January 2020

CLIMATE UPDATE

A MONTHLY SUMMARY FROM THE NEBRASKA STATE CLIMATE OFFICE

nsco.unl.edu

Winter storm punctuates January's weather

For the second month of winter, Nebraska experienced warmer than normal temperatures. Though we were not without typical winter weather as a blizzard swept through on the 24th – 26th and resulted in record daily snowfall for the south and east, along with strong sustained winds statewide. Overall, precipitation was above normal in the east and below normal in the west. Drought conditions improved slightly in southeast Nebraska with a transition from D1 to abnormal dryness. Extreme drought remains in the southwestern and western portions of the state. Expect a return to winter conditions in February as climate outlooks are trending toward cooler and wetter than normal conditions.

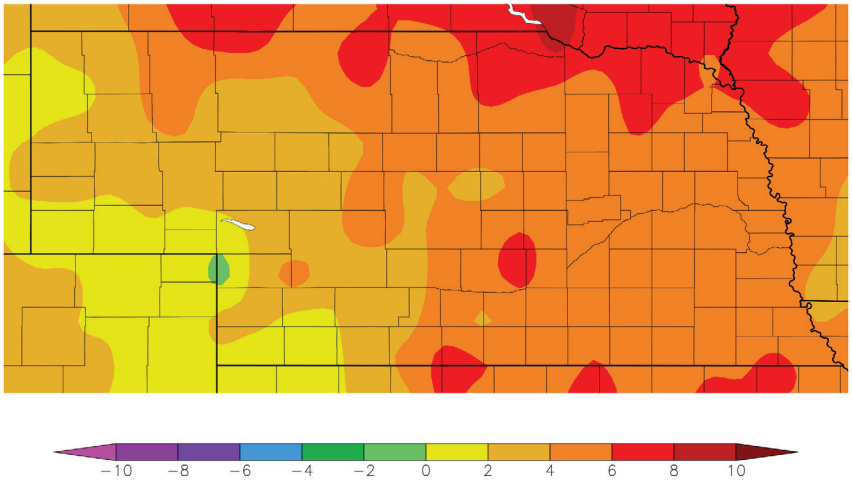
Precipitation

The big story for January was the blizzard and significant snowfall resulting in record-breaking amounts for the 25th. Respective airport observing stations at six locations all reported daily record snowfall and precipitation for this storm event: Norfolk (6.6" snow, 0.44" water equivalent), Omaha (11.9", 0.91"), Lincoln (14.5", 1.13"), Hastings (8.8", 0.87") and Grand Island (10.2", 0.97"). Travel disruptions and closed schools and businesses were widespread. For the month, liquid equivalent precipitation was above normal in the east, as would be expected given the snow amounts, and below normal in the west. Statewide, Nebraska averaged 0.68 inches of precipitation, which is 0.21 inches above normal. Incidentally, January has been getting drier in recent memory (since 1990), by about -0.15".

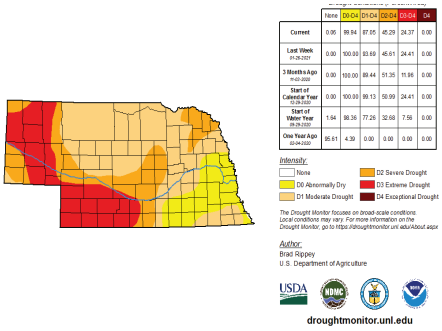
Temperature

Average monthly temperatures were quite warm statewide as departures in the north approached 8°F. The southwest and west was cooler in a relative sense with temperature departures less than 2°F. Daily minimum temperatures were quite a bit warmer than normal given the propensity of cloud cover. The statewide average temperature of 28.4°F is 3.4°F warmer than normal and over the past three decades, January has warmed by about 1°F. The highest temperatures for the month were in the mid 60s in southcentral and southwest Nebraska. Below zero readings occurred in all corners of the state with the lowest temperatures of -11 to -13°F in higher elevations of the Panhandle. Wind chill temperatures reached -15°F at the Nebraska Mesonet station near Lexington on the 27th.

DEPARTURE FROM NORMAL TEMPERATURES (F) 1/1/21 - 1/31/21



All maps generated using January provisional data.



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.06	99.94	87.05	45.29	24.37	0.00
Last Week 01-26-2021	0.00	100.00	93.69	45.61	24.41	0.00
3 Months Ago 10-27-2020	0.00	100.00	89.44	51.35	11.96	0.00
Start of Calendar Year 12-31-2020	0.00	100.00	99.13	58.99	24.41	0.00
Start of Water Year 09-29-2020	1.64	98.36	77.26	32.68	7.59	0.00
One Year Ago 02-04-2020	95.61	4.39	0.00	0.00	0.00	0.00

