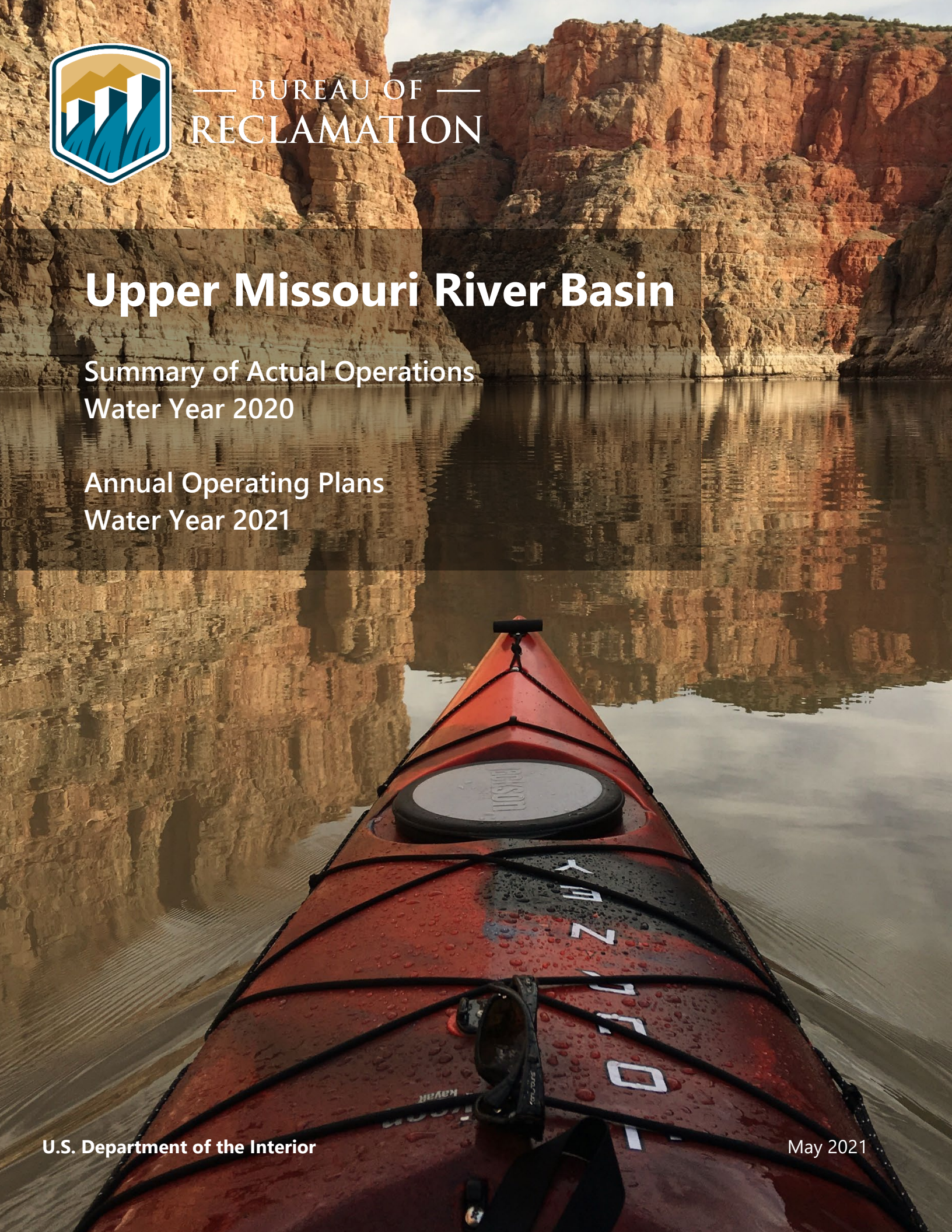

BUREAU OF RECLAMATION

Upper Missouri River Basin

Summary of Actual Operations
Water Year 2020

Annual Operating Plans
Water Year 2021

U.S. Department of the Interior

May 2021

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Upper Missouri River Basin

Summary of Actual Operations
Water Year 2020

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Hydrology and Water Operations
Wyoming Area Office
Montana Area Office
Dakotas Area Office

Cover Photo: Spring paddling through Bighorn Canyon in 2017. (Reclamation/Jack Connor)

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Annual Operating Plans for Water Year 2020 for Bighorn Basin Units Under the Responsibility of the Wyoming Area Office (WYAO)

Riverton Unit

The Riverton Project was reauthorized as the Riverton Unit Pick-Sloan Missouri Basin Program (P S MBP) on September 25, 1970. Major facilities of this unit are Bull Lake Reservoir, Wind River Diversion Dam, Wyoming Canal, Pilot Butte Powerplant, Pilot Butte Reservoir, and Pilot Butte Canal. The major facilities provide irrigation water to approximately 73,000 acres on the Midvale Irrigation District (Midvale). The water supply comes partly from the natural flow of the Wind River and partly from water stored in Bull Lake and Pilot Butte Reservoirs.

Bull Lake Reservoir

Bull Lake Reservoir is located on Bull Lake Creek, a tributary of the Wind River near Crowheart, Wyoming. Bull Lake has an active capacity of 151,737 acre-feet (AF), and is above all unit land. It is the principal storage facility for the unit and is operated by Midvale under contract with Reclamation. A small amount of flood control benefit is provided by normal operation for other purposes. However, when the Bull Lake Spillway is not operational the peak releases are limited to that of the outlet works (approximately 2,400 cfs). The status of the spillway requires adaptation of normal flood control operations as it is necessary to increase outflow as the inflows increase.

During the past several years, Midvale and Reclamation have entered into an annual agreement whereby Reclamation could store Boysen water in Bull Lake under any combination of four conditions set forth in the agreement. The agreement was approved for 2020 and the non-irrigation season releases were maintained above the required minimum flow rate of 20 cfs. As outlined in the agreement, a steady 20 cfs of the reservoir releases were accounted for as Boysen water being released from Bull Lake.

Summary of 2020 Operations

Bull Lake Reservoir carried 74,692 AF of storage into Water Year 2020 (WY2020), which is 49 percent of the reservoir's active storage capacity. The reservoir operations during the dam's spillway construction required Reclamation to have Bull Lake Reservoir down to elevation 5,777.00 feet on or before September 30, 2020 and maintain that elevation until April 1, 2021. Table WYT 1 below shows the monthly inflows, outflows, storage, and forebay elevation at Bull Lake Reservoir. Snow-water equivalent (SWE) values, as represented by the SNOTEL sites within/near the basin above Bull Lake, are also shown. For each monthly inflow, outflow, storage, and SWE value the corresponding percentage of average (30 years of historical data) are also shown.

Table WYT 1: Monthly inflow, outflow, storage, forebay elevation, and snow data for Bull Lake Reservoir.

Month	Inflow (KAF)	% of 30-yr Average	Outflow (KAF)	% of 30-yr Average	Storage (KAF)	% of 30-yr Average	Elevation (ft)	Snow (in)	% of 30-yr Average
Oct-19	8.2	128%	2	30%	92.2	120%	5,784.21	0	0%
Nov-19	3.1	94%	2	83%	93.3	120%	5,784.63	1.6	112%
Dec-19	2.2	88%	2	100%	93.4	120%	5,784.68	3.6	101%
Jan-20	1.5	68%	1.9	95%	93	119%	5,784.52	5	89%
Feb-20	1.7	100%	1.7	100%	92.6	118%	5,784.36	7.2	99%
Mar-20	0.9	45%	1.2	67%	92.1	117%	5,784.18	9.4	104%
Apr-20	3.1	74%	1.2	34%	94	119%	5,784.88	11.4	96%
May-20	26.2	89%	4.5	32%	115.7	122%	5,792.77	11.7	97%
Jun-20	60.6	94%	28.6	97%	147.6	114%	5,803.45	0	0%
Jul-20	33.1	73%	34.9	81%	145.9	110%	5,802.90	0	0%
Aug-20	15.2	78%	58.1	120%	103	99%	5,788.22	0	0%
Sep-20	5.4	57%	33.6	92%	74.7	97%	5,777.31	0	0%
WY 2020	**161.2**	**84%**	**171.7**	**90%**	-	-	-	-	-

Inflow and outflow values are summed for the entire month, storage and elevation values are from the end of the month, and snow values are from the beginning of the month.

Using hydrological state data (snowpack, streamflows, etc) forecasts of the April through July inflow volume are made each month between January and June. Table WYT 2 shows the forecast amounts that were made in WY2020. For each forecast, Table WYT 2 shows the percent of average of the forecast compared to 30 years of historical inflow data.

Table WYT 2: Forecasts of the April-July inflow volumes made into Bull Lake Reservoir each month starting in January and ending in June.

Forecast Issue Month	April-July Inflow Forecast (KAF)	% of 30-yr Average Inflow
Jan-20	135	(94%)
Feb-20	135	(94%)
Mar-20	135	(94%)
Apr-20	145	(101%)
May-20	140	(97%)
Jun-20	115	(80%)

Midvale began diverting water into the Wyoming Canal on April 17 to flush the canal system and finish filling Pilot Butte and other storage locations within the district. Diversions into the Wyoming Canal continued through September 25. The peak diversion of 2,044 cfs occurred on June 30.

Additional hydrologic and statistical information pertaining to Bull Lake operations during 2020 can be found in Tables WYT 3, 4, and 5 and Figure WYG1.

Table WYT 3: Reservoir allocations for Bull Lake Reservoir

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	5,739.00	722	722
TOP OF ACTIVE CONSERVATION	5,805.00	152,459	151,737

Table WYT 4: Storage and elevation data for Bull Lake Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FEET)	STORAGE (AF)	DATE
BEGINNING OF YEAR	5,781.85	86,736	10/1/2019
END OF YEAR	5,777.31	74,692	9/30/2020
ANNUAL LOW	5,777.13	74,251	9/25/2020
HISTORIC LOW*	5,743.03	6,228	9/2/1950
ANNUAL HIGH	5,803.63	148,158	6/29/2020
HISTORIC HIGH	5,805.70	154,677	8/10/1965

* Prior to 1952 daily records were not available. End of month records were used to determine the historic low.

Table WYT 5: Inflow and discharge data for Bull Lake Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	161,009	Oct '19-Sep '20	196,707	Oct '19-Sep '20
DAILY PEAK (cfs)	1,985	7-Jun-20	2,044	30-Jun-20
DAILY MINIMUM (cfs)	0	24-Sep-20	18	29-Apr-20
PEAK SPILLWAY FLOW (cfs)			0	
TOTAL SPILLWAY FLOW (AF)			0	

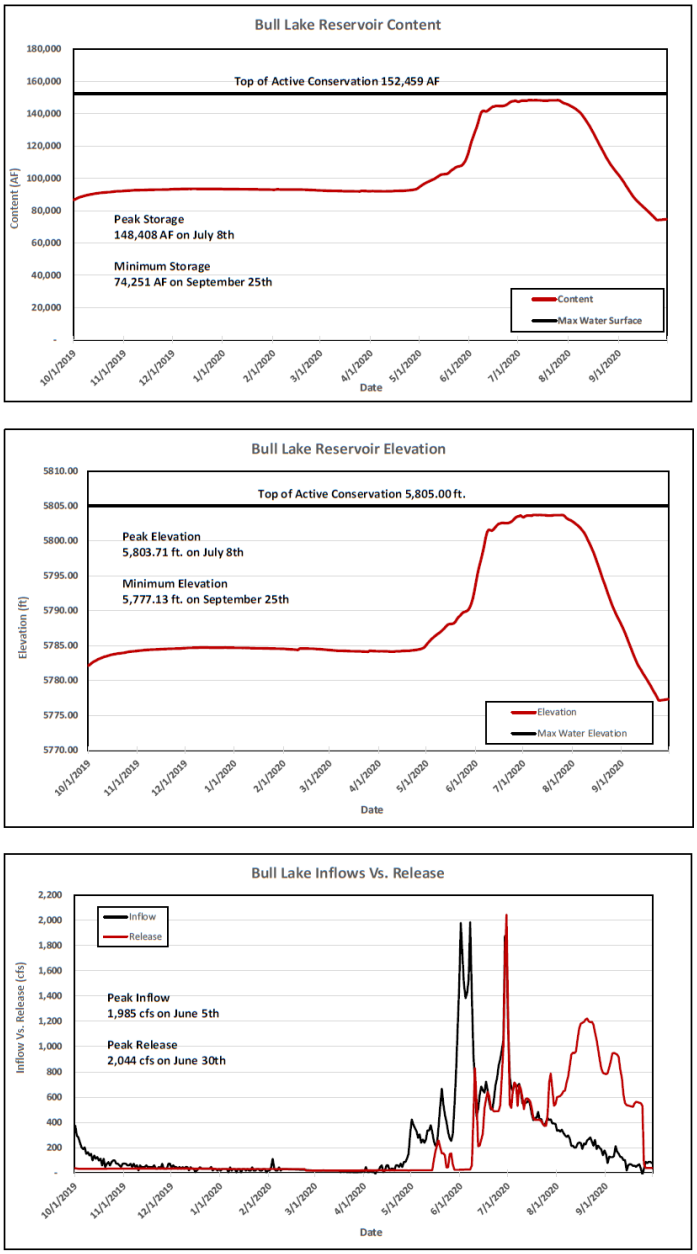


Figure WYG 1: Water Year 2020 storage, forebay elevation, inflow, and release at Bull Lake Reservoir.

Pilot Butte Reservoir

Pilot Butte Reservoir is an off-stream reservoir near Kinnear, Wyoming, and receives its water supply from the Wind River via the Wyoming Canal. Pilot Butte Reservoir has a total capacity of 33,721 AF. Of this amount 3,803 AF is inactive and 29,918 AF is active conservation storage. Pilot Butte Dam and the Wyoming Canal, which supplies the reservoir, are operated by Midvale under contract with Reclamation. The turbines at the inlet of the Wyoming canal are currently in inactive status.

Summary of 2020 Operations

Pilot Butte Reservoir began WY 2020 with a total storage content of approximately 16,088 AF, which is a pool elevation of 5,437.20 feet above sea level. Irrigation deliveries for the Wyoming Canal and Pilot Canal ended the WY 2020 irrigation season on October 12 and September 25 respectively. During October of Water Year 2020, the annual Bull Lake exchange agreement took place. The agreement allows Midvale irrigation district to divert and store an additional 10,000 AF of water from Bull Lake to Pilot Butte Reservoir via the Wyoming Canal. The agreement simultaneously transfers an equal amount of Boysen storage into Bull Lake Reservoir. The purpose of the agreement is to maintain a flow of no less than 20 cfs in Bull Lake Creek during the winter months. Bull Lake Creek is a prized fishery and the agreement insures its production. With the 10,000 AF of exchange water, and additional storage operations, Pilot Butte Reservoir ended the month of October with a storage content of 28,143 AF, which is 103 percent of average.

Table WYT 6 below shows the monthly inflows, outflows, storage, and forebay elevation at Pilot Butte Reservoir. For each monthly inflow, outflow, and storage value the corresponding percentage of average (30 years of historical data) are also shown.

Table WYT 6: Monthly inflow, outflow, storage, forebay elevation, and snow data for Pilot Butte Reservoir.

Month	Inflow, KAF	% of 30-yr Average	Outflow, KAF	% of 30-yr Average	Storage, KAF	% of 30-yr Average	Elevation, ft
Oct-19	11.9	(88%)	6.7	(209%)	28.0	(103%)	5,453.37
Nov-19	0	(0%)	0	N/A	27.9	(100%)	5,453.24
Dec-19	0	(0%)	0	N/A	27.8	(100%)	5,453.13
Jan-20	0	(0%)	0	N/A	27.7	(99%)	5,453.03
Feb-20	0	(0%)	0	N/A	27.7	(98%)	5,452.98
Mar-20	0	(0%)	0	N/A	27.6	(96%)	5,452.91
Apr-20	3.7	(66%)	1.8	(111%)	29.5	(100%)	5,455.22
May-20	18.1	(85%)	27.7	(107%)	19.9	(76%)	5,442.83
Jun-20	45.1	(137%)	34.1	(107%)	30.9	(105%)	5,456.75
Jul-20	31.2	(88%)	40.6	(95%)	21.5	(91%)	5,445.05
Aug-20	35.1	(113%)	39.2	(107%)	17.4	(90%)	5,439.25
Sep-20	25.0	(115%)	23.5	(92%)	18.9	(117%)	5,441.43
WY 2020	**170.1**	**(102%)**	**173.6**	**(102%)**	-	-	-

Inflow and outflow values are summed for the entire month, and storage and elevation values are from the end of the month.

Additional hydrologic and statistical information pertaining to Pilot Butte Reservoir during Water Year 2020 can be found in Tables WYT 7, 8, and 9 and Figure WYG2.

Table WYT 7: Reservoir allocations for Pilot Butte Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	5,410.00	3,803	3,803
TOP OF ACTIVE CONSERVATION	5,460.00	33,721	29,918

Table WYT 8: Storage and elevation data for Pilot Butte Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FEET)	STORAGE (AF)	DATE
BEGINNING OF YEAR	5,437.20	16,088	10/1/2019
END OF YEAR	5,441.43	18,895	9/30/2020
ANNUAL LOW	5,434.89	14,643	9/7/2020
HISTORIC LOW	5,409.80	3,748	12/1/2007
ANNUAL HIGH	5,456.85	30,937	7/1/2020
HISTORIC HIGH	5,460.60	37,465	4/20/1988

Table WYT 9: Inflow and discharge data for Pilot Butte Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	169,768	Oct '19-Sep '20	173,642	Oct '19-Sep' 20
DAILY PEAK (cfs)	918	19-Jun-20	732	24-Jul-20
DAILY MINIMUM (cfs)	0	WINTER MONTHS	0	WINTER MONTHS
PEAK SPILLWAY FLOW (cfs)			0	
TOTAL SPILLWAY FLOW (AF)			0	

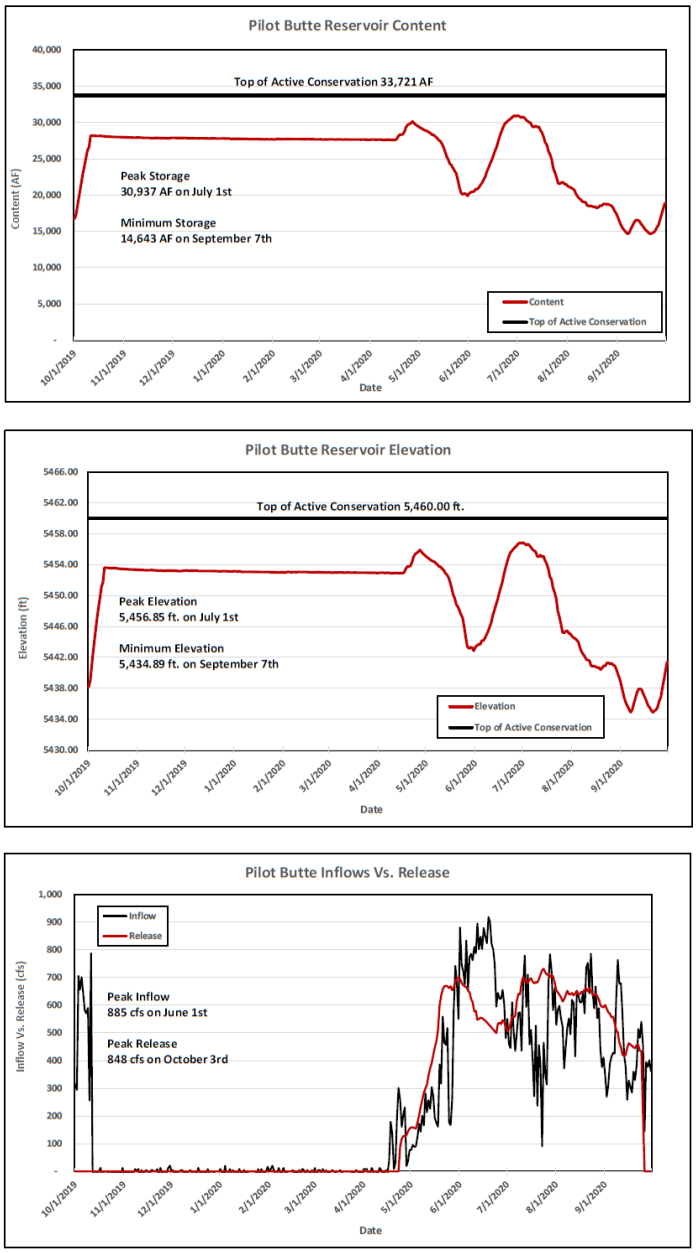


Figure WYG 2: Water Year 2020 storage, forebay elevation, inflow, and release at Pilot Butte Reservoir.

Boysen Reservoir and Powerplant

Boysen Reservoir (P-S MBP) is located on the Wind River above Thermopolis, Wyoming. The dam and reservoir were built for flood control, power generation, irrigation, recreation, and fish and wildlife. Boysen Reservoir has a total capacity of 892,226 AF. Of this amount, 219,181 AF are allocated for inactive and dead storage, 522,413 AF is for active conservation storage, and 150,632 AF is for exclusive flood control storage. Of the amount allocated for active conservation, 144,229 AF are specifically allocated for joint use flood control storage. All of the joint-use space is located between elevation 4,717.00 feet and elevation 4,725.00 feet, which is the top of the spillway gates

when closed. The exclusive flood control space is located between elevation 4,725.00 feet and elevation 4,732.20 feet. When the reservoir rises above elevation 4,724.50 feet, the spillway gates are operated to maintain 6 inches of clearance above the reservoir level for prevention of over-topping the gates. When all flood control space is filled, releases cannot be controlled to less than 14,000 cfs due to the required gate clearance.

Irrigation water is provided from the reservoir for several units, both upstream and downstream of Boysen Dam. Water is furnished downstream to about 7,500 acres in the Hanover-Bluff Unit (P-S MBP) and 3,400 acres on the Lucerne Canal in the Owl Creek Unit (P S MBP). Supplemental water is furnished to other irrigation districts and to a number of individual water users below the dam. The Bighorn Canal Irrigation District and Hanover Irrigation District receive water under long-term contracts with Reclamation. Depending on availability, water is provided to Bluff Irrigation District, Kirby Ditch Irrigation District, Lower Hanover Canal Association, Bighorn Canal Irrigation District, and Hanover Irrigation District utilizing temporary water service contracts.

Summary of 2020 Operations

Boysen Reservoir storage at the beginning of WY2020 was 577,663 AF. Table WYT 10 below shows the monthly inflows, outflows, storage, and forebay elevation at Boysen Reservoir. Snow-water equivalent (SWE) values, as represented by the Snotel sites within/near the basin above Boysen Reservoir, are also shown. For each monthly inflow, outflow, storage, and SWE value the corresponding percentage of average (30 years of historical data) are also shown.

Table WYT 10: Monthly inflow, outflow, storage, forebay elevation, and snow data for Boysen Reservoir.

