



## IOWA MONTHLY WEATHER SUMMARY – OCTOBER 2021

General Summary: Temperatures averaged 55.6 degrees or 4.6 degrees above normal while precipitation totaled 4.88 inches or 2.19 inches above normal. October 2021 ranks as the 21<sup>st</sup> warmest on record with a warmer October last occurring in 2007. The month ranks as the 8<sup>th</sup> wettest October in 149 years of statewide records with a wetter one last occurring in 2017, which was the 4<sup>th</sup> wettest on record.

Temperatures: Iowa experienced unseasonably warm conditions through October with positive departures from around three degrees in the southwest to over six degrees northeast. Of note during the month were unseasonably warm minimum temperatures with a statewide killing freeze (sub-28 degree temperatures) not occurring during October; there were portions of northwest Iowa that dipped below freezing for the first time on the mornings of the 16<sup>th</sup> and 17<sup>th</sup> as well as more widespread events across northern Iowa on the 22<sup>nd</sup> and 23<sup>rd</sup>; over 40 stations hit 28 degrees or colder.

October's statewide average maximum temperature was 65.8 degrees, 3.5 degrees above normal, while the average minimum temperature was 45.4 degrees, 5.8 degrees above normal. The average minimum low temperature ranks as the 6<sup>th</sup> highest October average since 1895. Davenport Municipal Airport (Scott County) reported the month's high temperature of 87 degrees on the 1<sup>st</sup>, 16 degrees above normal. Elkader (Clayton County) and Mason City Municipal Airport (Cerro Gordo County) reported the month's low temperature of 23 degrees on the 23<sup>rd</sup>, on average 11 degrees below normal.

Heating Degree Days: Home heating requirements, as estimated by heating degree day totals, averaged 48% less than last October and 31% less than normal. Thus far this heating season, heating degree day totals are running 48% less than last year at this time and 34% less than normal.

Precipitation: A more active storm track towards the end October brought unseasonably wet conditions statewide. These much-needed rains were beneficial in helping recharge soil-moisture profiles and improving below average stream flows. Most National Weather Service stations reported above-normal totals with a majority of these stations measuring at least two inches above average. Monthly precipitation totals ranged from 2.05 inches in Forest City (Winnebago County) to 9.18 inches at a Community Collaborative Rain, Hail and Snow (CoCoRaHS) rain gauge near Murray (Clarke County).

On the first day of the month, a low pressure center pushed east through Iowa with light showers forming behind the system into the afternoon hours. Sunshine peeked between gaps in the clouds as light rain and drizzle fell across much of Iowa through the evening hours. Stations reported totals below a few tenths of an inch though a handful of north-central and southeastern stations observed over 0.50 inch; Donnellson (Lee County) measured 0.52 inch with Estherville (Emmet County) picking up another 0.94 inch. Cloud cover and fog were present overnight into the 2<sup>nd</sup> with dreary and damp conditions hanging on throughout the day. Winds shifted to a westerly direction as isolated showers formed in southeastern Iowa. A majority of stations reporting rain had under a tenth of an inch, though De Witt (Clinton County) measured 0.49 inch.

Light rain filtered into southeastern Iowa later in the day of the 6<sup>th</sup> as a low pressure center spun over Missouri. Additional isolated showers moved into eastern Iowa overnight with rain totals reported at 7:00 am on the 7<sup>th</sup> generally below a tenth of an inch; a few stations measured higher totals with Clinton (Clinton County) observing 0.50 inch. The low pressure center remained cut-off from the upper-level westerly steering flow, slowing down the system appreciably.

Waves of showers spun into eastern Iowa through the evening hours with a concentrated area of rain showers covering northeastern Iowa overnight into the 8<sup>th</sup>. The showers finally departed eastern Iowa in the afternoon; event rain totals were highest in northeastern Iowa where over 20 stations observed an inch or more; a gauge near New Hampton (Chickasaw County) measured 2.70 inches while a gauge in Waucoma (Fayette County) reported 4.77 inches. Amounts tapered off rapidly farther west with a few tenths of an inch in east-central Iowa.

A slow-moving cold front sat over eastern Iowa through the afternoon on the 10<sup>th</sup> with showers moving northeast along the boundary. A secondary low pressure system pushed into Missouri into the overnight hours, spinning in more showers over the state's eastern half through the 11<sup>th</sup>. Rain showers dissipated late in the evening as the low pushed into the Great Lakes region as winds shifted to a westerly direction. Rain totals were generally above 0.25 inch across the state's southeastern half with isolated pockets at or above one inch; a gauge near Amana (Iowa County) measured 1.00 inch while Rathbun Dam (Appanoose County) observed 1.90 inches. Easterly winds and cloud cover increased as another potent low pressure center moved into southwestern Iowa overnight into the 13<sup>th</sup>, spinning in a line of showers and some strong thunderstorms with vivid lightning and loud thunderclaps. A shield of rain built in behind the initial line, leaving widespread rainfall statewide with moderate to heavy totals reported at many stations in central to eastern Iowa; Des Moines International Airport (Polk County) reported 1.43 inches with Williamsburg (Iowa County) measuring 1.62 inches. All of Iowa's weather stations experienced measurable rain from the disturbance as nearly 40 stations measured over an inch. General totals for a majority of stations were above 0.50 inch with a statewide average rainfall at 0.54 inch.