U.S. DROUGHT MONITOR MAP OF NEBRASKA
FEBRUARY 2, 2021

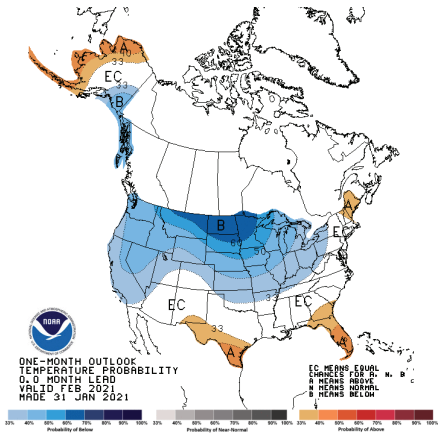
Agriculture

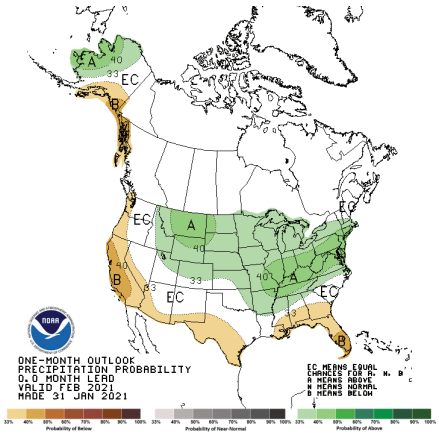
January was a tale of two cities across Nebraska. A very active weather pattern developed across the southern Plains during the second half of January as systems moved into the west coast and moved eastward through the southern Rockies. This storm track was favorable for widespread precipitation events that impacted the eastern half of the state, but largely bypassed western Nebraska.

Winter wheat conditions across the Panhandle and southwest Nebraska continue to be stressed due to the lack of soil moisture and continued dry conditions. Because of the dry conditions, soil temperatures at the 4-inch depth approached the low 20's after

30-DAY OUTLOOK

TEMPERATURE (LEFT) & PRECIPITATION





the January 25th storm brought single digit lows to the region. Wheat will be vulnerable to winterkill for the remainder of this winter, especially if the February forecast for Arctic air occurs without protective snow cover.

A large portion of east central and central Nebraska received nearly a season's worth of snowfall from these series of storms that crossed the southern and central United States. The most significant event on January 25th brought widespread 6-12 inch from Kearney eastward, with totals approaching 15 inches in the Lincoln area. This was a high moisture event that brought 0.75-1.25 inches of liquid equivalent moisture.

With surface temperatures above freezing prior to the January 25th snow event, moisture from this storm will have an open pathway for soil infiltration. Normally at this time of year soil surfaces would be froze and precipitation would be expected to run off into watersheds. The flip side to this beneficial moisture is that the deep snowfall will impede cattle grazing corn stocks, which would require supplemental freezing. Snow surfaces will likely crust in response to melting when temperatures breach the freezing mark during the day and refreeze overnight.

Outlook

The Climate Prediction Center (CPC) released their updated February temperature and precipitation outlooks January 31. Compared to the preliminary February outlook released 10 days prior, CPC has changed their temperature outlook from warmer than normal across the southeastern United States to a strong likelihood of below normal temperatures east of the Rocky Mountains.

CPC has also altered their precipitation outlooks for February, which now shows a tendency toward above normal moisture east of the Rocky Mountains, including the entire state of Nebraska. The preliminary February outlook had Nebraska in a region where there were equal chances of receiving above normal, normal, or below normal moisture. The current CPC precipitation outlook is the first time in over six months that CPC has depicted all of western Nebraska with odds tilted toward above normal moisture.

Short term weather models through the middle of February depict a strong upper trough developing east of the Rocky Mountains that will pull Arctic air into the region through the middle of February. Several impulses moving down the backside of this expansive trough appear to develop snow activity across western Nebraska periodically through mid-month.

Uncertainty exists from mid-month on in regards to temperature and precipitation trends. There are signs from the GFS model that temperatures will begin to moderate near mid-month as the eastern U.S. upper air trough weakens and lifts north. At the same time energy moves into the west coast and shifts east into the central Rockies. This would increase the likelihood that a significant snow event will develop somewhere across the central Plains the third week of February if current model forecast depictions are correct. In addition, if this pattern verifies, CPC's final temperature and precipitation outlooks for February will likely come to fruition across Nebraska.

January Extremes

Nebraska's statewide weather network operated by the Nebraska Mesonet at the University of Nebraska-Lincoln cataloged the following extremes this January:

Highest temperature: 65°F, Overton 6SE, 13th

Lowest temperature: -10°F, Merna 2SW, 27th

Lowest wind chill temperature: –15°F, Lexington 4S, 27th -

Max wind gust: 74 mph, Scottsbluff 6NW, 14th

Highest 1-day precipitation: 0.55 inches, Oakland 4W, 7th

Highest Soil Temperature: 50°F, Ainsworth 2NE, 13th 5

Lowest Soil Temperature: 16°F, Oshkosh 6N, 28th

Largest 12-hour Temperature Change: 41°F (from 12° to 53°F), Cozad 8N, 20th

Largest 1-hour Temperature Change: -17°F (from 55° to 43° F), Arthur 8S, 13th

Source: The Nebraska Mesonet at Nebraska State Climate Office, University of Nebraska-Lincoln

NEBRASKA STATE CLIMATE OFFICE
153 Hardin Hall | 3310 Holdrege St. | Lincoln, NE 68503-0931
School of Natural Resources at University of Nebraska - Lincoln

CONTACT US
e) nsco@unl.edu | p) 402.472.5206

ON THE WEB
nsco.unl.edu

FOLLOW US
@mshulski3