



Review – March 2024

Temperature

Temperatures in Ohio were above average for March, following the trend from previous months. Average temperatures in the northern part of the state were around 40-45°F, while southern regions logged 45-50°F (Fig. 1a). In contrast, temperature departures were more varied across Ohio. A slight northeast-southwest gradient can be observed with temperatures in the northeast around 5-8°F above normal, central parts of the state experiencing 4-6°F above normal, and southwestern regions 2-5°F above normal (Fig. 1b). At the county level, the entire state ranked in the warmer third of the record with more than half of Ohio’s counties ranking in the warmest tenth of the record (Fig. 2). Overall, the county data follows the same trend of the average temperature departures map for March of above average temperatures across the entire state.

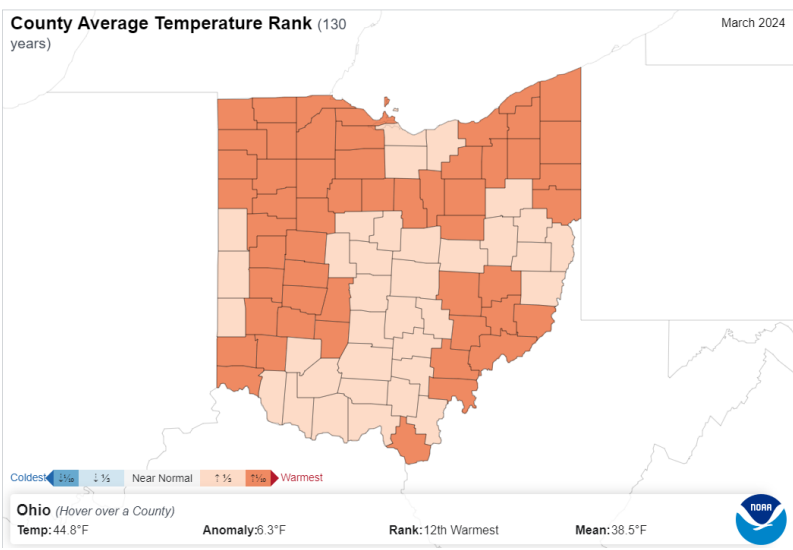
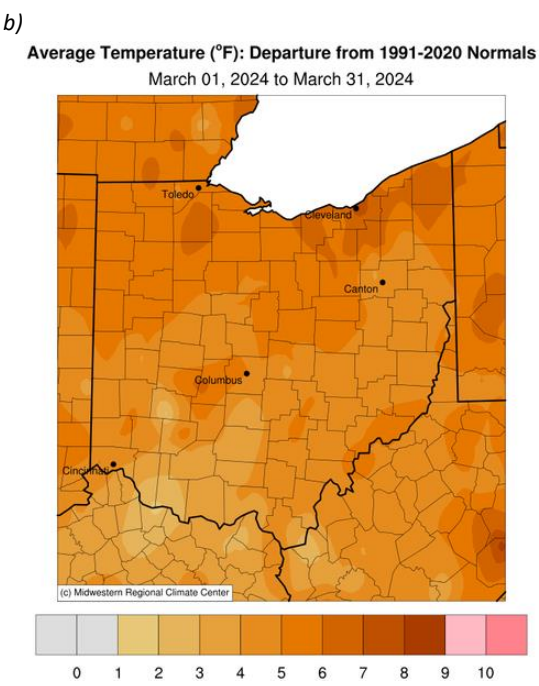
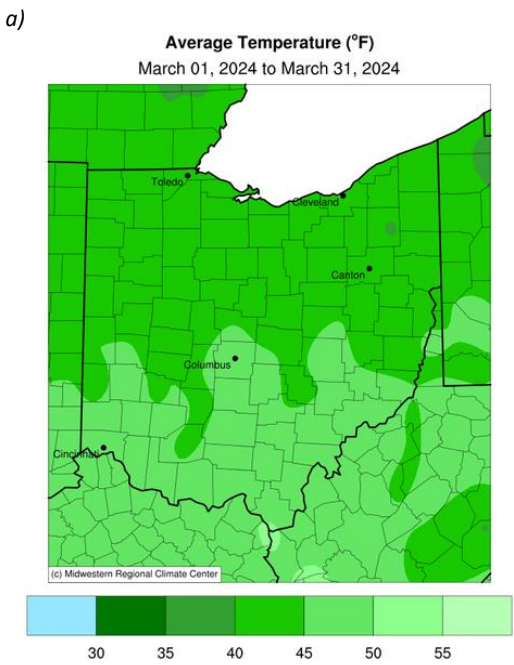


Figure 1a: Average temperature and 1b: Departure from Normal for the month of March 2024. Data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).

