NWS Raleigh Confirms an EF0 Tornado in Southwest Franklin County on June 18, 2013

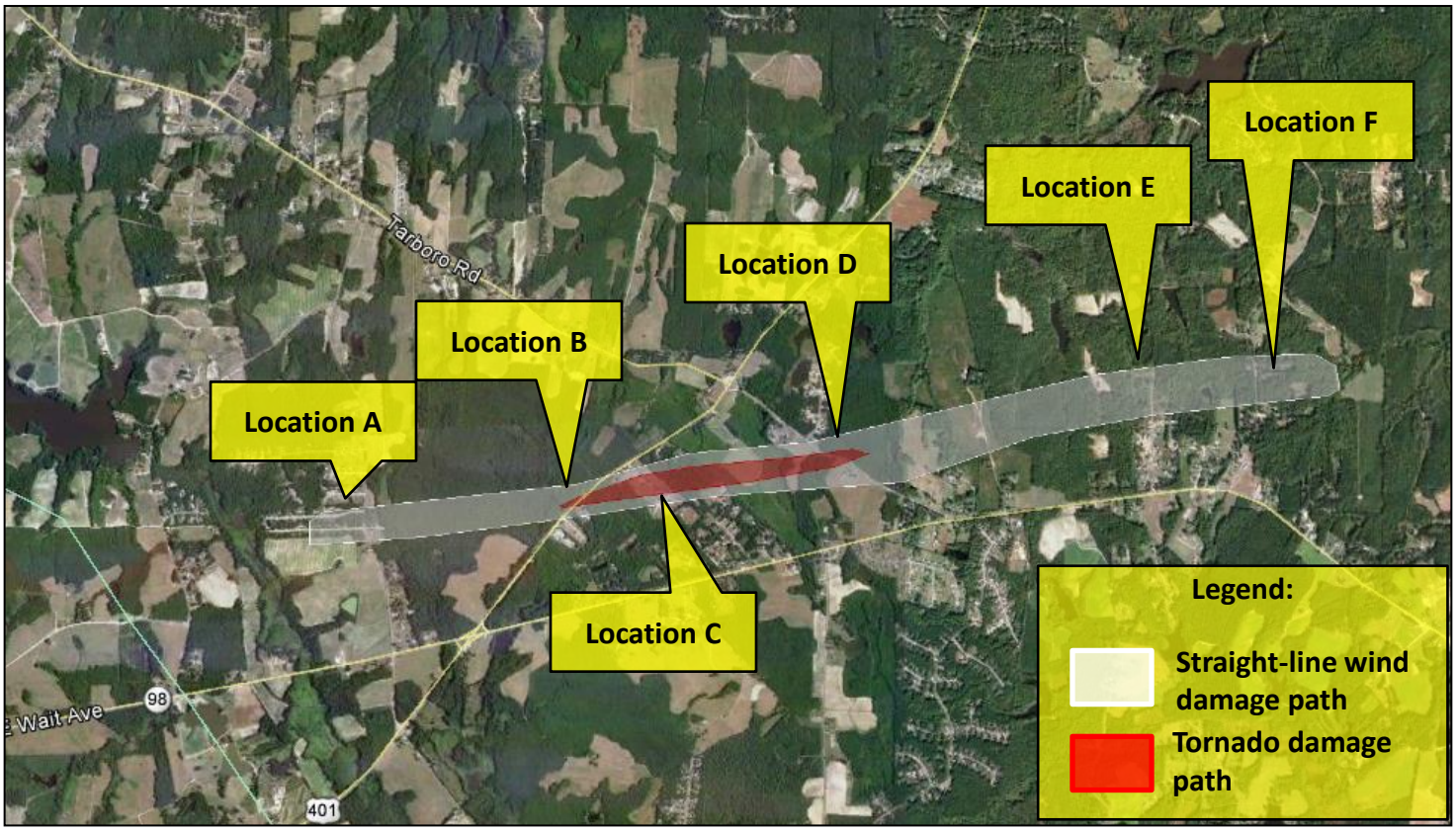
National Weather Service, Raleigh, NC

Report prepared on June 20, 2013

Event Summary

The National Weather Service in Raleigh, NC has confirmed that a tornado briefly touched down approximately 6 miles southeast of Youngsville, Franklin County, North Carolina around 6:30 pm EDT on June 18, 2013. Straight-line wind damage immediately preceded and followed the time that the tornado was on the ground, and the entire path length of damage, from combined