

## Blackfoot Water Supply Report May 7, 2015

### Montana Water Supply Outlook Report as of May 1, 2014 (from NRCS):

[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/snow/?cid=nrcs144p2\\_057799](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/snow/?cid=nrcs144p2_057799)

#### Overview

Compared to many of the western states, Montana is in decent shape snowpack wise this spring, but that doesn't mean the situation is good. On April 1, there were 47 measurement locations that set new period of record low snow water equivalent values, and there were 36 locations that set new records for May 1. This isn't to imply that conditions have improved, as many of the sites that set records in April were low-elevation and typically melt out before May 1. What it does mean is that the well below normal snowfall and well above average temperatures have persisted this month, transitioning some of the mid and high elevation sites into this category for May 1, leaving us with a historically low snowpack in some locations for our period of measurement.

Typically the snowpack in Montana reaches peak accumulation between April 1 and May 1. Low elevations made the transition to melt during the middle of March, the remaining snowpack at higher elevations made the transition during the middle of April. In most locations snowpack peaks were 2 to 3 weeks early this spring, low-elevations peaked during the beginning to the middle part of March, while upper elevations peaked during the middle to end of April.

All basins across the state are well below normal for May 1, down yet again from April 1 due to the melting at almost all elevations. Four basins in the northern part of the state have less than 50 percent of normal snowpack for this date (Kootenai – 42%, Lower Clark Fork – 47%, Sun-Teton-Marias – 43%, St-Mary-Milk – 47%). There was no improvement during the last month, something we have been hoping for all winter, and the snowpack contribution to streamflow will be well below normal this year in most basins. On May 1 statewide snowpack is 61 percent of normal, and 39 percent of last year at this time. It is easy to compare this year to last year as it is in recent memory, but there should be no uncertainty that this year is completely different snowpack wise.

<b><i>Snow Water Equivalent</i></b>		
<b><i>5/1/2015</i></b>	% Normal	% Last Year
<b>Columbia River Basin</b>	<b>62%</b>	<b>39%</b>
Kootenai in Montana	42%	29%
Flathead in Montana	71%	46%
Upper Clark Fork	66%	41%
Bitterroot	59%	31%
Lower Clark Fork	47%	29%
East of Divide	63%	41%
West of Divide	62%	39%
<b>Montana State-Wide</b>	<b>61%</b>	<b>39%</b>

## Upper Clark Fork River Basin

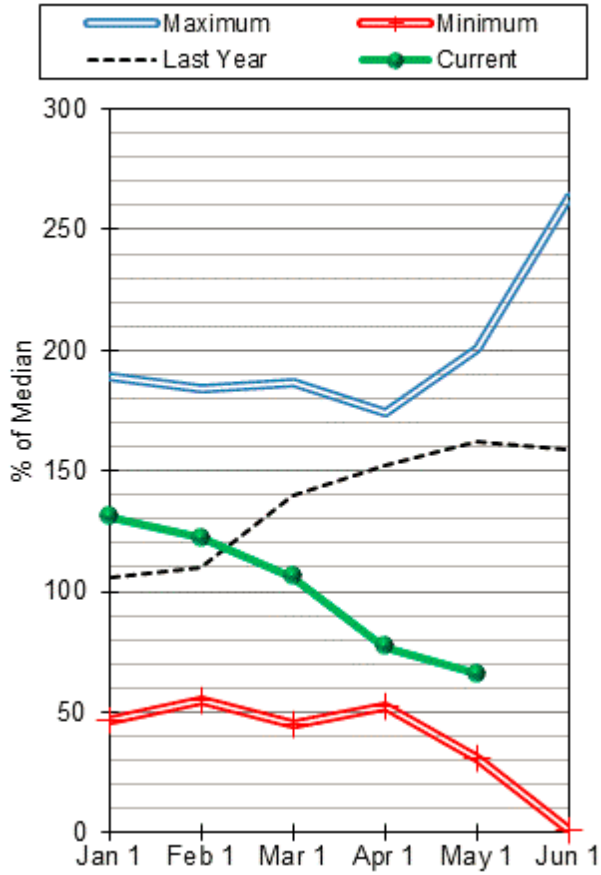
April was not a kind month to the snowpack in the Upper Clark Fork River basin. Percentages dropped off significantly as the month progressed with all of the low elevation sites melting out relatively early compared to average. Mid-month a storm hit most of the sub-basins cooling temperatures to allow for some increase in snow water equivalents at the higher elevations. Another storm occurred towards the end of the month which brought rain and snow to all elevations in the upper reaches of the basin. It was short lived and soon after temperatures warmed back up and strong melt returned.