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

Review – March 2024

Precipitation

Accumulated precipitation departures in Ohio were closer to normal values for March compared to previous months but variations from region to region still occurred. Accumulated precipitation measured 3 to 4 inches for most of the state with areas along Lake Erie and around Columbus recording 2 to 3 inches (Fig. 3a). Accumulated precipitation departures ranged between 0 to 2 inches below normal in southern Ohio while the northwest recorded values between 0 to 1.5 inches above normal. The rest of the state logged somewhere between -0.5 to 0.5 inches from normal (Fig. 3b). At the county level, a large portion of Ohio ranked near normal, with the southern region and central part of northern Ohio reaching the lowest third of the record. Contrastingly, Lucas, Wood, and Allen counties ranked in the wettest third of the record (Fig. 4). Overall, the variation in precipitation levels across the maps can likely be explained by a few localized intense precipitation events.

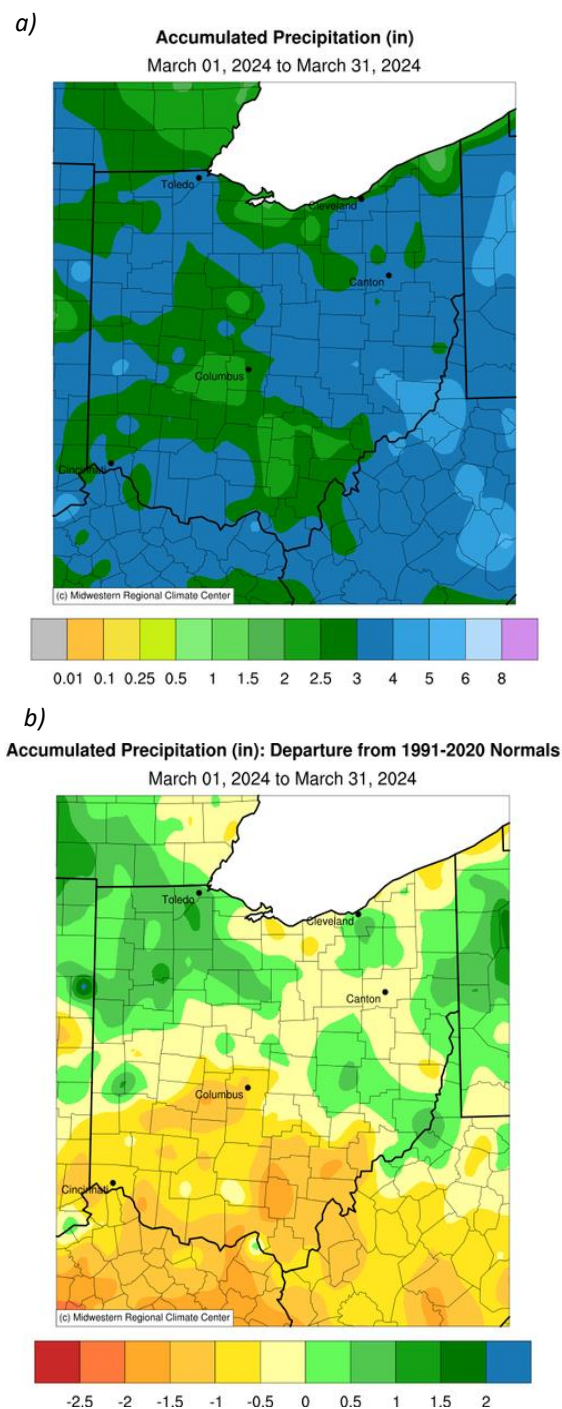


Figure 3a: Accumulated precipitation and 3b: Departures from Normal for the month of March 2024. Data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).

