



December 2023 Climate Summary



Sunrise over Flathead Lake in Montana, Photo Courtesy of Gannon Rush

Regional Breakdown

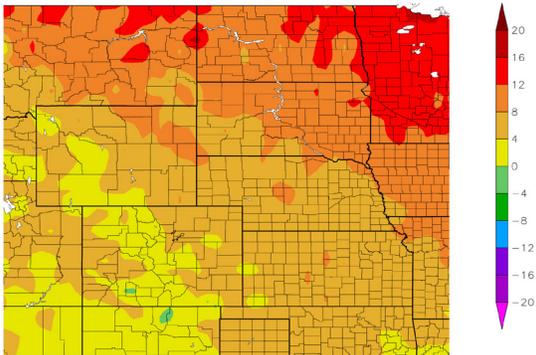
December ended in a similar fashion like both October and November. Exceptionally warm temperatures dominated the region, with a cold front pushing through late in the month but unable to prevent record warmth.

Temperatures were scalding hot in the Dakotas, with some locations breaking their previous monthly record by up to 6 degrees F (3.3 degrees C). Dozens of monthly records were broken, while every state in the region had locations ranking in the top 10 after nearly the entire High Plains was 3 degrees F (1.7 degrees C) or more above normal.

It was a dry month for much of the region but this condition changed with the front that pushed through around Christmas. Blizzard warnings were issued from northwestern Kansas into South Dakota on Christmas day, with 50 mph (81 km/h) winds and a combination of ice, sleet, and snow on one of the busier travel days for many. Interstate 80 was closed from Lexington, Nebraska to the Wyoming border, with hundreds of wrecks occurring. Interstate 70 in Kansas was also closed from Goodland to Denver, Colorado due to safety concerns.

Temperature and Precipitation Overview

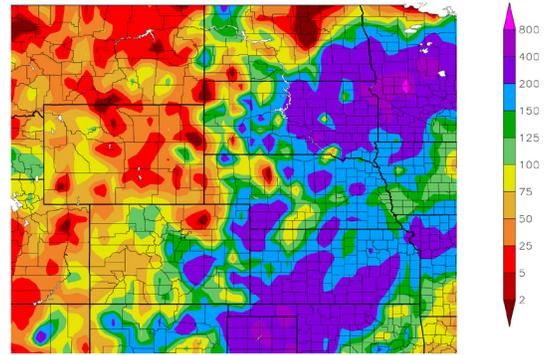
Departure from Normal Temperature (F)
12/1/2023 - 12/31/2023



Generated 1/20/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
12/1/2023 - 12/31/2023



Generated 1/20/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers

Above: Departure from 1991-2020 normal temperature (left) and percent of normal precipitation (right) for December 2023 in the High Plains region. Maps produced by the High Plains Regional Climate Center and are available at: <http://hprcc.unl.edu/maps/current>.

Precipitation

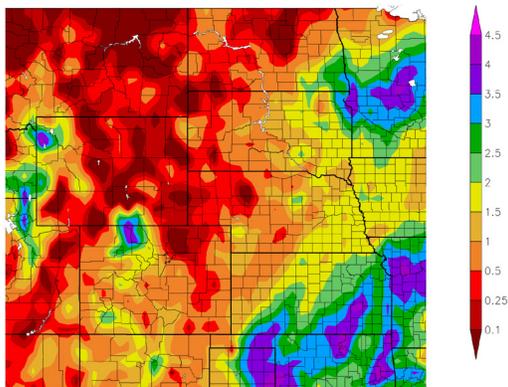
The situation was gloomy heading towards the end of December, with much of the region still reeling from record to near-record dryness in November. However, conditions improved with portions of South Dakota receiving over 400 percent of their normal precipitation by the end of the month.