Snowpack ranges from 54 percent of normal in the Rock Creek Drainage to **72 percent of average in the Blackfoot Drainage**. Snowpack in the Clark Fork reaches above Flint Creek came in at 71 percent of normal. Basin-wide snowpack in the Upper Clark Fork River basin as of May 1st is 68 percent of normal and 42 percent of last year at this time.

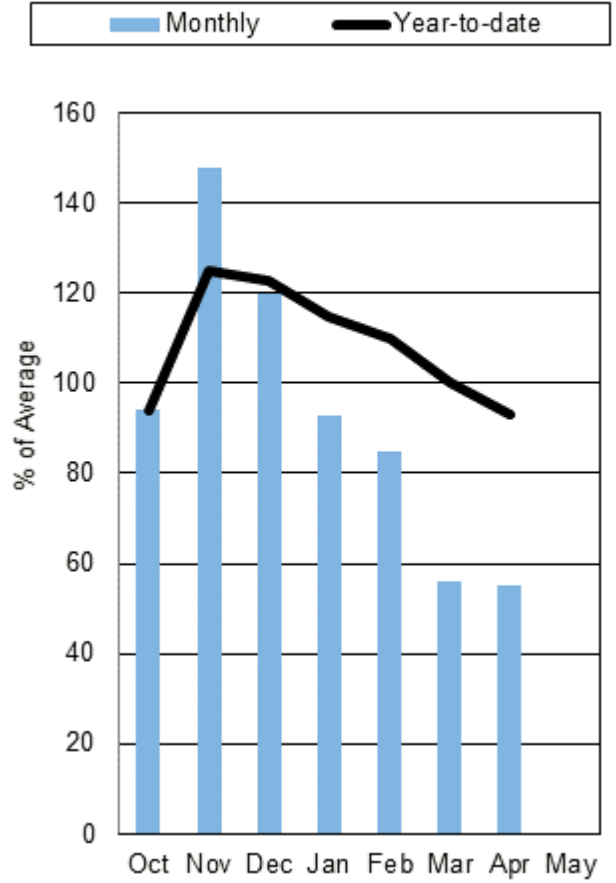
April “showers” consisted of two storms mid-month and towards the end of the month and neither one of these were gully washers but appreciated none the less! April mountain precipitation ranged from **42 percent of average in the Blackfoot Drainage** to 68 percent in the Rock Creek drainage. Valley weather stations received 82 percent of monthly average precipitation for April, while mountain SNOTEL sites received only 72 percent. Currently on May 1st, the Upper Clark Fork River Basin is 93 percent of the water year-to-date average, and 81 percent of last year at this time.

# Upper Clark Fork River Basin

## Mountain Snowpack



## Precipitation



## Snowpack Analysis

<b>Watershed Snowpack Analysis May 1, 2015</b>	<b># of Sites</b>	<b>% Median</b>	<b>Last Year % Median</b>
CLARK FORK ab FLINT CREEK	12	71%	168%
FLINT CREEK	5	56%	164%
ROCK CREEK	5	54%	144%
CLARK FORK ab BLACKFOOT	20	63%	162%
BLACKFOOT	13	72%	172%
UPPER CLARK FORK RIVER BASIN	31	66%	162%

## Reservoir Storage

In the Upper Clark Fork, basin-wide reservoir storage is currently at 111 percent of average for May 1st, and 110 percent of average of last year at this time.

