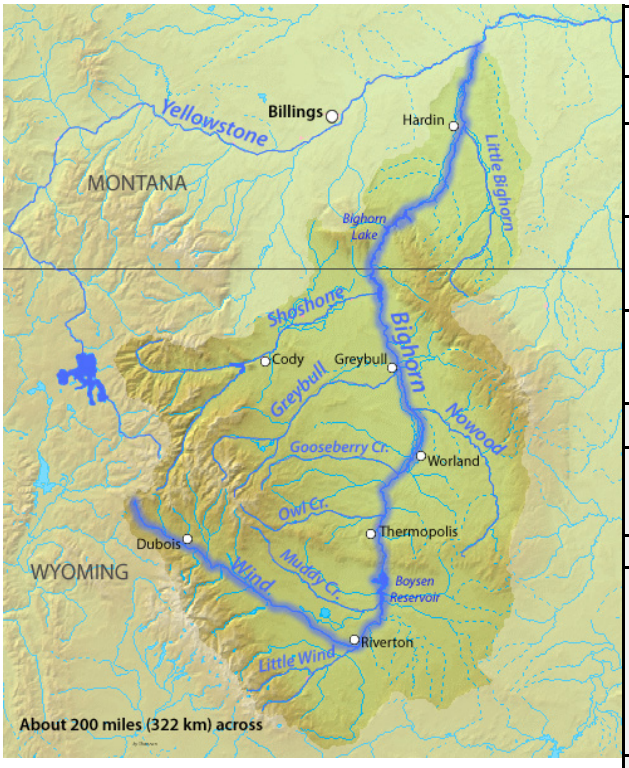
Yellowtail Dam Water Supply and Projected Operations

BUREAU OF RECLAMATION

September 2020



Bighorn River Basin Map Source: DEMIS Mapserver

September Operating Range			
Forecast	**Minimum**	**Median**	**Maximum**
Monthly Average Inflow (cfs)	2,380	2,815	3,455
Monthly Average River Release (cfs)	2,350	2,400	2,515
End of September Elevation (feet)	3632.3	3634.5	3637.5

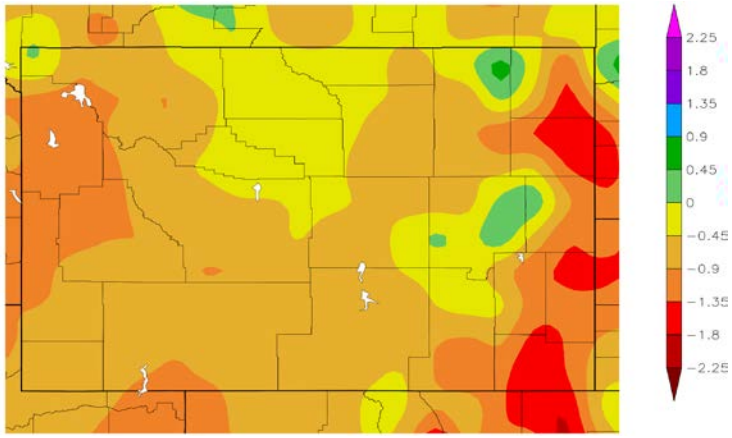
September 2020 Inflow Forecast		
September Volume		168
Percent of Average		100
Water Year	**Historic Inflow (kaf)**	**Rank**
2019	209	14
2018	163	30
2017	219	11
2016	181	24
30 Year Average	168	

Climate Departure from Normal

August 1 through August 31, 2020

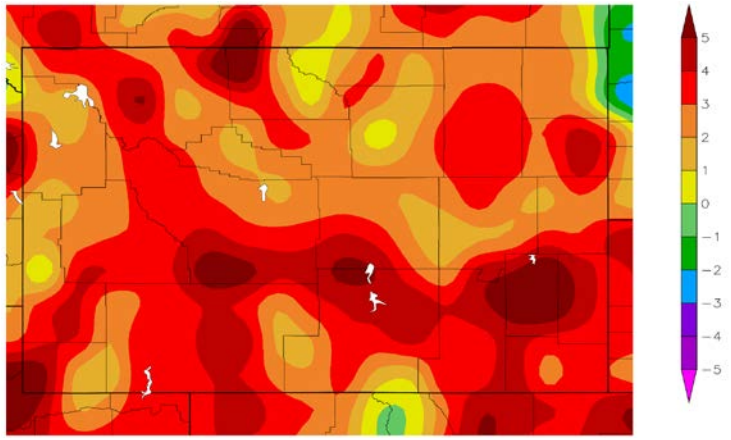
Precipitation

Departure from Normal (inches)



