

Water Quality has Improved in the Upper Mississippi and Illinois Rivers but Challenges Remain



Photo courtesy of KathiJo Jankowski

In many areas of the Upper Mississippi River System, water quality is adequate to support a diversity of life such as aquatic plants, breeding and migratory birds, and aquatic animals, such as fish and mussels. However, sediment and excess nutrients from urban and agricultural lands continue to affect water quality across the river system.

How do human actions affect water quality of the river?

Humans can introduce sediment and excess nutrients to rivers in a variety of ways such as through agriculture, urban development, stormwater runoff, and wastewater treatment plants. Excess sediment, made up of sand, silt, soil, and other materials, can bury healthy mussel beds, reduce the depth of backwater lakes, and reduce water clarity. Murky water affects the distribution and abundance of aquatic plants and fish that rely on good visibility for foraging or vegetation for habitat.

Nitrogen and phosphorus are key nutrients for plant growth. Excess nutrients have caused nuisance blooms of algae, overabundance of plant life, and loss of animal life in rivers. Algal blooms can interfere with river recreation and reduce oxygen availability, which threatens the survival of aquatic organisms. Under certain conditions, algal blooms resulting from excess nutrients have harmed human health.

What actions can help improve water quality?

- ▶ Improvements to wastewater treatment practices and processes have reduced nutrient contributions to the water.
- ▶ Agricultural producers can increase application of best management practices to reduce sediment and nutrient pollution from their fields.
- ▶ More restoration projects focused on wetlands and better connection between the river and floodplain can further reduce excess nutrients and sediment in the river through natural processes.
- ▶ In such a large watershed, realizing benefits from management actions takes time and requires extensive efforts at broad scales.

Monitoring water quality indicators helps us to understand the health of the river.

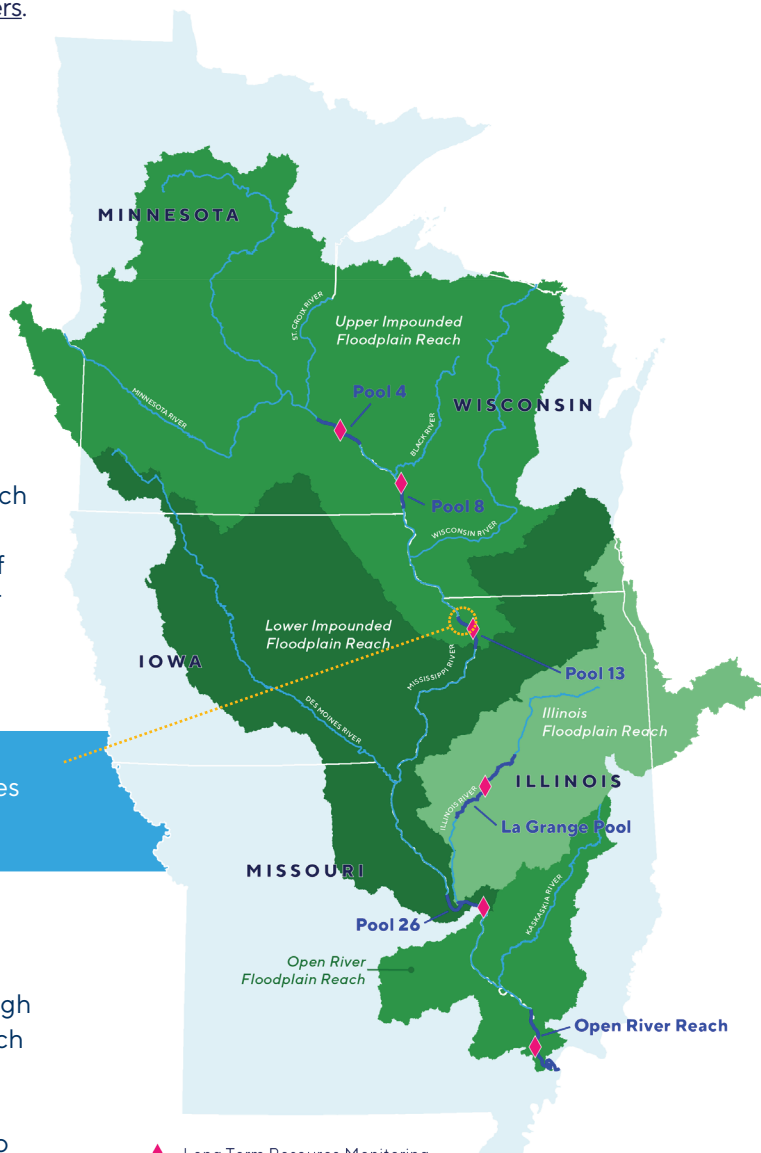


Indicators like phosphorus, nitrogen, and total suspended solids help us understand impacts to habitat suitability.

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This fact sheet is a summary of the long term changes observed from 25 years of monitoring water quality (1994-2019) reported in the Ecological Status and Trends of the Upper Mississippi and Illinois Rivers.

- ▶ **Total phosphorus** decreased in all long-term study areas (see map) except Open River and La Grange Pool (see table below). Concentrations continue to exceed US EPA water quality criteria frequently in all study areas.
- ▶ **Total nitrogen** increased in the Upper Impounded and Open River Reaches of the Upper Mississippi River and decreased in the La Grange Pool of the Illinois River. Concentrations remain above US EPA water quality criteria throughout most of the river system.
- ▶ **Total Suspended Solids (TSS)**, a measurement of how much sediment and other matter is suspended in water, decreased over time in most parts of the river. However, concentrations of TSS increase from north to south in the Upper Mississippi River System and remain too high to sustain aquatic plants in the La Grange Pool, Pool 26, and the Open River.



The Maquoketa River in Iowa flows into Pool 13 and contributes the most TSS of all tributaries analyzed in this report.

Changing hydrology alters water quality conditions
Climate change and human activities have altered the environment within the Upper Mississippi and Illinois Rivers. High flow events are more common and severe than in the past, which could diminish benefits from improved watershed practices as well as wash more sediment and nutrients into the river, decreasing water quality. Multiple agencies are collaborating to improve and implement watershed practices, reduce sediment and nutrient inputs, and improve overall water quality.

◆ Long Term Resource Monitoring (LTRM) stations
— Dark blue indicates long-term study areas within each floodplain reach

Take a Closer Look at the Data

WATER QUALITY	INDICATOR	UPPER MISSISSIPPI RIVER					ILLINOIS RIVER
		Upper Impounded			Lower Impounded	Unimpounded	La Grange
		Pool 4	Pool 8	Pool 13	Pool 26	Open River	
Main Channel	Suspended Solids*	▼	▼	■	▼	▼	▼
	Nitrogen	▲	■	▲	■	▲	▼
	Phosphorus	▼	▼	▼	▼	■	▲

*indicates flow-normalized concentration

▲ Significant Long-Term Increase ▼ Significant Long-Term Decrease ■ No Trend