# Teton River Water Supply Forecast

March 1, 2023

## Snowpack Conditions

*Click figures to link to plots*

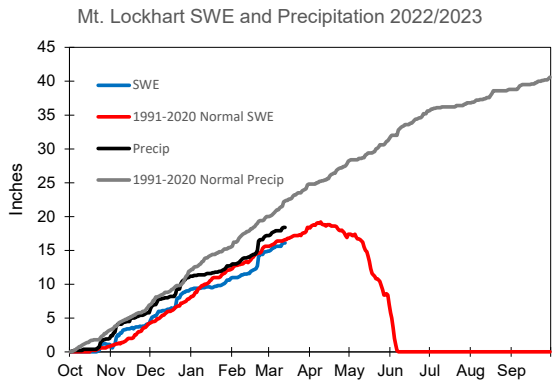



Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

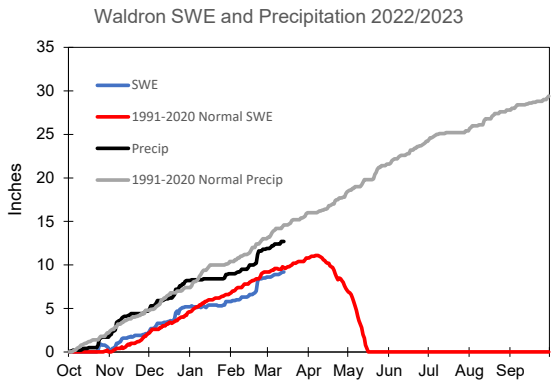



Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

– Snowpack conditions (Snow Water Equivalent or SWE) at the Natural Resource Conservation Service (NRCS) Mt. Lockhart and Waldron SNOTEL sites are **trending normal to slightly below normal** as of March 1. **Mt. Lockhart is at 97% of the median** (Figure 1) and **Waldron is at 95% of the median** (Figure 2). SWE started out normal to above normal in the fall until a dry spell in January and early February. Precipitation has shown a nearly identical trend staying below normal since. Based on snowpack and precipitation so far, it is equally likely it could be a drier than normal or normal year. As of March 1, the mountains should have accumulated almost (80%) of the winters total snow.

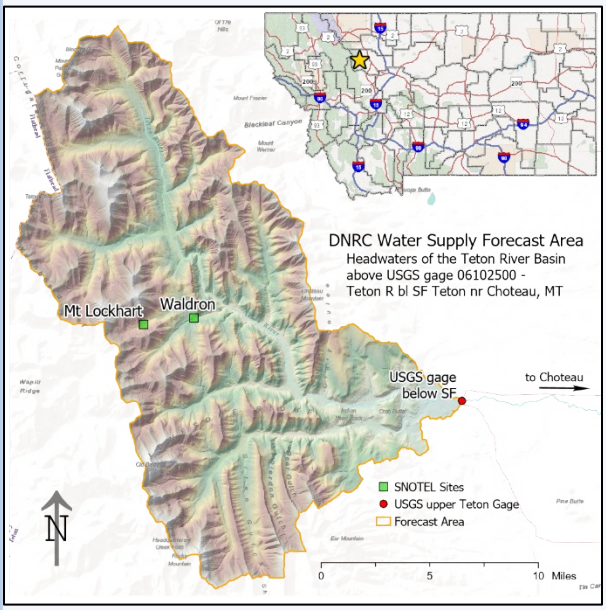
## Streamflow Conditions

– The United States Geological Survey (USGS) gage 06102500 Teton River Below South Fork near Choteau (TRSF) is still in winter baseflow. This gage is operated seasonally by USGS and is typically brought online on or before April 1st.

## Weather Outlook

– The National Weather Service (NWS) **one-month outlook indicates above normal precipitation and below 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, La Niña conditions exist with colder sea surface temperatures. La Niña has contributed to the colder conditions so far this year but is projected (~80-90% chance) to transition to ENSO-neutral within the next 2 months, meaning **La Niña may continue to influence Montana weather in the near-term but not as much over the summer**.