straight-line wind and tornado damage, was approximately 3.6 miles. A tornado was on the ground for 1.25 miles, had an average width 75 yards, and was 150 yards at its widest. It is estimated that the tornado was on the ground between 3 and 4 minutes, approximately between 6:29 PM and 6:33 PM EDT. The maximum winds speeds were determined to be 85 MPH, which makes this a high-end EF0 tornado on the Enhanced Fujita scale.

Storm Path



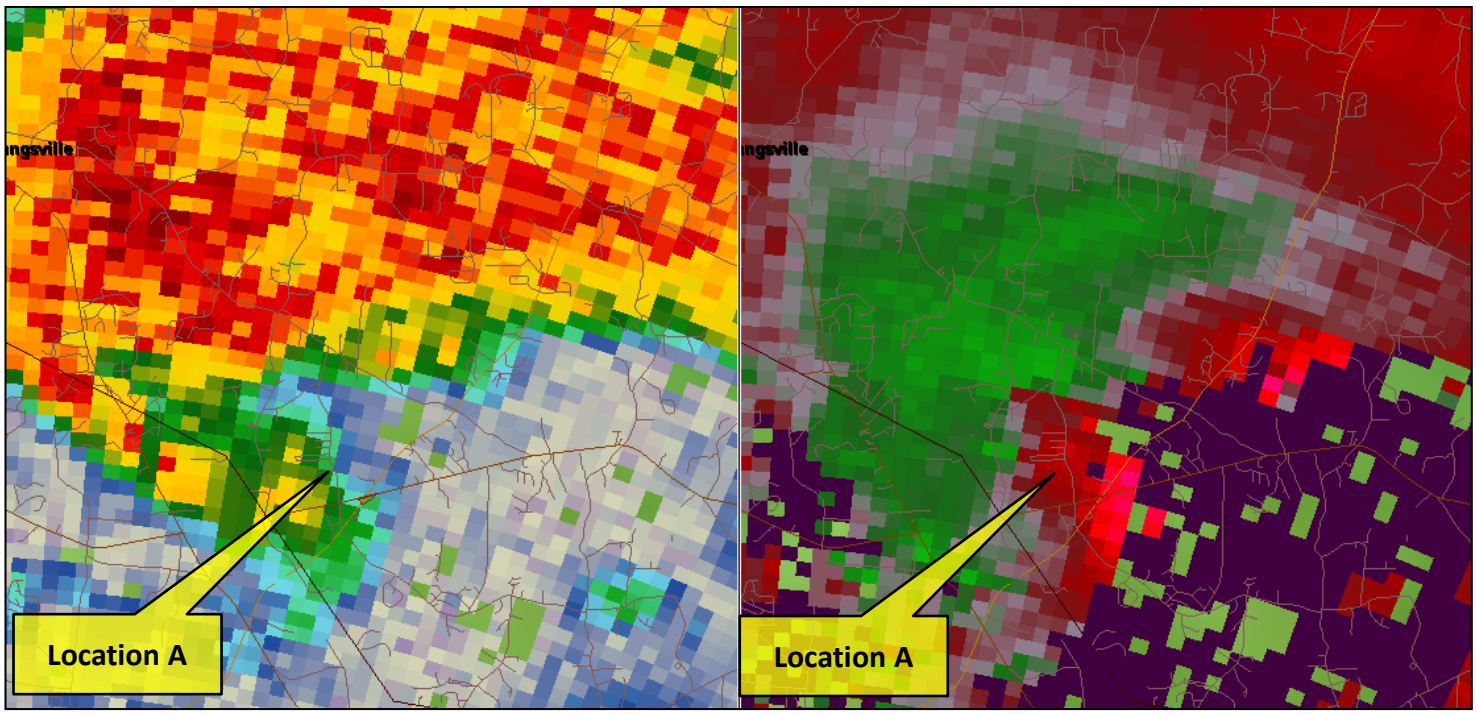
Damage at each location noted above will be highlighted on subsequent pages of this report.

