2012: A Review of the Year's Weather across Central Kentucky and South-Central Indiana

The year 2012 was first and foremost quite warm. Buoyed by a warm winter, a freakishly warm March, and a near record hot July, 2012 set the record, based on daily average temperature, for the warmest year on record at Louisville International Airport and at Bowling Green, and the second warmest year on record at Lexington. The chart below shows the 4 warmest years on record at these locations based on yearly average temperature (2012 is highlighted in red, including the departure from normal).

	Louisville	**Lexington**	**Bowling Green**
1st	***60.8 (2012) (+2.6)***	58.5 (1921)	***61.5 (2012) (+3.5)***
2nd	60.4 (2007)	***57.6 (2012) (+2.0)***	60.8 (1939)
3rd	60.2 (1921)	57.5 (2007)	60.7 (1933)
4th	59.7 (1991)	57.5 (1938)	60.6 (1941)

2012 Monthly Temperature Statistics for Louisville, Lexington, Bowling Green, & Frankfort:

Average Monthly Temperature (Departure from Normal)	**Louisville**	**Lexington**	**Bowling Green**	**Frankfort**
January	39.2 (+4.3)	37.3(+4.4)	41.4 (+5.7)	36.9 (+4.4)
February	42.3 (+3.5)	40.1 (+3.1)	44.6 (+4.8)	39.7((+3.3)
March	59.6 (+11.8) ***1st***	56.3(+10.8) ***1st***	61.1 (+12.7) ***1st***	55.8 (+10.9)
April	59.4 (+1.4)	55.9 (+0.6)	61.4 (+3.7)	56.0 (+0.8)
May	72.6 (+5.5) ***3rd***	68.7 (+4.5)	72.6 (+6.2) ***4th***	69.6 (+4.6)
June	76.2 (+0.6)	72.4 (-0.3)	76.0 (+1.0)	72.0 (-0.6)
July	84.5 (+5.2) ***1st***	80.5 (+4.3) ***2nd***	84.5 (+5.8) ***2nd***	80.4 (+4.0)
August	78.4 (0.00)	74.2 (-1.1)	77.7 (+0.2)	74.2 (-1.0)
September	69.7 (-1.3)	66.5 (-1.6)	69.9 (-0.2)	66.6 (-1.0)
October	57.3 (-2.2)	54.3 (-2.7)	57.3 (-1.5)	54.1 (-2.3)
November	45.9 (-2.8)	42.8 (-3.5)	46.2 (-2.2)	41.9 (-4.1)
December	44.4 (+6.5)	41.8 (+5.8)	45.8 (+7.2) ***7th***	41.7 (+6.4)
2012 Total	**60.8**	**57.6**	**61.5**	**57.4**

Above, red indicates the month's rank in the top 10 warmest months on record for that location.

Monthly Precipitation:

Monthly Precipitation (Departure from Normal)	**Louisville**	**Lexington**	**Bowling Green**	**Frankfort**
January	4.05 (+0.91)	3.54 (+0.34)	3.81 (-0.22)	3.13 (-0.13)
February	1.68 (-1.50)	3.09 (-0.11)	2.74 (-1.20)	2.61 (-0.68)
March	6.22 (+2.05)	3.31 (-0.76)	3.97 (-0.44)	4.10 (-0.28)
April	3.40 (-0.61)	2.30 (-1.30)	3.74 (-0.47)	2.63 (-1.06)
May	7.87 (+2.60)	3.60 (-1.66)	3.31 (-2.32)	5.07 (+0.22)
June	0.79 (-3.00) ***6th***	1.61 (-2.83) ***6th***	0.65 (-3.50) ***3rd***	1.22 (-2.87)
July	4.00 (-0.23)	8.01 (+3.36) ***9th***	5.82 (+1.71)	5.64 (+1.25)
August	1.46 (-1.87)	2.15 (-1.10)	2.78 (-0.55)	1.15 (-2.21))

September	5.83 (+2.78) ***9th***	5.42 (+2.51)	4.66 (+ 1.73)	6.05 (+2.72)
October	2.39 (-0.83)	1.28 (-1.85)	2.94 (-0.44)	1.83 (-1.41)
November	0.75 (-2.84) ***7th***	1.76 (-1.77)	1.11 (-3.11) ***6th***	1.16 (-2.57)
December	7.14 (+3.31) ***7th***	6.55 (+2.62)	5.41 (+0.61)	6.58 (+2.57)
2012 Total	**45.68 (+0.77)**	**42.62 (-2.55)**	**40.94 (-8.95)**	**41.17 (-4.45)**

Above, blue indicates the month's rank in the top 10 wettest months on record for that location.
Above, orange indicates the month's rank in the top 10 driest months on record for that location.

