

Yellowtail Dam Water Supply and Projected Operations



— BUREAU OF —
RECLAMATION

April 2022



About 200 miles (322 km) across
Bighorn River Basin Map Source: DEMIS Mapsserver

April Operating Range

Forecast	Minimum	Median	Maximum
Monthly Average Inflow (cfs)	1,545	1,880	2,745
Monthly Average River Release (cfs)	1,775	2,000	3,245
End of April Elevation (feet)	3613.4	3615.5	3612.5

April through July 2022

Inflow Forecast (kaf)

April through July Volume		728
Percent of Average		59
Water Year	Historic Inflow	Rank
2021	607	47
2020	1,042	32
2019	1,678	12
2018	2,318	3
30 Year Average	1,228	

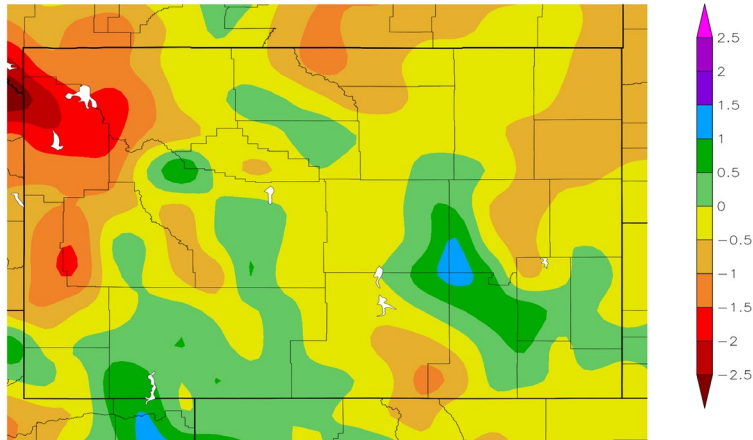


Climate Departure from Normal

March 1 through March 31, 2022

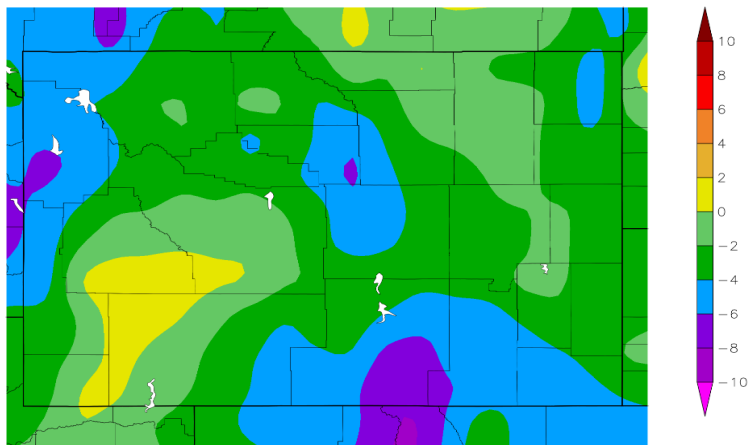
Precipitation

Departure from Normal (inches)



Temperature

Departure from Normal (°F)



HPRCC using provisional data from NOAA Regional Climate Centers

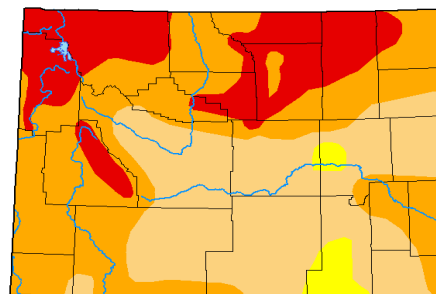
CLIMATE SUMMARY

Precipitation was near to below average while temperatures were below average during March in the Bighorn Basin above Yellowtail Dam. Drought conditions persist throughout the Basin.

The climate outlook shows there are near average chances for below-near-or above normal precipitation and temperature during April.

