



Maj. Gen. Michael C. Wehr
President



Hon. Sam E. Angel
Senior Member



Hon. R. D. James
Member, Civil Engineer



Hon. Norma Jean Mattei, Ph.D.
Member, Civil Engineer



Rear Adm. Gerd F. Glang
Member



Brig. Gen. Richard G. Kaiser
Member



Brig. Gen. David C. Hill
Member



Mississippi River Commission

2016 Executive Summary 395th & 396th Sessions

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To view full testimonies and other linked documents in this publication, visit:
[http://www.mvd.usace.army.mil/About/MississippiRiverCommission\(MRC\).aspx](http://www.mvd.usace.army.mil/About/MississippiRiverCommission(MRC).aspx)



Mississippi River Commission

www.mvd.usace.army.mil/mrc/

The Mississippi River Commission has a proud heritage that dates back to June 28, 1879, when Congress established the seven-member presidential commission with the mission to transform the Mississippi River into a reliable commercial artery, while protecting adjacent towns and fertile agricultural lands from destructive floods.

In its current capacity, the Mississippi River Commission prosecutes the Mississippi River & Tributaries (MR&T) project authorized by the 1928 Flood Control Act. The MR&T project employs a variety of engineering techniques, including an extensive levee system to prevent disastrous overflows on developed alluvial lands; floodways and backwater areas that provide expansion room for the river so that the levee system will not be unduly stressed; channel improvements and stabilization features to protect the integrity of flood control measures and to ensure proper alignment and depth of the navigation channel; and tributary basin improvements, to include levees, headwater reservoirs and pumping stations, that maximize the benefits realized on the main stem by expanding flood protection coverage and improving drainage into adjacent areas within the alluvial valley.

Since its initiation, the MR&T program has brought an unprecedented degree of flood protection to the four million people living in the 35,000-square-mile project area within the lower Mississippi Valley. The nation has contributed \$14.8 billion toward the planning, construction, operation and maintenance of the project. To date the nation has received a 45 to 1 return on that investment, including \$666 billion in flood damages prevented.

The performance of the MR&T system during the Great Flood of 2011 validated this wise investment. Despite record high flows and stages, not a single life was lost as a result of the flood. Water lapped at the top of floodwalls and levees the length of the river,

exerting unprecedented pressure on the backbone of the protection system, but the levees withstood the record stages and pressure due in large part to the operation of three floodways and the storage capacity provided by non-MR&T reservoirs in the Ohio and Arkansas-White basins. All told, the MR&T project prevented in excess of \$234 billion in damages, not including potential losses from interrupted business activities and related impact. One year later, with much of the drainage basin under exceptional drought conditions and river stages plunging to near historic lows more than fifty feet lower than the 2012 highs on the major gages between Cairo and Red River Landing, the performance of the MR&T system is again validating the nation's wise investment, as the navigation channel remains viable.



The Mississippi River Commission continued its 137-year process of listening to the concerns of partners and stakeholders in the Mississippi valley, inspecting the challenges posed by the river, and partnering to find sustainable engineering solutions to those challenges through the 2016 high-water (395th session) and 2016 low-water (396th session) inspections. The official record of the Proceedings of the Mississippi River Commission, complete with recorded hearings of public meetings, copies of signed formal statements provided by the public, executive summaries of the Proceedings, and other documents of significance, are kept on file in the Office of the President in Vicksburg, Miss.



Mississippi River Commission

Inspection Trip Objectives

LISTEN to partners, stakeholders and public – provide opportunities to meet with the commission for mutual understanding, education and discussion on value and use of water resources in the local and regional area. The vertical team hears the themes, issues and concerns at the same time – Headquarters, Mississippi Valley Division, Northwestern Division, Great Lakes & Ohio River Division, Southwestern Division, district, stakeholders and partners. Listen to issues of major concerns and on projects and studies and increase the understanding of how the entire system is related and impacted while formulating mature recommendations.

PARTNER with key associations and interest groups. Meet with partners to help enhance relationships and broaden collaboration. Discover and include diverse forums for collaboration, dialogue and education.

SHARE information with partners; in particular, the lessons that the MRC and partners have discovered since 1879 by listening, inspecting, partnering and engineering in the watershed.

LEARN from partners from the upper Mississippi, Ohio, Missouri, Arkansas, Tennessee, Cumberland, Illinois, Atchafalaya and Red river basins. Gain an understanding of the methods, procedures, systems and other resources used in these basins to improve the development and delivery of policy, planning, construction and operation and maintenance of the greater watershed.

INSPECT maintenance status of key MR&T structures used to convey the project design flood and to facilitate commerce on the inland navigation structure.

REVIEW/DISCUSS the Mississippi and Atchafalaya rivers and the MR&T project and impacts from and on the Mississippi, Ohio, Missouri, Red, Arkansas and Illinois river basins and projects; review status of current and future work. Review and identify comprehensive water resource engineering needs of the watershed.

EDUCATE our partners, stakeholders and public on water investments and water resource engineering capabilities for the Mississippi Valley watershed.

VISION -- continue to champion the broad participation, national/international recognition and working vision process for America's Watershed – the largest "navigable" system in the world! Gather feedback from international dialogue, across diverse sectors, through inspections and engagements with partners, stakeholders and the public.



Strategic Messages

Four Revolutions that will Compel Significant Investment

Four ongoing revolutions will drive changes in the greater Mississippi River basin. How the nation responds to the revolutions and invests in potential solutions will dictate the level of future economic prosperity of the valley and the greater watershed.

Revolution 1: Explosive growth of agricultural productivity will increase water, rail and overland transportation demands on the inland waterway system.

- Yields per acre doubling and tripling over the past few decades.
- World population expected to grow by 2 billion in the next few decades
- Ability to feed the world will impact American security and global stability.



Four
Revolutions
Video

Revolution 2: Increased energy production in the United States will increase demand on transportation systems.

- 2013 - U.S. became top producer of natural gas.
- 2014 - U.S. passed Saudi Arabia as largest producer of oil.
- U.S. energy prices cheaper than European energy (by as much as 75%).
- Water transportation is the only system with the excess capacity to meet increase in demand.



Strategic Messages

Four Revolutions that will Compel Significant Investment *(continued)*

Revolution 3: Return of manufacturing to the U.S near inland waters spurred by cheap fuel and cost advantages of inland navigation system.

- Growth in manufacturing investment driven by energy production revolution.
- U.S. remains world leader in manufacturing output due to past infrastructure investment.
- Using the U.S. model, other nations are investing more in water infrastructure and closing the manufacturing and export gap.



Revolution 4: Accelerating impacts of climate change demand system resiliency

- Intense precipitation falling in more condensed periods.
- Increased runoff from development.
- More prolonged drought
- Rising sea levels along the coast.





Strategic Messages

Call to Action

- Protecting productive farmland, manufacturing, refineries, pipelines and overland commerce through reliable flood control based on resiliency.
- Inland water transportation is the only economic game changing transportation system with the capacity capable of handling the increase in moving agricultural, energy and manufacturing products to the coasts for export.
- Water infrastructure makes delivery of domestic stability and security possible.

“The time for action is now, and the moment to start is immediately.”

[A Call to Action, Mississippi River Commission](#)

A partner's call to action:

“The agricultural products grown in our region provide food throughout the world.”

[Jim Carroll, Piney Drainage District, Ark](#)

A partner's call to action:

“It is time for those that help feed the world be afforded the same level of flood protection....”

[Kevin Mainord, Mayor, East Prairie, Mo.](#)

A partner's call to action:

“It is a cruel irony that most of the time flood events victimize those who are least financially able to cope with the devastation.”

[William Keiser, Lake County Levee and Drainage Board, Tenn.](#)



Strategic Messages

We Are a Maritime Nation

- We are losing hard-fought ground earned by prior generations through their financial and personal sacrifices.
- We have benefitted from the investments of our forefathers but have done little to assure this heritage will be passed on to our children's children.
- Our economic prosperity, standard of living, and environmental quality are increasingly vulnerable to threats posed by aging infrastructure and increase potential for failure.
- Reliable ports, harbors and channels matter.
- Reliable living in highly productive areas makes our nation great.
- The people in the alluvial valley drive productivity and help to feed the world.
- National security and global stability are assured through success in the Mississippi Valley.

“The Mississippi River Commission strives to help maintain the nation’s global economic competitiveness by ensuring a reliable navigation channel and the commercial reliability of ports and harbors....”

[Statement on extreme low water, Mississippi River Commission](#)

Plaquemines
Parish
Council
Resolution
16-126

“The Greater Mississippi Basin, together with the Intracoastal Waterway, has more kilometers of navigable waterways than the rest of the world combined. The American Midwest is both overlaid by this waterway and is the world’s largest contiguous piece of farmland...”

[The Geopolitics of the United States: The Inevitable Empire, STRATFOR Global Intelligence](#)

“Our dependence on the seas and inland waterways has driven our national security and economic success throughout our nation’s history.”

[Statement on inland waterway navigation system, Mississippi River Commission](#)



Strategic Messages

Much Authorized Work Remains to be Done

- Through the 2011 flood, the 2015 winter flood, and the recent March and August 2016 rain events, the Mississippi River and its tributaries are trying to remind us that much authorized work remains to be done on the MR&T system in order to safely pass the project design flood.
- In a short five-year period from 2011-2016 the people of the valley have endured three extreme record events on the main stem Mississippi River: 2011 flood, 2012 drought, and 2015-16 winter record flood. Each extreme event takes a toll on our flood control and navigation assets in the system and degrades the ability of critical project features to perform as designed for the next event.
- The Mississippi River at New Orleans has been at or above flood stage for six of the past eight months between January and August 2016.
- The pattern of unusual weather events continues to clearly establish that we are experiencing meteorological changes resulting in extreme events that significantly increase the risk of devastating floods to people and homes, agricultural lands that feed the world, industry and manufacturing that drive our economy, and critical infrastructure that form that backbone of our commerce.
- Five high-water events on the Red River in the last year; March 2016 rains -- in excess of 20 inches in the Sabine River basin.

MR&T System Component	Funds Required to Complete
MS River levees / floodwalls	\$3.1 billion
Floodway levees / floodwalls	\$1.3 billion
Channel improvement	\$1.7 billion
Structures	\$1.0 billion
TOTAL	\$7.1 billion





Strategic Messages

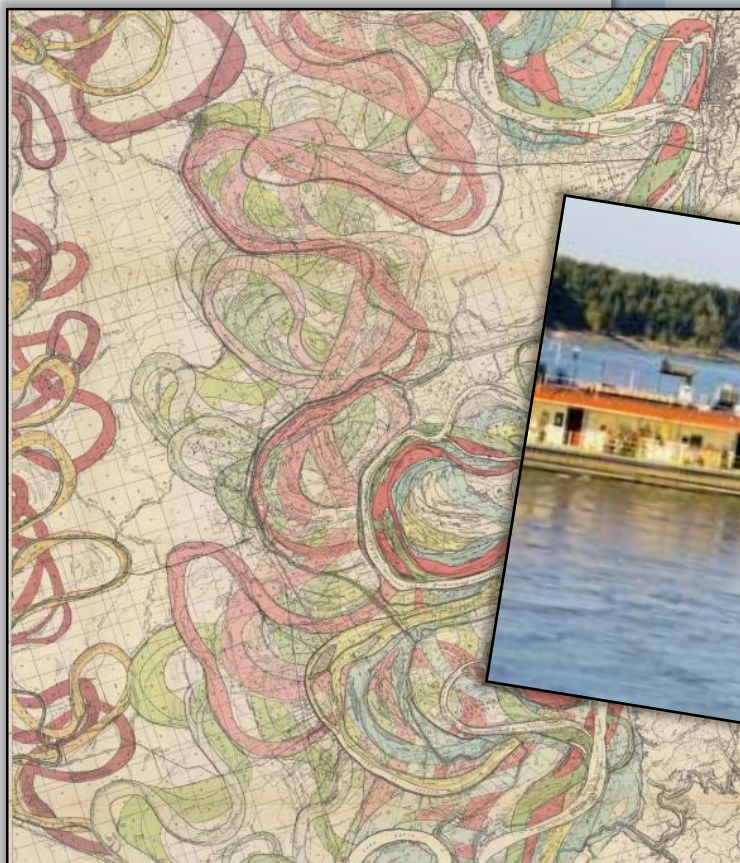
Invisible Infrastructure

- The MR&T project contains many miles of "invisible" infrastructure that is absolutely critical to not only keeping the river in proper alignment and delivering benefits to the nation by keeping our "center coast" reliable for navigation, but also serving as the first line of defense against ravaging floods by preventing the river from moving laterally and eroding levee foundations.
- The MR&T channel stabilization features make it possible to live alongside the river. With a meandering river capable of shifting course or migrating several miles laterally, where does one build cities, water intakes, bridges, ports and terminals?