Temperature/Wind:

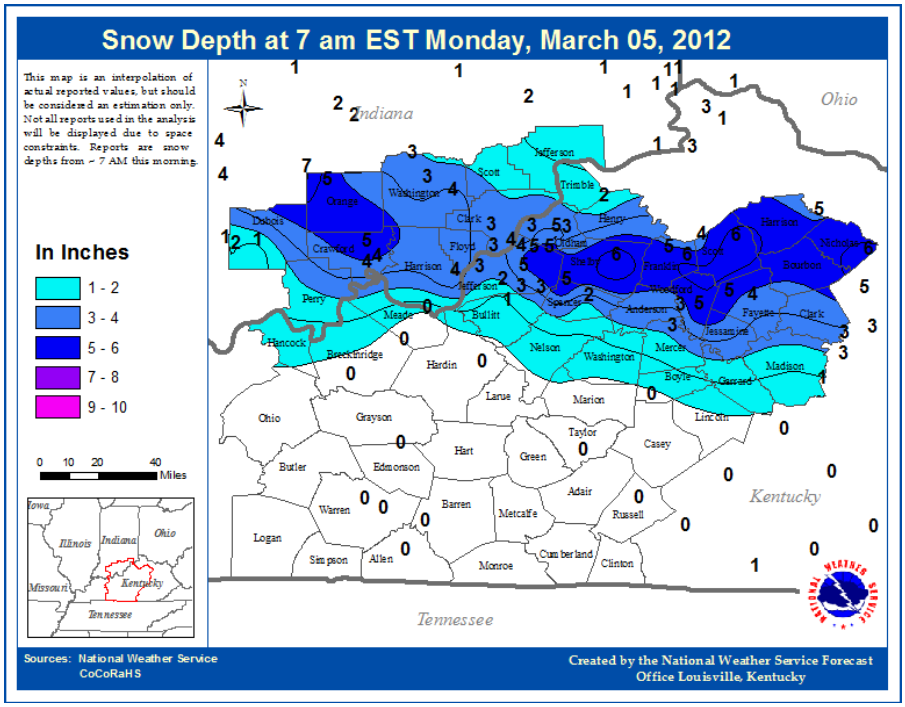
Category	Louisville	Lexington	Bowling Green	Frankfort
Highest temperature	106* (Jul 7)	105** (Jul 7)	110*** (Jun 29)	103 (Jul 7)
Lowest temperature	17 (Feb 12)	13 (Feb 12)	16 (Jan 14)	13 (Jan 14)
Yearly max sustained winds	43 (Jul 19)	44 (Jul 1)	43 (Mar 2)	35 (Oct 14, Feb 29)
Yearly max wind gust	64 (Jul 19)	66 (Jul 27)	64 (Mar 2)	54 (Sep 5)

*** Tied for second highest of all time (record=107 on July 28, 1930)**
**** Tied for third highest of all time (record=108 in July 10 and 15, 1936)**
***** Tied for second highest of all time (record=113 on July 28, 1930)**

Monthly Snowfall:

Monthly Snow Total (inches)	Louisville	Lexington	Bowling Green
January	1.8	1.1	1.4
February	1.7	1.2	Trace
March	3.5	5.3	0.0
April	Trace	0.0	0.0
December	2.7	3.4	Trace
2012 Total	**9.7**	**11.0**	**1.4**

