

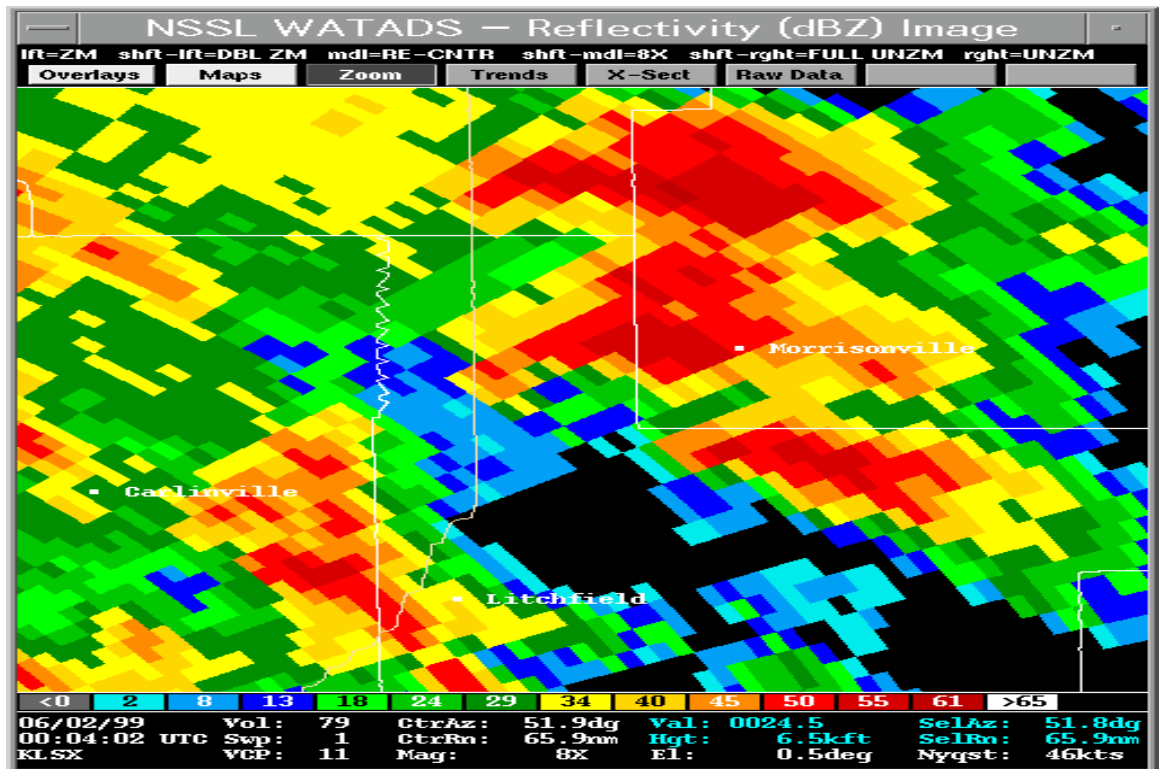
Southwestern Illinois Tornado Event

June 1st, 1999

Overview

Strong to severe thunderstorms moved across the bi-state region during the late afternoon and early evening June 1st, 1999. A number of these storms evolved into tornado producing supercells while other storms produced damaging winds and hail. This severe storm event was rather challenging since three supercells containing moderate to strong mesocyclones moved from the southwest across the southwest sections of our County Warning Area (CWA) between 6:45 and 7:30 PM CDT. During this same period, three other supercells rapidly formed over the northeast quadrant of our CWA (far northeast Macoupin/northern Montgomery counties in Illinois). This case was particularly challenging since we were focusing our energies on nearly opposite ends of our CWA. Two of the three supercells to our southwest spawned tornadoes over Phelps and Crawford counties in south-central Missouri. At nearly the same time, two of the three supercells over northern Montgomery county in central Illinois also produced two tornadoes (near or after 7:00 PM CDT). A fourth supercell rapidly formed after 7:40 PM CDT and developed yet another tornado over parts of eastern Fayette county Illinois just after 8:00 PM CDT.

View of WSR-88D reflectivity imagery taken at 0004 UTC (7:04 PM CDT) revealed the presence of three supercells over northern Montgomery, southwest Christian and far southeast Sangamon counties in central Illinois.



