



US Army Corps of Engineers

SPECIAL EDITION

Riverside

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April 10, 2008

Corps of Engineers to open Bonnet Carré Spillway to relieve high water on Mississippi River

Public Safety number one priority of Corps



The Bonnet Carré Spillway is 28 miles above New Orleans in St. Charles Parish. It requires about 36 hours to lift the 7,000 wooden needles from its 350 bays. The structure diverts high river water into Lake Pontchartrain.

From our Commander...

Protecting lives is our number one priority. That is the main reason we are opening the Bonnet Carré Spillway.

Other factors have affected that decision — the overall condition of the levees and the ability of the river to pass flows. We have also considered the effects of high water and river currents on vessels navigating the river, and the risk of vessels contacting the levees.



Col. Alvin Lee

The decision to open the Spillway structure was made by Brig.

Gen. Michael Walsh, Mississippi River Commission President and Commander of the Corps' Mississippi Valley Division in Vicksburg, Miss. His decision was based on my recommendation as the New Orleans District Engineer.

Though there is always a residual flood risk, the Corps is fully committed to reducing the risk of flood damages to property and, of course, to human lives. Our first weapon for reducing risk is communication. With the publication of this special edition of "Riverside," we want to communicate our vigilance to be transparent with you, our public and our stakeholders. Essayons!

Hheavy rain in the Mississippi Valley is prompting the U.S. Army Corps of Engineers to open the Bonnet Carré Spillway on Friday, April 11, 2008, for the first time in 11 years.

The Corps will open the spillway to keep the volume of Mississippi River flows at New Orleans from exceeding 1.25 million cubic feet per second (cfs), which current projections indicate will occur on April 11, 2008. The spillway may be open for an estimated two to four week period, during which time the Mississippi is expected to crest at about 17 feet at New Orleans, without operation of the spillway. Operation of the struc-

ture will protect the integrity of the flood protection system and the public by relieving pressure on local levees, lowering river stages, and reducing the velocity of the river current from the spillway southward.

The decision to open Bonnet Carré is the responsibility of Mississippi River Commission President Brig. Gen. Michael J. Walsh, commander of the Corps' Mississippi Valley Division in Vicksburg, Miss.

According to Col. Alvin Lee, commander of the Corps' New Orleans District, "Predicted crest levels are

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Col. Alvin Lee



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not suggesting flooding in the New Orleans area, but the 17 foot crest does require our attention to ensure we are addressing the risk proactively and providing the design capacity to accommodate future flows, if they occur.”

Environmental, hydrologic, structural, navigational and legal considerations all bear on the decision to open Bonnet Carré. Essentially, the spillway is only operated when existing conditions, combined with predicted discharges, reach the operational level as prescribed in the approved Bonnet Carré Spillway Operations Manual and the Mississippi Valley Division Operations Plan 2007-02 for Floods.

Other factors that affect the decision are the overall condition of the levees and the ability of the river to pass flows, the effects high water and river currents may have on vessels navigating the river, including the risk of vessels losing control and colliding with levees. “We don’t want to wait until we have a problem to address the situation,” Lee said.

A series of severe storm systems throughout the various basins in the central United States that feed into the Mississippi River have created

an accumulative surge that is slowly passing through the lower basin. “While we are not at a point of alarm regarding the current river flows,” said Lee, “we have made the decision as part of our response plan to engage portions of the Mississippi River and Tributaries Project (MR&T) to address the situation and protect life and property.”

Bonnet Carré, located 28 miles above New Orleans, is a vital element of the multi-state MR&T system, which uses a variety of features to provide flood protection to the alluvial Mississippi Valley from Cape Girardeau, Mo., to Head of Passes. MR&T features include levees and floodwalls to contain flood flows, floodways (such as Bonnet Carré) to redirect high flows out of the Mississippi River, reservoirs and pumping plants for flood control drainage, and channel improvement and stabilization features to protect the levees and improve navigation of the river.

Bonnet Carré is the southernmost floodway in the MR&T system. Located on the east bank in St. Charles Parish, it can divert a portion of the river’s floodwaters via Lake Pontchartrain into the Gulf of Mexico, thus allowing high water to bypass New Orleans and other nearby river communities. The structure has a

design capacity of 250,000 cfs, the equivalent of roughly 1,870,000 gallons per second.

