State of Ohio Monthly Climate Update

THE OHIO STATE UNIVERSITY

Review – January 2023

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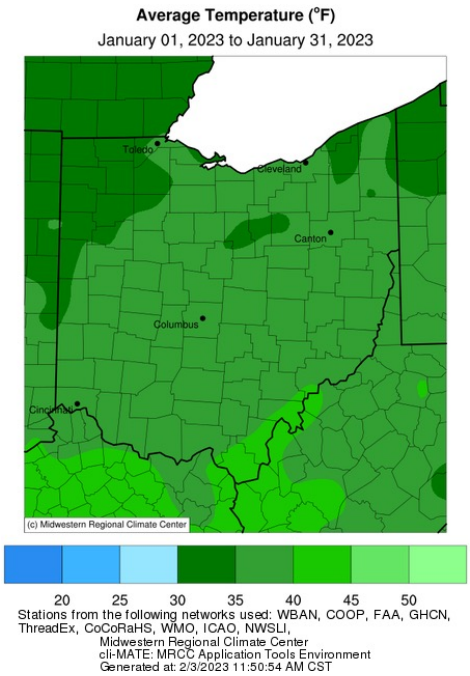

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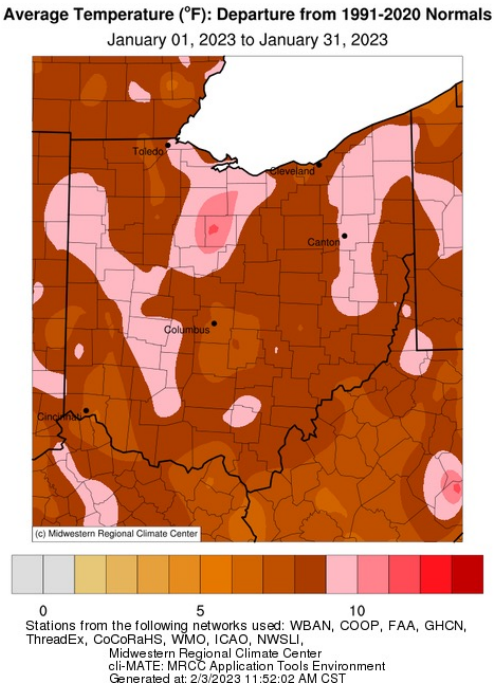

Figure 1a: Average temperature and 1b: Departure from Normal for the month of January 2023. Data courtesy of the Midwestern Regional Climate Center (http://mrcc.purdue.edu).

Temperature

Despite a cold end to the month, temperatures were generally well above normal in Ohio for most of January. Despite multiple dips into subfreezing conditions throughout the month, daily average temperatures mostly stayed near the upper 30s, culminating in total monthly average temperatures ranging from 30-45°F in Ohio, with most of the state averaging 35-40°F (Fig. 1a). These conditions resulted in large temperature departures throughout the state, spanning 9-11°F higher than historical normals, with areas in north central Ohio seeing the largest departures (Fig. 1b). At the county level, every county in the state ranked in the warmest tenth of the 129-year record, with only Gallia County in the state's southern portion not reaching within the top ten warmest. Overall, the month ranked as Ohio's fourth warmest January on record (Fig. 2).

