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New Orleans Levees
April 2007

▶ [Feature Main Page](#)

[Interactive Graphic](#)

[Video: Trouble at the Bayous](#)

[Video: Dangerous Terrain](#)

[Video: Over, Around & Under](#)

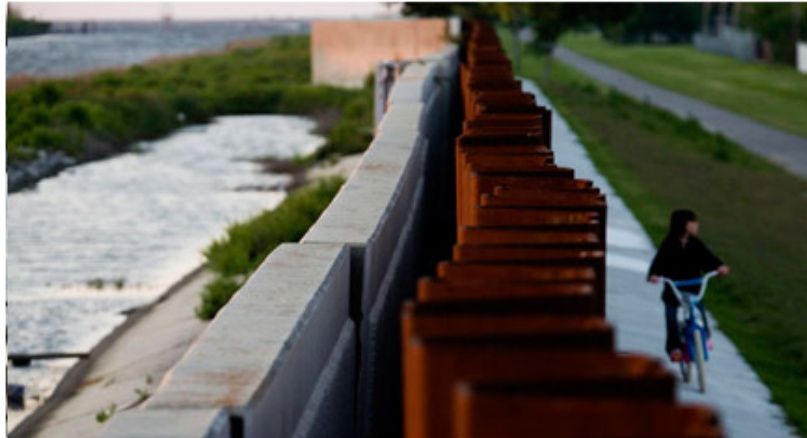
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A City's Faulty Armor

Experts Question Repairs to New Orleans Levees



By Joel Bourne, Senior Editor - Environment

Photographs by Tyrone Turner

New Orleans' Levees: Can Disaster Strike Again?

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As residents of New Orleans slowly rebuild their homes and lives after Hurricane Katrina, they are relying on the city's cordon of levees and floodwalls to protect them from the next big storm. The U.S. Army Corps of Engineers declared almost a year ago that it had restored the barriers to pre-Katrina strength. But leading experts from the U.S. and the Netherlands say the system is riddled with flaws. They say that even a weaker storm than Katrina could breach the levees if it hit this season.

During a recent inspection of the levee system with *National Geographic* Magazine, engineering professor Bob Bea of the University of California, Berkeley, found multiple weak spots. The most serious flaws turned up in the rebuilt levees along the Mississippi River Gulf Outlet ship channel, which broke in more than 20 places when Katrina's storm surge pounded it, leading to devastating flooding in the Lower Ninth Ward and St. Bernard Parish. Bea found several areas where rainstorms have already eroded the newly rebuilt levees, particularly where they consist of a core of sandy and muddy soils topped with a cap of Mississippi clay. "It's like icing on the top of angel food cake," Bea says. "These levees will not be here if you put a Katrina surge against them."

Bea also found that decade-old gaps remain in the floodwalls lining the Orleans Avenue Canal, and hurricane-damaged sections of the walls along the London Avenue and 17th Street Canals have not been repaired or replaced. Even more troubling, water appears to be seeping under the stout new floodwall erected along the Industrial Canal to protect the Lower Ninth Ward. The new wall sits atop steel sheet piles driven 20 feet into the ground, but water from holes in the canal bed, excavated before Katrina or scoured by the storm, may be seeping under the barrier through permeable layers of sand and silt. Bea, who actually tasted the seepage to make sure it was brackish—a sign that it was coming from the canal—says the wall could fail in the next hurricane.

Bea, co-leader of a Berkeley team that investigated the Katrina levee failures, is now serving as an expert witness in a multi-billion-dollar class-action lawsuit against the corps. But he is not alone in his criticisms. A Dutch engineer recently visited some of the new floodgates and pumps installed at the mouths of the city's three main drainage canals. His verdict: They may be "doomed to fail" in the next big storm.

The engineer, who asked not to be named because he sometimes collaborates with the corps, notes that the gates have no mechanism to remove sediment and other debris that might keep them from closing as a storm approaches. Instead, the corps says it will rely on divers to check for obstructions and clear them away. The engineer also points out that the pumps installed last year to pump rainwater out of the city when the gates are closed vibrated excessively and had to be repaired. The corps says the pumps are working well now, but some other experts say they have not been fully tested.

Ivor van Heerden, deputy director of Louisiana State University's Hurricane Center and leader of a team of state experts that examined the levee failures, concurs with Bea's list of weak spots and says they are representative of others throughout the system. Van Heerden, who will also testify as an expert witness in the lawsuit, adds that a section of I-shaped floodwall along the Duncan Canal, in Jefferson Parish—the city's western defense—is another weak link. "There is 1,900 feet of I-wall that actually dips—sinking from its own weight," he says. Sheet pilings installed by the corps to shore up the weak wall may not be adequate, he says.

The corps says the city's flood defenses are a work in progress. "After Katrina we achieved a massive accomplishment, repairing the damage that occurred," says John Meador, deputy director of Task Force Hope, the Army Corps group rebuilding the hurricane protection system. "We believe we are putting the system back better than it was before Katrina, but we're not at an end point yet. Any time we're made aware of such situations, we address them immediately."

Bea isn't satisfied. "The corps's motto is 'Let Us Try,' " he says. "We've been trying long enough. Now it's time to actually do something."

The August edition of *National Geographic* Magazine will include a full report on the challenges facing New Orleans. [For a full report on the fate of New Orleans, be sure to pick up a copy of the August edition of *National Geographic* magazine.]

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