

## IOWA MONTHLY WEATHER SUMMARY – NOVEMBER 2021

General Summary: Temperatures averaged 39.2 degrees or 2.3 degrees above normal while precipitation totaled 0.92 inch or 0.90 inch below normal. November 2021 ties 2006 and 2011 as the 43<sup>rd</sup> warmest on record with a warmer November occurring just last year. The month ranked as the 41<sup>st</sup> driest November in 149 years of statewide records with a drier one last occurring in 2014.

Temperatures: Overall unseasonably warm conditions blanketed Iowa during November with positive departures of up to four degrees in western Iowa. Statewide temperatures in eastern Iowa were near-normal to slightly warmer than average. Low temperatures on the morning of the 2<sup>nd</sup> were at or below 28 degrees statewide, signaling the end of the growing season as the first widespread killing freeze occurred. November's statewide average maximum temperature was 49.6 degrees, 3.2 degrees above normal while the average minimum temperature was 28.7 degrees, 1.3 degrees above normal. Lake Park (Dickinson County) reported the month's high temperature of 73 degrees on the 6<sup>th</sup>, 25 degrees above normal. Several northern stations reported the month's low temperature of eight degrees on the 26<sup>th</sup>, on average 12 degrees below normal.

Heating Degree Day Totals: Home heating requirements, as estimated by heating degree day totals, averaged 15% more than last November and 22% less than normal. Thus far this heating season, heating degree day totals are running 18% less than last year at this time and 22% less than normal.

Precipitation: After the 8<sup>th</sup> wettest October on record, a less active weather pattern set up over Iowa with below-average precipitation totals reported at most of the National Weather Service co-op stations and Community Collaborative Rain, Hail and Snow (CoCoRaHS) rain gauges. Only portions of northeast and south-central Iowa reported above-normal precipitation. Widespread, measurable snow was also absent across Iowa with only six stations observing at least one inch.

Light showers moved through southern Iowa late on the morning of the 1<sup>st</sup>, though much of the precipitation evaporated before hitting the surface. Several stations reported measurable amounts, however, totals were under 0.10 inch; New Market (Taylor County) observed 0.01 inch while College Springs (Page County) measured 0.08 inch. Westerly winds built in overnight into the 10<sup>th</sup> as a strong low pressure system approached from the west. Winds shifted back to a southerly direction as showers and thunderstorms spun through southwestern Iowa after noon. The system produced a broad shield of moderate rainfall with a wide swath over the state's middle third reporting heavy rainfall. Showers remained across northeastern Iowa as totals came in at 7:00 am on the 11<sup>th</sup>; 70 stations measured an inch or more with most stations receiving at least 0.50 inch. A gauge near Chariton (Lucas County) observed 2.00 inches while Allerton (Wayne County) reported 2.98 inches with the statewide average at 0.86 inch. Light rain and some snow fell as the day wore on. Several stations reported a trace of snow with more than 25 stations observing at least 0.10 inch; Forest City (Winnebago County) measured 1.00 inch of snow as overall precipitation totals were under 0.10 inch with Rockwell City (Calhoun County) reporting 0.20 inch of rainfall on the 12<sup>th</sup>. Light rain and snow remained as several fast-moving upper-level disturbances propagated over Iowa.

A complex of rain moved into Iowa through the afternoon hours on the 13<sup>th</sup> as a low pressure center pushed through Minnesota. A second wave of light rain with some snowflakes crossed Iowa overnight into the morning of the 14<sup>th</sup> with minor totals reported across the state. Isolated and very light snow moved through eastern Iowa overnight into the 15<sup>th</sup> leaving behind trace amounts at multiple stations. Light rain showers were also present with Iowa City (Johnson County) reporting 0.01 inch and Maquoketa (Jackson County) measuring 0.05 inch; many stations from central Iowa and east also reported trace amounts of rainfall. A colder airmass filtered in as the low's

attendant cold front swept across the state on the 17<sup>th</sup>. Spotty showers were also observed, though only a handful of stations reported measurable amounts with Atlantic Municipal Airport (Cass County) reporting 0.06 inch. On the 18<sup>th</sup>, an upper-level trough trailing the surface cold front brought snowflakes to eastern Iowa with no accumulation reported. Clear skies allowed for excellent viewing of the partial eclipse of the Beaver Moon into early Friday (19<sup>th</sup>) morning, marking the longest partial lunar eclipse in 580 years. Widely scattered showers formed in the evening hours across northern Iowa before dissipating near sunrise on the 21<sup>st</sup>. Nearly 15 stations reported measurable rainfall though the highest totals were well under 0.10 inch.

Pockets of snowflakes were also observed in central Iowa on the 25<sup>th</sup> with Des Moines International Airport (Polk County) reporting a trace; light rain was also observed in extreme southeast Iowa. Partly cloudy skies remained as a disturbance approached Iowa on the 26<sup>th</sup>. Light rain moved across sections of central and eastern Iowa with minor, but measurable totals ranging from 0.01 inch at ten stations to 0.03 inch in Cedar Rapids (Black Hawk County). More light rain fell as a low pressure center skirted northern Iowa through the morning of the 27<sup>th</sup>. A fast-moving low pressure center brought widespread rainfall to much of eastern Iowa though general totals were under 0.15 inch; a majority of stations reported at least a trace with a gauge near Tipton (Cedar County) measuring 0.21 inch.

Monthly precipitation totals ranged from 0.17 inch at Sioux City Airport (Woodbury County) to 3.01 inches in Allerton (Wayne County). The statewide average snowfall was 0.1 inch, which is 2.6 inches below average. Sanborn (O'Brien County) reported the highest monthly snowfall at 1.7 inches.

