

January 8, 2013

BAE

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### December 2013 Monthly Summary

Soaking rains and abundant snowfall made for an extremely wet December across the Bluegrass State. Overall, the eastern portion of the region came out the winners with an average of 6.56 inches. This was over 2 inches above normal and places 11th on the wettest years on record going back to 1895. Multiple systems throughout the month contributed to the wet pattern with the first two coming during the opening week. Snowfall ranged from 3 to 5 inches through Western Kentucky, the Louisville metro and up into the northern Bluegrass on December 6<sup>th</sup> (Figure 1). These amounts tapered farther southeast, but most areas still got some freezing rain. The most came in western portions of the state where more than a quarter inch of ice accumulated. After a day to recover, freezing rain once again returned to Bluegrass State on Sunday with a quarter inch of ice in south central Kentucky.

As the state headed into the second half of the month, wintry weather seemed to taper, while abnormally warm and moist conditions settled into the area. This was most prevalent the third week of December in which multiple locations topped 70 degrees. Record highs were set on the 21st at Bowling Green, Louisville, Frankfort, and Lexington. The state ended the week with an average temperature 11 degrees above normal. Although it was warm, a cold front stalled just north and west of the region. This contributed to a very wet pattern as multiple waves of low pressure rode along this boundary. Some locations recorded more than 4 inches in a 24 hour period, which is normally only seen once every 5 years. The state ended up being over 1.5 inches above normal for just that weekend. In addition to abundant rainfall, a line of storms developed on the night of the 21st. Damaging winds were common across the area with even a few weak, isolated tornados.

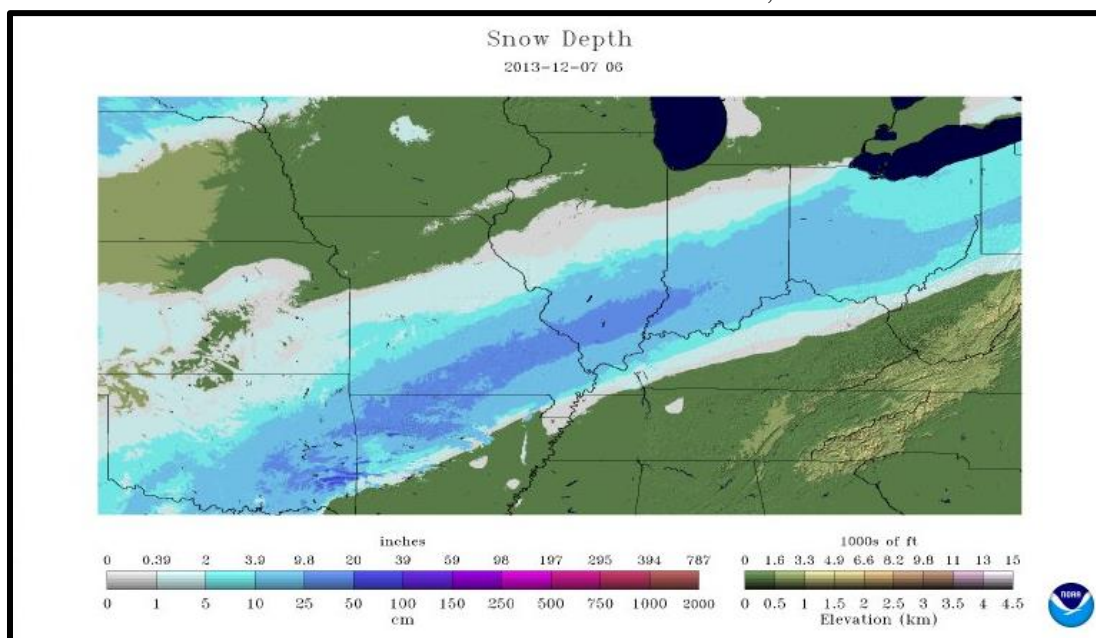


Figure 1

Summarized and averaged data for the period 20131201 to 20131231 (Last 31 Days) (Not for Legal purposes. Departure from Norms based on climate divisional Averages)											
STATION	AIR TEMPERATURE						PRECIPITATION			ExtremeTemp	
	MAX	DEV	MIN	DEV	AVR	DEV	TOTAL	DEV	%NORM	HI	LO
WEST (CD1)	46	-2	30	0	38	-1	5.75	0.87	118	75	-1
CENTRAL (CD2)	46	-1	31	2	39	1	5.73	0.91	119	74	9
BLUEGRASS (CD3)	44	-2	30	2	37	0	5.42	1.55	140	71	3
EAST (CD4)	48	0	32	4	40	2	6.56	2.33	155	76	10
STATE	46	-1	31	2	38	0	5.87	1.42	132	76	-1