<b>Reservoir Storage End of April 2015</b>	<b>Current (KAFI)</b>	<b>Last Year (KAF)</b>	<b>Average (KAEI)</b>	<b>Capacity (KAFI)</b>
East Fork Rock Creek Res	119	102	92	15.6
Georgetown Lake	29.0	26.8	28.2	31.0
Lower Willow Creek Reservoir	5.0	4.7	4.1	4.9
Nevada Creek Res	112	104	99	12.6
Basin-wide Total	57.1	52.2	51.4	64.1
# of reservoirs	4	4	4	4

## Streamflow Forecast

The basin-wide average May-July streamflow forecast for the Upper Clark Fork River is currently at 60 percent of average and 42 percent of last year. Due to the high variability of percentages in the forecasts please see the table below for individual river basins.

### Upper Clark Fork River Basin Streamflow Forecasts - May 1, 2015

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast
---

UPPER CLARK FORK RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Little Blackfoot nr Garrison	MAY-JUL	16.7	27	35	63%	44	59	56
	MAY-SEP	19.6	31	40	63%	50	67	63
Flint Ck nr Southern Cross	MAY-JUL	2.4	4	5.3	50%	6.9	9.4	10.5
	MAY-SEP	2.6	4.5	6.2	49%	8.1	11.4	12.7
Flint Ck bl Boulder Ck	MAY-JUL	13.5	20	26	58%	32	43	45
	MAY-SEP	20	29	36	61%	44	56	59
Lower Willow Ck Reservoir Inflow <sup>2</sup>	MAY	0.66	1.27	1.8	36%	2.4	3.5	5
	MAY-JUL	1.13	2.2	3	35%	4.1	5.9	8.5
MF Rock Ck nr Philipsburg	MAY-JUL	15.6	26	34	64%	41	52	53
	MAY-SEP	19.8	31	39	65%	47	59	60
Rock Ck nr Clinton	MAY-JUL	41	91	125	57%	159	210	220
	MAY-SEP	57	111	148	59%	185	240	250
Clark Fork R ab Milltown	MAY-JUL	15.7	152	245	55%	340	475	445
	MAY-SEP	48	198	300	57%	400	550	530
Nevada Ck nr Helmville	MAY	1.17	1.74	2.2	42%	2.7	3.6	5.2
	MAY-JUL	2.1	3.7	5	45%	6.5	9.2	11
Blackfoot R nr Bonner	MAY-JUL	235	315	375	64%	430	510	590
	MAY-SEP	285	375	435	64%	500	585	675
Clark Fork R ab Missoula	MAY-JUL	275	485	625	61%	770	980	1030
	MAY-SEP	360	585	740	62%	895	1120	1200

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

<b>May-July Streamflow</b>		
<b>5/1/2015</b>	<b>% Average</b>	<b>% Last Year</b>
<b>Columbia River Basin</b>	<b>80%</b>	<b>59%</b>
Kootnenai in Montana	80%	70%
Flathead in Montana	87%	60%
Upper Clark Fork	60%	42%
Bitterroot	70%	42%
Lower Clark Fork	77%	46%
<b>Missouri River Basin</b>	<b>47%</b>	<b>39%</b>
Jefferson	42%	36%
Madison	50%	52%
Gallatin	59%	50%
Headwaters Mainstem	46%	38%
Smith-Judith-Musselshell	65%	44%
Sun-Teton-Marias	58%	40%
St. Mary	75%	52%
<b>Yellowstone River Basin</b>	<b>67%</b>	<b>45%</b>
Upper Yellowstone	74%	51%
Lower Yellowstone	63%	40%
East of Divide	56%	42%
West of Divide	80%	59%
<b>Montana State-Wide</b>	<b>69%</b>	<b>50%</b>