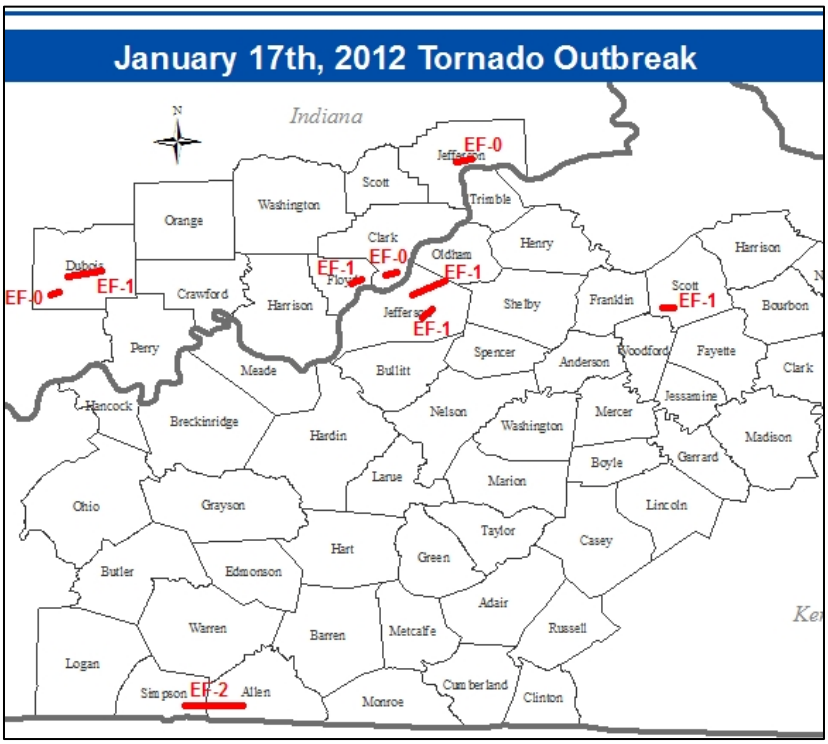
Winter 2012 at least for the first two months of the year was almost non-existent. Practically no snow fell with the exception of two Alberta Clipper systems, both of which brought an arc of snow extending from southern Indiana through central Kentucky. On March 5, our most significant snow of the winter brought 3 to 7 inches basically along and just north of Interstate 64 from southern Indiana through the Bluegrass Region. This snow fell just 60 hours after the major tornado outbreak in southern Indiana on March 2. The map below shows snowfall accumulation for this storm.



The fast moving storm brought several hours of intense snow. Our heaviest totals accumulated across the Bluegrass north of Lexington where 4-6 inches fell.

Snowfall photo courtesy of Tom Latek of Frankfort after the March 5 storm.

Similar to 2011, quite a few tornadoes touched down across our forecast area in 2012. Our severe weather season arrived early, with one line of thunderstorms on January 17 that set a record for the most tornadoes (9) ever for a specific January outbreak.



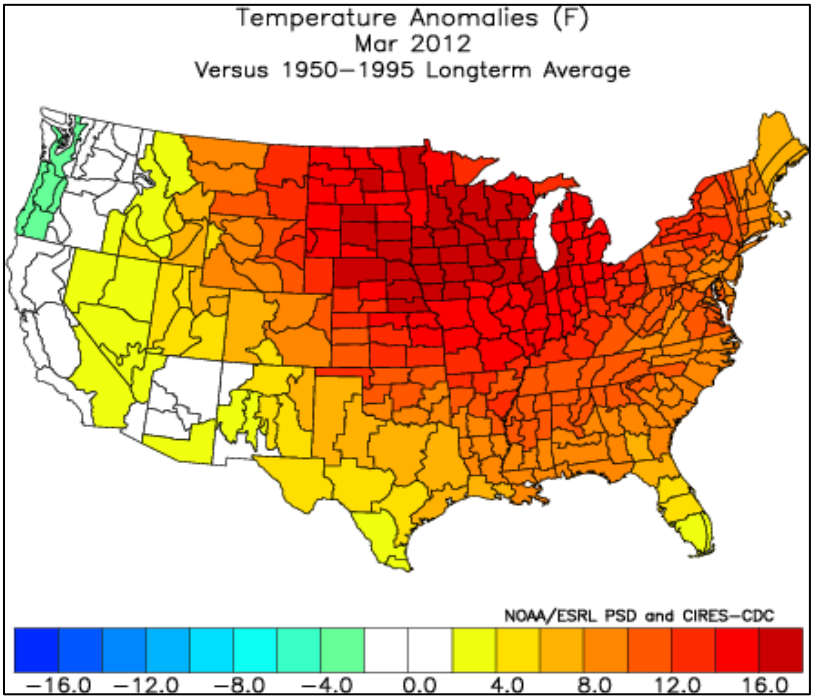
Map showing the tornado tracks and their Enhanced Fujita (EF) scale ratings for the January 17 severe weather outbreak.

