

Yellowtail Dam Water Supply and Projected Operations



— BUREAU OF —
RECLAMATION

January 2022



Bighorn River Basin Map Source: DEMIS Mapserver

January Operating Range			
Forecast	Minimum	Median	Maximum
Monthly Average Inflow (cfs)	1,375	1,480	1,590
Monthly Average River Release (cfs)	2,255	2,255	2,255
End of January Elevation (feet)	3621.2	3622.1	3623.0
April through July 2022 Inflow Forecast (kaf)			
April through July Volume			874
Percent of Average			71
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		

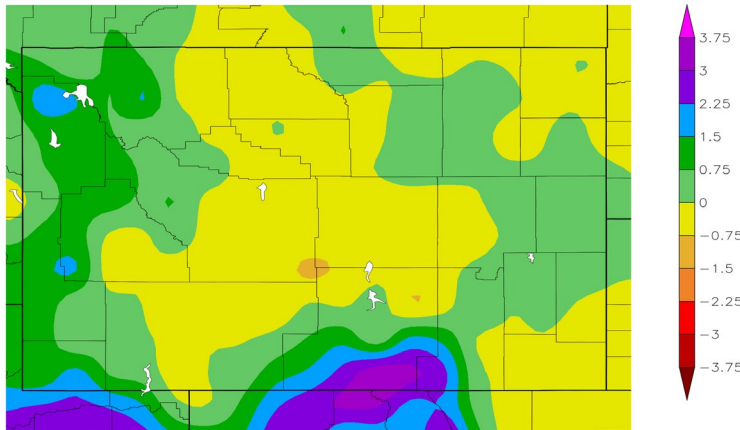


Climate Departure from Normal

December 1 through December 31, 2021

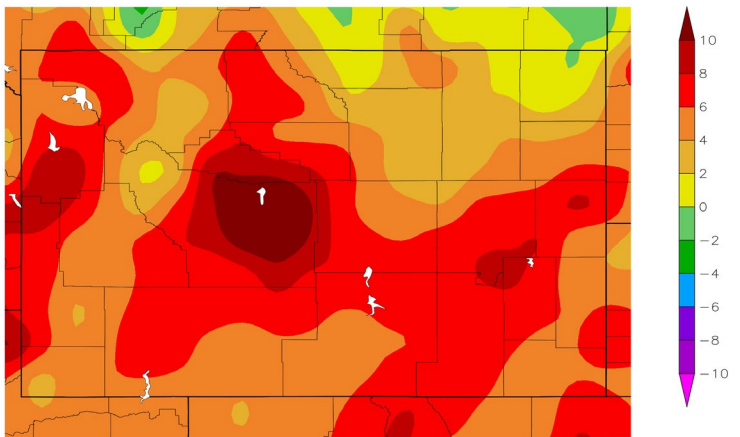
Precipitation

Departure from Normal (inches)



Temperature

Departure from Normal (°F)



HPRCC using provisional data from NOAA Regional Climate Centers

CLIMATE SUMMARY

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

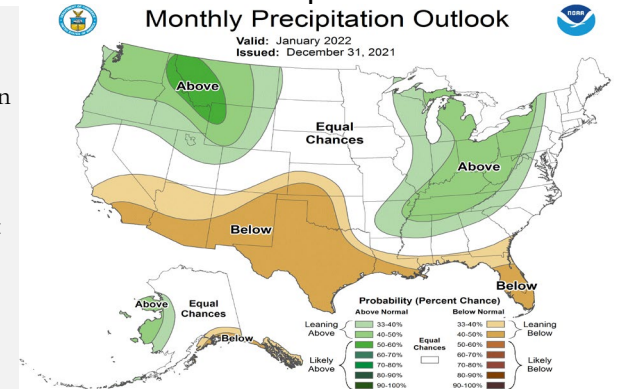
The climate outlook shows there is 40 to 50 percent chance precipitation will be above average during January. There is an equal chance temperatures will be either average, above average, or below average.

