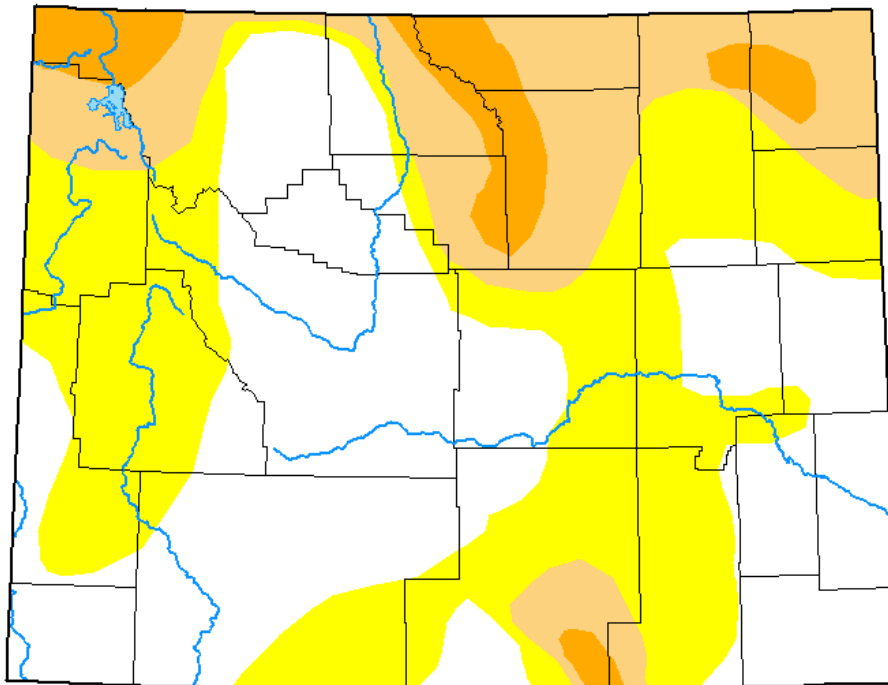


Sheridan County Water Supply Report







March 2024

U.S. Drought Monitor
Wyoming

February 20, 2024
(Released Thursday, Feb. 22, 2024)
Valid 7 a.m. EST



Intensity:

-  None
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Richard Heim
NCEI/NOAA



droughtmonitor.unl.edu

Map Source: The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration.



**Sheridan Community
LAND TRUST**
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Connecting people to land and history

How to Use This Report

What is this report?

Instead of combing the internet and clicking a million links to learn about water supply in Sheridan County, let us do the work for you! This report compiles many trustworthy sources into an easy-to-read and access report. It includes information about streamflow, snowpack, drought, soil moisture, and precipitation for both the Tongue and Powder Rivers. This report is a one-stop shop for information that can help you be aware of water in Sheridan to make decisions for your ranch and your land.

Helpful Hints:

- All forecasts have the word forecast underlined in the page's title.
- Each page has a little blurb at the top that gives you some helpful information.
- If you would like to know more about a topic, check out the sources at the bottom of the page!
- Sources are precise and bring you as close as possible to the original source.

Table of Contents

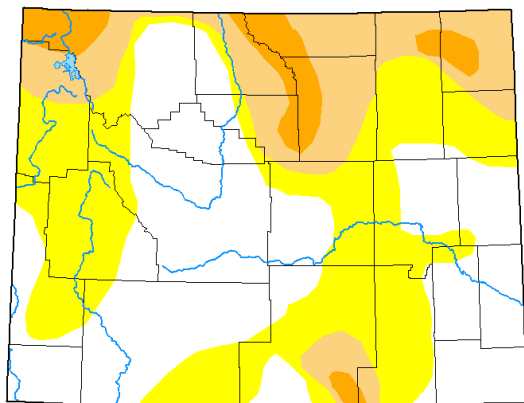
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Drought Index and Change

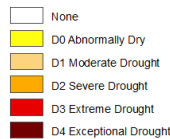
The U.S. Drought Monitor gives you a broad overview of the drought conditions in the US. Its strength is bringing together many ways of determining drought. It is useful as a large-scale view of drought, but local drought resiliency efforts are not considered.