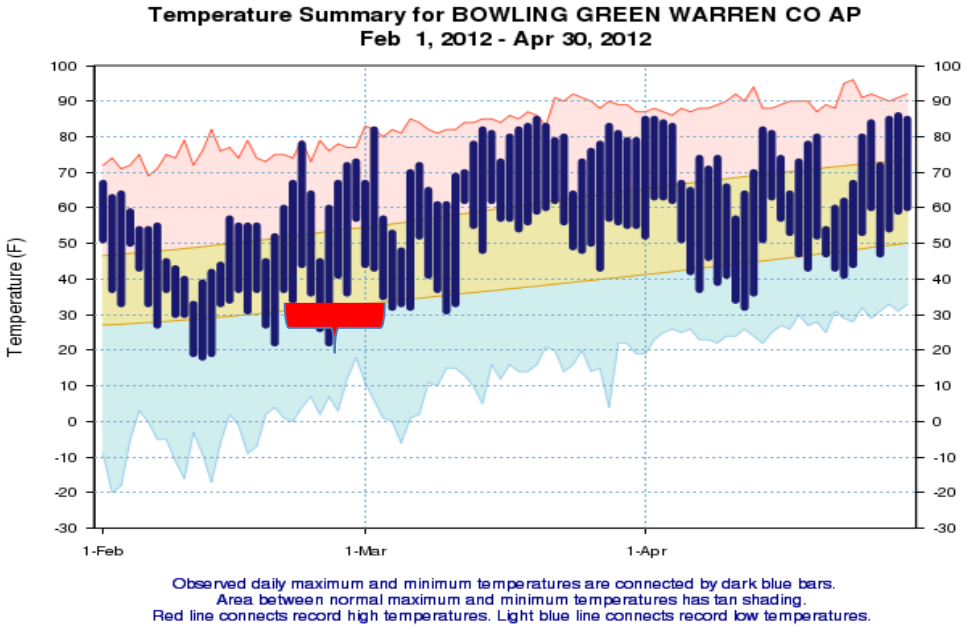
Image of the EF-1 tornado that damaged some homes east of downtown Louisville on January 17.

Our record warm March….

A persistent ridge of high pressure at the surface and aloft across the central and eastern portions of the country during March brought record warm temperatures to not only the Lower Ohio Valley, but for all of the

Midwest and much of the Plains. It is quite possible that this warm of a March will not be repeated in our lifetime. Below is a map showing how far above normal temperatures rose across the country.



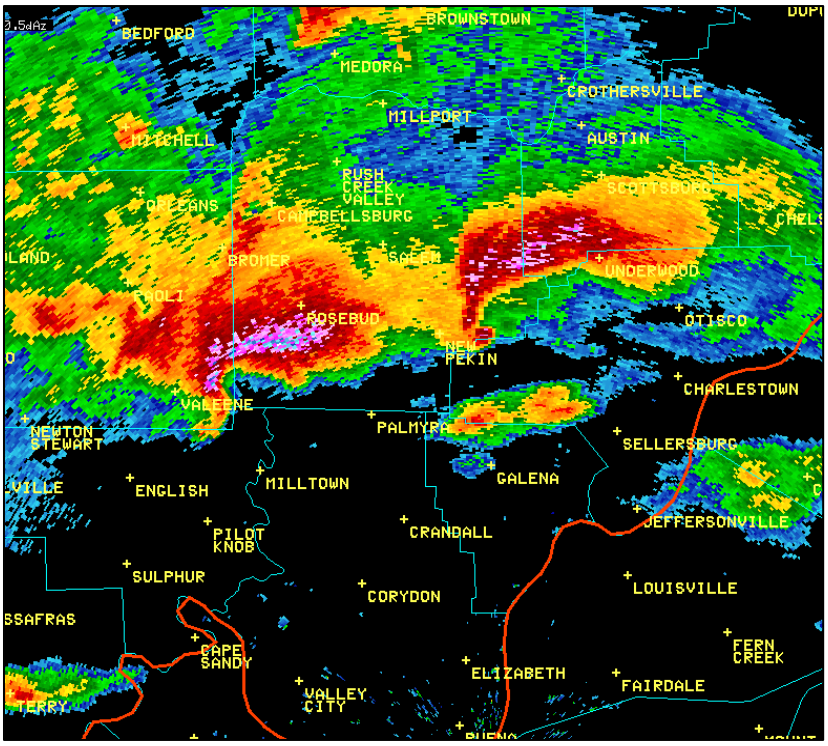


Note that at the Bowling Green airport over a 10 day period from around the 10th to 20th of March, overnight low temperatures did not fall much below normal mid-March high temperatures.

