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The Threatening Storm

By Michael Grunwald

The most important thing to remember about the drowning of New Orleans is that it wasn't a natural disaster. It was a man-made disaster, created by lousy engineering, misplaced priorities and pork-barrel politics. Katrina was not the Category 5 killer the Big Easy had always feared; it was a Category 3 storm that missed New Orleans, where it was at worst a weak 2. The city's defenses should have withstood its surges, and if they had we never would have seen the squalor in the Superdome, the desperation on the rooftops, the shocking tableau of the Mardi Gras city underwater for weeks. We never would have heard the comment "Heckuva job, Brownie." The Federal Emergency Management Agency (fema) was the scapegoat, but the real culprit was the U.S. Army Corps of Engineers, which bungled the levees that formed the city's man-made defenses and ravaged the wetlands that once formed its natural defenses. Americans were outraged by the government's response, but they still haven't come to grips with the government's responsibility for the catastrophe.

They should. Two years after Katrina, the effort to protect coastal Louisiana from storms and restore its vanishing wetlands has become one of the biggest government extravaganzas since the moon mission—and the Army Corps is running the show, with more money and power than ever. Many of the same coastal scientists and engineers who sounded alarms about the vulnerability of New Orleans long before Katrina are warning that the Army Corps is poised to repeat its mistakes—and extend them along the entire Louisiana coast. If you liked Katrina, they say, you'll love what's coming next.

Before Katrina, the Corps was spending more in Louisiana than in any other state, but much of it was going to wasteful and destructive pork instead of protection for New Orleans; one Corps project actually intensified Katrina's surge. After Katrina, a series of investigations ripped the Corps for building flimsy floodwalls in soggy soils, based on wildly flawed analyses—and shoddy engineering was only one way the Corps betrayed New Orleans. But while fema director Michael Brown's resignation made front-page news, Corps commander Carl Strock's resignation hardly made the papers. By the time Strock admitted his agency's "catastrophic failure" eight months after the storm, the U.S. had moved on.

As the disaster's Aug. 29 anniversary approaches, there will be plenty of talk about the future of New Orleans—-how to rebuild; bring home the diaspora; and deal with crises like housing, crime and education. But in the long run, recovery plans won't matter much if investors, insurers and homesick

evacuees can't trust the Corps to prevent the city from drowning again. "Katrina wasn't even close to the Big One," says Louisiana State University (lsu) hurricane researcher Ivor van Heerden, author of the Katrina memoir The Storm. "We better start getting ready."

Today, Corps leaders are rebuilding New Orleans levees, but they say it will still take four more years and billions of dollars more just to protect the city from a 100-year storm, the protection they were required to provide before Katrina. That's still paltry compared with Amsterdam's 10,000-year-storm protection. But Corps officials have also committed to restoring the surge-softening marshes, cypress swamps and barrier islands that are disappearing at a rate of a football field nearly every half-hour. They say they now understand that the survival of New Orleans depends on a sustainable coast. "This is not the Corps of old," says Karen Durham-Aguilera, director of the agency's Task Force Hope. "The world has changed, and the Corps is changing too."

But for all the talk about restoring wetlands, almost every dime of the $7 billion the Corps has received since Katrina is going to traditional engineering: huge structures designed to control rather than preserve nature. And its latest plan seeks to extend those structures along the entire coast, calling for such massive levees across so much of the state that scientists call it the Great Wall of Louisiana. The Corps says it's just an idea, but Congress is about to authorize the first stretch of the wall—a $900 million, 72-mile (116 km) levee for isolated bayou towns like Chauvin, Dulac and Montegut. "Nothing has changed," says G. Edward Dickey, a former Corps chief of planning. "It's the same engineering mentality, except now they'll build the levees even bigger."

Bigger levees aren't all bad. New Orleans desperately needs them; one local slogan is, "Make Levees, Not War." But New Orleans needs its eroding wetlands just as desperately; another local slogan is, "Fix the Coast, or We Are Toast!" To prevent another disaster, the construction addicts of the Corps, their enablers in Congress and the U.S.'s cockamamie approach to water resources will all have to change. The Great Wall concept sounds a lot like the mistakes of the past.