Fall Summary: Temperatures over the three autumn months (September-October-November) averaged 53.8 degrees or 3.4 degrees above normal while precipitation totaled 7.79 inches or 0.20 inch below normal. Fall 2021 ties 1947 as the 13<sup>th</sup> warmest fall among the period of record; it was also the 68<sup>th</sup> wettest fall on record. A warmer and wetter fall occurred in 2016 and 2020, respectively.

US Drought Monitor: Drought conditions had eased across north-central and eastern Iowa, where D2 (Severe Drought) was no longer present; a broad one-category improvement occurred from the last week of October to the first depiction of the month with the 10% area of D2 upgraded to D1 (Extreme Drought). This was the first time since July 7, 2020, that D2 was absent from the state. Drought was largely gone across western Iowa as well, with the lowest extent of D0 (Abnormal Dryness) and D1 since March 2020. After a wet stretch into the middle of November, D0 and D1 were further reduced in central and eastern Iowa. Longer-term deficits were nearly balanced out by short-term precipitation gains across much of Iowa. Sub-soil moisture profiles had also improved significantly along with elevated stream flows. These factors pointed to soils getting deep moisture infiltration and allowing some rainfall to runoff into streams. Drought conditions remained steady through the end of the month with a small expansion of D0 in southeast Iowa where 30-day precipitation deficits were stacking up. As of November 30, D0 covered 38% of Iowa while D1 covered 13%.

Winter 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 a 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 knowing how the general jet stream pattern will set up helps provide guidance for seasonal temperature and precipitation outlooks.

The Winter 2021-2022 climatological outlooks from 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 degree below average) and drier conditions (0.49" below normal). The state also had the 12th 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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# November 2021

## WEATHER BY DISTRICTS

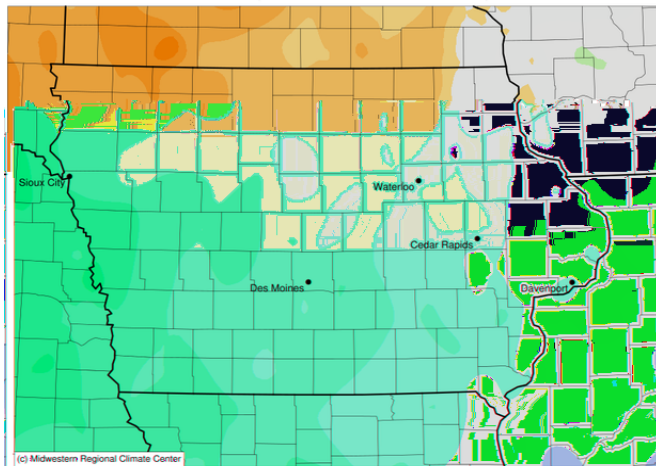
DISTRICT	TEMPERATURE (F)		HEATING DEGREE DAYS				PRECIPITATION (inches)				SNOWFALL Nov 2021 Average
	November 2021 Average	Departure*	November 2021 Average	Departure*	Since Jul., 1, 2021 Average	Departure*	November 2021 Average	Departure*	Since Jan. 1, 2021 Average	Departure*	
Northwest	37.7	3.4	819	-101	1302	-295	0.37	-1.03	27.35	-2.40	0.4
North Central	36.9	2.3	843	-68	1319	-280	1.09	-0.56	28.87	-5.07	0.5
Northeast	36.7	1.4	849	-41	1307	-264	1.20	-0.84	29.37	-7.10	0.2
West Central	40.1	3.5	747	-105	1157	-289	0.54	-0.94	28.86	-3.12	0.2
Central	39.1	2.0	777	-61	1165	-258	1.26	-0.59	27.33	-7.35	0.1
East Central	38.7	0.8	789	-25	1135	-233	0.63	-1.55	28.14	-7.72	0.1
Southwest	42.1	3.3	687	-100	1054	-252	1.10	-0.59	32.60	-1.59	0.0
South Central	41.4	2.1	708	-64	1055	-236	1.53	-0.47	35.94	+0.26	0.0
Southeast	40.8	1.1	726	-33	1029	-217	0.67	-1.56	36.20	+0.02	0.0
STATE	39.2	2.3	780	-56	1169	-255	0.92	-0.90	30.18	-4.00	0.1

\* 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.

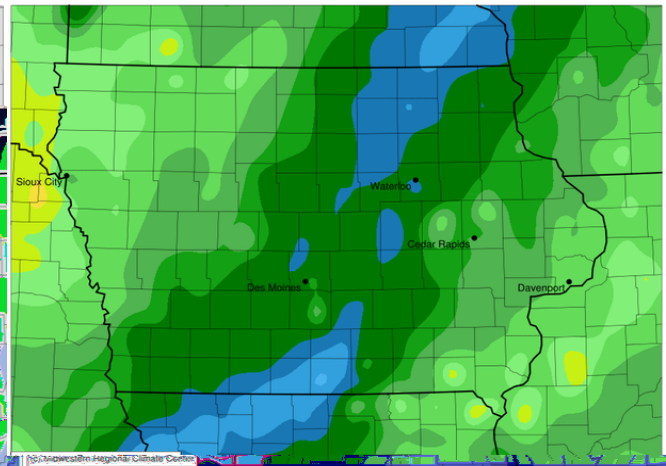
### Average Temperature (°F): Departure from 1991-2020 Normals

November 01, 2021 to November 30, 2021



### Accumulated Precipitation (in)

November 01, 2021 to November 30, 2021



Stations from the following networks used: WBAN, COOP, FAA, GHCN, PDE, URG, S, WVO, GPO, VWS, Midwestern Regional Climate Center, cli-MATE: MRCC Application Tools Environment, Generated at: 12/8/2021 12:07:07

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: 12/8/2021 1:01:48 PM CST