U.S. Drought Monitor Wyoming

February 20, 2024
(Released Thursday, Feb. 22, 2024)
Valid 7 a.m. EST



Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

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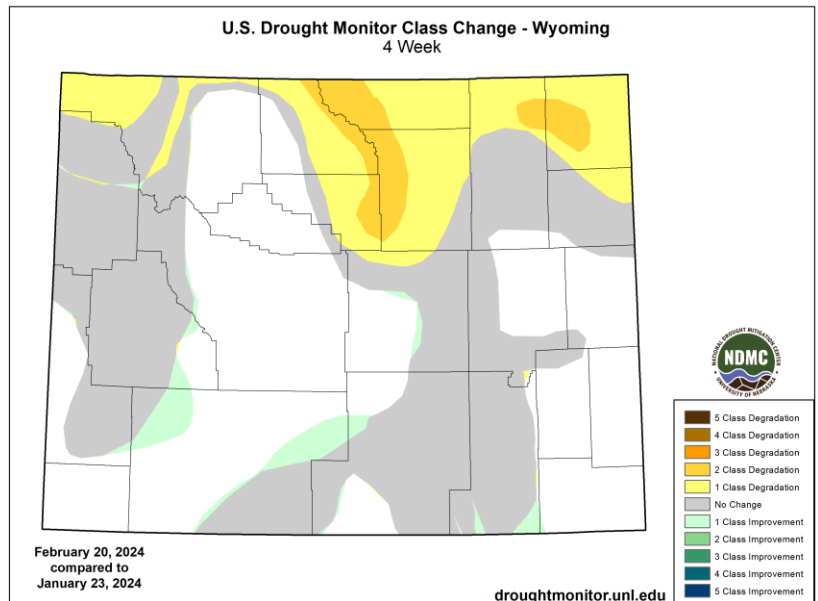


Current Drought Monitor:

Sheridan County is in D1, Moderate Drought, and D2, Severe Drought. The plains are experiencing less drought conditions than the mountains.

Change in Drought Monitor:

Degradation was more drastic in the western side of the county, although the entire county experienced a degradation in drought conditions.



Cooler tones represent improvement. Warm tones represent degradation.

Sources: <https://droughtmonitor.unl.edu/Maps/MapArchive.aspx>
<https://droughtmonitor.unl.edu/Maps/ChangeMaps.aspx>
<https://droughtmonitor.unl.edu/Summary.aspx>



Drought History and Forecast

The first half of this page shows current conditions, followed by the forecast. Current and historical data is based on known measured data. The outlook is a prediction of the future, so while it is helpful for making decisions be sure to factor in the level of uncertainty.

Drought in Sheridan County Over Time: Shown in Percentage Area in Drought

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	2024-02-20	0.00	100.00	100.00	35.09	0.00	0.00	235
Last Week to Current	2024-02-13	0.00	100.00	100.00	0.00	0.00	0.00	200
3 Months Ago to Current	2023-11-21	100.00	0.00	0.00	0.00	0.00	0.00	0
Start of Calendar Year to Current	2023-12-26	90.06	9.94	0.00	0.00	0.00	0.00	10
Start of Water Year to Current	2023-09-26	100.00	0.00	0.00	0.00	0.00	0.00	0
One Year Ago to Current	2023-02-21	91.56	8.44	0.00	0.00	0.00	0.00	8

DSCI stands for Drought Severity and Coverage Index. It is "an experimental method for converting drought levels from the U.S. Drought Monitor map to a single value for an area."

History of Drought Monitor: Last year, in March of 2023, 8.44% of Sheridan County was experiencing abnormally dry conditions (D0). This year is much drier than last year at this same time.

Forecast for Drought Monitor:

Looking into March, NOAA reports: "In the High Plains region, persistence is forecast across much of the existing drought areas, given unfavorable precipitation forecast for February, coupled with a dry time of year and below normal snowpack across much of the region."¹

U.S. Monthly Drought Outlook



Source(s): Climate Prediction Center
Updates Monthly: 02/23/24

Drought.gov

Sources: https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips_56033
<https://www.drought.gov/forecasts>
¹https://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.php
<https://droughtmonitor.unl.edu/Summary.aspx>



Reservoir Capacity and Stream Flow

The total capacity of reservoirs and current water storage includes inactive storage below the outlet.