Month	Inflow, KAF	% of 30-yr Average	Outflow, KAF	% of 30-yr Average	Storage, KAF	% of 30-yr Average	Elevation, ft	Snow, in	% of 30-yr Average
Oct-19	71.8	(129%)	71.3	(134%)	648.2	(112%)	4,719.99	0.0	(157%)
Nov-19	63.9	(129%)	68.3	(145%)	643.8	(110%)	4,719.74	2.53	(116%)
Dec-19	51.8	(134%)	65.7	(134%)	629.9	(110%)	4,718.94	4.74	(100%)
Jan-20	45.2	(120%)	65.5	(135%)	609.6	(108%)	4,717.74	6.26	(104%)
Feb-20	48.3	(126%)	60.3	(140%)	593.1	(106%)	4,716.74	8.67	(115%)
Mar-20	75.5	(143%)	88.1	(156%)	579.7	(105%)	4,715.90	11.69	(111%)
Apr-20	59.8	(117%)	121.0	(165%)	518.5	(97%)	4,711.83	14.44	(104%)
May-20	100.9	(71%)	96.8	(81%)	530.4	(95%)	4,712.65	14.23	(65%)
Jun-20	198.9	(69%)	85.0	(44%)	644.3	(98%)	4,719.77	2.93	(0%)
Jul-20	79.8	(59%)	85.7	(55%)	638.4	(100%)	4,719.43	0.0	(0%)
Aug-20	29.5	(58%)	75.7	(85%)	592.2	(99%)	4,716.68	0.0	(0%)
Sep-20	36.9	(78%)	57.9	(89%)	571.2	(98%)	4,715.36	0.0	(0%)
WY 2020	**862.3**	**(87%)**	**941.2**	**(95%)**	-	-	-	-	-

Inflow and outflow values are summed for the entire month, storage and elevation values are from the end of the month, and snow values are from the beginning of the month.

Using hydrological state data (snowpack, streamflows, etc) forecasts of the April through July inflow volume are made each month between January and June. Table WYT 11 shows the forecast

amounts that were made in WY20. For each forecast, Table WYT 11 shows the percent of average of the forecast compared to 30 years of historical inflow data.

Table WYT 11: Forecasts of the April-July inflow volumes into Boysen Reservoir made each month starting in January and ending in June.

Month Forecast Made	April-July Inflow Forecast, KAF	% of 30-yr Average
Jan-20	660	(107%)
Feb-20	645	(104%)
Mar-20	700	(113%)
Apr-20	700	(113%)
May-20	650	(105%)
Jun-20	475	(77%)

During water year 2020, the powerplants associated with Boysen Reservoir had a gross generation of approximately 72,000 MWh (116% of Average).

Additional hydrologic and statistical information pertaining to the operation of Boysen Reservoir can be found in Tables WYT 12, 13, and 14 and Figure WYG3.

Important Events – WY2020

October 5, 2019: Winter flow rate was set at 1,150 cfs.

December 5, 2019: Winter flow rate was set at 1,050 cfs.

March 24, 2020: Reservoir releases begin to be increased to evacuate storage for run-off.

June 2, 2020: Reservoir releases peak at 7,450 cfs.

July 9, 2020: Peak end of day forebay elevation observed with a pool elevation of 4,721.22 feet (670,230 acre-feet).

Table WYT 12: Reservoir allocations for Boysen Reservoir

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,685.00	219,181	219,181
TOP OF ACTIVE CONSERVATION	4,717.00	597,365	378,184
TOP OF JOINT USE	4,725.00	741,594	144,229
TOP OF EXCLUSIVE FLOOD CONTROL	4,732.20	892,226	150,632

Table WYT 13: Storage and elevation data for Boysen Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FEET)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,719.96	647,649	10/1/2019
END OF YEAR	4,719.96	571,249	9/30/2020
ANNUAL LOW	4,715.36	565,994	5/18/2020
HISTORIC LOW ELEVATION *	4,684.18		3/18/1956
HISTORIC LOW CONTENT *		235,737	9/24/2002
ANNUAL HIGH	4,721.22	670,230	7/9/2020
HISTORIC HIGH	4,730.83	922,406	7/6/1967

*Because storage space in a reservoir is lost as sediment is trapped behind the dam, reservoirs are resurveyed periodically to determine actual capacity. Based on the 1994 resurvey of Boysen Reservoir, the historic low content of 235,737 AF occurred at an elevation that was 2.69 feet higher than the historic low elevation.

Table WYT 14: Inflow and discharge data for Boysen Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	862,259	Oct '19-Sep '20	941,229	Oct '19-Sep '20
DAILY PEAK (cfs)	7,450	2-Jun-20	3,584	24-Mar-20
DAILY MINIMUM (cfs)	0	23-Jul-20	991	27-Sep-20
PEAK SPILLWAY FLOW (cfs)			1,170	26-Oct-19
TOTAL SPILLWAY FLOW (AF)			39,491	Oct '19-Sep '20

* High winds can affect the forebay reading used to calculate inflow.

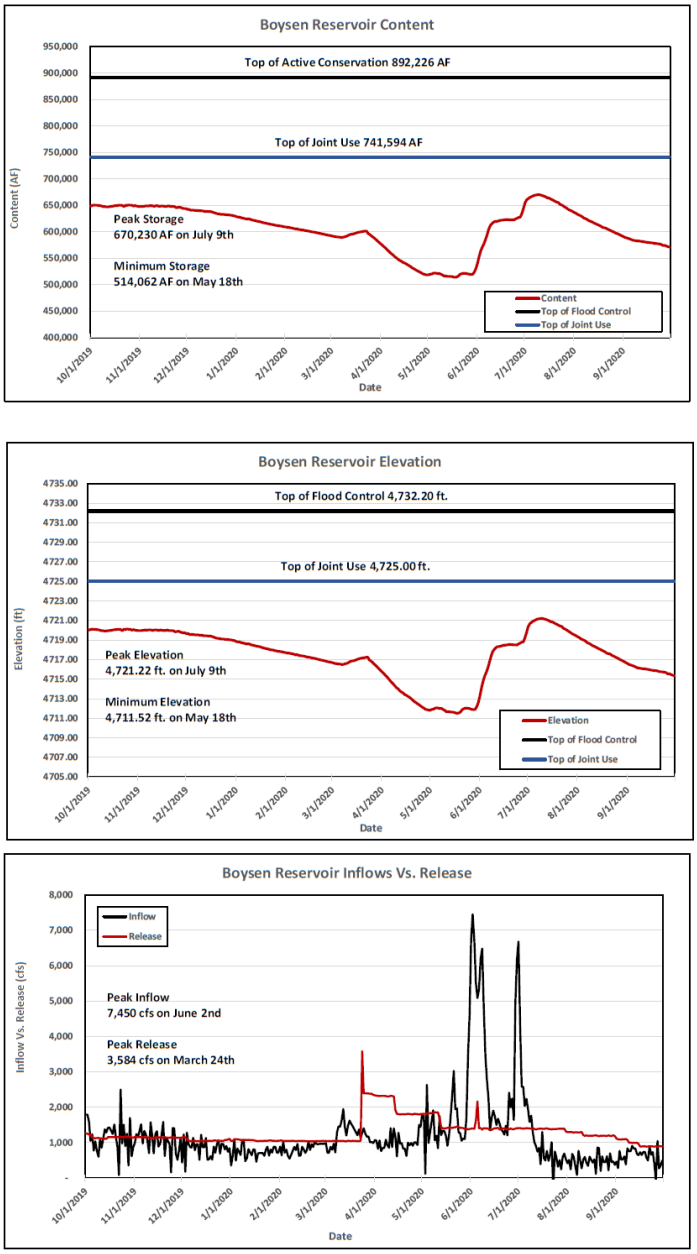


Figure WYG 3: Water Year 2020 storage, forebay elevation, inflow, and release at Boysen Reservoir.

Anchor Reservoir

Anchor Reservoir (P S MBP) is located on the South Fork of Owl Creek, a tributary of the Bighorn River near Thermopolis, Wyoming. It has a total storage capacity of 17,228 AF, of which, 17,160 AF is active storage. Construction of the dam provides supplemental irrigation supply for the Owl Creek Unit (P S MBP). The dam was completed in November 1960. However, several major sinkholes developed in the lower portion of the reservoir after it began to fill, and corrective work to plug the sinkholes has not been successful. Two dikes, in service since 1979, partition off the portions of the reservoir with high seepage losses. The top of the two dikes are at elevation 6,415.00 feet. However,

when the reservoir rises above elevation 6,412.80 feet, water flows through a notch in one of the dikes into the sinkhole area. The reservoir is operated to not exceed an elevation of 6,412.80 feet. Operation and maintenance of Anchor Dam is performed by Owl Creek Irrigation District under contract with Reclamation. Reclamation requires notification from the irrigation district any time the reservoir level is expected to exceed elevation 6,400.00 feet. Operation above 6,400.00 feet will be directed by Wyoming Area Office (WYAO) staff to avoid overtopping of the dikes.

Summary of 2020 Operations

The storage content of Anchor Reservoir at the beginning of WY 2020 was 448 AF. Storage in the reservoir peaked on June 1 at a storage content of 1,357 AF. From that point forward, the reservoir was operated to manage the reservoir level and deliver water supply to irrigators. Table WYT 15 below shows the monthly inflows, outflows, storage, and forebay elevation at Anchor Reservoir. The negative inflows displayed in Table WYT 15 are the result of the calculated inflow, which is subject to the wind influencing the pool elevation reading in addition to the normal seepage from the reservoir. For each monthly inflow, outflow, and storage value the corresponding percentage of average (30 years of historical data) are also shown.

Table WYT 15: Monthly inflow, outflow, storage, forebay elevation, and snow data for Anchor Reservoir.

Month	Inflow, KAF	% of 30-yr Average	Outflow, KAF	% of 30-yr Average	Storage, KAF	% of 30-yr Average	Elevation, ft
Oct-19	0.39	(65%)	0.41	(68%)	0.45	(111%)	6,360.86
Nov-19	0.02	(10%)	0.00	(0%)	0.45	(155%)	6,361.00
Dec-19	0.00	(0%)	0.00	(0%)	0.46	(154%)	6,361.27
Jan-20	0.00	(0%)	0.00	(0%)	0.47	(153%)	6,361.33
Feb-20	0.02	(20%)	0.00	(0%)	0.46	(157%)	6,361.33
Mar-20	-0.05	(-15%)	0.00	(0%)	0.44	(109%)	6,360.57
Apr-20	0.55	(92%)	0.16	(32%)	0.83	(138%)	6,368.60
May-20	2.51	(64%)	2.01	(80%)	1.33	(66%)	6,375.59
Jun-20	2.83	(40%)	3.52	(65%)	0.64	(17%)	6,365.26
Jul-20	1.08	(52%)	1.07	(32%)	0.65	(27%)	6,465.47
Aug-20	0.38	(63%)	0.51	(24%)	0.46	(77%)	6,361.20
Sep-20	0.25	(41%)	0.23	(30%)	0.47	(118%)	6,361.49
WY 2020	**7.90**	**(50%)**	**7.90**	**(50%)**	-	-	-

Inflow and outflow values are summed for the entire month, and storage and elevation values are from the end of the month.

Additional hydrologic and statistical data pertaining to Anchor Reservoir operations during 2020 can be found in Tables 16, 17, and 18 and Figure WYG4.

Table WYT 16: Reservoir allocations for Anchor Reservoir

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	6,343.75	68	68
TOP OF ACTIVE CONSERVATION*	6,441.00	17,228	17,160

* District operation has been restricted to elevation 6400.00 feet or less to prevent damage to the dikes and to minimize the chance of creating new sinkholes. Operations above elevation 6400.00 feet are directed by Reclamation.

Table WYT 17: Storage and elevation data for Anchor Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FEET)	STORAGE (AF)	DATE
BEGINNING OF YEAR	6,360.89	448	10/1/2019
END OF YEAR	6,361.49	472	9/30/2020
ANNUAL LOW	6,359.43	394	3/29/2020
HISTORIC LOW	-	-	-
ANNUAL HIGH	6,375.94	1,357	6/1/2020
HISTORIC HIGH	6,418.52	9,252	7/3/1967

Table WYT 18: Inflow and discharge data for Anchor Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW*	DATE
ANNUAL TOTAL (AF)	7,918	Oct '19-Sep '20	7,909	Oct '19-Sep '20
DAILY PEAK (cfs)	155	31-May-20	96	4-Jun-20
DAILY MINIMUM (cfs)	0	WINTER MONTHS	0	WINTER MONTHS
PEAK SPILLWAY FLOW (cfs)			0	
TOTAL SPILLWAY FLOW (AF)			0	

* Outflow is water released from the Dam to Owl Creek. When the reservoir level rises above approximately 6412.80 feet, water flows through a notch in one of the dikes into the sinkhole area. This water is neither measured nor accounted for.

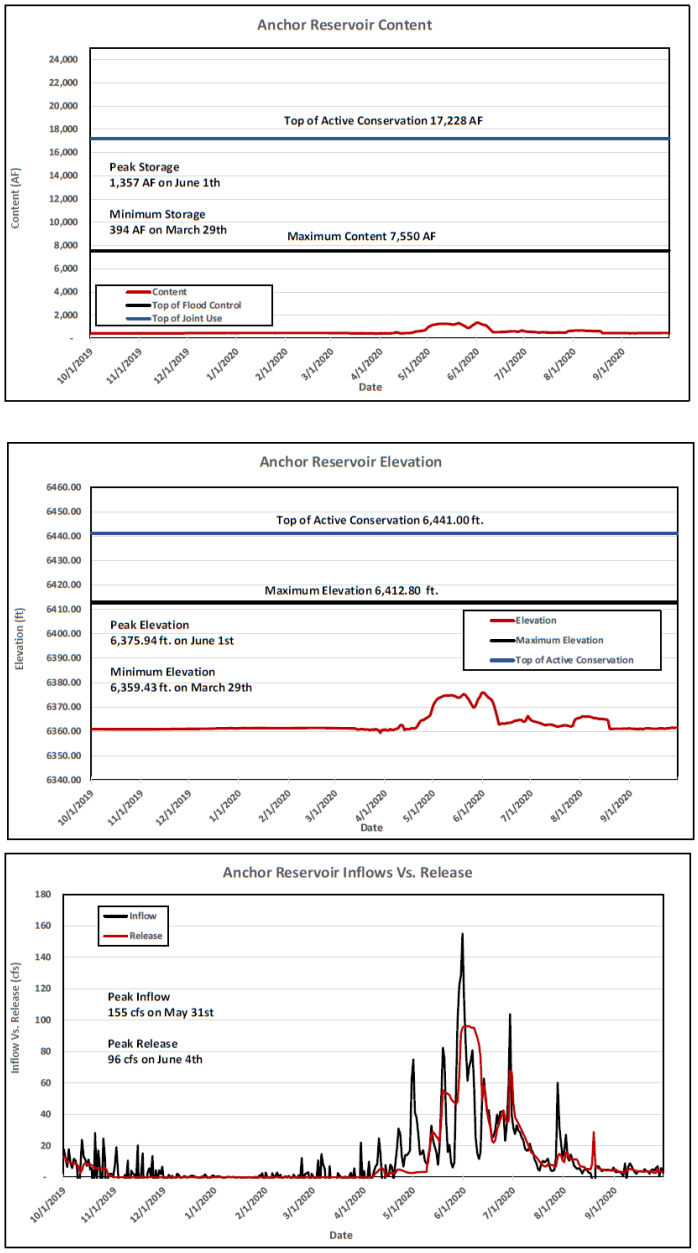


Figure WYG 4: Water Year 2019 storage, forebay elevation, inflow, and release at Anchor Reservoir.

Shoshone Project and Buffalo Bill Unit

The primary features of the original Shoshone Project included Buffalo Bill Dam and Reservoir, Shoshone and Heart Mountain Powerplants, and the canal and lateral systems for the Willwood, Frannie, Garland, and Heart Mountain Divisions. In 1982, The Buffalo Bill Dam and Reservoir Modifications, Shoshone Project, Wyoming, was authorized as the Buffalo Bill Unit (P-S MBP). The principal modifications to Buffalo Bill Dam included raising the height of the Dam by 25 feet, reconstructing the Shoshone Powerplant, construction of the Buffalo Bill Powerplant, construction of the Spirit Mountain Energy Dissipation Structure, pressurizing a portion of the Shoshone Canyon Conduit, enlarging and gating the spillway, constructing a visitor's center, and constructing the North Fork, South Fork, and Diamond Creek Dikes. The North and South Fork dust abatement dikes were designed to impound water in areas of the enlarged reservoir that would be dry during periods when the reservoir elevation is low, thereby reducing the dust producing area of the reservoir. The Diamond Creek protective dike prevents the enlarged reservoir from inundating Irma Flats.

Controlled releases are made from Buffalo Bill Reservoir at four points: (1) Shoshone Canyon Conduit, (2) Shoshone Powerplant, (3) the gated spillway, and (4) two river outlets (jet-flow valve and 4X5 high-pressure gates). Water for the Willwood, Frannie, and Garland Divisions of the Shoshone Project is diverted from the Shoshone River below Buffalo Bill Reservoir. The Heart Mountain Division is irrigated by water released at the dam through a high-level outlet to the Shoshone Canyon Conduit and Heart Mountain Canal. Irrigation releases for the project land along the Shoshone River are made through the Shoshone Powerplant, the river outlets, or through the Shoshone Canyon Conduit and Buffalo Bill or Heart Mountain Powerplants. Project works presently serve about 93,000 acres in the four divisions.

Heart Mountain Powerplant, Shoshone Project, with a nameplate capability of 6,000 kilowatts (kW) and maximum discharge capacity of 360 cfs, is located at the end of the Shoshone Canyon Conduit, which obtains its water from a high-level outlet, elevation 5,233.00 feet, at Buffalo Bill Dam. The powerplant is located 3.5 miles below the dam and discharges into the Shoshone River. During the summer months, the water released through the powerplant is used to satisfy a portion of the irrigation demand of lands diverting directly from the river.

Shoshone Powerplant, reconstructed as part of the Buffalo Bill Unit (P-S MBP), is located on the left bank of the Shoshone River at the toe of Buffalo Bill Dam and releases water directly into the Shoshone River. After 56 years of continuous use, the Shoshone Powerplant became obsolete because of safety problems beyond economical repair. On March 21, 1980, the original plant was taken out of service. In 1992, one of the three generating units was replaced with a new unit having a nameplate capability of 3,000 kW. In accordance with the Buffalo Bill Reservoir Enlargement Winter Release Operation Agreement, a flow of at least 100 cfs is released to the Shoshone River at the base of the dam at all times. This is normally achieved by the use of the Shoshone Powerplant. A maximum release of approximately 200 cfs can be made through the Shoshone Powerplant.

Buffalo Bill Powerplant, Buffalo Bill Unit (P-S MBP), with a nameplate capability of 18,000 kW, is located about one mile downstream of Buffalo Bill Dam on the right bank of the Shoshone River. Water for generation at this powerplant is supplied through a portion of the Shoshone Canyon Conduit, which was pressurized as part of the Buffalo Bill modification. The maximum discharge

capacity of the three units at the Buffalo Bill Powerplant is 930 cfs. The powerplant first generated power on July 15, 1992.

Spirit Mountain Powerplant, Buffalo Bill Unit (P-S MBP), with a nameplate capability of 4,500 kW and discharge capacity of 560 cfs, is a newly constructed energy dissipater powerplant located about one mile downstream of Buffalo Bill Dam on the right side of the Shoshone River. Water released through the Shoshone Canyon Conduit for Heart Mountain Canal or Heart Mountain Powerplant must be routed through the Spirit Mountain Powerplant or through associated sleeve valves to dissipate energy in the transition from the pressurized portion of the Shoshone Canyon Conduit to the free flow portion of the conduit. The discharge from the powerplant must be carried away from the plant by use of the free-flow conduit and operation of the powerplant depends on the availability of the conduit to carry discharged water.

Buffalo Bill Reservoir

Buffalo Bill Dam and Reservoir, located on the Shoshone River above Cody, Wyoming, is a multipurpose facility that provides water for domestic, irrigation, municipal, fish and wildlife, power, and recreational use. It also provides a small amount of incidental flood control, although no storage space is specifically reserved for this purpose. The total storage capacity of the reservoir is 646,565 AF at elevation 5,393.50 feet, the top of the active conservation pool.

Summary of 2020 Operations

Buffalo Bill storage carried over into WY 2020 amounted to 487,014 AF, which is 108 percent of the thirty-year average. Operations to evacuate storage and deliver irrigation supply were maintained through the end of October. Table WYT 19 below shows the monthly inflows, outflows, storage, and forebay elevation at Buffalo Bill Reservoir. Snow-water equivalent (SWE) values, as represented by the SNOTEL sites within the basin above Buffalo Bill Reservoir, are also shown. For each monthly inflow, outflow, storage, and SWE value the corresponding percentage of average (30 years of historical data) are also shown.

Table WYT 19: Monthly inflow, outflow, storage, forebay elevation, and snow data for Buffalo Bill Reservoir.

Month	Inflow, KAF	% of 30-yr Average	Outflow, KAF	% of 30-yr Average	Storage, KAF	% of 30-yr Average	Elevation, ft	Snow, in	% of 30-yr Average
Oct-19	51.2	(186%)	56.7	(136%)	481.5	(112%)	5,371.88	0.00	(NA)
Nov-19	33.7	(143%)	44.3	(229%)	470.8	(108%)	5,370.38	3.66	(206%)
Dec-19	23.2	(139%)	22.1	(122%)	471.9	(109%)	5,370.53	5.54	(106%)
Jan-20	19.7	(126%)	22.1	(131%)	469.6	(109%)	5,370.20	7.86	(94%)
Feb-20	15.7	(116%)	20.4	(121%)	464.9	(109%)	5,369.55	11.90	(103%)
Mar-20	20.6	(95%)	29.8	(116%)	455.7	(108%)	5,368.26	15.59	(113%)
Apr-20	47.8	(102%)	108.9	(160%)	394.6	(99%)	5,359.15	19.10	(111%)
May-20	234.1	(126%)	142.8	(103%)	486.0	(109%)	5,372.48	18.01	(102%)
Jun-20	359.3	(108%)	208.6	(106%)	636.7	(110%)	5,392.27	8.83	(93%)
Jul-20	149.9	(85%)	184.4	(103%)	602.2	(103%)	5,387.95	0.00	(NA)
Aug-20	35.1	(79%)	116.1	(102%)	521.2	(101%)	5,377.29	0.00	(NA)
Sep-20	20.8	(80%)	92.1	(106%)	450.1	(99%)	5,367.46	0.00	(NA)
WY 2020	**1011.3**	**(109%)**	**1048.4**	**(114%)**					

Inflow and outflow values are summed for the entire month, storage and elevation values are from the end of the month, and snow values are from the beginning of the month.

Using hydrological state data (snowpack, streamflows, etc) forecasts of the April through July inflow volume are made each month between January and June. Table WYT 20 shows the forecast amounts that were made in WY19. For each forecast, Table WYT 20 shows the percent of average of the forecast compared to 30 years of historical inflow data.

Table WYT 20: Forecasts of the April-July inflow volumes made into Buffalo Bill Reservoir each month starting in January and ending in June.

