

# The EF3 El Reno Tornado of 2013 and Lessons presented by KI5LNM

I have been back with an old friend of mine - tornadoes. I grew up on the edge of Tornado Alley in Illinois, and am intrigued by them.

If you are interested in tornadoes then probably the one that you notice most is the EF3 El Reno tornado of 2013. This tornado, as some would say, broke all the rules. It definitely had deviant tornadic activity for its 40 minutes of life and 16.2 miles path on the ground. Could there be any laws of physics or meteorology that could explain what happened there? It can be explained but not tonight by me. Why was this the one tornado that so many storm chasers were caught out? Can we understand what happened here, and can we learn from it and apply those lessons to other aspects that we may deal with.

This will be simplistic for the time allowed. So let's get a quick look and some lessons we can learn.

This tornado has been studied and scrutinized by more for longer than any other. The National Weather Service said that it was "the most dangerous tornado in storm observing history." It is famous for two things. Being the largest tornado recorded by man at 2.6 miles wide at its largest. And secondly, sadly, it is the tornado that took the Twistex team of Tim and Paul Samaris with Carl Young, as well as another storm chase and 4 other people.

First note is that this tornado was not a poster child for how most tornadoes act. All perceived wisdom of chasing tornadoes will go out the window for everyone that was out chasing that day. Tornadoes generally travel in a northeasterly direction. But they can have deviant tracks that seem unreal but can be explained why they broke what seems to be the rules. If a tornado is traveling in a fairly normal direction, to escape, you always drive south and southeast. Alas, as the tornado wound its way around south for a bit then turned east and then decided to wander some more then throw in a somewhat northeast passage, ending with a loopy-loop and a short east run. It seemed to do its own thing and anyone out there better keep track of where it was at any moment. This is the one storm that professional storm chasers with years and even decades of experience found themselves in trouble.

Let's look at its makeup. Simply. This was a very dark, wide, rain wrapped tornado. In that scenario you really can't see the actual tornado. In fact, some would say it looked like the whole wall cloud just landed on the ground. So where is the actual tornado? Only at its birth do you see amazing tornado video as such. There is later video but it is just a big dark mass. Otherwise, those tracking it carefully could point in the right direction and only with lightening could you actually be sure of it. Also they could not see that this tornado had multiple vortices bouncing around it. This can be a given with all large tornadoes. Studying it afterwards, 24 vortices have been tracked with it. These vortices were caught on doppler radar at 295 mph. None of these vortices crossed over any buildings which was a blessing.

Noting one issue with this tornado is that what chasers were seeing on their radar screens in their vehicles and with their eyes was not the reality of what was happening outside. One chaser states that he was a mile away from the tornado and so thought fairly safe but still getting out of Dodge as fast as he could. But the winds made it very difficult. What was learned is that the actual funnel of the tornado, albeit quite large, had a wind field around it ten times larger. You could be within a mile from the tornado but still be trapped in tornadic winds as if you were inside it. Their radar did not show this effect and visually many did not realize what was happening except that you had the pedal all the way down and only going 35 mph.

So what are a couple take aways here? And can they be applied to other situations? Think yourself how these can be applied to different storms or critical situations.

1. Even if you think you are safe keep your eyes wide to any changes. Do not lose situational awareness. That is probably what happened with the Twistex team. Video found afterward seems to show this. Also with Skip Talbot, his partner realized she could see wind bands much closer

than they expected, they could have been caught in it, but as soon as she pointed out what she was seeing, they packed up and moved quickly.

2. Don't trust what a tornado should do. Tornadic motion can be unpredictable. Keep your eyes ready for what you can see it doing. The Tempest Tour group was in a safe place southeast of the tornado when it formed but then the tornado came straight their way. The tour leader realizes this and they hurriedly tried to get away and almost made it but with minimal damage and injury.
3. A tornado can rapidly expand and speed up. This one went from 25 to 50 mph in 5 minutes. Don't wait too late to escape. Situations do not stay static watch for changes.
4. If you have a large tornado, then more than likely there will be satellite tornadoes (coming down from nearby supercells) and vortices (with the main tornado) along with it. Keep an eye out or plan that they are there. It doesn't matter where you think the tornado is. It was the same vortex that got the Twistex car and the Weather Channel lead vehicle which was rolled five times but all made it out alive. Vortices have the strongest winds in a tornado. What may look like the main danger may not be that at all. Look at all of the situation.
5. A quick escape may be impossible. Make sure you aren't caught in the wind field or traffic. There is more to this part of the story but the roads became bumper to bumper during this whole storm. If any of the tornadoes had come near these traffic jams, it would have been a disaster. Keep safe distance. Never wait too late to get out of Dodge. Always have a few escape plans already set ahead of time. If needed do take that couple moments to think through a situation and make sure you make the best decision you can.
6. Make allowances for a worse case scenario. One must always be aware of what is happening around them. Not just the tornado in front of you but watching for anything in all directions. This is a must whether you are chasing or watching the skies at your home. But always have a plan in place if what you would normally do doesn't turn out to be the safest or best decision. Many of the chasers that day would have been fine if they had gone north instead of the normal south or east. A couple vehicles went west for a bit and from their positions that was a perfect escape route. It could have been easier on many if they had taken a moment and then decided to do what was not normal.

If you are interested in watching some videos on the El Reno tornado, I would recommend -

Skip Talbot's "Safety Lessons from El Reno". He does have a previous video on El Reno, but as more knowledge came in, Skip did another video showing the updated tract and new information on different scenarios. This video covers the tornado and what was learned and how to make better decisions the next time.

Another good video is from the NWS Norman "El Reno: Lessons from the Most Dangerous Tornado in Storm Observing History". Skip Talbot helped with this so you will recognize some of the maps as his.

Convective Chronicles does case studies on tornadoes and has one on El Reno. "The El Reno, OK, Tornado of May 31, 2013: A Case Study". This was very informative about the way a storm like this is spawned and its workings till it dies. What looks like unpredictability can all be explained.