

# Yellowtail Dam Water Supply and Projected Operations



BUREAU OF RECLAMATION

June 2021



Bighorn River Basin Map Source: DEMIS Mapserver

June Operating Range			
Forecast	Minimum	Median	Maximum
<b>Monthly Average Inflow (cfs)</b>	2,815	3,845	6,365
<b>Monthly Average River Release (cfs)</b>	1,760	2,000	2,875
<b>End of June Elevation (feet)</b>	3625.1	3630.7	3639.4
June through July 2021 Inflow Forecast (kaf)			
June through July Volume		334	
Percent of Average		43	
Water Year	Historic Inflow	Rank	
2020	518	37	
2019	1,138	11	
2018	1,270	6	
2017	1,537	3	
<b>30 Year Average</b>	772		

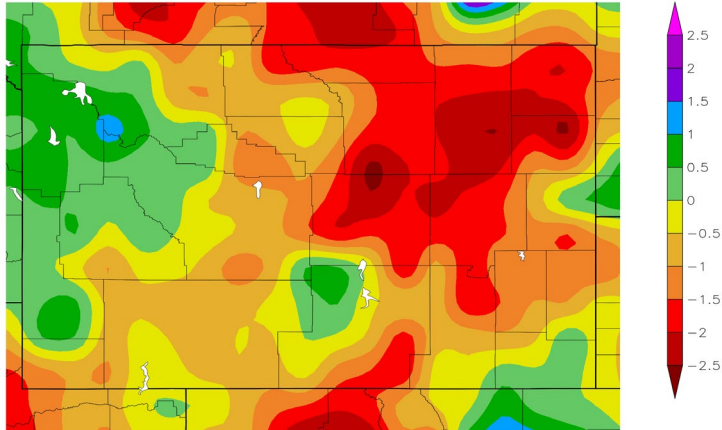


# Climate Departure from Normal

May 1 through May 31, 2021

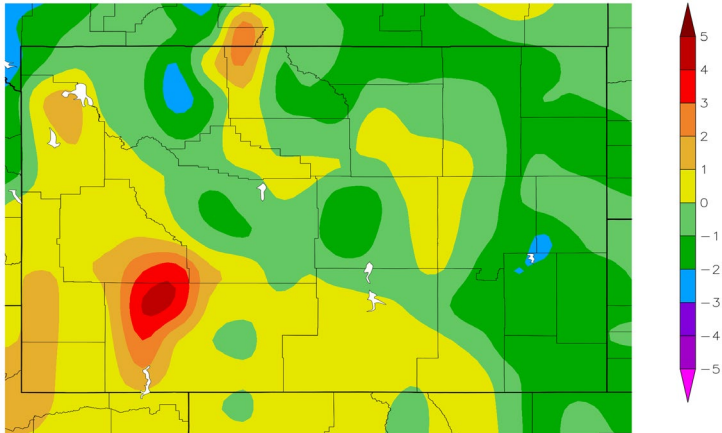
## Precipitation

Departure from Normal (inches)



## Temperature

Departure from Normal (°F)



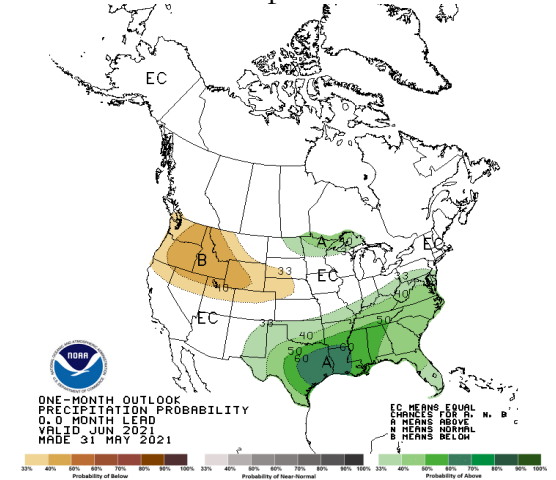
# CLIMATE SUMMARY

Precipitation in the Bighorn Basin above Yellowtail Dam was mostly drier than average during May. A portion of the Wind River Basin received a greater than average amount of precipitation. Most of the Basin was cooler than average except for the lower elevations.

The climate outlook shows there is a 33 to 40 percent chance precipitation will be below average during June. There is a 40 to 50 percent chance temperatures will be above average.

