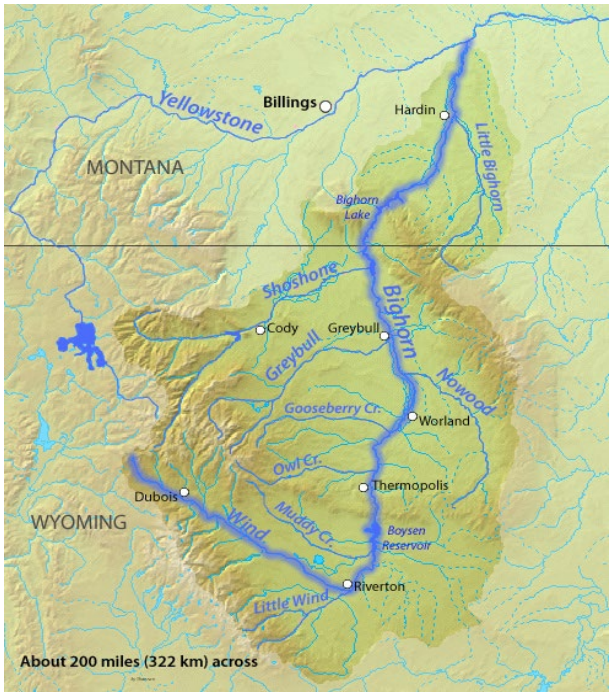
Yellowtail Dam Water Supply and Projected Operations

BUREAU OF RECLAMATION

May 2024



Bighorn River Basin Map Source: DEMIS Mapserver

May Operating Range			
Forecast	**Minimum**	**Median**	**Maximum**
Monthly Average Inflow (cfs)	3,555	4,240	6,870
Monthly Average River Release (cfs)	3,275	3,625	5,890
End of May Elevation (feet)	3618.3	3621.6	3625.0

May-July 2024 Inflow Forecast (kaf)		
May-July Volume		704
Percent of Average		65
Water Year	**Historic Inflow**	**Rank**
2023	1,711	6
2022	877	35
2021	458	50
2020	777	38
30 Year Average	1,080	

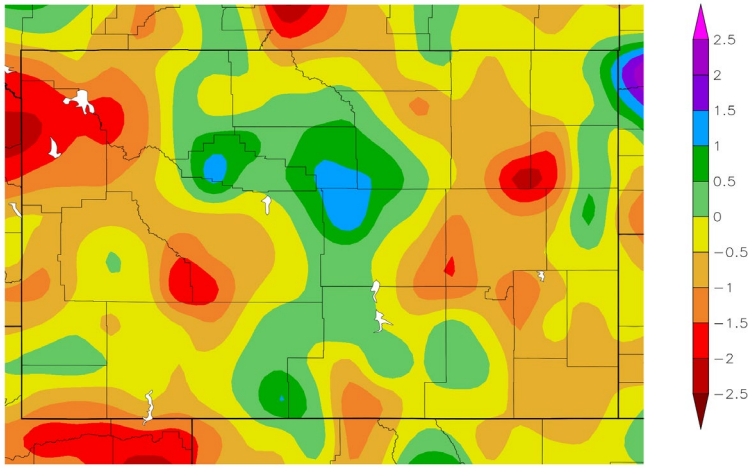
CLIMATE SUMMARY

Climate Departure from Normal

April 1 through April 30, 2024

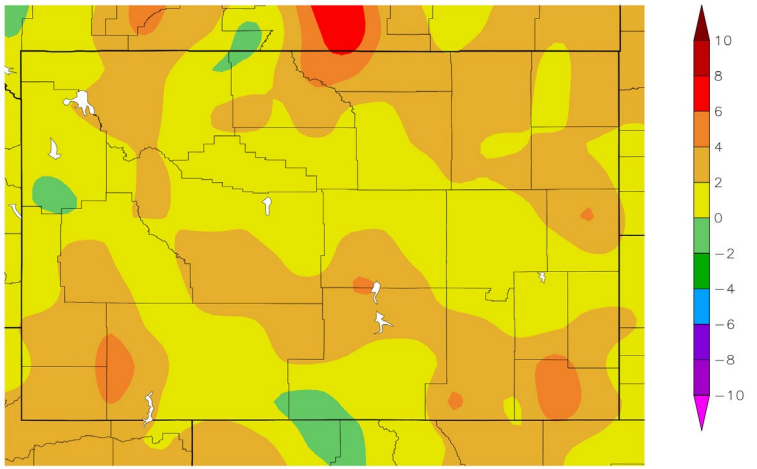
Precipitation

Departure from Normal (inches)



Departure from Normal (°F)

