TEAM KENTUCKY
ENERGY AND ENVIRONMENT CABINET

MONTHLY WATER RESOURCE REPORT

Kentucky Division of Water
Water Supply Section

June 2024

Precipitation

June was a dry month for the state, with the exception of parts of western Kentucky. The month started where May left off with storms and wet conditions. After the first week, conditions dried out and temperatures climbed. The warm conditions led to high evapotranspiration rates, quickly drying out soils. While the dry conditions were welcomed in western Kentucky where soils had been too wet, issues began to arise in central and eastern Kentucky. The month ended with some convective thunderstorms, bringing relief to some areas, especially in western Kentucky where the precipitation was more widespread.

The average precipitation for the state was 3.44", 0.98" below normal, making it the 23rd driest June on record for Kentucky. Regional averages ranged from 4.14" (0.15" above normal) for the Western Region to 2.44" (-1.91" below normal) for the Bluegrass Region. According to the Kentucky Mesonet, the greatest amount of precipitation in June was reported in Fulton County, 7.0", and Franklin County reported the least, 1.1".

Short-term precipitation deficits are developing across northern and eastern Kentucky. According to the July 2nd U.S. Drought Monitor, Abnormally Dry (D0) conditions have started to develop in these areas. There is also a small area of Moderate Drought (D1) in Boone County.

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	0.08	5.93	6.17	4.77	2.81	4.32
Central	-1.25	3.02	4.07	4.38	-1.89	3.26
Bluegrass	-1.95	-1.14	0.18	1.32	-2.92	1.6
Eastern	-1.23	-0.05	-0.12	0.52	-2.99	1.64

*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)

