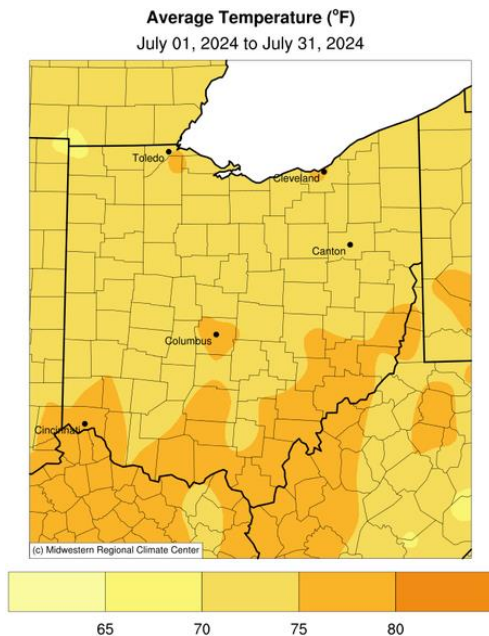


Review – July 2024

Temperature

In July temperatures throughout Ohio were seasonal with only slight deviation from normal levels. Average temperatures across most of Ohio were between 70-75°F except for the southern region of the state which recorded 75-80°F (Fig. 1a). Departures from normal temperatures were close to zero across the state with the exception of pockets of western Ohio being 1°F degree below normal and southeastern Ohio being 1°F above normal (Fig. 1b). Looking at the county level, the eastern half and a few southern counties ranked in the warmest third of their record while nearly the rest of the state ranked near normal. Fulton, Williams, and Defiance counties contrastingly ranked in the coldest third of their records. Overall, this ranked as the 40th warmest July for the entire state.

a)



b)

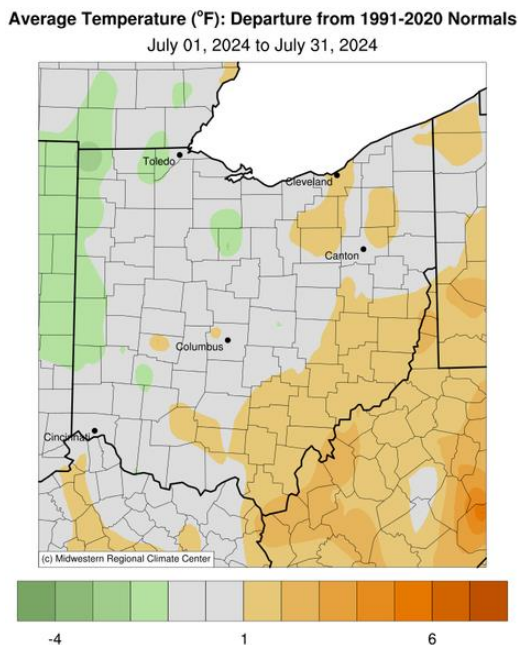


Figure 1a: Average temperature and 1b: Departure from Normal for the month of July 2024. Data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).