Month Forecast Made	April-July Inflow Forecast, KAF	% of 30-yr Average
Jan-20	675	(91%)
Feb-20	700	(94%)
Mar-20	840	(113%)
Apr-20	900	(121%)
May-20	750	(101%)
Jun-20	750	(101%)

During water year 2020, the powerplants associated with Buffalo Bill Reservoir had a gross generation of approximately 114,000 MWh.

Important Events – WY2020

October 20, 2020: End of 2020 irrigation diversions by the Shoshone Projects.

October 20, 2020: Releases to the Shoshone River reduced to the winter outflow rate of 200 cfs.

April 13, 2020: Irrigation diversions by the Shoshone Project were initiated for the WY 2020 irrigation season.

June 29, 2020: Buffalo Bill Reservoir reached a peak pool elevation for the water year of 5,392.84 ft.

Table WYT 21: Reservoir allocations for Buffalo Bill Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	5,259.60	41,748	41,748
TOP OF ACTIVE CONSERVATION	5,393.50	646,565	604,817

Table WYT 22: Storage and elevation data for Buffalo Bill Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FEET)	STORAGE (AF)	DATE
BEGINNING OF YEAR	5,372.62	487,014	10/1/2019
END OF YEAR	5,367.46	450,099	9/30/2020
ANNUAL LOW	5,358.96	393,387	4/29/2020
HISTORIC LOW*	-	19,080	1/31/1941
ANNUAL HIGH	5,392.84	641,348	6/29/2020
HISTORIC HIGH	5,393.51	646,647	7/30/1996

* Prior to 1952 daily records are not available. End-of-month data was used to determine the historic low.

Table WYT 23: Inflow and discharge data for Bull Lake Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW*	DATE
ANNUAL TOTAL (AF)	1,011,338	Oct '19-Sep '20	1,048,404	Oct '19-Sep '20
DAILY PEAK (cfs)	12,358	6/1/2020	8,056	6/30/2020
DAILY MINIMUM (cfs)	111*	3/11/2020	349	2/15/2020
PEAK SPILLWAY FLOW (cfs)	-	-	4,492	6/30/2020
TOTAL SPILLWAY FLOW (AF)	-	-	44,997	Oct '19-Sep '20

*High winds in the area can result in a false forebay readings, which can effect computed inflows.

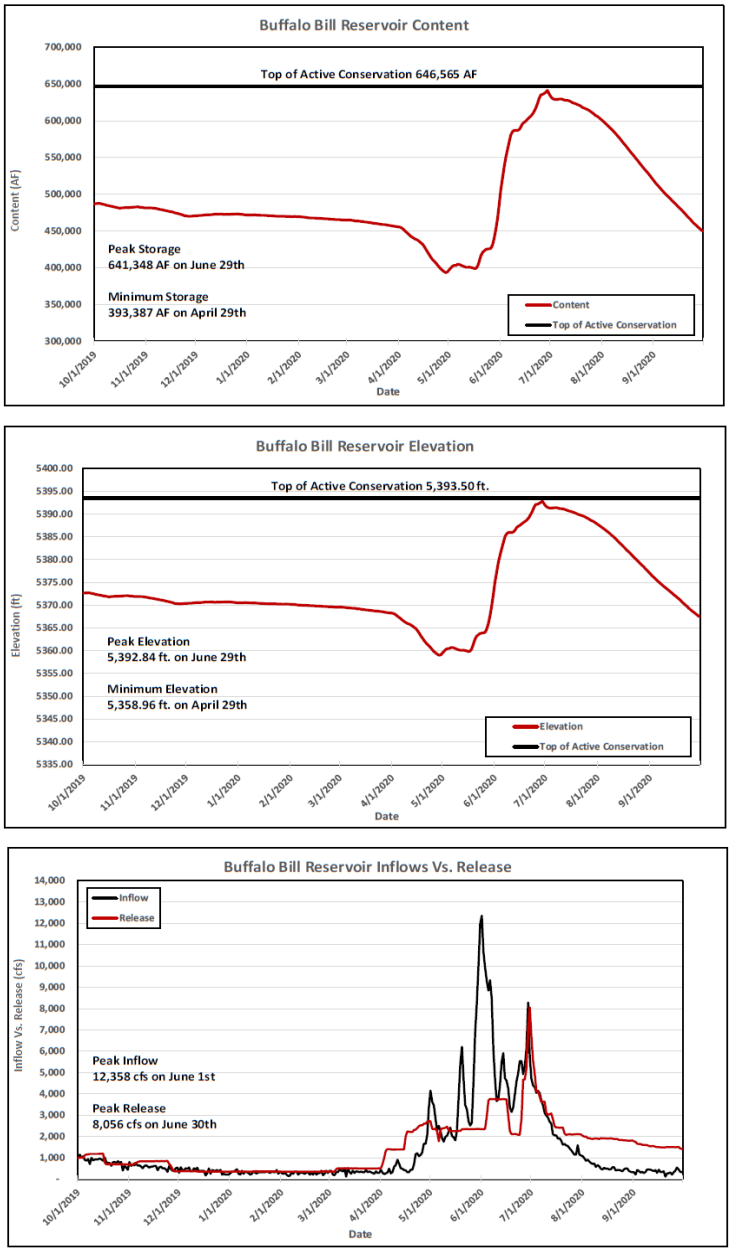


Figure WYG 5: Water Year 2020 storage, forebay elevation, inflow, and release at Buffalo Bill Reservoir.

Summary of Reservoir Operations for Benefit of Fish and Wildlife, Environment, and Recreation

Flushing flow from Boysen Reservoir are often performed in the Spring (when possible given other demands) to support the downstream fisheries. The Wyoming Game and Fish Department (WGF) did request a flushing flow and Reclamation did provide a flushing flow on March 24 - 25, 2020.

Winter releases from Buffalo Bill Dam are set to support fisheries downstream as well as mitigate ice jams. Normally the non-irrigation season releases are determined by the criteria outlined in the Buffalo Bill Reservoir Enlargement Winter Release Operation Agreement. The criteria include the previous year's annual inflow, end of year reservoir content, and state account ownership. Based on those conditions, a winter release of 100 cfs, 150 cfs, 200 cfs, or 350 cfs will be provided below Buffalo Bill Powerplant. The agreement serves to ensure a minimum release of 100 cfs is always maintained below the dam. Reclamation continues to support the WGF Reservoir Research Branch in its efforts to assess fish population and species distribution in the enlarged reservoir using hydro acoustic technology and by providing WGF river access and an aluminum tube for planting fish in the Shoshone River off the deck of Buffalo Bill Powerplant. At the end of WY 2020, based on the Agreement, Reclamation determined that a flow of 200 cfs was required for the winter release below Buffalo Bill Dam.

As Buffalo Bill Reservoir is drawn down the lake-bed is exposed to wind erosion, which creates dust in the reservoir area and in the town of Cody, Wyoming. As a part of the enlargement of Buffalo Bill Reservoir, dust abatement dikes were built on the upper ends of the North and South Fork arms of the reservoir to hold water in areas that would become dry as the reservoir level decreased, thus reducing the area of dry lake bed. The top of the North Fork Dike is approximately 5,370 Feet. When the reservoir pool elevation drops below 5,370 ft, the North Fork Dike helps to minimize the amount of lakebed exposure. The number of stop-logs at the outlet control structure on the South Fork Dike are used to maintain a nearly static water level above the dike of approximately 5,393.23 feet at the end of the water year. The stop logs provide a larger impoundment behind the dike, which benefits waterfowl habitat and fishery conditions.

The Diamond Creek Dike was constructed to prevent Diamond Creek and the Irma Flats area from being inundated by the enlarged reservoir. Inflows from the Diamond Creek drainage enter Diamond Creek Reservoir that lies at the base of the dike. This water is then pumped into Buffalo Bill Reservoir to maintain the elevation of Diamond Creek Reservoir between a maximum of 5,340.40 feet and a minimum of 5,339.50 feet. The normal water surface elevation is typically 5,340.00 feet.

Reservoir levels during all of WY2020 were adequate for recreational activities on Buffalo Bill Reservoir.

Water Year 2020 Flood Benefits

Table WYT 24: Flood Damage Prevented in the Wind/Bighorn and Shoshone River Systems[1].

Reservoir	Local	Main Stem	2020 Total	Previous Accumulation[3]	1950 - 2020 Accumulation Total
Bull Lake[2]	$0	$0	$0	$4,120,100	$4,120,100
Boysen	$0	$2,837,200	$2,837,200	$363,157,400	$365,994,600
Buffalo Bill[2]	$1,300,600	$0	$2,799,200	$65,059,400	$67,858,600

1/ This data is received from the Army Corps of Engineers Omaha District Office and is revised every October. The period of assessment is 1950 - 2020.
2/ No space is allocated to flood control, but some flood protection is provided by operation for other purposes.
3/ Adjusted in 2006 by 0.1 to 0.5 to account for previous rounding of cumulative total to nearest 1.0.
4/ In 2012, flood damages prevented in 2011 at Boysen Reservoir were revised. The accumulated total for Boysen Reservoir has been corrected to reflect the revision.

Outlook and Annual Operating Plans for Water Year 2021 for Bighorn Basin Reservoirs Under the Responsibility of the Wyoming Area Office (WYAO)

Riverton Unit: Bull Lake Reservoir

Three operating plans were prepared in October 2020 to project operations under various run-off conditions for WY 2021. The projected operations for three inflow scenarios are shown in Tables WYT 25, 26, and 27 and Figure WYG 6. The plans are prepared to show the probable limits of operations and therefore actual conditions and operations could vary widely from the most probable plan.

The primary objective of operations at Bull Lake is to provide irrigation water to the Midvale Irrigation District (Midvale). Under normal operation, the reservoir also provides flood control benefits and a water resource for fish, wildlife, and recreation. Bull Lake is operated under the following criteria and limitations:

(1) Based on forecasted inflows, March-June releases are scheduled with the objective of filling the lake to a content of 151,000 AF at elevation 5,804.50 feet during July while eliminating or minimizing any spill.

(2) During April-October, releases must be adequate to meet the irrigation needs of Midvale and downstream irrigators with senior water rights on Bull Lake Creek.

(3) Based on the available water supply, non-irrigation season releases from Bull Lake to Bull Lake Creek are generally maintained between 20 and 45 cfs.

(4) Reclamation identified deficiencies in the existing spillway at Bull Lake Dam and determined the preferred corrective action was to construct a new labyrinth spillway and remove the existing spillway (depicted the concept drawing on this slide). Reclamation awarded a contract on 9/20/2018 to Malcolm International LLC for about $44.5 million to construct the project. Construction is ongoing but due to unforeseen groundwater issues near the new Spillway the project has been delayed at least a year (completion in 2022). Heavy equipment to use alternate access south side Bull Lake Creek. Normal access route along Bull Lk Cr will remain open for non-construction traffic. USFWS/Tribes asked us to avoid using to reduce disturbance to wintering trumpeter swans which will not interfere with normal reservoir operations. Reservoir will be lowered to 5,777 feet (74,000 acre-feet) for cofferdam installation/removal in fall 2021 of the construction period of 2018–2022. Access across dam will be closed during bridge removal/relocation and cofferdam completion at existing spillway; alternate access to east side of dam will be provided, no dam crest closure in the month of April. Access to left abutment of dam may experience up to 15-minute delays. Access to creek below construction areas will remain open. Contract specifications requires

Contractor to meet Tribal Employment Rights Office (TERO) requirements Traffic Control Signage to Guide recreationalists.

If not for the modification to the spillway, normal operations of the reservoir would be to maintain the reservoir below elevation 5,794.00 feet through the winter to prevent damage to the concrete in the spillway inlet from ice. The reservoir is operated to have a storage level of 100,000 AF or less by November 30. The objective at the onset of winter is to be as close as possible to the 100,000 AF level (5,787.13 feet) and to also provide fishery habitat.

2021 Operating Plans

Operating plans have been generated for three scenarios for all months of the upcoming water year:

- Most probable inflow conditions are based on the historical median flows.
- Reasonable minimum inflow conditions are estimated to be lower decile flows. Lower decile flows are flows that have historically been exceeded 90 percent of the time.
- Reasonable maximum inflow conditions are estimated to be upper decile flows. Upper decile flows are flows that have historically been exceeded 10 percent of the time.

Under all inflow scenarios, releases in October following the end of irrigation season and continuing through the fall and winter will be adjusted to reach and maintain the targeted winter pool elevation. Water diverted into the Wyoming Canal can be delivered to Midvale lands directly or routed through Pilot Butte Reservoir and delivered to district lands via the Pilot Canal.

Table WYT 25: Monthly Operating Plans for Water Year 2021 for Bull Lake Reservoir and other Riverton Unit features based on the Most Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Bull Lake Reservoir (Initial content: 74.7 KAF)														
Reservoir Inflow	kaf	6.1	3.3	2.5	2.5	1.7	1.9	3.1	28.9	65	47.8	20.2	10.5	193.5
Total Dam Release	kaf	6.9	3.3	2.5	2.5	1.7	1.9	3.1	26.3	21.5	16.8	54.8	53	194.3
Total Dam Release	cfs	112	55	41	41	31	31	52	427	362	273	891	891	-
Excess Release	kaf	5.4	0	0	0	0	0	0	0	20.1	15.3	17.8	5	63.4
End-month Content	kaf	73.9	73.9	73.9	73.9	73.9	73.9	73.9	76.5	120	151	116.4	73.9	-
End-month Elevation	ft	5777	5777	5777	5777	5777	5777	5777	5778.1	5794.3	5804.5	5793	5777	-
BLR Net Change	kaf	-0.8	0	0	0	0	0	0	2.6	43.5	31	-34.6	-42.5	-0.8
Wind River														
Flow abv BL Creek	kaf	34.9	25	19.1	18	16.6	19.6	29.2	100.6	184.9	120.6	51.4	35.6	655.5
Crowheart Gage Flow	kaf	41.8	28.3	21.6	20.5	18.3	21.5	32.3	126.9	206.4	137.4	106.2	88.6	849.8
Flow Below Div Dam	kaf	32.5	28.3	21.6	20.5	18.3	21.5	14.9	72.2	141.7	56.5	47.5	28	503.5
Gain/Return Flow	kaf	0	0	0	0	0	0	4.8	7.4	7.1	7.4	6.1	5.4	38.2
Indian Irrigation	kaf	0	0	0	0	0	0	1.8	6.1	6	6.1	5.5	4.5	30
LeClair/Riverton	kaf	0	0	0	0	0	0	3.5	18.8	24.2	27.2	21.1	15	109.8
LeC/Riv Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
Riverton Gage Flow	cfs	528.6	475.1	351.7	333.4	329.5	349.7	241.6	887.7	1995.4	496.5	439.1	233.7	-
Wyoming Canal														
Total Diversion	kaf	9.3	0	0	0	0	0	17.4	54.7	64.7	80.9	58.7	60.6	346.3
North Canal Flow	kaf	0	0	0	0	0	0	9.8	26.4	31.2	36.5	30.9	27	161.8
North Canal Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilot Butte Reservoir (Initial content: 18.9 KAF)														
Reservoir Inflow	kaf	9.3	0	0	0	0	0	7.6	28.3	33.5	44.4	27.8	33.6	184.5

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Power Generated	mwh	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilot Canal Release	kaf	0	0	0	0	0	0	6.7	28	33.1	43.9	37.4	33.3	182.4
Pilot Canal Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
End-month Content	kaf	28	27.8	27.7	27.6	27.5	27.3	28	28	28	28	18	18	-
PBR Net Change	kaf	9.1	-0.2	-0.1	-0.1	-0.1	-0.2	0.7	0	0	0	-10	0	-0.9
End-month Elevation	ft	5457.8	5457.6	5457.5	5457.4	5457.3	5457	5457.8	5457.8	5457.8	5457.8	5445.5	5445.5	-

Based on Most Probable April-July runoff of: Bull Lake – 144.8 kaf / Wind River ab Bull Lake Creek – 435.2 kaf / Riverton – 218.8 kaf. This plan assumes an annual demand of 162 KAF for the North Canal and 182 KAF for the Pilot Canal

Table WYT 26: Monthly Operating Plans for Water Year 2021 for Bull Lake Reservoir and other Riverton Unit features based on the Minimum Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Bull Lake Reservoir (Initial content: 74.7 KAF)														
Reservoir Inflow	kaf	4.3	2.2	1.6	1.7	1.3	1.6	3.7	26.4	38.8	30.9	14.9	8.3	135.7
Total Dam Release	kaf	5.1	2.2	1.6	1.7	1.3	1.6	3.1	26.3	14.9	26.2	44.2	8.3	136.5
Total Dam Release	cfs	83	37	26	28	23	26	52	428	250	426	719	139	-
Excess Release	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
End-month Content	kaf	73.9	73.9	73.9	73.9	73.9	73.9	74.5	74.6	98.5	103.2	73.9	73.9	-
End-month Elevation	ft	5777	5777	5777	5777	5777	5777	5777.2	5777.3	5786.6	5788.3	5777	5777	-
BLR Net Change	kaf	-0.8	0	0	0	0	0	0.6	0.1	23.9	4.7	-29.3	0	-0.8
Wind River														
Flow abv BL Creek	kaf	29	21.4	17.2	15	13.7	16.5	24	74.8	160.7	75	36.1	29.2	512.6
Crowheart Gage Flow	kaf	34.1	23.6	18.8	16.7	15	18.1	27.1	101.1	175.6	101.2	80.3	37.5	649.1
Flow Below Div Dam	kaf	24.8	23.6	18.8	16.7	15	18.1	9.7	46.4	110.9	30.3	21.7	15.6	351.6
Gain/Return Flow	kaf	0	0	0	0	0	0	4.8	7.4	7.1	7.4	6.1	5.4	38.2
Indian Irrigation	kaf	0	0	0	0	0	0	1.8	6.1	6	6.1	2.5	1.8	24.3
LeClair/Riverton	kaf	0	0	0	0	0	0	3.5	18.8	24.2	27.2	21.1	15	109.8

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
LeC/Riv Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
Riverton Gage Flow	cfs	403.3	396.6	305.8	271.6	270.1	294.4	154.1	469.1	1476.6	70	70	70	-
Wyoming Canal														
Total Diversion	kaf	9.3	0	0	0	0	0	17.4	54.7	64.7	70.9	58.6	21.9	297.5
North Canal Flow	kaf	0	0	0	0	0	0	9.8	26.4	31.2	36.5	29.8	9.8	143.5
North Canal Shortage	kaf	0	0	0	0	0	0	0	0	0	0	1.1	17.2	18.3
Pilot Butte Reservoir (Initial content: 18.9 KAF)														
Reservoir Inflow	kaf	9.3	0	0	0	0	0	7.6	28.3	33.5	34.4	28.8	12.1	154
Power Generated	mwh	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilot Canal Release	kaf	0	0	0	0	0	0	6.7	28	33.1	43.9	36.4	11.8	159.9
Pilot Canal Shortage	kaf	0	0	0	0	0	0	0	0	0	0	1	21.5	22.5
End-month Content	kaf	28	27.8	27.7	27.6	27.5	27.3	28	28	28	18	10	10	-
PBR Net Change	kaf	9.1	-0.2	-0.1	-0.1	-0.1	-0.2	0.7	0	0	-10	-8	0	-8.9
End-month Elevation	ft	5457.8	5457.6	5457.5	5457.4	5457.3	5457	5457.8	5457.8	5457.8	5445.5	5433.5	5433.5	-

Based on Minimum April-July runoff of: Bull Lake – 99.8 kaf / Wind River ab Bull Lake Creek – 260.5 kaf / Riverton – 130.2 kaf. This plan assumes an annual demand of 159 KAF for the North Canal and 180 KAF for the Pilot Canal

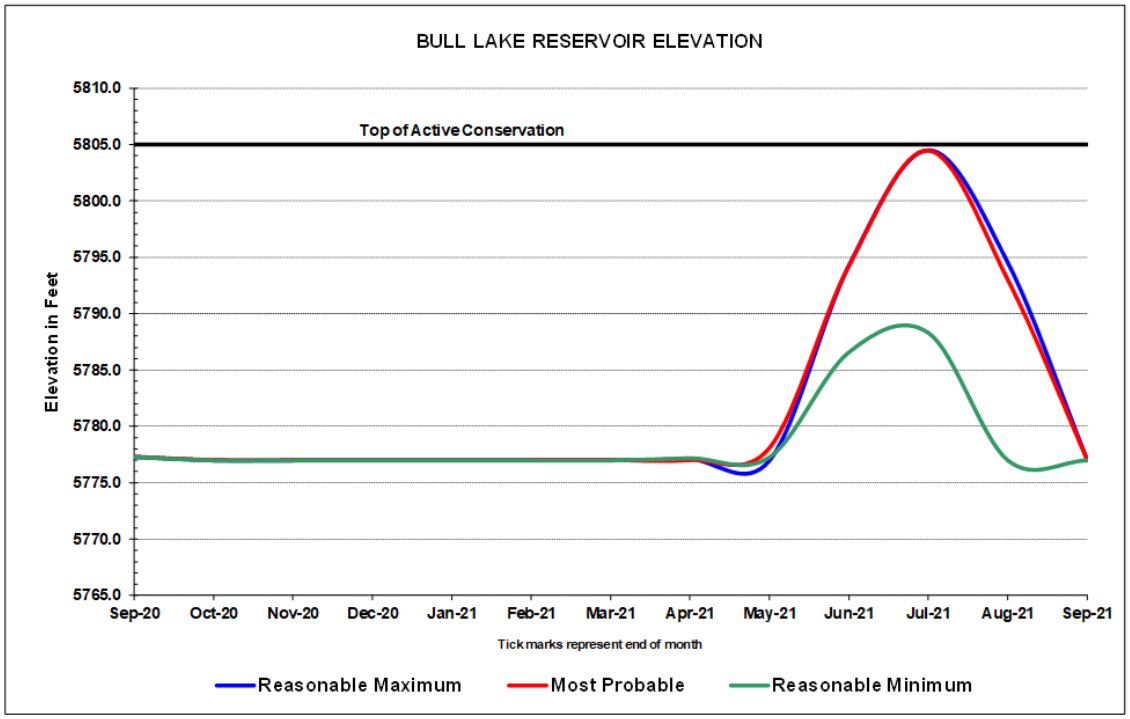
Table WYT 27: Monthly Operating Plans for Water Year 2021 for Bull Lake Reservoir and other Riverton Unit features based on the Maximum Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Bull Lake Reservoir (Initial content: 74.7 KAF)														
Reservoir Inflow	kaf	6.5	3.6	3	2.4	1.9	2.4	4.3	27.6	89.9	75.1	31.1	12.8	260.6
Total Dam Release	kaf	7.3	3.6	3	2.4	1.9	2.4	4.1	27.8	43.8	44.1	61.5	59.5	261.4
Total Dam Release	cfs	119	60	49	39	34	39	69	452	736	717	1000	1000	-
Excess Release	kaf	5.8	2.1	0	0	0	0	0	26.3	42.3	42.6	50.4	19.5	188.9
End-month Content	kaf	73.9	73.9	73.9	73.9	73.9	73.9	74.1	73.9	120	151	120.6	73.9	-
End-month Elevation	ft	5777	5777	5777	5777	5777	5777	5777.1	5777	5794.3	5804.5	5794.5	5777	-

