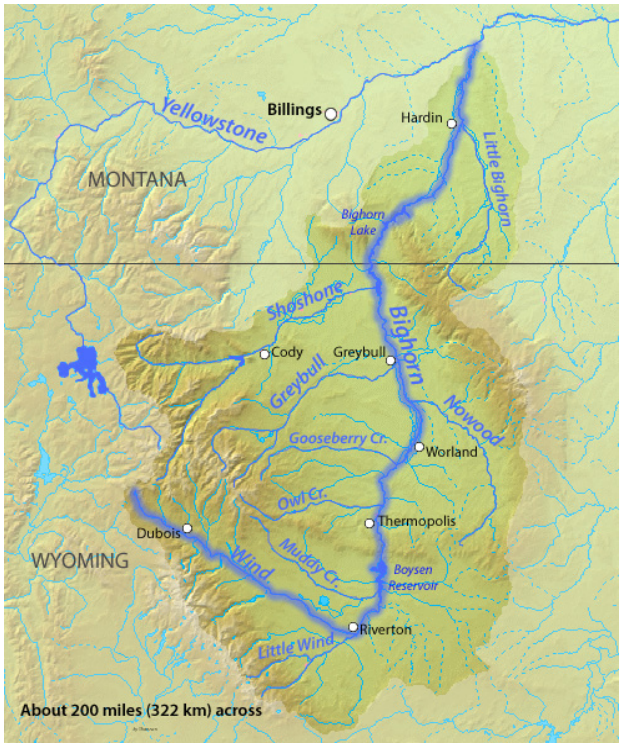
RECLAMATION

Managing Water in the West

Yellowtail Dam Water Supply and Projected Operations **June 2019**



Bighorn River Basin Map Source: DEMIS Mapserver

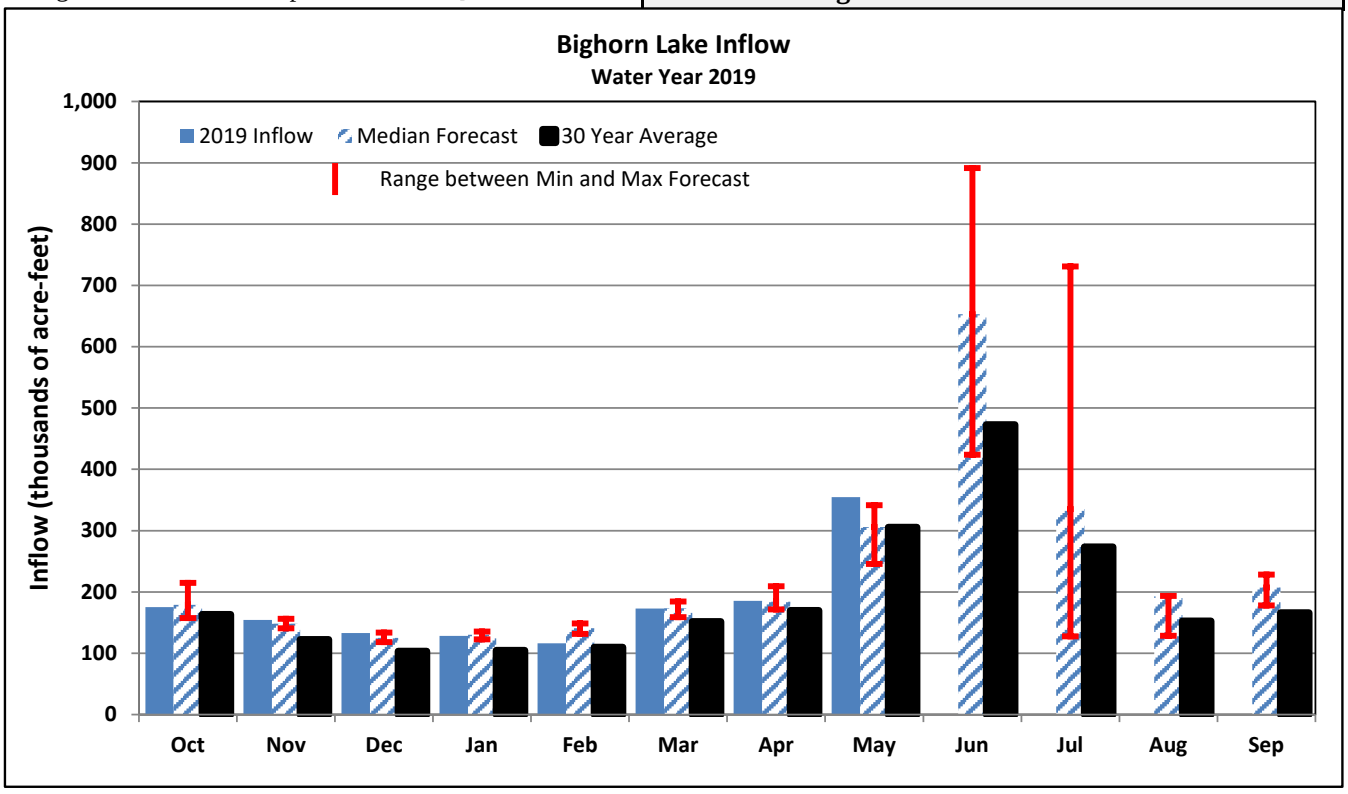
Forecasted June Operating Range

Forecast	Minimum	Median	Maximum
Monthly Average Inflow (cfs)	7,120	10,970	14,980
Monthly Average River Release (cfs)	4,500	7,370	10,440
End of June Elevation (feet)	3641.6	3646.0	3650.0

June 2019 Inflow Forecast

June through July Volume (kaf)	988
Percent of Average	132

Water Year	Historic Inflow (kaf)	Rank
2018	1,270	6
2017	1,537	3
2016	552	34
