

Yellowtail Dam Water Supply and Projected Operations



— BUREAU OF —
RECLAMATION

December 2021



Bighorn River Basin Map Source: DEMIS Mapserver

| December Operating Range | | | |
|-------------------------------------|-----------------|--------|---------|
| Forecast | Minimum | Median | Maximum |
| Monthly Average Inflow (cfs) | 1,320 | 1,415 | 1,510 |
| Monthly Average River Release (cfs) | 2,175 | 2,175 | 2,175 |
| End of December Elevation (feet) | 3625.1 | 3625.8 | 3626.5 |
| December 2021 Inflow Forecast (kaf) | | | |
| December Volume | | | 87 |
| Percent of Average | | | 81 |
| Water Year | Historic Inflow | Rank | |
| 2021 | 98 | 42 | |
| 2020 | 134 | 21 | |
| 2019 | 133 | 24 | |
| 2018 | 177 | 9 | |
| 30 Year Average | 107 | | |

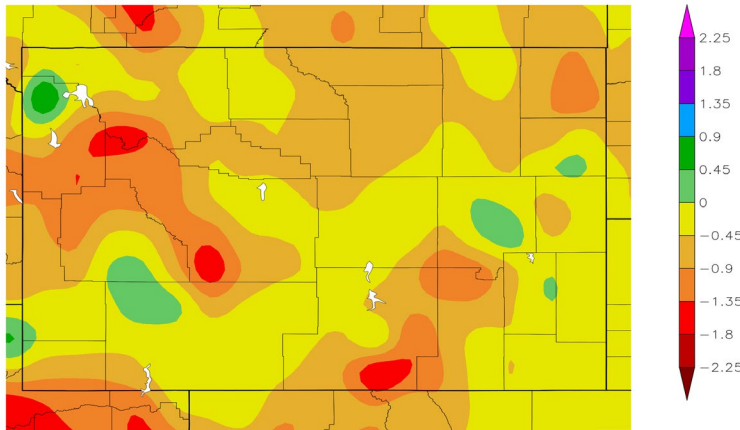


Climate Departure from Normal

November 1 through November 30, 2021

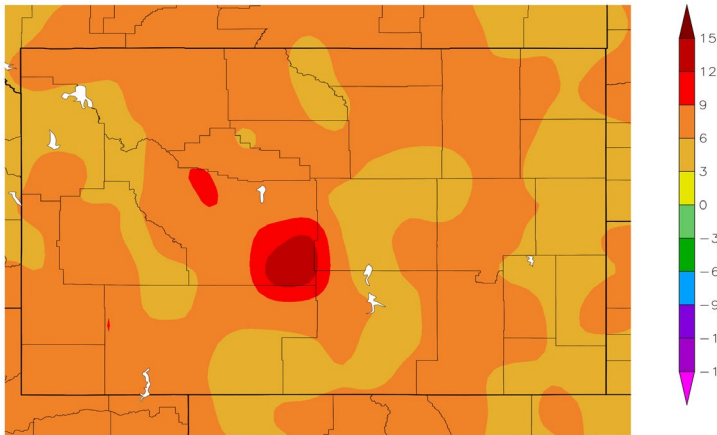
Precipitation

Departure from Normal (inches)



Temperature

Departure from Normal (°F)



HPRCC using provisional data from NOAA Regional Climate Centers

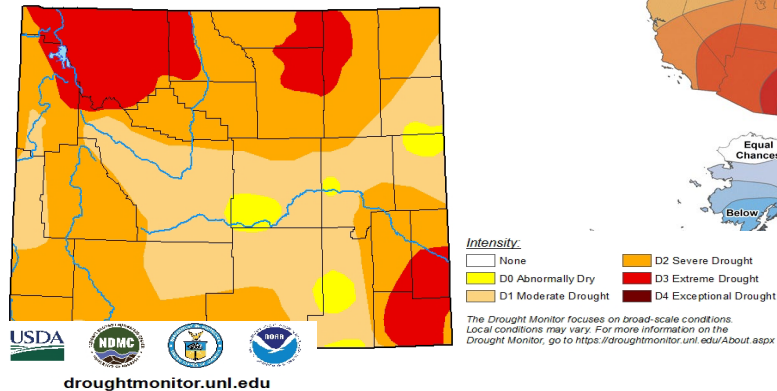
CLIMATE SUMMARY

In the Bighorn Basin above Yellowtail Dam, precipitation was drier and temperatures were warmer than average during November. Drought conditions persist throughout the Basin.