“Without constant vigilance.... and enduring maintenance, the river will once again demonstrate its power and dominance with devastating effects on people and commerce, as it has so many times in the past, while perhaps painfully reminding us that the MR&T project is a value-added investment and not a simple cost in the national budget.”

“The Mississippi River is not bound by yearly budget cycles and deficits....It does not yield to the myriad federal, state and local obstacles placed before it. Indeed, the Mississippi River never rests. It never takes a day off.”

The Triad Once More:
Restoring the MR&T System
after the 2011 Flood;
Mississippi River Commission, 2015





**395th Session of the
Mississippi
River
Commission
High-water
Inspection Trip**

Cairo, Illinois

Memphis, Tennessee

Lake Providence, Louisiana

New Orleans, Louisiana

High-Water Inspection Trip

April 10-17, 2016

The 395th session of the Mississippi River Commission took place from April 10-17, 2016. The annual high-water inspection of approximately 1,000 miles of the lower Mississippi River between Cairo, Ill., and Head of Passes, La., followed a significant winter flood crest emanating from heavy rains along the upper Mississippi River and Ohio River, and flash flooding from early spring rains in Arkansas, Louisiana and Mississippi.

A total of approximately 800 people, representing boards, agencies and associations with memberships and constituencies numbering in the tens of thousands, partnered directly with the commission through public hearings, partnering sessions and other engagements during the high-water inspection (see "Partners Engaged," pages 33-36).

The members of the Mississippi River Commission present during the 395th session were:

- Maj. Gen. Michael Wehr, appointed as president on August 5, 2015.
- Hon. Sam E. Angel, reappointed as member on December 30, 2010.
- Hon. R. D. James, civil engineer, reappointed as member on April 6, 2003.
- Hon. Norma Jean Mattei, PhD, civil engineer, appointed as member on December 3, 2012.
- Rear Adm. Gerd F. Glang, appointed as member on September 19, 2013.
- Brig. Gen. Richard Kaiser, appointed as member on August 5, 2015.
- Brig. Gen. David C. Hill, appointed as member on December 8, 2015.
- Col. Michael Derosier served as secretary of the commission, a non-voting position.



From left to right: Brig. Gen. Richard Kaiser, Dr. Norma Jean Mattei, Mr. Sam Angel, Maj. Gen. Mike Wehr, Mr. R. D. James, Rear Adm. Gerd Glang and Brig. Gen. David Hill.

High-Water Inspection Trip

Listening – Public Meetings

The Mississippi River Commission held formal public hearings at Cairo, Ill., Memphis, Tenn., Lake Providence, La., and New Orleans, La. Mississippi River Commission hearings are held in accordance with Section 8 of the 1928 Flood Control Act:

“Sec. 8. ...The commission shall make inspection trips of such frequency and duration as will enable it to acquire first-hand information as to conditions and problems germane to the matter of flood control within the area of its jurisdiction; and on such trips of inspection ample opportunity for hearings and suggestions shall be afforded persons affected by or interested in such problems.”

The hearings, engagements and dialogue help maintain a consistent connection — an exchange of viewpoints and ideas among the public, partners, stakeholders, elected officials, the Mississippi River Commission, the Corps of Engineers and agencies from the private, state and federal sectors. This process provides a greater voice for those who live and work in the region in shaping federal management and policy on the river.

Approximately 300 members of the public attended the public meetings and listened to the testimony presented by 71 individual speakers.



“Every time I attend one of these meetings, I get to see American democracy in action: ordinary people like me, speaking freely to our chosen leaders and making known our opinions, needs, wants and desires.”

[William Keiser, Lake County Levee and Drainage Board, Tenn.](#)

High-Water Inspection Trip

Listening – Partnering Sessions

As part of the 395th session, the Mississippi River Commission directed the Vicksburg and New Orleans districts to host round-table discussions to facilitate dialogue among our partners, Corps of Engineers staff and the commission.

- **April 13, Lake Providence, La., to Vicksburg, Miss.**
(30 stakeholders in attendance)
 - ✓ John Stringer, Tensas Basin Levee District
 - ✓ Reynold Minsky, Fifth Louisiana Levee Board
 - ✓ Richard Brontoli, Red River Valley Association
 - ✓ Bill Hobgood, Ouachita River Valley Association
 - ✓ Peter Nimrod, Mississippi Levee Board
- **April 14, Old River, La., to Baton Rouge, La.**
(100 stakeholders in attendance)
 - ✓ John Bradberry, Coastal Protection and Restoration Authority Board
 - ✓ Bill Hildalgo, St. Mary Parish Levee District
 - ✓ Monica Salins, Pontchartrain Levee District
 - ✓ Shawn Wilson, Louisiana Department of Transportation and Development
 - ✓ Mac Wade, Port of Morgan City, La.

Major Issues

- **Section 408 permitting process**
- **Shortage of dredging funds for Southwest Pass, Atchafalaya, Red River.**
- **Partners not being treated as partners.**



**“It isn’t a partnership
if the first word we
hear from the Corps is
“No.”**

**Chairman John Bradberry,
CPRA**



High-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need to repair and complete the MR&T system.

“If we don’t fix these deficiencies and damages throughout the MR&T system, we will be facing a future catastrophe.”

[Peter Nimrod,
Mississippi Levee Board](#)

MR&T System Component	Funds Required to Complete
MS River levees / floodwalls	\$3.1 billion
Floodway levees / floodwalls	\$1.3 billion
Channel improvement	\$1.7 billion
Structures	\$1.0 billion
TOTAL	\$7.1 billion

“The MR&T system is not complete and will not pass the project design flood.”

[Rob Rash, Mississippi Valley Flood Control Association](#)

“If we are going to protect people, property and commerce, we are going to need to invest in this system.”

[Dustin Boatwright, Little River Drainage District, Mo.](#)

“This project must be targeted for swift completion, proper maintenance, and increased investment for recapitalization.”

[Rob Rash, Mississippi Valley Flood Control Association](#)

Local people, representing 10 states and covering 17 million acres of land, industry and infrastructure, have passed **resolutions** calling for investment in the MR&T system.

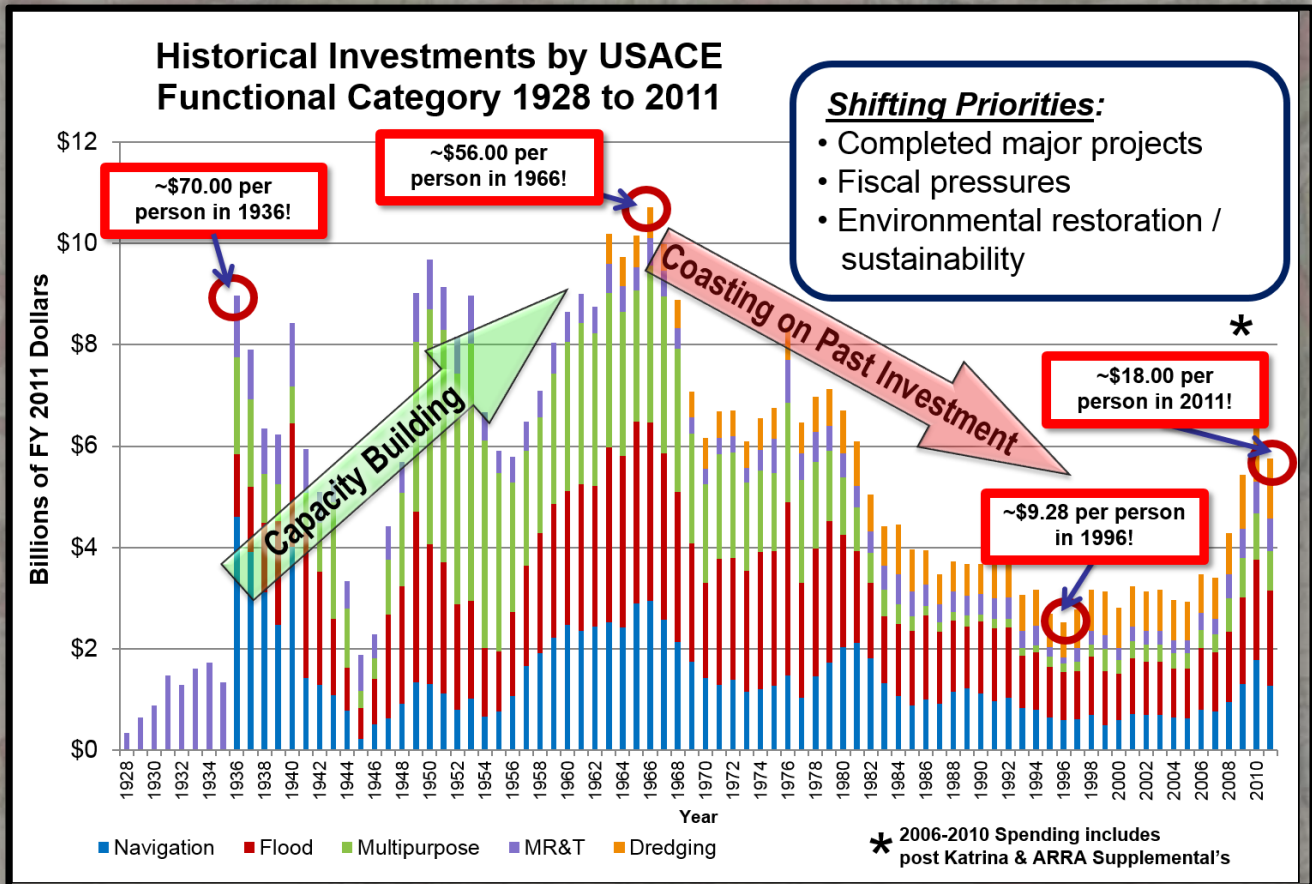


Levee slide, Lake Village, Ark.

High-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need for investment in water infrastructure.



“We’ve had 40 years of disregard for the future and now we are paying for it.”

Sean Duffy, Big River Coalition, La.

“Our current dismal situation in my opinion is due to an unacceptable neglects of our infrastructure needs.”

Harvey Joe Sanner, White River Coalition, Ark.

“The big question is are we investing in maintaining the infrastructure necessary to ensure people and property are protected . . . are we investing to ensure our economic viability, in the way of commerce, for the future? If you look at funding trends . . . the answer is clearly, NO.”

Dustin Boatwright, Little River Drainage District, Mo.

High-Water Inspection Trip

What We Heard: Top Regional Issues

Port of South
Louisiana Resolution

ISSUE: The importance of ports, harbors and inland navigation.

Port Rankings

#1	South Louisiana	292 million tons annually
#7	New Orleans, La.	84 million tons annually
#8	Baton Rouge, La.	69 million tons annually
#12	Plaquemines, La.	55 million tons annually



“Ports and harbors are a part of the network that is so important to moving goods along the Mississippi River Valley.”

[Greg Curlin, Hickman-Fulton County Riverport Authority, Ky.](#)

“If the channel is allowed to continue to fill with sediment, the workforce, suppliers, service companies and other businesses that contribute to sustaining this community will no longer survive.”

[Mac Wade, Port of Morgan City, La.](#)

“...waterborne transportation is the only competition to long haul rail...If our waterway is forced to close, rail rates will increase.”

