

Protecting Houston from the next big hurricane

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To protect Houston and Galveston from future hurricanes, a Rice University-led team of experts recommends building a floodgate across the Houston Ship Channel adding new levees to protect densely populated areas on Galveston Island and the developed west side of Galveston Bay. The team also recommends creating a 130-mile-long coastal recreation area to sustainably use wetlands that act as a natural flood barrier.

The recommendations appear in a new report this month from Rice University's Severe Storm Prediction, Education and Evacuation from Disasters (SSPEED) Center. The report follows more than two years of research into lessons learned from [Hurricane](#) Ike, which made [landfall](#) at Galveston Island in September 2008. Ike caused 112 U.S. deaths and is the third-costliest storm in U.S. history, with damages estimated at \$30 billion.

"Ike was a Category 2 storm, and Houston and Galveston stand to suffer greater losses from stronger storms, particularly if they hit south of Galveston Bay," said Phil Bedient, director of the SSPEED Center and Rice's Herman Brown Professor of Engineering. "As we studied this, we also met with leaders from industry and government to determine the most realistic and feasible way to protect lives and property from the next big storm."

Bedient said the study determined that storm-surge flooding could threaten thousands of lives in heavily populated West Galveston Bay

communities like Clear Lake and Dickinson. The study also found that [refineries](#) and other industry along the Houston Ship Channel was vulnerable to storm surge greater than 15 feet.

SSPEED's study began with a 2009 grant from Houston Endowment to investigate how the region had responded to and been impacted by Ike. The endowment also asked for a set of recommendations about how to protect the region from the most devastating effects of future storms.

"In developing our recommendations, we were focused on creating a comprehensive plan that addressed the entire region as well as a realistic plan that would be affordable in today's economy," said Jim Blackburn, co-principal investigator on the project and professor in the practice of environmental law at Rice. "It became obvious pretty quickly that we could only achieve both of those goals with a hybrid set of structural and nonstructural solutions."

Recommended structural improvements include:

- Build a floodgate across the mouth of the Houston Ship Channel at the Fred Hartman Bridge to protect ship-channel industry from storm surges up to 25 feet.
- Construct a 20-mile levee along Texas Highway 146 to protect most Galveston Bay communities west of Texas 146 against storm surges up to 25 feet.
- Build a bayside levee on east Galveston Island to protect urban portions of Galveston, including the University of Texas Medical Branch at Galveston.

Recommended nonstructural improvements include:

- Create a 130-mile-long coastal recreation area from High Island to Matagorda Island that would both utilize coastal wetlands as a

natural storm-surge barrier and act as an economic engine for ecotourism.

- Incorporate storm-surge data into flood-alert systems that can give advanced warning of impending floods in densely populated West [Galveston Bay](#) communities like Clear Lake.
- Enhance public information and public disclosure of storm-surge risks in low-lying coastal areas, and strengthen and update building codes in those areas.
- Provide emergency managers with a detailed database of critical infrastructure and facilities for use in assessing risk and planning for evacuation and post-storm re-entry.

"We met with dozens of leaders from both the public and private sectors, and the response has been very positive," Bedient said. "Ike clearly showed that Houston and Galveston are vulnerable. The key to engaging people is focusing on realistic solutions."

Blackburn said, "Hurricane-surge flooding is one of the most important issues in our region. We have focused on multiple solutions that can be funded from multiple sources, rather than relying on a single source or a single project. We think that this offers the best chance to develop alternatives that can be implemented in a reasonable amount of time. The time to act is now."

SSPEED was established in 2007 to improve the lead-time and accuracy of severe storm predictions and to deliver real-time storm information to emergency managers. The center includes researchers from Rice, the University of Houston, the University of Texas at Austin, Texas A&M University, Louisiana State University, Texas Southern University, Texas A&M University at Galveston and the University of Texas at Brownsville.

More information: A copy of the SSPEED Center report "Learning

the Lessons of Hurricane Ike: Preparing for the Next Big One" is available at: [sspeed.rice.edu/sspeed/downloa ... Final Paper 2011.pdf](https://sspeed.rice.edu/sspeed/download/.../Final_Paper_2011.pdf)

Provided by Rice University

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