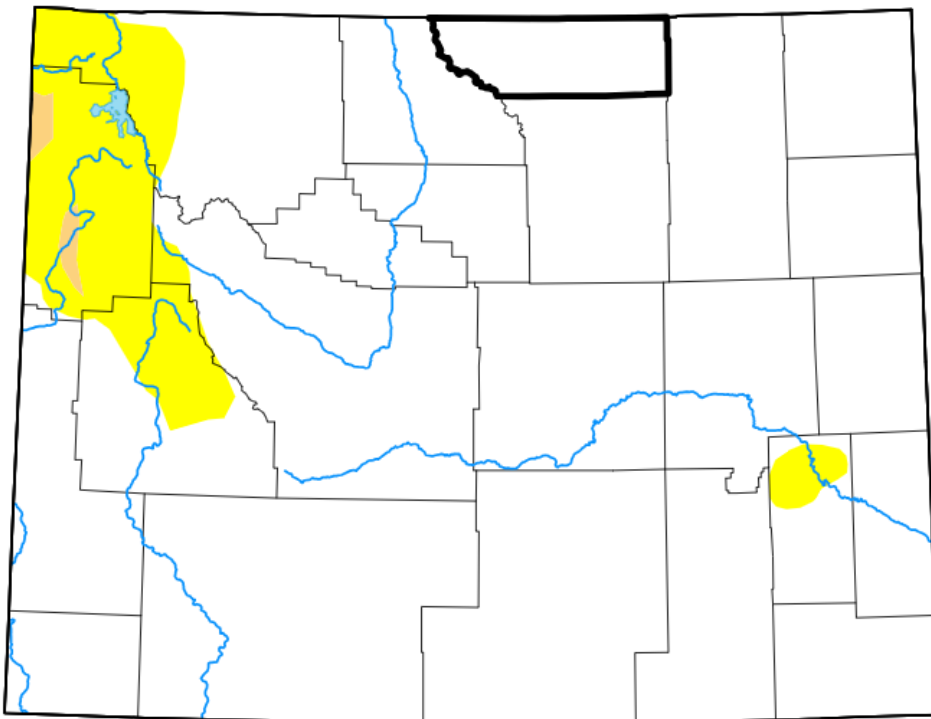


# Sheridan County Water Supply Report

August - 2023

**U.S. Drought Monitor**  
**Wyoming**

**July 25, 2023**  
(Released Thursday, Jul. 27, 2023)  
Valid 8 a.m. EDT



**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:**

Brian Fuchs  
National Drought Mitigation Center



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

Compiled for SCLT by Rebecca Ash. Contact [water@sheridanclt.org](mailto:water@sheridanclt.org) for questions and concerns.

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  
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# How to Use This Report

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## **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.



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# Highlight of the Month

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## Beautifully Bad



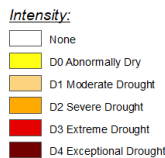
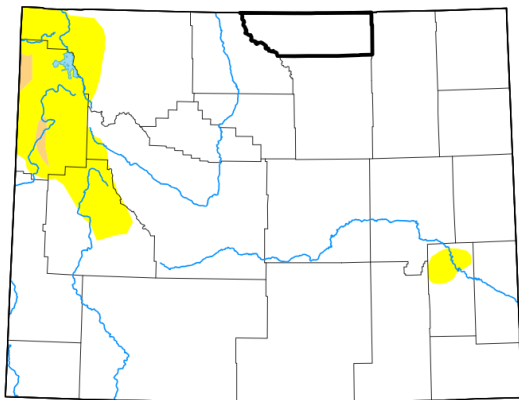
While strolling through the park or on the range you might notice this beautiful purple flower growing on the edge of a creek. It is called a Dame's Rocket. Don't be fooled by its beautiful looks and attractive name, though. Dame's Rocket (*Hesperis matronalis*) is an invasive species originally from Eurasia. It is part of the mustard family and was originally introduced for landscape use. This flower is commonly put into "wildflower seed" packets. Dame's Rocket can now be found throughout the U.S.A.

# 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

July 25, 2023  
(Released Thursday, Jul. 27, 2023)  
Valid 8 a.m. EDT



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:**  
Brian Fuchs  
National Drought Mitigation Center



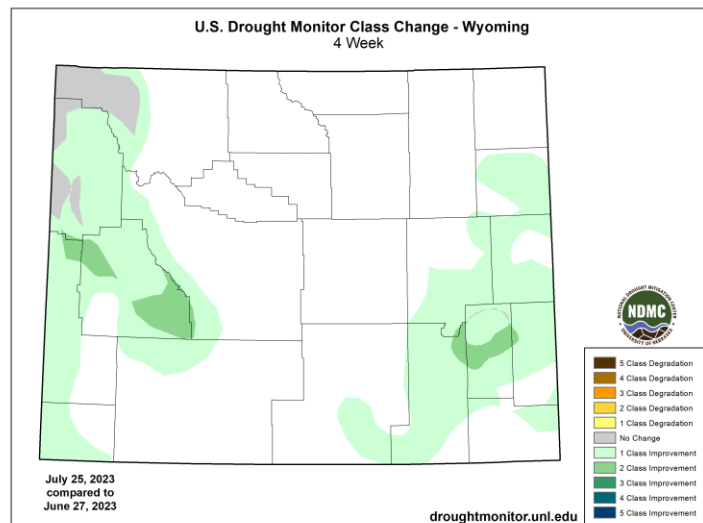
[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

## Current Drought Monitor:

No portion of Sheridan County is experiencing drought conditions. This is a constant from last month, as well as a complete change from last year's conditions which was classified as abnormally dry at this time of the year. Elevated precipitation over the past water year continues to alleviate drought in the county.