[Richard Brontoli, Red River Valley Association](#)

“When we have draft restrictions we broadcast to the world that the Mississippi is unreliable.”

[Sean Duffy, Big River Coalition, La.](#)

“We have lost several million dollars worth of business because of the shallow river.”

[Jim McElroy, Conrad Shipyards, La.](#)

“525,000 jobs in Louisiana - one in every five jobs - are dependent upon companies located along the ports of our state and move cargo by water....”

[Joe Acardo, Ports Assn. of La.](#)

“Every time a ship doesn’t make it into the channel, we lose money, fuel, taxes....”

[Louis Tamporello, Morgan City, La.](#)

High-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: Water security, water scarcity and aquifer depletion.

“This project provides an excellent opportunity for the Corps and the sponsor to show what can be done to restore an ecosystem when surface water and base stream flows return.”

[Ann Cash, Boeuf-Tensas Regional Irrigation Water Distribution District, Ark.](#)

“Protecting our food and water supply must become a priority at all levels of government and by private interests.”

[Gene Sullivan, Bayou Meto Basin, Ark.](#)

“Aquifer levels continue to decrease ... we feel that a coordinated response is needed to address this before it becomes a crisis for our region.”

[Reynold Minsky, Fifth Louisiana Levee Board](#)

“We would like to respectfully request that the Corps make “groundwater” a major mission emphasis.”

[Robert Knecht, Director of Public Works, Memphis, Tenn.](#)

“I am impressed by what I’ve seen in the valley. There is much we can share with the world.”

[Ali Zaidi, Office of Management and Budget](#)

- Each state/water management district is acting autonomously; water laws vary widely by state; there is reluctance to adopt mandatory water use regulations.
- The Corps only includes groundwater protection as a project purpose when it is mandated by Congress.
- U.S. Department of Agriculture is directing funding to farmers to adopt conservation measures and to construct small storage reservoirs.
- Any project to develop new water to address the problem is generally too small and only addressed local needs.
- Universities and extensions agencies are focusing on conservation and the development of crops which require less water.




High-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: Continuing concerns with the National Levee Safety Program, the Section 408 process and levee certification.

Based on testimony received during the last few years, partners and stakeholders continue to express lingering concern about the critical issues.



393rd Session
High-Water Inspection Trip

What We Heard
Top MR&T System-wide Issues

Levee districts from all seven states bordering the MR&T project footprint expressed strong concern over several federal initiatives or policies under various stages of development and implementation:

- Federal Flood Risk Management Standards (FFRMS) - Executive Order 13690.
- Proposed federal rules to define and regulate "Waters of the United States."
- Corps of Engineers guidance for engineer districts to issue Section 408 permits for work on levee rights of way owned by the local levee districts.
- National Flood Insurance Program.
- Rulemaking regarding the PL 84-99 program.

"These policies "are working in unison to create conditions not only in this great valley but throughout the nation THAT WILL SET BACK FLOOD CONTROL and navigation for generations to come."
-- Mike Reed, Sny Island Levee and Drainage District, Ill.

"The National Levee Safety Committee can impose unachievable standards on our levees."
-- Harry Stephens, Cotton Belt Levee District, Ark.

"This will affect millions of Americans by forcing them to purchase flood insurance and it will discourage industry and businesses from locating to the Mississippi Delta."
-- Peter Nimrod, Mississippi Levee Board, Miss.

"These actions need to be put on hold until we get more information on what is going on."
-- Reynold Minsky, 5th Louisiana Levee District, La.

Connecting people, land and water for a bright tomorrow.

High-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: Continuing concerns with the National Levee Safety Program, the Section 408 process and levee certification.



How can a levee system be rated “unacceptable” or “minimally unacceptable” and pass a record flood?

[Bruce Cook, Yazoo-Mississippi Levee District, Miss.](#)



The recommendation from the National Levee Safety Committee, if used, forces unachievable maintenance standards and predatory flood plain management tactics. This will needlessly destroy economic development for over 22,000,000 acres of land in this country. Please do not use a “one size fits all approach and place false fear in the minds of people living behind levees.

[Rob Rash, Mississippi Valley Flood Control Association](#)



“We are at the point where delays with the 408’s are becoming problematic for Morgan City.”

**Louis Tamporella,
Morgan City, La.**

High-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need for comprehensive flood control and investment on the upper Mississippi.

Flood control works and systemic flood control works better.

[Jim Koeller, Upper Mississippi, Illinois, Missouri Rivers Association](#)

This is not a situation that can easily be controlled and navigation on the Upper Mississippi is greatly at risk.

[Jeff Denny, Alexander County, Ill.](#)

The MR&T project in the lower valley is proof that flood control works. We need to model the MR&T project in the upper valley.

[Mike Reed, Sny Island Levee and Drainage District, Ill.](#)

ISSUE: Impacts of climate change.

The storms we have been receiving are getting more severe and producing substantial more amounts of rain up the Ohio River Valley.

[Charles Davis, St. Francis Levee District of Missouri](#)



The fact remains flooding is occurring more frequently and at higher stages than it has in the past.

[Dustin Boatwright, Little River Drainage District, Mo.](#)

- The changing climate will exacerbate the groundwater shortages in the world's most populous countries.

High-Water Inspection Trip

Inspection of Southwest Pass Dredging Operations & Baton Rouge-Gulf Ship Channel



Dredge WHEELER

High-Water Inspection Trip

Inspection of Southwest Pass Dredging Operations & Baton Rouge-Gulf Ship Channel



High-Water Inspection Trip

Inspection of Old River Control Complex

The MR&T project in Louisiana amounts to an elaborate plumbing system, with multiple entrance, transfer and exit points needed to accommodate the 3,000,000 cubic feet per second (cfs) expected under the project design flood. In that regard, the Mississippi River between Old River and New Orleans is one of the most engineered sections of river in the world.

The goal of the system in this reach of the river is to divert flows a little at a time so that the Mississippi River discharge will not exceed the manageable rates of 1,250,000 cfs past New Orleans and 1,500,000 cfs past Baton Rouge, while ensuring a distribution of 30 percent of the combined waters and sediment of the Mississippi and Red rivers at the latitude of Red River Landing pass through to the Atchafalaya basin.

Authorized in 1954, the Old River Control Complex was constructed to prevent the Atchafalaya River from capturing the Mississippi River. Three separate structures comprise the Old River Control Complex. The low sill structure and the auxiliary structure remain operable at all river stages, but the overbank structure is only operated during larger floods. During project flood conditions, the Old River Control Complex is designed to divert up to 620,000 cfs from the Mississippi River to the Atchafalaya River.



Overbank structure

High-Water Inspection Trip

Inspection of Old River Control Complex



Overbank structure



Gabion field



Gabion field



Overbank structure

An aerial photograph of a river scene at sunset. In the foreground, there are two large, cylindrical structures, possibly part of a dam or lock system, with red and black sections. In the middle ground, a large brick building with arched windows is visible. The background shows a wide river and a distant shoreline with trees under a colorful sky.

396th Session of the Mississippi River Commission Low-water Inspection Trip

St. Paul, Minnesota
Hannibal, Missouri
Alton, Illinois
Caruthersville, Missouri
Helena, Arkansas
Natchez, Mississippi
Berwick, Louisiana

Low-Water Inspection Trip

August 7-19, 2016

The 396th session of the Mississippi River Commission took place from August 7-19, 2016. The annual low-water inspection included approximately 1,500 miles of the upper and lower Mississippi River between St. Paul, Minn., and the Old River Control Structure in Louisiana, and approximately 120 miles of the Atchafalaya River down to Berwick, La. During the trip, as much as 31 inches of rain fell in just 15 hours in and around the Baton Rouge area, causing devastating flash floods across portions of southeastern Louisiana, damaging more than 60,000 homes and killing 13 people.

A total of approximately 1,500 people, representing boards, agencies and associations with memberships and constituencies numbering in the tens of thousands, partnered directly with the commission through public hearings, partnering sessions and other engagements during the low-water inspection. Chief of Engineers Lt. Gen. Todd Semonite and Assistant Secretary of the Army (Civil Works) Jo-Ellen Darcy also joined the commission during the second week of the trip.

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From left to right: Brig. Gen. David Hill, Dr. Norma Jean Mattei, Mr. Sam Angel, Maj. Gen. Mike Wehr, Mr. R. D. James and Rear Adm. Gerd Glang.

Low-Water Inspection Trip

Listening – Public Meetings

The Mississippi River Commission held formal public hearings at St. Paul, Minn., Hannibal, Mo., Alton, Ill., Caruthersville, Mo., Helena, Ark., Natchez, Miss., and Berwick, La. Mississippi River Commission hearings are held in accordance with Section 8 of the 1928 Flood Control Act:

“Sec.8....The commission shall make inspection trips of such frequency and duration as will enable it to acquire first-hand information as to conditions and problems germane to the matter of flood control within the area of its jurisdiction; and on such trips of inspection ample opportunity for hearings and suggestions shall be afforded persons affected by or interested in such problems.”

The hearings, engagements and dialogue help maintain a consistent connection —an exchange of viewpoints and ideas among the public, partners, stakeholders, elected officials, the Mississippi River Commission, the Corps of Engineers and agencies from the private, state and federal sectors. This process provides a greater voice for those who live and work in the region in shaping federal management and policy on the river.

Approximately 450 members of the public attended the public meetings and listened to the testimony presented by 103 individual speakers.



Low-Water Inspection Trip

Listening – Partnering Sessions

As part of the 396th session, the Mississippi River Commission hosted round-table and panel discussions to facilitate deeper dialogue among our partners, Corps of Engineers staff and the commission on key issues and challenges confronting those who live, work and prosper along the Mississippi River.

August 7, St. Paul, Minn.

- Roundtable discussion with River Industry Executive Task Force:
 - ✓ Jim Guidry, Kirby Corporation.
 - ✓ Dave O’Loughlin, Ingram Barge Line.
 - ✓ Darin Adrian, Marquette Transportation Company.
 - ✓ Joe Tyson, Canal barge Company.
 - ✓ Rich Kreider, Campbell Transportation Company.
 - ✓ Marty Hettel, American Commercial Barge Line.
 - ✓ Lee Nelson, Upper River Services.
 - ✓ Lynn Muench, American Waterways Operators.



August 8, St. Paul, Minn., to La Crescent, Minn.

- Pilot house reconnaissance of upper Mississippi River navigation challenges and features with local navigation partners.



August 9, La Crescent, Minn., to Dubuque, IA

- Discussion of watershed study with Upper Mississippi River Basin Association in La Crescent, Minn.

August 10, Le Claire, IA to New Boston, IL

- Panel discussion on a host of topics to include water quality, Hypoxia Task Force, hydraulic research, capital investment strategy for the navigation industry, the Navigation and Ecosystem Sustainability program and emergency plans for Asian carp mitigation.



Low-Water Inspection Trip

Listening – Partnering Sessions *(continued)*

August 11, Quincy, Ill., to Hannibal, Mo.

- Panel discussion on upper Mississippi River flood risk management strategy, including viewpoints from:
 - ✓ Robert Sinkler, the Nature Conservancy
 - ✓ Loren Wobig, Illinois Dept. of Natural Resources
 - ✓ Robert Stout, Missouri Dept. of Natural Resources
 - ✓ Megan Kaiser, Upper Mississippi, Illinois and Missouri Rivers Association
 - ✓ Dru Buntin, Upper Mississippi River Basin Association



August 12, Alton, Ill.

- Congressional and partner reception at the National Great Rivers Research and Education Center. Attendees included representatives from:
 - ✓ American River Transportation
 - ✓ Audubon
 - ✓ Great River Habitat Alliance
 - ✓ Greenway Network
 - ✓ Horinko
 - ✓ Husch Blackwell
 - ✓ Kaskaskia Regional Port
 - ✓ Lewis and Clark College
 - ✓ Mississippi Valley Flood Control Association
 - ✓ Upper Mississippi River Basin Association



August 16, Helena, Ark., to Vicksburg, Miss.

