

Gateway Observer



Volume 2, Issue 1

Spring 2011

In this issue...

- The Importance of Daily Reporting
- New Year's Eve Tornado Outbreak in Review
- Spring Flood Outlook
- Severe Weather and Flood Safety Tips
- NOAA Weather Radio - How it works, why every home needs one

The Importance of Being Earnest*

Karl Sieczynski
Observation Program Leader

The title, above, is that of a book written by Oscar Wilde, but is a most appropriate characteristic for National Weather Service Cooperative (NWS) observers. NWS observers agree to record temperature and precipitation data each and every day of their term as observer, come rain or shine, holiday, birthday or catastrophe. The observations become the official record for their location, and are used, among other things (1) in litigation where temperature and precipitation may have a bearing on the case; (2) in sizing furnaces and air conditioners, (3) to assist power companies in arranging for adequate fuel during times of peak weather-related demand, (4) to provide a quality database with which to study climate, and climate change. Each of these needs requires quality data from many locations across the country, preferably sites located in small towns and rural settings. Temperatures from small towns and rural sites are more representative of large areas than those from metro areas because of the heat generated within large cities.

Quality weather observers are **earnest** in taking quality observations. Obviously, poor temperature and precipitation values, or missing observations are of no value to any user.

In addition to completing the B-91, some of you transmit your observations every day over phone lines using IV-ROCS or the internet based WxCoder III. These systems enable NWS personnel, State Climatologists and many other users to access the Coop network each day rather than waiting for the B-91s to be keyed and published in Climatological Data. If you are using IV-ROCS or WxCoder III it is imperative that you transmit maximum and minimum temperatures (if your station records official temperature readings) and precipitation every day, along with snowfall and snow on the ground in winter, reporting temperature and precipitation even on days without precipitation. If you only transmit temperatures on those days, your precipitation will appear as missing, not zero. That's erroneous and misleading. So please take the time to enter zero precipitation on days without precipitation. That simple action makes your observation not only complete, but makes it fully usable.

Remember, the buzzword for quality weather observations being **earnest**. Be earnest, take complete observations, transmit temperature and precipitation everyday on IV-ROCS or WxCoder III. All users will **THANK YOU!** each time we access data from your site on the computer.

**The above article was originally written by Wayne Wendland, Illinois State Climatologist Winter 1994. Remote observation systems have been changed to IV-ROCS or WxCoder III to reflect current technology.*



New Year's Eve Tornado Outbreak (Part 1 of 3)

Julie Phillipson

On December 31, 2010, a line of severe thunderstorms moved eastward across Missouri and Illinois, dropping large hail and spawning destructive tornadoes along its path. Here at the St. Louis forecast office (WFO LSX), forecasters were closely watching the system as it progressed eastward through an environment that was especially favorable for severe weather, including tornadoes. Reports began to come in from southwestern Missouri, where numerous reports of severe hail (up to baseball-sized near Mansfield, Missouri) were received, along with reports of tornadoes in Fort Leonard Wood and Rolla. Both tornadoes were rated as EF3 on the Enhanced Fujita (EF) Scale after the

Springfield, Missouri forecast office surveyed the damage.

As the storms progressed eastward and entered the WFO LSX county warning area (CWA), storms that began as individual cells congealed into a fast moving line, reaching a radar-indicated speed of 60 miles per hour. Despite the line moving eastward, individual storms and circulations along the line were moving northeast, adding an element of difficulty to interrogating the system and discerning the locations and durations of severe thunderstorm and tornado warnings. The normal number of WFO LSX staff working operations during the day increased from 3 to 10. Each person fulfilled specific roles, such as issuing warnings, monitoring weather radio transmissions, taking telephone calls, working the HAM radio, logging internet reports from spotters and the public in the field, and serving as a communication line between the forecast office and local media partners, emergency managers, and law enforcement agencies in order to ensure the safety of individuals in the path of the destruc-

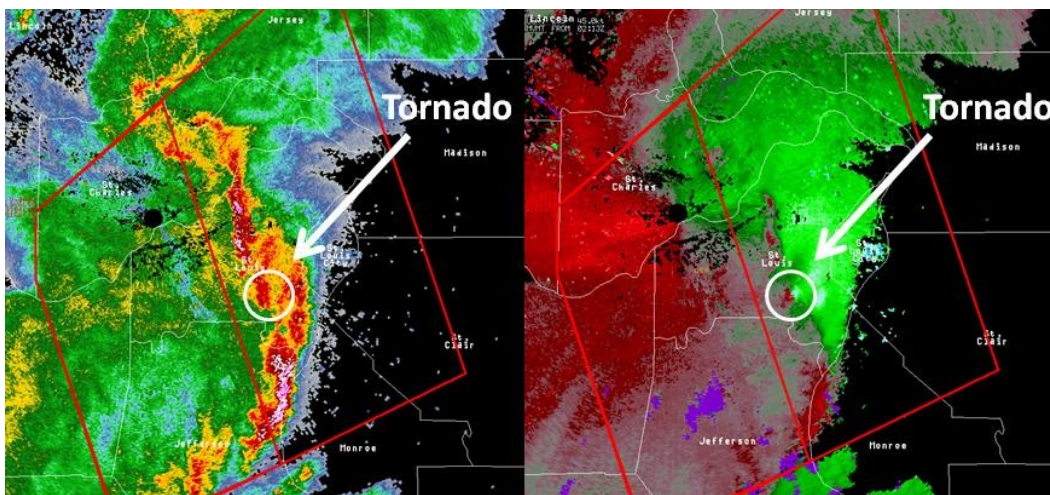
The Enhanced Fujita (EF) Scale

EF Number	Maximum 3 Sec. Gust
0	65 - 85 MPH
1	86 - 110 MPH
2	111 - 135 MPH
3	136 - 165 MPH
4	166 - 200 MPH
5	Over 200 MPH

tive storms. The experience and expertise of the WFO LSX staff paid off on December 31, as average lead time for tornado warnings across the CWA exceeded 30 minutes (the national average tornado warning lead time is approximately 19 minutes). In addition to issuing the warnings, phone calls were also made to localities that appeared to be directly in the path of the strongest circulations (associated with tornadoes), allowing for emergency managers and local officials to take appropriate actions. Those extra phone calls and emphasized urgency in the warning products likely saved many lives on New Year's Eve.

12/31 By The Numbers...

Rating	Number of Tornadoes (Missouri and Illinois)
EF0	9
EF1	7
EF2	3
EF3	4



Radar imagery as seen at 11:56am on 12/31/10. Left: Reflectivity Right: Velocity

Above: The location of the EF3 tornado that went through Sunset Hills is indicated by the white circle. The red polygons are tornado warnings that were in effect from WFO LSX on December 31 for the greater St. Louis metropolitan area. Though the location of the tornado is difficult to discern by the reflectivity image alone; the velocity image clearly indicates strong rotation co-located with the tornado. Intense couplets of inbound and outbound (green and red) velocities help to alert meteorologists of rotation within a storm and tornadic potential. Due to multiple couplets along the line of storms, one large tornado warning was issued rather than several small ones, so all in the path would be alerted to the risk to their lives and property.

New Year's Eve Tornado Outbreak (Part 2 of 3)

By late afternoon December 31, the storms had exited the WFO LSX CWA. Here at the forecast office, actions were immediately underway to send teams out to damaged areas to perform surveys in order to discern whether the damage was tornadic (or straight line winds, which are also a threat with fast moving storms), and if so, to establish a rating on the EF scale. The final tally after several days of multiple teams from WFO LSX surveying damage locations was that there were 12 tornadoes across the

46 county warning area, including 9 in Missouri and 3 in Illinois (1 EF3 tornado, 1 EF2 tornado, 4 EF1 tornadoes, and 6 EF0 tornadoes).

The strongest tornado in the WFO LSX CWA was an EF3 tornado that initially touched down at 11:48am approximately 1 mile east of Murphy, Missouri, in Jefferson County. It touched down once more at the border of St. Louis and Jefferson counties, and proceeded to cross Highway 141 just north of Highway 30. The tornado then moved through Fenton City Park, and crossed the Meramec River 1/2 mile north of Highway 30, continuing northeast before crossing Interstate 270 two miles southeast of Interstate 44. Damage along this initial path was rated EF0 to EF1, and included tree damage, roof damage, siding damage, and some vehicle damage. At approximately 11:56am, the tornado rapidly intensified as it approached Lindbergh Blvd. There were many trees in Watson Trail Park that were snapped or uprooted, and many homes along Old Watson Road and Court Drive sustained significant damage. Along Lindbergh Blvd., one home was completely destroyed and moved from its foundation, warranting a high-end EF3 rating. Damage in the Lindbergh Blvd. area indicated that the tornado was one quarter mile wide.

The tornado continued to move toward the northeast, crossing Lindbergh Blvd. near Court Drive, causing damage to a strip mall and other struc-



Above: Damage along the hardest hit part of Lindbergh Blvd. in Sunset Hills. Photo courtesy of Kenneth Bahr.

tures, and uprooting and snapping trees along its path. As it continued to Woodpark Drive, roof damage to homes and tree damage indicated that the tornado had weakened to EF1, with a width of 300 yards. The tornado continued to weaken beyond this point, resulting in EF0 damage along a path 150 yards wide in the vicinity Eggerling and Gladlea Drives before crossing East Watson. Additional roof damage beyond this point was observed along a path 100 yards wide, and a house had windows blown in, warranting an EF1 rating. Moving to the northeast, power poles were pushed over along Watson road, with additional damage to trees and roofs of homes in the path. The damage

path continued to maintain a 100 yard width and an EF0 and EF1 damage rating. The tornado finally lifted at the intersection of Rayburn Avenue and Sappington Road.

Despite the devastation left in the wake of the storm, there were a great number of survival stories from individuals who took shelter in interior rooms or hallways or their basements, averting serious injury. Tragically, there was one fatality attributed to the EF3 tornado (known as the Sunset Hills tornado), but due to the diligence of WFO LSX staff, local media partners, law enforcement officials, and emergency managers, countless other lives were saved.



Above: Power pole snapped in half along Watson Road in Crestwood

The Sunset Hills EF3 tornado is the strongest tornado to hit the St. Louis metropolitan area since April 7, 1980, when an F3 tornado formed near Florissant and moved to West Alton.



Left: Law enforcement, utility workers, and emergency responders work hard to clean up damage along Lindbergh Blvd. after the storm. Photo courtesy of the St. Louis Post-Dispatch

New Year's Eve Tornado Outbreak (Part 3 of 3)

Across WFO LSX's CWA on December 31, there were 11 additional tornadoes. In Missouri, there was an EF2 that affected Robertsville (Franklin county), EF1 tornadoes in Ballwin (St. Louis county), Washington (Franklin county), North St. Louis City, and northern Crawford county, and EF0 tornadoes that affected Washington (Franklin county), Augusta (St. Charles county), and 4 miles northwest of Cedar Hill (Franklin county). In Illinois, there were 3 EF0 tornadoes that affected Greenville (Bond county), Mozier (Calhoun county), and Lebanon (St. Clair county). The weather forecast office in Springfield, Missouri reported 8 tornadoes, two of which warranted EF3 ratings that affected Fort Leonard Wood (Pulaski county) and



Above: EF2 tornado damage in Robertsville, MO (Franklin county)

Rolla (Phelps county). The others included 3 EF1 tornadoes and 3 EF0 tornadoes, with 4 tornados being observed in the Table Rock Lake area in southwestern Missouri. The forecast office in Paducah, Ken-

tucky, observed two tornadoes in southeastern Missouri in the same storm, both of which were rated EF2 that affected Butler and Carter counties. As the storm exited the WFO LSX CWA to the east, the

forecast office in Lincoln, Illinois observed one tornado, an EF3 that caused significant damage in Menard county, Illinois. There was also one tornado observed in northwestern Oklahoma early in the morning hours, and another in northern Arkansas, bringing the total number of tornadoes for the outbreak to 25, 19 of which were observed in the state of Missouri alone. New Year's Eve 2010 will not soon be forgotten by many, including the individuals whose lives changed that day, and the forecasters in National Weather Service offices in Oklahoma, Arkansas, Missouri, Illinois, and Kentucky who maintained a constant watch on the intense storm system as it raked through the area, fulfilling their mission to save lives and protect property.

Interested in learning more about the New Year's Eve Tornado Outbreak? A detailed webpage with additional information about each tornado, along with damage photographs, is available on our website at the following link: http://www.crh.noaa.gov/lxx/?n=12_31_2010.

Severe Weather Safety Tips

In the Central US, thunderstorms are a common occurrence in the spring and summer months. These storms are capable of producing deadly lightning, heavy rain, hail, and tornadoes, all of which are threats to life and property. Though these storms cannot be avoided, it is possible to adequately prepare for them.

A thunderstorm is deemed to be severe when the radar or spotter reports indicate large hail (greater than 1 inch in diameter), strong winds (in excess of 58mph) and/or a tornado. If a severe thunderstorm warning is issued, it is important to remain indoors (or move indoors if outdoors), and monitor the evolving weather conditions. Even if there is not a Tornado Warning issued, straight line winds associated with a severe thunderstorm can still do large amounts of property damage. Downburst winds associated with these storms can reach speeds

in excess of 100 mph, uprooting trees and damaging structures in their path. It is also not uncommon for severe thunderstorm warnings to be upgraded to tornado warnings if the environment is favorable for tornadoes; further emphasizing the importance to monitor the weather conditions, either on the internet, through broadcast media, or on NOAA Weather Radio.

If a Tornado Warning is issued, it is important to seek shelter in a basement, or on the lowest floor in an interior room of a sturdy structure. If in your vehicle, never try to out run a tornado. Seek shelter in a building, or if a building is not an option, leave your vehicle and hide in a ditch or depression and cover your head. Do not seek shelter under a highway overpass, as the overpass can act as a wind tunnel, launching deadly debris under the structure.

In the hours before significant severe weather threatens, a Watch may be issued. It is important to discern the differences between Watches and Warnings, which can cover Severe Thunderstorms, Tornadoes, and Flooding.

Watch: Conditions are favorable for the event to occur. **Watch** the skies, and **prepare** to take action.

Warning: A Severe Thunderstorm/Tornado/Flood is **imminent** or **occurring**. **Take Action Now.**

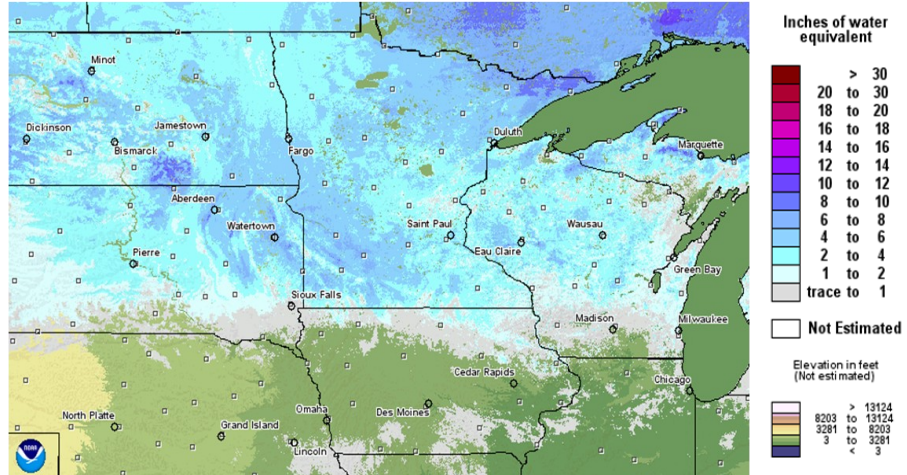
It is imperative that you have a plan of action should severe weather threaten at home, at the workplace, or at school. Prior to severe weather, this plan should be examined so each person knows what they need to do to be safe. Here at the NWS, we will ensure that you are provided with the most accurate and timely information needed to protect yourself and your property.

Spring Flood Outlook Indicates Significant Flooding Along Mississippi River

Mark Fuchs, Service Hydrologist

Any talk of drought this spring is being overshadowed by the likelihood of significant flooding along the Mississippi River. This flood potential is being driven by water in the form of ice and snow cover over southern and central Minnesota and western Wisconsin. While these areas typically have snow cover in early March, this year that snow cover is well above the average for early March. In fact, in southwestern Minnesota, there is a large area of snow cover along the Minnesota River basin that contains more than 6 inches of snow water equivalent, or what the ice and snow would measure after being melted. With soils beneath this snow cover already saturated since last year's wet fall, this should represent pure runoff for the Minnesota River. Meanwhile, the upper Mississippi River basin above St. Paul also has above average snow cover, with 3 to 5 inches of snow water equivalent common in this basin (Figure 1). This combination will mean a likelihood of significant flooding along the Mississippi River from St. Paul, Minnesota, all the way down to Winfield, Missouri, just above the confluence with the Missouri River. The probabilities for significant flooding at these locations are higher for the period March through May than in any of the past 8 years. And the outlook updated on March 3rd has higher probabilities for Mississippi River flooding than any of the previous 2011 updates.

Once again, this high flood potential comes on the heels of moderate to severe drought across extreme southern Missouri that is likely to persist into the spring. The U.S. Drought Monitor considers it "Abnormally Dry" for areas generally south of I-44 in central and eastern Missouri, with moderate generally south of a line from the southern end of Reynolds County, Missouri to Cairo, Illinois, and severe drought generally south of Poplar Bluff throughout the Missouri bootheel (Figure 2).



Above (Figure 1): Modeled snow water equivalent totals for the upper Midwest, valid March 2nd. Snow water equivalent is the amount of water resultant if all the snow were to melt. When the snow melts, the ground will be incredibly saturated, and runoff into area rivers, lakes, and streams will greatly increase.

U.S. Drought Monitor

February 22, 2011
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	78.32	21.68	5.19	1.26	0.00	0.00
Last Week (02/15/2011 map)	75.40	24.60	5.40	1.26	0.00	0.00
3 Months Ago (11/23/2010 map)	66.43	33.57	18.78	9.52	2.22	0.00
Start of Calendar Year (12/28/2010 map)	79.27	20.73	4.91	1.31	0.29	0.00
Start of Water Year (09/26/2010 map)	74.55	25.46	9.61	2.68	0.00	0.00
One Year Ago (02/16/2010 map)	90.20	9.80	3.08	0.45	0.00	0.00

Intensity:
■ D0 Abnormally Dry
■ D1 Drought - Moderate
■ D2 Drought - Severe
■ D3 Drought - Extreme
■ D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, February 24, 2011
B. Rippey, U.S. Dept of Agriculture

On local tributaries, the flood potential is rising to above average in many basins across northeast and east central Missouri into western Illinois. The Fabius Rivers of northeast Missouri, the Kaskaskia River, and the Meramec River all indicate above average chances of flooding this spring.

Other rivers of northeastern and central Missouri have averages chances of flooding over the next three months, while the Black River and St. Francis River of southeastern Missouri appear to have lower than average chances of flooding, based on current soil moisture and rainfall anomalies.

Left (Figure 2): US Drought Monitor for the Midwest valid on February 22nd. Above average winter precipitation across the upper Midwest served to alleviate much of the drought risk, though the focus is now on the high probabilities of significant flooding along the Mississippi River.

Flood Safety and Awareness Saves Lives

Mark Fuchs, Service Hydrologist

With major flooding expected this spring along the Mississippi River, this may be a good time to review flood safety procedures. The week of March 14th through 18th has been designated as National Flood Safety Awareness Week.

One of the primary messages promoted by the National Weather Service is the concept of making the correct decision on the road when approaching a bridge or low water crossing when water of unknown depth is flowing over the roadway. That message is summarized by the phrase, "Turn around, don't drown!". More than half of the people who die in flash floods are those who make the wrong decision when faced with this scenario. It only takes 18 inches of water to lift your car or SUV. Once your vehicle becomes buoyant, flowing water can easily push it

sideways. Most vehicles will then tend to roll over, trapping those inside while washing them downstream. Remember, most flash floods rise and fall within a few hours, and many of these are over within an hour of the time they develop. Being late for an appointment,



or even your job, is a small price to pay for your life.

Another point to remember is if you live or work alongside of a typically quiet creek. This creek could become a raging river if excessive rain continues over this area for too long. Have an evacuation plan prepared for such an event before rising waters limits your ability to escape or protect your property.

Finally, many people who live or work along the Mississippi River are taking advantage of the National Flood Insurance Program (NFIP). Remember this insurance is not valid until 30 days after the purchase of a policy. With major flooding likely within the next 90 days for locations upstream of Grafton on the Mississippi, there may not be much time left to buy such a policy.

FAQ sheet about Flood Insurance: www.floodsafety.noaa.gov/resources/FloodIns_Why_WhereToBuy_DM3-3.pdf

Additional information about what you can do to protect yourself prior to and during a flooding event: www.floodsmart.gov

NOAA Weather Radio: How it works, and why every home needs to have one

Julie Phillipson

When it comes to the weather, whether it involves winter storms, thunderstorms, heat waves, or simply the forecast for the next several days, most people obtain their information from their favorite broadcast meteorologist on their local television news channel. While a close working relationship is maintained between the National Weather Service and local media outlets, there is one tool that enables anyone to have all their weather information for their area at their fingertips, any time of the day or night. NOAA Weather Radio All Hazards (NWR) is an invaluable addition to anybody's home, as it receives transmissions 24 hours per day 7 days per week from the local NWS office, including everything from the seven day forecast, to river stages, to current weather conditions across the area, to active watches and advisories, and most importantly, severe weather and river flood warnings. In addition to weather information, NWR is capable of broadcasting information on a wide range of hazards, including natural hazards (earthquakes, volcanoes), technological hazards (911 outages), industrial hazards (oil spills, chemical releases), and information regarding threats to homeland security.

NWR broadcasts can be heard on any one of seven VHF frequencies ranging from 162.400 to 162.550 MHz, broadcasting live from one of the eleven NWR transmitters in the St. Louis Weather Forecast Office (WFO LSX) area across Missouri and Illinois. Transmitters are located in Salem, Chester, Jerseyville, and Hillsboro Illinois, and in St. Louis, Bellflower, Fredericktown, Bourbon, Fulton, and Jamestown Missouri. When a product is issued from WFO LSX, it is immediately disseminated to the appropriate transmitter(s) that covers the county(ies) included

in the product, generally without human intervention. In the event that the automated system that disseminates the information fails, or, if there is an emergency situation, forecasters can interrupt the broadcast and manually read emergency messages live on the air.

In order to receive NWR broadcasts at home, at school, or at your workplace, you must have a special receiver, ranging from handheld portable units which just pick up Weather Radio, to desktop and console models which receive Weather Radio in addition to other broadcasts. A simple AM/FM radio will not receive the NWR broadcast.

The importance of having a NOAA Weather Radio can never be stressed enough. It enables you to hear the warnings for your area the moment the products are issued by the NWS. It also sounds an alarm for watches and warnings (loud enough to wake even the deepest sleeper), so you can feel secure knowing that even while asleep, you'll be alerted to severe weather or flooding if it threatens your home. NWR has been credited with saving many lives, and is an essential part of any storm or disaster preparedness kit. Check with your local electronics retailer if interested in purchasing one of these affordable, life saving devices.