The Bonnet Carré structure consists of a control structure and a floodway. The control structure is a concrete weir that parallels the river for a mile and a half. It consists of 350 gated bays, each holding 20 timber “needles,” for a total of 7,000 needles. When needles are removed, river water flows into the floodway and is conveyed nearly six miles between guide levees to the lake. Operation of the structure is relatively simple. Two cranes, moving on tracks atop the structure, lift timbers from their vertical position in the weir and set them aside. A complete opening of all 350 bays is not planned at this time.

Bonnet Carré was first opened during the flood of 1937; since then it has operated seven other times, during high water in 1945, 1950, 1973, 1975, 1979, 1983, and 1997. The flood of 1997 was the last time the spillway was operated.

“Our process is working,” Lee said. “Key to that process is keeping everyone engaged—our partners, our stakeholders, the media—which is what we intend to keep doing.”





Col. Alvin Lee, left, attends a press conference with Gov. Bobby Jindal following a meeting on high water preparedness plans.

Corps and partners collaborate on Flood Fight efforts

The U.S. Army Corps of Engineers collaborates with its local, state and federal partners and stakeholders during each flood fight effort for disaster preparedness, emergency operations and advance measures. Protecting lives is our number one priority. The Corps is fully committed to reducing the risk of damages from floods by working closely with our partners and stakeholders to maintain and operate the MR&T flood control system.

The initial efforts for protecting the public from flood damage start at the local level. The local levee districts and levee authorities along the MR&T system maintain the levees by doing regular inspections and surveillances year-round prior to any high river occurrence.

"They are the eyes out in the field," said Lee Guillory, the Corps' Natural Disaster Manager.

During a high water event, the Corps has two flood fight phases to aggressively patrol the MR&T system. Phase I Flood Fight Activities are initiated when the river level at the Carrollton Gauge is predicted to reach 15 feet (ft) and rising based on the National Weather Service (NWS) forecast. Under Phase I, the Corps' proactive measures support the efforts of the local levee districts by mobilizing nine flood fight sector teams. These sector teams are on the ground performing levee inspec-

tions and surveillance operations three days a week.

The Corps works with its partners, the levee districts and authorities, to perform joint inspections to identify any maintenance needs. Surveillance and inspection of the levees look for any overtopping, breaches, along with scours along the river side of the levee, seepage through the levee, or sand boils on the protected side of the levee. If there are any impacts to the system, the Corps and its partners immediately go into emergency response mode and begin procedures to use flood damage reduction equipment such as sandbags, hesco baskets, flashboard (plywood wall), mudboxes or water tubes to close breaches.



Sand boil near White Castle, April 9, 2008

Additionally, the Corps begins initial preparations for advanced measures by testing the three main flood control structures along the Lower Mississippi River, which include the Bonnet Carré and Morganza Spillways and the Old River Control Structure

When the Mississippi River is pre-

dicted to reach 17 ft and rising at the Carrollton Gauge, the Corps increases our efforts along the Mississippi River and Atchafalaya River levees to Phase II Flood Fight Activation. The Corps' flood fight sector teams begin daily inspections of all 973 miles of the MR&T system.

During Phase II of the flood fight, the Corps closely monitors river stages and flows along the river to determine whether to operate any of the flood control structures. Prior to any operation of a flood control structure, the Corps notifies its local, state and federal partners if there is a need to operate any of the structures.

"During both phases, the Corps maintains active communication with its local, state and federal stakeholders and partners about any potential impacts within their area of jurisdiction," said Michael Lowe, the Corps' Emergency Manager.