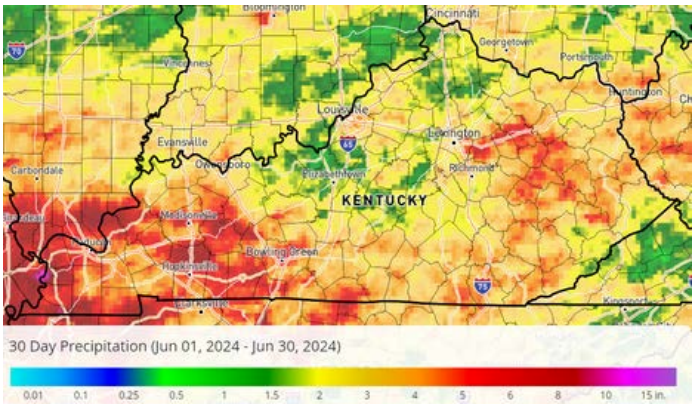

Figure 1. *Monthly Precipitation Map.*

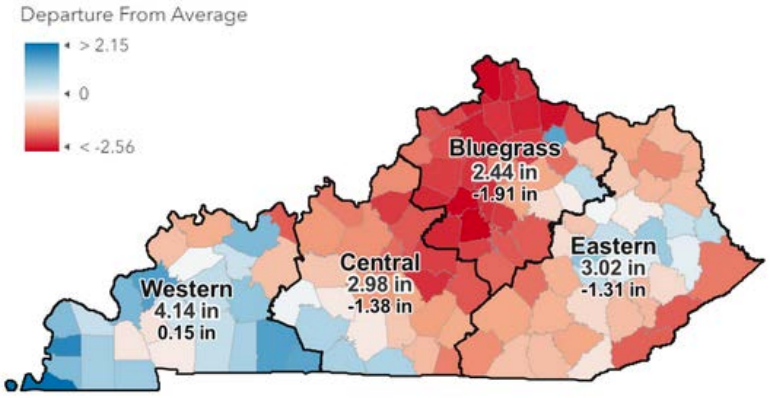

Figure 2. *Departure from Normal precipitation by County and Climate Division.*

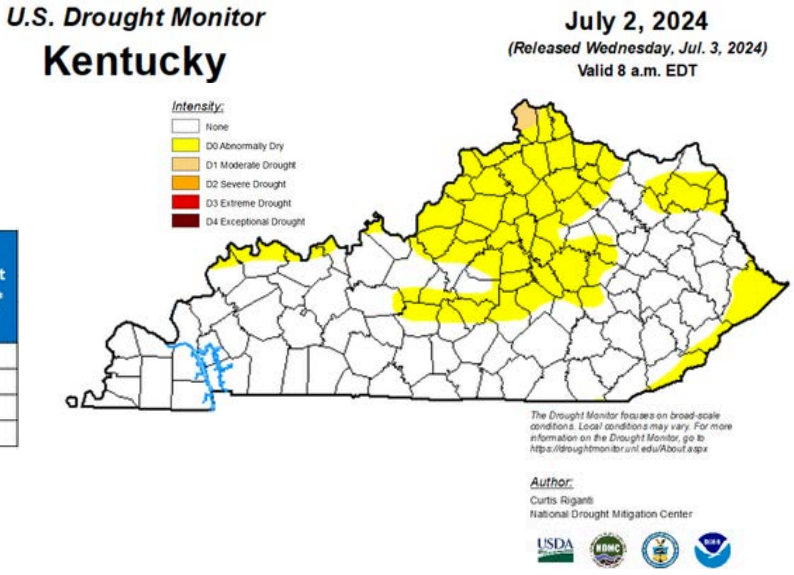

Figure 3.*Current US Drought Monitor Map.*

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Streamflow

Streamflow during June varied from below normal in northern Kentucky to above normal in western Kentucky. Streamflows in the Levisa Fork were particularly low as the month ended with the 7-Day average flow at Pikeville at only 24% of normal. This is in part due to dry conditions in western Virginia. Flows in the Ohio River are also low, but no navigation issues have been noted below Paducah, in part to above normal flows in the Mississippi River.

Flows at the beginning of June were typically at or above normal due to the very wet conditions in May. As precipitation waned and temperatures rose, streamflows began to drop. The high flows to start the month kept 28-day averages near normal for most watersheds. The month ended with average 7-day streamflow much below normal in the Middle and Lower Ohio River and below normal in the Salt, Lower Kentucky, Licking, Little Sandy/Tygarts and Big Sandy watersheds.