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
BLR Net Change	kaf	-0.8	0	0	0	0	0	0.2	-0.2	46.1	31	-30.4	-46.7	-0.8
Wind River														
Flow abv BL Creek	kaf	35.8	25.7	21.3	18.7	15.6	21.5	27	132	323.8	196.6	77.3	43.6	938.9
Crowheart Gage Flow	kaf	43.1	29.3	24.3	21.1	17.5	23.9	31.1	159.8	367.6	240.7	138.8	103.1	1200.3
Flow Below Div Dam	kaf	30.4	29.3	24.3	21.1	17.5	23.9	13.7	105.1	302.9	159.8	80.1	42.5	850.6
Gain/Return Flow	kaf	0	0	0	0	0	0	4.8	7.4	7.1	7.4	6.1	5.4	38.2
Indian Irrigation	kaf	0	0	0	0	0	0	1.8	6.1	6	6.1	5.5	4.5	30
LeClair/Riverton	kaf	5	0	0	0	0	0	3.5	18.8	24.2	27.2	21.1	15	114.8
LeC/Riv Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
Riverton Gage Flow	cfs	413.1	492.4	395.2	343.1	315.1	388.7	221.4	1423.6	4703.7	2176.5	969.4	477.3	-
Wyoming Canal														
Total Diversion	kaf	12.7	0	0	0	0	0	17.4	54.7	64.7	80.9	58.7	60.6	349.7
North Canal Flow	kaf	3.4	0	0	0	0	0	9.8	26.4	31.2	36.5	30.9	27	165.2
North Canal Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilot Butte Reservoir (Initial content: 18.9 KAF)														
Reservoir Inflow	kaf	9.3	0	0	0	0	0	7.6	28.3	33.5	44.4	27.8	33.6	184.5
Power Generated	mwh	0	0	0	0	0	0	0	0	0	0	0	0	0
Pilot Canal Release	kaf	0	0	0	0	0	0	6.7	28	33.1	43.9	37.4	33.3	182.4
Pilot Canal Shortage	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
End-month Content	kaf	28	27.8	27.7	27.6	27.5	27.3	28	28	28	28	18	18	-
PBR Net Change	kaf	9.1	-0.2	-0.1	-0.1	-0.1	-0.2	0.7	0	0	0	-10	0	-0.9
End-month Elevation	ft	5457.8	5457.6	5457.5	5457.4	5457.3	5457	5457.8	5457.8	5457.8	5457.8	5445.5	5445.5	-

Based on Maximum April-July runoff of: Bull Lake – 196.8 kaf / Wind River ab Bull Lake Creek – 679.3 kaf / Riverton – 514.4 kaf. This plan assumes an annual demand of 165 KAF for the North Canal and 182 KAF for the Pilot Canal

BULL LAKE RESERVOIR



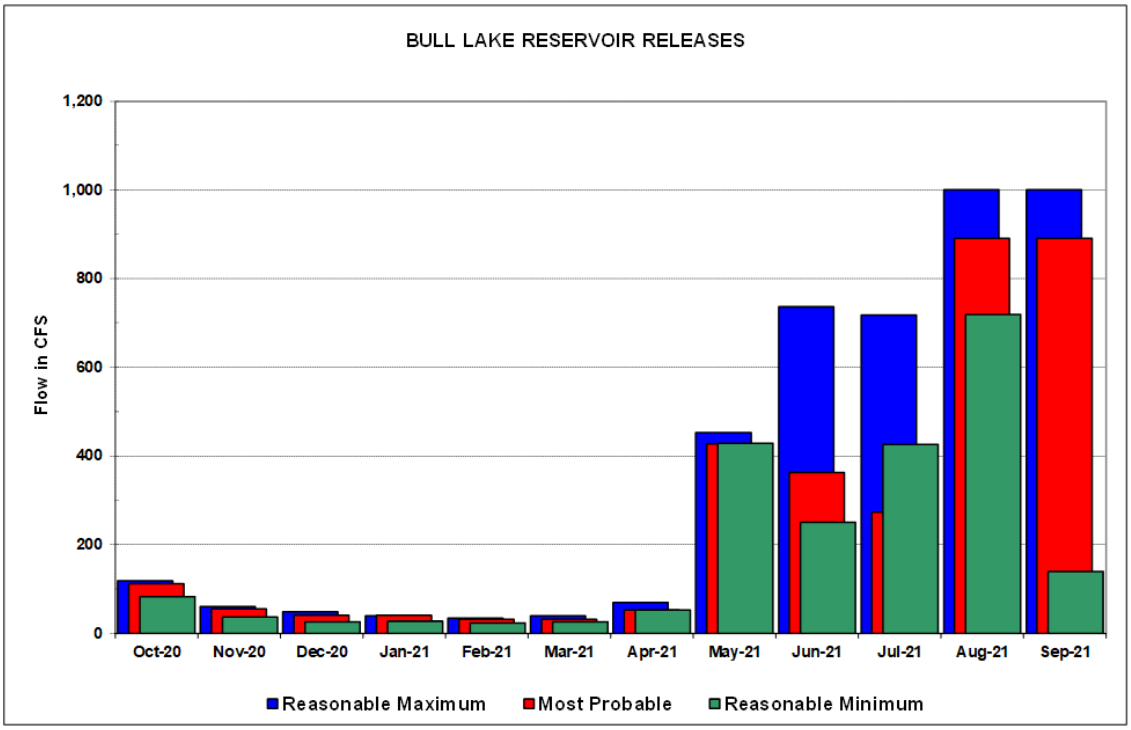


Figure WYG 6: Water Year 2021 forebay elevation and inflow at Bull Lake Reservoir under a Minimum, Expected, and Maximum-forecast.

Boysen Reservoir and Powerplant

Three operating plans were prepared in October 2021 to project water operations under various inflow conditions during WY 2021. The operations for the three runoff conditions are shown in Tables WYT 28, 29 and 30, and Figure WYG7. These plans are presented only to show the probable limits of operations and therefore, actual conditions and operations could vary widely from the most probable plan.

The operating objectives at Boysen Dam and Reservoir are to provide water for irrigation, municipal and industrial use, and power generation; provide flood control in cooperation with the Corps of Engineers; and enhance fish, wildlife, and recreation opportunities in both the reservoir and the Wind/Bighorn River.

Irrigation Season Release

During the irrigation season, water releases from Boysen Reservoir are made to satisfy all downstream senior water rights and storage contract commitments. Generally, demands for downstream senior water rights are met with a reservoir release between 900 and 1,200 cfs. Releases above what is required to meet irrigation demands may be made to manage reservoir levels and generate power.

Non-irrigation Season Release

During the non-irrigation season, releases are made to produce power, enhance the river and reservoir fishery, and provide storage space for the expected spring runoff or conserve storage if the reservoir is not expected to fill. Winter releases are generally in the range between 400 cfs and 1,150 cfs, depending on reservoir conditions going into the winter. The Wyoming Game and Fish Department considers 800 cfs to be the preferred fishery flow from October - February and flows below 600 cfs to be detrimental to the river fishery. A release of approximately 1,150 cfs can be made through one unit at Boysen Powerplant. By releasing less than the capacity of one powerplant unit, annual maintenance can be performed on the other unit during the winter months.

General Operating Procedures

(1) October - February: Releases of water for power generation are scheduled to evacuate storage while assuring an adequate water supply for the upcoming irrigation season. It is desirable to maintain a uniform release during November - February to reduce the risk of ice jams, which may cause flooding or damage to bridges and other structures.

(2) March - July: Based upon monthly water supply forecasts and as soon as river ice conditions allow, releases are scheduled to meet the irrigation demand as a minimum. Greater releases may be made if necessary, to eliminate or minimize a spill, with the objective of filling the reservoir to elevation 4,724.50 feet (731,841 AF) by the end of July. Depending on inflows, attempts will be made to provide a reservoir level of at least elevation 4,707.00 feet from the end of May through the end of August for recreational boating access. For the spawning of rainbow trout, it is desirable to have stable or slightly rising river flows from mid-March through early June. When conditions are suitable and without affecting power operations, attempts will be made to limit the drop in reservoir level to 2 feet or less during the reservoir fish spawn and hatch period (which begins in March and ends in May). A rising pool is desirable during this period.

(3) August - September: As soon as storage has peaked, water releases are scheduled to meet the irrigation demand and generate power. Releases above what is needed to meet irrigation demand may be made in order to generate power and prevent the need to release water through the spillway gates if inflow conditions warrant.

2021 Operating Plans

Operating plans have been generated for three scenarios for all months of the upcoming water year:

- Most probable inflow conditions are based on the historical median flows.
- Reasonable minimum inflow conditions are estimated to be lower decile flows. Lower decile flows are flows that have historically been exceeded 90 percent of the time.
- Reasonable maximum inflow conditions are estimated to be upper decile flows. Upper decile flows are flows that have historically been exceeded 10 percent of the time.

Annual operating plans are found in Tables WYT 28, 29, and 30 and Figure WYG 7. Turbine unit outage schedules are found in Figure WYG 9.

Table WYT 28: Monthly Operating Plans for Water Year 2021 for Boysen Reservoir based on the Most Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Boysen Reservoir (Initial content: 571.2 KAF)														
Monthly Inflow	kaf	56.8	47.2	36.5	33.1	35.5	50.3	56.8	164.7	295.6	130.7	66.8	55.5	1029.5
Monthly Inflow	cfs	924	793	594	538	639	818	955	2679	4968	2126	1086	933	-
Turbine Release	kaf	44.6	35.7	36.9	36.9	33.3	36.9	89.3	138.3	133.7	118.8	98.7	80.5	883.6
Bypass/Spill/Waste	kaf	0	0	0	0	0	0	0	0	42.1	0	0	0	42.1
Total Release	kaf	44.6	35.7	36.9	36.9	33.3	36.9	89.3	138.3	175.8	118.8	98.7	80.5	925.7
Total Release	cfs	725	600	600	600	600	600	1501	2249	2954	1932	1605	1353	-
End-Month Content	kaf	583.4	594.9	594.5	590.7	592.9	606.3	573.8	600.2	720	731.9	700	675	-
End-Month Elevation	ft	4716.13	4716.85	4716.82	4716.59	4716.72	4717.54	4715.52	4717.17	4723.89	4724.5	4722.83	4721.48	-
Net Change Content	kaf	12.2	11.5	-0.4	-3.8	2.2	13.4	-32.5	26.4	119.8	11.9	-31.9	-25	103.8
Boysen Power Plant														
Turbine Release	kaf	44.6	35.7	36.9	36.9	33.3	36.9	89.3	138.3	133.7	118.8	98.7	80.5	883.6
Turbine Release	cfs	725	600	600	600	600	600	1501	2249	2247	1932	1605	1353	
Generation	gwh	3.772	3.05	3.163	3.159	2.85	3.172	7.513	11.507	11.517	10.685	8.869	7.158	76.415
Max Generation	gwh	11.904	11.52	11.904	11.904	10.752	11.904	11.52	11.904	11.52	11.904	11.904	11.52	140.16
% Max Generation	%	32	26	27	27	27	27	65	97	100	90	75	62	-
Ave	kwh/af	85	85	86	86	86	86	84	83	86	90	90	89	86
End-Month Power Cap	mw	16	16	16	16	16	16	16	16	16	16	16	16	-

Based on Most Probable April-July inflow of 647.7 KAF.

Table WYT 29: Monthly Operating Plans for Water Year 2021 for Boysen Reservoir based on the Minimum Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Boysen Reservoir (Initial content: 571.2 KAF)														
Monthly Inflow	kaf	47.9	42.4	35.4	33	31.7	45.8	41.5	66.6	76.5	38.1	25.5	32	516.4
Monthly Inflow	cfs	779	713	576	537	571	745	697	1083	1286	620	415	538	-
Turbine Release	kaf	44.6	35.7	36.9	36.9	33.3	36.9	65.5	76.9	74.4	76.9	76.9	59.5	654.4
Bypass/Spill/Waste	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Release	kaf	44.6	35.7	36.9	36.9	33.3	36.9	65.5	76.9	74.4	76.9	76.9	59.5	654.4
Total Release	cfs	725	600	600	600	600	600	1101	1251	1250	1251	1251	1000	-
End-Month Content	kaf	574.5	581.2	579.7	575.8	574.2	583.1	559.1	548.8	550.9	512.1	460.7	433.2	-
End-Month Elevation	ft	4715.56	4715.99	4715.9	4715.65	4715.55	4716.11	4714.57	4713.89	4714.03	4711.38	4707.62	4705.48	-
Net Change Content	kaf	3.3	6.7	-1.5	-3.9	-1.6	8.9	-24	-10.3	2.1	-38.8	-51.4	-27.5	-138
Boysen Power Plant														
Turbine Release	kaf	44.6	35.7	36.9	36.9	33.3	36.9	65.5	76.9	74.4	76.9	76.9	59.5	654.4
Turbine Release	cfs	725	600	600	600	600	600	1101	1251	1250	1251	1251	1000	-
Generation	gwh	3.762	3.029	3.136	3.131	2.821	3.133	5.48	6.347	6.125	6.252	6.023	4.482	53.721
Max Generation	gwh	11.904	11.52	11.904	11.904	10.752	11.904	11.52	11.904	11.52	11.904	11.904	11.52	140.16
% Max Generation	%	32	26	26	26	26	26	48	53	53	53	51	39	-
Ave	kwh/af	84	85	85	85	85	85	84	83	82	81	78	75	82
End-Month Power Cap	mw	16	16	16	16	16	16	16	16	16	15	14	14	-

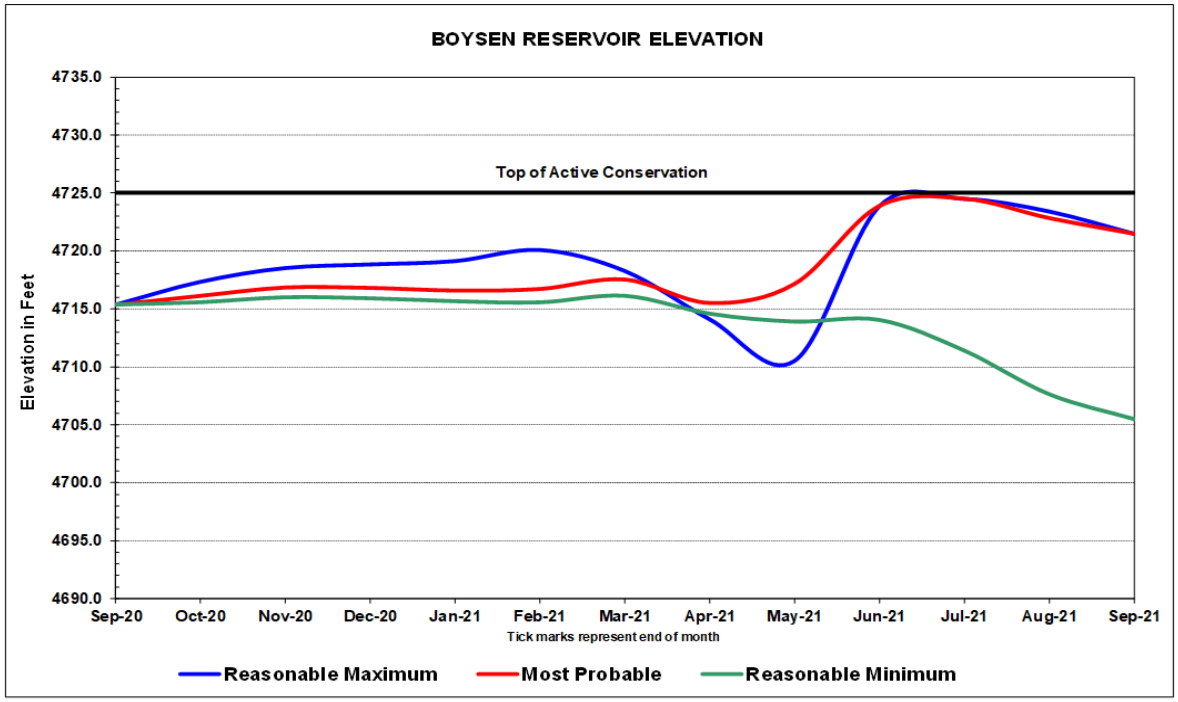
Based on reasonable minimum April-July inflow of 222.7 kaf.

Table WYT 30: Monthly Operating Plans for Water Year 2021 for Boysen Reservoir based on the Maximum Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Boysen Reservoir (Initial content: 571.2 KAF)														
Monthly Inflow	kaf	76.4	55.6	42.1	42	50	60.8	67.2	202.6	540.4	280.8	88.9	70.5	1577.3
Monthly Inflow	cfs	1243	934	685	683	900	989	1129	3295	9082	4567	1446	1185	
Turbine Release	kaf	44.6	35.7	36.9	36.9	33.3	92.2	133.9	139.6	138.2	135.2	109.9	106.4	1042.8
Bypass/Spill/Waste	kaf	0	0	0	0	0	0	0	114.8	182.2	133.7	0	0	430.7
Total Release	kaf	44.6	35.7	36.9	36.9	33.3	92.2	133.9	254.4	320.4	268.9	109.9	106.4	1473.5
Total Release	cfs	725	600	600	600	600	1499	2250	4137	5385	4373	1787	1788	
End-Month Content	kaf	603	622.9	628.1	633.2	649.9	618.5	551.8	500	720	731.9	710.9	675	
End-Month Elevation	ft	4717.34	4718.53	4718.84	4719.13	4720.09	4718.27	4714.09	4710.52	4723.89	4724.5	4723.41	4721.48	
Net Change Content	kaf	31.8	19.9	5.2	5.1	16.7	-31.4	-66.7	-51.8	220	11.9	-21	-35.9	103.8
Boysen Power Plant														
Turbine Release	kaf	44.6	35.7	36.9	36.9	33.3	92.2	133.9	139.6	138.2	135.2	109.9	106.4	1042.8
Turbine Release	cfs	725	600	600	600	600	1499	2250	2270	2323	2199	1787	1788	
Generation	gwh	3.795	3.093	3.219	3.228	2.93	7.957	11.128	10.891	11.36	11.906	9.879	9.433	88.819
Max Generation	gwh	11.904	11.52	11.904	11.904	10.752	11.904	11.52	11.904	11.52	11.904	11.904	11.52	140.16
% Max Generation	%	32	27	27	27	27	67	97	91	99	100	83	82	
Ave	kwh/af	85	87	87	87	88	86	83	78	82	88	90	89	85
End-Month Power Cap	mw	16	16	16	16	16	16	16	14	16	16	16	16	

Based on reasonable maximum April-July inflow of 1091.0 kaf.

BOYSEN RESERVOIR



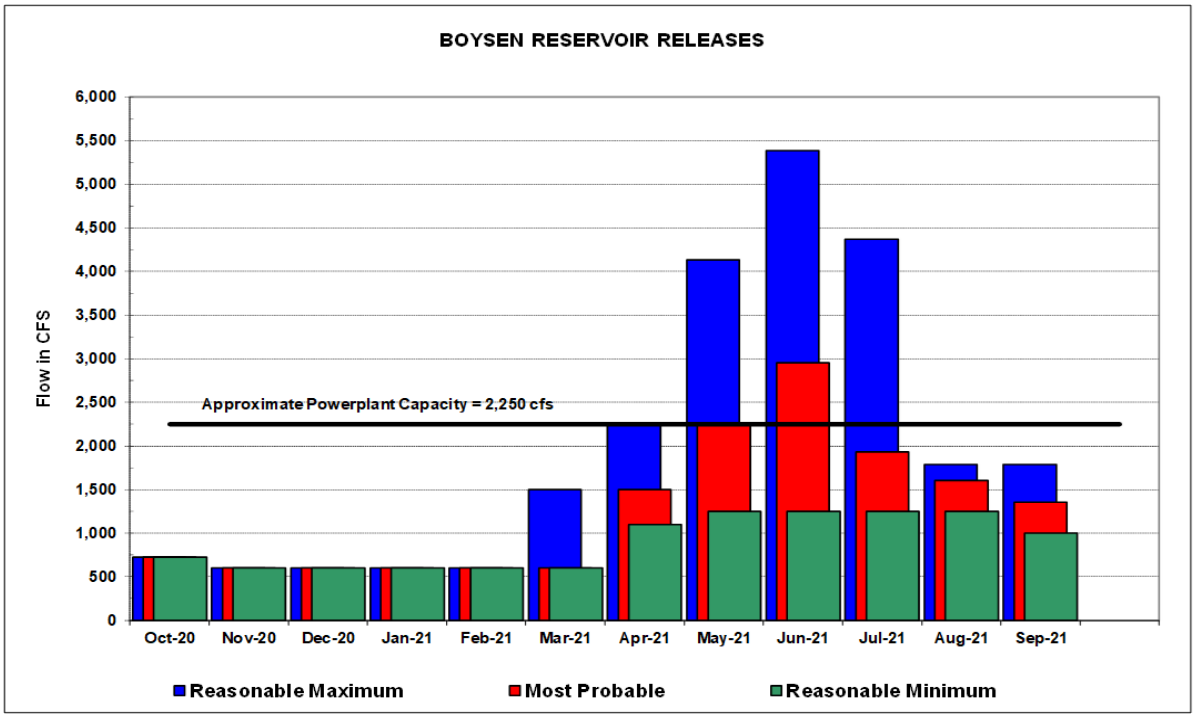


Figure WYG 7: Water Year 2021 forebay elevation and inflow at Boysen Reservoir under a Minimum, Expected, and Maximum-forecast.

Buffalo Bill Reservoir and Powerplants

Three operating plans were prepared for WY 2021 to show the operations of Buffalo Bill Reservoir that could occur under various runoff conditions. The operations for the three runoff conditions are shown in Tables WYT 31, 32, and 33 and Figure WYG 8. These plans were prepared only to show the probable limits of operations; therefore, actual conditions and operations could vary widely from the most probable plan.

Normal Operating Procedures

At the end of the irrigation season, releases will be adjusted with the objective of filling the reservoir to elevation 5,393.50 feet (646,565 AF) while meeting the release criteria of the *Buffalo Bill Reservoir Enlargement Winter Release Operation Agreement*. Under the Agreement, Buffalo Bill Reservoir will be operated to ensure that a minimum flow of 100 cfs is provided in the river below the dam at all times. Additional winter releases beyond the 100 cfs minimum release up to a combined total of 350 cfs in the river below Buffalo Bill Powerplant will be provided based on the criteria set forth in the Agreement.

Reservoir releases to meet downstream irrigation requirements will, to the extent possible, be made through the most efficient power turbines available, after meeting winter flow requirements. A release of at least 100 cfs will be made through the Shoshone Powerplant, whenever the powerplant is available, to provide the required river flow directly below the dam. If the Shoshone Powerplant is not available, the release will be made through the jet flow valve at the Dam.

