Sheridan County Water Supply Report

July - 2023

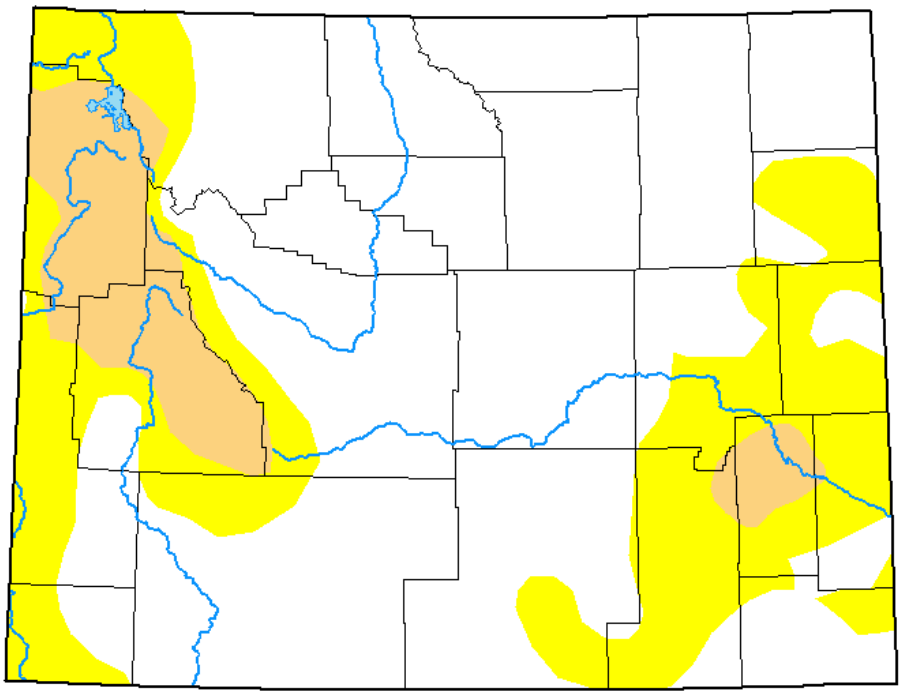
U.S. Drought Monitor

Wyoming

June 27, 2023

(Released Thursday, Jun. 29, 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:

Curtis Riganti
National Drought Mitigation Center

droughtmonitor.unl.edu

Compiled for SCLT by Rebecca Ash. Contact 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 LAND TRUST
Conservation | History | Recreation
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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

Highlight of the Month

Prairie Dog Swimming?

Have you ever seen a prairie dog swimming in Prairie Dog Creek? This month's highlight is an interview with Jackie Turner from the Sheridan County Conservation District (SCCD) about the Prairie Dog Creek watershed. She might not be able to tell us if prairie dogs can swim but she can update us on and how the SCCD is making a difference. Prairie Dog Creek is currently listed by the Wyoming Department of Environmental Quality as impaired for recreational use due to elevated *E. coli* bacteria concentrations. SCCD is taking action this summer with a couple of projects. "The purpose of these projects is to decrease or eliminate uncontrolled use of riparian areas by livestock and allow the landowner to better manage the riparian area," says Jackie. These projects include approximately 2,000 feet of riparian fencing, shallow well, livestock pipeline, waterers, and hydrants. These will serve a wide variety of livestock including horses and goats. Waterers and stock tanks will provide access to reliable and safe water year-round. Jackie expresses that, "The hope is that the water quality will improve within these watersheds over time." SCCD offers 50-80% cost-share assistance for eligible livestock projects along impaired waterbodies within the Tongue River, Goose Creek, and Prairie Dog Creek watersheds. The next cost share assistance application deadline is August 1, 2023. They would love to help anyone who is interested in making their property safer and more efficient for livestock as well help increase the Prairie Dog watershed health.

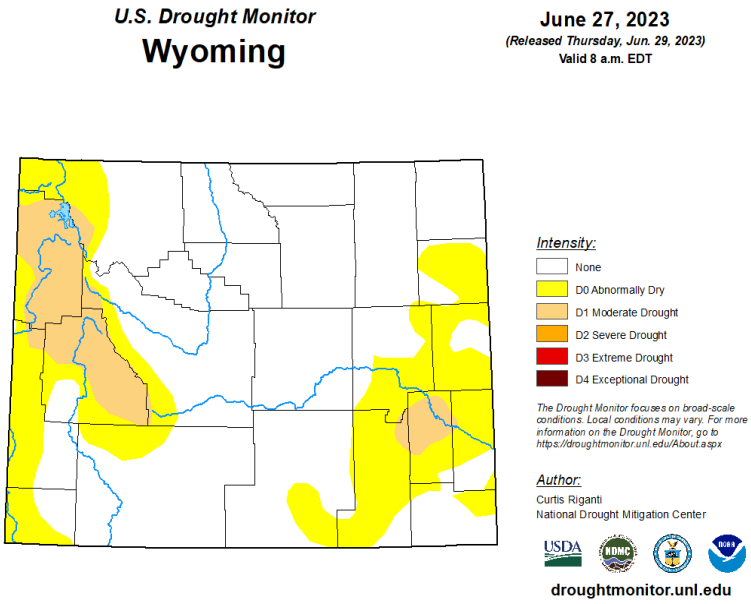
SHERIDAN COUNTY CONSERVATION DISTRICT

Sheridan County Conservation District
1949 Sugarland Drive, Suite 102
Sheridan, WY 82801
(307) 672-5820 ext. 3

SCLT

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.