Killing the Coast

New Orleans wasn't always a city in a bowl. The French founded it in 1718 on high ground along the Mississippi, a "natural levee" of sediment deposited by the river. That's why tourists in the French Quarter stayed dry during Katrina. And that's how all of south Louisiana was built—by the Mississippi River mutinying its banks and rambling around its floodplain like an unruly teenager, dropping mud around its delta and creating roughly 4.5 million acres (1.8 million hectares) of wetlands between New Orleans and the Gulf. So while the French built an earthen levee 1 mile long and 3 ft. high (1.6 km long, 1 m high) to block the river's annual tantrums, they didn't bother trying to block the occasional hurricanes that swept up the Gulf. "They didn't need hurricane levees," says Kerry St. Pe, a marine biologist whose ancestors arrived in 1760. "They had wetlands to protect them." New Orleans wasn't on the coast, and hurricanes wilt over land.

Now the Gulf has advanced some 20 miles (32 km) inland, thanks in large part to the Army Corps. The Corps started as a Revolutionary War regiment, fortifying Bunker Hill, but it evolved into an all-purpose engineering unit, eventually overseeing local flood control on the Mississippi. The Corps ordered communities to imprison the river in a narrow channel with a strict "levees only" policy, rejecting calls to give the river room to spread out. So levees rose, and the Corps repeatedly declared the river floodproof. But the constrained river also rose, and its jailbreaks repeatedly proved the Corps wrong. In the epic flood of 1927, crevasses shredded the entire valley and nearly destroyed New Orleans.

Congress rewarded this failure by allowing the Corps to seize control of the entire river and its tributaries, an unprecedented Big Government project that foreshadowed the New Deal and established the Corps as the U.S.'s manipulator of water and manhandler of nature. It built dams, floodways, revetments and pumped-up levees throughout the Mississippi basin, caging the beast in its channel, safeguarding riverfront cities, creating a reliable web of liquid highways. But by walling off the river, trapping its sediments behind giant dams and armoring its erosive banks with concrete, the Corps inadvertently choked off the land-building process. The straitjacketed river now carries less than half its original sediment load down to Louisiana. So there's little new land-building material to offset the natural erosion of the coast, much less the unnatural rising of the sea fueled by global warming.

The result is that New Orleans is sinking, and about 30% of the coast's wetlands have slipped into the Gulf, jutting Louisiana's chin even further into the path of Mother Nature's fist, endangering the U.S.'s largest offshore oil and gas fields, a lucrative seafood industry, a busy network of ports and about 2 million people. If Mexico had seized all that land, we'd be at war. lsu hydraulic engineer Hassan Mashriqui says just 100 yds. (91 m) of cypress trees can reduce wave energy 95%; he has seen a similar phenomenon with mangroves in his native Bangladesh. Katrina and then Hurricane Rita confirmed that marshes knock down surges as well. "Basically, we found that none of the levees that failed were protected by wetlands or trees," Mashriqui says.

Oil and gas canals have accelerated the land losses. But so have Corps navigation canals, especially the notorious Mississippi River Gulf Outlet, a shipping shortcut to the Port of New Orleans that was a larger dirt-moving project than the Panama Canal when it opened in 1965. The canal never carried many ships, but it has carried plenty of saltwater into freshwater marshes and cypress forests, killing nearly 100 sq. mi. (259 sq km) of wetlands. Shortly before Katrina, Mashriqui called it a "critical and fundamental flaw" in New Orleans' defenses; after Katrina, his modeling found that the outlet boosted Katrina's surge 2 ft. (0.6 m) and increased its velocity 10-fold, overwhelming St. Bernard Parish and the Lower Ninth Ward. "This was a disaster created by the Corps," Mashriqui says.

