State of Ohio Monthly Climate Update

THE OHIO STATE UNIVERSITY

Review – February 2024

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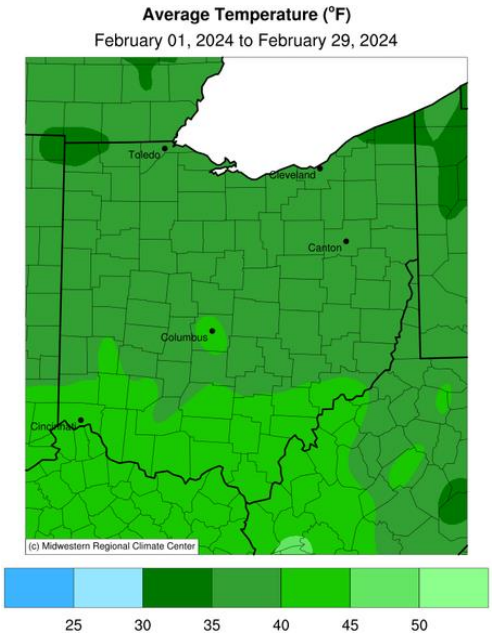

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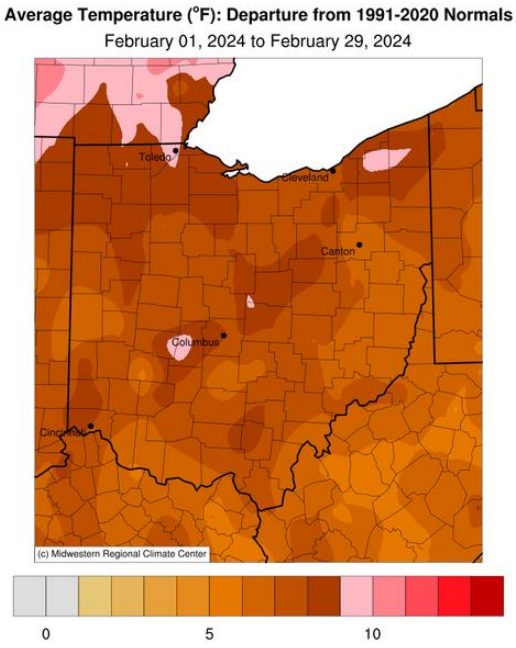

Figure 1a: Average temperature and 1b: Departure from Normal for the month of February 2024. Data courtesy of the Midwestern Regional Climate Center (http://mrcc.purdue.edu).

Temperature

February temperatures were much higher than average in Ohio, resulting in the frequent occurrence of unseasonal conditions across the state. While most of Ohio saw average temperatures around 35-40°F over the month, the southernmost portion of the state recorded averages of up to 40-45°F (Fig. 1a). As a result of such high temperatures, average departures ranged around 6-9°F above normal, with some localized areas seeing positive departures of 9-10°F (Fig. 1b). With nearly the entire state averaging above freezing, temperatures usually not observed until spring were common. At the county level, this month was within the top 5 warmest Februarys for every county in Ohio, with most counties ranking within the top 3 warmest (Fig. 2). Additionally, Lawrence County at Ohio's southern point observed its warmest February on record.

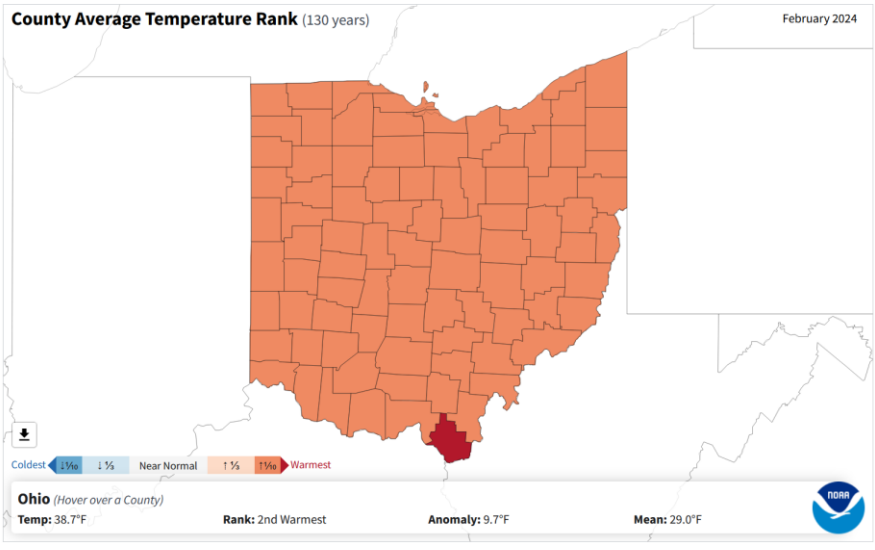

Figure 2: State of Ohio average temperature ranks by county for February 2024. Courtesy of the National Centers for Environmental Information (https://www.ncdc.noaa.gov/sotc/).