## Change in Drought Monitor:

We enter another month drought free. There has been no change in the county's drought status throughout the month of July. The entire county has been free of drought conditions for the past three months due to the amount of precipitation that has been received. Counties to the East and West show class one improvement of drought compared to last month.



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	<a href="#">2023-07-25</a>	100.00	0.00	0.00	0.00	0.00	0.00	0
Last Week to Current	<a href="#">2023-07-18</a>	100.00	0.00	0.00	0.00	0.00	0.00	0
3 Months Ago to Current	<a href="#">2023-04-25</a>	100.00	0.00	0.00	0.00	0.00	0.00	0
Start of Calendar Year to Current	<a href="#">2022-12-27</a>	94.99	5.01	0.00	0.00	0.00	0.00	5
Start of Water Year to Current	<a href="#">2022-09-27</a>	49.02	50.98	0.00	0.00	0.00	0.00	51
One Year Ago to Current	<a href="#">2022-07-26</a>	6.35	93.65	32.07	0.00	0.00	0.00	126

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 July of 2022, Sheridan County was experiencing abnormally dry to moderate Drought conditions (D0-D4). Conditions improved steadily through 2022, especially with the start of the new water year in September and have remained constant with 100% of the county being free of drought conditions.

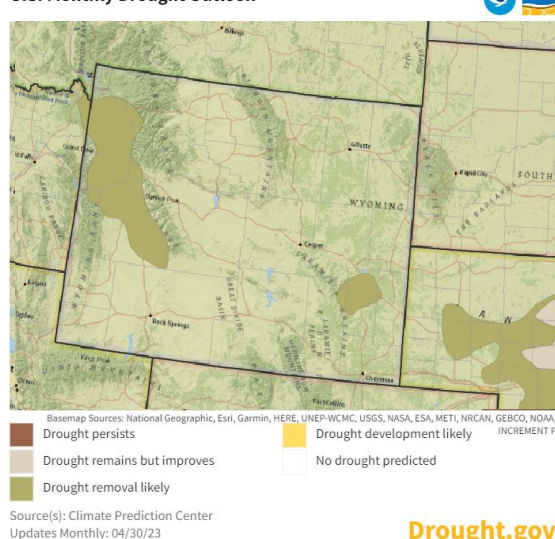
### Forecast for Drought Monitor:

“It was a mostly dry week across the region with the most significant rains falling over eastern Wyoming.”<sup>1</sup>

“Below normal temperatures and near to above normal precipitation are favored over the next couple of weeks and through the remainder of August across much of the Great Plains, increasing the potential for drought improvement”<sup>2</sup>

Forecast confidence is moderate for the Northern Intermountain West and High Plains Regions.

### U.S. Monthly Drought Outlook



Drought.gov

Sources: [https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips\\_56033](https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips_56033)

<https://www.drought.gov/forecasts>

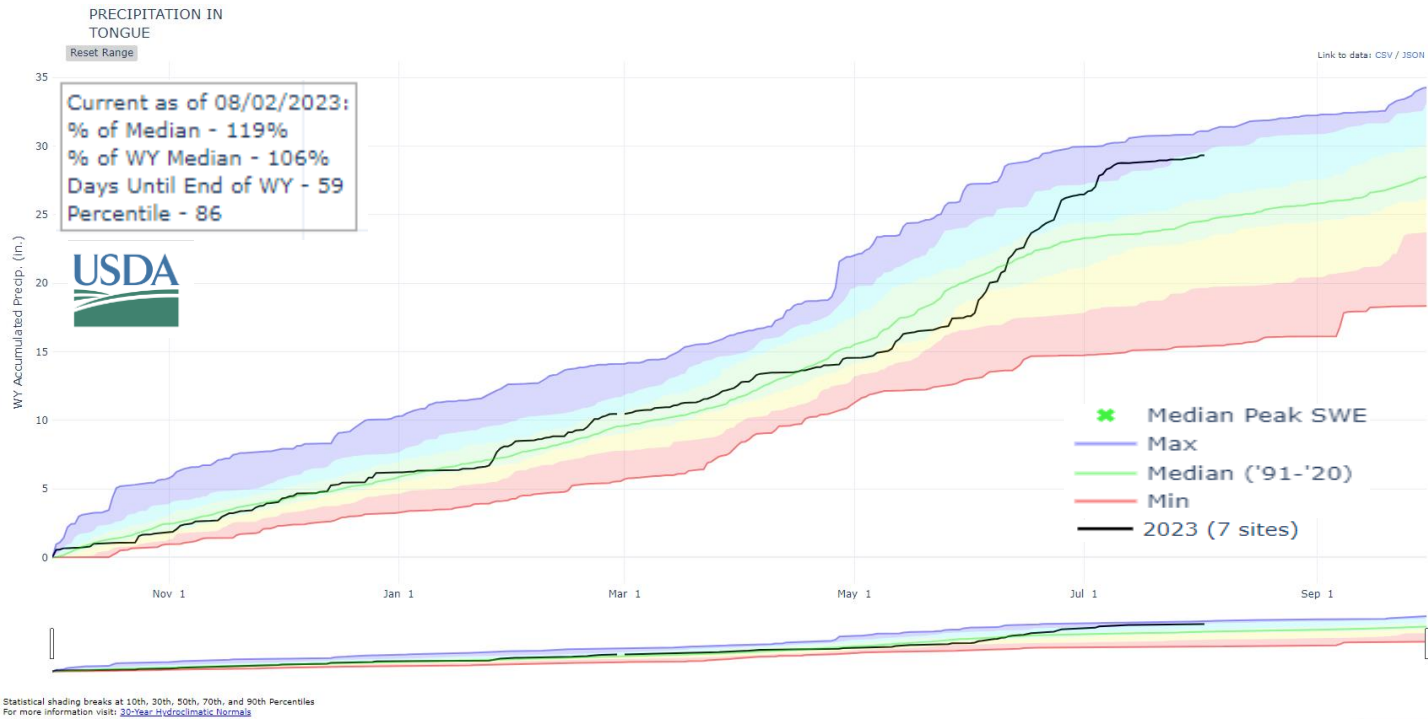
<sup>1</sup>[https://www.cpc.ncep.noaa.gov/products/expert\\_assessment/mdo\\_summary.php](https://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.php)

