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Tornadoes Take Aim on Central and Southeast Illinois

By Chris Miller, Warning Coordination Meteorologist

The drought of 2005-06 broke with a bang, when numerous early season tornadoes descended upon central and southeast Illinois. The “tornado season” started early, when a twister cut a short path in rural area about one mile south of Oconee, in southwest Shelby County at 8:02 AM on January 2.

A series of 9 tornadoes ripped through central Illinois, in a two hour period, between

7:22 PM and 9:25 PM, on Sunday, March 12. The five F2 and four F1 tornadoes traveled across more than 107 miles of land in Scott, Morgan, Sangamon, Logan, Macon and DeWitt counties. The supercell thunderstorm that produced the nine tornadoes, traveled from northeast Oklahoma to eastern Michigan, March 12-13. The 17 hour, 850 mile track was the longest recorded supercell in U.S. history. Springfield bore the brunt of this storm when numerous homes



and business were damaged or destroyed by two F2 tornadoes that cut a path through the southern part of the city. Early warnings, with lead times of more than 30 minutes, along with excellent communications between spotters, the Sangamon County Office of Emergency Management, the Springfield Fire Department and the National Weather Service, contributed to no loss of life and only 19 injuries. This path was very similar to the path of an F3 twister that did extensive damage and killed 2 people on June 14, 1957.

The next big tornado outbreak was also on a Sunday – April 2. A total of 25 tornadoes descended upon central Illinois in less than two hours, during the late afternoon. Two tornadoes moved across the southwest and east sides of Springfield, close to the tracks from three weeks prior. These tornadoes were weaker, and much shorter lived, resulting in less damage. The hardest hit areas were within the city of Taylorville and near the town of Macon. A total of 36 tornadoes were reported in Illinois that day, the second highest number of tornadoes in a single day. The largest tornado outbreak was April 19, 1996, when 41 twisters sliced across the state.

Two weeks later, the string of Sunday tornado outbreaks continued, when 9 tornadoes affected east central and southeast Illinois on April 16 – Easter Sunday. The strongest storm that day moved from Effingham into Jasper County, producing two F2 tornadoes – one near Dieterich, and another near Wheeler. One highly photographed tornado crossed Interstate 57 between Mattoon and Arcola, resulting in a moment to remember for many holiday travelers. (Photo at right taken by Jeff Abell.)



The spate of tornadoes across Illinois in the month of April broke a record for the most reported twisters in a month, with 55. The previous record of 46 was set in 1998. The

average for Illinois in the month of April is only 8! The 25 tornadoes reported in the previous three months of the year, brought the total to 80 for the state, as of April 30th.

This already ranks fourth on the all time list for most tornadoes in the state during a year! The highest total was in 2003 when 120 were reported, followed by 107 in 1974, and 99 in 1998. Typically, 15 tornadoes are reported each year in Illinois between June and December, so the tornado season is far from over!

Anatomy of a Severe Weather Outbreak

By: Chris Geelhart, Hydrometeorological Technician

Ever wonder what happens at the NWS office during a severe weather outbreak? Here is a review of what happened at the Lincoln office during the March 12 outbreak.



During severe weather events, staff will often divide into "sectors", with specific people focusing on certain areas. In the above image, Chris Miller and Kirk Huettl (lower left) focus on the supercell storm headed for Springfield. Dan Smith (blue sweatshirt), who is the overall shift leader at this time, coordinates with Ernie Goetsch and Chris Geelhart, who are monitoring severe weather potential elsewhere across central Illinois.

