

April 2024

Precipitation

April was an active and highly variable month for Kentucky. The month started out with a severe weather outbreak on April 2nd that included numerous tornadoes across the Bluegrass and western KY. The first half of the month remained wet with precipitation recorded almost daily in at least some part of the state. The next significant precipitation event occurred on April 11th with most of the state receiving at least 1 inch of precipitation. The second half of the month was significantly drier with only a few periods of light rain noted until a system with significant precipitation moved across the state on April 29th and 30th, though amounts were typically below 1 inch.

The average for the state was 4.68", 0.59" above average. Regional averages ranged from 5.42" (1.22" above average) for the Central Region to 3.78" (0.04" below average) for the Eastern Region. The greatest amount of April precipitation was reported in Ohio County, 7.10", and Letcher County reported the least, 2.72".

Precipitation deficits, both short- and long-term, remain for much of the state as the state continues to recover from drought. The Bluegrass Region has recovered the best, averaging 0.21" above normal over the past three months and only 0.78" below normal over the past six months. The Western Region is still 4.29" below normal over the past three months and 6.67" below normal over the past six months. Parts of the Western Region remains in Moderate (D1) Drought according to the US Drought Monitor.

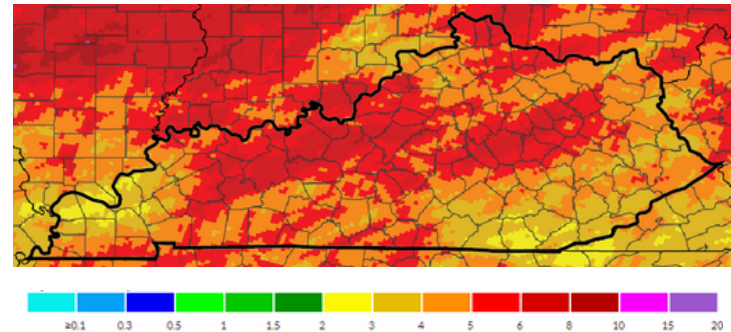


Figure 1. Monthly Precipitation Map.

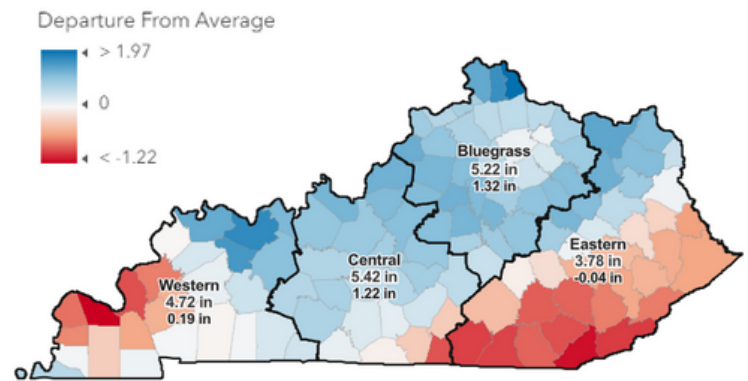


Figure 2. Departure from Normal precipitation by County and Climate Division.

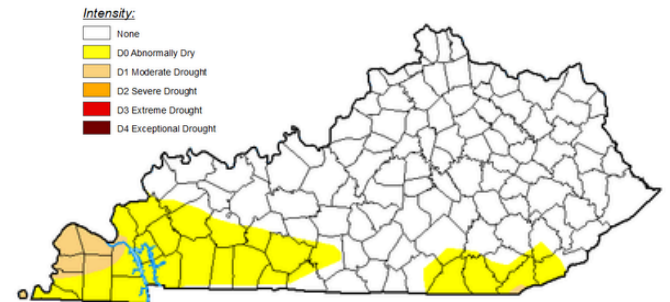
Table 1. Regional precipitation patterns

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	0.19	-2.41	-4.29	-6.67	-5.04	-1.05
Central	1.22	-0.98	-1.25	-3.26	-4.92	-0.36
Bluegrass	1.32	0.21	0.21	-0.78	-4.17	0.48
East	-0.04	-1.57	-0.49	-2.08	-4.59	-0.7

*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)

U.S. Drought Monitor
Kentucky

April 30, 2024
(Released Thursday, May 2, 2024)
Valid 8 a.m. EDT



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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Figure 3. Current US Drought Monitor Map.