Lake DeSmet

As of March 1, Lake DeSmet has a total of 200,514 acre-feet in storage, which is an increase of 423 acre-feet since February 1.

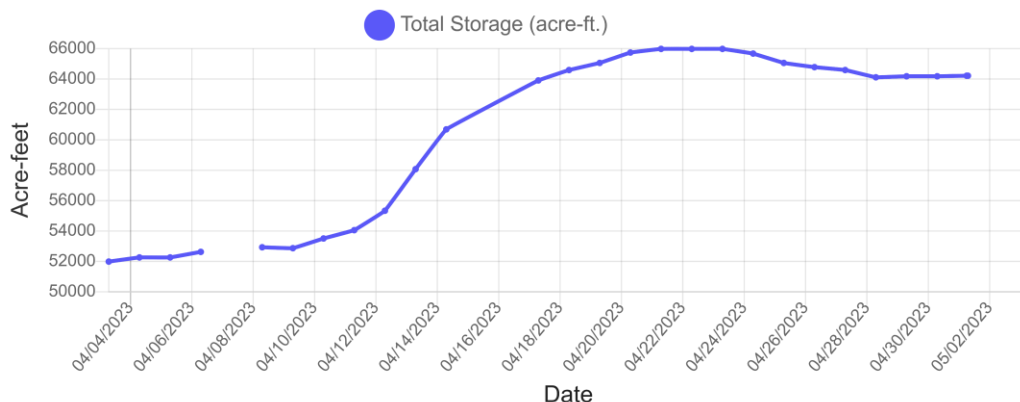
Reservoir	Total Storage (Acre-ft)	Current Storage (Acre-ft)	Percent of Total Capacity (%)
Bighorn	4,624	3,271	70.7
Cross Creek	824	236	28.6
Dome Lake No.1	1,506	1,324	87.9
Kearney Lake	6,324	2,975	47.0
Park	10,362	5,615	54.2
Sawmill	1,275	**	**

**Measurement stations for Sawmill Reservoir are currently offline

Tongue River Reservoir

Water levels at Tongue River Reservoir decreased 2.1% over the last month, from 49,082 acre-feet to 48,040 acre-feet.

Tongue River Reservoir
42B 01900



Reservoir Level



This graph displays the real time data of the Tongue River Reservoir. This data remains provisional until it is officially reviewed due to variables that can affect the gages. Things that can effect that data includes but not limited to algal and aquatic growth, sediment movement, malfunction of recording equipment, and back water from ice or debris such as log jams.

Sources:

Lake DeSmet Operating Department at lakedesmet@johnsoncowy.us

<https://seoflow.wyo.gov/Data/Map/Parameter/Total%20Storage/Location/Identifier/Interval/Latest>

<https://gis.dnrc.mt.gov/apps/stage/gage->

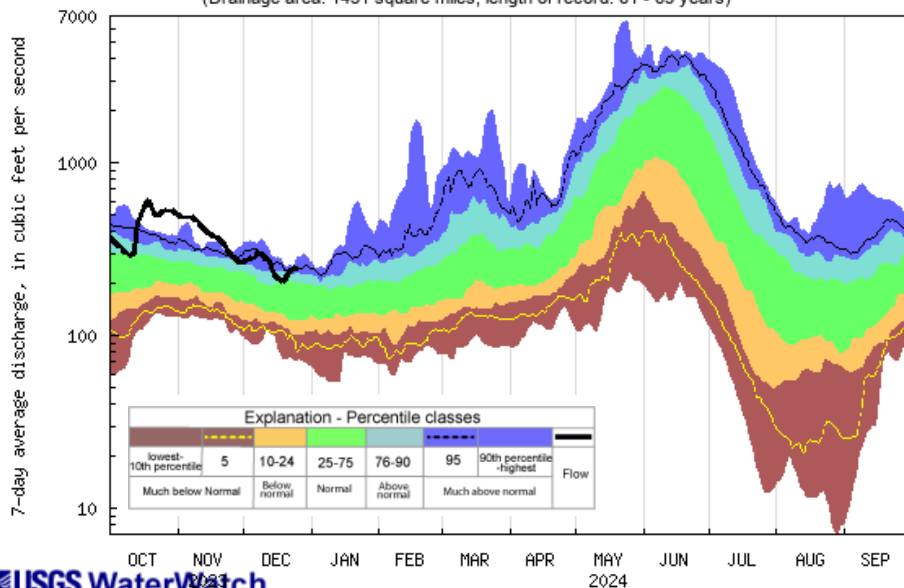
<report/location/3f087fe86bde421f857dfedff4e40e93/1680476400000-1683154740000/>



