Central Illinois Lincoln Logs

National Weather Service, Lincoln, IL

Summer 2008 **Volume 11, Number 2**

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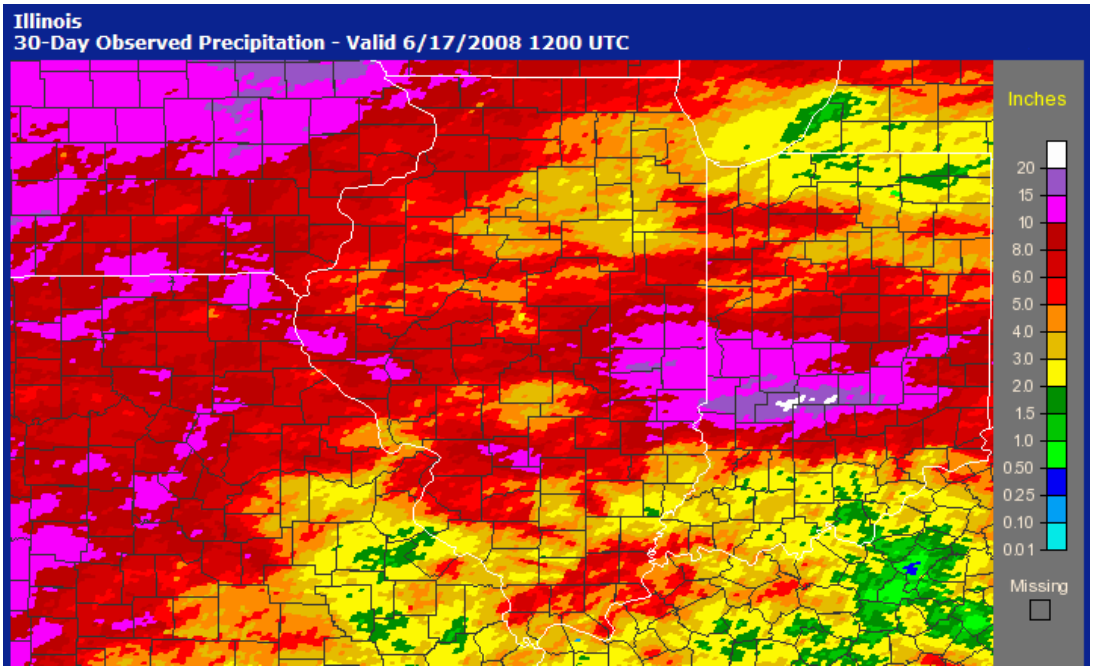
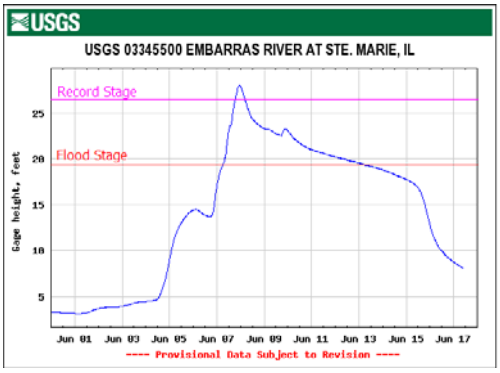
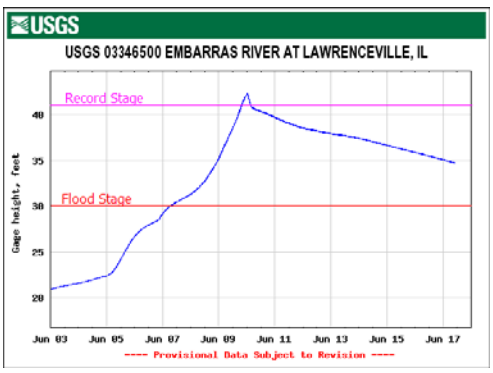
Major Flooding as Spring Closes

Extreme amounts of rain fell over much of the Midwest from mid May to mid June. The map below shows the totals for the 30 day period ending June 17. The light purple shades indicate totals of at least 10 inches, with 15 or more inches in the dark purple. Most of central and southeast Illinois saw at least 5 inches.



Major flooding occurred on many area rivers as a result. The Embarras River set records at Ste Marie and Lawrenceville.





