



Everything New Orleans

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PROTECTING THE AREA FROM ANOTHER MAJOR STORM IS CRUCIAL TO GETTING NEW ORLEANS BACK ON ITS FEET...BUT HOW?

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Spending billions of dollars to stop a worst-case scenario is the only solution that can guarantee the city's long-term future and persuade people to return and businesses to invest again, they say.

"If we don't do that, there's no hope of rebuilding the city of New Orleans. Frankly, if we can't get that done, why would anyone come back?" said Randy Hanchey, assistant secretary of the state Department of Natural Resources. "And there's only one way we can do that: build a barrier system strong enough to withstand the storm surge of a Category 5 storm. And we can't take our time doing it. We have to start now."

That could mean building levees higher and stronger, linking some combination of levees and giant gates or even bulldozing residential areas in the name of flood control.

The New Orleans District of the U.S. Army Corps of Engineers recently finished the first draft of a Category 5 hurricane protection plan for the New Orleans area. The major goal of the plan, according to officials who have seen it, is to prevent storm surges entering the city through lakes Pontchartrain and Borgne. It would accomplish this with a system of giant levees across exposed and low-lying areas, and sea gates across natural passes, shipping channels and canals.

Corps officials say the project, which would cost up to \$3.5 billion, could take between five and 15 years to complete.

It will be an anxious wait. Meteorologists say there has been a period of intense hurricane activity for 10 years, and it could last another 10 years or more. A record-setting 22 named tropical storms have formed in the south Atlantic or Gulf of Mexico this year, including the two monster hurricanes that hit south Louisiana -- Katrina and Rita -- resulting in unprecedented devastation. Hurricane Wilma was measured as the strongest Category 5 storm ever recorded in the Atlantic before hitting Florida on Monday as a Category 3.

The corps says it plans to restore the New Orleans region's heavily damaged levee system to its pre-Katrina strength by the start of the next hurricane season in June. But the current designs were never meant to handle giant storms and may not have offered as much safety as originally advertised. Until the levee system is somehow upgraded, even Category 2 and 3 storms could swamp the city again, drowning the rebuilding effort.

That uncertainty is a huge problem for a region struggling to persuade its evacuated residents to return. Some are wondering if it is safe to come back.

William Yurt's Mithra Street house a few blocks from the breached London Avenue Canal floodwall was heavily damaged by Katrina flooding. He said that only a big fix -- giant sea gates to keep storm surges out of Lake Pontchartrain -- will persuade him to stay in the city after his impending retirement.

"I'm not going to stay after that if they don't put these things up. I don't see how I could be comfortable without knowing this technology is out there, and that there's something besides levees to protect us," he said.

Yurt, a New Orleans city inspector, is living on a cruise ship.

Sifting ideas

Sea gates are a key element of an array of ambitious fixes that local, state and federal officials say will be necessary to re-engineer the New Orleans area to protect against a Category 5 hurricane.

At the moment, all that exists is a jumble of old and new ideas that will take more than a year to sort through, evaluate and shape into a working plan, corps chief engineer Carl Strock said. It's an engineering challenge unprecedented in the United States, one whose details will affect residents' daily lives, property values, the regional economy and the area's unique and vulnerable coastal environment.

According to corps officials and other experts familiar with the south Louisiana landscape, the new design could include:

-- Giant sea gates. Gates at the Chef Menteur and Rigolets passes would halt the flow of storm surge into Lake Pontchartrain, the most dire threat to central New Orleans and East Jefferson. Another gate close to the juncture of the Mississippi River-Gulf Outlet and Gulf Intracoastal Waterway could protect eastern New Orleans, the Lower 9th Ward and St. Bernard Parish, the most exposed parts of the metropolitan area.

-- Bigger levees. The metro area's east levee flank -- especially Chalmette -- will need to almost double the size of the existing earthen berms to repel the frequent high storm surges affecting that area. A similar, huge levee may need to run across the eastern New Orleans land bridge separating Lake Pontchartrain from Lake Borgne and the Gulf of Mexico.

-- Better canal protection. Installing floodgates at the mouths of drainage canals where floodwalls breached would prevent storm surge from getting in. Moving New Orleans pump stations to the Lakefront could provide a barrier to surge using the long channels to reach into the heart of the city.

-- One system. Linking levees, other flood control structures and coastal restoration projects into a single, integrated system would make managing storms easier. And the restored barrier islands and wetlands contained in the proposed Louisiana Coastal Area Ecosystem Restoration Project should reduce the height of storm surge and diminish the waves that accompany it.

-- Abandon the Mississippi River-Gulf Outlet. The little-used channel has caused marsh erosion and provided an additional conduit for storm surge into the city.

A long road

No one knows how fast such new protections can be built. Strock told a Senate committee recently that it might be five years. Don Basham, the corps chief of engineering and construction, said a realistic deadline for completing such a project would be 15 years.

