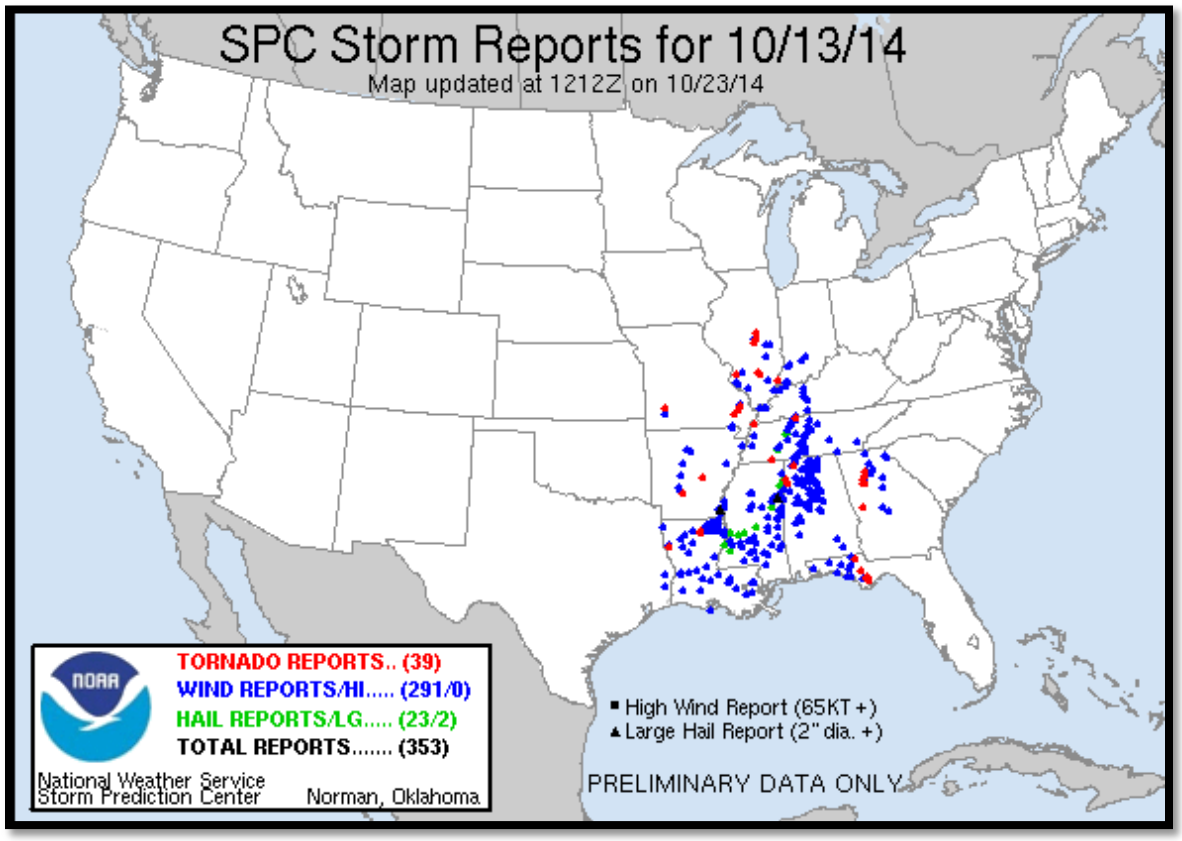


Reports of severe weather received by the Storm Prediction Center on October 13, 2014.

