

September 2024

Precipitation

September was dry for much of the month resulting in the continued intensification and expansion of drought conditions. At the peak of the drought, the US Drought Monitor (USDM) had two-thirds of the Commonwealth in at least Moderate Drought (D1) and a small amount of Extreme Drought (D3), including the cities of Frankfort and Ashland. The remnants of Hurricane Francine, mid-month, brought limited precipitation to western Kentucky. The last week of the month started with a storm system that brought significant precipitation, followed by the remnants of Hurricane Helene which brought widespread soaking rains to the entire state. These rains resulted in September being above normal for precipitation and eliminated drought conditions.

The October 1st edition of the USDM depicts only a small area of drought remaining in the Commonwealth in the Ashland area. A few areas of Abnormally Dry (D0) conditions remain in areas where the drought was the most intense.

The average precipitation for the state was 6.73", 3.15" above normal. It was the 6th wettest September on record in Louisville, 6.71", and the 4th wettest on record in Paducah, 8.31". Regional averages ranged from 7.51" (4.05" above average) for the Western Region to 6.24" (2.89" above average) for the Bluegrass Region. According to the Kentucky Mesonet, the greatest amount of precipitation in September was reported in Harlan County, 12.4", and McCreary County reported the least, 2.96".

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	4.11	2.22	4.08	3.54	10.22	-0.02
Central	2.88	1.10	3.39	2.13	7.18	0.11
Bluegrass	2.96	2.01	1.68	-2.19	2.00	-0.50
Eastern	2.95	2.12	3.27	-1.25	3.07	0.71

*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)

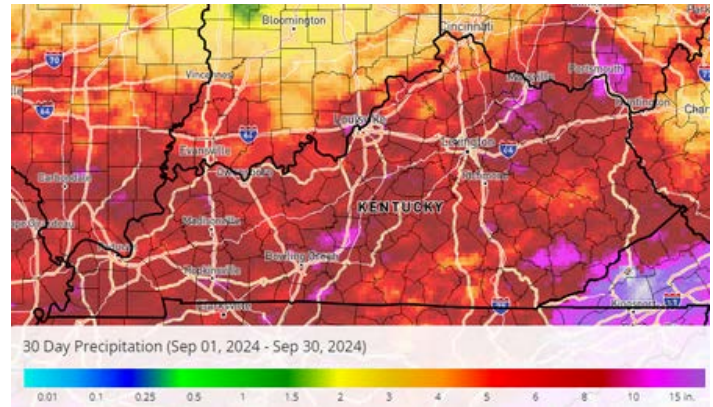


Figure 1. Monthly precipitation map.

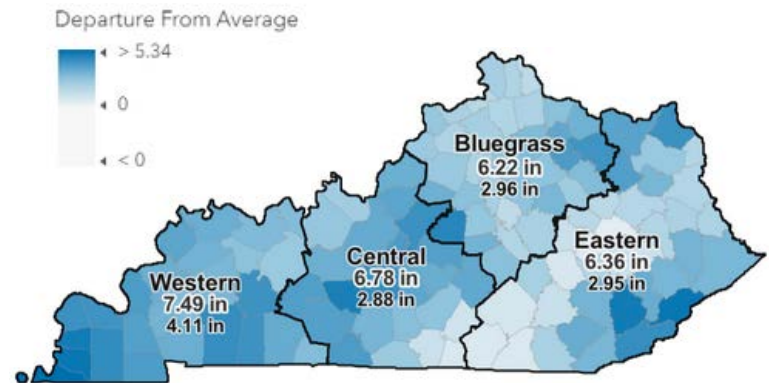


Figure 2. Departure from normal precipitation by county and climate division.

