

Wisconsin's DRAFT Water Monitoring Strategy 2015 to 2020

Section 3.7 Monitoring Strategy for the Mississippi River Program

Table 26: Mississippi River Monitoring Studies

Study	Purpose	Supports
Wisconsin's Long Term Trend (LTT) program	Wisconsin's Long Term Trend (LTT) program monitors at Locks and Dams 3 (Red Wing, MN), 4 (Alma, WI), 8 (Genoa, WI) and 9 (Lynxville, WI).	Provides site specific condition assessment and attainment. Provides large scale view of major constituent loading and broad perspective on landscape such as climate change.
Environmental Management Program (EMP) Long Term Resource Monitoring Program (LTRMP)	Bimonthly and monthly fixed station sampling and quarterly stratified random sampling (SRS) of water quality of Pool 4 (Sampled by Minnesota WDNR) and Pool 8. SRS provides a comprehensive pool-wide evaluation of aquatic areas including main channel, side channels, impounded and backwater areas. Monitoring components included water quality, fish, invertebrates (1992-2004 only), and aquatic vegetation. Periodic aerial photo interpretation measurements of changes in land use and land cover.	National program datasets and river system specific data provides trend, long-term change and current status information.
U.S. EPA's Great Rivers Ecosystems Environmental Monitoring and Assessment Program (EMAP-GRE)	Probabilistic sampling design with sites selected randomly within pre-defined study reaches. There are a total of 33 sites sampled each year in Wisconsin waters of the Mississippi River.	National program datasets and river system specific data provides trend, long-term change and current status information.
Zebra Mussels Longitudinal Studies	Longitudinal zebra mussel sampling began in 1998, with water quality and bacteria added in 2004.	Resource specific program with results shared regionally and locally.
Large River Soft Sediment Macroinvertebrate Sampling	Multi-agency soft-sediment macroinvertebrate sampling in selected backwater areas is conducted during the fall period.	National program datasets and river system specific data provides trend, long-term change and current status information.
Habitat Project Evaluation	Evaluation of habitat rehabilitation projects constructed as part of EMP or Channel Maintenance Plans is conducted using general limnological (DO, temperature, conductivity, transparency, velocity) and hydrologic (velocity/discharge) monitoring (Weaver Bottoms, Pool 5).	National program datasets and river system specific data provides trend, long-term change and current status information.
Clean Water Act Monitoring Strategy	WDNR use the results from the planned pilot program with Minnesota, and when will those results be available.	To be determined.

Study Descriptions

Wisconsin's Long Term Trend Monitoring

Wisconsin's Long Term Trend (LTT) program monitors Locks and Dams 3 (Red Wing, MN), 4 (Alma, WI), 8 (Genoa, WI) and 9 (Lynxville, WI). Site-specific variables include general chemistry, field measurements (DO, temperature, pH conductance, and turbidity), low-level metals, light penetration and contaminant analysis of time-integrated composite suspended sediment samples. Sampling frequency ranges from biweekly to semi-annually depending upon the monitoring site and variable measured.

Environmental Management Program (EMP) Long Term Resource Monitoring Program (LTRMP)

Wisconsin conducts water quality monitoring on the Mississippi River with state-funded programs and federal funding as part of the U.S. Corps of Engineers Environmental Management Program (EMP) Long Term Resource Monitoring Program (LTRMP) and U.S. EPA's Great Rivers Ecosystems Environmental Monitoring and Assessment Program (EMAP-GRE). <http://www.umesc.usgs.gov/ltrmp.html>

Bimonthly and monthly fixed station sampling and quarterly stratified random sampling (SRS) of water quality of Pool 4 (Sampled by Minnesota WDNR) and Pool 8 are conducted as part of the LTRMP (Soballe and Fischer 2004). SRS provides a comprehensive pool-wide evaluation of aquatic areas including main channel, side channels, impounded and backwater areas. Monitoring components included water quality, fish, invertebrates (1992-2004 only), and aquatic vegetation. Periodic aerial photo interpretation provides measurements of changes in land use and land cover.



Zebra Mussel Longitudinal Studies

Longitudinal water quality synoptic surveys assess main channel water quality and zebra mussel infestation problems during the summer months (July-September). Longitudinal sampling provides a 'snapshot' assessment of the entire main river channel by sampling at nine locations during a single day. Longitudinal zebra mussel sampling began in 1998, with water quality and bacteria added in 2004.



Large River Soft Sediment Macroinvertebrate Sampling

Multi-agency soft-sediment macroinvertebrate sampling in selected backwater areas is conducted during the fall period.

Habitat Project Evaluation

Evaluation of habitat rehabilitation projects constructed as part of EMP or Channel Maintenance Plans is conducted using general limnological (DO, temperature, conductivity, transparency, velocity) and hydrologic (velocity/discharge) monitoring (Weaver Bottoms, Pool 5).