Event Overview:

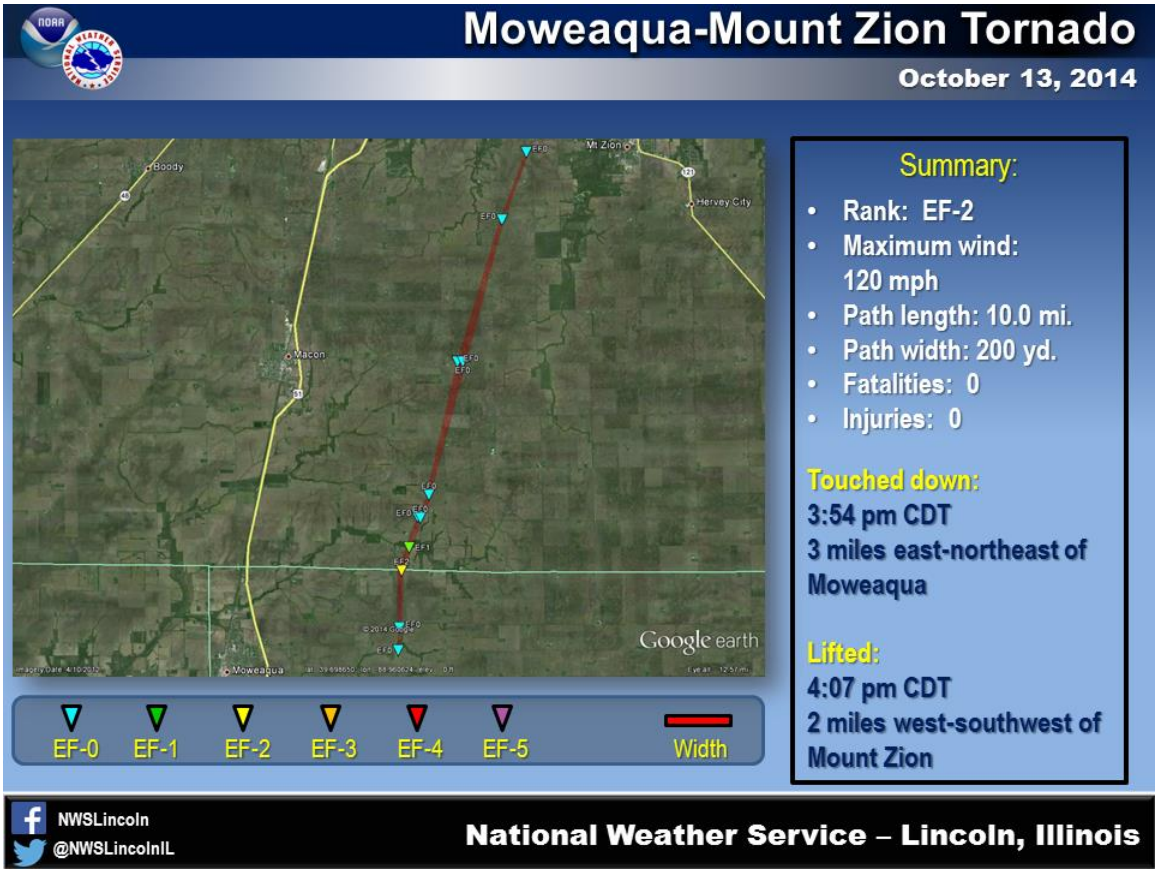
Severe weather occurred over a large part of the middle and lower Mississippi Valley on October 13, 2014, extending into parts of the southeast U.S. Many of these reports were of wind damage or high wind gusts, but tornadoes were also reported as far north as central Illinois. Click here for a listing of nationwide reports.

Synoptic Setup:

As a vigorous upper-level wave tracked southeastward across the Rockies, an area of surface low pressure developed over the Texas panhandle on Sunday, October 12th. The upper wave continued to amplify and eventually closed off from the prevailing jet stream winds to the north by Monday, October 13th. As a result, the forward speed of the system decreased markedly. The low pressure system gradually lifted northeastward, reaching northeast Missouri by Monday evening. Thanks to southerly flow through a deep layer of the atmosphere ahead of the slow-

moving system, copious amounts of moisture were transported northward from the Gulf of Mexico. Precipitable water values, which are a measure of the total amount of moisture contained within the entire depth of the atmosphere, climbed into the 99th percentile for this time of year by Monday afternoon and evening. With so much moisture available, locally heavy rainfall amounts of 1 to 1.50 inches occurred across much of the area. Widespread clouds and showers north of an advancing warm front kept the atmosphere rather stable across central Illinois for much of the day. Despite the lack of instability, the amplifying upper wave to the west created strong low-level wind shear. The increasing shear was enough to help a few of the thunderstorm cells become organized and begin rotating by mid to late afternoon.

