$ ) for DTH algae, whereas dissolved ammonia best correlated with RTH algae ( $Rho = 0.45$ ;  $p < 0.001$ ). The percentage of wetlands within 25 meters of the stream was the most correlated of land-use categories for DTH ( $Rho = 0.28$ ;  $p < 0.05$ ) and RTH ( $Rho = 0.38$ ;  $p < 0.01$ ) algal communities.

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