Damage Surveys

This report is a brief overview of the damage survey information and WSR-88D radar images showing the evolution of the tornadic-producing storms over parts of central and south-central Illinois. The morning after the event, Ron Przybylinski (former SOO) and Scott Truett (former Lead Forecaster) surveyed the tornado damage over northern Montgomery county Illinois, while on the following day, Ron and Mark Britt (Forecaster) surveyed the tornado damage over eastern Fayette county in Illinois.

The Waggoner, Illinois Tornado

Maximum Rating: F3

Maximum Estimated Wind Speed: 250 MPH

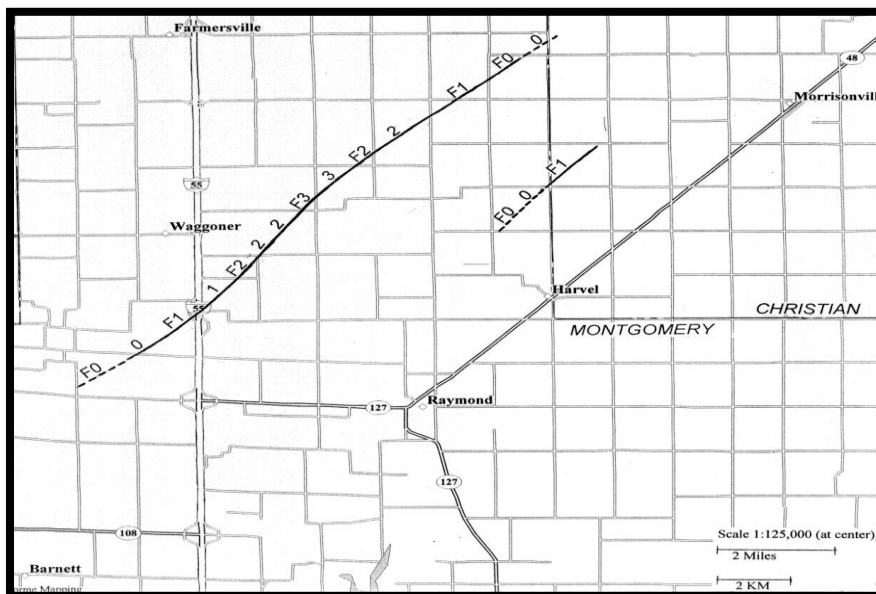
Path Length: 10 miles

Fatalities: 1

Injuries: 4

The first of several tornadoes initially touched down around 2357 UTC about 1 mile southwest of the rest area on a farmstead (6 miles west of Raymond, Illinois).

Several farm implement buildings and a corn silo sustained minor damage at this location southwest of the southbound rest area. A few minutes later, the tornado struck the southbound I-55 rest area overturning or tossing several large trucks across the parking and grass areas. Several windows from the rest area's main building were severely damaged. Over the southern part of the rest area several large trees were uprooted or snapped. The orientation of the fallen trees suggested a convergent damage pattern often typical with tornadoes. One fatality occurred while two other truck drivers were injured. Tornadoic damage was rated F1 intensity.



Detailed damage map of the tornado tracks near Waggoner, Illinois and Harvel, Illinois on June 1st, 1999.

Swirl marks (suction vortex marks) in the soybean and corn fields suggested that multiple suction vortices were apparent and orbited around the core of the tornado. Photos taken (not shown) northeast from the northbound rest area off from Interstate 55 show the presence of three vortices rotating around the core of the tornado. The tornado width remained between 200 and 250 yards wide. A north-south row of large pine trees on the west side of the plot were blown down and laid southeast further suggesting the presence of a convergent damage pattern often associated with tornadoes. The strength of this tornado was also revealed when a large pickup truck was tossed in the air and displaced over 1/2 mile to the northeast of the farmstead. The engine from the truck was ejected and tossed an additional 50 yards downwind (to the northeast). The path was 200 to 250 yards wide while damage associated with the tornado was rated F3 intensity.

The tornado continued to move across the flat farmlands of northern Montgomery county for another 5 miles before dissipating near the Montgomery - Christian county line or 6 miles east of Farmersville, Illinois. The overall length of the Waggoner tornado damage track was approximately 10 miles was damage intensity was rated F3 at its mid-point in its lifecycle.