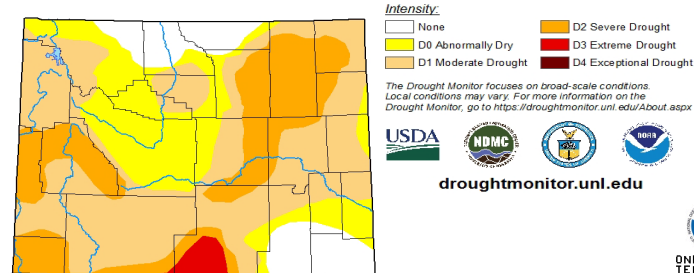
# June Climate Outlook

## Precipitation

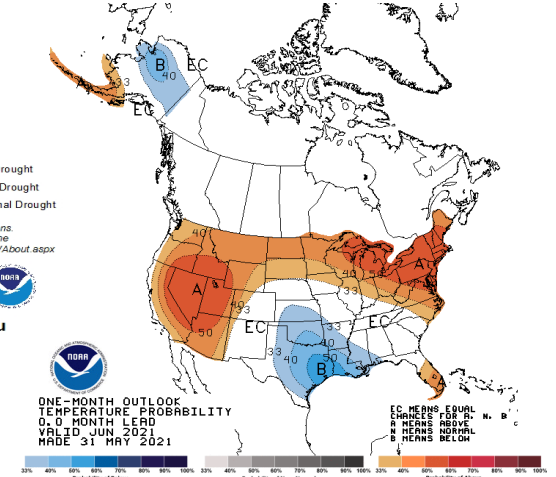


## Wyoming Drought Monitor Map

June 1, 2021



## Temperature

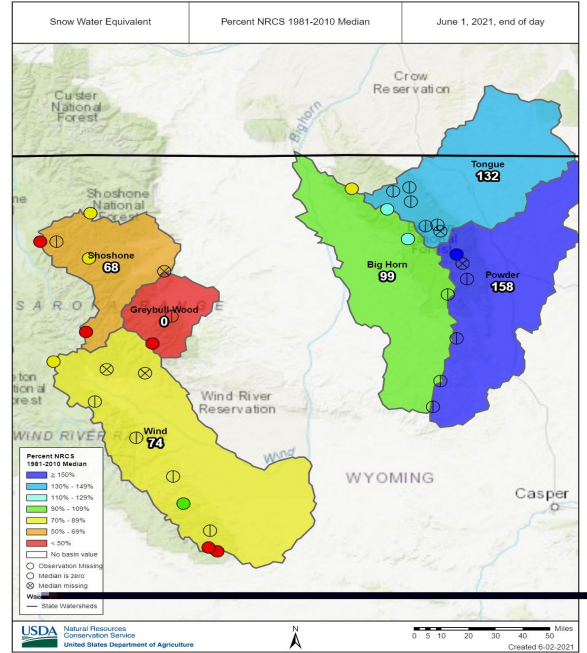
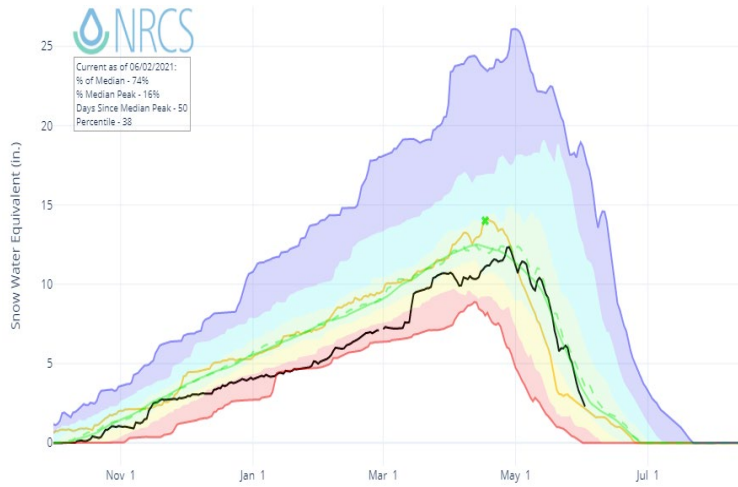