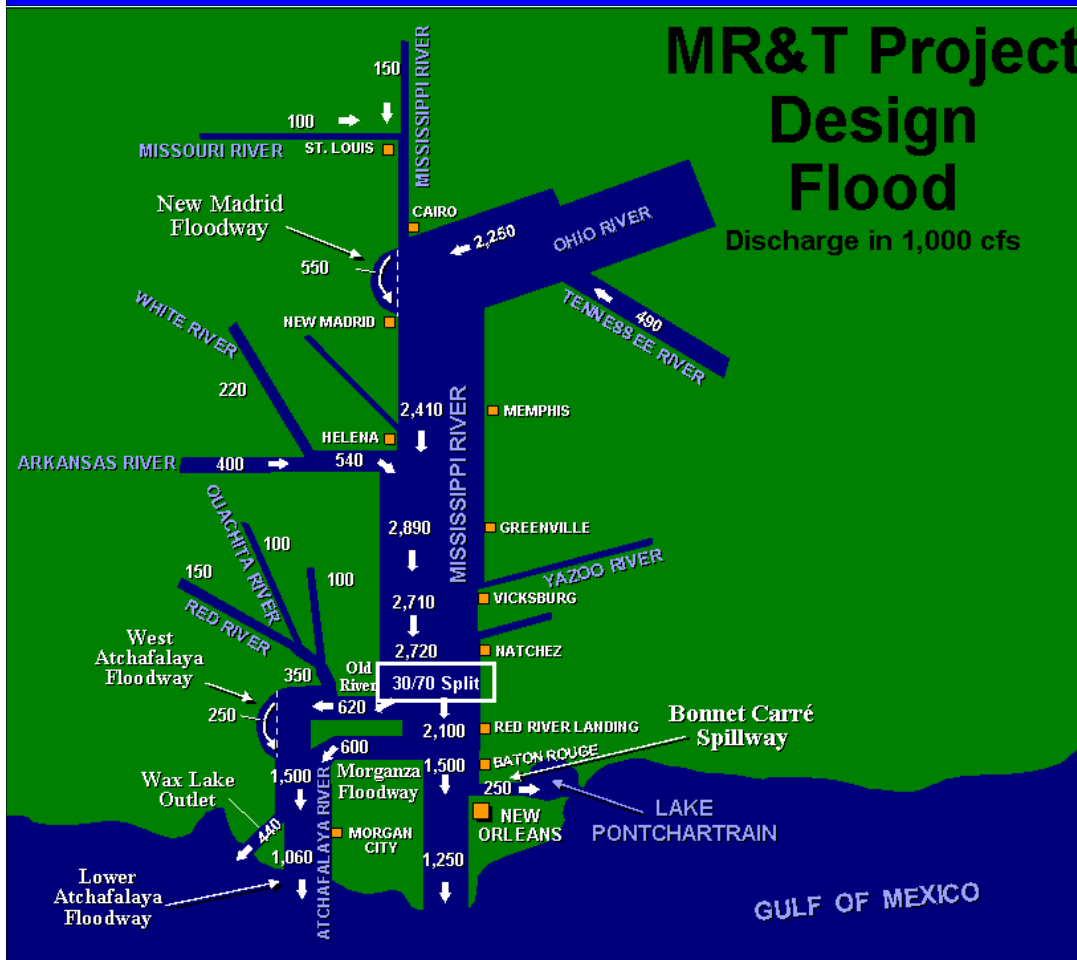
The Corps is in daily communication with the US Coast Guard, the Governor's Office of Homeland Security and Emergency Preparedness, and all levee districts and authorities. Communication and coordination with stakeholders and partners plays a critical role during a flood fight effort. Besides the local partners, the Corps works closely with its state and federal agencies to manage and

mitigate any impacts as much as possible. Additionally, the Corps provides technical assistance before, during and after the flood event.

The Corps is committed to protecting the public. The Corps and our Federal, State, and Local partners are closely monitoring the high river, but no matter how good the flood protection systems are there is always a residual flood risk and the Corps is prepared to respond immediately.



Mississippi River & Tributaries System



This chart (which is a functional, not geographical representation) of the MR&T system

includes three systems; the Bonne Carré and Morganza Spillways as well as the Old River Control Structures.

The coordinated and combined contributions of the entire MR&T Project are designed to preserve life throughout the basin as well as provide a prioritized, equitable, and systematic response to severe water flow events in the Mississippi River. The decision to open either the Morganza Spillway or Bonnet Carré Spillway relies on current and projected river flows and levee conditions, river currents and potential effects on navigation and revetments, extended rain and stage forecasts, duration of high stages, environmental effects and potential effects to flood side activities. The decision-making process for operating the spillways allows some flexibility to account for current river condi-

tions, levee conditions, and the specifics of a given flood hydrograph.

The Old River Structure is the Northern most structure and is continually diverting 30% of the combined flows of the Mississippi River and the Red River down the Atchafalaya River. The Old River Structure has the capacity to pass a maximum of 620,000 cfs to the Atchafalaya River.

