

HISTORY OF THE LOWER MISSISSIPPI LEVEE SYSTEM

Levees are the backbone of the flood control plan for the Mississippi River and Tributaries (MR&T) project. The system protects the vast expanse of the developed alluvial valley from periodic overflows of the Mississippi River. The mainstem levee system begins at the head of the alluvial valley at Cape Girardeau, Mo., and continues to Venice, La., approximately 10 miles above the Head of Passes near the Gulf of Mexico. The MR&T levee system includes 3,787 miles of authorized embankments and floodwalls. Of this number, nearly 2,216 miles are along the mainstem Mississippi River. The remaining levees are backwater, tributary and floodway levees.

The grade (height) and section (width) of the present levee system dwarfs, by comparison, those of the levee system that the Great Flood of 1927 overwhelmed with devastating effect. For instance, a typical mainline Mississippi River levee along the Yazoo front near Greenville, Miss., now stands 30 feet tall and contains 907,000 cubic yards of material mile. In 1927, that same levee was only 22 feet high and contained only 421,000 yards of cubic material per mile.

In addition to higher and wider levees, the MR&T levee system design incorporates technological breakthroughs from the science of soil mechanics that take into account the type, condition and moisture content of material used in the construction of the levees. The integrity of the current levee system is enhanced by advancements in the design, construction, installation and maintenance of seepage control measures, to include landside berms, drainage trenches, drainage blankets and relief wells. More than 1,000 miles of articulated concrete mattress revetment also protect the levee system by preventing erosion.

In an effort to further guarantee the soundness of the levee system, levee districts



and backwater areas, are operated to control and convey potentially damaging floodwaters to relieve stress on the levee system.

Levee Evolution Prior to the MR&T Project

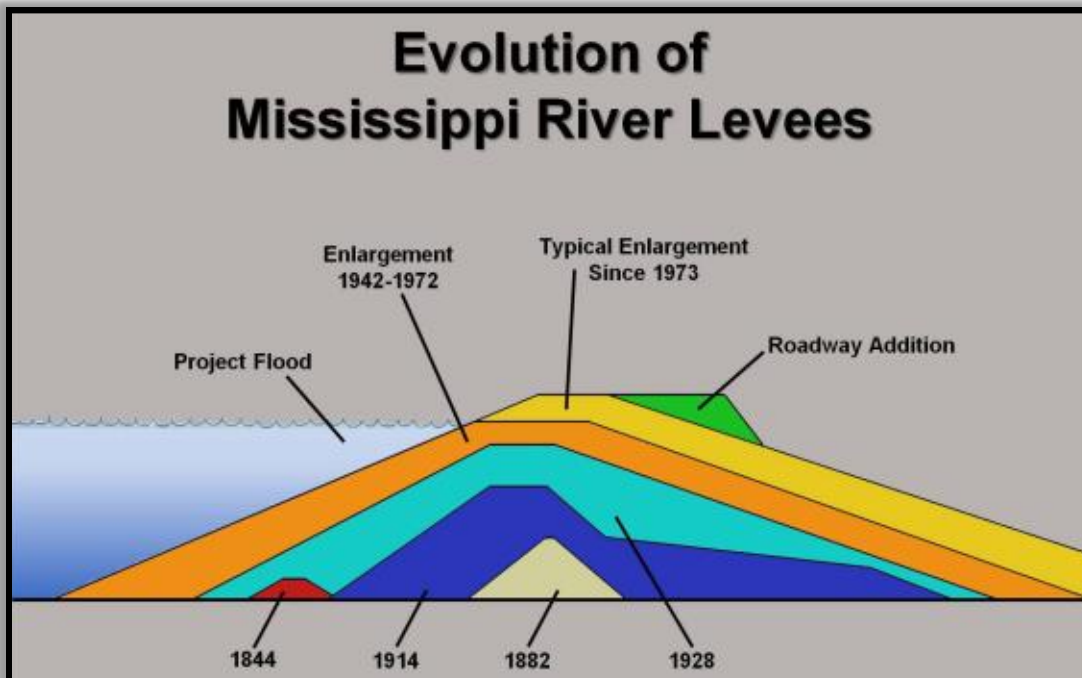
Approximately 59 years before the signing of the Declaration of Independence, 85 years before the creation of the Corps of Engineers and 200 years before the first federal flood control act, the French began constructing the first levee on the Mississippi River in 1717 to protect the fledgling city of New Orleans from high water. That original levee was only three feet high and 5,400 feet long. The French, and later the Spanish, extended the modest levee system up the river, but progress was slow with the bulk of the work left to the landowners along the river.

With the extension of American political control over the Mississippi Valley brought about by the Louisiana Purchase in 1803, the United States government moved to facilitate trade and develop the region's rich economic potential through settlement. New settlers adopted aggressive flood-control tactics to

protect their new settlements from inundation. Rather than only settling those lands less susceptible to overflow, the new frontiersmen also reclaimed lands well within the floodplain and constructed levees to protect them. They soon realized the difficult nature of the job. In addition to the original expense of their construction, the inadequate levee system required continual maintenance, repair and improvement. To that end, the landowners of the lower Mississippi Valley committed ever-increasing resources to the task of protecting their lands from overflow. By 1812, when Louisiana gained statehood, cleared fields extended along the Mississippi River to the northern boundary of the state, with the levees extending from Caernarvon to the bluffs near Baton Rouge on the east bank and from just opposite Caernarvon to Morganza on the west bank. By 1844 levees on the west bank, with the exception of the gap at the mouth of the Red River, extended from 20 miles below New Orleans to the just below the mouth of the Arkansas River.

