

January 4, 2013

BAE

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December 2012 Monthly Summary

The month of December followed the same trend Kentucky saw for most of the year in which above normal temperatures prevailed across the Commonwealth. The state as a whole ended the month 6 degrees above normal with an average temperature of 44 degrees, which marks the 7th warmest December on record going back to 1895 and the 8th month this year Kentucky had witnessed above normal temperatures. One of the major contributors to this warmth was temperatures in the low to mid 70s witnessed statewide the first week of December. Southwesterly winds pumped warm air into the Bluegrass State throughout the week resulting in temperatures that were on average 15 degrees above normal, leaving some to question whether it really was the start of December. This high of a deviation has not been seen since mid March. During this time span, Louisville saw its second warmest December temperature ever recorded of 75 degrees. While the month was on the warm side, following the passage of a low on the 28th, temperatures plunged through the overnight. So much so, that the coldest temperature of the year was recorded in Henderson, Kentucky of 6 degrees.

December also provided the lower Ohio Valley with beneficial rainfall. Previously the state had gone 3 straight months with below normal rainfall, with nearly 70% of Kentucky seeing abnormally

dry conditions. Going into December, the skies seemed to open up and several rainfall producers soaked the state with an average of over 5 inches (figure 1) and diminished this percentage back down to near 27%. While most of this precipitation fell in the form of rain, the end of December brought quite the change. While it was not a white Christmas, a couple strong low pressure systems brought cooler air down from our northwest and a transition to snow for some portions of the state. The most significant was the mid-level low that passed through on the 26th. A heavy swath of snow fell in mainly western sections of Kentucky with totals in excess of 4 to 6 inches. The snow did not stop there as yet another low passed through the last Friday of the month with numerous totals in excess of 3 inches falling in northwestern and Bluegrass portions of the state.

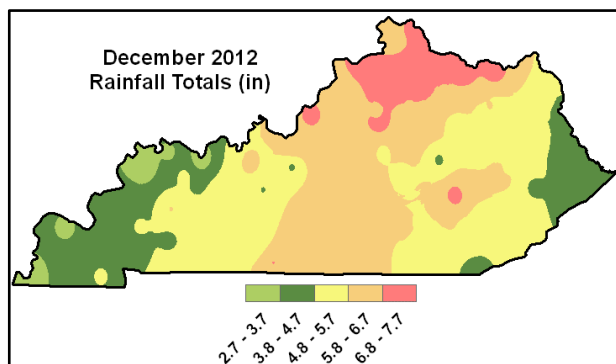


Figure 1

Summarized and averaged data for the period 20121201 to 20121231 (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) | 52 | 4 | 37 | 7 | 45 | 6 | 3.96 | -0.87 | 82 | 75 | 6 |
| CENTRAL (CD2) | 52 | 5 | 37 | 8 | 45 | 7 | 6.03 | 1.23 | 126 | 75 | 16 |
| BLUEGRASS (CD3) | 49 | 4 | 36 | 8 | 42 | 5 | 6.34 | 2.49 | 165 | 73 | 14 |
| EAST (CD4) | 51 | 3 | 37 | 10 | 44 | 6 | 5.27 | 1.06 | 125 | 74 | 17 |
| STATE | 51 | 4 | 37 | 8 | 44 | 6 | 5.40 | 0.98 | 122 | 75 | 6 |

Data obtained from KY Mesonet and NWS Station

Two Week Forecast

In the short term, it is expected that dry conditions will be the dominant feature through early next week. Only a slight chance for rain and snow showers is in place going into the weekend with a couple upper level disturbances passing aloft. A mid level ridge will then build in for the start of next work week, bringing a nice warming trend to the Bluegrass State. After a rather cool weekend with highs only getting into the upper 30s to low 40s statewide, highs back near 50 are possible going into the Tuesday through Thursday time frame. It isn't until mid work week when a low pressure system tracks into the Ohio Valley region that Kentucky sees its next chance of significant rainfall.

Winter Outlook (JFM)

Above Normal Rainfall and Temperatures

Looking farther out into late next week and into the mid-January time frame, the state looks to be under the influence of slightly above normal temperatures with above normal rainfall. Average temperatures for this time of the year are generally in the low to mid 30s across the state, with average highs in the upper 30s to low 40s and lows in the mid 20s. Average rainfall is around a tenth of an inch each day with a total just over 3 inches for the month. The latest 3 month outlook also keeps the same trend as the Commonwealth is in line to see above normal temperatures, in addition to above normal precipitation as shown below in figure 2.