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

Wyoming Drought Monitor Map

November 30, 2021

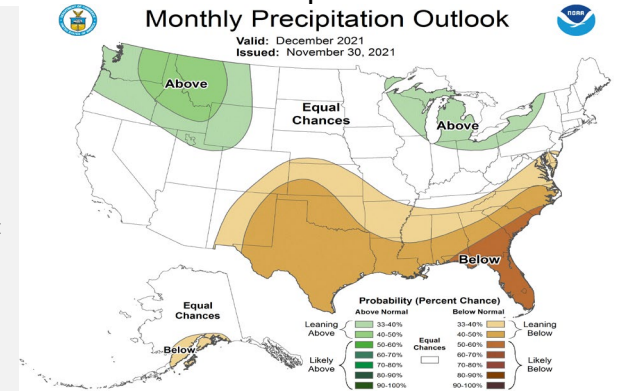


December Climate Outlook

Precipitation

Monthly Precipitation Outlook

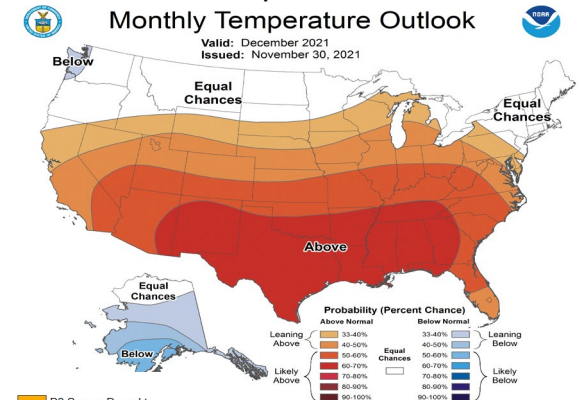
Valid: December 2021
Issued: November 30, 2021