Cloud cover increased across western Iowa in advance of a low pressure center in northwestern Nebraska that began spinning in scattered rain showers a few hours after midnight on the 20<sup>th</sup>. Stronger thunderstorms with isolated pockets of small hail and heavier rain were reported in northwestern Iowa into the late morning hours. As the low's center of circulation pushed through Iowa, additional pockets of showers with some thundershowers formed in central and eastern Iowa. Much of northern Iowa observed measurable rainfall with totals generally under a few tenths of an inch. Heavier amounts were found in northwestern Iowa with three Lyon County stations reporting over 1.50 inches; a station near Lester reported 1.65 inches while Larchwood measured 2.19 inches.

The final week and a half of October shifted to a more active pattern as the first of several low pressure systems brought widespread rainfall to Iowa. Moderate to heavy rain fell across Iowa overnight and through the 24<sup>th</sup> as a strong center of low pressure spun over the state; 7:00 am totals from the initial wave of showers ranged from 2.21 inches in Randolph (Fremont County) to 2.55 inches at Mount Ayr (Ringgold County). Event totals from the disturbance observed at 7:00 am on the 25<sup>th</sup> were above 2.00 inches at more than 100 stations with most of Iowa's reporting stations measuring at least an inch. There were isolated pockets above 3.00 inches in southwest, central and east-central Iowa with Shenandoah (Page County) observing 3.21 inches, while a gauge near Murray (Clarke County) collected 3.54 inches; the statewide average 24-hour total was 1.43 inches. Strong winds developed during the day as a second low pressure system approached from the west on the 26<sup>th</sup>. South to north moving showers entered western Iowa into the early morning hours on the 27<sup>th</sup> as the low slowly moved into Missouri. A broader shield of moderate showers formed through the day and continued to bring widespread rainfall over much of Iowa's western three-quarters.

Wet and dreary conditions persisted through the 28<sup>th</sup> as light to moderate rain continued into the evening hours. Scattered showers persisted, mainly over eastern and central Iowa as the low finally exited the region into the 29<sup>th</sup>. Event rain totals were above an inch across the western half of Iowa with widespread amounts approaching 2.00 inches. A pocket of southwest Iowa reported the highest totals with Corning (Adams County) observing 2.00 inches and Randolph (Fremont County) measuring 3.05 inches; the statewide average total was 0.99 inch.

#### US Drought Monitor:

The current US Drought Monitor depiction, valid November 2, shows significant improvement across Iowa, with slightly more than half of the state out of abnormal dryness (D0) or drought. As of the first week of September, 52% of Iowa was classified in D1 (Moderate Drought) to D2 (Severe Drought) with 29% D0 coverage on the periphery of the drought region.

Conditions remained in stasis until a return to an active weather pattern brought widespread rainfall across Iowa during the last 10 to 14 days of October. Heavier rainfall led to a general one-category improvement in western Iowa on the final USDM map of the month. The final week of October brought the wettest week of the growing season as multiple low pressure systems brought widespread and much-needed rainfall statewide. All of Iowa's National Weather Service stations reported above-average rainfall with most stations reporting more than two inches above average. With stream flows and sub-soil moisture rebounding significantly, Severe Drought was removed from the state during the first week of November; the last time Iowa was free from D2 conditions was the week of July 7, 2020. As of this writing, a core of Moderate Drought remains in areas where precipitation deficits exceeding eight inches still exist. As of the first week of November, the breakdown of USDM categories was as follows: D0 – 27% and D1 – 23%.

### Outlooks:

La Niña (LN) is the cold phase of a multi-decadal coupled atmospheric/oceanic pattern known as the El Niño -Southern Oscillation (ENSO); we all have heard the better-known phase, El Niño (EL), which is the warm phase. EN/LN typically spans a two to seven-year time frame and is part of a longer duration, larger spatial pattern known as the "Southern Oscillation"; think of the Southern Oscillation as a large wheel and EL/LN as a smaller wheel moving around within. With the LN phase, a cold sea surface temperature anomaly is found in a specific part of the tropical Pacific. When the atmosphere couples to this anomaly, tropical thunderstorm activity is pushed farther west in the Pacific Basin. The behavior impacts the track of the jet stream across the United States and has implications on seasonal weather patterns. Given analog years in which LN has been present and how the general jet stream pattern will set up provides guidance for seasonal temperature and precipitation outlooks.

The Winter 2021-2022 climatological outlooks from the Climate Prediction Center (CPC) exhibit a classic LN pattern with elevated chances of wetter conditions across the Great Lakes/Ohio Valley and Pacific Northwest, along with colder than average temperatures from Minnesota to the northwest coast. Much of the southern United States has higher probabilities of warmer and drier conditions. For the meteorological winter months of December-January-February, there is an elevated probability of both warmer and wetter conditions in eastern Iowa with Equal Chances (EC) of above/below/near-average conditions for the rest of Iowa. The increases in temperature and precipitation probabilities across the state are fairly small. Other (less forecastable) factors can play a larger, shorter-term influence in the winter outlooks.

