The Federal Government and Flood Control in the Lower Mississippi Valley

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Abstract: *This essay provides an overview of the development of flood control legislation regarding the Lower Mississippi Valley. It narrates how the burden of flood control in the region has passed from private landowners to local and state authorities and, after the disastrous flood of 1927, to the federal government. Despite enormous investments in flood prevention, the safety of the Lower Mississippi Valley remains an issue.*

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Flooding has always posed a physical threat to human subsistence in the Lower Mississippi Valley.[1] From their arrival on the banks of North America's greatest river, European-American settlers in the Lower Mississippi Valley realized that economic development in the flood-prone region would be in direct proportion to the amount of control gained over

1. For a thorough discussion of much of the material in this essay, and exhaustive documentation, see Mikko Saikku, *This Delta, This Land: An Environmental History of the Yazoo Mississippi Floodplain (Athens: University of Georgia Press, 2005), chap. 5.[The book is reviewed in this issue (the editor).]*

The definitive research on the subject is Robert W. Harrison's *Alluvial Empire: A Study of State and Local Efforts toward Land Development in the Alluvial Valley of the Lower Mississippi River,Ö* (Little Rock, Ark.: 1961). The web pages of the U.S. Army Corps of Engineers (ACE) contain much useful historical information, including chronologies of flood control activities in the Lower Mississippi Valley.
See http://www.usace.army.mil/ and http://www.mvd.usace.army.mil/.

the Mississippi's hydrological system.[2] It was the relief from flooding – a natural phenomenon of the floodplain – that made the development of agriculture, infrastructure, and industry possible in the alluvial lowlands of the region.

The massive task of walling the river off from the floodplain demanded investments on a scale unavailable to any individual landowner, county, or even state. Governmental involvement in flood control and water resource development in the Lower Mississippi Valley evolved during the nineteenth and twentieth centuries with far-reaching effects on the floodplain's natural hydrological regime. In the beginning the burden of flood control was placed directly on the riparian landowners. As the inadequacy of this approach for successful prevention of overflows became evident, state and federal governments began to assume control in the regional water management. An argument can be made that the history of water management in the Lower Mississippi Valley is therefore a narrative of shifting the burden of controlling floods from riparian landowners to local and state governments and, in the end, to the federal authorities. As the economic importance of the region grew with agricultural expansion, local interests succeeded in persuading Congress to facilitate development of the alluvial floodplain with investments in flood control structures. But the federal participation did not come easy, and representatives of the region had to work hard in order to gain congressional support for flood control.

Dams and levees have played an inestimable role in the socioeconomic and environmental history of the Lower Mississippi Valley ever since the founding of New Orleans in 1718. From the very beginning French engineers understood that the new settlement was prone to flooding and opposed locating the city at its present site. The objections were overruled, and an earthen embankment was designed along the Mississippi to protect the city. The French word *levèe* for such structures, as well as *crevasse* for breaks in them, were later adopted by all

2. From the late eighteenth to the mid-nineteenth century, massive overflows were recorded in the region in 1782, 1828, and 1858. Considerable flooding took place also in 1809, 1815, 1823, 1849, 1858, 1862, 1865, 1867, 1874, 1882, 1883, 1884, 1890, 1897, 1903, 1912, 1913, 1916, and 1922. After the great flood of 1927, which committed the federal government to the construction of a comprehensive flood control system, overflows have been much less common. Still, serious flooding has occurred along the Mississippi in 1937, 1973, and 1993.

European settlers along the lower Mississippi and became a part of the regional vernacular.