Select Stream Flow Stations

These graphs give context to stream flow percentile classes. The selected USGS stream gauges are on the stateline with Montana, being the downstream end of the Tongue and Powder within our region. The flow represent average 7-day flows. The vertical axis is logarithmic meaning it goes up by 10x for each major tick mark.

USGS 06306300 Tongue River at State Line nr Decker MT
(Drainage area: 1451 square miles, length of record: 61 - 63 years)



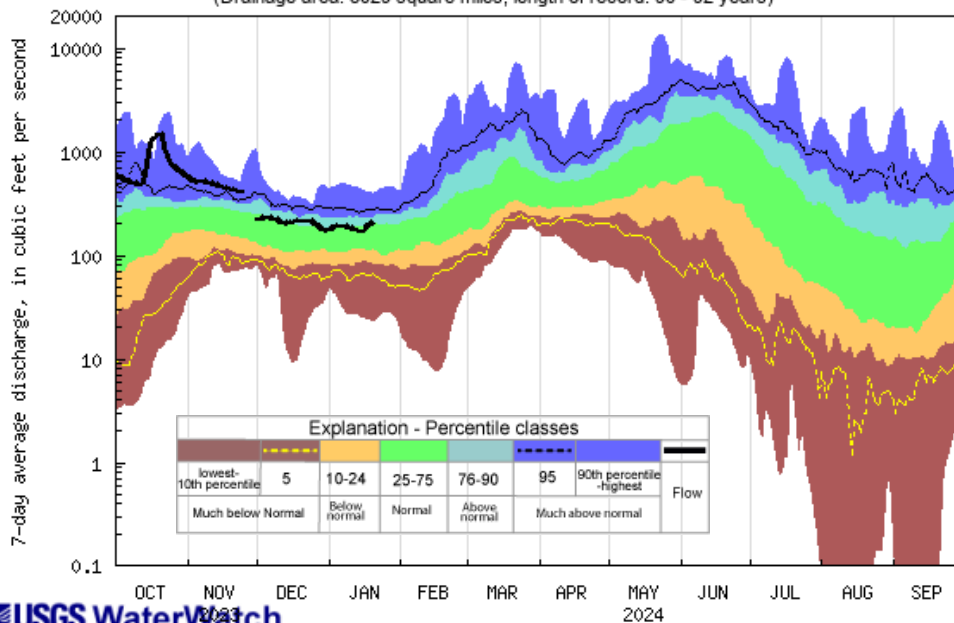
Tongue River Border Station Stream Flow

Streamflow through mid-December remained higher than normal and ranked in the 90th percentile. These graphs are not current since January.

Powder River Border Station Stream Flow:

As of late January, streamflow was within the normal range and near the 75th percentile. These graphs are not current since January.

USGS 06324500 Powder River at Moorhead MT
(Drainage area: 8029 square miles, length of record: 90 - 92 years)