January Climate Outlook

Precipitation

Monthly Precipitation Outlook

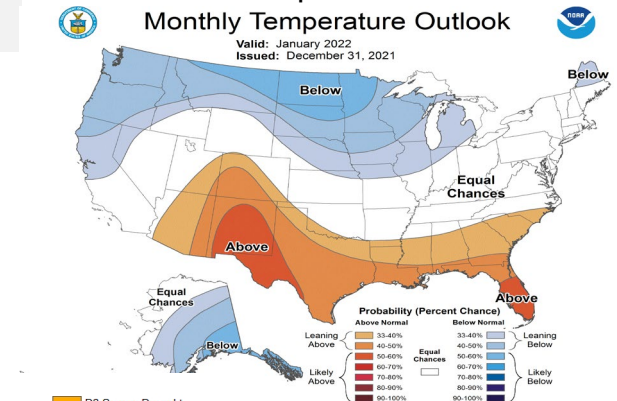
Valid: January 2022
Issued: December 31, 2021



Temperature

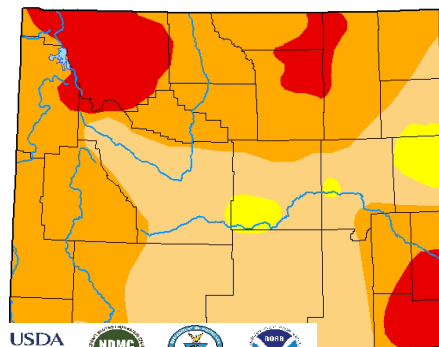
Monthly Temperature Outlook

Valid: January 2022
Issued: December 31, 2021



Wyoming Drought Monitor Map

December 28, 2021



droughtmonitor.unl.edu

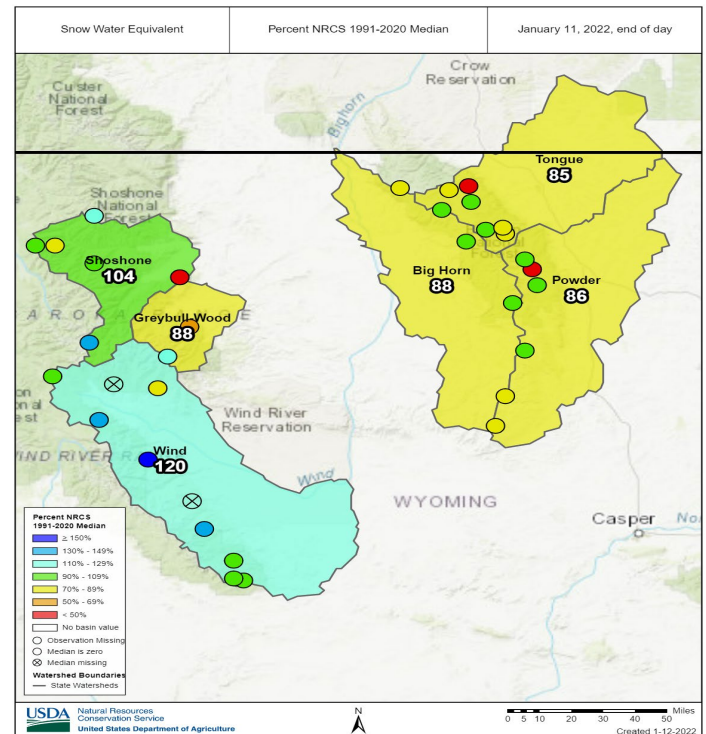
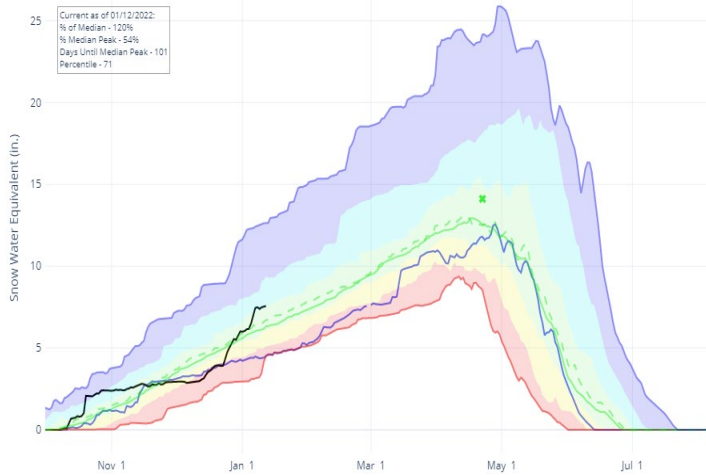
Intensity
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

