

# Yellowtail Dam Water Supply and Projected Operations



BUREAU OF RECLAMATION

**October 2020**



Bighorn River Basin Map Source: DEMIS Mapsver

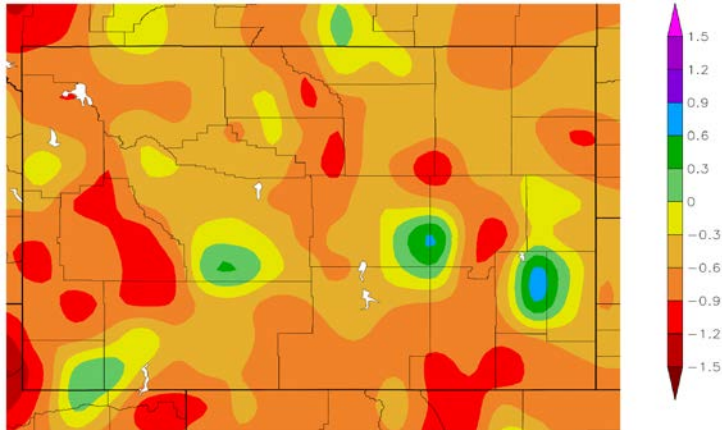
| <b>October Operating Range</b>             |                              |               |                |
|--|------------------------------|---------------|----------------|
| <b>Forecast</b>                            | <b>Minimum</b>               | <b>Median</b> | <b>Maximum</b> |
| <b>Monthly Average Inflow (cfs)</b>        | 2,150                        | 2,410         | 2,775          |
| <b>Monthly Average River Release (cfs)</b> | 2,215                        | 2,215         | 2,215          |
| <b>End of October Elevation (feet)</b>     | 3632.5                       | 3634.2        | 3636.3         |
| <b>October 2020 Inflow Forecast</b>        |                              |               |                |
| October Volume                             |                              |               | 148            |
| Percent of Average                         |                              |               | 89             |
| <b>Water Year</b>                          | <b>Historic Inflow (kaf)</b> | <b>Rank</b>   |                |
| 2020                                       | 202                          | 17            |                |
| 2019                                       | 175                          | 29            |                |
| 2018                                       | 278                          | 3             |                |
| 2017                                       | 203                          | 16            |                |
| <b>30 Year Average</b>                     | 166                          |               |                |

# Climate Departure from Normal

September 1 through September 30, 2020

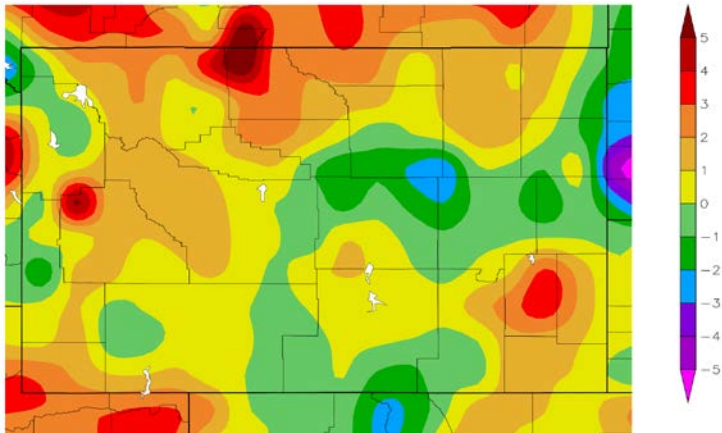
## Precipitation

Departure from Normal (inches)



## Temperature

Departure from Normal (°F)



HPRCC using provisional data from NOAA Regional Climate Centers

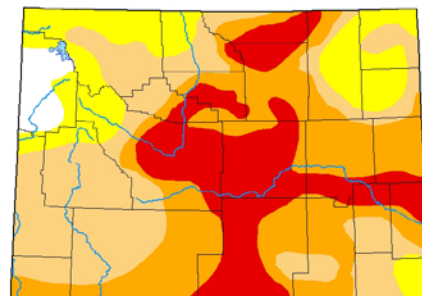
# CLIMATE SUMMARY

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

The climate outlook for October shows there is a 40-50 percent chance that precipitation will continue to be below average and a 60-70 percent chance temperatures will be above average.