- Mekong River Commission met with Mississippi River Commission and the Assistant Secretary of the Army (CW) Jo-Ellen Darcy.



August 18, Krotz Springs, La., to Berwick, La.

- Partners and stakeholders included:
 - ✓ Tim Matte, executive director, St. Mary Levee District
 - ✓ Joe Cain, commissioner, Port of Morgan City
 - ✓ Mac Wade, executive director, Port of Morgan City
 - ✓ Bill Hidalgo, St. Mary Levee District
 - ✓ Warren Byrd, executive director, Red River, Atchafalaya and Bayou Boeuf Levee District



Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need for investment in water infrastructure.

Civil Works' Value to the Nation (2010-2013 Average)

USACE has been working to characterize and document the Value to the Nation provided by the Civil Works program, based on economic return on investment as measured by NED benefits produced, and the financial measure of revenues that flow back to the U.S. Treasury.

Program	NED Benefits (billions of dollars)	Net NED Benefits (billions of dollars)	U.S. Treasury Revenues (billions of dollars)
Flood Risk Management	\$79.83	\$79.19	\$25.30
Coastal Navigation	\$9.87	\$9.07	\$3.88
Inland Navigation	\$8.84	\$8.24	\$2.27
Water Supply	\$7.61	\$7.59	\$0.08
Hydropower	\$2.92	\$2.73	\$1.43
Recreation	\$3.31	\$3.01	\$1.17
Leases and Sales			\$0.03
Total Annual NED	\$112.38	\$109.83	\$34.16

Notes:

- (1) Net NED benefits are defined as NED benefits less the costs of operations, maintenance, and investigations. Since the costs associated with expenses and oversight by the Assistant Secretary of the Army (ASA) serve all Corps programs, including those we did not calculate benefits for in this report, this report does not account for those costs.
- (2) The Benefits and Revenues numbers are not additive.

“It is very important that we continue to work together to complete the much needed flood control projects so flooding can be reduced in the lower Mississippi River Valley.”

[Bruce Cook, Yazoo-Mississippi Delta Levee District](#)

“It costs millions of dollars today, but you are avoiding billions of dollars of losses.”

[Tim Matte, St. Mary Levee District](#)

“As the world gets more integrated through trade and commerce, this system will only grow in importance. We must maintain and enhance our navigation infrastructure.”

[Andrew Grobmeyer, Agricultural Council of Arkansas](#)

“We ask that you lead in the re-investment in flood control and navigation...so that families and their ability to be productive in the delivery of Food, Fiber, and wise use of water will continue to result in the provision of food at an affordable price.”

[Sam Hunter, Mississippi Valley Flood Control Assn.](#)

“This “fix as it fails” strategy is well on its way to leaving U.S. waterborne transportation as a weak link in our commodities supply chain.”

[Patrick McGinnis, The Horinko Group](#)

Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need to repair and complete the MR&T system.



“The MR&T project had merit from its beginning and continues to reward the citizens of the valley and the entire nation. This project must be targeted for swift completion, proper maintenance and increased investment for recapitalization.”

[Rob Rash, St. Francis Levee District, Ark.](#)

“Without flood control, nothing else matters.”

[Windell Curole, South Lafourche Levee District, La.](#)

“It is imperative that the MR&T project receive the proper funding to expediently move toward completion. Currently the MR&T project...will not pass the Project Design Flood.”

[Bruce Cook, Yazoo-Mississippi Delta Levee District](#)

Local people, representing 10 states and covering 17 million acres of land, industry and infrastructure, have passed [resolutions](#) calling for investment in the MR&T system.

Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need to repair and complete the MR&T system.



“Moving forward we must be proactive rather than reactive. It is time to finish the MR&T project and recapitalize the system we have in place.”

[Dustin Boatwright, Little River Drainage District, Mo.](#)



“We need to act now to not only repair the damages to the system during the winter flood, but also to complete the remaining authorized components necessary to pass the Project Design Flood.”

[Peter Nimrod, Board of Mississippi Levee Commissioners](#)



“The federal government would be wise to openly discuss this MR&T project as an example of how federal partnerships and investments WORK to help people and our nation's economic success.”

[Harry Stephens, Cotton Belt Levee District](#)

Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The importance of ports, harbors and inland navigation.

“In comparison to using land, it is so much cheaper to transport by water that it enables our farmers to compete in a global market.”

**Brenda Buck, Claiborne
County Port**

“We need to continue to be a voice in Washington to find a permanent resolution in making sure that the ports and harbors along the Mississippi River are fully maintained and kept open for business.”

**Greg Curlin, Hickman-Fulton County
Riverport Authority, Ky.**

“The reliability of the locks and dams are essential for navigation all up and down the river. A farmer may need to plan to sell and ship goods six months in the future and he can only do this if the system is reliable.”

**Darrow Wenom, Inland Rivers, Ports
and Terminals**

“The unreliability of a channel will kill navigation and our local economies up and down the river system.”

**Cindy Cutera, Inland Rivers,
Ports and Terminals**

“The ability to utilize the Mississippi River to transport food products to the rest of the country and the world is vital to our economy.”

**Bruce Cook, Yazoo-Mississippi
Delta Levee District**



Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The importance of ports, harbors and inland navigation.



“We have a river that is the envy of the world. It has sustained the United States over the ages, and will do so well into the future if we demonstrate the leadership to make the needed investments to...protect one of the most cost effective transportation and flood control systems known to man.”

[John Charles Edwards, Helena-West Helena/Phillips County Port Authority](#)



“The loss of a dependable, reliable and safe harbor will have significant adverse impacts on the region due to the increased shipping costs by rail and trucks.”

[Robert Maxwell, Rosedale Harbor, Miss.](#)



“The River is responsible for creating \$400 billion worth of U.S. GDP; transporting 40 percent of our nation's agricultural output; and directly supporting 1.3 million jobs and millions more indirectly.”

[Aimee Andres, Inland Rivers, Ports and Terminals](#)

“No Taxation without channelization.”

Sean Duffy, Big River Coalition

Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: Continuing concerns with National Levee Safety Program, the Section 408 process and levee certification

“Permitting has become so complicated and so costly, what used to take a few months is taking years to get through the process...This is bureaucracy at its worst, leading in many cases of stakeholders giving up hope and abandoning much needed improvement projects.”

[Meagan Kaiser, Upper Mississippi, Illinois & Missouri Rivers Association](#)

“We need Corps Headquarters to wake up and stop this non-sense about issuing Permits on Levees owned and operated by Levee Boards and keep the permitting process in the hands of the levee owners.

[Peter Nimrod, Board of Mississippi Levee Commissioners](#)

“It has taken five years to get the permits for a couple segments of levee. You realize we won WWII in less time. The men and material we moved and we couldn’t move a piece of paper. We have to find a better way to do things.”

[Windell Curole, South Lafourche Levee District, La.](#)



Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: The need for comprehensive flood control and investment on the upper Mississippi River.

“The Upper Mississippi River System is a vital component of the nation’s inland waterway system and is extremely important to local, regional and national economies, particularly for its ability to efficiently move a substantial portion of the nation’s agricultural exports to the Gulf of Mexico.”

[Dru Buntin, Upper Mississippi River Basin Association](#)



“We cannot be stuck in a non-systemic 1950s piecemeal level of protection for another 25 years while waiting for a watershed plan.”

[Michael Klingner, Upper Mississippi, Illinois & Missouri Rivers Association](#)

“Without a Systemic Flood Control Plan, districts have had to resort to a twisted game of levee roulette, we wait to see whose sandbags and levees won't hold and give a sigh relief when it isn't ours, and wonder how we will ever pay for the cleanup when it is our levee that overtops.”

[Meagan Kaiser, Executive Director, Upper Mississippi, Illinois & Missouri Rivers Association](#)

“We support the delivery of a comprehensive flood control approach for the upper Mississippi River basin north of Cape Girardeau, Mo.”

[Dustin Boatwright, Little River Drainage District, Mo.](#)

Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: Water security, water scarcity and aquifer depletion.



“Many of our water resource issues are related to intensive agricultural irrigation that has steadily depleted groundwater aquifers. Protecting our food and water supply must become a priority at all levels of government and by private property interests.”

[Gene Sullivan, Bayou Meto Basin, Ark.](#)



“We are depleting our groundwater aquifer every year. [W]e need the Corps of Engineers to add Water Supply as one of its missions.”

[Peter Nimrod, Board of Mississippi Levee Commissioners](#)



“Continued irrigation practices through the use of surface and groundwater have led to low flows which have contributed to ecosystem degradation....[and] impacted groundwater recharging.”

[Ann Cash, Boeuf-Tensas Regional Irrigation Water Distribution District, Ark.](#)

Low-Water Inspection Trip

What We Heard: Top Regional Issues

ISSUE: Call to reexamine the flow distribution at Old River Control and water control manuals at structures to alleviate batture land flooding (unprotected land between levee systems).



“The Secretary of State’s Office supports a review of Public Law 780 adopted in 1954 by the United States Congress to revisit the mandatory 70.30 diversion at the Old River Control Structure...we believe there exists a need for flexibility in amending and currently changing the allocation of water in the Lower Mississippi Valley.

[Delbert Hosemann,
Secretary of State,
State of Mississippi](#)

“...the commerce in the batture area of the Mississippi River....is being adversely affected by some of the decisions....This water is coming faster and more frequently. It hits the bottleneck at Old River Control Structure, and the flow slows down. This causes the low ground in the batture in the Lower Mississippi River to stay inundated with surface water and/or ground water.”

[Conner House, forestry/logging/landowner](#)

“We are requesting that the Corps manage the Mississippi River water levels by adjusting the flow through the Old River Control Structures with the goal of maintaining the Mississippi River level to as low as possible at all times while still maintaining adequate height for river traffic.”

[Troy Orso, private citizen](#)

Low-Water Inspection Trip

Site Visit to St. Anthony Falls, Minn.

The Mississippi River Commission and St. Paul District staff visited St. Anthony Falls and the University of Minnesota's St. Anthony Falls Laboratory, which conducts environmental, engineering and hydraulic research using large scales hydraulic models.



Low-Water Inspection Trip

Site Visit to Caruthersville, Mo., Floodwall

The Mississippi River Commission visited the Caruthersville, Mo., floodwall to learn more about how the 2011 flood challenged the city's flood control system and to hear recommendations for structural improvements.



Low-Water Inspection Trip

Site Visit to Big River Steel Mill

The Mississippi River Commission and the Chief of Engineers Lt. Gen. Todd Semonite visited the Big River Steel Mill near Osceola, Arkansas, to see how investments in the Mississippi River and Tributary System are making a real economic difference for industries and farms that depend on the river for reliable navigation and dependable flood control. The \$2 billion steel mill will create approximately 1,000 new high-paying jobs for the region, all of which are only possible because of the flood control and navigation benefits provided by the MR&T project.



Low-Water Inspection Trip

Aerial Inspection Tour of Ohio-Mississippi Rivers Confluence Area

After the conclusion of the Mississippi River Commission public meeting on Aug. 16 at Helena, Ark., Chief of Engineers Lt. Gen. Todd T. Semonite, MRC President Maj. Gen. Michael C. Wehr and Memphis District Commander Col. Michael A. Ellicott Jr. took an aerial tour of the Ohio-Mississippi River confluence area near Cairo, Ill. and of the Birds Point-New Madrid Floodway in order to give Lt. Gen. Semonite a first-hand look at this critically important region.



Low-Water Inspection Trip

Site Visit to Lilly Bayou Structure in East Baton Rouge Parish, La.

Heavy rains fell over portions of the lower valley during the inspection trip. Some places received in excess of 20 inches of rain, causing severe flash flooding and interior flooding. Members of the Mississippi River Commission met with state and local partners at the Comite River Diversion project Lilly Bayou Structure in East Baton Rouge Parish, part of the region ravaged by flash floods. The diversion project calls for the Corps of Engineers to build a drainage canal that would connect the Comite River to the Mississippi River. Had the project been completed, it would have substantially reduced flooding and damages during the recent disaster.