2015	1,101	13
30 Year Average	746	

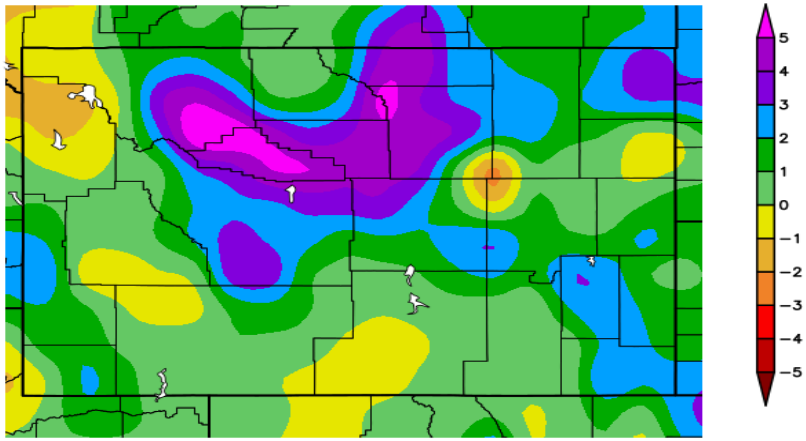


Climate Departure from Normal

May 1 through May 31, 2019

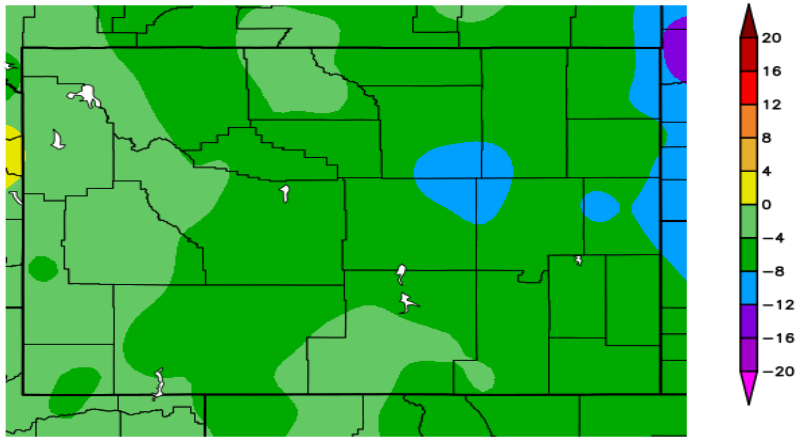
Precipitation

Departure from Normal (inches)



Temperature

Departure from Normal (°F)



HPRCC using provisional data NOAA Regional Climate Centers

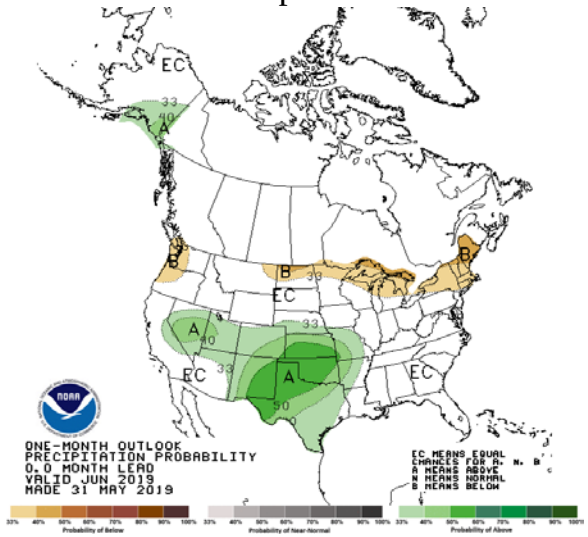
CLIMATE SUMMARY

Precipitation was well above average and temperatures were below average throughout the Bighorn River Basin during May. This produced higher inflows than forecasted duirng May while adding to the snowpack during the second half of May.