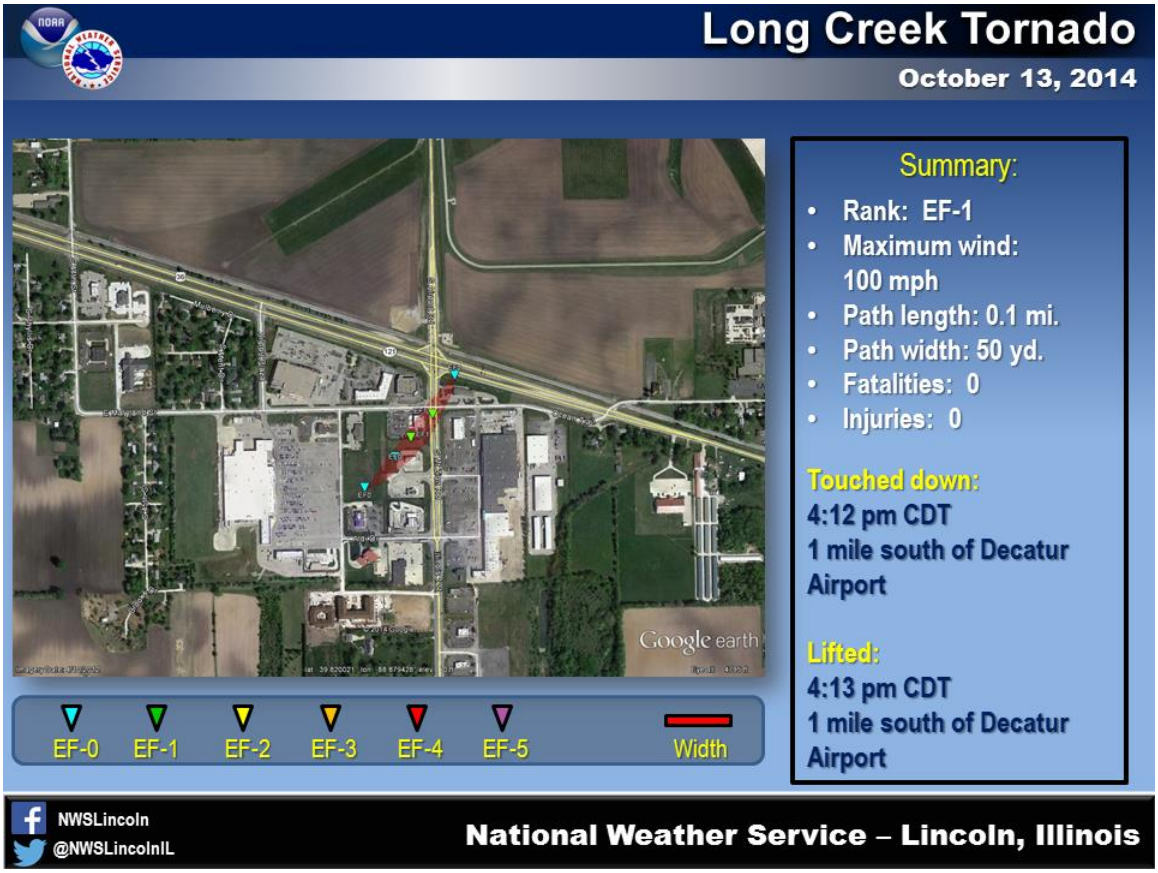
Tornado Details:



