

RESEARCHERS IMPROVE SAFETY FOR WHEN DISASTERS STRIKE

When Dan Dolan, professor of civil and environmental engineering, went to visit the Gulf Coast last year after Hurricane Katrina, he wasn't surprised by the devastation—just considerably frustrated. Building codes work, but they're often not followed.

Funded by the Institute for Business and Home Safety (IBHS) and as a representative of FEMA, Dolan traveled the Gulf Coast last year to assess damage after Hurricane Katrina. In particular, the researchers wanted to determine if the current building codes and design specifications in the U.S. Building Code are sufficient to keep structures safe and to protect people from natural forces. Dolan traveled to several Gulf Coast cities, visiting hard-hit areas in Mississippi, such as Waveland and Bay St. Louis. "Waveland was essentially wiped off the map," he said.

In the nearby community of Bay St. Louis, almost all structures were destroyed—with the notable exception of a few recently-built houses. There, the builder had followed newly adopted building department regulations, such as adding knee walls in the top story, blocking wall sheathing, and reducing the space between nails from 6 inches to 4 inches.

"The minor changes to his building practices meant the difference between the structure standing while those around it did not," Dolan said. "The recently built homes resisted 120–130 mph winds and a 12-foot storm surge.

"If people cut corners, they pay the price in the long-term," said Dolan. "People are so worried about cost and making the maximum profit on construction that they cut corners. The low-income residents are the worst hit."

The devastation was great and unnecessary. Although building officials would like to do their job properly, they often don't have sufficient resources, said Dolan.

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—Professor Dan Dolan



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He would like to see a state law requiring that building fees stay within the building department, so that inspectors are able to do their job properly.

Since his visit to Louisiana, Dolan continues to pursue efforts to improve building codes. He was featured in Public Broadcasting Network's television program entitled "Disaster Resistant Housing," which covered designing and building new houses to resist disasters such as earthquakes, hurricanes, and floods. He also was involved in several FEMA publications, including *Home Builders' Guide to Seismic Resistance Construction* and *Home Builders' Guide to Coastal Construction*. These publications will reach over 250,000 people during their first year of publication.

He served as chair of the International Code Council committee to address the wall sheathing requirements of the International Residential Code (IRC). This committee's work will define the safety level of all single-family houses in the United States, and will result in a specific path for parties developing new products for housing. He

was also a member of the International Code Council IRC Building and Energy Committee. This nine-member committee evaluates all proposals for the IRC pertaining to structural performance and energy conservation to determine if the change is beneficial to the public's safety. He is now serving on the International Building Code Technical Update Committee to evaluate changes proposed for the building code governing large buildings.

On the Gulf Coast trip after Katrina, Dolan saw an apartment building that was completely destroyed due to the loss of the roof. He determined that each truss in the building had to resist 1,200 pounds of uplift force at each end. Instead, he found that rafters were held down by one 10-penny nail, which provides about 80–90 pounds of resistance. "Statics and physics work...The world still follows the laws of physics. The building obviously wasn't constructed properly or inspected properly—that's primarily the cause of most damage in hurricanes." ■