Wyoming Drought Monitor Map

March 29, 2022



Intensity

None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

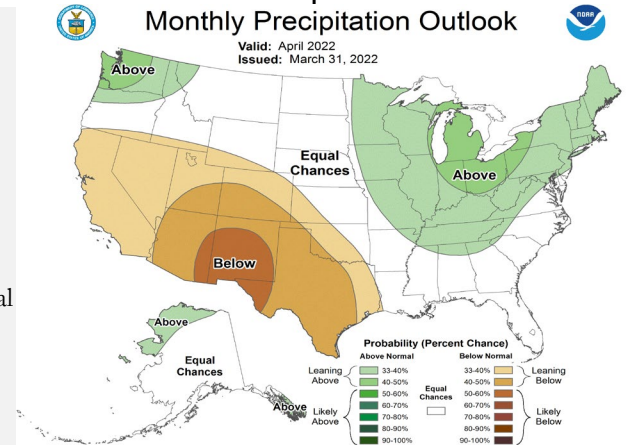


droughtmonitor.unl.edu

April Climate Outlook

Precipitation Monthly Precipitation Outlook

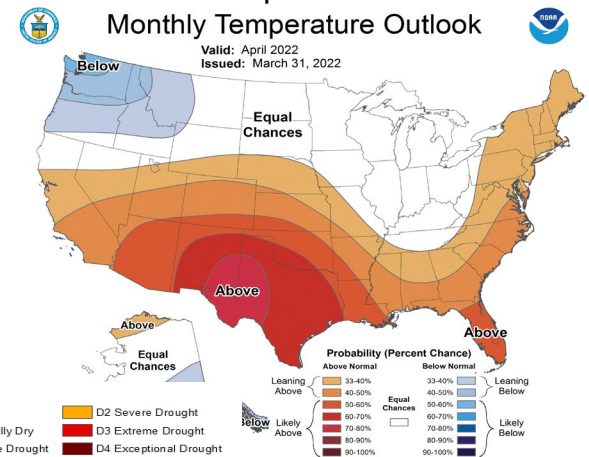
Valid: April 2022
Issued: March 31, 2022



Temperature

Monthly Temperature Outlook

Valid: April 2022
Issued: March 31, 2022

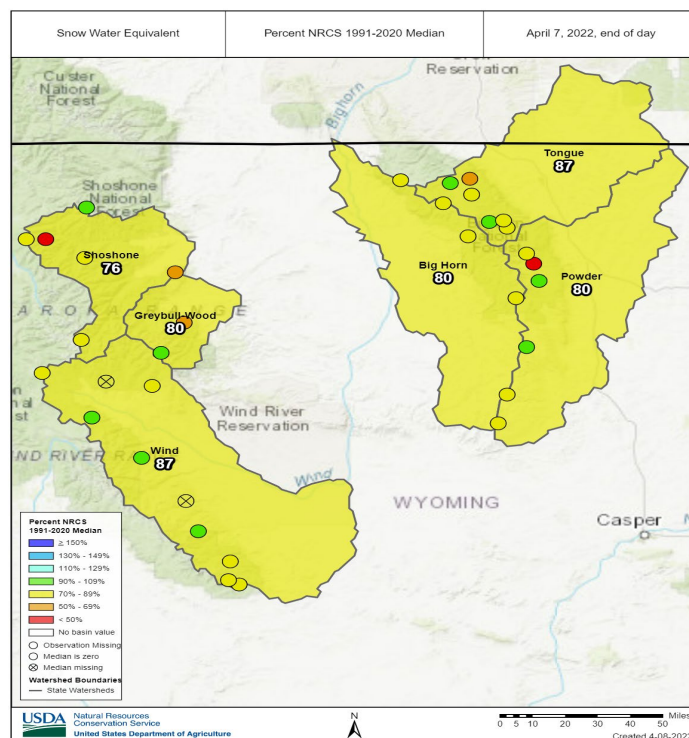
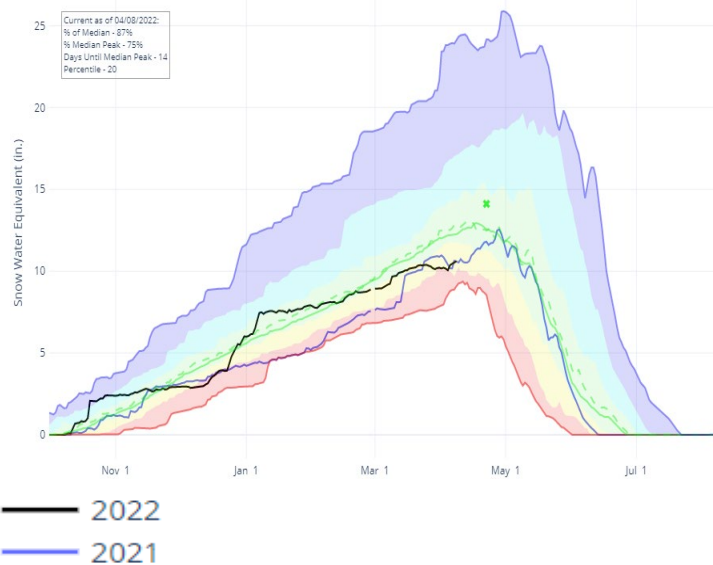