According to the flood control plan, the first structure to alleviate high river flows through New Orleans is the Bonnet Carré Spillway which can divert a design maximum of 250,000 cfs from the Mississippi River into Lake Pontchartrain. The maximum design flow rate through the lower Mississippi as it passes through New Orleans is 1.250 million cubic feet per (cfs) second. When predicted flow rates for this area are projected to surpass that stage, the Corps en-

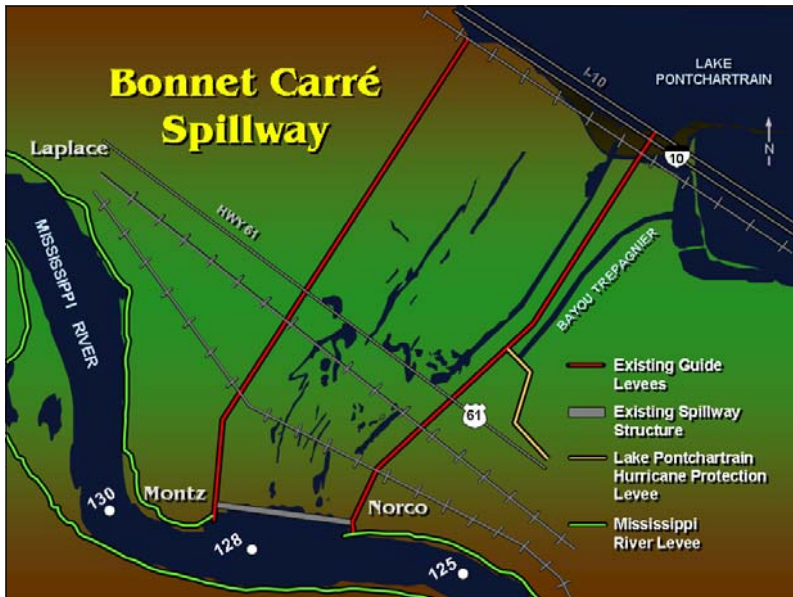
gages in a coordinated process to assess if operation of the spillway is

necessary, balancing the multiple concerns along the basin, to ensure the preservation of life throughout the area.

During significantly more serious water events, the Morganza control structure can divert an additional flow of up to 600,000 cfs. When river flows at the Red River Landing are predicted to reach 1.5 million cfs and rising, the Corps would consider opening the Morganza Spillway to pass river flows from the Mississippi River to the Atchafalaya River.

The combined efforts of these three projects help distribute elevated Mississippi River Basin flows between the Atchafalaya and Mississippi Rivers and help alleviate stresses on the MR&T system as river flows pass to the Gulf of Mexico.



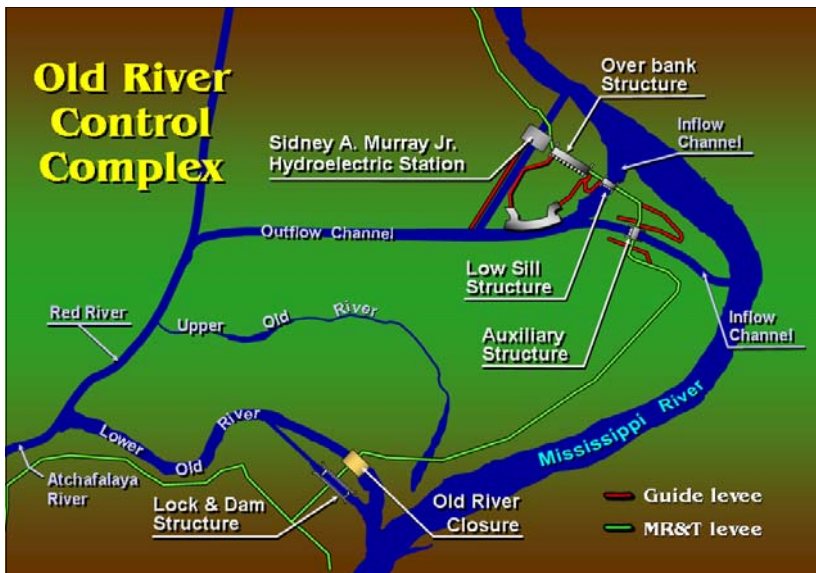
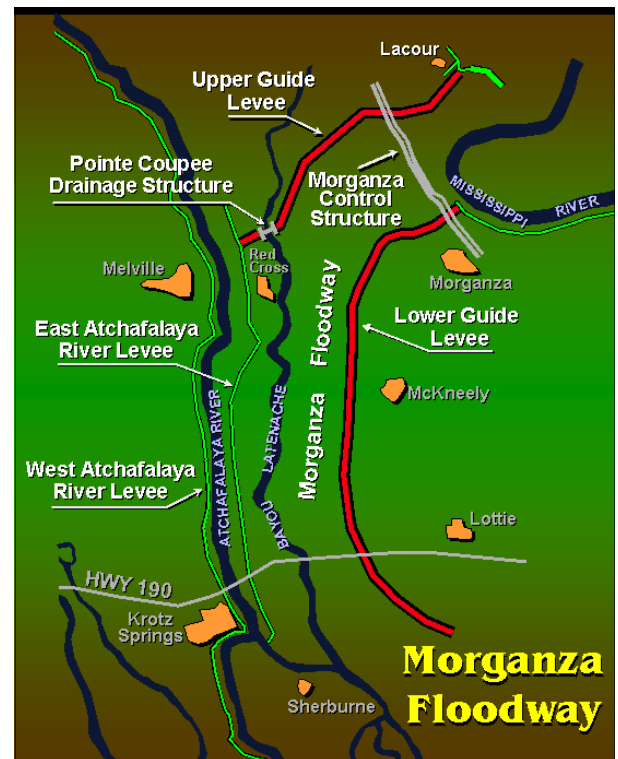