Temperature

Departure from Normal (°F)

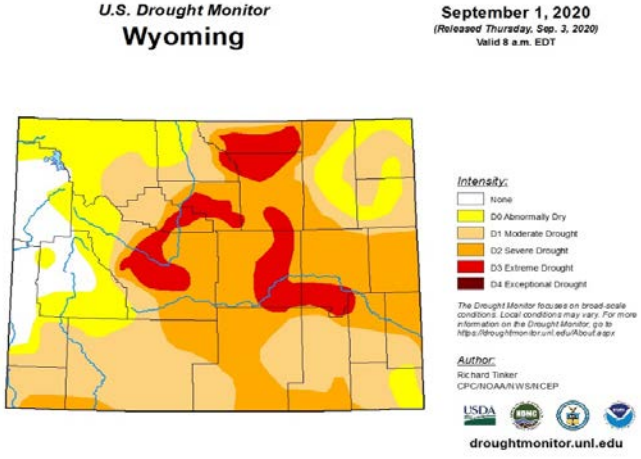


HPRCC using provisional data from NOAA Regional Climate Centers

CLIMATE SUMMARY

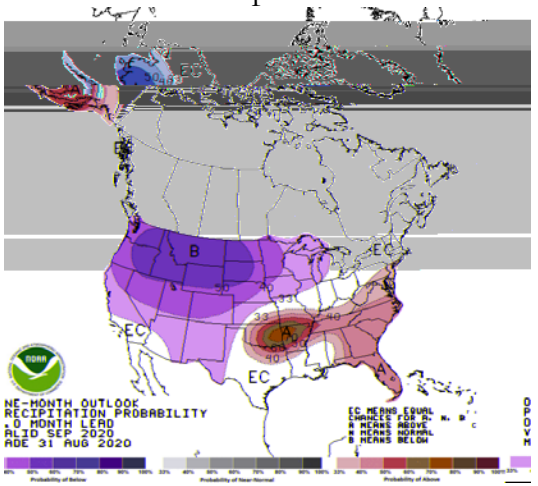
The climate in the Bighorn Basin above Yellowtail Dam was much drier and warmer than average during August.

The climate outlook for September shows there is a 50 percent chance that precipitation will continue to be below average and a 33-40 percent chance temperatures will be above average.