Record River Stages:

Embarras River --

Ste Marie reached a stage of 28.01 feet on June 7. The old record of 26.54 feet was set June 30, 1957.

Lawrenceville reached 42.32 feet on June 9. The old record of 41.34 feet was set May 16, 2002.

Other Top 10 River Crests:

Sangamon River:

- Monticello 18.78 on June 2 (2nd highest)
- Riverton 26.97 on June 8 (4th highest)
- Petersburg 28.01 on June 10 (4th highest)
- Oakford 474.06 on 6/11 (9th highest)

Wabash River:

- Hutsonville 28.40 on 6/10 (6th highest)
- Vincennes 27.50 on 6/10 (3rd highest)

The high water on the Embarras River was the result of a rainstorm on June 6-7 which dropped as much as 10 inches of rain on the river basin. River levels rose until levees began to fail, causing additional widespread flooding. Several levees failed on both the Embarras and Wabash Rivers. The image below right shows one of the levees in Lawrence County that gave way. The one on left shows the extent of the overall flooding in parts of Lawrence County.

Major flooding also occurred in Iowa, Wisconsin, Indiana, and portions of Missouri.

Lightning Safety Awareness Week – June 22-28

By: Heather Stanley, Meteorologist

Lightning Safety Awareness Week is at the end of this month -- June 22-28. Although lightning can strike year-round, summer is a perfect time to brush up on your lightning safety rules, as summertime thunderstorms are well known for popping up in the afternoon hours and interrupting outdoor activities. In order to keep ourselves and our loved ones safe, there are a few guidelines to follow. For example, did you know that if you can hear thunder, you are close enough to be struck by lightning? Even if there are no clouds overhead, and it isn't raining! Lightning can strike 10 miles away from a thunderstorm!

The vast majority of lightning casualties occur outdoors. Lightning victims are not just swimming, boating, grilling, or involved in sports. Oftentimes the victims are people outdoors doing their jobs or chores—gardening, mowing the lawn, etc. Taking the time to be aware of the forecast, and preparing to stop your activities—any activities-- in a timely manner can save your life.

Summer is the peak season for lightning. In the United States, on average, 62 people are killed each year by lightning. That's more than the annual number of people killed by tornadoes! No place is absolutely safe from lightning; however, some places are much safer than others. The SAFEST location during lightning activity is a large enclosed building, not a picnic shelter or shed. The second safest location is an enclosed metal vehicle (car, truck, van, etc.), but NOT a convertible, bike or other topless or soft top vehicle. A common myth is that the tires insulate you from the strike, but **THIS ISN'T TRUE!** It's the metal framework of the car that conducts the electricity around you.

Knowing your weather forecast should be a critical part of planning your outdoor activities every day. In the case that thunderstorms develop in your area, here are some tips to keep the lightning from threatening you and your family:

IF YOU HEAR THUNDER…

1. **Get to a safe building --** one that is fully enclosed with a roof and four walls: a home, school, office building or shopping center. Picnic shelters, pavilions, tents, dugouts, or sheds are **NOT** safe. A tent or picnic shelter may keep you dry, but they will NOT keep you safe.

2. If you cannot get to a safe building, **get in a safe vehicle** -- one with a hard top. Roll up all windows and close the doors. Avoid any metal surface within the car.
3. If you cannot get to safe shelter or in a car, and are caught out in the open: **Do not seek shelter under tall isolated trees!** The tree will increase your risk of being struck. Lightning often hits the tallest object, which could be you in an open field. If caught in the open, get low to the ground, on the balls of your feet in a crouching position. The goal is to be as low as possible while minimizing your contact with the ground.
4. **Know the weather forecast.** If there are thunderstorms in the forecast, change or alter your plans to include an action plan should you hear thunder.
5. The vast majority of lightning injuries and deaths on boats occur on small boats with NO cabin. It is crucial to listen to the weather on a small boat without a cabin. **If thunderstorms are forecast, don't go out. If you are out on the water and skies are threatening, get back to land and find a safe building or vehicle.**
6. **Get personal watercraft OFF THE WATER** and get to a safe shelter.
7. **Keep informed** by listening regularly to a NOAA Weather All Hazards radio broadcast for forecasts and changing weather conditions.
8. Do not return to outdoor activities until 30 minutes after the last rumble of thunder is heard.

