Blackfoot Water Supply Report
April 18, 2014

Montana Water Supply Outlook Report as of April 1, 2014 (from NRCS):
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/snow/?cid=nrcs144p2_057799

Overview

March snowpack accumulation continued the trend set in February by increasing snowpack an average 13 percent across the state's watersheds. Increments this month were not as drastic as last month but snowpack is now requiring more vigilance than usual as statewide snowpack is 143 percent of median. Precipitation in the mountains and valleys of Montana over the course of March was nearly exactly the same as it was last month statewide. March precipitation ended the month at 180 percent of average bringing the year to date precipitation to 121 percent of average from 108 percent of average last month. Many mountain reservoirs are beginning to draw down storage in anticipation of above average spring runoff. Streamflow predictions increased significantly due to the climbing snowpack and the much improved forecast skill that comes with April 1 forecasts.

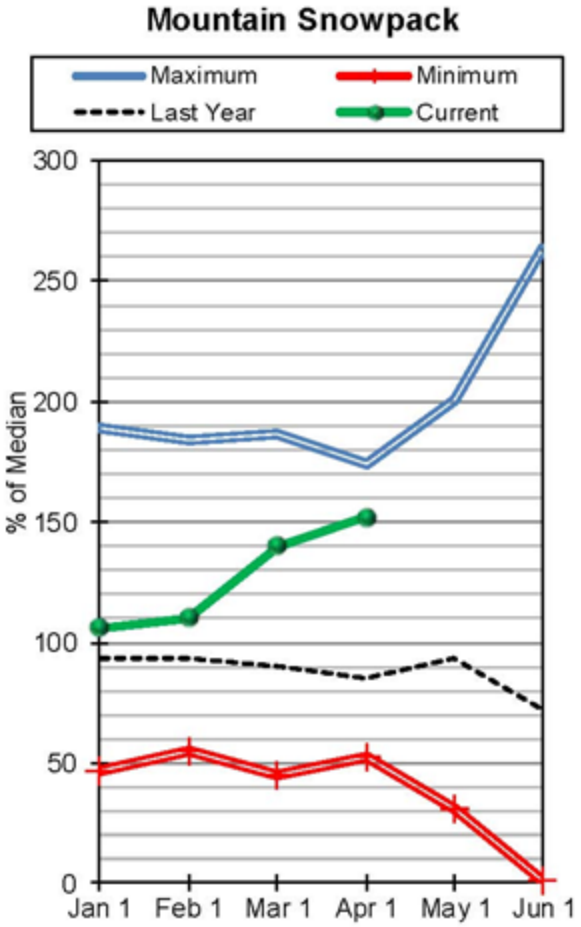
Currently in most mountain locations snowpack is slightly above 2011 levels. But it is at this point in 2011 where the faucet turned on and snowpack started to accumulate at well above normal rates. In addition, several significant rain events in 2011 which fell on valley snow cause significant runoff in May. Finally, mountain snowpack in 2011 saw temperatures high enough to melt snow starting in late May and peeking in June which is later than usual. Currently there are no indications of weather that will cause the events seen in 2011. Regardless snowpack and streamflow runoff needs to be closely monitored for the remainder of this spring until the majority of mountain snow has run into the rivers of Montana.