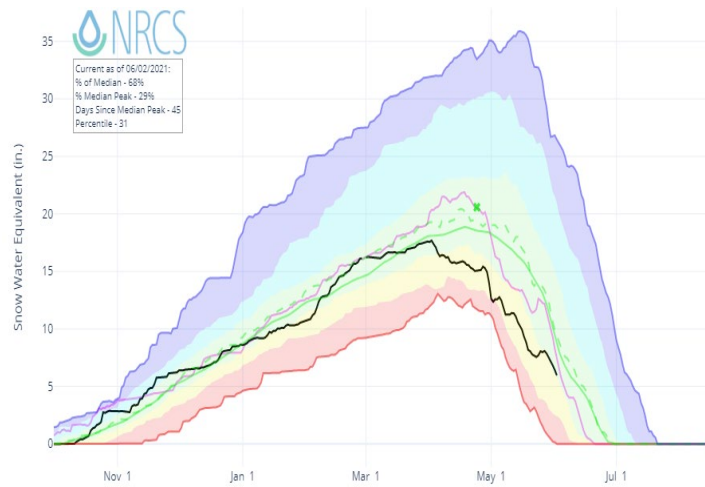
# SNOWPACK SUMMARY

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).

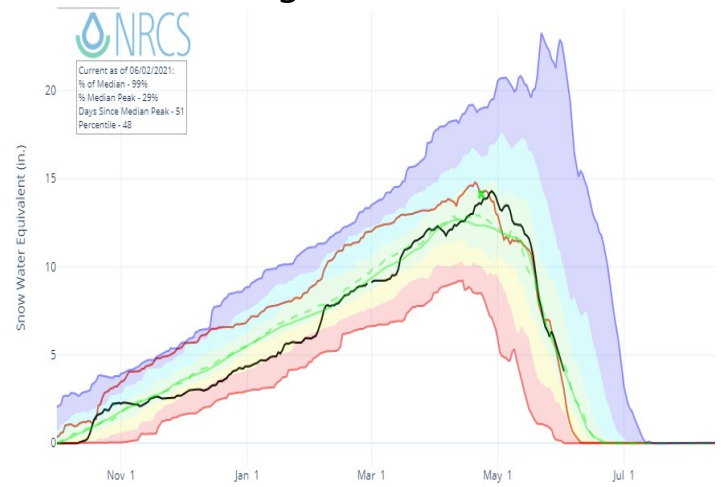
## Wind River



## Shoshone River



## Bighorn River



- ✱ Median Peak SWE
- Max
- - - Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading
- 2021
- 2020

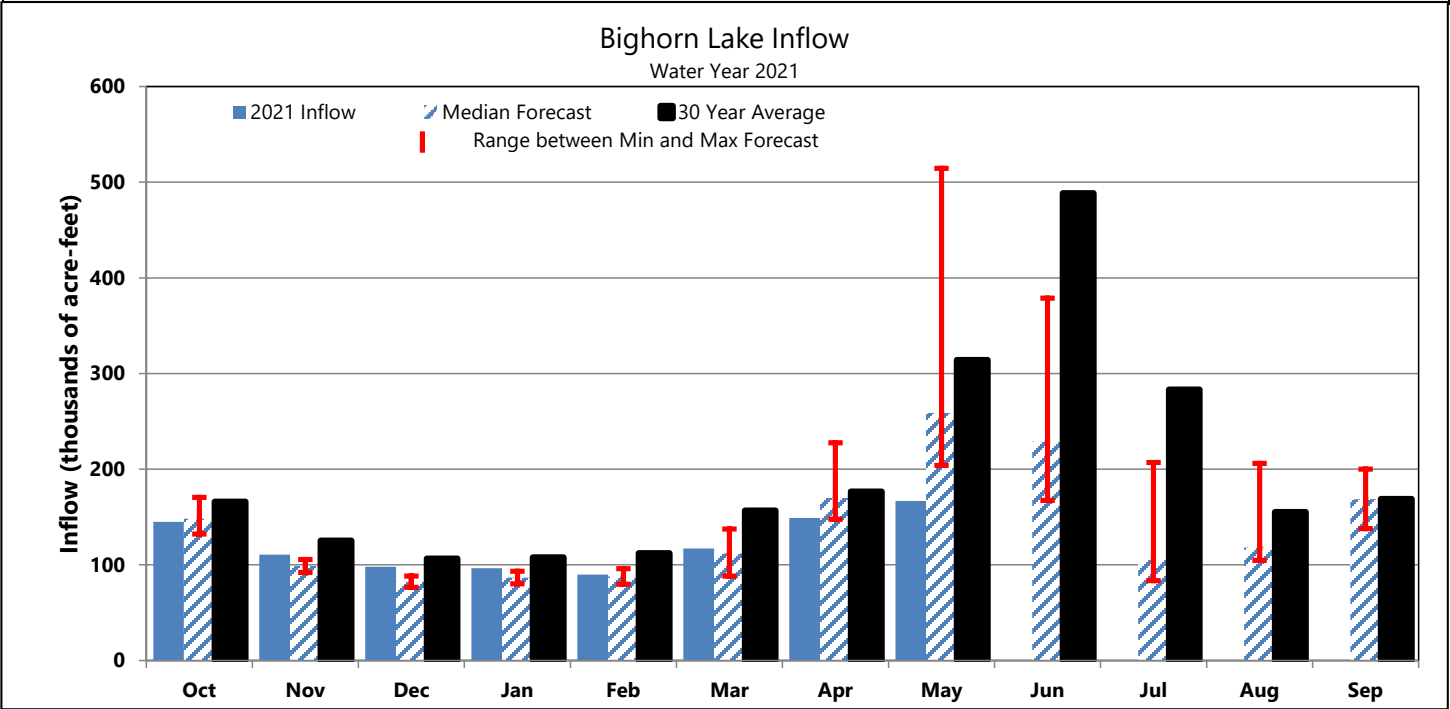
NRCS Montana Snow Survey Website: <https://www.nrcs.usda.gov/wps/portal/nrcs/mt/snow/>