Data obtained from KY Mesonet and NWS Station

### Forecast

After a very cold start to January, conditions will take a turn for the better heading into the middle of the month. Southerly flow will bring much milder air into the Commonwealth for the weekend. Average highs are generally in the upper 30s to low 40s for this time of the year, but this weekend will feature highs in the low to mid 50s on Saturday. Accompanying the warm temperatures will be another round of rainfall as a cold front sweeps through the region. Up to an inch is anticipated with the boundary's passage. Drier conditions will then return on Sunday with more rain for the first half of the workweek.

**Winter Outlook (JFM)**  
**Near Normal Temperatures and Precipitation**

Looking farther out into late next week, the state looks to be under the influence of slightly below

### 2013 Year in Review

The last couple of years have been out of the ordinary for the Bluegrass State. 2011 was compromised by heavy rainfall and flooding, while 2012 brought one of the worst droughts in Kentucky history. What did 2013 bring? Well, it was normal year for the most part. There were no major droughts, flooding events, or catastrophic ice events. Temperature deviations were right around normal for the year as a whole. The only number that really stands out is the fact that the state was 4 inches above normal. This amount gives the feel that flooding may have been an issue, but the precipitation was much more spread out over time

normal temperatures (Figure 9) with near normal rainfall. Throughout the rest of the month and all the way through March, outlooks are calling for near normal temperatures and precipitation. Average rainfall is around a tenth of an inch each day with a total just over 3 for the month of January.

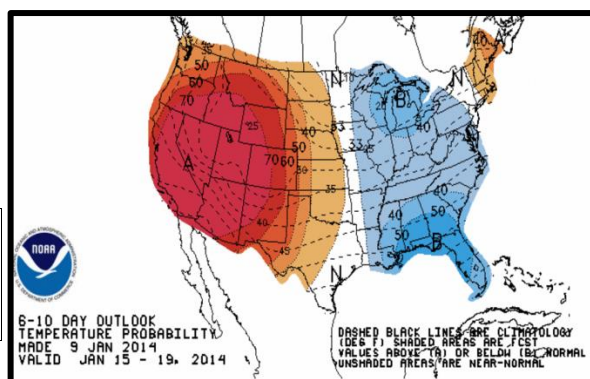


Figure 2

compared to 2011. That year, the Commonwealth was 13.11 inches above normal just for the period of February 27<sup>th</sup> through May 8<sup>th</sup>. So more than anything, 2013 brought a break from extreme weather events, and at the same time, produced one of the best crop seasons in Kentucky history.

The year started off with a fairly warm winter. In fact, the 2<sup>nd</sup> week's average temperature was 16 degrees above normal. Southerly flow bumped highs well into the 60s throughout the week. Jackson even hit a high of 78 degrees. Keep in mind that this was January, when normal high temperatures are only supposed to be in the low to mid 40s. Plentiful rainfall accompanied the warm

weather with the Bluegrass State averaging over 5 inches through the month of January. This essentially brought an end to the devastating drought of 2012 and put much needed moisture into the soil for the upcoming growing season. Towards the end of January, one of the worst squall lines of the year ripped through the area. The image below (Figure 3) provided by the NWS office in Louisville, KY, shows damage to a farmstead in Warren County following the track of an EF2 tornado through the area on the 30th. Wind speeds were estimated at 125 mph.



Figure 3

The end of February signaled the end of meteorological winter. Over the course of the season, not much snow had fallen across the state. In fact, the Jackson National Weather Service Office was 10 inches of snow below normal. Following a rather unseasonably warm winter season, conditions took a turn for the worse in March. The state averaged a chilly 40 degrees for the month and placed the state within the top 15 coldest March's on record going back to 1895. Mother Nature missed the memo with spring starting on the 20<sup>th</sup> as temperatures were 9 degrees below normal for the second half of the month. Comparing March of 2012 and that of 2013 showed a drastic difference as shown in Figure 4 below, provided by the NWS office in Jackson, KY. April then turned things around with a return to near normal temperatures. Wet conditions throughout the month resulted in the corn crop a bit delayed getting into the ground. Progress then slowly inched forward through the month of May.

