Long Term Resource Monitoring
of the Upper Mississippi River System

Upper Mississippi River Restoration

The Upper Mississippi River System is changing for a variety of reasons, mostly because of **changing hydrology** and **invasive species**. Changing hydrology affects habitat quality and food sources for fish and wildlife.

We know these changes are occurring because of the **Long Term Resource Monitoring** (LTRM) in the Upper Mississippi River Restoration Program. The data collected for 35 years at six field stations has **produced many insights that would be otherwise unobtainable.**

The six field stations collect data on **water quality, forests, aquatic vegetation, fish,** and other variables to measure the river's health. The six study reaches have different habitats, threats, and conditions.

Lake City Field Station
Monitored by the state of Minnesota. This station's findings illuminate how investing in nutrient reduction leads to a healthier ecosystem.

La Crosse Field Station
Monitored by the state of Wisconsin. Findings from this field station show the value of UMRR's habitat projects, particularly island and backwater restoration.

Bellevue Field Station
Monitored by the state of Iowa. This station found that the Maquoketa River, which flows into Pool 13, contributes the most sediment out of the tributaries studied. This has led to a decline in aquatic plant diversity and abundance.

Havana Field Station
Monitored by the state of Illinois. The establishment of invasive carp in the La Grange Reach has led to a decrease in recreationally valued native fish populations at this field station .

Great Rivers Field Station
Monitored by the state of Illinois. Water levels at Pool 26 have been managed to expand the areas where native emergent plants can grow. The plants then help to limit sediment movement and enhance water clarity.

Open River Field Station
Monitored by the state of Missouri. In contrast to the Havana field station, recreationally valued native fish populations are stable in the Open River Reach despite the presence of invasive carp.

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For 35 years, UMRR's Long Term Resource Monitoring (LTRM) captures trends in nutrient concentrations, plant community changes, forest loss across the system, and the impacts from invasive carp expansion to the abundance and diversity of native fishes.

LTRM informs our understanding of the river's ecology and focuses investments for the greatest benefit of the river and the public .

What Does LTRM Tell Us?

- There is **more water in the river more of the time**. High flows are lasting longer and occurring more frequently throughout the system. This is important because water flow is the primary driver affecting the quality and quantity of habitat.
- **Floodplain forest loss has occurred in nearly all study areas** except south of the locked portion of the river. The forests may be responding to changes like increased flood inundation and invasive species.
- In most of the river system, **water in main channel has become clearer** and **aquatic plants have become more abundant,** improving habitat for some fish and wildlife. Increased water clarity in the river allows sunlight to reach deeper into the water and promotes plant growth. These plants slow water flow and anchor the sediment, which further improves water clarity and triggers more plant growth.
- **Concentration of nutrients, notably nitrogen and phosphorus, remain high,** exceeding U.S. Environmental Protection Agency benchmarks. However, total phosphorus concentrations have declined in many of the studied reach areas.
- **The river continues to support diverse and abundant fishes.** Recreational fishes have increased in parts of the system. However, there have been substantial declines in forage fish, an important food source for larger fishes and animals, throughout the river network. Invasive carps have substantially affected the river ecosystem where they have become common.

How Does LTRM Benefit People Along the River?

In the 1980s, there was a massive collapse of vegetation on the Upper Mississippi River that increased sedimentation of the navigation channel, negatively impacting the river's ability to support navigation. The collapse was likely caused by poor water quality. Monitoring vegetation, sediment and water quality is important to maintaining reliable transportation of commerce.

UMRR long term monitoring of nutrients provides the agricultural community with long term information about trends, informing the success of past investments in nutrient management and informing decisions about future investments in conservation practices.

The Upper Mississippi River System is a treasured ecosystem abundant with fish and wildlife and a multi-billion-dollar economic engine. It plays a major role in local, regional, state, and national economies. LTRM works towards a healthier and more resilient ecosystem that supports these systems.

This information is available in greater detail in the following scientific publications:

2022 Ecological Status and Trends of the Upper Mississippi and Illinois Rivers

2018 UMRR Habitat Needs Assessment II