Location A

Straight-line wind damage was first noted in a neighborhood near the intersection of Quail Drive and Sid Eaves Rd (35.9743/-78.4079). The damage consisted of dozens of downed trees, and a carport that was lifted and tossed across the street. A resident of the neighborhood who witnessed the entire event indicated that he saw a funnel beginning to descend over the area, but he was certain that it was not on the ground when the damage occurred. The survey team concluded that this area of damage was caused by rear-flank downdraft (straight-line) winds, prior to the tornado touchdown.

The carport shown in the picture on the right was originally situated in the driveway shown in the picture on the left

The KRAX radar data shown below (0.5 degree base reflectivity on the left and 0.5 degree base velocity on the right) corresponds to approximately 6:27 PM. Location A is noted on the images. Strong outbound velocity values (red) suggest powerful straight-line wind at the surface, likely due to the rear-flank downdraft. Also, while large scale rotation is noted, strong "gate-to-gate" values have not yet occurred at this time.



Location B

About one mile east-northeast of the aforementioned initial damage location, a more significant area of tree damage was noted along Highway 401, near the intersection of Thompson Lane. The damage here consisted of a large stand of trees that had been blown down, and the convergent arrangement of the downed trees suggested that the initial tornado touchdown occurred at this location (35.9757/ -79.39 32). The damage here suggested wind gusts with speeds of 80 MPH, which is an EF0 on the Enhanced Fujita Scale (EF scale).

The image above is a panoramic photo of the damage along Hwy 401.

Location C

The most significant damage of this particular event was noted in the Wyndfield neighborhood (35.9767/-79.3882), which is about 3/10 of a mile to the east-north east of the initial tornado touchdown. The tornado reached its widest point at this location, reaching a maximum width of 150 yards. The damage at this location consisted of manufactured homes that experienced partial uplift of roofing material, shingle damage, and siding damage. In addition, dozens of hard and soft wood trees were blown down. The damage here suggested wind gusts with speeds of 85 mph, which is a high-end EF0 on the EF scale.