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Streamflow

Streamflow during April was below normal in most of the state with a large peak in flow during the middle of the month. This spike helped raise the average streamflow for the month to normal levels, with the exception of the Upper Kentucky River and Bayou de Chien, which were both below normal for the month. April streamflow was generally higher than March, especially in the western part of the state where most watersheds were below normal to much below normal during the month of March.

Flows at the beginning of April were typically at or below normal, despite a wet start to the month. Greatest flows for the month occurred during the second week of April as widespread precipitation fell in Kentucky during the first two weeks of the month. Flows declined from this peak during the month as conditions dried out during the second half of the month. Lowest flows for the month occurred near or at the end of the month for most areas of the state. Flows at the end of April were below normal across most of the state with the exception of the Ohio River and western Kentucky thanks to significant precipitation at the end of the month. Average 7-day streamflow was much below normal in the Upper Kentucky, Upper Cumberland, and Upper Green River watersheds as April came to an end.

7 Day Streamflows

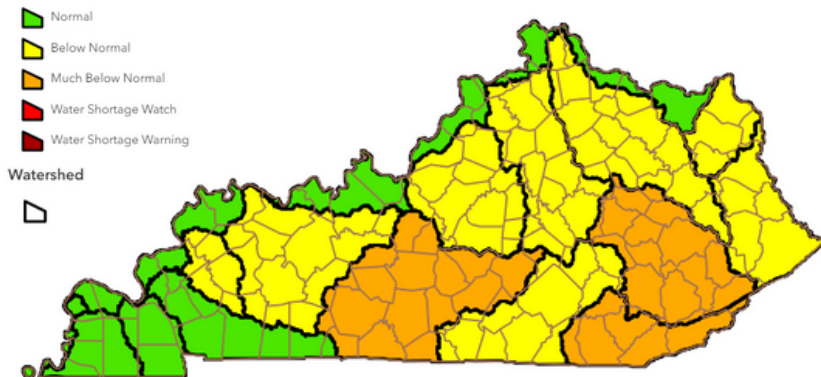


Figure 5. Average streamflow by watershed over the past 7-days (April 24-30).

28 Day Streamflows

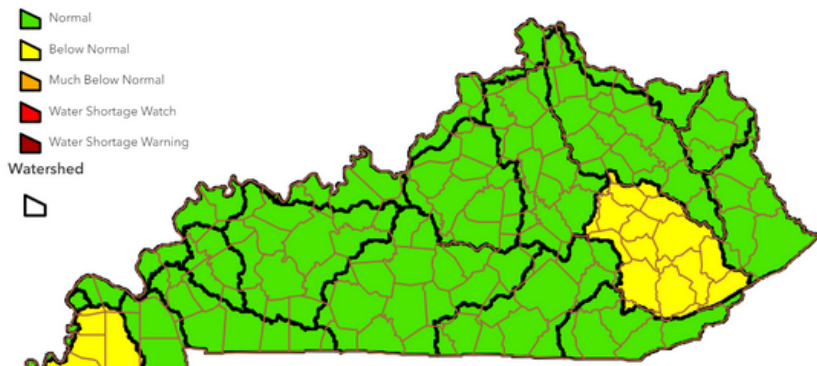


Figure 6. Average streamflow by watershed over the past 28-days (April 3-30).