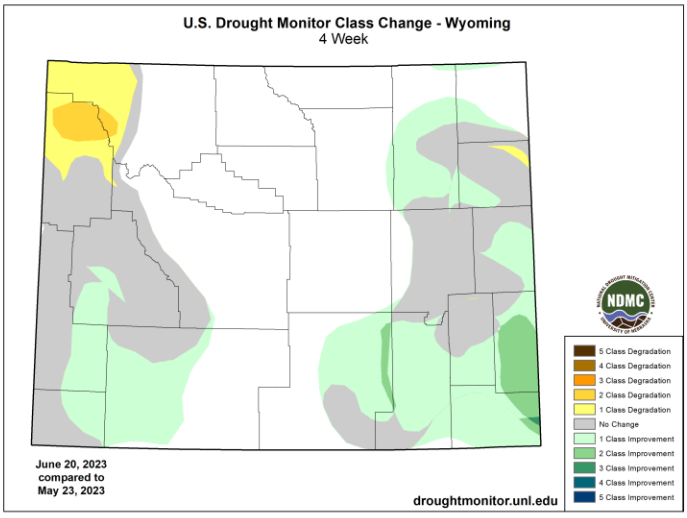


Current Drought Monitor:

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 has alleviated drought in the county.

Change in Drought Monitor:

As the end of June quickly approaches there has been no change in the county's drought status throughout the month. The entire county is free of drought conditions 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	D1	D2	D3	D4	DSCI
Current	2023-06-20	100.00	0.00	0.00	0.00	0.00	0.00	0
Last Week to Current	2023-06-13	100.00	0.00	0.00	0.00	0.00	0.00	0
3 Months Ago to Current	2023-03-21	100.00	0.00	0.00	0.00	0.00	0.00	0
Start of Calendar Year to Current	2022-12-27	94.99	5.01	0.00	0.00	0.00	0.00	5
Start of Water Year to Current	2022-09-27	49.02	50.98	0.00	0.00	0.00	0.00	51
One Year Ago to Current	2022-06-21	6.81	60.79	32.41	0.00	0.00	0.00	126

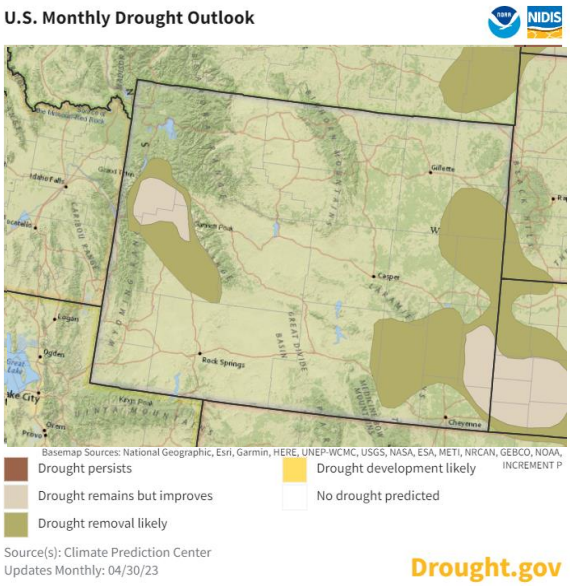
DSCI stands for Drought Severity and Coverage Index. It is "an experimental method for converting drought levels from the U.S. Drought Monitor map to a single value for an area."

History of Drought Monitor: Last year, in June 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:

"Another week of above normal rainfall across many areas of the Intermountain West resulted in widespread, yet targeted improvements to long-term drought conditions, assisted by near and below normal average high temperatures for the week."[1]