<https://droughtmonitor.unl.edu/Summary.aspx>



# Precipitation - Tongue River

These graphs represent precipitation in the Big Horn Mountains that affect the Tongue River. Snow water equivalent (SWE) represents the amount of water contained within the snowpack when it melts.



**Precipitation in Tongue River Watershed:** Precipitation in the Tongue River Water shed is currently is at a 119% of median which is in the 86th percentile. As of August 2nd, the stations have recorded approximately 29.3 inches of precipitation. This is a 2.8 inch increase since July 1, 2023.

Sources:

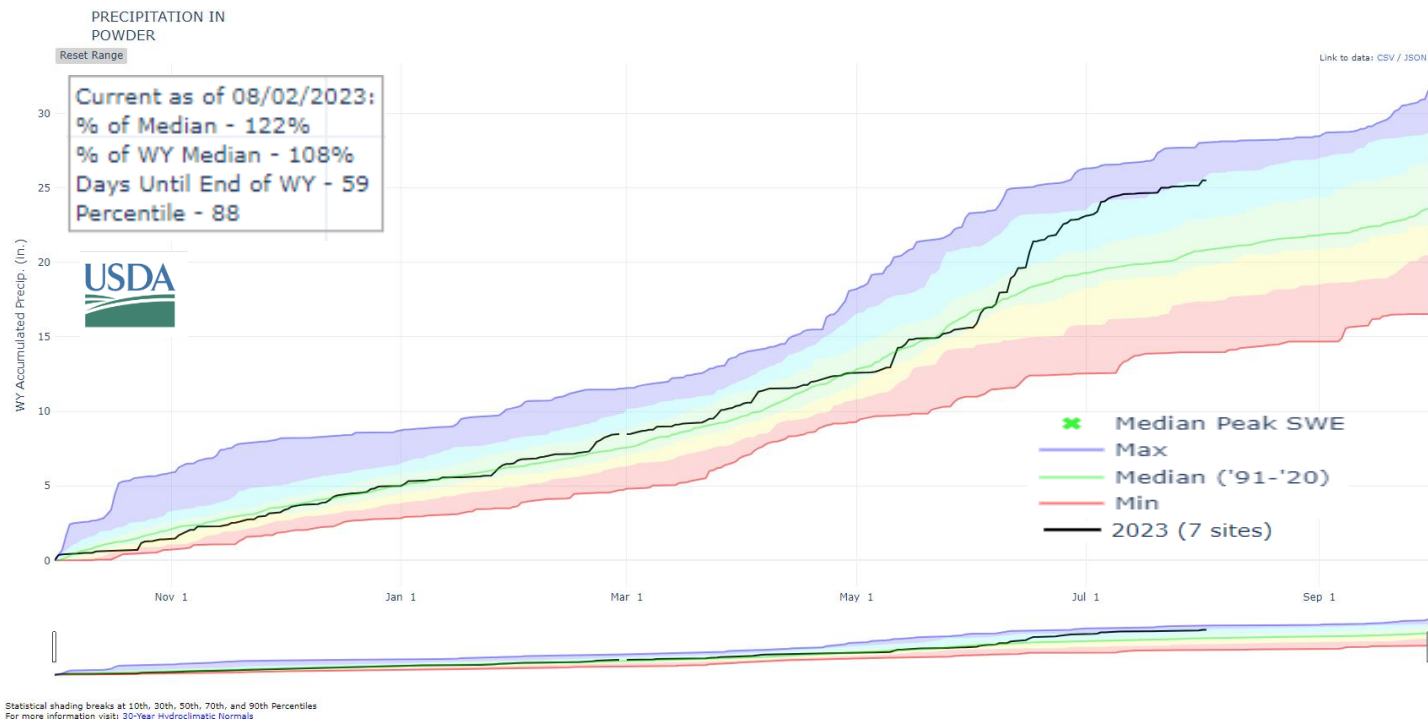
[https://www.nrcs.usda.gov/Internet/WCIS/AWS\\_PLOTS/basinCharts/POR/WTEQ/assocHUC6/100901\\_Tongue.html](https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assocHUC6/100901_Tongue.html)

[https://www.nrcs.usda.gov/Internet/WCIS/AWS\\_PLOTS/basinCharts/POR/PREC/assocHUC6/100901\\_Tongue.html](https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/PREC/assocHUC6/100901_Tongue.html)



# Precipitation - Powder River

These graphs represent precipitation in the Big Horn Mountains that affect the Powder River. Snow water equivalent represents the amount of water contained within the snowpack when it melts.