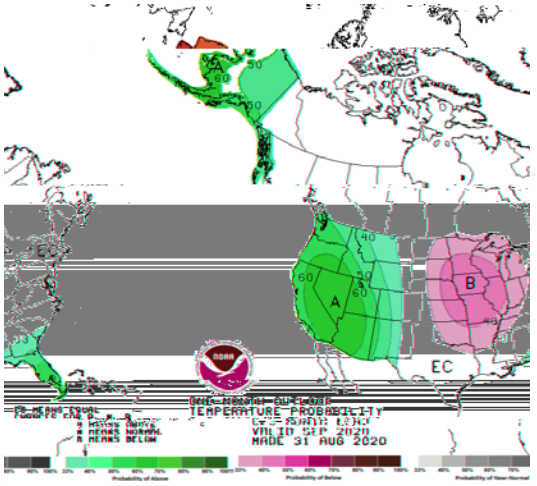


September Climate Outlook

Precipitation



Temperature

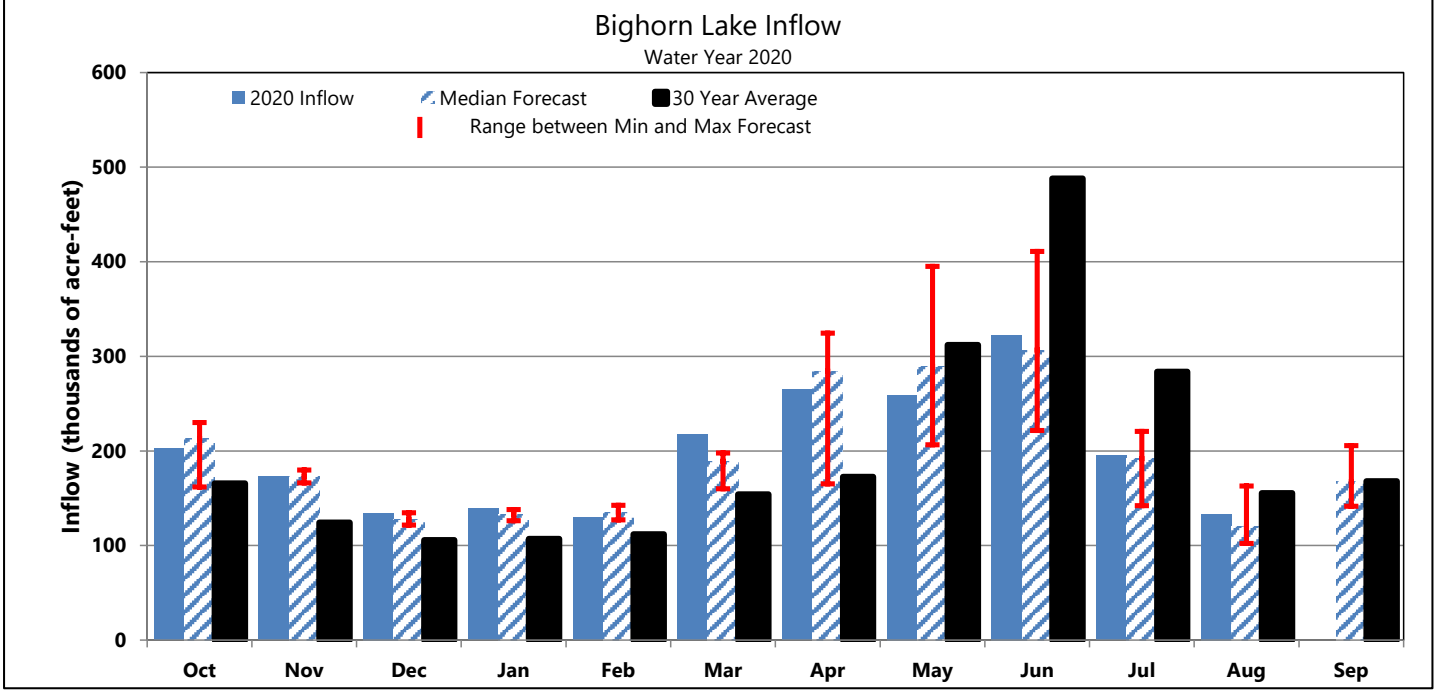


FORECAST SUMMARY

SNOTEL data, streamflow data and planned releases from Boysen and Buffalo Bill Reservoirs are used to compute an inflow forecast for Bighorn Lake.

August Forecast Review

	Median Forecast (kaf)	Actual (kaf)	Difference (kaf)	Actual (% of Avg)
August Inflow	119.7	133.2	13.5	86