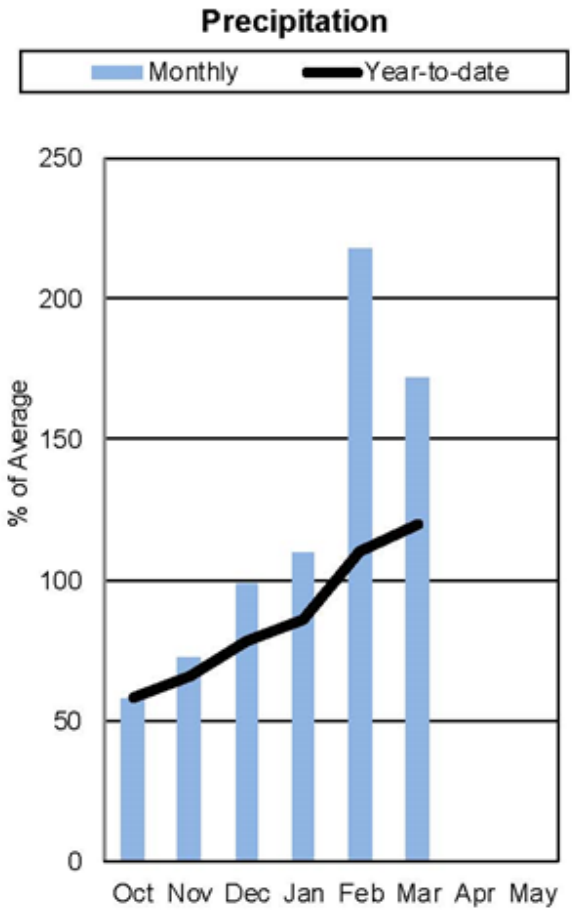
Upper Clark Fork River Basin

Another banner month in the Upper Clark Fork drainages has brought the basinwide percent of normal up an additional 12 percent from March 1st to 152 percent of normal for April 1st, and 178 percent of last year at this time. An average of the SNOTEL sites in the basin yielded 235 percent of normal snowfall for the month, which builds on the significantly above normal snowfall received during the month of February. Snowfall across most elevations in the basin has left significant low-elevation snowcover at the end of March, where some low elevation SNOTEL sites below 5,000 feet are seeing record snowpacks for this date in the Blackfoot River drainage. While a substantial amount of snow has fallen in the basin, the Upper Clark Fork is ranked 3rd for SWE basin total for this date, and 4th for annual Maximum SWE.

Precipitation in the basin mimics the trends seen in snowfall during the month – a well above average 172 percent of average was measured during March. This has helped to increase the water year to date precipitation total for the fourth straight month to 120 percent of average, up 10 percent from last month, and 128 percent of last year at this time.

Upper Clark Fork River Basin





Snowpack Analysis

From an analysis of 118 SNOTEL sites in Montana and northern Wyoming using April 3rd snowpack values, it was determined 30 locations were experiencing the highest snowpack levels of all historical snowpacks on April 1 with an average of 27 years in the period of record. On April 1 SNOTEL data indicates statewide snowpack is ranked 2nd of 34 years at 22.2 inches of snow water equivalent (SWE) with only 1997 exceeding this year at 26.1 inches, while 2011 snowpack levels were at 20.9 inches at this time. Snowpack currently most closely compares to 1982 at 21.7 inches of SWE. Watersheds currently at record high (dating back to 1981) snowpacks include: Tongue, Powder, Missouri Mainstem, Upper Yellowstone and the combined Smith-Judith-Musselshell. Five basins currently maintain snowpacks between the upper 70 & 90 percentiles which are: Kootenai, Lower Clark Fork, Madison, Wind and combined St Mary & Milk River basins.

Watershed Snowpack Analysis April 1, 2014	# of Sites	% Median	Last Year % Median
CLARK FORK ab FLINT CREEK	14	148%	80%
FLINT CREEK	14	148%	80%
ROCK CREEK	5	146%	90%
CLARK FORK ab BLACKFOOT	22	150%	83%
BLACKFOOT	22	150%	83%
UPPER CLARK FORK RIVER BASIN	33	151%	84%

Reservoir Storage

Reservoir storage for the Upper Clark Fork is currently 99 percent of average and 100 percent of last year.

Reservoir Storage End of March, 2014	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
NEVADA CREEK RES	6.5	6.3	7.7	12.6
Basin-wide Total	44.3	46.8	47.6	64.1
# of reservoirs	3	4	4	4

Streamflow Forecast

Streamflow prospects for the April-July time period in the major basin have risen since last month, with 164 percent of average flows are forecasted, up 16 percent from last month, and 204 percent of last year.

	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Clark Fork R ab Milltown								
	APR-JUL	715	850	940	177%	1030	1170	530
	APR-SEP	810	960	1060	172%	1160	1310	615
Nevada Ck nr Helmville								
	APR-MAY	14.4	17.5	19.6	233%	22	25	8.4
	APR-JUL	23	29	32	225%	35	41	14.2
Blackfoot R nr Bonner								
	APR-JUL	915	1020	1090	151%	1160	1270	720
	APR-SEP	1010	1120	1200	150%	1280	1390	800
Clark Fork R ab Missoula								
	APR-JUL	1690	1910	2060	165%	2210	2430	1250
	APR-SEP	1880	2120	2280	161%	2440	2680	1420

1) 90% and 10% exceedance probabilities are actually 95% and 5%.

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

3) Median value used in place of average.

