

November 2024

Precipitation

November brought much needed precipitation, after a dry October. The first half of the month featured three different precipitation events that brought a total of 4" to 8" of precipitation to western and northern Kentucky but less than 2" to southeastern Kentucky. The second half of the month remained active, but precipitation amounts were considerably less due to the cooler temperatures. Precipitation amounts across the western half of the state were less than 1.5" with a pocket of 2" precipitation in the east. For the entire month, most of the state finished at or above normal, but the Lake Cumberland area was below normal with less than 3" of precipitation for the month.

The November 26th edition of the US Drought Monitor (USDM) depicts only a small area of Moderate Drought (D1) and Abnormally Dry (D0) in south central Kentucky, which lines up with the area of the state that remained dry during November. A small area of D0 also remains along the West Virginia border, which is the edge of the significant drought that has existed in Ohio and West Virginia since summer.

Preliminary data estimates that the average precipitation during November was 5.01" (0.97" above normal) for the state. This would make it the 23rd wettest November on record. According to the Kentucky Mesonet, the highest precipitation amount was in McLean County, 10.1", and the lowest was in McCreary County, 1.98".

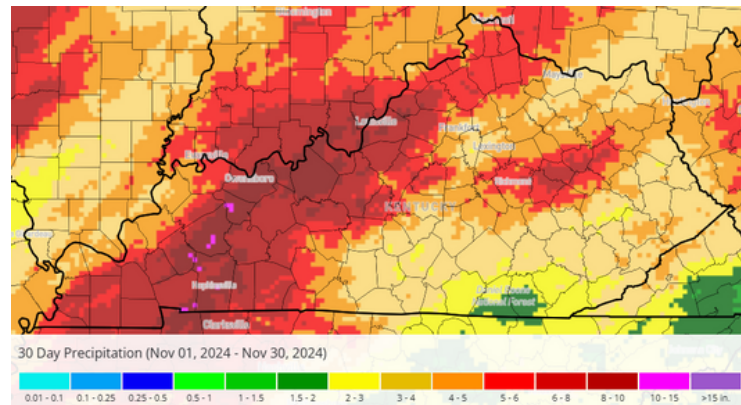


Figure 1. Monthly precipitation map.

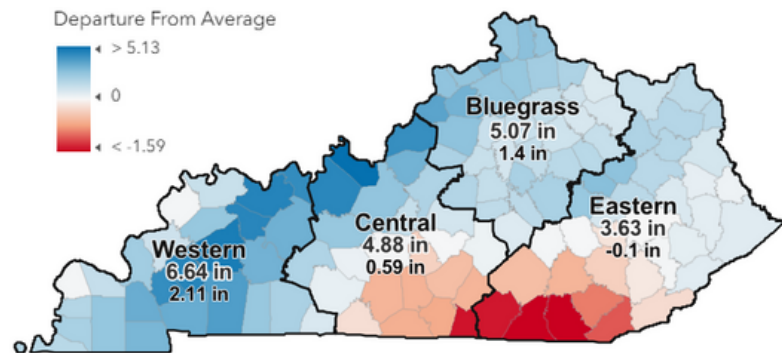


Figure 2. Departure from normal precipitation by county and climate division.

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	2.11	-0.82	3.49	3.63	5.89	1.67
Central	0.59	-2.50	0.54	-0.37	3.01	0.91
Bluegrass	1.40	-1.38	1.69	-1.41	0.65	-1.48
Eastern	-0.10	-2.69	0.42	-0.58	0.56	-1.26

*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)