Based on experience, either goal would be very quick for the corps. The agency began work on the current system in earnest after Hurricane Betsy struck in 1965. It's still not complete 40 years later.

Sustaining such an ambitious project over the long haul may be difficult. Corps estimates for building Category 5 protection for the New Orleans area have ranged from \$2.5 billion to \$3.5 billion.

That's a pittance compared to the damage caused by Katrina and Rita or the \$62 billion Congress has appropriated for disaster relief so far. But it's also a substantial, multiple-year commitment during a time when federal budget-cutting pressures are rising.

The corps has had problems consistently financing levee construction in recent years, and the Louisiana congressional delegation will likely lose a House seat and some clout after the 2010 census. In his Sept. 15 speech in Jackson Square, President Bush promised to "make the flood protection system stronger than it has ever been" but made no promises on exactly how strong it would be.

But given the scale of the disaster and the current willingness to spend, the corps expects to get the money for Category 5 protection and keep it flowing. "In this case I find it a little unusual that people in the space of 10 years could say, well, it's really not that important," Strock said. "The memory of this event is going to be around for an awful long time."

Accelerated process

The corps completed a preliminary "reconnaissance" study on Category 5 protection three years ago, but could not get full financing for a more extensive feasibility study. But things are moving fast now.

A New Orleans-based team of 20 engineers and planners last week sent the rough outlines of a Category 5 plan for review by top corps officials, the White House and Congress, said Col. Richard Wagenaar, the chief of the corps's New Orleans District.

But that's only the beginning of the planning process. Some political leaders are urging the corps to start building immediately, but the corps says that isn't possible.

"Even if Congress told us today to go build and protect against a Category 5, I think we still would have to have done some study and some evaluation of both technically what's the right engineering solution or solutions you ought to come up with, and then what are the economic or social impacts of that," Basham said.

Strock said the initial process normally takes 24 to 30 months, but that the corps plans to accelerate it, perhaps by assigning several teams to look at different design scenarios simultaneously.

Public hearing requirements could also be compressed by including the public from the first stages, Wagenaar said.

Officials say it will go faster than usual -- but not at lightning speed. "I am confident we could beat a 2- to 2 ½-year feasibility study (deadline)," Strock said. "(By) how much, I'd be reluctant to put a mark on the wall because I'd be held to that." He said it wouldn't be less than a year.

There are risks in moving too fast, because the issues are complex. Even if New Orleans and the nation are foursquare behind the overall concept, its potential effects on communities and the environment are likely to be fiercely debated.

Among them are questions about the project's scope and equity. Many places outside the metro area have lower hurricane levees -- some none at all -- and already are awaiting congressional approval of new levees costing hundreds of millions of dollars, such as the proposed Morganza to Gulf system that would protect Houma. And even with the higher New Orleans system, risks will vary depending on location because of the landscape.

"It gets beyond us," Basham said. "And that is really what the administration and Congress have to wrestle with. We can help them frame that debate, help them understand what the risks and consequences of that are, but at the end of the day you've moved beyond an engineering answer here and said, 'Yeah, we're going to protect everybody equally,' or, 'No, some people are going to be more equal than others.' "

Reshaping the region

Once construction starts, officials said, there are ways to accelerate it. "If you want to throw money at something, you can typically accomplish it a lot quicker," Strock said.

He suggested that construction contracts could provide rewards for quick completion, something California did after the 1989 Loma Prieta earthquake. Wagenaar said contractors could work triple shifts on urgent projects.

The big unknown is what the new system, and the entire New Orleans area landscape, will look like when it's done. The engineering challenges are formidable: Any plan must upgrade hurricane protection, make sure it does not accelerate the disappearance of coastal marshlands, protect or limit damage to fisheries and oyster production, and also account for sinking land and rising sea levels over the next 50 years.

The single biggest element of Category 5 protection could be building gates at the Chef Menteur and Rigolets passes into Lake Pontchartrain. The corps dropped a more modest version of the project called the "barrier plan" in 1977 after environmental groups challenged in court the scope of the corps's environmental studies backing the plan and a judge ordered the corps to consider other alternatives.

But officials say an updated barrier plan is the best way to block the large lake storm surges that are the most serious threat to the entire south shore. With lake surges minimized, the corps might not have to raise the lakefront levees.

"If it's economically justifiable and, critically, environmentally acceptable, it may be that going back to that barrier plan would mean that we wouldn't have to significantly alter the levees on the system right now," Strock said.

Environmental objections to such barrier plans center on the design's potential to block the migration of marine life between the Gulf of Mexico and the inshore estuaries, which could dramatically reduce seafood production, the third largest piece of the state's economy.