The March 2 tornado outbreak…

Unseasonably warm and humid air combined with a strong storm system over Missouri to bring a violent regional tornado outbreak centered over southern Indiana. A violent long-tracked twister crossed southern Indiana during the afternoon hours, and became our first EF-4 rated tornado since the Bullitt County tornado

on May 28, 1998. With a track of 49 miles, the March 2 twister unfortunately became our deadliest tornado since the Brandenburg tornado on April 3, 1974. The image below shows the two strongest supercell thunderstorms of March 2 as viewed by National Weather Service Doppler radar. The cells both essentially moved over the same path. The lead storm to the east produced the EF-4 tornado over southeastern Washington and western Clark counties, including the Henryville area, while the western supercell brought softball sized hail on its path and an EF-1 tornado just south of Henryville.

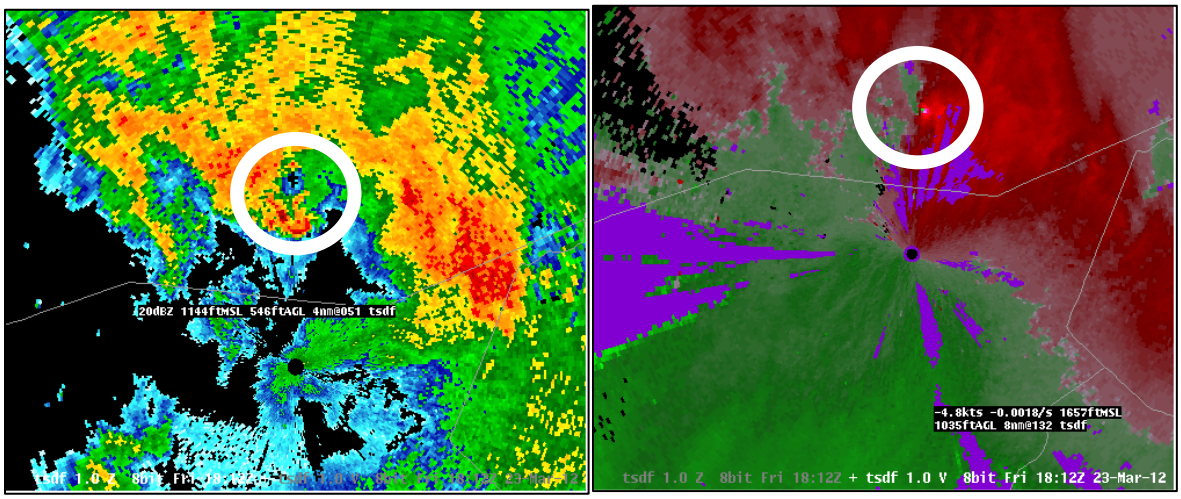


The two images below show the tornado from the first (lead) supercell. The first photo shows the tornado near peak strength as it passed just north of Palmyra. The image is courtesy of Simon Brewer of The Weather Channel.

Toward the end of this violent tornado's life, it weakened as it crossed the Ohio River. This picture, courtesy of Wayne Mahoney, looks southeast across the Ohio River from Jefferson County, Indiana into Trimble County.

March 23 northern Kentucky tornadoes…

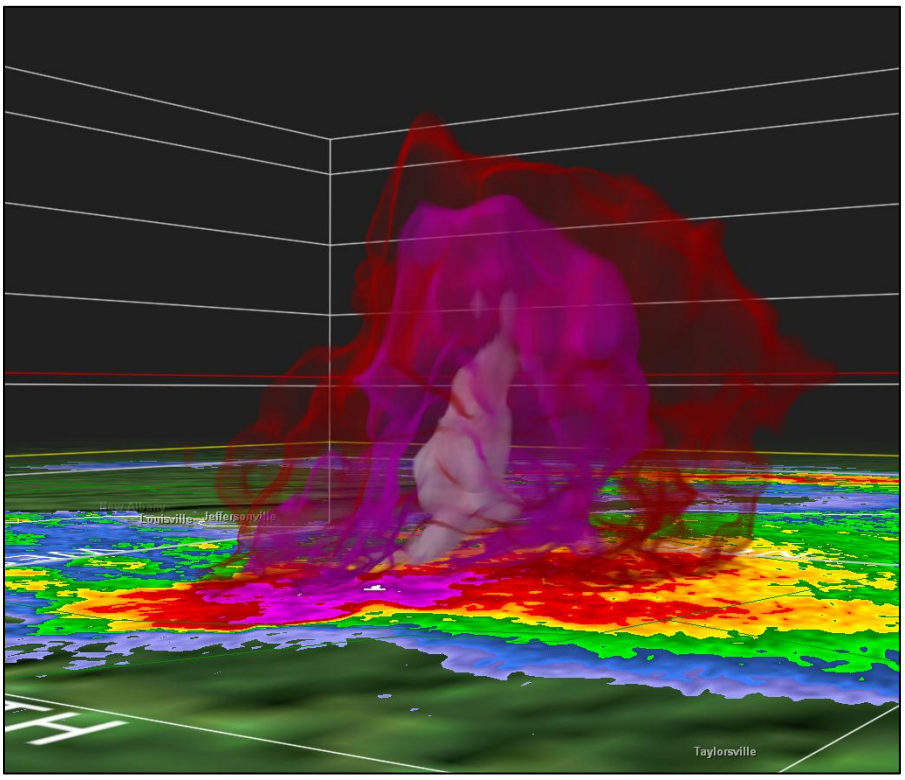
A couple of tornados touched down southeast of Louisville during the afternoon of March 23. These storms were unusual, forming in an environment that did not even support lightning. However, these "*showers*" developed the shape that is associated with supercells (i.e., mini-supercells). The two highlighted images below show Doppler radar reflectivity (left) and velocity (right) of the westernmost storm, which did some damage to a small area in southern Jefferson County, Kentucky southeast of Louisville. The tornado developed just a few miles north of a FAA radar located in northeastern Bullitt County (small black circle in images).