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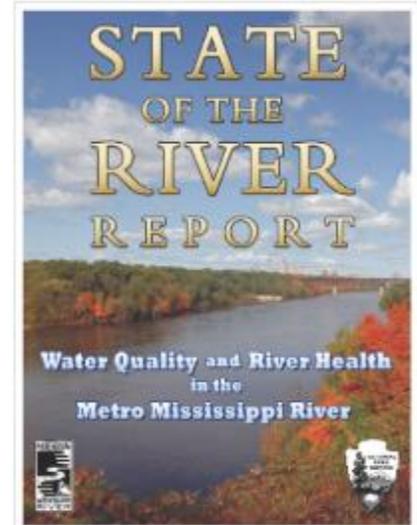
Monitoring Objectives:

Mississippi River Clean Water Act

- Determine attainment of WQS
- Identify Impaired Waters
- Identify Causes of Impairment
- Support Water Management Programs
- Support Evaluation of Program Effectiveness
- Identify Targets/WQS Interstate TMDLs

UMR Restoration - EMP LTRM

- Develop Better Understanding of the UMRS Ecology & Problems
- Monitoring Resource Change
- Develop Management Alternatives for UMRS
- Manage Monitoring Information
- Develop tools and models to support decision makers and better understand complex problems.



Monitoring Design

CWA Monitoring

- Fixed Station (LTT sites, Sediment Traps, habitat project evaluation)
- Intensive (point source impact evaluations, sediment contamination)
- Synoptic (longitudinal WQ surveys)
- Screening-Level (emerging contaminants of concern)
- EMAP-GRE (probabilistic survey (fish, inverts, veg, WQ algae, zooplankton, habitat, other)

LTRM Monitoring

- Fixed Station (WQ)
- Stratified Random Sampling (fish, WQ & Veg in Pools 4 and 8)

Water Quality Indicators

The monitoring strategy defines a core set of monitoring indicators (e.g., water quality parameters), including physical/habitat, chemical/toxicological, and biological/ecological endpoints that states use to assess attainment.

CWA Monitoring

- Core: DO, pH, temp, toxics, nutrients, fish (IBI), bacteria, algae (chl a), fish tissue
- Supplemental: sedimentation, current velocity, light penetration, turbidity, transparency

Note: EMAP-GRE has identified Fish, Invertebrate and Submersed Veg IBIs that are expected to be used in the future for interstate WQ assessments.

LTRM Monitoring

Similar to above core & supplemental indicators with the exception that they do NOT collect contaminants and they do conduct much more GIS-based habitat work.

Quality Assurance

- State-sponsored training at meetings and hands-on review of DNR field monitoring procedures.
- Federal-sponsored training provided by EMAP-GRE and LTRM following field monitoring and QA/QC protocols.
- Detailed procedures manuals for water quality, vegetation and fisheries sampling.

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Data Management

- State-sponsored work carried out by MR WQ Spec with assistance of MR staff (WQ planner, FH and WM staff).
- LTRM work carried out by La Crosse Field Station which is 100% federally funded by UMR Restoration Environmental Mgt. Program
- Team Leader, WQ spec, Fish spec, Veg spec. and 1 or 2 Techs/LTEs.
- Extensive data QA/QC conducted on an annual basis.
- User-friendly data browser and graphical tools accessible to both professionals and the public.

Program Gaps

While coverage of the main channel is generally comprehensive, thousands of acres of backwaters are not regularly monitored. The LTRMP sampling of Pools 4 and 8 provide a detailed assessment of the state of those specific backwaters as indicator sites. Through what is learned in from the LTRMP, EMAP-GRE, and the Department's lakes, nonwadeable rivers, and wetlands monitoring, a more comprehensive sampling design for the river may be constructed in the future if additional resources become available. Specifically, the following gaps have been identified. An implementation plan for the Mississippi River Monitoring is beyond the scope of this document.

- Need to implement the 2014 coordinated Clean Water Act Monitoring Strategy was endorsed by all five UMRS states (IA, IL, MN, MO and WI).
- Coordinated and consistent monitoring among the states will lead to more consistent and unified assessment and listing of impairment among the states.
- Funding mechanisms need to be identified for this effort.
- Insufficient funding for contaminant monitoring.
- Improvements to enhance the SWIMS and Fisheries data management systems and greater emphasis on training and knowledge to make better use of monitoring data by agency staff and the public.
- WQ assessment procedures need to be developed for off-channel aquatic areas including impounded, backwaters and wetlands.
- Need an improved process for capturing LTRM data and using it for state CWA assessments, including the Section 3.8 Monitoring Strategy for the Great Lakes Program.

Section 3.8 Monitoring Strategy for the Great Lakes

Table 27: Great Lakes Program Primary DNR Monitoring Studies

Study	Purpose: Public Health & Welfare, Fish and Aquatic Life, Recreation, Wildlife
Lake Michigan Major Tributary Phosphorus Loading	The sampling is needed to allow calculation of nutrient loads to Lake Michigan http://dnr.wi.gov/water/projectDetail.aspx?key=590070
Lake Superior Tributary Loading	The sampling is needed to allow calculation of nutrient loads to Lake Superior. http://dnr.wi.gov/water/projectDetail.aspx?key=62786687
Great Lakes Fishery Assessment	Example, Area of Concern: http://dnr.wi.gov/water/projectDetail.aspx?key=100696597
Pathogen Indicator Monitoring	Pathogen Monitoring on Great Lakes Beaches (see Beach Section).
Contaminated Sediment	Evaluation Monitoring and is widespread in the Great Lakes.
Cladophora/Nutrient	Monitoring of near shore waters of Lake Michigan is also conducted as a targeted program.
Public Water Intake monitoring	Lakes Superior and Michigan have 15 public water intakes are monitored using the same protocols as Public Drinking Water Well Monitoring.