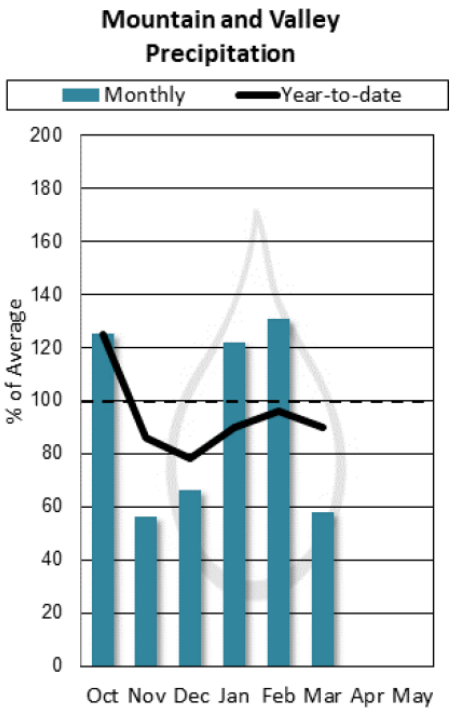
Blackfoot Water Supply Report
April 10, 2020

Montana Water Supply Report as of April 1, 2020 (from NRCS):
https://www.nrcs.usda.gov/wps/portal/nrcs/mt/snow/waterproducts/basin/

Overview

Upper Clark Fork Basin



Snow totals for March were less than impressive in river basins west of the Divide; however, most river basins remain near to above-normal for April 1 due to the abnormally wet January and February. On April 1, we have a reasonable idea of what the mountain snowpack will contribute with regards to overall runoff volumes this spring and summer. The news is good this year, and aside from one small lower elevation range west of Flathead Lake, all other sub-basins in Montana have snowpack that is at least normal for this date. Precipitation totals for March in valley locations west of the Divide were well below average, with some areas reporting less than 30% of average precipitation for the month (Kalispell Airport, Missoula Airport). Mountain locations west of the Divide received slightly more precipitation but were also below to well below average for monthly precipitation.

