TEAM KENTUCKY
ENERGY AND ENVIRONMENT CABINET

MONTHLY WATER RESOURCE REPORT

Kentucky Division of Water
Water Supply Section

August 2024

Precipitation

August was a dry month across the state resulting in the rapid intensification of drought conditions. The month started out with a storm system that brought scattered storms the first couple days of the month. That was followed by a stretch of dry weather that lasted until the middle of the month when another storm system brought scattered storms on the 17th and 18th. These two systems were the only significant precipitation producers the entire month. The month ended with temperatures at or near 100 degrees and a few convective storms.

The September 3rd edition of the US Drought Monitor (USDM) depicts western Kentucky, roughly west of I-165 and northern Kentucky as being in Moderate Drought (D1). Mercer and Boyle County were also in D1 and was part of northeastern Kentucky with the Ashland area being in Severe Drought (D2).

The average precipitation for the state was 2.33", 1.28" below normal, making it the 21st driest August on record. Regional averages ranged from 3.24" (0.66" below normal) for the Eastern Region to 1.32" (1.87" below normal) for the Western Region. According to the Kentucky Mesonet, the greatest amount of precipitation in August was reported in Rowan County, 6.17", and Caldwell County reported the least, 0.38".

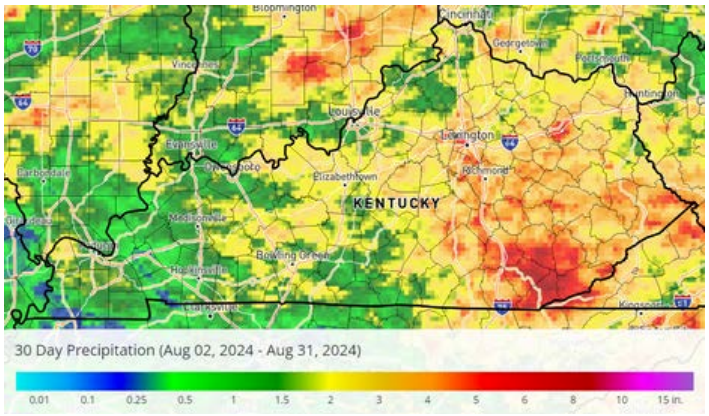

Figure 1. *Monthly precipitation map.*

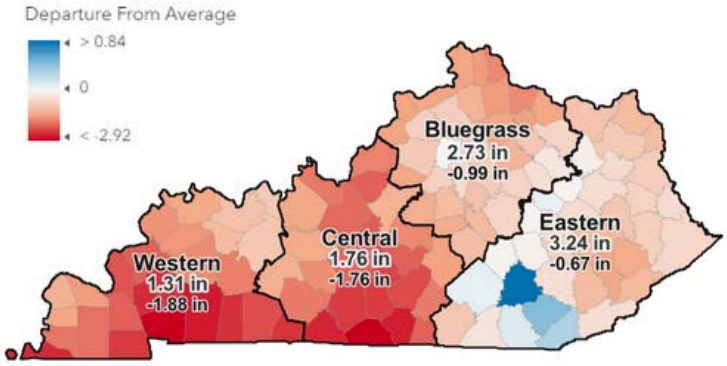

Figure 2. *Departure from normal precipitation by county and climate division.*

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	-1.88	-0.02	0.12	3.54	-1.8	-1.87
Central	-1.76	0.53	-1	2.13	-3.21	-2.1
Bluegrass	-0.99	-1.4	-3.21	-2.19	-5.57	-3.05
Eastern	-0.67	0.48	-0.83	-1.25	-4.34	-2.06

