

# Effects of flooding on Cairo, Ill.

March 9 2012

---



Fort Defiance State Park at the southernmost point of Illinois, south of Cairo levees and seawall at the confluence of the Ohio and Mississippi rivers. Credit: Kenneth Olson

When faced with a choice between a deluge or a controlled deluge in May 2011 that would protect the city of Cairo, Illinois, the U.S. Army Corps of Engineers chose the latter by ordering an intentional breach of the Mississippi River levee at Bird's Point, but was it the right decision?

"The decision was a difficult and complex engineering problem with significant social and political trade-offs between loss of human lives and loss of properties in urban and rural areas," said University of Illinois researcher Ken Olson. "But it was a calculated risk built on a growing body of river science and prior flooding experiences."

Olson explained that the city of Cairo occupies a small sliver of land

about 2 square miles or 1,300 acres in size, which is only 1 percent of the size of the New Madrid Floodway (210 square miles or 133,000 acres).

"Due to the size of Cairo and lack of an outlet, even if the sea wall or the earthen levee system which protects Cairo had failed, the filling of the city with floodwater would have done little to drop the record Cairo gauge peak of 61.72 feet on May 3, 2011, and threats to downstream levees would have continued to be a high concern," Olson said.

According to Olson's study, the greatest danger to levee failure is constant water pressure against the levee. The weight of the river pushes water underneath the levee, creating boils and undermining the strength of the levee and its capacity to hold water. Consequently, allowing the levee to break on its own would have created much more damage.

"Cairo levee failure was a real possibility because there was a serious sand boil situation on the earthen levee which was apparently part of the reason the Corps of Engineers rushed to open the floodway on May 2nd," Olson said. By the end of April, the floodwaters on the levee and [seawall](#) at Cairo, Illinois, had reached 18.6 meters (61 ft) and were rising. "[Floodwaters](#) were starting to put significant pressure on the Cairo seawall and levee system with some seepage or sand boils," he said.

In Olson's opinion, the failure of the seawall and levee system would have covered the City of Cairo with 22 feet of floodwater for days and could have resulted in significant loss of life and severe damage to more than 600 buildings in the cities of Cairo, Future City, and Urbandale, Illinois.

"Given that scenario, any Illinois citizens who failed to follow evacuation orders issued on May 1 would have been in serious trouble, and the

Cairo levee or seawall breach could have resulted in the loss of life as well as significant damage to city infrastructure and buildings," he said.

Olson's study states that the Future City area has the capacity to provide an additional 3,000 acres of unintended floodwater storage and an additional 30,000 to 45,000 acre-feet of floodwater storage if the Cache River levee break had occurred.

"This area, which is at a slightly higher elevation, could store water to a 10- to 15-foot depth, depending on the location, and also includes levee-protected Illinois farmland," Olson said. "Ultimately, the Illinois agricultural land inside the Cairo seawall and levee system was protected from flooding, and there was no crop loss or soil damage. The Illinois cropland outside the [levee](#) was flooded before the 2011 crop was planted, and the water dropped sufficiently by June 10, 2011, to permit the planting of soybeans."

"The effects of 2011 Ohio and [Mississippi river](#) valley flooding on Cairo, Illinois, area," co-authored by Lois Wright Morton, was published in the March/April 2012 issue of the *Journal of Soil and Water Conservation*.

Provided by University of Illinois at Urbana-Champaign

Citation: Effects of flooding on Cairo, Ill. (2012, March 9) retrieved 11 May 2024 from <https://phys.org/news/2012-03-effects-cairo-ill.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.