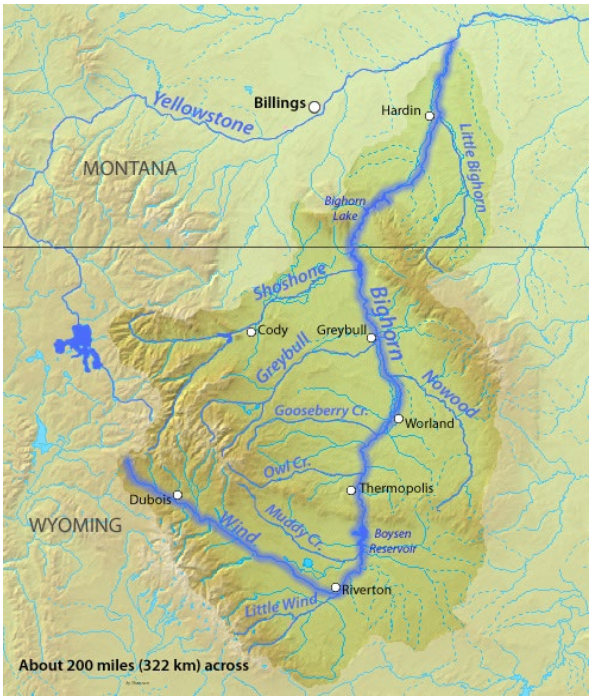
Yellowtail Dam Water Supply and Projected Operations

BUREAU OF RECLAMATION

April 2024



Bighorn River Basin Map Source: DEMIS Mapserver

April Operating Range			
Forecast	**Minimum**	**Median**	**Maximum**
Monthly Average Inflow (cfs)	3,675	4,200	4,605
Monthly Average River Release (cfs)	3,940	5,065	5,775
End of April Elevation (feet)	3617.1	3613.4	3610.6

April-July 2024 Inflow Forecast (kaf)		
April-July Volume		1,172
Percent of Average		93
Water Year	**Historic Inflow**	**Rank**
2023	2,000	5
2022	990	38
2021	607	49
2020	1,042	33
30 Year Average	1,264	

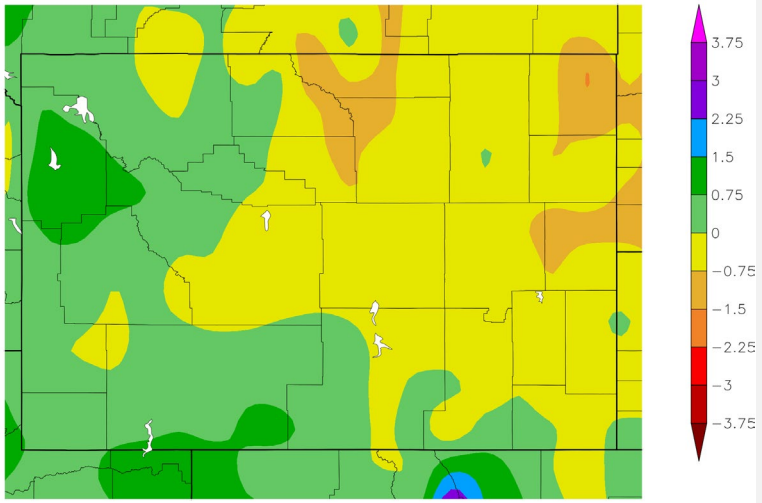
CLIMATE SUMMARY

Climate Departure from Normal

March 1 through March 32, 2024

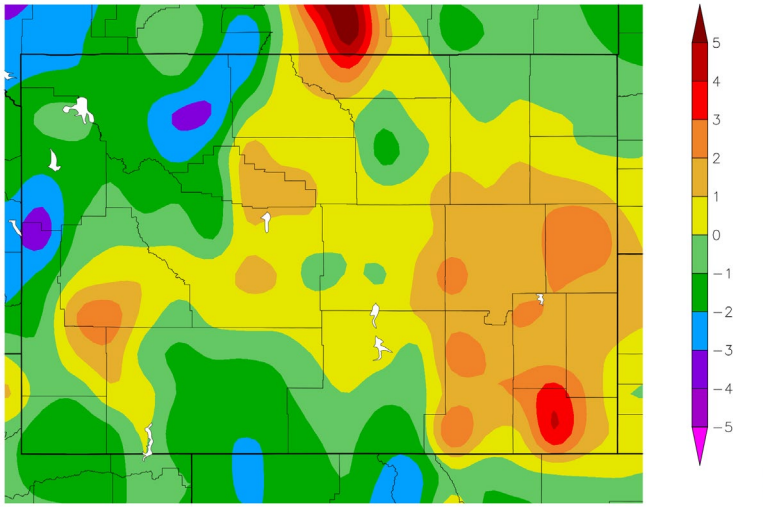
Precipitation

Departure from Normal (inches)



Departure from Normal (°F)

