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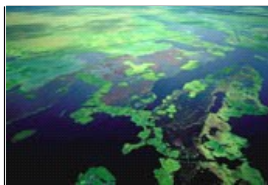
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South Florida Dike Poses "Grave Danger," Engineers Say

Willie Drye
for [National Geographic News](#)
August 15, 2006

An alarming engineering report on the 140-mile (225-kilometer) dike around Florida's Lake Okeechobee has prompted emergency management officials to prepare evacuation plans for 40,000 residents living near the lake.

Consulting engineers Leslie Bromwell, Robert Dean, and Stephen Vick wrote in their April report that the Herbert Hoover Dike "poses a grave and imminent danger to the people and the environment of south Florida."



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The engineers say the dike, which is about 250 feet (76 meters) wide at its base, could fail during a hurricane or even if the lake level becomes too high.

At 730 square miles (1,900 square kilometers), Okeechobee is the second-largest freshwater lake in the continental United States, behind only to Lake Michigan.

Flooding from the lake, which is almost as big as Rhode Island, could kill hundreds. Lake water would cover tens of thousands of acres and possibly contaminate water supplies for nearby West Palm Beach, Fort Lauderdale, and Miami.

The Everglades, which adjoins Lake Okeechobee, could be irreversibly damaged as well ([map of Florida](#)).

"Recovery could take years, with indirect losses far exceeding direct damages and likely running into tens of billions of dollars," the report says.

Construction of the dike started in 1930 after powerful hurricanes in 1926 and 1928 sent floodwaters churning out of the lake. Combined, the storms killed about 4,000 people around the lake.

The dike — now holding in a major water reservoir — was intended to be only a protective barrier and was built of porous earth dredged from the lake. The dike sits on subterranean limestone, which also is porous.

"The basic problem is simple," the authors say. "Certain geologic formations that underlie the dike, and portions of the material that comprise it, bear a striking resemblance to Swiss cheese."

Repair Work

The U.S. Army Corps of Engineers is responsible for maintaining and repairing the dike. The corps has known about the dike's shortcomings for some time, but the problems were less well known outside the federal agency.



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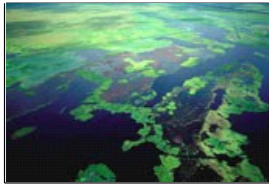
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That changed during the past two hurricane seasons, however. Hurricane Frances pounded the dike in September 2004, and Hurricane Wilma tore at it in October 2005. The dike held both times, but the outcome could have been much different.

"If Wilma had stalled here like it did over the Yucatán Peninsula, it could have been truly catastrophic," said George Horne, deputy executive director of the South Florida Water Management District. "Frances could have [devastated the dike] the year before, if it had been a little farther south."



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The South Florida Water Management District which regulates the lake's level hired the consulting engineers to examine the dike and write a report.

Horne says district officials tried to get the engineers to rephrase some of their more alarming statements before they released the report.

But the engineers said they would "walk away" if they had to tone down the report, he adds.

Amanda Ellison, spokesperson for the corps in Jacksonville, says the report did not take into account the corps' continual effort to keep the dike repaired.

But the corps agrees that the dike needs "rehabilitation," Ellison said.

The corps has started work on a 22-mile (35-kilometer) section of the dike on the lake's eastern shore. But funding for major repairs to the entire structure has to be approved by Congress and will take years to complete.

Since the dike's completion in 1966, Lake Okeechobee has become a water reservoir serving the burgeoning population of South Florida. That use has put more pressure on the

dike.

During the past two decades engineers have noticed leaks caused by water pressure against the earthen barrier. The pressure loosens the earth, and the water seeps through or beneath the dike.

(Related story: ["Dike Along Huge Florida Lake Is Leaking"](#) [March 10, 2006])

If the lake water reaches 21 feet (6.5 meters) above sea level, the dike will undoubtedly fail, the engineering report says. If it reaches 18 feet (5.5 meters), the chances of failure are about 50 percent.

In the summers of 1995 and 1998 the lake exceeded 18 feet (5.5 meters) above sea level, and the dike's stability was threatened. As of about three weeks ago, however, the water was about 12 feet (4 meters) above sea level, which is considered safe.

Evacuation Plans

The six counties with shoreline on the lake include two — Martin and Palm Beach with large urban populations living on the Atlantic coast. The other four — Glades, Hendry, Highlands, and Okeechobee — are rural inland counties with smaller populations.

Mike Stone, a spokesperson for the Florida Division of Emergency Management, says the regional evacuation plan is not yet completed, but the state is satisfied with progress so far.

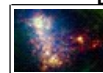


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As the peak of the hurricane season approaches, Stone said an evacuation around the lake "could be put into motion this summer if necessary."

Tony Smith, city manager for the lakeside town of South Bay, says the report reminded residents of the awful images of flooding in New Orleans after Hurricane Katrina a year ago ([Hurricane Katrina full coverage](#)).

"A lot of these people don't have much, but this is their home," Smith said. "To be [aware of] what happened in New Orleans, and having put that into their minds that it could happen to them it made them very uneasy."

Engineers say the Herbert Hoover Dike isn't as vulnerable as the New Orleans levees were. Still, the dike's condition has forced local officials to revise hurricane evacuation plans for residents on the Atlantic coast.

Earlier plans sent coastal residents inland to counties around Lake Okeechobee. But emergency managers realized that the condition of the dike meant they could be sending people into harm's way instead of protecting them.

If there's a silver lining to the revelations of the dike's flaws, however, it's the renewed effort to fix the problems. Vick, an author of the report, said there was "very clear evidence that there was a bureaucratic logjam here."

"Things occurred very slowly up until the report," Vick said. "We're pleased to see the interest at all levels, and the response, since the report came out. We see things very positive about the acceleration from the pace that's been maintained in the past 20 years."

Willie Drye is the author of Storm of the Century: the Labor Day Hurricane of 1935, published by National Geographic Books.

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