Low-Water Inspection Trip

Site Visit to Bayou Chene and Bayou Boeuf

The Mississippi River Commission and New Orleans District staff visited Bayou Chene on the Atchafalaya River. During flood events, Atchafalaya backwater flooding threatens Morgan City and the area within the St. Mary Levee District.





Mississippi River & Tributaries Project

Economic Values

Congress authorized the Mississippi River & Tributaries project in 1928; one year after the devastating Great Flood of 1927 flood cut an 80-mile wide swath across the alluvial valley. The massive flood ravaged the valley by inundating 26,000 square miles of land, destroying 41,000 buildings, killing 500 people and creating up to 700,000 refugees. The flood was not merely one that impacted the valley; its consequences were felt nationwide as the raging waters put more than the 3,000 miles of rail and thousands of miles of highways out of service, severing east-west communications and commerce for months.

To prevent a similar tragedy, the nation invested heavily in a unified system of public works to provide unprecedented flood protection and a reliable commercial artery. The resultant MR&T project has four main features:

1. Levees and floodwalls to confine ordinary floods.
2. Floodways and backwater areas to provide room for the river to expand and relieve pressure on the levee system during larger floods.
3. Channel stabilization and channel improvements to provide an efficient channel that carries more water at lower stages during floods.
4. Tributary basin improvements that maximize the benefits of main stem protection by providing reservoirs for headwater protection and interior drainage improvements.

These features work in tandem to provide a safe and dependable commercial navigation channel on the Mississippi River, while protecting adjacent towns, farms, industry, manufacturers, energy providers, public and private investment, ports and transportation systems from "uncontrolled" flooding.

This increases reliability and productivity, and protects the nation's high-value investments.

The MR&T provides flood protection for:

- More than 4 million people and 900,000 households.
- 10.6 million acres of prime agricultural lands needed to feed the world.
- 3,600 miles of rail used by four major Class I freight carriers with combined (nationally) operating revenues of \$50 billion in 2011.
- 5,100 miles of highways, including major sections of I-10, I-20, I-40, I-55 and I-57, needed to transport commerce.
- 12 major oil refineries with a combined capacity of nearly 3 million barrels per day.
- Hundreds of thousands of oil and gas wells and related pipelines.
- 102 power plants, including three nuclear power plants.
- Hundreds of manufacturers, which generate more than \$100 billion and provide approximately 400,000 jobs.

In addition, the MR&T project provides:

- For more than 670 million tons of cargo to move annually (\$5.6 billion in annual transportation rate savings).
- Authorized depths for continued water commerce during severe droughts (1988, 1999, 2012).
- A commercial link from the bread basket and sugar and rice bowls of the nation to more than 30 ports, including four of the nation's busiest ports.

¹ Association of American Railroads, *Class I Railroad Statistics*, April 17, 2013. The major Class I freight operators include Burlington Northern-Sante Fe Railroad (\$19.6 billion), Kansas City Southern Railroad (\$1.2 billion), Canadian National Railroad (\$9.1 billion), and the Union Pacific Railroad (\$19.5 billion).

² Oil and Gas Journal, *List of Oil Refineries in the United States*

³ Industrial Economics, Inc., *Economic Profile of the Lower Mississippi Region*. This report states that in 1998 manufacturing generated \$87 billion in revenues and provided 383,000 jobs. The \$87 billion figure, when adjusted for inflation, amounts to approximately \$126 billion in revenues in 2014.



Mississippi River & Tributaries Project

Authorized Work Remaining Necessary to Convey the Project Design Flood

SEPTEMBER 2016

*MR&T System Component	Funds Required to Complete
Main Stem Improvements Total:	\$7.1 B
MS River Levees / Floodwalls	\$3.1 B
Floodway Levees / Floodwalls	\$1.3 B
Channel Improvement	\$1.7 B
Structures	\$1.0 B
Tributary Improvements Total:	\$1.4 B

Levees & Floodwalls

MS River: (\$3.1 billion)

- 138 levee & floodwall segments encompassing over 370 miles remain to be raised.
- 97 levee segments have confirmed seepage encompassing approximately 395 miles.

Atchafalaya Floodway: (\$1.3 billion)

- 35 levee enlargement segments encompassing over 115 miles remain to be raised.
- 19 floodwall segments that do not meet stability standards & require structural evaluation.

MS River Channel Improvements: (\$1.7 billion)

- Construction of new Mat Sinking Unit - Armor One.
- 31 miles of revetments to be constructed & extended.
- 56 dikes remaining to be raised/ extended

Structures: (\$1.0 billion)

MS River: Improvements to the Old River Overbank are required.

Atchafalaya Floodway:

- Bayou Sorrel, Berwick, & Bayou Boeuf navigation locks are below design elevation.
- Charenton, East Calumet, & West Calumet floodgate replacements.
- Yellow Bayou Pump Station requires reconstruction.

Tributary Improvements Total: (\$1.4 billion)

▪ Tributary Levees & Floodwalls:

- 67.5 miles of levees remain to be constructed.
- 33 levee reaches are below design grade.
- Approximately 40 miles of levee segments require seepage or stability berms.

▪ Tributary Channel Improvements:

- 30 Channel enlargements & one dike remain to be constructed.

▪ Tributary Structures:

- Yazoo Backwater Improvements
- St. Johns New Madrid Improvements
- Various locations where work required to complete is still under evaluation:
 - Little Bayou Meto-drainage, Tillatoba Creek grade control structures, Panola-Quitman grade control structures, & 47 stoplog water control structures.

MR&T Deferred Maintenance: (\$300 million)

- Proper operation & function of the features of the system is critical.
- Known deficiencies require enhanced readiness & increased flood fighting measures.
- Does not include unknown channel improvement deficiencies due to dynamic changes in the river or maintenance incurred from recent flood events.

* Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 & preliminary cost estimates from the Economic Re-evaluation Report, August 2016.



Mississippi River & Tributaries Project



Authorized Work Remaining Necessary to Convey the Project Design Flood State of Arkansas

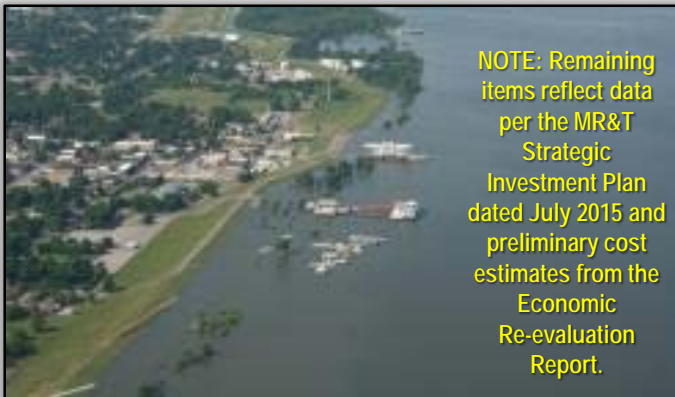
September 2016

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Mellwood, AR	8.8	\$15,062,947
MO-AR State Line to St. Francis River Levee	26.0	\$119,388,175
Luna-Leland: Levee/Berms	5.3	\$20,586,476
Below Arkansas City:Levee	0.5	\$1,504,192
Sunnyside: Levee	3.2	\$13,631,450
Panther Forest: Berms	1.4	\$4,115,680
Cypress Creek: Berms	2.1	\$7,158,490
Gaines Landing: Berms	3.7	\$9,385,305
Above Lakeport-Harwood:Levee/Berms	8.6	\$48,297,890
Dewey: Berms	0.9	\$2,192,910
Seepage Controls		
Above Ferguson, AR	6.7	\$14,351,400
Fair Landing, AR	3.6	\$7,711,200
Helena, AR	0.7	\$1,499,400
Henrico, AR	8.2	\$17,564,400
Horseshoe Lake, AR	3.2	\$6,854,400
Huffman, AR	0.8	\$1,713,600
Knowlton, AR	5.2	\$11,138,400
Mellwood, AR	8.8	\$18,849,600
Modoc, AR	7.5	\$16,065,000
Oldtown, AR	4.8	\$10,281,600
Poker Point, AR	7.3	\$15,636,600
St. Thomas, AR	6.0	\$12,852,000
West Memphis, AR	2.0	\$4,284,000
Westover, AR	9.9	\$21,205,800
White River, AR (Backwater)	1.9	\$4,069,800
Williamson, AR	3.9	\$8,353,800
Leland-Vaucluse	6.0	\$23,969,914
Totals:		146.9 \$437,724,429

Main Stem Channel Improvements

Project or Item Name	Length (Miles)	Total
Revetments		
Oldtown, AR	0.5	\$6,336,750
Hopefield, AR SP	0.1	\$1,043,700
Bauxippi Wyanoke, AR	0.1	\$3,104,475
Horseshoe, AR, SP	0.3	\$2,385,600
Westover, AR	0.1	\$2,822,250
Reinforcement	0.2	\$5,362,275
Lower Bullerton, AR SP	0.2	\$1,491,000
St. Francis, AR SP	0.2	\$1,491,000
Horseshoe, AR	0.2	\$4,656,713
Ludlow, AR, SP	0.2	\$1,192,800
Island 68/Knowlton, SP	0.2	\$1,192,800
Cypress Bend, AR	0.6	\$16,584,400
AR City-Yellow Bend	0.6	\$16,584,400
Dikes		
Cat Island, AR	0.7	\$4,901,916
Below Walnut Bend, AR	0.4	\$4,309,172
Corona Bar, AR	0.7	\$9,850,740
Below Knowlton, AR	0.3	\$5,121,535
Island 68, AR	0.4	\$5,684,435
Island 64, AR	0.1	\$1,407,249
Kangaroo, AR	0.2	\$2,869,937
Walnut Bend, AR	0.6	\$8,609,812
Porter Lake, AR	0.9	\$9,381,658
Dismal Point, AR	0.2	\$3,377,397
Poker Point, AR	0.2	\$2,814,497
Corona Bar, AR	0.4	\$5,739,875
Island 25, AR	0.3	\$3,855,011
Nebraska Point, AR	1.2	\$11,501,062
Barfield Bend, AR	0.9	\$40,898,164
Wright's Point, AR	1.1	\$13,658,844
White River Mouth Dike	0.2	\$1,964,600
White River Landing	0.2	\$2,133,950
Malone Field, AR	0.2	\$3,069,550
Chicot Landing, AR	0.2	\$4,286,300
Below Yellow Bend	0.1	\$1,403,300
Island 82	0.7	\$2,806,400
Leland Neck	0.6	\$4,940,250
Leland Bar	0.1	\$1,403,300
Vaucluse BWW	0.4	\$6,360,900
Anconia, AR	0.3	\$5,817,290
Seven Oaks	0.2	\$1,403,300
Island 86	1.1	\$5,437,720
Totals:		16.2 \$239,256,325



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project



Authorized Work Remaining Necessary to Convey the Project Design Flood State of Illinois

September 2016

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Levee Enlargement		
Mound City to Cairo Levee	6.1	\$13,346,676
Floodwalls		
Floodwall and Levee Raise, 8/4 (City of Cairo, IL)	3.0	\$10,285,884
Cairo Floodwall Structural Evaluation	2.4	\$15,750,000
Floodwall Utility Crossings (City of Cairo, IL)	2.4	\$3,150,000
Cairo Floodwall Opening at Fish Market	0.2	\$1,181,250
Seepage Controls		
		0
Mound City, IL Floodwall Opening 2 at Monoliths 3&4	0.4	\$856,800
North Mound City	0.4	\$856,800
Totals:	14.9	\$45,427,410



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project

Authorized Work Remaining Necessary to Convey the Project Design Flood State of Kentucky



September 2016

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Floodwall		
Hickman, KY Floodwall Tie-In	0.2	\$4,770,360
Seepage Control		
Island 8, KY P2	3.9	\$8,353,800
	4.1	\$13,124,160