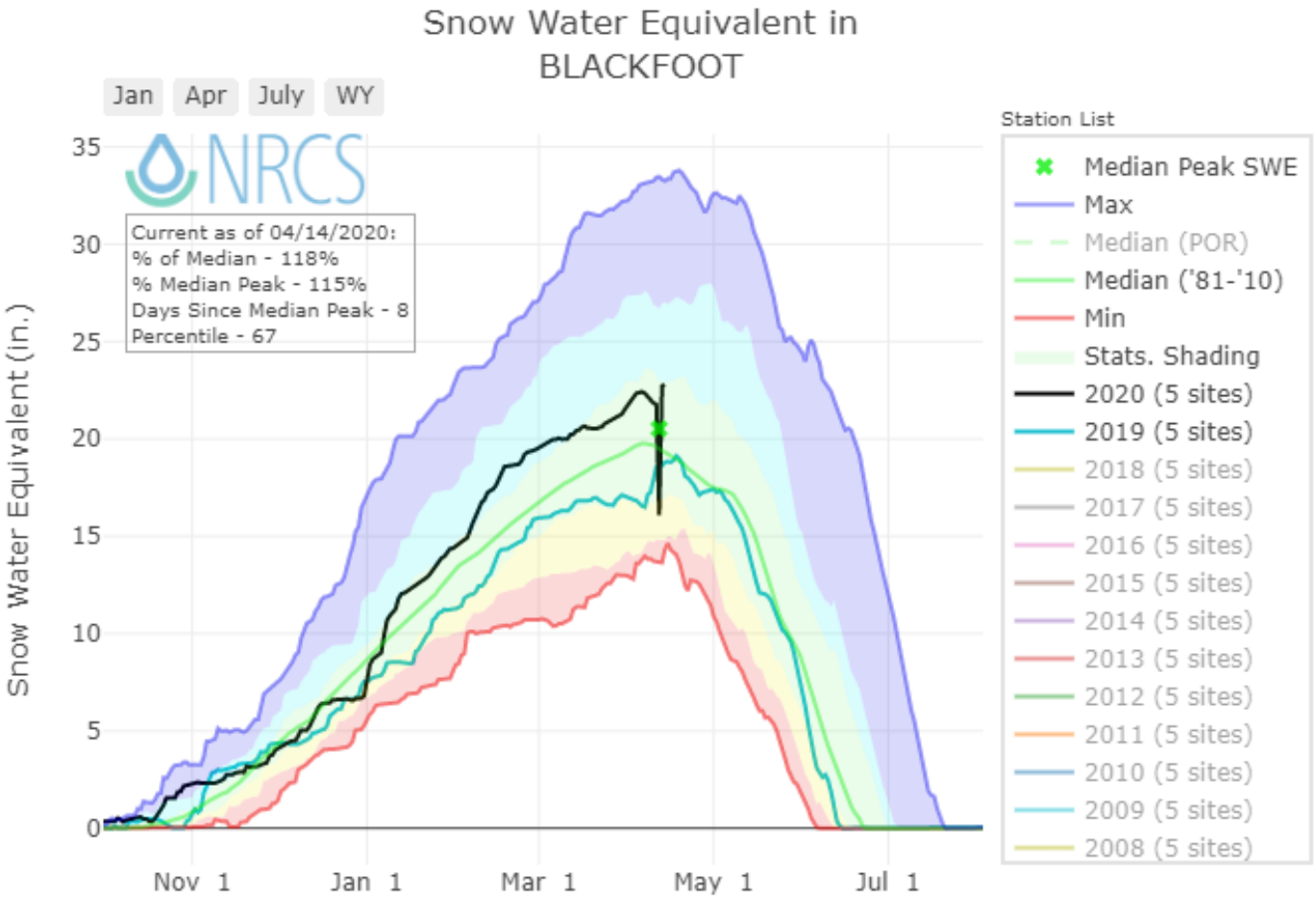
Overall water year precipitation (starting October 1) ranges from near to below average for many mountain and valley locations. In large part, this is due to the abnormally dry November and December in many places, and in some areas, this water year deficit has been increased by the lack of precipitation in March. The inclusion of water year precipitation in forecast models has decreased the overall volumes forecasted for certain rivers, even though the snowpack is near or above normal for this date.

For mountain locations, peak snowpack has already occurred or will likely occur sometime during the coming month. Translating this into forecasts this month has yielded a variety of outcomes as there is a disparity between mountain snowpack and overall water year precipitation. While mountain snowpack in many locations is near to well above normal for this date, water year precipitation deficits exist, meaning that some of the water that would typically be in the hydrologic system is missing. Although this situation is not occurring in all river basins in the state, it should be noted that it has impacted volumetric runoff forecasts where it is present.

Take the Hebgen Lake forecast, for example. Snowpack in the region ranges from 95 percent to 122 percent of normal for April 1, however, water year precipitation is 70 percent to 107 percent of normal. The result in this region is streamflow forecasts, which are slightly below normal for April 1 through July 31. Snowpack is a critical component of runoff across the state, but it's certainly not the only component. Total water year precipitation, peak snowpack accumulation, and future spring precipitation all contribute to the overall water volumes we experience.

Upper Clark Fork River Basin Overview

Upper Clark Fork snow totals remain above average at all sites in the basin, sparing Skalkaho Summit and Basin Creek SNOTELs. Above-average February snowfall is paying dividends for below-average March storm totals, as most sites only received 60-80% of normal. Barker Lakes and Skalkaho Summit SNOTELs received the least amount of March precipitation on record, with several other near minimum records. The good news is that Barker Lakes set a record for the second month in a row, as snowfall in February stacked up the 2nd most ever accumulated at the site. With a month of accumulation left in the Pintlers, April will play a crucial role in high mountain reserves that feed late summer flows. A return to normal conditions after two very different storm tracks over February and March would help the Upper Clark Fork to finish off the accumulation season. Even with below-average March precipitation, the basin snowpack remains slightly above normal for April 1st. Streamflow forecasts vary within the basin from slightly below average in the tributaries of the Clark Fork above the Blackfoot, to slightly above average within the Blackfoot River basin.



