



Temperature and Precipitation

While temperatures were near normal across Ohio, accumulated precipitation was fully below average in autumn. Overall, the state's average temperatures ranged between 0-2°F higher than normal, with small areas across the north reaching 2-3°F higher (Fig. 1a). Meanwhile, accumulated precipitation was relatively consistent throughout Ohio, with the bulk of the state receiving 5-7.5 inches of precipitation in autumn. Additionally, most of western Ohio saw only 4-5 inches, while the northeast and other small areas saw up to 7.5-10 inches (Fig. 1b). Resultingly, most of the state recorded precipitation departures of 2-4 inches less than normal, with areas in the west, northeast, and south recording 4-6 inches less (Fig. 1c). Accordingly, most of Ohio's accumulated precipitation was around 50-75% of the normal amount seen in autumn, with various portions of the southwest, southeast, and far north staying around 75-100% of normal, and small areas including the far south reaching as low as 25-50% of normal (Fig. 1d).

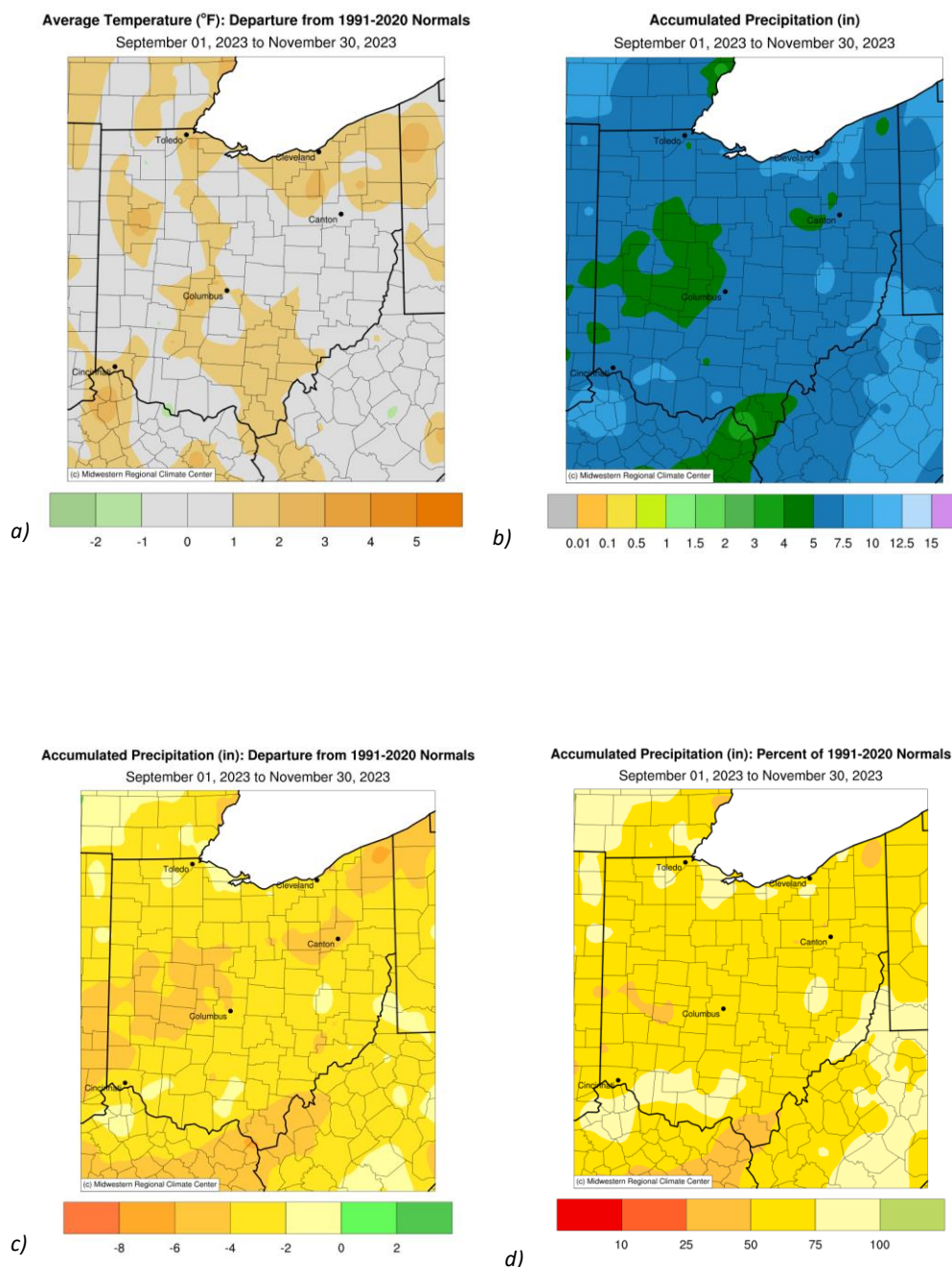
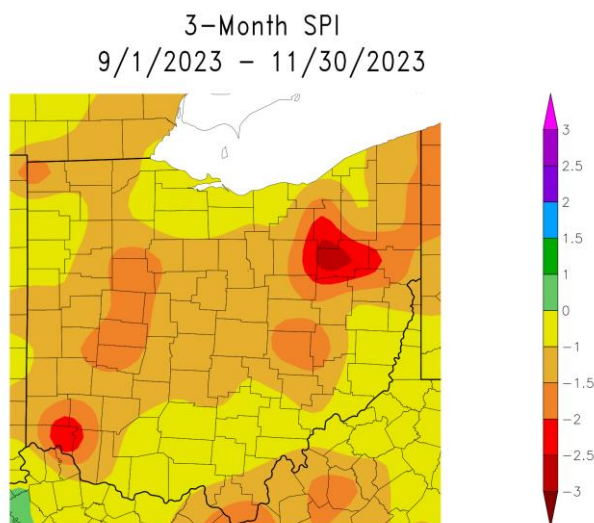