Temperature



HPRCC using provisional data from NOAA Regional Climate Centers

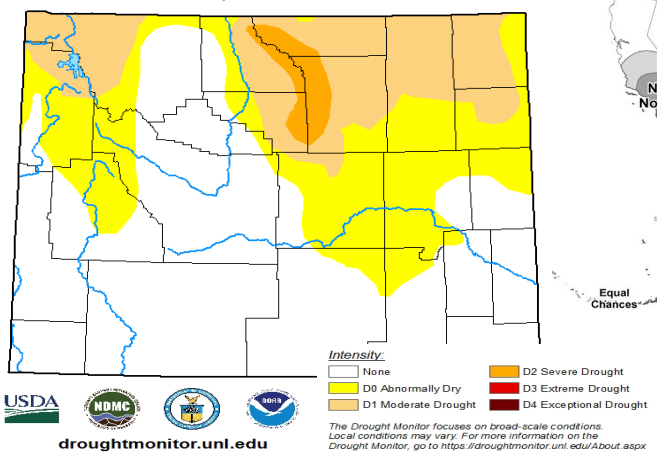
Precipitation in the Bighorn Basin was above average in the Bighorn Mountains but below average elsewhere in the Basin during April. Temperatures were above average throughout the Basin.

The climate outlook for May shows there is an equal chance temperatures and precipitation 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.