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

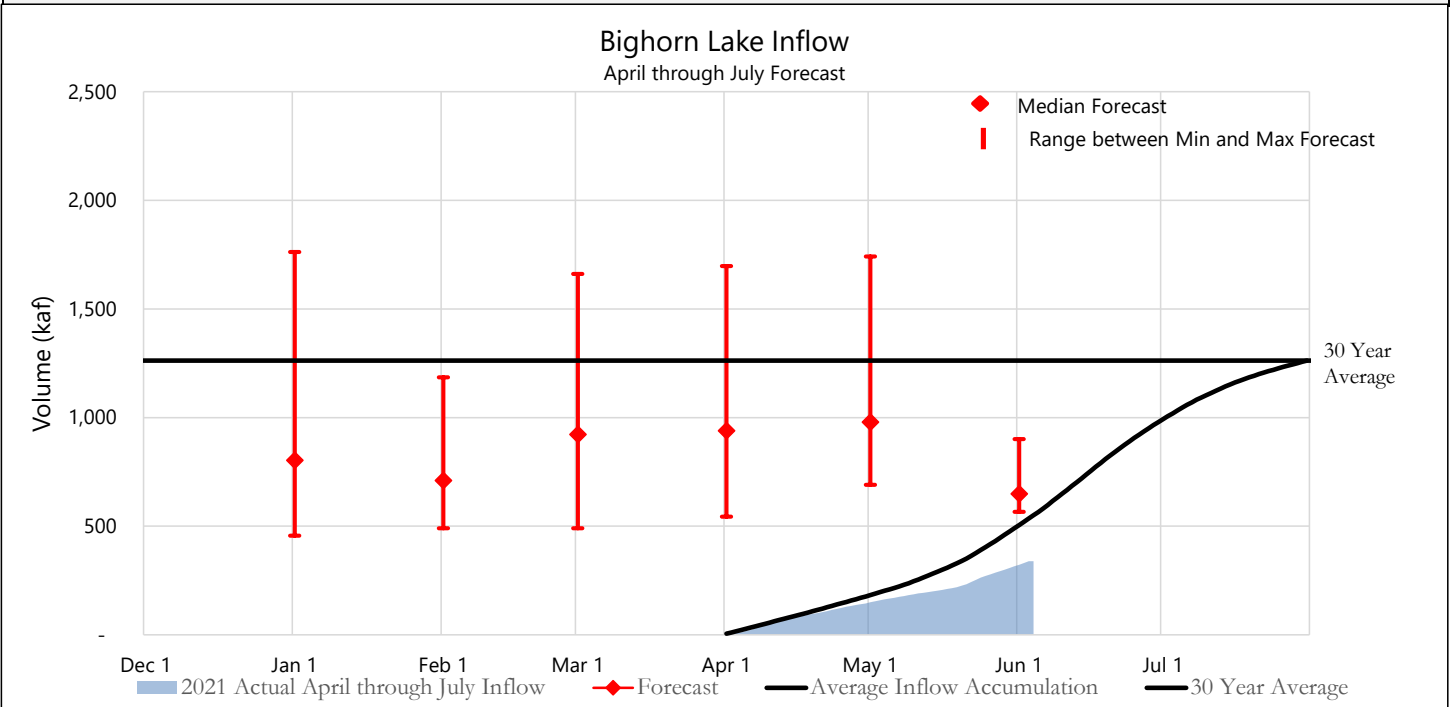
# FORECAST SUMMARY

SNOTEL data, streamflow data and planned releases from Boysen and Buffalo Bill Reservoirs are used to compute an inflow forecast for Bighorn Lake. Actual May inflow was below the minimum inflow forecast. The mid-month forecast was lowered to below minimum fill condition based on mid-month snowpack and precipitation.

May Forecast Review				
	Median Forecast (kaf)	Actual (kaf)	Difference (kaf)	Actual (% of Avg)