Temperature



HPRCC using provisional data from NOAA Regional Climate Centers

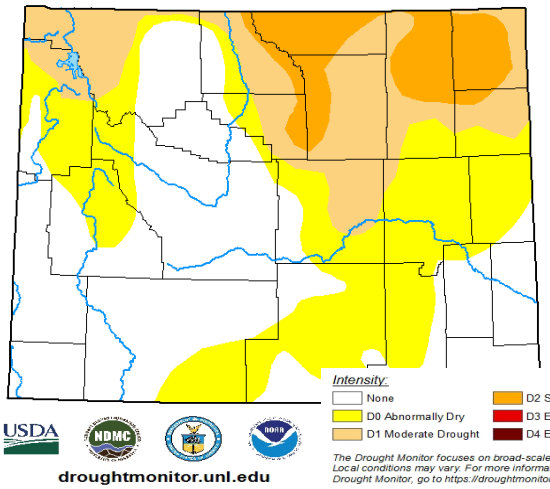
Precipitation in the Bighorn Basin was near average during March. Temperatures were mixed. Some areas were above average and other areas in the basin were below average.

The climate outlook for April shows there is a 33 to 40 percent chance precipitation will be above average. There is an equal chance temperatures will be either below, near, or above average.

The drought monitor map shows drought conditions in the Bighorn River Basin range from areas with no drought to areas of severe drought.