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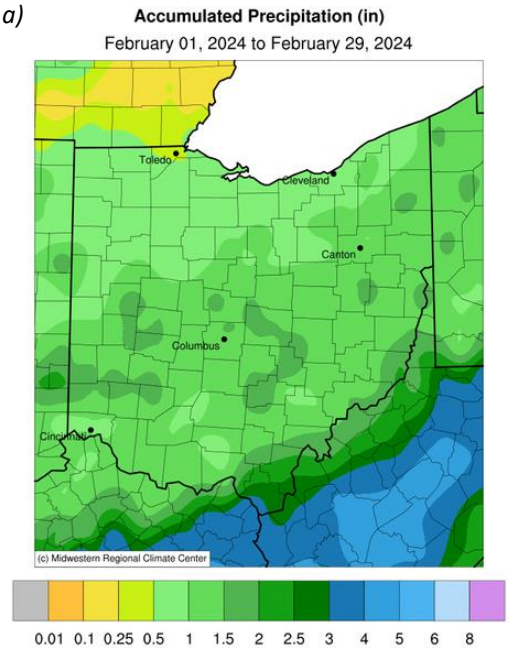

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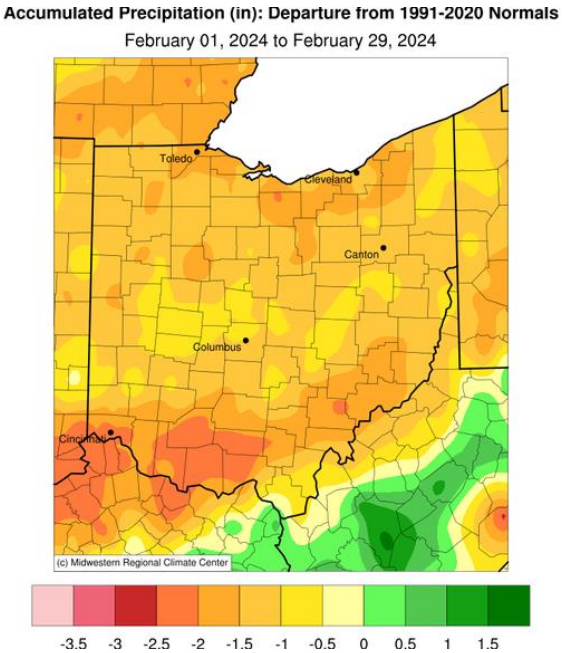

Figure 3a: Accumulated precipitation and 3b: Departures from Normal for the month of February 2024. Data courtesy of the Midwestern Regional Climate Center (http://mrcc.purdue.edu).

Precipitation

With a general lack of large-scale precipitation events in Ohio during February, much of the state recorded consistently low accumulation totals over the month. Most of Ohio saw around 1-2 inches of accumulated precipitation in February, with the northernmost portion receiving only 0.5-1 inches. At both extremes, the Toledo area recorded only 0.25-0.5 inches, while the state's southern tip recorded 2-4 inches (Fig. 3a). Resultingly, the bulk of Ohio recorded departures of around 0.5-2 fewer inches of accumulated precipitation than normal, with much of the southwest seeing up to 2.5 fewer inches than normal (Fig. 3b). At the county level, nearly every county ranked within the drier third of their records, with many counties in the north and south ranking within the driest tenth of their records (Fig. 4). The most notable departures were seen in Summit, Medina, and Lorain Counties in northeast Ohio, which saw their second driest recorded February.