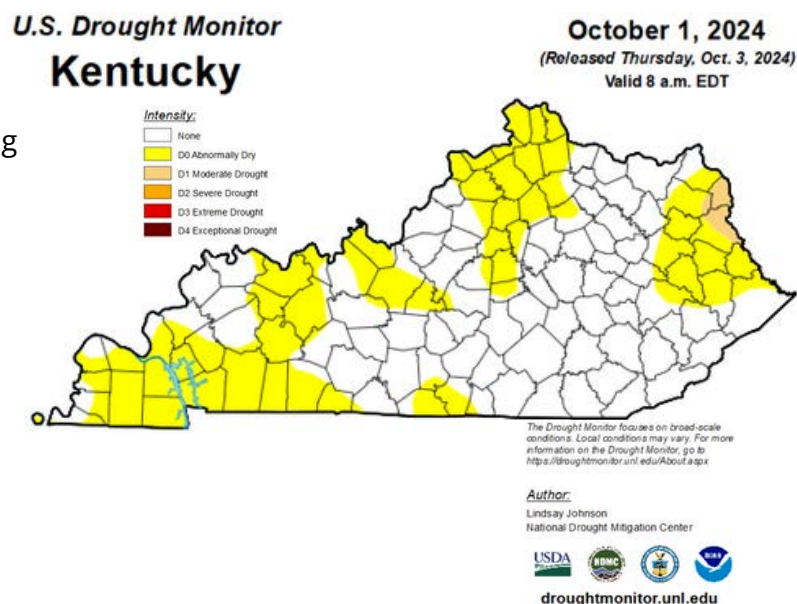


Figure 3. Current US Drought Monitor Map.

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Streamflow

September streamflow was below normal statewide for the first three weeks of the month. Flows were not low enough to cause any water supply issues. The significant precipitation during the last week of the month improved hydrologic conditions dramatically and streamflow across the state were at or above normal as the month ended.

Despite the spike in flows, the 28-day average flow on the Ohio River remain below normal. Long term outlooks predict flows in the Ohio River will return to below normal flows, in part due to the ongoing drought conditions in Ohio and West Virginia. The potential still exists for navigation issues below Paducah, but unlikely thanks to the precipitation from Hurricane Helene.

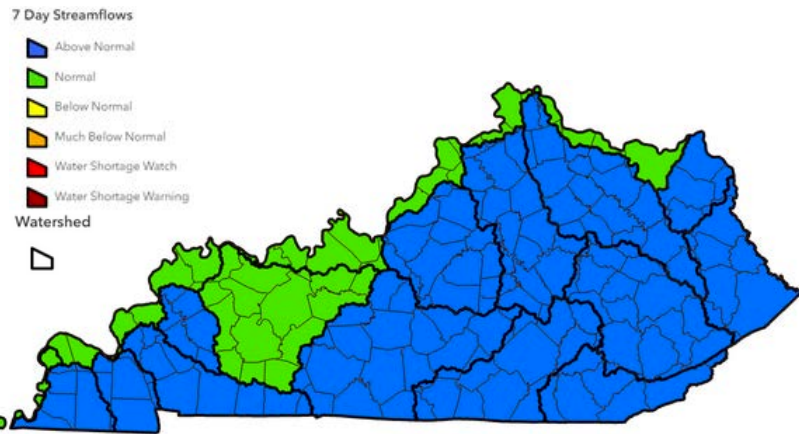


Figure 5. Average streamflow by watershed over the past 7-days (September 24-30).

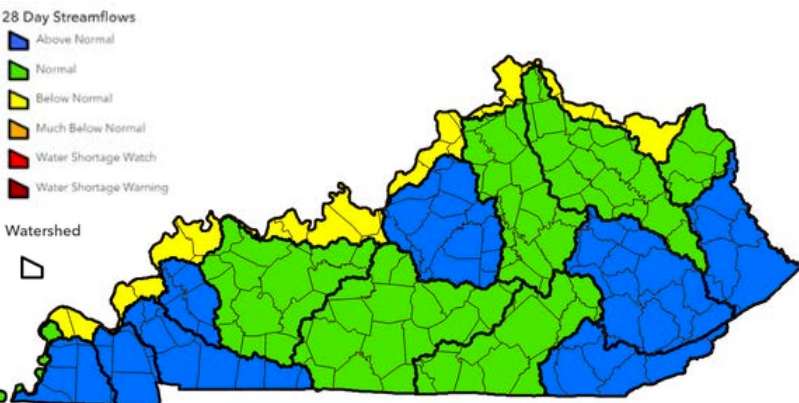


Figure 6. Average streamflow by watershed over the past 28-days (September 3-30).