Figure 1: Statewide departures from normal temperature (a) and accumulated precipitation (b) over the autumn months at top, followed by statewide accumulated precipitation departures (c) and percent of normals for precipitation (d) at bottom. All data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).



Generated 12/2/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Figure 2: Three-month Standardized Precipitation Index (SPI) across the state of Ohio from September through November 2023, used as a proxy for soil moisture conditions. Data courtesy of the High Plains Regional Climate Center (<https://hprcc.unl.edu/>)

Soil and Energy

Reduced precipitation throughout autumn led to widespread dry soil conditions in Ohio. While some areas along the state's borders saw 3-Month SPIs of -1 to 0, indicating generally moderate conditions, the rest of the state recorded SPIs of less than -1, indicating at least some level of soil dryness across autumn. The driest areas were centered around Hamilton County, with an SPI of -2 to -2.5, and Stark County, with an SPI less than -3, indicating high soil dryness over the season (Fig. 2).

Meanwhile, the slight tendency towards higher-than-average temperatures in autumn led to marginally fewer Heating Degree Days (HDDs) than normal across Ohio. Despite this, temperature departures weren't significant enough to offset seasonal cooling, leading to near-average Cooling Degree Days (CDDs) in nearly all parts of the state, with the only significant difference seen in southwest Ohio (Fig. 3).

Climate Division	Heating Degree Days	Normal	Departure	Cooling Degree Days	Normal	Departure
1	1114	1217	-104	95	91	3
2	1062	1174	-113	96	94	2
3	1160	1246	-87	73	66	7
4	1053	1143	-90	105	108	-3
5	1028	1112	-84	100	108	-9
6	1111	1209	-98	78	81	-4
7	1092	1160	-68	89	85	4
8	976	1054	-78	111	127	-16
9	927	1016	-89	127	127	0
10	1007	1102	-95	103	103	1
Statewide	1048	1139	-91	99	101	-2



Figure 3: (Left) Total September-November 2023 heating & cooling degree days. (Right) Corresponding Ohio Climate Divisions. Data courtesy of the Midwestern Regional Climate Center (<http://mrcc.purdue.edu>).