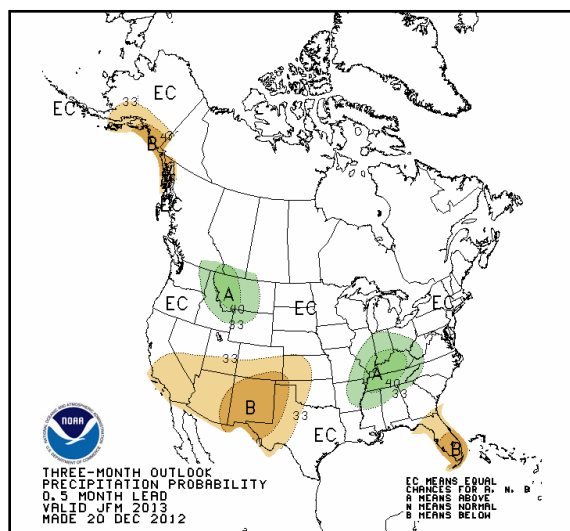


Figure 2

2012 Year in Review

2012 has been completely different from any other year on record. Each season has been far from normal and has been dominated by different features. Spring seemed to come early this year as warm temperatures dominated the latter half of winter. Severe weather started nearly a month ahead of normal. June and July have been known for the historic drought that took hold of the country, while the beginning of August brought more fall-like temperatures. The abnormal year didn't stop there as going into the fall season, the remnants of 2 hurricanes passed through the state, just before a major warm up going into the beginning of December. The following article strives to give a sense of how different this year has been from years past.

The year started off with an incredibly mild winter and very little snowfall. Did we even have a winter? Temperatures were above normal for the entire season and ended 11 degrees above normal for the month of March. This ended up being the warmest March on record for the Bluegrass State. The spring-like temperatures led to severe weather instances starting about a month ahead of normal. As of the end of February and into March, the weather pattern had shifted to support strong to severe thunderstorms and some tornados. This started as early as Leap Day, as several tornados ripped through the Ohio Valley. The worst of the severe weather happened on March 2nd as a powerful storm system initiated large scale tornados, with an EF4 tornado touching down just north of Louisville. The picture below (figure 3) was provided by the Louisville NWS and displays the monstrous tornado as it moves near New Pekin, Indiana.



Figure 3

The record warmth in March allowed for farmers to start planting earlier than normal. Unbeknownst to them at the time, 2012 would lay claim to one of the worst agricultural droughts of all time. As was the winter season, spring was also very dry. April is supposed to be known for a more vigorous weather pattern with multiple chances of rainfall and severe weather. April of 2012 was nearly the exact opposite. Kentucky ended the month almost 2.5 inches of rainfall below normal and drought started to set in upon the Bluegrass State. Temperatures returned to near normal, but this was short-lived. By May, warm temperatures were making a comeback with temperatures on average, 12 degrees warmer across Kentucky during the first week of the month. The warming trend became significant during the last 2 weeks of June when temperatures started to exceed 100 degrees on a daily basis and break records across the state. Drought continued to deepen and expand throughout the month. The entire state of Kentucky only averaged 0.88 inches of precipitation in June, which was 3.5 inches below normal. This resulted in the second driest June on record for the Bluegrass State. As of the end of June, most areas of the state were under moderate to extreme drought conditions.

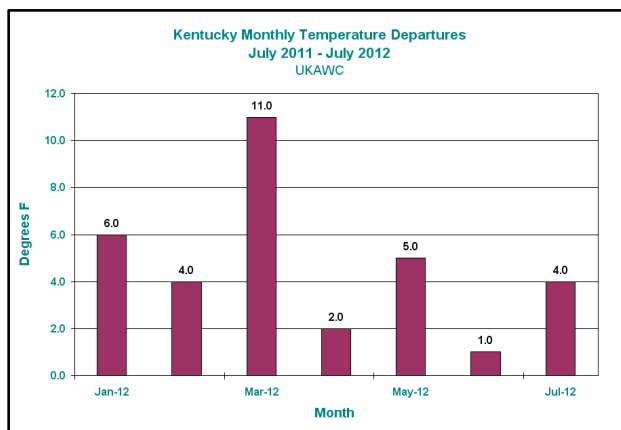


Figure 4

Scorching heat and high humidity carried over to the month of July. Kentucky witnessed its 3rd warmest July on record. This is nearly an understatement compared to the contiguous United States as a whole, which experienced the warmest July ever recorded at an average temperature of 77.6 degrees. The previous record was set back in the dust bowl year of 1936, when the average U.S. temperature was 77.4 degrees (National Climatic

Data Center). July accounted for Kentucky's 9th straight month of above normal temperatures here in the Bluegrass State. Figure 5 displays the record warming trend across the United States.

