

HURRICANE KATRINA AFTERMATH



# LEVEES' WEAKNESS WELL-KNOWN BEFORE BREACHES

## Lack of political will, funds cited in failure

By John McQuaid, Bill Walsh, Jim Barnett and Mark Schliefsstein  
Staff writers

Officials at the Army Corps of Engineers knew it for years, and emergency managers and hurricane experts issued dire warnings: The hurricane levees surrounding the New Orleans area were built to withstand only a relatively weak Category 3 hurricane - not anything like Hurricane Katrina, a Category 4 megastorm. So it should not have been a surprise that the system failed when the waves pushed ahead by Katrina topped levees in the 17th Street and London Avenue drainage canals, broke through them and poured into the city. Water also spilled over levees in St. Bernard and in eastern New Orleans and inundated those areas. The result is one of the worst natural disasters in U.S. history.

Now that the nightmare scenario has become a reality, devastated New Orleans residents, emergency managers and political leaders are asking why one of the nation's most vulnerable cities wasn't better protected. And when the city is rebuilt, how to protect it in the future?

"There were a lot of people in emergency management who were very frustrated," said Joseph Suhayda, a professor emeritus at Louisiana State University's Coastal Studies Institute who studies catastrophic hurricane risks. "They said this was just ridiculous. They couldn't stand the fact that they had this situation known as an unsolvable problem that had lasted for years, and they were faced with little staff and little resources. It should have been prevented."

The problem was, in fact, solvable. It's possible to engineer pro-

tections for the New Orleans area against Category 4 and 5 storm surges, which can top 20 feet. It would mean raising and fortifying levees, and building gates to control water flow into the lake. But that would cost billions of dollars, according to Corps estimates.

It never happened because of two main problems, Suhayda said: A lack of political will to tackle an enormous and costly problem when competition for federal resources is intense; and what he called a "bureaucratic mentality" at the Corps of Engineers that focused on incremental upgrades of existing structures.

### Outdated design

The current levee system was designed in the 1960s in response to 1915 and 1947 hurricanes, whose storm surges inundated parts of the region. Corps engineers were limited by 1960s-era knowledge; they used pencils and slide rules and suppositions about hurricane storm tracks and surges that engineers today say are no longer valid. Only later, using computer modeling, did they estimate the system would protect against a fast-moving Category 3 storm.

Designing levee systems is a complex task. Storm surges crossing South Louisiana's unusual landscape of lakes, wetlands and artificial barriers rise up to variable heights, making it impossible to design a simple solution.

It also is a political process based largely on experience. For example, Mississippi River levees - raised to 20-plus feet after disastrous flooding in 1927 - are much higher than hurricane levees and offer much more protection, according to Corps statistics.

Since the 1960s the Corps has dedicated itself to building, then maintaining and upgrading exist-

ing river levees. That alone is a major job. Levees are sinking in many spots because the whole area is sinking and eroding under the weight of natural and man-made forces. That means proposing projects, passing them through channels in successive presidential administrations and getting money from Congress.

It also means applying what are bureaucratic standards for weighing costs against risks. "To identify a level of risk a given area faces, we do engineering and an economic analysis and come to an optimum solution for a level of protection," Corps of Engineers chief Carl Strock said Thursday. "In its early design stages it was meant to provide protection from a 200- to 300-year event striking the city. It is a very low probability."

But Suhayda said that approach - which measures mainly property damage as the cost of disaster - does not take into account the sheer scale and human toll of the disaster unfolding now.

"The Corps says, 'we did a benefit-to-cost analysis, and that's how it came out,' he said. "If you give an insurance adjuster an assignment to do a job like this, this is what you'll get. Well, what happens to your benefit-to-cost ratio now that the costs are astronomical?"

### Urgent priorities, major obstacles

Louisiana's members of Congress, who pride themselves on securing federal spending for the state, said they had asked in general terms for more money for

Corps projects, but not singled out catastrophic hurricane protection for the New Orleans area.

"In speech after speech that I made, that the governor has made, we have said we need to fully fund the Corps of Engineers or we would have monumental problems," said former Sen. John Breaux, D-La., who retired in January after 32 years in Congress and was a leader in getting coastal restoration money for the state. "Because there is a limited amount of money, Congress hasn't been able to find funding for what the Corps' needs are."

Gov. Kathleen Blanco acknowledged Thursday that the state's priorities have not always focused on improving the levee system around New Orleans. "We certainly do need to put more attention on our levee network," Blanco said in Baton Rouge.

There were many competing and seemingly more urgent priorities and significant political obstacles. In recent years the Bush administration, struggling with budget deficits and the war in Iraq, has tried to cut financing for the Corps while agency officials and members of Congress have struggled to restore it - succeeding only sometimes.

