

# Teton River Runoff Forecast April 1, 2021



## Snowpack Conditions

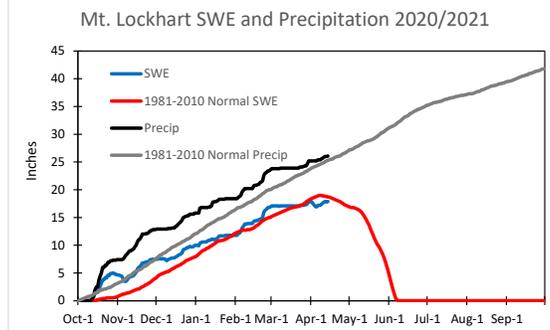


Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

*Double-click to enlarge*

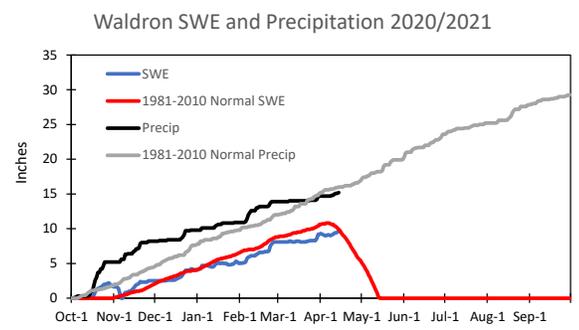


Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

*Double-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 slightly below normal** as of April 1. **Mt. Lockhart is at 96% of the median** (Figure 1) and **Waldron is at 99% of the median** (Figure 2). SWE started out much higher than normal in the fall and early winter but has since declined beginning in January. The trend of higher than normal precipitation at high and low elevations continues but is approaching the 30-year median. The pattern of less precipitation being stored as snowpack has also persisted as high elevations have seen no substantial increases in SWE and low elevations have seen a slight increase. Recent cold weather has slowed the melt that began the first weekend of April. There is still a chance that drought conditions develop depending on temperatures at high elevations this month.

## Streamflow Conditions

– The United States Geological Survey (USGS) gage [06102500](#) Teton River Below South Fork near Choteau (TRSF) came online March 10. The most recent reading at the issuance of this forecast was 62.6 cfs, which is approximately normal for this time of year. Flows began to increase rapidly (to above normal) the first week of April as low elevation (4,000 -5,000 ft) snowpack began to melt due to warm weather. Flows have since dropped with temperatures as snow is falling in the mountains.

## Weather Outlook

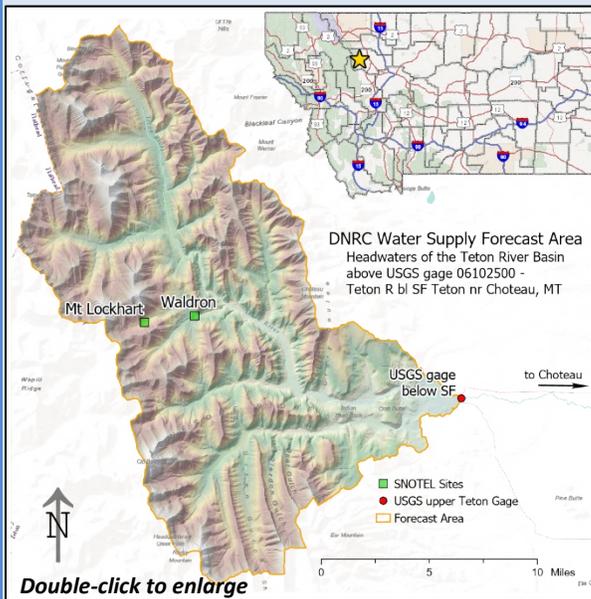
– The National Weather Service (NWS) **one-month outlook indicates normal precipitation and a 30-40% chance of above average temperatures** for Central Montana. The El Niño Southern Oscillation (ENSO) index, is a measure of whether equatorial Pacific Ocean conditions known as El Niño (warm and dry for 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 (~80% chance) to transition to ENSO-neutral by next month, meaning **La Niña is still influencing Montana weather now but will likely not by May**.



