

Holding Louisiana

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Land sinks. Water rises. Coastal Louisiana is losing ground to the ocean as fast as any region on earth—an acre every twenty-five minutes, a slab the size of New Orleans every five or six years.¹ Geologists call it subsidence. Swampers say the salt marsh trembles and floats where the toe of Louisiana points toward Havana, bleeding soil from thirty-one states. Layers of compacted mud weigh down the butter-soft lowlands. Ponds become estuaries. Barrier islands erode, exposing beachfront. The shore migrates, and so does the mile-wide river that has in its time carved five different paths to the ocean. Curling and coiling like a snake in a sandbox, the Mississippi giveth and the Mississippi taketh away. It fans alluvial silt, then leaps to a new location, building, destroying. No dam or system of levees can hold that mud-scape-in-motion. Yet hold we must. For the sake of 2.1 million Louisianans on 3.3 million acres of marshland. For the nation's largest fin and shell fishery. For nine ports, 3,000 miles of shipping channels, 16,000 miles of pipelines, 180,000 licensed saltwater sport fishermen, and a \$4-billion-a-year tourist industry. For 70 percent of the winged commuters on the Mississippi Flyway. For 15 percent of America's oil and 20 percent of its natural gas.

Holding Louisiana has vexed the nation's preeminent builders since the U.S. Army Corps of Engineers first assumed control of the New Orleans levees in 1917. The corps, founded in 1802, has defended the Mississippi from foreign invasion, from Confederate rebellion, from snags that impaled

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0040-165X/06/4701-0007\$8.00

1. Donald F. Boesch et al., "Scientific Assessment of Coastal Wetland Loss, Restoration and Management in Louisiana," *Journal of Coastal Research* 20 (May 1994): 1–6; Karen Wright, "Diluvian Tremors: Policy Initiatives Could Turn Tide on Wetlands Loss," *Scientific American*, October 1989, 32–34; Louisiana Coastal Wetlands Conservation Task Force, *Louisiana Coastal Wetlands Restoration Plan* (n.p., November 1993), 2.

steamboats, from hurricanes and floods. In the wake of Hurricane Katrina, however, the agency confronts a conundrum beyond the scope of its dam-it, ditch-it tradition: how to let the world's third-ranking river approximate the rhythms of nature, and meander and spread its replenishing mud blanket across the Delta without disrupting navigation or risking a serious flood.

Construction interferes with the land-building process: levees contain the silt needed to replenish the lowlands, dredging loosens the land by killing freshwater plants, floodgates and reservoirs further aggravate marsh subsidence. To abandon these kinds of projects is to court economic disaster; to build as before is to invite a worse catastrophe. "It's ironic," writes Robert Brown of New Orleans, a corps publicist. "The system which brings prosperity and security to humans is literally costing them the earth beneath their feet."²

Like vengeance wreaked on a state famous for resisting wetland regulation in a nation that plows and paves about 800,000 wet acres each year, the tragedy of the marsh has become, as Secretary of the Interior Bruce Babbitt observed a decade before Katrina, "the single most important environmental issue of our times."³ And it's not just a coastal problem. Upriver, the flood-protected residents long for the grassy streams that once braided through sodden woods and cattail marshes: in Minnesota, where urban sewage and PCBs have poisoned backwater marshland; in Missouri, where navigation dikes have quickened sedimentation; in Kentucky and Tennessee, where the clearing of flood-prone creeks has aggravated forest erosion; in Arkansas, where farming behind federal levees has decimated flood-swept woodlands; in Louisiana, where the river below Baton Rouge is a sewer for chemical toxins; and in Mississippi, where the draining of the Yazoo delta has replaced a watery habitat for songbirds and heron and a sanctuary for migratory geese and ducks with furrows of cotton and soybeans.⁴

How to restore America's main stream is a technological quandary clouded by foreboding and doubt. Our expectations are jaded, partly by our fear of the harmful effects engineering might yet have on nature. The corps swings with the nation. Pliant and decentralized, it answers first to Congress, but also to the president, the secretary of the army, the courts, regional commissions, public opinion, the laws of physics and finance, and

2. Robert D. Brown, "Restoring Louisiana's Wetlands," *Military Engineer* 550 (July 1992): 4.

3. Bruce Babbitt, "Saving Tomorrow's Wetlands Today," *Water Marks: Louisiana Coastal Wetlands Planning, Protection and Restoration News*, spring 1995, 1.