- **11:50 pm March 11:** The Storm Prediction Center (SPC) issues their "Day 1" outlook, which included all of central Illinois in a "High Risk" of severe weather for March 12.
- **12:30 am March 12:** NWS staff sends an E-mail to emergency managers and the media, notifying them of planned conference calls to review the severe weather potential. Due to the time the E-mail was sent, and because of the day of the week (Sunday), it is decided to hold two calls, 2 hours apart, to catch as many people as possible. E-mails are also sent to participants in the Significant Weather Observer Program (SWOP), advising them of the upcoming situation.
- **10:30 am:** The SPC requests 2 extra balloon launches (noon and 3 pm) from the Lincoln office, to obtain updated critical upper-air data for the area.
- **11:30 am:** The first special balloon launch takes place, for the scheduled observation time of noon.
- **11:45 am:** The SPC initiates a conference call with the NWS offices in Lincoln, St. Louis, Kansas City, Davenport IA, Springfield MO, Topeka KS, and Wichita KS. SPC notifies the offices that Tornado Watch #73 will be issued, in an area extending from eastern Kansas to central Illinois. The offices coordinate with the SPC on the counties to be included in the watch. The watch is valid for an unusually long 10 hours, until 10 pm.
- **Noon:** NWS staff conducts the first conference call with emergency managers and media, briefing them on the severe weather potential for the afternoon and nighttime hours. Three off-duty NWS employees arrive between noon and 12:30 pm to assist in severe weather operations.
- **12:20 pm:** The Lincoln NWS issues its first Severe Thunderstorm Warning of the day, for Cass, northern Morgan, and northwest Scott counties in west central Illinois. The storm had been producing severe weather as it moved out of Missouri into Illinois.
- **2 pm:** The second conference call is conducted. It is decided during the call that a 3rd conference call will be conducted at 6 pm, closer to the time of the storms' arrival in Illinois. Another off-duty forecaster is brought in.
- **2:30 pm:** The second special balloon launch of the day is conducted. The regular evening shift data acquisition staff member is brought in a couple hours early to relieve the morning shift, who had been working since 2:30 am.
- **4 pm:** The evening short-term forecaster arrives. None of the scheduled day shift forecasters leave at this time.
- **5:30 pm:** The meteorologist-in-charge arrives to assist with the expected severe weather. An electronics technician is also brought in, to be ready to fix any critical systems that may fail during the event.
- **6 pm:** The warning coordination meteorologist arrives, relieving one of the forecasters called in at noon. The day shift's long term forecaster conducts the third conference call of the day. At this time, the supercell of interest is near the Mississippi River, having crossed Missouri from southeast Kansas during the afternoon.
- **7 pm:** Another off-duty forecaster is brought in, relieving one that was called in several hours ago. Staffing at this point consists of 9 NWS personnel and 3 HAM radio operators. Normally at this time of evening, there would only be 2 people at the office.
- **7:11 pm:** The Lincoln NWS issues its first Tornado Warning of the evening, for southern



Volunteer HAM radio operators are an important part of the severe weather operation. They coordinate with the individual counties to provide information to spotters in the field, and to receive real-time reports from the storm spotters. In this image, Gerald Hubrich, Devon Vannoy (KB9ZQS), and Rick Kempf (WD9HRU) operate the HAM radios at the office.

Scott and southern Morgan counties. The storm in question had been producing severe weather across its entire track through Missouri. It is later determined that a tornado touched down in northwest Greene County at 7:15 pm, moving into Scott County at 7:29 pm, and into Morgan County at 7:36 pm.

- **7:44 pm:** A new Tornado Warning is issued for much of Morgan and Sangamon Counties, as far east as Springfield. 5 updated statements are issued on this storm over the next 30-40 minutes.
- **8:20 pm:** NWS staff begins frequent live broadcasts on the Springfield NOAA Weather Radio station, warning of the impending tornado threat for the Springfield area.
- **8:25 pm:** As the tornado moves into the southwest side of Springfield, a new Tornado Warning is issued for northern Sangamon and southern Logan Counties. Around this time, the SPC conducts a conference call with the NWS offices in Lincoln, Chicago, Milwaukee, Davenport, Kansas City, St. Louis, and Springfield MO, regarding the upcoming Tornado Watch #77, which runs until 4 am.
- **10:39 pm:** The initial supercell, which originated in northern Oklahoma, is about to leave the Lincoln NWS coverage area, and into the Chicago coverage area. However, the night is not over, as new severe thunderstorms begin moving into west central Illinois.
- **11:30 pm:** With the severe weather still ongoing, another special balloon launch is done.
- **12:45 am March 13:** One of the original day shift forecasters, who has been on duty since 8 am March 12, prepares to leave after nearly 17 hours at the office. His replacement is a forecaster who just left at 6 pm. Another forecaster, who left at 7 pm, is also called back to the office.
- **1:21 am:** The second round of severe weather approaches the Springfield area, with a Tornado Warning issued until 2 am. This warning is later extended until 2:30 am.
- **2:30 am:** The warning coordination meteorologist coordinates with the Illinois Emergency Management Agency on the weather situation. The science and operations officer, who had left at 6 pm, comes back in to relieve him.
- **3:50 am:** The SPC issues Tornado Watch #85, this one from east central Illinois eastward to the Ohio border.
- **5:54 am:** The Lincoln NWS issues its final severe thunderstorm warning of the event, for southeast Clay and Richland counties. This is canceled at 6:35 am.
- **7:35 am:** The remaining Illinois counties are removed from the tornado watch.

Although the weather on March 13 was much quieter, this was not the end for the staff. Several staff members went to conduct tornado damage surveys, while the ones remaining in the office had to contend with upwards of 2 dozen media interviews, as well as contacting emergency managers for updated severe weather reports.

Lightning - The "Underrated" Killer

By: Chris Miller, Warning Coordination Meteorologist



Numerous thunderstorms have already impacted Illinois this year, resulting in dozens of tornadoes, wind damage and large hail. Despite all of these dangerous elements of severe storms, there is something that often gets overlooked – lightning. This potentially deadly phenomenon kills more people than tornadoes each year.