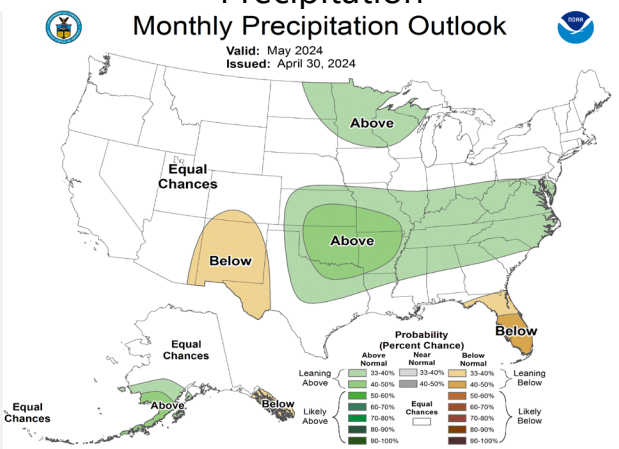
Wyoming Drought Monitor Map

April 30, 2024

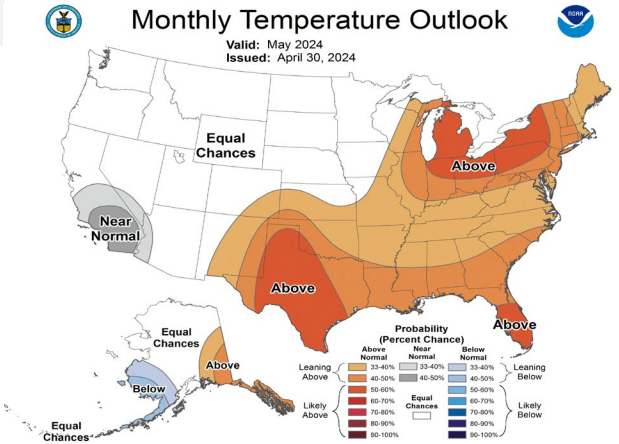


May Climate Outlook

Precipitation



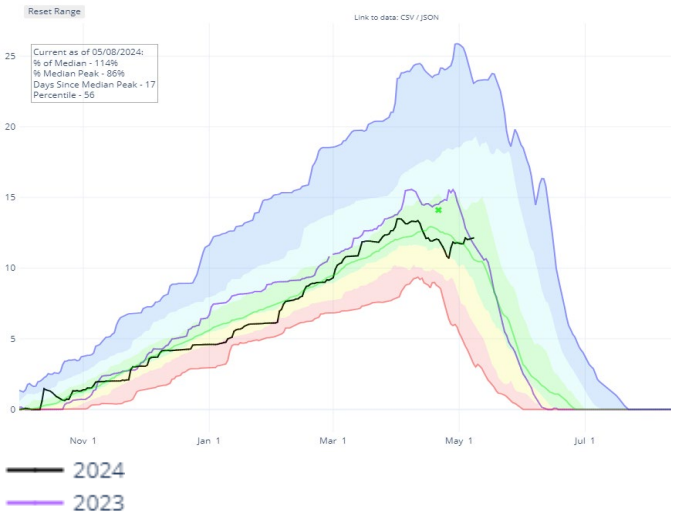
Temperature

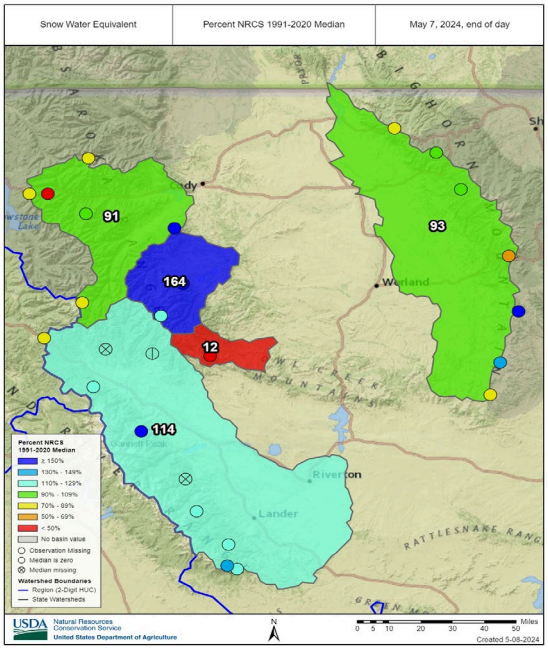


SNOWPACK SUMMARY

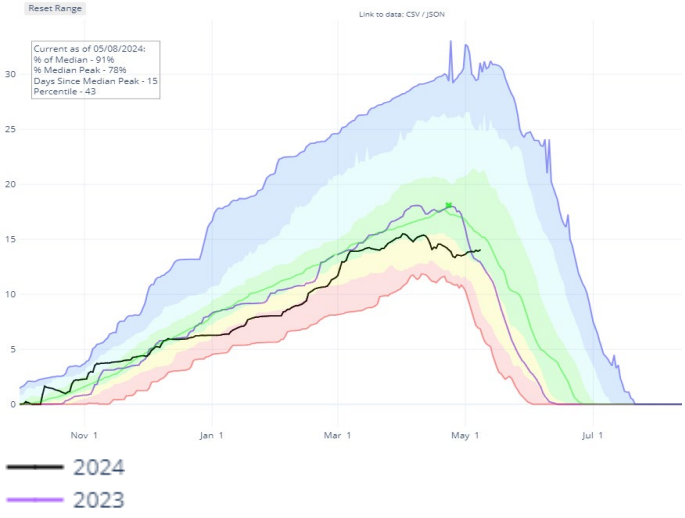
The snow water equivalent (SWE) graphs are a composite of SNOTEL sites within the Bighorn River Basin managed by the Natural Resources Conservation Service (NRCS).