The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

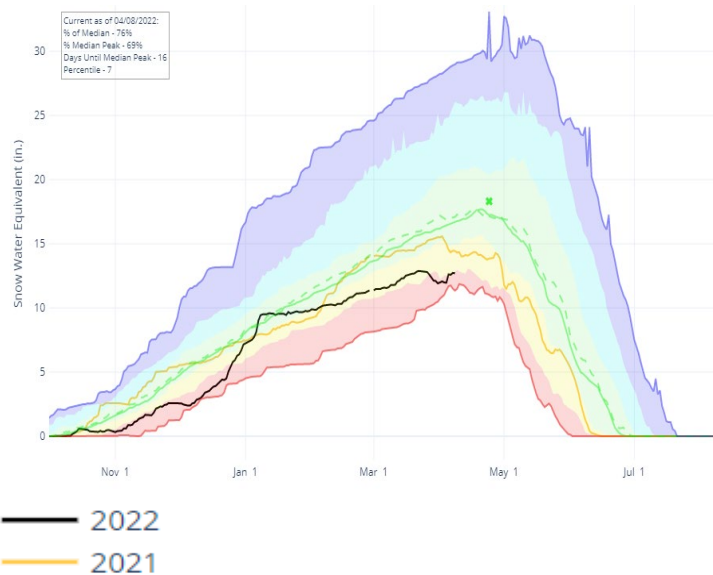
SNOWPACK SUMMARY

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).