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The Bonnet Carré Spillway, the southernmost of the three floodways in the district, has repeatedly proven its effectiveness as a floodway designed to divert flows from New Orleans. Completed in 1929, the spillway has been operated eight times, diverting river water into Lake Pontchartrain and the Gulf of Mexico, therefore, relieving pressure on the levee system and lowering river stages. The spillway can be operated when flows reach 1.25 million cubic feet per second and are expected to rise. The design flow through the spillway can reach a maximum of 250,000 cfs. The spillway was last operated in 1997 when river flows reached a maximum 1.48 million cfs.

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The Morganza Floodway, located 35 miles above Baton Rouge, is designed to transfer flows from the Mississippi River into the east Atchafalaya Basin. The Mississippi River Commission president would normally make a decision to open Morganza when flows reach 1.5 million cfs at Red River Landing just above the Morganza structure, with data indicating a continued rising river. This situation has never occurred; the Morganza Floodway has been operated only once. During the 1973 flood, the structure was partially open to lower river stages and relieve pressure on the Old River Low Sill Control Structure.



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The Old River Control Complex is located about 50 miles northwest of Baton Rouge. The complex governs the distribution of flows between the Mississippi and Atchafalaya rivers using four structures: the Low Sill Structure, Overbank Structure, Auxiliary Structure and the Sidney Murray Hydroelectric Power Plant. The New Orleans District operates the complex to maintain a 70/30 flow distribution between the Mississippi and Atchafalaya rivers, respectively, at the latitude of Old River. The Old River Control Complex can safely pass 620,000 cfs of water from the Mississippi River to the Atchafalaya River. The Atchafalaya's flows comprise waters from both the Red River and diverted Mississippi River.

High water on Mississippi River presents special challenges to navigation



During high river conditions, the increased flows in the Mississippi have created some challenges for river navigation. Currently the Corps has been working with the U.S. Coast Guard to provide navigational bulletins to maintain safety along the river during the present high river stages.

The Coast Guard will issue navigation safety bulletins based on the current situation and their high water navigation plans. Mariners are advised to exercise extreme caution when navigating in the section of the river between Baton Rouge and the Gulf of Mexico, proceed at the slowest safe speed, and steer a course as far away as possible from the levees and revetments to avoid damage by suction and wave wash. Extreme caution is advised particularly in the fore bays of Algiers, Harvey, Inner Harbor Navigation Canal, Port Allen and Old River locks to prevent vessels and tows from coming in contact with the controlling levee line in those areas.

During the Mississippi River high water season, the river carries an increased amount of sediment. The Corps continually monitors the navigable depths within the river and will

take actions to maintain the dimensions of the authorized channel.

“High water conditions present a challenge for those trying to sustain deep draft navigation in the Mississippi River,” said Chris Accardo, chief of the Operations Division.

“Higher flows carry more sediment. As long as the velocity in the river remains high, the sediment stays in suspension. However, as flows meet the Gulf of Mexico, river velocities slow, causing suspended material to fall and deposit in the channel.”