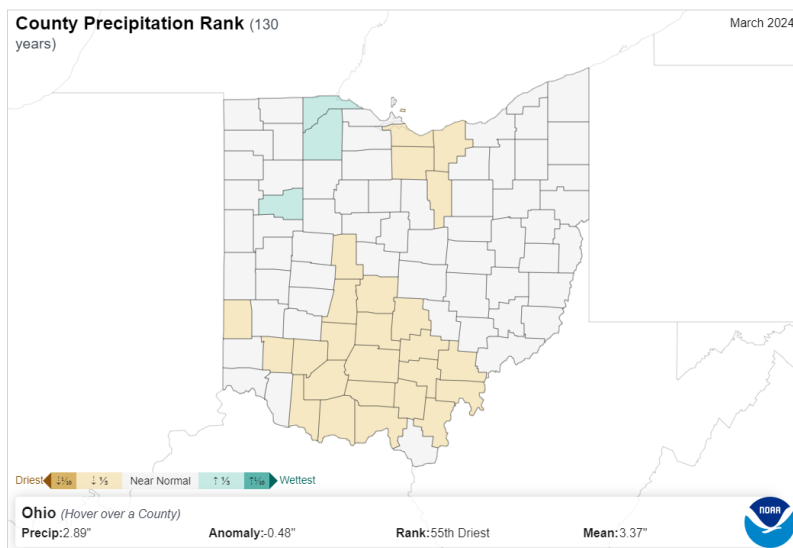
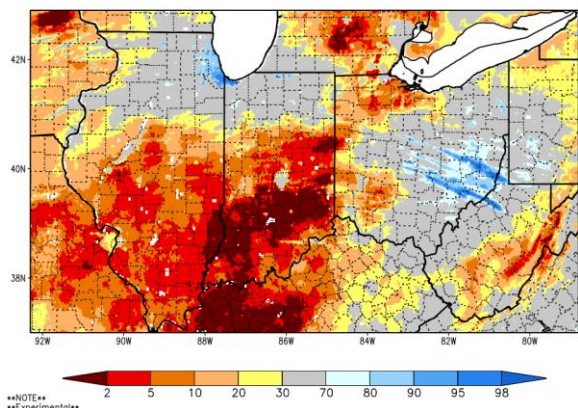


Figure 4: State of Ohio precipitation ranks by county for March 2024. Courtesy of the National Centers for Environmental Information (<https://www.ncdc.noaa.gov/sotc/>).



Review – March 2024

a) SPoRT-LIS 0–40 cm Soil Moisture percentile valid 31 Mar 2024



b) SPoRT-LIS 0–200 cm Soil Moisture percentile valid 31 Mar 2024

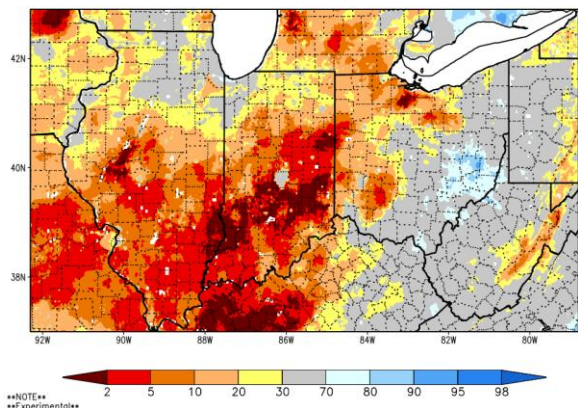


Figure 5a: 0–40 cm and 5b: 0–200 cm soil moisture percentile across the region at the end of March 2024. Courtesy of NASA SPoRTLIS (https://weather.msfc.nasa.gov/sport/case_studies/lis_IN.html).

Soil and Energy

Regions of dryness persist despite many areas of improvement at the end of March. On the 0-40cm map (Fig. 5a), soil conditions are shown to be dry across the entire western border of the state while a region of moist soil conditions is displayed in the southeast portion of the state. The rest of the state recorded soil conditions in the middle percentiles. The 0-200cm map (Fig. 5b) shows similar trends of dry soil conditions in the west, moist soil conditions in the southeast, and average conditions across the rest of the state. Recent precipitation events are shown more evidently in the top 0-40 cm layers of soil compared to the 0-200cm levels, with more notable dryness still apparent in these lower layers.

