Climate change is already making Atlantic hurricanes more fierce, study finds

February 11 2019, by Jenny Staletovich

Credit: CC0 Public Domain

Climate change has already made Atlantic hurricanes more fierce, driving up the number of storms that rapidly intensify, become more lethal and difficult to forecast, according to new research led by the National Oceanic and Atmospheric Administration.

Published Thursday in the journal *Nature*, the research looked at storms churning in the Atlantic over nearly three decades between the 1980s and 2000s and found the number of storms that underwent rapid intensification nearly tripled. The team considered natural variations in climate that might drive the increase, but still found the number "highly unusual."

While past studies have confirmed a rise in more intense storms and predicted they would continue to increase as a warming planet heats up oceans, this is the first to directly link the cause to climate change. And such a dramatic increase.

"I wasn't surprised there was an upward trend, but I was surprised by the magnitude," said lead author Kiernan Bhatia, who earned a doctoral degree from the University of Miami and completed the research while a fellow at Princeton University working with the NOAA team.

For the study, researchers looked at the record of hurricanes in the Atlantic. Global data exist, but they said they had less confidence in the information because of tracking methods and signals that might change findings. As reporting and satellites have improved, researchers say that has influenced the record of storms and appeared to indicate an increase. So they look for consistency in data. The period between 1982 and 2009

remained remarkably consistent for both satellite and hurricane information.

Once they had the data, they also looked for natural variability in climate that might fuel rapid intensification. Rapid intensification occurs when wind speeds spike, increasing by about 35 mph in less than 24 hours. Such storms are unpredictable, even more difficult to forecast in intensity, and tend to cause the most damage.

Last October, Hurricane Michael transformed from a middling tropical storm with 40 mph winds to a Category 1 hurricane in less than a day. It underwent two more rapid changes before it made landfall as a ferocious storm with 155 mph winds, just shy of a Category 5, in the Panhandle. A month earlier, Florence rapidly intensified before slamming the Carolina coast. Those storms were not included in the study. However, it did cover the record-breaking 2005 season, which produced 28 named storms including Katrina and Wilma, as well as 1992's lethal Hurricane Andrew.

Natural changes can fuel more intense storms. For example, since the 1990s, a pattern that can last decades and affect temperatures on the surface of the ocean has been running warm. El Ninos and La Ninas, other patterns that change ocean temperatures year to year in the Pacific, can also trigger more hurricanes in the Atlantic. But those fluctuations failed to account for the steep increase, Bhatia said, which left manmade changes on the planet as the culprit.

Rising ocean temperature has been considered a chief cause, but Bhatia said scientists have so far not confirmed it's the only factor.

"It's definitely something we're trying to understand better," he said. "If you think of rapid intensification as a recipe, we know warm ocean waters are part of the ingredients, but we still haven't identified the most

important ingredients. It's really hard to make good cookies without sugar. That's the ocean part. But at the same time you need flour and baking soda."

Directly linking the increase to climate change stands as a big advance in hurricane research, particularly in the tricky area of rapid intensification. However, Bhatia said the research also turned up another important factor: deficiencies in data. Without global data as reliable as information from the Atlantic, scientists will continue to struggle, he said.

"The hurricane community and research community needs to reconcile that," he said. "We need better observations because right now what we have available is providing inconsistent conclusions."

More consistent data could allow them to paint a better global picture, identifying when and where hurricane might become more intense. In the coming months, researchers expect to get a new 10-year collection of data that will help them better understand the trends, he said.

"That trend might also be significant," he said. "It will be interesting to see if the trend globally persists."