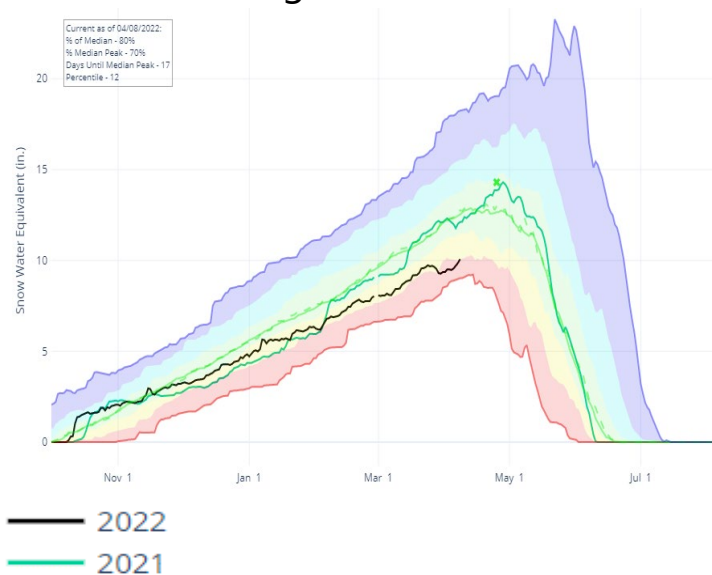
Wind River



Shoshone River



Bighorn River



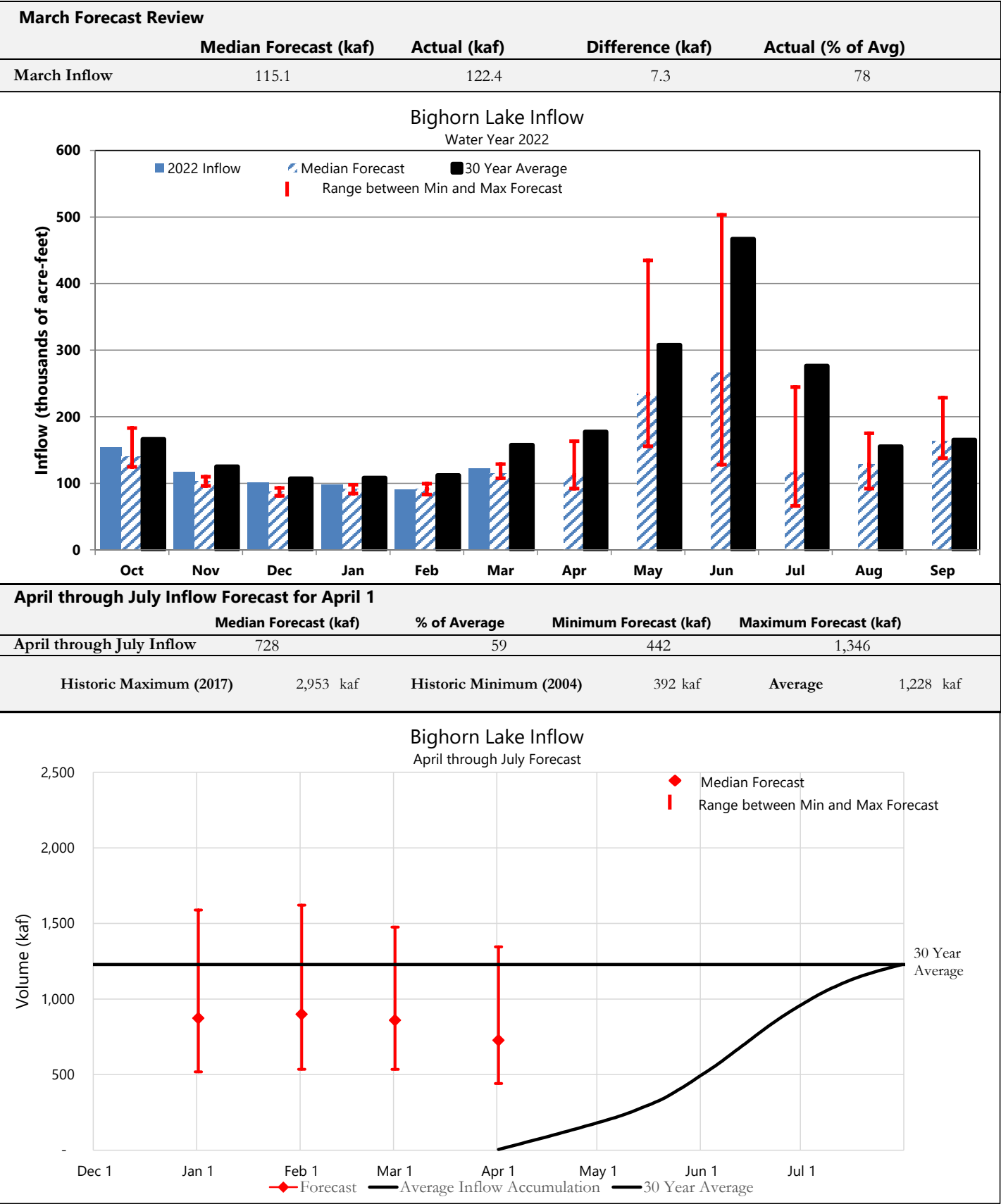
NRCS Montana Snow Survey Website: <https://www.nrcs.usda.gov/wps/portal/nrcs/mt/snow/>

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

- ✱ Median Peak SWE
- Max
- Median (POR)
- Median ('91-'20)
- Min
- Stats. Shading

FORECAST SUMMARY

Streamflow data and planned releases from Boysen and Buffalo Bill Reservoirs are used to compute an inflow forecast for Bighorn Lake. Actual March inflow was higher than the median inflow forecast.