Louisville April 28 hailstorm…

Aside from the many damaging hailstorms associated with the March 2 outbreak, one thunderstorm in particular deserves special mention. This supercell, which developed over Dubois County during the afternoon of April 28, tracked right over Louisville and became the city's most destructive hailstorm in decades. Two inch diameter hail fell at Churchhill Downs, interrupting the evening's races. Trees were partially denuded of leaves

at Fern Creek and along portions of Billtown Road. The two images below show a three-dimensional image of the hail core and a hail photo taken at Audubon Park in Louisville.



A three dimensional image of this supercell was captured when the storm was right over Fern Creek, just to the northwest of Taylorsville. The white shows an intense hail core that was producing over 2 inch hail at the time.

Two inch diameter hail, courtesy of Tyler Martin, which fell at Audubon Park.

Very hot period this summer…

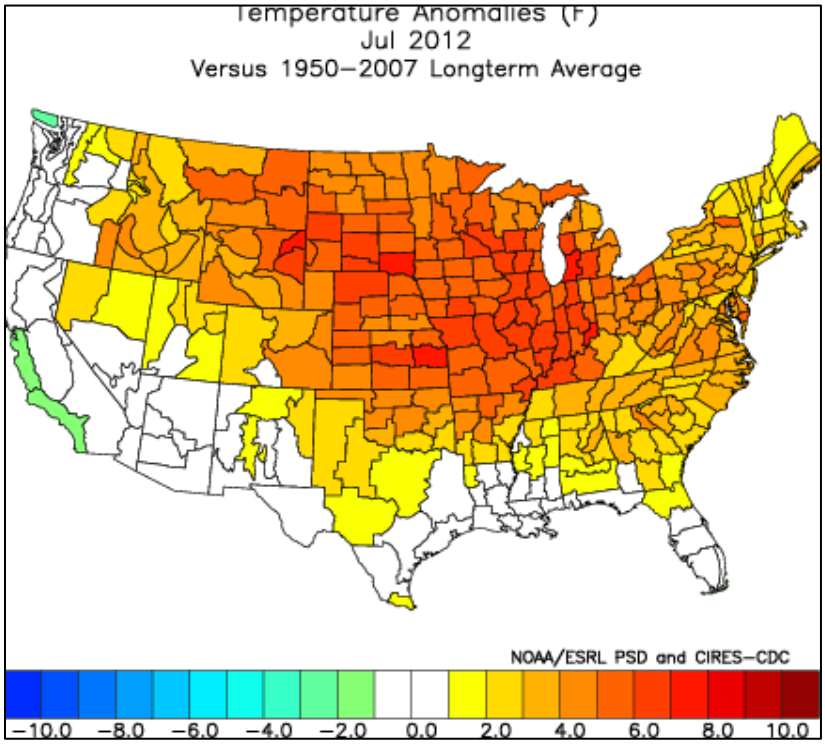
Although June and August were not exceptionally hot, ***record or near record heat*** quickly developed in late June and continued into the second week in July. This 10-day period produced one of the hottest stretches of temperatures over the Commonwealth since the Dust Bowl days of the 1930s. The chart below shows high temperatures from late June through the 7th of July. All temperatures were recorded at the airport official observation site for each city.