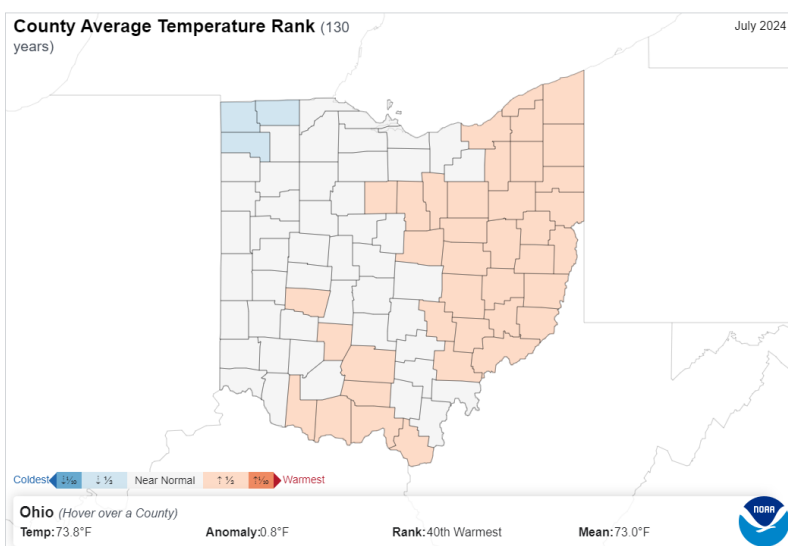


Figure 2: State of Ohio average temperature ranks by county for July 2024. Courtesy of the National Centers for Environmental Information (<https://www.ncdc.noaa.gov/sotc/>).

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Precipitation

Similar to last month, accumulated precipitation levels varied across Ohio in July. Most of the state experienced 2 to 4 inches of accumulated precipitation. The northern, central, and eastern parts of the state displayed pockets of 1 to 2 inches of accumulated precipitation while southwestern Ohio received 5 to 6 inches (Fig. 3a). Departures from normal show a similar pattern with most of the state reporting 0 to 3 inches below normal while small regions in the southwest and northeast region noted 0 to 3 above normal (Fig. 3b). The inconsistent precipitation levels is a result of the isolated storm coverage that occurred in July. Looking at the county level, nearly the entire state ranked in the driest third of their record except for a few southwestern Ohio counties. Ten counties ranked in the driest tenth of their record including Jefferson County which recorded their second driest July. Six counties ranked in the wettest third of their record with Preble County recording their third wettest July.

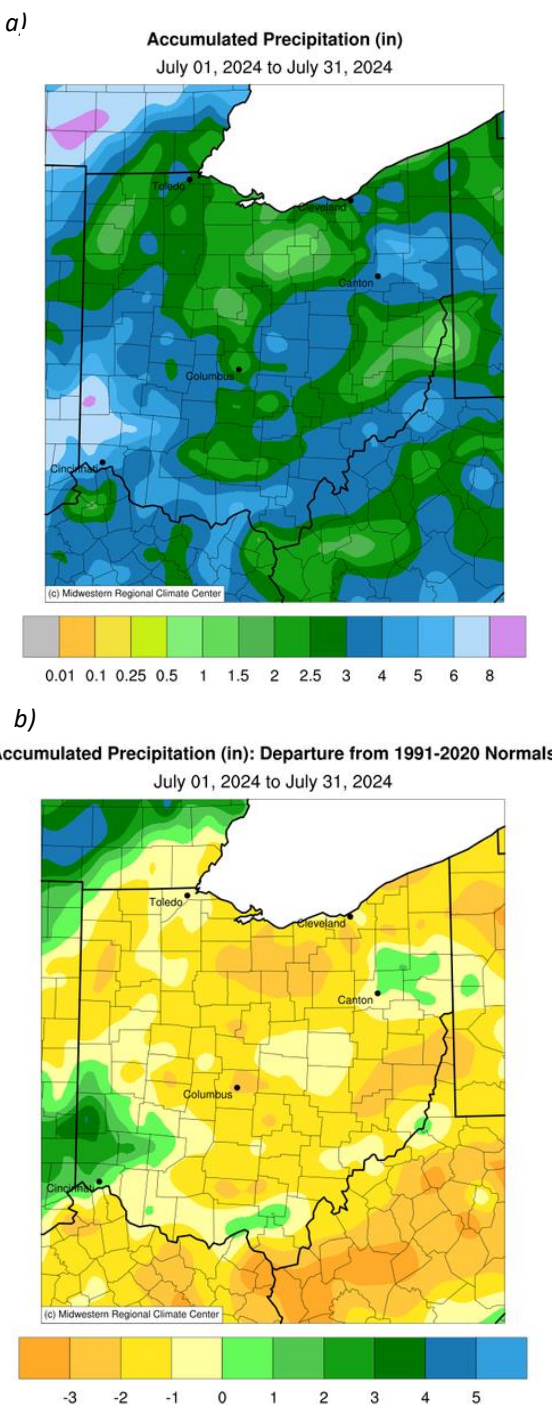


Figure 3a: Accumulated precipitation and 3b: Departures from Normal for the month of July 2024. Data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).