May Inflow	258.7	166.8	(91.9)	53



June through July Inflow Forecast for June 1					
	Median Forecast (kaf)	% of Average	Minimum Forecast (kaf)	Maximum Forecast (kaf)	
June through July Inflow	334	43	251	586	
Actual April Inflow	316 kaf		April through July Inflow	650 kaf	Average
					1,262 kaf



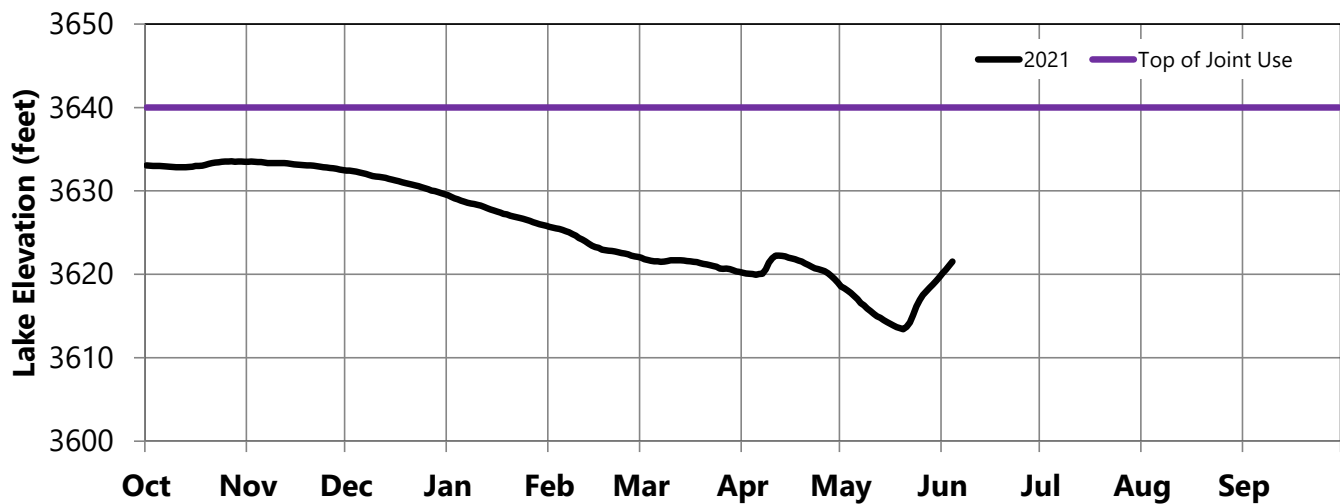
# OPERATIONS REVIEW (October 1, 2020 through May 31, 2021)

River releases were decreased to 2,000 cfs during May based on inflows and a reduced runoff forecast. The elevation of Bighorn Lake increased by 0.7 ft during May.