Under the French administration attempts at flood control were tied to land grants: landowners with riverfront property were responsible for building and maintaining levees, and the government intervened only to enforce the standards with occasional inspections. This policy generally continued after the Lower Mississippi Valley became a part of the United States. Landowners in the region by necessity restricted their flood-control efforts to building small levees that provided at least some relief from the, nearly annual, overflows. The early levees were only a couple of feet high and constructed by field hands with no specialized equipment for the task. Consequently, the flood of 1828 destroyed much of the scattered and unconnected levee system along the lower Mississippi, as crevasses opened in the frail embankments "generally not more than two or three feet wide at top, and ten or twelve at the base."[3]

In the 1830s and 1840s American settlers to the Lower Mississippi Valley began in earnest to transform the region's rich alluvial forests into cotton fields. But funding the levee system remained a constant problem, and construction standards varied widely, while severe floods continued to occur. Because of the rapidly growing economic importance of the region, southern planting interests began to call for the federal government to take a role in flood protection. Already in 1835, Henry Clay unsuccessfully introduced a congressional resolution calling for a survey for a levee system on the west bank of the Mississippi. A serious flood in 1844 intensified demands for national help. In 1845, John C. Calhoun proposed that the Mississippi River should properly be considered an "inland sea" and that levee building and other improvements on the river were issues of national defense and therefore federal, not local or state, responsibilities. By 1847 the issue had gained national attention as numerous public figures began to advocate federal involvement in levee building. Since most of the floodwaters originated from outside the Lower Mississippi Valley, proponents argued that flood control was not a local problem.

3. Basil Hall, *Travels in North America in the Years 1827 and 1828*, 3rd ed., vol. 3 (Edinburgh: Cadell, Simpkin, and Marshall, 1830), 351.

There were congressional attempts at flood protection, such as the Swamp Lands Acts of 1849 and 1850, but lack of coordination among different states and levee districts resulted in an ineffective program. The Swamp Lands Acts donated to Arkansas, Louisiana, and Mississippi all unsold swamp and overflowed federal lands within their boundaries to be used to raise funds for flood control. In the following three decades the states undertook various flood control and drainage programs that became plagued with frauds and scandals. Arkansas and Louisiana created a central state organization for the development of a levee system, but in Mississippi land scrip was divided among the river counties, which were free to decide on the details of the reclamation program. There was also some standardization of levee construction in the Lower Mississippi Valley, but most levees still remained modest earthen embankments. Numerous interruptions in the line of levees allowed floodwaters to enter the countryside behind them, causing heavy but localized damage. In the long run this inefficient system had advantages as well as disadvantages. Occasional flooding replenished the soils, and gaps in the levee line prevented the river from rising as high as it would later, after a more comprehensive levee system was in place.

In addition to flood protection, transportation needs figured heavily in debates over federal policy toward the lower Mississippi during the nineteenth century. An 1824 Supreme Court decision had granted the United States the power to regulate river navigation connected to commerce. For an expanding nation relying heavily on waterways for commerce, easy navigation was of an utmost economic importance, and substantial federal appropriations were approved for clearing the channels of the Mississippi and its tributaries already during the 1830s. Much of the improvement work was carried out by the U.S. Army Corps of Engineers, and it produced a vast amount of scientific data that later proved useful for flood control. In the mid-nineteenth century proponents for a national flood control system – unlike those demanding traffic improvements – were still perceived to represent too narrow an agricultural interest to justify federal involvement.[4]

4. The Army Corps of Engineers was created by Congress in 1802. The 1824 General Survey Act and 1826 Rivers and Harbors Act authorized the ACE to carry out river surveys and building projects. Already in 1852

Severe flooding in 1858, 1862, and 1865, combined with the destructive effects of the Civil War, caused extensive damage to the levee system in the Lower Mississippi Valley. Many levees had been swept away by the floods, and neglect and military action had devastated the remaining structures. Taxation was the only source of funds for levee rebuilding, but few could afford to pay the taxes. After the war the states of the Lower Mississippi Valley responded differently to the problem of flood control: Arkansas issued state bonds in order to finance the construction work, Louisiana contracted a private company to rebuild the levee system, while Mississippi entrusted levee districts with the power to sell bonds based on the future value of the lands to be reclaimed.