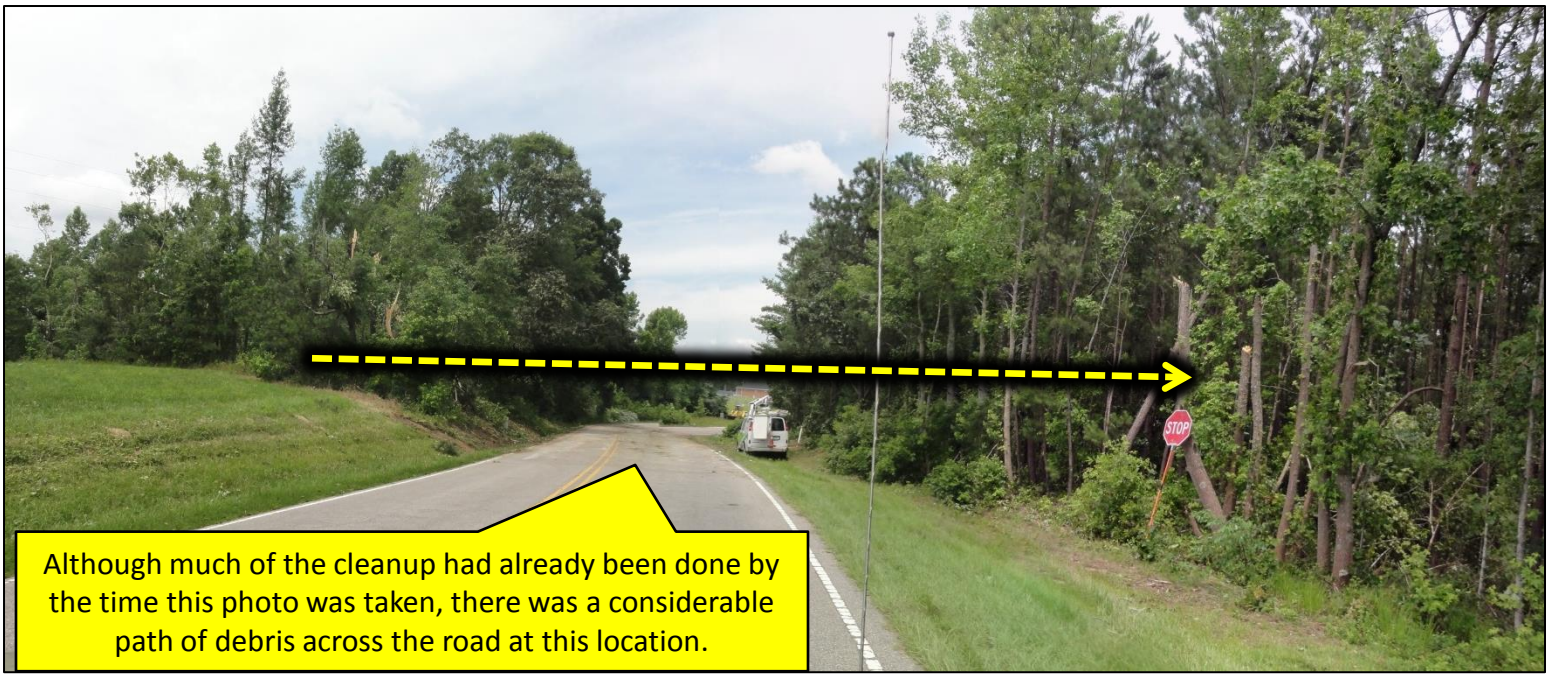
Location C continued

A large swath of trees were blown down immediately adjacent to and just east-northeast of the Wyndfield neighborhood. The arrangement of the downed trees yielded clues as to the nature of the wind directions, and suggested circulation and likely tornado damage.