## U.S. Drought Monitor Wyoming

September 29, 2020  
(Released Thursday, Oct. 1, 2020)  
Valid 8 a.m. EDT



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

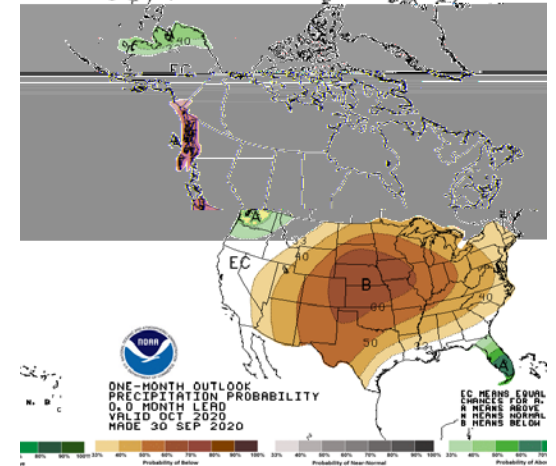
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <http://droughtmonitor.unl.edu/about.aspx>.

**Author:**  
Brad Rippey  
U.S. Department of Agriculture

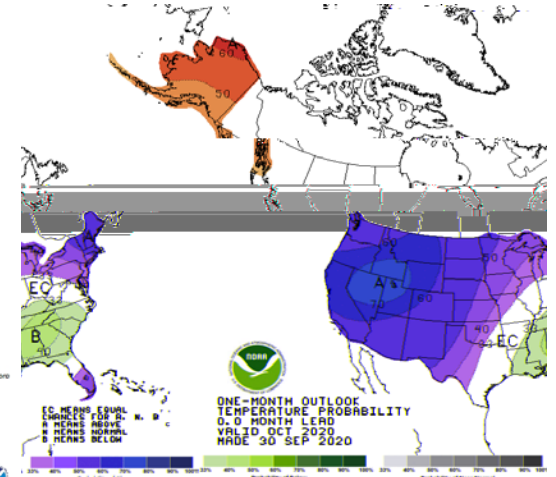


# October Climate Outlook

## Precipitation



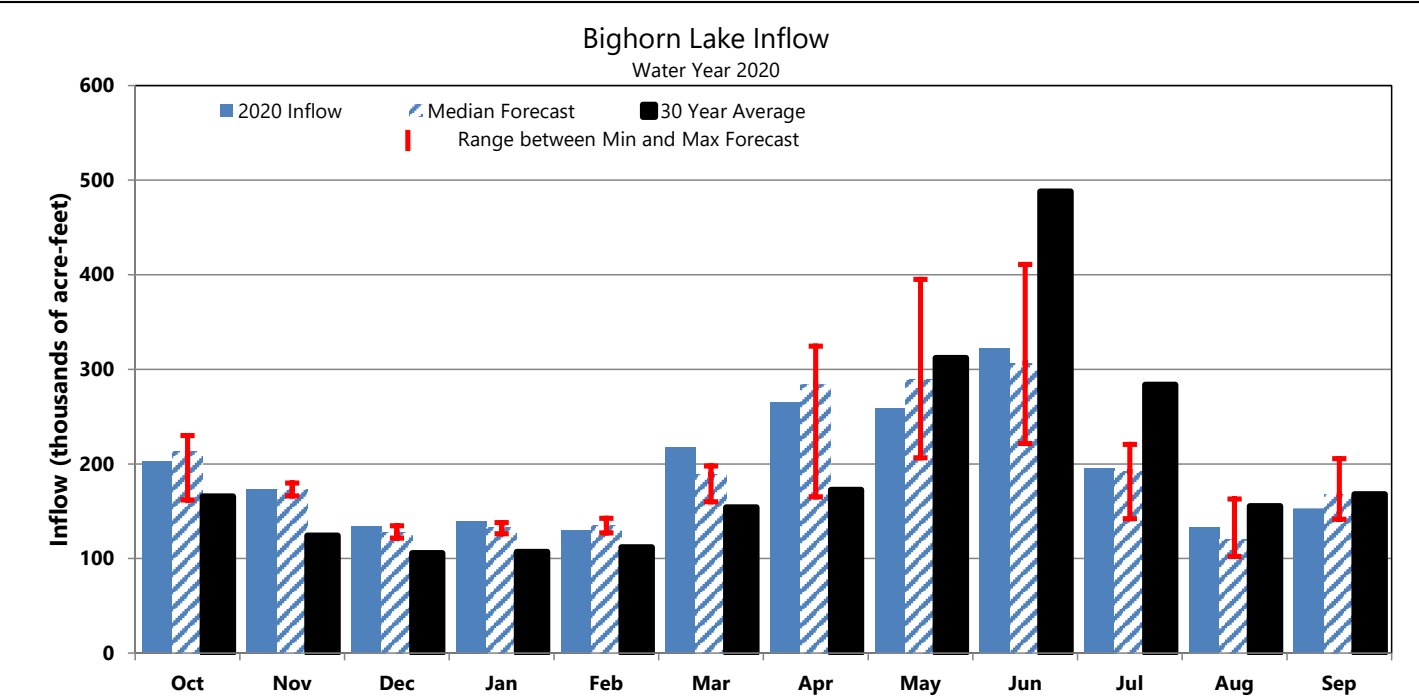
## Temperature



# 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.

| September Forecast Review |                       |              |                  |                   |