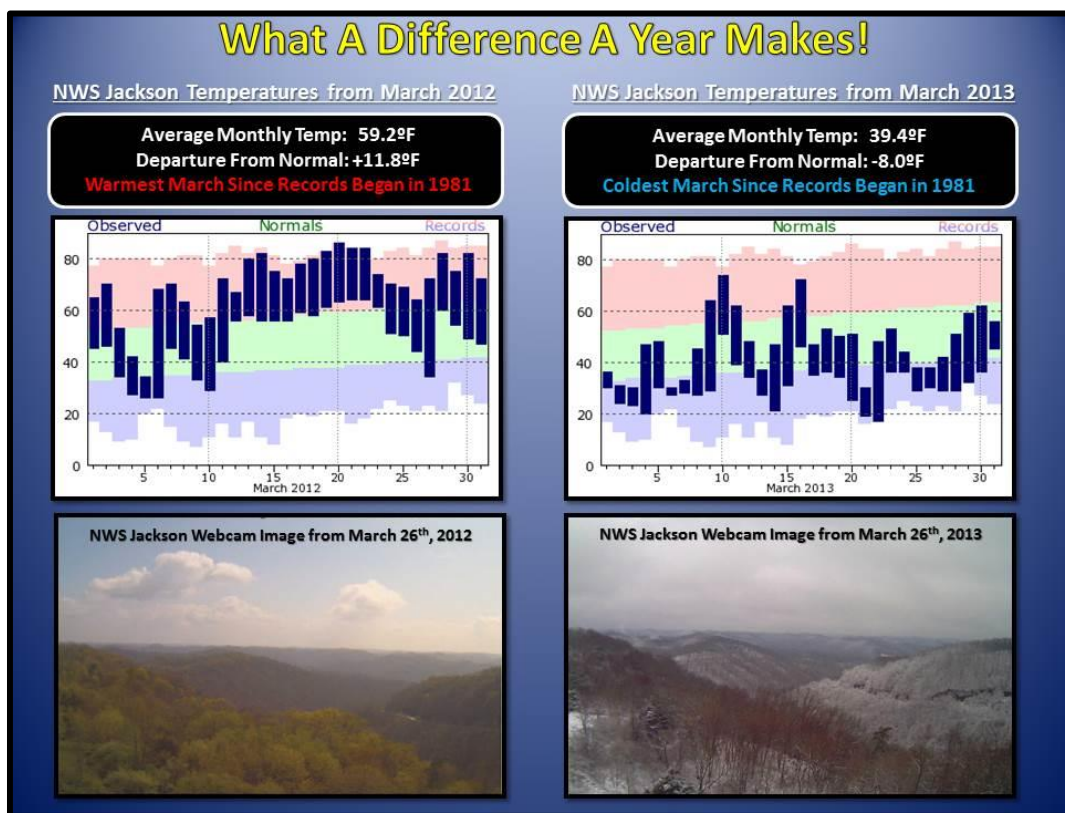


Figure 4

The weather pattern then shifted dramatically going into the summer months. The state averaged over 6 inches of rainfall for both June and July. A slow moving cold front drenched western portions of the state over the first week of June with Paducah getting over 6 inches in one day. Extensive flash flooding occurred with the town of Paducah submerged in some areas.

The National Weather Service in Jackson recorded there wettest season on record with more than 10 inches falling over the course of the summer. One

of the most pronounced rainfall events occurred on the 4<sup>th</sup> of July, which put a damper on most outdoor activities. This is shown in Figure 6 where quite a few areas saw over 2 inches through the holiday. Figure 7 then shows how much of the state saw well above normal rainfall through the month of July with some areas 5 inches above normal. After corn planting was delayed, this set off a chain reaction through the early stages of the summer months with winter wheat harvested later than usual followed by double-crop soybeans late getting into the ground.