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

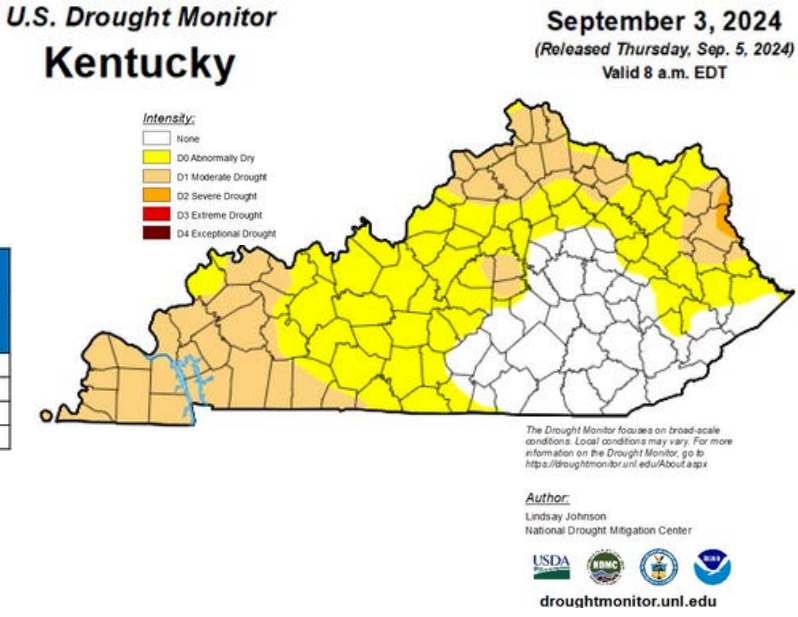

Figure 3. *Current US Drought Monitor Map.*

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Streamflow

August streamflow varied from below normal to normal across the state. Notable lows were Tygarts Creek and South Licking River basins. The Ohio River remains low with its watershed upstream of Kentucky experiencing significant drought conditions. No navigation issues have been noted below Paducah, but there is concern as flows in the Mississippi River continue to drop.

Despite dry conditions, the state has remained out of hydrologic drought thanks to early and mid-August and low seasonal base flow. Flows in western Kentucky, started the month at or above normal due to the wet conditions during July and have been trending downwards. During the last 7 days of the month, flows in the Big Sandy, Licking, Lower Kentucky, Salt, and Upper Cumberland have been below normal.