Date	Louisville	Lexington	Bowling Green
June 28	103 *	102	106 *
June 29	105 * **	102	110 * **
June 30	103 *	103 *	108 *
July 1	100 *	103 *	105 *
July 2	100 *	97 *	101
July 3	97	95	98
July 4	102 *	99 *	102 *
July 5	104 *	99 *	103 *
July 6	103 *	103 *	103 *
July 7	106 *	103 *	103

* **Record high for the date**

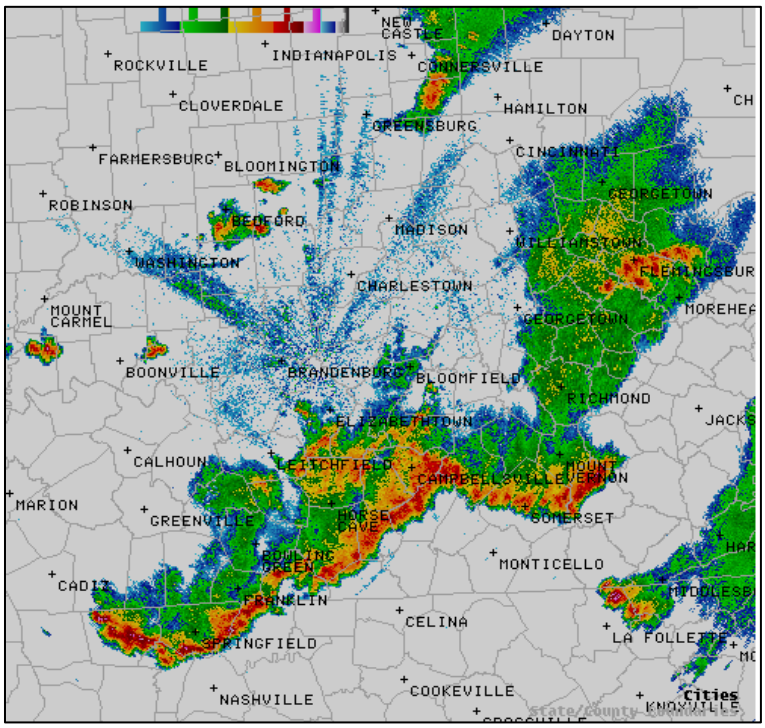
** **Record high for the month of June**

July 2012 will be remembered as one of the 3 hottest Julys on record across the Lower Ohio Valley. Using temperature anomalies (departures from normal), the chart below shows how hot the month was across the entire country.



Not much organized severe weather developed this past summer. Our only widespread concentration of damaging storms developed during the ***evening of July 19***. Scattered severe storms east of Louisville during the afternoon congealed into a long line of severe storms that moved south over south-central Kentucky. The

image below shows this line of storms at its peak. Wind gusts of over 60 mph were recorded at a Kentucky Mesonet site in Simpson County at the time of this image.



The line of storms also caused a ragged wall cloud near Brownsville in Edmonson County (image courtesy of John Betner). This storm prompted a tornado warning.

