

Teton River Runoff Forecast May 1, 2020



Snowpack Conditions

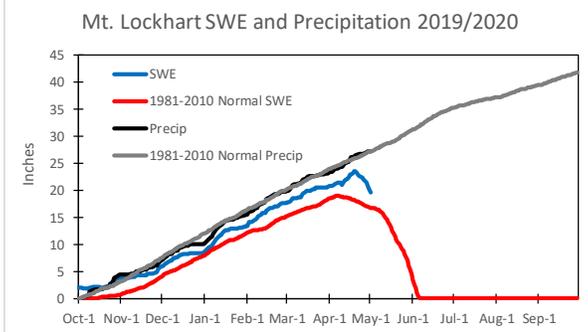


Figure 1: Mt. Lockhart (Elev. at 6400 ft) SWE and precipitation.

Double-click to enlarge

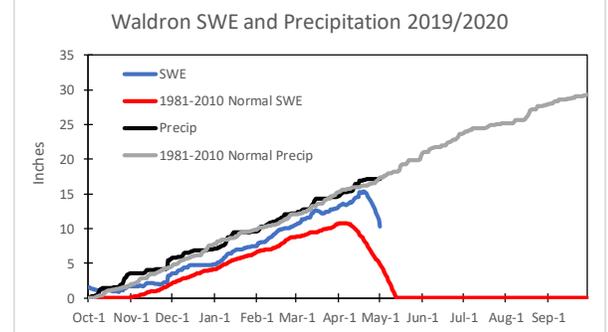


Figure 2: Waldron (Elev. at 5600 ft) SWE and precipitation.

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 May 1. **Mt. Lockhart is at 116% of the median** (Figure 1) and **Waldron is at 215% of the median** (Figure 2). Snowpack had peaked for the year at the elevation of the SNOTEL sites and below. Melting in late April accelerated quickly with a period of warm weather, causing faster than average snowmelt. If this trajectory continues, an above average amount of snow will melt quickly with snowpack disappearing up to 6400 ft by the first week of June. Colder weather and precipitation forecasted for May will likely slow melt and prolong peak runoff.

Stream Flow Conditions

– The United States Geological Survey (USGS) gage [06102500](#) Teton River Below South Fork near Choteau (TRSF) has been operating since April 1. The most recent reading at the issuance of this forecast was 199 cfs. Flow in April was above average due to spell of warm weather that caused snowmelt in the mountains (Figure 3). With colder temperatures in the last week of April, flows have returned to approximately average for the beginning of May. 4845 acre-feet of water flowed past the USGS gage in the month of April, which is less than 10% of the runoff volume forecasted by DNRC last month.

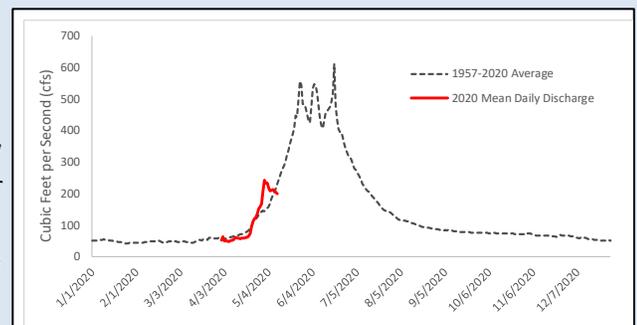


Figure 3: 2020 vs Average flow conditions.

Double-click to enlarge

Weather Outlook

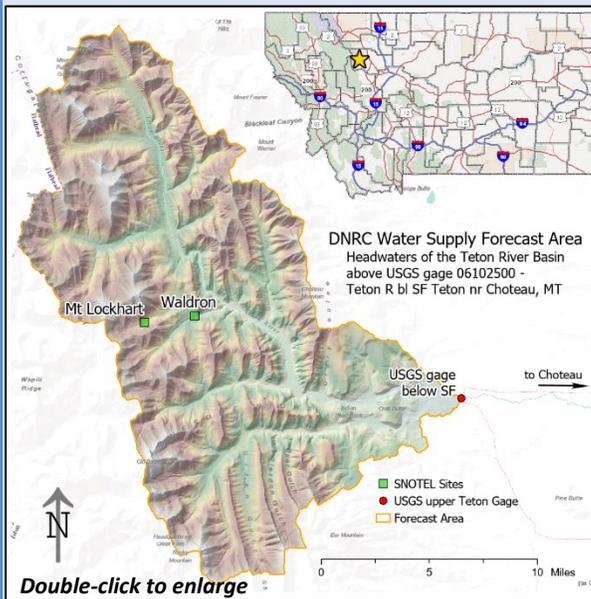
– The National Weather Service (NWS) **one-month outlook indicates normal precipitation and a slight chance of above normal temperatures** for Central Montana. Above normal temperatures could cause rapid snowmelt and rain-on-snow flooding potential. Forecasters predict neutral ENSO conditions to develop in the next few months, meaning **El Niño will not strongly influence Montana weather through summer and into fall.**



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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Forecast Area



Runoff Forecast

– The DNRC May 1 runoff forecast predicts an **above normal volume of 46,960 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 April forecast is +/- 21 %**, meaning the prediction could vary from normal, to wet conditions (Figure 3). The error range in May is much smaller than previous forecasts because snowpack has peaked and the volume available to melt is better known.