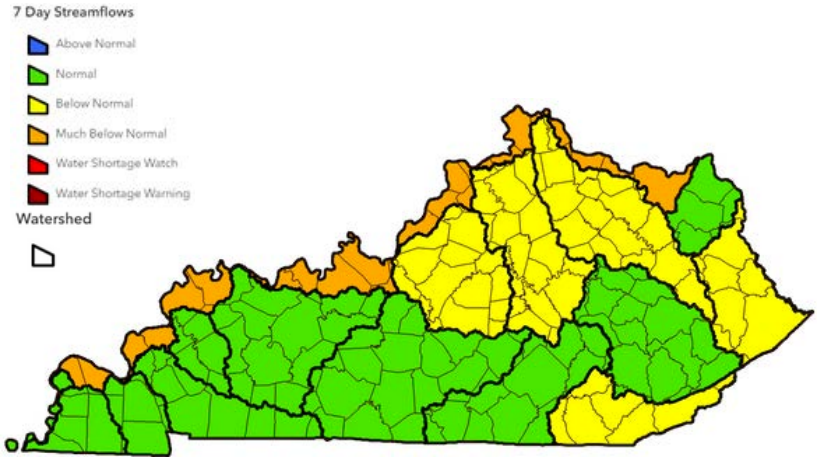

Figure 5. *Average streamflow by watershed over the past 7-days (July 25-31).*

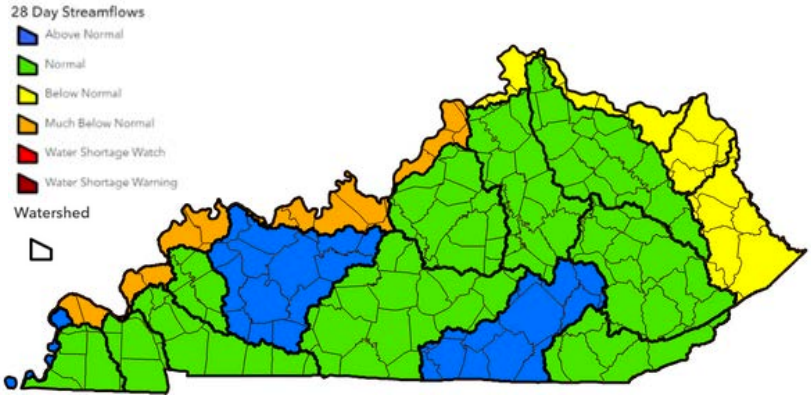

Figure 6. *Average streamflow by watershed over the past 28-days (July 4-31).*

Table 2. *Mean Stream Discharge select stream gages.*

River and Location	Drainage Area (mi2)	7 Day		28 Day	
		Average Flow (cfs)	% of Normal*	Average Flow (cfs)	% of Normal*
Levisa Fork at Paintsville	2144	631	52	991	60
Little Sandy River near Grayson	400	103	46	122	45
North Fork Licking River nr Mt Olivet	226	2.9	14	5.79	9
Kentucky River at Lock 14	2657	329	46	1199	90
Kentucky River at Lock 2	6180	605	39	1795	72
Cumberland River at Cumberland Falls	1977	344	64	2193	299
Beaver Creek near Monticello	43	3.8	14	9.9	13
Beech Fork at Maud	436	3.4	4	33.2	26
Barren River at Bowling Green	1849	114	15	688	107
Green River at Calhoun	7566	1014	41	4634	164
Tradewater River at Olney	255	2.8	6	11.3	18
Clarks River at Almo	134	25	50	25	44
Bayou De Chien near Clinton	69	24.9	91	25.5	65
Ohio River at Greenup Dam	62000	9833	33	17111	49
Ohio River at Cannelton Dam	97000	14306	33	28234	55
Mississippi River @ Thebes, IL	713200	142143	79	203516	102