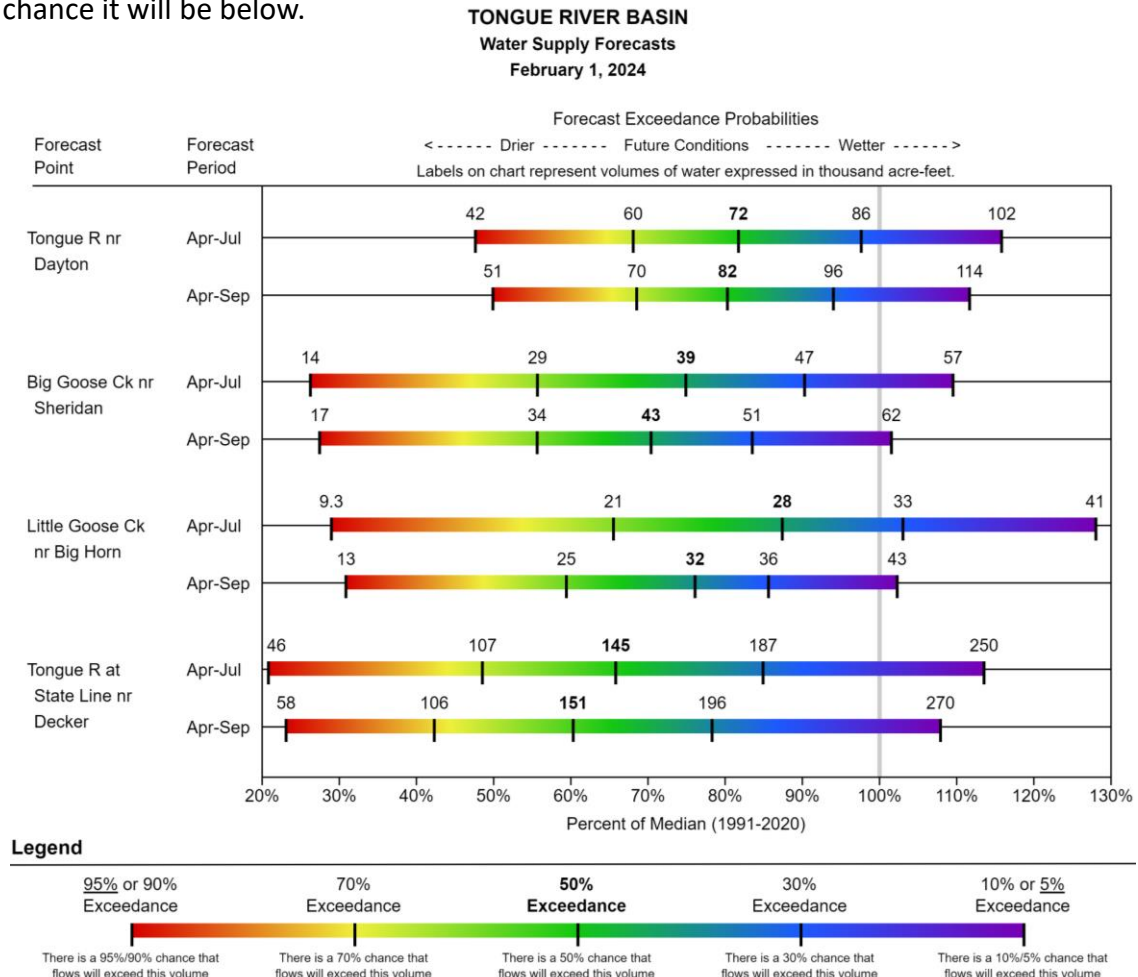
Sources: <https://waterwatch.usgs.gov/index.php?id=mv01d>
https://waterwatch.usgs.gov/?id=wwchart_sitedur&ofmt=plot_mvbg&site_no=06306300
https://waterwatch.usgs.gov/?id=wwchart_sitedur&ofmt=plot_mvbg&site_no=06324500

Last updated: 2024-02-07



Tongue Water Supply Forecast

This chart takes a while to understand but take your time to look at the axes and the legend. It holds valuable information. The exceed value is percent chance that flows exceed will exceed a given volume. For instance, 90% exceedance means there is a 90% chance it will be above and a 10% chance it will be below.



Tongue River Water Supply: This forecast shows drier conditions likely for the Tongue River basin from April to September. For the Little Goose Creek near Big Horn, conditions are expected to be near normal from April to June with a 50% chance that flows will exceed 90% of median. Elsewhere, flows are expected to be lower. This forecast also predicts conditions to be dry for a long season, with flows closer to median from April to July but farther from median looking into September.