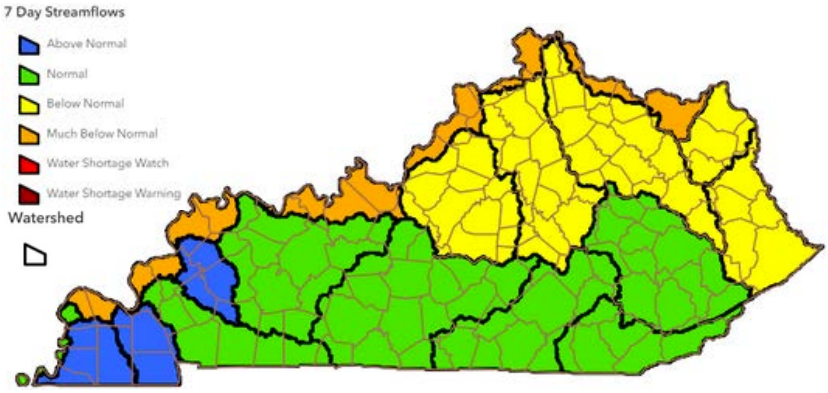

Figure 5. *Average streamflow by watershed over the past 7-days (May 25-31).*

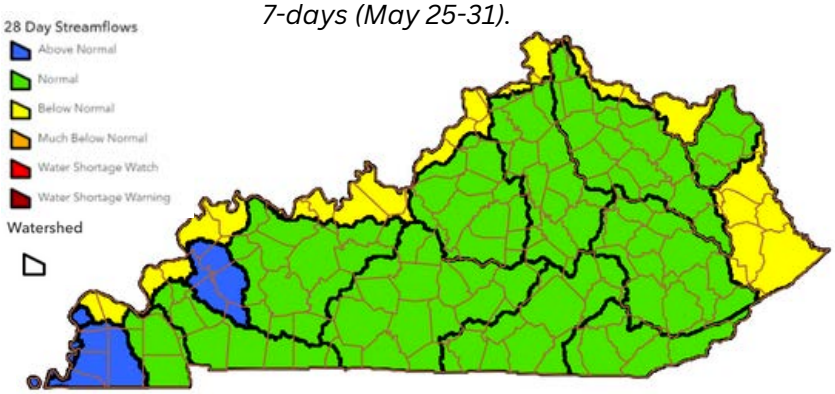

Figure 6. *Average streamflow by watershed over the past 28-days (May 4-31).*

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

River and Location	Drainage Area (mi2)	7 Day Average Flow (cfs)	7 Day % of Normal*	28 Day Average Flow (cfs)	28 Day % of Normal*
Levisa Fork at Pikeville	1232	184.9	24	284	36
Little Sandy River near Grayson	400	54.1	22	134	52
North Fork Licking River nr Mt Olivet	226	5.6	3.5	58	34
Kentucky River at Lock 14	2657	492	25	1064	52
Kentucky River at Lock 2	6180	948	21	3202	69
Cumberland River at Cumberland Falls	1977	963	52	1370	70
Beaver Creek near Monticello	43	7.9	29	15	51
Beech Fork at Maud	436	9.2	2.8	170	48
Barren River at Bowling Green	1849	3768	196	4127	209
Green River at Calhoun	7566	7341	109	13801	197
Tradewater River at Olney	255	124	71	234	128
Clarks River at Almo	134	219	185	90	70
Bayou De Chien near Clinton	69	174	240	157	204
Ohio River at Greenup Dam	62000	18641	36	25194	47
Ohio River at Cannelton Dam	97000	24818	32	42400	55
Mississippi River @ Thebes, IL	713200	329625	161	373207	199