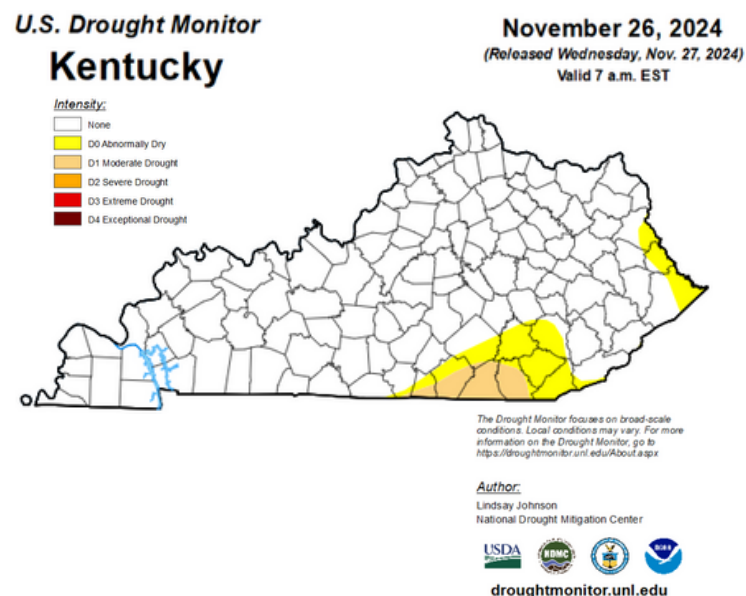


Figure 3. Current US Drought Monitor Map.

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Streamflow

November streamflow was generally at or above normal in November. The higher precipitation amounts in western Kentucky led to very high flow and even some minor flooding. Streamflow in south central Kentucky have generally been below normal. This correlates with the drier conditions that have been noted in that area.

Flows in the Ohio River remain low. As of the end of the month, flows were below the 10th percentile. This is mainly due to the continued drought in Ohio and West Virginia. We've reached the time of year when average flows begin to rise, so while flows remain well below normal, they are rising. Therefore, there are no navigation concerns below Paducah, and none are expected for the remainder of the year.

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	1261	98	1099	94
Little Sandy River near Grayson	400	326	64	244	52
North Fork Licking River nr Mt Olivet	226	152	44	110	38
Kentucky River at Lock 14	2657	1183	28	902	26
Kentucky River at Lock 2	6180	3023	32	2848	36
Cumberland River at Cumberland Falls	1977	708	16	452	12
Beaver Creek near Monticello	43	4	6	5	8
Beech Fork at Bardstown	669	774	62	641	61
Barren River at Bowling Green	1849	997	28	2482	74
Green River at Calhoun	7566	8954	62	10767	85
Tradewater River at Olney	255	131	256	802	203
Clarks River at Almo	134	57	18	243	97
Bayou De Chien near Clinton	69	38	23	124	93
Ohio River at Greenup Dam	62000	62638	64	30751	35
Ohio River at Cannelton Dam	97000	76188	52	54634	43
Mississippi River @ Thebes, IL	713200	124375	65	152321	80

7 Day Streamflows

- Above Normal
- Normal
- Below Normal
- Much Below Normal
- Water Shortage Watch
- Water Shortage Warning

Watershed

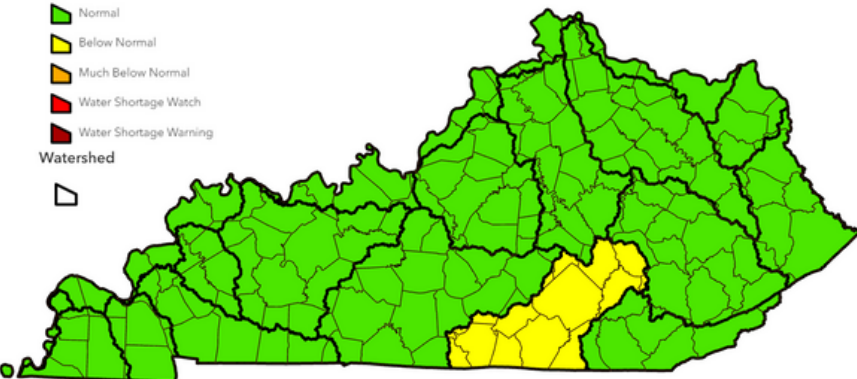


Figure 5. Average streamflow by watershed over the past 7-days (November 24-30).