|---------------------------|-----------------------|--------------|------------------|-------------------|
|                           | Median Forecast (kaf) | Actual (kaf) | Difference (kaf) | Actual (% of Avg) |
| September Inflow          | 167.5                 | 152.2        | (15.3)           | 91                |



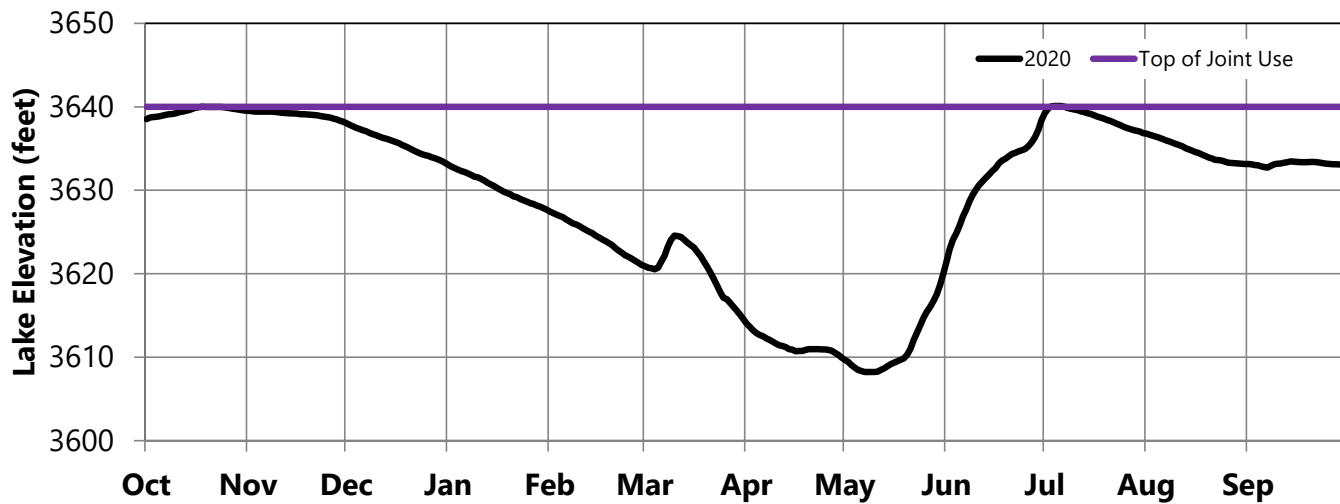
# OPERATIONS REVIEW (October 1, 2019 through September 30, 2020)

River releases remained at 2,400 cfs during September. Storage in Bighorn Lake decreased by 0.1 feet or 1,100 AF during September.