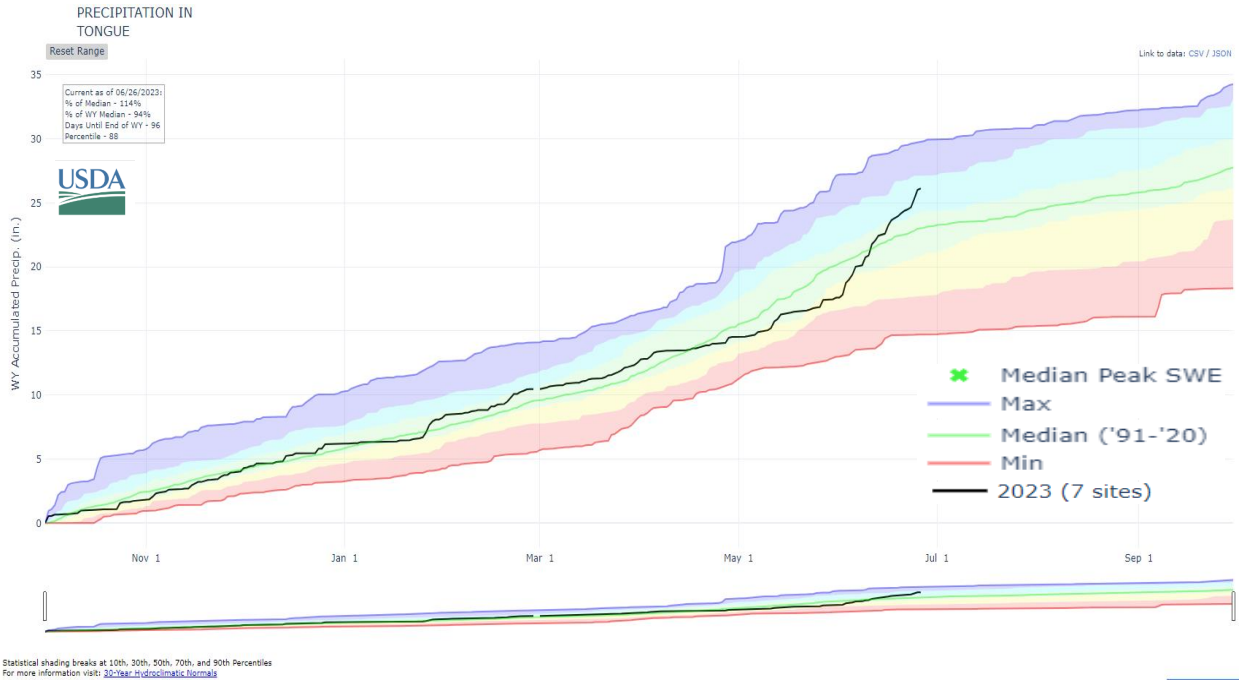
Forecast confidence is moderate for the Western and High Plains Regions.



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

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.

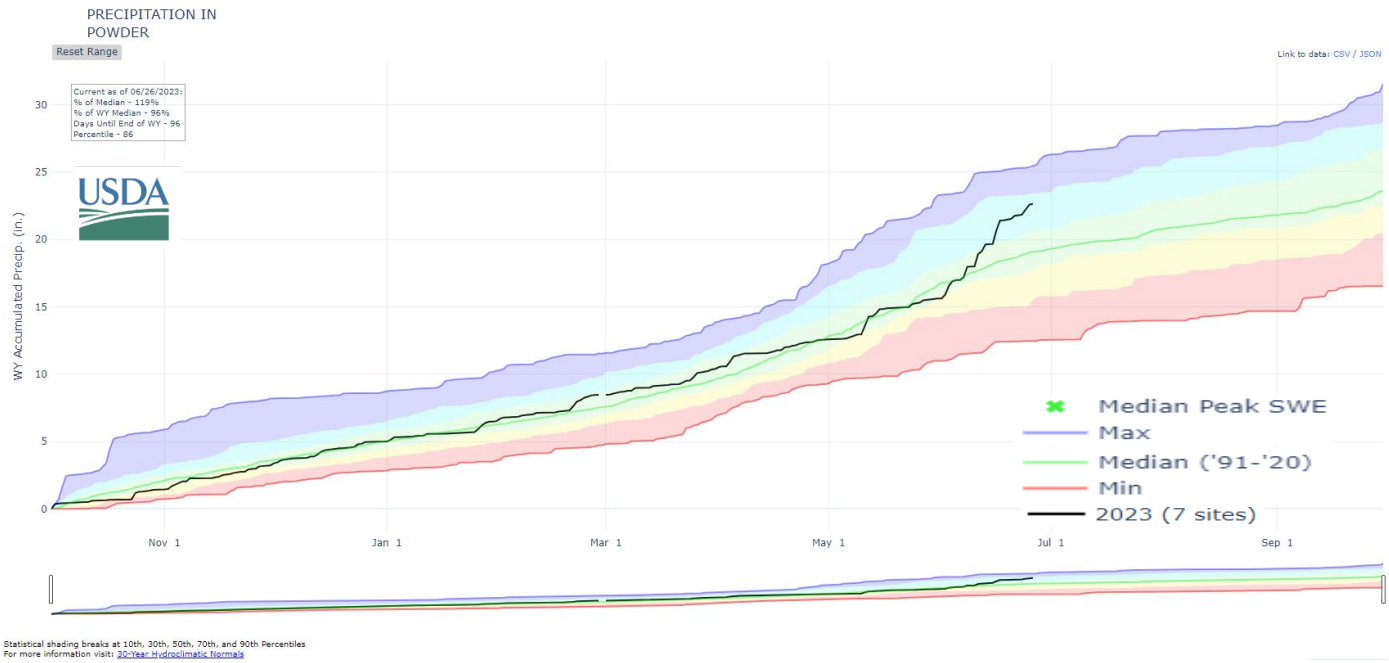


Precipitation in Tongue River Watershed: : Precipitation Tongue River Watershed has steadily increased as summer monsoons continued to occur throughout the month of June. It is currently 114% of median which is in the 88th percentile. As of June 26, the stations have recorded approximately 26.1 inches of precipitation. This is an 8.6 inch increase from May 30,2023.