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>

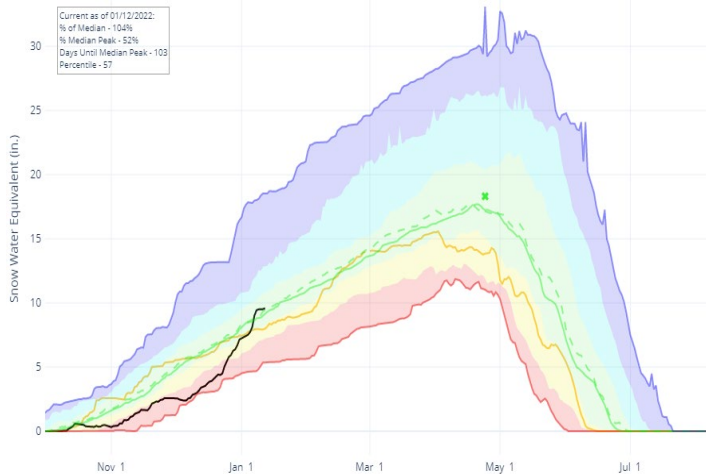
SNOWPACK SUMMARY

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).

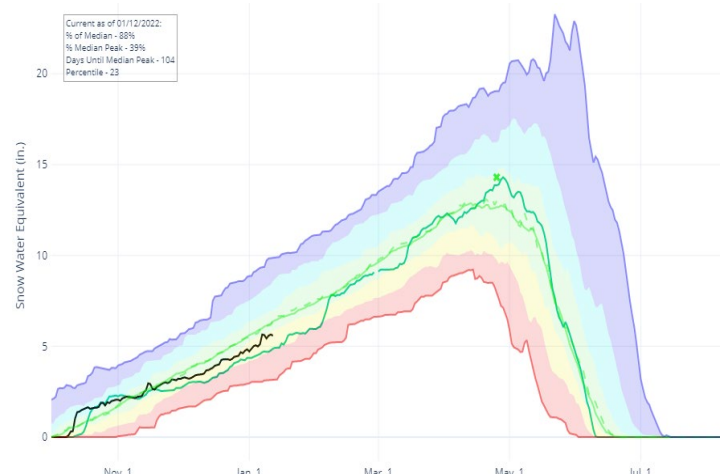