The dredge Eagle 1

The Corps is currently running five dredges 24 hours a day, seven days a week in the Southwest Pass near the mouth of the river to maintain

river navigation.

“During high river conditions, shoaling is rapidly occurring near the mouth of the Mississippi River where surveys are taken daily and dredge assignments are constantly being issued to keep pace with the dynamic changes in the river,” said Accardo.

No river has played a greater part in the development and expansion of America than the Mississippi. In 1705 the first cargo was floated down the river from the Indian country around Wabash, now the states of Indiana and Ohio. This was a load of 15,000 bear and deer hides brought downstream for shipment to France.

Invention of the steamboat in the early nineteenth century brought about a revolution in river commerce. The first steamboat to travel the Mississippi was the “New Orleans.”

The Mississippi River is the main stem of a network of inland navigable waterways which form a system of about 12,350 miles in length, not including the Gulf Intracoastal Waterway of 1,173 miles.

Waterborne commerce on the Mississippi rose from 30 million tons in 1940 to almost 400 million in 1984. This heavy commercial traffic in-

cludes grains, coal and coke, petroleum products, sand and gravel, salt, sulphur and chemicals, and building materials among others. In addition, many

pleasure craft from all parts of the country now use the Mississippi for vacation and travel.



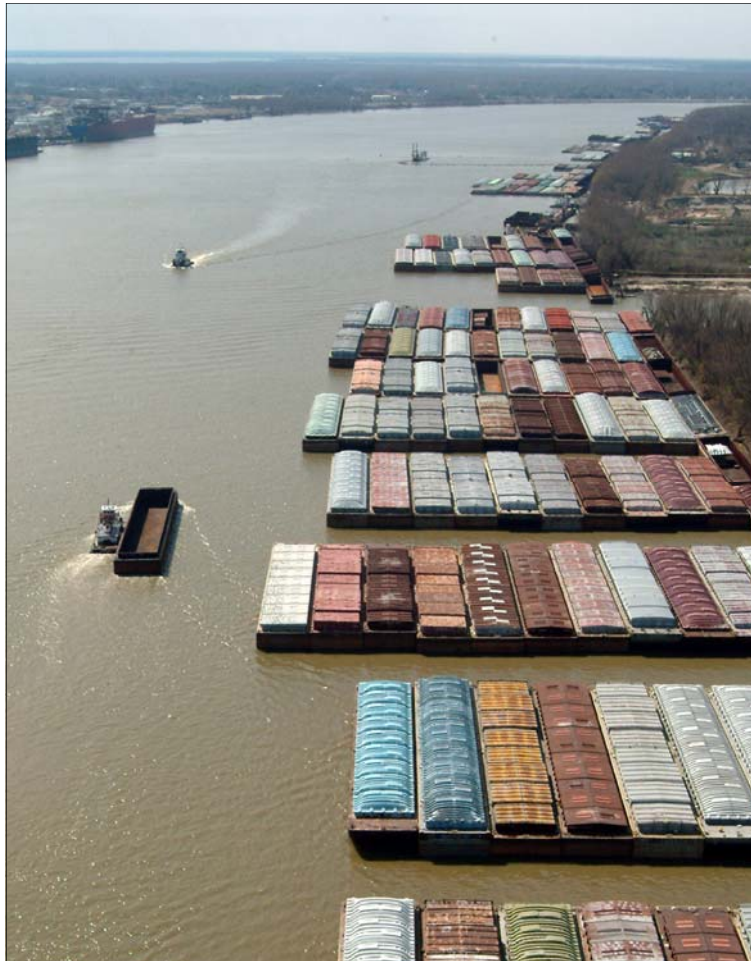
America's greatest river: *the Mighty Mississippi*

Without question America's greatest river, the Mississippi, has made major contributions to the physical and economic growth of the nation. It is a navigation artery of great importance to the nation's transportation system, carrying an ever-growing commerce.

Coursing through the heart of America, it supplies water for the cities and industries that have located along its banks. More and more, the Mississippi's importance is emphasized as America continues to grow. This great river is truly one of the nation's outstanding assets. Uncontrolled, it would be just as great a liability.

In its natural condition, the Mississippi River regularly overflowed its banks and meandered back and forth across the floodplain. For hundreds of years, Native Americans accepted the whims of the river and adapted to its patterns. The arrival of European settlers in the early 1700s, however, brought a radically new perspective on the river's habits. The river's tendency to flood was a serious hindrance to settlement and development--a problem which demanded solutions.