If there is a normal amount (6.8 inches) of rain from May 1 – July 31, the total runoff is predicted to be 59,504 acre-feet. This is **7,932 acre-feet more than normal.** Any excess rain, more than the normal 6.8 inches, could increase the volume substantially (Figure 4). An extra 2 or more inches from May 1 to July 31, 2020 could produce a wetter year than 2019, while **5 or more extra inches could make 2020 the 4th wettest year since 1999.** The effects of excess rain are visualized in Figure 4 as inches above normal.

Forecast Period is May 1 – July 31

All predicted and displayed values are calculated for this period.

On a **normal year, 51,571 acre-feet of water flows** by the TRSF gage from May 1 – July 31. **Approximately 37,211 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 May 1 and July 31. The median rainfall in the forecast area during this period is 6.8 inches but can vary between 5 and 9 inches. **The median rainfall (6.8 in) produces 11,422 acre-feet of runoff based on DNRC estimates.**

The **average runoff in the month of April is 4898 acre-feet.** In **April 2020 there was 4845 acre-feet** measured at the TRSF gage. There was an **estimated 1.6 inches of rain in April** for the forecast area which is greater than the April average of 1.1 inches.

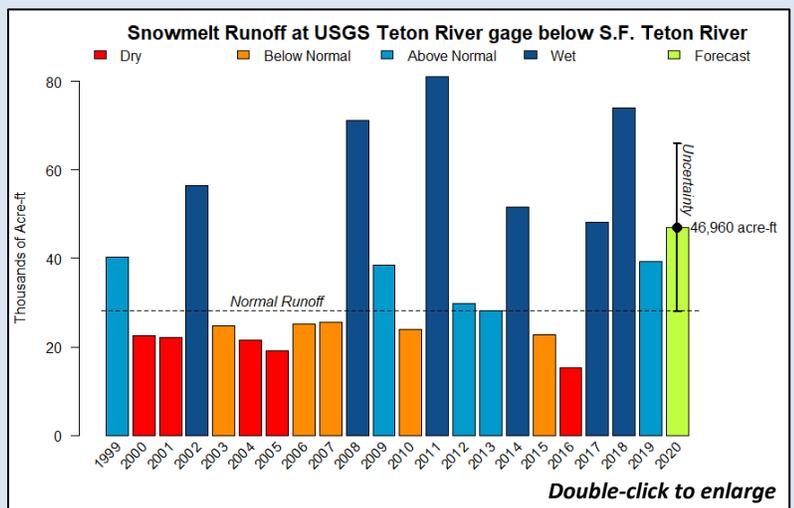


Figure 3: Historical snowmelt runoff and 2020 prediction.

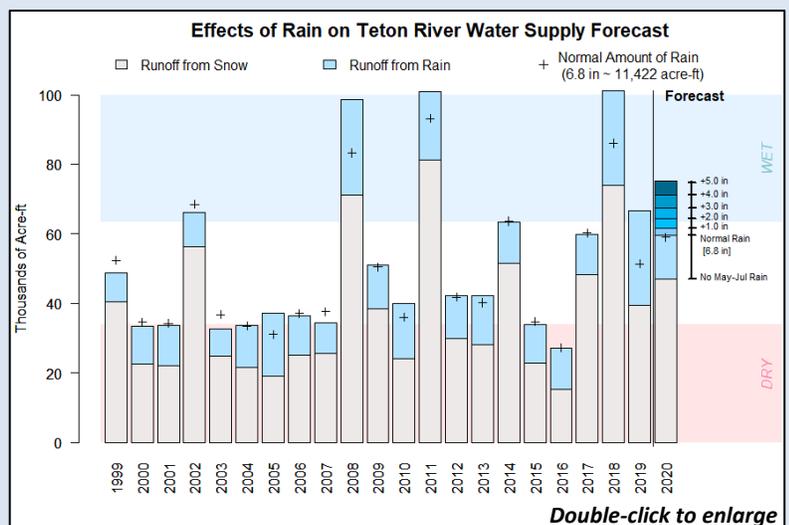


Figure 4: Proportion of flow from snowmelt vs. rain and the effects of April 1 – July 31 rain on predicted flow.



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