During irrigation season, releases are determined by the requirements for irrigation, and municipal and industrial demand. If snow conditions, inflow, and reservoir content indicate an assured fill of the reservoir, additional releases may be required after the start of the spring runoff to provide flood control and make optimum use of the water for power generation. An attempt is made to maintain a release of 7,000 cfs or less during the runoff season and assures that outflow is less than inflow at all times of flood rate inflow.

2021 Operating Plans

Under most probable inflow conditions, projected inflows for October, November, and December of WY 2021 have been adjusted to reflect the recent trends for the basin. Inflows for January through September of WY 2021 are median flows or flows that have historically been exceeded 50 percent of the time.

The reasonable minimum volumes are determined from historical lower decile flows for all months of WY 2021. A lower decile flow is a flow that has historically been exceeded 90 percent of the time.

Upper decile volumes are determined from flows that have historically been exceeded 10 percent of the time. These values are projected for January through September of WY 2021 in the reasonable maximum inflows operating plan.

At the beginning of WY 2021, storage in Buffalo Bill Reservoir was 450,099 AF. Winter releases under all three scenarios are the same as defined by the AOP. Based on the criteria set forth in the *Buffalo Bill Reservoir Enlargement Winter Release Operation Agreement*, the 2021 winter release would be

200 cfs. Ice in the Shoshone River can limit Reclamation's ability to change releases during the winter months due to the potential of ice jams near Lovell, Wyoming.

The Shoshone, Buffalo Bill, Heart Mountain, and Spirit Mountain Powerplants will all be available for power generation in WY 2021 after all the winter maintenance is completed. Releases from Buffalo Bill Reservoir will be dependent upon the most efficient operation of all the powerplants while providing the required flow in the Shoshone River.

Table WYT 31: Monthly Operating Plans for Water Year 2021 for Buffalo Bill Reservoir based on the Most Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Buffalo Bill Reservoir (Initial content: 446.4 KAF)														
Monthly Inflow	kaf	27.6	22.5	17.7	15.7	13.9	16.9	35.9	144	324.6	185.8	51.3	28.3	884.2
Shoshone Release	kaf	12.4	6	6.1	12.3	11	12.2	6	12.2	11.3	11.2	11.4	6	118.1
Non-Power Release	kaf	9.4	5.9	6.2	0	0.1	0.1	0	15.3	34.1	56.3	4.7	0	132.1
Total Flow Below Dam	kaf	21.8	11.9	12.3	12.3	11.1	12.3	6	27.5	45.4	67.5	16.1	6	250.2
Buffalo Bill Release	kaf	0	0	0	0	0	0	18.8	54.7	51.3	51.4	51.5	49.5	277.2
Municipal Delivery	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
Heart Mtn Release	kaf	12.7	0	0	0	0	0	8.6	18.6	18	18.6	18.6	17.5	112.6
Heart Mtn Delivery	kaf	8	0	0	0	0	0	7	36	42	48	41	33	215
Total Outflow	kaf	42.8	12.2	12.6	12.6	11.4	12.6	40.7	137.1	157	185.8	127.5	106.3	858.6
Spill/Waste	kaf	0	0	0	0	0	0	0	15.3	32	56.3	4.7	0	108.3
End-Month Targets	kaf		463.9		463.9	463.9	470	460		626.2	626.2	550	472	
End-Month Content	kaf	431.2	441.5	446.6	449.7	452.2	456.5	451.7	458.6	626.2	626.2	550	472	
Est Total Storage	kaf	434.6	444.9	450	453.1	455.6	459.9	455.1	462	629.6	629.6	553.4	475.4	
End-Month Elevation	ft	5365.34	5366.82	5367.55	5368	5368.35	5368.96	5368.28	5369.26	5391.5	5391.5	5381.69	5371.13	
Net Change Content	kaf	-15.2	10.3	5.1	3.1	2.5	4.3	-4.8	6.9	167.6	0	-76.2	-78	25.6
Flow Below BB Pwr	kaf	21.8	11.9	12.3	12.3	11.1	12.3	24.8	82.2	96.7	118.9	67.6	55.5	527.4
Flow Below BB Pwr	cfs	355	200	200	200	200	200	417	1337	1625	1934	1099	933	
Spring Inflow	kaf	3.7	3.6	3.7	3.7	3.3	3.7	3.6	3.7	3.6	3.7	3.7	3.6	43.6
Passing Cody Gage	kaf	38.2	15.5	16	16	14.4	16	37	104.5	118.3	141.2	89.9	76.6	683.6
Passing Cody Gage	cfs	621	260	260	260	259	260	622	1700	1988	2296	1462	1287	
Shoshone Power Plant														
Shoshone Release	kaf	12.4	6	6.1	12.3	11	12.2	6	12.2	11.3	11.2	11.4	6	118.1
Generation	gwh	2.24	1.085	1.109	2.241	2.007	2.231	1.099	2.224	2.158	2.228	2.24	1.135	21.997
Max Generation	gwh	2.232	1.08	1.116	2.232	2.016	2.232	2.16	2.232	2.16	2.232	2.232	2.16	24.084
% Max Generation	-	100	100	99	100	100	100	51	100	100	100	100	53	
Ave	kwh/af	181	181	182	182	182	183	183	182	191	199	196	189	186
End-Month Power Cap	mw	3	2	2	3	3	3	3	3	3	3	3	3	
Buffalo Bill Power Plant														
Buffalo Bill Release	kaf	0	0	0	0	0	0	18.8	54.7	51.3	51.4	51.5	49.5	277.2
Generation	gwh	0	0	0	0	0	0	5.086	13.391	12.951	13.384	13.399	12.62	70.831
Max Generation	gwh	0	0	0	0	0	0	6.48	13.392	12.96	13.392	13.392	12.96	72.576
% Max Generation	-	0	0	0	0	0	0	78	100	100	100	100	97	
Ave	kwh/af							271	245	252	260	260	255	256
End-Month Power Cap	mw	0	0	0	0	0	0	9	18	18	18	18	18	

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Spirit Mountain Power Plant														
Spirit Mtn Release	kaf	20.7	0	0	0	0	0	15.6	34.4	33.3	34.4	34.4	33.3	206.1
Generation	gwh	2.108	0	0	0	0	0	1.591	2.693	2.877	3.263	3.23	2.938	18.7
Max Generation	gwh	2.277	0	0	0	0	0	1.62	3.348	3.24	3.348	3.348	3.24	20.421
% Max Generation	-	93	0	0	0	0	0	98	80	89	97	96	91	
Ave	kwh/af	102						102	78	86	95	94	88	91
End-Month Power Cap	mw	3	0	0	0	0	0	2	4	5	5	4	4	
Heart Mountain Power Plant														
Heart Mtn Release	kaf	12.7	0	0	0	0	0	8.6	18.6	18	18.6	18.6	17.5	112.6
Generation	gwh	3.04	0	0	0	0	0	2.059	4.453	4.309	4.453	4.453	4.189	26.956
Max Generation	gwh	3.036	0	0	0	0	0	2.16	4.464	4.32	4.464	4.464	4.32	27.228
% Max Generation	-	100	0	0	0	0	0	95	100	100	100	100	97	
Ave	kwh/af	239						239	239	239	239	239	239	239
End-Month Power Cap	mw	4	0	0	0	0	0	3	6	6	6	6	6	
Total Generation														
Total Generation	gwh	7.388	1.085	1.109	2.241	2.007	2.231	9.835	22.761	22.295	23.328	23.322	20.882	138.484
End-month Power Cap	mw	10	2	2	3	3	3	17	31	32	32	31	31	

Based on Most Probable inflow of 884.4 kaf.

Table WYT 32: Monthly Operating Plans for Water Year 2021 for Buffalo Bill Reservoir based on the Minimum Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Buffalo Bill Reservoir (Initial content: 446.4 KAF)														
Monthly Inflow	kaf	25.2	22.2	14.4	12.8	11.7	15.8	38.7	145.3	199.1	71.4	25.3	20.6	602.5
Shoshone Release	kaf	6.2	6	6.1	6.2	5.6	6.2	6	6.2	6	6.2	6.2	6	72.9
Non-Power Release	kaf	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1
Total Flow Below Dam	kaf	6.2	6	6.2	6.2	5.6	6.2	6	6.2	6	6.2	6.2	6	73
Buffalo Bill Release	kaf	15.6	5.9	6.1	6.1	5.5	6.1	9.4	52.6	50	51.6	52.7	49.6	311.2
Municipal Delivery	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
Heart Mtn Release	kaf	12.7	0	0	0	0	0	18	14.4	14.8	15.4	8.1	0.3	83.7
Heart Mtn Delivery	kaf	8	0	0	0	0	0	7	36	42	48	41	33	215
Total Outflow	kaf	42.8	12.2	12.6	12.6	11.4	12.6	40.7	109.5	113.1	121.5	108.3	89.2	686.5
Spill/Waste	kaf	0	0	0	0	0	0	0	0	0	0	0	0	0
End-Month Targets	kaf	-	463.9	463.9	463.9	463.9	463.9	463.9	550	626.2	626.2	-	475	-
End-Month Content	kaf	428.8	438.8	440.6	440.8	441.1	444.3	442.3	478.1	564.1	514	431	362.4	-
Est Total Storage	kaf	432.2	442.2	444	444.2	444.5	447.7	445.7	481.5	567.5	517.4	434.4	365.8	-
End-Month Elevation	ft	5364.99	5366.44	5366.7	5366.72	5366.77	5367.23	5366.94	5371.98	5383.54	5376.89	5365.31	5354.75	-
Net Change Content	kaf	-17.6	10	1.8	0.2	0.3	3.2	-2	35.8	86	-50.1	-83	-68.6	-84
Flow Below BB Pwr	kaf	21.8	11.9	12.3	12.3	11.1	12.3	15.4	58.8	56	57.8	58.9	55.6	384.2
Flow Below BB Pwr	cfs	355	200	200	200	200	200	259	956	941	940	958	934	-
Spring Inflow	kaf	3.7	3.6	3.7	3.7	3.3	3.7	3.6	3.7	3.6	3.7	3.7	3.6	43.6
Passing Cody Gage	kaf	38.2	15.5	16	16	14.4	16	37	76.9	74.4	76.9	70.7	59.5	511.5
Passing Cody Gage	cfs	621	260	260	260	259	260	622	1251	1250	1251	1150	1000	-
Shoshone Power Plant														
Shoshone Release	kaf	6.2	6	6.1	6.2	5.6	6.2	6	6.2	6	6.2	6.2	6	72.9
Generation	gwh	1.125	1.086	1.108	1.127	1.018	1.128	1.092	1.14	1.142	1.191	1.148	1.06	13.365
Max Generation	gwh	2.232	1.08	1.116	2.232	2.016	2.232	2.16	2.232	2.16	2.232	2.232	2.16	24.084
% Max Generation	-	50	101	99	50	50	51	51	51	53	53	51	49	-
Ave	kwh/af	181	181	182	182	182	182	182	184	190	192	185	177	183
End-Month Power Cap	mw	3	2	2	3	3	3	3	3	3	3	3	3	-
Buffalo Bill Power Plant														
Buffalo Bill Release	kaf	15.6	5.9	6.1	6.1	5.5	6.1	9.4	52.6	50	51.6	52.7	49.6	311.2
Generation	gwh	4.19	1.602	1.661	1.662	1.499	1.663	2.537	13.088	12.646	13.046	13.219	12.283	79.096
Max Generation	gwh	6.696	10.368	9.374	13.392	12.096	13.392	12.96	13.392	12.96	13.392	13.392	12.96	144.374
% Max Generation	-	63	15	18	12	12	12	20	98	98	97	99	95	-
Ave	kwh/af	269	272	272	272	273	273	270	249	253	253	251	248	254
End-Month Power Cap	mw	9	14	13	18	18	18	18	18	18	18	18	18	-

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Spirit Mountain Power Plant														
Spirit Mtn Release	kaf	20.7	0	0	0	0	0	25	34.4	33.3	34.4	34.4	33.3	215.5
Generation	gwh	2.063	0	0	0	0	0	2.513	2.818	2.868	2.959	2.891	2.683	18.795
Max Generation	gwh	2.277	2.365	3.348	3.348	3.024	3.248	3.013	3.348	3.24	3.348	3.348	3.24	37.147
% Max Generation	-	91	0	0	0	0	0	83	84	89	88	86	83	-
Ave	kwh/af	100	-	-	-	-	-	101	82	86	86	84	81	87
End-Month Power Cap	mw	3	0	0	0	0	0	3	4	5	4	4	3	-
Heart Mountain Power Plant														
Heart Mtn Release	kaf	12.7	0	0	0	0	0	18	14.4	14.8	15.4	8.1	0.3	83.7
Generation	gwh	3.04	0	0	0	0	0	4.309	3.447	3.543	3.687	1.939	0.072	20.037
Max Generation	gwh	3.036	0	0	0	0	0	4.32	4.464	4.32	4.464	4.464	4.32	29.388
% Max Generation	-	100	0	0	0	0	0	100	77	82	83	43	2	-
Ave	kwh/af	239	-	-	-	-	-	239	239	239	239	239	240	239
End-Month Power Cap	mw	4	0	0	0	0	0	6	6	6	6	6	6	-
Total Generation														
Total Generation	gwh	10.418	2.688	2.769	2.789	2.517	2.791	10.451	20.493	20.199	20.883	19.197	16.098	131.293
End-month Power Cap	mw	19	16	15	21	21	21	30	31	32	31	31	30	-

Based on reasonable minimum April-July inflow of 602.4 kaf.

Table WYT 33: Monthly Operating Plans for Water Year 2021 for Buffalo Bill Reservoir based on the Maximum Probable runoff scenario.

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Buffalo Bill Reservoir (Initial content: 446.4 KAF)														
Monthly Inflow	kaf	32.1	27	20.5	17.4	15.5	23.6	57.6	223.5	456.7	304.5	75.7	36.4	1290.5
Shoshone Release	kaf	6.2	5.9	6.1	12.2	11	12.1	11.9	12.7	11.6	11.3	11.4	11.4	123.8
Non-Power Release	kaf	0	6	6.2	0.1	0.1	0.2	60.2	118.1	117.1	168.4	19.2	10.7	506.3
Total Flow Below Dam	kaf	6.2	11.9	12.3	12.3	11.1	12.3	72.1	130.8	128.7	179.7	30.6	22.1	630.1
Buffalo Bill Release	kaf	17.1	0	0	0	0	0	24.2	56.4	52.4	51.7	51.4	51	304.2
Municipal Delivery	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
Heart Mtn Release	kaf	11.2	0	0	0	0	0	9	18.6	18	18.6	18.6	18	112
Heart Mtn Delivery	kaf	8	0	0	0	0	0	7	36	42	48	41	33	215
Total Outflow	kaf	42.8	12.2	12.6	12.6	11.4	12.6	112.6	242.1	241.4	298.3	141.9	124.4	1264.9
Spill/Waste	kaf	0	0	0	0	0	0	22.6	98.8	83.7	164.5	19.2	10.7	399.5
End-Month Targets	kaf	461	463.9	-	-	-	480	423.3	-	620	626.2	560	472	-
End-Month Content	kaf	435.7	450.5	458.4	463.2	467.3	478.3	423.3	404.7	620	626.2	560	472	-
Est Total Storage	kaf	439.1	453.9	461.8	466.6	470.7	481.7	426.7	408.1	623.4	629.6	563.4	475.4	-
End-Month Elevation	ft	5365.99	5368.11	5369.23	5369.9	5370.48	5372.01	5364.17	5361.35	5390.72	5391.5	5383.01	5371.13	-
Net Change Content	kaf	-10.7	14.8	7.9	4.8	4.1	11	-55	-18.6	215.3	6.2	-66.2	-88	25.6
Flow Below BB Pwr	kaf	23.3	11.9	12.3	12.3	11.1	12.3	96.3	187.2	181.1	231.4	82	73.1	934.3
Flow Below BB Pwr	cfs	379	200	200	200	200	200	1618	3045	3043	3763	1334	1228	
Spring Inflow	kaf	3.7	3.6	3.7	3.7	3.3	3.7	3.6	3.7	3.6	3.7	3.7	3.6	43.6
Passing Cody Gage	kaf	38.2	15.5	16	16	14.4	16	108.9	209.5	202.7	253.7	104.3	94.7	1089.9
Passing Cody Gage	cfs	621	260	260	260	259	260	1830	3407	3406	4126	1696	1591	-
Shoshone Power Plant														
Shoshone Release	kaf	6.2	5.9	6.1	12.2	11	12.1	11.9	12.7	11.6	11.3	11.4	11.4	123.8
Generation	gwh	1.127	1.072	1.115	2.239	2.024	2.237	2.153	2.237	2.167	2.232	2.24	2.153	22.996
Max Generation	gwh	2.232	1.08	1.116	2.232	2.016	2.232	2.16	2.232	2.16	2.232	2.232	2.16	24.084
% Max Generation	-	50	99	100	100	100	100	100	100	100	100	100	100	-
Ave	kwh/af	182	182	183	184	184	185	181	176	187	198	196	189	186
End-Month Power Cap	mw	3	2	2	3	3	3	3	3	3	3	3	3	-
Buffalo Bill Power Plant														
Buffalo Bill Release	kaf	17.1	0	0	0	0	0	24.2	56.4	52.4	51.7	51.4	51	304.2
Generation	gwh	4.599	0	0	0	0	0	6.474	13.39	12.96	13.379	13.394	12.965	77.161
Max Generation	gwh	6.696	0	0	0	0	0	6.48	13.392	12.96	13.392	13.392	12.96	79.272
% Max Generation	-	69	0	0	0	0	0	100	100	100	100	100	100	-
Ave	kwh/af	269	-	-	-	-	-	268	237	247	259	261	254	254
End-Month Power Cap	mw	9	0	0	0	0	0	9	18	18	18	18	18	-

Item	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Spirit Mountain Power Plant														
Spirit Mtn Release	kaf	19.2	0	0	0	0	0	16	34.4	33.3	34.4	34.4	33.3	205
Generation	gwh	1.922	0	0	0	0	0	1.608	2.474	2.735	3.245	3.253	2.926	18.163
Max Generation	gwh	2.277	2.365	0	0	0	0	3.24	3.348	3.24	3.348	3.348	3.24	24.406
% Max Generation	-	84	0	0	0	0	0	50	74	84	97	97	90	-
Ave	kwh/af	100	-	-	-	-	-	101	72	82	94	95	88	89
End-Month Power Cap	mw	3	0	0	0	0	0	2	4	5	5	5	4	-
Heart Mountain Power Plant														
Heart Mtn Release	kaf	11.2	0	0	0	0	0	9	18.6	18	18.6	18.6	18	112
Generation	gwh	2.681	0	0	0	0	0	2.154	4.453	4.309	4.453	4.453	4.309	26.812
Max Generation	gwh	2.678	0	0	0	0	0	2.16	4.464	4.32	4.464	4.464	4.32	26.87
% Max Generation	-	100	0	0	0	0	0	100	100	100	100	100	100	-
Ave	kwh/af	239	-	-	-	-	-	239	239	239	239	239	239	239
End-Month Power Cap	mw	4	0	0	0	0	0	3	6	6	6	6	6	-
Total Generation														
Total Generation	gwh	10.329	1.072	1.115	2.239	2.024	2.237	12.389	22.554	22.171	23.309	23.34	22.353	145.132
End-month Power Cap	mw	19	2	2	3	3	3	17	31	32	32	32	31	-

Based on reasonable maximum April-July inflow of 1042.2 kaf.

BUFFALO BILL RESERVOIR

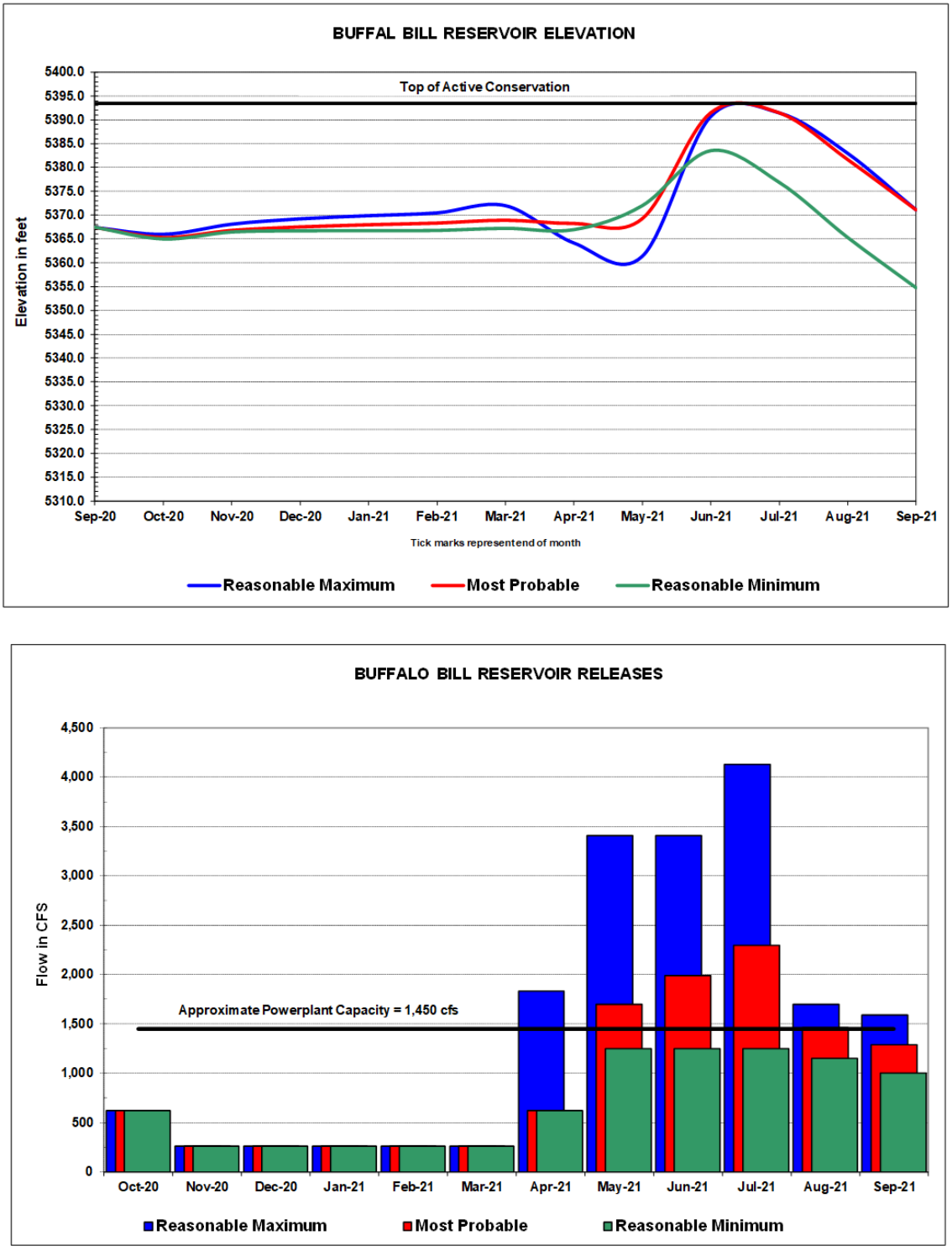


Figure WYG 8: Water Year 2021 forebay elevation and inflow at Buffalo Bill Reservoir under a Minimum, Expected, and Maximum forecast.