Early inhabitants began constructing earthen levees along the river's banks to contain the flow to protect residents and developed property. The French built levees to protect



Stacking barges along the Mississippi River

New Orleans as early as 1717. At the turn of the 19th century, a crude system of levees extended for 100 miles upriver of New Orleans, with individual landowners constructing and maintaining the levees.

By the 1830s, states were becoming involved in flood damage reduction on the Mississippi River through both direct funding and the creation of levee boards. These boards took over levee construction and maintenance with funds acquired from taxes on landowners.

Despite these efforts, flooding continued throughout the 19th century with major floods in 1844, 1850, 1858, 1862, 1865, 1867 and 1874. Some of these floods were immense, causing great misery and destruction along the river. As a result of these

floods and the ravages caused by the Civil War, the levee system was in a devastated condition by the 1870s, and appeals for federal involvement grew with each flood event.

Since 1879, U.S. Army Corps of Engineers was responsible for keeping the river open for navigation, but had little role in flood control until Congress established the Mississippi River Commission (MRC) in 1879. The MRC, initially headquartered in St. Louis, MO, relocated to Vicksburg, MI, in 1929. It was charged with developing

and implementing a comprehensive plan to improve navigation and prevent destructive floods. Engineering studies of the river were undertaken and many improvements to navigation were accomplished. In the area of flood control, the MRC assisted local levee boards by developing reliable levee standards and new construction techniques. Actual construction of flood damage reduction features by the MRC, however, was severely limited by congressional directives and largely confined to repairing crevasses.

Initial federal involvement significantly improved flood protection but it was still less than satisfactory. Great floods in 1882 and subsequent

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years plagued the valley as levees were overtopped or crevassed. These disasters and the rising flood heights between the levees caused many to question the total reliance on building levees to contain the river's flood waters. Other approaches to improving flood protection -- reforestation of the floodplain, cut-offs to speed up the river's flow, reservoirs to hold back flood waters, and floodways to divert flows away from the main channel were suggested but always rejected by the MRC in favor of a "levees only" policy.

The MRC's role grew with each flood, finally culminating in the Flood Control Act of 1917, which authorized the MRC to construct an extensive program of flood protection with cost-sharing by states and local interests. The program maintained the "levees only" approach and included new levee construction and strengthening of existing levees to standards set three feet above the high water of 1912.

By the end of 1926, the improved levee system had successfully passed several major high water events. These successes convinced the MRC and the public that the flood control problem was nearly solved.

The false sense of security in the Lower Mississippi Valley vanished in the flood of 1927, a natural disaster of great proportions. This tremendous flood extended over nearly 26,000 square miles, killed more than 500 people and drove an addi-

tional 700,000 from their homes. Thirteen crevasses in the main Mississippi River levees occurred, demonstrating that even the largest and strongest levees would not alone protect from flooding.

To prevent a recurrence of the 1927 flood, Congress authorized the [Mississippi River and Tributaries Project \(MR&T\)](#) in the Flood Control Act of 1928. The "levees only" policy of the past was discarded and the U.S. Army Corps of Engineers adopted a new approach based on improved levees plus floodways, including a spillway to divert water into Lake Pontchartrain above New Orleans.



Construction of the Bonnet Carré Spillway, 1929

Today the MRC provides water resources engineering direction and policy advice to the Administration, Congress, and the Army in a drainage basin that covers 41 percent of the drainage from the 48 contiguous United States and parts of two Canadian provinces by overseeing the planning and reporting on the improvements on the Mississippi River.

The intent behind the mission of the MRC today is the same as the mission placed on the commission upon its creation—to lead sustainable management and development of water related resources for the nation's benefit and the people's well-being.



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Winner:

The "J" Award, the Department of the Army journalism honor, 2000 and 2003.

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Submissions:

Articles and story ideas are welcome; publication depends on the general interest as judged by the editor. Direct queries by calling (504) 862-2201 or e-mailing us at:

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The current members of the MRC are President Brig. Gen. Michael Walsh, Sam Angel, R.D. James, William Clifford Smith, Rear Adm. Jonathan Bailey, Brig. Gen. Bruce Berwick, Col. Albert Bleakley Jr., and Brig. Gen. Gregg Martin.

For more information on the MRC, visit this Web site:
<http://www.mvd.usace.army.mil/mrc>.