Wind River Basin

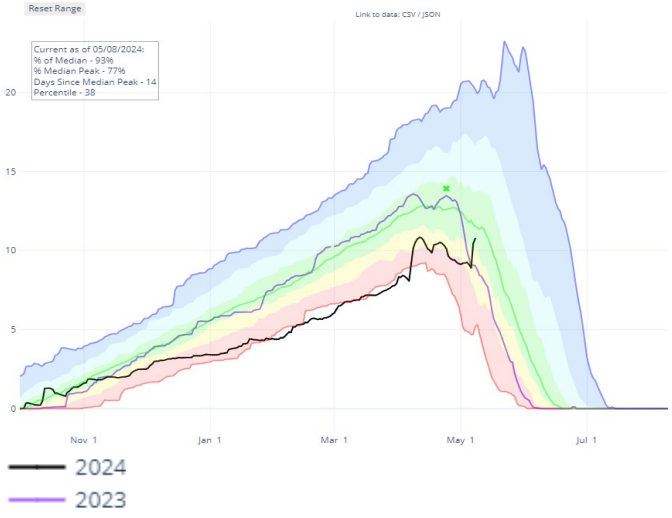




Shoshone River Basin

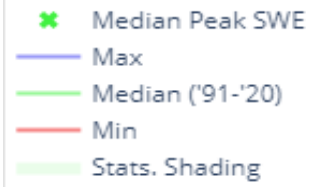


Bighorn Mountains



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

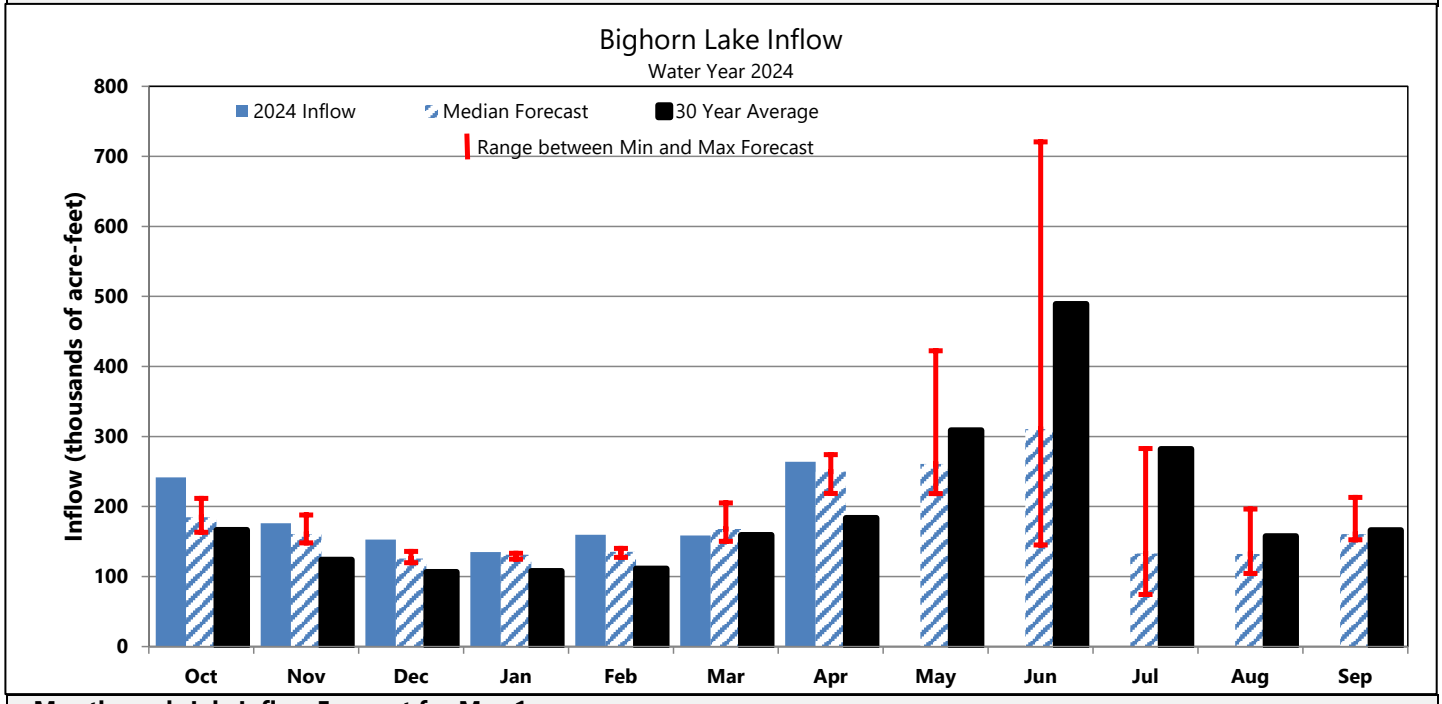


FORECAST SUMMARY

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 May through July inflow forecast decreased 218 kaf from April 1 to May 1.

April Forecast Review

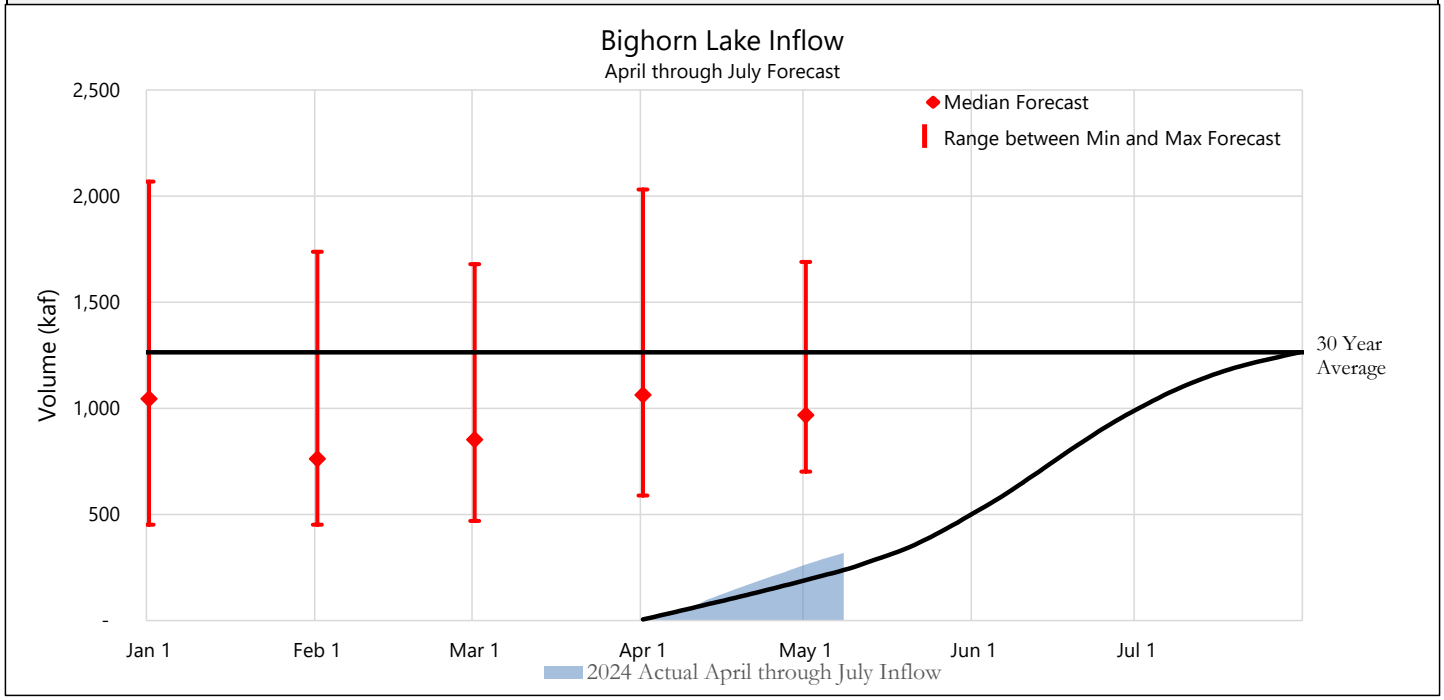
	Median Forecast (kaf)	Actual (kaf)	Difference (kaf)	Actual (% of Avg)
April Inflow	249.9	263.8	13.9	144