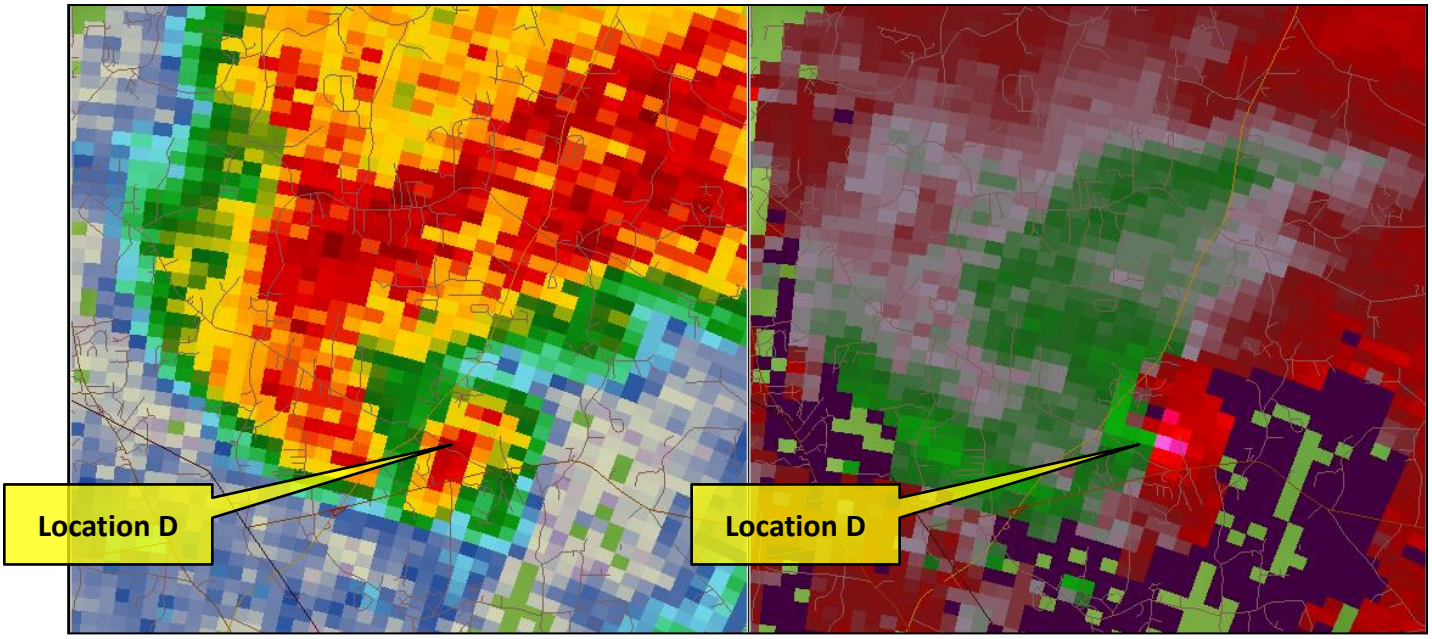
Location D on next page

Location D

To the east-northeast of this location, the tornado path appeared to narrow as it approached Tarboro Road near the Harris Chapel Baptist Church. At this location, numerous headstones at an adjacent cemetery were blown over, and once again dozens of trees were noted to be blown down. The tornado appeared to cross Tarboro Road just south of the Braeburn subdivision. The damage pattern among the trees just east of Tarboro Road suggested that the tornado had lifted at or just east of this location (35.9782/-78.3744), and the wind damage subsequently transitioned to a straight-line configuration. The damage at this location suggested wind gusts with speeds of 75 MPH, which is an EF0 on the EF scale.



The KRAX radar data shown below (0.5 degree base reflectivity on the left and 0.5 degree base velocity on the right) corresponds to approximately 6:32 PM. Location D is noted on the images. A gate-to-gate circulation is noted on the velocity data, along with a classic "hook echo". The damage survey noted however, that the tornado began to lift off the ground just to the east of where this gate-to-gate rotation signature is noted.