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	5728	52	5728	653
Little Sandy River near Grayson	400	229	66	97	32
North Fork Licking River nr Mt Olivet	226	562	260	157	81
Kentucky River at Lock 14	2657	4935	186	1574	66
Kentucky River at Lock 2	6180	5615	93	1868	35
Cumberland River at Cumberland Falls	1977	3945	157	1271	55
Beaver Creek near Monticello	43	7.6	20	5.2	15
Beech Fork at Maud	436	1309	262	364	82
Barren River at Bowling Green	1849	1644	60	555	23
Green River at Calhoun	7566	6447	66	2429	28
Tradewater River at Olney	255	241	87	71	30
Clarks River at Almo	134	401	225	117	75
Bayou De Chien near Clinton	69	234	231	84	93
Ohio River at Greenup Dam	62000	32134	49	16525	27
Ohio River at Cannellton Dam	97000	56514	58	24545	28
Mississippi River @ Thebes, IL	713200	112563	61	110922	62

* Base Period 1980-2023

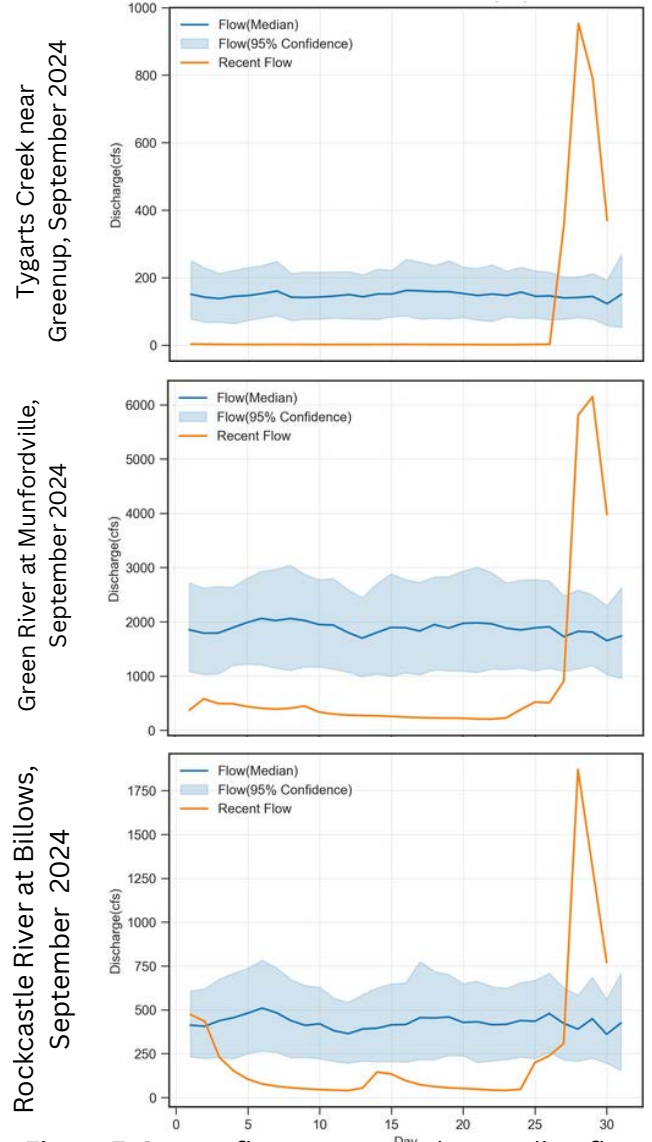


Figure 7. Streamflows compared to median flows for the month.

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Reservoir Storage

Reservoir storage for water supply lakes remain normal for the entire state. This is despite the drought that developed this summer, though the rains from Helene were welcome.

As we move into fall, we watch for the summer drawdown to come to an end and lakes begin to refill. A dry fall can create issues for some of the more vulnerable water supply lakes as it extends the amount of time drawn 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: Total discharge from Royal Springs remains above the annual average. Flow was low across the month until responding to the recent sustained rainfall. Storm response will recede however, and discharge will likely again fall below the reference period without additional rainfall.