Wind River



Shoshone River

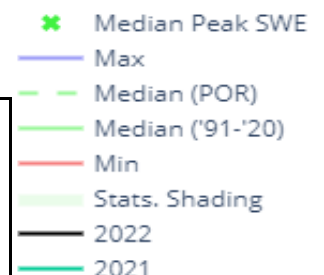


Bighorn River



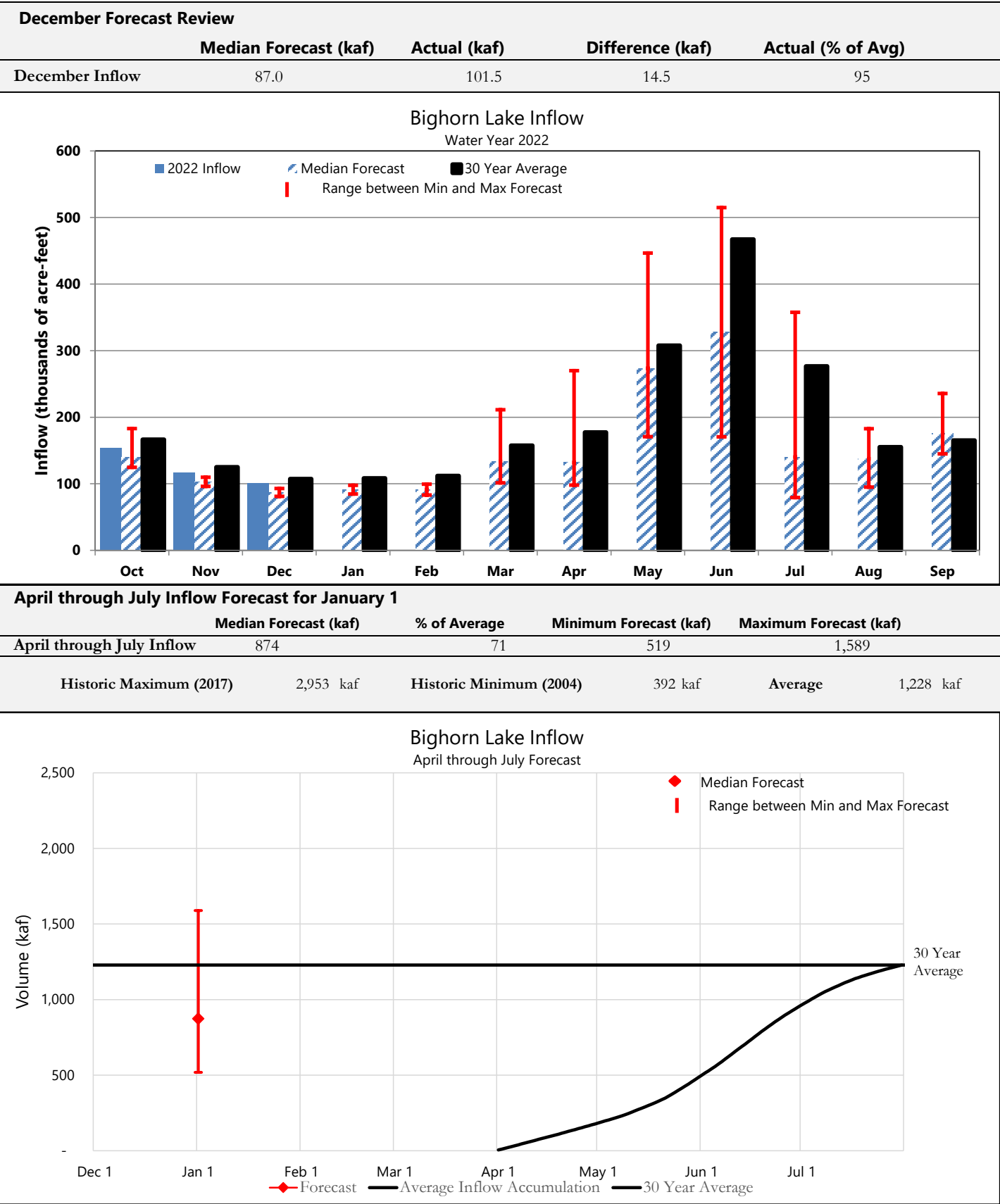
NRCS Montana Snow Survey Website: <https://www.nrcs.usda.gov/wps/portal/nrcs/mt/snow/>