Overall, little lasting flood protection resulted from the different approaches adopted in the region. Aiming to boost the Southern economy, the federal government now became increasingly involved in flood control efforts, as evidenced by the establishment of a House standing committee on Mississippi levees in 1875. In 1879, Congress established the Mississippi River Commission (MRC) to supervise all federal public works on the river. The seven members of the MRC were appointed by the President, confirmed by the Senate, and represented the ACE Coast and Geodetic Survey, and civilian interests. Initially the federal projects were aimed at aiding navigation on the river, but soon the Corps of Engineers included flood control in their hydrological design: they could approve levee construction having a direct impact on maintaining the navigation channel. The River and Harbor Act of 1881 was the first piece of legislation to provide direct federal funding for levee construction, though low appropriations limited its effectiveness to maintenance of levees and navigational channels already in existence. Local levee districts continued to bear most of the financial burden, while the MRC performed a coordinating function. Despite these efforts, a major flood in 1882 "put all the unprotected lowlands under water, from Cairo to [the Mississippi's] mouth," prompting Mark Twain to claim that the flood would "doubtless be celebrated in the river's history for several genera-

a report by Charles Ellet advocated larger federal involvement in flood control efforts. The most influential study of river engineering in the United States is probably A. A. Humphreys and H. L. Abbot's *Report Upon the Physics and Hydraulics of the Mississippi River* (Philadelphia: U.S. Army, Corps of Topographical Engineers, 1861), which is the origin of the 'levees-only' approach to flood control.

tions before a deluge of like magnitude" would be experienced.[5] As the nineteenth century drew to a close, higher and stronger levees were going up all along the river. This "levees only" strategy, however, possessed a grave inherent weakness: walling off the floodplain increased the river stage downstream, where the waters gathered. Flood control in the Lower Mississippi Valley consequently became, in the words of Thomas Dabney, the chief engineer of the Yazoo-Mississippi Delta Levee District, "a desperate contest between opposite sides of the river ... the side that could hold out the longer would win."[6]

The flood of 1897 once again demonstrated the vulnerability of the regional economy to a major overflow. The flood received wide national attention and calls for a federal flood control program intensified. Already in 1890 a convention in Vicksburg had led to the formation of the Inter-State Mississippi Improvement and Levee Association for the purpose of attracting federal funds. Although the federal government still declined major funding, the levee system along the lower Mississippi continued to expand. The national economy had picked up after the financial depression of 1893, and land values in the region were again on the rise. New drainage districts were being organized, while lumber and railroad companies had begun aggressive marketing to agricultural interests of their cutover acreage in flood-prone lowlands. New debts and higher taxes could now be tolerated, as bigger and stronger levees were seen as the best way to assure a prosperous future.

Despite the constant development of the levee program, serious flooding took place in the Lower Mississippi Valley in 1903, 1912, and 1913. Moreover, the existing levee system stopped at the mouths of tributaries, and serious backwater flooding continued to occur. The expansion of the Mississippi levee system actually aggravated flooding along some tributaries. Prior to large-scale levee construction, plantations in the lower Yazoo area had endured roughly the same amount of flooding as other parts of the Yazoo-Mississippi Delta. With the increase of levee mileage along the Mississippi, however, high river stages of longer dura-

5. Mark Twain, *Life on the Mississippi (New York: Book-of-the-Month Club, 1992 [1883]), 224.*

6. Thomas Dabney in *Reports of the Chief Engineer, Yazoo-Mississippi Delta Levee District, 1884-1900,* 293-94, quoted in Robert W. Harrison and Joseph F. Mooney, Jr., *Flood Control and Water Management in the Yazoo-Mississippi Delta* (Mississippi State, 1993), 6.

tion became more common in the main stem, and the unprotected backwater lands flooded more often. In 1916, yet another major flood occurred along the lower Mississippi. This time the devastation along the river created enough momentum for the passage of the Ransdell-Humphreys Flood Control Act of 1917. The act authorized greater federal aid for the construction of levees and affirmed the policy of cooperation between local levee districts along the lower Mississippi and its tributaries. Under the new legislation, the federal government would pay up to two-thirds of the construction cost of new levees.