## June 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3619.7	814,472	100	81
Buffalo Bill	5369.2	462,082	105	71
Boysen	4717.5	605,905	112	82

## Bighorn Lake Operations Water Year 2020

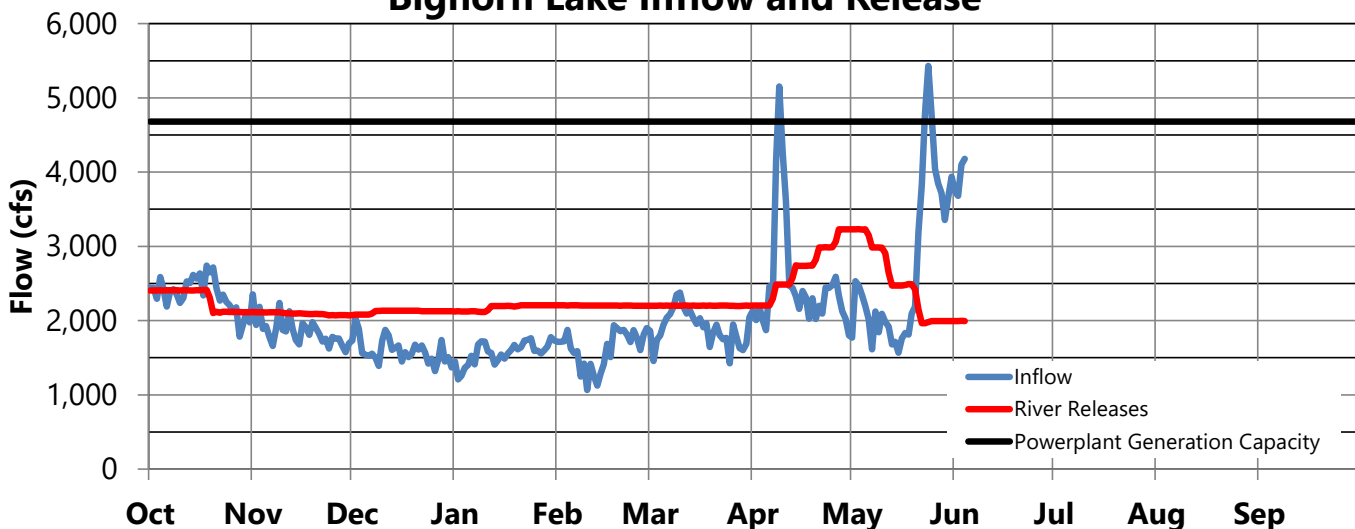


## Average May Inflow

## Average May Release

	Monthly Avg cfs	Percent of Average		Monthly Avg cfs	Percent of Average
Bighorn Lake	2,715	53	Bighorn River	2,535	68
Buffalo Bill	2,695	87	Buffalo Bill Total Release	1,980	88
Boysen	1,660	71	Boysen Release	1,030	52

## Bighorn Lake Inflow and Release



# OPERATIONS OUTLOOK (June 1, 2021 through October 31, 2021)

Bighorn Lake is expected to peak at approximately elevation 3631 feet, 9 feet below normal full pool, under median inflow conditions. Releases will be adjusted based on actual inflows, changes to forecasted inflows, and snowpack conditions. Forecasted releases during June range anywhere between 1,500 and 4,500 cfs based on the minimum, median, and maximum inflow forecasts.

## Median Inflow Conditions (June through July Inflow: 334 kaf)

	Jun	Jul	Aug	Sep	Oct
Boysen Release (cfs)	1,301	1,299	1,299	1,250	1,000
Buffalo Bill Release (cfs)	1,901	1,976	1,761	1,600	696
Tributary Gain (cfs)	645	-1,568	-1,140	-17	890
Monthly Inflow (cfs)	3,847	1,707	1,920	2,833	2,586
Monthly Inflow (kaf)	228.9	105.0	118.1	168.6	159.0
Monthly Release (kaf)	144.3	151.3	150.0	136.6	141.4
Afterbay Release (cfs)	2,425	2,460	2,440	2,295	2,300
River Release (cfs)	2,000	2,000	2,000	2,000	2,250
End-of-Month Content (kaf)	903.3	861.3	833.6	869.8	891.7
End-of-Month Elevation (feet)	3630.7	3626.0	3622.4	3627.0	3629.5