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



FORECAST SUMMARY

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



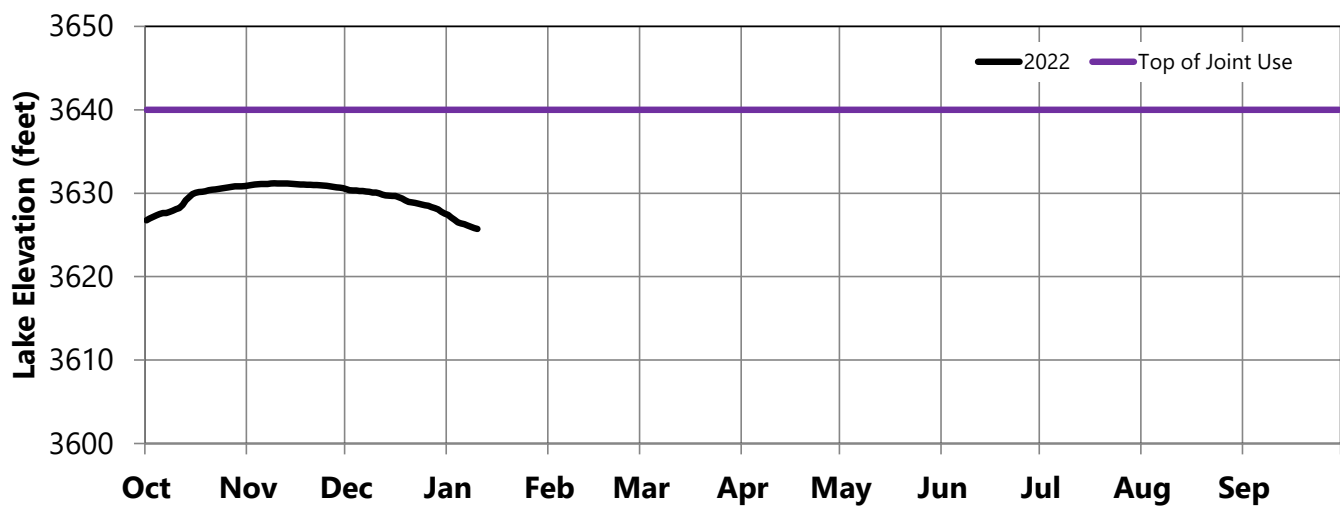
OPERATIONS REVIEW (October 1, 2021 through December 31, 2021)

River releases were increased to 2,190 cfs during December based on forecasted inflows and the March 31, 2022 carryover storage target of 3617 feet. The storage in Bighorn Lake decreased 3.0 feet during December.

January 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3627.6	874,604	104	87
Buffalo Bill	5358.3	388,836	92	60
Boysen	4719.0	631,586	114	85

Bighorn Lake Operations Water Year 2022



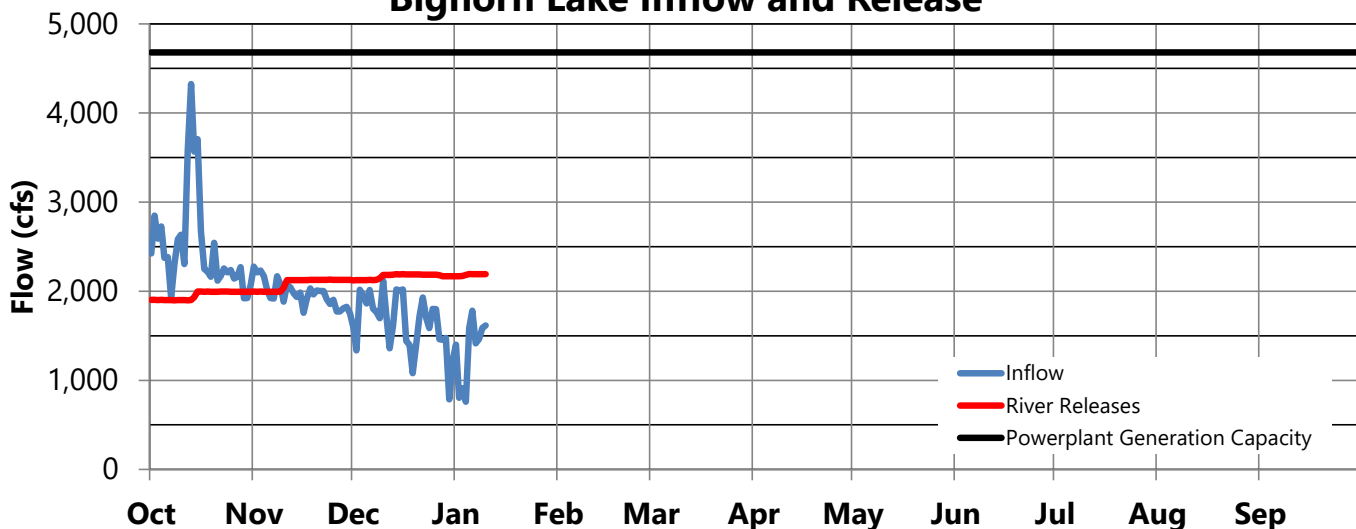
Average December Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	1,650	95
Buffalo Bill	195	70
Boysen	520	81

