Geography In The News™

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IS NO PLACE SAFE FROM HURRICANES?

With coastal development booming along the Atlantic and Gulf coasts, we need to be reminded that hardly any coastal location in this region is safe from hurricanes. However, even hurricanes Katrina, Rita and Wilma aren't likely to deter public interest in coastal property ownership and development.

The accompanying map is a modified version of a highly detailed map published on the Web by NOAA's National Climatic Data Center (NCDC) in Asheville, N.C. The NCDC map shows all of the 96 U.S. hurricane landfalls between 1950 and 2004 by name, date and Saffir-Simpson Category (1-5). The accompanying map generalizes much of the data and adds the five 2005 landfalls as of October 12, bringing the total to 101.

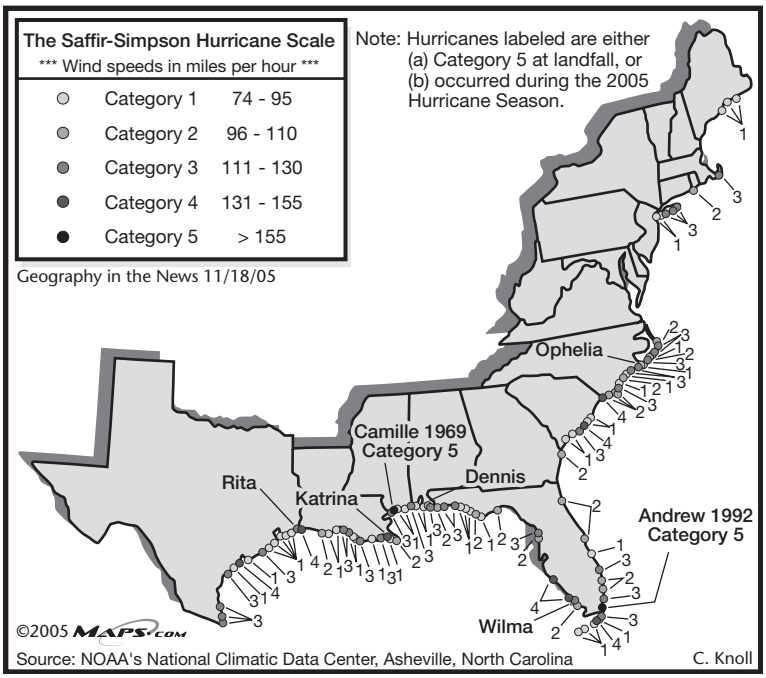
Hurricane landfalls are the locations where the eye of a hurricane crosses a coastline from the water. Generally, the landfall site sustains the most direct damage from the eye of a hurricane, but the right side of the eye's landfall is where wind and water tend to create the greatest damage from the storm's counterclockwise rotating winds. Not only are these winds unimpeded as they flow onto the land from water, but they also tend to push water onto the land in a *storm surge.*

The Saffir-Simpson classification system has been adopted by climatologists and meteorologists to provide five categories of hurricanes' sustained winds. Category 1 is a fairly weak hurricane with sustained winds of 73-95 mph; Category 2 has winds of 96-110; Category 3 has 111-130; Category 4 has 131-155; and Category 5 hurricanes have sustained winds over 155 mph. Categories 4 and 5 storms cause extensive structural failures of roofs and walls and flooding of at least first levels of coastal buildings.

North America's hurricane season begins each year on June 1 and ends on November 30. According to NOAA, the Atlantic basin, including the Gulf, has had an average of six hurricanes per year and approximately five hurricanes strike the United States' coastline between Texas and Maine over each three-year period. There were no hurricane landfalls in the region during the 2000 and 2001 hurricane seasons.

The 1940s, 1950s, 1960s and 1990s were the most active hurricane decades in the Atlantic basin since the documentation began in the 1850s, but the current decade is proving be most active. Over the past 155 years, there was an average of 2.2 hurricanes per year in the Atlantic basin, or 22 per decade. Twelve decades had fewer than the average. The 1950s had 39 hurricanes, 1960s had 28 and the 1990s had 25 hurricanes. During the first five years of the 2000s decade, however, there have been at least 24 hurricanes and by October 12 of the 2005 hurricane season there had been 11 hurricanes in the basin, making this one of the two most active hurricane years on record.

Hurricane Landfalls 1950 - 2005



Sources:
http://www.ncdc.noaa.gov/img/climate/severeweather/hur5005.jpg;
http://www.aoml.noaa.gov/hrd/tcfaq/tcfaqHED.html

The geographic pattern of U.S. hurricane landfalls is interesting in that there are some clusters and some parts of coastlines relatively free of landfalls. Two clusters are evident in North and South Carolina's exposed coastlines. Florida's southeast coast stretching from Cape Canaveral to Key West has a distinctive cluster. Landfalls also are clustered from Florida's western panhandle nearly continuously to south Texas. Long Island, New York, and coastal New England are sometimes exposed to hurricanes traveling northward along the East Coast.

Between 1950 and 2005, Florida had the most numerous landfalls at 28, but it also has the longest coastline of any of the East Coast states and it sustained the most landfalls by Category 4 and 5 storms (4). Eighteen landfalls occurred in North Carolina, including Ophelia in 2005, where the Outer Banks are most susceptible. Because these low islands protrude into the Atlantic and have major bodies of water on both sides, *overwash* of these exposed islands from both sides can occur even with minor storms.

Gaps between clusters of hurricane landfalls also are interesting. Florida's west coast has had relatively few landfalls, except the recent one by Hurricane Wilma and only five others. But perhaps the most interesting gaps are found on Florida's northeast coast and nearly along Georgia's entire coastline. Accounting for this gap may be the westward indentation of the coast, similar to the coastlines of Virginia, Delaware and New Jersey.

Geographic patterns of hurricane landfalls are of extreme interest to insurance companies, among many others interested in coastal development. Is there really any coastal location totally safe from hurricane landfalls? Maybe not. But a few places are certainly more vulnerable than others.

And that is *Geography in the News*™. November 18, 2005. #807.

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