**Precipitation in Powder River Watershed:** Precipitation in the Bighorn Mountains for the Powder River watershed has continued to increase since the beginning of July. It is currently 122% of median which is in the 88th percentile. As of August 2nd, the stations have recorded approximately 25.5 inches of precipitation. This is a 2.8 inch increase from May 30, 2023.

Sources:

[https://www.nrcs.usda.gov/Internet/WCIS/AWS\\_PLOTS/basinCharts/POR/WTEQ/assocHUC6/100902\\_Powder.html](https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/WTEQ/assocHUC6/100902_Powder.html)

[https://www.nrcs.usda.gov/Internet/WCIS/AWS\\_PLOTS/basinCharts/POR/PREC/assocHUC6/100902\\_Powder.html](https://www.nrcs.usda.gov/Internet/WCIS/AWS_PLOTS/basinCharts/POR/PREC/assocHUC6/100902_Powder.html)





# Reservoir Capacity & Stream Flow

The total capacity of reservoirs and current water storage includes all the water in the reservoir including unusable water beneath the outtake.

## Lake DeSmet

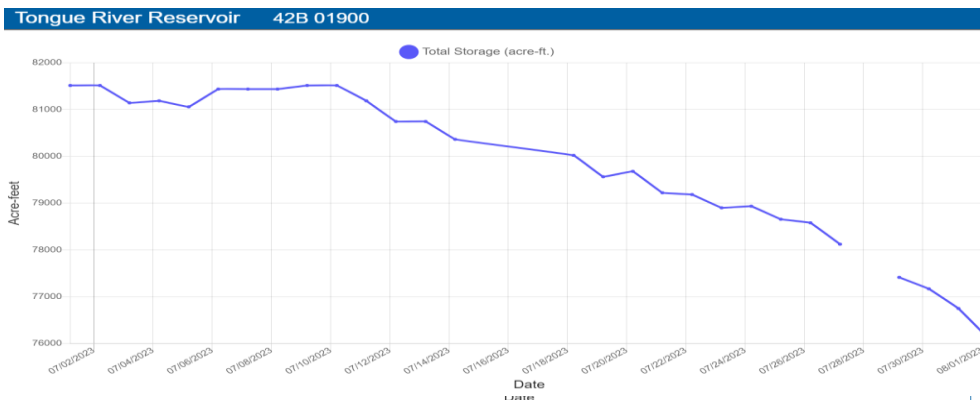
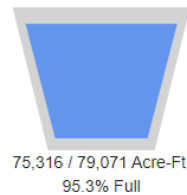
As of Aug 1, 2023, Lake DeSmet has increased to a total of 212,963 A.F. in storage, which is 91% of its total capacity.

Reservoir	Storage (Acre-ft)	Total Storage (Acre-ft)	Active Storage (Acre-ft)	Total Storage (%)
Bighorn	4,400	5,756	4,624	76.4
Cross Creek	773	798	798	96.8
Dome Lake No.1	1,496	1,506	1,506	99.4
Kearney Lake	5,551	7,500	6,324	74.0
Park	9,977	12,500	10,362	79.8
Sawmill	1,231	1,831	1,275	67.2

## Tongue River Reservoir

Even though the amount of water in the Tongue River Reservoir declined in the month of July, the Reservoir level remains high being 95.3% full. It currently is at 75,316 acre feet of water storage as of Aug 1, 2023.

### 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.

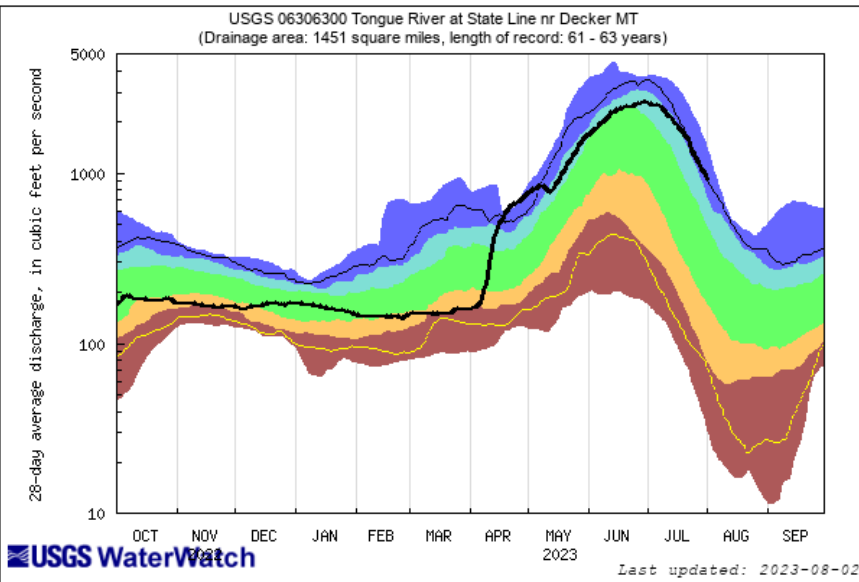
### Sources:

Lake DeSmet Operating Department at [lakedesmet@johnsoncowy.us](mailto: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/>



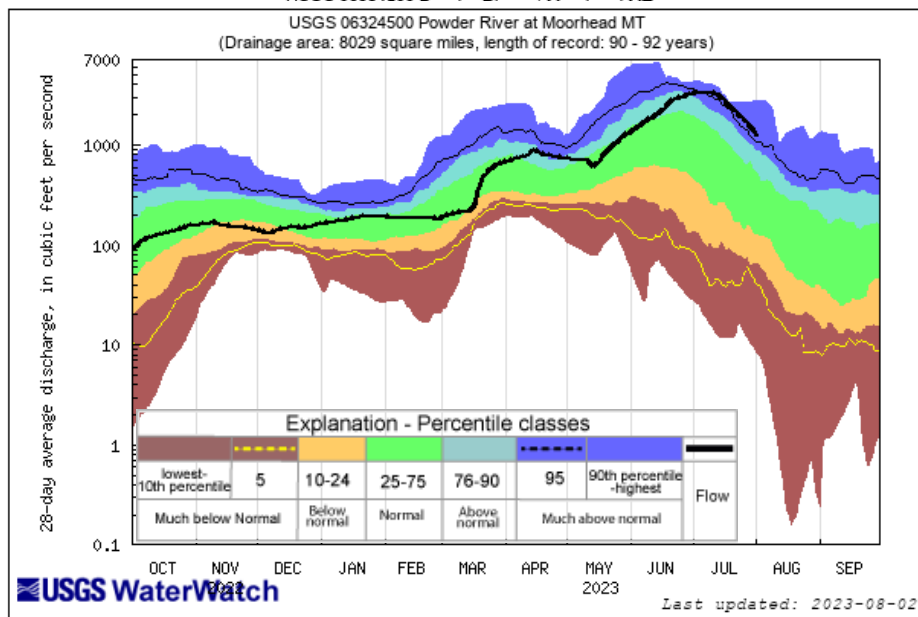
# Select Stream Flow Stations

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.



**Tongue River Border Station Stream Flow:** Throughout the month of July the average discharge was approximately 928.25 cfs. This rate has decreased since the beginning of July. Streamflow for the Tongue River remains much above normal for this time of the year.

**Powder River Border Station Stream Flow:** Through out the month of July the average discharge was approximately 1250.86 cfs. Even though the rate has decreased since the beginning of July, it is still much above normal flow amount for this time of year.

