

Teton River Water Supply Forecast

April 1, 2024

Snowpack Conditions

Click figures to link to plots

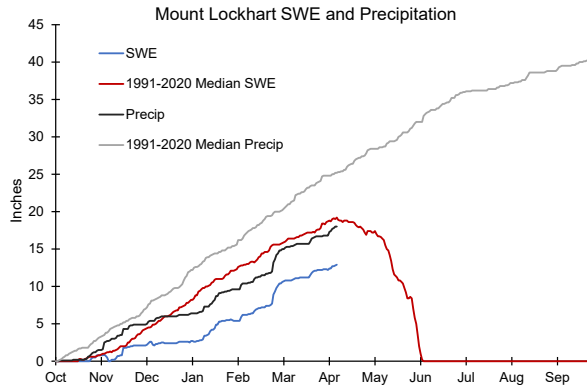


Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

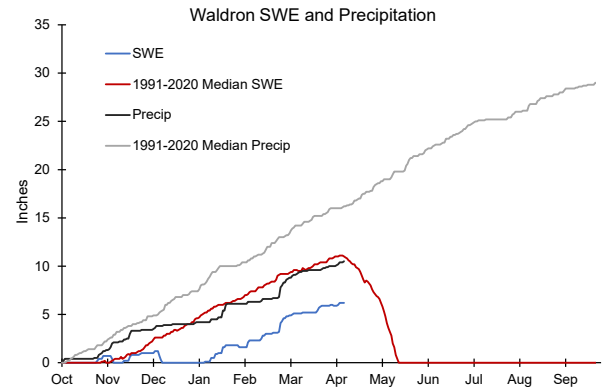


Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

– Snowpack conditions (Snow Water Equivalent or SWE) at the Natural Resource Conservation Service (NRCS) [Mt. Lockhart and Waldron SNOTEL](#) sites are **trending significantly below normal** as of March 1. **Mt. Lockhart is at 67% of the median** (Figure 1) and **Waldron is at 56% of the median** (Figure 2). SWE started out normal in the fall with major October snow, but has stayed far below normal since mid-November. This year's SWE has set the 40-yr low for portions of January at Mt. Lockhart and most of January and February at Waldron. Precipitation has shown a nearly identical trend staying below normal. Based on snowpack and precipitation so far, it is likely it will be a poor year for water supply. As of April 1, Waldron has likely peaked with SWE and Mt. Lockhart will with the next week if it hasn't already.

Streamflow Conditions

– The United States Geological Survey (USGS) gage [06102500](#) Teton River Below South Fork near Choteau (TRSF) is still in winter baseflow. The gage was started on April 1 and is reading 52 cfs, which is approximately normal for this time of year..

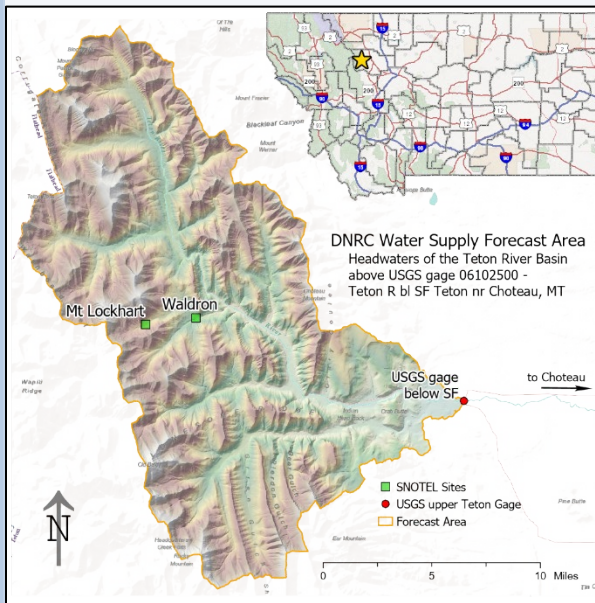
Weather Outlook

– The National Weather Service (NWS) **one-month outlook indicates approximately normal precipitation and above normal temperatures** for most of Montana. The El Niño Southern Oscillation (ENSO) index, is a measure of whether equatorial Pacific Ocean conditions known as El Niño (warm and dry for Montana) or La Niña (cold and wet) could develop and influence weather along the Rocky Mountain Front. Currently, El Niño conditions exist with warmer sea surface temperatures. El Niño has likely contributed to the warmer and drier conditions so far this year but is projected (~83% chance) to transition to ENSO-neutral by the end of May, meaning **El Niño may continue to influence Montana weather in the near-term but not as much over the summer.**



Disclaimer: The DNRC snowmelt runoff forecast follows NRCS methodology using statistical best practices and professional judgment. Like any forecast it contains uncertainty. Please consider the stated error and documentation associated with each model when using the predicted flow in your decision-making process.