Task Name	Start	Finish	Outage Hours	Notes	Total Unit Outage Hours	Planned Availability
Big Horn Basin						
Buffalo Bill						
Buffalo Bill Unit One					576	93%
Annual	1/4/2021	1/26/2021	576	Short Annual		
	1/27/2021	1/28/2021				
Buffalo Bill Unit Two					744	92%
Annual	2/1/2021	3/2/2021	744	Long Annual		
	3/1/2022	3/2/2021	0			
	3/3/2021	3/4/2021				
Buffalo Bill Unit Three					576	93%
Annual	11/9/2020	12/1/2020	576	Short Annual		
	12/2/2020	12/3/2020				
Spirit Mountain						
Spirit Mountain Unit One					648	93%
	4/13/2021	4/14/2021	36	HMID Spring walk-thru Clearance		
	11/20/2020	4/13/2021		Seasonal Plant-ID determines shutdown & startup		
Annual	10/26/2020	11/19/2020	576	Short annual		
	4/21/2021	4/22/2021	36	Heat run - date is water dependent		
Shoshone						
Shoshone Unit Three					744	92%
Annual	11/16/2020	12/15/2020	744	Long Annual		
Functional Testing	12/14/2020	12/15/2020	0			
	12/16/2020	12/17/2020				
Heart Mountain						
Heart Mountain Unit One					1188	86%
	10/26/2020	11/19/2020	576	Unavailable		
	4/13/2021	4/14/2021	36	HMID Spring walk-thru Clearance		
Annual	2/8/2021	3/4/2021	576	Short Annual		
	10/20/2020	4/13/2021		Seasonal Plant-ID determines shutdown & startup		
	4/14/2021	4/15/2021	36	Heat run - date is water dependent		
Boysen						
CO2 Odorizer	10/19/2020	11/5/2020				
Penstock Interior Inspection	10/19/2020	11/5/2020				
Boysen Unit Two					1080	88%
Annual	10/19/2020	12/3/2020	1080			
Plant offline	10/19/2020	11/5/2020	415			
K1A 4.16KV ISE Phase Bus HiPot Test	10/21/2020	11/4/2020		Alternate Feed / 5 Year		
Ring Seal Gate 2 Inspection	10/19/2020	11/5/2020		Annual		
K1A Generator Transformer	10/20/2020	10/30/2020		Annual		
Governor Alignment	10/26/2020	10/27/2020		5 year		
Governor Accumulator Float Inspection	10/26/2020	10/27/2020		5 year		
U2 Penstock Ultrasonic Thickness Survey &	11/2/2020	11/6/2020		Boysen rehab		
Runner Crack Inspection	10/21/2020	11/4/2020		Annual		
Unit one on-line	11/5/2020					
Unit Two CO2 Nozzles	10/19/2020	11/25/2020				
Breaker 5 Maintenance	10/19/2020	11/25/2020				
Stator	10/19/2020	11/25/2020				
Station Service	10/19/2020	11/25/2020				
BO PP - U2 TEMPERATURE RECORDER TESTING	10/19/2020	11/25/2020		Annual		
BO PP - U2 TRANSDUCER INSPECTION & CALIBI	10/19/2020	11/25/2020				
BO PP - U2 EXCITER RELAY TESTING	10/19/2020	11/25/2020		2 year		
BO PP - U2 CT TESTING	10/19/2020	11/25/2020		6 year		
BO PP - U2 PT TESTING	10/19/2020	11/25/2020		6 year		
BO-U2 11G2 RELAY SETTINGS CHANGES AND TI	10/19/2020	11/25/2020				
BO SS ANNUAL	10/19/2020	11/25/2020		Annual		
BO PP - BUS 2 PT TESTING	10/19/2020	11/25/2020		5 year		
BO PP - CHANGE THE NEXT SCHEDULED MAINT	10/19/2020	11/25/2020				
BO PP - SS RELAY TESTING	10/19/2020	11/25/2020		2 year		
Boysen Unit One					1152	87%
Annual	1/4/2021	1/28/2021	744			
Plant off line (K1A annual and penstock inspec	10/19/2020	11/5/2020	408			
Stator	1/4/2021	2/4/2021				
Rotor	1/4/2021	2/4/2021				
BO PP - U1 TEMPERATURE RECORDE	1/4/2021	2/4/2021				
BO PP - U1 TRANSDUCER INSPECTION	1/4/2021	2/4/2021				
Breaker 3 Maintenance	1/4/2021	2/4/2021				
Breaker 4 Maintenance	1/4/2021	2/4/2021				

Figure WYG 9: Water Year 2021 Scheduled Outages for Bighorn Powerplants.

Annual Operating Plans for Water Year 2020 for Missouri Basin Units Under the Responsibility of the Montana Area Office (MTAO)

Water Year 2020 Hydrologic Conditions

October through December

Water year (WY) 2020 began in October with varying storage levels across the state of Montana. Willow Creek Reservoir was empty, having been drained in WY 2019 for gate maintenance purpose and repairs, while Clark Canyon storage content was 148 percent of average. The Reclamation reservoir with the greatest amount of carryover storage was Bighorn Lake at 98 percent of full capacity.

Temperatures in October were six to ten degrees below normal temperatures across Montana. Precipitation amounts were mixed, with below normal values across southeast Montana and above normal amounts fell across the northern Rockies. Precipitation was heaviest in the Maria Pass area recording 7.3 inches while the statewide soil moisture was above normal during October.

November temperature anomalies were four degrees below normal over most of the Montana. Precipitation was scattered throughout Montana with the heaviest precipitation occurring along the Rocky Mountain front and northern high line. The towns of Choteau and Cut Bank exceeded and nearly doubled the yearly average snowfall by the month's end, Table MTT 1.

Table MTT 1: Inches of snow as reported by the National Weather Service.

Location	End of November Snowfall (inches)	Normal Snowfall for Season (inches)
Bozeman	17.9	40.2
Chinook	22.5	31.2
Choteau	68.6	39.8
Cut Bank	61.7	33.6
Dillon	25.6	37.9
East Glacier	90.8	176.6
Great Falls	60.4	63.5
Helena	19.3	38.1
West Yellowstone	35.6	162.7

December temperatures were all near to above normal with Yellowtail Dam recording about 10°F above normal for the month. The northern Rockies exhibited below normal precipitation while 200 to 300 percent of normal fell in southwestern Montana. The year to date mountain precipitation from October through December ranged from 73 percent of average in the Madison drainage to 96 percent of average in the Gallatin drainage and above Lake Sherburne. The valley precipitation ranged from 72 percent of average in the Beaverhead Basin to 163 percent of average in the Sun-Teton and Marias basins. Additional monthly data on valley and mountain precipitation per basin during WY 2020 can be found in Figures MTG 1, 2, 3, and 4.

PRECIPITATION IN INCHES AND PERCENT OF AVERAGE
2020 VALLEY PRECIPITATION

BASIN	OCT		NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP	
	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%
Beaverhead																								
Monthly Average Precip	0.98		0.69		0.60		0.61		0.51		0.79		1.21		2.11		2.11		1.25		1.13		0.95	
Monthly Precip and % of Average	0.74	76	0.35	51	0.54	90	0.59	96	0.85	166	0.73	92	0.42	34	1.37	65	3.05	145	0.84	67	0.42	37	0.64	67
Year-to-Date Precip and % of Average	0.74	76	1.09	66	1.63	72	2.22	77	3.07	91	3.80	91	4.22	78	5.59	75	8.64	90	9.48	87	9.90	83	10.54	81
Jefferson																								
Monthly Average Precip	0.88		0.57		0.45		0.40		0.38		0.63		1.04		1.91		2.05		1.26		1.15		0.94	
Monthly Precip and % of Average	0.65	74	0.41	73	0.47	103	0.33	82	0.65	173	0.64	101	0.39	38	1.21	63	3.07	150	0.57	45	0.39	34	0.62	66
Year-to-Date Precip and % of Average	0.65	74	1.06	74	1.53	81	1.86	81	2.51	94	3.15	95	3.54	82	4.75	76	7.82	94	8.39	88	8.78	82	9.40	81
Madison																								
Monthly Average Precip	1.59		1.69		1.76		1.56		1.35		1.73		2.01		2.73		2.60		1.63		1.32		1.27	
Monthly Precip and % of Average	1.77	112	0.94	56	1.00	57	1.68	108	1.75	129	1.77	102	1.34	67	2.14	79	3.36	129	1.21	74	0.60	45	0.93	73
Year-to-Date Precip and % of Average	1.77	112	2.71	83	3.72	74	5.40	82	7.14	90	8.91	92	10.25	88	12.40	86	15.76	93	16.97	91	17.57	88	18.49	87
Gallatin																								
Monthly Average Precip	1.28		0.85		0.59		0.56		0.53		1.01		1.73		2.63		2.66		1.38		1.18		1.23	
Monthly Precip and % of Average	1.31	102	0.86	101	0.20	33	0.31	56	1.08	202	1.14	113	0.91	53	1.25	47	3.38	127	0.82	59	0.45	38	0.54	44
Year-to-Date Precip and % of Average	1.31	102	2.17	102	2.36	87	2.68	81	3.75	98	4.89	101	5.80	88	7.05	77	10.44	88	11.25	85	11.70	81	12.25	78
Missouri Above Toston																								
Monthly Precip Average	1.13		0.91		0.81		0.74		0.65		0.99		1.42		2.29		2.34		1.40		1.21		1.09	
Monthly Precip and % of Average	1.06	94	0.62	68	0.55	68	0.68	92	1.01	155	1.01	102	0.72	51	1.51	66	3.30	141	0.82	59	0.45	37	0.67	61
Year-to-Date Precip and % of Average	1.06	94	1.69	83	2.23	78	2.92	81	3.93	93	4.94	94	5.67	85	7.17	80	10.47	93	11.29	89	11.74	85	12.41	83
Sun-Teton																								
Monthly Average Precip	0.81		0.47		0.41		0.39		0.39		0.79		1.33		2.19		2.54		1.33		1.43		1.41	
Monthly Precip and % of Average	1.31	163	1.35	288	0.09	23	0.07	17	0.33	83	0.72	91	1.09	82	3.00	137	4.26	167	0.53	40	0.44	31	0.89	63
Year-to-Date Precip and % of Average	1.31	163	2.66	209	2.76	163	2.82	136	3.15	128	3.86	119	4.95	108	7.95	117	12.21	131	12.74	120	13.18	109	14.07	104
Marias																								
Monthly Average Precip	0.67		0.75		0.64		0.62		0.57		0.85		1.11		1.96		2.55		1.38		1.19		1.20	
Monthly Precip and % of Average	0.84	125	2.08	277	0.42	65	0.51	82	0.61	108	0.89	105	0.92	83	2.74	140	3.51	138	0.47	34	0.46	39	1.06	89
Year-to-Date Precip and % of Average	0.84	125	2.92	206	3.34	162	3.85	143	4.46	137	5.35	131	6.28	120	9.02	126	12.53	129	13.00	117	13.46	110	14.53	108
Milk																								
Monthly Average Precip	0.72		0.46		0.39		0.38		0.28		0.52		0.90		2.05		2.52		1.56		1.17		1.26	
Monthly Precip and % of Average	0.44	60	1.35	291	0.32	83	0.22	57	0.43	150	0.35	67	0.53	59	2.00	97	2.87	114	1.19	76	0.41	35	1.57	124
Year-to-Date Precip and % of Average	0.44	60	1.78	150	2.11	134	2.32	119	2.75	123	3.10	112	3.62	99	5.62	98	8.49	103	9.69	99	10.10	92	11.67	95
St. Mary																								
Monthly Average Precip	1.87		2.80		2.30		2.27		2.15		2.47		2.24		2.80		3.54		1.72		1.43		1.80	
Monthly Precip and % of Average	2.44	131	2.03	73	1.62	70	2.60	115	2.25	104	2.36	95	2.57	115	2.49	89	4.41	125	0.99	57	0.38	26	1.29	72
Year-to-Date Precip and % of Average	2.44	131	4.47	96	6.09	87	8.69	94	10.93	96	13.29	96	15.86	99	18.34	97	22.75	101	23.73	98	24.11	94	25.40	93
Bighorn Above Yellowtail																								
Monthly Average Precip	0.93		0.55		0.42		0.36		0.39		0.67		1.16		1.81		1.43		0.88		0.60		1.06	
Monthly Precip and % of Average	0.85	92	0.83	149	0.22	52	0.31	84	1.00	254	0.37	55	1.13	98	0.75	41	1.66	116	0.27	31	0.27	45	0.68	64
Year-to-Date Precip and % of Average	0.85	92	1.68	113	1.90	100	2.21	97	3.21	121	3.58	107	4.71	105	5.46	87	7.12	92	7.39	86	7.66	83	8.34	81

The following National Weather Service station locations were input into PRISM to compute the data in Table MTT1A:

Beaverhead.....Dillon 18 WSW, Dillon Airport, Grant 5 SE, Lima, Polaris 3.7 NNE and Wisdom

Jefferson.....Alder 19 S, Boulder 0.3 E, Diloon 18 WSW, Dillon Airport, Glen 0.2 SE, Grant 5 SE, Laurin 2 NE, Lima, Sheridan 1.4 ENE, Twin Bridges, Wisdom and Wise River 3 WNW

Madison.....Bozeman Montana State University, Ennis, Hebgen Dam, Norris Madison Power House, Old Faithful and West Yellowstone Gateway

Gallatin.....Bozeman 6 W Experimental Farm, Bozeman 1.5 SSE, Bozeman Gallatin Field Airport and Logan Landfill

Missouri Above Toston.....Alder 19 S, Boulder 0.3 E, Bozeman 1.5 SSE, Bozeman 6 W Experimental Farm, Bozeman Gallatin Airport and Bozeman Montana State University, Dillon 18 WSW, Dillon Airport, Ennis, Glen 0.2 SE, Grant 5 SE, Hebgen Dam, Laurin, Lima, Logan Landfill, Norris Madison Power House, Old Faithful, Polaris 3.7 NNE, Sheridan 1.4 ENE, Townsend, Trident, Twin Bridges, West Yellowstone Gateway, Wisdom and Wise River 3 WNW

Sun-Teton.....Cascade 5 S, Choteau 8 NE, Choteau, Dutton 3.3 ENE, Fairfield, Great Falls Weather Forecast Office, Rogers Pass 9 NNE and Sun River 4 S

Marias.....Chester, Conrad, Cut Bank Airport, Dunkirk 19 NNE, East Glacier, Galata 16 SW and Shelby

Milk.....Chinook, Fort Belknap 2 SW, Gildford, Glasgow Weather Forecast Office, Goldbutte 7 N, Harlem 20 S, Havre Airport ASOS, Hingham 12 N, Hinsdale 4 SW, Hogeland 7.0 SSE, Malta, Rudyard 21 N, Saco 1 NNW and Simpson 6 N Wildhorse

St. Mary.....East Glacier and St Mary 1 SSW

Bighorn Above Yellowtail....Basin, Black Mountain, Boysen Dam, Buffalo Bill Dam, Burris, Cody 12 SE, Cody 7.6 NNW, Deaver, Dubois, Emblem, Fort Smith 0.5 ENE, Greybull South Big Horn Co Airport, Lander 11 SSE, Lander 7.3 WNW, Lander Airport, Lovell, Pahaske, Pavillion, Powell Field Station, Rairden 2 WSW, Riverton Regional Airport, Shell 9.5 NNW, Shell, Shoshoni, Sunshine 3 NE, Ten Sleep 0.3 SSW, Tensleep 16 SSE, Thermopolis, Thermopolis 9 NE, Worland 14.4 SW and Worland Municipal Airport

Figure MTG 1: 2020 Annual monthly precipitation data for valleys of interest in Montana and Wyoming.

PRECIPITATION IN INCHES AND PERCENT OF AVERAGE
2020 VALLEY PRECIPITATION

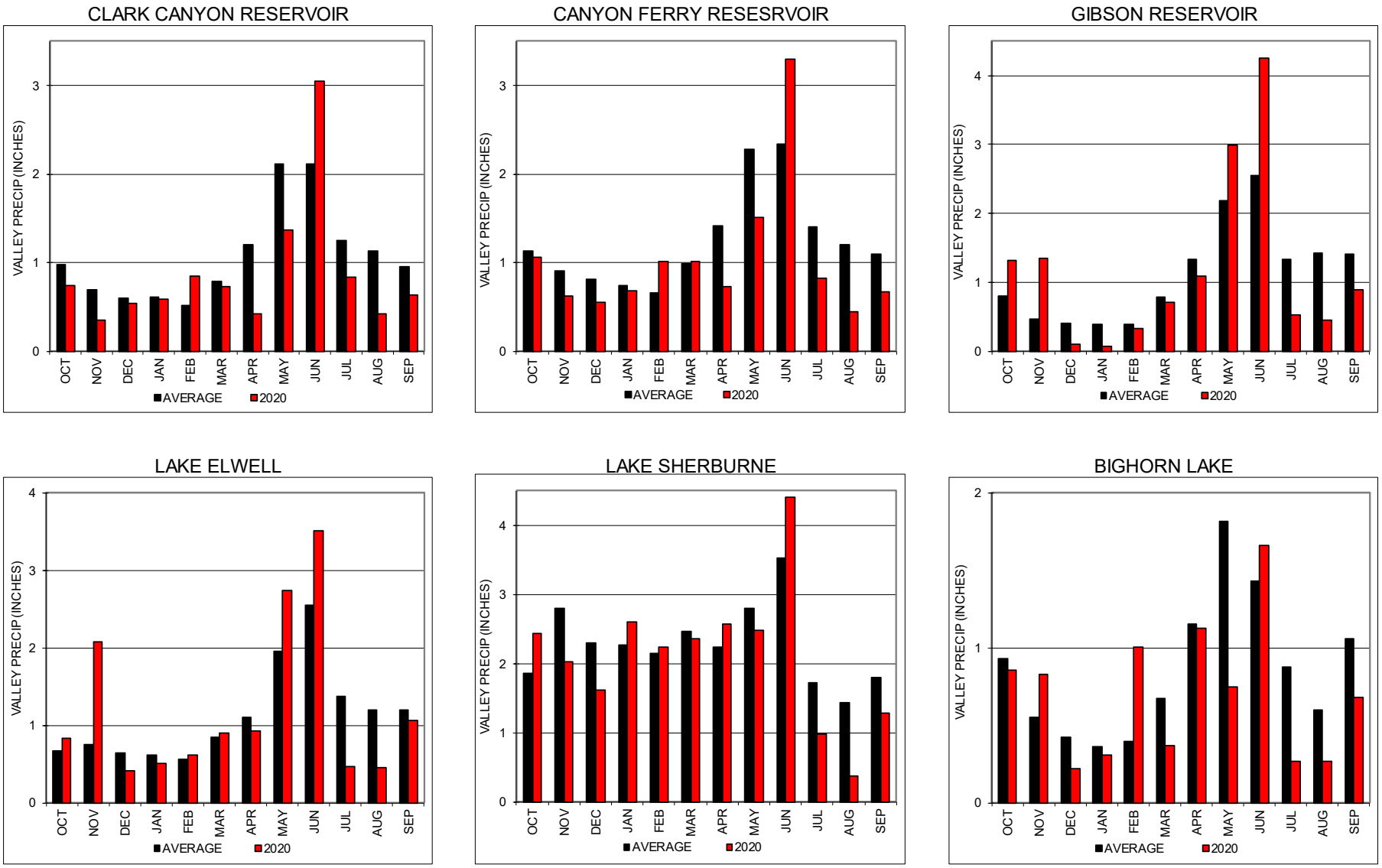


Figure MTG 2: 2020 Annual monthly precipitation in valleys above selected reservoirs in Montana and Wyoming.