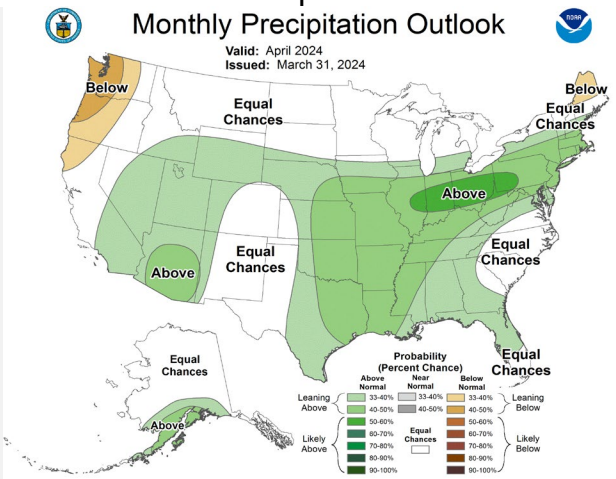
Wyoming Drought Monitor Map

March 26, 2024

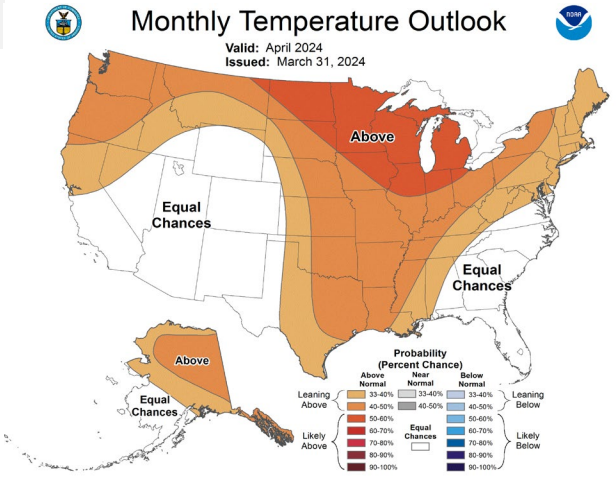


April Climate Outlook

Precipitation



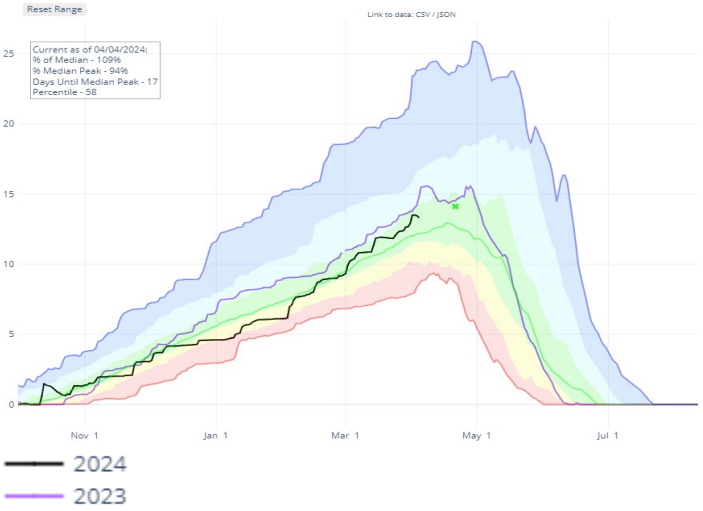
Temperature

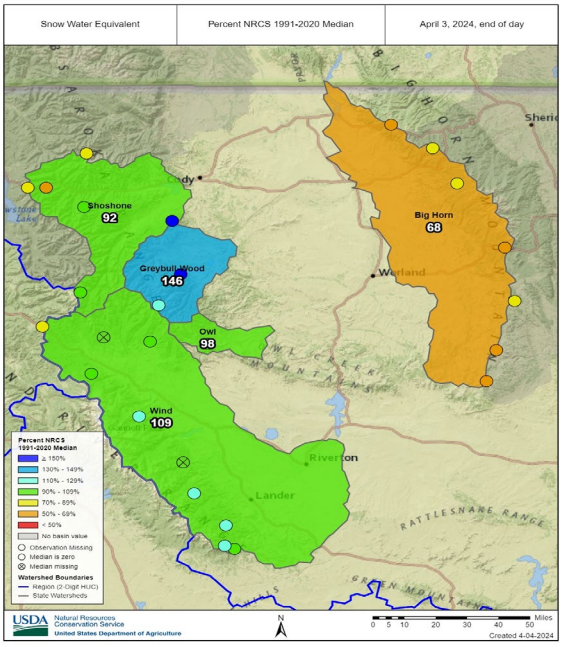


SNOWPACK SUMMARY

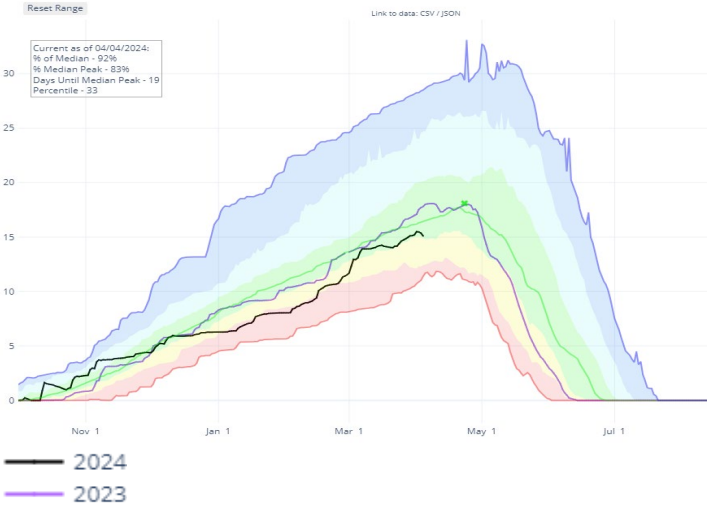
The snow water equivalent (SWE) graphs are a composite of SNOTEL sites within the Bighorn River Basin managed by the Natural Resources Conservation Service (NRCS).

Wind River

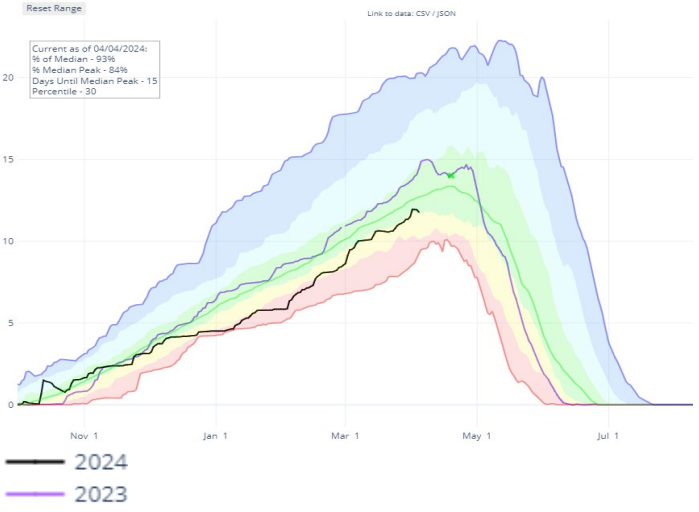




Shoshone River

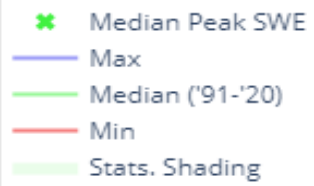


Bighorn River



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 ('91-'20) – Official median calculated from 1991-2020 data
Normal (POR) – Unofficial mean calculated from Period of Record data