By concentrating on the construction of higher and stronger levees of a new standard, the legislation perpetuated the traditional "levees only" policy and ignored other solutions for flood control along the lower Mississippi. The strengthened levees successfully constrained a major flood in 1922, and the region was for the first time seen as adequately protected from flooding. Already at the turn of the century, the chief engineer of the Mississippi Levee District, C. H. West, had asserted that "three feet more in height [of the levees], with a relative strengthening of the base, will give protection from any flood that may be expected in the future."[7] By 1926, the MRC, Corps of Engineers, and general public assumed that in the future levee work would entail only maintenance of existing structures. Then came the spring of 1927.

According to William Faulkner, it was almost as if the river's condition that spring "was no phenomenon of a decade, but the intervening years during which it consented to bear upon its placid and sleepy bosom the frail mechanicals of man's clumsy contriving was the phenomenon and this the norm and the River was now doing what it liked to do, had waited patiently the ten years in order to do, as a mule will work for you ten years for the privilege of kicking you once."[8] Prolonged heavy rainfall in the headwater areas swelled the tributaries and added to the already high water levels in the Mississippi itself. By early May, water levels in the lower Mississippi approached sixty feet above mean sea level. Not designed to hold back such volume of water, the levees began

7. C. H. West, "Brief History of Levee Building in the Mississippi Levee District," *Riparian Lands of the Mississippi River, Past-Present-Prospective,* ed. Frank H. Tompkins (Chicago: A. L. Swift, 1901), 306.

8. William Faulkner, "Old Man," *The Portable Faulkner*, ed. Malcolm Cowley (New York: Viking Penguin, 1977 [1946]), 516.

to crumble. Even with numerous crevasses up the river, the confined discharge at Vicksburg, Mississippi, was estimated at almost 2.3 million cubic feet per second.

The "levees only" policy came to an abrupt end on April 29, when the authorities were compelled to dynamite a levee at Caernarvon, Louisiana, downstream from New Orleans. The artificial crevasse eased the pressure on the levees protecting the city and saved it for the time being. Waters from the crevasse, however, flooded Plaquemines and St. Bernard parishes and turned their inhabitants into refugees by federal action. Everywhere in the Lower Mississippi Valley, the flood caused staggering economic losses and human suffering. Altogether over sixteen million acres in seven states had been inundated, with estimates of the direct property loss varying from 236 to 363.5 million dollars. In some places, prospects for growing cash crops had been destroyed for years to come, as productive acreage had been covered by a foot-deep layer of sand carried in by the flood waters. Hundreds of lives were lost along the Mississippi, and an estimated 637,000 persons became homeless. After witnessing the misery in the Lower Mississippi Valley, the American public was now ready to support drastic measures for flood control. In the aftermath of the devastation, Congress requested the Corps of Engineers to examine the problem in a national context. As a result, Lieutenant General Edgar Jadwin came up with a three-hundred-million-dollar program for the development of the Mississippi and its tributaries.

In addition to a stronger levee system, the authorities now proposed new approaches to flood control under the Jadwin plan: deepening river channels with jetties and constructing cut-offs, floodways, and storage reservoirs. Congress hastily passed the Jones-Reid Flood Control Act of 1928, which authorized the Corps to proceed with the plan and committed the federal government to a comprehensive program of flood control along the lower Mississippi. The federal government now undertook the full cost of levee building and left to local levee boards only the tasks of obtaining rights-of-way and maintaining the completed levees. The objective of the new program was to safely channel a hypothetical flood of unprecedented magnitude – the so-called Project Flood – through the Lower Mississippi Valley to the Gulf of Mexico.[9]

9. The scientific aspect of the MR&T project included the creation of the Waterways Experiment Station

Already during the late nineteenth century, conservationists had begun to promote the principle of regional planning under local control, including the treatment of river systems as units. During the first decades of the twentieth century, legislation approved by Congress reinforced the idea of multipurpose water developments under federal authority, as evidenced by the Reclamation Act of 1902 and the creation of the Inland Waterways Commission in 1907. A landmark law, the Weeks Act of 1911, recognized the connection between forest conservation and watershed protection. The idea of comprehensive watershed planning gradually gained momentum in Congress and was included in the Water Power Act of 1920 and the Rivers and Harbors Act of 1925. Such aspirations for regional development projects culminated with the launching of the Tennessee Valley Authority (TVA) in 1933.