## October 1 Storage Conditions

|              | Elevation<br>feet | Storage<br>acre-feet | Percent of<br>Average | Percent<br>Full |
|--------------|-------------------|----------------------|-----------------------|-----------------|
| Bighorn Lake | 3633.1            | 940,905              | 105                   | 92              |
| Buffalo Bill | 5367.5            | 450,099              | 99                    | 70              |
| Boysen       | 4715.4            | 571,249              | 98                    | 77              |

## Bighorn Lake Operations Water Year 2020



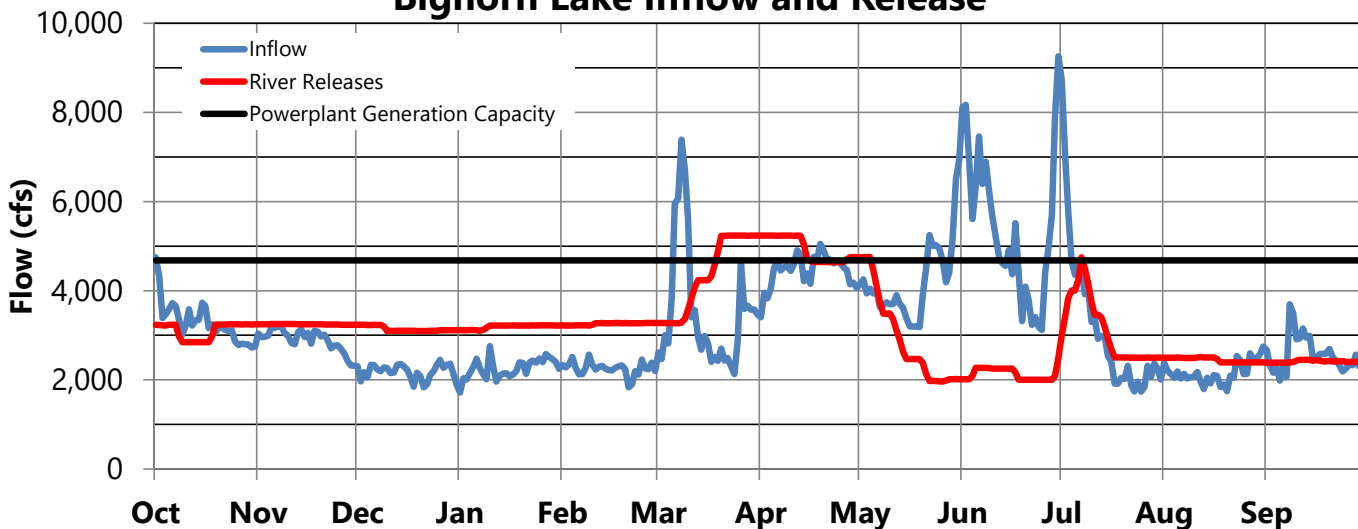
## Average September Release

|                            | Monthly Avg<br>cfs | Percent of<br>Average |
|----------------------------|--------------------|-----------------------|
| Bighorn River              | 2,410              | 94                    |
| Buffalo Bill Total Release | 1,550              | 105                   |
| Boysen Release             | 970                | 88                    |

## Average September Inflow

|              | Monthly Avg<br>cfs | Percent of<br>Average |
|--------------|--------------------|-----------------------|
| Bighorn Lake | 2,560              | 91                    |
| Buffalo Bill | 350                | 80                    |
| Boysen       | 620                | 78                    |

## Bighorn Lake Inflow and Release



# OPERATIONS OUTLOOK (October 1, 2020 through March 31, 2021)

River releases are expected to decrease to 2,100 cfs during October 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

