

Surprises in a New Tally of Areas Vulnerable to Hurricanes

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Using a formula based on storm intensity, flooding potential, population, evacuation routes and other factors, coastal scientists at Florida International University have determined, “to nobody’s surprise,” that New Orleans has the top spot on the list of East Coast and Gulf Coast areas most vulnerable to loss of life and property damage in [hurricanes](#).

[Right Behind New Orleans](#)

But their second choice is far less obvious: Lake Okeechobee, Fla.

Few people can recall what happened in 1928 when a hurricane sloshed the lake’s water into a powerful surge that broke the earthen dike around it. As many as 2,500 people died in the resulting flood, most of them impoverished farm workers. The hurricane remains the second deadliest ever in the [United States](#) — only the 1900 hurricane that killed about 6,000 people in Galveston, Tex., was worse.

The [Army Corps of Engineers](#) rebuilt the dike, naming it for Herbert Hoover, then the president. It is a massive affair, 140 miles long, 45 feet high in places and up to 150 feet wide at its base. It is part of the extensive system of levees, canals and other engineering that turned the lake’s ancient watercourse to the Everglades into farmland.

But many worry whether the dike can stand up to an assault from a hurricane.

“It’s an accident waiting to happen,” said Stephen P. Leatherman, who directs the International Hurricane Research Center at the university, where the new analysis was produced. He and his colleagues estimate that 40,000 people live near enough to the dike to be threatened. If it breaks, Dr. Leatherman said, “thousands of people are going to drown again.”

In another study, an expert panel commissioned by the South Florida Water Management District reported that the dike did “not meet current dam safety criteria,” and repair work that is under way or scheduled would not be enough to ensure its stability. The panel said the area of maximum concern is a 68-mile stretch centered on the town of Belle Glade, along the south shore.

In its report, issued in May, the panel said the pace of repairs should be accelerated. The experts said additional steps should be taken to protect the dike against seepage-related erosion that has plagued it for years, and from wave action and storm surges, the forces that breached it in 1928.

The panel recommended lowering the water levels in the lake until repairs are complete, storing emergency repair materials near the dike and updating and rehearsing evacuation plans for the area.

Dr. Leatherman said of his research, “Our report shows how big the storm surge gets in that lake.”

“The lake is 60 miles across and very shallow — those are the ingredients for a surge” if it is swept by hurricane winds, Dr. Leatherman continued. Land outside the dike is low lying, he said, so “if it breaks, it will be like a wall of water.”

The storm surge analysis is expected to be reported in The Journal of Coastal Research, said Dr. Leatherman, who also coordinated a review of a [National Academy of Sciences](#) report on the levee failures in New Orleans after Hurricane Katrina.

The formula used by Dr. Leatherman's group for assessing likely impacts relies on hurricane frequency and intensity, levee and dike vulnerability, storm surge and flooding potential, erosion trends, island breaching history, population estimates, evacuation distance and routes, and local and state response capacity.

There are a few other surprises on the hurricane vulnerability list.

[Florida](#) dominates the list, which "was to be expected," the researchers said. But eastern New York, where hurricane strikes are unusual, ranks eighth, ahead of the Tampa-St. Petersburg area and the Florida Panhandle, both of which regularly have close encounters with powerful storms.

Dr. Leatherman said that given the historical record, the East End of Long Island is "overdue" for a major hurricane, like the storm that devastated the island and New England in 1938. But if such a storm strikes today, he said, it will be even more costly. On Long Island, he said, "real estate values are so high, if it is hit there are going to be astronomical losses."

On the plus side, he said, building codes have been strengthened since 1938, and New York has "a pretty good emergency management system." But he points to the fragile sandy barriers on the island's south shore that were battered in the storm. "Now there are mansions there," he said.