Average December Release

	Monthly Avg cfs	Percent of Average
Bighorn River	2,165	88
Buffalo Bill Total Release	205	68
Boysen Release	695	88

Bighorn Lake Inflow and Release



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

Releases during January will increase to 2,290 cfs based on actual December inflows being higher than the median inflow forecast and the March 31, 2022, storage target of 3617 feet.

Median Inflow Conditions (April through July Inflow: 874 kaf)

	Jan	Feb	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	699	700	1,000	1,050	2,160	2,294	1,665
Buffalo Bill Release (cfs)	205	205	205	684	1,680	1,901	1,976
Tributary Gain (cfs)	577	738	968	482	608	1,323	-1,363
Monthly Inflow (cfs)	1,481	1,643	2,173	2,216	4,448	5,518	2,278
Monthly Inflow (kaf)	91.1	91.3	133.6	131.9	273.5	328.3	140.1
Monthly Release (kaf)	138.5	127.0	140.1	137.0	218.5	192.5	181.4
Afterbay Release (cfs)	2,253	2,287	2,278	2,303	3,554	3,235	2,950
River Release (cfs)	2,253	2,287	2,278	2,278	3,354	2,835	2,500
End-of-Month Content (kaf)	831.5	799.6	797.4	796.4	855.7	995.7	958.7
End-of-Month Elevation (feet)	3622.1	3617.4	3617.1	3616.9	3625.3	3638.9	3635.9

Minimum Inflow Conditions (April through July Inflow: 519 kaf)

	Jan	Feb	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	699	700	600	701	1,025	1,200	1,150
Buffalo Bill Release (cfs)	205	205	205	684	1,680	1,901	1,976
Tributary Gain (cfs)	472	591	844	262	72	-235	-1,836
Monthly Inflow (cfs)	1,376	1,496	1,649	1,647	2,777	2,866	1,290
Monthly Inflow (kaf)	84.6	83.1	101.4	98.0	170.7	170.5	79.3
Monthly Release (kaf)	138.5	121.6	117.3	107.1	121.2	130.9	138.3
Afterbay Release (cfs)	2,253	2,190	1,908	1,800	1,971	2,200	2,250
River Release (cfs)	2,253	2,190	1,908	1,725	1,721	1,750	1,750
End-of-Month Content (kaf)	825.0	790.3	778.7	773.8	827.6	871.4	816.6
End-of-Month Elevation (feet)	3621.2	3616.0	3614.1	3613.2	3621.6	3627.2	3620.0

Maximum Inflow Conditions (April through July Inflow: 1,589 kaf)

	Jan	Feb	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	699	700	1,600	2,250	3,114	3,114	3,523
Buffalo Bill Release (cfs)	205	205	745	1,513	2,804	2,924	2,997
Tributary Gain (cfs)	685	884	1,090	773	1,345	2,615	-704
Monthly Inflow (cfs)	1,589	1,789	3,435	4,536	7,263	8,653	5,816
Monthly Inflow (kaf)	97.7	99.4	211.2	269.9	446.6	514.9	357.6
Monthly Release (kaf)	138.5	133.3	264.5	272.1	442.9	323.3	315.7
Afterbay Release (cfs)	2,253	2,400	4,302	4,572	7,203	5,433	5,134
River Release (cfs)	2,253	2,400	4,302	4,572	7,053	5,083	4,734
End-of-Month Content (kaf)	838.1	808.0	759.0	761.0	769.0	964.8	1,011.1
End-of-Month Elevation (feet)	3623.0	3618.7	3610.7	3611.0	3612.4	3636.4	3640.0