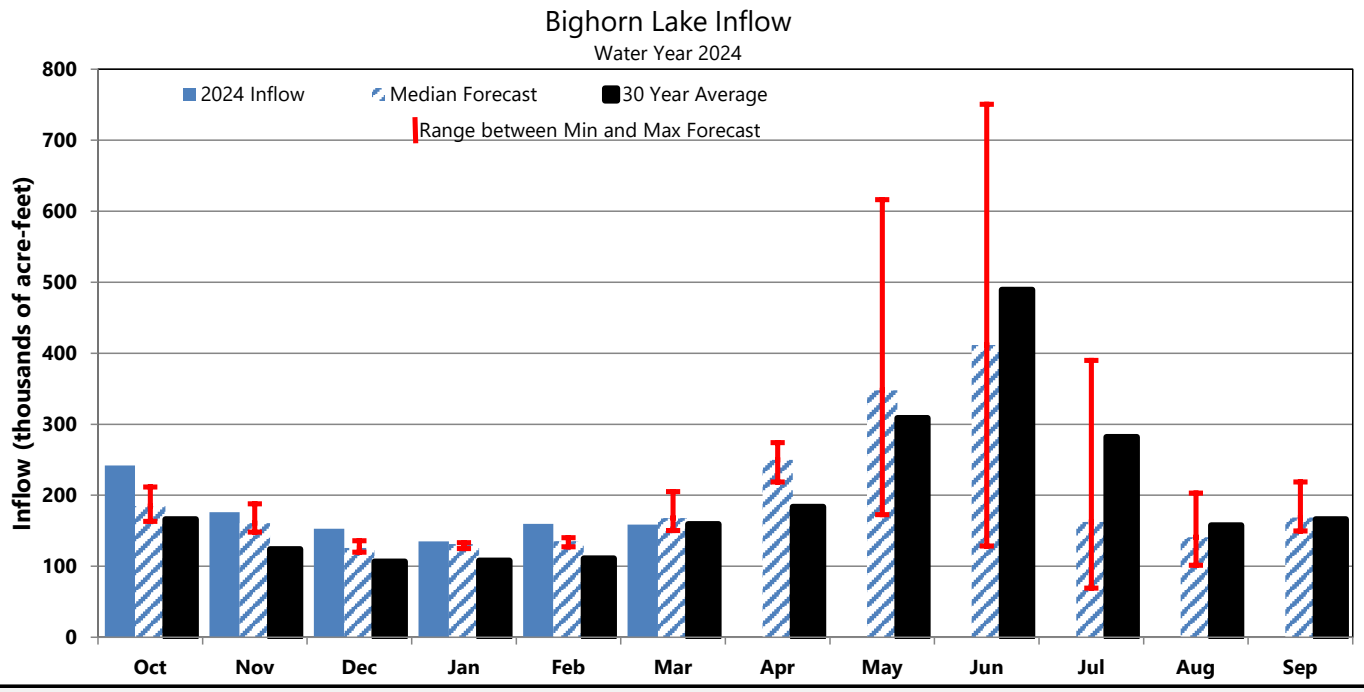


FORECAST SUMMARY

NRCS SNOTEL data, streamflow data, climate data, and planned releases from Boysen and Buffalo Bill Reservoirs are used to compute an inflow forecast for Bighorn Lake. The April through July inflow forecast increased 320 kaf from March 1 to April 1.

March Forecast Review

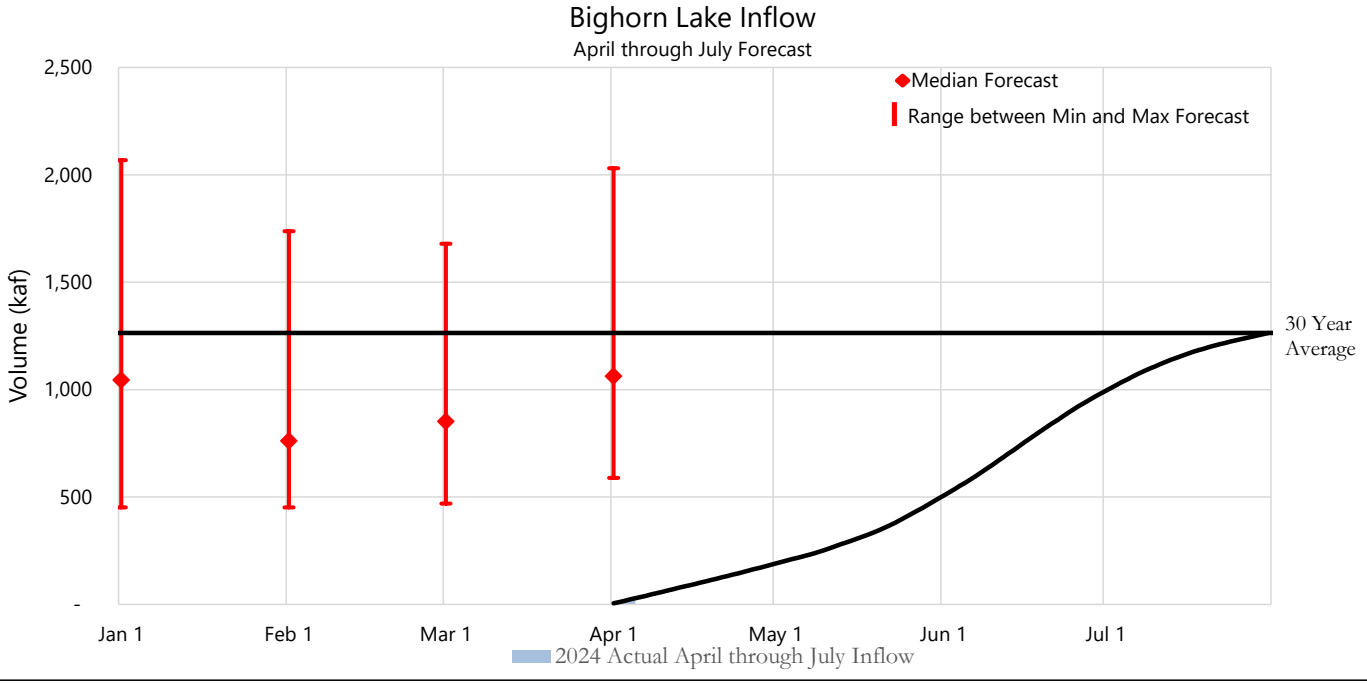
	Median Forecast (kaf)	Actual (kaf)	Difference (kaf)	Actual (% of Avg)
March Inflow	168.0	158.6	(9.4)	100