Warmer-than-average temperatures recorded in March were beneficial to Ohio’s energy consumption as the occurrence of Heating Degree Days (HDDs) was lower across every climate division in the state. No Cooling Degree Days (CDDs) were observed for March, but this is expected to change as we move further into the spring season (Fig. 6).

Product Note: Both NASA SPoRT LIS soil moisture products contain small pockets of inaccurate data indicating extremely wet or dry conditions. These small-scale errors can emerge in remote sensing products covering large areas or grid-spacings. For more information, please contact Geddy Davis (davis.5694@osu.edu).

Climate Division	Heating Degree Days	Normal	Departure	Cooling Degree Days	Normal	Departure
1	680	856	-176	0	1	-1
2	674	851	-177	0	1	-1
3	716	892	-176	0	0	0
4	637	796	-160	0	1	-1
5	623	770	-148	0	1	-1
6	664	829	-164	0	1	-1
7	657	815	-157	0	1	-1
8	598	727	-130	0	2	-2
9	557	693	-136	0	1	-1
10	597	749	-153	0	1	-1
State	640	798	-158	0	1	-1



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

Review – March 2024

Notable Events

By far the most notable event in March was the tornado outbreak on the 14th. Storms early in the morning of the 14th decreased the level of atmospheric instability in Ohio leading to uncertainty in the extent of severe weather. However, later in the day, a rebound of warm and moist air combined with favorable low-level winds contributed to a redevelopment of severe weather around 5pm local time. Intense supercell thunderstorms went on to produce tornadoes, large hail, and intense winds over northern and western Ohio through the evening. This is an example of conditions in the atmosphere changing rapidly over the afternoon hours, proving it is important to remain vigilant throughout the entire day when severe weather is forecast.

Nine tornadoes would eventually develop including two EF3s, two EF2s, four EF1s, and one EF0. Numerous buildings across the state were damaged with campers, mobile homes, and RV's being impacted the most. Devastatingly, the Logan County EF3 tornado took the lives of 3 individuals and injured many more. Hundreds of families were displaced from their homes and recovery efforts are still ongoing. This event serves as a stark reminder that February and March mark the beginning of tornado season in Ohio, and as such it is becoming increasingly important to be weather-aware as we move into the peak of severe weather season.

Ohio Severe Weather Reports: March 14, 2024

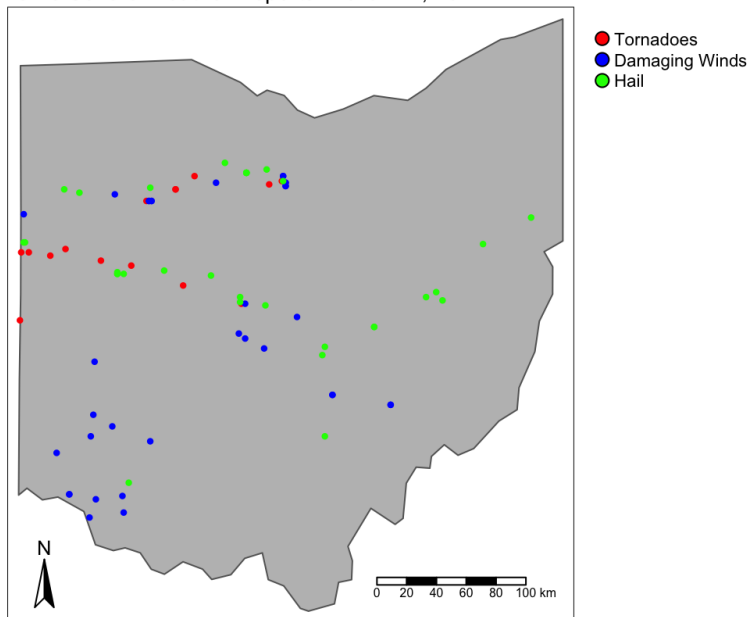


Figure 7: Statewide severe weather reports for Ohio on March 14, 2024, including damaging winds, hail, and tornadoes. Data courtesy of the National Weather Service Local Storm Report archive, accessed via Iowa Environmental Mesonet (<https://mesonet.agron.iastate.edu/>).