Jackson Purchase: While water level continued to fall over September the rate of decrease has slowed. Water levels did rebound following recent rain. As we enter fall, evapotranspiration will decrease leading to water levels likely stabilizing pending continued rainfall.

Middlesboro: Water levels rebounded by 4-feet from well below the reference to above in response to rainfall. Maintenance above or at normal will depend on continued rainfall across the month.

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.

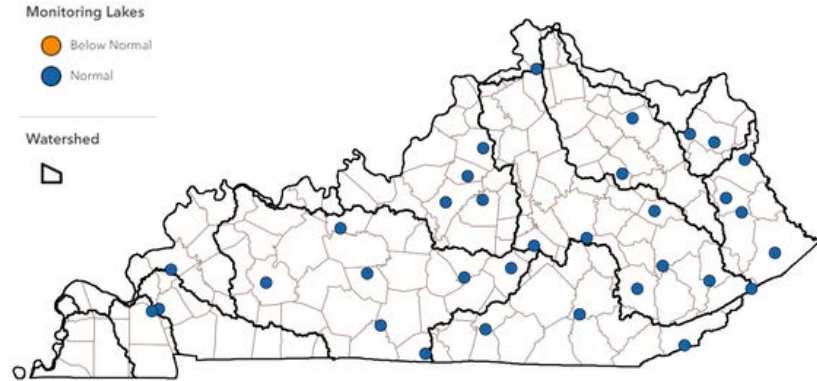
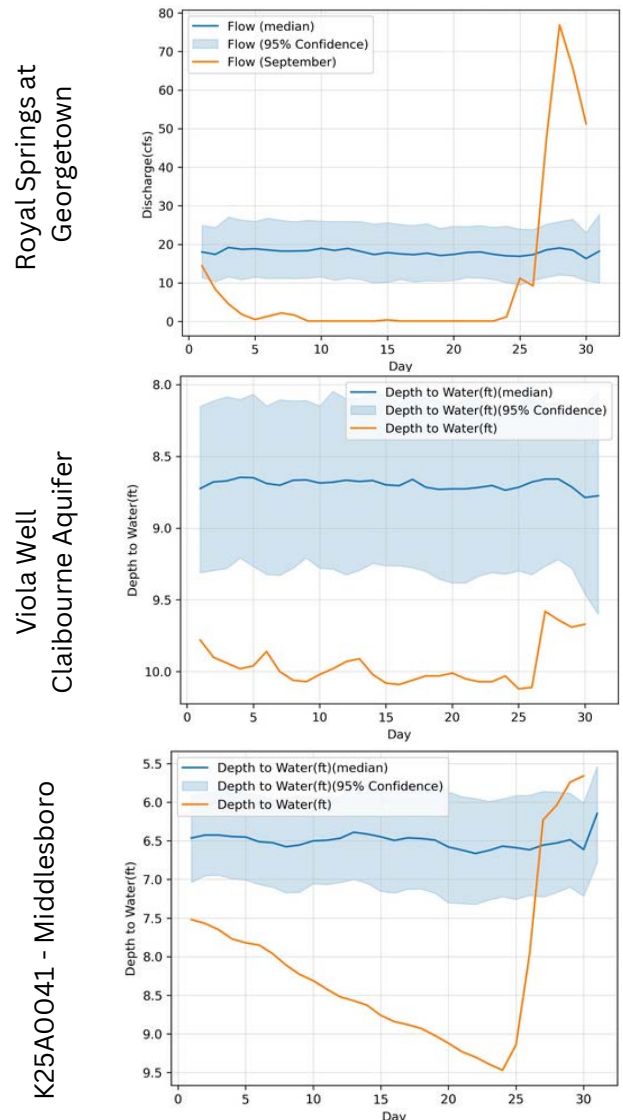


Figure 9. Groundwater observations compared to normal for the month.



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Forecast

The Climate Prediction Center (CPC) is currently predicting slightly increased chances for below normal precipitation for Kentucky during the month of October. The chances for below normal precipitation increase as you go west.

The outlook for October through December shows no clear signal for precipitation in Kentucky. Above normal precipitation is predicted for the Great Lakes and Northeast and below normal precipitation is predicted for the Southern Plains and Desert Southwest.