Sources:

<https://www.nrcs.usda.gov/wps/portal/wcc/home/waterSupply/waterSupplyForecasts/>



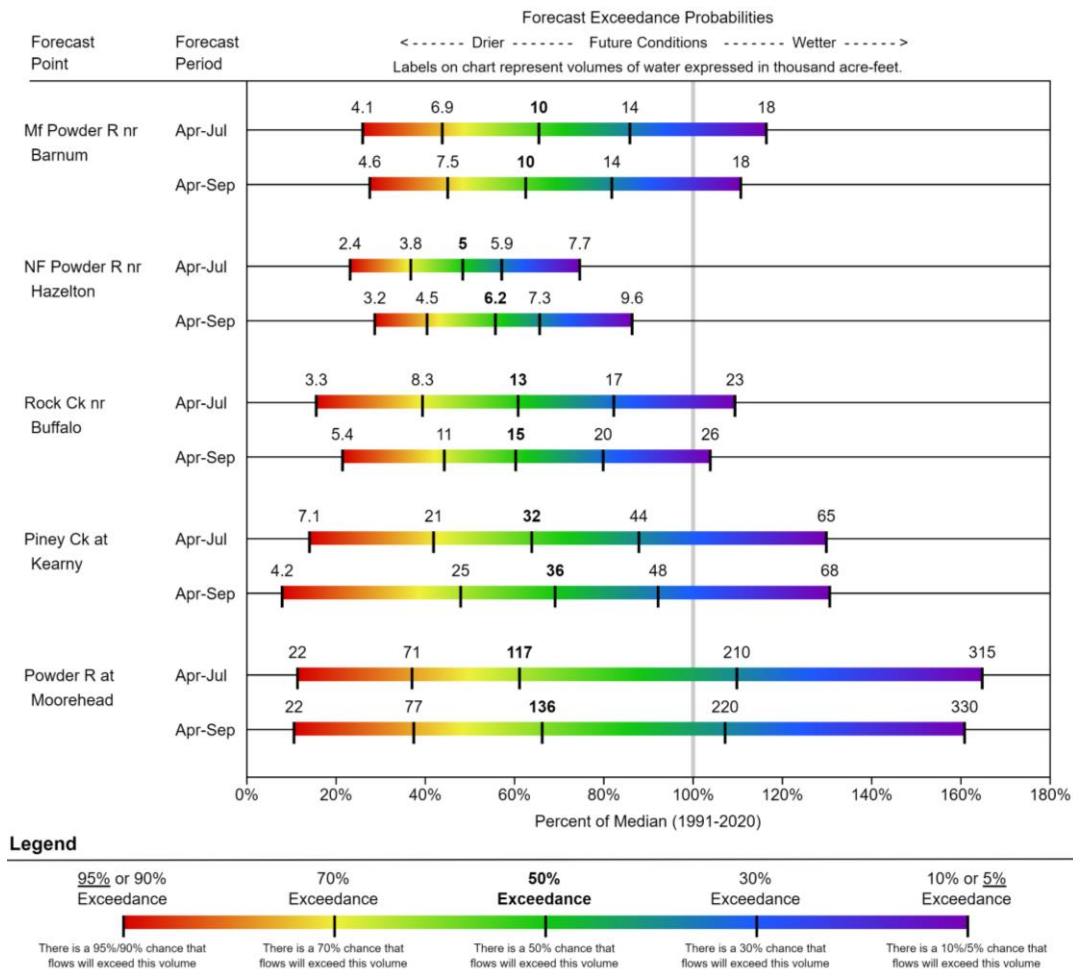
Powder Water Supply Forecast

This chart takes a while to understand but take your time to look at the axes and the legend. It holds valuable information. The exceed value is percent chance that flows exceed will exceed a given volume. For instance, 90% exceedance means there is a 90% chance it will be above and a 10% chance it will be below. It's still a 1/10 chance of being below.

POWDER RIVER BASIN

Water Supply Forecasts

February 1, 2024



Powder River Water Supply: Conditions are expected to be drier than usual, with many forecast points showing only a 50% chance of flows exceed 60% of median. The forecast for April to July is similar to the long term forecast of April to September.

