

October 2024

Precipitation

Rain was scarce in October with some locations not receiving any measurable precipitation until the last day of the month. This comes on the heels of a moderate to severe drought that was ended by Hurricane Helene at the end of September. The precipitation from Helene had replenished soil moisture levels and improved streamflows. The lack of rain in October, combined with temperatures that averaged 3 degrees above normal for the month resulted in soils once again drying out.

The November 5th edition of the US Drought Monitor (USDM) depicts nearly the entire state as being Abnormally Dry (D0) with 2 small areas of Moderate Drought (D1) along the Tennessee border. This comes a month after precipitation from Helene resulted in the removal of Moderate to Extreme (D3) drought across the state.

Had it not been for the rain on Halloween night, many locations would have set new records for the driest October and even the driest overall month. Still, preliminary data estimates that the average precipitation during October was only 0.23" (2.82" below normal) for the entire state. This would make it the 2nd driest October and 3rd driest month on record. It was also the driest October for the city of Jackson, and the 4th driest October for Lexington and Louisville. According to the Kentucky Mesonet, the greatest amount of precipitation in October was recorded in Ballard County, 0.88", and Morgan County recorded the least, 0.06".

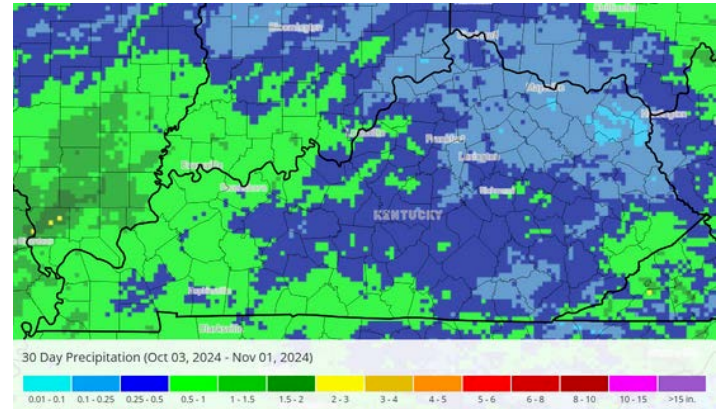


Figure 1. Monthly precipitation map.

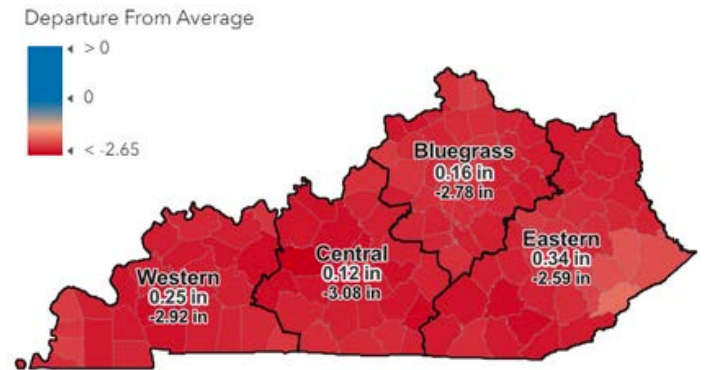


Figure 2. Departure from normal precipitation by county and climate division.

Table 1. Regional precipitation patterns

Climate Region	Departure From Normal (inches)					Palmer Drought Severity Index*
	This Month	Past 2 Mos.	Past 3 Mos	Past 6 Mos	Past 12 Mos	
Western	-2.92	1.38	-0.46	7.29	0.68	-4.97
Central	-3.08	-0.05	-1.71	3.31	-0.11	-4.62
Bluegrass	-2.78	0.30	-0.58	-1.99	-2.76	-5.82
Eastern	-2.59	0.52	-0.32	0.71	-1.40	-5.01

*4.0 and above (Extremely Moist) -2.0 to -2.9 (Moderate Drought)
 3.0 to 3.9 (Very Moist Spell) -3.0 to -3.9 (Severe Drought)
 2.0 to 2.9 (Unusual Moist Spell) -4.0 or less (Extreme Drought)
 -1.9 to 1.9 (Near Normal)

