

ORAL PRESENTATION

COMPARISON OF DIATOM-BASED INDICES OF WATER QUALITY FOR MID-CONTINENT (USA) GREAT RIVERS

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One hundred eighty-four periphyton and 174 phytoplankton samples from Midwest Great Rivers (Ohio, Mississippi, and Missouri rivers) were selected in a random stratified design to represent a gradient of environmental quality conditions from an original set of 393 unbiased sample sites. Water quality was inferred using 16 commonly used diatom taxonomic indices. These included indices developed in Europe and Japan for assessing biologic oxygen demand (saprobity), trophic status, and general pollution. Four new weighted-average models developed by calibrating diatoms to total phosphorus (TP) in the rivers were also used to infer TP at the sample locations. Inferred data from all indices were compared to a suite of water chemistry and watershed stressor variables to determine the ability of the indices to track environmental quality. Some of the indices developed in Europe and Japan performed satisfactorily as indicators of water quality conditions in the basin using periphyton or phytoplankton data. The weighted-average models correlated more strongly than the other indices with measured phosphorus. Weighted average models based on periphyton also correlated more strongly with water chemistry and watershed stressor variables.