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/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 steadily increased as summer monsoons continue to occur throughout the month of June. It is currently 119% of median which is in the 86th percentile. As of June 26, the stations have recorded approximately 22.7 inches of precipitation. This is a 7.1 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/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.

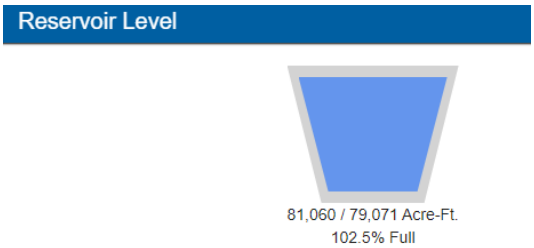
Lake DeSmet

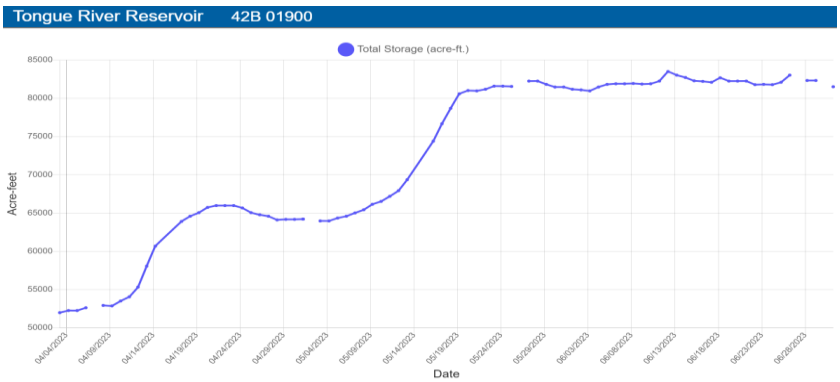
As of July 1, 2023, Lake DeSmet has increased to a total of 4,613.40 A.F. in storage, which is 91% of its total capacity.

Reservoir	Current Storage (Acre-ft)	Total Storage (Acre-ft)	Total Storage (%)
Bighorn	4,627	4,627	100.00%
Cross Creek	798	798	99.96%
Dome Lake No.1	1,458	2,030	71.83%
Kearney Lake	6,324	6,324	100.00%
Park	10,362	10,362	100.00%
Sawmill	1,275	1,275	100.00%

Tongue River Reservoir

With the amount of precipitation that has been received and the total remaining snowpack being 0.0 in. for the Tongue River watershed. It is no surprise that the reservoir is at 102.5% full with 81,060 Acer-Feet of water storage as of July 1, 2023.



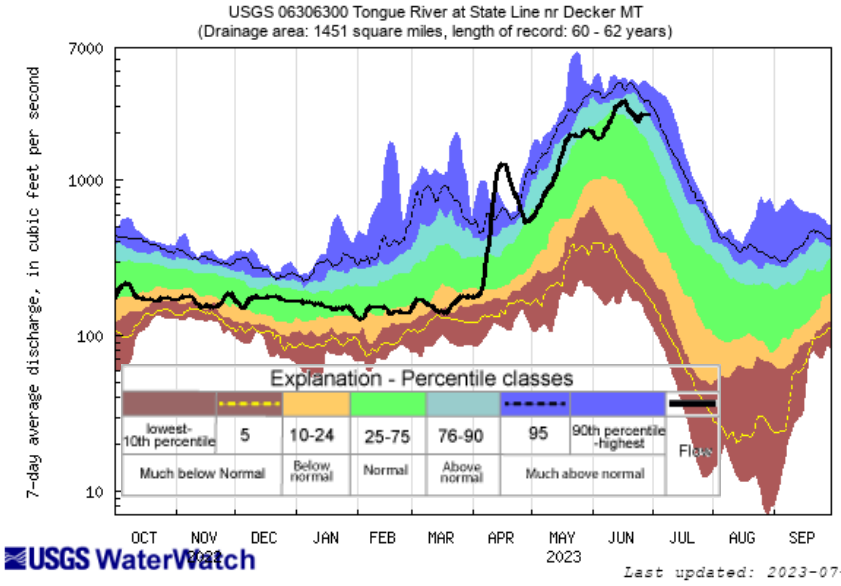


This graph displays the real time data of the Togue River Reservoir. This data remains provisional until it is officially re viewed due to variables that can affect the gages. Things that can effect that data includes but not limited to algal and aquatic growth, sediment movement, malfunction of recording 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/