April through July Inflow Forecast for April 1

	Median Forecast (kaf)	% of Average	Minimum Forecast (kaf)	Maximum Forecast (kaf)
April through July Inflow	1,179	93	589	2,031

Historic Maximum (2017)	2,953 kaf	**Historic Minimum (2004)**	392 kaf	**Average**	1,264

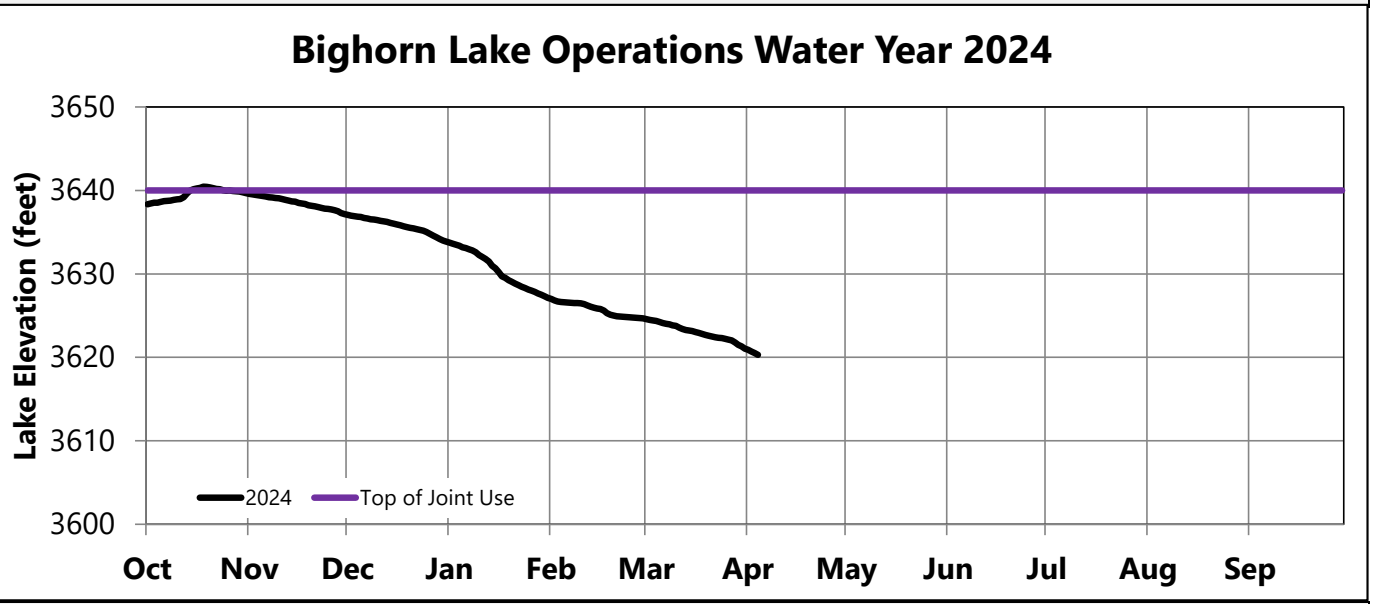


OPERATIONS REVIEW (October 1, 2023 through March 31, 2024)

Releases to the Bighorn River were decreased to 3,500 cfs towards the end of March based on actual and forecasted inflows. Releases during March were based on forecasted inflows and the end of April storage target of 3617.2 feet.