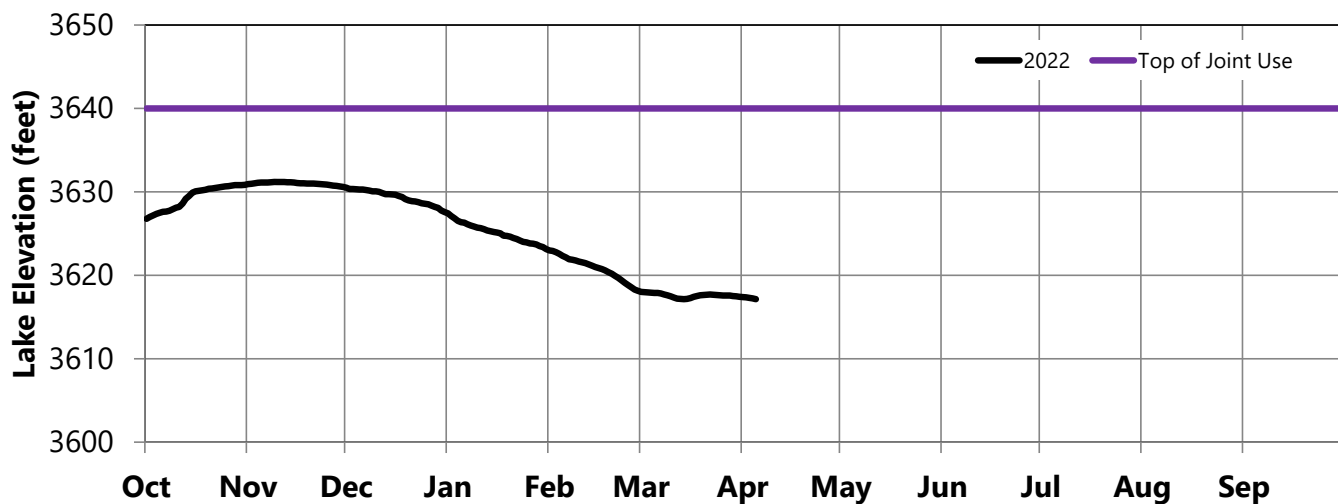
OPERATIONS REVIEW (October 1, 2021 through March 31, 2022)

River releases were decreased to 2,000 cfs during March based on forecasted inflows and the April 30, 2022 rule curve storage target of 3617 feet. The storage in Bighorn Lake decreased 0.7 feet during March.

April 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3617.4	799,601	104	79
Buffalo Bill	5358.4	389,405	94	60
Boysen	4718.5	623,187	115	84

Bighorn Lake Operations Water Year 2022



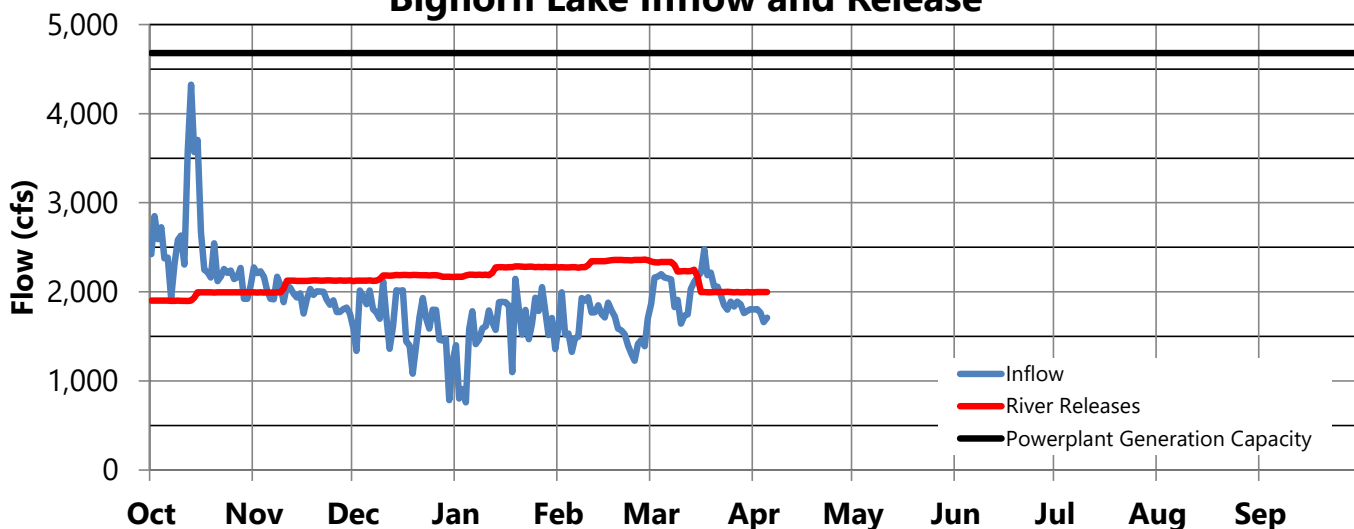
Average March Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	1,990	78
Buffalo Bill	285	80
Boysen	775	89