Precipitation totals were abysmal in parts of the Dakotas up until the 22nd. The maximum amount recorded the previous month in both states was just over an inch (2.54 cm) and December was not proving any better. Things rapidly turned around, with several days of beneficial precipitation in the form of rain and snow. Fargo, North Dakota recorded their wettest December, with 3.00 inches (7.62 cm) of precipitation. Across the border in South Dakota, Sisseton crushed their previous record of 2.03 inches (5.16 cm) and observed a whopping 3.61 inches (9.17 cm) of precipitation. Nearby Milbank recorded an even higher value of 4.31 inches (10.95 cm), just shy of the all-time December precipitation record for the state. There were also plentiful amounts of snow, with 16.0 inches (40.64 cm) reported near the town of Gregory.

The western parts of the Plains were not as lucky this month, with portions of Wyoming reporting no precipitation. Shoshoni and Basin reported no precipitation to tie their driest month on record, while Casper and Sheridan both ranked 2nd driest after minimal amounts. Casper also recorded their lowest December snowfall, with only 1 inch (2.54 mm) of snow reported.

Regional Precipitation

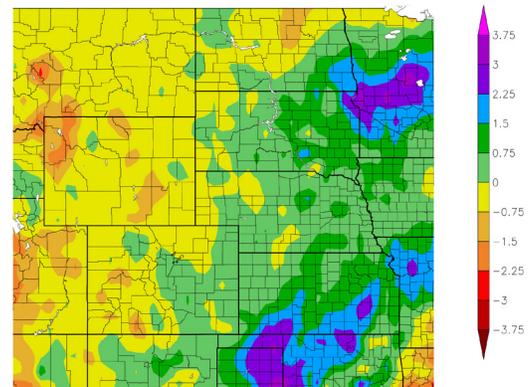
Precipitation (in)
12/1/2023 – 12/31/2023



Generated 1/20/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Precipitation (in)
12/1/2023 – 12/31/2023



Generated 1/20/2024 at HPRCC using provisional data.

NOAA Regional Climate Centers

Above: Total precipitation in inches (left) and departure from normal precipitation in inches (right) for December 2023. These maps are produced by HPRCC and can be found on the Current Climate Summary Maps page at: <http://hprcc.unl.edu/maps/current>.

Temperatures

To say December was unseasonably warm would be an understatement. Parts of the Dakotas were a record-breaking 15 degrees F (8.3 degrees C) above normal, even with a significant cool-down occurring.

Fargo, North Dakota not only broke their monthly record but also tied the record for the warmest December for the state. The average temperature was 31.5 degrees (-0.3 degrees C), easily breaking the previous record of 25.9 degrees F (-3.4 degrees C) and the normal of 15.7 degrees F (-9.1 degrees C). Elsewhere in the state and in South Dakota, just about every major city observed record warmth.

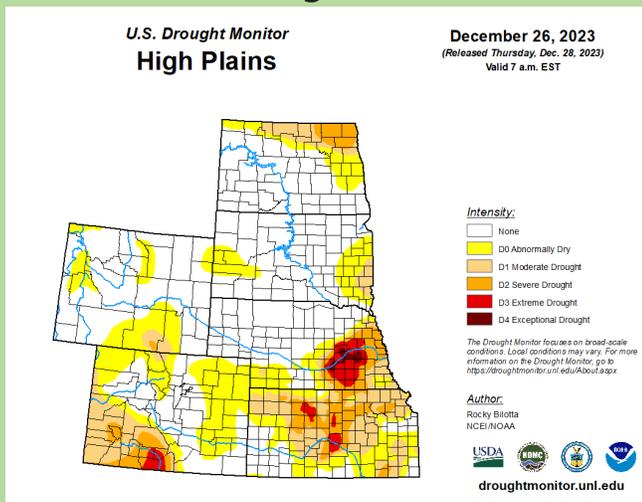
Outside of the Dakotas, record to near-record warmth impacted every state. Norfolk, Nebraska surpassed their record, while McCook tied for 2nd. Further to the west, Sheridan, Wyoming ranked 2nd as well. Rounding out the region, Colorado and Kansas both had at least one major location rank in the top 5 warmest.