* Base Period 1980-2023

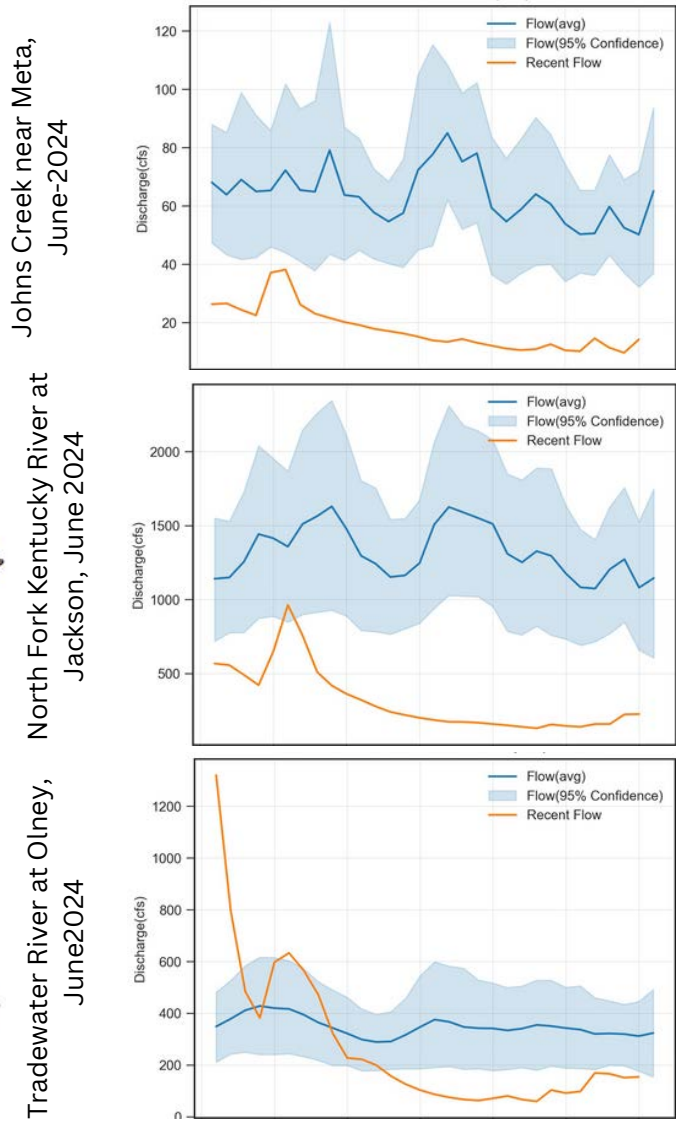

Figure 7. *Streamflows compared to average flows for the month.*

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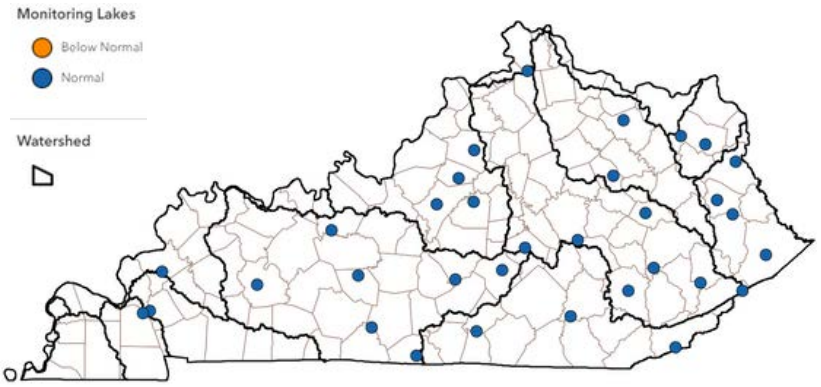
Reservoir Storage

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

By the end of June, most water supply lakes have begun 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, 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 periods (1980 – 2010) or the longest available period of data.

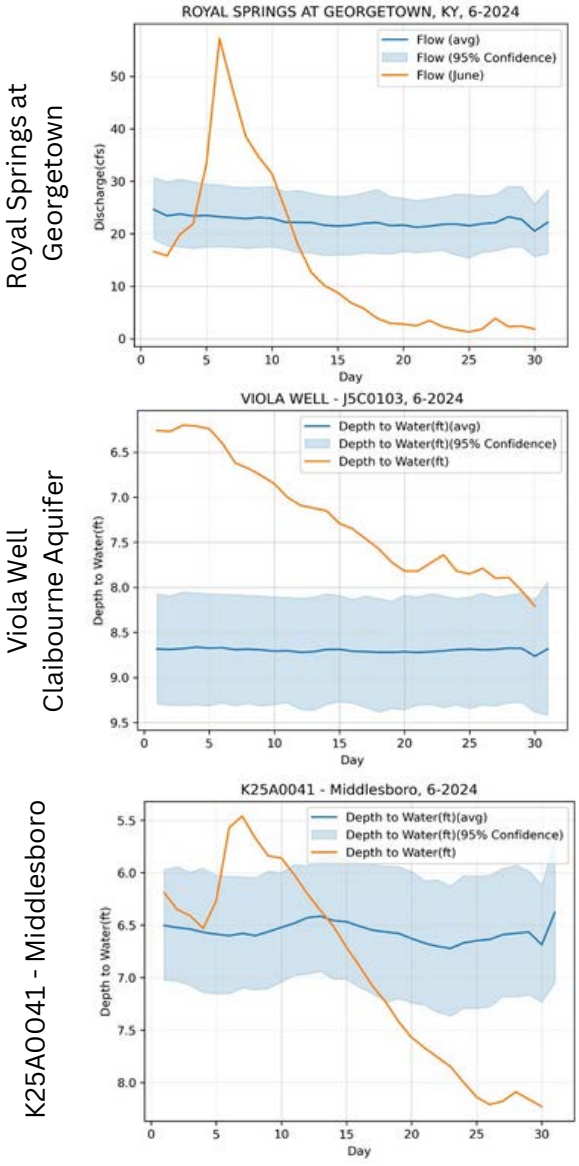
Inner Bluegrass: Total discharge at Royal Springs continues to remain above normal for the year. However, discharge in June has fallen below average following a peak in flow early in the month.

Jackson Purchase: Water levels in the Viola Well have fallen from a peak early in the month and are now close to the historical average across June. Water levels for the year to date remain above the historical reference period.

Middlesboro: Water levels fell in the Middlesboro well over the month from above average in early June. However, water levels for the year have generally been above normal.

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.*



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Forecast

The Climate Prediction Center (CPC) is currently predicting equal chances for above or below normal precipitation for Kentucky during the month of July and for the period of July through September.

The current U.S. Monthly Drought Outlook for July does predict the development of drought for northern and eastern Kentucky.