OPERATIONS OUTLOOK (January 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)	Jan	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	0	0	0	25	200	400	450
Minimum Forecast	0	0	0	75	250	450	500
Maximum Forecast	0	0	0	0	150	350	400

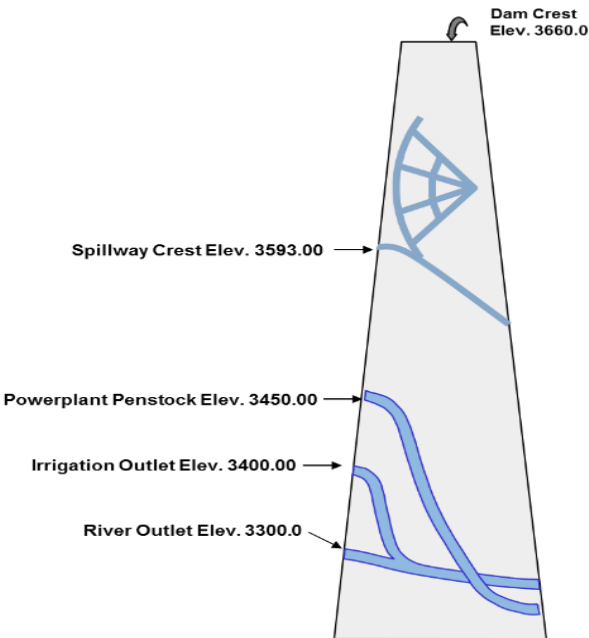
Power Generation Outlook

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)	Jan	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	2,183	2,217	2,208	2,233	3,484	3,165	2,880
Minimum Forecast	2,183	2,120	1,838	1,730	1,901	2,130	2,180
Maximum Forecast	2,183	2,330	4,232	4,502	4,926	4,690	4,623

Yellowtail Powerplant Generation (gwh)	Jan	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	52.6	47.7	52.2	51.2	84.0	76.4	73.2
Minimum Forecast	52.5	45.2	43.3	39.4	45.0	49.4	52.3
Maximum Forecast	52.6	50.6	99.5	100.8	113.8	110.2	113.8

Yellowtail Spill (cfs)	Jan	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	0	0	0	0	0	0	0
Minimum Forecast	0	0	0	0	0	0	0
Maximum Forecast	0	0	0	0	2,207	673	441