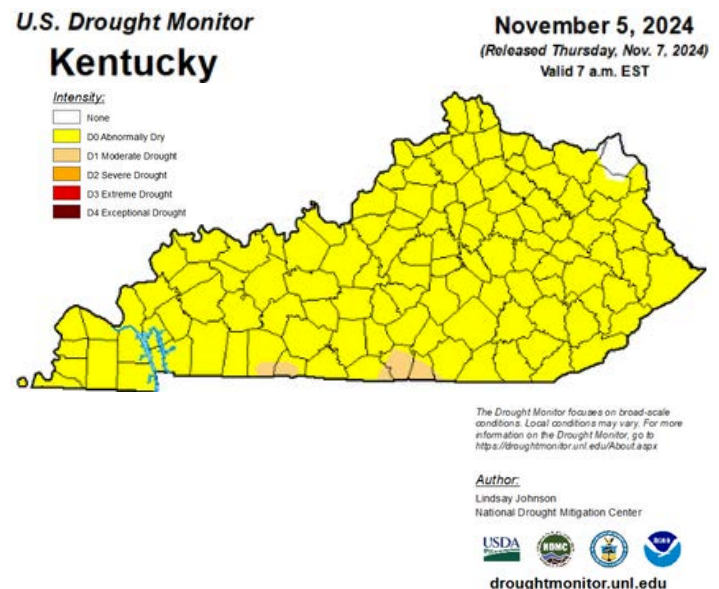


Figure 3. Current US Drought Monitor Map.

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Streamflow

October streamflow started the month at or above normal thanks to precipitation from Helene in late September. With the lack of precipitation during the month of October, flows quickly dropped off. However, most streams and rivers have remained in the normal range, which is defined as being between the 25th and 75th percentile.

Flows in the Ohio River remain much below normal due to the short-term dryness across the entire Ohio River Valley, combined with the significant drought conditions upstream in Ohio and West Virginia. No navigation issues are expected below Paducah thanks to normal flows in the Upper Mississippi.

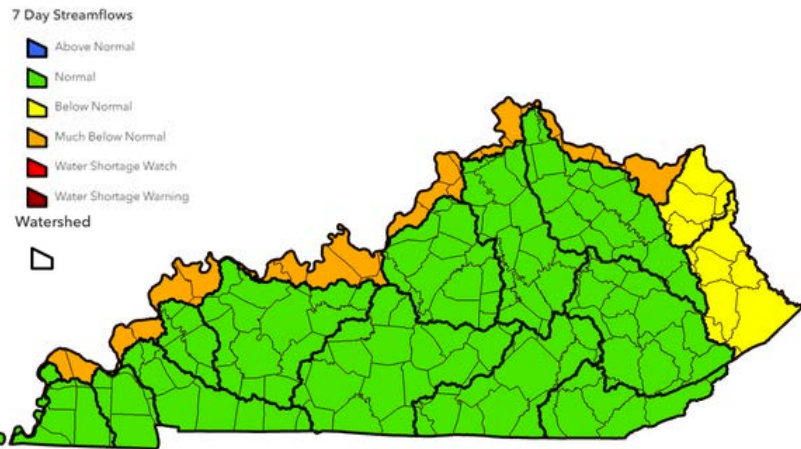


Figure 5. Average streamflow by watershed over the past 7-days (October 25-31).

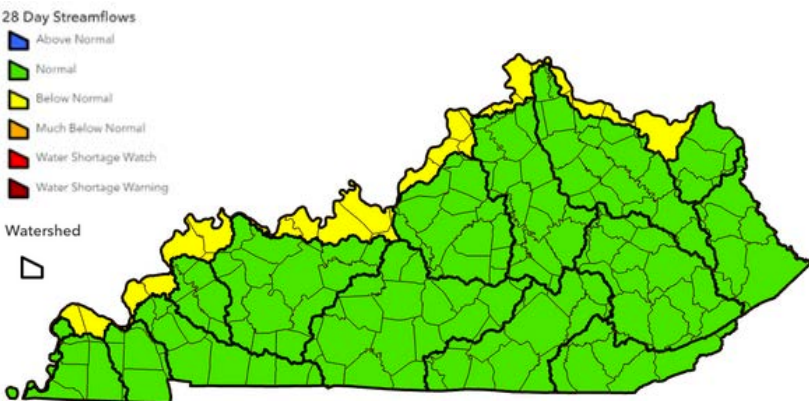


Figure 6. Average streamflow by watershed over the past 28-days (October 4-31).

Table 2. Mean Stream Discharge select stream gages.