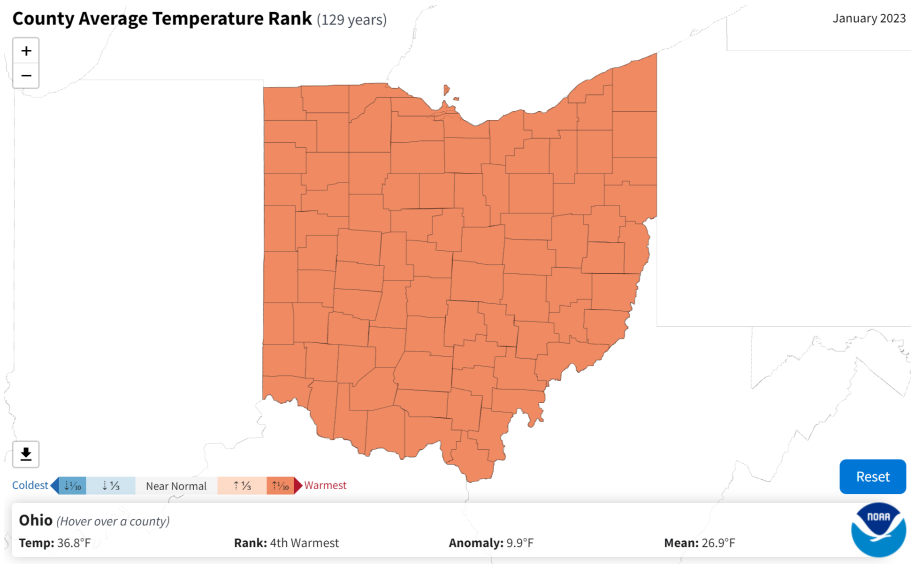

Figure 2: State of Ohio average temperature ranks by county for January 2023. Courtesy of the National Centers for Environmental Information (https://www.ncdc.noaa.gov/sotc/).

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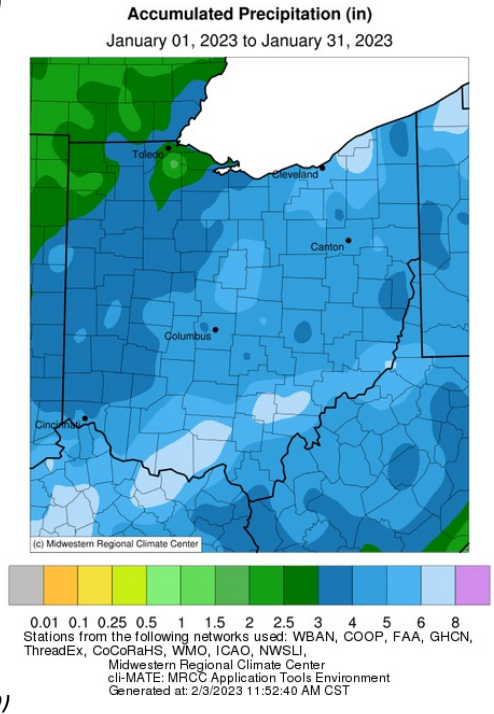

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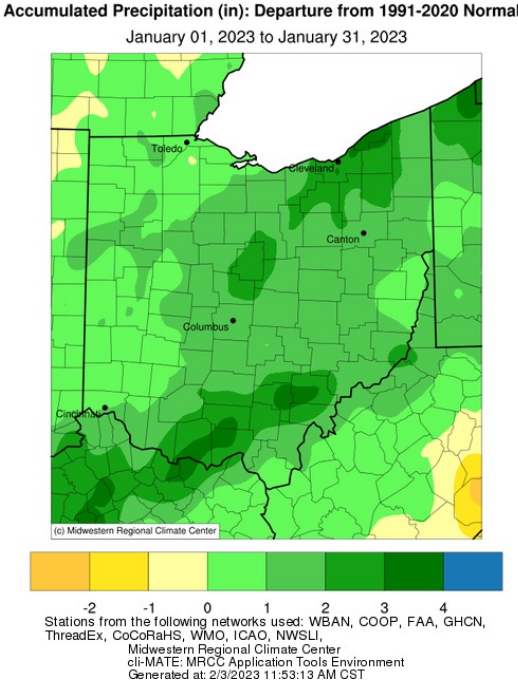

Figure 3a: Accumulated precipitation and 3b: Departures from Normal for the month of January 2023. Data courtesy of the Midwestern Regional Climate Center (http://mrcc.purdue.edu).

Precipitation

A wide array of precipitation events in January reversed moisture trends in Ohio, with accumulation totals exceeding monthly normals throughout the state. The region mostly received 3-6 inches of accumulated precipitation in the month, with northwest Ohio seeing the driest conditions at only 2-3 inches, and areas in the south and northeast receiving up to 8 inches. (Fig. 3a). Overall, heightened accumulation resulted in above-normal precipitation in the entire state, ranging from 0-3 inches more than historical normals, with various pockets throughout Ohio seeing departures of nearly 4 inches more (Fig. 3b). At the county level, the entire region ranked within the wettest third of the 129-year record, with portions in the state's south and northeast ranking within the tenth wettest. Notably, Cuyahoga and Lake Counties saw the highest rankings, reaching their seventh wettest January on record (Fig. 4).