Drought Conditions

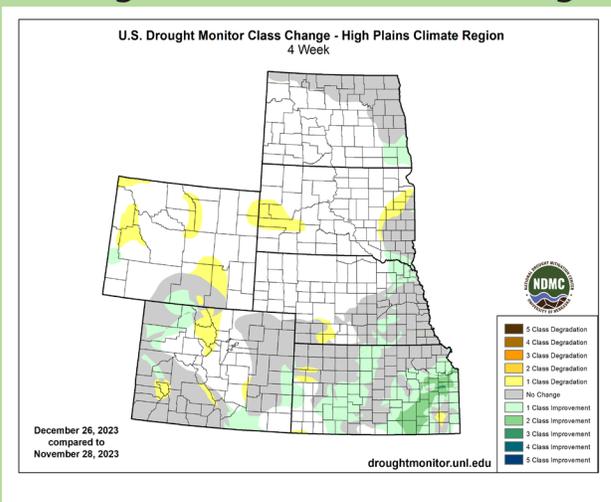
Drought conditions improved this month, even though the amount of abnormal dryness (D0) slightly increased. The heavy snowfall in Kansas towards the end of November was noticeable, with large improvements in the state. Overall, abnormally dry to exceptional drought (D0-D4) conditions were reduced by over 3 percent.

Eastern Kansas greatly benefited from the heavy snow, with severe to exceptional drought (D2-D4) reduced by 23 percent. Currently, a little over 19 percent of the state is experiencing D2-D4, the lowest percentage since the beginning of February 2022. The dryness in Wyoming has begun to take its toll, with D0 increasing by nearly 14 percent this month. D0 was also increased by nearly 10 percent in South Dakota, however, the heavy precipitation towards the end of December should lead to improvements.

U.S. Drought Monitor



Drought Monitor 1-Month Change



The U.S. Drought Monitor is produced as a joint effort of the U.S. Department of Agriculture (USDA), National Drought Mitigation Center, U.S. Department of Commerce, and the National Oceanic and Atmospheric Administration (NOAA). For current Drought Monitor information, please see: <http://droughtmonitor.unl.edu/>.

December 2023 Climate Summary

Climate Outlooks

According to the Climate Prediction Center, an El Niño Advisory has been issued and is likely to be a moderate to strong event. For more information, visit https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

The National Weather Service's long-range flood outlook indicates low chances of flooding through March. According to the National Interagency Fire Center (NIFC), fire potential will be normal across the region through April.

The seasonal temperature and precipitation outlooks presented below combine the effects of long-term trends, soil moisture, and when applicable, the El Niño Southern Oscillation cycle (ENSO). To learn more about these outlooks, please visit <http://www.cpc.ncep.noaa.gov>.