|                               | Oct    | Nov    | Dec    | Jan    | Feb    | Mar    |
|-------------------------------|--------|--------|--------|--------|--------|--------|
| Boysen Release (cfs)          | 725    | 600    | 600    | 600    | 600    | 600    |
| Buffalo Bill Release (cfs)    | 696    | 205    | 205    | 205    | 205    | 205    |
| Tributary Gain (cfs)          | 990    | 864    | 543    | 615    | 789    | 1,010  |
| Monthly Inflow (cfs)          | 2,411  | 1,669  | 1,348  | 1,420  | 1,594  | 1,815  |
| Monthly Inflow (kaf)          | 148.3  | 99.3   | 82.9   | 87.3   | 88.5   | 111.6  |
| Monthly Release (kaf)         | 140.0  | 125.0  | 129.1  | 129.1  | 116.6  | 152.1  |
| Afterbay Release (cfs)        | 2,277  | 2,100  | 2,100  | 2,100  | 2,100  | 2,474  |
| River Release (cfs)           | 2,216  | 2,100  | 2,100  | 2,100  | 2,100  | 2,474  |
| End-of-Month Content (kaf)    | 939.4  | 918.0  | 876.0  | 838.5  | 814.3  | 778.1  |
| End-of-Month Elevation (feet) | 3634.2 | 3632.2 | 3627.7 | 3623.1 | 3619.7 | 3614.0 |

## Minimum Inflow Conditions

|                               | Oct    | Nov    | Dec    | Jan    | Feb    | Mar    |
|-------------------------------|--------|--------|--------|--------|--------|--------|
| Boysen Release (cfs)          | 725    | 600    | 600    | 600    | 600    | 600    |
| Buffalo Bill Release (cfs)    | 696    | 205    | 205    | 205    | 205    | 205    |
| Tributary Gain (cfs)          | 729    | 857    | 537    | 608    | 780    | 1,002  |
| Monthly Inflow (cfs)          | 2,150  | 1,662  | 1,342  | 1,413  | 1,585  | 1,807  |
| Monthly Inflow (kaf)          | 132.2  | 98.9   | 82.5   | 86.9   | 88.0   | 111.1  |
| Monthly Release (kaf)         | 142.1  | 121.4  | 125.4  | 125.4  | 113.3  | 125.5  |
| Afterbay Release (cfs)        | 2,310  | 2,040  | 2,040  | 2,040  | 2,040  | 2,040  |
| River Release (cfs)           | 2,216  | 2,040  | 2,040  | 2,040  | 2,040  | 2,040  |
| End-of-Month Content (kaf)    | 921.3  | 902.9  | 864.3  | 830.1  | 808.7  | 798.6  |
| End-of-Month Elevation (feet) | 3632.5 | 3630.7 | 3626.4 | 3621.9 | 3618.8 | 3617.3 |

## Maximum Inflow Conditions

|                               | Oct    | Nov    | Dec    | Jan    | Feb    | Mar    |
|-------------------------------|--------|--------|--------|--------|--------|--------|
| Boysen Release (cfs)          | 725    | 600    | 600    | 600    | 600    | 1,499  |
| Buffalo Bill Release (cfs)    | 696    | 205    | 205    | 205    | 600    | 1,499  |
| Tributary Gain (cfs)          | 1,352  | 874    | 551    | 623    | 799    | 1,020  |
| Monthly Inflow (cfs)          | 2,773  | 1,679  | 1,356  | 1,428  | 1,604  | 2,724  |
| Monthly Inflow (kaf)          | 170.5  | 99.9   | 83.4   | 87.8   | 89.1   | 167.5  |
| Monthly Release (kaf)         | 138.5  | 130.3  | 134.7  | 134.7  | 138.8  | 221.2  |
| Afterbay Release (cfs)        | 2,252  | 2,190  | 2,190  | 2,190  | 2,500  | 3,597  |
| River Release (cfs)           | 2,216  | 2,190  | 2,190  | 2,190  | 2,500  | 3,597  |
| End-of-Month Content (kaf)    | 963.1  | 936.9  | 889.9  | 847.4  | 801.5  | 752.1  |
| End-of-Month Elevation (feet) | 3636.3 | 3634.0 | 3629.3 | 3624.2 | 3617.7 | 3609.4 |

# OPERATIONS OUTLOOK (October 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)

|                  | Oct | Nov | Dec | Jan | Feb | Mar |
|------------------|-----|-----|-----|-----|-----|-----|
| Median Forecast  | 60  | 0   | 0   | 0   | 0   | 0   |
| Minimum Forecast | 94  | 0   | 0   | 0   | 0   | 0   |
| Maximum Forecast | 36  | 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)