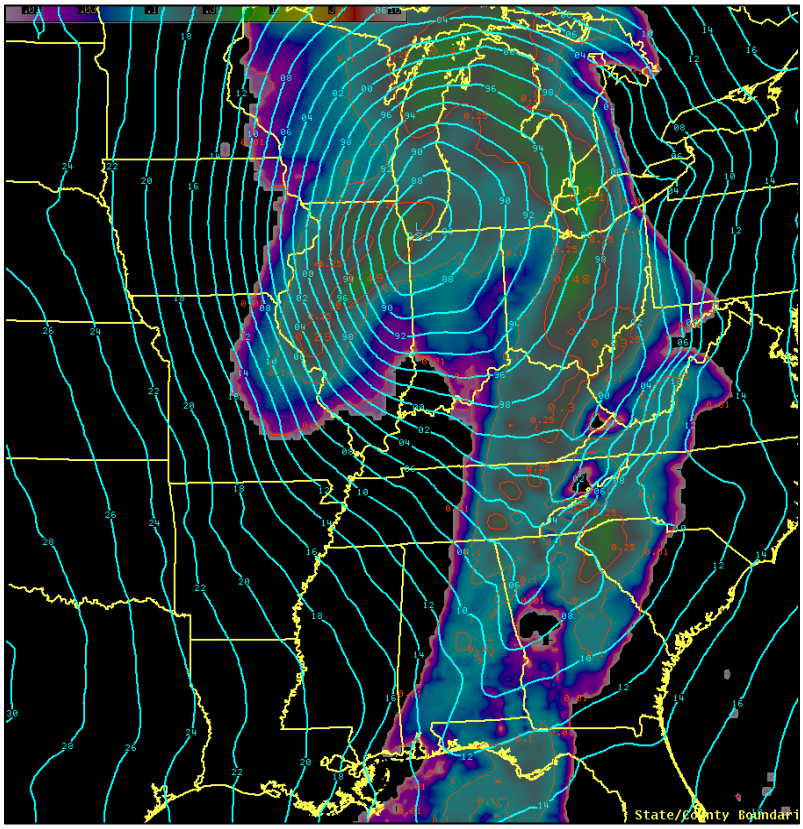
Unusually warm first half of December…

After a coolish fall, the first half of December 2012 saw either record or near record warmth as shown in the table below.

Highest Average High Temperatures for all of December and for December 1-17		
	December	Record Start to December
Louisville	50.9 **2nd highest on record**	51.6 (1889)
Lexington	47.9 **3rd highest on record**	49.9 (1889)
Bowling Green	51.6 **New record warmth**	

The December windstorm…

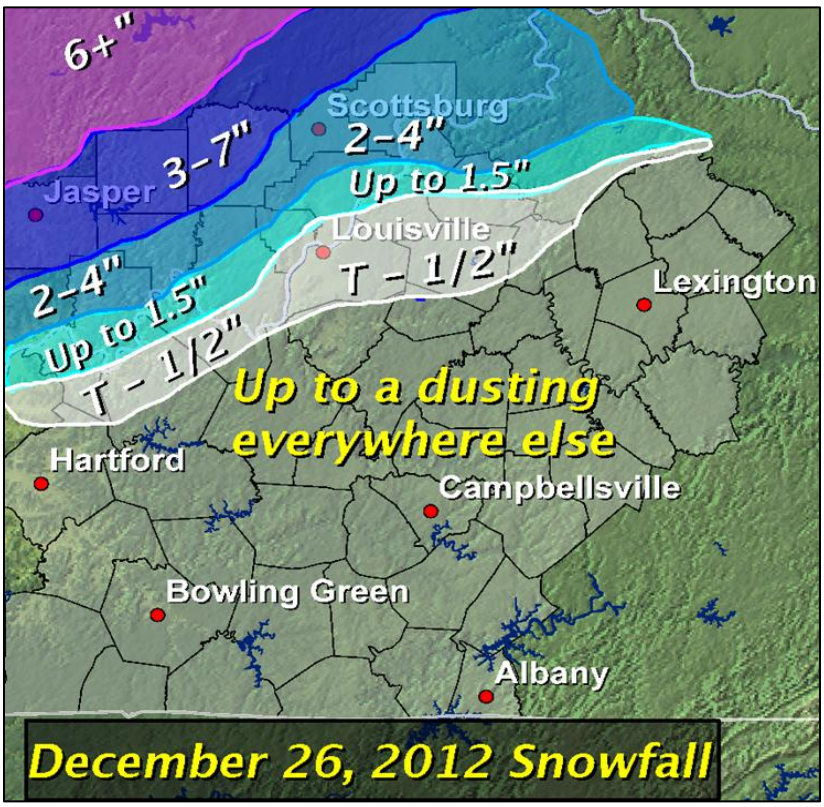
Low pressure rapidly deepened as it moved over Chicago during the early afternoon on December 20. Strong winds developed across the Commonwealth and southern Indiana after the passage of a cold front. By mid to late afternoon, westerly winds increased to an average of 30 mph, with occasional gusts above 55 mph. Using daily average wind speed as a guide, the 20 mph average wind for Louisville International Airport gave Louisville its windiest day in 3 years, last eclipsed by a 22 mph wind speed average on December 9, 2009.



This map of unusually deep low pressure near Chicago the afternoon of December 20th shows a tight pressure gradient over Kentucky.

The December 26 snowstorm…

Low pressure deepened as it traveled northeast from western Tennessee to eastern Kentucky during the early morning hours on December 26. The storm spread a narrow but heavy swath of snow from the Missouri Bootheel through southern Illinois and central Indiana. Blizzard warnings were verified across central Indiana, where northeast winds gusting up to 40 mph accompanied heavy snow during the pre-dawn hours. Five to 7 inches of snow fell across the northern sections of Dubois, Orange, and Washington Counties in Indiana.



A tight gradient of snow is apparent across southern Indiana. Snowfall amounts varied from just 2 to near 7 inches from south to north across Dubois and Orange Counties.