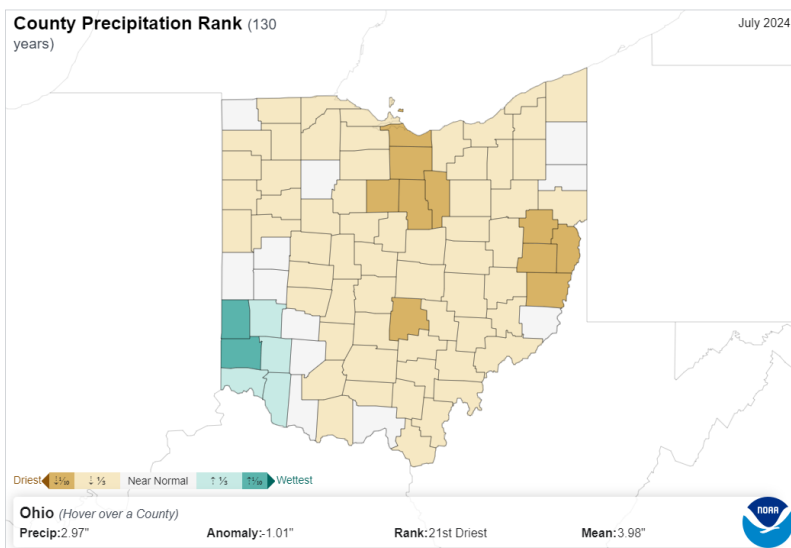
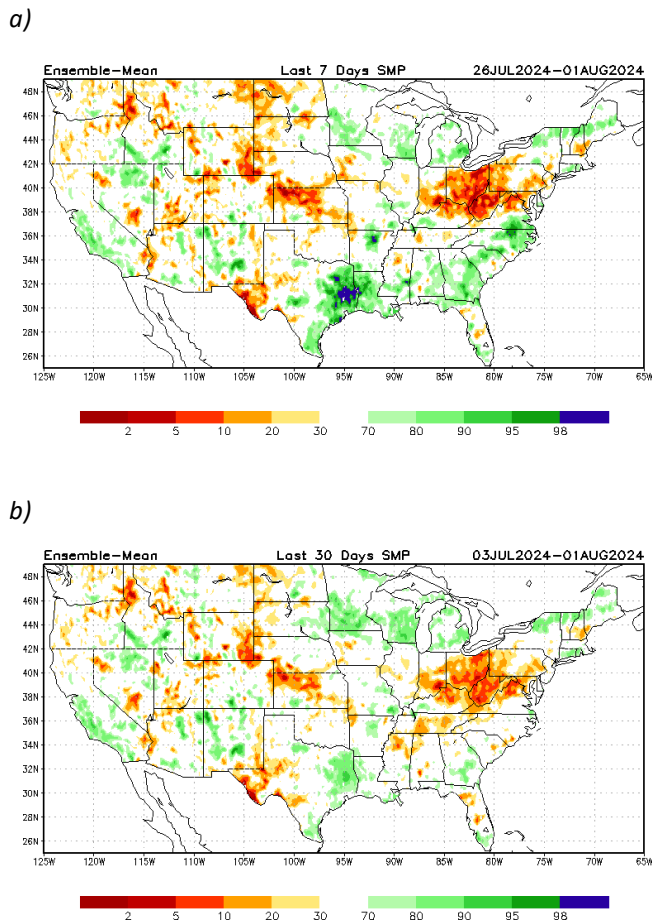


Figure 4: State of Ohio precipitation ranks by county for July 2024. Courtesy of the National Centers for Environmental Information (<https://www.ncdc.noaa.gov/sotc/>).



Review – July 2024



Soil and Energy

Dry soil conditions developed by the end of July in Ohio. The last 30 days' soil moisture percentile showed below-normal soil moisture levels, which have only intensified over the last 7 days of July. The worst of these conditions were recorded in the southern and eastern regions of the state but the entire state has some level of below average soil moisture (Figs. 5a and 5b). It is important to note that during the time of writing this summary broad areas of heavy precipitation have fallen across northern Ohio so changes have likely occurred just a few days into August.