Sources:

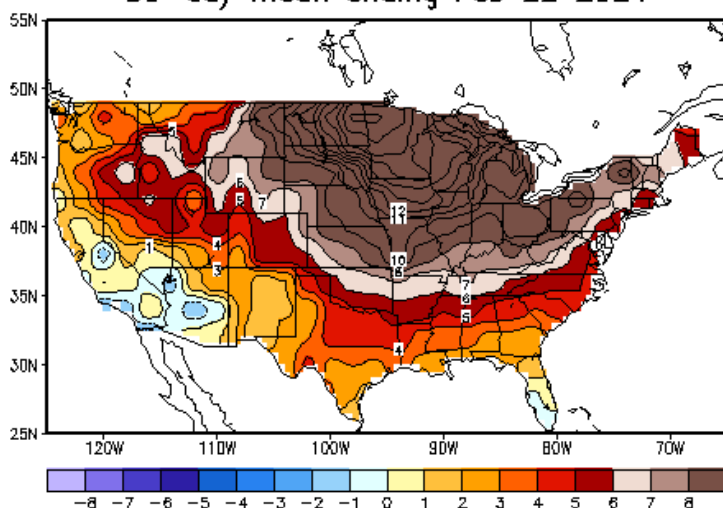
<https://www.nrcs.usda.gov/wps/portal/wcc/home/waterSupply/waterSupplyForecasts/>



Temperature and Precipitation

Temperature and precipitation are large drivers of changes in drought conditions. As you might expect, high temperatures and low precipitation can worsen drought conditions while low temperature and high precipitations can improve them.

Mean Temp (F) Anomaly
30-day mean ending Feb 22 2024

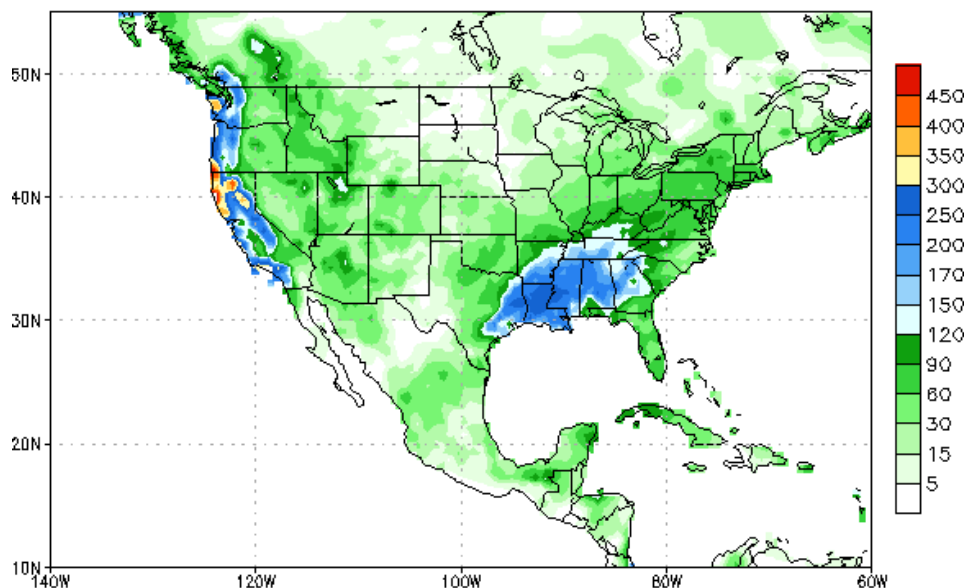


Temperature Anomaly: February was a warm month. The average temperature in January was between 30 and 35 degrees, which is 6 to 7 degrees above average.

Precipitation Anomaly:

The precipitation anomaly for most of Sheridan County was between 0 and -15 mm.

