

# Teton River Runoff Forecast March 1, 2020



## Snowpack Conditions

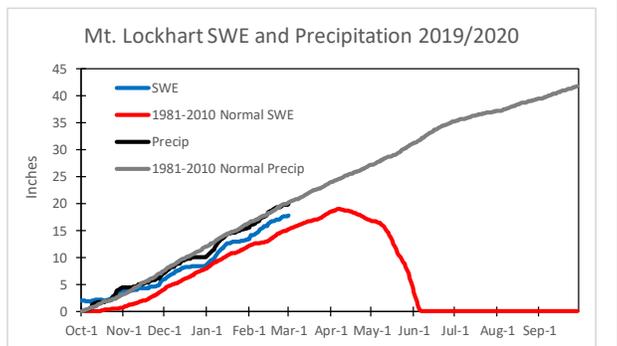


Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

*Double-click to enlarge*

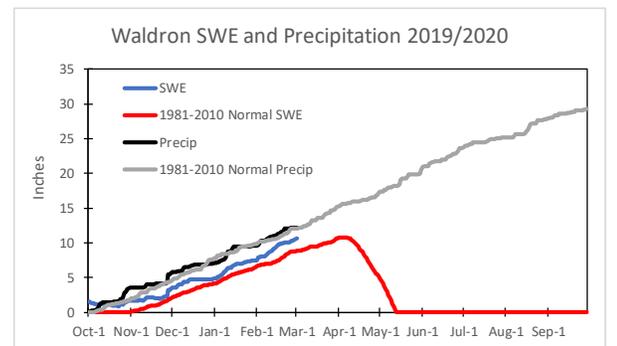


Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

*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 above normal** as of March 1. **Mt. Lockhart is at 119% of the median** (Figure 1) and **Waldron is at 126% of the median** (Figure 2). Above average conditions began primarily due to early-fall snow storms and have sustained with a dry spell in January and February. This surplus will likely translate into high runoff this year, but the length of the runoff season will depend heavily on spring and early-summer temperatures. As of March 1, the mountains should have accumulated almost (80%) of the winters total snow.

## Stream Flow Conditions

– The United States Geological Survey (USGS) gage [06102500](#) Teton River Below South Fork near Choteau (TRSF) is still in winter baseflow. The low elevation (4,000 -5,000 ft) snowpack has yet to melt and raise water levels. This gage is operated seasonally by USGS and is typically brought online on or before April 1st.

## Weather Outlook

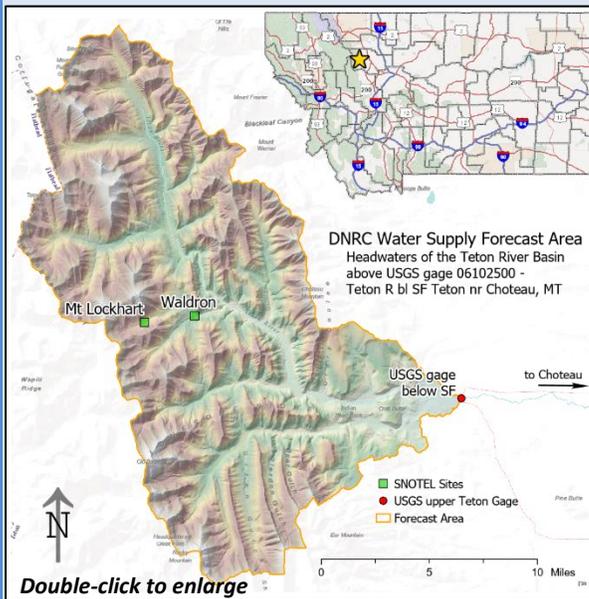
– The National Weather Service (NWS) **one-month outlook indicates normal precipitation and normal temperatures** for Central Montana. The El Niño Southern Oscillation (ENSO) index, is a measure of whether equatorial Pacific Ocean conditions known as El Niño (warm and dry for Montana) or La Niña (cold and wet) could develop and influence weather along the Rocky Mountain Front. ENSO is currently indicating slightly warmer equatorial Pacific Ocean temperatures or a relatively neutral ENSO index for the next few months, meaning **El Niño will not strongly influence Montana weather in the near-term**.