Temperature

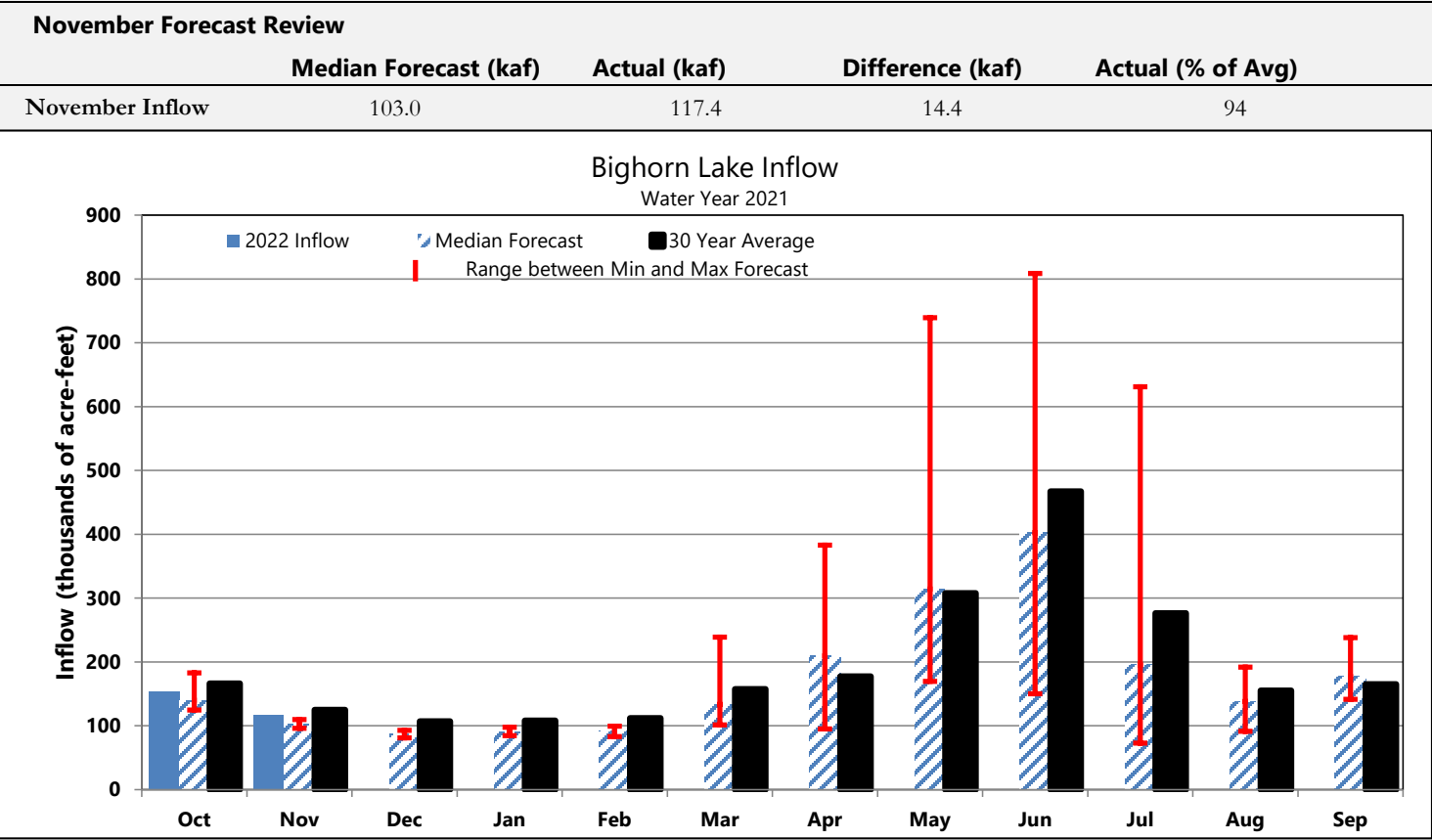
Monthly Temperature Outlook

Valid: December 2021
Issued: November 30, 2021



FORECAST SUMMARY

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



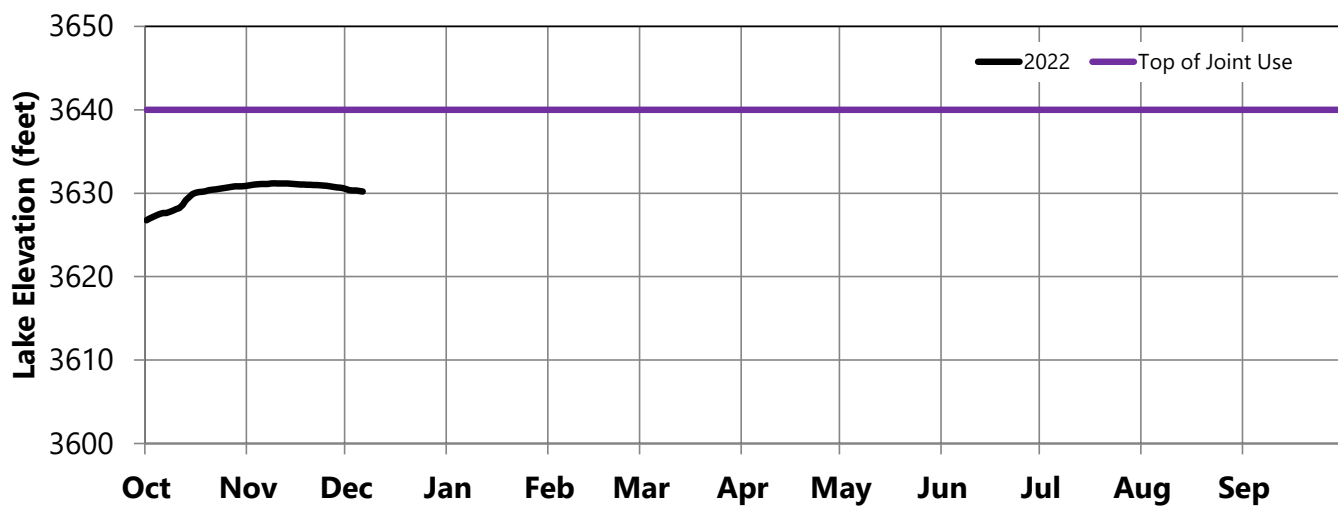
OPERATIONS REVIEW (October 1, 2021 through November 30, 2021)

