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## **10 Most Hurricane Vulnerable Areas**

The entire East and Gulf Coasts are subject to hurricane impacts, but some areas are much more vulnerable than others. Dr. Stephen P. Leatherman, Director of the International Hurricane Research Center, has released the Top 10 List that nobody wants to be on—“10 Most Vulnerable US Mainland Areas to Hurricanes.”

To nobody’s surprise, “The Big Easy” tops the list with the protective levees of this below-sea level city being in little better shape than when Hurricane Katrina flooded 80% of New Orleans last year. The only other area that is protected from flooding by levees (e.g., the 140-mile long Hoover Dike) is adjacent to Lake Okeechobee, Florida where the second worst hurricane disaster for life loss in US history occurred in 1928. Presently more than 40,000 people live at the base of this giant Corps of Engineers earthen structure that is leaking and declared by two recent reports (e.g., Bromwell, Dean, and Vick, 2006 and Zhang, Xiao and Leatherman, 2006) to be a “grave and imminent danger to the people and the environment of South Florida.”

Twelve criteria were used to evaluate the vulnerability of US mainland areas to hurricanes. Cyclonic energy (hurricane frequency and storm intensity) and levee/dike failure were primary determinants of vulnerability. Physical factors included storm surge and freshwater flooding potential as well as coastal erosion trends and island breaching

history. Socioeconomic indicators involved populations at risk, evacuation distance and routes, what's at risk, and local/state capabilities to respond to major hurricane impacts.

The rankings are as follows:

1. New Orleans, Louisiana
2. Lake Okeechobee, Florida
3. Florida Keys
4. Coastal Mississippi
5. Miami/Ft. Lauderdale, Florida
6. Galveston/Houston, Texas
7. Cape Hatteras, North Carolina
8. Eastern Long Island, New York
9. Wilmington, North Carolina
10. Tampa/St. Petersburg, Florida

Florida dominates the list with four out of the ten most vulnerable areas, but this is to be expected with its long shoreline that includes both the Atlantic and Gulf Coasts.

Waveland, Mississippi was hit by a 30-foot storm surge during Hurricane Katrina, but the entire coastal area of Mississippi was devastated by Katrina's high surge. Hurricane Camille in 1969 did a similar amount of damage. Such disasters are to be expected, yet beachfront property in Mississippi is now selling at a premium in spite of the widespread devastation still evident. The Hampton's in eastern Long Island, New York have been impacted by Hurricane Donna in 1960, Gloria in 1985 and Bob in 1991. The fear is a return of a 1938-type Great Hurricane that generated a 15-foot storm surge that overtopped and pancaked the barrier beaches (which now are crowned with waterfront mansions) and flooded the downtown villages of Westhampton Beach, Southampton, and Montauk.

The International Hurricane Research Center (IHRC) is working hard to make a difference; major IHRC contributions include:

- **Wall of Wind**—The first-of-its-kind full scale, destructive testing of houses to understand how buildings fail and to change the public perception of building safety, just as crash testing of cars led to seat belts and air bags. The IHRC has recently submitted a \$5 million proposal to the State of Florida for a Center of Excellence in Hurricane Damage Mitigation for a Wall of Wind facility. (<http://www.ihrc.fiu.edu/media/news.htm>).
- **Public Loss Model**--The IHRC recently completed the first Public Hurricane Loss Projection (Catastrophe) Model that is being used by the State of Florida in its insurance rate making evaluations and policies.
- **Storm Surge Modeling**—The new high resolution surge model developed by IHRC researchers correctly predicted the 30-foot surge at Waveland, Mississippi more than 24 hours before Hurricane Katrina made landfall, which drowned hundreds of people who did not believe that the surge could go this high.
- **Storm Chasing**—The deployment of meteorological towers and surge instrumentation at hurricane landfalls to provide critical information for post-storm assessments.
- **National Windstorm Damage Reduction Act**—The IHRC Director wrote the draft Act that was passed in 2004 , which calls for tens of millions of dollars in new funding for hurricane research; now that the funds have been authorized, they still must be appropriated by Congress.