4. Constance Elizabeth Hunt, *Down by the River: The Impact of Federal Water Projects and Policies on Biological Diversity* (Washington, D.C., 1988), 146–47, 164–69. For the environmental impact of river engineering, see U.S. Army Corps of Engineers Vicksburg District, *Upper Yazoo Projects Reformulation Study* (Vicksburg, Miss., 1993), 1:13–19, passim; R. K. Yancy, "Our Vanishing Hardwoods," *Louisiana Conservationist*, March–April 1970, 26–31; and Philip V. Scarpino, *Great River: An Environmental History of the Upper Mississippi, 1890–1950* (Columbia, Mo., 1985).

its own historical sense of purpose. Critics say that inner-directedness creates a bias toward massive construction. Defenders say the corps has learned to rethink the meaning of river improvement as the green agenda gains influence. Oystermen want freshwater diversions. Duck hunters want reedy lakes and hardwoods in the bottomlands. The Mississippi Wildlife Foundation wants to preserve a riverine corridor for migratory fruit bats. The president of the Baton Rouge Audubon Society wants to reclaim strips of healthy woodland by reflooding forests and farms.⁵ “We need to be a sophisticated customer,” says wetlands advocate Mark Davis.

It’s carrot and stick. When they [the engineers] do it right, we pat them on the head. When they do it wrong, we hit them. If engineers don’t have the authority [to replenish the marsh, to protect fish and wildlife], we’ll get it. If they don’t have the money, we’ll find it. They have the bulldozers. They’ve engineered us into this dangerous situation. We need to help them engineer a way out.⁶

Replenish or perish. But how? To unmake such a fluid, sprawling machine would be ambitious beyond the store-for-the-future programs that Congress calls conservation. Ecologists want restoration. A 1992 report from the aquatic-restoration committee of the National Research Council targeted ten million acres of impaired but repairable wetlands along 400,000 miles of overbuilt rivers and streams. Dike notching, dam breaching, marsh building, and the reflooding of riparian farmland were hailed as effective ways to buffer human disturbance and promote biodiversity—to emulate, as the report put it, “a natural, self-regulating system that is integrated ecologically with the landscape in which it occurs.”⁷ Never mind that scientists remain deeply divided over how the dynamic earth functioned in prehuman times; biology and smart engineering could “approximate” liquid nature in its “predisturbance state.”⁸

The hope is that engineering contrivance can sustain enough watery chaos to keep a larger balance in place. For now, however, the research on restoration is as soft as the nodding grasslands. What is the measure of human disturbance? After twelve thousand years of Mississippi civilization—a history of hunting with fire, of fishing with weirs, of managing water with

5. Charley Fryling, Baton Rouge Audubon Society, interview by author, Baton Rouge, 13 June 1996. On the corps’ changing constituency, see Leonard A. Shabman, “Decision Making in Water Resource Development and the Potential of Multi-Objective Planning: The Case of the Army Corps of Engineers,” technical report no. 2, Cornell University Water Resources and Marine Science Center, Ithaca, N.Y., 1972.

6. Mark Davis, Coalition to Restore Coastal Louisiana, interview by author, Baton Rouge, 20 June 1996.

7. National Research Council, *Restoration of Aquatic Ecosystems* (Washington, D.C., 1992), 18.

8. *Ibid.*, 10, 12, 18, 498–99. On scientific debate over the state of nature, see Michael G. Barbour, “Ecological Fragmentation in the Fifties,” in *Uncommon Ground: Toward Reinventing Nature*, ed. William Cronon (New York, 1995), 233–55.

drainage canals and levee-like burial mounds—how can an infant science relying on ambiguous historical data pick out a point in the past and call it pristine? It can't. "Wilderness," writes William Cronon, "is quite profoundly a human creation—indeed, the creation of very particular human cultures at very particular moments in history."⁹ The pristine is a cultural construct. No science can restore a river to the state of nature, because nature—defiant, erratic, a mirror of our own expectations—never freezes into a state.