There are an estimated 25 million cloud-to-ground lightning flashes each year in the United States, nearly 650,000 of which occur in Illinois alone. Few people really understand the dangers of lightning. Many people don't act promptly to protect their lives, property, and the lives of others. The first step in solving this potentially life threatening problem is through education.



(Photo by William Johns)



(Photo by Paul Hadfield)



(Photo by Mike Ley)

To assist with this effort, the National Weather Service, the Illinois Emergency Management Agency, the Illinois Department of Natural Resources, and the American Red Cross will combine forces to offer safety information during National Lightning Safety Awareness Week, June 18 – 24, 2006.

Simply put, **if you are close enough to hear thunder, you are close enough to be struck by lightning**. Seek shelter indoors in a sturdy enclosed building with the windows and doors shut. If a building is not available, then seek shelter from lightning in the enclosed compartment of a vehicle. If you are caught outdoors, and you feel your hair stand on end – or your skin starts to tingle, lightning may be about the strike. **DO NOT LIE FLAT**, rather, crouch down on the balls of your feet – similar to a baseball catcher.

Other facts about lightning include:

- Lightning kills 67 people, on average, in the United States each year. This is higher than those killed by tornadoes, and only second to flash flooding deaths.
- It is estimated that more than 1,000 people are injured by lightning strikes in the United States each year.
- In 2005, 38 people were killed and more than 300 injured by lightning strikes in the United States. One person was killed, and two injured as a result of lightning in Illinois during 2005. Lightning also resulted in nearly \$53 million in reported property damage across the country.
- Ninety-seven people have been killed by lightning in Illinois in the past 45 years.
- In 2001, Illinois ranked SECOND among the 50 states for lightning fatalities.
- About 67% of lightning fatalities and injuries occur outdoors at recreation events (baseball games, soccer games, lakes, and on golf courses), and under or near trees.
- Lightning results in about \$5 Billion of economic impact in the U.S. each year, and is one of the leading causes of forest fires.
- Lightning is most likely to happen in the spring and summer months, in the late afternoon or evening.

Lightning safety messages will also be available on NOAA Weather Radio All Hazards, the NWS Lincoln web page, (www.weather.gov/Lincoln/lightning/index.php) and the National Lightning Awareness website (www.lightningsafety.noaa.gov). Stay safe this summer!

About COOP Awards

The NWS begins presenting service awards to observers who have completed 10 years of service, then every 5 years afterward. Institutions that function as COOP stations receive the "Honored Institution Award" every 25 years.

The awards at the 45-year level and above are named after specific people:

45 years – Dick Hagemeyer (former Cooperative Program Manager who later served as director of the NWS Pacific Region)

Benjamin Franklin Award Presented to Hoopeston Weather Observer



The National Weather Service honored Audrey Mushrush of Hoopeston at a luncheon on May 8, as a recipient of Benjamin Franklin Award, given to observers who have completed 55 years of service. Ernie Goetsch, Meteorologist-in-Charge of the Lincoln NWS office, presented Audrey with the award.

Ms Mushrush and her family have provided the NWS with weather data for nearly 21,000 consecutive days. NWS Lincoln Data Acquisition Program

50 years – Edward Stoll
(cooperative observer in Elwood, NE, for 76 years)

55 years – Benjamin Franklin
(used a network of postal workers to observe the weather along the East Coast, the first known method of tracking hurricanes)

60 years – Helmut Landsberg
(largely responsible for establishing the nationwide climate network as we know it today)

65 years – Gen. Albert Myer
(the “father” of U.S. meteorological services, who was the chief of the NWS’s predecessor, the Signal Service)

70 years – Ruby Stufft
(observer in Elsmere, NE, who became the first woman to serve 70 years as a COOP observer)

75 years – Earl Stewart
(longest-serving individual COOP observer, 77 years at Cottage Grove, OR)

Year to Date Precipitation (through May 26):

- Danville: 16.25”
- Decatur: 14.64”
- Effingham: 16.23”
- Galesburg: 15.38”
- Havana: 12.76”
- Lincoln: 12.36”
- Minonk: 11.38”
- Morrisonville: 11.62”
- Palestine: 22.78”
- Peoria: 13.27”
- Rushville: 8.27”
- Springfield: 12.92”
- Urbana: 11.64”

Statewide average through May 21: 15.17” (1.49” above normal)

Manager Billy Ousley says, “Audrey Mushrush is truly a unique American who stands out among the 11,000 cooperative observers nationwide.”