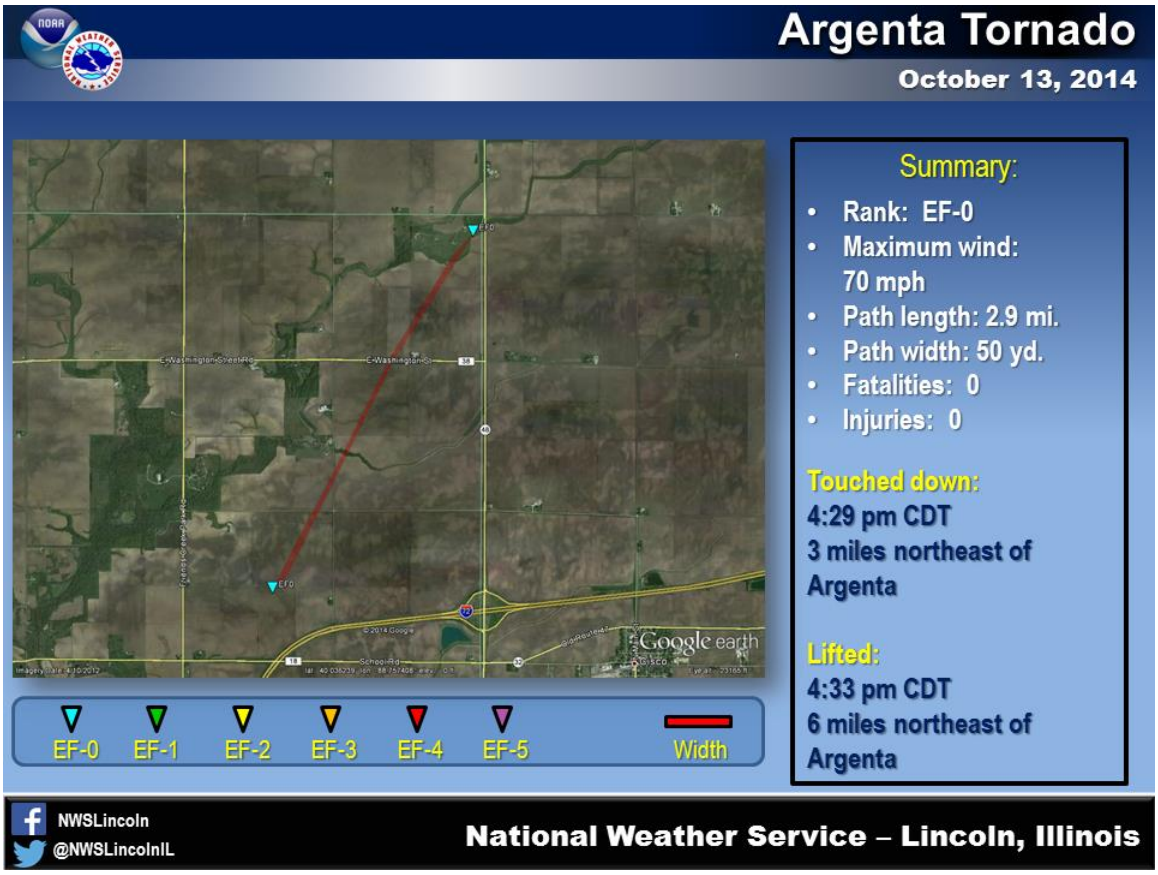
This tornado touched down in far northwest Shelby County, about 3 miles east-northeast of Moweaqua, along county road 1000E between roads 2800N and 2900N. Two machine sheds were destroyed here and trees were broken just to the north. About 20 acres of corn were flattened just to the south, but this was determined to be caused by rear-flank downdraft winds. From here, the tornado tracked north-northeast, and struck a farmstead along the Macon/Shelby County line just east of county road 1000E. The home sustained significant damage to its roof

and windows on the south side of the building, with damage to the attached garage. Several trees were snapped off within a few feet of the base, and several outbuildings were completely destroyed. The tornado peaked at EF-2 intensity at this location.