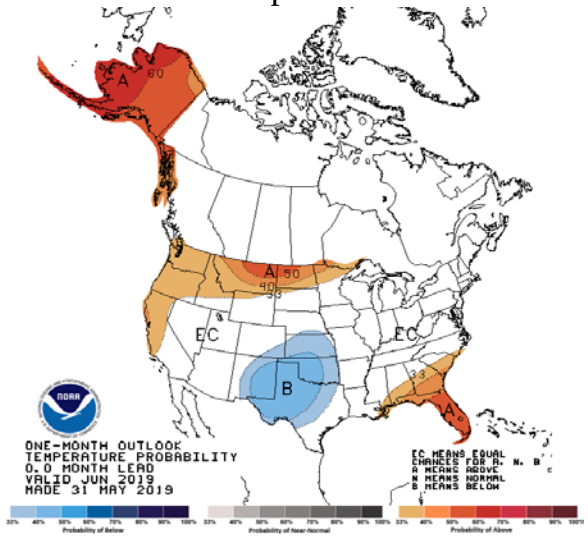
The June outlook is for equal chance of above average, below average, or average precipitation throughout the Bighorn River Basin. There is also an equal chance of above average, below avearge, or average throughout most of the Bighorn Basin with an increased chance of warmer than average temperatures in the far northern part of the Basin.