May through July Inflow Forecast for May 1

	Median Forecast (kaf)	% of Average	Minimum Forecast (kaf)	Maximum Forecast (kaf)
May through July Inflow	704	65	438	1,426

Actual April Inflow	264 kaf	April through July Inflow	968 kaf	Average	1,264

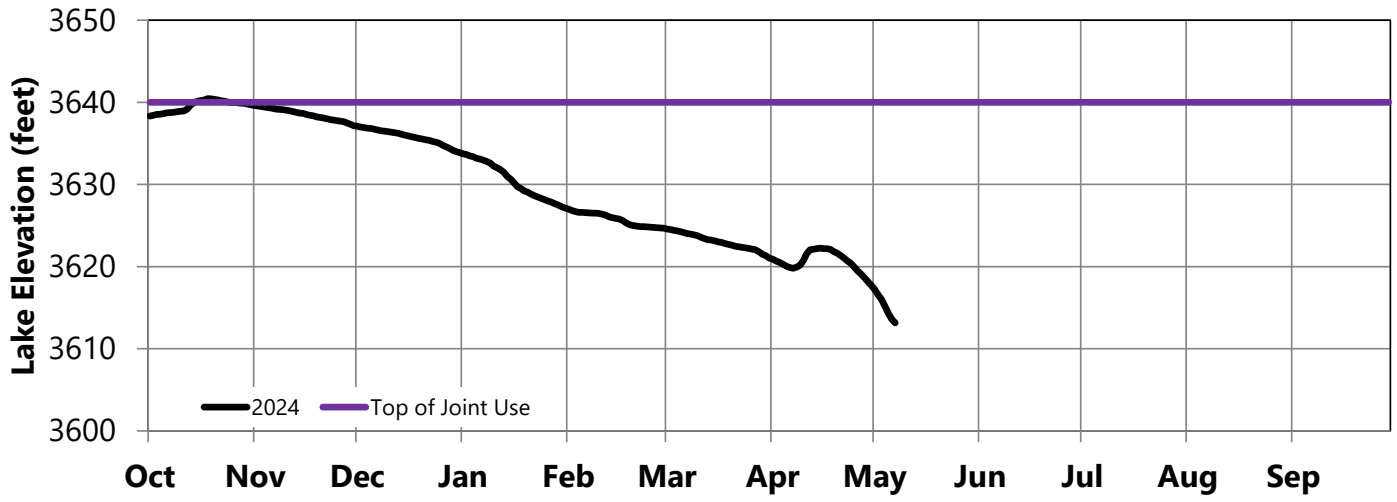


OPERATIONS REVIEW (October 1, 2023 through April 30, 2024)

Releases to the Bighorn River were increased to 6,000 cfs during April based on actual and forecasted inflows. The end of April storage target was 3613.4 feet. Actual end of April elevation was 3.3 feet higher than the target but the rate of drawdown on storage indicated that targeted storage levels would be achieved in early May with the 6,000 cfs release.

May 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3617.7	850,724	106	79
Buffalo Bill	5371.3	476,444	118	72
Boysen	4715.0	621,999	109	76