28 Day Streamflows

- Above Normal
- Normal
- Below Normal
- Much Below Normal
- Water Shortage Watch
- Water Shortage Warning

Watershed

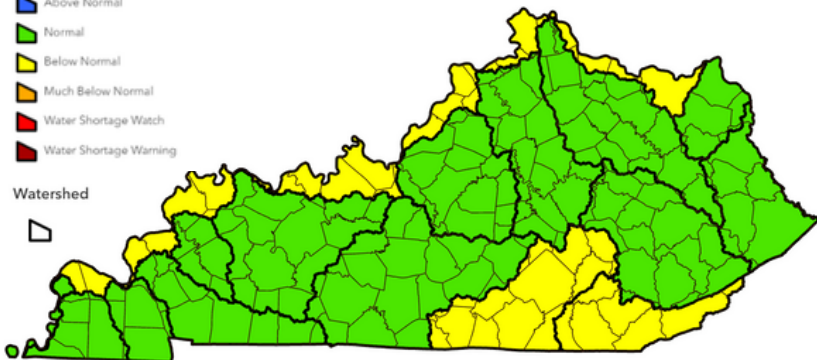
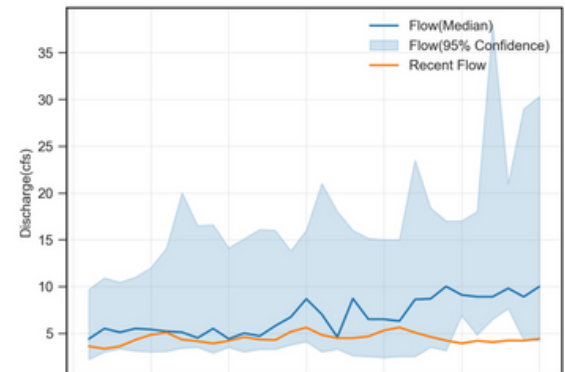
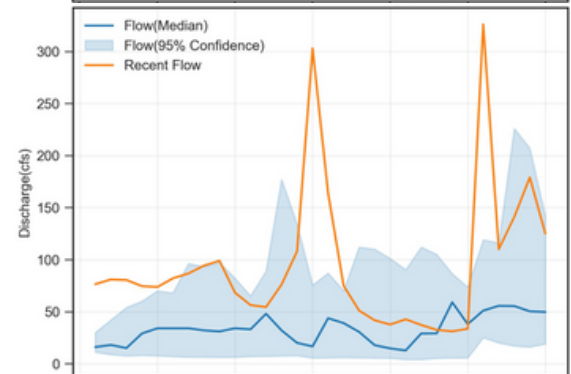


Figure 6. Average streamflow by watershed over the past 28-days (November 3-30).

Beaver Creek near Monticello, November 2024



Hinkston Creek near Carlisle, November 2024



Tradewater River at Olney, November 2024

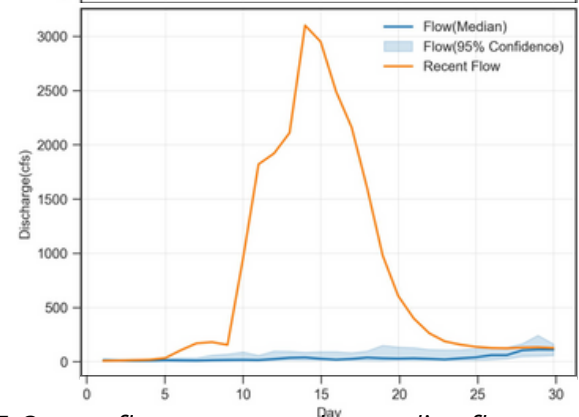


Figure 7. Streamflows compared to median flows for the month.

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Reservoir Storage

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

We have reached the time of the year where reservoirs begin to refill. Reservoirs in western and northern Kentucky have likely seen some refilling take place after the heavier precipitation amounts. The refill season is likely slow or delayed in the Lake Cumberland area, however, the water supply lakes in that region (Lake Cumberland, Laurel Lake, Wood Creek Lake) have a low drought vulnerability.

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 Springs has rebound from below the reference median to at or above median flow. Reference flow increases across the month as Kentucky exits drought and the seasonal dry period; groundwater in the region should follow the seasonal increase barring rainfall below seasonal averages.

Jackson Purchase: Water levels in the Viola well remain above reference period median water levels or above the 95% confidence interval. This is consistent with an observed increase in water level in the well and seasonal increases in water level as the region exits a dry period. Water levels are expected to remain above the reference median or increase over the next month.

Middlesboro: Water level in the Middlesboro well increased to within the confidence interval and approached the reference median over the course of the month. Reference water level decreases across the month but water level is expected to increase, meeting the past observed median as the region exits drought and the seasonal dry period.