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

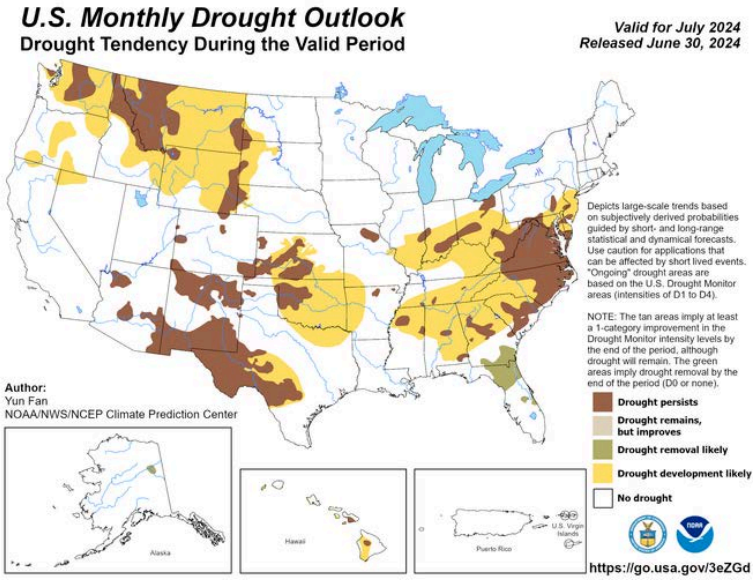
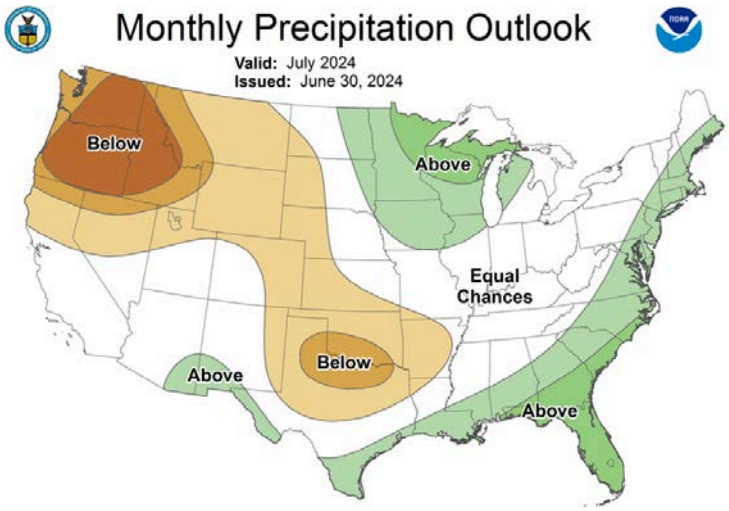


Figure 10. *The monthly drought outlook.*



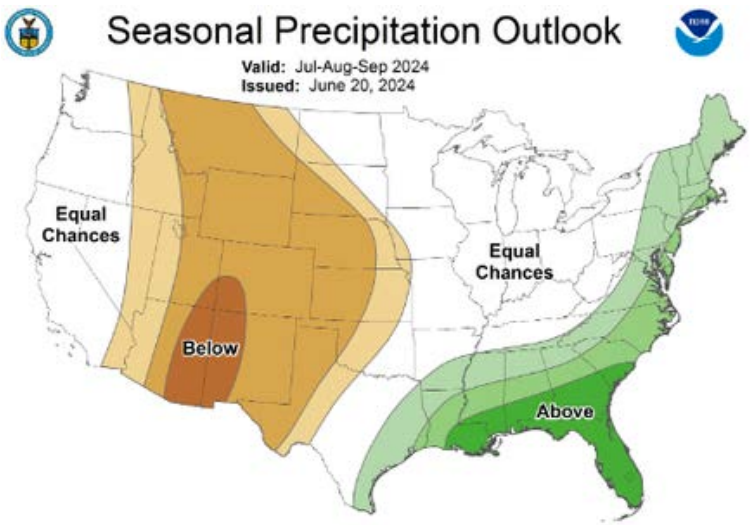


Figure 11. *The monthly and seasonal precipitation outlooks.*

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.