River releases were increased to 2,125 cfs during November based on forecasted inflows and the March 31, 2022 carryover storage target of 3617 feet. The storage in Bighorn Lake decreased 0.3 feet during November.

December 1 Storage Conditions

| | Elevation feet | Storage acre-feet | Percent of Average | Percent Full |
|--------------|-------------------|----------------------|-----------------------|-----------------|
| Bighorn Lake | 3630.6 | 902,096 | 103 | 89 |
| Buffalo Bill | 5358.4 | 389,394 | 92 | 60 |
| Boysen | 4719.7 | 642,542 | 114 | 87 |

Bighorn Lake Operations Water Year 2022



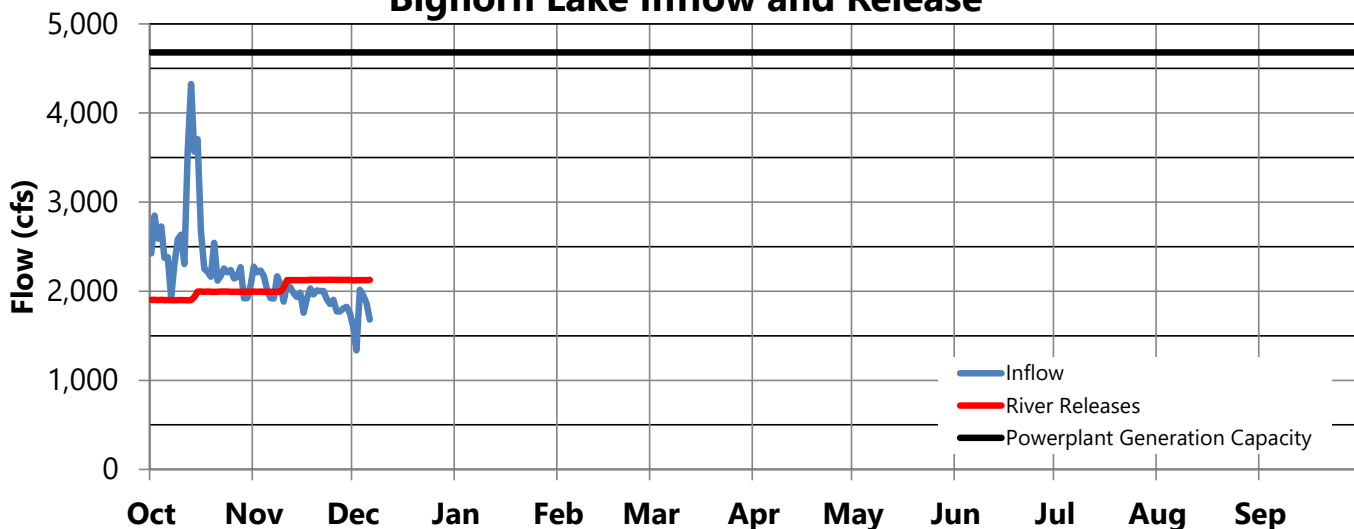
Average November Inflow

| | Monthly Avg cfs | Percent of Average |
|--------------|--------------------|-----------------------|
| Bighorn Lake | 1,970 | 93 |
| Buffalo Bill | 300 | 75 |
| Boysen | 590 | 71 |

Average November Release

| | Monthly Avg cfs | Percent of Average |
|----------------------------|--------------------|-----------------------|
| Bighorn River | 2,085 | 84 |
| Buffalo Bill Total Release | 200 | 58 |
| Boysen Release | 695 | 87 |

Bighorn Lake Inflow and Release



OPERATIONS OUTLOOK (December 1, 2021 through March 31, 2022)

Releases during December will increase to 2,190 cfs based on actual November inflows being higher than the median inflow forecast and the March 31, 2022, storage target of 3617 feet. Forecasted end of March elevation, 3613.9 feet, under the median plan is based on expected drawdown for an average April through July runoff in 2022.