* Base Period 1980-2023

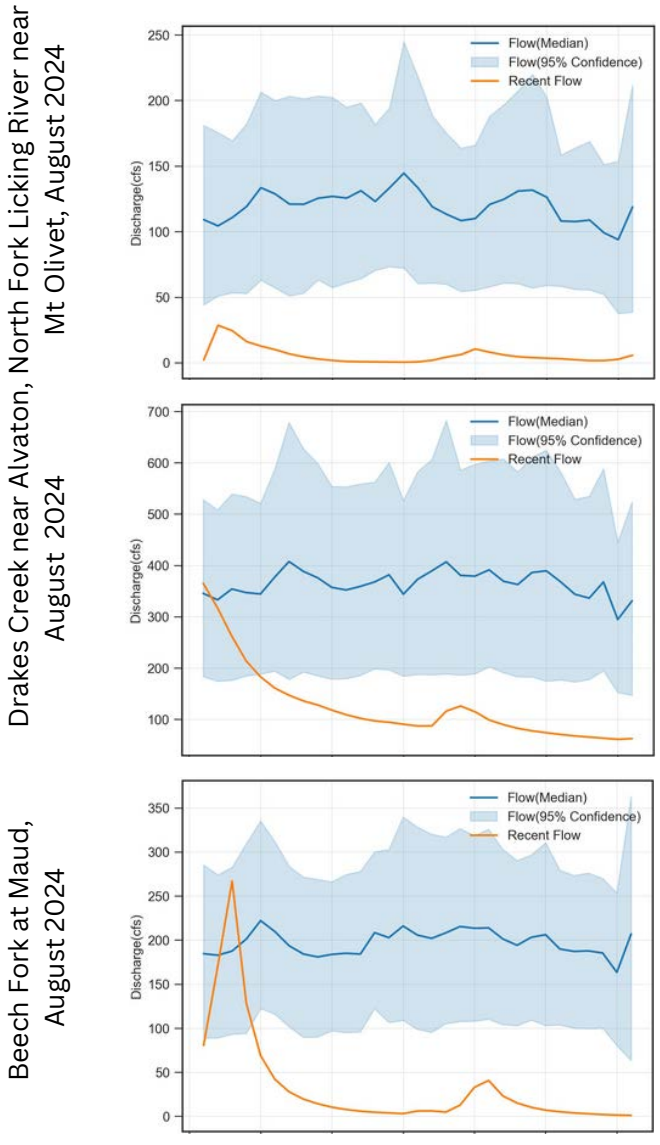

Figure 7. *Streamflows compared to average flows for the month.*

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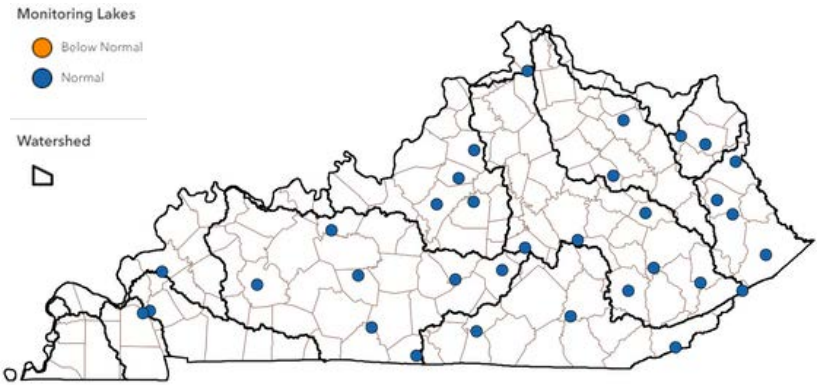
Reservoir Storage

Reservoir storage for water supply lakes remain normal for the entire state.

Water supply lakes continue their summer drawdown. This is normal for this time of year as draw down season for these lakes typically begins sometime between May and July, depending on precipitation patterns. The Water Supply Section will continue to monitor the lakes, especially during the current drought conditions, but there are no concerns at this time.

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



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 data.

Inner Bluegrass: Total discharge from Royal Springs remains above the annual average. Excluding the response to rainfall early in the month, flow continued the trend over the summer months of below normal in August with later response to rainfall not reaching the median discharge values for the reference period.

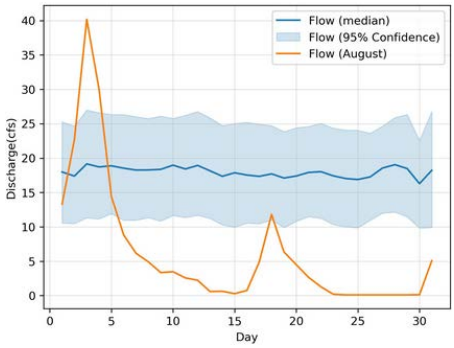
Jackson Purchase: Water levels in the Viola well continued to fall over the month of August and fell below normal water levels for the reference period. Limited rainfall and average temperatures above normal are likely driving increased evapotranspiration leading to the lowering of groundwater levels across the region.

Middlesboro: Rainfall early and towards the middle of the month have kept water levels in the Middlesboro well above or within expected levels for the month of August, only falling below normal in the last week of the month.

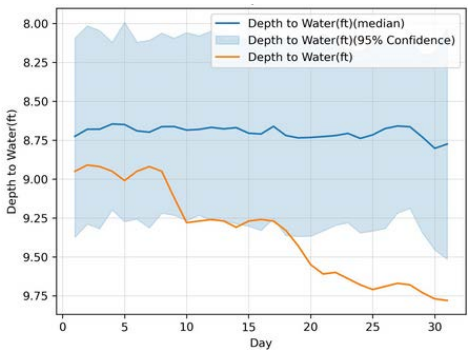
Additional data can be found at:
https://www.uky.edu/KGS/water/water-groundwater-monitoring.php

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

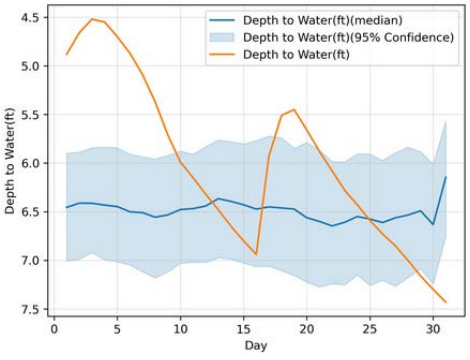
Royal Springs at Georgetown



Viola Well Claibourne Aquifer



K25A0041 - Middlesboro



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Forecast

The Climate Prediction Center (CPC) is currently predicting slightly increased chances for above normal precipitation for southern and eastern Kentucky during the month of September and equal chances for above or below normal precipitation for northern and western Kentucky. The prediction for September through November is for equal chances for above or below normal precipitation for most of the state, but there is an increased chance for below normal precipitation along the Mississippi River.

The current U.S. Monthly Drought Outlook for current drought areas to persist and for drought to develop along the Ohio River in western and northern Kentucky.