Audrey and her late husband John and family have also been recognized several other times for various awards. Among them is the John Campanius Holm Award, which is granted each year to a maximum of 25 cooperative observers for outstanding accomplishments in the field of cooperative observations. Holm was the first person known to have taken systematic weather observations in the American colonies in 1644 and 1645. The Mushrushes have also received the Thomas Jefferson Award, the highest and most prestigious award bestowed on Cooperative Weather Observers. That award is named for our nation’s third President, who kept an almost unbroken series of weather records from 1776 to 1816. This award is given to very few observers each year, usually not more than five, for outstanding and unusual achievements. All candidates for the Jefferson Award must have received the Holm Award in the past.

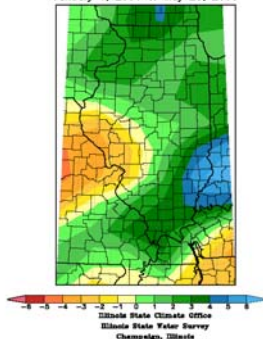
While Benjamin Franklin is best known for the lightning and kite incident, he was also the first person to track a storm moving up the East Coast. While serving as United States Postmaster, he instructed other postmasters along the eastern seaboard to record the weather, and used the compilation of these records to show storm movement.

Pictured with Audrey are John Parr, Dan Kelly, Chris Geelhart, Billy Ousley, and Ernie Goetsch of the NWS office in Lincoln. Also in attendance were Bill Nelson of the NWS office in Chicago, Al Shipe of the NWS office in Indianapolis, and Illinois state climatologist Dr. Jim Angel.



Drought Conditions Abating

Total Precipitation Departure from Mean in Inches
January 1, 2006 to May 25, 2006



Rainfall in March and April largely eliminated drought conditions across Illinois. West central portions of the state were still considered to be “abnormally dry” during May, but the remainder of the state was not classified in the U.S. Drought Monitor.

The image at left, from the Illinois State Water Survey, shows year to date precipitation departures from normal, as of May 25. Orange shaded areas indicate below normal precipitation; light green is near normal, and dark green and blue are above normal.

Although rainfall in May was averaging below normal across much of central and western Illinois, cooler than normal conditions during the middle of the month helped to keep the soil from drying out too fast. However, adequate rainfall will be needed soon, as the summertime heat will soon be upon us.

Lincoln Doppler Radar Upgraded

Technicians from the Radar Operations Center in Norman, OK, worked with Lincoln NWS electronics staff to upgrade the Lincoln radar, during the week of May 22.

The upgrade was to deploy the new Open Radar Data Acquisition (ORDA) system. In the past, there have been many changes to the radar software and associated components, but this is the first time changes have been made to the receiver and its associated hardware elements.

An "open system" design, used by ORDA, is flexible with respect to hardware, software, and communications. This allows for future upgrades and enhancements.

The ORDA has several impacts:

- Improved calibration methods will result in higher quality radar products.
- Improved sensitivity when the radar is run in "long-pulse" mode (VCP 31).
- Improvements in clutter suppression (i.e. removal of false echoes).

The National Severe Storms Laboratory has information available on future radar plans at: <http://www.nssl.noaa.gov/researchitems/radar.shtml>

NOAA Online Weather Data (NOWData)

There is a new online feature available to retrieve historical weather data from around the nation. This is known as NOAA Online Weather Data (NOWData).

For central and southeast Illinois, NOWData contains information for approximately 45 locations. These are typically stations with a long record (at least 30 years). The information is updated in real-time by the observations that the observers relay each day, then is later updated when the observing forms are processed, to fill in any gaps.

The following information is

available:

- Observed data for the current month and previous month
- Normals, records, and running totals for any day of the year, along with all-time records
- Monthly normals and extremes for the current year, previous year, and the 1971-2000 period, for various elements
- Daily normals and extremes for the current year, previous year, and the 1971-

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Your comments are welcomed
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2000 period, for various elements

- Frost and freeze information

Items are selected from left to right, then click on the "Go" button to display the output.

The address for NOWData is: <http://www.weather.gov/climate/xmacis.php?wfo=ilx>

You can also get to it from our homepage (<http://www.weather.gov/lincoln>) by clicking on the "Climate" tab that appears above the satellite image, then clicking on "NOWData".

2006 Atlantic Hurricane Outlook

NOAA released its 2006 predictions for the Atlantic hurricane season on May 22. The outlook indicates an 80% chance of above-normal hurricane activity, a 15% chance of near normal conditions, and a 5% chance of below normal activity. The prediction calls for 13 to 16 named storms, and 8 to 10 hurricanes, of which 4 to 6 are expected to be "major" (winds of 115 mph or higher).



This year's hurricane names will be: Alberto, Beryl, Chris, Debby, Ernesto, Florence, Gordon, Helene, Isaac, Joyce, Kirk, Leslie, Michael, Nadine, Oscar, Patty, Rafael, Sandy, Tony, Valerie, and William. If more names are needed, the Greek alphabet will be used.

More detailed information on the predictions can be found at:
<http://www.cpc.ncep.noaa.gov/products/outlooks/hurricane.shtml>