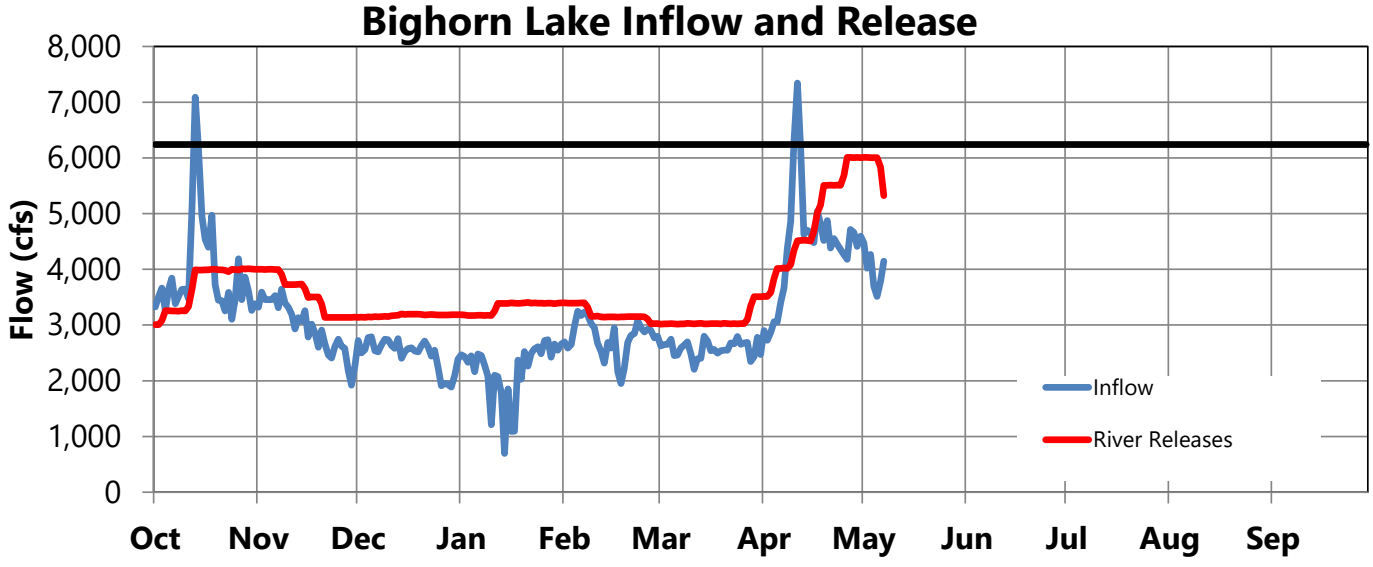


Average April Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	4,435	144
Buffalo Bill	1,075	138
Boysen	1,055	120

Average April Release

	Monthly Avg cfs	Percent of Average
Bighorn River	4,840	141
Buffalo Bill Total Release	1,385	114
Boysen Release	2,080	163



OPERATIONS OUTLOOK (May 1 through October 31, 2024)

May releases under the median inflow conditions are based on forecasted inflows and the end of May storage target of 3626.1 feet. Releases will be adjusted during May based on the storage target. Releases are decreasing to 4,500 cfs by May 8 and are expected to decrease further during May under median and minimum inflow forecasts and increase under the maximum inflow forecast. Additional changes up or down will depend on current hydrologic conditions and actual inflows.

Median Inflow Conditions (May - July Inflow: 704 kaf)

	May	Jun	Jul	Aug	Sep	Oct
Boysen Release (cfs)	2,200	2,723	1,882	1,451	1,200	1,099
Buffalo Bill Release (cfs)	1,838	2,354	2,000	1,929	1,602	792
Tributary Gain (cfs)	202	143	-1,722	-1,226	-101	823
Monthly Inflow (cfs)	4,240	5,220	2,160	2,154	2,701	2,714
Monthly Inflow (kaf)	260.7	310.6	132.8	132.4	160.7	166.9
Monthly Release (kaf)	238.6	172.6	181.4	175.1	160.6	150.4
Afterbay Release (cfs)	3,880	2,900	2,950	2,849	2,699	2,445
River Release (cfs)	3,624	2,500	2,500	2,399	2,399	2,410
End-of-Month Content (kaf)	827.8	970.0	925.7	887.3	891.6	912.5
End-of-Month Elevation (feet)	3621.6	3636.8	3632.9	3629.0	3629.5	3631.7

Minimum Inflow Conditions (May - July Inflow: 438 kaf)

	May	Jun	Jul	Aug	Sep	Oct
Boysen Release (cfs)	1,800	1,200	1,200	1,200	1,200	899
Buffalo Bill Release (cfs)	1,830	1,901	1,976	1,862	1,600	725
Tributary Gain (cfs)	-76	-662	-1,966	-1,365	-237	717
Monthly Inflow (cfs)	3,554	2,439	1,210	1,697	2,563	2,341
Monthly Inflow (kaf)	218.5	145.1	74.4	104.4	152.5	144.0
Monthly Release (kaf)	219.0	125.0	129.1	129.1	119.0	103.6
Afterbay Release (cfs)	3,562	2,100	2,100	2,100	2,000	1,685
River Release (cfs)	3,276	1,650	1,650	1,650	1,650	1,650
End-of-Month Content (kaf)	805.2	829.5	779.1	758.6	796.3	840.9
End-of-Month Elevation (feet)	3618.3	3621.8	3614.1	3610.6	3616.9	3623.4

Maximum Inflow Conditions (May - July Inflow: 1,426 kaf)

	May	Jun	Jul	Aug	Sep	Oct
Boysen Release (cfs)	2,801	5,596	3,054	1,800	1,400	1,381
Buffalo Bill Release (cfs)	2,643	3,808	2,176	2,062	1,749	974
Tributary Gain (cfs)	1,426	2,707	-631	-668	430	1,207
Monthly Inflow (cfs)	6,870	12,111	4,599	3,194	3,579	3,562
Monthly Inflow (kaf)	422.4	720.7	282.8	196.4	213.0	219.0
Monthly Release (kaf)	374.7	585.2	269.1	242.0	224.5	202.0
Afterbay Release (cfs)	6,094	9,835	4,377	3,935	3,773	3,285
River Release (cfs)	5,890	9,439	3,919	3,500	3,500	3,250
End-of-Month Content (kaf)	853.5	993.1	1,011.1	969.7	962.4	983.6
End-of-Month Elevation (feet)	3625.0	3638.7	3640.0	3636.8	3636.2	3637.9

