



Please contact drought@centennialvalleyassociation.org if you have any questions, comments, or suggestions.

Greetings from the Centennial Valley Association!

Summer went flying by and fall is here in the Centennial Valley! August and September rains were fairly significant compared to most years, finishing the 2023 Water Year off on a high note. For the end of the Water Year (September 30th), the Jefferson River basin reported 116% of median precipitation and the Red Rock subbasin reported 114% of median precipitation. As of October 9th, the Jefferson River basin is reporting 67% of median for snow water equivalent and the Red Rock subbasin is reporting 100% of snow water equivalent!

Temperatures have begun cooling off in the Centennial Valley. September averaged 65.8°F for the high and 34.8°F for the low. So far in October, the [BLM RAWS](#) site is reporting 58.6°F for the average high and 30.8° as the average low. The National Weather Service issued a winter weather advisory for the Centennial Mountains from midnight on October 10th through the early morning hours of October 12th. It is predicting upwards of 8" of mountain snow! Despite this weather system moving through, the temperatures are predicted to be back above normal from October 15th-23rd, with near normal to below average precipitation ([NOAA](#)).

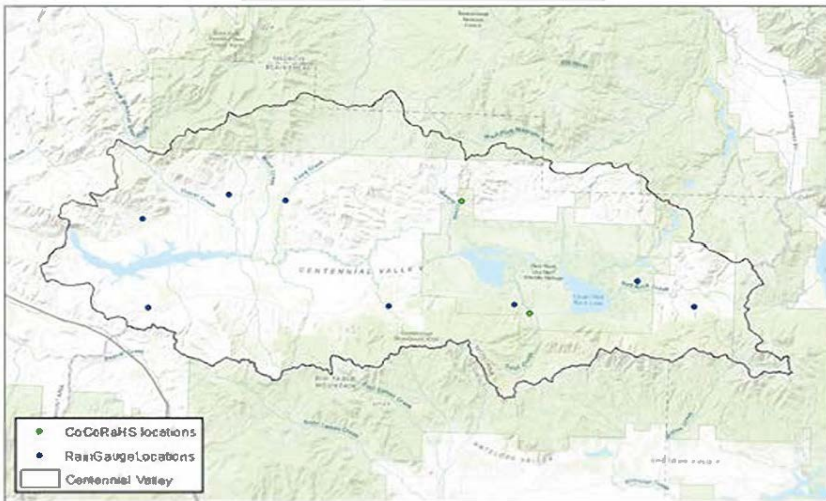
Rifle season started on October 7th for pronghorn antelope, and general rifle season for elk and deer begins October 21st. Although the fall temperatures and weather may make it seem like fire danger is summer history, please remain vigilant about fire safety and risk indicators while out hunting or recreating this fall. Enjoy the fall days!

Precipitation Data - September 2023

September had a good amount of moisture come to the Centennial Valley to close out the water year, enough moisture to even contribute to another grass green-up! In August, CVA staff relocated the Elk Lake Road rain gauge over to the Wolverine area to capture data. As low temperatures have begun to stay near or below freezing, the rain gauges were removed at the end of the month to prevent breakage. CVA hopes to expand our [automated rain gauge network](#) more broadly in the Centennial Valley next season. If this interests you, please let us know! We appreciate guidance on where data gaps are, as well as any funds to help purchase more gauges.

**Please note: The Elk Lake rain gauge was removed on August 14th and relocated to Wolverine on August 31st, so both sites do not reflect the full month of August.