The construction of levees had paralleled the growth of commerce. As the lower

Mississippi Valley became more prosperous, the landowners grew increasingly anxious to protect their investments. Through the mid-nineteenth century, landowners assumed sole responsibility for the construction and maintenance of levees, but in 1849 Louisiana led a congressional fight to secure the transfer of swamp and overflowed lands to the states of the



Mississippi Valley, culminating in the Swamp Land Grants of 1849 and 1850. Revenue raised from the sale of those lands paid for further levee improvements and encouraged the organization of levee districts throughout the lower valley. Over time, these districts acquired substantial authority, including the power of eminent domain, the power of taxation within carefully defined limits and corporate authority.

By 1858, the levee system reached its greatest extent up to that time. On the west bank, the line extended continuously from 45 miles south of New Orleans to the Arkansas River, and intermittently from the Arkansas River to just opposite Cairo, Ill. On the east bank, the levees stretched from Pointe-a-la-Hache to the bluff at Baton Rouge and along the Yazoo front between Vicksburg and the Mississippi-Tennessee state border. Successive floods in 1858 and 1859, though, overwhelmed and damaged the fledgling levee system and proved conclusively that the system needed to be raised and strengthened.

The people of the lower Mississippi Valley, however, had already expended \$40 million on the damaged levee system. Nearing the end of their resources, they made strong appeals to the federal government for assistance, but the country soon disintegrated into civil war. Necessarily preoccupied, landowners and levee districts abandoned their levee repairs and maintenance responsibilities. Floods and military operations further damaged the system. Following the war, local interests struggled to promote a unified levee system under the strictest of financial constraints. Such efforts lacked centralized coordination and mostly failed.

The formation of the Mississippi River Commission June 28, 1879, certainly marked the beginning of a new era in levee development. With its creation, the federal government now appeared as an active agent capable of transcending regional issues that had long hampered the development of a more effective levee system. The commission, however, almost immediately was victimized by congressional legislation that prohibited the construction of levees with federal funds for the specific purpose of protecting property from overflow.



After the 1882 flood, the commission adopted a levee policy that sought to join the unconnected lengths of levees into a continuous line. This policy was one of restraint in the interest of navigation that rested on the theory that the confinement of floodwaters would periodically flush out the channel and remove sand bars and other obstructions to navigation while still providing the incidental benefit of protection from overflow. Following the passage of the 1882 rivers and harbors legislation that authorized the new policy, the Mississippi River Commission began coordinating local efforts,

setting standards and specifications for levee construction, and allocating federal funds to the cash-strapped levee districts. The levee districts, in turn, provided rights of way for federally sponsored levee work. Federal assistance with the levee system had remained limited to work done in the interest of navigation, commerce and the postal service, although the Mississippi River Commission continued to regard the levee lines as necessary for flood protection.

Successive record-breaking floods in 1912 and 1913, though, precipitated a crisis in the lower Mississippi Valley. In response to the floods, the commission established a new levee grade and section in 1914. In 1882, a typical Mississippi River levee near Greenville stood only 8 feet high and contained approximately 31,500 cubic yards of material per mile. Under the 1914 grade and section, that same levee would be 22 feet high and contain 421,000 cubic yards of material. The commission estimated that it would cost \$57 million to complete the system to the new grade and section. With this in mind, the tremendous expense incurred by local interests because of periodic inundation, combined with the cost of building, maintaining and repairing the levee system, was becoming prohibitive. Between 1882 and 1914, local interests had expended in excess of \$91 million on levee construction to protect themselves from the ravages of the river—more than triple the amount of federal expenditures on the levee system during that same period. With

establishment of the 1914 grade and section, local interests were being expected to contribute even more. Out of complete self-preservation, landowners in the lower Mississippi Valley launched a massive campaign directed at obtaining greater federal commitment to their flood problem.

In 1917, Congress answered their pleas and passed the first federal flood control act, which authorized \$45 million dollars over a 10-year period to carry out the plans of the Mississippi River Commission. The act finally



allowed for the expenditure of federal funds for the express and sole purpose of flood control and also eased the burden of local interests by only requiring them to contribute at least one-third of levee construction costs. After the passage of this act and the subsequent 1923 flood control act, levee construction continued at an unprecedented pace, and by the close of 1926 the levee system was nearing completion.

In the fall of 1926, though, a vicious weather pattern stalled over much of the



project in 1928, however, the comprehensive flood control program has been designed to control the “project design flood.”