Median Inflow Conditions

| | Dec | Jan | Feb | Mar |
|-------------------------------|------------|------------|------------|------------|
| Boysen Release (cfs) | 699 | 699 | 700 | 1,000 |
| Buffalo Bill Release (cfs) | 205 | 205 | 205 | 205 |
| Tributary Gain (cfs) | 511 | 577 | 738 | 968 |
| Monthly Inflow (cfs) | 1,415 | 1,481 | 1,643 | 2,173 |
| Monthly Inflow (kaf) | 87.0 | 91.1 | 91.3 | 133.6 |
| Monthly Release (kaf) | 133.6 | 134.8 | 121.8 | 153.7 |
| Afterbay Release (cfs) | 2,173 | 2,192 | 2,192 | 2,500 |
| River Release (cfs) | 2,173 | 2,192 | 2,192 | 2,500 |
| End-of-Month Content (kaf) | 859.8 | 820.4 | 793.8 | 777.9 |
| End-of-Month Elevation (feet) | 3625.8 | 3620.5 | 3616.5 | 3613.9 |

Minimum Inflow Conditions

| | Dec | Jan | Feb | Mar |
|-------------------------------|------------|------------|------------|------------|
| Boysen Release (cfs) | 699 | 699 | 700 | 600 |
| Buffalo Bill Release (cfs) | 205 | 205 | 205 | 205 |
| Tributary Gain (cfs) | 415 | 472 | 591 | 844 |
| Monthly Inflow (cfs) | 1,319 | 1,376 | 1,496 | 1,649 |
| Monthly Inflow (kaf) | 81.1 | 84.6 | 83.1 | 101.4 |
| Monthly Release (kaf) | 133.6 | 132.5 | 116.6 | 107.6 |
| Afterbay Release (cfs) | 2,173 | 2,155 | 2,100 | 1,750 |
| River Release (cfs) | 2,173 | 2,155 | 2,100 | 1,750 |
| End-of-Month Content (kaf) | 853.9 | 810.3 | 780.6 | 778.7 |
| End-of-Month Elevation (feet) | 3625.1 | 3619.1 | 3614.4 | 3614.1 |

Maximum Inflow Conditions

| | Dec | Jan | Feb | Mar |
|-------------------------------|------------|------------|------------|------------|
| Boysen Release (cfs) | 699 | 699 | 700 | 1,600 |
| Buffalo Bill Release (cfs) | 205 | 205 | 205 | 1,195 |
| Tributary Gain (cfs) | 607 | 685 | 884 | 1,090 |
| Monthly Inflow (cfs) | 1,511 | 1,589 | 1,789 | 3,885 |
| Monthly Inflow (kaf) | 92.9 | 97.7 | 99.4 | 238.9 |
| Monthly Release (kaf) | 133.6 | 136.8 | 131.5 | 286.6 |
| Afterbay Release (cfs) | 2,173 | 2,225 | 2,368 | 4,661 |
| River Release (cfs) | 2,173 | 2,225 | 2,368 | 4,661 |
| End-of-Month Content (kaf) | 865.7 | 830.9 | 802.6 | 759.2 |
| End-of-Month Elevation (feet) | 3626.5 | 3622.0 | 3617.9 | 3610.7 |

OPERATIONS OUTLOOK (December 1, 2021 through March 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) | Dec | Jan | Feb | Mar |
|---------------------|-----|-----|-----|-----|
| Median Forecast | 0 | 0 | 0 | 0 |
| Minimum Forecast | 0 | 0 | 0 | 0 |
| Maximum Forecast | 0 | 0 | 0 | 0 |