Winter Forecast (Jan-Mar)

Released: 12/22/2023

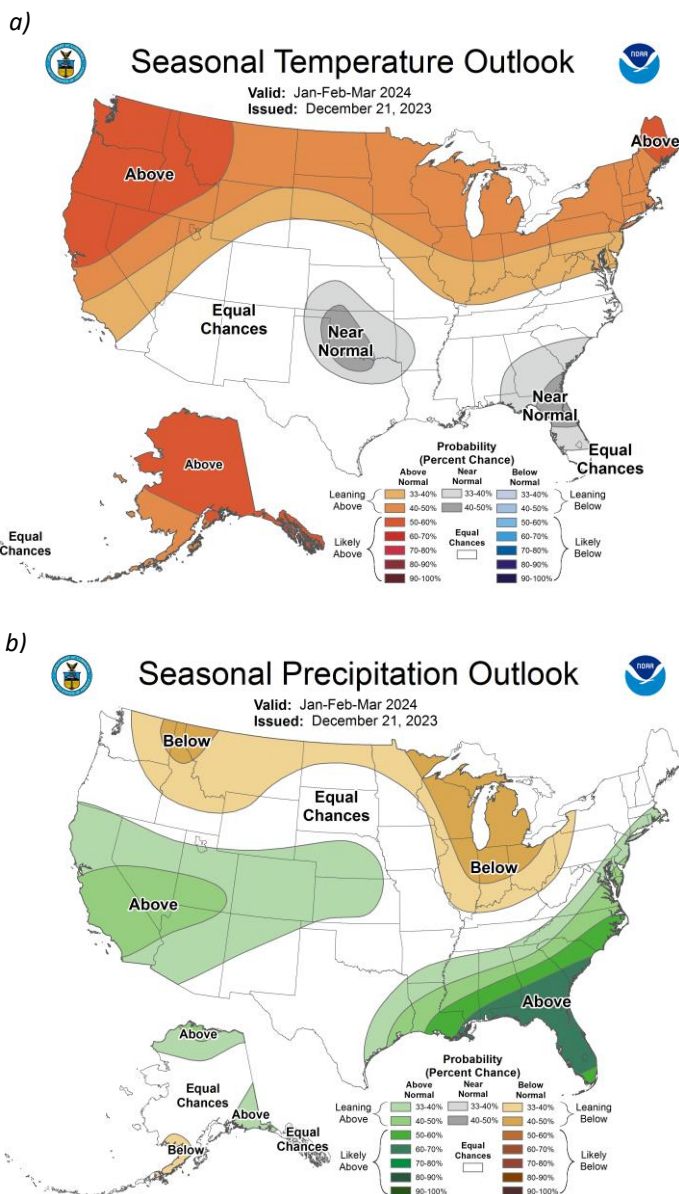


Figure 4: a) Nationwide Seasonal Temperature and b) Precipitation Outlook for January-March 2024. Courtesy of the Climate Prediction Center (<https://www.cpc.ncep.noaa.gov/>).

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Looking Ahead

The CPC's 3-month outlooks indicate generally warmer and drier conditions than normal for Ohio throughout winter. Temperatures are predicted to be above-normal across the state, with the forecast for northern Ohio having greater confidence than Ohio's southern half (Fig. 4a). Additionally, the precipitation outlook indicates a below-normal occurrence of rain and snow in the coming months, with confidence in the prediction being greater in northwest Ohio than the rest of the state (Fig. 4b).

Overall, these outlooks follow very closely with the conditions currently seen in Ohio, suggesting that the existing trend of warm and dry weather may continue for the foreseeable future. The most noticeable impact of this would be the prevalence of mild weather throughout the season, with minimal snowfall events and a general lack of extended frigid periods. While this would be beneficial for human activities during winter, long-term soil dryness in Ohio could be intensified by the reduced precipitation, potentially impacting the early growing season near the start of spring.

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