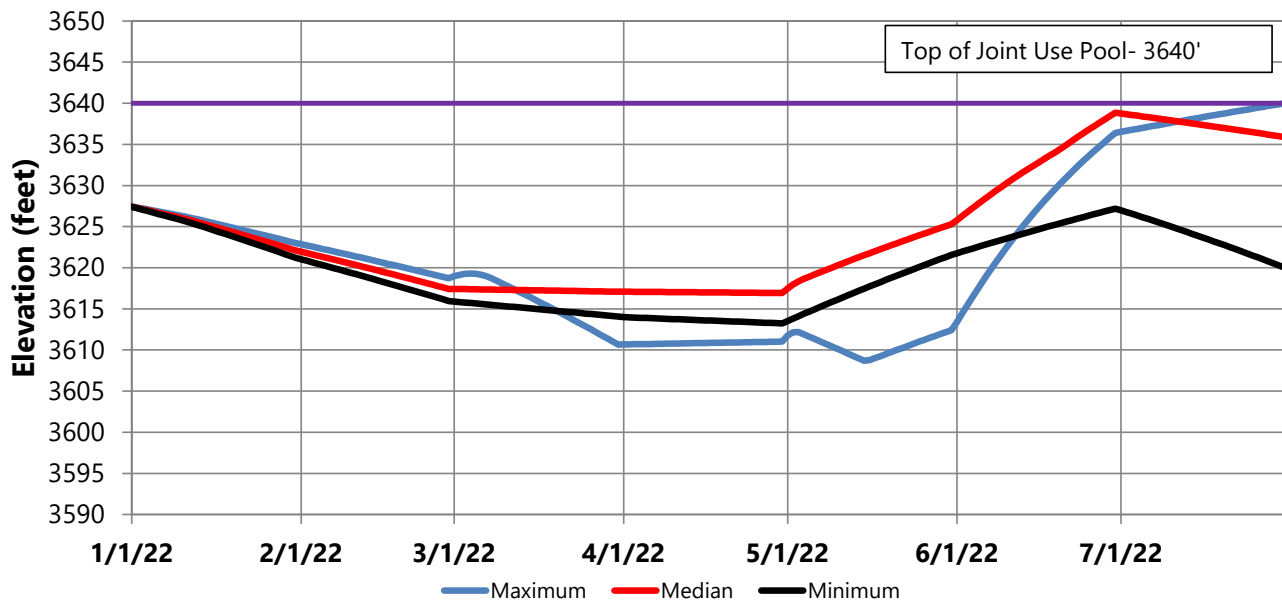
Release Outlook by Outlet

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 in May.

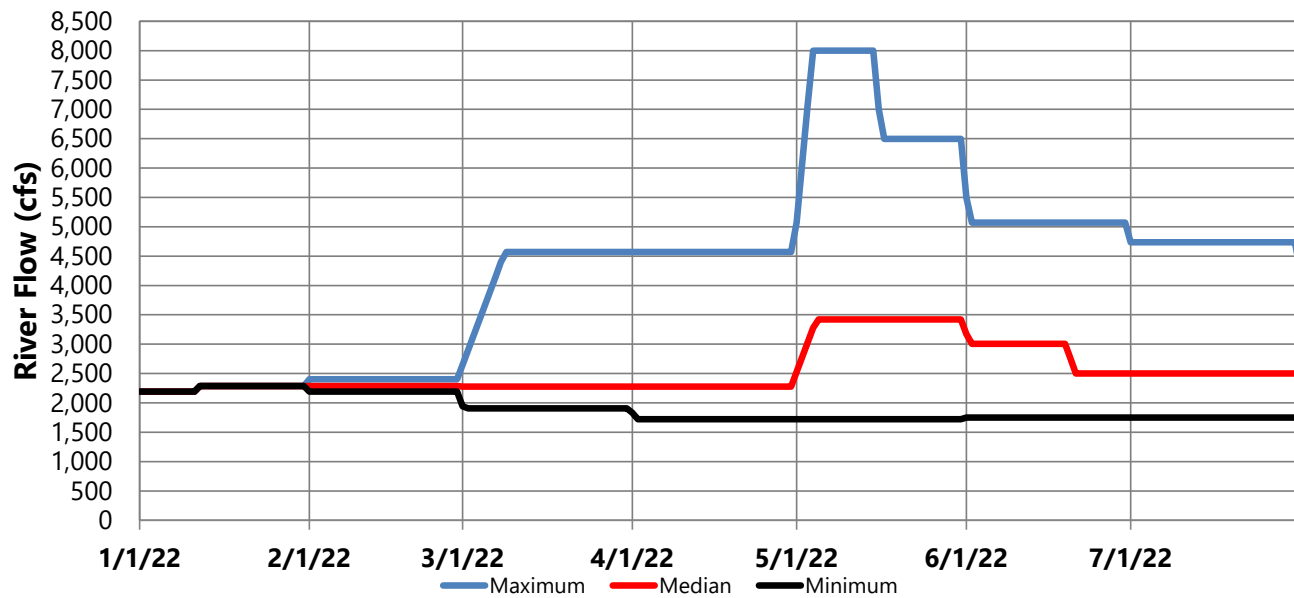
OPERATIONS OUTLOOK (January 1, 2022 through July 31, 2022)

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/en/lakes/reservoirs/warents/main_menu.html