Snow Water Equivalent: April 17, 2014

Montana SNOTEL Snow/Precipitation Update Report

Based on Mountain Data from NRCS SNOTEL Sites

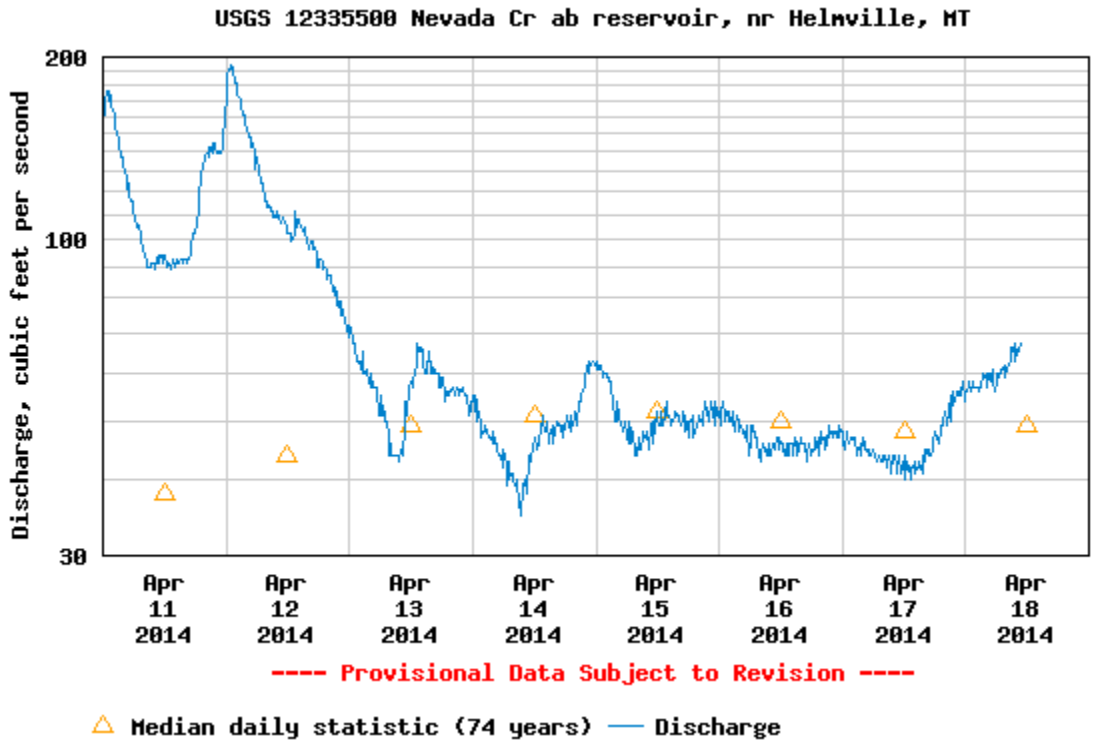
Provisional data, subject to revision

Data based on the first reading of the day (typically 00:00) for Thursday, April 17, 2014

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	20.4	15.3	133	17.3	17.5	99
BASIN CREEK	7180	11.9	8.6	138	11.3	10.8	105
BLACK PINE	7210	18.3	9.8	187	18.5	14.3	129
COMBINATION	5600	5.0	2.3	217	11.4	9.6	119
COPPER BOTTOM	5200	4.3	N/A	*	19.7	16.2	122
COPPER CAMP	6950	50.5	N/A	*	29.1	32.7	89
LUBRECHT FLUME	4680	1.0	0.0	*	12.6	10.7	118
NEVADA RIDGE	7020	22.7	13.5_C	168	20.5	16.8_C	122
N FK ELK CREEK	6250	16.8	9.9	170	16.3	14.7	111
NORTH FORK JOCKO	6330	54.2	42.0	129	55.1	48.7	113
PETERSON MEADOWS	7200	15.0	10.4	144	15.8	13.0_C	122
ROCKER PEAK	8000	22.2	13.9	160	18.7	14.9	126
SKALKAHO SUMMIT	7250	29.8	21.7	137	27.6	23.3	118
STUART MOUNTAIN	7400	38.9	30.0_C	130	37.1	32.5_C	114
WARM SPRINGS	7800	29.7	21.2	140	27.8	23.7	117
Basin Index (%)		**144**			**113**		