Black line: 2020 Blue line: 2019 Green line: 30-year median

Reservoir Storage

Reservoir storage continues to be near to above average for this time of year in most reservoirs across the state of Montana. The only exceptions can be found in the Rocky Mountain Front, where some reservoirs are below the 1981-2010 average.

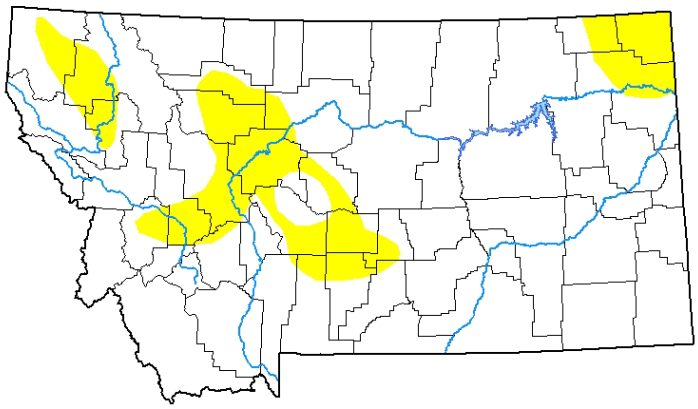
Upper Clark Fork Storage

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	105%	79%	102%

**See Reservoir Storage Table for storage in individual reservoirs*

Nevada Creek Reservoir Storage, April 1 = 8,665 ac/ft

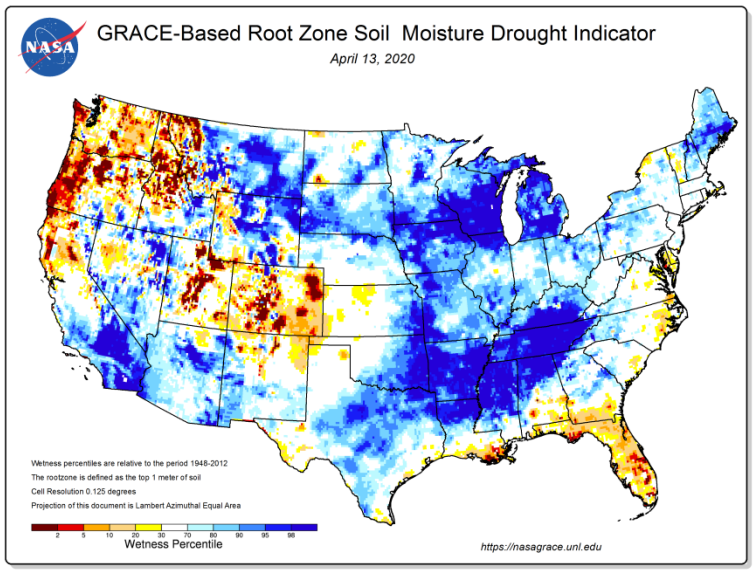
Montana Drought Monitor – April 7, 2020



Drought Intensities

- None: No Drought
- D0: Abnormally Dry
- D1: Moderate Drought
- D2: Severe Drought
- D3: Extreme Drought
- D4: Exceptional Drought

National Root Zone Soil Moisture – April 13, 2020



Montana SNOTEL Snow Water Equivalent: April 14, 2020

Montana SNOTEL Snow / Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

Provisional data, subject to revision

Data based on the first reading of the day (typically 00:00) for Tuesday, April 14, 2020