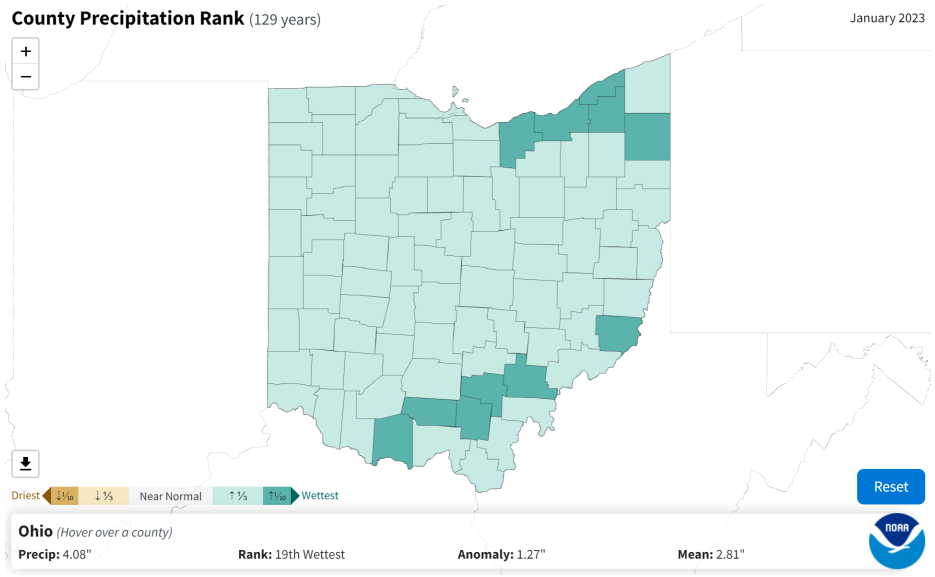

Figure 4: State of Ohio precipitation ranks by county for January 2023. Courtesy of the National Centers for Environmental Information (https://www.ncdc.noaa.gov/sotc/).

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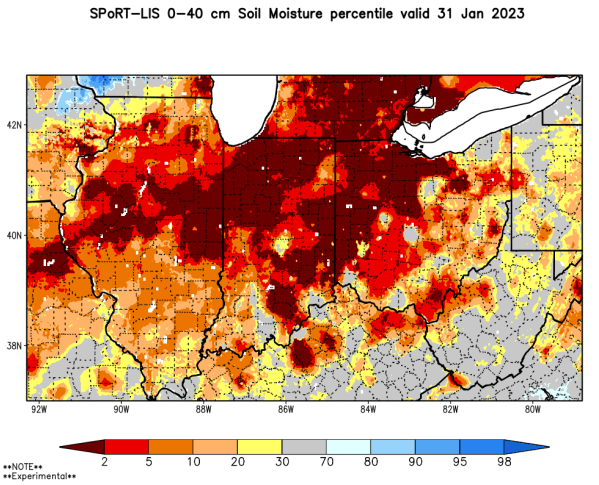

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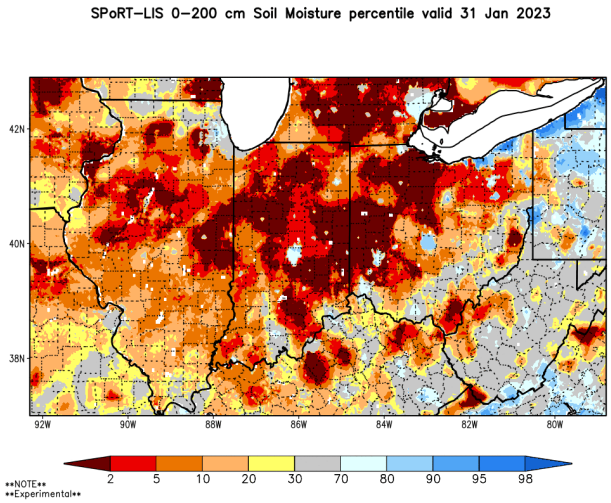


Soil and Energy

Elevated precipitation in January resulted in improved soil moisture in Ohio at the end of the month. At both 0-40cm and 0-200cm depths, only the northwest portion of the state reached very dry levels, while some regions in central and northeast Ohio saw moist soil conditions at 0-200cm depth (Figs. 5a and 5b). With levels higher than in previous months, Ohio's soil moisture at the end of January is a good sign of the continuing decline of drought conditions in the state.