Main Stem Channel Improvements

Project or Item Name	Length (Miles)	Total
Revetments		
Wolf Island Bar, KY, SP	0.2	\$1,192,800
Wickliffe, KY	0.2	\$3,951,150
Mayfield Creek, KY	0.2	\$4,656,713
Mayfield Creek, KY	0.4	\$9,313,425
Columbus, KY	0.2	\$6,350,063
Wolf Island Bar, KY SP	0.2	\$5,362,275
Williams, KY	0.6	\$16,933,500
Hickman Bar, KY, SP	0.5	\$3,727,500
Island 8 Trenchfill, KY	1.3	\$2,556,000
Island 8, KY	1.0	\$25,400,250
Dikes		
Below Williams, KY	0.4	\$4,582,090
Moore Island, KY	0.8	\$5,957,353
Campbell, KY	0.5	\$3,400,851
Island 1, KY	0.3	\$1,876,332
Totals:	6.7	\$95,260,300



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project



Authorized Work Remaining Necessary to Convey the Project Design Flood State of Louisiana – Main Stem

September 2016

Main Stem Channel Improvements					
Project or Item Name	Length (Miles)	Total	Project or Item Name	Length (Miles)	Total
Revetments			Dikes		
Sarah Island - Opossum Point	0.4	\$11,056,300	Lower Cracraft	0.7	\$4,004,640
Baleshed - Stack Island	1.4	\$41,460,900	Wilson Point	0.9	\$12,646,410
Milliken Bend	0.9	\$27,640,600	Lake Providence	0.7	\$22,916,090
Togo Island	0.8	\$22,112,500	Point Lookout	0.6	\$3,069,550
Hardscrabble	0.5	\$13,820,300	Cottonwood Bar	0.6	\$3,197,240
Goldbottom	1.1	\$33,168,700	Willow Cutoff	0.5	\$2,788,750
Gibson	0.4	\$11,056,300	Forrest Home Towhead	1.1	\$3,760,700
Bougere	0.2	\$5,528,200	Marshall Cutoff	0.9	\$6,587,600
Burnside	0.4	\$20,171,090	False Point	0.4	\$6,401,450
Romeville	0.3	\$15,924,550	Racetrack Towhead	0.8	\$7,541,700
Twelve Mile Point	0.2	\$12,739,620	Togo Island	2.2	\$21,647,260
Diamond	0.6	\$31,849,100	Hardscrabble	0.4	\$4,463,840
Point Michel	0.4	\$21,232,700	Bondurant Towhead	1.2	\$3,760,700
Morganza Bend	0.4	\$24,417,630	Brownsfield	0.6	\$3,069,550
Bayou Sara	0.1	\$7,431,470	Natchez Island	0.7	\$3,087,100
Port Allen	0.4	\$22,294,410	Bougere	1.9	\$15,715,500
New River Bend	0.5	\$26,540,850	Union Point	0.7	\$5,203,100
Burnside	0.5	\$25,479,240	Lower Plaquemines Point	0.3	\$414,860
Belmont	0.4	\$22,294,410	Point Pleasant	0.6	\$283,900
Vacherie	0.2	\$8,493,080	Upper Point Clair	0.7	\$283,900
Third District Reach	0.3	\$16,986,260	Reserve	0.4	\$247,500
English Turn	0.6	\$36,095,740	Ama	0.4	\$375,100
Scarsdale	0.4	\$22,294,410	Fanny-Belair	0.4	\$211,100
Port Sulphur	0.8	\$45,650,530			
Totals:	12.1	\$657,416,430	Totals:	17.7	\$131,677,540



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project



Authorized Work Remaining Necessary to Convey the Project Design Flood State of Louisiana – Main Stem

September 2016

Main Stem Structure

Project or Item Name	Total
Old River Control Structure Overbank	\$60,756,000

Tributary Structures

Project or Item Name	Total
Charenton Floodgate	\$41,405,058
Bayou Sorrel Lock	\$328,050,950
East Calumet Floodgate	\$112,222,808
West Calumet Floodgate	\$112,222,808
Berwick Lock	\$73,138,516
Bayou Bouef Lock	\$176,663,643
Yellow Bayou Pump Station	\$15,105,033
Sherburne Control Structure	\$45,492,314
Henderson Control Structure	\$45,492,316
Non Fed Pumping Plants	\$23,300,982
Total:	\$973,094,429

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Levee Enlargements		
Pt. Pleasant-Yucatan	9.6	\$50,958,928
St. Joseph-Waterproof	13.3	\$61,816,859
Bayou Vidal-Elkridge	2.8	\$15,591,690
Yucatan-Lake Bruin	9.0	\$46,052,795
Bayou Vidal-Elkridge	3.0	\$19,261,828
Waterproof-Concordia	10.8	\$67,597,337
Morville-Blackhawk	34.4	\$101,681,680
Up Concordia-Vidalia	9.5	\$64,666,706
Phoenix to Bohemia Polder	15.0	\$42,499,072
Caernarvon to Phoenix Polder	17.0	\$153,109,572
Mississippi River West Bank	157.2	\$1,015,575,747
New Orleans East Bank	12.2	\$109,177,891
Mississippi River East Bank	5.0	\$47,864,000
New Orleans West Bank	4.9	\$124,123,176
Additional Data Pending, (Misc. Channels & Canals)	-	\$3,863,552
Totals:	303.8	\$1,923,840,833

Tributary Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Levee Enlargements		
Bayou Sale E/W Tie-In	0.3	\$3,284,019.20
W. Bayou Sale – Maryland	1.6	\$5,129,058.46
Atchafalaya Basin LD - Morganza Floodway, Coswell	7.9	\$95,771,658.75
Alabama Bayou	1.7	\$33,706,200.20
Mussell Bayou	11.4	\$61,225,000.23
Morris Bayou	1.3	\$7,408,232.17
West Atchafalaya Floodway, Bayou LaRose	11.1	\$75,780,288.46
Krotz Springs Ring Area	-	\$4,882,950.20
Wax Lake West Area	24.1	\$182,363,935.22
Wax Lake East Area	26.9	\$197,087,066.47
West of Atchafalaya Basin	30.5	\$132,731,279.69
Additional Data Pending, Multiple Items	-	\$496,795,800.16
Totals:	116.9	\$1,296,165,489



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project



Authorized Work Remaining Necessary to Convey the Project Design Flood State of Mississippi

September 2016

Construction of New Mat Sinking Unit

Project or Item Name	Total
ARMOR ONE	\$120,000,000

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Levee Enlargements		
Lake Jackson-Palmetto: Levee	3.2	\$9,007,530
Avon: Levee/Berm	0.7	\$4,201,770
Brunswick-Halpino: Levee/Berm	4.7	\$30,500,110
James-Longwood: Levee/Berm	5.0	\$21,946,060
Seepage Controls		
Clack, MS	3.6	\$7,711,200
Commerce, MS	5.0	\$10,710,000
Flower Lake, MS	2.0	\$4,284,000
Friars Point, MS	7.9	\$16,921,800
Norfolk, MS	11.9	\$25,489,800
Sherard, MS	5.1	\$10,924,200
Stovall, MS	0.9	\$1,927,800
Trotters, MS	5.0	\$10,710,000
Walls, MS	6.4	\$13,708,800
Deerfield	3.7	\$4,820,580
LaGrange	2.6	\$5,716,040
Below Catfish Point	3.2	\$4,460,000
Catfish Point	1.0	\$2,846,730
Lake Bolivar	3.2	\$9,666,855
Upper Lake Bolivar	0.9	\$2,544,945
Sledge-Waxhow	0.8	\$2,177,600
Deeson	2.9	\$4,080,380
Round Lake	1.4	\$3,316,810
Avon-Longwood	3.8	\$11,874,930
Avon	1.6	\$3,252,550
Francis	4.4	\$8,654,180
Brunswick-Halpino: Relief Wells	3.8	\$23,325,340
Magna Vista-Brunswick: Relief Wells	5.4	\$39,477,420
Riverton	2.1	\$3,680,800
Rosedale	0.5	\$1,307,900
Warfield	0.8	\$1,127,440
Above Greenville	4.8	\$11,449,210
Totals:	108.4	\$311,822,780



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



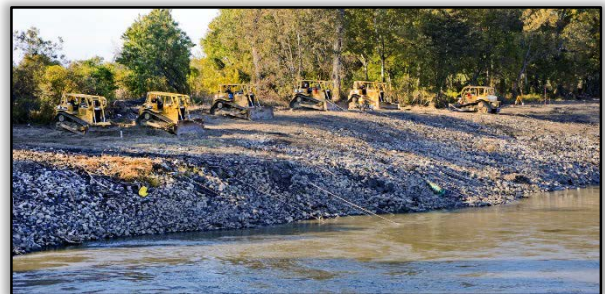
Mississippi River & Tributaries Project

Authorized Work Remaining Necessary to Convey the Project Design Flood State of Mississippi

September 2016

Main Stem Channel Improvements

Project or Item Name	Length (Miles)	Total	Project or Item Name	Length (Miles)	Total
Revetments			Dikes		
Island 63 Upper, MS	0.4	\$10,583,438	Coahoma, MS	0.5	\$6,865,673
Trotters, MS	0.1	\$3,810,038	Cessions Towhead, MS	0.4	\$6,302,774
Reinforcement	0.1	\$1,834,463	Sunflower, MS	0.5	\$5,505,333
Cessions, MS SP	0.4	\$3,131,100	Friars Point, MS	0.7	\$9,498,928
Mhoon Bend, MS SP	0.3	\$2,385,600	Mhoon Bend, MS	1.0	\$44,987,980
Island 63 Upper, MS	0.6	\$14,816,813	Norfolk Star, MS	0.2	\$2,643,928
Scrubgrass, MS	0.6	\$16,933,500	Smith Point	0.8	\$5,426,750
Lake Concordia, MS	0.5	\$13,820,300	Rosedale	0.7	\$5,051,500
Rosedale Bend	0.5	\$13,820,300	Catfish Point	0.9	\$4,940,250
Mayersville	0.5	\$13,820,300	Ashbrook Cutoff	0.3	\$3,069,550
Belle Island	0.6	\$16,584,400	Tarpley Cutoff	0.9	\$15,083,710
Kings Point - Opposite Delta	0.4	\$11,056,300	Warfield Point	0.9	\$7,813,050
Grand Gulf, MS - SP	1.4	\$41,460,900	Island 84	0.5	\$3,741,490
Ashland	0.7	\$19,348,400	Refuge, MS	1.1	\$21,614,110
Railroad	0.3	\$8,845,000	Leota	0.7	\$1,964,600
			Corregidor	0.4	\$3,332,300
			Baleshed Landing	2.1	\$12,423,740
			Ben Lomond	2.1	\$28,580,020
			Ajax Bar	0.4	\$9,543,350
			Arcadia Point	2.9	\$13,425,650
			Forest Home Towhead, MS	0.9	\$3,760,700
			Below Racetrack	0.3	\$3,069,550
			Cottage Bend	1.3	\$10,206,010
			Spithead Towhead	0.7	\$5,203,100
			Ashland	0.3	\$3,332,300
			Opposite Warniott Landing	0.5	\$3,332,300
			Glasscock	0.5	\$1,403,300
			Railroad	0.5	\$1,403,300
			Buck Island	1.2	\$3,367,700
			Jackson Point	1.0	\$6,869,350
Totals:	7.3	\$192,250,850	Totals:	25.2	\$253,762,296



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project



Authorized Work Remaining Necessary to Convey the Project Design Flood State of Missouri

September 2016

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Levee Enlargements		
Birds Point to New Madrid Set Back Levee	5.0	\$19,887,890.40
Commerce to Birds Point Levee	5.4	\$18,062,352.00
New Madrid to MO-AR Levee	4.3	\$8,408,685.60
Floodwall		
Caruthersville, MO Floodwall	0.5	\$7,875,000.00
Seepage Controls		
Above Dorena, MO	27.0	\$57,834,000.00
Barnes Ridge, MO	22.7	\$48,623,400.00
Bayouville, MO	11.4	\$24,418,800.00
Below New Madrid, MO	17.5	\$37,485,000.00
Concord, MO	12.2	\$26,132,400.00
Hubbard Lake, MO	6.5	\$13,923,000.00
Nash, MO	7.7	\$16,493,400.00
Samos, MO	12.5	\$26,775,000.00
Totals:	132.7	\$305,918,928.00