## Snow Water Equivalent: May 11, 2015

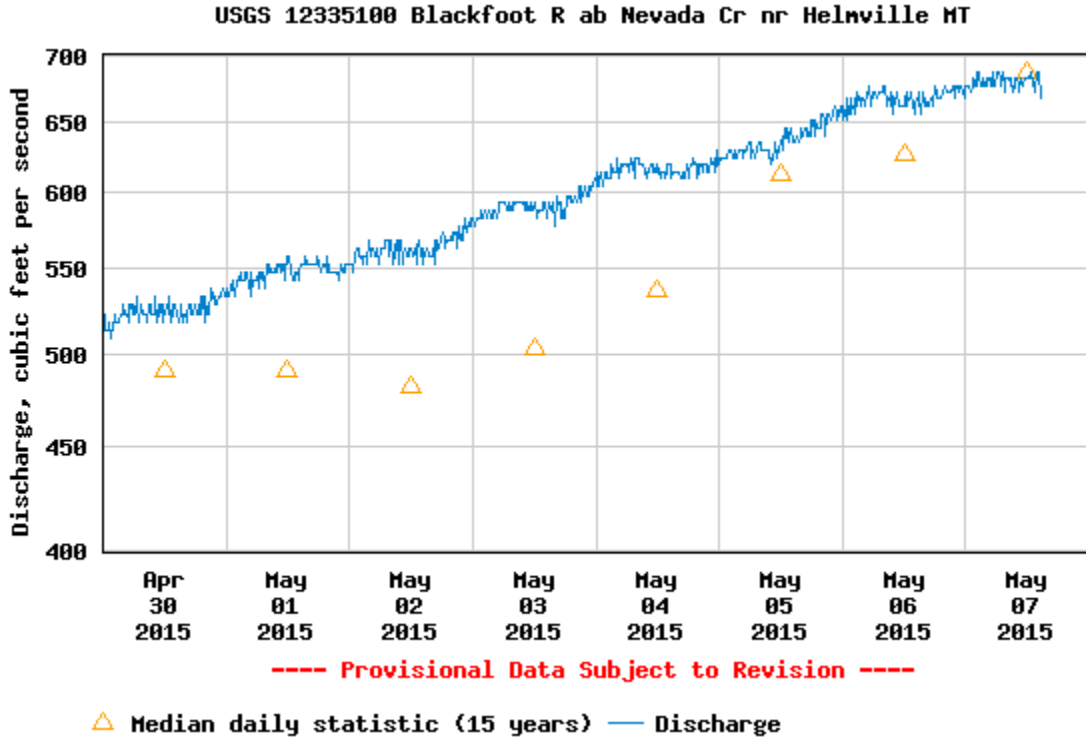
Columbia River Basin SNOTEL Snow/Precipitation Update Report							
Based on Mountain Data from NRCS SNOTEL Sites							
**Provisional data, subject to revision**							
Data based on the first reading of the day (typically 00:00) for Monday, May 11, 2015							
Basin Site Name	Elev (ft)	Snow Water Equivalent			Water Year-to-Date Precipitation		
		Current (in)	Median (in)	Pct of Median	Current (in)	Average (in)	Pct of Average
<b>UPPER CLARK FORK RIVER BASIN</b>							
Barker Lakes	8250	10.9	15.5	70	18.1	21.3	85
Basin Creek	7180	3.6	8.4	43	9.0	13.5	67
Black Pine	7210	0.0	6.6	0	15.8	16.4	96
Combination	5600	0.0	0.0	*	10.2	11.4	89
Copper Bottom	5200	0.0	N/A	*	14.8	17.7	84
Copper Camp	6950	13.8	N/A	*	26.2	35.4	74
Lubrecht Flume	4680	0.0	0.0	*	11.4	12.0	95
Nevada Ridge	7020	2.8	10.8 <sub>c</sub>	26	16.6	18.9 <sub>c</sub>	88
N Fk Elk Creek	6250	0.0	3.3	0	12.7	16.8	76
North Fork Jocko	6330	23.1	37.0	62	52.2	52.3	100
Peterson Meadows	7200	1.7	10.0	17	15.2	15.9 <sub>c</sub>	96
Rocker Peak	8000	13.1	15.2	86	15.4	17.7	87
Skalkaho Summit	7250	5.6	20.6	27	23.8	25.9	92
Stuart Mountain	7400	28.0	30.9 <sub>c</sub>	91	35.2	35.2 <sub>c</sub>	100
Warm Springs	7800	20.5	21.8	94	26.0	27.0	96
<b>Basin Index (%)</b>		<b>61</b>			<b>90</b>		