**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.

**Contact Info:** Todd Blythe,  
Hydrologist DNRC  
406-444-4571  
[todd.blythe@mt.gov](mailto:todd.blythe@mt.gov)

## Forecast Area



## Runoff Forecast

– DNRC’s April 1 runoff forecast predicts an **above normal volume of 51,798 acre-feet** (Figure 3) of water from snowmelt. **\*\*This is the estimated flow only from snowmelt\*\***. Current information indicates that the 2021 runoff from accumulated snowpack is predicted to be like conditions observed in 2017 and 2020. The **error associated with the March forecast is +/- 47 %**, meaning the prediction could vary from below normal, to wet conditions (Figure 3). The error range in April is still high because there is still a possibility for snow accumulation.

**If there is a normal amount (7.5 inches) of rain from April 1 – July 31, the total runoff is predicted to be 65,003 acre-feet.** This is **16,417 acre-feet more than normal**. Any excess rain (i.e. more than 7.5 inches) could increase the volume substantially (Figure 4). If it rains 11.5 or more inches from April 1 to July 31, 2021 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.

## Forecast Period is April 1 – July 31

All predicted and displayed values are calculated for this period.

On a **normal year, 48,586 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 2020). **Approximately 34,076 acre-feet (or 70%) 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 median rainfall in the forecast area during this period is 7.5 inches but can vary considerably. **The median rainfall (7.5 in) produces about 13,205 acre-feet of runoff** based on DNRC rainfall runoff model estimates.

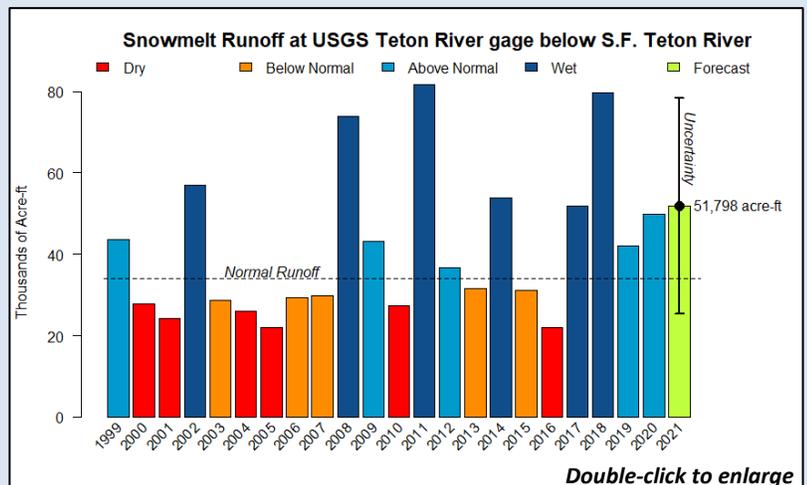


Figure 3: Historical snowmelt runoff and 2021 prediction.

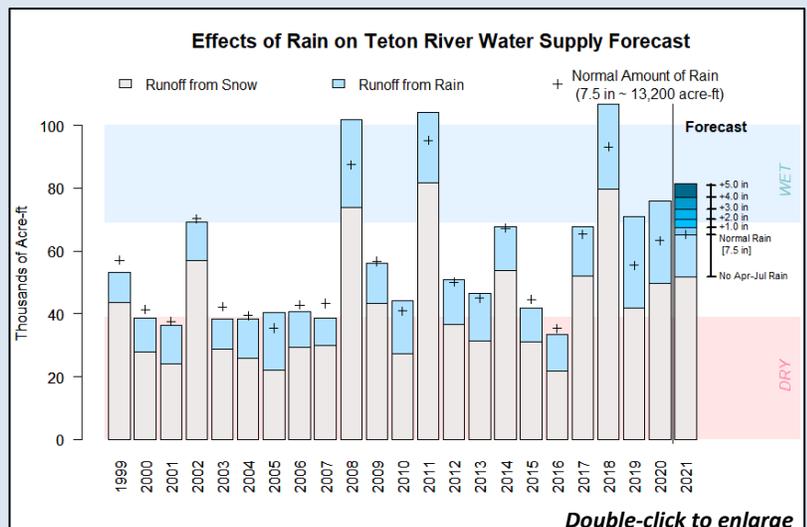


Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.



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