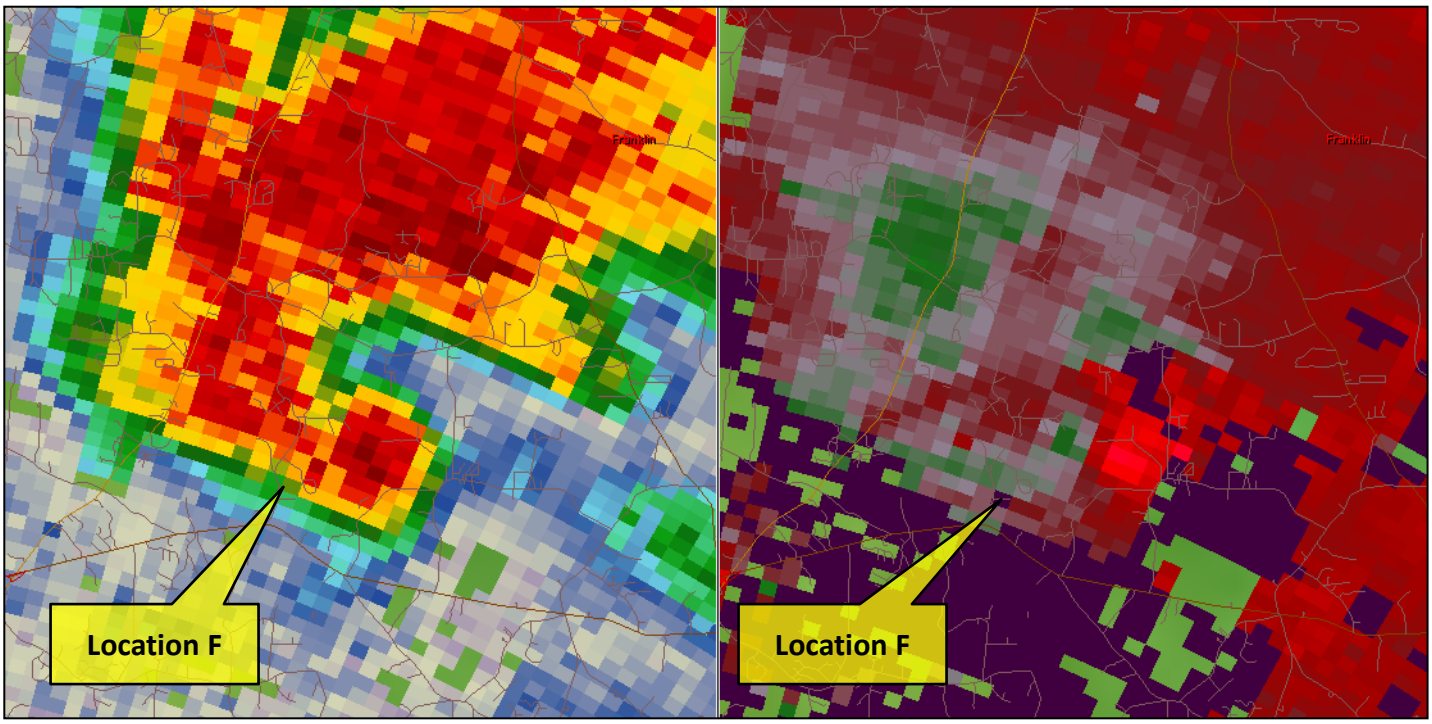
Locations E and F

Additional tree damage was noted to the east and northeast of where the tornado lifted, including numerous downed trees on Boxwood Drive (35.9826/-78.3546), and dozens of additional trees down on Clifton Pond Road just north of William Way (3 5.9821/-78.3477). The arrangement of the tree damage at these locations was more consistent with straight-line wind damage, likely caused by one last cycle of the rear-flank downdraft.

Tree damage on Boxwood Drive

Panorama of tree damage on Clifton Pond Road

The KRAX radar data shown below (0.5 degree base reflectivity on the left and 0.5 degree base velocity on the right) corresponds to approximately 6:36 PM. Location F is noted on the images. The strong gate-to-gate circulation has ended, and the outbound velocity is dominating, thus suggesting one last cycle of the rear-flank downdraft. This is consistent with the straight-line wind damage that noted at damage locations E and F.