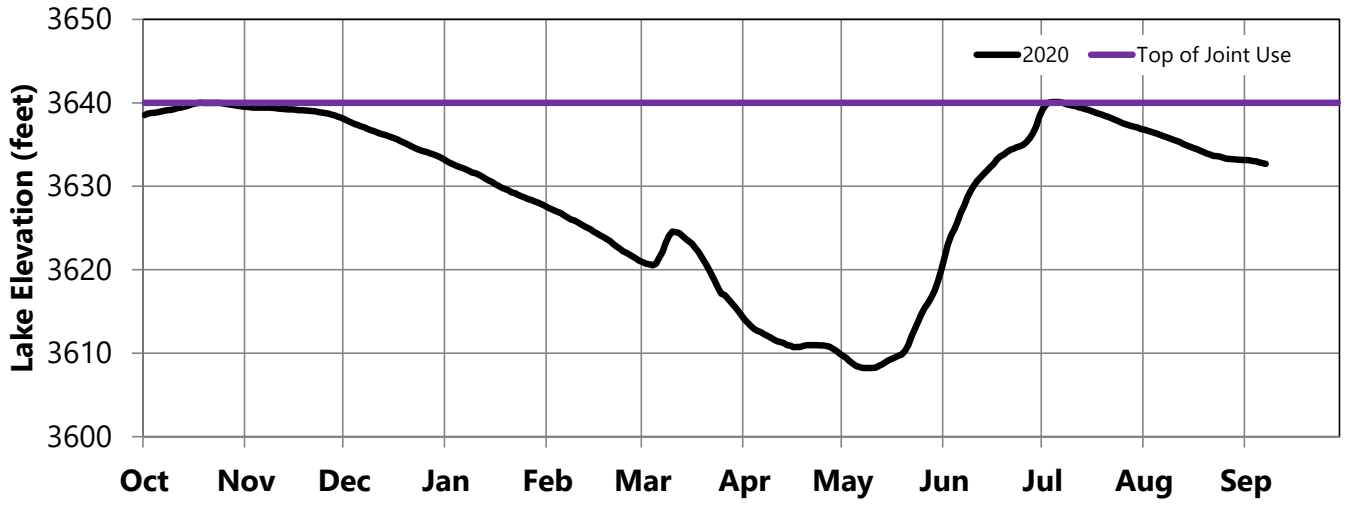


OPERATIONS REVIEW (October 1, 2019 through September 1, 2020)

River releases were 2,500 cfs at the start of August and were reduced to 2,400 cfs on August 17 due to lower inflows from the hot and dry climate conditions. Storage in Bighorn Lake decreased by 3.7 feet or 40,600 AF during August.

September 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3633.2	942,035	106	92
Buffalo Bill	5377.3	521,218	101	81
Boysen	4716.7	592,174	99	80

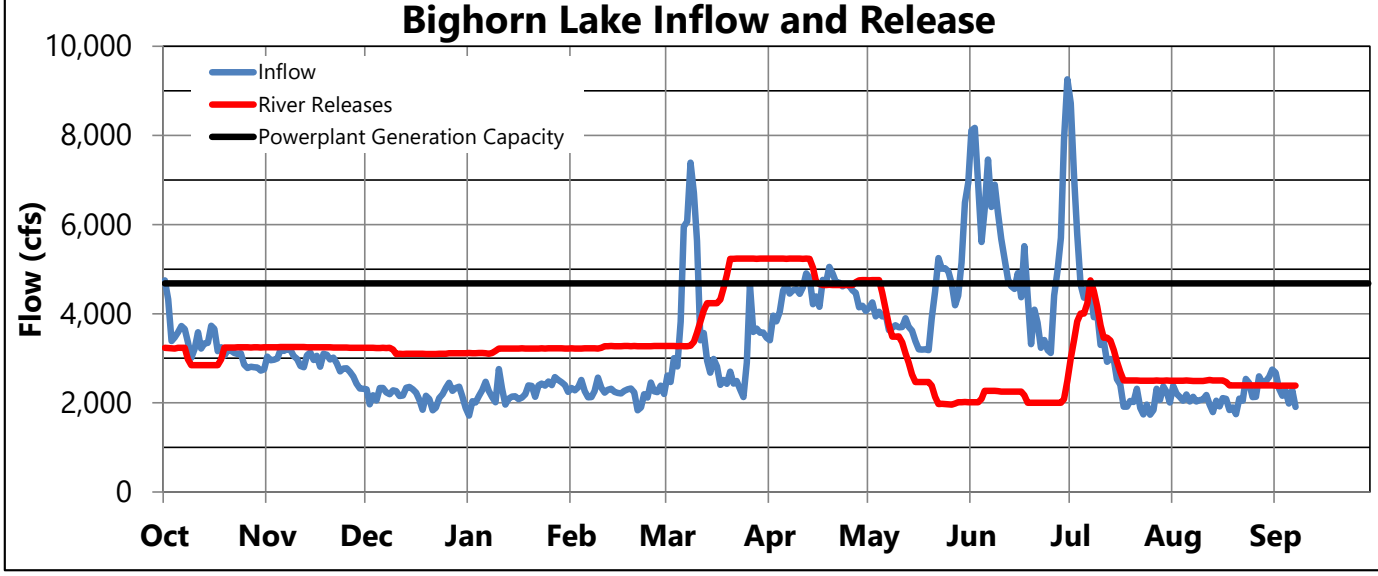


Average August Release

	Monthly Avg cfs	Percent of Average
Bighorn River	2,450	85
Buffalo Bill Total Release	1,890	102
Boysen Release	1,230	85

Average August Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	2,165	86
Buffalo Bill	570	79
Boysen	480	58



OPERATIONS OUTLOOK (September 1, 2020 through March 31, 2021)

River releases are expected to remain at 2,400 cfs during September under median inflow conditions. In accordance with the operating criteria, releases from Yellowtail Dam are adjusted as needed based on actual and revised forecasted inflows to stay on track with the October 31 elevation target (3635-3640 feet) as long as river releases can be maintained at 2,500 cfs or more. If river releases can not be maintained at 2,500 cfs or more while using the end of October elevation target, river releases are adjusted to the approximate expected winter release using the March 31 target of 3617 feet.