Rain Gauge Locations

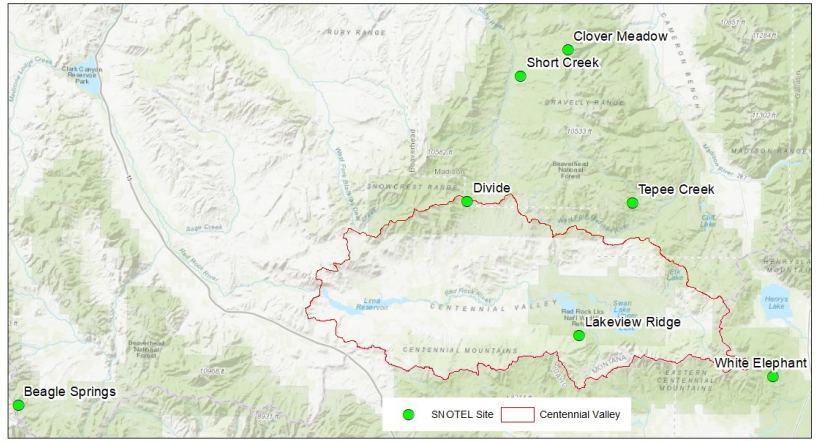


| Rain Gauge Name | September Precipitation Accumulation in inches (end of period values) | August Precipitation Accumulation in inches (end of period values) |
|-----------------------------------|---|--|
| Elk Lake Road | - | 1.59** |
| Alaska Basin | 1.05 | 4.18 |
| Lakeview | 3.43 | 8.89 |
| South Valley Road | 1.46 | 3.74 |
| Monida Hill | 1.38 | 2.78 |
| Lima Dam | 1.07 | 2.76 |
| Wolverine | 0.95 | 0.01** |
| Long Creek | 1.14 | 2.27 |
| TNC | 1.10 | 3.16 |
| Red Rock BLM RAWS | 1.60 | 2.95 |

Source: CVA & Partner Monitoring

Snowpack and Precipitation Data - As of September 30th, 2023

There are seven Natural Resources Conservation Service (NRCS) SNOTEL sites that surround the Centennial Valley (right). The SNOTEL site reports for precipitation accumulation for the end of the water year looked great! Percent median for precipitation accumulation for the month of September were all above 120%, with the exception of Beagle Springs at 99%. For the month of September, White Elephant received the most precipitation accumulation at 3.1", and Short Creek and Tepee Creek tied for the least amount of precipitation accumulation at 1.9". Lakeview Ridge recorded 2.3" of precipitation accumulation. Snow accumulation in the month of September was not captured by the SNOTEL sites.



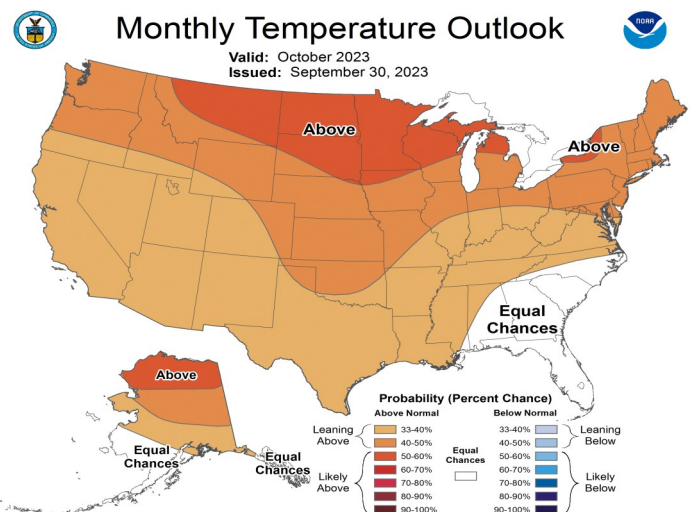
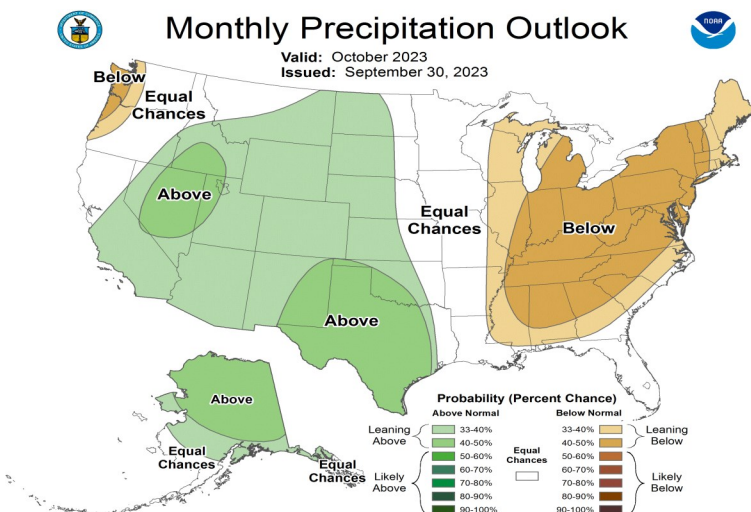
Source: [NRCS Report Generator](#)

| | Total Precipitation Accumulation for the Water Year (in) | Median Precipitation Accumulation (1991-2020) (in) | Precipitation Accumulation % of Median (1991-2020) |
|---------------------------|--|--|--|
| Beagle Springs (8,850 ft) | 23.0 | 23.2 | 99% |
| Clover Meadow (8,600 ft) | 39.6 | 32.6 | 121% |
| Divide (7,800 ft) | 29.7 | 23.8 | 125% |
| Lakeview Ridge (7,400 ft) | 34.2 | 26.8 | 128% |
| Short Creek (7,000 ft) | 23.9 | 18.0 | 133% |
| Tepee Creek (8,000 ft) | 33.0 | 25.6 | 129% |
| White Elephant (7,710 ft) | 53.2 | 44.6 | 119% |

Precipitation and Temperature Outlook – October 2023

The precipitation outlook for October predicts 33-40% chance of above normal precipitation in southwest Montana. The temperature outlook for October predicts a 40-50% chance of above normal temperatures in southwest Montana, with northern and eastern Montana seeing a 50-60% chance of above normal temperatures. For the near-term, the 6-10 day (October 15-19) outlooks issued by NOAA on October 9th shows that the entire state will see above normal temperatures and 30-40% chance of below normal precipitation.