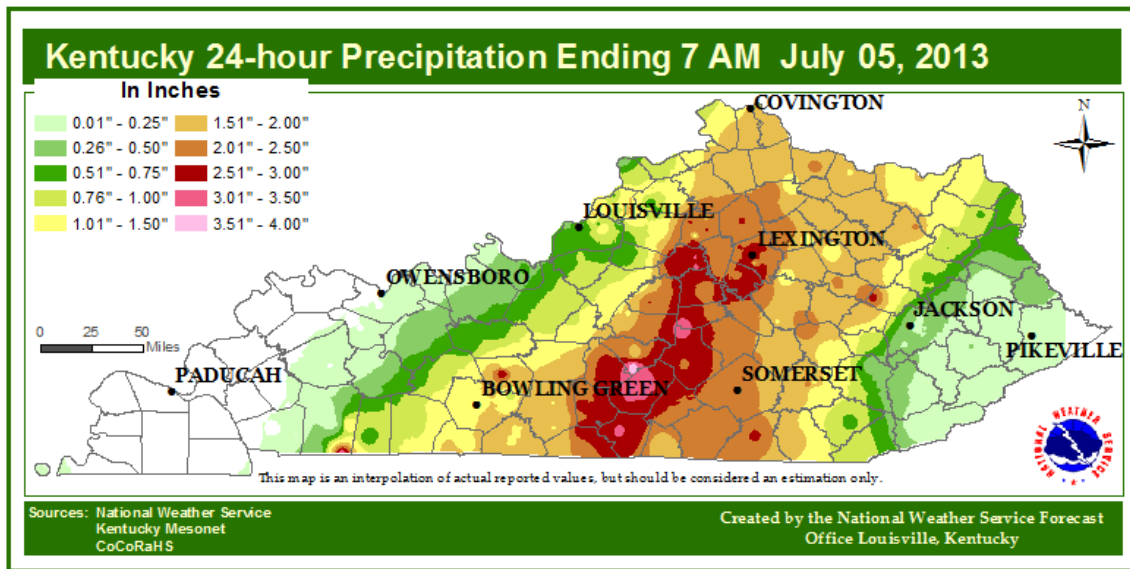


Figure 6

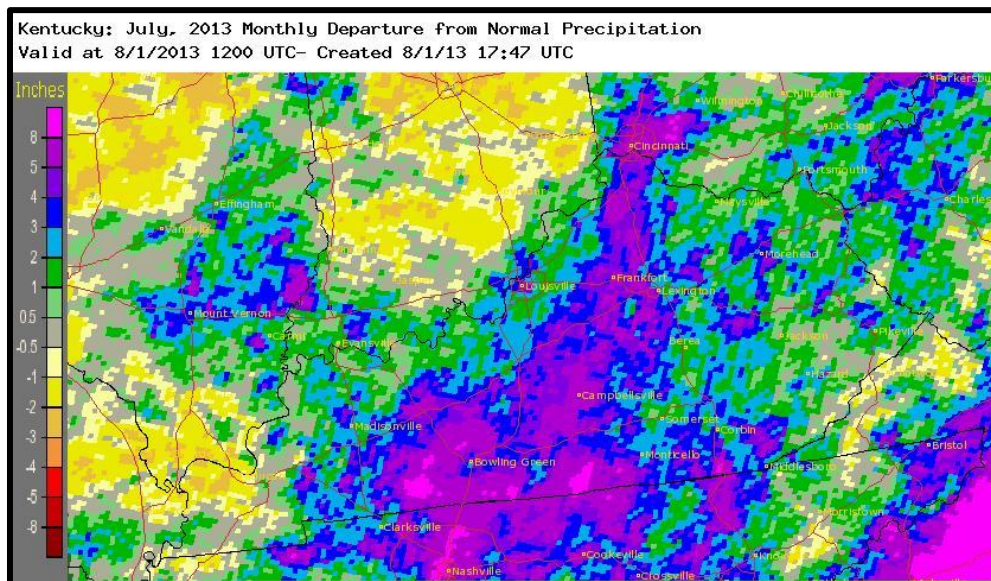


Figure 7

Accompanying moist conditions was a rather cool trend. Throughout the entire summer, only the West reached triple digits at any time. July ended up being the 12<sup>th</sup> coolest on record for the Bluegrass State with high temperatures hovering in the upper 70s to lower 80s for much of the month. Lows toward the end of July even dropped into the upper 40s across western portions of the state, giving the feel that fall had come early. This pattern carried over into August until the last week of the month. A late-season heat wave put temperatures back into the upper 80s to lower 90s with the livestock heat-stress index heading into the emergency category at times.