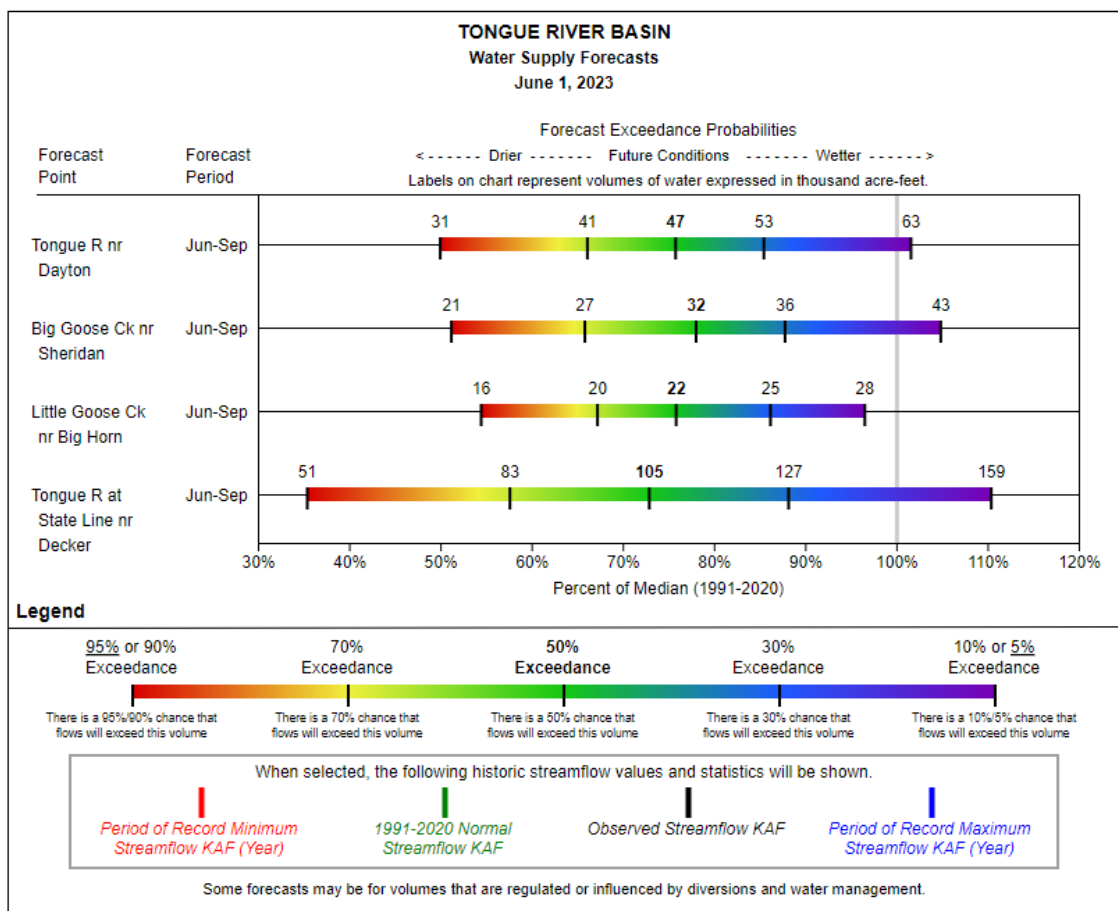


Sources: <https://waterwatch.usgs.gov/index.php?id=mv01d>  
[https://waterwatch.usgs.gov/?id=wwchart\\_sitedur&ofmt=plot\\_mvbg&site\\_no=06306300](https://waterwatch.usgs.gov/?id=wwchart_sitedur&ofmt=plot_mvbg&site_no=06306300)  
[https://waterwatch.usgs.gov/?id=wwchart\\_sitedur&ofmt=plot\\_mvbg&site\\_no=06324500](https://waterwatch.usgs.gov/?id=wwchart_sitedur&ofmt=plot_mvbg&site_no=06324500)



# 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:** The chart was last updated in June but includes the predicted water supply forecast for July through September. In the Tongue River watershed, based on the Jun-Sept forecast, we are likely to see at least 75% of median. Based on this forecast, there is only a 5-10% chance we will be above median.

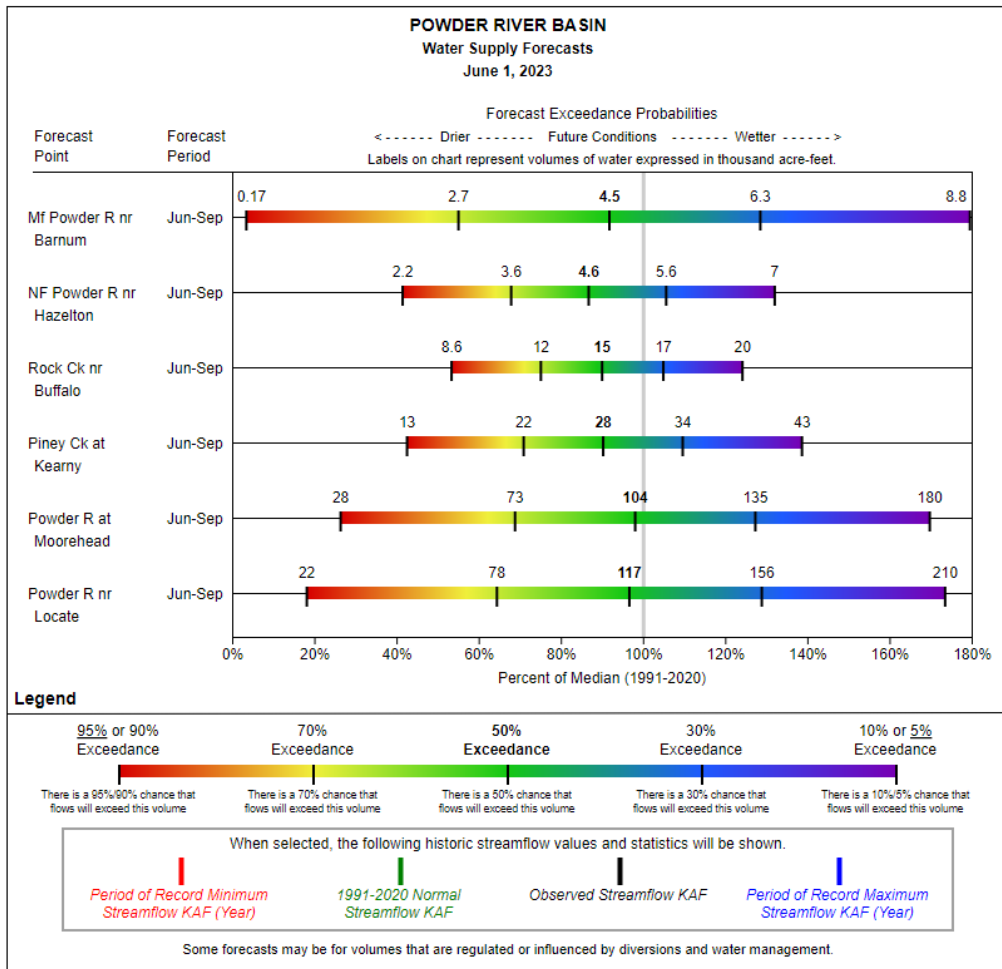
Sources:

<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 Water Supply:** The chart was last updated in June, but includes the predicted water supply forecast for July through September. In the Powder River Watershed, streamflow is forecast to be close to the 30-year median, with a 30%-50% chance that the amount of water will be more than the median for most sites.