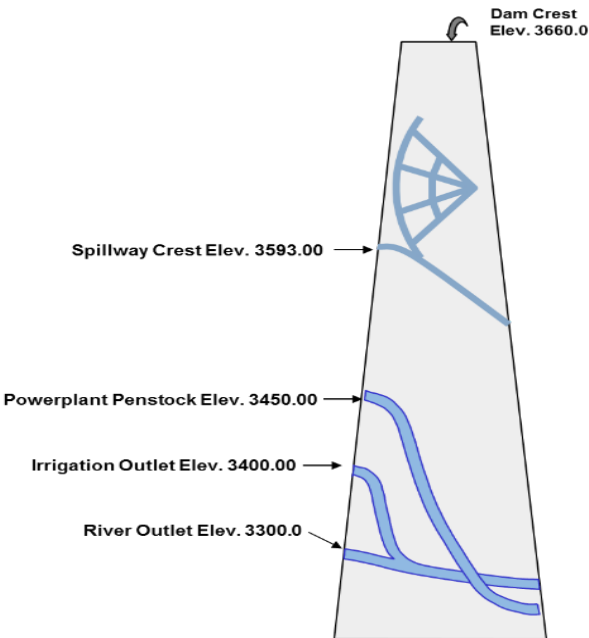
Power Generation Outlook

Current Number of Units Available: 3 of 4
Approximate Yellowtail Powerplant Turbine Capacity: 6,150 cfs
Approximate Yellowtail Powerplant Scheduled Generation Limit: 4,680 cfs

| Yellowtail Powerplant Release (cfs) | Dec | Jan | Feb | Mar |
|-------------------------------------|-------|-------|-------|-------|
| Median Forecast | 2,103 | 2,122 | 2,122 | 2,430 |
| Minimum Forecast | 2,103 | 2,085 | 2,030 | 1,680 |
| Maximum Forecast | 2,103 | 2,155 | 2,298 | 4,550 |

| Yellowtail Powerplant Generation (gwh) | Dec | Jan | Feb | Mar |
|--|------|------|------|-------|
| Median Forecast | 50.9 | 50.7 | 45.2 | 58.1 |
| Minimum Forecast | 50.8 | 49.7 | 43.2 | 39.7 |
| Maximum Forecast | 50.9 | 51.7 | 49.7 | 106.8 |

| Yellowtail Spill (cfs) | Dec | Jan | Feb | Mar |
|------------------------|-----|-----|-----|-----|
| Median Forecast | 0 | 0 | 0 | 0 |
| Minimum Forecast | 0 | 0 | 0 | 0 |
| Maximum Forecast | 0 | 0 | 0 | 41 |



