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Is This Tornado Season the Worst Ever?

April set the record for most tornadoes in a calendar month, and the much-publicized outbreaks—especially the cells that ripped through the South—have made this tornado season seem like one of the worst ever. Tornado expert Victor Gensini explains what has allowed 2011's storms to be so bad, and why there may have been worse outbreaks in the past, but we just didn't notice them.

BY VICTOR GENSINI



Devastation caused by a tornado April 27, 2011 aftermath in Birmingham, Alabama.

Jamiesrabbits/Flickr

We are nearing peak climatological tornado

season, though to some it might feel like it's been going on forever. Tornadoes have battered the United States this spring, causing major property damage, injuries and loss of life. Disaster experts estimate that the barrage of twisters that hit the South in late April caused as much as \$5.5 billion in damages, and it is not over yet. All these storms raise the question: What is going on this year?

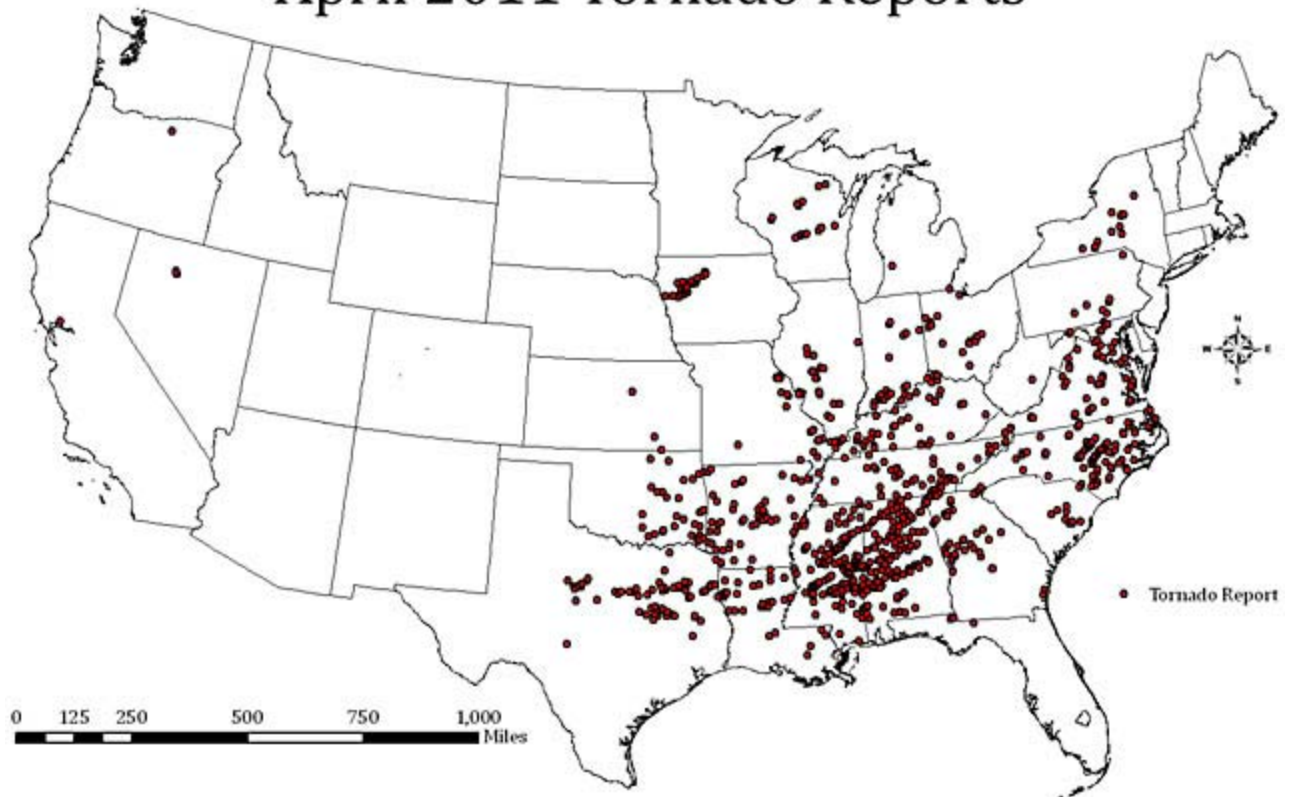
The month of April is no stranger to tornadoes, and April 2011 saw more tornado occurrences than any other month on record. Only four days during the month saw zero

tornadoes, but the bulk of the twisters came in short blasts: More than two-thirds of April's record-setting total happened during just four extremely tornado-heavy days.

Large numbers of tornadoes in such short time spans are commonly known as tornado outbreaks. The atmosphere needs certain physical ingredients to form tornado outbreaks. They include ample moisture, instability, lift and wind shear. If the atmospheric recipe has all of the needed ingredients, the likelihood of tornadoes will increase. A simple analysis of archived meteorological data indicates that those variables were abundant this April.

