

Wet, wild and weird: Some answers about Hurricane Matthew

5 October 2016, by Seth Borenstein

Hurricane Matthew is wet, wild and weird. Meteorologists say its path has been harder to pin down than that of other storms, but Matthew is definitely dangerous and may possibly stick around to bedevil the Southeast coast for a week or so.

Here's are some questions and answers about Matthew :

Q: How bad and unusual is this?

A: If Matthew keeps its current status as a major hurricane—with winds of 110 mph or more as a Category 3 or higher—it will be the first major hurricane to make landfall in the United States since Wilma in October 2005. Wilma's winds at landfall were 120 mph; earlier that year, Katrina hit with winds of 125 mph. As of 2 p.m. Wednesday, Matthew's maximum sustained winds were 120 mph.

Superstorm Sandy in 2012 caused more than \$50 billion in damage, but even if it hit the coast as a hurricane, it would have qualified only as a Category 1, with peak winds of 85 mph. Storm surge, large size and location were the big problems. It was also a combination of three different types of storm systems so it isn't a good comparison.

The last hurricane with a similar strength and track to threaten the U.S. East Coast was 1999's Hurricane Floyd , which caused about \$7 billion in damage in the Carolinas, says Jeff Masters, a former hurricane hunter meteorologist and meteorology director of Weather Underground.

"There's no question that it's going to have major impacts," he says. "Is it going to be devastating or just major-damaging?"

That depends: A few degrees difference in the

hard-to-forecast track as it hugs the coast could make the difference between a \$1 billion storm and a \$10 billion one, he said.

MIT meteorology professor Kerry Emanuel says, "it could give a very extensive part of the Southeast coastline a pounding, and if it's moving very slowly, a lot of rain."

Q: Does it matter if it makes landfall or stays just offshore?

A: In some ways, the worst case scenario would be if the storm's eye stays just offshore, enabling it to feed over water and avoid weakening while its strongest hurricane winds keep smacking the beaches, says University of Miami tropical meteorology researcher Brian McNoldy, who just finished his own storm preparations. In that case, "you're raking hundreds of miles of coastline."

Don't think of it as just an eye—this storm is already so large, and likely to expand even more, that it will have widespread impacts, Masters says.

Technically a storm doesn't "make landfall " until its eye reaches land, but it can still be considered a "direct hit" if it is close enough to shore have maximum winds over land, even if the eye stays just over water.

Q: So which is the big worry with Matthew: Wind, rain or storm surge?

A: While storm surge and rain can be a problem, McNoldy and Masters worry most about Matthew's winds.

"It's going to do a lot of wrecking," Masters says. "Matthew will get big and bad."

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Q: Is Matthew harder to forecast than other storms, and if so, why?

A: Emanuel and Masters say this is harder to forecast. Some computer models have changed long-term tracks from up the East Coast into New England a couple days ago, to now possibly lingering around the Southeast.

But McNoldy points out the turn due north between Haiti and Cuba was well forecast, and only the long-term forecasts gyrate greatly, which is more understandable. As for short-term track forecasts, the changes are only more noticeable because they are so close to land that 50 to 75 miles one way or another makes a huge difference.

Still, new Tropical Storm Nicole is likely affecting the path of Matthew. And the Bermuda high pressure system and low pressure trough coming from the west over the United States aren't strong enough to block Matthew or push it seaward, the meteorologists say.

With weak steering systems, some computer models have Matthew sticking around the U.S. coast for another week or so. Chuckling—because meteorologists have a dark sense of humor about storms—both Masters and McNoldy acknowledge that one trusted computer model even sees a possible loop-de-loop that curls Matthew back around to South Florida for a second time.

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Q: What's to blame: El Nino, La Nina, global warming? Or do hurricanes just happen?

A: Mostly hurricanes simply happen. However, warm water fuels storms, and the water in the Caribbean, where Matthew has been growing, is 1.8 to 2.7 degrees warmer than its long-term average, the meteorologists said. Masters says that makes climate change a possible factor, although McNoldy and Emanuel disagree.

Maximum potential intensity—a key measurement of heat energy in the ocean—has increased by about

15 mph in the past 35 years in the areas of the Atlantic where tropical storms spawn. And the maximum potential intensity is especially high now just east of Palm Beach, Florida, Emanuel says. But he says that's because of reductions in sulfur particle air pollution and its cooling effects, not climate change.

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