

Temporal Variation in Ohio River Macroinvertebrates: A Historical Rock Basket Comparison, 1960s to Present

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Biographical Sketches of Authors

Matt Wooten is an aquatic biologist for the Ohio River Valley Water Sanitation Commission (ORSANCO). Matt began his career with ORSANCO in 1999 and has served as a crew leader in the biological program the entire time. He has done extensive electrofishing work on the Ohio River and is currently the macroinvertebrate program lead. His work with macroinvertebrates has focused on the development of an Index of Biotic Integrity for the Ohio River. Prior to coming to ORSANCO, Matt worked the West Virginia District of USGS during the Kanawha/New River NAQWA program.

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, temporal trends in Ohio River fish community condition. Erich began his career with ORSANCO in 1993.

Brent Johnson is an aquatic ecologist with the Ecological Exposure Research Division of the U.S. Environmental Protection Agency. Since starting with EPA in 2003, Brent has worked as a Principal Investigator with the Ecosystem Research Branch. Brent came to EPA after earning his PhD from the University of Georgia. His primary research efforts have focused on developing assessment methods in streams and rivers for macroinvertebrates. Prior to coming to EPA, Brent also spent time employed the Florida Department of Environmental Protection and the Kentucky Division of Water.

Abstract

Collecting macroinvertebrates from the Ohio River has historically presented researchers with the challenge of collecting adequate samples. One method, rock basket artificial substrates, was utilized in the 1960's and 1970's. With this method, a steel basket (7" diameter, 11" long) was filled with 2 – 3 inch limestone aggregate and suspended by steel cable in 2 – 3 feet of water. The baskets were generally suspended from lock chamber walls, although other permanent structures, such as concrete water intakes, were also used. The objective of this study was to repeat these rock basket surveys in order to observe temporal trends within the macroinvertebrate community. Rock baskets were deployed in the same area (when possible) of the previous studies and remained in the water for a colonization period of six weeks. The macroinvertebrate communities were examined using to methods: (1) a draft index developed for Ohio River macroinvertebrates and (2) the Shannon-Wiener Community Similarity Index. Box and whisker plots are used to demonstrate the increase in macroinvertebrate index scores over time. These same trends are observed among the individual metrics of the index. The Shannon-Wiener index also produced higher values in the recent samples, indicating a more evenly distributed macroinvertebrate community. These results indicate marked improvement in the macroinvertebrate community over the past 35 years.