The current U.S. Monthly Drought Outlook shows much of the current drought areas are likely to be removed. Most drought was already removed from Kentucky in the October 1st edition of the U.S Drought Monitor.

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 October 2024
Released September 30, 2024

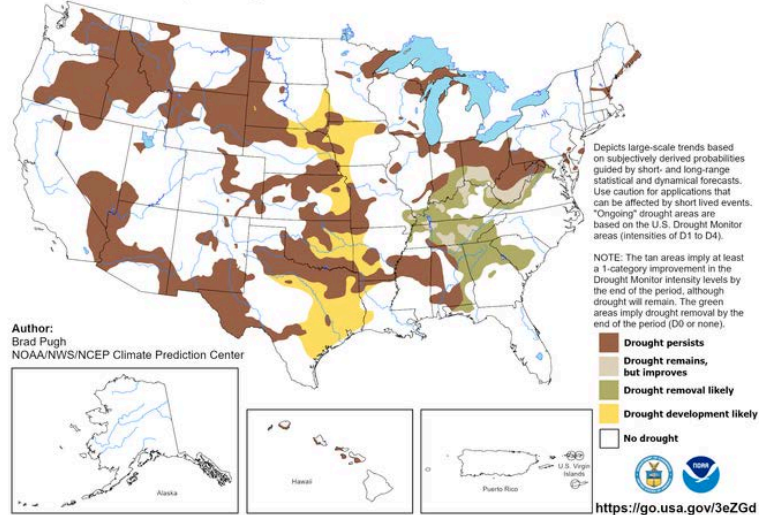


Figure 10. The monthly drought outlook.

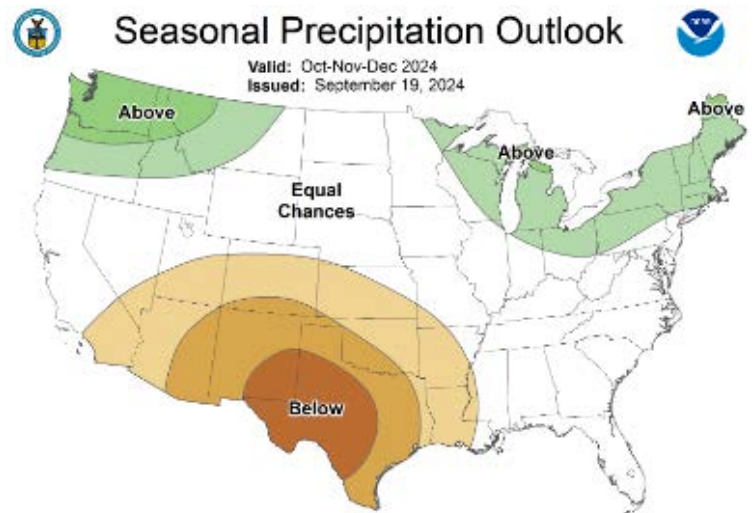
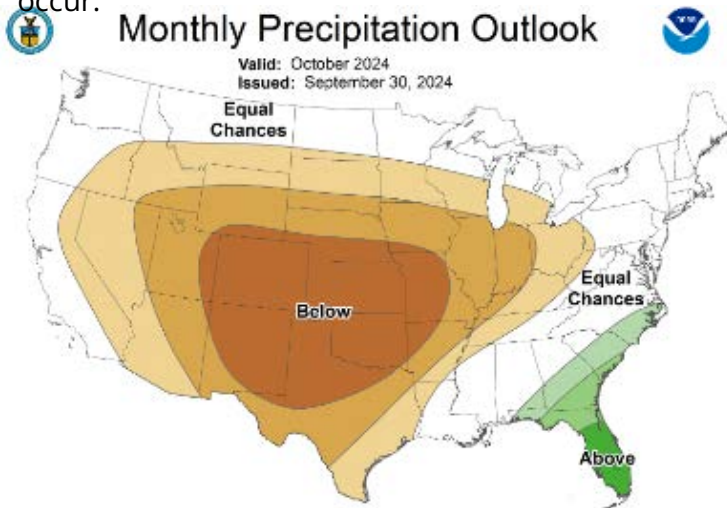


Figure 11. The monthly and seasonal precipitation outlooks.

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.