



300 tornadoes hit Europe every year

The deadly tornado that hit the city of Moore near Oklahoma City in the US on 20 May dramatically highlighted such extreme weather events and their dangers. In Europe, the same phenomenon is under close scrutiny.

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Europe is not a tornado-free region. ‘In the US, some 1 200 tornadoes are observed every year,’ said Dr Pieter Groenemeijer, director of the European Severe Storms Laboratory (ESSL), a non-profit association based in Wessling, near Munich (DE). ‘In Europe, we have an average of 300 every year,’ he added. ‘But most tornadoes are not as dramatic as the one of last Monday, 20 May, and that is actually true for the United States or other tornado-prone areas such as Bangladesh and northern Argentina as well. Most tornadoes do not produce a lot of damage.’

Europe also regularly endures severe weather events. Tornadoes are less frequent over here than in the US, but storms, for instance, can be really devastating, like the Kyrill storm in 2007 that caused huge damage and loss of life in the UK and in Germany. In August 2008 though, Poland was severely hit by an outbreak of strong tornadoes. Earlier that same month, the North of France was also hit. And in November 2012, Taranto, in Italy also suffered such a violent weather event.

The European Severe Weather Database (ESWD), managed by the European Severe Storms Laboratory, indicates that all regions of Europe have seen the formation of tornadoes in the recent past. ‘They can occur when three specific meteorological ingredients are present at the same time,’ said Groenemeijer. ‘Humidity close to the ground surface must be significant, the temperature of the atmosphere must decrease quickly with altitude, and finally the wind speed has to increase rapidly with height and make a sharp clockwise turn in direction.’

Such events cannot be forecast precisely days in advance. However, meteorological offices in Europe can, depending on the numerical models they are using, identify zones where so-called supercell storms can occur. In these regions, tornadoes may develop.

[Tornado events in Europe 2000-2012 as recorded in the European Severe Weather Database. The colours and sizes of the symbols refer to the classification of the tornado on the Fujita scale.](#)

Tornado events in Europe 2000-2012 as recorded in the European Severe Weather Database. The colours and sizes of the symbols refer to the classification of the tornado on the Fujita scale. © ESSL

‘But it is really when the rotation in a storm is observed by radar that the risk of a developing tornado is high enough to warn people about it,’ added the Dutch scientist, whose organisation has taken part in the EU-funded project EWENT (Extreme Weather Impacts on European Networks of Transport).

In this project, the European Severe Storms Laboratory studied more specifically the climatology of thunderstorms, and the hazardous phenomena that may accompany them, such as flash floods, large hail, damaging winds, and indeed tornadoes.

‘These last years, we see an increase in the number of tornadoes being reported in Europe,’ added Groenemeijer. ‘But, it is impossible to say whether a real increase has occurred. The rise in the number of reported tornadoes is almost certainly due to increased efforts to collect such data, supported by the EWENT project.’

The Fujita-scale of tornadoes

F-scale	Wind speed (km/h)	Effect on an average (e.g. brick) European house
F0	64 - 116	(almost) no damage
F1	117 - 180	light to moderate damage to roof
F2	181 - 253	significant roof damage / roof gone
F3	254 - 332	roof gone / some walls collapsed
F4	333 - 418	most walls collapsed
F5	419 - 512	blown down, and possibly blown away

The last F5 tornado within the current European Union was in Palluel in northern France on 24 June 1967.

More info

[European Severe Storms Laboratory](#)

‘Extreme Weather Impacts on European Networks of Transport’ project

The EWENT project was part of a cluster of EU-funded projects that specifically deal with the impact of weather events, along with the WEATHER, and ECCONET projects. The MOWE-IT project is their follow-up:

[WEATHER](#)

[MOWE-IT](#)

[ECCONET](#)