April 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3621.1	850,724	107	81
Buffalo Bill	5371.3	476,444	115	75
Boysen	4718.7	621,999	117	84

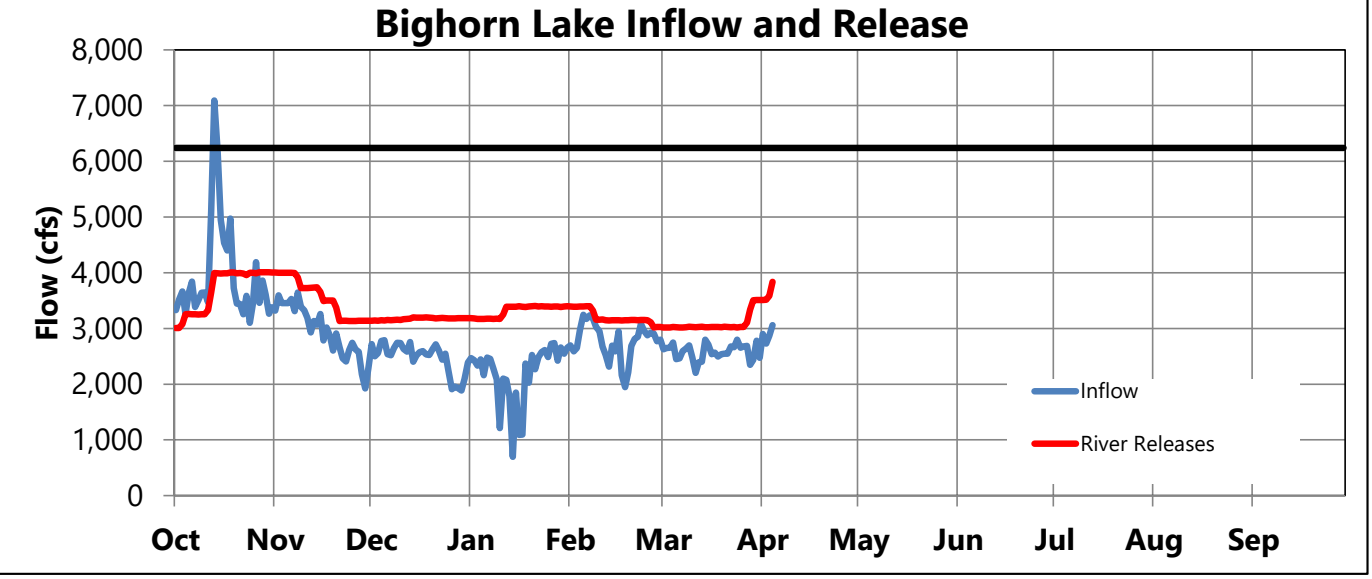


Average March Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	2,580	100
Buffalo Bill	420	120
Boysen	1,080	125

Average March Release

	Monthly Avg cfs	Percent of Average
Bighorn River	3,085	106
Buffalo Bill Total Release	310	70
Boysen Release	1,015	107



OPERATIONS OUTLOOK (April 1 through July 31, 2024)

April releases under the median inflow conditions are based on forecasted inflows and the end of April storage target of 3613.4 feet. Releases will be adjusted during April based on actual inflows and changes to forecasted inflows. Releases were increased to 4,000 cfs during the first week of April and are expected to increase to 4,500 cfs during the second week of April. Additional changes up or down will depend on current hydrologic conditions.

Median Inflow Conditions (April - July Inflow: 1,172 kaf)

	Apr	May	Jun	Jul
Boysen Release (cfs)	2,200	3,163	3,163	2,124
Buffalo Bill Release (cfs)	1,321	2,101	2,991	2,000
Tributary Gain (cfs)	679	392	765	-1,482
Monthly Inflow (cfs)	4,200	5,656	6,919	2,642
Monthly Inflow (kaf)	249.9	347.8	411.7	162.5
Monthly Release (kaf)	303.2	300.8	237.4	182.9
Afterbay Release (cfs)	5,096	4,893	3,990	2,974
River Release (cfs)	5,067	4,689	3,590	2,524
End-of-Month Content (kaf)	774.8	826.0	1,004.4	988.3
End-of-Month Elevation (feet)	3613.4	3621.3	3639.5	3638.3

Minimum Inflow Conditions (April - July Inflow: 589 kaf)

	Apr	May	Jun	Jul
Boysen Release (cfs)	2,200	1,200	1,200	1,200
Buffalo Bill Release (cfs)	1,313	1,781	1,901	1,976
Tributary Gain (cfs)	163	-172	-941	-2,051
Monthly Inflow (cfs)	3,676	2,809	2,160	1,125
Monthly Inflow (kaf)	218.7	172.7	128.5	69.2
Monthly Release (kaf)	249.4	123.7	125.0	129.1
Afterbay Release (cfs)	4,192	2,011	2,100	2,100
River Release (cfs)	3,942	1,661	1,650	1,650
End-of-Month Content (kaf)	797.4	850.7	858.5	802.8
End-of-Month Elevation (feet)	3617.1	3624.7	3625.6	3617.9

Maximum Inflow Conditions (April - July Inflow: 2,031 kaf)

	Apr	May	Jun	Jul
Boysen Release (cfs)	2,338	5,404	5,647	3,853
Buffalo Bill Release (cfs)	1,363	2,931	3,968	2,884
Tributary Gain (cfs)	906	1,688	3,000	-395
Monthly Inflow (cfs)	4,607	10,023	12,615	6,342
Monthly Inflow (kaf)	274.1	616.3	750.6	389.9
Monthly Release (kaf)	343.6	626.4	546.1	344.7
Afterbay Release (cfs)	5,775	10,188	9,178	5,605
River Release (cfs)	5,775	9,984	8,781	5,148
End-of-Month Content (kaf)	758.6	752.8	961.5	1,011.1
End-of-Month Elevation (feet)	3610.6	3609.5	3636.1	3640.0

OPERATIONS OUTLOOK (April 1 through July 31, 2024)

There is approximately 70 cfs of gain between Yellowtail Dam and Yellowtail Afterbay Dam from springs flowing into Yellowtail Afterbay. Total release from Yellowtail Dam is 70 cfs less than total release from Yellowtail Afterbay Dam. Diversions to the Bighorn Canal are anticipated to start during April.