**May 7, 2015 USGS Real Time Flow Conditions**

**BLACKFOOT RIVER ABOVE NEVADA CREEK NEAR HELMVILLE**

**Discharge, cubic feet per second**

Most recent instantaneous value: 672 05-07-2015 14:45 MDT



Daily discharge, cubic feet per second -- statistics for May 7 based on 15 years of record [more](#)

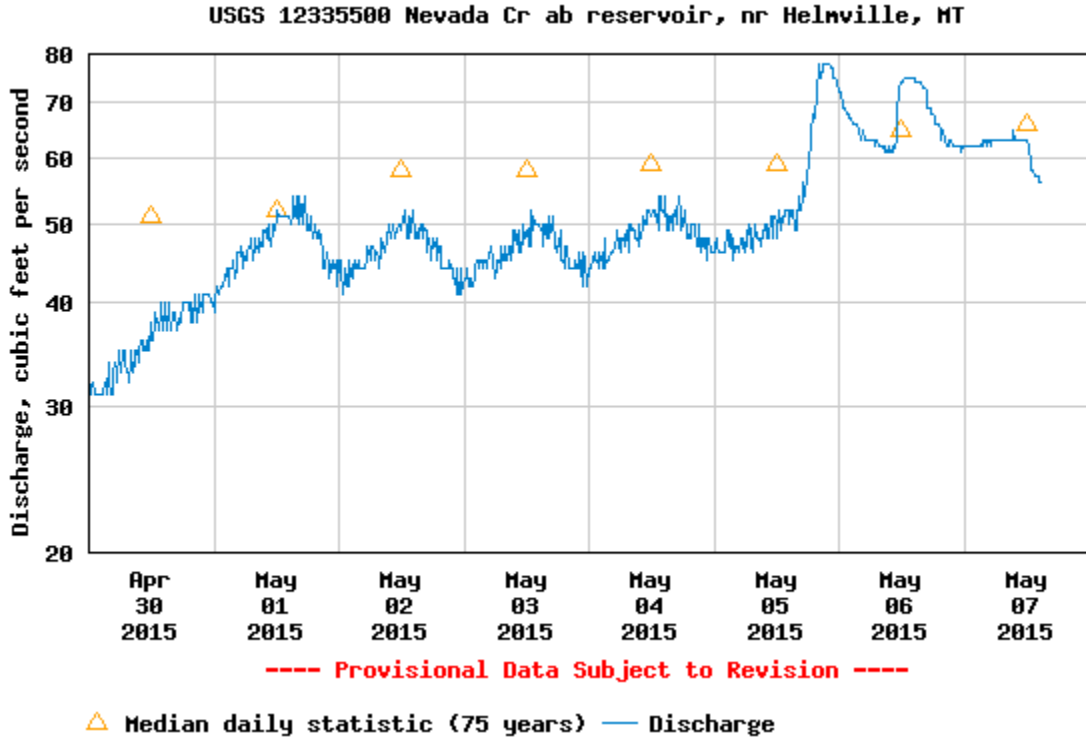
Min (2002)	25th percentile	Mean	Most Recent Instantaneous Value May 7	Median	75th percentile	Max (2014)
173	324	649	672	688	989	1430