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.

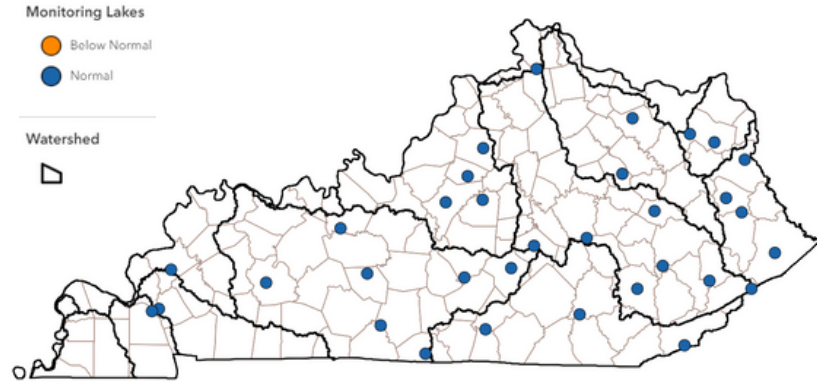
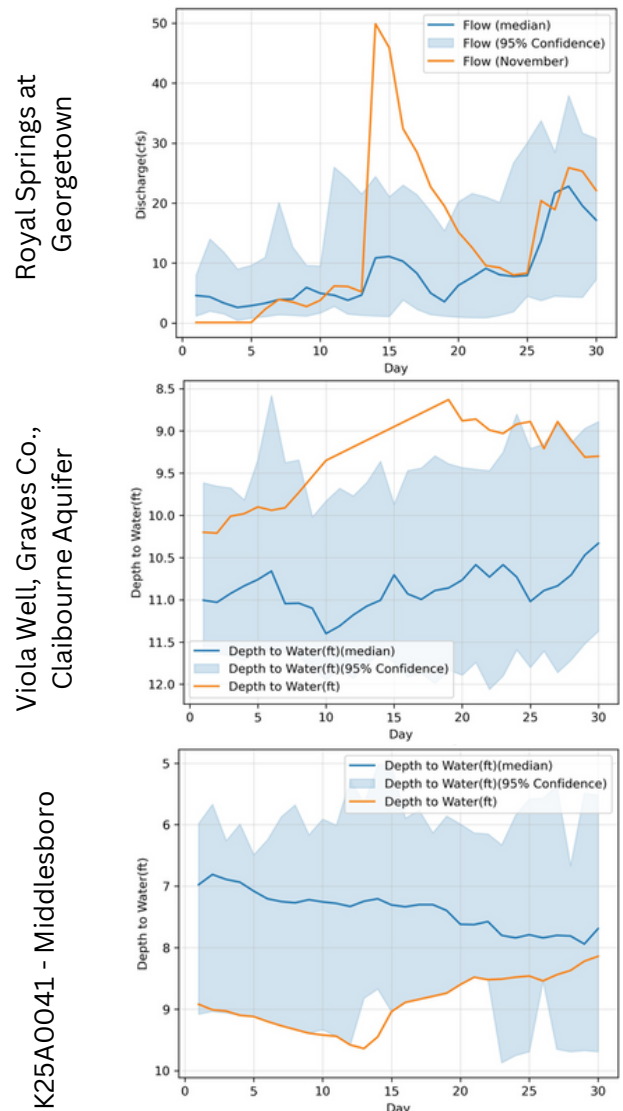


Figure 9. Groundwater observations compared to normal for the month.



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Forecast

The Climate Prediction Center (CPC) is currently predicting equal chances for above and below normal precipitation in December, for Kentucky and the entire Ohio Valley and Midwest regions.

The outlook for December through February shows a slightly higher chance for above normal precipitation in the Great Lakes extending into northern Kentucky. La Niña typically brings above normal precipitation to the Great Lakes/Ohio Valley with below normal precipitation across the Deep South. Though La Niña is expected to be weak, its presence still tilts the odds in the outlook forecast.

The current U.S. Monthly Drought Outlook shows drought is expected to persist in south central Kentucky during the month of December.