Irrigation Demands Outlook

Bighorn Canal (cfs)

	Apr	May	Jun	Jul
Median Forecast	30	204	400	450
Minimum Forecast	250	350	450	450
Maximum Forecast	0	204	396	457

Power Generation Outlook

Current Number of Units Available: 4 of 4
Approximate Yellowtail Powerplant Turbine Capacity: 8,200 cfs
Approximate Yellowtail Powerplant Scheduled Generation Limit: 6,240 cfs

Yellowtail Powerplant Release (cfs)

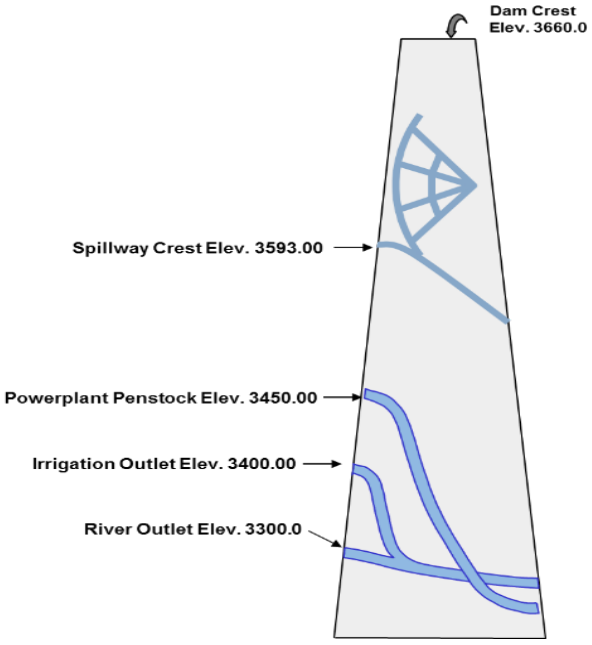
	Apr	May	Jun	Jul
Median Forecast	4,475	4,473	3,920	2,904
Minimum Forecast	4,112	1,941	2,030	2,030
Maximum Forecast	4,480	5,099	6,240	4,512

Yellowtail Powerplant Generation (gwh)

	Apr	May	Jun	Jul
Median Forecast	98	101	86	65
Minimum Forecast	90	44	44	46
Maximum Forecast	98	115	136	102

Yellowtail Spill (cfs)

	Apr	May	Jun	Jul
Median Forecast	551	350	0	0
Minimum Forecast	10	0	0	0
Maximum Forecast	1,225	5,018	2,868	1,024