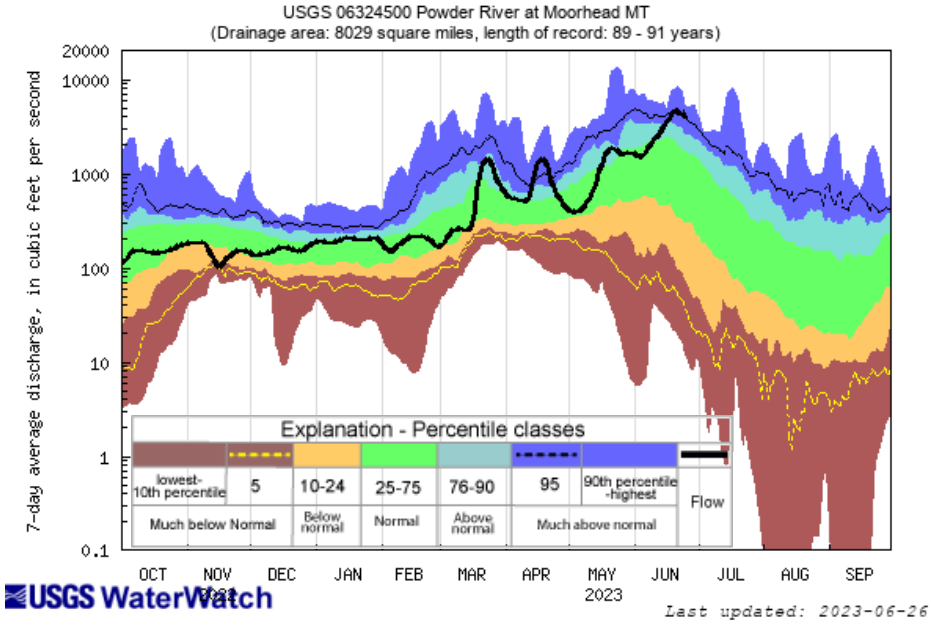
Select Stream Flow Stations

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.



Tongue River Border Station Stream Flow: Throughout the month of June the average discharge was approximately 2430 cfs. This rate has increased since the beginning of the month. Streamflow for the Tongue River is above normal for this time of the year.

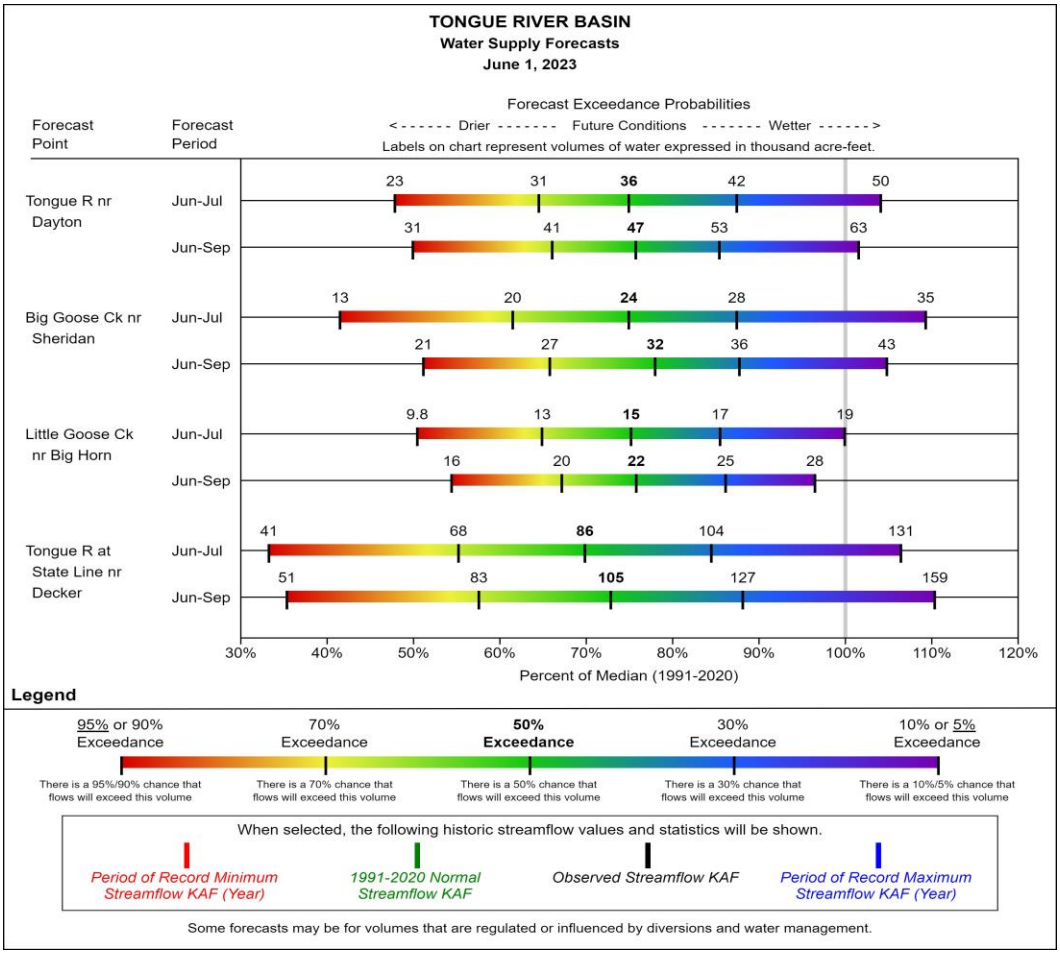
Powder River Border Station Stream Flow: Through out the month of June the average discharge was approximately 2230 cfs. This rate has increased since the beginning of the month of June and remains much above normal flow amount for this time of year.