Conditions then turned dry going into the fall months, which is a normal occurrence for the lower Ohio Valley. High pressure for much of month limited rainfall amounts to a state average of 3 inches over the course of September. Frost held off until the 19<sup>th</sup> of October when clearing skies following the passage of a cold front allowed temperatures to drop into the mid 30s for much of the state. This was followed by a hard freeze on the 25<sup>th</sup> and 26<sup>th</sup> as Arctic high pressure sent lows plummeting into the mid to upper 20s. This essentially brought an end to the 2013 growing season.

Severe weather events were few and far between for much of the year, but Halloween was one of the

more significant. Winds gusts in excess of 50 mph were common across the area, with even some weak tornados scattered across the state. A damage survey performed by the National Weather Service in Paducah described bean fields as flattened with the passage of an EF1 tornado through Cunningham, Kentucky with estimated peak winds of 105 mph. Dr. Chad Lee of UK Plant and Soil Sciences stated in an [article](#) that the high winds also led to some downed corn. He attributed this to a combination of slow dry down, shallow roots, and heavy ears.

The Halloween storm was then followed by another severe weather outbreak midway through the month of November. A cold front being dragged through the area on the 17<sup>th</sup> resulted in the strongest tornados of the year touching down across western portions of the Commonwealth. Multiple were of EF3 strength with one in particular passing near Paducah with estimated winds of 145 mph. The track was 42 miles long and according to the National Weather Service in Paducah, this was the 3<sup>rd</sup> largest track recorded over the past 2 decades (Figure 8). Other than severe weather, Kentucky did get an early glimpse of winter heading into the Thanksgiving holiday. Bluegrass and eastern portions of the state saw anywhere from 0.5 to 2 inches as low pressure passed to the southeast.

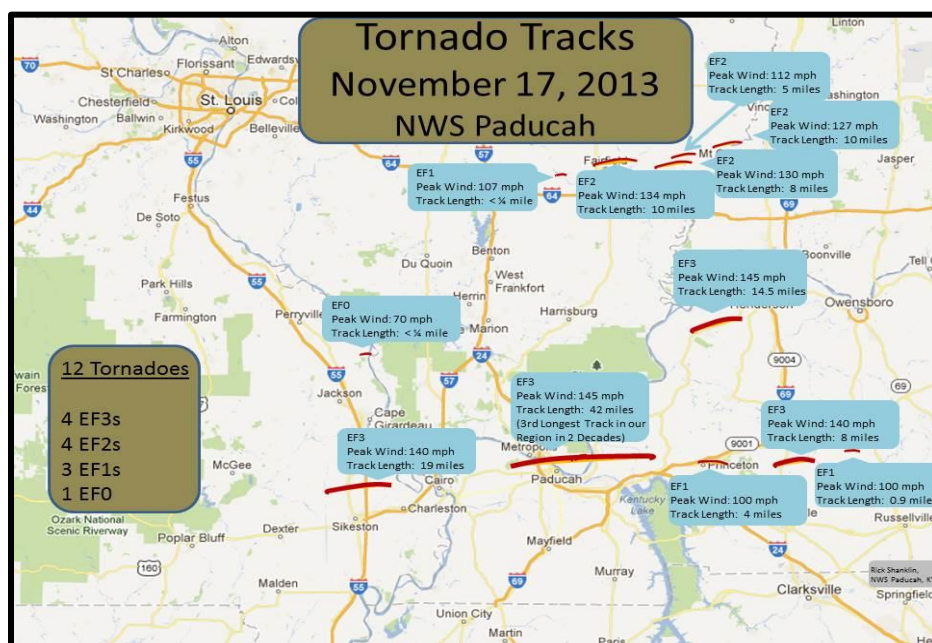


Figure 8

The Commonwealth then saw many more opportunities for snowfall throughout the last month of the year. 3 to 5 inches fell across western portions of the state and up through the Bluegrass over the first week of the month. Accompanying the snow was a period of freezing rain, where some areas received more than a quarter inch of ice accumulations. All of this just contributed to a very wet month in general. Over the latter half, a cold front stalling just north and west of the region allowed for 4 inches to fall in just a 24 hour period for areas in western Kentucky. This normally only occurs once every 5 years.