Figure 8: Image of the March 14th EF1 tornado in Celina, OH courtesy of Geddy Davis.



Forecast: April - June

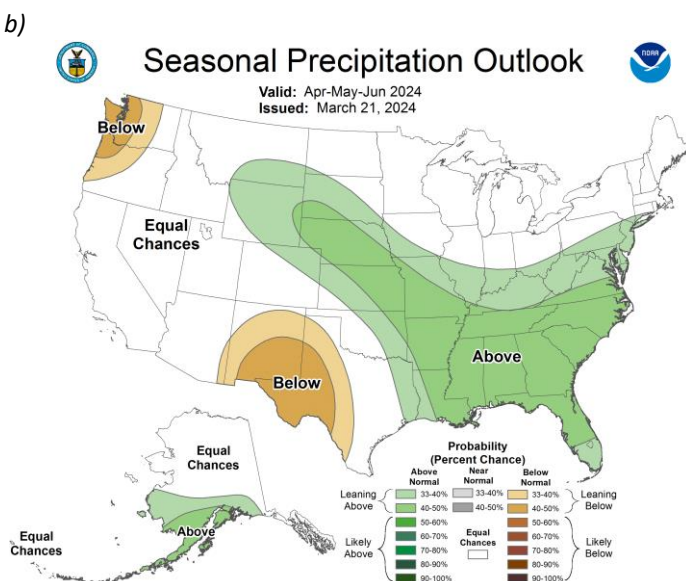
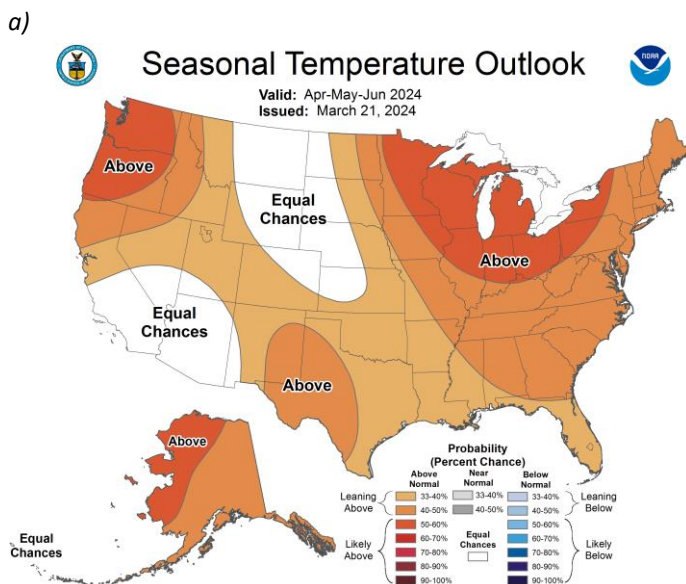


Figure 9a: Nationwide Seasonal Temperature and 9b: Precipitation Outlook for April-June. Courtesy of the Climate Prediction Center (<https://www.cpc.ncep.noaa.gov/>).

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Looking Ahead

The CPC’s 3-month outlook continues the trend showcased in previous outlooks of likely warmer-than-average temperatures in Ohio for the transition to the summer season. Temperatures are predicted to be above normal across the state with moderate confidence (Fig. 9a). The precipitation outlook indicates equal chances of precipitation being above or below normal for most of Ohio excluding the southern part of the state, which has a minimal probability of having above-average precipitation (Fig. 9b). Warmer-than-average temperatures would continue the fast start to the growing season. However, uncertainty of the precipitation outlook could impact how effectively growers can take advantage of the early start. Recent precipitation events between March 30 and April 3 have saturated soil in many places, adding to the uncertainty in future soil conditions. Additional precipitation could cause an overabundance of soil moisture while possible warm dry conditions could lead to a faster drying out of surface soil. Thus, upcoming weather events may prove very influential for the coming spring months.

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

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