## 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 March 1 water supply forecast predicts a slightly **above normal volume of 40,021 acre-feet** (Figure 3) of water from snowmelt, or 109% of normal. ***This is the estimated flow only from snowmelt***. Current information indicates that the 2023 runoff from accumulated snowpack is predicted to be like conditions observed in 2021. The uncertainty in the March forecast is highest because the mountains can still accumulate snow for the next several months. Based on the uncertainty of the prediction, there is a **90% chance snowmelt runoff will exceed 26,900 acre-feet (73% of normal)** and a **10% chance snowmelt runoff will exceed 53,800 acre-feet (147% of normal).**

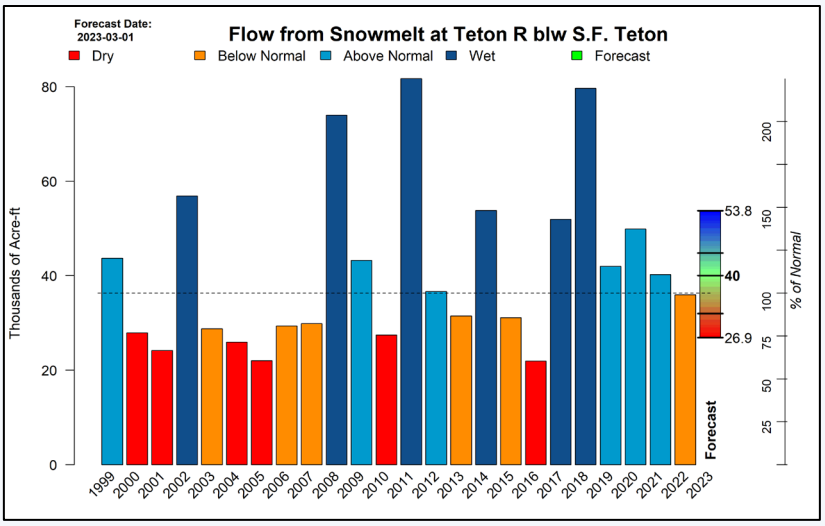



Figure 3: Historical snowmelt runoff and 2023 prediction.

**If there is a normal amount (7.7 inches) of rain from April 1 – July 31, the total flow is predicted to be 53,380 acre-feet.** This is **3,472 acre-feet more 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, 2023 could be like 2017 or 2019. 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.

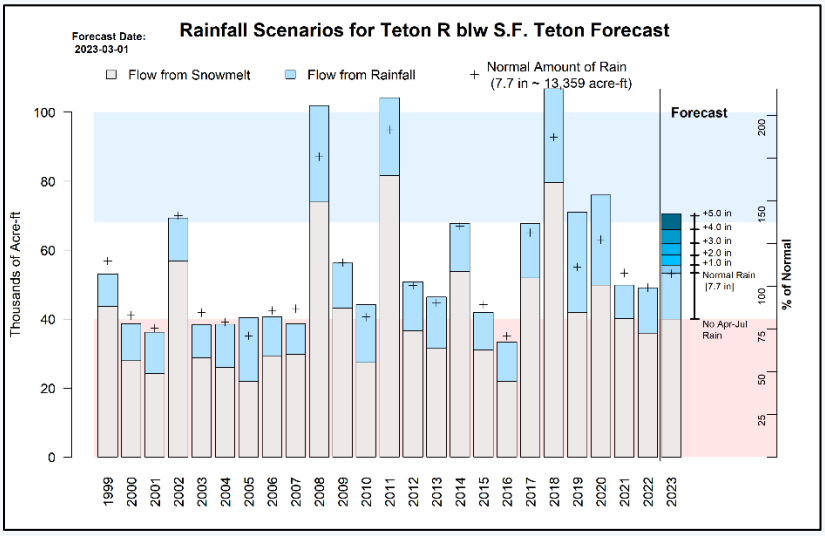



Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.



**Contact Info:** Todd Blythe, Hydrologist DNRC
406-438-0717
todd.blythe@mt.gov