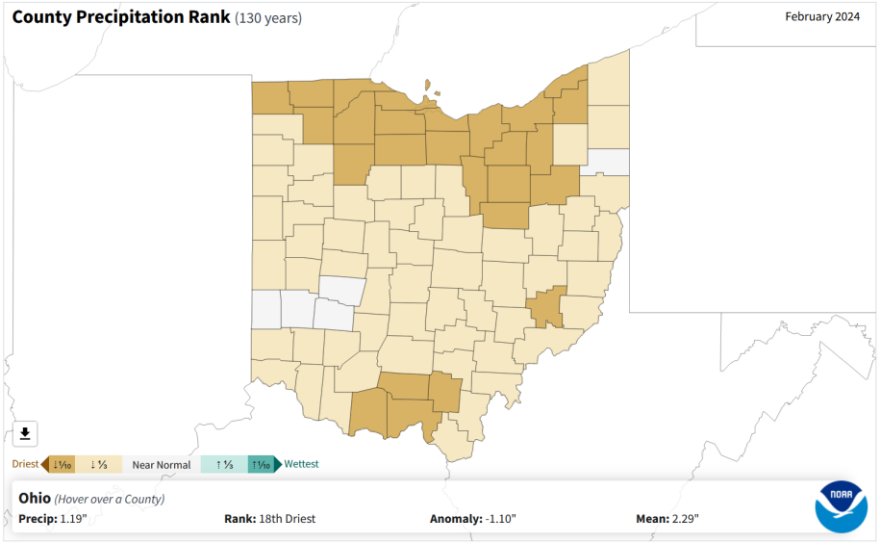

Figure 4: State of Ohio precipitation ranks by county for February 2024. Courtesy of the National Centers for Environmental Information (https://www.ncdc.noaa.gov/sotc/).

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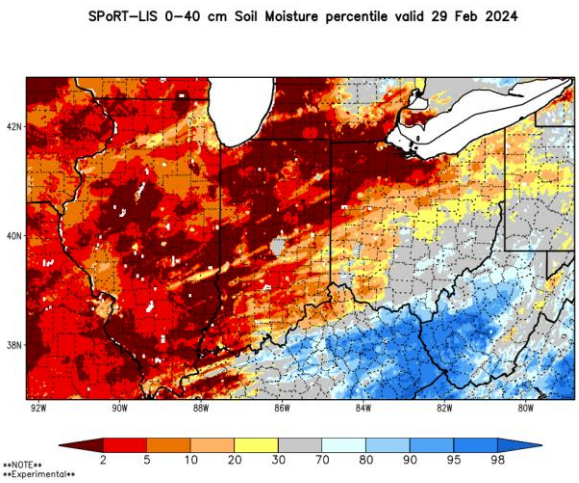

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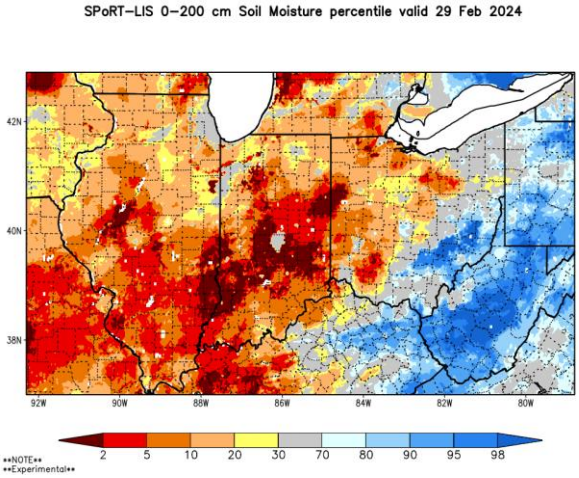

Figure 5a: 0-40 cm and 5b: 0-200 cm soil moisture percentile across the region at the end of February 2024. Courtesy of NASA SPoRTLIS (https://weather.msfc.nasa.gov/sport/case_studies/lis_IN.html).

Soil and Energy

Despite a lack of significant precipitation, soil conditions in Ohio were generally moderate at the end of February. While significant dryness was seen across northwest Ohio at the 0-40cm depth, the rest of the state saw either slight dryness or intermediate soil conditions (Fig. 5a). Meanwhile, at the 0-200cm depth, much of western Ohio saw some level of soil dryness, while the Appalachian region in the south and east saw generally moderate to moist soil conditions at the end of the month (Fig. 5b). Soil moisture was highly varied across the state in both depth ranges, and as the state shifts towards more spring like conditions, this pattern may continue and provide varying impacts to the early part of the growing season.