In addition to adding the supplemental engineering techniques to the flood control system, the 1928 Flood Control Act also authorized higher levee grades and stronger levee sections. Through the 1928 act, Congress also recognized that cash-strapped local interests had contributed more than \$290

million toward the flood problem in the Mississippi Valley up to 1927. In order to facilitate navigation, protect interstate commerce and provide uninterrupted mail service, the federal government waived the local contribution requirement for the MR&T project levees and other flood control structures, provided the local levee districts granted all rights-of-way for levee foundations and levees and maintained and repaired the levees after their completion.

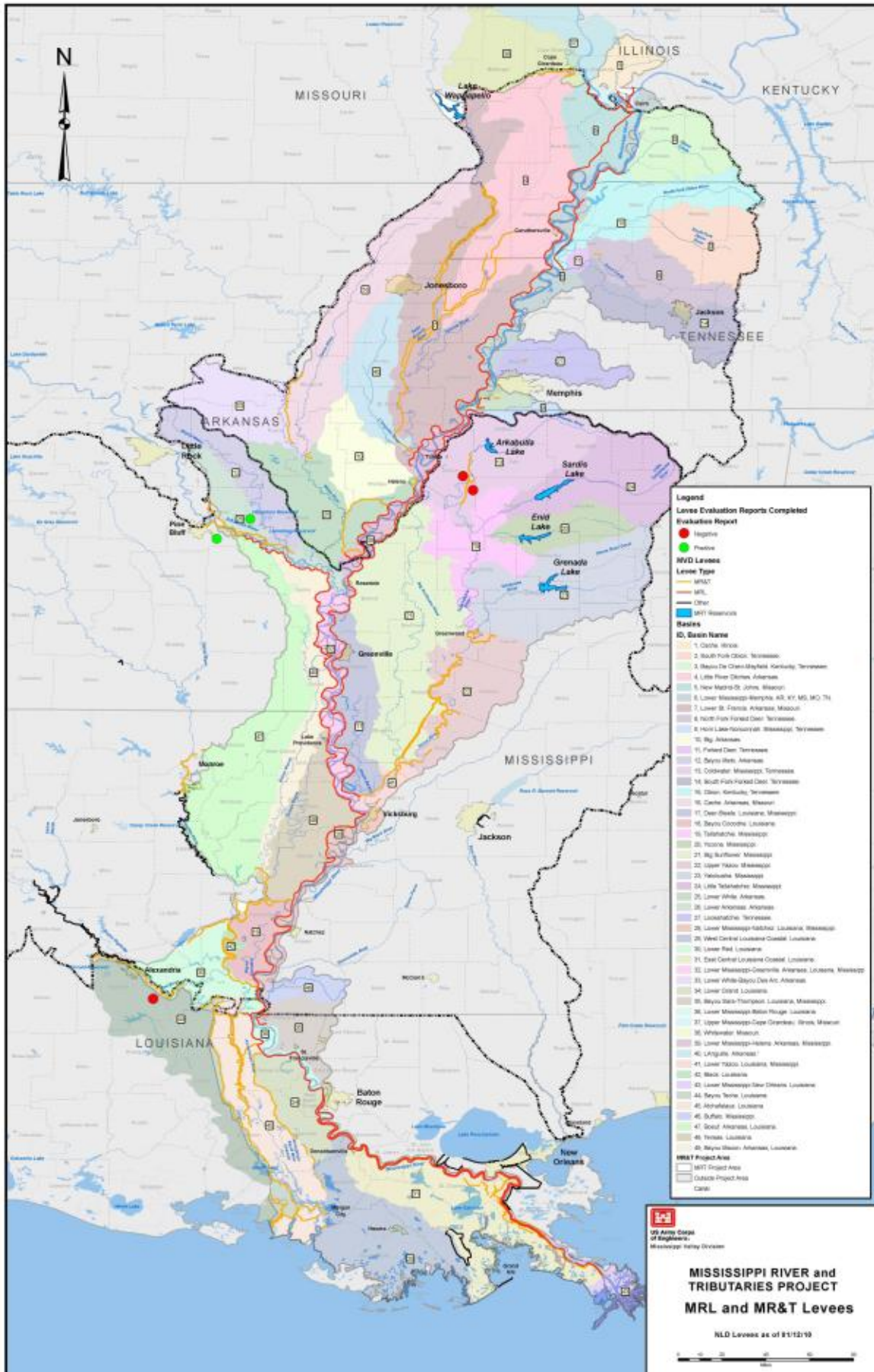
Mississippi River drainage basin, swelling the river and its tributaries. The rain saturated surrounding lands to the point that any additional precipitation immediately turned into runoff. Heavy rains continued from December through early spring, and in early January the first of three waves of floodwaters approached the lower Mississippi Valley. The successive flood crests overwhelmed the strengthened, but outmatched, levee system creating hundreds of crevasses, including 17 major crevasses on the federal levees. By late April 1927, nearly 23,000 square miles of the valley were under water.

Following the devastating 1927 flood, the nation was galvanized in its support for a comprehensive and unified system of public works within the lower Mississippi Valley that would provide enhanced protection from floods and an equally efficient navigation channel. Prior to that tragic flood event, the control of floods on the lower Mississippi was attempted by building levees high enough to withstand the last great flood of record. Since the inception of the MR&T

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