

Summer Review (Jun-Aug)

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Temperature and Precipitation

Despite a high degree of local variation, the summer months generally featured cooler and wetter conditions than average in Ohio. For the majority of the state, average temperatures over the season were 1-2°F cooler than normal, with various areas centered around the southern, northwestern, and northeastern regions of the state staying within a degree of normal (Fig. 1a). Meanwhile, accumulated precipitation was greatest in the northeast, which recorded around 15-20 inches of rain over the season. Except for a portion of northwest Ohio, which recorded only 7.5-10 inches, most of the state saw around 10-15 inches of rain (Fig. 1b). This resulted in the north seeing accumulated precipitation departures of around 6-8 inches more than normal (125-175%), with the northeastern bulk of the state seeing departures of around 0-6 inches more than normal (100-125%). In contrast, the far southern and western regions of Ohio saw negative rain departures of 0-4 inches (50-100%), as the only parts of the state with less rain than usual (Fig. 1c and 1d).

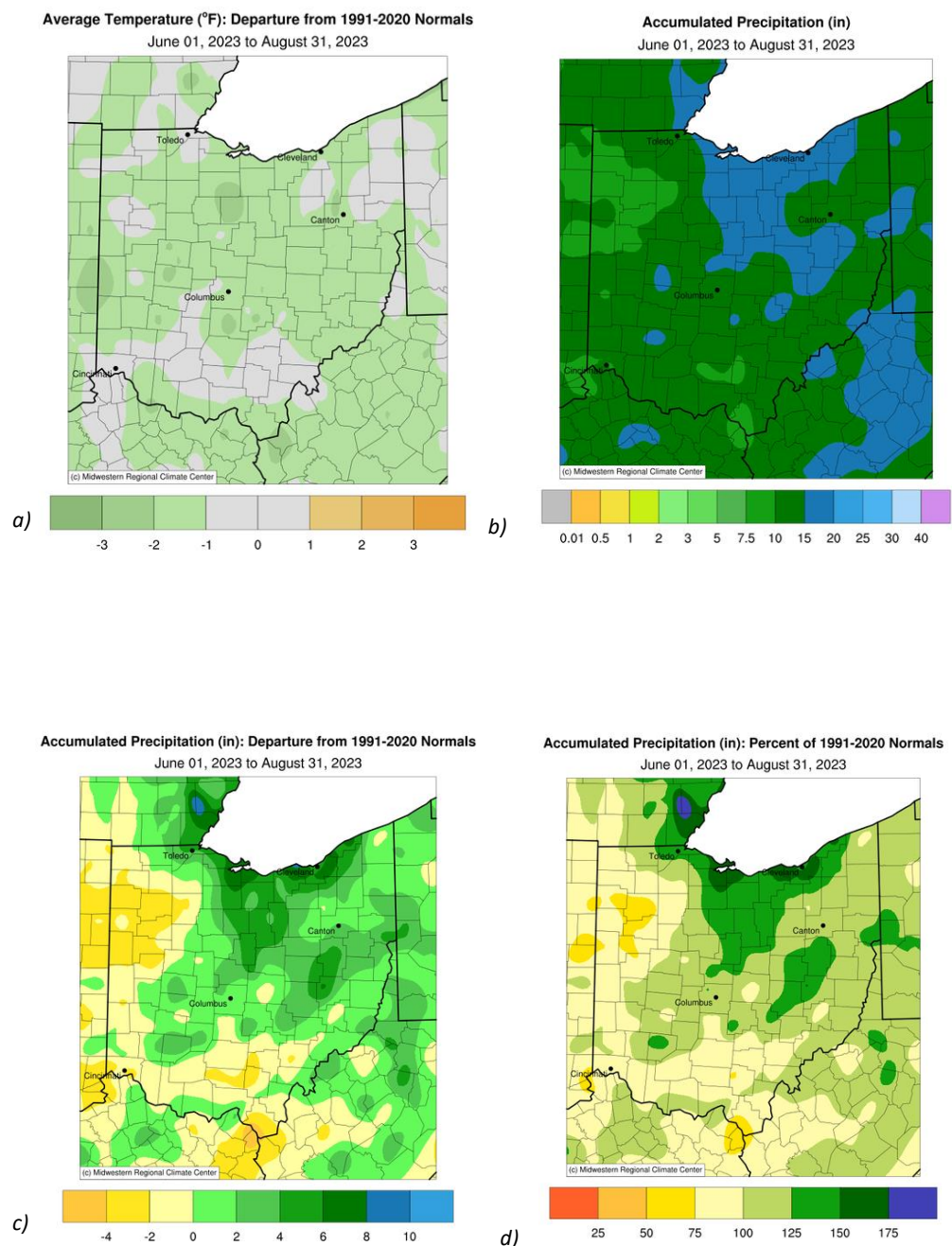
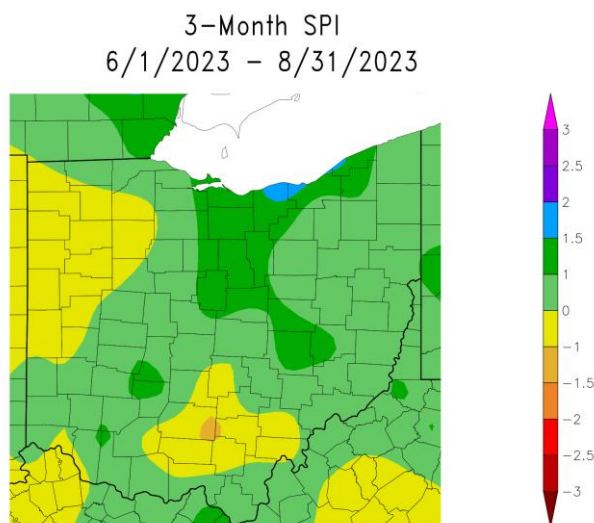