**NEVADA CREEK (above reservoir)**

**Discharge, cubic feet per second**

Most recent instantaneous value: 56 05-07-2015 14:45 MDT



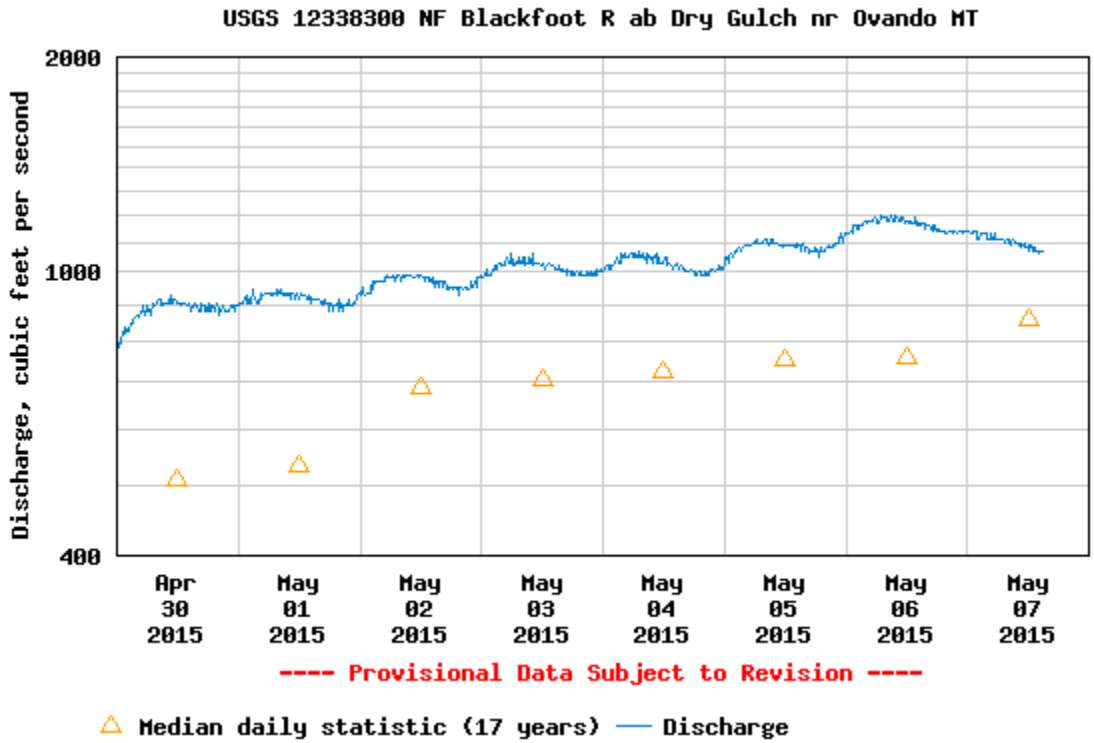
Daily discharge, cubic feet per second -- statistics for May 7 based on 76 years of record [more](#)

Min (1991)	25th percentile	Most Recent Instantaneous Value May 7	Median	Mean	75th percentile	Max (1975)
12	39	56	66	85	103	384