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	% of Normal*
Levisa Fork at Pikeville	1232	966	97	1736	222
Little Sandy River near Grayson	400	177	54	995	384
North Fork Licking River nr Mt Olivet	226	60	28	612	360
Kentucky River at Lock 14	2657	1274	49	3329	163
Kentucky River at Lock 2	6180	3290	57	12040	259
Cumberland River at Cumberland Falls	1977	1270	59	2893	148
Beaver Creek near Monticello	43	20.8	61	53.3	179
Beech Fork at Maud	436	137	32	1169	329
Barren River at Bowling Green	1849	323	15	746	38
Green River at Calhoun	7566	5089	64	8792	125
Tradewater River at Olney	255	68.5	31	488	267
Clarks River at Almo	134	55.2	39	150	117
Bayou De Chien near Clinton	69	81	98	63.2	82
Ohio River at Greenup Dam	62000	103175	163	243566	455
Ohio River at Cannelton Dam	97000	161550	168	336083	433
Mississippi River @ Thebes, IL	713200	255750	105	20966	134

* Base Period 1980-2023

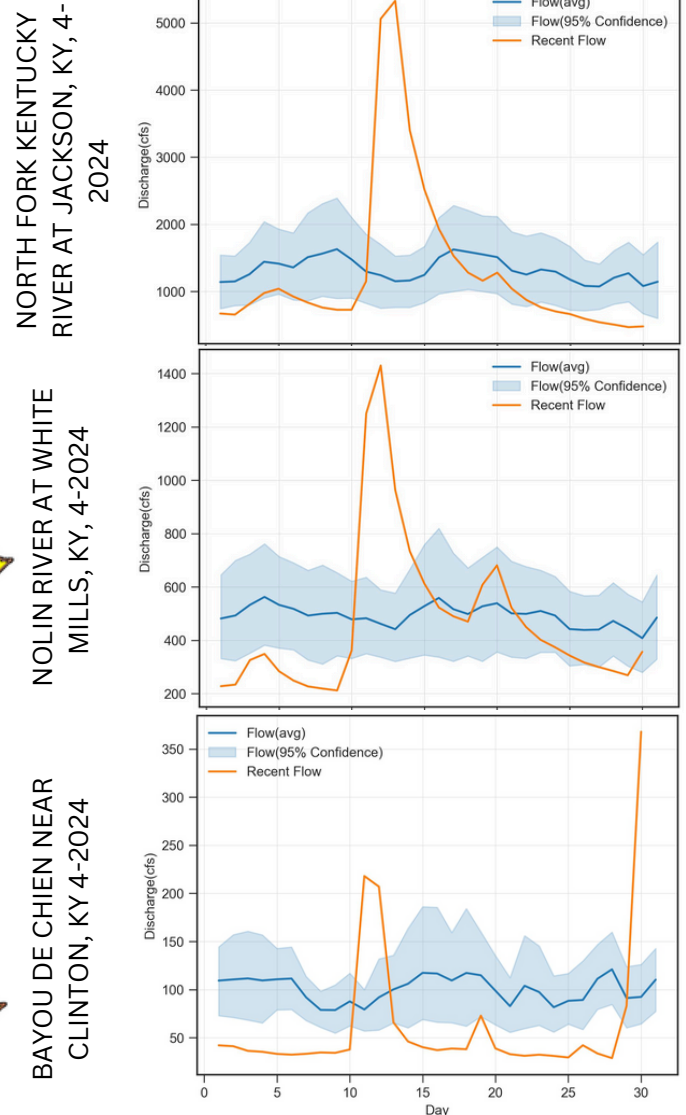


Figure 7. Streamflows compared to average flows for the month.

April 2024

Reservoir Storage

Reservoir storage for water supply lakes improved statewide during April.

By the end of April, most small to medium sized water supply lakes had returned to normal pool. Lake Liberty was the exception which was still down 4 feet, but has been improving since earlier in the spring. This is a good sign as typically the draw down season for these lakes begins sometime between May and July, depending on precipitation patterns.

Several USACE Projects have been slow to fill to summer pool, including Nolin River Lake, Barren River Lake, and Lake Cumberland. This is an indication of the low streamflows across these basin during March and April. As a result, releases from the dams have been significantly lower than normal to help allow the lake to refill, resulting in below normal streamflow downstream of the dams. This is been particularly noticeable in flows at the USGS gage on the Barren River at Bowling Green.