Sources:

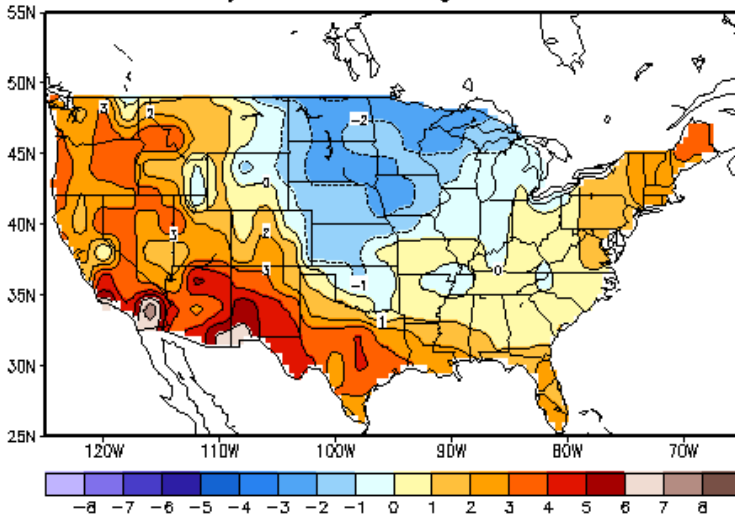
<https://www.nrcs.usda.gov/wps/portal/wcc/home/waterSupply/waterSupplyForecasts/>



# 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.

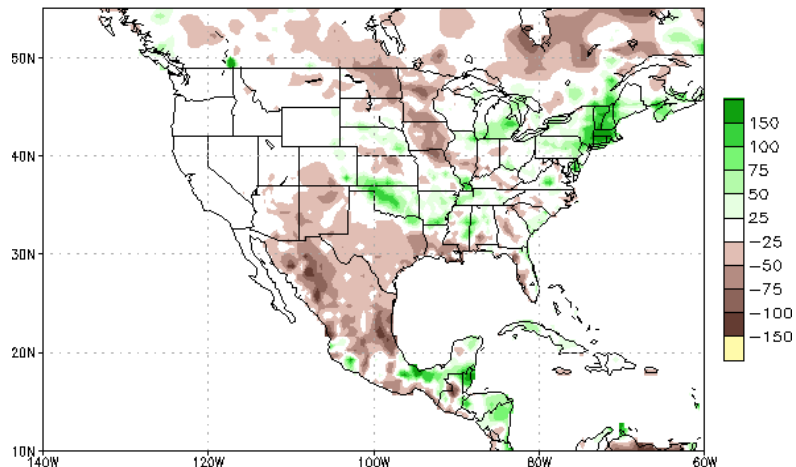
Mean Temp (F) Anomaly  
30-day mean ending Jul 30 2023



**Temperature Anomaly:** In July the temperature in Sheridan County was 1-2 degrees lower than the normal range. The average temperature for Sheridan in the past 14 days is between 70 and 75 degrees Fahrenheit.

**Precipitation:** The rainfall for July in Sheridan County was between 0-25 mm. This a decreased amount of precipitation from last month which was 100-150 mm.

Prep Anomalies (mm) 03JUL2023-01AUG2023



Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1991-2020)

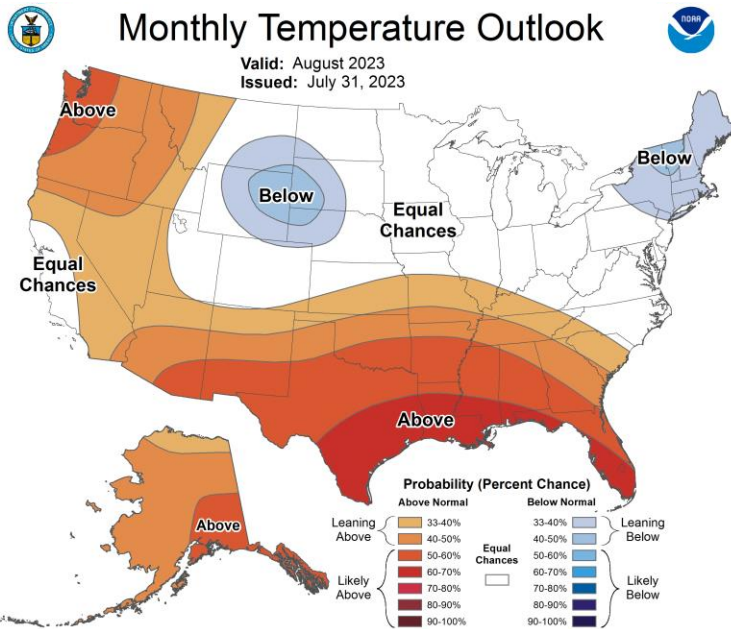
Sources: [https://www.cpc.ncep.noaa.gov/products/tanal/temp\\_analyses.php](https://www.cpc.ncep.noaa.gov/products/tanal/temp_analyses.php)  
[https://www.cpc.ncep.noaa.gov/products/Global\\_Monsoons/American\\_Monsoons/NAMS\\_precip\\_monitoring.shtml](https://www.cpc.ncep.noaa.gov/products/Global_Monsoons/American_Monsoons/NAMS_precip_monitoring.shtml)  
2 [https://www.cpc.ncep.noaa.gov/products/expert\\_assessment/mdo\\_discussion.php](https://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_discussion.php)