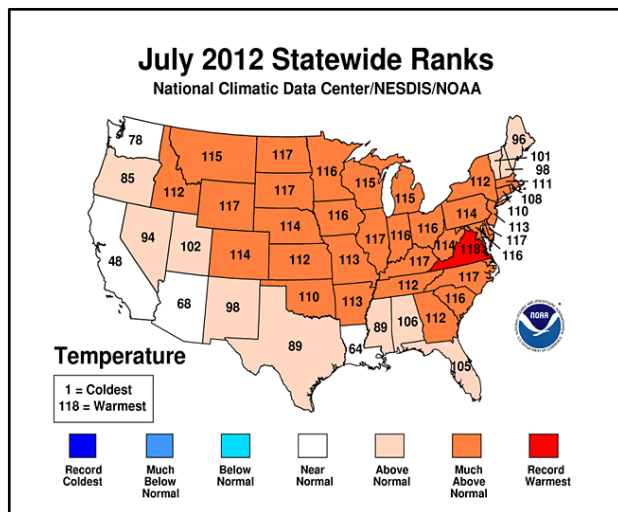


Figure 5

By the middle of July, drought had overtaken nearly the entire state (figure 6). Western portions of the Commonwealth were hardest hit with exceptional drought conditions. The impacts were severe and were displayed both hydrologically and agriculturally. On a positive note, near the end of July, mainly eastern and central portions of Kentucky did start to see significant amounts of rainfall as cold fronts moved through the area on nearly a weekly basis. This created abrupt and very significant drought turnaround periods. Going into the last 2 weeks of July, the entire state of Kentucky was in agricultural despair as drought took hold of the lower Ohio Valley. By the end of July; only western sections remained in extreme drought hardship.

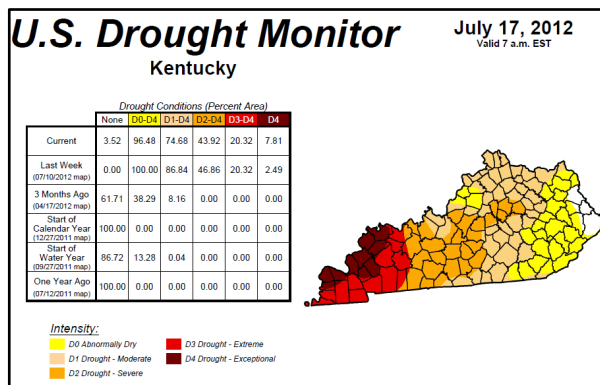


Figure 6

Fall seemed to come early during the middle 2 weeks of August. The passage of a strong cold front had temperatures only topping out in the upper 70s to mid 80s. This was around 6 degrees below normal for this time of the year. By the end of the month, the remnants of the earlier known Hurricane Isaac made themselves up through the Ohio Valley. This was the first major tropical system to progress into Kentucky since Hurricane Dennis and Katrina back in 2005.

Weather conditions seemed to make a complete 180 going into September, where the Commonwealth got drenched. Kentucky ended the month over 2 inches above normal as a combination of the remnants of Isaac and multiple frontal passages made for a very wet pattern. The state hasn't seen this much rainfall since November of 2011. Midway through the fall season, conditions took another turn. First off, Kentucky was welcomed by yet another hurricane. The remnants of Hurricane Sandy soaked eastern portions of the state with around 2 inches of rainfall. Some higher elevations even saw over a foot of snow. After this system, rainfall seemed to taper off through the month of November. It was the 5th driest November on record since 1895 with the state over 2.5 inches below normal. Over the course of the month, most of the state had slipped back into abnormally dry conditions.