June Climate Outlook

Precipitation



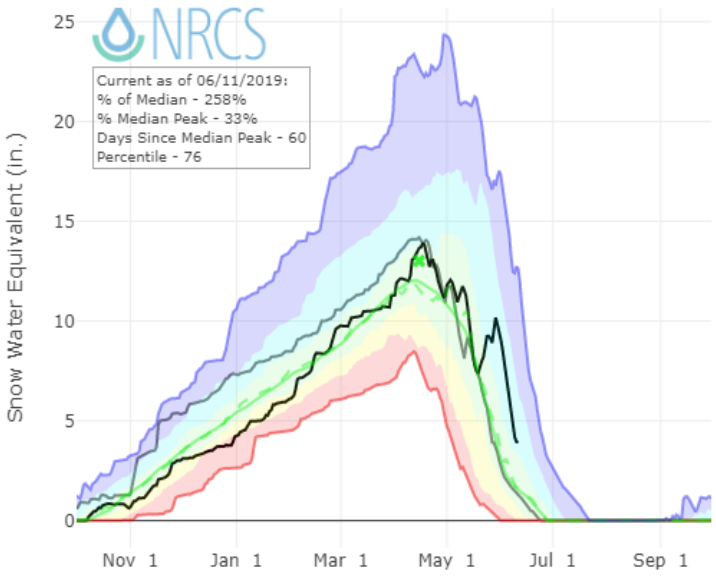
Temperature

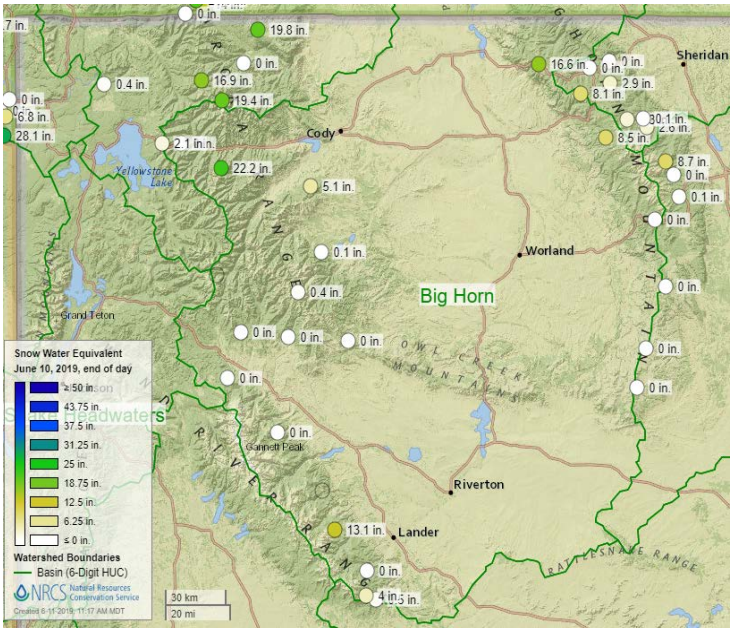


SNOWPACK SUMMARY

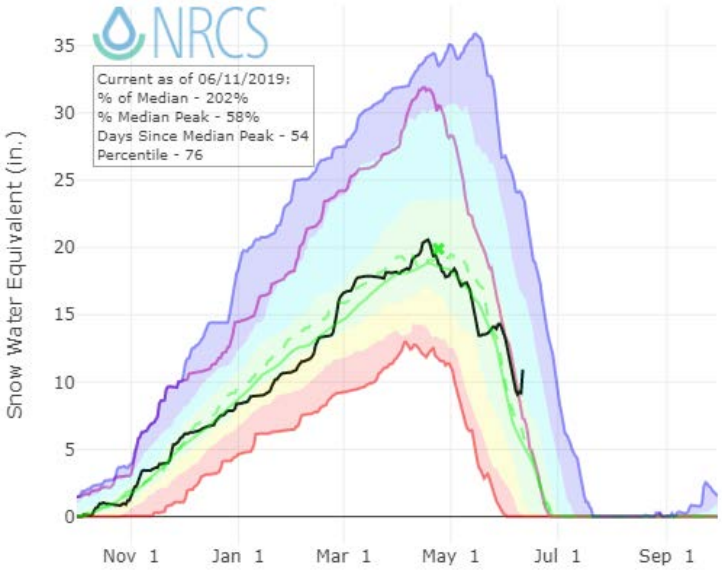
The snow water equivalent (SWE) graphs are a composite of SNOTEL sites within the Bighorn River Basin that is managed by the Department of Natural Resources Conservation Service (NRCS). The June 1, 2019 SNOTEL data, streamflow data and planned releases from Boysen and Buffalo Bill Reservoirs was used to compute a June through July runoff inflow forecast volume into Bighorn Lake of 987,900 acre-feet, or 132 percent of average.

