

Studies: Warming made Harvey's deluge 3 times more likely

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In this Tuesday, Aug. 29, 2017, file photo, water from Addicks Reservoir flows into neighborhoods as floodwaters from Tropical Storm Harvey rise in Houston. Global warming's fingerprints are all over the record rainfall from Hurricane Harvey, several new studies showed Wednesday, Dec. 13. (AP Photo/David J. Phillip, File)

Global warming's fingerprints were all over the record rainfall from Hurricane Harvey this year, confirming what scientists suspected, according to new research.

While scientists say man-made climate change didn't trigger Harvey, new studies calculate that a warmer, wetter world made it at least three times more likely that the stalled storm over Houston would flood the fourth most populous U.S. city. Researchers also said global warming often goosed aspects of two other destructive hurricanes this year, Irma and Maria.

Findings were discussed Wednesday at the American Geophysical Union meeting in New Orleans.

The Harvey studies used a combination of established and new techniques. An international team used computer simulations and decades of past observations to estimate the odds for the record rainfall that came with Harvey over a period of three days in August with and without global warming. By comparing those two, they concluded global warming tripled the likelihood for the deluge, which reached more than 50 inches in one location.

Based on Houston's weather history, researchers said a storm like Harvey would occur about once every 9,000 years.

"Did climate change make this event more likely than in the past? Yes," said Karin van der Wiel of the Royal Netherlands Meteorological Institute.

Another study by the Lawrence Berkeley National Laboratory used computer simulations to analyze Harvey's downpours over a week and calculated that global warming increased rainfall by nearly 20 percent.

Kevin Trenberth of the National Center for Atmospheric Research linked Harvey's downpours to the heat content in the ocean. Most of the heat trapped by greenhouse gases gets absorbed by oceans and that energy serves as fuel for hurricanes and other storms. The ocean heat

content was record high in the Gulf of Mexico and elsewhere before Harvey hit. If it had been lower, there would have been much less rain, he said.

Changes in the jet stream—the rivers of air that steer weather—led to Harvey's stalling over Houston, unleashing rain, said Kerry Emanuel of the Massachusetts Institute of Technology who presented two studies.

While Emanuel wouldn't directly blame climate change on Harvey, he said destructive hurricanes will be more likely in a warmer world.

"I think this is a window into the future. I think nature is giving us a foretaste of the future," Emanuel said in an interview.

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