Seasonal temperatures this month led to very small departures from normal numbers of Cooling Degree Days (CDDs) and Heating Degree Days (HDDs). HDDs were already close to zero to begin with because July is one of the warmest summer months leaving little need for heating. The number of CDDs was quite high but only barely higher than normal at the state level (Fig. 6).

Product Note: The NASA SPoRT LIS soil moisture product is currently unavailable due to a technical failure. While this is repaired, we will be using national soil moisture percentage products from the Climate Prediction Center. For more information, please contact Geddy Davis (davis.5694@osu.edu).

Figure 5a: Last 7 days and 5b: last 30 days mean soil moisture percentile across the United States. Courtesy of the Climate Prediction Center (https://www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp_nw.shtml#).

Climate Division	Heating Degree Days	Normal	Departure	Cooling Degree Days	Normal	Departure
1	0	2	-2	246	265	-18
2	0	2	-2	267	263	3
3	3	6	-3	217	212	5
4	0	1	-1	264	277	-13
5	0	1	-1	286	280	5
6	1	3	-2	264	239	25
7	1	2	-1	282	247	34
8	0	0	0	295	304	-10
9	0	0	0	339	304	35
10	0	1	-1	316	269	48
State	0	2	-1	278	266	11



Figure 6: (Left) July 2024 heating & cooling degree days. (Right) Corresponding Ohio Climate Divisions. Data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).

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Notable Events

The most notable event for weather and climate in Ohio during July is the increasing levels of drought across large parts of the state. Categorically, 13.82 percent of the state is under a D2 or severe level of drought, 25.95 percent is under a D1 or moderate level of drought, 32.59 percent D0 or abnormally dry conditions, and the other 27.63 percent have no drought conditions. The worst of these conditions and the majority of the D2 region is located in the southeastern part of the state which again received below-normal levels of precipitation in July (Fig. 7).

This level of drought can impact farmers in eastern Ohio because many crops such as corn and soybeans which are grown there are under higher levels of stress due to the limited access to natural moisture. When crops become stressed they are not able to fully grow and develop which can lead to reduced yield come harvest season. The general population may notice the grass in their yards begin to turn brown or yellow as the result of the same environmental stress of not having available moisture (Fig. 8). Additionally, pasture lands have also been stressed in the southeast which has led to issues for feeding livestock. Athens, Morgan, Pickaway, and Noble counties are all completely in D2 and are likely having the largest impacts as a result.

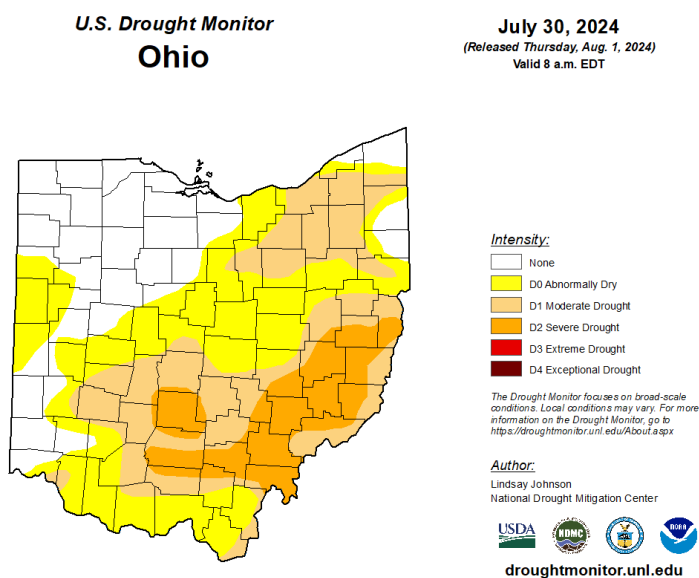


Figure 7: Map of drought conditions in Ohio determined by the U.S. Drought Monitor.

