Teton River Water Supply Forecast

March 1, 2025

Snowpack Conditions

Click figures to link to plots

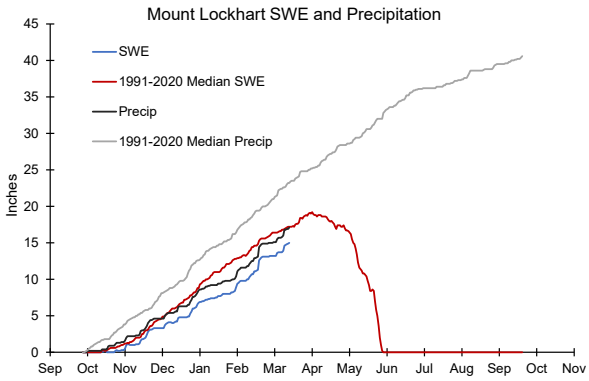


Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

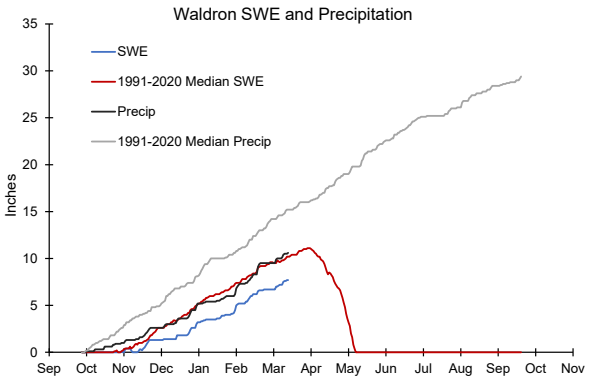


Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

– Snowpack conditions (Snow Water Equivalent or SWE) at the Natural Resource Conservation Service (NRCS) Mt. Lockhart and Waldron SNOTEL sites are **trending slightly below normal** as of March 1. **Mt. Lockhart is at 93% of the median** (Figure 1) and **Waldron is at 81% of the median** (Figure 2). SWE started out near normal in the fall at higher elevations but has hovered below average all season. Precipitation has shown a nearly identical trend staying below normal, especially at lower elevations. Lack of fall moisture/snow started the season off with less moisture overall. Given current conditions, there is an equal chance that this year is normal or below average for water supply. As of March 1, the mountains should have accumulated almost (80%) of the winter's total snow.

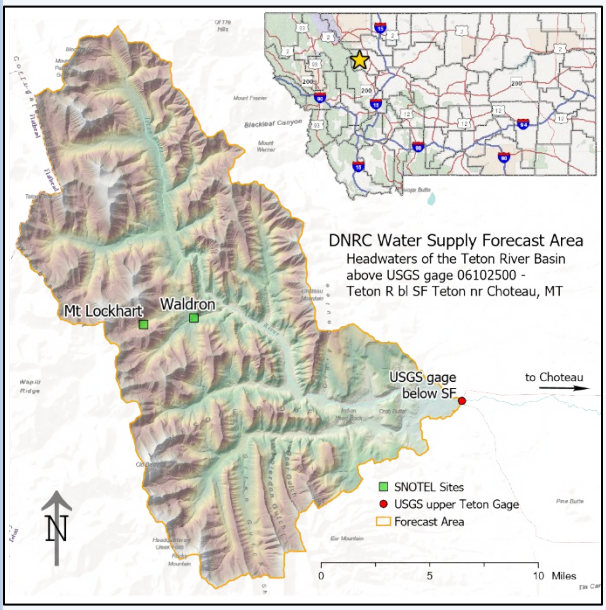
Streamflow Conditions

– 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 estimates above average precipitation and 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 cooler sea surface temperatures in the Central Pacific. ENSO is projected (~66% chance) to transition to ENSO-neutral in the next 3 months, meaning **wet conditions could develop through May creating favorable water supply conditions**.

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 **far below normal volume of 28,250 acre-feet** (Figure 3) of water from snowmelt, or 77% of normal. ***This is the estimated flow only from snowmelt***. Current information indicates that the 2025 runoff from accumulated snowpack is predicted to be like conditions observed in 2010. 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 15,110 acre-feet (41% of normal)** and a **10% chance snowmelt runoff will exceed 41,993 acre-feet (115% of normal).**

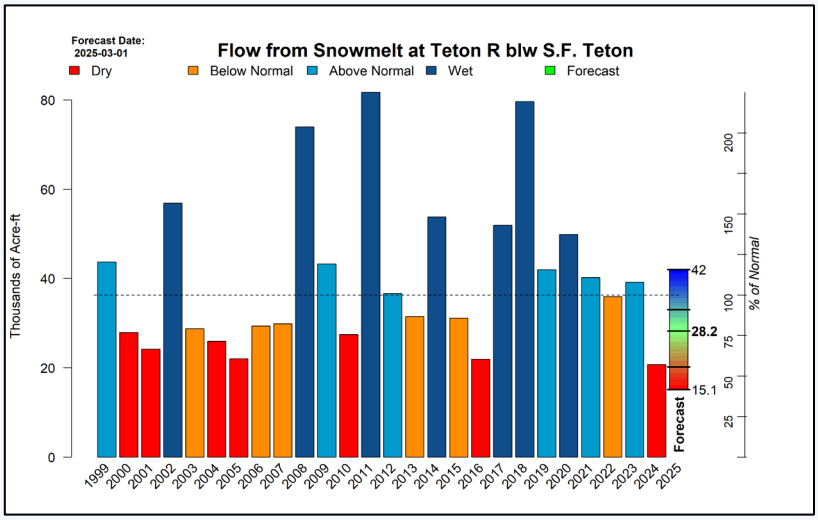


Figure 3: Historical snowmelt runoff and 2025 prediction.

If there is a normal amount (7.7 inches) of rain from April 1 – July 31, the total flow is predicted to be 41,608 acre-feet. This is **8,300 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, 2025 could be like 2009 or 2023. 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.

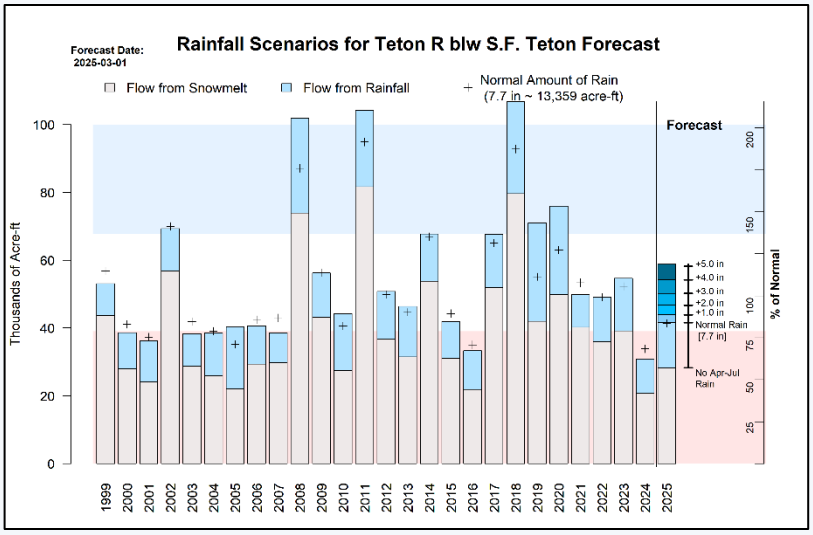


Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.

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.

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