Wind River

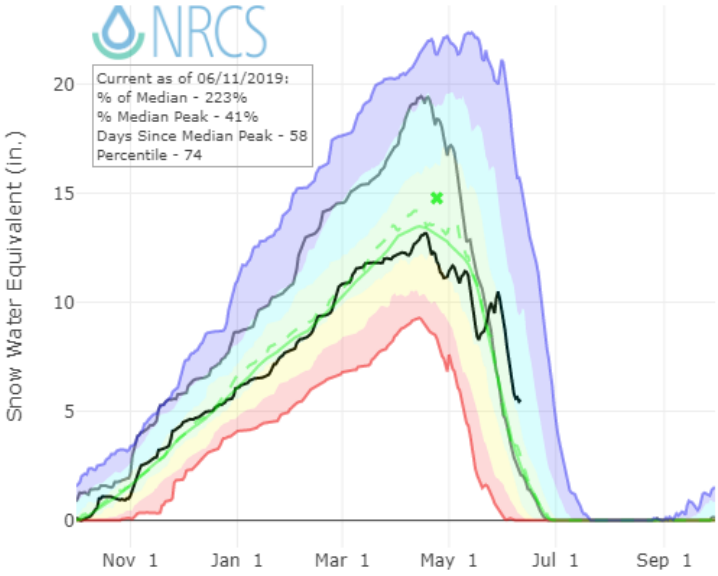


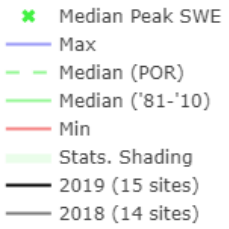


Shoshone River



Bighorn River



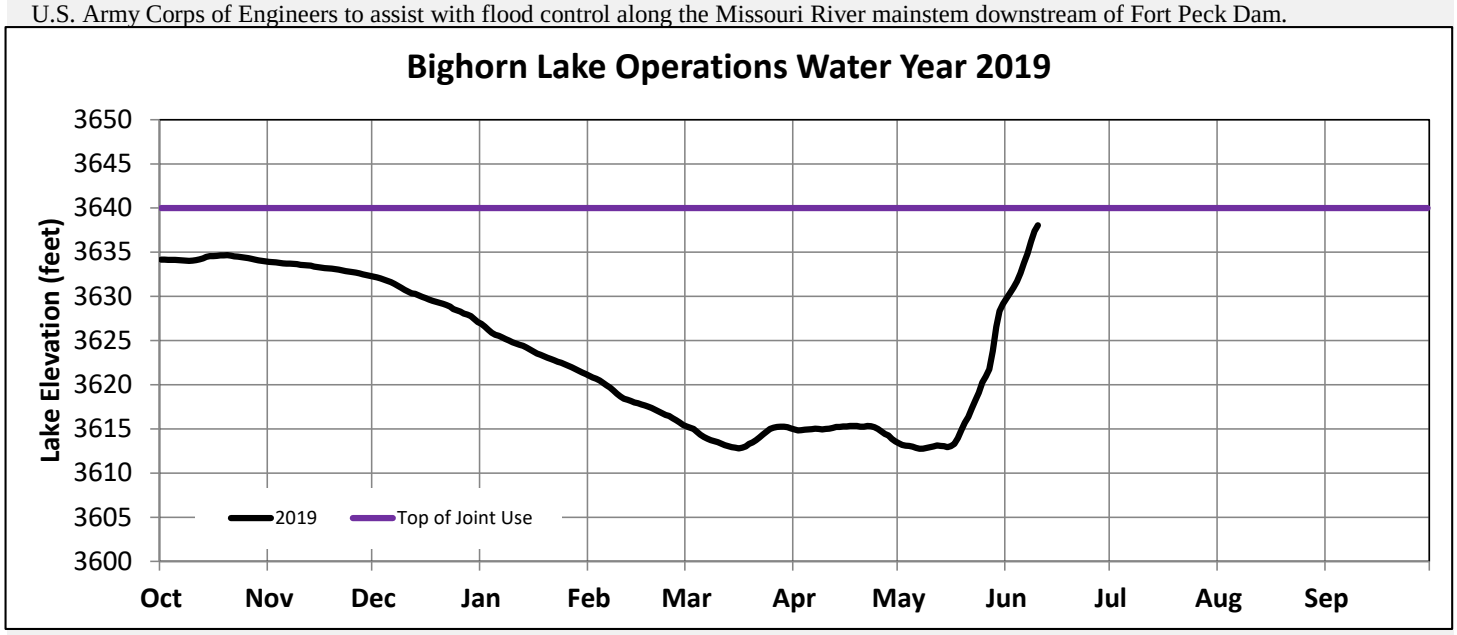


NRCS Montana Snow Survey Website: https://www.nrcs.usda.gov/wps/portal/nrcs/mt/snow/

Statistical shading breaks at 10th, 30th,50th, 70th, and 90th Percentiles
Normal ('81-'10) – Official median calculated from 1981-2010 data
Normal (POR) – Unofficial mean calculated from Period of Record data