The year ended with a very mild December, as the Commonwealth saw its 8th month of 2012 with above normal temperatures. It was the 7th warmest December on record going back to 1895. The warm temperatures were led in the first week of the month where strong southwesterly flow put temperatures on average, 15 degrees above normal. The state also saw the skies open up after an extremely dry November. Numerous frontal boundaries and disturbances soaked the Commonwealth with on average, around 5 inches of rainfall. A couple strong low pressure systems also brought some significant snowfall events toward the end of the month with totals in excess of 6 inches falling in western Kentucky the day after Christmas. Figure 7 was provided by the National Weather Service Office in Louisville and shows a high resolution visible satellite image taken on December 30th of the snowpack across the region following the 2 snowfall events.

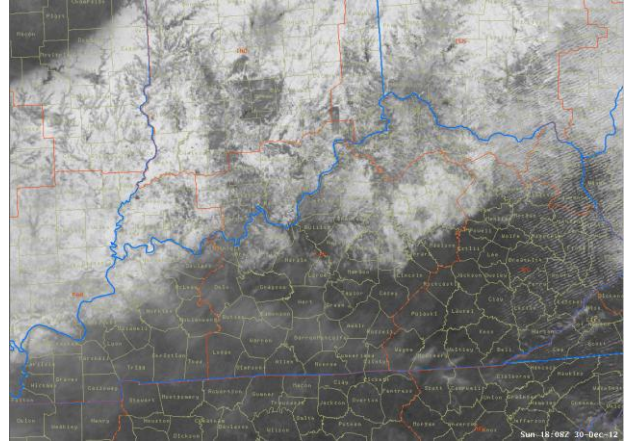


Figure 7

So overall the state did see quite a few extremes throughout the year. The drought was truly evident in the rainfall data. The western climate division ended the year with only 32.94 inches of precipitation, which made for the driest year going all the way back to 1963, where just over 30 inches was recorded. The state as a whole ended the year with an average of just over 40 inches, making it the driest since 2005. Overall, Kentucky was over 7 inches below normal with 8 of the 12 months seeing below normal precipitation. Temperature wise, the west also saw a very warm year with an average temperature of 60.8 degrees. This makes for the warmest year on record going back to 1895. 2012 also now holds name to the warmest year on record for Louisville, in addition to the second warmest year for Lexington at 60.8 and 57.6 degrees, respectively. So, what does 2013 have in store for the Commonwealth? Just like the 2012, only time will tell what truly happens.

Other News

One aspect of the UK Ag Weather Center website that can be an important tool useful to farmers across the nation is the Point Ag Forecast, which can be found at the following:

<http://weather.uky.edu/ukawc.shtml>.

Based off the National Weather Service Digital Forecast Database, this unique tool is available across the nation for prospective producers or even just the common public, to see what the weather is trending going into the future. Simply just input your zip-code, your county/state, or just click on

your location using the Google map tool and a 7 day forecast will be generated for your area of concern. In addition to getting the standard forecast weather parameters such as temperature, wind speed, sky cover, etc. , the Point Ag Forecast also forecast parameters specifically related to agricultural needs. These include various indices such as livestock cold-stress and heat-stress, spraying conditions, or even drying conditions for tobacco. The livestock cold-stress index is of particular importance during the months of January and February so producers can take the proper precautions if necessary. The index takes into account the air temperature and wind chill to determine if livestock will be exposed to dangerous conditions.

observers can now take readings of evapotranspiration. Kentucky observers provide a great volunteer service to the community, the county and the state by providing information on precipitation, snowfall, and snow depths. The information is used by government and university scientists, community officials, farmers, county emergency managers, watershed managers, drought monitors, and by your friends and neighbors.



The Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS) is currently looking for more observers across the state of Kentucky. Observers are asked to record daily measurements of rain or snowfall accumulations. New to 2012,

More information about this organization and how to join can be found here at <http://www.cocorahs.org/state.aspx?state=ky>.

January Weather-Related Ag Operations

| | |
|---|---|
| Field Activities | 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. |
| Grain Bin Management | 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. |
| Livestock Management And Cold Stress | 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. |
| Soil Temperatures | Typically during the extended cold weather, if soils are wet or snow-covered, soil temperatures stay right around 32 degrees. |
| Replanting Conditions | <ul style="list-style-type: none"> • 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. • 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! • 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. |

January Vegetable Gardener's Calendar

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

January Beef Operations

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