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=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.

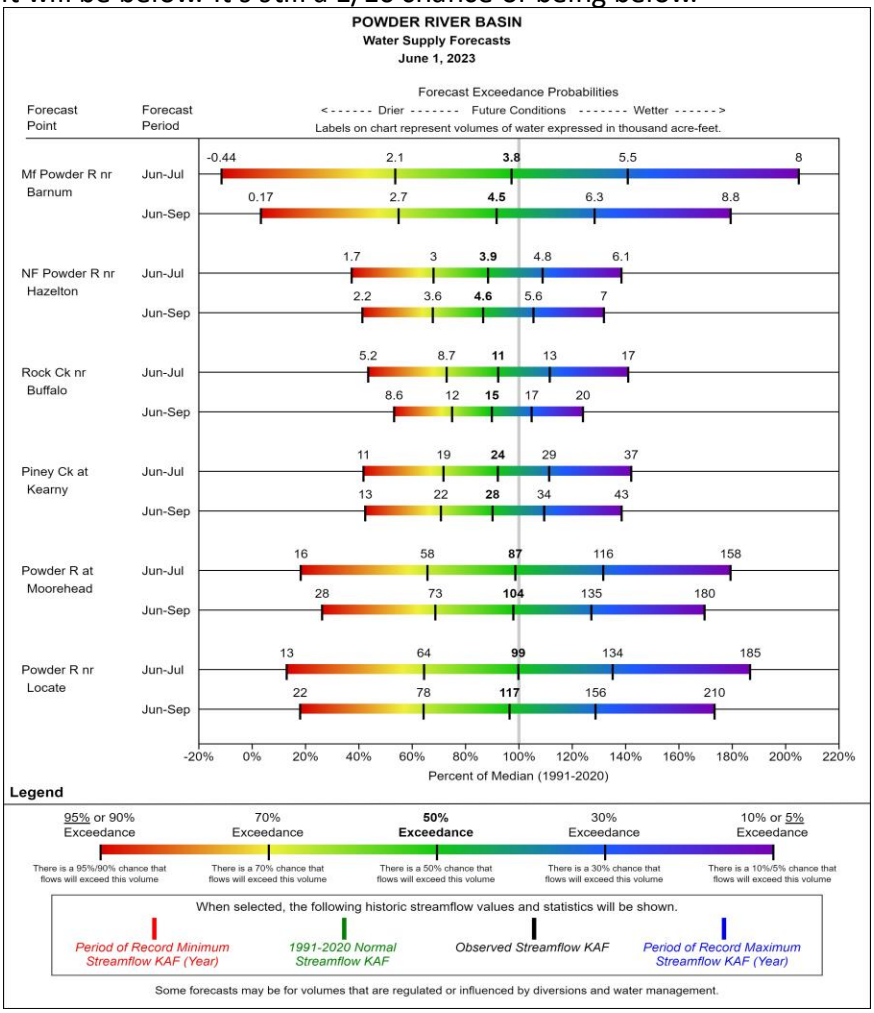


Tongue River Water Supply: The chart was last updated in June but includes the predicted water supply forecast for July through September**.** The top line for each station is the short-term forecast(June - July), and the bottom line is the long-term forecast. In the Tongue River watershed, streamflow is forecasted to be below the 30 year median with a 50% chance that most of the sites will see at least 75% of 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.