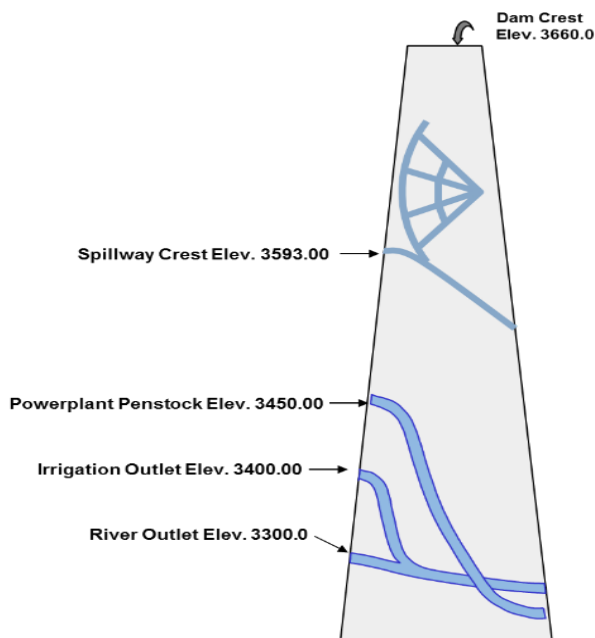
|                  | Oct   | Nov   | Dec   | Jan   | Feb   | Mar   |
|------------------|-------|-------|-------|-------|-------|-------|
| Median Forecast  | 2,207 | 2,030 | 2,030 | 2,030 | 2,030 | 2,404 |
| Minimum Forecast | 2,240 | 1,970 | 1,970 | 1,970 | 1,970 | 1,970 |
| Maximum Forecast | 2,182 | 2,120 | 2,120 | 2,120 | 2,430 | 3,527 |

Yellowtail Powerplant Generation (gwh)

|                  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  |
|------------------|------|------|------|------|------|------|
| Median Forecast  | 54.4 | 48.1 | 49.4 | 48.9 | 43.7 | 57.5 |
| Minimum Forecast | 55.1 | 46.6 | 47.9 | 47.4 | 42.4 | 46.6 |
| Maximum Forecast | 53.8 | 50.3 | 51.6 | 51.1 | 53.1 | 83.2 |

Yellowtail Spill (cfs)

|                  | Oct | Nov | Dec | Jan | Feb | Mar |
|------------------|-----|-----|-----|-----|-----|-----|
| Median Forecast  | 0   | 0   | 0   | 0   | 0   | 0   |
| Minimum Forecast | 0   | 0   | 0   | 0   | 0   | 0   |
| Maximum Forecast | 0   | 0   | 0   | 0   | 0   | 0   |