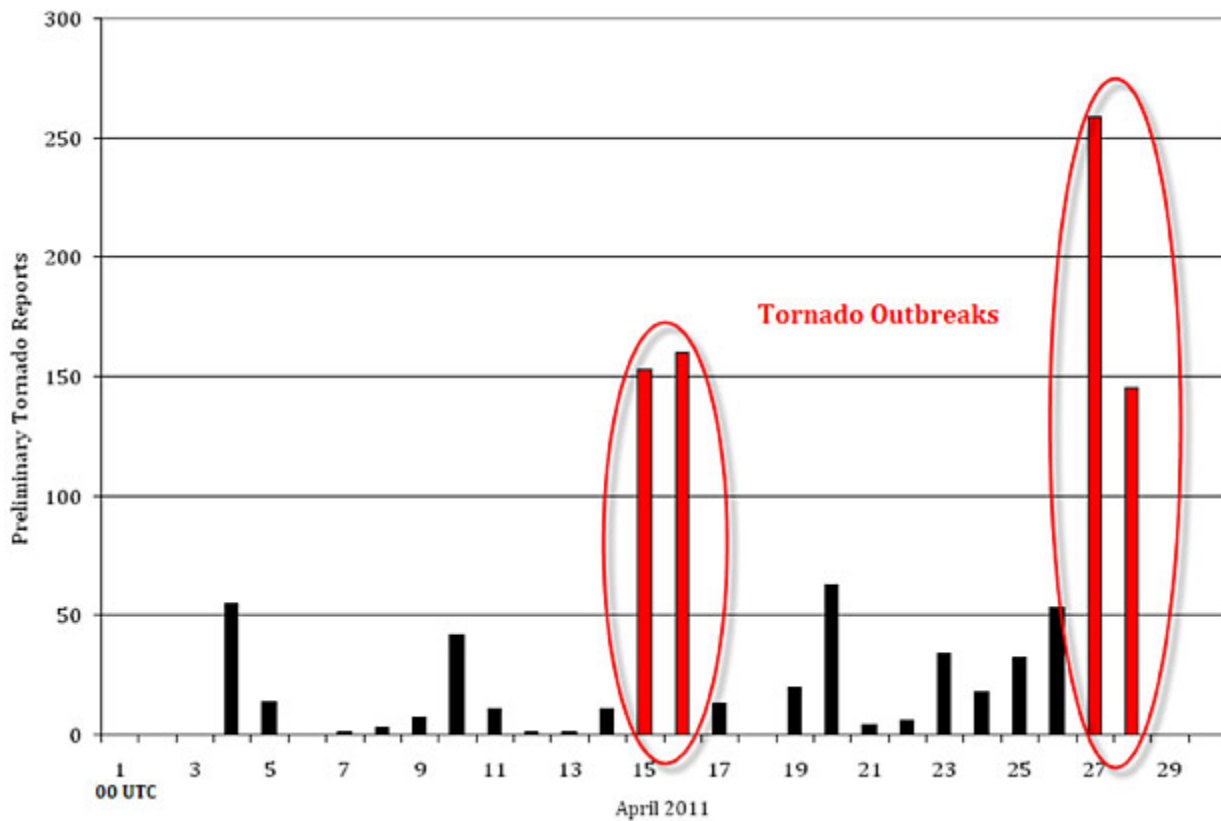
One reason that April in particular was so bad may be the large aerial extent of a meteorological phenomenon known as the "lid." The lid is a layer of hot, dry air just off the surface of the Earth that traps energy and usually prevents the formation of thunderstorms. More simply, it acts like the lid on a pot of boiling water. When enough energy has accumulated, the lid may break and spark explosive thunderstorm development—similar to lifting the lid off the pot of boiling water. It's a delicate balance, as too strong a lid may prohibit thunderstorm formation altogether—but a large one that breaks can spawn a supercell if all the other ingredients align.

April 2011 Tornado Reports



The rash of storms also brought another suspect into the public discussion: climate change. While this makes for interesting discussion, scientists are not yet sure of the fate of tornado frequency in the future. Global climate models indicate that some of the ingredients necessary for tornado-producing storms, such as instability, will increase. But others, like wind shear, may decrease.

However, it is unlikely that scientists will ever be able to forecast tornado outbreaks that far in advance. Weather and climate are different concepts, and just as it is difficult to tie any specific snowstorm or drought to climate change, the same goes for tornado outbreaks. Besides, humans have not been accurately watching and recording tornadoes for long enough to capture the natural variability in how often they occur. Combine this relatively short record with the "noise" associated with changes in reporting, and conclusions regarding tornado frequency are far from concrete.



In fact, because of the looseness of the reporting record, it is hard to say April 2011 was the worst tornado month ever, or even the worst in recent memory. For starters, due to increases in population density, there are more people to report tornadoes. Most storms today are caught on camera and many are uploaded to the Internet within minutes. However, in the years before everyone owned a convenient camera or settled in particular locales, many tornadoes simply went unreported in rural areas. Therefore, bigger outbreaks may have happened in the past, but we will never know.

While increases in population density have made reporting better than ever, it has also made people more vulnerable to twisters. As the natural landscape is being converted to industrial, commercial and residential uses, more people and assets are being put into the path of any given tornado. The number of actual tornadoes may be changing very little in the big picture, but tornadoes' danger to humans appears to be anything but constant.

Victor Gensini is a Ph.D. student in climatology at the University of Georgia. His primary research interests include severe storms, applied climatology and natural hazards. Check out [his academic website](#) and [his blog](#).

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