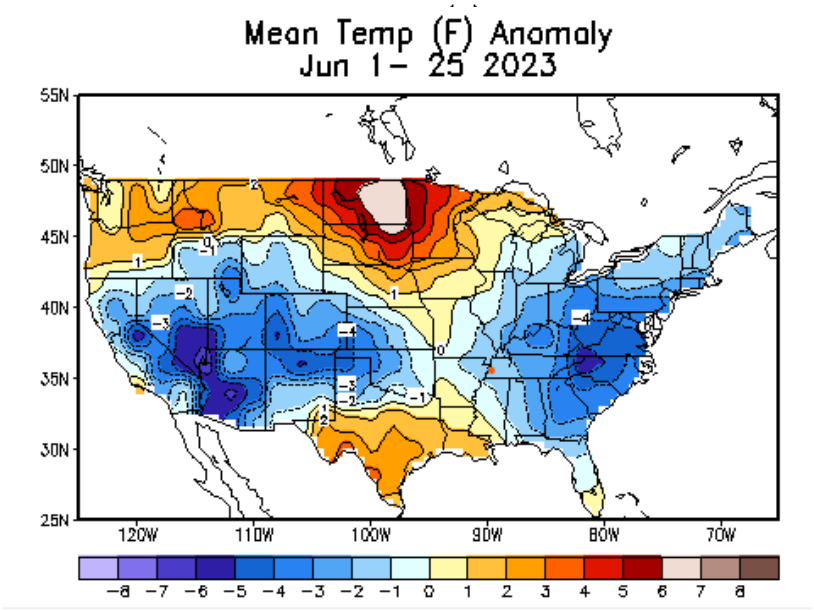


Powder River Water Supply: : The chart was last updated in June, but includes the predicted water supply forecast for July through September. The top line for each station is the short term forecast(June - July), and the bottom line is the long-term forecast. In the Powder River Watershed, streamflow 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/

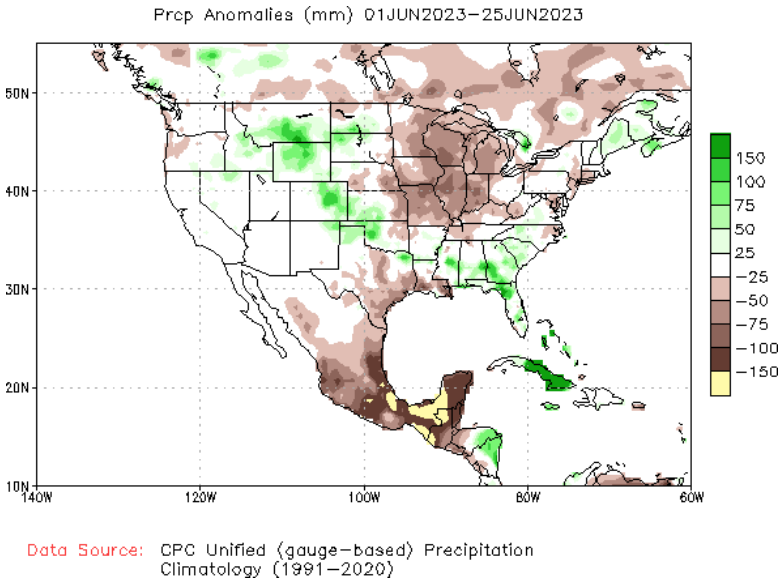
Temperature and Precipitation

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.



Temperature Anomaly: In June the temperature in Sheridan County was 1-2 degrees lower than the normal range. The average temperature for June in Sheridan is between 60 and 65 degrees Fahrenheit.

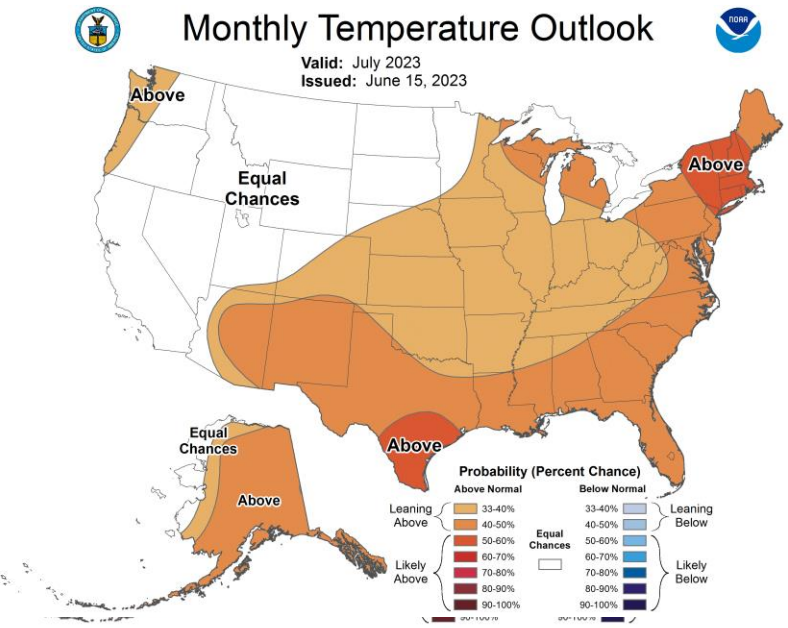
Precipitation: The rainfall for June in Sheridan County was between 100-150 mm. This is above the normal average for the month



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

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.



Temperature: Sheridan County has equal chances of seeing temperatures below or above average for the month of July.