Median Inflow Conditions

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Boysen Release (cfs)	1,101	1,000	600	600	600	600	800
Buffalo Bill Release (cfs)	1,600	696	355	355	355	357	355
Tributary Gain (cfs)	114	990	867	545	616	792	1,013
Monthly Inflow (cfs)	2,815	2,686	1,822	1,500	1,571	1,749	2,168
Monthly Inflow (kaf)	167.5	165.2	108.4	92.2	96.6	97.1	133.3
Monthly Release (kaf)	157.7	150.6	142.2	146.9	146.9	132.7	146.9
Afterbay Release (cfs)	2,650	2,449	2,390	2,390	2,390	2,390	2,390
River Release (cfs)	2,400	2,400	2,390	2,390	2,390	2,390	2,390
End-of-Month Content (kaf)	956.0	975.0	945.3	894.9	848.9	817.2	807.9
End-of-Month Elevation (feet)	3634.5	3636.2	3633.5	3628.2	3622.6	3618.3	3617.0

Minimum Inflow Conditions

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Boysen Release (cfs)	1,101	1,000	600	600	600	600	600
Buffalo Bill Release (cfs)	1,499	696	205	205	205	205	205
Tributary Gain (cfs)	-222	729	852	532	603	772	995
Monthly Inflow (cfs)	2,378	2,425	1,657	1,337	1,408	1,577	1,800
Monthly Inflow (kaf)	141.5	149.1	98.6	82.2	86.6	87.6	110.7
Monthly Release (kaf)	154.7	132.1	125.8	130.0	130.0	117.4	130.0
Afterbay Release (cfs)	2,600	2,149	2,114	2,114	2,114	2,114	2,114
River Release (cfs)	2,350	2,100	2,114	2,114	2,114	2,114	2,114
End-of-Month Content (kaf)	933.0	954.3	931.3	887.8	848.8	822.9	807.9
End-of-Month Elevation (feet)	3632.3	3634.3	3632.1	3627.4	3622.6	3619.1	3617.0

Maximum Inflow Conditions

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Boysen Release (cfs)	1,101	1,099	1,000	1,000	1,000	999	1,000
Buffalo Bill Release (cfs)	1,694	701	405	355	1,000	999	1,000
Tributary Gain (cfs)	660	1,352	891	564	639	821	1,038
Monthly Inflow (cfs)	3,455	3,152	2,296	1,919	1,994	2,177	2,393
Monthly Inflow (kaf)	205.6	193.8	136.6	118.0	122.6	120.9	147.1
Monthly Release (kaf)	161.7	169.1	174.3	180.1	180.1	162.7	180.1
Afterbay Release (cfs)	2,717	2,750	2,930	2,930	2,930	2,930	2,930
River Release (cfs)	2,517	2,750	2,930	2,930	2,930	2,930	2,930
End-of-Month Content (kaf)	990.2	1,019.2	985.6	927.8	874.6	836.6	807.9
End-of-Month Elevation (feet)	3637.5	3639.9	3637.1	3631.7	3625.8	3621.0	3617.0

OPERATIONS OUTLOOK (September 1, 2020 through March 31, 2021)

There is approximately 70 cfs of gain between Yellowtail Dam and Yellowtail Afterbay Dam from spring 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)

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Median Forecast	250	49	0	0	0	0	0
Minimum Forecast	250	49	0	0	0	0	0
Maximum Forecast	200	0	0	0	0	0	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)