Average March Release

	Monthly Avg cfs	Percent of Average
Bighorn River	2,135	74
Buffalo Bill Total Release	210	49
Boysen Release	710	76

Bighorn Lake Inflow and Release



OPERATIONS OUTLOOK (April 1, 2022 through July 31, 2022)

Releases during April will be maintained at 2,000 cfs based on a reduced inflow forecast. The inflow forecast is slightly below the minimum fill forecast which changes the storage target to 3617 feet on March 31, 2023. Additional release changes (increases or decreases) will depend on changes to forecasted inflows, actual inflows, and storage conditions.

Median Inflow Conditions (April through July Inflow: 728 kaf)

	Apr	May	Jun	Jul
Boysen Release (cfs)	800	1,724	1,833	1,451
Buffalo Bill Release (cfs)	684	1,680	1,901	1,976
Tributary Gain (cfs)	398	403	729	-1,543
Monthly Inflow (cfs)	1,882	3,807	4,463	1,884
Monthly Inflow (kaf)	112.0	234.1	265.6	115.8
Monthly Release (kaf)	128.4	144.5	144.4	166.0
Afterbay Release (cfs)	2,158	2,350	2,427	2,700
River Release (cfs)	2,000	2,000	2,000	2,250
End-of-Month Content (kaf)	787.3	881.2	1,006.6	960.7
End-of-Month Elevation (feet)	3615.5	3628.3	3639.7	3636.1

Minimum Inflow Conditions (April through July Inflow: 442 kaf)

	Apr	May	Jun	Jul
Boysen Release (cfs)	701	1,025	1,200	1,150
Buffalo Bill Release (cfs)	684	1,680	1,901	1,976
Tributary Gain (cfs)	161	-175	-950	-2,054
Monthly Inflow (cfs)	1,546	2,530	2,151	1,072
Monthly Inflow (kaf)	92.0	155.6	128.0	65.9
Monthly Release (kaf)	121.3	121.1	120.2	127.3
Afterbay Release (cfs)	2,038	1,970	2,020	2,070
River Release (cfs)	1,777	1,570	1,570	1,570
End-of-Month Content (kaf)	774.5	813.2	825.2	768.1
End-of-Month Elevation (feet)	3613.4	3619.5	3621.2	3612.3

Maximum Inflow Conditions (April through July Inflow: 1,346 kaf)

	Apr	May	Jun	Jul
Boysen Release (cfs)	1,301	3,785	3,783	2,539
Buffalo Bill Release (cfs)	684	1,981	2,101	2,176
Tributary Gain (cfs)	758	1,306	2,572	-739
Monthly Inflow (cfs)	2,743	7,072	8,456	3,976
Monthly Inflow (kaf)	163.2	434.8	503.2	244.5
Monthly Release (kaf)	197.8	421.2	329.7	202.6
Afterbay Release (cfs)	3,324	6,850	5,540	3,294
River Release (cfs)	3,244	6,700	5,190	2,894
End-of-Month Content (kaf)	769.2	787.2	964.8	1,011.1
End-of-Month Elevation (feet)	3612.5	3615.5	3636.4	3640.0

OPERATIONS OUTLOOK (April 1, 2022 through July 31, 2022)

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.