## Minimum Inflow Conditions (June through July Inflow: 251 kaf)

	Jun	Jul	Aug	Sep	Oct
Boysen Release (cfs)	1,250	1,251	1,251	1,000	800
Buffalo Bill Release (cfs)	1,901	1,976	1,761	1,499	696
Tributary Gain (cfs)	-338	-1,869	-1,309	-182	760
Monthly Inflow (cfs)	2,813	1,358	1,703	2,318	2,256
Monthly Inflow (kaf)	167.4	83.5	104.7	137.9	138.7
Monthly Release (kaf)	132.0	123.0	119.3	106.8	107.6
Afterbay Release (cfs)	2,218	2,000	1,940	1,795	1,750
River Release (cfs)	1,758	1,500	1,500	1,500	1,700
End-of-Month Content (kaf)	854.0	818.9	808.6	843.9	879.2
End-of-Month Elevation (feet)	3625.1	3620.3	3618.8	3623.8	3628.1

## Maximum Inflow Conditions (June through July Inflow: 586 kaf)

	Jun	Jul	Aug	Sep	Oct
Boysen Release (cfs)	2,198	2,078	2,249	1,250	1,200
Buffalo Bill Release (cfs)	2,460	2,534	2,062	1,949	881
Tributary Gain (cfs)	1,707	-1,246	-960	163	1,029
Monthly Inflow (cfs)	6,365	3,366	3,351	3,362	3,110
Monthly Inflow (kaf)	378.8	207.0	206.1	200.1	191.3
Monthly Release (kaf)	194.9	217.7	224.7	203.2	199.8
Afterbay Release (cfs)	3,275	3,541	3,655	3,415	3,250
River Release (cfs)	2,875	3,121	3,250	3,250	3,250
End-of-Month Content (kaf)	1,002.5	996.1	981.7	982.7	978.5
End-of-Month Elevation (feet)	3639.4	3638.9	3637.8	3637.9	3637.5

# OPERATIONS OUTLOOK (June 1, 2021 through October 31, 2021)

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. Yellowtail Powerplant is limited to 3 units due to on-going refurbishment project.

## Irrigation Demands Outlook

Bighorn Canal (cfs)

	Jun	Jul	Aug	Sep	Oct
Median Forecast	425	460	440	295	50
Minimum Forecast	460	500	440	295	50
Maximum Forecast	400	420	405	165	0

## Power Generation Outlook

Current Number of Units Available: 3 of 4

Approximate Yellowtail Powerplant Turbine Capacity: 6,150 cfs

Approximate Yellowtail Powerplant Generation Limit: 4,615 cfs

Yellowtail Powerplant Release (cfs)

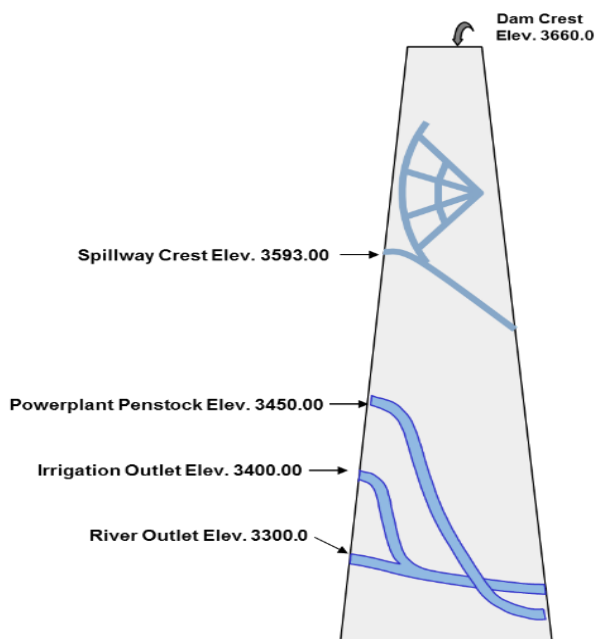
	Jun	Jul	Aug	Sep	Oct
Median Forecast	2,355	2,390	2,370	2,225	2,230
Minimum Forecast	2,148	1,930	1,870	1,725	1,680
Maximum Forecast	3,163	3,471	3,585	3,345	3,180

Yellowtail Powerplant Generation (gwh)

	Jun	Jul	Aug	Sep	Oct
Median Forecast	55.4	58.6	57.6	51.9	54.2
Minimum Forecast	50.1	46.3	44.6	40.3	41.2
Maximum Forecast	75.3	87.1	89.6	81.2	80.1

Yellowtail Spill (cfs)

	Jun	Jul	Aug	Sep	Oct
Median Forecast	0	0	0	0	0
Minimum Forecast	0	0	0	0	0
Maximum Forecast	42	0	0	0	0