Source: [NWS NOAA Climate Prediction Center](#)



USGS Stream Gage Data — September 2023

On September 30th, at 11:45pm, the stream gage at Red Rock Creek near Lakeview was at 2.77 feet and discharging around 30 CFS. This is a decrease from August 31st, when the site was at 2.89 feet and discharging around 36.8 CFS. This gage is seasonal and stopped recording on October 1st, 2023. On September 30th, at 11:45pm, the stream gage at Red Rock River near Lima Reservoir was at 2.46 feet and discharging around 243 CFS. This is a decrease from August 31st, when the site was at 2.81 feet and discharging around 343 CFS.

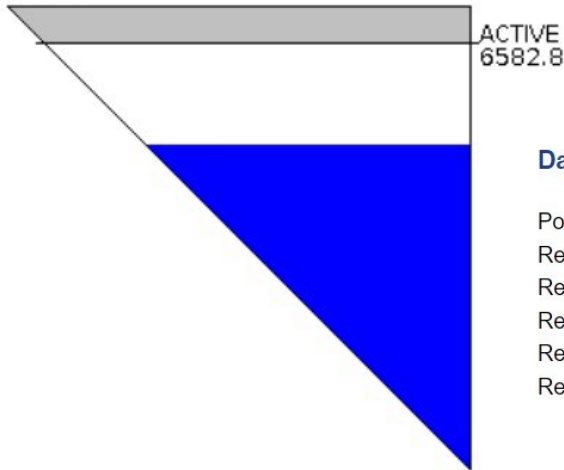
Source: [USGS Streamflow Data](#)

Lima Reservoir Data - As of October 4th, 2023

The Lima Reservoir currently has a pool elevation of 6575.7 feet and is 57.8% full. The reservoir inflow is 120.9 CFS and the outflow is 242.0 CFS.

Source: [Bureau of Reclamation](#)

FLOOD
6582.8



Daily Reservoir Data as of 10/04/2023

Pool Elevation is 6575.7 Feet
Reservoir Storage is 48560.6 Acre-Feet
Reservoir Inflow is 120.9 CFS
Reservoir Outflow is 242.0 CFS
Reservoir is 57.8 % Full*
Reservoir Flood Control Pool is filled 0.0 %

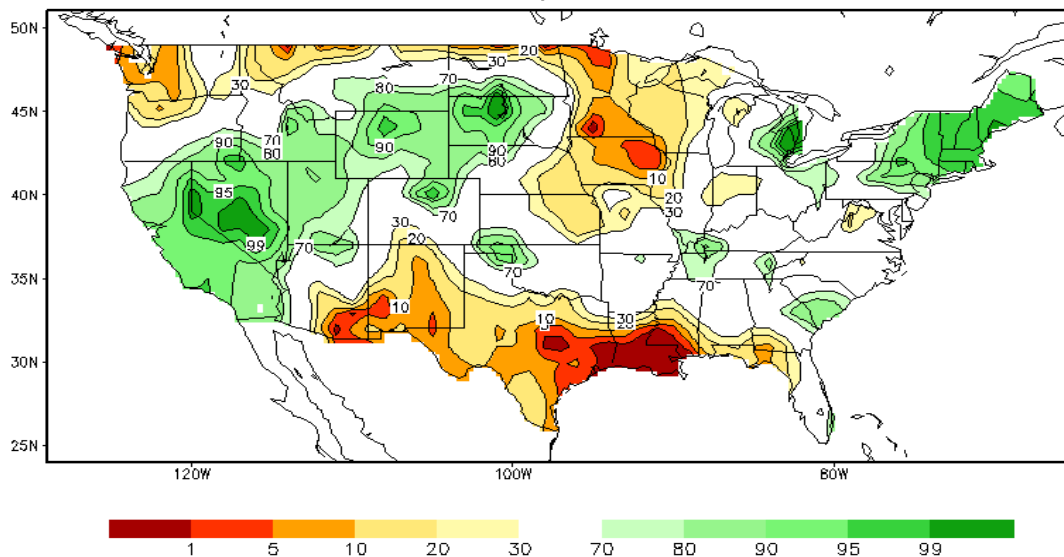
* Reservoir is considered "full" when pool elevation is at top of active conservation pool. Percentage is based on total reservoir volume below that level.