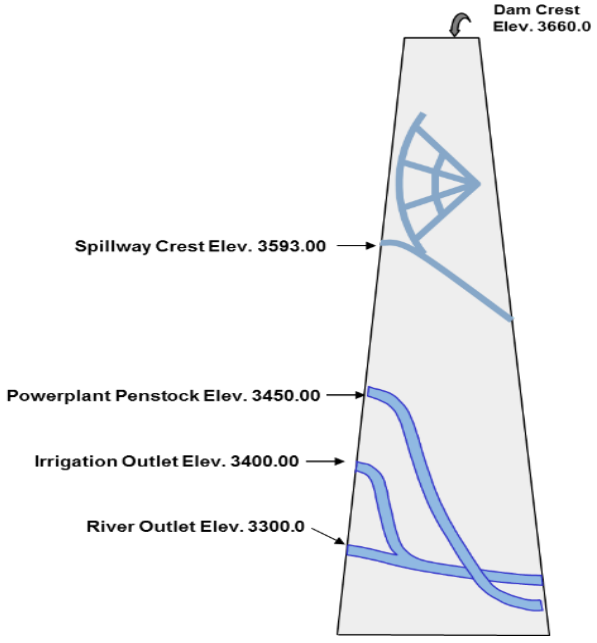
	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Median Forecast	2,580	2,379	2,320	2,320	2,320	2,320	2,320
Minimum Forecast	2,530	2,079	2,044	2,044	2,044	2,044	2,044
Maximum Forecast	2,647	2,680	2,860	2,860	2,860	2,860	2,860

Yellowtail Powerplant Generation (gwh)

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Median Forecast	62.5	59.0	55.4	56.9	56.3	50.3	55.3
Minimum Forecast	61.0	50.8	48.4	49.7	49.2	43.9	48.3
Maximum Forecast	64.5	68.1	70.5	72.4	71.6	63.7	69.5

Yellowtail Spill (cfs)

	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Median Forecast	0	0	0	0	0	0	0
Minimum Forecast	0	0	0	0	0	0	0
Maximum Forecast	0	0	0	0	0	0	0

