# Development of a Probability-Based Monitoring and Assessment Program for the Ohio River

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**Biographical Sketch of Author**

Erich Emery is an aquatic biologist and manager of ORSANCO's biological programs. His primary research efforts have focused on developing fish community-based assessment methods for the Ohio River, culminating in the recent development of the Ohio River Fish Index, a multi-metric tool for assessing fish community condition. His other areas of research have included the study of macroinvertebrate and fish community response to disturbance, influences of in-stream habitats on Ohio River fish, and temporal trends in Ohio River fish community condition. Erich began his career with ORSANCO in 1993.

**Abstract**

The great rivers of the central basin of the United States are the inland receiving waters for the majority of the Nation's heartland, are the link between small upland streams and the Gulf of Mexico, and have been burdened by long-term loading of nutrients, sediment, toxic chemicals as well as extensive habitat alterations. Achieving the capacity for States or ORSANCO to quantify the extent of impairments, ascertain the relative contribution of stressors to overall condition, and track trends in ecological condition, remains a challenge. The Clean Water Act (CWA) specifies that States and Tribes must report on the condition of the waters, describe temporal changes, and determine what factors or conditions bring about the changes. It is fiscally and logistically impossible to census a resource the size of the Ohio River in a timely fashion. As such, ORSANCO is investigating the utility of adopting some form of probability survey to serve as a more cost-effective approach to monitor using biological indicators. ORSANCO has received grants to examine the effectiveness of probability designs of various spatial densities, will be participating in EPA's EMAP-GRE (Environmental Monitoring and Assessment Program – Great River Ecosystems) program, and hopes to expand the scope of probability sampling beyond the mainstem Ohio River to include the lower reaches of the major tributaries to this river. Results from the first rounds of probability-based sampling will be presented as well as data collected following a targeted design that contributed to the overall approach to developing a probability design.

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