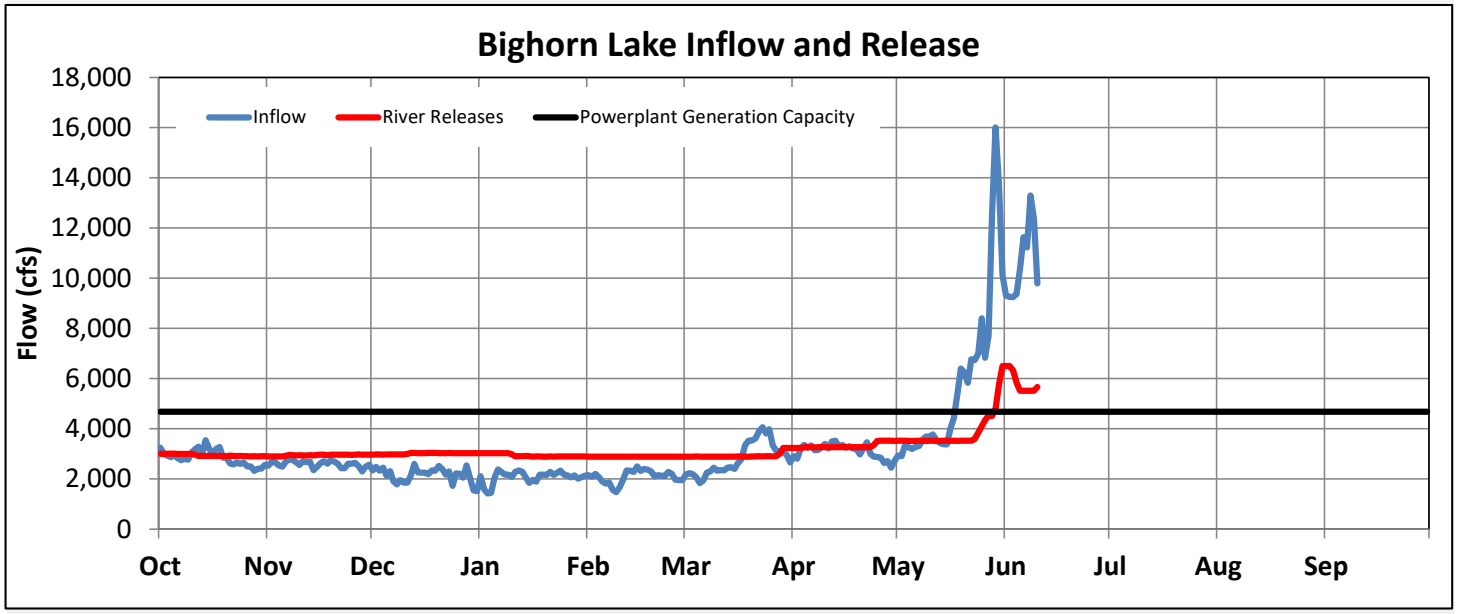
OPERATIONS REVIEW

Releases to the Bighorn River were increased to 6,500 cfs during May based on storage conditions and forecasted inflow. May inflows were higher than what was forecasted. Releases were reduced to 5,500 cfs on June 3 and 4 in accordance with reservoir regulation orders from the U.S. Army Corps of Engineers to assist with flood control along the Missouri River mainstem downstream of Fort Peck Dam.



June 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3629.1	903,636	111	89
Buffalo Bill	5360.2	401,554	91	62
Boysen	4717.5	605,082	114	82



Average May Release

	Monthly Avg cfs	Percent of Average
Bighorn River	3,854	102
Buffalo Bill Total Release	2,476	111
Boysen Release	1,994	104

Average May Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	5,768	116
Buffalo Bill	2,553	84
Boysen	2,461	110

OPERATIONS OUTLOOK

Releases to the Bighorn River are being directed by the U.S. Army Corps of Engineers to assist with flood control along the Missouri River mainstem below Fort Peck Dam. Releases will increase during June as the snowmelt runoff continues through coordination with the U.S. Army Corps of Engineers. Bighorn Lake is expected to fill into the exclusive flood control pool during June.

Median Inflow Conditions (June through July Inflow: 988 kaf)

	Jun	Jul	Aug	Sep	Oct	Nov
Boysen Release (cfs)	3,927	2,950	1,654	1,262	1,262	1,000
Buffalo Bill Release (cfs)	3,850	3,248	1,888	1,694	899	358
Tributary Gain (cfs)	3,193	-748	-402	524	1,246	1,010
Monthly Inflow (cfs)	10,971	5,450	3,140	3,480	3,407	2,368
Monthly Inflow (kaf)	652.8	335.1	193.1	207.1	209.5	140.9
Monthly Release (kaf)	453.8	417.1	234.8	193.3	184.8	175.8
Afterbay Release (cfs)	7,697	6,853	3,889	3,319	3,075	3,025
River Release (cfs)	7,374	6,434	3,449	3,025	3,027	3,025
End-of-Month Content (kaf)	1,102.6	1,020.6	978.9	992.7	1,017.4	982.5
End-of-Month Elevation (feet)	3646.0	3640.0	3636.5	3637.7	3639.7	3636.9

Minimum Inflow Conditions (June through July Inflow: 551 kaf)

	Jun	Jul	Aug	Sep	Oct	Nov
Boysen Release (cfs)	2,914	1,368	1,200	1,082	1,000	600
Buffalo Bill Release (cfs)	2,650	1,976	1,862	1,749	675	205
Tributary Gain (cfs)	1,558	-1,269	-973	160	1,031	926
Monthly Inflow (cfs)	7,122	2,075	2,090	2,991	2,706	1,731
Monthly Inflow (kaf)	423.8	127.6	128.5	178.0	166.4	103.0
Monthly Release (kaf)	286.4	177.5	176.4	162.1	152.4	129.2
Afterbay Release (cfs)	4,884	2,957	2,939	2,795	2,548	2,242
River Release (cfs)	4,501	2,500	2,500	2,501	2,500	2,242
End-of-Month Content (kaf)	1,041.0	991.1	943.2	959.1	973.1	946.9
End-of-Month Elevation (feet)	3641.6	3637.6	3633.3	3634.8	3636.0	3633.6

Maximum Inflow Conditions (June through July Inflow: 1,622 kaf)

	Jun	Jul	Aug	Sep	Oct	Nov
Boysen Release (cfs)	6,015	6,450	1,238	1,235	1,000	1,000
Buffalo Bill Release (cfs)	5,107	5,183	2,103	1,795	1,189	358
Tributary Gain (cfs)	3,859	254	-194	807	1,436	1,071
Monthly Inflow (cfs)	14,980	11,887	3,147	3,837	3,625	2,428
Monthly Inflow (kaf)	891.4	730.9	193.5	228.3	222.9	144.5
Monthly Release (kaf)	631.6	791.7	297.4	219.6	210.9	179.9
Afterbay Release (cfs)	10,685	12,946	4,907	3,761	3,500	3,094
River Release (cfs)	10,438	12,526	4,500	3,501	3,500	3,094
End-of-Month Content (kaf)	1,163.4	1,102.6	998.7	1,007.4	1,019.4	984.0
End-of-Month Elevation (feet)	3650.0	3646.0	3638.2	3638.9	3639.9	3637.0

OPERATIONS OUTLOOK

Irrigation diversions resumed on May 14. Diversions remained low due to above average precipitaiton throughout the month of May. Irrigation diversions are forecasted to increase during June.