Temperature

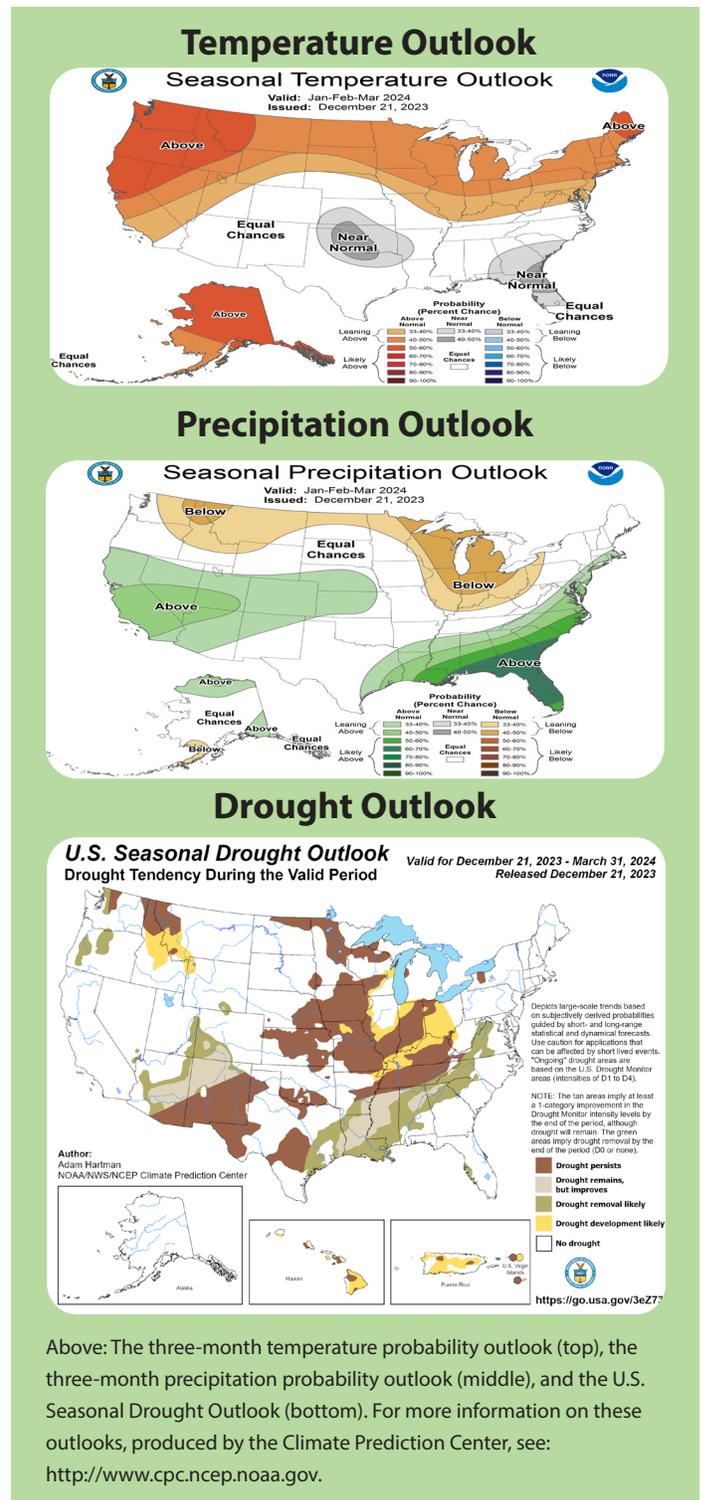
The three-month temperature outlook shows an increased chance of above-normal temperatures across the northern United States. Increased chances of above-normal temperatures are present in the Dakotas and Wyoming.

Precipitation

The outlook for the next three months indicates below-normal precipitation in the northern part of the country and the Great Lakes, while above-normal precipitation is favored for the southeastern and west-central United States. Increased chances of below-normal precipitation are present in parts of North Dakota and Wyoming, while above-normal precipitation is favored for Colorado, Kansas, and Nebraska. Equal chances of above-, below-, or normal precipitation are present in the rest of the region.

Drought

The U.S. Seasonal Drought Outlook released on December 21st indicates drought conditions will likely improve in Colorado but persist for much of the region.



Above: The three-month temperature probability outlook (top), the three-month precipitation probability outlook (middle), and the U.S. Seasonal Drought Outlook (bottom). For more information on these outlooks, produced by the Climate Prediction Center, see: <http://www.cpc.ncep.noaa.gov>.

Station Summaries: By the Numbers

Colorado	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Akron Washington County Airport	47.6	23.2	35.4	6.1	66	12/06	10	12/24	0.22	0.02	110
Alamosa San Luis Airport	38.8	4.4	21.6	3.5	56	12/07	-8	12/29	0.40	0.06	118
Colorado Springs Municipal Airport	50.2	24.6	37.4	5.7	71	12/06	10	12/10	0.57	0.34	248
Denver International Airport	50.5	24.3	37.4	6.2	71	12/06	8	12/25	0.12	-0.23	34
Grand Junction Walker Field Airport	44.9	23.7	34.3	5.9	55	12/13	15	12/27	0.57	-0.03	95
Pueblo Memorial Airport	51.1	20.6	35.9	4.2	77	12/06	6	12/10	1.31	1.02	452