The high temperatures seen in February led to significant negative departures of Heating Degree Days (HDDs) in all of Ohio's climate divisions. Combined with the seasonal lack of Cooling Degree Days (CDDs), energy usage was largely minimized across the state.

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	828	1074	-246	0	0	0
2	807	1053	-245	0	0	0
3	838	1076	-238	0	0	0
4	783	1017	-234	0	0	0
5	758	986	-227	0	0	0
6	799	1032	-233	0	0	0
7	796	1005	-209	0	0	0
8	732	944	-212	0	0	0
9	685	890	-205	0	0	0
10	734	948	-215	0	0	0
Statewide	773	999	-226	0	0	0

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

Notable Events

February saw its fair share of notable events in Ohio, primarily due to an amplified weather pattern that brought multiple types of significant weather to close the month. Firstly, a broad cold front dropped temperatures to below freezing on the evening of February 16th and brought significant snow accumulation to the central belt of Ohio that generally ranged from 2.5 to 6 inches, with much of Delaware County and surrounding areas receiving up to 8 inches of snow (Fig. 7). While impacts were minimal with only low-level snow emergencies in some counties, this system is notable because it serves as the first significant snowfall of the year for much of central Ohio, constituting more than half of the total snowfall seen this winter in the region.

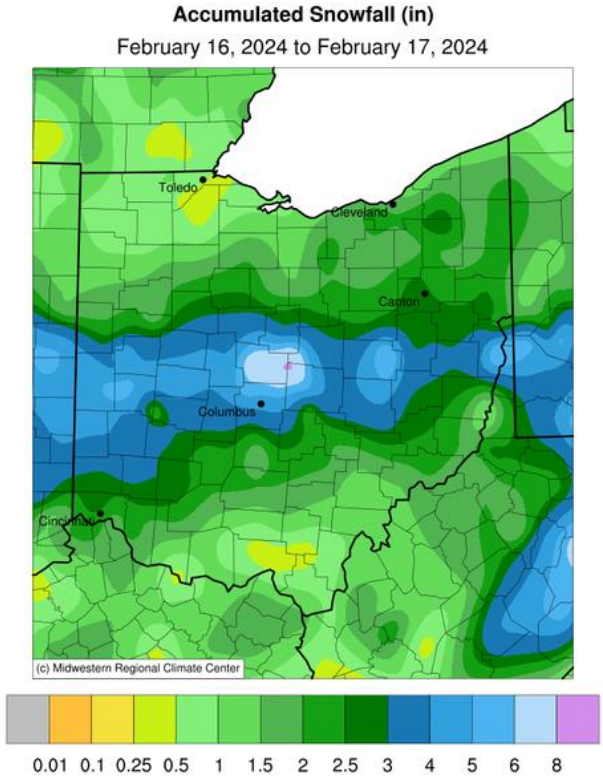

Figure 7: Accumulated snowfall in Ohio on February 16-17, 2024. Image courtesy of the Midwestern Regional Climate Center (http://mrcc.purdue.edu).

Another result of the month's dynamic weather pattern was the outbreak of severe weather that occurred during the early morning hours of February 28th. In addition to a multitude of hail and damaging wind reports, nine tornadoes were reported across the central belt of Ohio, the strongest of which being three EF2s spotted across the region (Fig. 8). While no injuries were reported, significant property damage and power outages were widespread. The similar geographical ranges and origins of both events serve as a reminder that impactful weather can occur at any time, even after long periods of relative inactivity. As such, it is important to stay aware of the weather and be prepared for any type of severe event.