**NORTH FORK BLACKFOOT (above Dry Gulch near Ovando)**

**Discharge, cubic feet per second**

Most recent instantaneous value: 1,070 05-07-2015 15:00 MDT



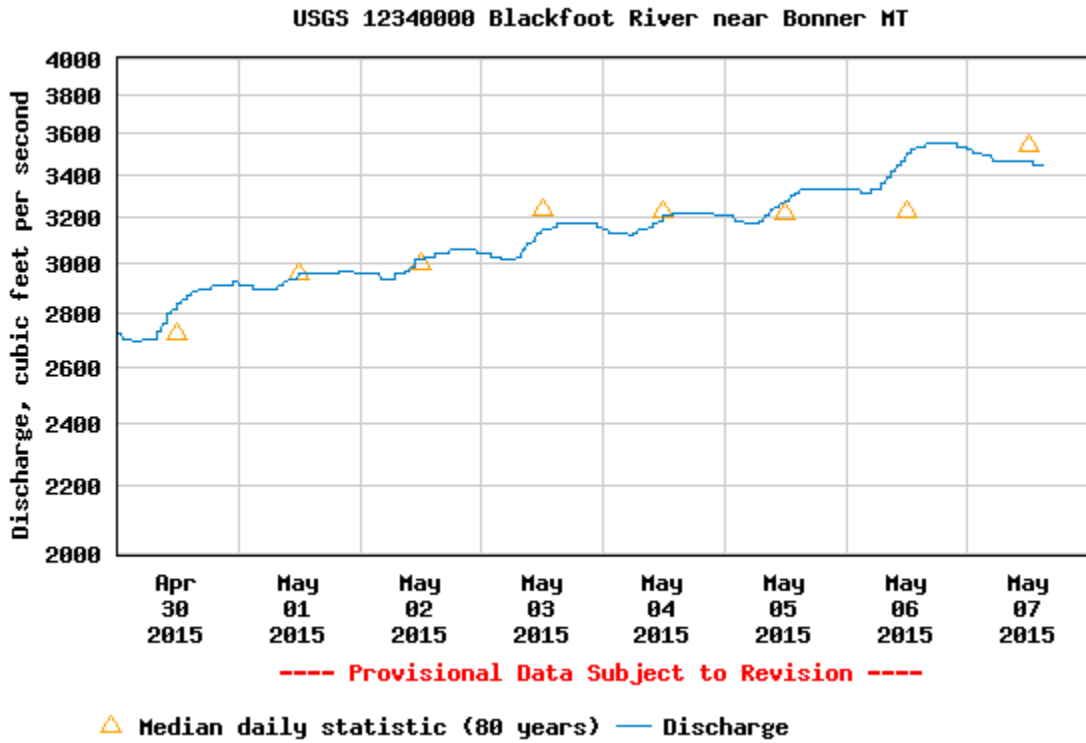
Daily discharge, cubic feet per second -- statistics for May 7 based on 17 years of record [more](#)

Min (2010)	25th percentile	Median	Mean	Most Recent Instantaneous Value May 7	75th percentile	Max (2004)
288	630	859	903	1070	1140	1690

## BLACKFOOT RIVER AT BONNER

### Discharge, cubic feet per second

Most recent instantaneous value: 3,450 05-07-2015 14:45 MDT



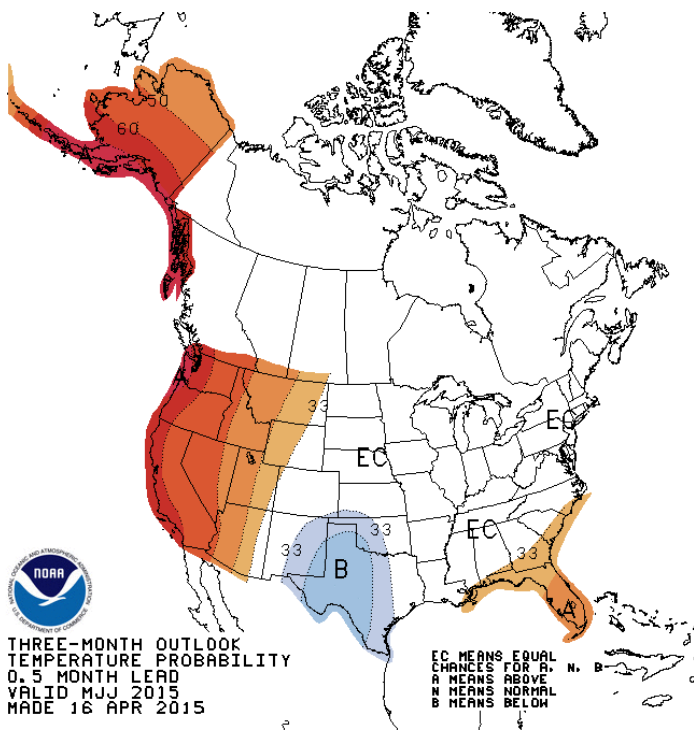
Daily discharge, cubic feet per second -- statistics for May 7 based on 81 years of record [more](#)

Min (1905)	25th percentile	Most Recent Instantaneous Value May 7	Median	Mean	75th percentile	Max (1947)
735	2420	3450	3540	3900	4510	10700

# Three-Month Outlook May 7, 2015

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

Higher chance for above normal temps  
over the next 3 months



Chance for above normal precipitation  
over next 3 months