So overall, while the Commonwealth did have its ups and downs throughout the year, it was much more manageable compared to 2012. There were no prolonged periods of dry weather as drought became nearly non-existent. Sufficient rainfall throughout the year allowed for one of the better

crop seasons in Kentucky history. The Kentucky Small Grain Growers' Association gave an idea of how successful the 2013 season actually was. 45.8 million bushels of winter wheat had been harvested, which is a 60% increase from 2012. This included 610,000 acres, which was the most acres harvested since 1982 across the Bluegrass State. While the official statistics for the 2013 season have not been released in regards to corn and soybeans, the USDA remained extremely optimistic in their latest November report with expected record yields. The Kentucky Extension Corn Yield Contest has already proven the significance of 2013. The highest yields for both non-irrigated and irrigated entries were both records at 297.22 and 365.11 bushels, respectively. More information can be found [here](#). Horticulture also saw a rather good year, which was explained by a collection of specialists in the most recent edition of [Fruit Facts](#). Most all fruits and nuts had a normal full crop

### January Weather-Related Ag Operations

<b>Field Activities</b>	Field activities vary during the non-growing season from feeding livestock, completing harvest of corn/soybeans in some years, to working fields in preparation for spring. Short periods of rainy weather provide interruptions to getting in the field. Extended wet periods make for a muddy mess and make even the minor field activities postponed. Lengthy dry periods are particularly important for fields to dry out.
<b>Grain Bin Management</b>	The key in grain bin management is to get moisture out of the bin without adding too much or too little heat. Significant changes in daily air and dew-point temperatures are extreme important for grain bin management. On dry days, grain bin fans pump moisture out of bins, but producers need to maintain a bin core temperature very close to the monthly average temperature.
<b>Livestock Management And Cold Stress</b>	During periods of extended cold outbreaks (cP air), especially during windy conditions providing serious wind chill (less than zero (F))... livestock must have access to windbreaks, unfrozen water, extra dry bedding, and access to dry shelter. This is especially true for very young (newborn) and old livestock.
<b>Soil Temperatures</b>	Typically during the extended cold weather, if soils are wet or snow-covered, soil temperatures stay right around 32 degrees.
<b>Replanting Conditions</b>	<ul style="list-style-type: none"> <li>• Very wet conditions...a week or 2 with above normal liq. precip. and soils become saturated...causes serious problems with winter wheat and barley stands.</li> <li>• Extremely cold temperatures (cP) air after a very mild (5 to 10 degrees above normal) period can do serious damage to stands of winter wheat and barley. However, snow-cover reduces this damage. The more snow-cover, the better!</li> <li>• Several days of undulating temperatures, above and below freezing, can do serious damage to winter wheat and barley stands. The freeze/thaw cycle can cause heaving.</li> </ul>

### January Vegetable Gardener's Calendar

<b>January 15th</b>	Start seeds indoors for ONIONS
<b>NOTE:</b> Add 10 days for Central KY and 15 for Eastern KY to these dates for spring and summer crops.	

### January Beef Operations

<b>Spring Calving Herd</b>	<ul style="list-style-type: none"> <li>• Prepare for Calving</li> <li>• Prepare a calving area and equipment</li> </ul>
<b>Fall Calving Herd</b>	<ul style="list-style-type: none"> <li>• Breeding season ENDS</li> <li>• Provide clean windbreaks and shelter for young calves</li> </ul>
<b>All Cattle</b>	<ul style="list-style-type: none"> <li>• Feed hay in areas where mud is less of a problem</li> <li>• Increase feed intake as the temperature drops</li> <li>• Provide clean water at all times. Be aware of frozen pond hazards</li> </ul>
<b>Forages</b>	<ul style="list-style-type: none"> <li>• Prepare for pasture renovation by purchasing seeds, inoculants, etc. and getting equipment ready.</li> <li>• Determine the need for N fertilization of selected grass pasture fields for early spring growth.</li> <li>• Assess hay quality and inventory.</li> <li>• Allocate hay feeding based on animal needs and hay quality.</li> <li>• Determine varieties to be used for renovation.</li> <li>• Plan pasture utilization strategy (fencing, water, shade)</li> </ul>