At the behest of officials in low-lying areas in suburban New Orleans, for example, the Corps has pressed most strenuously for financing of flood protection measures outside the city, notably the Southeast Louisiana urban flood control project, known as SELA, an intricate drainage system designed to quickly divert water in flood-prone areas.

Securing adequate financing for SELA year after year has been the major spending battle for the Louisiana delegation in Washington. The Bush administration annually budgets far less than officials say they need, and Louisiana lawmakers lobby their colleagues in Congress to boost it.

"Whenever the Corps has come and talked to me, it has always been oriented around SELA," said Rep. Bobby Jindal, R-Kenner, who was elected in January.

The state's other principal focus has been on coastal restoration.

The bipartisan delegation united this year like never before and secured a steady, \$570 million stream of federal financing over four years to repair Louisiana's coastline, which erodes at a rate of 24 square miles per year and leaves the southeastern part of the state increasingly vulnerable to storms raging northward from the Gulf of Mexico. It was far short of the \$14 billion the state says it needs.

### Protection and prevention

The Corps did begin a decade-long study of the issue of expanded hurricane protection after Hurricane Georges sideswiped the city in 1998 and devastated the Mississippi Gulf Coast.

"Because that storm scared a lot of people, we were asked to start looking at how to protect the city from a Category 4 or 5 storm," Corps project manager Al Naomi said.

An initial report concluded that "there is a federal interest in Category 5 protection for this area," he said.

Naomi estimates it would cost \$2.5 billion to build higher levees stretching from south of

Chalmette to north of Slidell and around West Bank communities, combined with floodgates that would barricade the Mississippi River-Gulf Outlet at the Paris Road bridge and the Rigolets and Chef Menteur passes. All would be designed to withstand the impact of a 30-foot or higher storm surge, Naomi said.

The next step would be a \$12 million feasibility study, which would include a detailed estimate of the project's cost, determinations of levee height, width, strength, its economic impact, and an environmental impact statement, all of which has yet to be financed by Congress, Naomi said. But that faced obstacles.

"There have been funding issues in getting the project management plan together, and issues about getting permission to get the study totally funded," he said.

Naomi said even if officials had embarked on the study years earlier, such projects can take decades from inception to completion, so it's doubtful the city would have been completely protected against Katrina.

Now that political leaders are saying New Orleans will be rebuilt, Naomi and other officials are saying the huge infusion of federal cash likely to follow the disaster must include enhanced protection so it never happens again.

If history is any guide, Congress may pass legislation ordering the Corps to prevent a similar tragedy from happening, said retired Gen. Robert B. Flowers, the Corps' former chief of engineers, who pointed to the Mississippi's high river levees built in the wake of flooding.

"You are like to see something akin to that come out of this disaster," Flowers said. "Sometimes, unfortunately, it takes the worst to happen before things get done."