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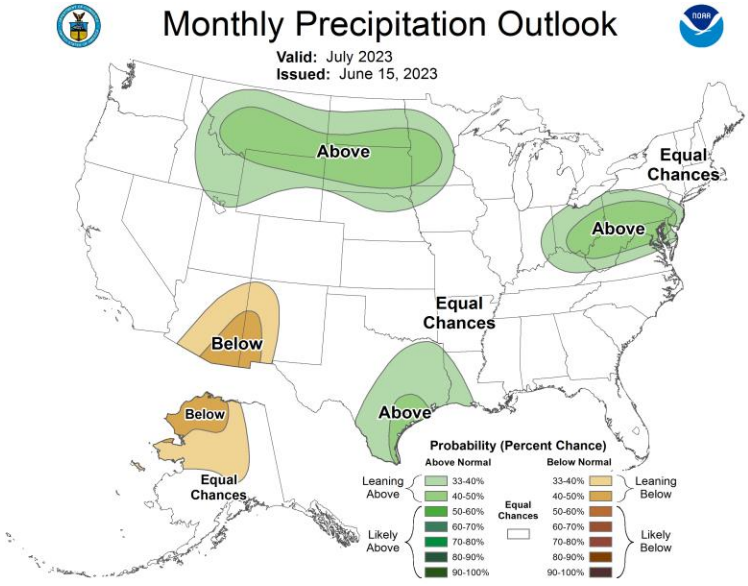
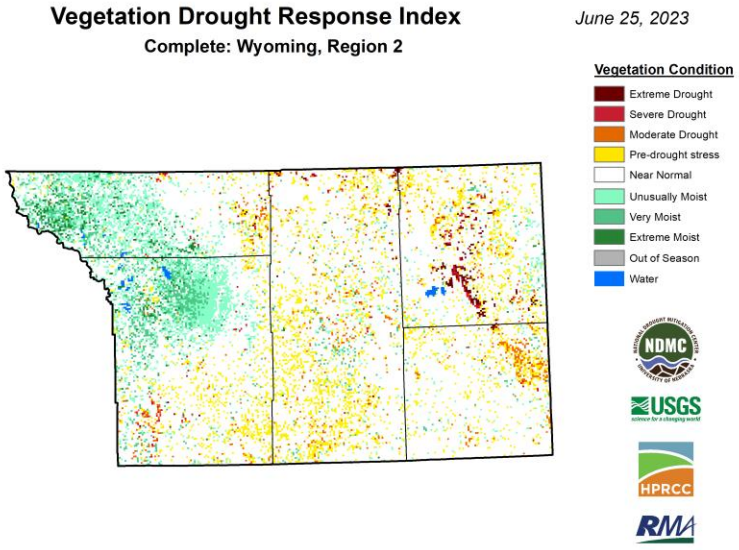
Precipitation: Sheridan County has a 40-50% chance of receiving precipitation above the normal amount for the month of July.



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

Vegetation Drought Response and Soil Moisture

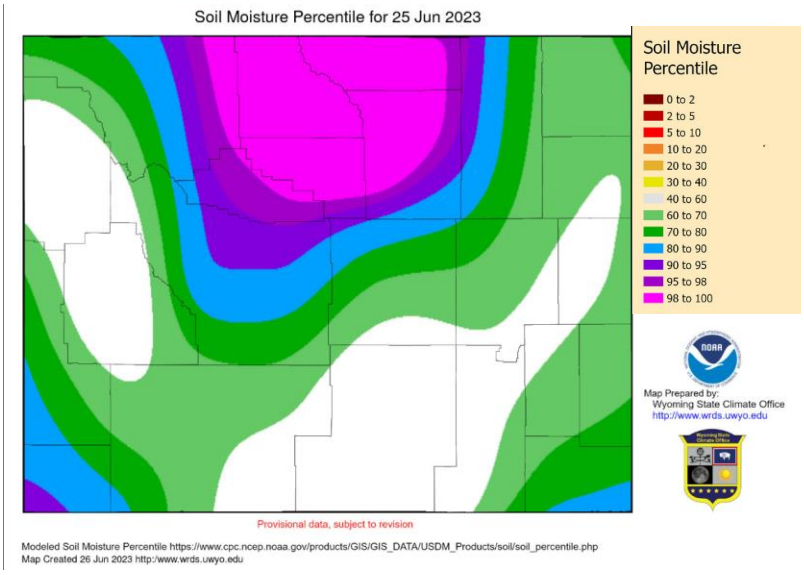
The graphs below are two ways of visualizing on-ground conditions. The vegetation Drought Response Index (Vegdri) uses a satellite to estimate vegetative stress. Soil moisture is helpful when looking at many things. Soil acts as a bank for moisture and can buffer drought degradation or improvement. It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



Vegetation Drought Response:. The Vegetation Drought Response Index shows that Sheridan County is experiencing a variety of vegetation conditions. The majority of the county is showing unusually moist to normal vegetation conditions for the month of June and continues as we go into July.

Soil Moisture:

For the month of June Sheridan County fell into the 98-100th percentile for soil moisture. As we enter into July, the high soil moisture will prevent the vegetation from being as vulnerable to hotter temperatures.



Sources: https://vegdri.unl.edu/Home/VegDRIQuad.aspx?WY,2
https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml
http://www.wrds.uwyo.edu/Soil/SM-Ptile-Current.html