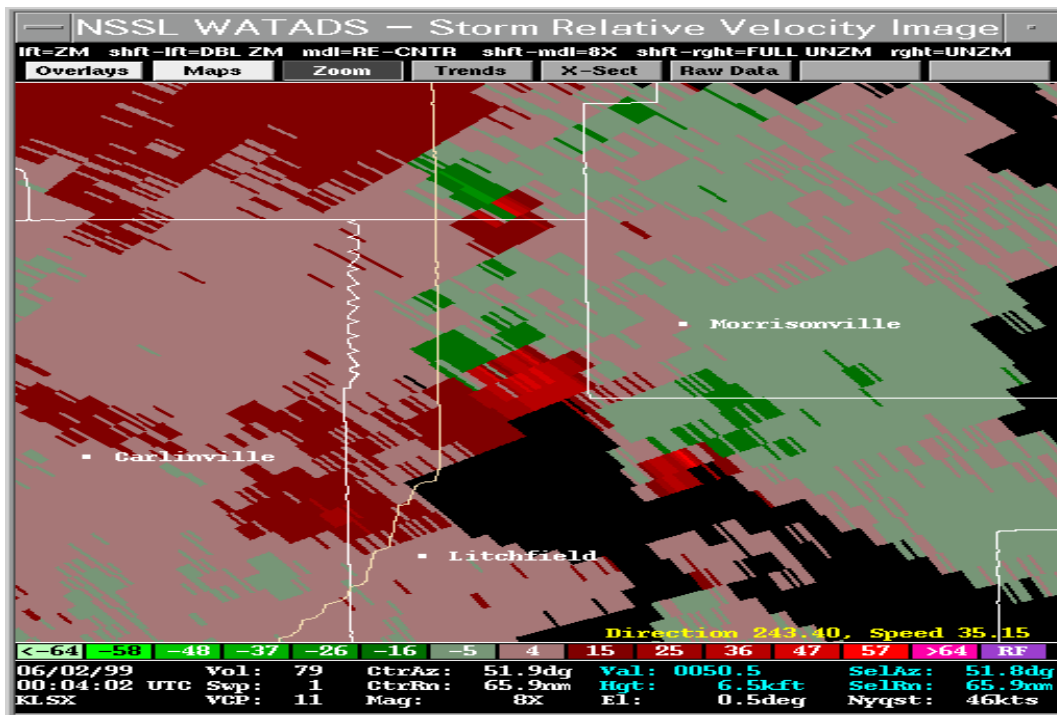
Damage Surveys

The Harvel, Illinois Tornado

Maximum Rating: F1
Path Length: 50 yards
Fatalities: None
Injuries: None

A second tornado, identified as the Harvel, Illinois tornado, initially touched down approximately 2 miles north-northwest of Harvel, Illinois or 3.5 miles south of the first tornado track between 7:10 and 7:15 PM CDT. The damage to this tornado was minimal in Montgomery county Illinois before crossing into southwest Christian county. The overall damage track was 50 yards while damage intensity was rated F0.

Supercells are severe storms which are known to contain persistent rotating updrafts. The reflectivity pattern showed well-defined hook-shaped echoes along the southwest flanks of each storm. Corresponding storm-relative velocity imagery taken at this time (0004 UTC) revealed three mesocyclones (vorticity centers) located near the southern flank of each hook echo. The strongest circulation noted with the center supercell was responsible for spawning the long-track tornado over the panhandle of Montgomery county Illinois. This mesocyclone also appeared to spawn the second tornado which formed northwest of Harvel, Illinois and traveled northeastward along and northwest of Illinois Route 48 northwest of Morrisonville, Illinois. One possible cause of the center storm becoming tornadic was due to outflow boundary interaction with the rear flank of this storm. The supply of baroclinic-generation of horizontal vorticity associated with an accelerated outflow boundary from a line of convection to the west likely interacted with the western flank and updraft center of the center storm thus causing the vortex tube to tilt, stretch and spawn a tornado. It is interesting to point out that circulation centers which rapidly developed with the adjacent storms between 2358 (6:58 PM) and 0004 (7:04 PM) were also likely the result of outflow boundary - isolated storm interactions.