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 December 2024
Released November 30, 2024

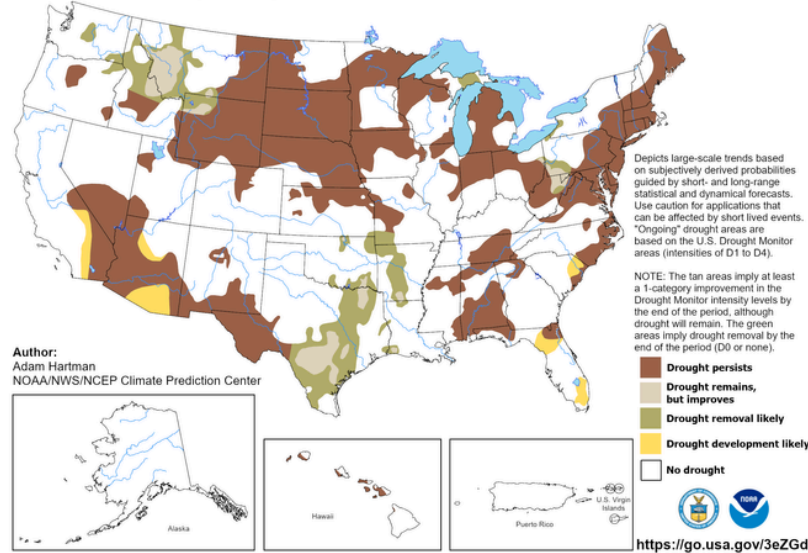


Figure 10. The monthly drought outlook.

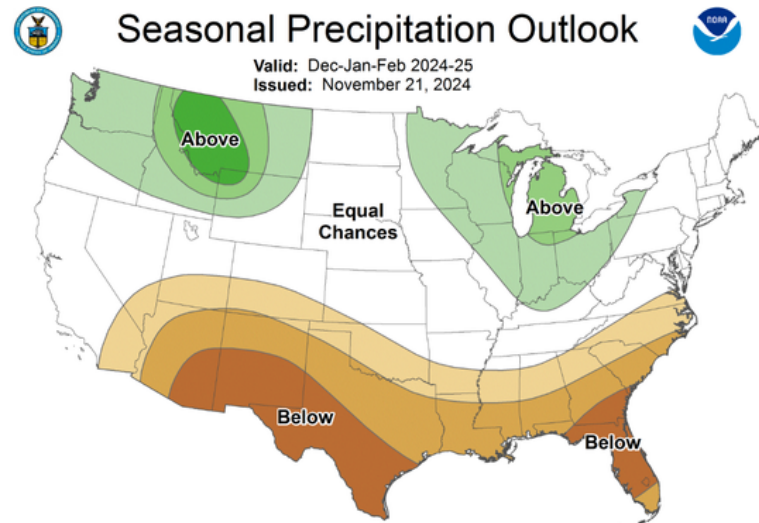
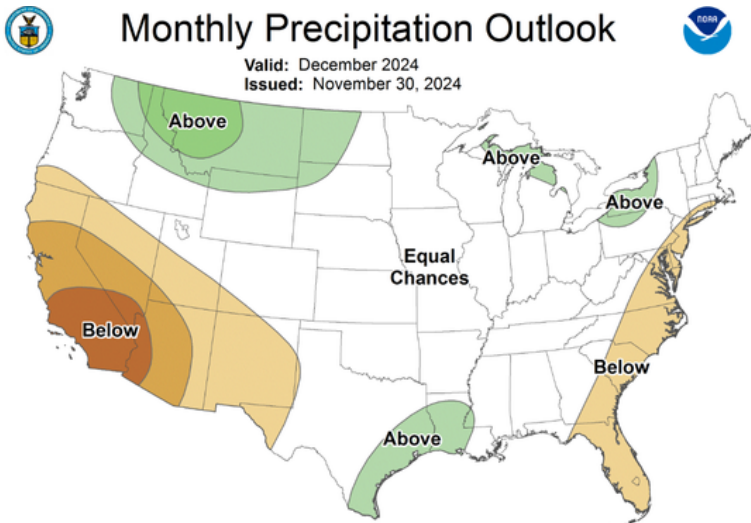


Figure 11. The monthly and seasonal precipitation outlooks.

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.