Establishing consistent fish sampling methods for biological assessments on inter-state great rivers: A case study on the Upper Mississippi River.

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The use of Indices of Biotic Integrity (IBI) to assess aquatic waters has become an acceptable practice for many Clean Water Act (CWA) agencies. For states that share waters such as Minnesota and Wisconsin along the Mississippi River, the states' respective IBI's may show vastly different results. This could be related the agencies using different sampling protocols in these border waters. As part of the Environmental Monitoring and Assessment Program for Great River Ecosystems (EMAP-GRE), we conducted a study to quantitatively assess three fish sampling methods. We used a three-way, paired design using probabilistic and fixed sites on the Mississippi River along the Minnesota-Wisconsin border. These methods were independently developed by EMAP-GRE, Minnesota Pollution Control Agency (MPCA) and Wisconsin DNR (WDNR) for use on large to nominally great rivers. Primary differences included length and placement of transect sampled, boat speed, number of dippers/booms, and dip net mesh size. Results of program head-to-head comparisons show MPCA methods yielded significantly ($p<0.05$) greater fish abundance and species richness values than EMAP-GRE methods, but IBI scores were not significantly different. The comparison between EMAP-GRE and WDNR methods showed abundance, species richness, biomass, and IBI scores were significantly ($p<0.05$) higher for the EMAP-GRE method.