

A Robust Design for Great River Ecosystem Monitoring And Assessment

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Abstract

Great Rivers and mainstem reservoirs are complex trans-border resources that are difficult and expensive to monitor, assess and manage. The U.S. EPA Environmental Monitoring and Assessment Program (EMAP) is developing sampling and assessment methodologies applicable to Great River Ecosystems (GRE) through an ongoing five-year research project on the Garrison Reach and three associated mainstem reservoirs of the upper Missouri River. The EMAP approach is an important component of a comprehensive monitoring strategy for the Nation's GREs. Contributions of EMAP to GRE monitoring include establishment of a rigorous and unbiased baseline, development of the regional scale information critical in public policy decisions such as adaptive management, and in general lending a more robust, statistical approach to the delineation of issues inherent in GRE monitoring and assessment. Compared to traditional sampling programs, the EMAP approach increases the capacities of States and Tribes to conduct large-scale multi-resource assessments because fewer sampling locations are needed to make statistically defensible statements. We discuss the conceptual underpinning of the EMAP design, its strengths and weaknesses as applied to Great Rivers, and lessons learned from implementation of the EMAP design through our work on the upper Missouri River, including examples of provisional results. Finally, we propose a straw man design for application of EMAP to a large-scale pilot on GREs of the Missouri and upper Mississippi River Basins. The approaches and technology developed within this effort will be transferred to the many responsible parties within the Basins to enable coordinated, scientifically defensible long-term monitoring of the condition of GREs. This abstract does not necessarily reflect EPA policy.