New map of the UK pinpoints tornado hotspots for the first time in two decades

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Researchers have updated a map of the UK that pinpoints tornado hotspots for the first time in two decades.

Although most people think of twisters striking 'Tornado Alley' in the US, the UK actually has more tornadoes per area than any other country. And now we know where they are most likely to occur.

In a paper published in the journal *Monthly Weather Review*, the team from the University of Manchester show how they used eye-witness reports of the twisters to put together the map, which covers the UK from 1980–2012. Data for the study came from TORRO, an organisation which collects severe weather reports from the media and over 350 observers in the UK, Ireland and around the world.

During that period the country experienced an average of 34 tornadoes every year. Although the peak season for tornadoes is from May to October, they can occur at any time of the year. Most of those were in England (78%), with the most prone regions the south, south east and west where the threat of a tornado may be as high as 6% in any given year (in other words, a one in 17-year event).

Few of the storms were very strong however, with 95% classified as being F0 or F1 (or estimated wind speeds of up to 112 mph) with the remainder F2 (estimated wind speeds up to 157 mph). There were none any stronger than that, such as the devastating F5s (estimated wind speeds over 300 mph) that can hit the United States and cause

widespread loss of life and damage to property. There were no tornadoes reported at all in large parts of Wales, Scotland, Ireland and Northern Ireland during 1980–2012. The study only included land-based tornadoes (not waterspouts) as they pose more of a threat to life and property.

Lead author of the paper Kelsey Mulder, of the School of Earth, Atmospheric and Environmental Sciences at The University of Manchester, said: "F2 tornadoes are still quite strong and are perfectly capable of causing damage and injury. For example there was the twister that hit Birmingham in 2005 that caused 19 injuries and £40m of damage. Because tornadoes are capable of causing such damage it is important that we have some kind of idea where they are most likely to hit."

Tornadoes are impossible to spot on satellite images and weather radar images aren't always accurate either. They can show rotation where a tornado doesn't occur and sometimes tornadoes occur where rotation is not shown on the radar. So the only way we know about them for sure is from eye-witness reports.

Kelsey added: "It seems that most tornadoes in the UK are created along long, narrow storms that form along cold fronts, whereas most tornadoes in the United States are created by isolated storms, which are more similar to the beautiful supercells you see in the movie Twister. Even in the United States, tornadoes formed along cold fronts tend to be weaker than those formed from supercells. That could be one reason why tornadoes in the UK are much weaker. But the process for how tornadoes form along cold fronts is not yet very well understood. Understanding why is my current research project."

And Kelsey has a special reason for dedicating her life to studying tornadoes. She explained: "I was inspired to study these beautiful things when I was six years old. My home town of Boulder in Colorado was hit

by one. It was my last day of school when the town was hit. It was only a small one that destroyed a few sheds but I was so scared at the time. But then later I realised just how amazing the weather is and I decided I wanted to study it."

The areas of the UK most likely to have a tornado are:

- Between London and Reading: 6% chance per year of a tornado occurring within 10km of a given location
- From Bristol, north to Birmingham and Manchester:5%
- Northeast of London to Ipswich: 4%
- South coast of Wales near Swansea: 3%

More information: "Climatology, Storm Morphologies, and Environments of Tornadoes in the British Isles: 1980–2012." *Mon. Wea. Rev.*, 143, 2224–2240. doi: dx.doi.org/10.1175/MWR-D-14-00299.1

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