The tornado tracked into Macon County, crossing Long Grove Creek before curving a bit more due northeast. Several areas of corn and beans were observed to be flattened and bent at different directions from along Crosson Road, northeast past Walker Road, with the greatest crop damage along East Andrews Street Road between Cornthwaite and Sanner Roads. Continuing northeast, the last damage was observed to a barn roof located 2 miles west-southwest of Mount Zion, south of Elwin Road and just west of Karl Road.

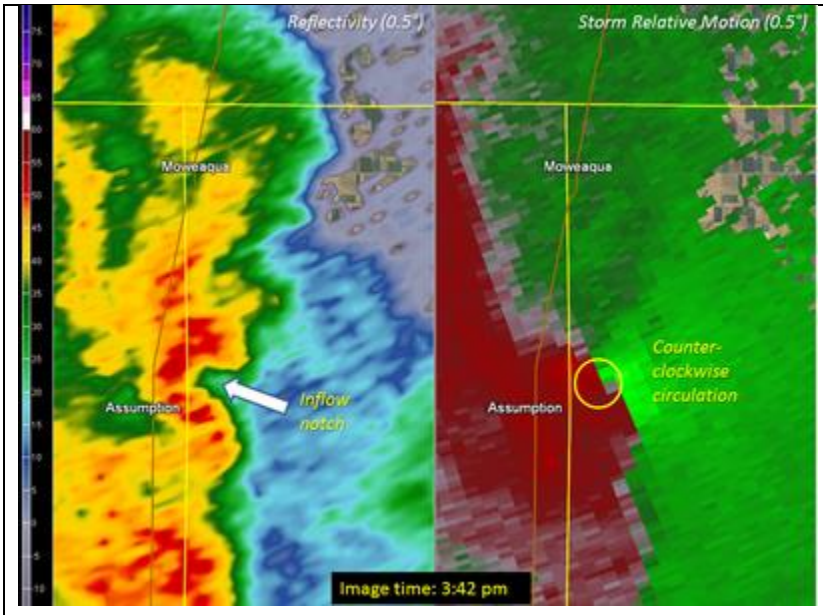


This brief tornado touched down south of the Decatur Airport along Illinois Route 121, just south of the US-36 intersection. A traffic signal mast was rotated about 90 degrees and broken. Power lines were downed in the area. Two trees were snapped off at the McDonald`s and a shed and dumpster were overturned at the Arby`s next door. The airport itself reported a peak wind speed of 63 mph around this time.



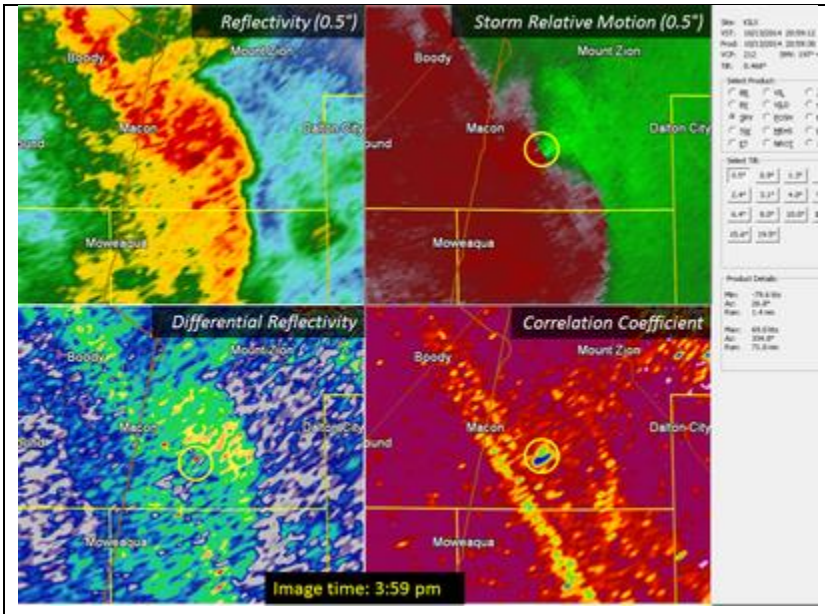
Storm spotters tracked this tornado from near the Friends Creek County Park near Duroc Road, northeast and reaching near the intersection of Macon, Piatt and De Witt Counties along Illinois Route 48 near Lake Fork. This tornado remained in open fields and caused no damage.