A Tragedy of Priorities

New Orleans still might have fended off Katrina if its levees hadn't played matador defense. After Hurricane Betsy pummeled New Orleans in 1965, Congress assigned the Corps to protect the city from a

100-year storm. The agency's first mistake was calculating that 100-year event as a modest Category 3 hurricane, even though Betsy had been a 4, and the National Weather Service later proposed a more severe 4. The Corps then made such egregious engineering errors that it wasn't even ready for a smaller storm. For example, its levees sagged as much as 5 ft. (1.5 m) lower than their design because the Corps miscalculated sea level and then failed to adjust for subsidence. Some were built in soils with the stability of oatmeal. "These were inexcusable, lethal mistakes," says University of California, Berkeley, engineering professor Robert Bea, who led a post-Katrina investigation for the National Science Foundation. The Corps also built most of its levees around swampland, a conscious effort to promote the development of low-lying subdivisions like New Orleans East. That no longer seemed like such a good idea after New Orleans East went underwater during Katrina. "That should be the first lesson: build levees around people, not around wetlands," says Paul Harrison of Environmental Defense.

The basic problem is that protecting New Orleans from deadly storms was never anyone's top priority. That's why the city's main hurricane project was 37 years behind schedule when Katrina hit. Louisiana's congressional delegation steered Corps funds toward boondoggles that had nothing to do with flood protection, like a $2 billion effort to channelize the Red River for barges that never materialized. Stingy local officials actually helped scuttle a Corps plan to build pumps and floodgates along Lake Pontchartrain, a plan that could have prevented much of Katrina's flooding. "We can beat ourselves up about the past—or we can use the past to do business differently in the future," says Corps Colonel Jeffrey Bedey, who is now overseeing construction of, yes, huge pumps and floodgates along Lake Pontchartrain. "I don't just mean we the Corps. I mean we the country."

Corps leaders often say their projects simply reflect the will of the nation; when the U.S. wanted them to ransack the landscape with dams and dredges, they saluted and obeyed. But it's also true that the Corps helps shape that will. In recent years the Government Accountability Office, the National Academies of Science and the Pentagon inspector general have documented the agency's bias toward approving projects that keep its 35,000 employees busy and its congressional paymasters happy. In 2000 its leaders were caught cooking an economic analysis to justify a $1 billion upper Mississippi River lock project and launching a secret Program Growth Initiative to lard their budget with make-work. In New Orleans, the Corps endorsed a $750 million lock on the Industrial Canal even though its economists considered it a waste of money; the agency justified it by citing increasing use, even though use was decreasing.

Pam Dashiell, a community activist in the Lower Ninth Ward, fought for years against the Gulf Outlet and the Industrial Canal lock, lobbying Corps officials and Louisiana politicians to focus on safety instead. But both projects were on the wish list of the port, the city's most powerful interest. Dashiell remembers the hostility of Congressmen like Democrat William Jefferson, now indicted on corruption charges, and Republican David Vitter, now embroiled in a prostitution scandal. "They said I was an obstructionist," she says. "I was like, J Where are your priorities?'" Her working-class Holy Cross neighborhood had one of the highest elevations in New Orleans, but it was nearly wiped out by the surge that blasted up the Gulf

Outlet and tore through floodwalls along the Industrial Canal—just a stone's throw from the white-elephant lock project.

For the U.S.'s water-resources system, these haphazard priorities are a feature, not a bug. The Corps is funded almost exclusively by earmarks, individual slices of pork requested by individual Congressmen. Since F.D.R., Presidents have routinely tried to rein in the agency, with little success. After the Program Growth scandal, the Clinton Administration issued a gentle reminder that Corps generals are supposed to report to their superiors in the Pentagon chain of command but speedily retracted it following a venomous outcry from their real superiors on Capitol Hill. President Bush keeps proposing zero funding for most of the Corps projects that taxpayer and environmental groups hate, but Congress continues to fund them anyway.

So the U.S. has no water-resources policy, just a ready-to-build water-resources agency whose agenda is dictated by an annual funding free-for-all among its 535 bosses. It's a classic example of Washington's iron triangle: commercial interests lobby the Corps and their Congressmen for projects that supply the Corps with work and political cover and help the Congressmen steer jobs and money to constituents and contributors. "It's a sinister system," says American Water Resources Association president Gerry Galloway, a former Army brigadier general who is now a visiting scholar at the Corps. "Water is a national-security issue, but we treat it like the Wild West. The big guns get the money."

Katrina didn't change that system. Louisiana Senators Vitter and Mary Landrieu promptly proposed a bloated quarter-trillion-dollar Louisiana reconstruction bill, drafted by lobbyists for oil, shipping and other corporate interests. The request included $40 billion for the Corps—10 times the agency's budget for the rest of the nation—including nonreconstruction projects like the Industrial Canal lock and a New Iberia port deepening that had flunked the Corps' cost-benefit tests. It also included pre-Katrina coastal levee schemes, with names like Morganza-to-the-Gulf and Donaldsonville-to-the-Gulf to suggest their grandiose sweep. The bill stalled after it was widely mocked as legislative looting, but it sent the message that pre-Katrina priorities were still in effect. Vitter kept pushing a measure to help timber companies harvest cypress swamps. Landrieu tucked language into emergency bills ordering the Corps to redo its New Iberia analysis and fast-tracking the Industrial Canal lock. "Katrina was just a perfect excuse to pull the old pork off the shelf in the name of otherwise-we-drown," says Tulane law professor Oliver Houck, the sage of Louisiana environmentalism. "And away we go: another Louisiana hayride."

The Path Forward

The hayride has not yet left the barn. Since Katrina, the Corps has focused on repairing and improving its New Orleans defenses: rebuilding or strengthening 220 miles of the city's 350 miles of levees (about 350 km of New Orleans' 560-km levee system), installing gigantic pumps and gates along the lake and releasing block-by-block maps to publicize lingering flood risks. Some engineers believe the new levees are still too short and weak—"They're a frigging disgrace," U.C. Berkeley's Bea says—and the new pumps

repeatedly malfunctioned during testing. But the Corps is about to unveil its plan for 100-year protection, with a rumored price tag of $15 billion, and the agency says that by 2011 the city will be safe from "severe storms," though not from storms as severe as Katrina. The Corps has even proposed to close the Gulf Outlet, a stunning turnaround after 40 years. "We're being much, much more conservative," says Thomas Podany, a Corps manager in New Orleans.

The real controversies involve a separate study of Category 5 protection and restoration for the entire Louisiana coast. The initial plans floated by the Corps and its state partners proposed a Maginot Line of towering new levees that evoke the "levees only" policy that failed on the Mississippi River, this time seeking to confine the Gulf. Water needs to go somewhere, and the agency's own modeling suggested that Donaldsonville-to-the-Gulf would not only cut off vast swaths of wetlands but also double storm surges in some areas by piling up water and concentrating its fury. "They're talking about chopping an estuary in half," says John Lopez, a former Corps geologist who is now the Lake Pontchartrain Basin Foundation's director of coastal sustainability. "Even for the Corps, that's extreme."

Morganza-to-the-Gulf is less extreme but imminent; it's part of a $20 billion national package of Corps projects nearing congressional approval. The Corps has proposed to use "leaky levees" to allow tidal exchange, but many scientists predict the structures will still wall off marshes, providing a false sense of security to vulnerable towns while increasing their vulnerability. lsu's Van Heerden calls it "absolutely screwy, the exact opposite of what we need." Many scientists argue that it's dangerous and unrealistic to commit billions of dollars to protect middle-of-nowhere fishing towns, when the Corps has a $58 billion backlog of unfinished projects, and cities like New York and Miami are largely exposed to the sea. They want the Corps to focus on fixing the coast and protecting denser communities while helping families in small coastal towns elevate homes or move to higher ground. "I'm afraid that once we say yes, we're giving clearance to levees all across the state," says lsu ecologist Robert Twilley, who's leading Louisiana's science-review team. "My great fear is that we're going to cut off the coast with barriers, just like we did to the river. I'd hate for that to be my legacy."

Even Morganza's most ardent defenders say coastal levees can have dire coastal consequences. But they don't want to do nothing for people in harm's way. "I sit up at night and ask myself, Why the hell do you want to spend $1 billion on another levee?" says Jerome Zeringue, a biologist who runs the local levee district. "But if we don't protect Dulac, there won't be a Dulac."