Nowhere is the nature of nature more elusively problematic than in the alluvial valley of the lower Mississippi, home to 8.3 million people in 219 counties of seven states from southern Illinois to Louisiana, some of the South's most productive soil. That fertile, fragile valley is the spout of a mud funnel that drains 1.2 million square miles, or 41 percent of the continental United States. Soft and unstable, a rich belt of topsoil as much as fifty feet deep, the dark alluvium spread by the river has always defined the valley. "Creamy and sweet-smelling" was how William Alexander Percy described the famous silt in *Lanterns on the Levee*, the 1941 memoir of a patrician who pined for the premodern landscape yet understood that his Mississippi cotton plantation would be ankle-deep in syrupy water if not for levees built by the Corps of Engineers. For Percy, the river that formed the murderous, magical Delta was "the shifting, unappeasable god of the country . . . gaunt and terrible . . . beautiful and dear . . . wise . . . aloof . . . an imbecile blind Titan."¹⁰

The managing of that mythic river is complicated by the fact that the corps's most concrete solutions have been proposed and rejected before. In 1964, for example, the New Orleans District advocated building a phalanx of steel gates that would have lain across the path followed by Katrina. The next year Hurricane Betsy drove a monstrous swell into the city's Ninth Ward. Six thousand houses sustained serious damage. Twenty thousand people barely escaped with their lives. Betsy, said an insurance spokesman, was "the worst natural disaster in [the history of] America—greater even than the San Francisco Earthquake and the Chicago Fire combined."¹¹ Damage estimates ran as high as \$2.4 billion—more costly than any storm on record, the inflation-adjusted equivalent of \$13 billion today.

Six hours into the flooding, President Lyndon Johnson was stepping from *Air Force One* onto the tarmac at New Orleans's Moisant Field. "I am here," he said, "because I want to see with my own eyes what the unhappy alliance of wind and water have done to this land and its people."¹² Wind and water and man, he might better have said, because the storm had

9. William Cronon, "The Trouble with Wilderness: Or, Getting Back to the Wrong Nature," in *Uncommon Ground*, 69.

10. William Alexander Percy, *Lanterns on the Levee: Recollections of a Planter's Son* (Baton Rouge, 1941; reprint, 1973), 3, 4, 24, 248.

11. Joe Englert, ed., *The Great Disaster: Hurricane "Betsy," September 9, 1965* (Chalmette, La., 1965), 1. See also U.S. Army Corps of Engineers, *Report on Hurricane Betsy* (New Orleans, 1965), 1–13, 32.

12. "President Tours Hurricane Area," *New York Times*, 11 September 1965.

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landed hard where Texas investors, the president's wife Lady Bird Johnson among them, planned to levee off 32,000 acres for 250,000 people in a new suburb and industrial park. New Orleans East, as it was called, would need flood protection; so would the north-shore suburbs, Jefferson Parish, the Port of New Orleans, the Port of Venice, Morgan City, and a dozen or more other storm-battered sites.

Johnson pressured Congress to approve \$250 million for Gulf Coast hurricane projects, including a \$56-million down payment on New Orleans levees and those storm gates, a fortress-like hurricane barrier in the Rigolets pass of Lake Pontchartrain, with sixteen rotating doors to allow plankton to wash in with the tide during normal weather and steel gates to seal off the lake during dangerous storms.¹³ Although biologists worried that a "dead zone" behind the gates might disrupt water circulation in the lake, an environmental-impact statement minimized the threat to marine life. Environmentalists scoffed.¹⁴

More was at stake than marine life. Luke Fontana of New Orleans, an attorney who had fished for crab and hunted ducks in the black lagoons now slated for subdivisions, led a crusade linking hurricane engineering to tax-supported "land enhancement" schemes. Fontana noted that the plan would help developers drain construction sites in New Orleans East and that it also featured protection for housing projects in the crab-rich north-shore wetlands that builders called Eden Isle. He and other critics feared a "piracy" that would "lead to the collapse of the Pontchartrain basin as a viable system."¹⁵ It was "pure pork-barrel," according to Fontana.¹⁶ Builders would reap "windfall profits" by trashing the public domain.¹⁷

13. A similar project in the same location is under discussion now; see John Schwartz, "Full Flood Safety in New Orleans Could Take Billions and Decades," *New York Times*, 29 November 2005.