Accumulated Precip (mm) 24JAN2024-22FEB2024



Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis

Sources: https://www.cpc.ncep.noaa.gov/products/tanal/temp_analyses.php
https://www.cpc.ncep.noaa.gov/products/Global_Monsoons/American_Monsoons/NAMS_precip_monitoring.shtml

2 https://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_discussion.php

3 https://www.weather.gov/byz/daily_records?city=Sheridan



Temperature Forecast and Precipitation Forecast

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/interactive/index.php

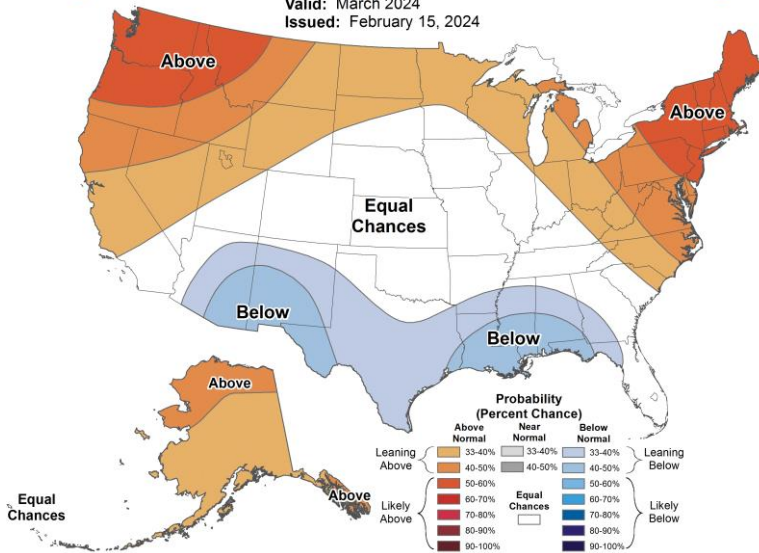
Explore link above for an Interactive map that displays percentage chance above and below normal for any point in US.



Monthly Temperature Outlook



Valid: March 2024
Issued: February 15, 2024



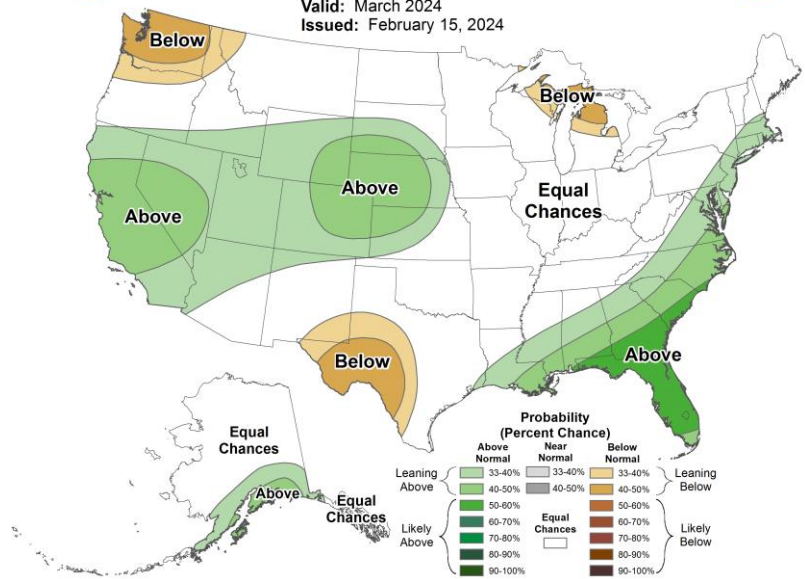
Temperature: Sheridan County has a 33-40% chance for temperatures being above average in March.



Monthly Precipitation Outlook



Valid: March 2024
Issued: February 15, 2024



Precipitation: There is a small chance precipitation will be above average in March.

Sources: <https://www.cpc.ncep.noaa.gov/>

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/interactive/index.php – Interactive with percentages

https://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_discussion.php



Additional Resources

These are the broad sources we got information from. These websites are trustworthy and are reliable sources for additional information. In the future we hope to add more source for additional information.

- <https://droughtmonitor.unl.edu>
- <https://www.drought.gov>
- <https://www.cpc.ncep.noaa.gov>
- <https://www.nrcs.usda.gov/wps/portal/wcc/home>
- <https://waterwatch.usgs.gov>
- Lake DeSmet Operating Department at lakedesmet@johnsoncowy.us
<http://dnrc.mt.gov/divisions/water/projects/tongue-river>
- <https://seoflow.wyo.gov/Data/Map/Parameter/Total%20Storage/Location/Identifier/Interval/Latest>
- <https://vegdiri.unl.edu/Home/VegDRIQuad.aspx?WY,2>