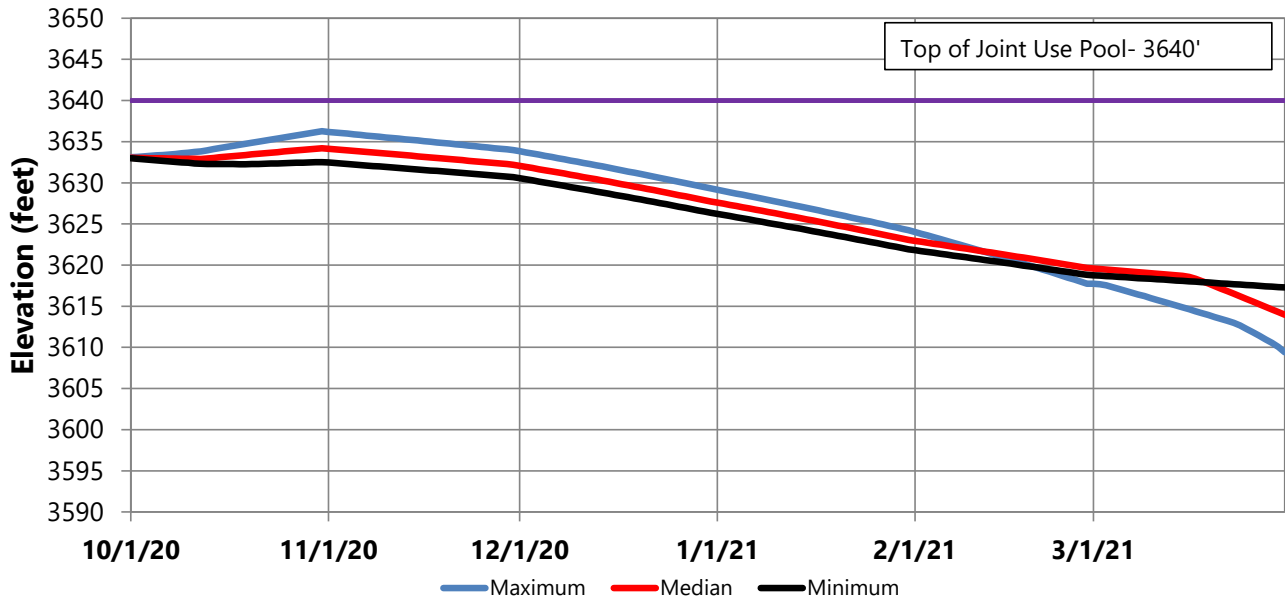
## Release Outlook by Outlet

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

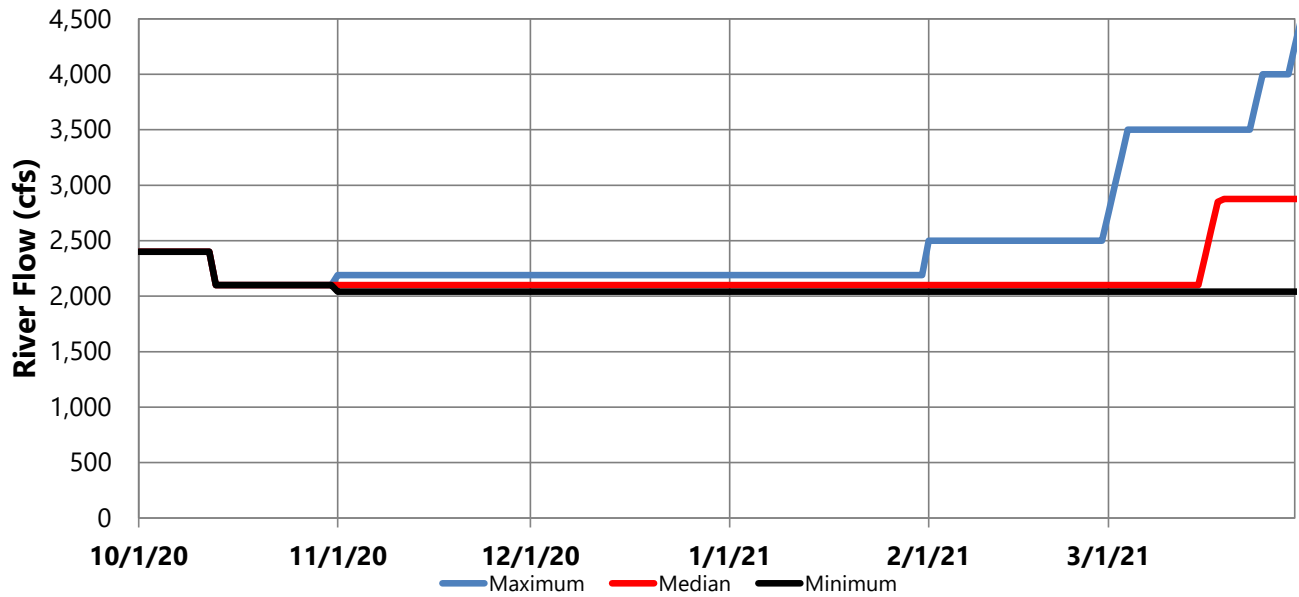
# OPERATIONS OUTLOOK (October 1, 2020 through March 31, 2021)

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.

## Bighorn Lake Elevation



## River Release



## Contact Us

Clayton Jordan  
[cjordan@usbr.gov](mailto:cjordan@usbr.gov)  
 406-247-7334

Stephanie Micek  
[smicek@usbr.gov](mailto:smicek@usbr.gov)  
 406-247-7320

Chris Gomer  
[cgomer@usbr.gov](mailto:cgomer@usbr.gov)  
 406-247-7307