14. Fred Chatry of the corps' New Orleans District provided a helpful chronology of events. Sue Hawes, Corps of Engineers New Orleans District, interview by author, New Orleans, 1 November 1996; Barry Kohl, New Orleans Audubon Society, interview by author, New Orleans, 13 June 1996; Cornelia Carrier, "Expert: Lake's Productivity in Danger," *New Orleans Times-Picayune*, 19 November 1974.

15. John Fahey, "Pontchartrain: Cesspool or Playground? Environmentalists, Dredgers Differ," *New Orleans Times-Picayune*, 23 January 1975.

16. Luke Fontana, Save Our Wetlands, interview by author, New Orleans, 4–6 November 1996.

17. "Dredging Foes Win One Round," *New Orleans Times-Picayune*, 1 November 1974. See also Fahey, "Pontchartrain: Cesspool or Playground?"; Cornelia Carrier, "Wetlands Dispute New Trial Denied," *New Orleans Times-Picayune*, 21 February 1975; Cornelia Carrier, "Lake Plan Hit as Private Windfall," *New Orleans Times-Picayune*, 23 February 1975; Gordon Gsell, "SOWL Files Suit against Lake Plan," *New Orleans Times-Picayune*, 6 December 1975; John LaPlace, "Could a State Panel Save Pontchartrain?" *New Orleans Times-Picayune*, 25 March 1977; Cornelia Carrier, "Louisiana Delegation Is Environment's Foe," *New Orleans Times-Picayune*, 15 June 1977; and "Environmental Group Asks to Join Hurricane Plan Suit," *New Orleans Times-Picayune*, 7 December 1977.

Chastised and sent back to the swamps with a team of Environmental Protection Agency biologists, the corps had eliminated the gated barriers from the hurricane-protection design by 1984. During two decades of delays, the cost of the gates ballooned from \$85 million to \$924 million. Dirt was less expensive. Reluctantly the corps returned to a simpler, but less-effective system of earthen and concrete levees, though it was common knowledge that lakeside earthen embankments were not enough to withstand another Betsy. “Today humans are playing too large a role in natural disasters to call them natural,” said a 1984 report from the Swedish Red Cross. “People are changing their environment to make it more prone to some disasters, and are behaving so as to make themselves more vulnerable to those hazards.”¹⁸ In 1996, in the hurricane office at corps headquarters on River Road in New Orleans, division chief Robert Guizerix predicted that the lakeside levees would fail if relentlessly hammered by swells from a Category 3 storm.¹⁹

As the earth experiences its most dramatic climatic shift since the time of Julius Caesar, the forecast is for more of the same. Global warming and rising oceans will make major storms more frequent and their impact more intense. The toe of Louisiana will vanish, according to that dismal forecast, and the battle to hold the alluvial Delta will consume more tax and engineering resources than were spent originally to reclaim it. Therein lies the tragedy of safety innovations that promote unsafe construction. Katrina underlined what we already know. We know that the levees prevent the river from replenishing the Delta landscape. We are aware that our activities in the saltwater marshes further their destruction as natural defenses against storms. We understand that the cost of maintaining deep-water shipping canals in the Gulf can be much greater than any savings gained from faster shipping. We know that a moving shoreline is not much of a problem until we try to stop it, that concrete solutions to coastal erosion can steepen a beach by deflecting its sand supply. But we also realize, or we should, that there is no turning back from all that we’ve made of the marsh without risking economic disaster. Technology is seldom an unmixed blessing. Certainly it is not in Louisiana, where the levees that shield New Orleans also intensify the processes that are consigning it to the Gulf.

18. Anders Wijkman and Lloyd Timberlake, *Natural Disasters: Acts of God or Acts of Man?* (London, 1984), 11.

19. Robert J. Guizerix, Corps of Engineers New Orleans District, interview by author, New Orleans, 19 June 1996. See also “Reconsidering the Barriers,” *New Orleans Times-Picayune*, 4 January 1978; “Lake Study Falls Short,” *New Orleans Times-Picayune*, 30 January 1978. For a more detailed history of the dispute over Pontchartrain storm barriers, see Todd Shallat, “In the Wake of Hurricane Betsy,” in *Transforming New Orleans and Its Environs*, ed. Craig Colten (Pittsburgh, 2000), 121–40.