Plan view of WSR-88D storm-relative Doppler velocity imagery taken at 0004 UTC (7:04 PM CDT) revealed the presence of three supercells over northern Montgomery, southwest Christian and far southeast Sangamon counties in central Illinois.

Damage Surveys

The St. Elmo, Illinois Tornado

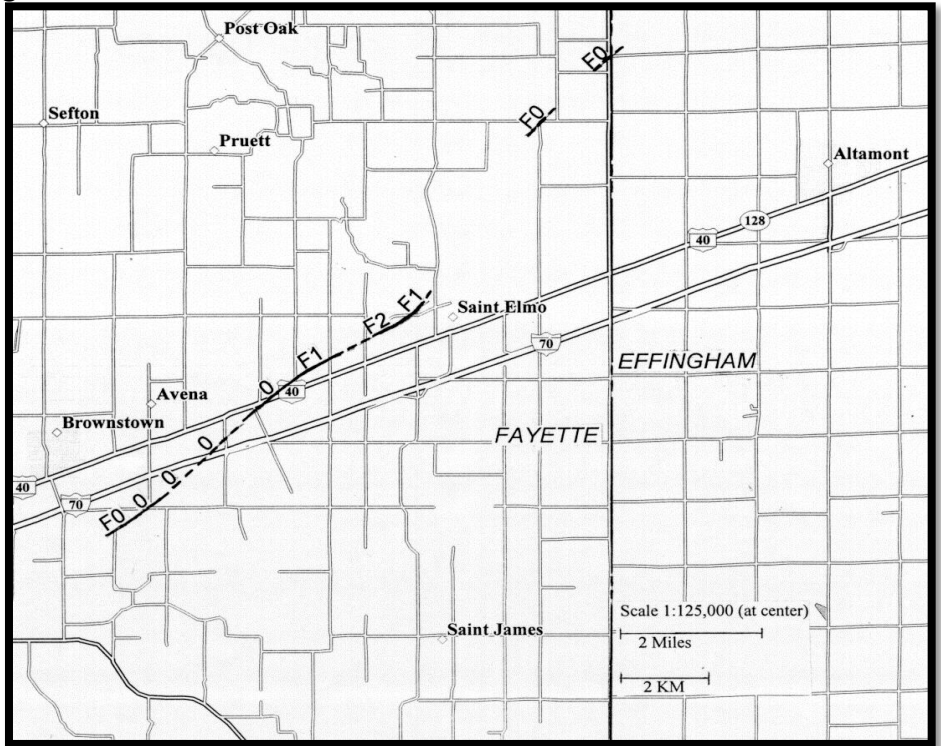
Maximum Rating: F2

Fatalities: None

Injuries: None

The tornado initially touched down at approximately 0100 UTC (800 PM CDT) 1.5 miles southeast of Brownstown, Illinois. Two large machine sheds at this location sustained minor roof and side damage. A farm house 100 feet away sustained very little damage. The width of the damage area was less than 50 yards while damage intensity was rated F0. The vortex briefly lifted and touched down a second time 2 miles southeast of Brownstown, about 1/4 mile south of Interstate 70.

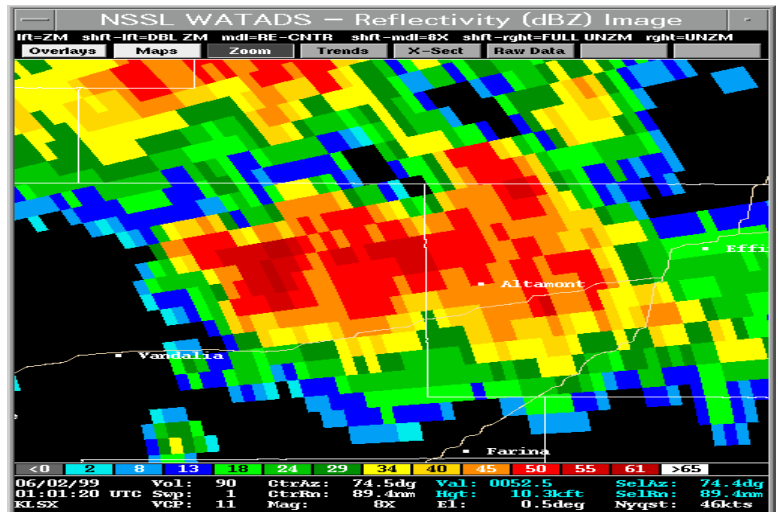
Several trees were either uprooted or snapped at the base at this location.