River and Location	Drainage Area (mi ²)	7 Day		28 Day	
		Average Flow (cfs)	% of Normal*	Average Flow (cfs)	% of Normal*
Levisa Fork at Pikeville	2144	346	31	431	42
Little Sandy River near Grayson	400	48	11	50	14
North Fork Licking River nr Mt Olivet	226	14	5	19	8
Kentucky River at Lock 14	2657	587	18	664	24
Kentucky River at Lock 2	6180	860	12	1211	19
Cumberland River at Cumberland Falls	1977	250	8	516	19
Beaver Creek near Monticello	43	3	6	3	7
Beech Fork at Bardstown	669	23	2	81	9
Barren River at Bowling Green	1849	2853	88	1829	64
Green River at Calhoun	7566	6101	51	5381	52
Tradewater River at Olney	255	3	1	14	5
Clarks River at Almo	134	47	21	50	26
Bayou De Chien near Clinton	69	27	22	27	24
Ohio River at Greenup Dam	62000	10459	13	21448	31
Ohio River at Cannelton Dam	97000	14855	13	27452	27
Mississippi River @ Thebes, IL	713200	78188	42	82292	45

* Base Period 1980-2023

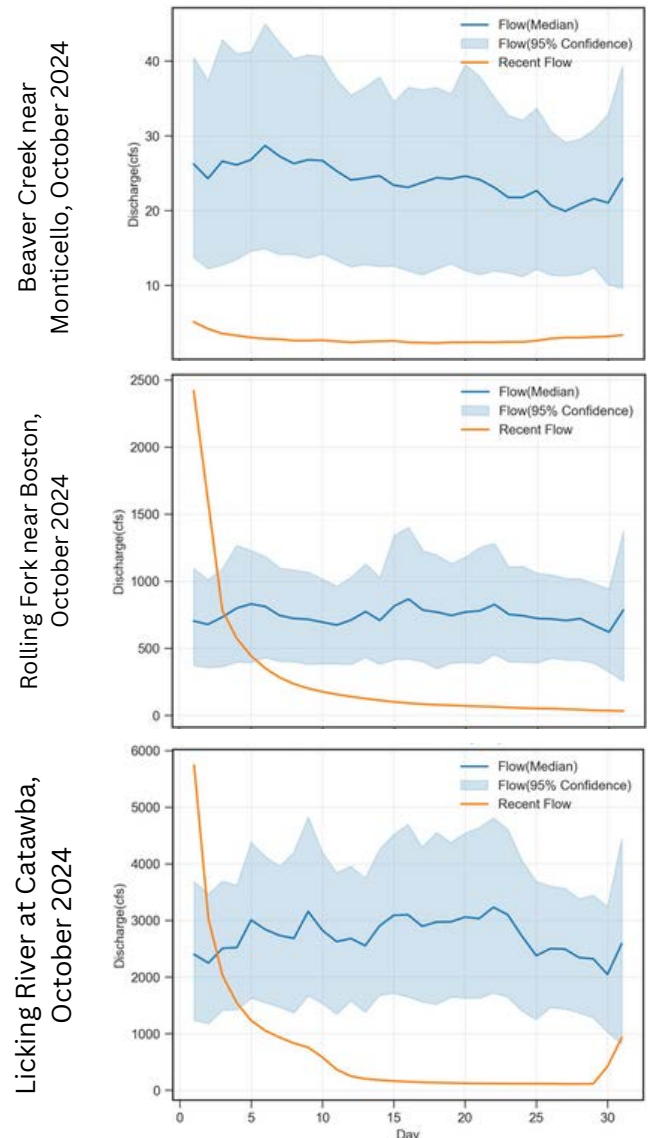


Figure 7. Streamflows compared to median flows for the month.

October 2024

Reservoir Storage

Reservoir storage for water supply lakes remain normal for the entire state. This is despite the drought that developed this summer along with the dry October.

As we move into November, we watch for the summer drawdown to come to an end and lakes begin to refill. A dry November can create issues for some of the more vulnerable water supply lakes as it extends the amount of time draw down occurs. The Water Supply Section will continue to monitor the lakes but there are no concerns at this time.

Groundwater

General Statement: Kentucky is a geologically, and hydrogeologically, diverse state. Groundwater data is limited in availability and where available may only be applicable to the immediate area given regional geologic variability. Local conditions may not be accurately reflected by the reference locations selected and local rainfall and surface water conditions may provide additional or more representative information. Current data is compared to a 30-year reference period (1980 - 2010) or the longest available period of continuous data.

Inner Bluegrass: Flow at Royal Spring was briefly above the reference period in response to heavy rainfall late in September. A lack of rainfall over the remainder of October has led to a rapid decrease in flow below the reference period. Currently Royal Springs is 50% of the six-month and 34% of the 12-month median for the reference period. For the year however, total flow has remained above the reference period.

Jackson Purchase: While water levels in the Viola Well (Graves Co.) responded to rainfall late in September, it has remained below the reference median water level. With the onset of fall water levels are expected to begin to increase over the winter months barring continued drought conditions. For the year, water levels have remained above the reference.