<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OH>



Figure 8: Photo of stressed brown/yellow lawn grass in a D1 zone in Columbus, Ohio. Image courtesy of Geddy Davis.

Forecast: August - October

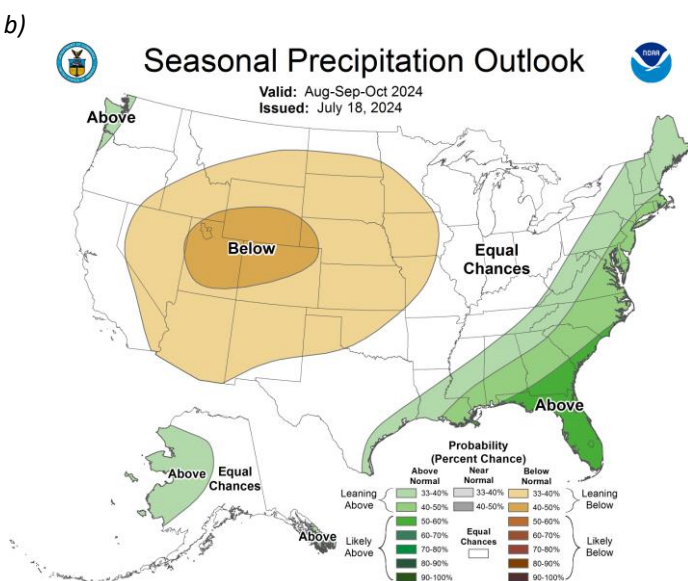
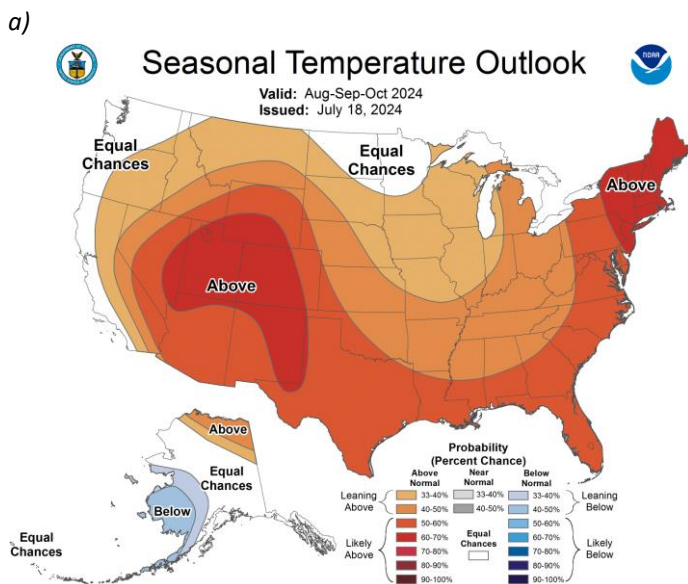


Figure 9a: Nationwide Seasonal Temperature and 9b: Precipitation Outlook for August-October. Courtesy of the Climate Prediction Center (<https://www.cpc.ncep.noaa.gov/>).

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Looking Ahead

The CPC's 3-month outlooks suggest a warmer-than-average transition into fall over the next three months. The temperature outlook shows the entire state is predicted to be above normal temperatures with moderate confidence (Fig. 9a). The precipitation outlook indicates that Ohio is predicted for equal chances of above or below normal levels of precipitation (Fig. 9b). Although the CPC outlooks only indicated confidence levels of above average or below average conditions, if warmer than average conditions continue without any increase in precipitation, drought conditions will likely continue as a result in the coming months. This could impact farmers during the harvest season as already stressed crops could be at risk of further impacts if conditions are prolonged or worsen. However, conditions in Ohio can change quickly during the summer months, and recently a more active pattern has provided some beneficial rains to a few areas dealing with drought. It will be important to monitor week-to-week how conditions and trends evolve during the coming months.

Note: these outlooks do not provide the quantity of above or below normal conditions, just the likelihood of occurrence (i.e., the probability).