In Shrimpers Row in tiny Dulac, a sign says water on road ahead—not a flashing sign, a permanent sign. Ivy Pierre has fished these bayous since he was a kid. He says the biggest change over his 78 years is that he walks up a ladder instead of down a ladder to climb into his boat. "We're sinking!" he says. Katrina was the fifth time his house has flooded, but home is a powerful place. "They call it Dulac," he says with a grin, "because we Du what we Lac!"

Dulac is ground zero in an age-old coastal debate: Defend or retreat? It's worth noting that the people of Dulac didn't move into harm's way. Harm moved into their way when the coast collapsed around them. But levees can create perverse incentives; Pierre wanted to elevate his house until he heard the Feds might protect it for him. Pierre also understands that Dulac might be doomed, or at least a bit remote for American taxpayers to protect for more than $10 million a mile, and he might be willing to move to higher ground for the right offer. "Retreat is not an American thing," Houck says. "We need a better word for it, because the concept is inexorable."

Corps managers say they're open to non-structural approaches to reducing flood risk. They also say they might adjust their levee paths to avoid damaging the coast. But expectations are hardening. "Morganza is considered egregious in the scientific community, but there's not a lot of enthusiasm down there for changing the alignment," says Randy Hanchey, who left the Corps after 37 years to oversee coastal projects for Louisiana. "The politics are very tricky."

Levees are still seen as instant local relief, even though Morganza is supposed to be a 16-year project and would probably take much longer. Restoration is often cast as a more general solution, even though scientists expect the Gulf to advance to the New Orleans suburbs within a decade. So political pressure and engineering instincts tend to favor a futile effort to wall ourselves off from nature. But Katrina and Rita wiped out 217 sq. mi. (562 sq km) of wetlands in a single month. And even Bush has acknowledged that without the coast, Louisiana is toast.

The good news is that scientists believe they know how to save it. They want the Corps to let go of the river in strategic areas so it can get back to work building land, even if that requires rearranging navigation at the mouth of the Mississippi. They want to fill in oil and gas canals, constrict the Gulf Outlet and start pumping sediment back into ridges and barrier islands. The Corps developed $14 billion worth of Louisiana restoration plans before Katrina, but Bush scaled them back to $2 billion. Now the scientists want to think even bigger about the entire ecosystem, even the sediments trapped behind dams 1,000 miles upstream (about 1,600 km). And they don't want to have to think about new to-the-Gulfs schemes that could further degrade the coast.

Can the system adapt? The Corps has announced "12 actions for change," but it's hard to find outsiders who believe that it has moved beyond its "teach Mother Nature a lesson" roots. It's still not a Corps of ecologists. And its projects are still a popular form of political swag for its enablers on Capitol Hill. The $20 billion Corps package also includes some modest reforms that would require more review of the agency's projects and mitigation of their environmental damage. But the Senate overwhelmingly rejected an effort to require the prioritization of Corps projects according to national need. And on Wednesday, the Bush Administration threatened to veto the "unaffordable" bill. Lieut. General Robert Van Antwerp, the new Corps commander, would like to see an independent commission recommending water projects outside the political process, like the one that advises military-base closures. But if New Orleans has to wait for an independent commission, it's probably time to invest in scuba gear. "We've got to break the

cycle," Twilley says. "We've got to stop the political hacking. If we really want to go to the moon, we ought to go." The scientists make the task sound simple: build New Orleans 500-year protection and restore its natural protection. Have the courage to cause inconvenience and economic harm to some in the name of protecting all. After all, Katrina was harmful too. Moving 30 million tons of debris was pretty inconvenient. And the next Katrina is a question of when, not if.

Since Katrina, New Orleans has lost more than one-third of its population, and only two of St. Bernard Parish's 26 child-care centers have reopened. In the Lower Ninth Ward, floodwalls have been rebuilt and reinforced, but behind them stand blocks full of overgrown lots, where the remains of a gas meter or front step here or there provide the only evidence of the houses and lives washed away. "I look at this, and I think of the shortsighted people who crippled a great city," Dashiell says. She knows that city needs better hospitals and more jobs. But first, better levees and more wetlands. Otherwise, it's going to need an obituary.