OPERATIONS OUTLOOK (May 1 through October 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)

	May	Jun	Jul	Aug	Sep	Oct
Median Forecast	256	400	450	450	300	35
Minimum Forecast	285	450	450	450	350	35
Maximum Forecast	204	396	457	435	273	35

Power Generation Outlook

Current Number of Units Available: 3 of 4
Approximate Yellowtail Powerplant Turbine Capacity: 6,150 cfs
Approximate Yellowtail Powerplant Scheduled Generation Limit: 4,430 cfs

Yellowtail Powerplant Release (cfs)

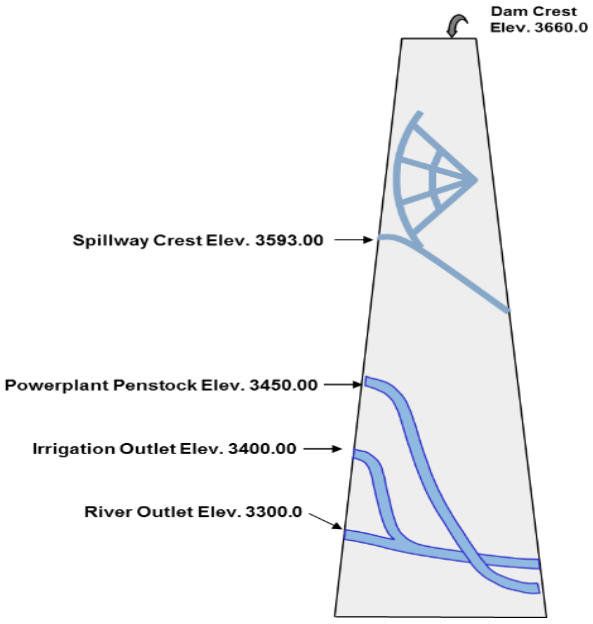
	May	Jun	Jul	Aug	Sep	Oct
Median Forecast	3,358	2,830	2,880	2,779	2,629	2,375
Minimum Forecast	3,031	2,030	2,030	2,030	1,930	1,615
Maximum Forecast	4,878	6,240	4,301	3,865	3,703	3,215

Yellowtail Powerplant Generation (gwh)

	May	Jun	Jul	Aug	Sep	Oct
Median Forecast	76	62	65	63	57	54
Minimum Forecast	68	44	46	46	42	36
Maximum Forecast	110	136	97	87	81	72

Yellowtail Spill (cfs)

	May	Jun	Jul	Aug	Sep	Oct
Median Forecast	452	0	0	0	0	0
Minimum Forecast	461	0	0	0	0	0
Maximum Forecast	1,146	3,525	6	0	0	0