Irrigation Demands Outlook

Bighorn Canal (cfs)

	Apr	May	Jun	Jul
Median Forecast	158	350	427	450
Minimum Forecast	262	400	450	500
Maximum Forecast	80	150	350	400

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: 4,680 cfs

Yellowtail Powerplant Release (cfs)

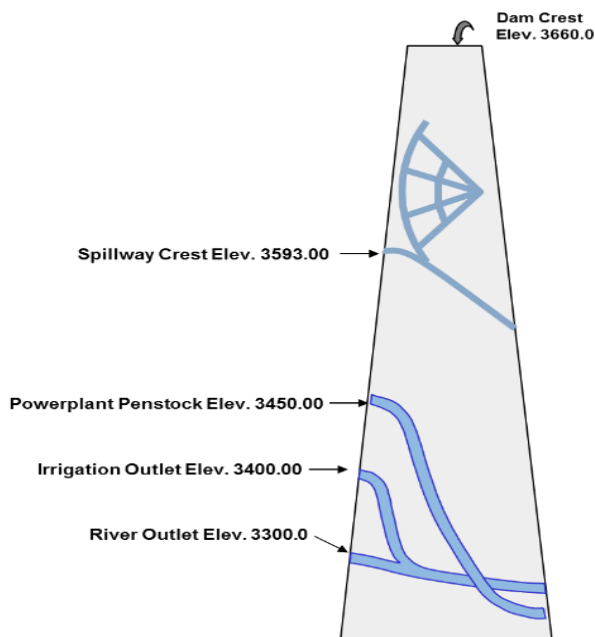
	Apr	May	Jun	Jul
Median Forecast	2,088	2,280	2,357	2,630
Minimum Forecast	1,968	1,900	1,950	2,000
Maximum Forecast	3,032	4,902	4,669	3,224

Yellowtail Powerplant Generation (gwh)

	Apr	May	Jun	Jul
Median Forecast	47.7	54.8	56.4	66.5
Minimum Forecast	44.8	44.9	45.0	47.2
Maximum Forecast	69.7	113.8	110.2	81.2

Yellowtail Spill (cfs)

	Apr	May	Jun	Jul
Median Forecast	0	0	0	0
Minimum Forecast	0	0	0	0
Maximum Forecast	222	1,877	801	0