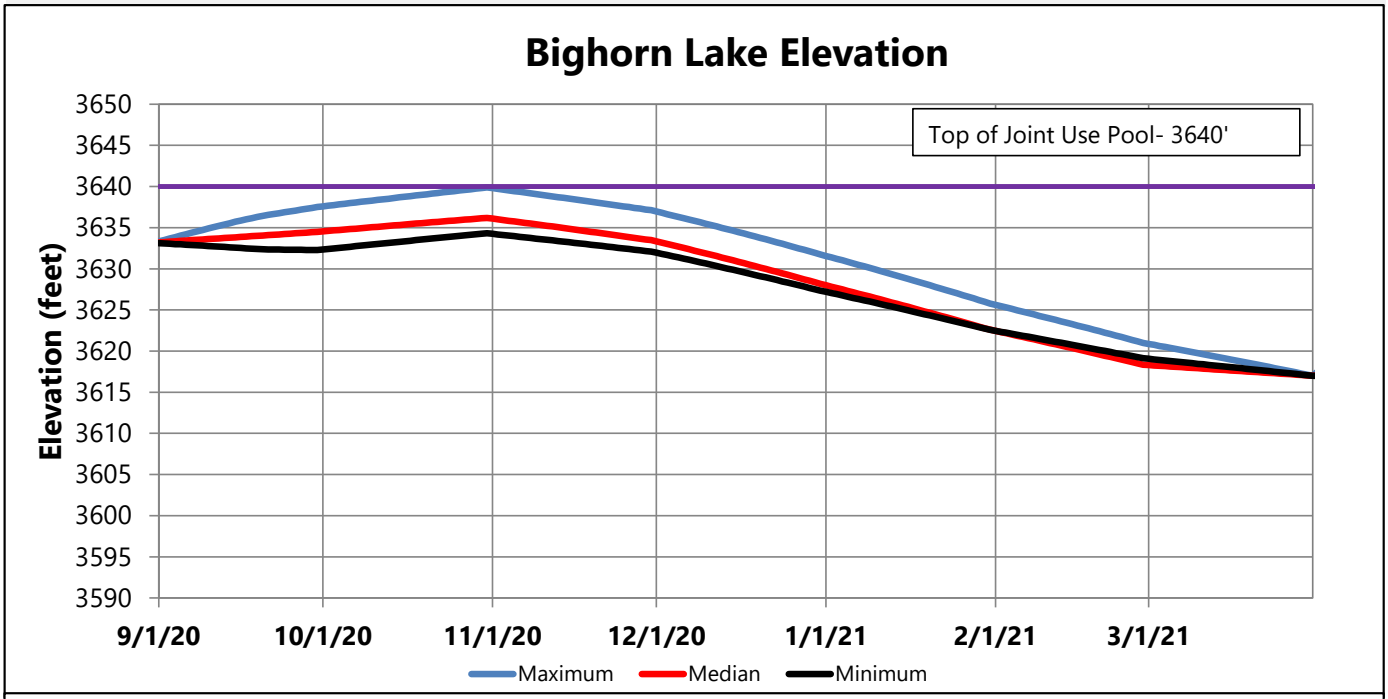


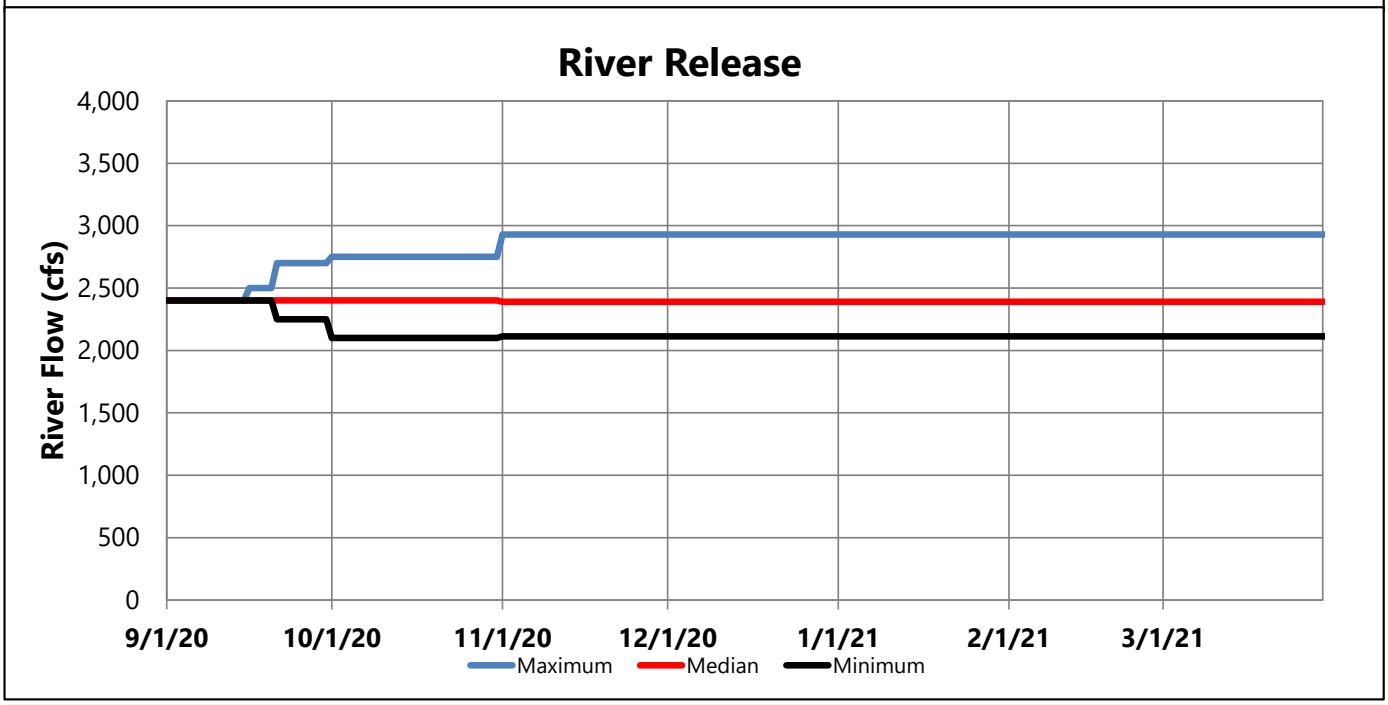
Release Outlook by Outlet

All releases are currently going through the powerplant and are expected to go through the powerplant through the end of March.

OPERATIONS OUTLOOK (September 1, 2020 through March 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.





Contact Us

Clayton Jordan
cjordan@usbr.gov
406-247-7334

Stephanie Micek
smicek@usbr.gov
406-247-7320

Chris Gomer
cgomer@usbr.gov
406-247-7307

Monthly Operating Plans, Current Conditions, Snowpack and Other Water Management Information
https://www.usbr.gov/gp/lakes_reservoirs/wareprts/main_menu.html