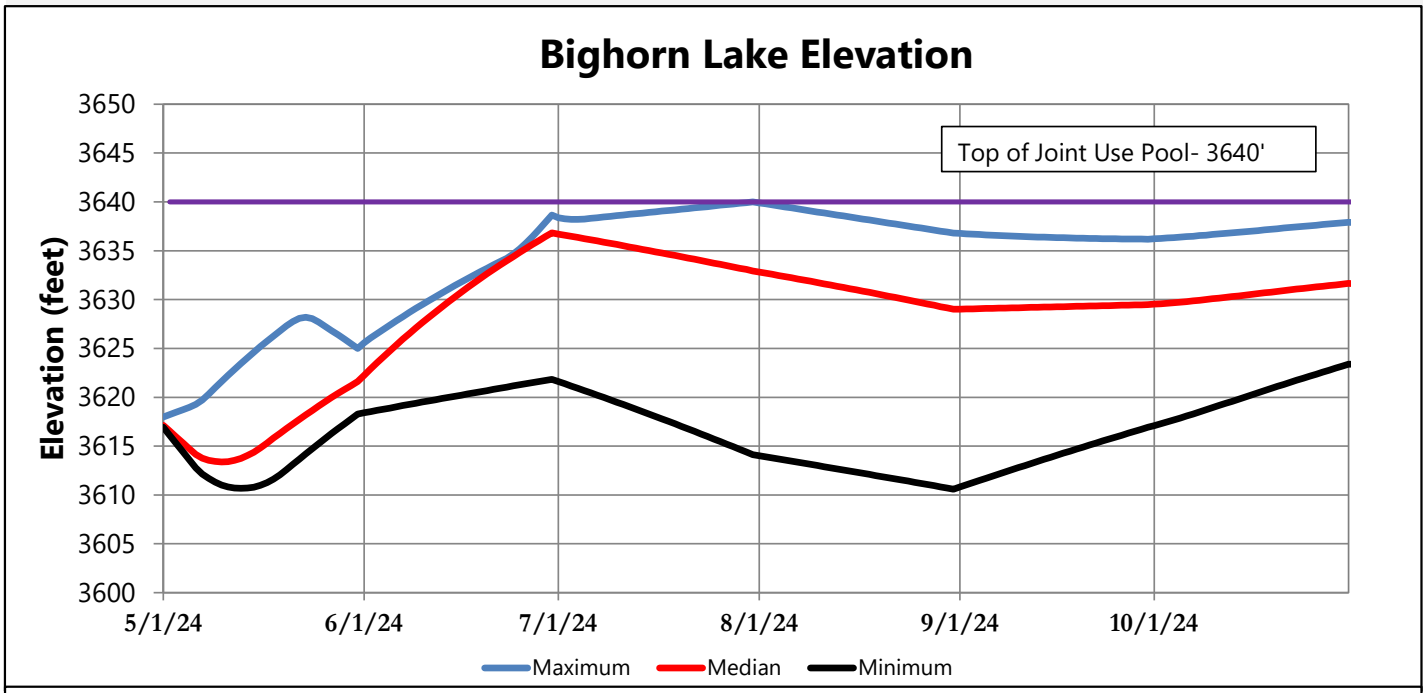


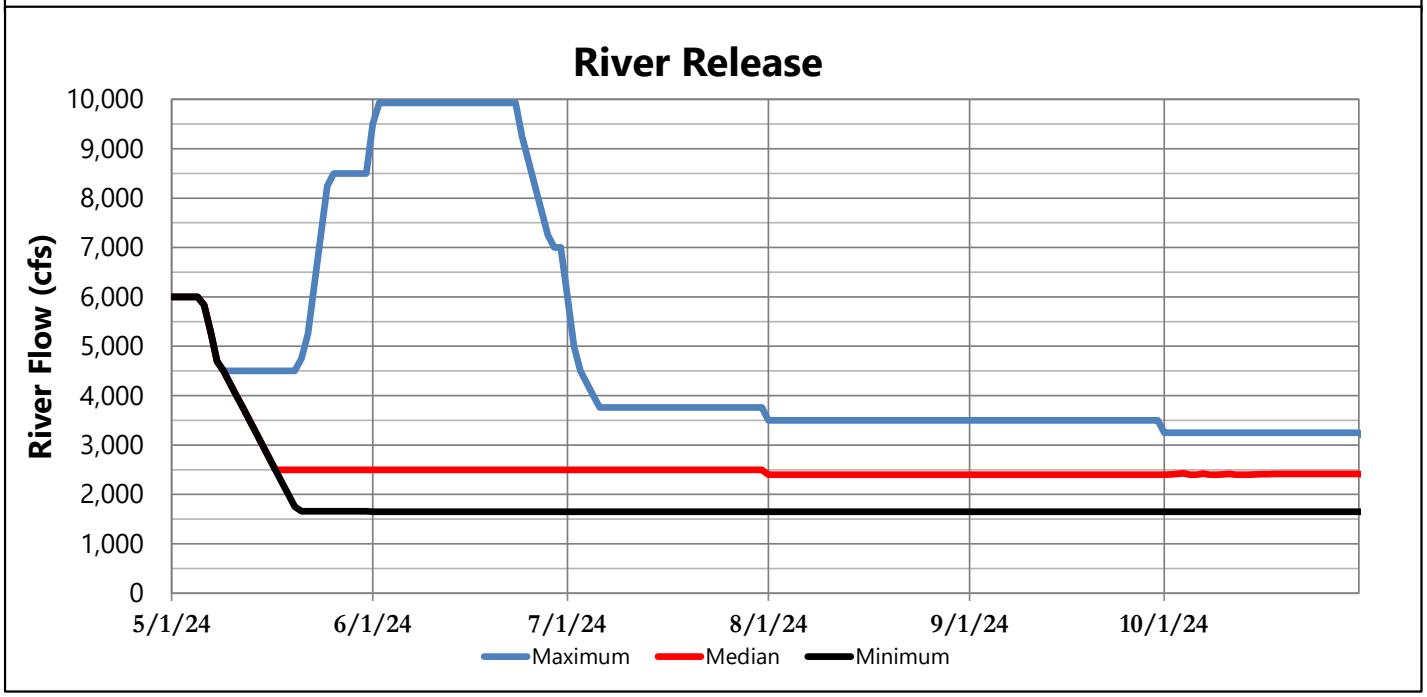
Release Outlook by Outlet

Releases through the spillway or river outlet works occurred through May 8. Under maximum inflow conditions, a bypass release expected again in May and could go through early July.

OPERATIONS OUTLOOK (May 1 through October 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