Don't let thunderstorms ruin your fun -- being prepared is the best way to stay safe **AND** keep everyone happy. On days with rain or thunderstorms in the forecast, plan an excursion to a museum or shopping center, plan other **indoor** activities, or reschedule if possible.

2008 Tornadoes to Date:

Jan. 7 – 2 mi. S to 3.5 miles SSE of Mackinaw

May 27 – 5 mi. SSE of Olney

May 30 – 3 mi. WSW of Waverly to 8 mi. WSW of Auburn

May 30 – 1 mi. S of Taylorville

May 30 – 1 mi. NNE to 2 mi. NE of Westervelt

June 3 – 1 mi. E of Alsey to 4.7 mi. NNE of Manchester

June 4 – 2.5 mi. NE to 4 mi. NE of Mackinaw

June 4 – 4 mi. ENE of Mackinaw to 1.5 mi. SSE of Congerville

June 6 – 2.5 mi. WSW to 2.5 mi. ENE of Lerna

June 15 – 1 mi. NW of Colfax to Colfax

Severe Weather Returns with a Vengeance Across Central Illinois

By: Ed Shimon, Senior Meteorologist

2008 started off with central Illinois being in Tornado Watch #1 for all of the United States, and even had a very early season tornado reported on January 3rd. Then things quieted down significantly, with relatively little severe weather in the next 5 months. April and May were especially void of the severe weather we typically see in the spring-time. However, things changed drastically in late May and early June. The severe weather season definitely picked up the pace, with the National Weather Service issuing 122 warnings for severe storms between May 28th and June 9th (46 tornado warnings and 76 severe thunderstorm warnings). In the 5 months prior to that, the NWS had issued only 75 warnings through May 28th.

Why such a change? The jet stream played a major role. For much of May, the jet stream remained much farther south than normal, allowing colder air to remain across Illinois. This allowed May to be one of the coldest months on record. Since then, the jet stream has moved north and finally set up in the typical spring-time southwest to northeast flow across the Plains and Midwest. This pattern allowed for a frontal boundary to reside across central Illinois for an extended period of time. The front acted as a focus for converging winds, and set the stage for multiple severe weather events, as weather disturbances flowed northeast along the boundary.

So far this year, 10 tornadoes have been confirmed in central Illinois, with 9 of those occurring since May 28th. (The picture at left was taken by Skip Talbot near Waverly on May 30th.) The average lead time from when a tornado warning was issued to when the tornadoes have occurred has been 14.7 minutes, which has allowed for no injuries or fatalities during

those tornadoes. We have had 3 tornadoes rated EF1 (86-110 mph) and 7 rated EF0 (65 to 85 mph

There have also been hundreds of large hail and damaging wind reports since May 28th, with some hail stones reported as large as a softball, or 4.25 inches, on May 30th near Philo in Champaign County. The rest of the severe weather season may not be as active as the late May-early June time period, but the staff at NWS Lincoln will remain diligent to whenever the call occurs to protect the public from harm.

Spring Climate Statistics:

Peoria:

- Average temperature 50°F (1°F below normal)
- 9.96” of precipitation (0.60” below normal)
- Trace of snow (4.2” below normal)

Springfield:

- Average temperature 50.5°F (2.2°F below normal)
- 11.48” of precipitation (0.91” above normal)
- 4.2” of snow (0.1” above normal)

Lincoln:

- Average temperature 49.5°F (1.3°F below normal)
- 9.23” of precipitation (1.93” below normal)
- 1.7” of snow (1” below normal)

NWS Participation in Relay for Life

By: Ed Shimon, Senior Meteorologist

A team made up of staff from NWS Lincoln and their families participated in the Logan County Relay for Life on Saturday, May 17, at Lincoln Christian College in Lincoln.

(left) Senior meteorologist Ed Shimon, Warning Coordination Meteorologist Chris Miller, and Michelle Miller show off their Packer pride
(right) Chris Miller and James Auten (senior meteorologist)

The "walkers" took the course at 1 pm after a ceremonial lap for all cancer survivors. A different theme was developed for each hour from 1 pm to 1 am, to show enthusiasm during the event. One hour was for wearing red, white and blue, another hour was for sports teams, and another later that night was for pajamas. As people participated in the themes, they received raffle tickets for small prizes.