Soil Moisture Conditions — September 2023

Soil moisture is the total amount of water, including water vapor, in unsaturated soil. Soil moisture represents the water that resides in the pores of soil. In the Centennial Valley, the soil moisture was in the 70-80 percentile for the month of September.

Sources: [Climate Prediction Center](#)

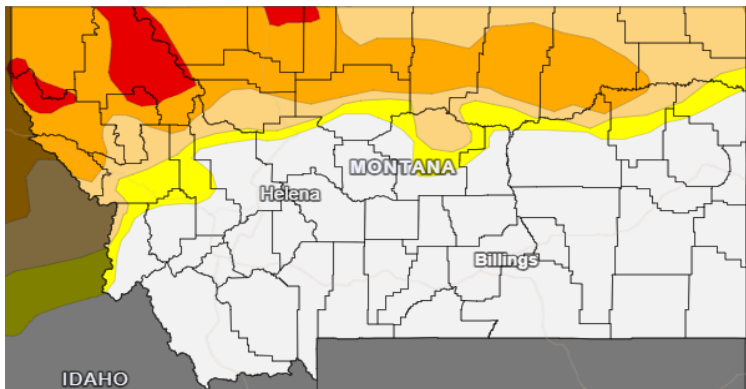
Calculated Soil Moisture Ranking Percentile SEP, 2023



Drought Data — October 2023

As of October 3rd, drought is not impacting the Centennial Valley. Unfortunately, northwest, north-central, and northeastern Montana are experiencing varying levels of drought, including extreme drought near Glacier and the Flathead Valley. In total, 37.3% of Montanans are experiencing drought. In Beaverhead County, the National Integrated Drought Information System is reporting that August was the 3rd wettest August on its 129 year record, up 1.71" from normal!

Source: [National Integrated Drought Information System](https://nids.dri.edu/)



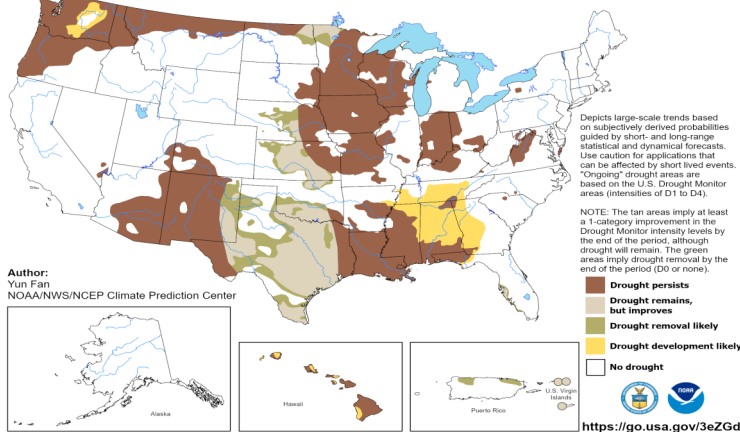
Drought Outlook – October 2023

Montanans in all northern parts of the state will experience persisting drought conditions for the month of October. For the rest of the state, drought is not predicted.

Source: [NWS NOAA Climate Prediction Center](https://www.noaa.gov/forecast/monitoring-assessment-and-data/drought/)

U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for October 2023
Released September 30, 2023



Warm and dry or cold and snowy? NOAA gives its winter prediction

The National Oceanic and Atmospheric Administration (NOAA) released their projections for the upcoming winter. Their projections indicate that there is a 95% chance that El Niño will continue through the winter. What does this mean? El Niño is a part of a cycle when waters of the equatorial Pacific Ocean become warmer. Usually when this pattern occurs, the northern US has warmer winters. According to NOAA, we may experience above average or well above average temperatures and below average precipitation from December 2023—February 2024.



To read the full article from KBZK Bozeman: <https://www.kbzk.com/warm-and-dry-or-cold-and-snowy-noaa-gives-its-winter-prediction/?fbclid=IwAR2dsh7pi8ZBW5T8Xt71bJbXQFWO4uCEBRw67Sqx85IV1rwC52RTVFDaxs>



If you have any questions, comments, or trouble interpreting the data, please contact drought@centennialvalleyassociation.org!

Helpful Links:

[Montana Drought Status Percentage](#)
[NRCS SNOTEL Report Generator](#)
[USGS Streamflow Data](#)
[Lima Reservoir](#)
[Palmer Drought Severity Index](#)
[BLM Weather Station](#)