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 reference periods (1980 – 2010) or the longest available period.

Groundwater levels should be generally rising across the state where precipitation deficits are decreasing within the Bluegrass, Central, and portions of the Western and Eastern Climate Divisions. For the Central and Bluegrass regions dominated by karst aquifers, spring discharge is likely decreasing from above normal flow in response to rain events at the beginning of the month. Within the Western Region, water levels within the Claibourne Aquifer are likely above historical average but not yet recovered from drought conditions. Portions of South Central and Southeastern Kentucky remain in a rain deficit, but groundwater has likely increased over 3 and 6 – month lows in response to rainfall across the beginning of the month as observed in Middlesboro and discharge from mine voids in response to rainfall across the beginning of the year.

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.

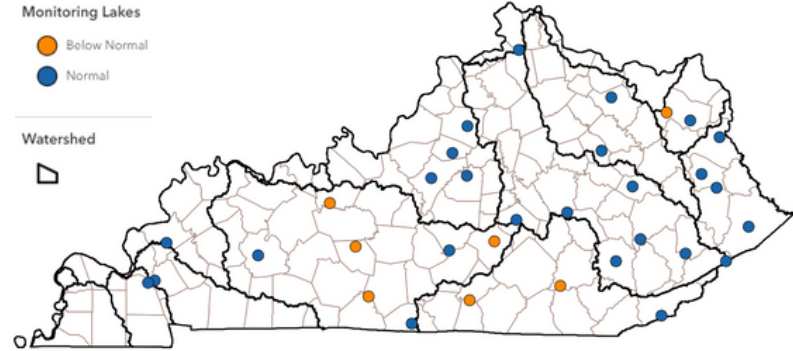
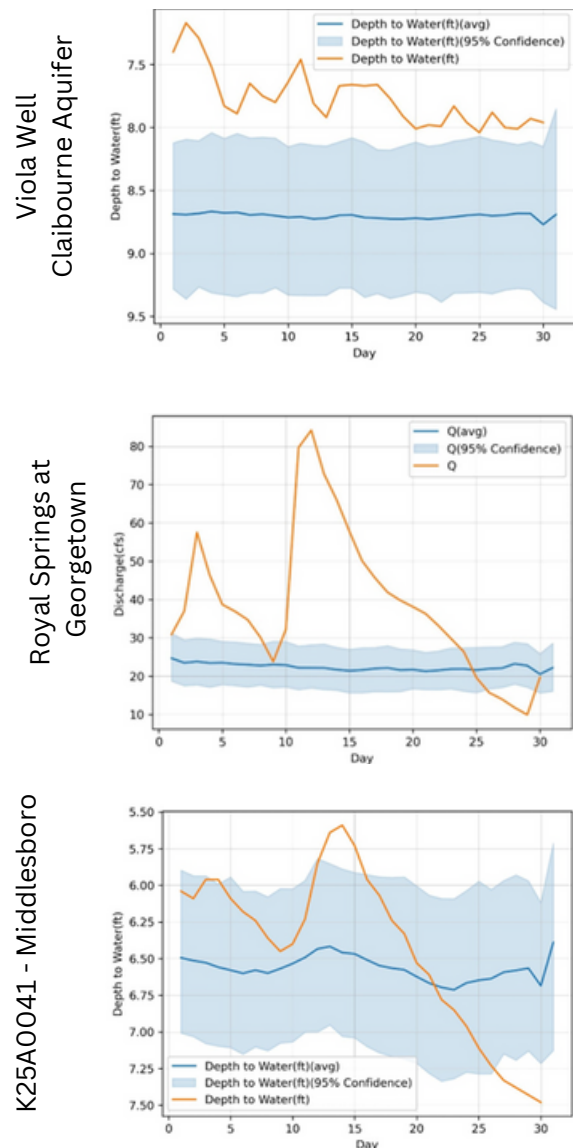


Figure 9. Groundwater observations compared to normal for the month.