Main Stem Channel Improvements

Project or Item Name	Length (Miles)	Total
Revetments		
New Madrid Front, MO SP	0.2	\$1,640,100
Reinforcement	0.1	\$1,975,575
Pritchard, MO, SP	0.6	\$5,069,400
Laforge, MO Stone Fill - Phase 2	0.6	\$5,680,000
Dikes		
Milton Bell, MO, SP	0.2	\$1,491,000
Donaldson Point, MO	0.4	\$2,776,121
Fritz, MO	0.6	\$26,174,825
Lee Towhead, MO	0.9	\$39,262,237
Caruthersville-Linwood, MO	0.2	\$2,814,497
Robinson Bayou, MO	0.9	\$6,918,972
Stewart Towhead, MO	0.5	\$3,752,663
Ruddles Point, MO	0.8	\$6,801,702
Island 11, MO	0.2	\$2,307,038
Hotchkiss Bend, MO	0.6	\$8,443,492
Donaldson Point, MO	1.4	\$8,795,304
Beckwith Bend, MO	0.3	\$4,277,186
Pritchard, MO	0.5	\$5,156,716
Birds Point, MO	0.5	\$7,991,472
Totals:	9.4	\$141,328,300



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project

Authorized Work Remaining Necessary to Convey the Project Design Flood State of Tennessee



September 2016

Main Stem Levee and Floodwalls

Project or Item Name	Length (Miles)	Total
Seepage Controls		
Miston, TN	8.9	\$19,063,800
Phillippy, TN	2.1	\$4,498,200
Totals:	11.0	\$23,562,000



Main Stem Channel Improvements

Project or Item Name	Length (Miles)	Total
Revetments		
Ensley, TN	0.4	\$9,877,875
Presidents Island	0.1	\$3,386,700
Reinforcement	0.2	\$4,515,600
Ensley, TN	0.2	\$5,362,275
Cedar Point-Densford, TN	0.2	\$4,797,825
Heloise, TN SP	0.2	\$1,938,300
Heloise, TN	0.2	\$5,362,275
Chute Of Island 35, TN	0.2	\$5,926,725
Obion-Tamm, TN, SP	0.2	\$1,491,000
Merriwether-Cherokee, TN SP	0.4	\$2,982,000
Above Lee Towhead, TN	0.8	\$21,872,438
Driver Bar, TN SP	0.2	\$1,491,000
Cedar Point-Densford, TN SP	0.4	\$2,982,000
Dean Island, TN	0.1	\$2,116,688
Presidents Island, TN	0.3	\$8,466,750
Ensley, TN SP	0.3	\$2,683,800
Dikes		
Kate Aubrey, TN	0.2	\$3,714,286
Hatchie Towhead, TN	0.6	\$3,752,663
Randolph, TN	0.2	\$2,814,497
Keyes Point, TN	0.8	\$9,999,997
Densford, TN	0.2	\$2,869,937
Armstrong, TN	0.3	\$4,221,746
Loosahatchie Bar, TN	0.3	\$5,066,095
Above Loosahatchie, TN	0.7	\$9,850,740
Randolph Point, TN	0.6	\$5,722,811
Cedar Point, TN	0.2	\$2,345,414
Reverie	0.4	\$17,995,192
Island 18 Towhead	0.3	\$4,558,636
Totals:	9.3	\$158,165,266



NOTE: Remaining items reflect data per the MR&T Strategic Investment Plan dated July 2015 and preliminary cost estimates from the Economic Re-evaluation Report.



Mississippi River & Tributaries Project

2016 Mississippi River Winter Flood Event

- The MR&T system performed effectively as designed without loss of life or land flooded that was not intended to be flooded.
- The repairs from the 2011 Flood have proven to be effective.
- The system is not complete and not capable of passing the design flood.
- Partnerships with local, state and federal entities are critical to the success and operation of the MR&T system.
- Approximately 68 items remain to be completed from the 2011 post flood repairs at an approximate value of \$110 million.
- The 2016 Winter flood caused significant damages to the system that must be repaired.
- ✓ If the current MR&T appropriation is to be used to respond to future events and to repair the damages incurred from this event, both present and future funded work will be deferred.
- ✓ The flood control and navigation features have suffered impacts that may make the system vulnerable heading into the 2016 flood season.
- ✓ Extra vigilance and advanced preparedness is required to ensure the safety and security of our citizens, infrastructure, and industry.



Levee slides



Structure damage

Revetment and dike damage





Mississippi River & Tributaries Project

2016 Winter Flood Damages

(as of August 2016)

Mississippi River
& Tributaries:
\$275 million

FCCE:
\$40 million

Operations &
Maintenance:
\$56 million



MR&T Winter Flood Impacts

- Channels impacts:
 - ✓ Dredging: significant shoaling is expected at locations that are historical problematic crossings.
 - ✓ Ports and harbors: expect substantial shoaling, requiring approximately 50 percent more than normal effort to recover from this event.
 - ✓ Revetments: excessive scour along the toe and upper bank failures are expected along the main stem.
 - ✓ Dikes: increased degradation and loss of bank head (key in) is expected to occur at dikes along the main stem. Without repair, dikes cannot perform as designed which leads to an increased need for dredging and a potential for accidents and/or groundings.
- Delaying repairs to existing revetments and dikes results in higher risk during future events and increased repair costs. Increased scour along the toe of the revetments leads to upper bank failures which threaten the integrity of levees and channel alignment which adversely impacts navigation.
- Levee impacts: numerous levee slides, sand boils, damaged culverts, gates and relief wells have been identified along the main stem Mississippi River levees.
- Without repair, uncontrolled under seepage through levee slides, damaged gates and culverts, and relief wells can result in the loss of material from the levee foundation. Over time, continued migration of material from the levee subgrade results in increased seepage and material loss accelerates. If left unaddressed, uncontrolled seepage can lead to a levee breach.



Mississippi River Commission

We Value

Listening - Access

... providing an equal opportunity for all citizens to share their insight and wisdom in a free and open forum – a forum that offers greater access for citizens to actively engage in and shape federal water resource management policy.



Inspecting - Professionalism

... setting the highest professional, engineering and process standards that are emulated nationally and internationally, and offer an intergenerational vision for the world's 3rd largest watershed.



Partnering – Relationships

... establishing and nurturing long-term collaborative relationships with diverse interests, elected representatives, state and federal agencies, and the Corps of Engineers to develop sustainable solutions for current and future watershed challenges.



Engineering - Action

... protecting lives, property, economic prosperity and the nation's natural resources by advancing balanced and sound water resource engineering solutions reached through collaboration and long-term relationships.





Mississippi River Commission

Priorities

Navigation – assuring availability, preparing for the future by improving delivery of goods

- Consider, discuss and address container on barge with opening of the new Panama Canal set of locks (2015).
- Dredging of small ports and harbors.
- Navigation, Ecosystem Sustainability Program (NESP).

Infrastructure

- Use MRC process of listening, inspecting, partnering and engineering to increase awareness of the deteriorating infrastructure in the watershed.
- Through established relationships develop plans to address infrastructure in the watershed; lead federal efforts.
- Use MRC process to increase and help improve infrastructure investment.

Comprehensive Flood Control and Management – a systems approach

- MR&T (2011 flood system restoration; Mississippi River levees, Morganza to the Gulf).
- Upper Mississippi / Illinois Rivers Comprehensive Plan.
- Communicate MRC/MR&T process as a comprehensive balanced watershed approach to follow in the six major sub-basins comprising the world's largest watershed inland navigation system – the Mississippi, Missouri, Ohio, Red, Arkansas, Illinois river basins and tributaries.

Environmental Sustainability – uniting water, land and people

- Integrate science based, sustainable and resilient work into all projects (life-cycle cost and delivery of solutions to long term viability of water resources).
- LCA: Explore and recommend innovative science based approaches and solutions to coastal challenges ... such as water and sediment diversions.

Water Supply and Ground Water

- Prolonged drought concerns / storage of runoff.
- Multi-state aquifer depletion.

200-year working Vision – America's Watershed

- MRC signed a working vision on Aug. 20, 2009 (revised 2015). It serves as:
 - A system-wide balanced approach, offers an intergenerational commitment and compliments a national vision.
 - A platform for broad participation, international recognition and a long term balanced working vision for the world's largest navigable watershed.





Mississippi River & Tributaries Project

Facts

The Mississippi River and Tributaries project was authorized by the 1928 Flood Control Act. In the wake of the 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 protection from floods and an equally efficient navigation channel.

The MR&T project has four major features:

- Levees/floodwalls
- Floodways
- Channel improvement and stabilization
- Tributary basin improvements

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

PROJECT BENEFITS

Flood Control

- \$14.8 billion invested for planning, construction, operation and maintenance since 1928.
- \$666 billion in flood damages prevented, since 1928.
- Approximately 4 million people protected.
- \$234 billion damages prevented in 2011.
- 45 to 1 return on each dollar invested.
- 1927 Flood = 16.8 million acres flooded.
- 2011 Flood = 6.4 million acres flooded.
- Untold economic productivity enables farms, towns & factories.

Navigation

- More than 670 million tons of cargo move on the Mississippi River system each year.
- \$5.6 billion saved annually in transportation benefits.
- The Mississippi River remained opened during the 1988, 1999 and 2012 droughts, as well as the 2011 record flood. The ability to keep the river open offered unequivocal evidence of the benefit of the MR&T project to the nation. Keeping it open and reliable is a pillar of economic stability and national security.



America's Watershed: A 200-year working vision

An Intergenerational Commitment

Our people enjoy a quality of life unmatched in the world:

- We lead secure lives along the river or tributary.
- We enjoy fresh air and the surrounding fauna, flora and forests while hunting, fishing and recreating.
- We travel easily, safely and affordably.
- We drink from and use the abundant waters of any river, stream or aquifer.
- We choose from an abundance of affordable basic goods and essential supplies that are grown, manufactured and transported efficiently and reliably along and by the river to local and world markets.



The Mississippi watershed is 41% of the U.S., 31 states, 1.25 million square miles, more than 250 tributaries.

Balancing needs for:

- ✓ National security, flood control and flood damage reduction
- ✓ Environmental sustainability and recreation
- ✓ Infrastructure and energy
- ✓ Water supply and water quality
- ✓ Movement of goods; agriculture and manufacturing

Leveraging local citizens' input, international dialogue, science, engineering, technology and public policy.