Figure 1: Statewide departures from normal temperature (a) and accumulated precipitation (b) over the summer months at top, followed by statewide accumulated precipitation departures (c) and percent of normals for precipitation (d) at bottom. All data courtesy of the Midwestern Regional Climate Center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



Generated 9/10/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

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

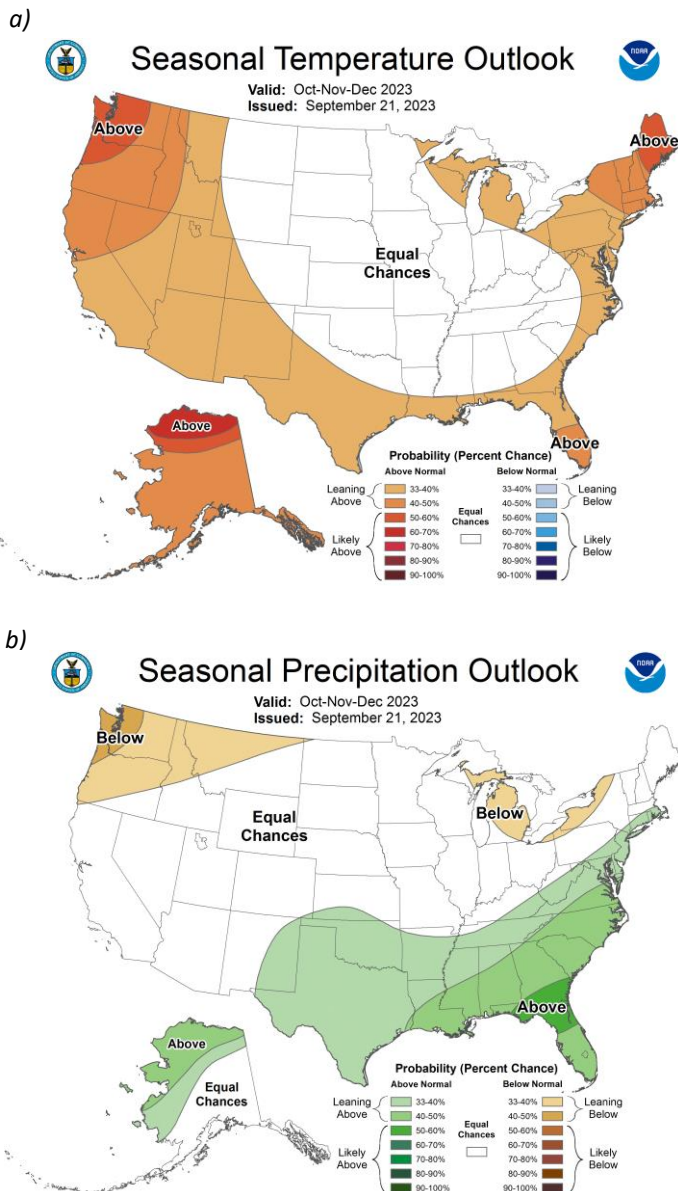
Soil and Energy

The frequent occurrence of precipitation throughout the summer months led to mostly moderate soil conditions in Ohio. Most of the state recorded 3-month SPIs of around -1 to 1, indicating largely moderate soil moisture conditions over the season. In addition, north-central Ohio recorded SPIs of 1-1.5, reaching up to 2 along the coast of Lake Erie, showing moist soil conditions. The driest areas were in the south and west, though only a small portion of Ross County had overall dry soil (Fig. 2). This data stands in stark contrast to the signs of drought development seen early in the season, which failed to materialize in Ohio. Mild summer temperatures led to significantly fewer Cooling Degree Days (CDDs) than usual for this time of year throughout the state, and especially in central Ohio. With cooler temperatures, the few Heating Degree Days (HDDs) recorded over summer were higher than normal in every region except for the western third of Ohio (Fig. 3).

Climate Division	Heating Degree Days	Normal	Departure	Cooling Degree Days	Normal	Departure
1	30	35	-5	546	648	-102
2	40	36	4	529	647	-119
3	78	63	14	381	503	-122
4	27	26	1	570	697	-127
5	32	23	10	565	707	-142
6	57	41	16	488	587	-100
7	52	36	16	500	602	-102
8	13	16	-3	655	777	-122
9	19	15	4	658	771	-112
10	35	25	10	579	669	-90
Statewide	37	30	6	554	668	-114



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



Looking Ahead

The CPC's 3-month outlooks show a general lack of confidence for Ohio as the state moves through autumn. Temperatures are predicted to lean above normal in the northeastern portion of the state, though this forecast comes with low confidence. At the same time, the rest of Ohio has equal chances of above- or below-normal temperatures in the coming months (Fig. 4a). Similarly, the state has equal chances of above- or below-normal precipitation, with only the northeastern tip of Ohio falling within the area of below-normal precipitation, though this too comes with low confidence (Fig. 4b). Overall, these predictions are held back by the variable weather patterns the state has seen in past months. While autumn brings a seasonal cooling and drying to Ohio's climate, the recent trend across the Midwest has featured the frequent passage of widespread weather systems that not only increase the amount of precipitation, but moderate temperature as well. As a result, weather conditions over the coming months will be defined by the extent to which this trend continues into autumn.

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

Figure 4: a) Nationwide Seasonal Temperature and b) Precipitation Outlook for October-December 2023. Courtesy of the Climate Prediction Center (<https://www.cpc.ncep.noaa.gov/>).

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