"If these floodgates were open except when there was an approaching hurricane, I think we could live with that," said John Roussel, state Department of Wildlife and Fisheries assistant secretary for fisheries. "If you're talking about gates that would be closed frequently, then that would have an impact we would want to avoid."

A weak side

When the corps designed the current levee system in the 1960s and 1970s, it used computing methods that are considered primitive today. Now, sophisticated computer models can simulate an array of storms and run them into New Orleans at varying speeds and angles, testing how various man-made barriers will respond to storm surges.

In general, current models show the city's eastern flank is unusually vulnerable to storm surges coming over Lake Borgne, said Joannes Westerink, a University of Notre Dame engineer who is supervising a computer model that will help the corps design Category 5 protection.

"That whole eastern side of the coast is a huge catch-all for storm surge," he said.

Computer modelers have learned that the current levee system is full of angled junctures that can redirect and amplify storm surges in dangerous ways unaccounted for in the old designs. The new system will have to smooth out those sharp angles to minimize the problems, Westerink said.

Another problem area is that the single Mississippi River levee on the west bank of Plaquemines Parish can direct storm surge up the river all the way into the city, Westerink said. Katrina's storm surge raised water in the river at the Carrollton gauge in New Orleans to 15.5 feet, well below the river's 22-foot floodwalls in the city. But computer modeling of alternate Katrina landfalls showed the surge in the river rising dangerously high.

The most notorious storm surge trouble spot, though, is at the V-shaped juncture where the Gulf Outlet meets the Intracoastal Waterway. Computer modelers have warned for years that storm surges can build up dangerously high in that area and then quickly flow into the Industrial Canal, topping levees along the way, exactly what happened with Katrina.

One solution would be to build another floodgate in that area while significantly raising levees in that area, Strock said.

The corps has also suspended dredging of the Gulf Outlet and may recommend that the controversial waterway be shut down permanently, he said.

"It may be that the economic risk of another event far outweighs the economic value of having the short run to the Gulf that that outlet provides," he said. "There will have to be a lot of thought about what to do about MR-GO, but I think certainly we will need to look at whether that is something we will continue to support."

The corps had launched a cost-benefit study of either closing or reducing the depth of the channel three years before Katrina but had never completed it.

Hassan Mashriqui, an assistant research professor at Louisiana State University who studies coastal storm surge dynamics, has a bolder proposal: He would like to see a structure built east of the current levees that would prevent storm surge from getting near St. Bernard or eastern New Orleans.

"In the long term, I'd like to move it farther by building a levee system closer to the shore of Lake Borgne, so we don't have a funnel shape -- it's more of a curved shape,"

Mashriqui said. "If we decided to close or fill up the MR-GO, then you would only need one shape out there." A gently curved levee structure would more effectively repel the storm surge, he said.

Canal floodgates

Officials face another challenge deciding what to do about the canals that proved to be the city's weakest link during Katrina, sustaining multiple topping and breaches.

The corps could build floodgates at the lake entrance to the Industrial Canal and at the mouths of the city's drainage canals. That would avert the need for rebuilding miles of floodwalls along the canals to repel surge in the canals.

Gating the 40-foot-deep Industrial Canal would be an expensive proposition and could be hard to maintain. And erecting gates at the 17th Street, London Avenue and other drainage canals could make it difficult to pump water out of the city if they are closed during hurricanes.

If gates at the Chef and Rigolets passes are built, though, that could reduce the need for gates in interior lake areas.

Strock also suggested the city study relocating its pump stations to the Lakefront and redesigning the canal system so that lake surges can't penetrate the city as they did during Katrina. But that would also be an expensive project costing hundreds of millions of dollars, he said.

Such a proposal was floated in the 1980s for the 17th Street Canal, but was beat back by Bucktown fishers who docked their vessels near the Old Hammond Highway.

Right now, officials are concentrating on building barriers to protect New Orleans. But over the long run, experts said, ambitious New Orleans projects will have to be knitted together with other protections around the region. Floodgates, levees, waterways, and marshes will have to coexist in a way that allows all to last over the long term.

New construction must be carefully tied to the state's coastal restoration plan, said Mark Davis of the Coalition to Restore Coastal Louisiana. Without significant coastal restoration, the Gulf of Mexico will continue to encroach on the city, amplifying its vulnerabilities as the decades go by and raising the costs of protecting it over the long-term.

"Even if you build Category 5 levees today, they're going to sink," he said. "And if you don't do anything with the rest of the coast, the Gulf of Mexico will continue to get closer and you'll end up with less than you bargained for again."

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Even if its battered levees are restored to their pre-Hurricane Katrina strength as planned, the New Orleans area will still be dangerously exposed if another big storm strikes. So state and local officials have rallied behind a big idea: Re-engineering the region's flood control system to protect against a Category 5 hurricane.