Kansas	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Concordia Municipal Airport	48.4	29.9	39.2	7.7	65	12/07	18	12/02	1.56	0.52	150
Dodge City Regional Airport	50.6	28.2	39.4	5.5	73	12/07	17	12/10	2.28	1.32	238
Goodland Renner Field	48.3	23.2	35.8	5.0	74	12/06	11	12/01	1.04	0.57	221
Topeka Municipal Airport	50.4	31.4	40.9	7.0	66	12/07	21	12/19	2.92	1.43	196
Wichita Mid-Continent Airport	50.3	31.4	40.9	5.3	66	12/07	22	12/10	2.64	1.42	216

Nebraska	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Chadron Municipal Airport	45.5	17.6	31.5	5.8	64	12/06	-3	12/31	1.05	0.74	339
Grand Island Airport	44.3	24.6	34.5	5.6	62	12/22	16	12/31	1.29	0.45	154
Lincoln Municipal Airport	46.2	24.3	35.2	6.4	62	12/07	13	12/02	1.70	0.52	144
Norfolk Karl Stefan Airfield	43.3	23.9	33.6	7.9	60	12/06	14	12/31	1.53	0.69	182
North Platte Regional Airport	48.1	20.0	34.0	6.5	72	12/07	11	12/10	0.90	0.45	200
Omaha Eppley Airport	44.1	26.2	35.1	6.4	61	12/07	18	12/02	1.68	0.46	138
Valentine Miller Field	45.1	19.9	32.5	6.2	70	12/06	9	12/18	0.64	0.21	149

North Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Bismarck Municipal Airport	38.5	18.2	28.4	10.5	66	12/06	6	12/12	0.44	-0.16	73
Fargo International Airport	37.8	25.3	31.5	15.8	62	12/07	8	12/18	3.00	2.11	337
Grand Forks International Airport	33.4	19.3	26.4	13.6	56	12/06	-1	12/18	0.93	0.27	141
Theodore Roosevelt Airport	41.3	19.0	30.1	10.2	63	12/06	6	12/12	0.15	-0.04	79
Williston International Airport	37.3	20.2	28.8	12.7	60	12/06	7	12/12	0.29	-0.38	43

All data are preliminary and subject to change. + indicates multiple dates, latest date listed. * indicates some missing data for the period. ** indicates value is under evaluation. Data are retrieved through the Applied Climate Information System (ACIS) and are available online through the CLIMOD system. For more information please contact us: <http://www.hprcc.unl.edu/contact.php>.

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South Dakota	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Aberdeen Regional Airport	40.9	19.2	30.0	11.7	63	12/06	9	12/12	2.18	1.57	357
Huron Regional Airport	41.7	21.0	31.4	10.8	66	12/07	9	12/12	1.29	0.63	195
Pierre Regional Airport	42.3	20.6	31.5	8.7	67	12/07	9	12/31	1.23	0.59	192
Rapid City Regional Airport	47.1	20.2	33.7	8.1	65	12/07	13	12/16	0.32	-0.03	91
Sioux Falls Joe Foss Field Airport	43.2	24.7	34.0	11.5	61	12/07	11	12/01	1.85	1.02	223

Wyoming	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	% Norm
Casper Natrona County International AP	42.6	21.5	32.0	7.2	56	12/06	0	12/25	0.06	-0.55	10
Cheyenne Municipal Airport	44.5	24.4	34.4	5.7	64	12/06	10	12/25	0.31	-0.17	65
Lander Hunt Field Airport	34.1	14.7	24.4	2.8	50	12/05	-1	12/25	0.71	0.08	113
Laramie Regional Airport	42.0	16.5	29.3	7.8	57	12/06	-15	12/25	0.21	-0.11	66
Rawlins Municipal Airport	37.5	17.5	27.5	5.4	53	12/06	-5	12/28	0.19	-0.21	48
Sheridan County Airport	48.6	20.4	34.5	10.0	64	12/05	7	12/25	0.10	-0.44	19