Forecast Area



Forecast Period is April 1 – July 31

All predicted and displayed values are calculated for this period.

On a normal year, 49,908 acre-feet of water flows by the TRSF gage from April 1 – July 31 (based on the median of the total annual flow from 1999 to 2021). **Approximately 36,660 acre-feet (or 73%) of this flow is from snowmelt** built up at high elevations during the winter and spring. The remainder of flow is from rain events between April 1 and July 31. The normal rainfall in the forecast area during this period is 7.7 inches but can vary considerably. **The median rainfall (7.7 in) produces about 13,359 acre-feet of flow based on DNRC rainfall runoff model estimates.**

Runoff Forecast

DNRC’s April 1 water supply forecast predicts a **far below normal volume of 18,646 acre-feet** (Figure 3) of water from snowmelt, or 51% of normal. ****This is the estimated flow only from snowmelt****. Current information indicates that the 2024 runoff from accumulated snowpack is predicted to be like conditions observed in 2016, which is the driest year on record. For this site, the April forecast still has relatively high uncertainty. Based on the uncertainty of the prediction, there is a **90% chance snowmelt runoff will exceed 9,585 acre-feet (26% of normal)** and a **10% chance snowmelt runoff will exceed 33,285 acre-feet (91% of normal)**.

If there is a normal amount (7.7 inches) of rain from April 1 – July 31, the total flow is predicted to be 32,005 acre-feet. This is 17,903 acre-feet less than normal. Any excess rain (more than 7.7 inches) could increase the volume substantially (Figure 4). If it rains 11.5 or more inches during the forecast period, 2024 could be like 2021 or 2022. For reference, 2019 had more than 12 inches of rain from April 1 – July 31. **The effects of excess rain are visualized in Figure 4 as inches above normal.**

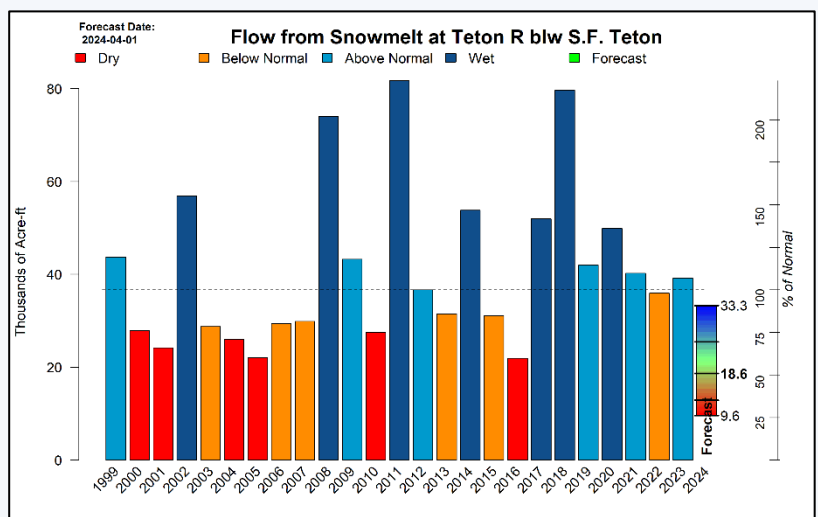


Figure 3: Historical snowmelt runoff and 2024 prediction.

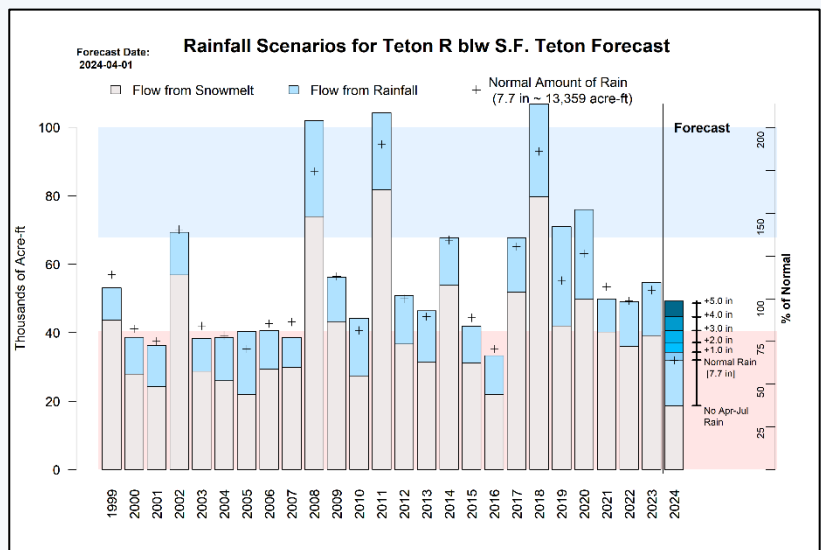


Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.



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