Levees-Only: Controlling the Mississippi and Its Consequences

For much of the nineteenth and early twentieth centuries, flood control on the lower Mississippi River was dominated by a deceptively simple idea: keep the river between levees and move its water toward the Gulf of Mexico as quickly as possible. This approach became known as the Levees-Only policy. Rather than routinely allowing high water to spread onto its natural floodplain or diverting it through alternative channels, engineers constructed increasingly continuous, high, and strong levees along the river. The approach reflected growing confidence that engineering could make the Mississippi more predictable while protecting cities, farms, transportation networks, and commerce.

The policy was closely associated with the work of nineteenth-century U.S. Army engineer Andrew A. Humphreys and became deeply embedded in federal river-management policy. Levees provided very real benefits. By reducing frequent flooding, they allowed communities and agriculture to expand across the extraordinarily fertile Mississippi floodplain. Land that had once experienced regular inundation could support permanent settlements, railroads, roads, businesses, and intensive cotton agriculture. Consequently, however, society became increasingly dependent on the assumption that the levees would continue to hold. Flood protection did not eliminate risk; in some respects, it changed and redistributed risk.

Ecological Implications

Flooding is a natural ecological process in a large alluvial river. Before extensive leveeing, high water periodically connected the Mississippi with its floodplain, carrying water, sediment, nutrients, organisms, and organic matter into surrounding wetlands, forests, lakes, and backwaters. These connections helped create fertile soils and supported highly productive aquatic and terrestrial habitats.

Levees interrupted those connections. Keeping the river in its channel reduced the frequency with which sediment and nutrients reached the floodplain. Wetlands and backwaters became increasingly disconnected from the river, affecting habitat for fish and wildlife and altering patterns of sediment deposition. Farther downstream, restricting the movement of sediment onto the floodplain also changed where the river's enormous sediment load was deposited. In coastal Louisiana, the long-term separation of the river from adjacent wetlands became one of several important contributors to the inability of parts of the delta to receive enough sediment to offset subsidence and land loss.

Levees therefore present an ecological paradox: the floods society sought to eliminate were also processes that created and maintained the landscape people wanted to occupy.

Social and Economic Implications

Levees transformed human settlement as profoundly as they transformed ecology. Flood protection encouraged investment in farms, towns, infrastructure, and businesses within a naturally flood-prone landscape. As protection increased, so did the consequences if that protection failed. This creates what is sometimes called a levee effect: greater perceived protection encourages more development behind levees, increasing the people and property exposed to a catastrophic failure.

The benefits and risks were also distributed unequally. In the pre-1927 Mississippi Delta, flood control protected an extraordinarily profitable agricultural economy dominated by large landowners and cotton production. That economy depended heavily on African American tenant farmers, sharecroppers, and laborers living under Jim Crow racial and economic hierarchies. Thus, decisions about protecting land, maintaining labor, evacuation, and disaster relief were not made within an equal society. The 1927 flood exposed how existing differences in wealth, race, mobility, and political power could determine who was protected, who could leave, who made decisions, and who bore the consequences when the system failed.

The Lesson of 1927

The Great Mississippi Flood of 1927 demonstrated the limits of relying on levees alone. When levees failed, water inundated enormous areas that had become dependent upon those structures for protection. In response, the Flood Control Act of 1928 marked a fundamental shift toward a broader federal flood-management system. Levees remained critically important, but they were increasingly combined with floodways, spillways, control structures, channel improvements, and other engineering measures.

The larger lesson is not that levees are inherently bad. Levees protect millions of people and enormous economic investments. Rather, the history of Levees-Only demonstrates a central principle of environmental systems thinking:

Changing one part of a complex natural system produces consequences elsewhere—and protection from one risk can create new vulnerabilities.