Detailed damage map of the tornado track near St. Elmo, Illinois on June 1st, 1999.

The orientation of the fallen trees suggested a convergent damage pattern. The tornado crossed Interstate 70 overturning one semi-truck on the west bound lanes of the highway. The driver of the truck sustained minor injuries. The tornado briefly lifted just north of the interstate then dropped a third time causing tree damage near U.S. 40 and extensive damage to a section of large greenhouses, 2 miles southwest of St. Elmo, Illinois. The width of the damage track was approximately 100 yards while the damage over the area was rated the lower-end of F1 intensity.

Plan view of WSR-88D reflectivity imagery taken at 0101 UTC (8:01 PM CDT) showed the presence of a hybrid supercell having multicellular characteristics over eastern Fayette County Illinois. Multiple high-reflectivity cores (55 - 60 dBZ), and weak echo notches (inflow notches) along the southern flank of the storm can be seen in the 0101 UTC reflectivity plan view (0.5° elevation slice).



Damage Surveys

The tornado lifted again and dropped a fourth time destroying a large warehouse on the western edge of St. Elmo. Several large steel I-beams supporting the warehouse were severely twisted or snapped at the base of the foundation while sections of the warehouse were scattered several hundred yards downwind (northeast) from the initial site. The tornado destroyed a 300 foot radio tower then continued to travel northeast completely destroying one house trailer and damaging three homes. One home was partially lifted off its foundation while a section of roof from a second home was removed. A large house trailer located 40-50 yards east of the three homes was completely destroyed. Only the base frame of this trailer remained intact. Several large trees (5 feet in diameter at the base) near the homes were either uprooted or snapped at the base of the trunk.

The overall downed trees showed a convergent pattern with the center axis aligned southwest-northeast 20 to 50 yards north of the three homes. The damage path over this area ranged from 75 to 150 yards while the damage suggested F1 to the lower end of F2 intensity.

The tornado lifted again and briefly touched down a fifth time 3 miles north-northeast of St. Elmo. At this farmstead only minor damage was observed to one machine shed and a few downed trees. The overall length of the damage path was 50 yards, 30 yards wide and the damage suggested F0 intensity. The funnel briefly dropped a sixth time near Illinois State Route 128 (4 miles north of U.S. 40) on the Fayette - Effingham county line. Only minor tree damage was noted at this location.

It is interesting to point out from our damage surveys that continuous tornadic damage tracks were observed across northern Montgomery County Illinois while the damage path across eastern Fayette County Illinois was intermittent. It is difficult to say why we observed continuous tracks across Montgomery county Illinois and intermittent damage near St. Elmo. However, one possible reason is the absence of a clearly defined external outflow boundary coming in contact with the St. Elmo, Illinois tornadic storm as compared to the outflow boundary - isolated storm interaction seen over northern Montgomery county.



Greenhouses destroyed by tornado about 2 miles southwest of St. Elmo, Illinois.

Damage Surveys



Warehouse destroyed by tornado on western edge of St. Elmo, Illinois.



Debris in a tree on western edge of St. Elmo, Illinois.



Please note that while the severe weather data presented in this event synopsis has been quality controlled, it is still considered unofficial. Official reports & statistics for severe weather events can be found in the **Storm Data** publication (<http://www.ncdc.noaa.gov/IPS/sd/sd.html>) or **Storm Events Database** (<http://www.ncdc.noaa.gov/stormevents/>), available from the National Centers for Environmental Information (NCEI) web page [formerly the National Climate Data Center (NCDC)].

More detailed tornado track information can be accessed using the National Weather Service Damage Assessment Toolkit for all tornadoes beginning in 2012. <https://apps.dat.noaa.gov/StormDamage/DamageViewer/>

Any questions regarding this event review should be address to w-lsx.webmaster@noaa.gov