Irrigation Demands Outlook

Bighorn Canal (cfs)

	Jun	Jul	Aug	Sep	Oct	Nov
Median Forecast	323	420	439	294	49	0
Minimum Forecast	383	457	439	294	49	0
Maximum Forecast	247	420	407	260	0	0

Power Generation Outlook

Current Number of Units Available: 3
Approximate Yellowtail Powerplant Turbine Capacity: 6,150 cfs
Approximate Yellowtail Powerplant Generation Limit: 4,615 cfs

Yellowtail Powerplant Release (cfs)

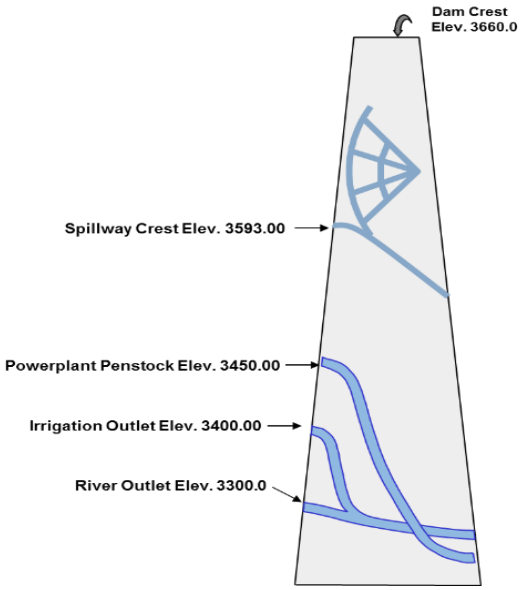
	Jun	Jul	Aug	Sep	Oct	Nov
Median Forecast	4,080	4,616	3,819	3,249	3,006	2,954
Minimum Forecast	4,080	2,887	2,869	2,724	2,479	2,171
Maximum Forecast	4,080	4,616	4,616	3,691	3,430	3,023

Yellowtail Powerplant Generation (gwh)

	Jun	Jul	Aug	Sep	Oct	Nov
Median Forecast	99.1	115.9	95.5	77.3	73.8	69.3
Minimum Forecast	99.1	70.1	69.0	62.7	58.5	47.8
Maximum Forecast	99.1	115.9	115.9	89.3	85.6	71.1

Yellowtail Spill (cfs)

	Jun	Jul	Aug	Sep	Oct	Nov
Median Forecast	3,546	2,168	0	0	0	0
Minimum Forecast	733	0	0	0	0	0
Maximum Forecast	6,534	8,260	221	0	0	0



