

Teton River Runoff Forecast

March 1, 2022

Snowpack Conditions

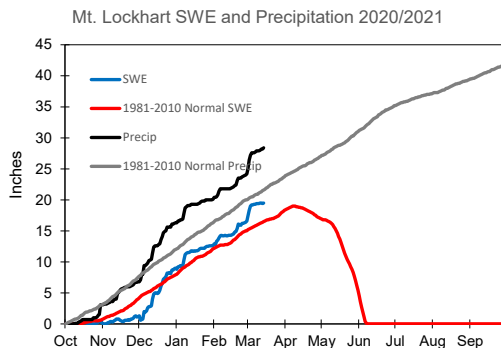


Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

[Click to enlarge](#)

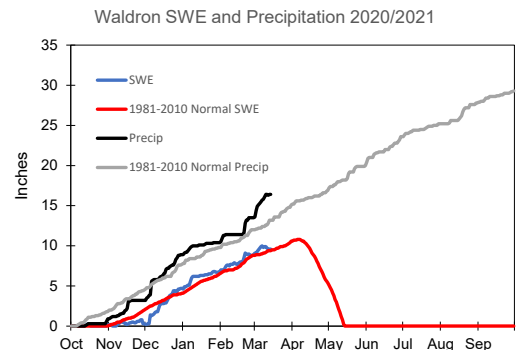


Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

[Click to enlarge](#)

– Snowpack conditions (Snow Water Equivalent or SWE) at the Natural Resource Conservation Service (NRCS) [Mt. Lockhart and Waldron SNOTEL](#) sites are **trending normal to above normal** as of March 1. **Mt. Lockhart is at 117% of the median** (Figure 1) and **Waldron is at 100% of the median** (Figure 2). SWE started well below normal in the fall showing a sudden increase in mid-December. Precipitation has shown a nearly identical trend with large increases in December, January, and now March. Based on snowpack and precipitation so far, conditions are looking favorable for normal water supply. 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.

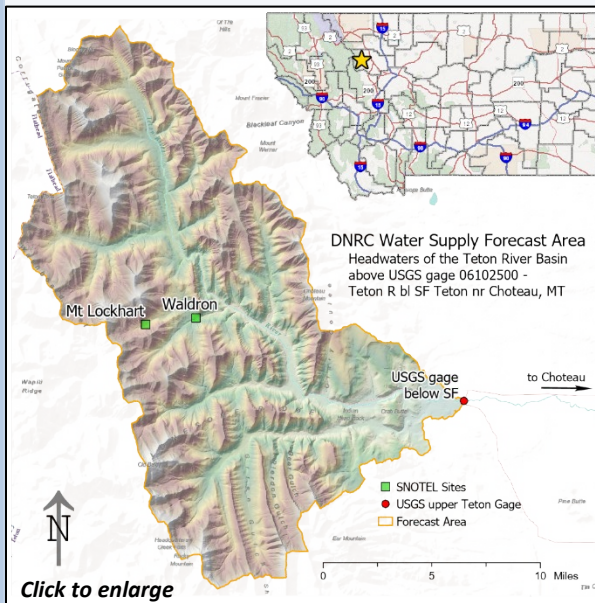
Weather Outlook

– The National Weather Service (NWS) **one-month outlook indicates above normal precipitation and below normal temperatures** for Central 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 wet conditions so far this year but is projected (~40-50% chance) to transition to ENSO-neutral after May 31, meaning **La Niña may continue to influence Montana weather in the near-term and over the summer as well.**



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 7.5 inches but can vary considerably. **The median rainfall (7.6 in) produces about 13,177 acre-feet of runoff based on DNRC rainfall runoff model estimates.**

Runoff Forecast

DNRC's March 1 runoff forecast predicts an **above normal volume of 51,213 acre-feet** (Figure 3) of water from snowmelt, or 140% of normal. ****This is the estimated flow only from snowmelt****. Current information indicates that the 2022 runoff from accumulated snowpack is predicted to be like conditions observed in 2017 and 2020. 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 37,800 acre-feet (103% of normal)** and a **10% chance snowmelt runoff will exceed 65,000 acre-feet (177% of normal)**.

If there is a normal amount (7.6 inches) of rain from April 1 – July 31, the total runoff is predicted to be 64,390 acre-feet. This is **14,482 acre-feet more than normal**. Any excess rain (more than 7.6 inches) could increase the volume substantially (Figure 4). If it rains 11.5 or more inches from April 1 to July 31, 2022 could be a wetter year than 2019 or 2020. For reference, both 2019 and 2020 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.**

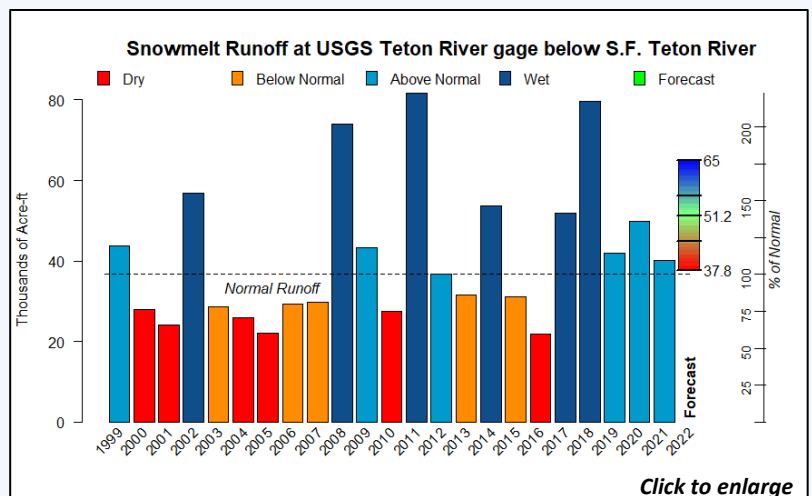


Figure 3: Historical snowmelt runoff and 2022 prediction.

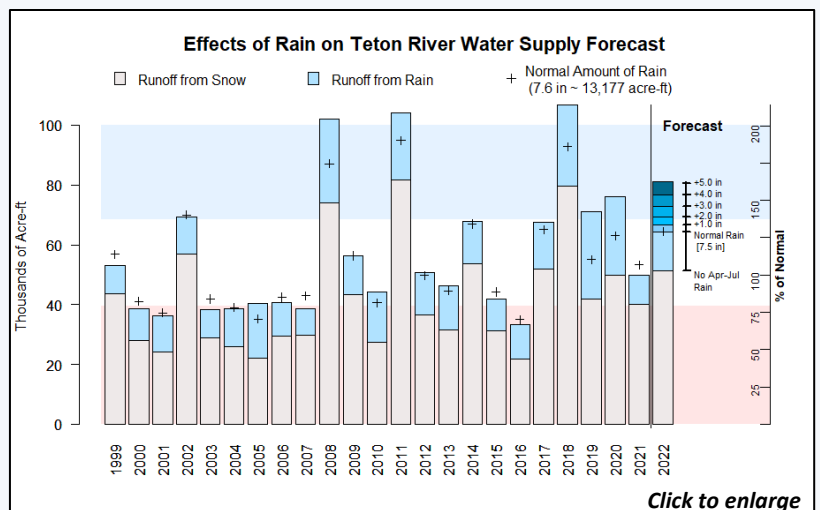


Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.



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