**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

– The DNRC March 1 runoff forecast predicts an **above normal volume of 52,173 acre-feet** (Figure 3) of water from snowmelt. **\*\*This is the estimated flow only from snowmelt\*\***. Current information indicates that the 2020 runoff from accumulated snow pack is predicted to be like conditions observed in 2017. The **error associated with the March forecast is +/- 49 %**, meaning the prediction could vary from below normal, to wet conditions (Figure 3). The error range in March is high because for the next several months the mountains can still accumulate snow.

**If there is a normal amount (7-8 inches) of rain from April 1 – July 31, the total runoff is predicted to be 65,378 acre-feet.** This is **18,978 acre-feet more than normal.** Any excess rain, more than the normal 7.5 inches, could increase the volume substantially (Figure 4). If it rains 10 or more inches from April 1 to July 31, 2020 could be a wetter year than 2019 (in 2019 it rained 12 inches between April 1 and 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, 46,400 acre-feet of water flows** by the TRSF gage from April 1 – July 31. **Approximately 31,500 acre-feet (or 60-70%) 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 between 6 and 9 inches. **The median rainfall (7.5 in) produces 13,200 acre-feet of runoff based on DNRC estimates.**

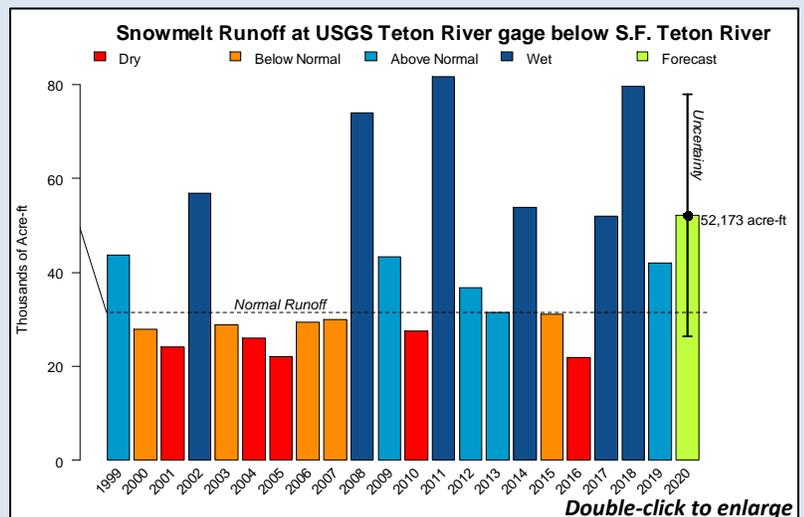


Figure 3: Historical snowmelt runoff and 2020 prediction.

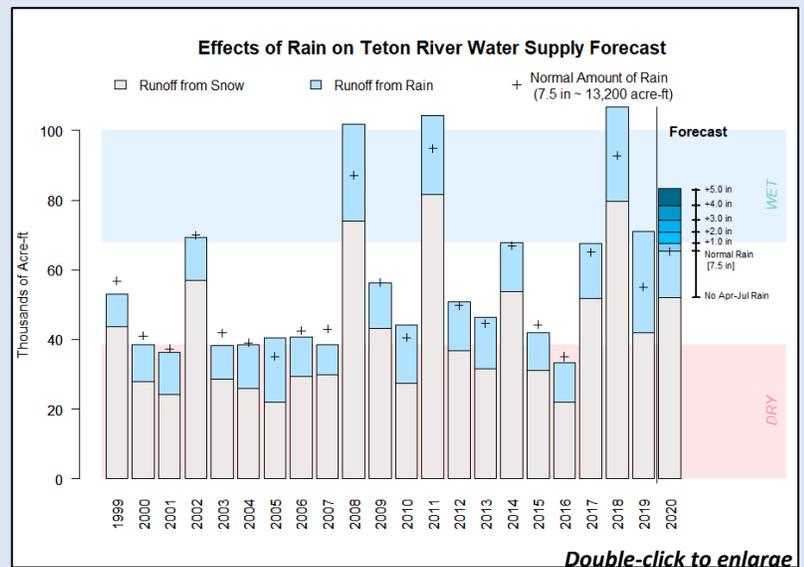


Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.



**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.

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