In the 1930s significant legislation was passed authorizing structural control of flooding along the Mississippi tributaries. The Flood Control Acts of 1936 and 1938 affirmed flood control as a federal activity, and the massive Mississippi River and Tributaries (MR&T) project commenced in the Lower Mississippi Valley in 1941. The basis for the existing structure of federal authority over flood control in the Lower Mississippi Valley was now firmly in place. Numerous additional flood-control acts have since then authorized "corrective" works in the area, including new levees for containing flood flows and floodways for the swift passage of excess flows. The Flood Control Act of 1944 paid special attention to channel improvement and stabilization in order to increase flow capacity of the lower Mississippi.

Large-scale federal flood-control projects had begun as early as 1929 on the Atchafalaya, lower Arkansas, and lower Red River basins, while similar work along the St. Francis, White, and Yazoo was initiated by the new legislation. During the Great Depression, such massive projects had the additional benefit of providing relief work to the region's masses of unemployed. By 1948 the federal government had spent over fifty million dollars for levee work in the Yazoo-Mississippi Delta alone, and all

just south of Vicksburg. Among the activities of the laboratory was the construction of a scale model of the entire Mississippi Basin, covering some two hundred acres. In the mid-1970s the ACE described the project flood as 11 percent greater than the flood of 1927 at the mouth of the Arkansas and 29 percent greater at the latitude of Red River Landing, amounting to over three million cubic feet per second at that location.

the tributary basins of the lower Mississippi had by then become sites of vast engineering works with numerous dams, reservoirs, pumping plants, and auxiliary channels.

The watershed strategy adopted in the 1930s has been controversial, especially with respect to the development of the Atchafalaya Basin, which conveyed excess water from the main stem of the Mississippi into the bottomlands of southern Louisiana. The Corps of Engineers, by deepening and straightening the Atchafalaya River, has greatly restricted the basin's absorbency. Drainage into many tributary bayous has been blocked, while an extensive system of high levees conveys floodwaters down the Atchafalaya to the Gulf of Mexico. In addition to criticism of the immense ecological changes along the Atchafalaya caused by flood-control structures, the safety consequences of the Corps' design have become an issue. By altering the natural hydrological regime, federal flood-control measures may have created unprecedented potential for disaster, should the levees ever be breached.

After centuries of hard work and massive investments by individual interests and local, state, and federal governments, it has customarily been assumed that almost any amount of high water can be safely transported through the Lower Mississippi Valley. But as the Mississippi floods of 1973 and 1993 – not to mention the 2005 Hurricane Katrina – have demonstrated, the potential for serious flooding still exists in the region despite the remaking of the Lower Mississippi Valley's hydrological systems at an enormous economic and environmental cost. The Mississippi River and Tributaries Project is today fast approaching completion, but the collapse of New Orleans levees in 2005 after a storm surge caused serious doubts about the reliability of the whole flood control system in the South.[10]

Through its involvement in flood control the federal government has for more than a century shaped the agricultural, industrial, and urban development of the Lower Mississippi Valley. The federal involvement in

10. Since the 1960s, Congress has paid more attention to the growing environmental concerns of the American public. The 1969 National Environmental Policy Act (NEPA) requires an environmental impact statement from all federal projects, including flood control activities carried out by the ACE. The Federal Water Pollution Control Act of 1972 (later the Clean Water Act) and the Coastal Wetland Planning, Protection and Restoration Act of 1990 similarly reflect changing priorities in the use of water resources.

flood management in the region came slowly at first, as levee building and other flood control activities were originally perceived to profit too narrow an interest group to justify the enormous investments required. Since the disastrous flood of 1927, however, federal funding has enabled massive human-induced change in the hydrology of the Mississippi and its tributaries.

The present system of flood control in the Lower Mississippi Valley is a compromise resulting from a long and complicated interplay between, and among, several interest groups. The current solution to the problem of floodplain settlement attempts to balance widely conflicting views on economy, politics, engineering, and the environment, but satisfies only few and faces an uncertain future.