As a reminder, the LN phase was also present last winter. In years in which LN transitions to ENSO-neutral from winter to spring, as happened this year, a double-dip LN is more likely in fall and winter of the same year. Last winter, Iowa experienced slightly cooler (0.9 degrees below average) and drier conditions (0.49" below normal). The state also had the 12<sup>th</sup> snowiest winter in 134 years, with 32.2 inches of snow, 9.4 inches above average. It should be noted that precipitation behavior during a LN winter is highly variable as opposed to when the LN phase is present.

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# October 2021

## WEATHER BY DISTRICTS

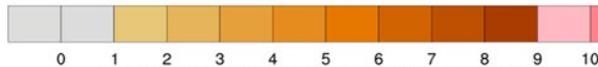
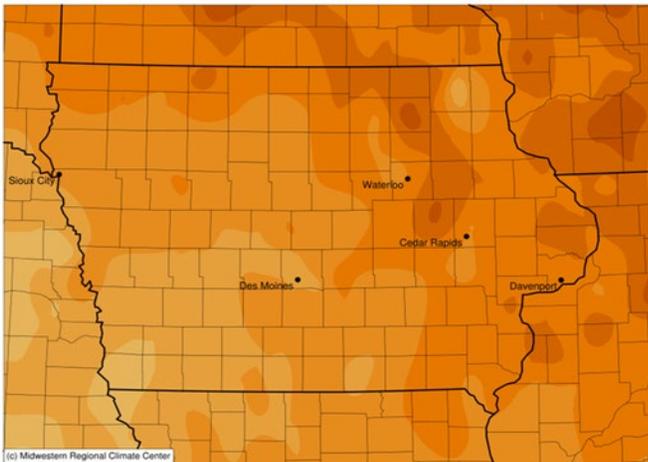
DISTRICT	TEMPERATURE (F)		HEATING DEGREE DAYS				PRECIPITATION (inches)				SNOWFALL Oct 2021 Average
	October 2021		October 2021		Since Jul., 1, 2021		October 2021		Since Jan. 1, 2021		
	Average	Departure*	Average	Departure*	Average	Departure*	Average	Departure*	Average	Departure*	
Northwest	53.6	+4.3	363	-126	480	-197	4.07	+1.72	26.56	-1.79	0.0
North Central	54.5	+5.4	339	-156	463	-225	3.60	+1.10	27.76	-4.52	0.0
Northeast	55.0	+5.6	324	-163	455	-227	3.90	+1.06	28.05	-6.37	0.0
West Central	55.1	+4.0	320	-116	414	-180	4.13	+1.67	27.74	-2.75	0.0
Central	55.6	+4.5	308	-128	388	-198	5.51	+2.84	25.88	-6.96	0.0
East Central	56.6	+5.0	280	-143	345	-210	5.34	+2.41	27.49	-6.19	0.0
Southwest	56.3	+3.6	288	-102	361	-159	5.73	+2.93	31.49	-1.01	0.0
South Central	56.6	+4.0	282	-112	343	-176	6.75	+3.92	34.17	+0.49	0.0
Southeast	57.9	+4.8	247	-133	299	-189	5.51	+2.58	35.60	+1.65	0.0
STATE	55.6	+4.6	302	-135	387	-200	4.88	+2.19	29.07	-3.29	0.0

\* Departures are computed from 1991-2020 normals.

The weather data in this report are based upon information collected by the U. S. Dept. of Commerce, NOAA National Weather Service.

**Average Temperature (°F): Departure from 1991-2020 Normals**

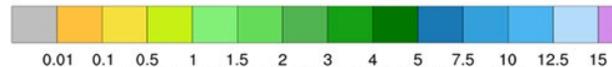
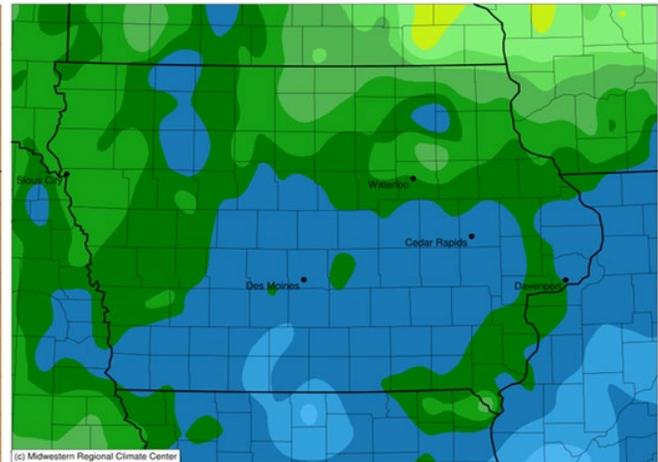
October 01, 2021 to October 31, 2021



Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI,  
Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 11/1/2021 8:56:56 AM CDT

**Accumulated Precipitation (in)**

October 01, 2021 to October 31, 2021



Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI,  
Midwestern Regional Climate Center  
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