The NWS team sponsored a tent with snacks and refreshments to raise additional money for the team contribution. Through generous donations from family, friends, co-workers and Relay participants, the team raised a total of $1,313.35! That was more than $300 higher than last year - which is definitely a large amount considering the tough economic times we are all facing. The team also raised an additional $40 for the purchase of a weather radio, which was auctioned off at the event.

Despite some breezy conditions during the afternoon, the weather was great for most of the event. There were also some poorly timed sprinkles during the candle lighting of the luminaria ceremony, but that didn’t dampen the solemn moments of silence in remembrance of those who battled through cancer. All in all, a great time was had by all, and it was for a wonderful cause.

Earthquake Glossary:

An *earthquake* is a term used to describe both sudden slip on a fault, and the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth.

Aftershocks are earthquakes that follow the largest shock of an earthquake sequence. They are smaller than the main shock and within 1-2 rupture lengths distance from the main shock. Aftershocks can continue over a period of weeks, months, or years. In general, the larger the main shock, the larger and more numerous the aftershocks, and the longer they will continue.

Intensity is often relayed using the *Richter Scale*, which is calculated using the logarithm of wave amplitudes as determined from seismographs. Magnitude is expressed in whole numbers and decimals. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

April Earthquakes in Southeast Illinois

By: Heather Stanley, Meteorologist

On April 18, a 5.2 magnitude earthquake hit southern Illinois in the early morning hours. At 4:36 am, many people woke to their houses shaking. No major damage was reported across the region, though some minor damage occurred to homes and other buildings. The photo at left shows damage to a building in Sumner *(courtesy of the Lawrence County EMA).*

The epicenter was about 38 miles north-northwest of Evansville, Indiana, very near Mount Carmel. The earthquakes point of origin (hypocenter) was 7 miles beneath the surface of the earth.

For those people that got to sleep through the earthquake, a second chance came later mid morning, when one of the aftershocks from the earthquake registered 4.6 on the Richter Scale at 10:14 am.

Central Illinois may not be as used to earthquakes as to severe weather, but the area is very near to an active fault system known as the New Madrid Seismic Zone. The New Madrid fault system was named after a series of major earthquakes struck in 1811 and 1812. Three earthquakes all greater than 7.0 in magnitude shook the Midwest in less than 3 months. The New Madrid Seismic Zone stretches from New Madrid, Missouri to the southwest.

The earthquakes at the end of April in Illinois occurred in the Wabash Valley Fault System, just northeast of the New Madrid seismic zone. Though California is considered far more likely to experience earthquakes, the one that shook central Illinois seemed to be felt wide and far. People from Michigan to Georgia reported feeling it. The United States Geological Survey explains that the earth's crust (top layer) is older and less fractured in the Midwest than it is in California, so the earthquakes tend to resonate even further.

The largest earthquake to hit the state of Illinois was a 5.5 magnitude earthquake on September 27, 1891. The image above, courtesy of the Illinois State Geological Survey, shows the location of all known earthquakes in Illinois from 1795 to 2004; the vast majority of them occurred across the southern third of the state.

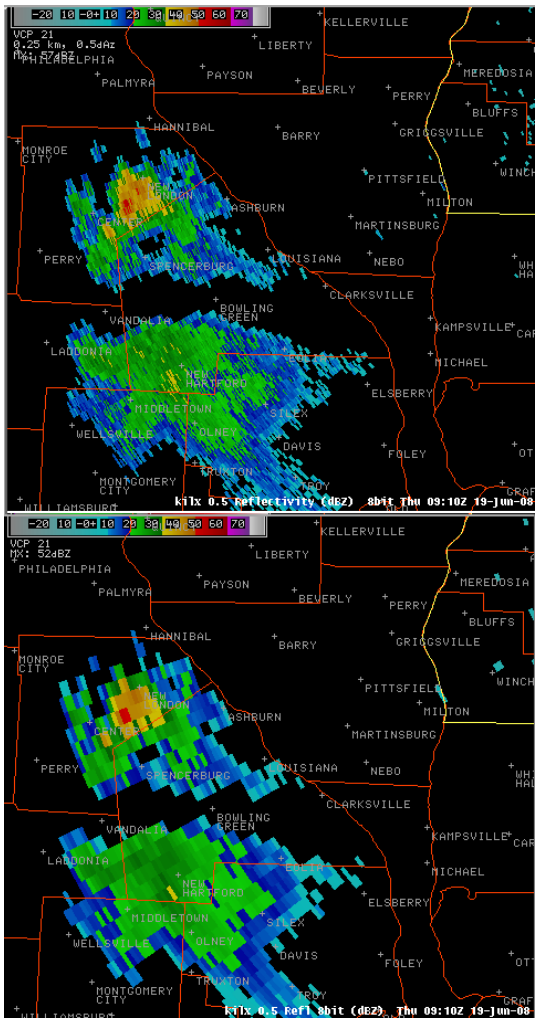
Cooperative Observer Awards

Ken Litchfield of Athens received a 10 year Length of Service Award in February.