Middlesboro: Water levels fell across the month after rising above the median in response to rainfall late in September to a depth approaching 2.5 ft below the median. With the onset of fall, water levels are expected to begin to increase over the winter months barring continued drought conditions. For the year, water levels have ranged from just below to just above reference water levels but have generally remained above with the 6-month and 12-month median at 111% and 115% of the reference.

Additional data can be found at:
<https://www.uky.edu/KGS/water/water-groundwater-monitoring.php>

Figure 8. Locations of reference reservoirs across the state. Status of reservoir levels indicated by color.

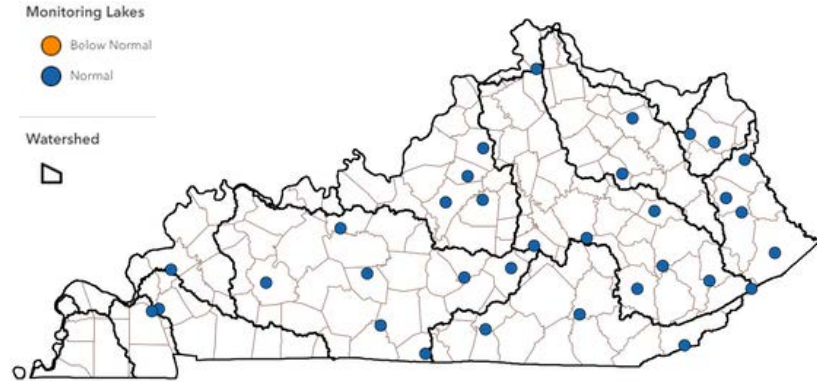
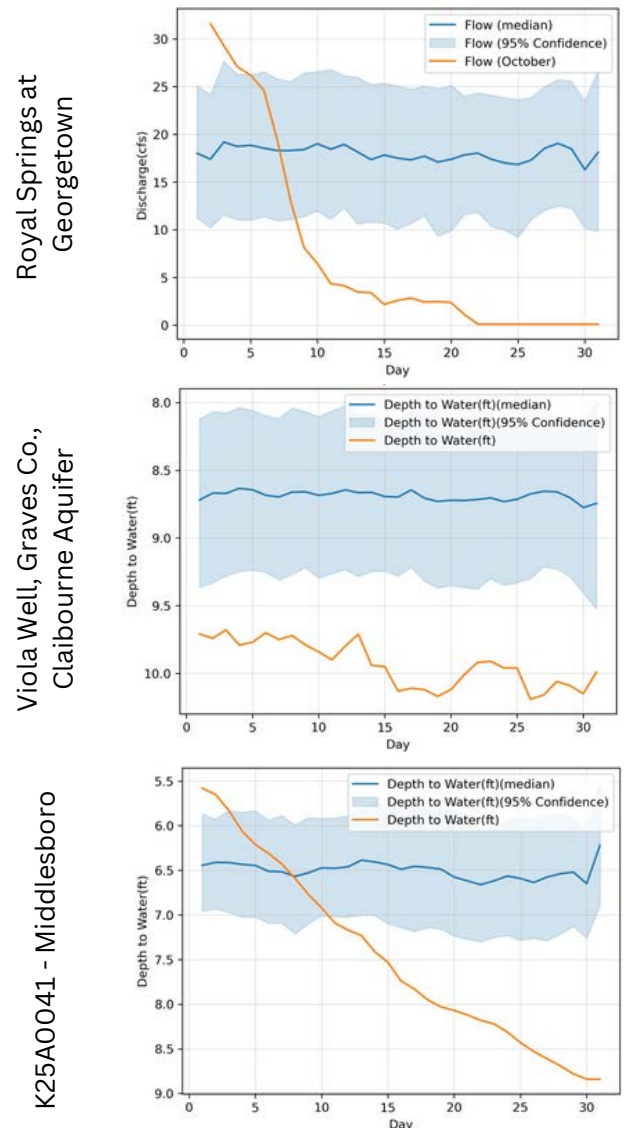


Figure 9. Groundwater observations compared to normal for the month.



October 2024

Forecast

The Climate Prediction Center (CPC) is currently predicting equal chances for above and below normal precipitation in November, though there is a strong chance for above normal precipitation just to the west of Kentucky.

The outlook for November through January shows no clear signal for precipitation in Kentucky. La Niña typically brings above normal precipitation to the Ohio Valley with below normal precipitation across the Deep South, but La Niña conditions have been slow to develop. Because of that, any impacts from La Niña won't be expected until later this winter.

The current U.S. Monthly Drought Outlook shows drought is expected to develop in Kentucky during November.

Note: these forecasts do not provide the quantity above or below normal, just the probability it will occur.