December 2023 Highlights

Monthly Rankings

Temperature in degrees Fahrenheit, Precipitation in inches

Precipitation	Precipitation/ Ranking	Record / Year	Period of Record
Casper, Wyoming	0.06 / 2nd Driest	0.03 / 1952	1939-2023
Sheridan, Wyoming	0.10 / 2nd Driest (tied with 1986)	0.03 / 1930	1907-2023
Fargo, North Dakota	3.00 / Wettest	2.28 / 1927	1881-2023
Sisseton, South Dakota	3.61 / Wettest	2.03 / 1968	1931-2023
Pueblo, Colorado	1.31 / 2nd Wettest	1.35 / 1913	1888-2023
Snowfall	Snowfall/ Ranking	Record / Year	Period of Record
Casper, Wyoming	1.0 / Least Snowiest	1.5 / 1952	1939-2023
Temperature	Temperature/ Ranking	Record / Year	Period of Record
Sisseton, South Dakota	31.4 / Warmest	31.0 / 1939	1931-2023
Mobridge, South Dakota	30.8 / Warmest	30.2 / 1939	1911-2023
Huron, South Dakota	31.4 / Warmest	29.9 / 1939	1881-2023
Sioux Falls, South Dakota	34.0 / Warmest	31.9 / 1918	1893-2023
Grand Forks, North Dakota	26.4 / Warmest	23.8 / 1939	1893-2023
Fargo, North Dakota	31.5 / Warmest	25.9 / 1959	1881-2023
Williston, North Dakota	28.8 / Warmest	28.4 / 1939	1894-2023
Dickinson, North Dakota	30.1 / Warmest	29.6 / 1979	1938-2023

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About the High Plains Regional Climate Center

The High Plains Regional Climate Center (HPRCC) is one of six NOAA Regional Climate Centers (RCCs) that has been providing timely climate data and information to the public for cost effective decision-making since 1987. The HPRCC primarily serves the six-state region of Colorado, Kansas, Nebraska, North Dakota, South Dakota, and Wyoming, but has also served people from all across the country and even throughout the world. HPRCC operates under a three-tiered structure of climate services and works closely with other organizations on the local, regional, and national levels. HPRCC staff engage with a wide range of stakeholders including K-20 education, the public, media, private industry, research, and state/tribal/federal entities, among others.

Much of the data and products found throughout this publication were built on the Applied Climate Information System (ACIS) framework. ACIS was designed to manage the complex flow of information from climate data collectors to the end users of climate data information. The main purpose of ACIS is to alleviate the burden of climate information management for people who use climate information to make management decisions.

HPRCC is involved in the ongoing development and management of ACIS. In the spring of 2014, the RCCs released a new website for ACIS. This new and improved website not only contains descriptions of ACIS and the sources of data found within, but also features real-world examples of how RCCs and external groups are using ACIS for their particular climate data needs. In addition to these examples, there is extensive documentation and tutorials on how ACIS can be used and accessed by external clients using Web Services. For more information see: <http://rcc-acis.org>.



Additional Summary Information for the High Plains

Missouri River Basin Quarterly Climate Impacts and Outlook

The screenshot shows the cover page of a report titled "Missouri River Basin Quarterly Climate Impacts and Outlook" for September-October 2014. It features a map of the basin, a table of contents, and several sections of text and graphics. Key sections include "National - Significant Events for September - November 2014", "Regional - Impacts for September - November 2014", "Regional - Outlook for January - March 2015", and "MO River Basin Partners".

For more information:
<https://www.drought.gov/drought/dews/missouri-river-basin/reports-assessments-and-outlooks>

Midwest and Great Plains Monthly Climate and Drought Webinar

The screenshot shows a video player for a webinar titled "20141120 Monthly Climate and Drought Webinar". The main content is a map titled "Forecast Precipitation Amounts (7 day)" showing precipitation forecasts for the Midwest and Great Plains regions. The map uses a color scale from blue (low) to red (high). A play button is visible in the center of the map.

To sign up for future webinars:
<https://www.drought.gov/drought/calendar/webinars>

For an archive:
www.hprcc.unl.edu/webinars.php

Author Information

For questions, comments, or suggestions, please contact:
Gannon Rush
711 Hardin Hall, 3310 Holdrege Street
Lincoln, NE 68583-0997
402-472-8968
<https://hprcc.unl.edu/contact.php>