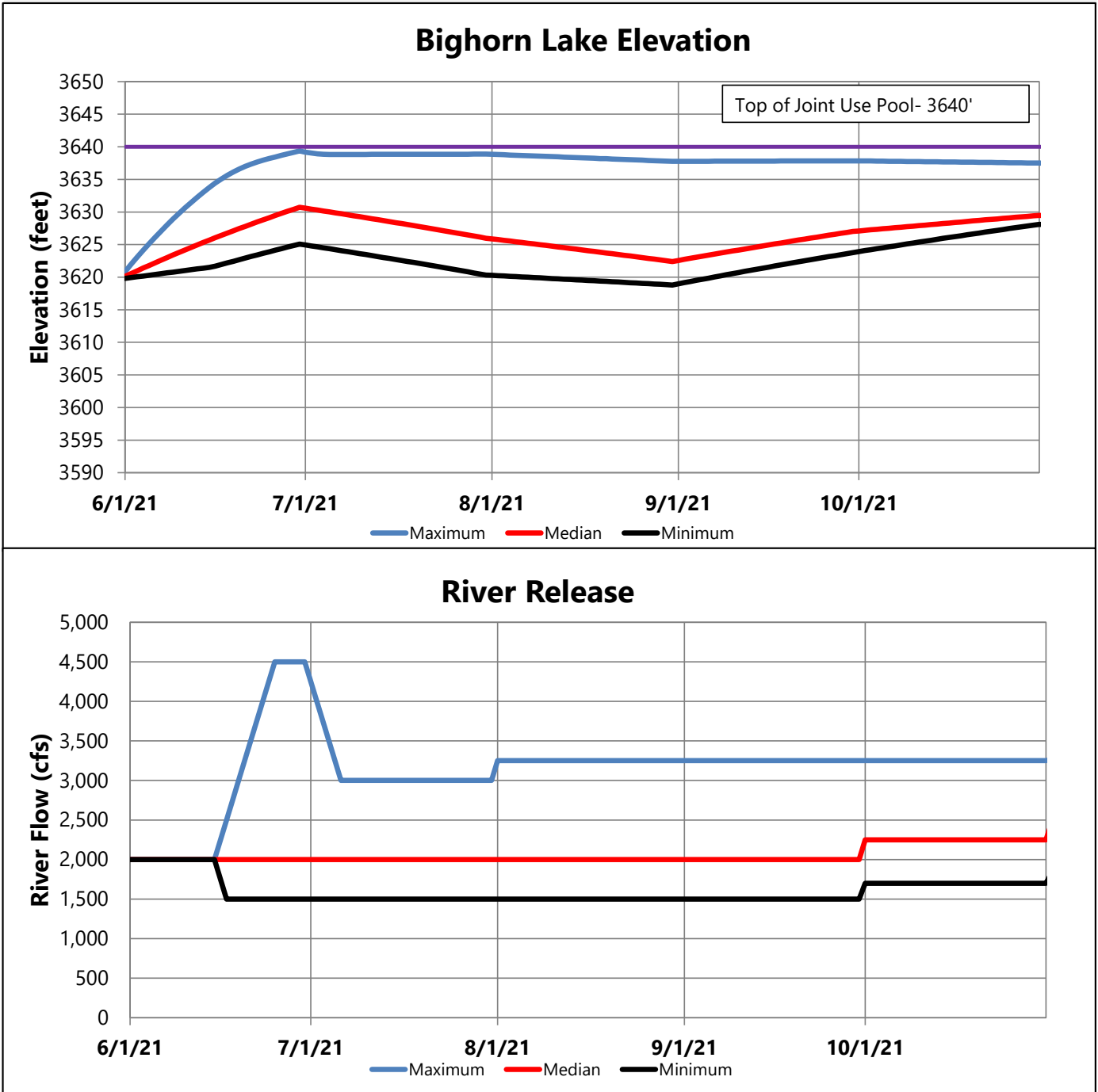


## Release Outlook by Outlet

All releases are currently going through the powerplant and are expected to go through the powerplant under median and minimum inflow conditions. Additional releases would be made through the spillway or river outlet works during June under maximum inflow conditions.

# OPERATIONS OUTLOOK (June 1, 2021 through October 31, 2021)

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/en/lakes\\_reservoirs/warents/main\\_menu.html](https://www.usbr.gov/en/lakes_reservoirs/warents/main_menu.html)