U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for November 2024
Released October 31, 2024

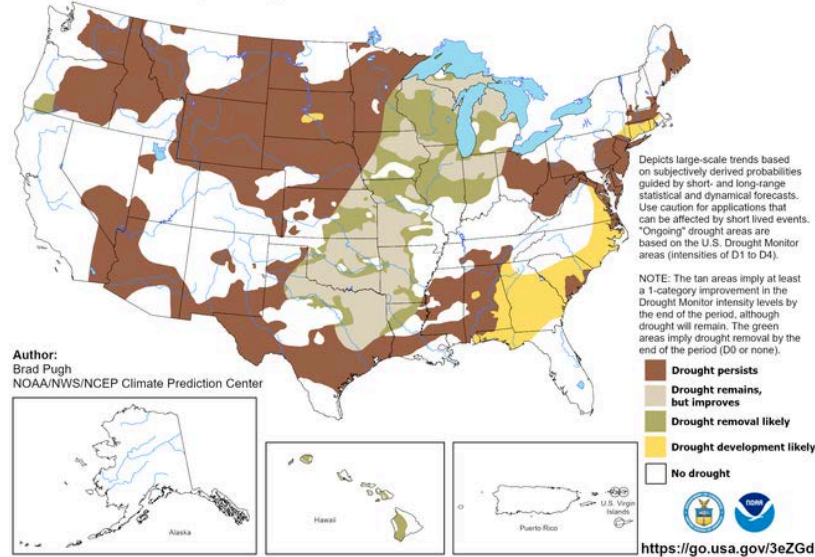


Figure 10. The monthly drought outlook.

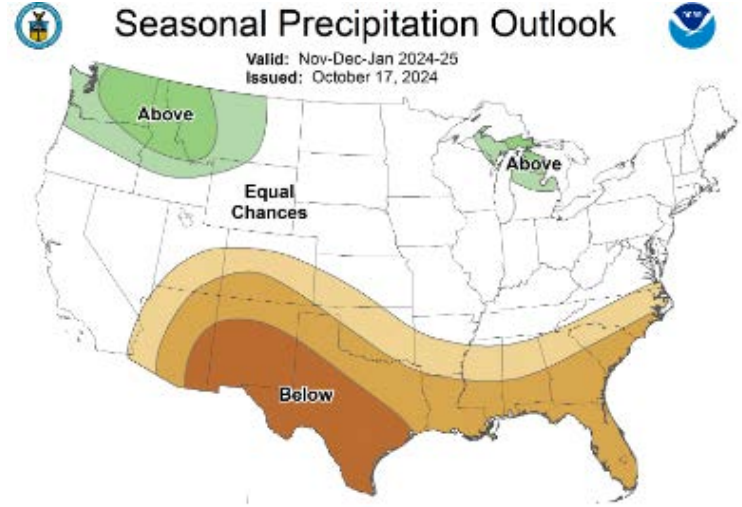
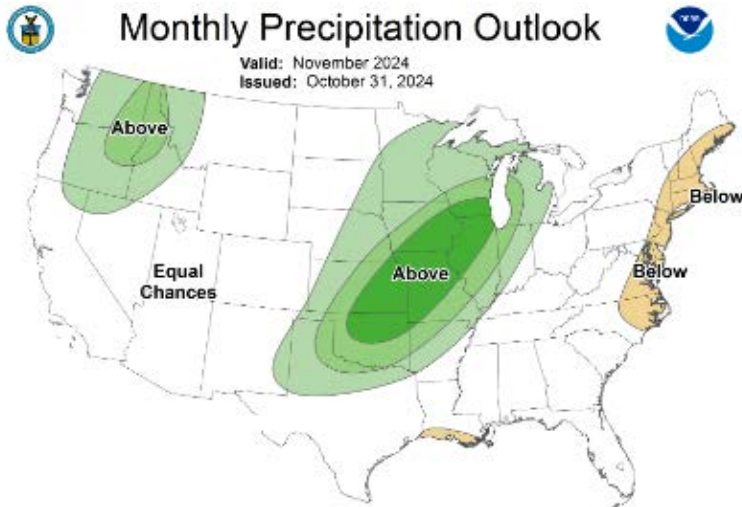


Figure 11. The monthly and seasonal precipitation outlooks.

Contact Us

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Report Drought Conditions



Acknowledgments

Precipitation Data:

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Centers for Environmental Information; Kentucky Mesonet; Midwest Regional Climate Center; Southern Regional Climate Center.

Streamflow Data:

U.S. Geological Survey, Water Resources Division.

Reservoir Data:

U.S. Army Corps of Engineers, Huntington, Louisville, and Nashville Districts; Kentucky Division of Water, Water Supply Section.

Forecast Data:

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center.