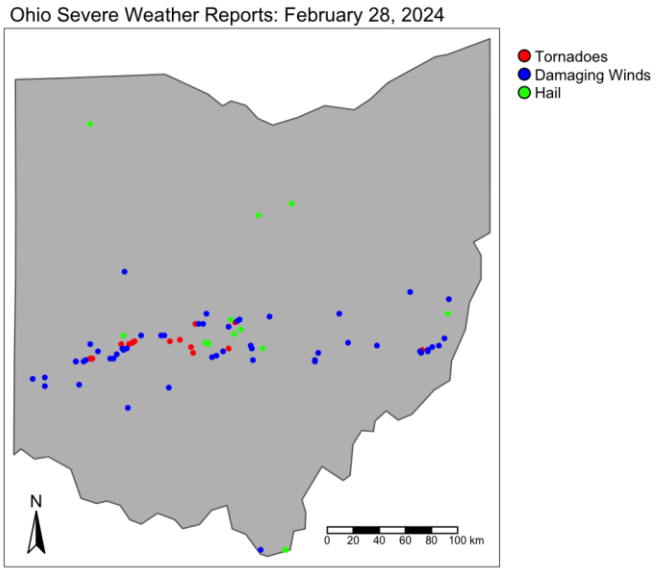

Figure 8: Statewide severe weather reports for Ohio on February 28, 2023, including damaging winds, hail, and tornadoes. Data courtesy of the National Weather Service Local Storm Report archive, accessed via Iowa Environmental Mesonet (https://mesonet.agron.iastate.edu/).

Forecast: March - May

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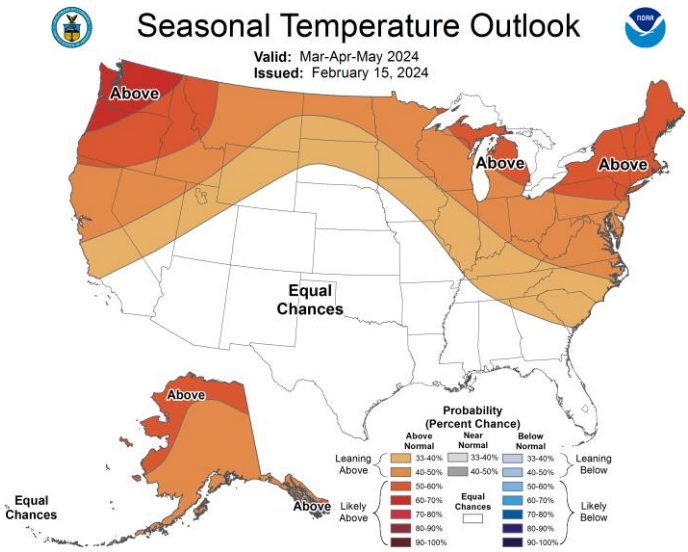

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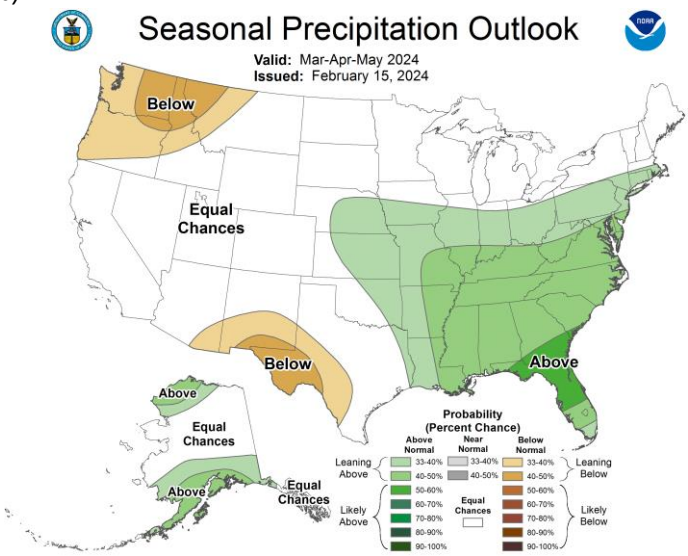

Figure 9a: Nationwide Seasonal Temperature and 9b: Precipitation Outlook for March-May. Courtesy of the Climate Prediction Center (https://www.cpc.ncep.noaa.gov/).

Looking Ahead

While the CPC's 3-month outlooks show shifting precipitation patterns over Ohio, temperature trends may stay the same as the state moves through spring. Temperatures are forecast with moderate confidence to be above-normal across Ohio (Fig. 9a). Meanwhile, for the first time in nine months, most of Ohio is forecast to have above-normal precipitation in the coming season, although such predictions come with generally low confidence. Additionally, far northern Ohio has equal chances of above- or below-normal precipitation over the same forecast period (Fig. 9b). Zooming out, this month's temperature and precipitation outlooks exhibit large-scale changes in the weather patterns seen across the United States, due in large part to the predicted reduction of the strong El Niño that has impacted the country over the last year. As we begin to transition from the El Niño towards a more neutral status in the coming months, conditions in the Ohio Valley may see greater influence from local and seasonal weather patterns.

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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