

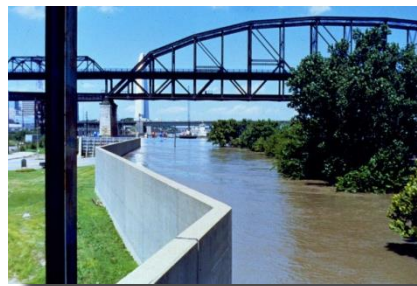


MR&T PROJECT

US ARMY CORPS OF ENGINEERS ★ MISSISSIPPI VALLEY DIVISION ★ BUILDING STRONG®

MISSISSIPPI RIVER & TRIBUTARIES PROJECT

The Mississippi River and Tributaries project was authorized by the 1928 Flood Control Act. In the wake of the devastating 1927 flood, it was deemed necessary to put into place a comprehensive, unified system of public works within the lower Mississippi Valley that would provide unprecedented flood risk management and an equally efficient navigation channel.



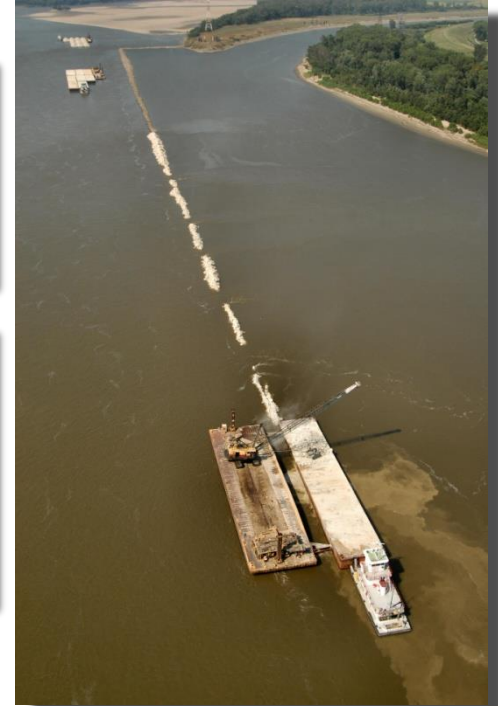
The MR&T project has four major features:

1. Levees/floodwalls
2. Tributary basin improvements
3. Floodways
4. Channel improvement and stabilization

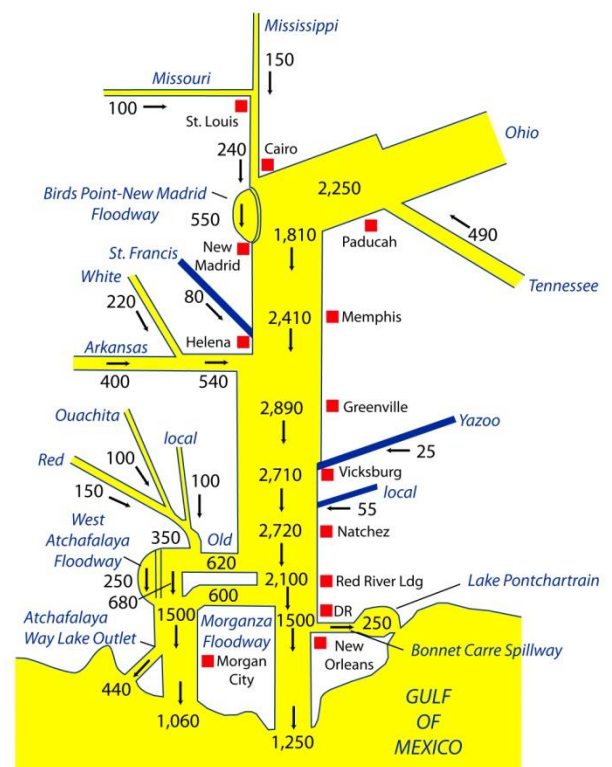
These features work together to provide flood risk management and navigation, and foster environmental protection and enhancement.

• The Project Design Flood

The flood risk management plan is designed to control the "project design flood". The present project design flood was developed in 1956 when the Mississippi River Commission made a complete review of the adequacy of the MR&T project. The National Weather Service was asked to provide the largest storm series considered to have a reasonable chance of occurrence in the season when floods are likely to occur over the Mississippi River Basin. After investigating 35 different hypothetical storm series, the one that produced the greatest discharges from Cairo, Ill., to the Gulf of Mexico was selected as the project design flood. The adequacy of the project design flood was reaffirmed following additional review in 1973. Following the 2011 Flood, the physical and hydraulic changes in the river system along with complex flow patterns observed, identified the need to validate the project design flood.



MR&T Project Design Flood Discharge in 1,000 cfs



- **Levee Feature**

MR&T levees are designed to reduce the risk of inundation in the alluvial valley from the project design flood by confining flow to the leveed area, except where backwater storage areas are used or when water is diverted purposely into floodway areas. The risk reduction is provided from Cape Girardeau, Missouri, to Venice, Louisiana, about ten miles above the mouth of the Mississippi River. Some 3,727 miles of levees, including tributary levees, have been authorized for the MR&T and 3,486 miles are in place. Since inception of the project in 1928, no project levee built to MR&T standards has ever failed.