Radar Images:

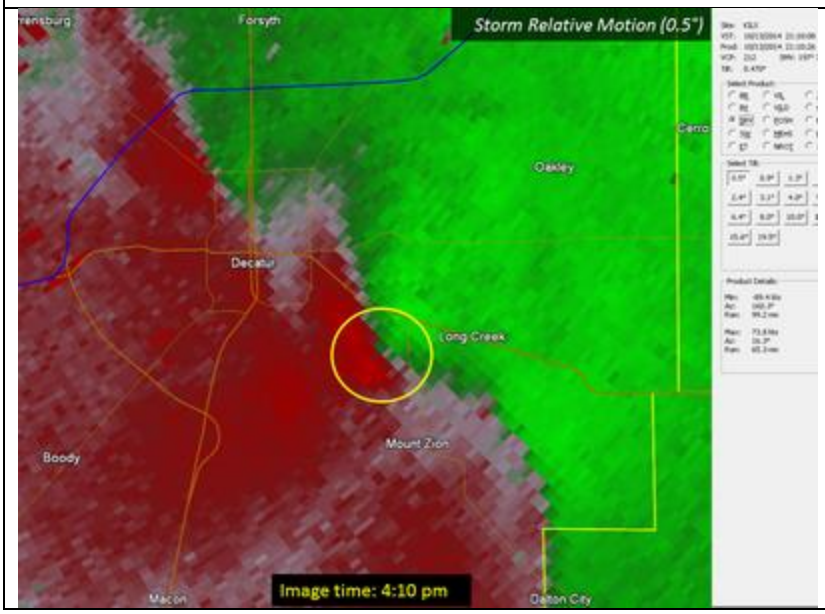


These radar images were taken at 3:42 pm, a few minutes after the tornado warning was issued for northwest Shelby County. On the left is the regular reflectivity image, which shows what meteorologists refer to as an "inflow notch" (area of low precipitation intensity, which shows an area of strong inflow winds). On the right is the storm relative motion product from the radar, which shows the wind flow. Green colors are indicating winds moving toward the radar (located off the northwest corner of the image), and red colors are moving away from the radar. The area inside the circle, with the red and green immediately adjacent to each other, shows a circulation is developing.

These images were taken at 3:48 pm, and are a bit higher in elevation (0.9 degrees vs. 0.5 degrees on the previous picture). The notch has filled in, but there is an area of lower reflectivity (green shades) completely surrounded by high reflectivity (yellow/red shades). This is referred to as a "bounded weak echo region", which is indicative of potential tornadic activity. The circulation on the right side continues to intensify, as indicated by the brighter greenish-white shades.



This image from 3:59 pm shows the storm about halfway between Moweaqua and Mount Zion. It shows 4 different radar products. The top left and top right are the reflectivity and storm relative motion products, as we have been discussing. The two lower panels are products resulting from the dual polarization upgrade to our radar a couple years back. The lower left image is called "differential reflectivity" (ZDR), and is a ratio of the reflected horizontal and vertical parts of the radar beam. The lower right image is called "correlation coefficient" (CC), and is a measure of how the horizontal and vertical pulses of the radar beam are behaving. Low values of CC are an indication of non-precipitation targets detected by the radar beam. The location of the lower CC values line up with the location of the circulation, helping to give confidence to the radar operator that a tornado is on the ground.



Storm relative motion image from 4:10 pm This storm relative motion image from 4:10 pm shows the storm coming into the Long Creek area. The intensity of the circulation is weaker than it had been, but it is still present. A brief touchdown of a tornado was reported a minute or two later.

Photos: