



Eye on the Sky

Spring/Summer 2008

National Weather Service Louisville

The National Weather Service Forecast Office (WFO) in Louisville is responsible for all official weather warnings, forecasts, and historical weather data across ten counties in southern Indiana and 49 counties in central Kentucky. Our area reaches roughly from Jasper and Madison in Indiana south to the Tennessee border, including the Lexington and Bowling Green regions. The office operates 24 hours a day, every day of the year.

The office is led by Meteorologist-in-Charge (MIC) John Gordon. Mr. Gordon arrived at Louisville in January 2005.



Monroe County, February 5, 2008

...in this issue

Severe Weather Review **P.2**

University of Louisville Tornado Drill **P.6**

Flooding **P.7**

WxCoder **P.8**

We Can Do That! **P.9**

Your Only Official Source for Weather Warnings

Tornadoes, damaging winds, and large hail can happen any time of year in southern Indiana and central Kentucky. Rarely has this been more evident than during the fall and winter months of 2007 into 2008. October 18, 2007, witnessed the region's largest autumn tornado outbreak on record as seven tornadoes tore through counties along the Ohio River, including an EF3 in Clark County, Indiana. On January 29 a squall line hundreds of miles long swept through, with 100 mph winds and several tornadoes, one of which struck a popular shopping district in St. Matthews, Kentucky.



Harrodsburg, Kentucky, February 6, 2008

**National Weather Service
6201 Theiler Lane
Louisville, Kentucky 40229**

(502) 969-8842
<http://weather.gov/louisville>



Monroe County, KY, February 5, 2008

To cap the stormy winter, an historic tornado outbreak ravaged central Kentucky on the night of February 5 and 6, with no fewer than 18 tornadoes. An EF3 tornado in Allen County resulted in the deaths of four people, including a two-year-old boy.

And that was just over the winter! Spring and summer are often the busiest times of year for severe weather, and there are indications that this spring will be more active than normal. It is imperative that everyone be prepared *now*, before the storms strike. Have a programmable NOAA Weather Radio and practice your severe weather safety plans with your family and co-workers. Storms can strike in a matter of moments, so know what to do when you are threatened by deadly weather regardless of if a warning has been issued or not. We all must be weather aware. Our very lives depend on it.

Winter 2007-2008

In November 2007 the Climate Prediction Center issued a winter forecast for the Ohio and Tennessee valleys that called for a good chance of a warm and wet winter.

Indeed, a warm and wet winter is exactly what we got. The entire region was one to two degrees warmer than normal over the course of the season. As for precipitation, southern Indiana and northern Kentucky were five to seven inches above normal, while southern Kentucky was roughly one to five inches above normal.

The wet winter was a welcome relief after a terribly dry summer and fall that sent much of central Kentucky into the depths of a significant drought.

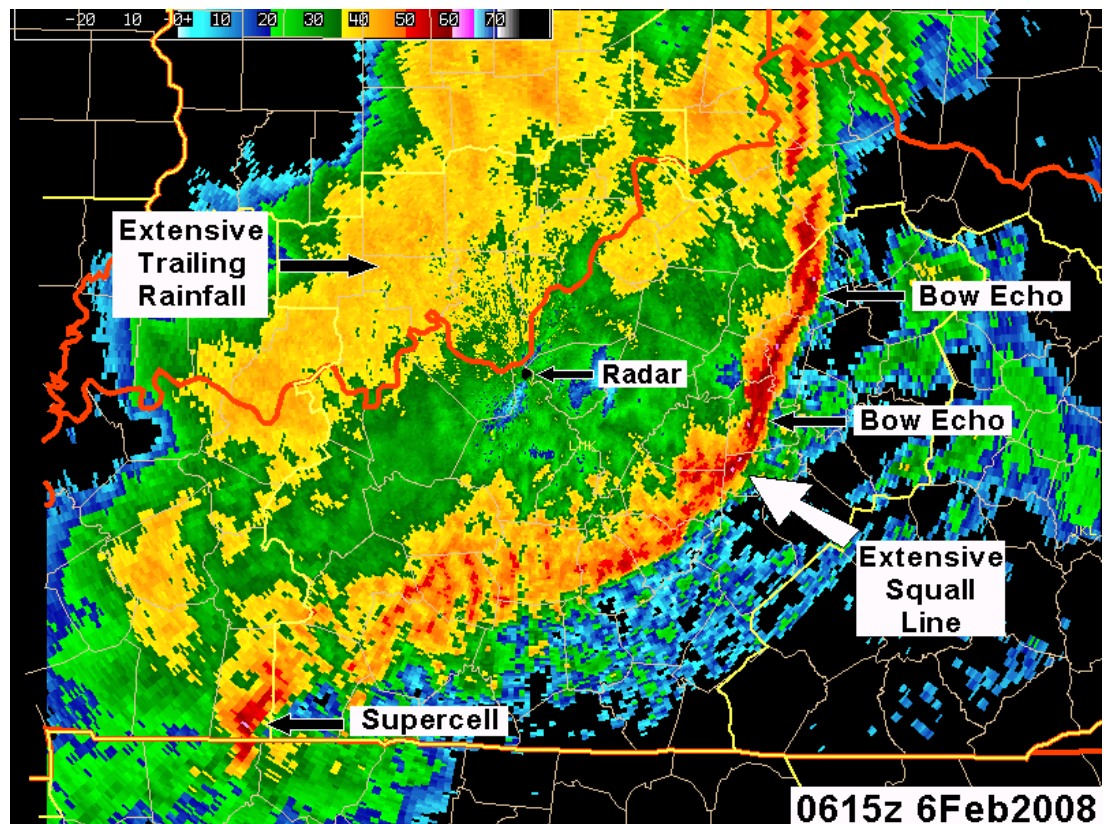
Much of the precipitation came in the form of rain, with the region receiving much below normal snowfall. Bowling Green didn't have its first measurable snow of the season until February 26!

Is Severe Weather Season Coming or Going?

By Ted Funk, NWS Louisville

Central Kentucky and south-central Indiana experienced an unusual winter, with two major severe weather events. As we head through March, this begs the question, "Is severe weather season coming or going?" Severe weather can occur in any month of the year, but it is unusual that major outbreaks occur in the Ohio Valley in the winter, let alone two outbreaks, not to mention a third major event that occurred back on October 18, 2007. Severe weather on January 29 and February 5-6, 2008 both rival any severe weather outbreaks we usually have in the "normal" severe season, i.e., April through June.

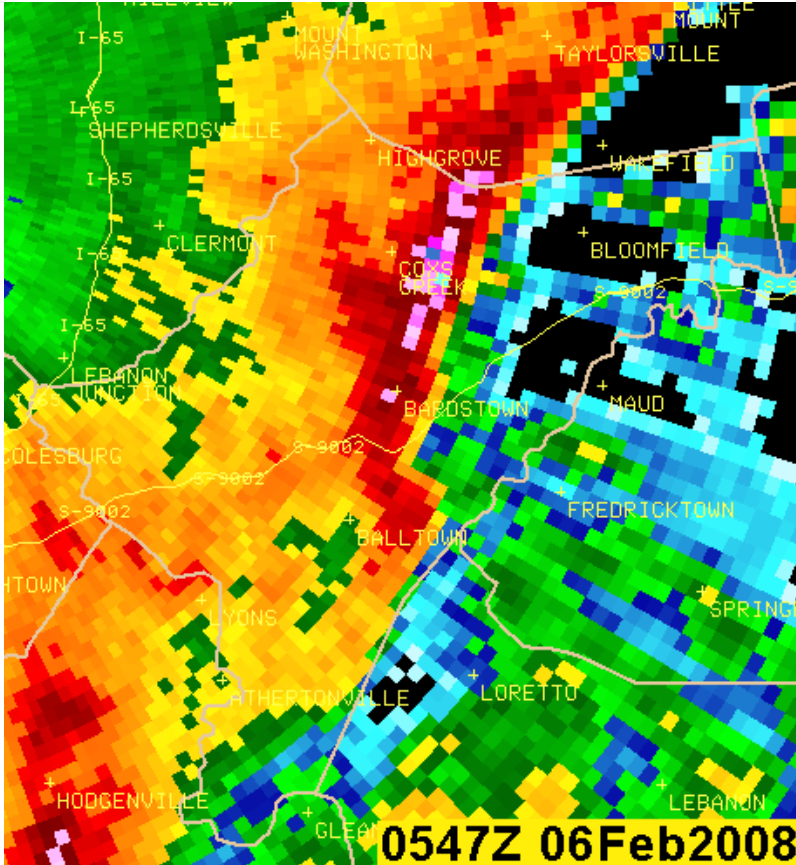
Both wintertime events featured an extensive line of thunderstorms (squall line), with embedded "bow echoes" and "supercells." The bow echoes produced straight-line wind damage and brief tornadoes (primarily EF0-EF1). Supercells over south-central Kentucky on February 5-6 produced larger, longer-lived tornadoes (EF3s). In all, 18 tornadoes were documented in the February 5-6 event, making it one of the greatest severe outbreaks in the history of our area. In addition, a bow echo produced wind damage and EF1 tornadoes in Louisville on January 29.



This reflectivity image at 1:15 am EST February 6 shows a long squall line over central Kentucky (red = heavy rain). Strong straight-line winds occurred along the line, with narrow, intense wind damage and brief tornadoes along the path of the embedded bow echoes within the line. A supercell thunderstorm is evident on the southwest part of the line. Behind the line, yellow and orange colors denote a large area of trailing rainfall, but with no additional severe weather.

Is Severe Weather Season Coming or Going?

A TOUGH SEVERE WEATHER SEASON THIS YEAR?



On the left is a close-up reflectivity image at 12:47 am EST February 6 that shows a bow echo east of Bardstown and south of Bardstown in east-central Nelson County, where the line bulges eastward. Over north-central Nelson County, pink and dark blue colors denote hail within the line of storms.



Nelson County, February 6

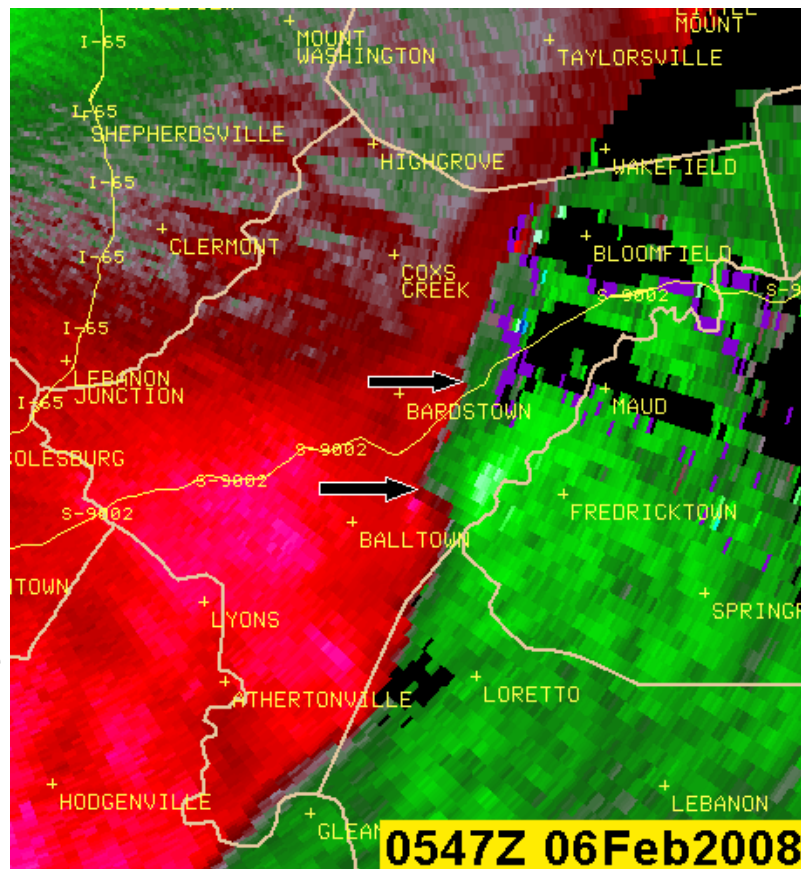
What's in Store?

The Climate Prediction Center is forecasting La Nina conditions, which persisted through the 2007-08 winter, to continue into the middle of 2008. What does this mean for us?

Recent studies have shown that the spring and summer months following a La Nina winter are characterized by a marked increase in severe weather from the lower Mississippi Valley northward through Kentucky and Indiana.

An informal local study done at the Louisville NWS office found that central Kentucky and southern Indiana see nearly *twice* the number of tornadoes after a La Nina winter compared with after El Nino and neutral winters. Also, all springtime F5 and F4 tornadoes since 1950 in this region have occurred following a La Nina winter!

This image shows storm-relative velocity data at the same time as the image above. Red (green) colors denote winds directed away from (toward) the radar site located at Ft. Knox northwest of the area shown in the image. The two arrows identify locations of small-scale cyclonic (counter-clockwise) shear, called "mesovortices," where narrow paths of intense wind damage and brief tornadoes can occur, and did occur in this event.



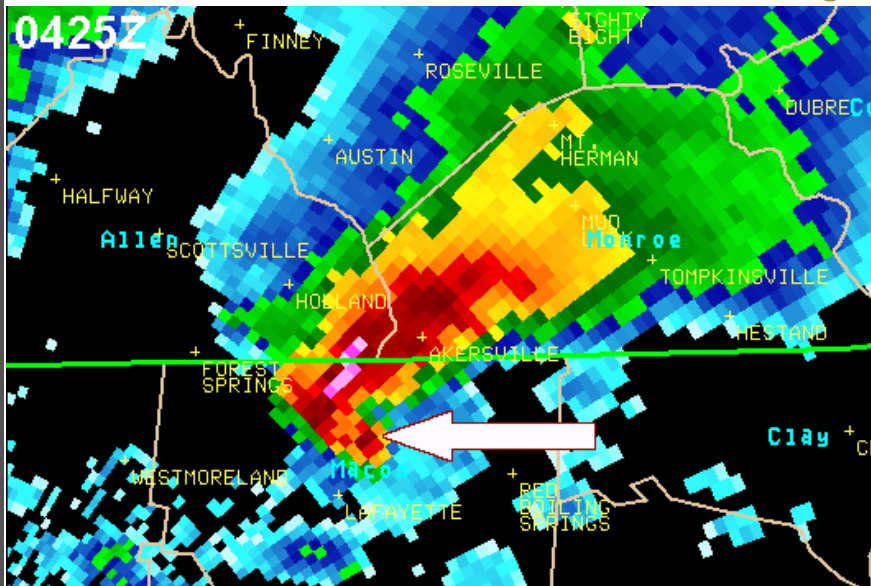
NWS Speakers and Tours Available

Meteorologists from NWS Louisville are happy to speak at club functions, schools, and other public forums. We can speak on any weather-related subject, and have given many talks at schools, social club meetings, and chambers of commerce. We bring our own presentation and our shows are usually less than an hour in length.

We also welcome tours to the weather office. We are located at the junction of Interstate 265 and Smyrna Road on the far south side of Louisville. We can accommodate tour groups of 20 people or less. The tours include a demonstration of how we forecast the weather, the tools we use, and a quick look at items such as NOAA Weather Radio, WSR-88D radar data, and our rain gauge and temperature shelter.

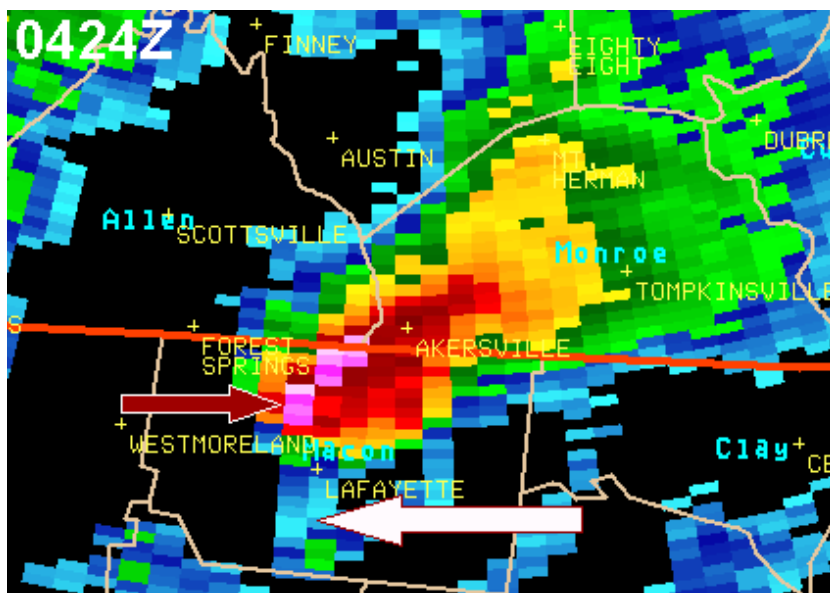
For more information or to set up a tour appointment please call us at (502) 969-8842 during regular business hours. We look forward to meeting you!

Is Severe Weather Season Coming or Going?



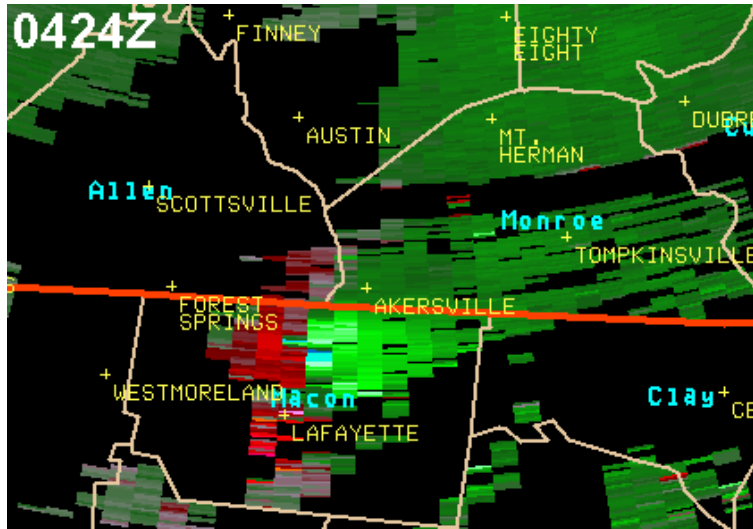
The image above, from Nashville's NWS Doppler radar, shows a tornadic supercell along the Kentucky-Tennessee border southeast of Bowling Green at 10:25pm CST February 5. The arrow points to the storm's "hook echo" where a tornado was occurring, with hail and heavy rain to the north (dark red and pink colors). This storm's EF3 tornado moved northeast into Monroe County in south central Kentucky.

The image below shows the same tornadic supercell at the same time as the image above, but using the Doppler radar located at Fort Knox. The storm appears different in the two pictures because Nashville's radar is closer and sensing lower in the storm, while Fort Knox's radar is farther away, sensing higher in the storm (the radar beam goes out at a slight angle, getting farther away from the ground with distance from the radar). NWS meteorologists can use several neighboring radars to ensure an accurate assessment of storms from different perspectives. The red arrow points out large hail in the storm (pink colors), telling forecasters that large hail is contained aloft in the storm and that a warning is necessary.

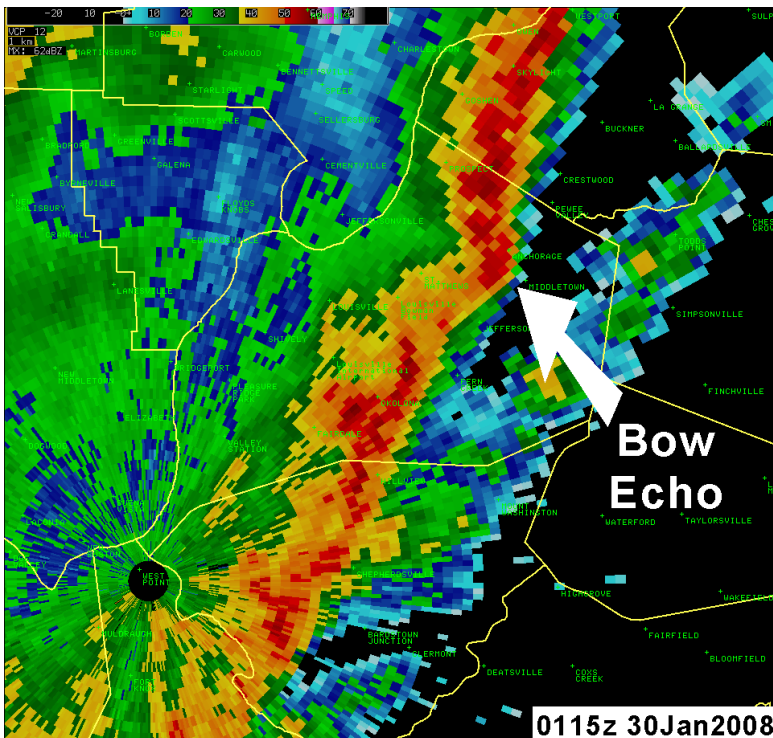


Is Severe Weather Season Coming or Going?

NWS Louisville “storm-relative velocity” data at 10:24pm CST February 5 shows an intense counter-clockwise circulation over northern Macon County, TN, about 95 miles from the radar. The circulation was producing a tornado at the time, which moved northeast into Monroe County, KY, and produced EF3 damage.



The NWS Doppler radar at Ft. Knox (located at the black dot in the lower left of the image below) revealed a squall line at 8:15pm EST January 29 over Oldham, Jefferson, and Bullitt counties in north central Kentucky. Within the line, a pronounced bow echo was shown over northeast Jefferson County, which produced a narrow, but intense swath of damaging straight line winds and a brief EF1 tornado. Comparing the tornado signature in this radar picture with the signatures in the previous pictures, note how differently the radar depicts tornadic storms given the storm mode, i.e., squall line versus supercells. All tornadoes are definitely not the same.



NWS NEEDS YOUR HELP!

Observe and Report Weather from Your Back Yard

Every year meteorologists from the NWS give severe weather spotter training classes. The single session class takes about two hours and thoroughly trains members of the public on recognizing severe weather, and, most importantly, reporting it to the NWS. It is through these reports that the NWS can more easily issue accurate and timely life-saving warnings.

Another fun way to get involved with weather is to join CoCoRaHS (Community Collaborative Rain, Hail, and Snow Network). It is a national network of thousands of volunteers who measure precipitation at their home or business and send the report in to the NWS. The information is extremely valuable to meteorologists, especially when gauging the possibility of flooding.

Major Weather Conference Coming to Louisville

Louisville has been picked as the site of the National Weather Association's annual conference. The National Weather Association (NWA), which was founded in 1975, is one of the premier meteorological organizations in the United States. Over 2700 professional meteorologists are members of the NWA, primarily from the broadcast media and government institutions such as the NWS.

The conference will be held October 11 through 16 at the Galt House downtown. This year's theme will be "Utilizing Our Past to Improve Our Future" and will be chaired by the Meteorologist-in-Charge of the Louisville NWS office, John Gordon. Workshops will be held on the first full day of the conference, during which weather broadcasters can attend special presentations and swap tapes. General operational sessions will then fill out the rest of the week.

University of Louisville Conducts Tornado Drill

By Dennis K. Sullivan, University of Louisville



On March 4, 2008, the Commonwealth of Kentucky had its annual tornado drill. Elementary, middle, and high schools as well as news media and emergency management participated in this drill. The University of Louisville (U of L) has participated in this drill annually since 2001 and this year was no different...with one significant difference.

The University of Louisville staff has participated in tornado drill every year, but faculty and students were never asked to participate because of class disruption. In order to test the building emergency action plans for each building, the provost directed that *everyone* at the university would participate.

In the weeks prior to the drill, all of the university's Building Emergency Coordinators (BEC's) reviewed their plans and some made changes to ensure that sufficient safe areas were available. U of L has three campuses, 21,000 students, and about 7,000 faculty and staff. During the daytime about 20,000 people are on the U of L campuses.

Upon notification of the tornado drill through the NOAA Weather Radios, U of L activated its emergency communication system which includes outdoor sirens, email messages, cell phone text messages, and broadcast messages, among others. Faculty members led their students to pre-designated safe areas. Staff employees did the same. Finally, the BEC's and their assistants ensured that each building's occupants were evacuated to the safe areas. Everyone was then released to return to normal activities.

U of L is still in the process of conducting a thorough after-action report, but preliminary findings indicate no system-wide problems and only a few small individual issues. University administrators will be analyzing and addressing any problems during the spring. A cursory check with emergency managers from other universities indicates that U of L is the only university that has conducted a tornado drill of this magnitude.



After Summer Drought, a Wet Winter

By Mike Callahan, NWS Louisville



Photo: Michael Halcomb/Bill Meck/WLEX

A prolonged wet period began on December 7 and continued through the 13th. During this period, rain fell every day and added up to three or four inches in most locations. This triggered minor flooding in the Licking, Salt, and Green River basins. Another period of rain, some of it quite heavy, fell on the 15th and 16th when another one to two inches prolonged the minor flooding and caused new flooding on the Ohio River.

This truck was swept into floodwaters near Sadieville on March 4. The people caught inside were able to wade to safety.

The next period of heavy rain started on January 5 and extended to the 10th when a

series of winter storms moved over the region. Most locations collected around two inches of rain. This did result in some rises to near bankfull in central Kentucky and minor flooding in the Licking Basin.

February was a damp month with precipitation falling somewhere almost every day. The first period of heavy rain ran from the 4th through the 6th when two to three inches fell in the north, with one to two in the south. The rain triggered minor flooding in the Muscatatuck River in Indiana, and the Licking, Rolling Fork, Rough, and Green Rivers in Kentucky. Some minor flooding was also noted on the Ohio River near Tell City.

A mixture of rain, sleet, and snow occurred from the 11th into the 13th with liquid precipitation amounts between one and two inches. Snow packs in the north approached 4 inches in depth before they quickly melted. That triggered a new round of flooding on the Rough River and prolonged the flood on the Ohio.

Another inch of rain was noted on the 21st and the 22nd of February. This resulted in the third round of minor flooding of the month on the Rough River. Thankfully, all flooding this winter was minor with no damage or injuries reported.



Photo: Chris Bailey/WKYT

Flooding on Shady Oaks Drive in Richmond, Kentucky on December 10.

NOAA Weather Radio Can Save Your Life

It's 3 a.m. and a Tornado Is Coming Your Way...

If you and your family are sound asleep, how do you know if a deadly storm is bearing down on your home?

NOAA Weather Radio is a direct pipeline straight from the NWS to you. As soon as NWS meteorologists issue a severe weather warning, it is immediately broadcast across the NWR airwaves. Many NWRs have an alert feature that sounds an alarm, plenty loud enough to wake even the soundest sleeper, when a warning is issued. Special needs radios with bed-shakers, pillow-shakers, and strobe lights are also available for the hard of hearing. The warning is displayed in a text window.

NWR is affordable for most and is widely available through electronics outlets. If you have a smoke detector, you should also have NWR!

Become Part of a Legacy More Than a Century Old

In 1890 the Cooperative (Co-Op) Observer Program was formed, and has been going strong ever since. Thousands of observers across the nation participate in the Co-Op network, providing the NWS with vital climatological information. Each day these intrepid men and women submit reports that include data such as air temperature, precipitation, humidity, and soil temperature — all right from their own home!

While some folks call their reports in to us here at the Louisville NWS, others choose to enter the data through an easy to use website called WxCoder III (see story at right).

Some Co-Op weather stations have been in existence for over 100 years, with the responsibilities passed down through families from one generation to the next.

If you'd like to become a part of this amazing program, contact us at (502) 969-8842.

WxCoder III Arrives for Our Volunteer Observers

By Mike Crow, NWS Louisville

On Friday, February 1, 2008, a new method was introduced for the nation's cooperative weather observers to communicate their valuable data. WxCoder III is a new web-based data entry system. WxCoder stands for 'Weather Transmitted Cooperative Observer Data Encoded Report.' The new system has many advantages over previous data entry systems, and will in many cases take the place of pen and paper forms.

One of the advantages of WxCoder III is that the system is very user friendly. It is easy for the observer to enter new data, to make any corrections to entries even up to a month later, and to enter observations for several days at the same time.

Cooperative data will be available in near real time using WxCoder III. Supervising forecast offices can download and view the observer's recording forms on a daily basis if desired. This will enable public service personnel at the WFO to fulfill requests for cooperative data within a day of the observation.

WxCoder III performs basic quality control checks as data is entered. This feature will greatly decrease the number of data entry errors, and streamline the quality control process at the end of the month.

Paper forms will no longer be a necessity. This will cut down on mailing costs, as well as eliminating the problems of damaged, lost, or hard-to-read forms.

Best of all, the system has been well-received by its users, the cooperative weather observers of central Kentucky and south central Indiana. In spite of some early communications problems, all have enjoyed using the system, and see the program itself as very robust.

Thanks to all of our cooperative observers, the "backbone of the nation's climatology." No matter what the technology or data entry method, their hard work, diligence, and dedication to providing high quality data makes the job of the National Weather Service much easier. In many cases, we really could not do our jobs without the efforts of these volunteers.

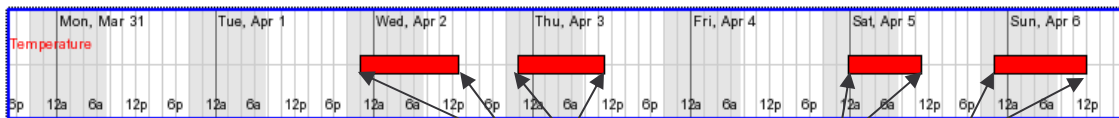


WxCODER

We Can Do That!

“I have sensitive plants outside and need to know how long temperatures will be below 32 degrees tonight.”

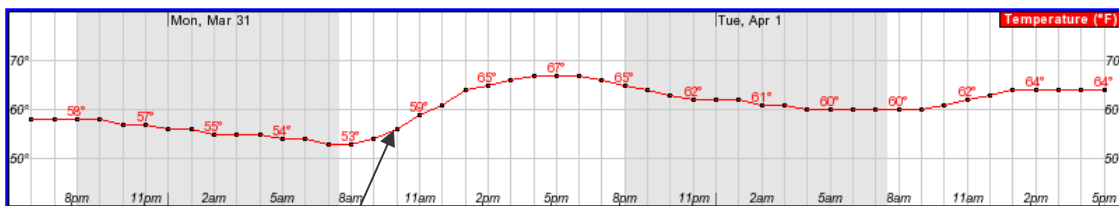
Simply use our Activity Planner, at <http://forecast.weather.gov/wxplanner.php?site=lmk>. Enter in the temperature range in which you are interested (in this case, 32 and below), and click on your location on the map. A chart will appear showing you which hours meet the criteria you specified. This can also be used with humidity, winds, sky cover, and precipitation chances.



Temperatures will be at or below 32 degrees during these hours

“I know what the afternoon high will be, but I have an outdoor activity this morning at 10 o'clock. What will the temperature be then?”

For this you can use our Interactive Weather Graphs at <http://www.crh.noaa.gov/forecast/gridpoint.php?site=lmk>. Choose “Hourly Weather Graph” in the pull-down menu, select which weather elements you are curious about (in this case, temperature), and click on your location on the map. An easy-to-read graph will display for you the temperatures for each hour through the course of the entire day. Other available parameters include dew point, wind chill, wind, humidity, sky cover, precipitation chances, and precipitation amounts and types.



Monday, March 31 at 10am
Temperature: 56°F

Hover your mouse over the graph to get an exact readout!

“My basement flooded last Thursday. How much rain did we get in Lexington that day?”

We have daily climatological information back to 2003 freely available via our website, at <http://www.weather.gov/climate/index.php?wfo=lmk>. Data such as daily high and low temperatures, rainfall, snowfall, and weather conditions are just a few mouse-clicks away.

For information from longer ago than 2003, feel free to give us a call during normal business hours at (502) 969-8842, or drop us a line at w-lmk.webmaster@noaa.gov. We've had many occasions where people wished to know the weather conditions on the day they were born, or weather information for a historical book or article they were writing. Depending on the location, we have some weather information from as far back as the 1870s!

We're Well into Our Second Century

Serving You Since 1870

Though the Smithsonian began the nation's first network of weather observes in 1849, it was the advent of the telegraph 20 years later that really spurred the development of a national weather observing and forecasting organization.

On February 9, 1870, President Grant officially signed into law what would become today's National Weather Service.

The Louisville office opened its doors on September 11, 1871, and has been in operation without interruption for all of those 136 years.

The Lexington office opened in October 1872, though it was closed a few years later in 1876, before then being re-opened in 1887. The Lexington office merged with the Louisville office in 1996.

February

6

2008

Allen
County

Kentucky



Photo: Matt Pedigo/Scottsville Citizen-Times