April 18, 2014 USGS Real Time Flow Conditions

Nevada Creek
Discharge, cubic feet per second
Most recent instantaneous value: 67 04-18-2014 10:45 MDT



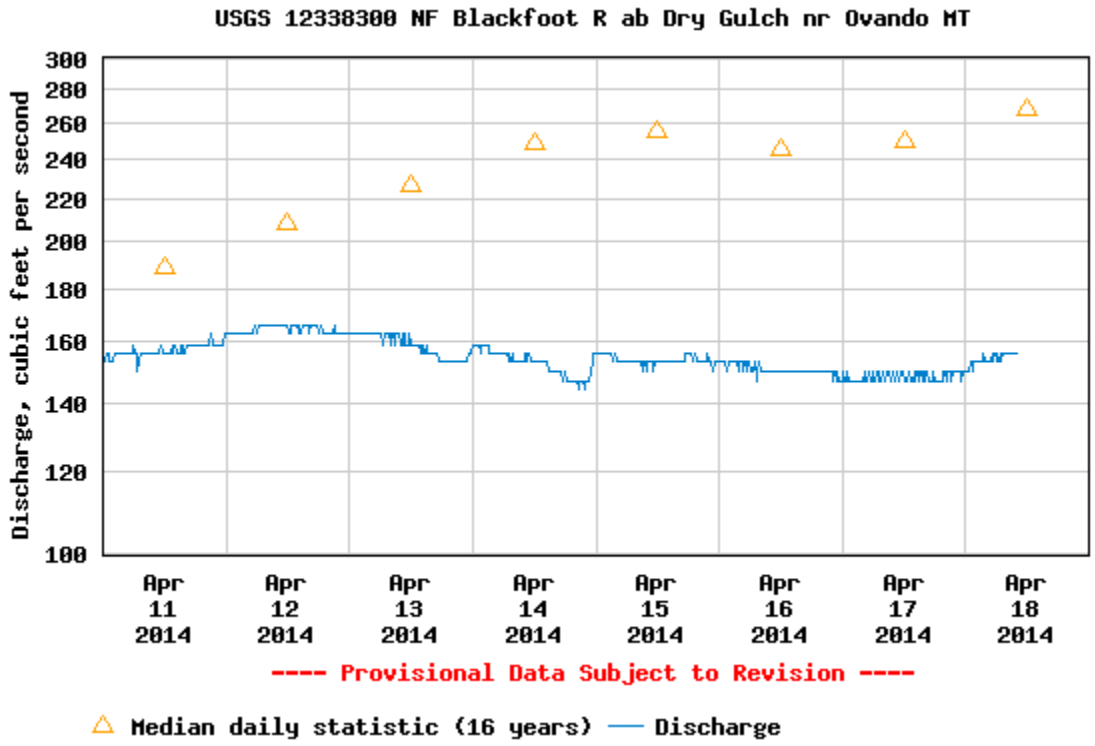
Daily discharge, cubic feet per second -- statistics for Apr 18 based on 74 years of record more

Min (1941)	25th percen-tile	Median	Mean	Most Recent Instantaneous Value Apr 18	75th percen-tile	Max (1948)
7.3	28	49	60.	67	74	273