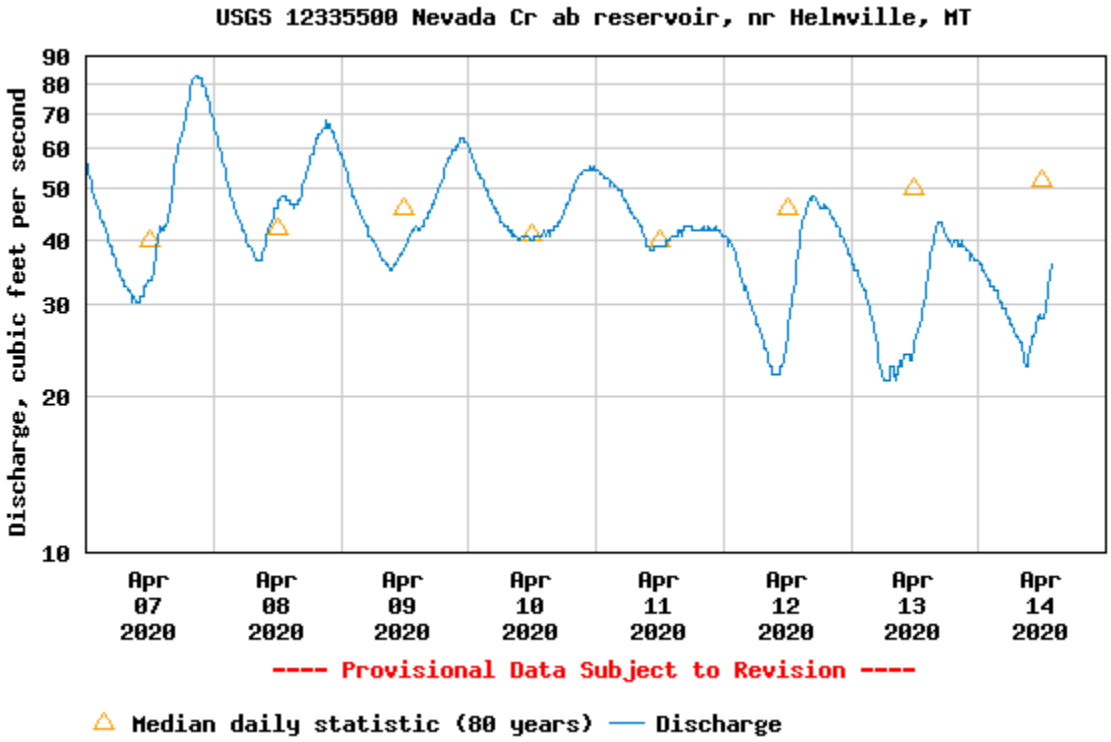
Basin Site Name	Elev (ft)	Snow Water Equivalent			Water Year-to-Date Precipitation		
		Current (in)	Median (in)	Pct of Median	Current (in)	Average (in)	Pct of Average
UPPER CLARK FORK RIVER BASIN							
Barker Lakes	8250	15.1	15.0	101	12.9	17.2	75
Basin Creek	7180	7.8	8.4	93	9.5	10.6	90
Black Pine	7210	11.3	10.0	113	12.6	14.1	89
Combination	5600	2.9	3.1	94	5.6	9.4	60
Copper Bottom	5200	4.6	N/A	*	13.4	16.0	84
Copper Camp	6950	28.4	N/A	*	24.3	32.3	75
Lubrecht Flume	4680	0.5	0.0	*	9.6	10.6	91
Nevada Ridge	7020	17.5	13.7$_C$	128	16.4	16.6$_C$	99
N Fk Elk Creek	6250	12.4	10.2	122	12.3	14.5	85
North Fork Jocko	6330	48.7	42.4	115	53.5	48.2	111
Peterson Meadows	7200	11.7	10.4	112	11.7	12.6$_C$	93
Rocker Peak	8000	15.4	13.7	112	12.7	14.6	87
Skalkaho Summit	7250	20.6	22.0	94	18.5	23.0	80
Stuart Mountain	7400	34.8	30.2$_C$	115	32.4	32.1$_C$	101
Warm Springs	7800	21.6	21.0	103	20.2	23.3	87
Basin Index (%)				**110**			**90**

April 14, 2020, USGS Real Time Flow Conditions

Nevada Creek above Reservoir

Discharge, cubic feet per second

Most recent instantaneous value: 35.7 CFS (04-14-2020)