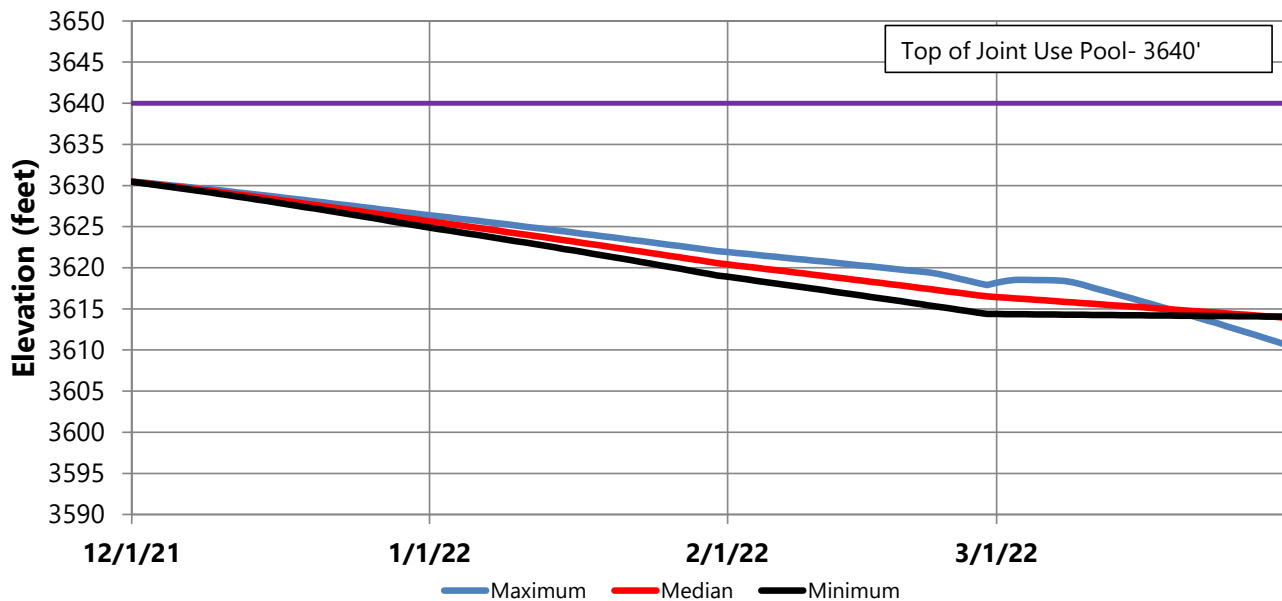
Release Outlook by Outlet

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 during March.

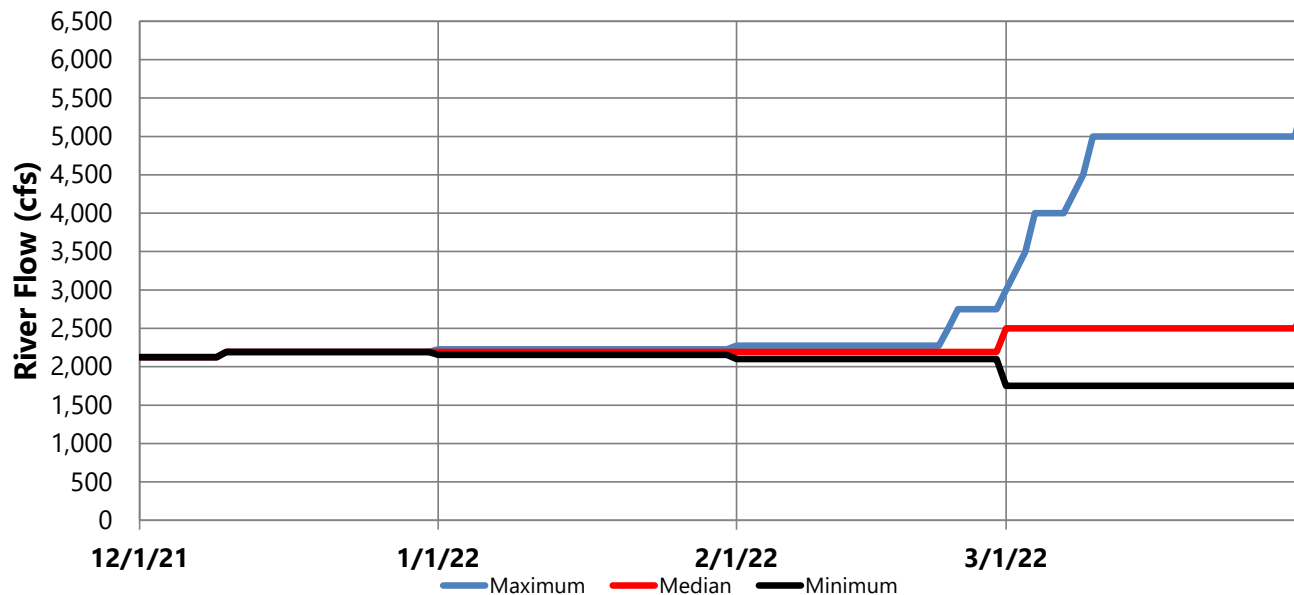
OPERATIONS OUTLOOK (December 1, 2021 through March 31, 2022)

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