North Fork Blackfoot

Discharge, cubic feet per second

Most recent instantaneous value: 156 04-18-2014 10:00 MDT



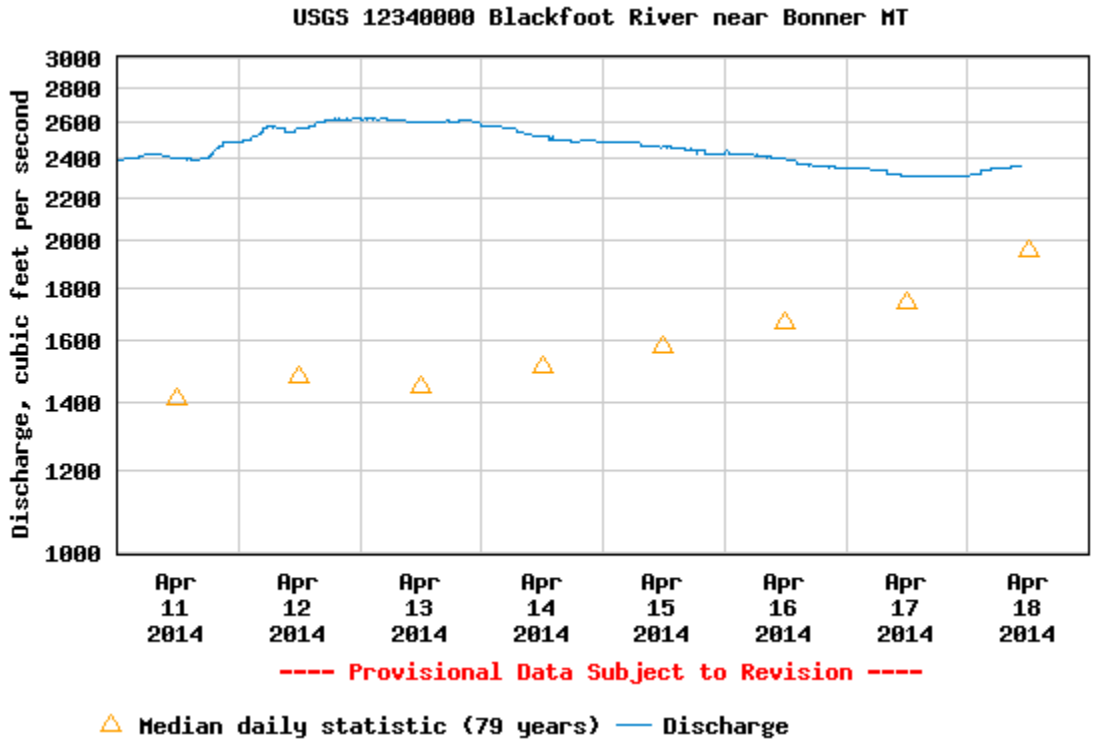
Daily discharge, cubic feet per second -- statistics for Apr 18 based on 16 years of record more

Min (2001)	Most Recent Instantaneous Value Apr 18	25th percen-tile	Median	Mean	75th percen-tile	Max (2004)
88	156	186	268	302	450.	589

Blackfoot River at Bonner

Discharge, cubic feet per second

Most recent instantaneous value: 2,360 04-18-2014 08:45 MDT



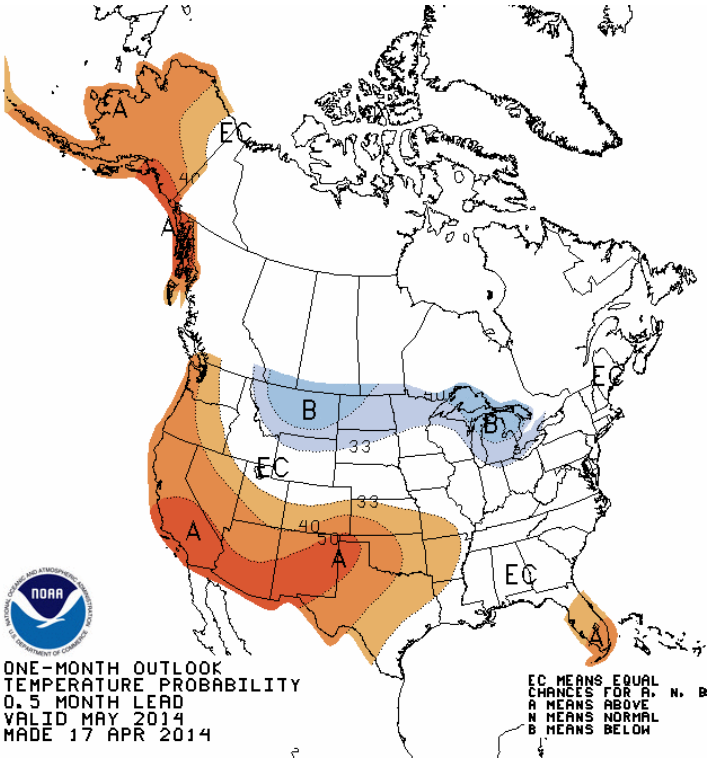
Daily discharge, cubic feet per second -- statistics for Apr 18 based on 79 years of record more

Min (1905)	25th percen-tile	Median	Mean	Most Recent Instantaneous Value Apr 18	75th percen-tile	Max (1943)
440	1120	1960	2180	2360	3010	7130

One-Month Outlook
April 17, 2014

From
National Weather Service Climate Prediction Center
http://www.cpc.ncep.noaa.gov/products/forecasts/

Higher chance for below normal temperatures



Equal chances for dryer or wetter conditions