PRECIPITATION IN INCHES AND PERCENT OF AVERAGE
2020 MOUNTAIN PRECIPITATION

BASIN	OCT		NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP	
	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%	IN.	%
Lima Reservoir																								
Monthly Average Precip	2.04		2.42		2.70		2.58		2.18		2.54		2.54		3.06		2.84		1.64		1.32		1.54	
Monthly Precip and % of Average	2.34	115	1.42	59	2.18	81	2.92	113	2.10	96	2.68	106	1.74	69	2.44	80	4.88	172	1.04	63	0.60	45	0.56	36
Year-to-Date Precip and % of Average	2.34	115	3.76	84	5.94	83	8.86	91	10.96	92	13.64	94	15.38	90	17.82	89	22.70	99	23.74	97	24.34	94	24.90	91
Clark Canyon Reservoir																								
Monthly Average Precip	2.16		2.59		2.53		2.43		2.09		2.59		2.97		3.41		3.04		1.54		1.46		1.67	
Monthly Precip and % of Average	3.00	139	1.11	43	1.94	77	2.80	115	3.34	160	2.67	103	1.93	65	2.74	80	4.90	161	0.83	54	0.60	41	0.80	48
Year-to-Date Precip and % of Average	3.00	139	4.11	87	6.06	83	8.86	91	12.20	104	14.87	103	16.80	97	19.54	94	24.44	103	25.27	100	25.87	97	26.67	94
Jefferson Drainage																								
Monthly Average Precip	2.11		2.61		2.61		2.53		2.15		2.60		2.97		3.38		3.01		1.58		1.54		1.72	
Monthly Precip and % of Average	2.92	139	1.19	45	1.70	65	3.01	119	3.23	150	2.41	93	2.01	68	2.76	82	5.31	177	0.92	58	0.59	39	1.07	62
Year-to-Date Precip and % of Average	2.92	139	4.11	87	5.81	79	8.81	89	12.04	100	14.45	99	16.46	94	19.21	92	24.52	102	25.44	100	26.03	96	27.10	94
Madison Drainage																								
Monthly Average Precip	2.81		3.80		4.15		3.98		3.34		3.71		3.78		4.05		3.25		1.83		1.65		1.89	
Monthly Precip and % of Average	3.20	114	1.54	40	3.00	72	4.64	117	3.24	97	4.31	116	2.65	70	3.33	82	4.56	140	1.40	77	0.91	55	1.26	67
Year-to-Date Precip and % of Average	3.20	114	4.74	72	7.74	72	12.38	84	15.61	86	19.93	91	22.58	88	25.90	87	30.46	93	31.86	92	32.78	90	34.04	89
Gallatin Drainage																								
Monthly Average Precip	3.03		3.37		3.43		3.30		3.00		3.90		4.47		5.00		4.17		2.23		1.93		2.27	
Monthly Precip and % of Average	4.77	157	2.40	71	2.27	66	3.90	118	5.53	184	4.57	117	2.80	63	4.43	89	4.47	107	1.17	52	0.80	41	1.57	69
Year-to-Date Precip and % of Average	4.77	157	7.17	112	9.43	96	13.33	102	18.87	117	23.43	117	26.23	107	30.67	104	35.13	104	36.30	101	37.10	98	38.67	96
Canyon Ferry Reservoir																								
Monthly Average Precip	2.36		3.01		3.13		3.03		2.57		3.00		3.29		3.68		3.17		1.66		1.57		1.79	
Monthly Precip and % of Average	3.19	135	1.41	47	2.12	68	3.57	118	3.50	136	3.17	106	2.22	68	3.09	84	4.99	158	1.06	64	0.69	44	1.11	62
Year-to-Date Precip and % of Average	3.19	135	4.60	86	6.72	79	10.30	89	13.79	98	16.97	99	19.19	94	22.28	93	27.27	100	28.33	98	29.02	95	30.13	93
Gibson Reservoir																								
Monthly Average Precip	2.19		2.74		2.69		2.39		2.23		2.41		2.54		3.49		3.62		1.72		1.99		2.11	
Monthly Precip and % of Average	3.36	154	2.28	83	1.32	49	2.23	93	2.37	106	2.22	92	2.79	110	3.22	92	6.80	188	0.52	30	0.41	21	1.14	54
Year-to-Date Precip and % of Average	3.36	154	5.65	114	6.97	91	9.19	92	11.57	94	13.79	94	16.58	96	19.79	96	26.59	109	27.12	104	27.53	98	28.66	95
Lake Elwell Reservoir																								
Monthly Average Precip	3.00		4.20		4.16		3.96		3.46		3.58		3.40		4.12		4.12		1.86		2.14		2.60	
Monthly Precip and % of Average	4.58	153	2.66	63	2.52	61	4.42	112	3.96	114	3.12	87	3.60	106	3.66	89	6.96	169	0.56	30	0.28	13	1.44	55
Year-to-Date Precip and % of Average	4.58	153	7.24	101	9.76	86	14.18	93	18.14	97	21.26	95	24.86	97	28.52	95	35.48	104	36.04	101	36.32	96	37.76	93
Sherburne Reservoir																								
Monthly Average Precip	4.55		7.60		6.90		7.35		5.35		5.15		4.60		4.60		5.25		2.45		2.00		3.30	
Monthly Precip and % of Average	4.60	101	3.90	51	9.75	141	9.55	130	4.95	93	6.50	126	3.10	67	4.05	88	7.05	134	1.40	57	0.30	15	1.55	47
Year-to-Date Precip and % of Average	4.60	101	8.50	70	18.25	96	27.80	105	32.75	103	39.25	106	42.35	102	46.40	101	53.45	104	54.85	102	55.15	99	56.70	96
Bighorn Lake																								
Monthly Average Precip	2.31		2.43		2.27		2.23		1.99		2.62		3.21		3.54		2.66		1.65		1.36		2.07	
Monthly Precip and % of Average	2.90	126	1.88	78	1.51	67	2.23	100	2.63	133	2.06	79	2.85	89	2.16	61	2.52	95	0.76	46	0.42	31	1.81	87
Year-to-Date Precip and % of Average	2.90	126	4.78	101	6.29	90	8.52	92	11.15	99	13.21	96	16.06	94	18.22	89	20.73	89	21.49	86	21.91	83	23.72	84

The following Natural Resources Conservation Service SNOTEL site data was used to compute Table MTT1B:

Lima Reservoir.....Crab Creek, Divide, Island Park, Lakeview Ridge and Tepee Creek

Clark Canyon Reservoir.....Beagle Springs, Bloody Dick, Darkhorse Lake, Divide, Lakeview Ridge, Lemhi Ridge and Tepee Creek

Jefferson Drainage.....Beagle Springs, Bloody Dick, Calvert Creek, Clover Meadow, Darkhorse Lake, Divide, Frohner Meadow, Lakeview Ridge, Lemhi Ridge, Lower Twin, Moose Creek, Mule Creek, Rocker Peak, Saddle Mtn, Short Creek and Tepee Creek

Madison Drainage.....Beaver Creek, Black Bear, Carrot Basin, Clover Meadow, Lower Twin, Madison Plateau, Tepee Creek and Whiskey Creek

Gallatin Drainage.....Carrot Basin, Lick Creek and Shower Falls

Canyon Ferry Reservoir.....Beagle Springs, Beaver Creek, Black Bear, Bloody Dick, Calvert Creek, Carrot Basin, Clover Meadow, Darkhorse Lake, Divide, Frohner Meadow, Lakeview Ridge, Lemhi Ridge, Lick Creek, Lower Twin, Madison Plateau, Moose Creek, Mule Creek, Rocker Peak Saddle Mtn, Short Creek, Shower Falls, Tepee Creek and Whiskey Creek

Gibson Reservoir.....Dupuyer Creek, Mount Lockhart, Waldron and Wood Creek, Gibson (NWS/PRISM)

Lake Elwell Reservoir.....Badger Pass, Dupuyer Creek, Mount Lockhart, Pike Creek and Waldron

Sherburne Reservoir.....Flattop Mountain and Many Glacier

Bighorn Lake.....Bald Mountain, Bear Trap Meadow, Blackwater, Bone Springs Div, Cold Springs, Deer Park, Evening Star, Grave Springs, Hobbs Park, Kirwin, Little Warm, Middle Powder, Owl Creek, Powder River Pass, Shell Creek, South Pass, St. Lawrence Alt, Sylvan Lake, Sylvan Road, Timber Creek, Togwotee Pass, Townsend Creek and Younts Peak.

Figure MTG 3: 2020 Annual monthly precipitation data for mountains of interest in Montana and Wyoming.

PRECIPITATION IN INCHES AND PERCENT OF AVERAGE
2020 MOUNTAIN PRECIPITATION

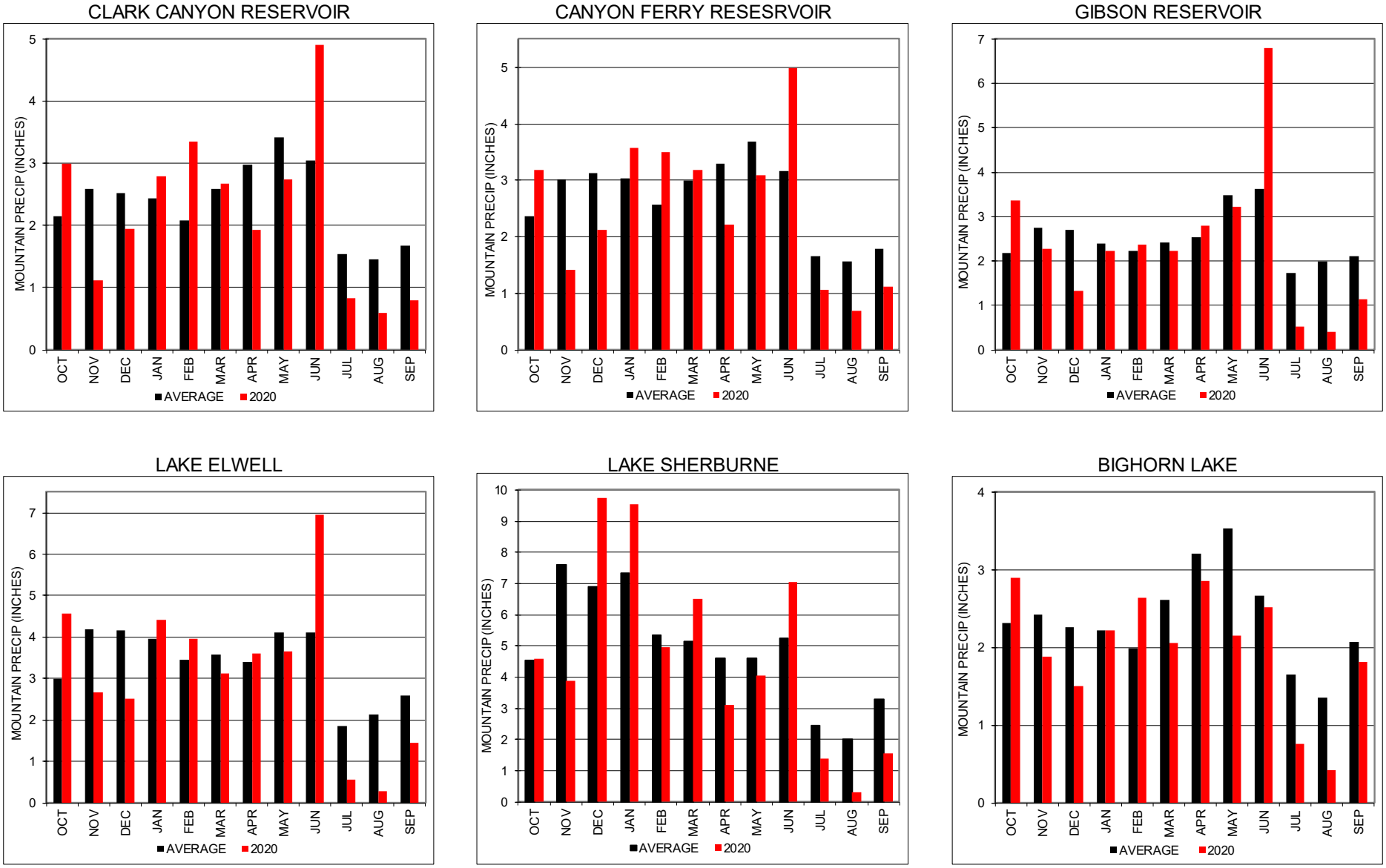


Figure MTG 4: 2020 Annual monthly precipitation in mountains above selected reservoirs in Montana and Wyoming.

January through March

On January 1 the Natural Resources Conservation Service (NRCS) begins reporting mountain snowpack or snow water equivalent (SWE) throughout Montana and parts of Wyoming. For January 1, the NRCS mountain snow water content ranged from 79 percent of normal in the Madison River Basin to 122 percent of normal in the Sun, Teton, and Marias River Basins, Figure MTG5. A tabular report of the snow water content is also shown on Table MTT 2. On January 1, Reclamation began forecasting the April through July spring runoff volumes for Reclamation reservoirs east of the Continental Divide. The water supply forecasts prepared on January 1 for April through July runoff volumes varied from 80 percent of average for Fresno Dam to 110 percent of average for Gibson Dam, Table MTT 3. Montana temperatures continued to be slightly above normal for January, while precipitation was 25 to 50 percent of normal across much of the state.

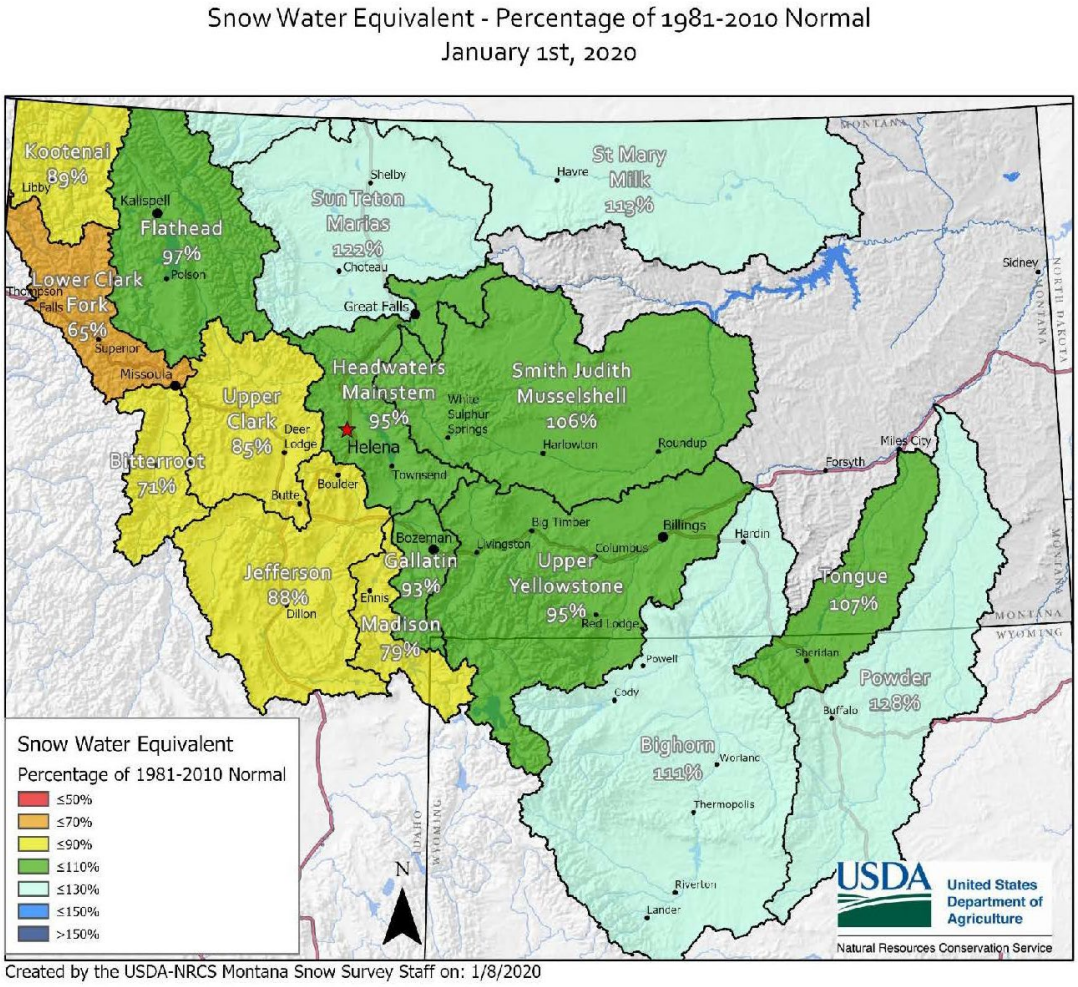


Figure MTG 5: January 1, 2020 Snow Water Equivalent, Percent of Normal (NRCS).

Table MTT 2: 2020 NRCS mountain snow water content as a percent of normal.

DRAINAGE BASIN	JAN 1	FEB 1	MAR 1	APR 1	MAY 1
Jefferson	88	99	113	108	94
Madison	79	94	99	106	93
Gallatin	93	104	120	115	106
Headwaters Mainstem Missouri	95	110	120	107	96
Sun-Teton-Marias	122	110	115	114	138
St. Mary - Milk River	113	125	127	138	137
Lower Yellowstone (Bighorn Basin)	111	112	121	112	105

Table MTT 3: 2020 Reclamation water supply forecasts.

RESERVOIR	JAN 1, KAF[1]	% OF AVG	FEB 1, KAF[1]	% OF AVG	MAR 1, KAF[1]	% OF AVG	APR 1, KAF[2]	% OF AVG	MAY 1, KAF[3]	% OF AVG	JUN 1, KAF[4]	% OF AVG	APRIL-JULY, KAF[5]	% OF AVG	% OF APRIL FORECAST[6]
Clark Canyon	71.7	90	64	82	82	105	96	120	59.8	95	33.5	84	58.4	74	61
Canyon Ferry	1,843.40	102	1,866.00	104	2,250.00	126	2,123.00	118	1,432.00	97	799	98	1,822.30	100	80
Gibson	455	110	395	95	424	100	434	104	414	111	198	117	451.8	109	104
Tiber	383	99	396	103	406	105	429	111	362	110	182	94	485.7	126	113
Sherburne	93.6	94	107	108	113	114	108	109	101	113	71	123	106	107	98
Fresno[7]	65	80	67.9	84	70	86	65	108	37	85	21.6	89	76	94	106
Yellowtail	1,115.00	89	1,216.00	97	1,459.00	116	1,469.00	117	938	87	444	58	1,041.70	83	71

1/ Runoff Forecast for April-July; Fresno Reservoir is March through September
2/ Runoff Forecast for April-July; Fresno Reservoir is April through September
3/ Runoff Forecast for May-July; Fresno Reservoir is May through September
4/ Runoff Forecast for June-July; Fresno Reservoir is June through September
5/ Fresno Reservoir is Actual March through September
6/ Fresno Reservoir is % of March Forecasted
7/ Fresno Reservoir Forecast is natural flow of Milk River at Eastern Crossing for March -September; Forecasts by Alberta Environment and Parks

February brought 150 - 300 percent of normal precipitation to southwestern Montana and northern Wyoming with up to eight degrees below normal in the same areas. The rest of the state of Montana continued with near normal conditions.

All the March 1 water supply forecasts (April through July) increased as a result of the above normal snowfall during February. During mid-March, a strong weather system moved south through the eastern plains of Montana with blizzard conditions and power outages along the Rocky Mountain Front. Snowfall totals of around a foot or more fell from Helena to Lewistown to Zortman, then to Cut Bank and back to the Rocky Mountain Front. Heavy amounts also fell over the southern mountains, 12 to 21 inches. The rest of the month was more tranquil with temperatures varying a few degrees either side of normal. Another winter system moved into the state on the March 31 where some areas reported up to 6 to 12 inches of snow. Temperatures returned to cooler than normal by the months end.

April through June

The April 1 month to date snow water equivalent were above or near normal, Figure MTG6. The April through July forecasted runoff volumes remained near the March 1 forecasts. The April 1 forecasts ranged from 104 percent of average into Gibson Dam to 120 percent of average into Clark Canyon Dam. All of Reclamation's reservoirs reached their peak snowpack for the year between April 17 and 19, Figure MTG7.

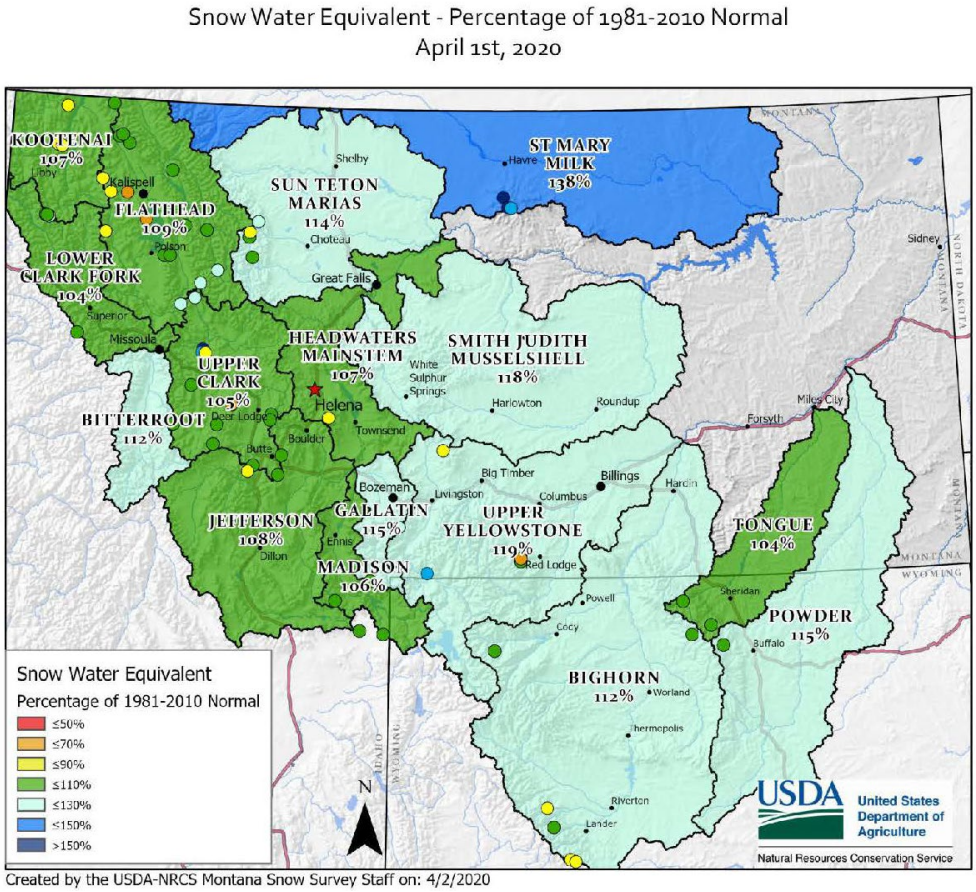


Figure MTG 6: NRCS Snow Water Equivalent, April 1, 2020.

April began with very cold temperatures, up to 25 to 30 degrees below normal with high temperatures in the teens. A few winter storm systems brought precipitation to western and southwest Montana. The greatest precipitation amounts of over 1.5 inches fell over portions of western Montana. Even though some rain fell, most of the state reported much below normal precipitation, down to 25 percent of normal. April's mountain precipitation varied from a low of 63 percent of average in the Gallatin River Basin to 110 percent of average above Gibson Reservoir. The April valley precipitation varied from a low at 34 percent of average in the Beaverhead River Basin to 115 percent of average in the St. Mary's River Basin. Due to the below average precipitation during the month, many reservoirs cut back on river releases or remained steady to conserve storage and limit reservoir drafting.

May began with near normal temperatures in Montana, cooling to a period of below normal temperatures by midmonth. During this time, a storm brought up to 2 inches of rain in central Montana and snow to some of the Rocky Mountain ranges. Temperatures were mixed throughout Montana while warmer temperatures prevailed in Wyoming, Figures MTG 8, 9, 10, and 11. Precipitation continued to lack in the Milk River Basin and the basins above Canyon Ferry Reservoir and Yellowtail Dam. By the end of May, the year to date mountain precipitation varied from a low of 87 percent of average in the Beaverhead River Basin to 126 percent of average in the Marias River Basin. The year to date valley precipitation varied from a low at 75 percent of average in the Beaverhead River Basin to 104 percent of average in the Gallatin River Basin.

Drought conditions started forming across parts of Montana and Wyoming because of the low precipitation during April and May.

June brought much-needed precipitation to parts of Montana and Wyoming. During the first week, a storm system brought cold temperatures and snow near the Rocky Mountains. Another storm system brought cool air and heavy precipitation to the same area from the June 16 - 19. Darkhorse Lake Snotel reported 17 inches of snow, with one to two inches of rain over much of the southwest. One last large storm affected Montana during June 28 – 30. This late June storm was unusual for Montana producing the highest amount of 4.40 inches at Wood Creek Snotel site. Wyoming also saw late rainstorms. Tables MTT 4 and 5 shows location and precipitation totals for the June 28 - 30 event. Canyon Ferry and Yellowtail Dams increased releases to manage the rainfall runoff. Both reservoirs utilized minimal flood control space and for a short duration of several days.

