Title: Nutrient Enrichment in the Eastern Corn Belt Plains Ecoregion: A Multivariate Approach Linking Nutrients to Algae, Fish, and Invertebrate Communities

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Nutrient enrichment is one of five national-priority topics addressed by the U.S. Geological Survey's National Water-Quality Assessment (NAWQA) Program. Nutrient enrichment in rivers, lakes, and estuaries is causing substantial ecological and economic problems. The objective of this analysis was to document the relations of nutrient concentrations and load estimates to algae, fish, and invertebrate communities from 30 streams in the Eastern Corn Belt Plains Ecoregion. Nutrient samples were collected in June and in August, while algae, fish, and invertebrate communities were sampled in August. Detrended Correspondence Analysis (DCA) was used to determine site scores for the algae, fish, and invertebrate community data sets. Algae, fish, and invertebrate DCA site scores from the first axis were related to the nutrient concentration and load data sets, using Spearman rank correlation. Correlations among nutrient concentrations to the algal, fish, and invertebrate community site scores were low (r_s <0.47). Invertebrate community site scores had the highest correlations to nutrient concentrations and loads. Furthermore, nutrient load estimates consistently had higher correlations with site scores than the measured nutrient concentrations. Relations of algae, fish, and invertebrate communities to nutrients can differ across a nutrient gradient, so these differences need explored before indicator species can be identified.