Warren Chamberlain (right) of Varna received a 20 year Length of Service Award from John Parr in June.

Radar Upgrade Completed on June 18

The Lincoln Doppler radar was upgraded with new software on June 18. One of the highlights is the use of "super-resolution" data.



Since its inception, the radar data from the current Doppler radar network have been measured at increments of 1 degree, over the entire 360 degree span around the radar site. This resulted in a range resolution of 1 km for most products. New processing methods with this radar upgrade allow for an azimuth resolution of ½ degree, and a range resolution of ¼ km. The range of the Doppler velocities has been extended from 230 km to 300 km for the lowest elevation angles.

In the example at left, the top image shows radar echoes using the new resolution, as compared to the old one (below). The improved resolution should allow for detection of smaller scale features, even at greater distances from the radar.

While this new resolution will not be used on NWS radar sites initially, some private vendors will distribute this new data.

StormReady: Prepared Communities Are Ready for Disasters

By Chris Miller, Warning Coordination Meteorologist

Our nation is the most severe weather prone country in the world, averaging a staggering 10,000 severe thunderstorms, 5,000 flash floods and more than 1,200 tornadoes each year. Nearly 90% of all presidentially declared disasters are weather related, leading to about 500 fatalities, 5,000 injuries and more than $14 Billion in damage. There is no way to avoid the storms, but there are things that communities can do to be better prepared for disasters. That is where the National Weather Service's (NWS) StormReady ® program comes in.

The StormReady program, which has been in existence for nearly 10 years, helps communities with communication and safety skills needed to save lives and property – before and during an event. When the NWS designates a community or county as "StormReady" we are recognizing the planning and organizational skills that are in place in the event of a disaster. Some of the items that need to be in place for a community to be declared StormReady include:

- Established communications with a 24 hour Warning Point and Emergency Operations Center
- Numerous methods for the community to monitor weather conditions, receive NWS warnings and disseminate the warnings to the public
- Community preparedness through weather safety presentations to schools, businesses and civic groups
- Severe weather training for storm spotters and dispatchers

Currently, there are 1,355 StormReady communities in the United States. In Illinois there have been 55 StormReady designations. Most recently, Piatt County and the city of Hoopeston have been declared StormReady the NWS Lincoln office. They join the communities of Champaign, Urbana, Savoy, Mahomet, Peoria, Tuscola, Flora, Taylorville and Pana that have the StormReady designation in central and eastern Illinois. For more information about the StormReady program visit our website at: http://www.stormready.noaa.gov/

Lincoln NWS Awarded Dept. of Commerce Bronze Medal

NOAA officials selected the Lincoln National Weather Service forecast office to receive the agency's prestigious Bronze Medal. The forecast staff was recognized for issuing life-saving forecasts and warnings during the Nov. 30 – Dec. 1, 2006, historic ice storm that struck eastern Missouri and southwest and central Illinois.

"The Bronze Medal exemplifies the dedication of the central Illinois staff to keep local emergency management agencies, the media and Illinois residents aware of the approaching ice storm and to update them on changing conditions," said weather service central region director Lynn Maximuk. "After the event, local and state officials credited Central Illinois forecasters with saving lives."

NOAA meteorologists began forecasting freezing rain 25-30 hours before it started. Conference calls with emergency management, local governments and the media assisted in planning resource allocations, opening and staffing emergency operations centers, and preparing emergency shelters.

The forecasts allowed utility companies to position resources in advance and coordinate activities with regional utility crews. The worst ice storm to hit the area in decades knocked out power to more than half a million customers for more than a week. Without the forecasts, communities could have faced two-to-three week power outages and double or triple the economic loss.