April 2024

Forecast

The Climate Prediction Center (CPC) is currently predicting a slightly higher probability of above normal precipitation for all of the Commonwealth during the month of May. Above average precipitation during the month of May can help delay the start of the summer draw down on water supply lakes.

The CPC is also predicting a slightly higher probability of above normal precipitation for Kentucky for May through July, with an increased probability in the south east. Above normal precipitation for the first half of the summer would be beneficial to water resources in the state. However, it should be noted that a wet start to summer does not rule out a late summer and fall drought from occurring, as we saw in both 2022 and 2023.

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 May 2024
Released April 30, 2024

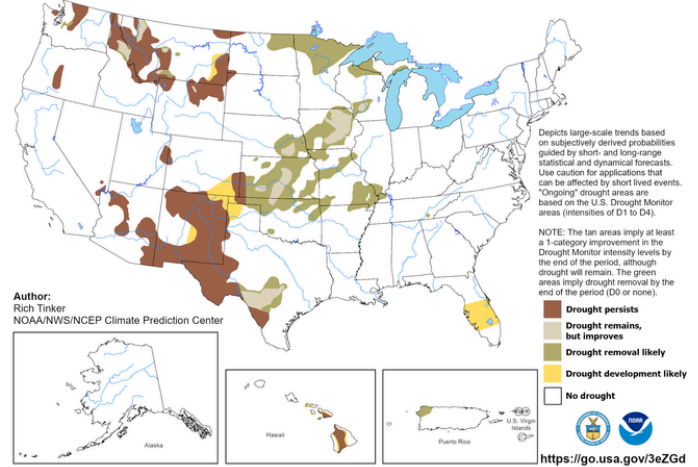


Figure 10. The monthly drought outlook.

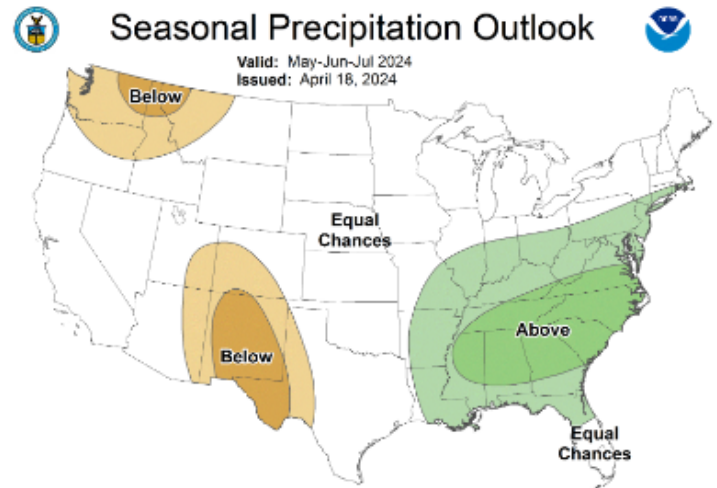
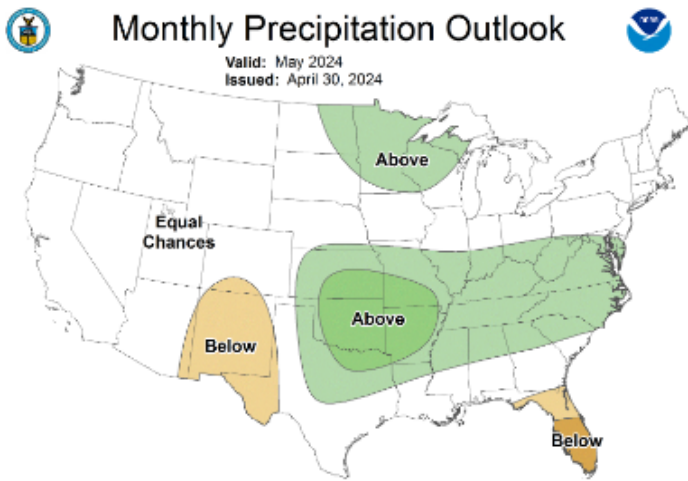


Figure 11. The monthly and seasonal precipitation outlooks.

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.

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.