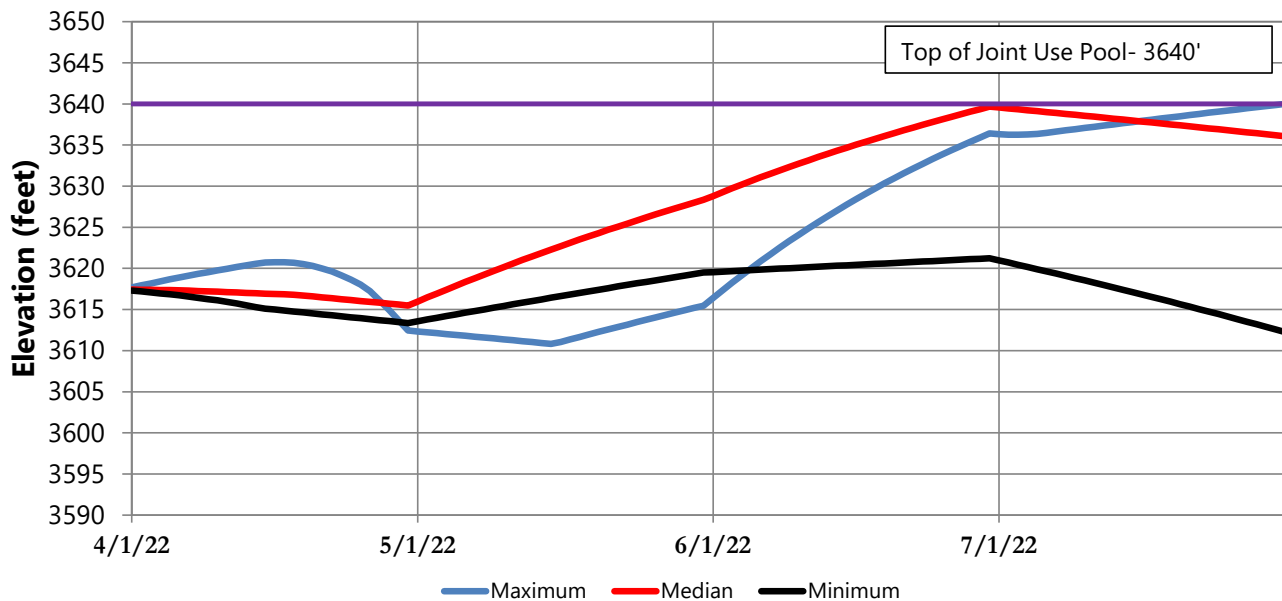
Release Outlook by Outlet

All releases are currently going through the powerplant and are expected to go through the powerplant under median and minimum inflow conditions. Under maximum conditions, a bypass release is expected to start this month.

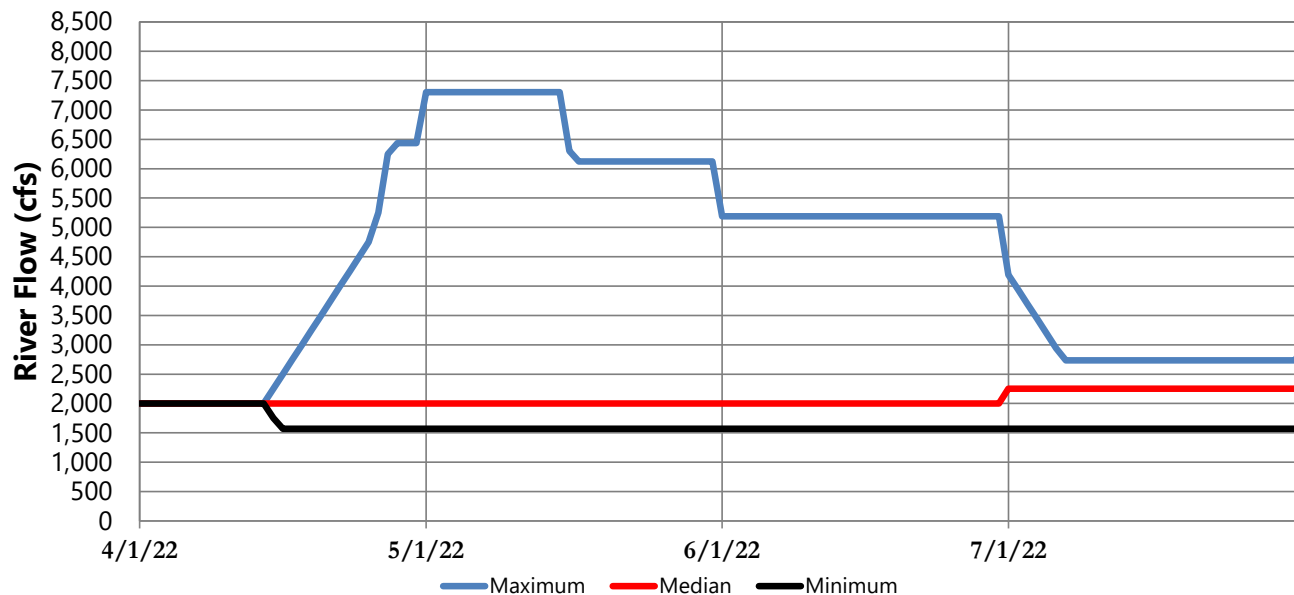
OPERATIONS OUTLOOK (April 1, 2022 through July 31, 2022)

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.

Bighorn Lake Elevation



River Release



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Monthly Operating Plans, Current Conditions, Snowpack and Other Water Management Information
https://www.usbr.gov/so/lakes/reservoirs/wareorts/main_menu.html