- **Tributary Feature**

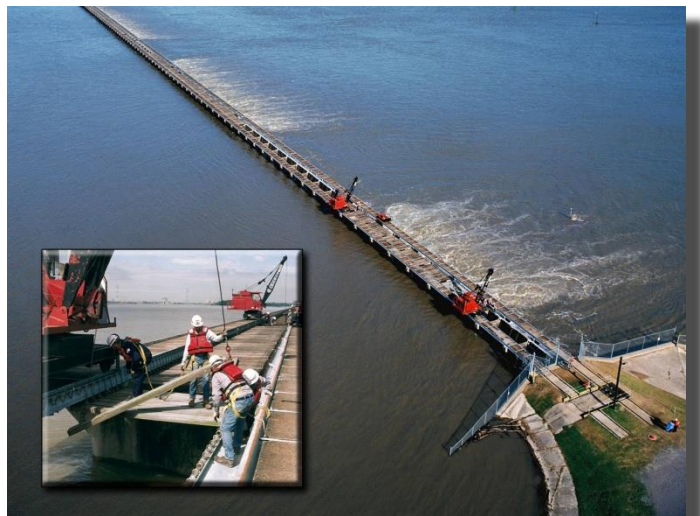
Tributary improvements such as dams, levees, reservoirs, control structures, and pumping plants provide for flood risk management and drainage. While the Ohio, Upper Miss., Red and Arkansas/White river basins contribute to the significant flow of the Mississippi River, there are four major drainage basins that are contained entirely within the project: St. Francis in east Arkansas; Yazoo in northwest Mississippi; Tensas in northeast Louisiana; and Atchafalaya in south Louisiana.



There are five flood risk management reservoirs in the tributary basin improvement plan: Wappapello Lake in the St. Francis Basin, and four lakes – Arkabutla, Sardis, Enid, and Grenada – in the Yazoo Basin.

- **Floodway Feature**

Floodways safely divert excess flows past critical reaches so that levee systems will not be unduly stressed and to minimize levee heights. There are three floodways in Louisiana and one in Missouri.



• Channel Stabilization Feature

Stabilization and protection of the river banks are critical to both flood risk management and navigation — by protecting flood control features and ensuring the alignment of the navigation channel. This is accomplished by:

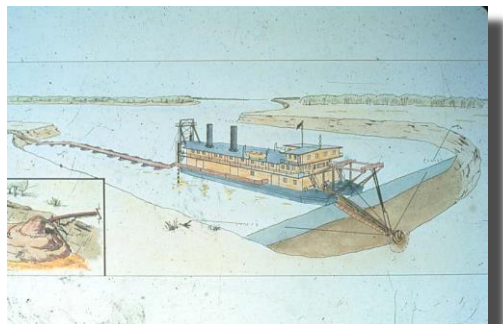
Cutoffs - to reduce flood heights and provide a more efficient channel (completed);



Revetment - small concrete blocks joined together by wires placed on the river bank to maintain the proper channel alignment and protect nearby levees from bank erosion;



Dredging - to adjust river flow patterns and maintain navigable channels by deepening shallow areas that tend to form during low water stages, and



Dikes - large stone structures built perpendicular to the bank that direct most of the river flow to a single channel.



PROJECT CHALLENGES

- **Levees** - The saying that a chain is only as strong as its weakest link is certainly true for a levee system. MR&T levees are designed using criteria which assure adequate cross-section and height and undergo inspections to identify problems and assure proper maintenance. Constant vigilance and maintenance are vital to the integrity of the MR&T levee system.
- **Channel Improvement & Stabilization** - Much progress has been made in stabilizing the Mississippi River's banks using revetments and dikes. These revetments and dikes protect the levees and flood risk management works from destruction by the river's erosive power and maintain alignment for navigation. This critical work is important to the overall success of the flood risk management and navigation of the MR&T project.
- **Environmental Sustainability** – The Lower Mississippi River Environmental Studies program began more than 20 years ago to help ensure sustainability of the natural habitats that exist in the valley. Numerous enhancements resulting from these studies include: dike notching, bio-friendly revetment surface treatment, improved borrow pit design and monitoring of endangered species including the interior least tern and pallid sturgeon. These important studies and environmental enhancements are needed to sustain diverse habitats for future generations.



PROJECT BENEFITS

- **Flood Protection**
 - ✓ \$15.9 billion invested for planning, construction, operation and maintenance, since 1928
 - ✓ \$1.27 trillion in flood damages prevented, since 1928
 - ✓ \$206.5 billion in flood damages prevented in 2018
 - ✓ 80 to 1 return on each dollar invested
 - ✓ 4.5 million people protected
 - ✓ The MR&T system has proven its value, particularly in recent years, as the system was tested and passed its third major flood in less than a decade with the Winter 2015/2016 event.
- **Navigation**
 - ✓ 669 million tons of cargo move on the Mississippi River System each year.
 - ✓ \$6.2 billion in domestic transportation savings.
 - ✓ The Mississippi River remained opened during 1988, 1999 and 2012 droughts. The ability to keep the river open offered unequivocal evidence of the benefit of the MR&T project to the nation.

PROJECT EXECUTION

The Mississippi Valley Division continues to evaluate activities across business lines with a risk-based approach; balancing the needs with the resources to meet the mission. Execution of the project involves balancing the investigation, construction, operations and maintenance requirements for flood risk management to: protect against the project design flood, provide a safe and reliable navigation channel, preserve and restore natural resources through environmental stewardship, ensure consistent recreational services to the public and provide water security for generations to come. Funding is used for the following purposes: General investigations, construction and maintenance.

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