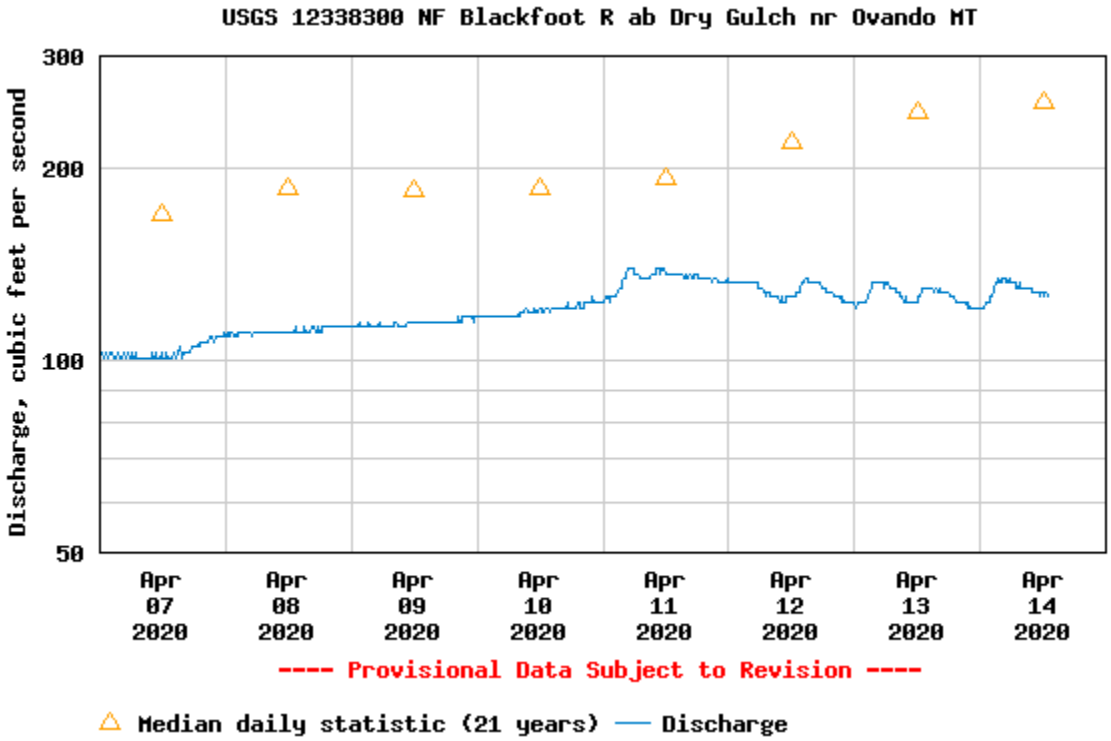
Daily discharge, cubic feet per second -- statistics for Apr 14 based on 80 water years of record more

Min (1953)	25th percen-tile	Most Recent Instantaneous Value Apr 14	Median	Mean	75th percen-tile	Max (1952)
7.20	24	35.7	52	66	90	378

North Fork Blackfoot above Dry Gulch

Discharge, cubic feet per second

Most recent instantaneous value: 126 CFS (04-14-2020)