As a result of the significant shift towards warm temperatures throughout the month, heating degree days (HDDs) were considerably fewer than normal in January, with consistent departures throughout the state. Despite such persistent warm temperatures, no cooling degree days (CDDs) were recorded in the state, following expectations for the winter months (Fig. 6).

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

Climate Division	Heating Degree Days	Normal	Departure	Cooling Degree Days	Normal	Departure
1	961	1232	-272	0	0	0
2	919	1200	-281	0	0	0
3	931	1206	-276	0	0	0
4	908	1183	-274	0	0	0
5	887	1146	-258	0	0	0
6	896	1183	-287	0	0	0
7	879	1149	-271	0	0	0
8	860	1107	-247	0	0	0
9	809	1047	-238	0	0	0
10	847	1103	-256	0	0	0
Statewide	888	1153	-264	0	0	0

Figure 6: (Left) January 2023 heating & cooling degree days. (Right) Corresponding Ohio Climate Divisions. Data courtesy of the Midwestern Regional Climate Center (http://purdue.mrcc.edu).

Notable Events

Despite a multitude of precipitation events in January, the month was relatively calm in terms of notable events for Ohio. One particular set of precipitation events on January 22nd - 25th resulted in the highest snow accumulation in Ohio for the month, with a band stretching from the state's southwest to northeast receiving 3-6 inches of snow, and a small area near Dayton receiving more than 8 inches (Fig. 7).

With temperatures ranging from 30-35°F and straddling the freezing point throughout the event, most of the region south of I-71 experienced mixed precipitation, resulting in widespread slush and ice throughout the southern and central parts of the state (Fig. 8). The snow that did fall was heavy and wet, creating challenges for those travelling and working on foot. Despite triggering warnings of adverse driving conditions, impacts were minimal as aforementioned high temperatures allowed for quick melting and clearing of snow and ice on most roadways.

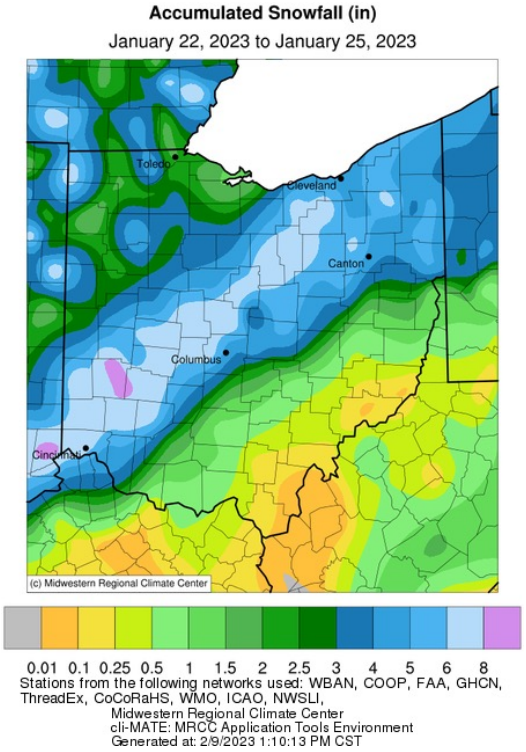
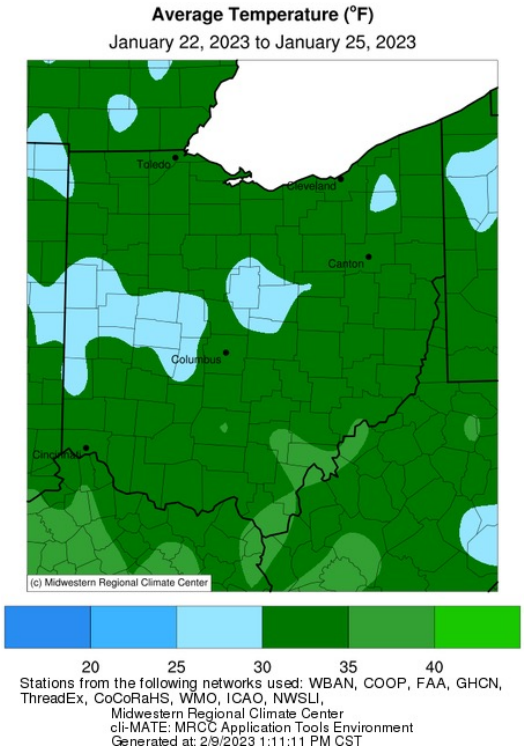


Figure 7: Accumulated Snowfall on January 22nd-25th (above) and Figure 8: Average temperature on January 22nd-25th, 2023 (below). Data courtesy of the Midwestern Regional Climate Center (http://mrcc.purdue.edu).