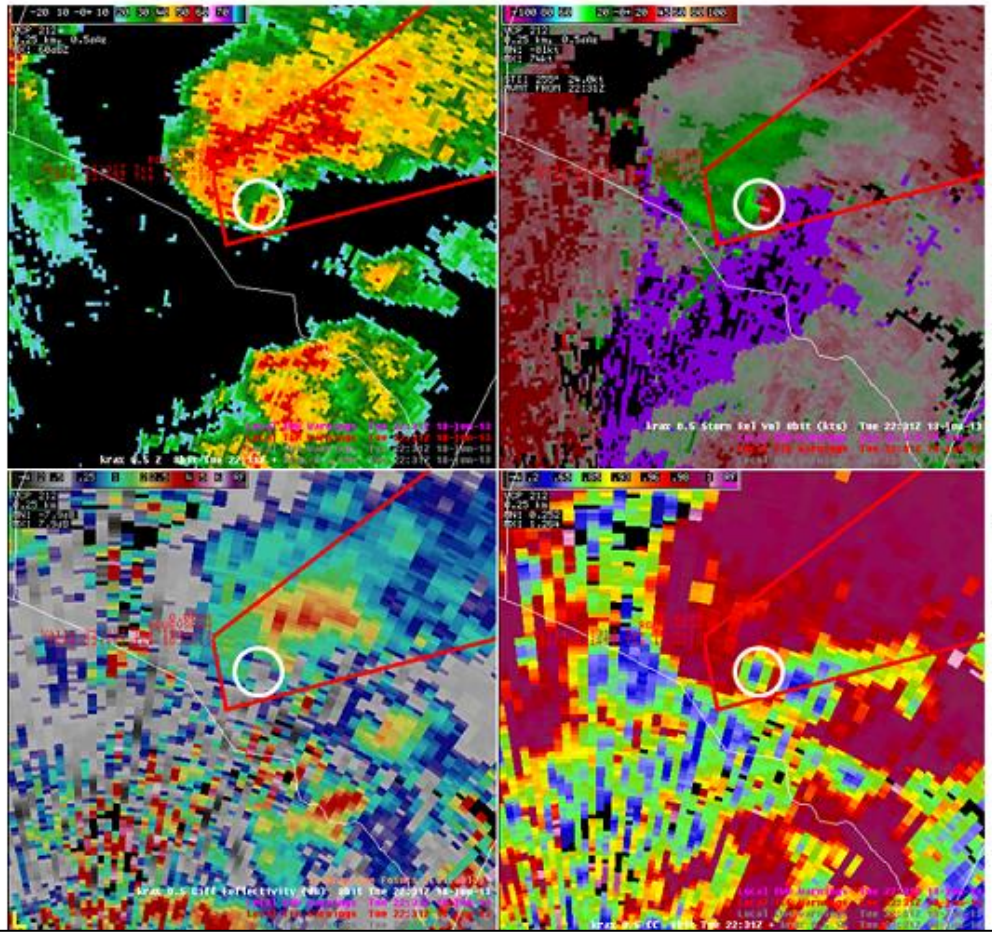
Other noteworthy items

- NWS Raleigh's KRAX Dual Pol Doppler Radar indicated a Tornado Debris Signature (TDS) associated with this tornado. This was one of the first times that such a signature has been detected with the KRAX radar since the Dual Pol upgrade was performed at the KRAX radar site. The TDS signature in Correlation Coefficient data helps to confirm that a tornado has touched down, based on the detection of debris.

Tornado Debris Signature (TDS)

KRAX WSR-88D 4-Panel Image from 2231 UTC on 18 June 2013

Base reflectivity values near the TDS range around 50 dBZ in a fairly classic "hook" signature.



Storm relative velocity values indicate 41kts of rotation (36 in/45 out) at 1200 ft AGL at a range of 20nm from the radar.

ZDR values are low and near zero but range around -1.0 dB indicative of vertical and horizontal objects with a slight bias toward the vertical.

CC values are very low around 0.6 with some values near 0.5 indicative of a mix of objects in the sky.

- The survey team spoke with many people in the storm-affected area who indicated that they received the tornado warning for this storm on their cell phones via the new Wireless Emergency Alerts (WEA) service. The alert on their phones prompted them to seek shelter. For more information about Wireless Emergency Alerts, please visit the following web site: http://www.nws.noaa.gov/com/weatherreadynation/wea.html The NWS Raleigh first issued a Tornado Warning for this cell at 6:14 PM EDT, providing at least 15 minutes of lead time for those affected.
- Finally, the NWS Raleigh survey team made extensive use of Twitter during the survey, and provided numerous live or on-scene tweets during the survey. This was the first time that NWS Raleigh utilized Twitter in this way, and so far, feedback has been very favorable. See appendix A for a list of the tweets provided during the storm survey, and an example of the positive feedback that has been received. You can follow NWS Raleigh on Twitter by visiting: https://twitter.com/nwsraleigh

Event Stats:	The Enhanced Fujita Scale classifies tornadoes into the following categories:
• Date: June 18, 2013 • Estimated Time: 6:30 PM EDT • Maximum EF-Scale Rating: EF0 • Estimated Maximum Wind Speed: 85 MPH • Maximum Path Width: 150 Yards • Average Path Width: 75 Yards • Tornado Path Length: 1.25 Miles • Beginning Lat/Lon of Tornado: 35.9757n / -78.3932w • Ending Lat/Lon of Tornado: 35.9782n / -78.3744w • Fatalities: 0 • Injuries: 0 • Tornado warning issued at 6:14 PM EDT, providing at least 15 minutes of lead time for those affected.	• EF0...WIND SPEEDS 65 TO 85 MPH. • EF1...WIND SPEEDS 86 TO 110 MPH. • EF2...WIND SPEEDS 111 TO 135 MPH. • EF3...WIND SPEEDS 136 TO 165 MPH. • EF4...WIND SPEEDS 166 TO 200 MPH. • EF5...WIND SPEEDS GREATER THAN 200 MPH.

For more information

To keep up-to-date on the weather across central North Carolina, please visit the NWS Raleigh online, on your phone, or on NOAA Weather Radio.