**"We certainly do need to put more attention on our levee network."**

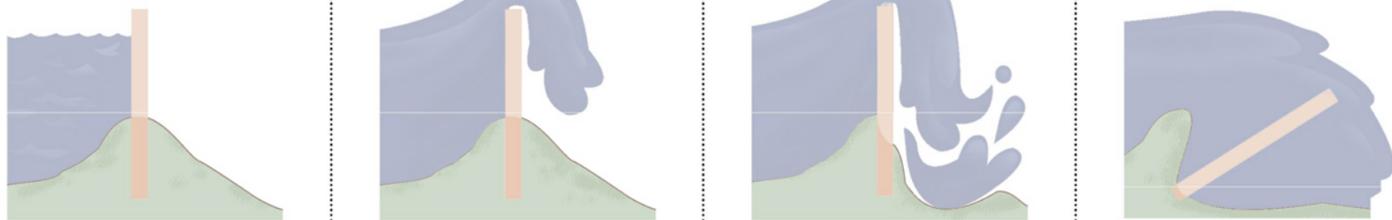
Gov. Kathleen Blanco

# WHY IT WENT UNDER

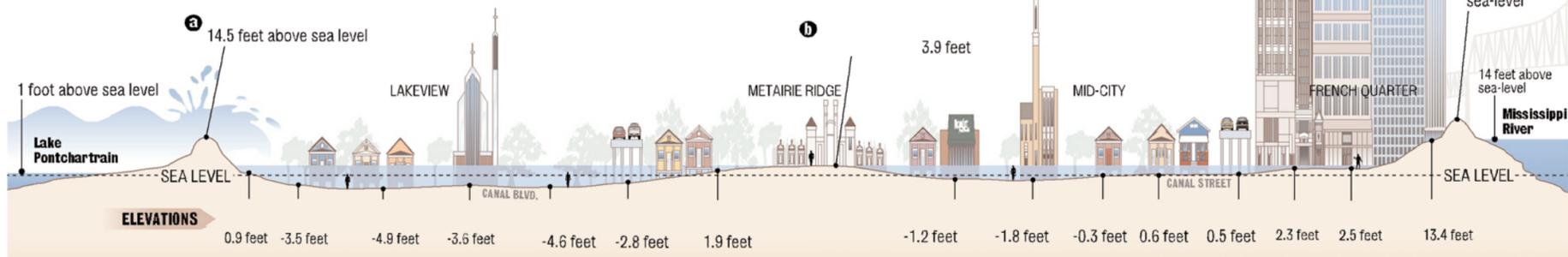
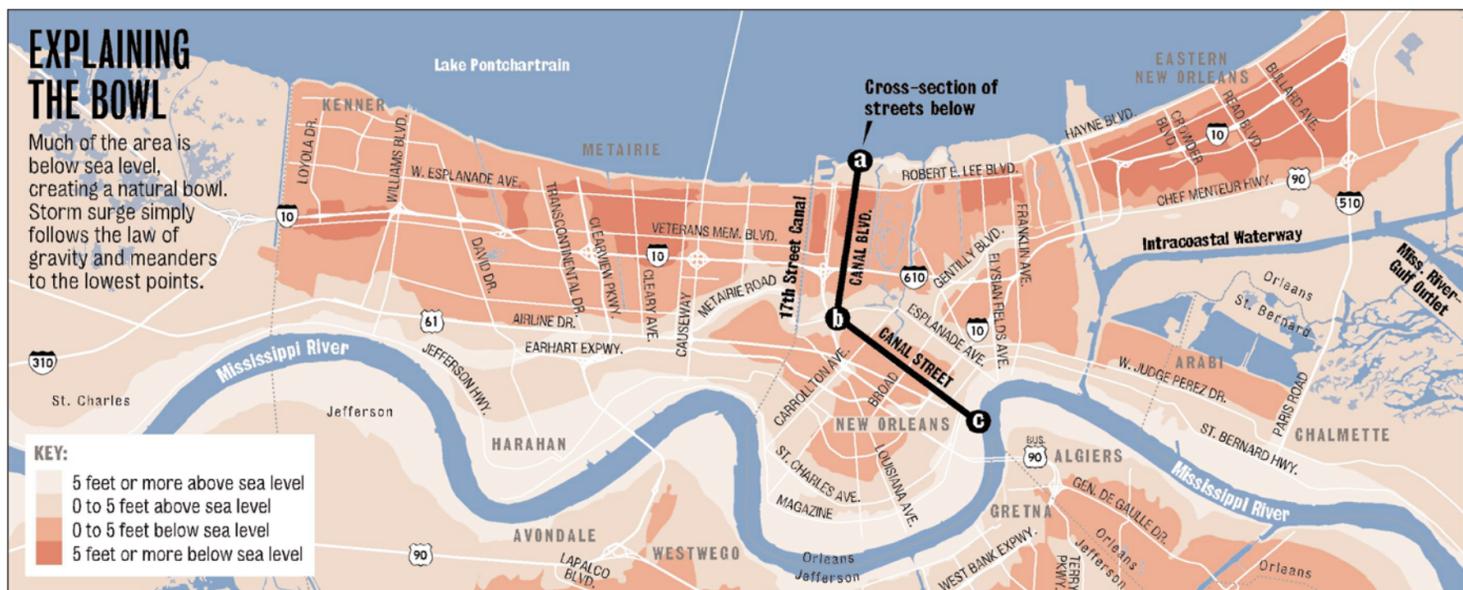
## A WALL, AND A CITY, TUMBLE DOWN

Here's what Army Corps of Engineers officials believe happened at the 17th Street Canal that caused the cataclysm

- Under normal operating conditions, the levee along the canal is augmented by a concrete seawall embedded in the levee.
- Under the awesome force of Katrina, the water in Lake Pontchartrain rises high enough to top the seawall.
- Water coursing down like a powerful waterfall at the base of the dry side of the levee begins eroding the dirt.
- Eventually, the weakened levee can no longer support the concrete wall, and it collapses, sending lake water pouring into the city.



Experts have long warned of the precarious nature of living below sea level. Katrina brought that danger home in a horrific way. Once the edges of the bowl failed, there was no stopping the catastrophe.



Note: Elevations are approximate. Source: LSU's Louisiana Water Resources Research Institute, Army Corps of Engineers, staff research. STAFF GRAPHIC BY DAN SWENSON, KENNY HARRISON AND EMMETT MAYER III