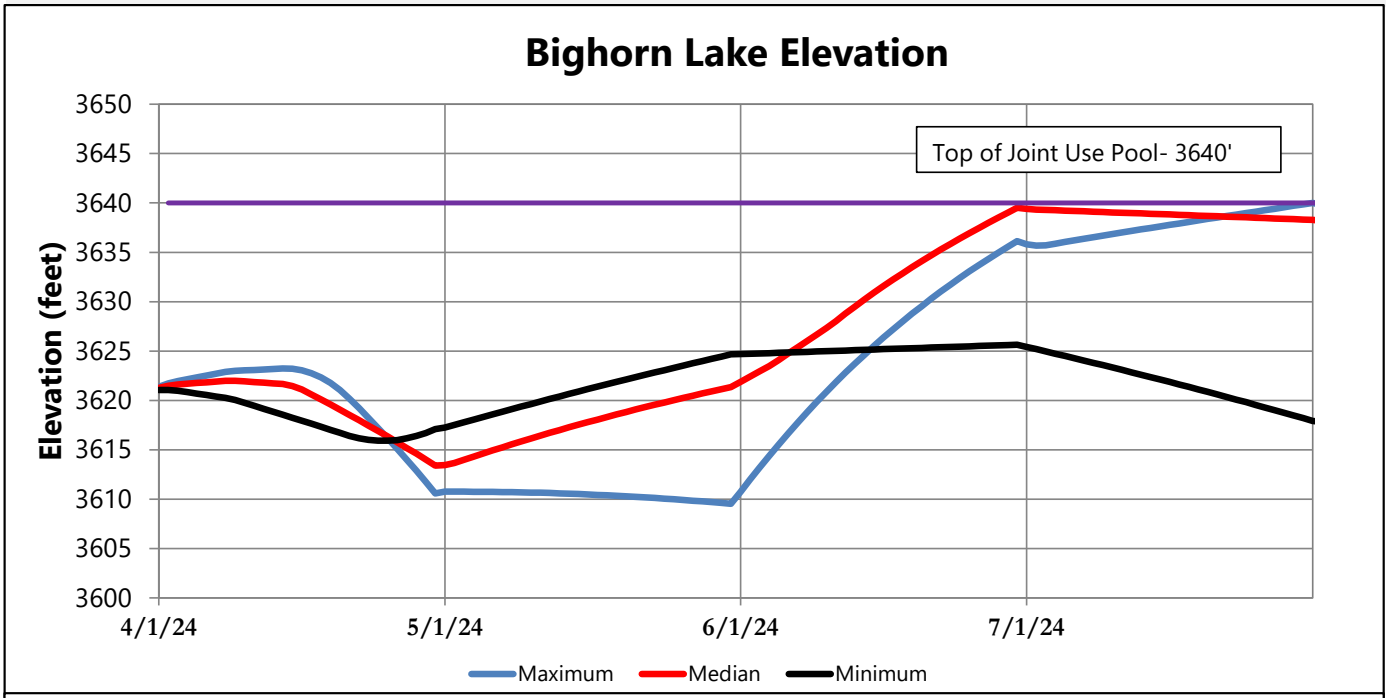


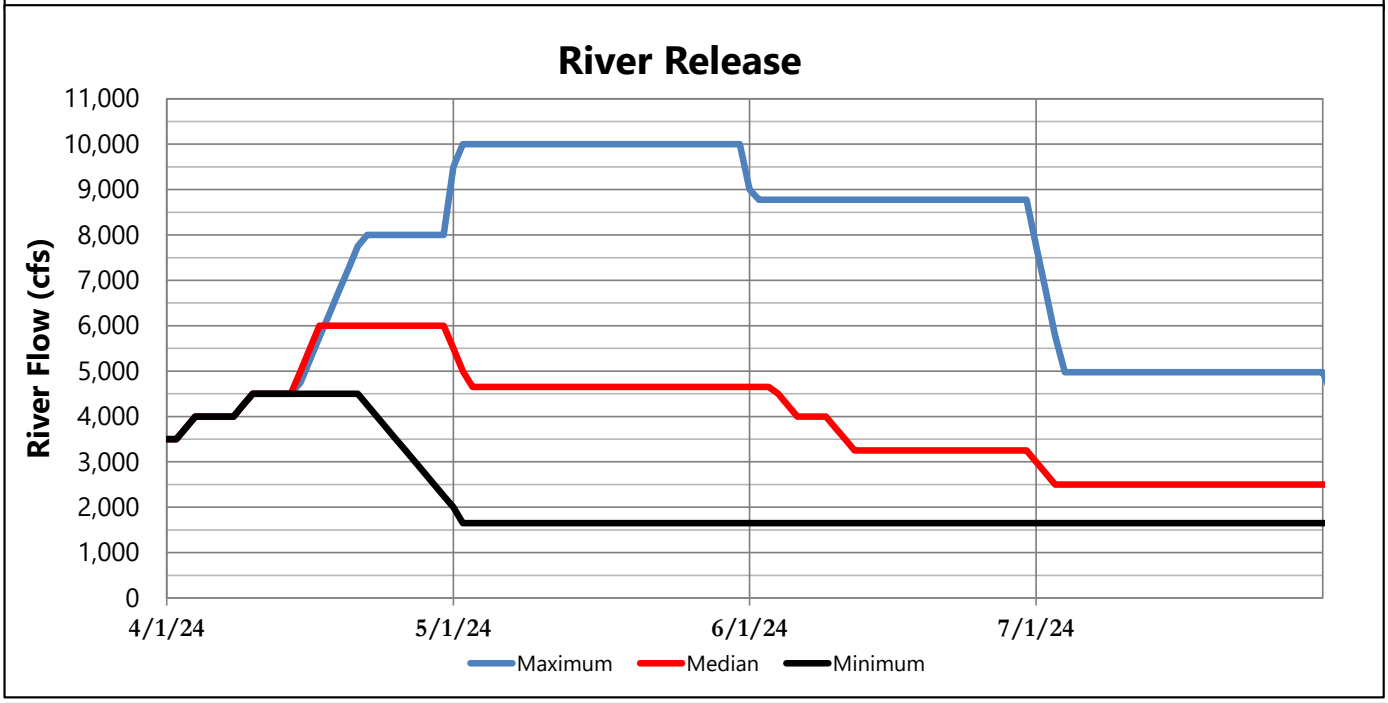
Release Outlook by Outlet

All releases are currently going through the powerplant. Based on the expected powerplant maintenance schedule and the inflow forecasts, a release through either the river outlet works or spillway is likely later this month.

OPERATIONS OUTLOOK (April 1 through July 31, 2024)

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.





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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