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

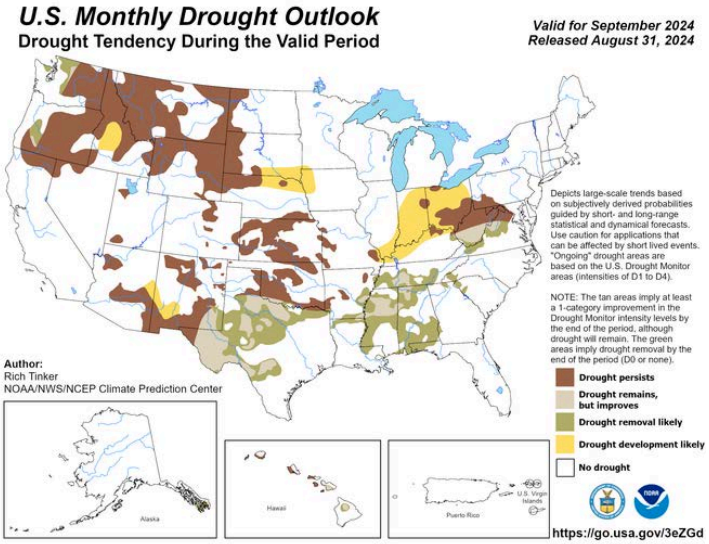

Figure 10. *The monthly drought outlook.*

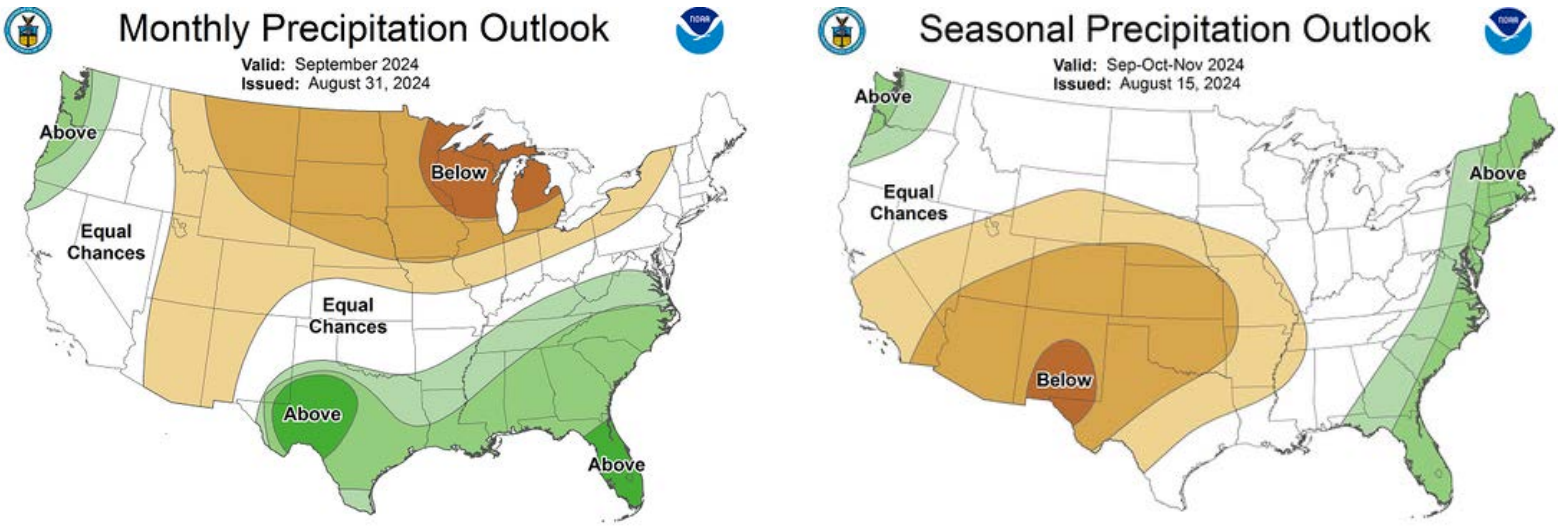

Figure 11. *The monthly and seasonal precipitation outlooks.*

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.