# Temperature Forecast and Precipitation Forecast

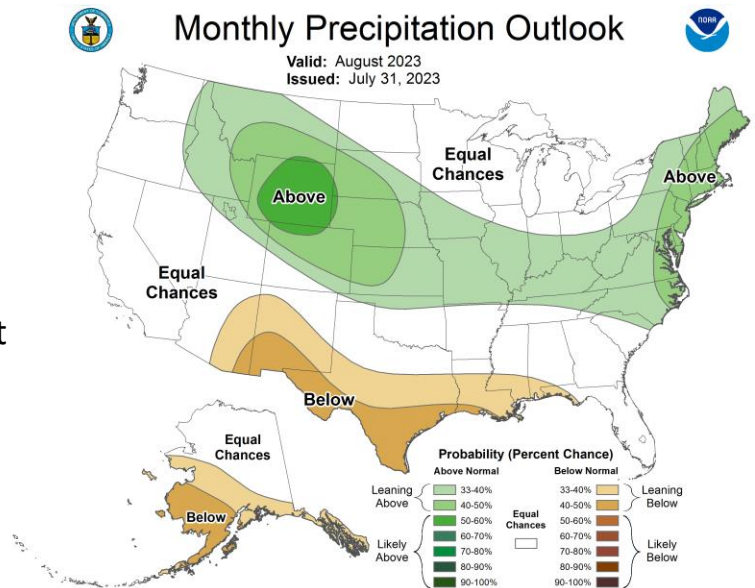
[https://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/lead14/interactive/index.php](https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/interactive/index.php)

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



**Temperature:** Sheridan County has a 33-40% chance of having Temperatures below average for the month of August

**Precipitation:** Sheridan County has a 50%-60% chance of receiving precipitation above the normal amount for the month of August.



Sources: <https://www.cpc.ncep.noaa.gov/>  
[https://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/lead14/interactive/index.php](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](https://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_discussion.php)

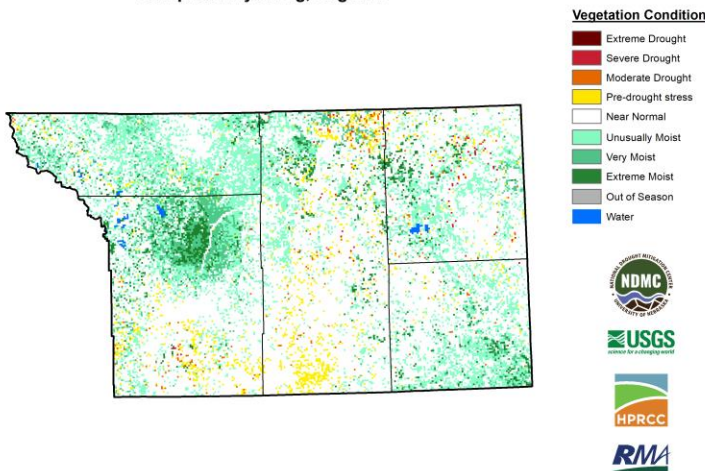


# Vegetation Drought Response and Soil Moisture

The graphs below are two ways of visualizing on-ground conditions. The vegetation Drought Response Index (Vegdri) uses a satellite to estimate vegetative stress. Soil moisture is helpful when looking at many things. Soil acts as a bank for moisture and can buffer drought degradation or improvement. It is also the water that plants have available to them so is linked to vegetative stress.

**Vegetation Drought Response Index**  
Complete: Wyoming, Region 2

July 30, 2023



## **Vegetation Drought Response:**

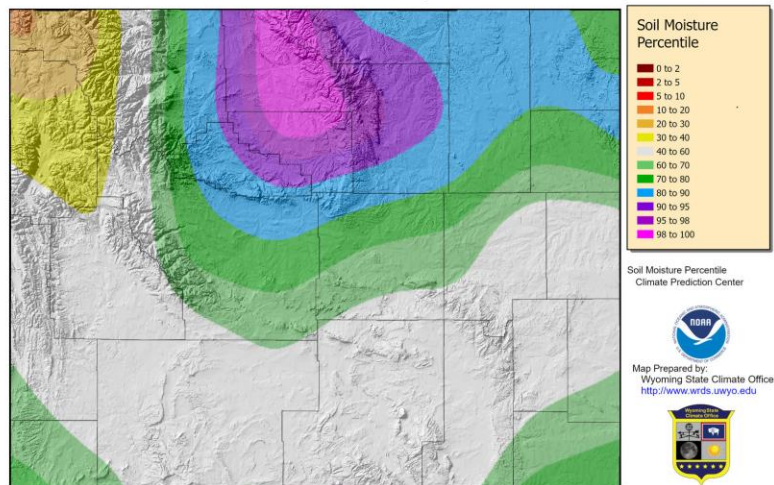
The Vegetation Drought Response Index shows that Sheridan County will be entering August with usually moist to very moist conditions. There is an increased amount of these conditions compared to last month.



## **Soil Moisture:**

As of August 1, 2023 the soil moisture in Sheridan County falls between the 80-90 percentile and the 90-95 percentile as you go into the West side of the county.

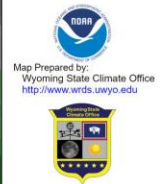
Soil Moisture Percentile for 01 Aug 2023



Provisional data, subject to revision

Modeled Soil Moisture Percentile [https://www.cpc.ncep.noaa.gov/products/GIS/GIS\\_DATA/USDM\\_Products/soil\\_percentile.php](https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil_percentile.php)  
Map Created 02 Aug 2023 <http://www.wrds.uwyo.edu>

Soil Moisture Percentile  
Climate Prediction Center



Sources: <https://vegdril.unl.edu/Home/VegDRIQuad.aspx?WY,2>  
[https://www.cpc.ncep.noaa.gov/products/Soilmst\\_Monitoring/US/Soilmst/Soilmst.shtml](https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml)  
<http://www.wrds.uwyo.edu/Soil/SM-Ptile-Current.html>