Join the dialogue, visit:

- www.mvd.usace.army.mil/mrc
- cemvd-ex@usace.army.mil

High- & Low-Water Inspection Trips

Partners Engaged

AGRICULTURE AND ECONOMIC DEVELOPMENT

- Delta Council, Miss.
- East Arkansas Enterprise
- Economic Development Growth Engine (EDGE) Memphis, Tenn.
- Illinois Farm Bureau
- Illinois Corn Growers Association
- Illinois Soybean Association
- International Traders of Iowa
- Iowa Corn Growers Association
- Iowa Farm Bureau
- Iowa Natural Resources Conservation Service
- Louisiana Cotton & Grain Association
- Louisiana Farm Bureau
- Missouri Farm Bureau
- United Soybean Board
- U.S. Department of Agriculture

BUSINESS AND MANUFACTURING

- Associated General Contractors of America
- Big River Steel
- J. M. Jones Lumber Company
- Rye Development
- United Steel Workers

EDUCATION AND RESEARCH

- Clyde C. Miller Academy, Mo.
- Great Rivers Environmental Law Center, Ill.
- Lewis and Clark Community College
- Louisiana State University
- NewPOT Solutions Charitable Foundation
- Presbyterian Day School, Memphis, Tenn.
- Saint Louis University
- University of Arkansas, Pine Bluff
- University of Illinois
- University of Iowa Institute of Hydraulic Research
- University of Memphis
- University of Minnesota
- Western Illinois University Institute for Environmental Studies

ENVIRONMENTAL CONSERVATION, RECREATION & TOURISM

- Alton Regional Convention and Visitors Bureau
- American Rivers
- Arkansas Department of Parks and Tourism
- Audubon Center at Riverlands
- Audubon Society, La.
- Big River Strategic Initiative
- Department of Natural Resources
- Friends of the Riverfront, Memphis
- Great Rivers Environmental Law Center
- Great Rivers Habitat Alliance
- Greenway Network
- Gulf of Mexico National Wildlife Federation
- Gulf Restoration Network
- The Horinko Group
- Lower Mississippi River Conservation Committee
- Meeting of the Rivers Foundation
- Minnesota Boat Club
- Mississippi River Corridor
- The Nature Conservancy
- Quad City Convention and Visitors Bureau
- River Action, Inc.
- Sierra Club
- Soil and Water Conservation
- U.S. Fish and Wildlife Service
- Upper Midwest Environmental Science Center
- Working Lands for Wildlife



High- & Low-Water Inspection Trips

Partners Engaged

FLOOD CONTROL

- Alexander County, Ill.
- Atchafalaya Basin Levee District, La.
- Beaver Bayou Drainage District
- Cotton Belt Levee District, Helena Arkansas
- Drainage District No. 7, Ark.
- Dyer County Little Levee District, Tenn.
- Elk Chute Drainage District of Missouri
- Fabius River Drainage District
- Fifth Louisiana Levee District
- Fulton County Levee Board, Ky.
- Harrisonville Drainage and Levee District
- Hatchie Drainage District, Miss.
- Iowa Flood Center
- Laconia Levee District
- Lake County Levee and Drainage District, Tenn.
- Len Small Levee & Drainage District, Ill.
- Levee District No. 3, Mo.
- Little River Drainage District, Mo.
- Mississippi Levee Board, Miss.
- Mississippi Valley Flood Control Association
- Monarch-Chesterfield Levee District
- Neighbors of the Mississippi
- Piney Drainage District, Ark.
- Pontchartrain Levee District, La.
- Red River, Atchafalaya and Bayou Boeuf Levee District
- Sny Island Levee District, Ill.
- Southeast Levee District of Arkansas
- St. Francis Levee District of Missouri
- St. Francis Levee District of Arkansas
- St. Johns Levee & Drainage District, Mo.
- St. Mary Levee District, La.
- Tensas Basin Levee District, La.
- Terrebonne Levee & Conservation District, La.
- Two Rivers Levee and Drainage District
- Upper Mississippi, Illinois, Missouri Rivers Association (UMIMRA)
- White River Drainage District, Ark.
- Wood River Drainage and Levee District
- Yazoo-Mississippi Delta Levee Board, Miss.

PORTS AND HARBORS

- Claiborne County Mississippi Port
- Helena Harbor, Ark.
- Hickman-Fulton County Riverport Authority, Ky.
- Inland River, Ports and Terminals
- Jackson Port Boatworks
- Kaskaskia Regional Port District
- Mid-American Port Commission
- New Madrid County Port Authority, Mo.
- Pemiscot County Port Authority, Mo.
- Poinsett County Port Authority, Ark.
- Port of Claiborne County, Miss.
- Port of Greater Baton Rouge, La.
- Port of Lake Providence, La.
- Port of Greater Baton Rouge, La.
- Port of Memphis, Tenn.
- Port of Morgan City, La.
- Port of West St. Mary, La.
- Ports Association of Louisiana
- Rosedale-Boliver County Port Commission
- Southeast Missouri Regional Port Authority, Mo.
- St. Paul Port Authority
- Windsor Harbor, Columbia, Ill



High- & Low-Water Inspection Trips

Partners Engaged

RIVER INDUSTRY

- AEP River Operations, Mo.
- American Commercial Barge Line
- American River Transportation Company
- American Waterways Operators
- Archer Daniels Midland Co.
- Bar Pilots Association
- Big River Coalition
- Blue Water Shipping
- Bunge North American
- Campbell Transportation Company
- Canal Barge Company
- Central Boat Rentals
- Conrad Shipyards
- Federal Pilots Association
- Illinois River Carriers Association
- Ingram Barge Line, Tenn.
- Inland Waterways User Board
- Kirby Corporation, Texas
- Louisiana Maritime Association
- Marquette Transportation Company
- River Industry Action Committee
- River Industry Executive Task Force
- Steamship Pilots Association
- Upper River Services
- Upper Mississippi Waterway Association
- Waterways Council Inc.

RIVER BASIN ASSOCIATIONS

- America's Watershed Initiative
- Arkansas Waterways Commission
- Big River Coalition, La.
- Delta Regional Authority
- Delta Council
- Gulf Intracoastal Canal Association
- Mississippi River Cities and Towns Initiative
- Mississippi River Delta Coalition
- Mekong River Commission
- Ouachita River Valley Association, La. & Ark.
- Red River Valley Association, La.
- Upper Mississippi River Basin Association
- Upper Cedar Watershed Management Authority
- West Tennessee River Basin Authority
- White River Coalition, Ark.

WATER SUPPLY /

WATER MANAGEMENT ENTITIES

- Amite River Basin Drainage & Water Conservation, La.
- Bayou Meto Water Management District, Ark.
- Boeuf-Tensas Water District, La. and Ark.
- Union County Water Conservation Board, Ark.
- Illinois Office of Water Resources
- Teche-Vermilion Fresh Water District
- Union County Water Conservation Board, Ark.
- White River Irrigation District, Ark.
- Yazoo-Mississippi Delta Joint Water Management District, Miss.



High- & Low-Water Inspection Trips

Partners Engaged

U.S. SENATE

- Sen. Lamar Alexander, Tenn. (Chris Connolly)
- Sen. Tammy Baldwin, Wisc. (Kelly Westlund)
- Sen. Roy Blunt, Mo. (Derrin Lingle, Jennifer Hoskins, Sarah Graff, Tricia LaValle, Darren Lingle)
- Sen. John Boozman, Ark. (Chris Caldwell, Ty Davis)
- Sen. Bill Cassidy, La. (Michael Eby, Angie Robert)
- Sen. Thad Cochran, Miss. (JoAnn Clark, Win Ellington)
- Sen. Tom Cotton, Ark. (Shane Fletcher, Jeff Morris)
- Sen. Joni Ernst Iowa (Andrew Spyrow)
- Sen. Grassley, Iowa (Penny Vacek)
- Sen. Mark Kirk, Ill. (Alex Maggos, Deborah Haffner)
- Sen. Claire McCaskill, Mo. (Faey Breneden, Brendan Fahey, Kirsten Wright, Christy Mercer)
- Sen. David Vitter, La. (Murphy Chestnut)
- Sen. Roger Wicker, Miss. (Andrew Hinkebein)

U.S. HOUSE OF REPRESENTATIVES

- Rep. Mike Bost, IL-12 (Carol Klaine)
- Rep. Cheri Bustos, IL-17 (Kate Jennings Gerber)
- Rep. Steve Cohen, TN-9 (Jeremy Jordon)
- Rep. Rick Crawford, AR-1 (Jay Sherrod)
- Rep. Rodney Davis, IL-13 (Phillip Lasseigne)
- Rep. Sean Duffy, WI-7 (Justin Rose, Callahan Krivanek)
- Rep. Garret Graves, LA-6 (Lynn Dunston)
- Rep. Sam Graves, MO-6 (Bryan Nicholes)
- Rep. Gregg Harper, MS-3 (Scot Malvaneyy, Chip Reynolds)
- Rep. Trent Kelly, MS-1 (Walt Starr)
- Rep. Dave Loebsack, IA-2 (Jared Mullendore)
- Rep. Blaine Luetkemeyer, MO-3 (Trey McKenzie)
- Rep. Jason Smith, MO-8 (Eric Bohl, Leslie Herbst)

MAYORS, PARISH PRESIDENTS & ELECTED OFFICIALS

- Mayor Paxton Branch, Tallulah, La.
- Mayor Steven Burch, Sikeston, Mo.
- Mayor Mike Burton, Carlyle City, Ill.
- Mayor Tyrone Coleman, Cairo, Ill.
- Mayor Rita Flummer, Mound City, Ill.
- Mayor Robert Gallagher, Bettendorf, Iowa
- Mayor Darryl Grennell, Natchez, Miss.
- Mayor Frank Grizzaffi, Morgan City, La.
- Mayor Jay Hallowell, Helena, Ark.
- Mayor Bobby Hardrick, City of Madison, Ark.
- Mayor Emzka Jackson-Hicks, City of East St. Louis, Ill.
- Mayor Denny Johnson, Lake County, Tenn.
- Mayor Frank Klipsch, Davenport, Iowa
- Mayor Allen Latimer, Horn Lake, Miss.
- Mayor David Lattus, Hickman, Ky.
- Mayor Davis Lattus, Caruthersville, Mo.
- Mayor Kevin Mainord, East Prairie, Mo.
- Mayor Mike McCormick, Village of Godfrey, Ill.
- Mayor Benny McGuire, Obion County, Tenn.
- Mayor Branch Paxton, Tallulah, La.
- Mayor Louis Ratcliff, Berwick, La.
- Mayor Fred Reeves, Port Gibson, Miss.
- Mayor Billy Russell, Sardis, Miss.
- Mayor James Spann, Village of Hartford, Ill.
- Mayor John Thodos, East Moline, Ill.
- Mayor Stephen Tisdale, Eudora, Ark.
- Mayor Brant Walker, Alton, Ill.
- Mississippi River Cities & Towns Initiative
- Mississippi State Senator Albert Butler
- Mississippi State Senator Bob Dearing
- Parish President David Hanagriff, St. Mary Parish, LA.
- President of Adams County Board of Supervisors, Mike Lazarus
- Secretary of the State of Mississippi Delbert Hoseman

High- & Low-Water Inspection Trips

Partners Engaged

CITIES, TOWNS, COUNTIES AND PARISHES

- Adams County, Miss.
- Baton Rouge, La.
- Blytheville, Ark.
- Cairo, Ill.
- Cape Girardeau, Mo.
- Claiborne County, Miss.
- DeSoto County, Miss.
- Dyer County, Tenn.
- East Baton Rouge, La.
- Fulton County, Ky.
- Hickman, Ky.
- Horn Lake, Miss.
- Lake County, Tenn.
- Memphis, Tenn.
- Morgan City, La.
- Obion County, Tenn.
- Poinsett County, Ark.
- Port Gibson, Miss.
- Pulaski County, Ill.
- Shelby County, Tenn.
- St. Mary Parish, La.
- Terrebonne Parish, La.



FEDERAL AGENCIES

- Assistant Secretary of the Army for Civil Works Jo-Ellen Darcy (Lowry Crook, LetMon Lee)
- Illinois Department of Natural Resources
- Iowa Department of Natural Resources
- Iowa Department of Transportation
- Minnesota Department of Natural Resources
- Missouri Department of Natural Resources
- National Oceanic and Atmospheric Administration
- National Weather Service
- Office of Management and Budget (Ali Zaidi)
- U.S. Department of Agriculture
- U.S. Fish & Wildlife Service
- U.S. Geological Survey
- Wisconsin Department of Natural Resources

STATE AGENCIES

- Arkansas Game and Fish Commission
- Arkansas Natural Resources Commission
- Arkansas Waterways Commission
- Illinois Emergency Management Agency
- Louisiana Coastal Protection and Restoration Authority
- Louisiana Department of Environmental Quality
- Louisiana Department of Natural Resources
- Louisiana Department of Transportation and Development
- Louisiana Governor's Office of Homeland Security and Emergency Preparedness
- Mississippi Department of Agriculture and Commerce
- Mississippi Department of Environmental Quality
- Mississippi Department of Transportation
- Tennessee Department of Agriculture
- Tennessee Emergency Management Agency



World's Largest Naturally Navigable Watershed

95% of all U.S. imports and exports (about \$1.4 trillion) move on waterways and/or ports.



2 billion tons of domestic and import/export cargo move on the U.S. waterways annually.