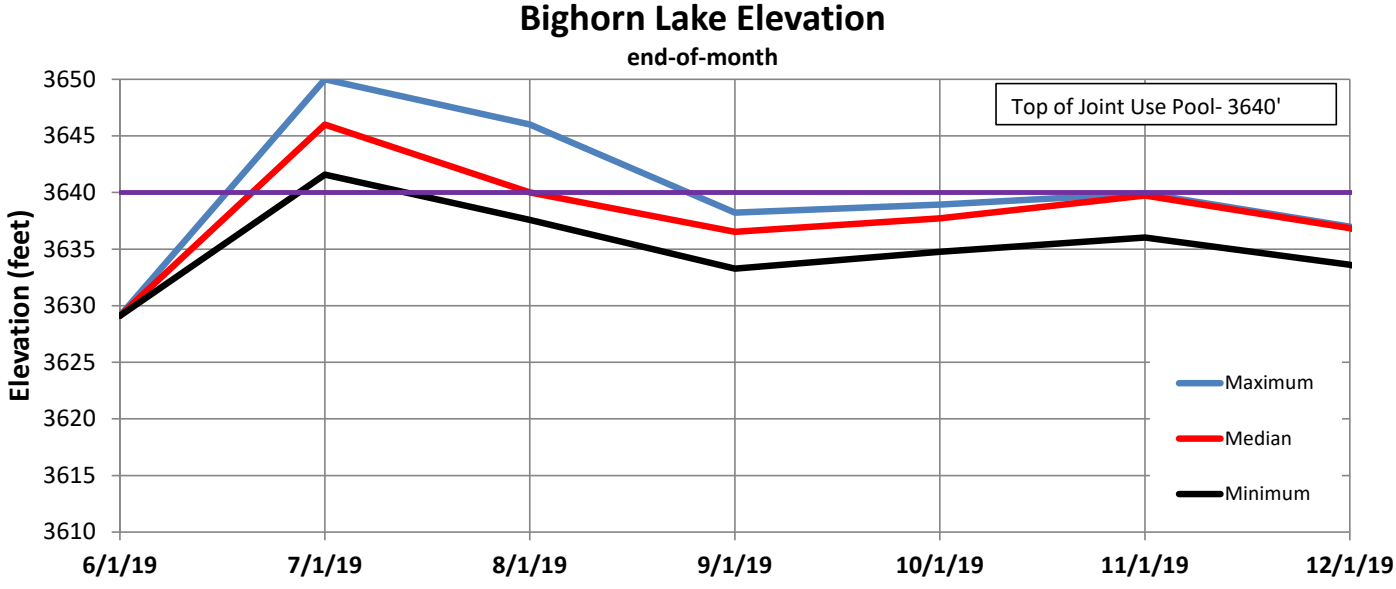
Release Outlook by Outlet

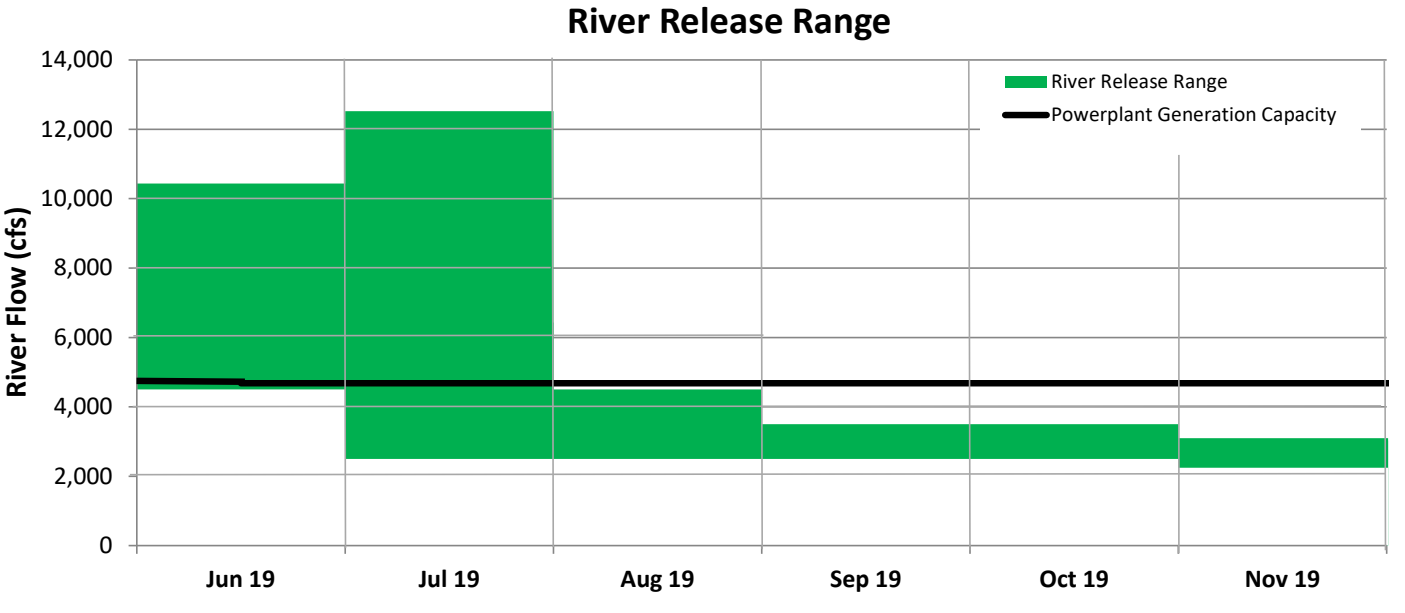
Release through either the spillway or river outlet works will continue during June. Bypass releases will increase during scheduled maintenance and inspection of the Yellowtail Powerplant which will limit Yellowtail Powerplant to two units from June 17 through June 28.

OPERATIONS OUTLOOK

Projected elevations and the range of river releases are based on the median, minimum, and maximum inflow forecasts. End of month elevations and river releases vary based on the difference between forecasted inflow scenarios. The monthly average river releases during June through July range between 2,500 and 12,525 cfs.

The current June through July inflow forecast projects storage between 1.5 to 10 feet of the exclusive flood control space by the end of June. At the request of the U.S. Army Corps of Engineers, flows from Yellowtail Dam are being minimized in an effort to store water and mitigate flooding on the Missouri River and the Missouri River mainstem reservoir system.





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Monthly Operating Plans, Current Conditions, Snowpack and Other Water Management Information
https://www.usbr.gov/gp/lakes_reservoirs/wareprts/main_menu.html