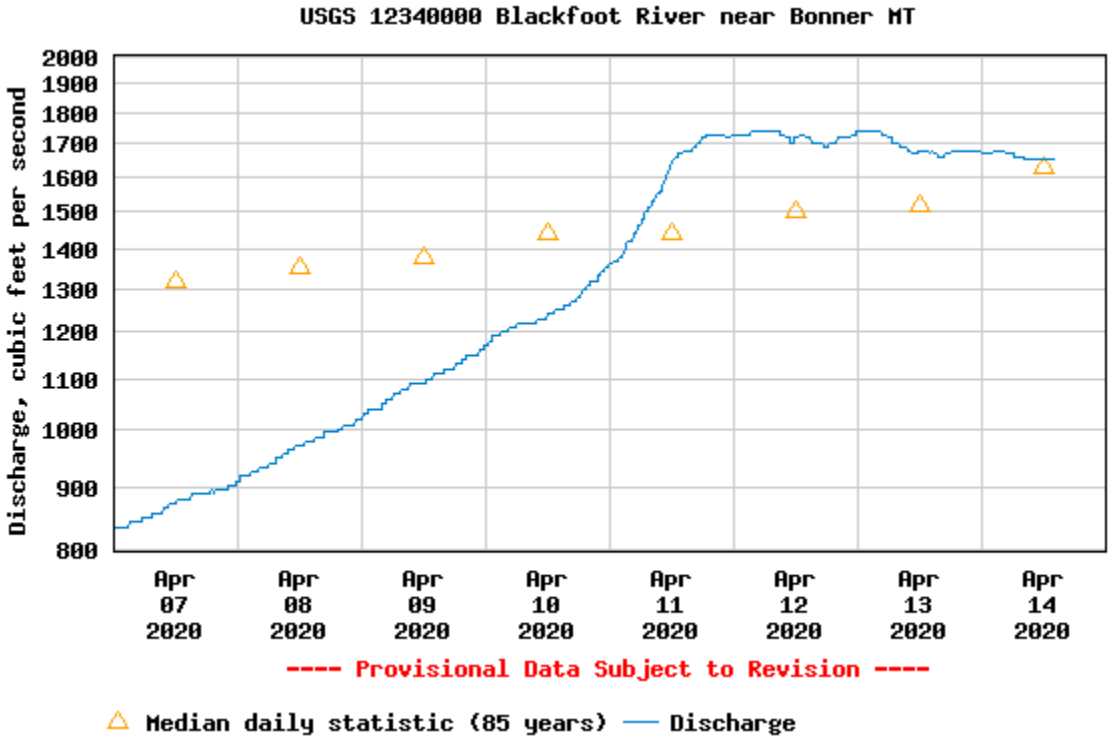
Daily discharge, cubic feet per second -- statistics for Apr 14 based on 21 water years of record more

Min (2001)	Most Recent Instantaneous Value Apr 14	25th percen-tile	Median	Mean	75th percen-tile	Max (2004)
83.0	126	178	255	312	460	745

Blackfoot River at Bonner

Discharge, cubic feet per second

Most recent instantaneous value: 1650 cfs (04-14-2020)



Daily discharge, cubic feet per second -- statistics for Apr 14 based on 85 water years of record more

Min (1905)	25th percen-tile	Median	Most Recent Instantaneous Value Apr 14	Mean	75th percen-tile	Max (1976)
390	1110	1630	1650	2030	2700	7010

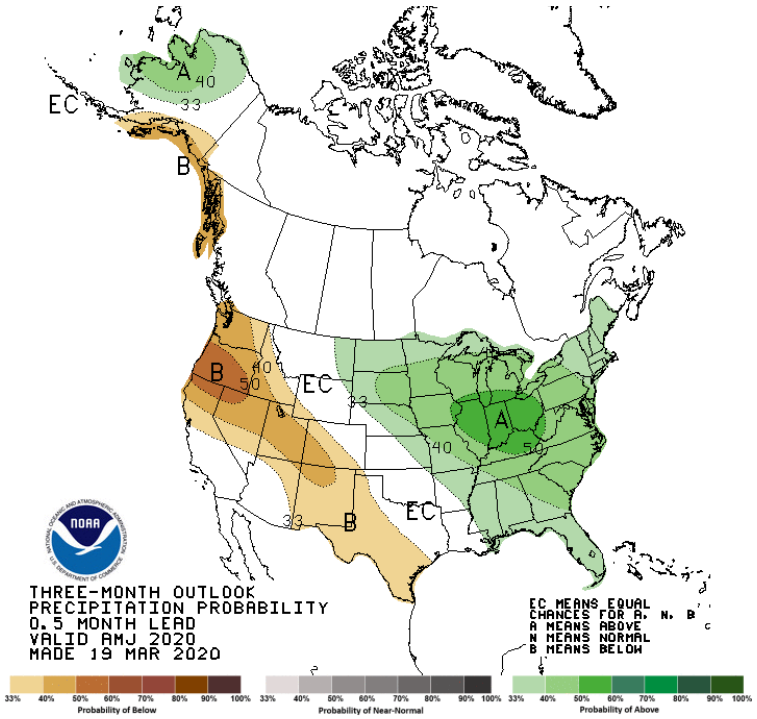
Three-Month Outlook
April 14, 2020

From

National Weather Service Climate Prediction Center

http://www.cpc.ncep.noaa.gov/

Equal chances for normal, above or below average precipitation April through June.



Slightly increased chance for above normal temperatures from April through June.