Forecast: Feb-Apr 2023

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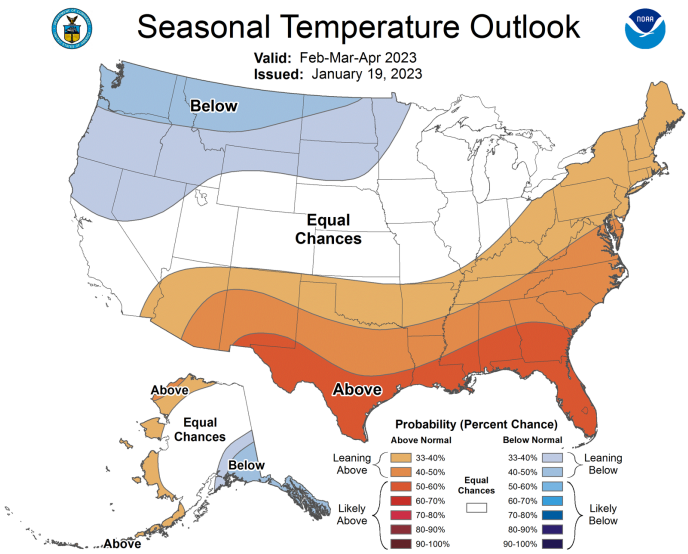

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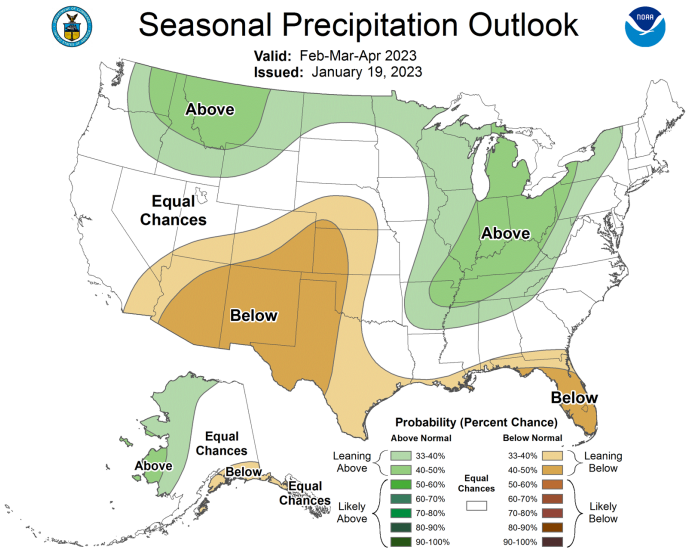

Figure 9a: Nationwide Seasonal Temperature and 9b: Precipitation Outlook for February-April. Courtesy of the Climate Prediction Center (https://www.cpc.ncep.noaa.gov/).

Looking Ahead

The CPC's 3-month outlook continues predictions of higher temperatures and precipitation in Ohio through April. Most of the state has a slight probability of above-normal temperatures, with northwest Ohio having equal chances of above or below normal temperatures in the coming months (Fig. 9a). At the same time, above-normal precipitation is likely for the entire state, with predictions having a high degree of confidence (Fig. 9b). With the removal of drought conditions for most of the state in January, extended periods of above-normal precipitation will continue to assist in the removal of remaining areas of minor drought in far western Ohio. As winter transitions into spring, the earliest planting of crops may benefit from possible warm and wet conditions into April should field conditions permit, though some periods of cold cannot be ruled out.

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

Authors:

Jacob L. Fields
Atmospheric Sciences Undergraduate Student Assistant: Climate Services
Byrd Polar and Climate Research Center
The Ohio State University
fields.609@osu.edu

Geddy R. Davis
Meteorologist/Atmospheric Scientist
Program Coordinator: Climate Services
Byrd Polar and Climate Research Center
The Ohio State University
davis.5694@osu.edu

Aaron B. Wilson
State Climate Office of Ohio
Byrd Polar and Climate Research Center
OSU Extension
The Ohio State University
wilson.1010@osu.edu