

More than 600 square kilometers of wetlands have disappeared in the last decade alone. After hurricanes Katrina and Rita—and a National Academies call for action—ecologists hope their large-scale plans will be implemented

Louisiana's Wetlands Struggle for Survival

LULING, LOUISIANA—From its headwaters in Minnesota to the Gulf of Mexico, the Mississippi is lined with massive earthen levees designed to prevent the mighty river from flooding. But here, 37 kilometers upstream from New Orleans, the Army Corps of Engineers and the state of Louisiana have spent \$120 million to get a little flooding back. On a sunny October afternoon, inside a control room, a technician presses a button, and hydraulics begin to whine. Deep within the concrete structure, four steel sluice gates slowly rise, and the Mississippi springs a leak.

With a gurgle, water from the Mississippi begins to flow through the four 16-square-meter culverts of the Davis Pond Freshwater Diversion Structure and into a 3-kilometer-long canal. Eventually, the water will reach the marshes of Barataria Bay, which, like much of coastal Louisiana, are starved of sediment. According to calculations by the corps, the water from Davis Pond should help preserve more than 13,000 hectares of Louisiana's endangered marshes—if it works, that is.

Three years into the project, engineers have realized it's not easy to mimic a flood. Since Davis Pond began operation in 2002, engineers have struggled to get the water to flow properly and enough sediments to accumulate in the right places (see sidebar, p. 1265). And this effort is just a tiny fraction of what's needed to restore the devastated Louisiana coastline, a National Academy of Sciences

(NAS) panel said this month. "The challenge of protecting and restoring this wetland system is unprecedented," said the panel.

According to the report,* the corps' current plan—an unfunded, \$1.9 billion, 10-year proposal to slow down the destruction—is generally a good start, but it's by no means comprehensive enough. "This is really [just] the first step," says Robert Dean, a civil and coastal engineer at the University of Florida, Gainesville, who chaired the committee. The academy is the latest in a long string of expert advisory bodies to call for urgent action. But

* *Drawing Louisiana's New Map: Addressing Land Loss in Coastal Louisiana*, National Academies Press, 2005.



Small steps. Restoration happens at many scales, such as planting vegetation. Broader action is critically needed, scientists say.

its timing, less than 3 months after hurricanes Katrina and Rita devastated the coast and focused a spotlight on its problems, could make it the most influential. The question now is whether Louisiana, and the nation, will muster the political will and funds to set the course toward recovery.

Robbed of sediments

Coastal degradation was a problem long before Katrina roared into New Orleans. After the Army Corps tamed the Mississippi in the 1940s, the wetlands, deprived of the river's sediment, began to sink below sea level. Their health further deteriorated as extensive canals were dug, first to explore for oil and gas and then to pump them out. Adding insult to injury, a beaver-sized rodent called the nutria, introduced in the 1930s for its fur, turned out to have a voracious appetite for marsh plants. All told, more than 4000 square kilometers have been lost since 1950.

Faced with damage to marshes as well as impacts to wildlife, politicians began to address the problem in the 1960s. But despite many commissions and reports, there was little action until 1990, when federal legislation channeled about \$50 million a year of funds to the state of Louisiana. Some 120 restoration projects are currently active, from hunting nutria to building new marshes with dredged silt. But these projects are small and piecemeal.

After years of debate, in 1998, a coalition of state, federal, and local officials finally settled on an ambitious blueprint for reclaiming the coast. Called Coast 2050 (*Science*, 15 September 2000, p. 1860), it would have cost \$14 billion over 30 years.