NOAA Administrator Conrad C. Lautenbacher presented the award to meteorologist-in-charge Ernest Goetsch during a ceremony in Washington, DC in April.

Central Illinois Lincoln Logs

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Early and Intense Tornado Season Could be Record

This year may set records for tornadoes and tornado-related deaths. “We have already seen more than 115 tornado-related deaths, making this the deadliest tornado season since 1998,” said Greg Carbin, a meteorologist at the Storm Prediction Center in Norman, Okla.

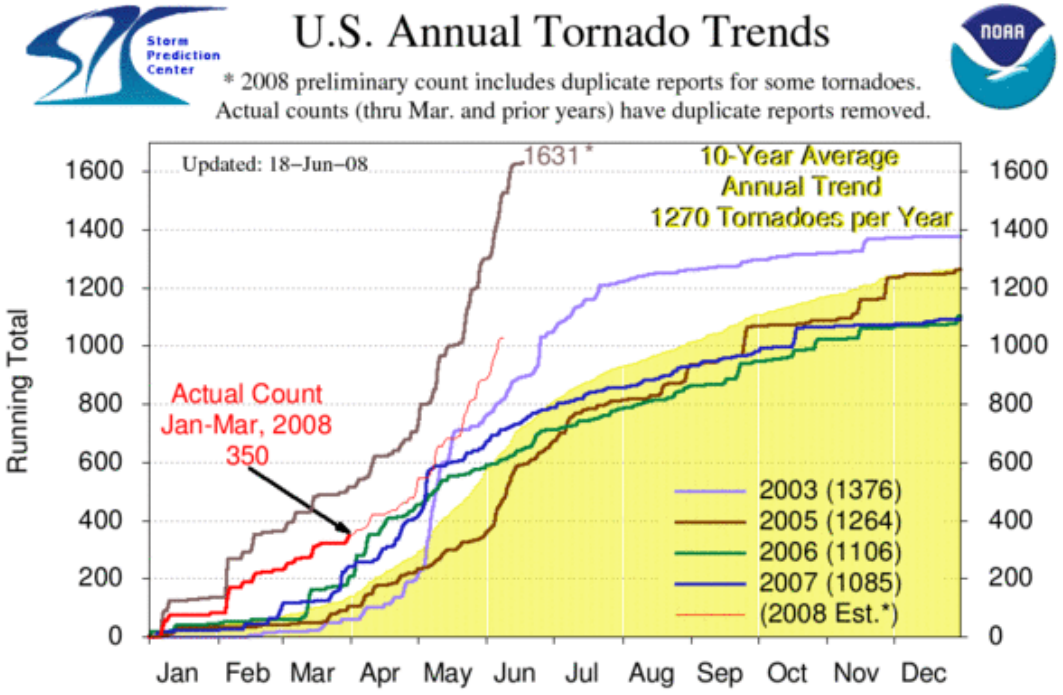
“It is only the third time since the 1974 super tornado outbreak that there have been more than 100 tornado-related deaths during a single tornado season in the U.S.,” added Harold Brooks, a research meteorologist at the National Severe Storms Laboratory in Norman. “In 1998 and 1984 there were 132 and 122 tornado-related deaths, respectively — 2008 will likely equal or exceed that record.”

Recent years averaged about 1,200 tornadoes and 60 tornado-related deaths reported annually across the United States. Most tornadoes occur from late winter to mid-summer, mostly in the Southeast in the early part of the season, followed by the Midwestern and Plains states in the later part of the season.

So why has this tornado season been so active? Meteorologists at the Storm Prediction Center say this winter's and early spring’s unusually turbulent weather may be to blame.

"The storm track over the last three months was very active across the Rockies and into the East Coast. This active storm track lends itself to more severe weather events, including tornadoes," said Carbin. “In previous years, major storms happened every week or so, but we have had a major storm system affecting some part of the U.S. every three to four days through early spring.”

“Another contributing factor is this year’s early start to the season. A total of 87 tornadoes struck the Tennessee valley and Midwest over a 24 hour period starting on Feb. 5, resulting in a total of 56 deaths,” said Carbin. “This storm ranks as number 15 in terms of the number of fatalities since 1950. February will likely turn out to be a record setting month once all the tornado reports have been verified.”



The tornadoes this season are also touching down in highly populated areas, thus increasing both the number of fatalities and the number of eyewitness reports of each tornado.