Hurricanes can kill from 1,000 miles away

A tornado spawned by Hurricane Ian left residents of a 55+ community in Palm Beach County, on the state's east coast, homeless after the county deemed the structures uninhabitable. THOMAS CORDY/PALM BEACH POST

Categories don't account for storm surge, rip tides

Doyle Rice and Dinah Voyles Pulver USA TODAY

Hurricane season 2024 is shaping up to be dangerous and deadly, and the threats come from a variety of reasons. ● The National Hurricane Center has started issuing daily tropical outlooks and the Atlantic hurricane season will officially begin June 1. In the months ahead, we will again hear about storms reaching Category 1 through 5 strength – with storms at the upper end of the scale often rightly generating much more alarm than storms at the lower end.

But experts say that scale can be confusing, because it only measures the wind risk and does not account for coastal storm surge and flooding from torrential rain – the two biggest killers in hurricanes. Perhaps even more unexpected: Hurricanes can cause deadly rip currents even when they are spinning out at sea more than 1,000 miles away from land.

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Larry Hickman walks in floodwaters from the Waccamaw River caused by Hurricane Florence on Sept. 26, 2018, in Bucksport, South Carolina. Nearly two weeks after making landfall in North Carolina, river flooding continued.
SEAN RAYFORD/GETTY IMAGES

Hurricanes

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"The category is just a very small piece of the puzzle," said Robbie Berg, senior hurricane specialist at the National Hurricane Center.

Another expert from the hurricane center, Cody Fritz, agreed. "If you ask me, I would always say never focus on the categories. I think you focus more on the hazards, whether it be wind, surge or rainfall."

Storm surge

Storm surge, the massive amount of water that builds up and comes ashore during a hurricane, is often the deadliest and most destructive threat from these devastating storms.

Storm surge has accounted for about half of all the deaths in hurricanes since 1970, according to the hurricane center. It caused most of the 1,800 deaths in Hurricane Katrina in 2005.

"The storm surge, by far, creates more damage because it's coming in like a large wave, a large flow of water, and basically mowing everything down with that water," said AccuWeather senior meteorologist Dan Kottlowski.

All locations along the U.S. East and Gulf coasts are vulnerable to storm surge. Storm surge can penetrate well inland from the coastline, the hurricane center said.

Inland flooding

Hurricanes often produce widespread, torrential rains in excess of six inches, which can result in deadly and destructive floods, the hurricane center said. In fact, flooding is the major threat from hurricanes and tropical storms for people living inland.

Overall, between 2013 and 2022, 57% of the hurricane- and tropical storm-related deaths in the U.S. were attributed to freshwater flooding, according to a report from the American Meteorological Society.

Flash flooding, defined as a rapid rise in water levels, can occur quickly due to intense rainfall. Longer-term flooding on rivers and streams can persist for several days after the storm.

When approaching water on a roadway, remember "Turn Around Don't Drown."

The cause of a 14-foot storm surge and extreme winds, Hurricane Michael was rated Category 5 when it made landfall in Florida, one of only four storms of that strength to reach U.S. land since 1850. BREAWNA SMITH/ISTOCK VIA GETTY IMAGES

Rip currents

The winds of a hurricane can cause dangerous waves that pose a significant hazard to mariners, coastal residents and visitors, the hurricane center said. When the waves break along the coast, they can produce deadly rip currents – even at large distances from the storm.

A report published by the American Meteorological Society last year concluded the percentage of direct deaths attributed to tropical cyclone-related rip currents has doubled in recent years. The authors also found Florida, North Carolina and New Jersey experienced the highest number of tropical cyclone-related surf and rip current deaths.

In 2008, despite the fact that Hurricane Bertha was more than a 1,000 miles offshore, the storm resulted in rip currents that killed three people along the New Jersey coast and required 1,500 lifeguard rescues in Ocean City, Maryland, over a one-week period.

Tornadoes

Tornadoes aren't uncommon during hurricanes. In fact, almost all hurricanes and tropical storms that make landfall in the United States spawn at least one tornado, provided that enough of the storm's circulation moves over land, according to the National Oceanic and Atmospheric Administration.

"These tornadoes most often occur in thunderstorms embedded in rain bands well away from the center of the hurricane," NOAA said.

"However, they can also occur near the eyewall. Usually, tornadoes produced by tropical cyclones are relatively weak and short-lived, but they still pose a significant threat."

Although hurricanes can spawn tornadoes up to about three days after landfall, statistics show that most of the tornadoes occur on the day of landfall or the next day, NOAA said.

The worst tornado outbreak occurred during 2004's Hurricane Ivan, which caused a multiday outbreak of 127 tornadoes.

Carbon monoxide poisoning

One deadly hazard that impacts areas hit hard by hurricanes is poisoning from carbon monoxide, an invisible, odorless gas that's emitted from generators used to provide power after the storms.

The Centers for Disease Control and Prevention reports that carbon monoxide poisoning is "a primary cause of storm-related deaths," as all generators emit fumes, even when operating properly.

In 2020, at least 21 fatalities after the storm were attributed to carbon monoxide poisoning from generators in the aftermath of Hurricanes Ida and Laura.

Wind

Finally, the wind, the mark by which all hurricanes are measured. Hurricane-force winds – 74 mph or more – can destroy buildings and mobile homes, the hurricane center warned.

"Debris, such as signs, roofing material, siding and small items left outside become flying missiles during hurricanes," the hurricane center said.

Winds can stay above hurricane strength well inland: In 2004, for example, Hurricane Charley produced major damage well inland across central Florida with gusts of more than 100 mph.