- Website: http://weather.gov/Raleigh
- Smart phones and mobile devices: http://mobile.weather.gov
- Facebook: https://www.facebook.com/US.NationalWeatherService.Raleigh.gov
- Twitter: https://twitter.com/nwsraleigh

For questions about this NWS Raleigh storm survey, contact Nick Petro, Warning Coordination Meteorologist, at Nicholas.Petro@noaa.gov

NWS Raleigh storm survey team:

- Nick Petro
- Terry Click

Special thanks to the NWS Raleigh staff who contributed to the report, including:

- Phil Badgett
- Katie Roussy
- Kathleen Pelczynski
- Shawna Cokley
- Jonathan Blaes

Appendix A

Tweets All / No replies

NWS Raleigh @NWSRaleigh 18h
The NWS Raleigh full report regarding the Franklin County tornado on June 18, 2013 can be found at: mesonet.agron.iastate.edu /wx/afos/p.php?… #ncwx
View summary

NWS Raleigh @NWSRaleigh 21h
NWS survey team headed back to the office. Be sure to look for our complete report on weather.gov/rah later today or early tomorrow.
Expand

NWS Raleigh @NWSRaleigh 21h
Many of the homes that were damaged experienced partial uplift of roofing material, shingle damage, & siding damage.
pic.twitter.com/HG7o10N2C1
Expand

NWS Raleigh @NWSRaleigh 21h
NWS Survey team is now at the Wyndfield Neighborhood off of Hwy 401 for media interviews. Will be here til 2:40 PM.
Expand

NWS Raleigh @NWSRaleigh 22h
We will be happy to do media interviews at this time. we are heading over to the Wyndfield neighborhood, and will be there soon.
Expand

NWS Raleigh @NWSRaleigh 22h
On ground for 1.25 miles. avg width 75 yards,150 yards at it's widest. Starting point 35.9757/-78.3932 ending: 35.9782/-78.3744
Expand

NWS Raleigh @NWSRaleigh 22h
Just wrapped up survey...here's what we found... EF0 Tornado with max winds of 85 mph.
Expand

NWS Raleigh @NWSRaleigh 22h
1 more place we're going to check out to find the path's end, then we should have prelim results and will be available for media interviews
Expand

NWS Raleigh @NWSRaleigh 23h
Getting a lot of eyewitness accounts stating that the funnel generally stayed at the tree-top level. Very consistent w/damage we're seeing.
Expand

NWS Raleigh @NWSRaleigh 23h
Some noteworthy tree damage at Junewood Ln and Boxwood Dr. Taking a closer look at this time.
Expand

NWS Raleigh @NWSRaleigh 23h
No damage noted in Braeburn.
Expand

NWS Raleigh @NWSRaleigh 23h
Obvious tree damage path across Tarboro Road. Checking out the Braeburn subdivision at this time.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
On to our next damage site...just to the ENE of the Wyndfield neighborhood.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
Trees always yield clues. This one suggests tornado touchdown due to the downed tree arrangement, next to Wyndfield.
pic.twitter.com/SCr4mOxWQq
Expand

NWS Raleigh @NWSRaleigh 19 Jun
Surveying the Wyndfield neighborhood at this time.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
While we are still trying to find a possible "touchdown" location, we estimate that wind speeds w/damage so far was as high as 75 mph.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
Examining damage at Hwy 401 and Thompson Lane.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
Leaving Quail/Sid Eaves. Lots of tree damage. Eyewitness here saw funnel but said it only descended to tree tops - consistent w/damage here.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
Examining some damage right now at the intersection of Quail Dr. and Sid Eaves Rd. Could be the starting point of a potential path.
Expand

NWS Raleigh @NWSRaleigh 19 Jun
NWS Raleigh survey team heading up to SW Franklin County. Estimating that we'll arrive near intersection of Hwy 401 & Tarboro Rd by 1045AM
Expand

NorthCarolinaEE @NorthCarolinaEE 22h
Very interesting and enlightening to follow @NWSRaleigh tweets as they survey yesterday's Franklin Co tornado damage. Thanks for your work.
Expand