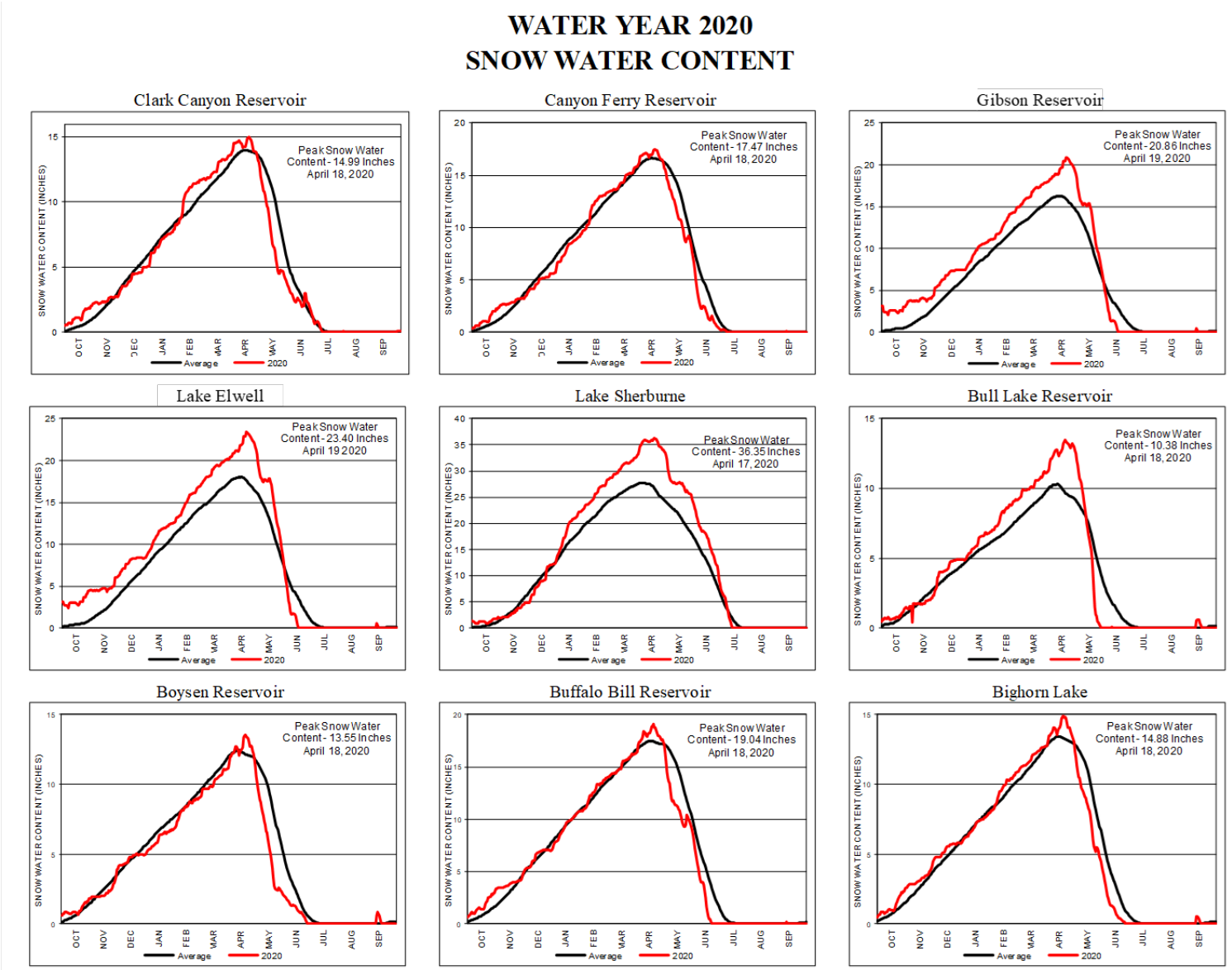


Figure MTG 7: Water year 2020 snow water content measured above selected reservoirs.

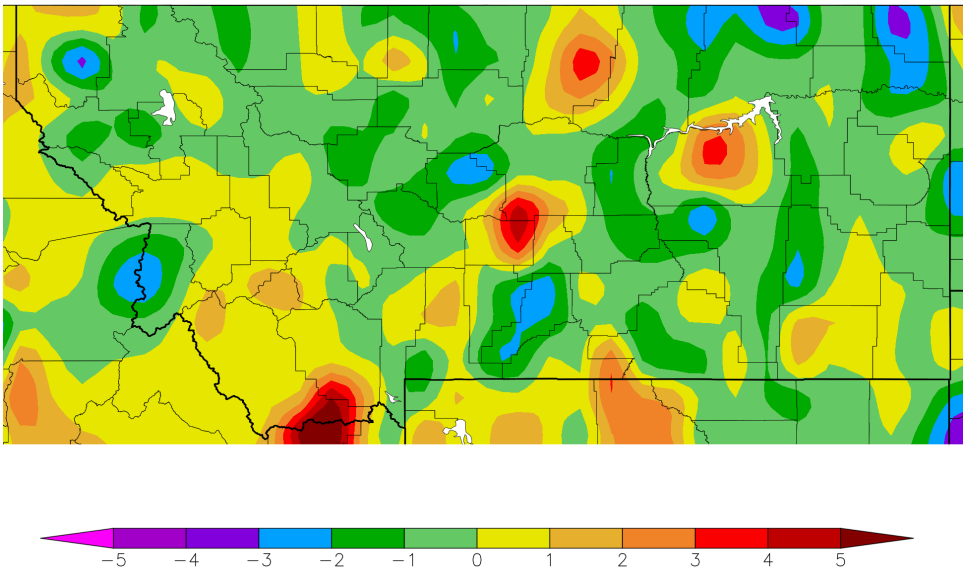


Figure MTG 8: Montana May 2020 temperature departures from normal (°F) (NOAA Regional Climate Center).

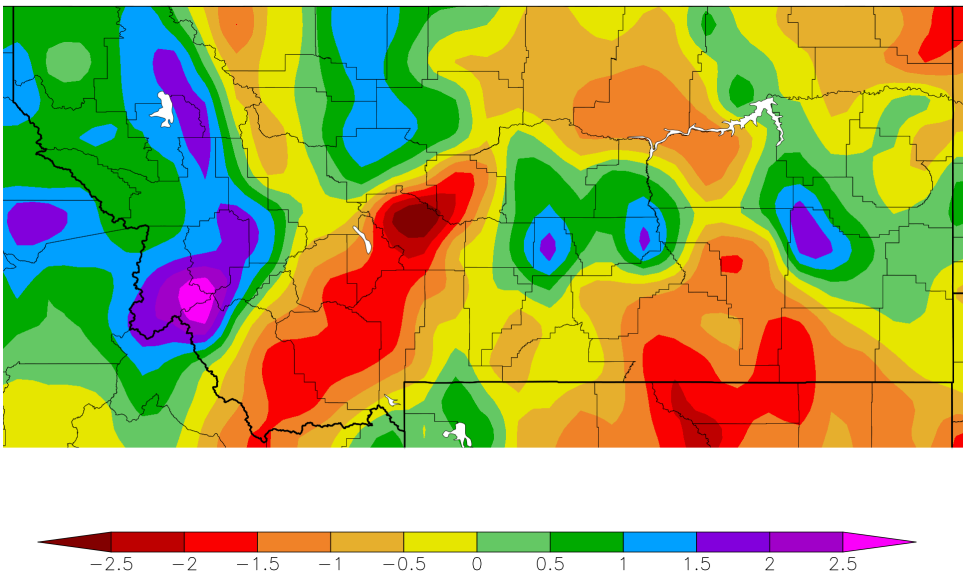


Figure MTG 9: Montana May 2020 precipitation departures from normal (inches) (NOAA Regional Climate Center).

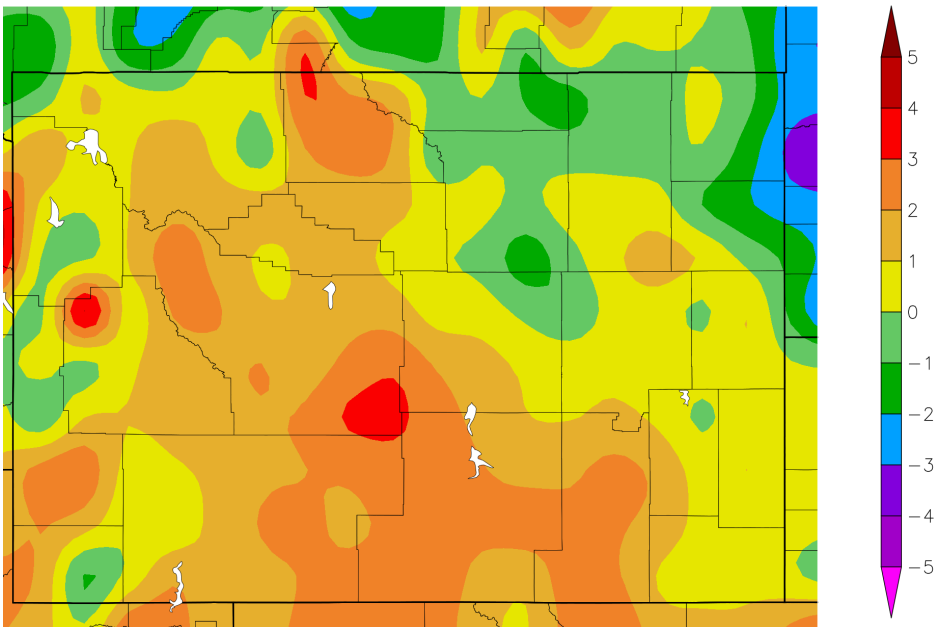


Figure MTG 10: Wyoming May 2020 temperature departures from normal (°F) (NOAA Regional Climate Center).

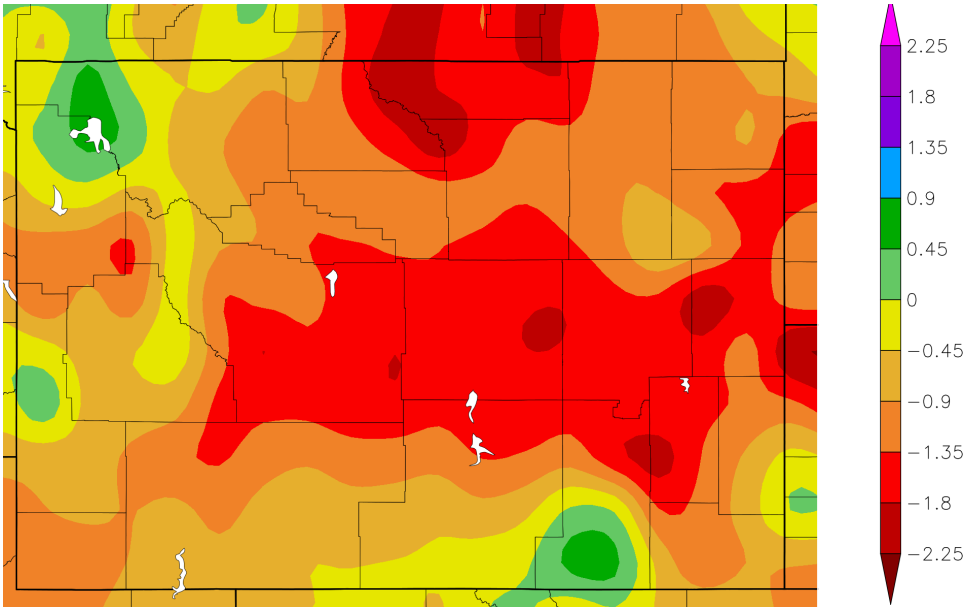


Figure MTG 11: Wyoming May 2020 precipitation departures from normal (inches) (NOAA Regional Climate Center).

Table MTT 4: Valley Locations Reporting Over 1 Inch of Precipitation During June 28 – 30, 2020.

Location	Valley Precipitation (inches)
Sun River	
Cascade 5	2.32
Chouteau 8	1.62
Choteau	1.83
Dutton 3.3	2.1
Fairfield	1.5
Great Falls SW	2.63
Rogers P9	2.13
Sun R4	2.08
Above Canyon Ferry Reservoir	
Boulder 0.3	1.38
Hebgen	1.16
Norris MPH	1.07
Townsend	1.48
Trident	1.18
Wise R3	1.02
Above Tiber Dam	
Cut Bank A	1.18
Dunkirk 19	1.3
East Glacier	1.59
Galata 16	2.38
Shelby	1.03
Above Yellowtail Dam	
Buffalo Bill	1.52
Burris	1.2
Cody 12	1.52
Cody 7.6	1.34
Deaver	1.3
Dubois	1.67
Emblem	1.36
Fort SM 0.5	1.12
Greybull	1.02
Lovell	1.58
Powell FS	1.43

Table MTT 5: Mountain Locations Reporting Over 1 Inch of Precipitation During June 28 – 30, 2020.

Location	Mountain Precipitation (inches)
Sun River	
Dupuyer Creek	4.8
Mount Lockhart	3.6
Waldron	2.2
Wood Creek	4.1
Gibson Dam	2.22
Above Canyon Ferry	
Beaver Creek	1.5
Black Bear	1.7
Bloody Dick	1
Carrot Basin	1.2
Darkhorse Lake	1.9
Divide	1.3
Frohner Meadow	2
Lakeview Ridge	1
Lower Twin	1.3
Madison Plateau	1
Moose Creek	1.7
Mule Creek	1.3
Rocker Peak	1.6
Saddle Mtn.	1
Shower Falls	1.4
Tepee Creek	1.4
Above Tiber Dam	
Badger Pass	3.7
Dupuyer Creek	4.8
Mount Lockhart	3.6
Pike Creek	3.8
Waldron	2.2

Location	Mountain Precipitation (inches)
Above Yellowtail Dam	
Bald Mnt.	2.1
Bone Spring Div.	1.4
Kirwin	1.5
Little Warm	1.5
Owl Creek	1.8
Shell Creek	1.2
Sylvan Lake	1.6
Timber Creek	1.6
Togowtee Pass	1.4
Younts Peak	1.1

July through September

July delivered cooler temperatures in Montana while near-normal temperatures prevailed across Wyoming. Both states continued to see drought develop as 25 to 50 percent of precipitation fell during the month. Irrigation continued to draw on reservoir storage to satisfy their needs. By the end of July, the actual April through July runoff volumes for WY 2020 ranged from 74 percent of average into Clark Canyon Dam to 126 percent of average into Tiber Dam, Table MTT 3.

August continued to deliver four to five degrees above normal temperatures and 25 to 50 percent of average precipitation throughout Montana and Wyoming. August valley precipitation ranged from a low at 26 percent of average in the St. Mary's basin to 45 percent of average in the Madison and Bighorn River basin.

September ended with warm conditions and little precipitation. Irrigation projects leaned heavily on reservoir storage for its water supply during the past few months causing most reservoir to draft below average levels. By the end of the water year, most of Wyoming and Montana were designated as abnormally dry to extreme drought, Figures MTG 12 and 13.

WY 2020 ended with varying storage levels. Fresno Reservoir was at 38 percent of average while Sherburne was 427 percent of average, as a result of a catastrophic failure of drop 5 of the St. Marys Canal shutting down diversions from May 17 until the end of the water year. The Reclamation reservoir with the greatest amount of carryover storage was Lake Sherburne at 95 percent of full capacity.

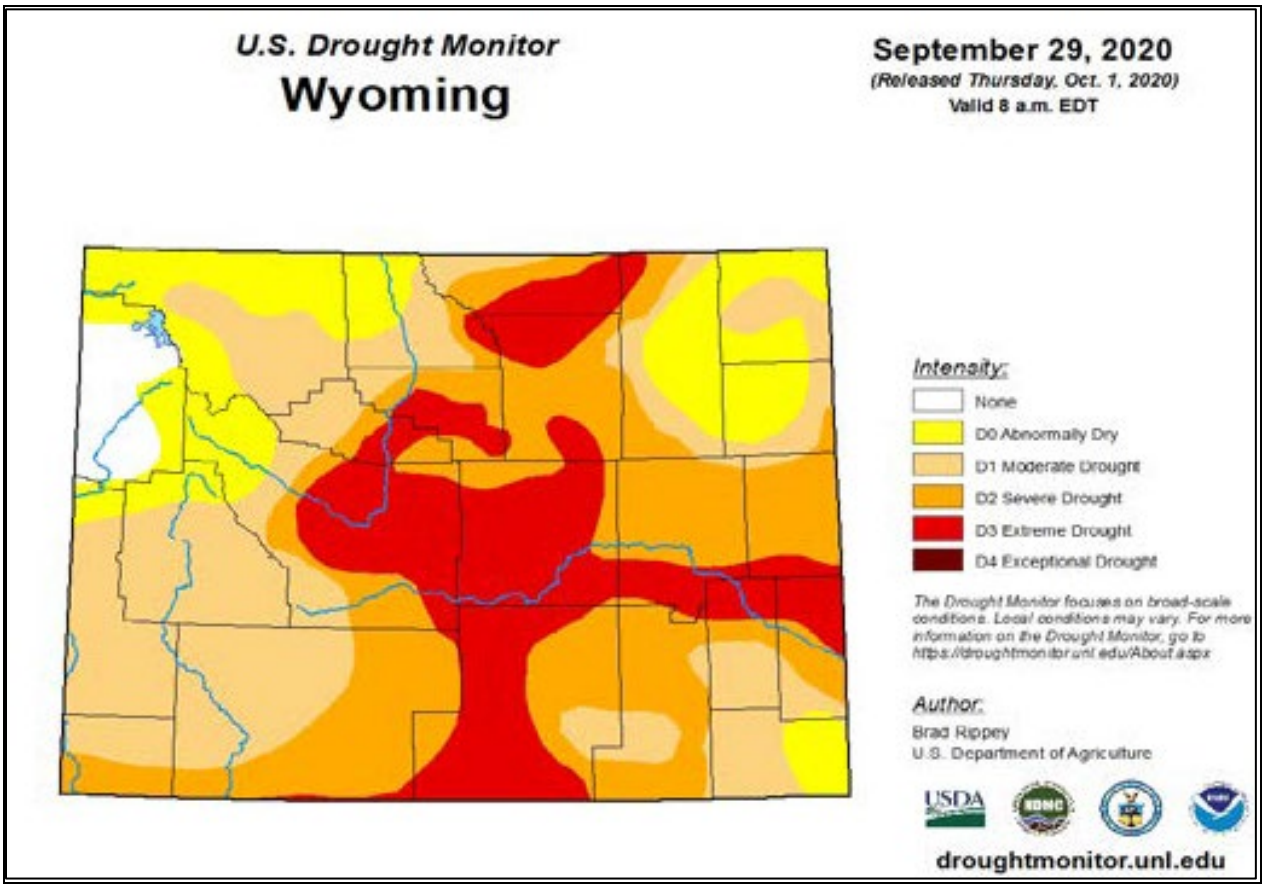


Figure MTG 12: Wyoming Drought Status Map, September 29, 2020

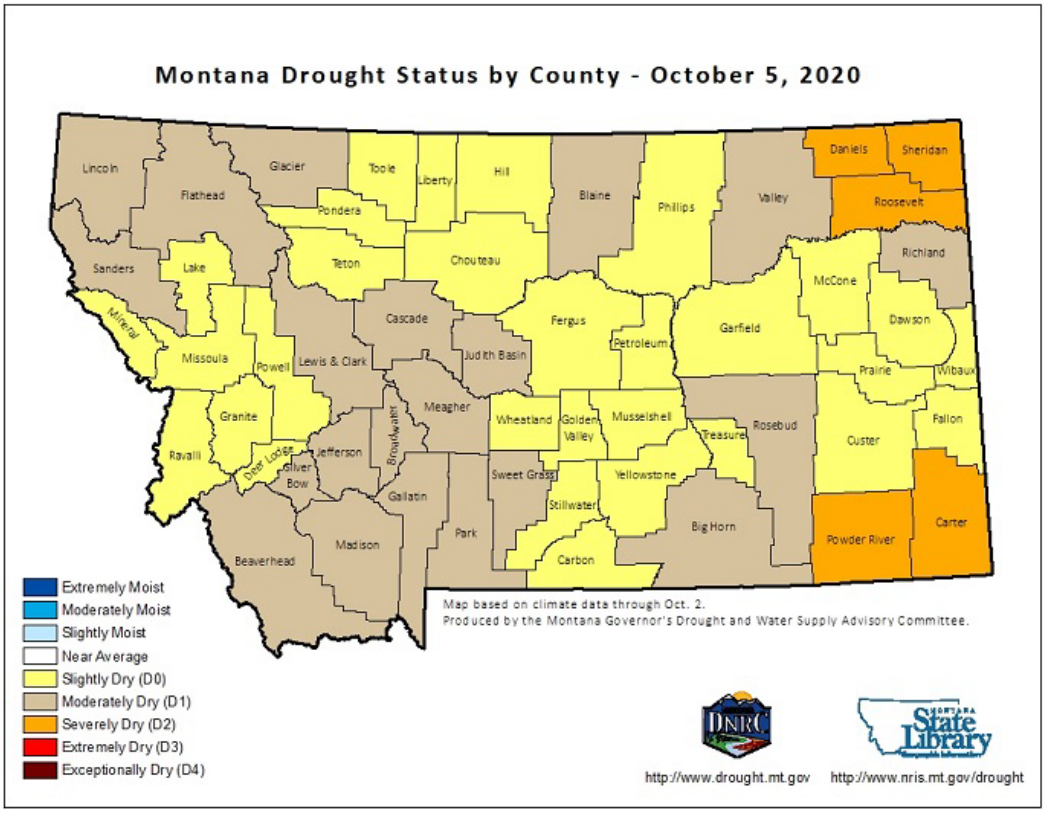


Figure MTG 13: Montana Drought Status Map, October 5, 2020.

Water Year 2020 Flood Benefits

The U.S. Army Corps of Engineers (Corps) evaluated reservoir regulation data pertaining to Reclamation reservoirs within the jurisdiction of the MTAO and indicated that four reservoirs provided flood relief during WY 2020. They were: Canyon Ferry Lake on the Missouri River near Helena; Lake Elwell on the Marias River near Chester; Fresno Reservoir on the Milk River near Havre and Bighorn Lake on the Bighorn River near Fort Smith. The most notable examples of peak flows regulated by Reclamation reservoirs during spring runoff are as follows:

Table MTT 6: Water year 2020 peak flows regulated at Reclamation reservoirs.

Reservoir	Peak Inflow (cfs)	River Discharge (cfs)	Date
Canyon Ferry Lake	17,655	4,607	06/02/20
Lake Elwell	5,431	2,301	07/02/20
Fresno Reservoir	1,200	799	04/25/20
Bighorn Lake	9,259	2,487	06/30/20

The Corps estimated the operations of Reclamation reservoirs in Montana during WY 2020 reduced flood damages by $20,898,000. Some of these benefits were derived by reducing local damages and other benefits were derived by storing water which would have contributed to flooding downstream on the main stem of the Missouri River below Fort Peck Reservoir. The flood damages prevented are listed in Table MTT 7. For additional information on the operations of the reservoirs within the jurisdiction of the MTAO, refer to the individual "Summary of Operations for 2020" for each reservoir in this report. Figure MTG14 shows the annual flood damages prevented by MTAO reservoirs since 1950.

Table MTT 7: Water year 2020 flood damages prevented (thousands of dollars).

Reservoir	Local	Mainstem	2020 Total	Prev. Accum.	Total Accum.
Clark Canyon Reservoir	0	0	0	19,224	19,224
Canyon Ferry Lake	1,211	9,496	10,707	266,749	277,456
Lake Elwell	0	2,267	2,267	100,419	102,686
Fresno Reservoir	46	0	46	19,913	19,959
Gibson Reservoir[1]	0	0	0	3,103	3,103
Bighorn Lake	313	7,565	7,878	199,044	206,922
Lake Sherburne[2]	0	0	0	10,412	10,412
Total	1,570	19,328	20,898	618,864	639,762

1 No space allocated to flood control, but some flood protection provided through other purposes.
2 Includes Corps estimated flood damages.

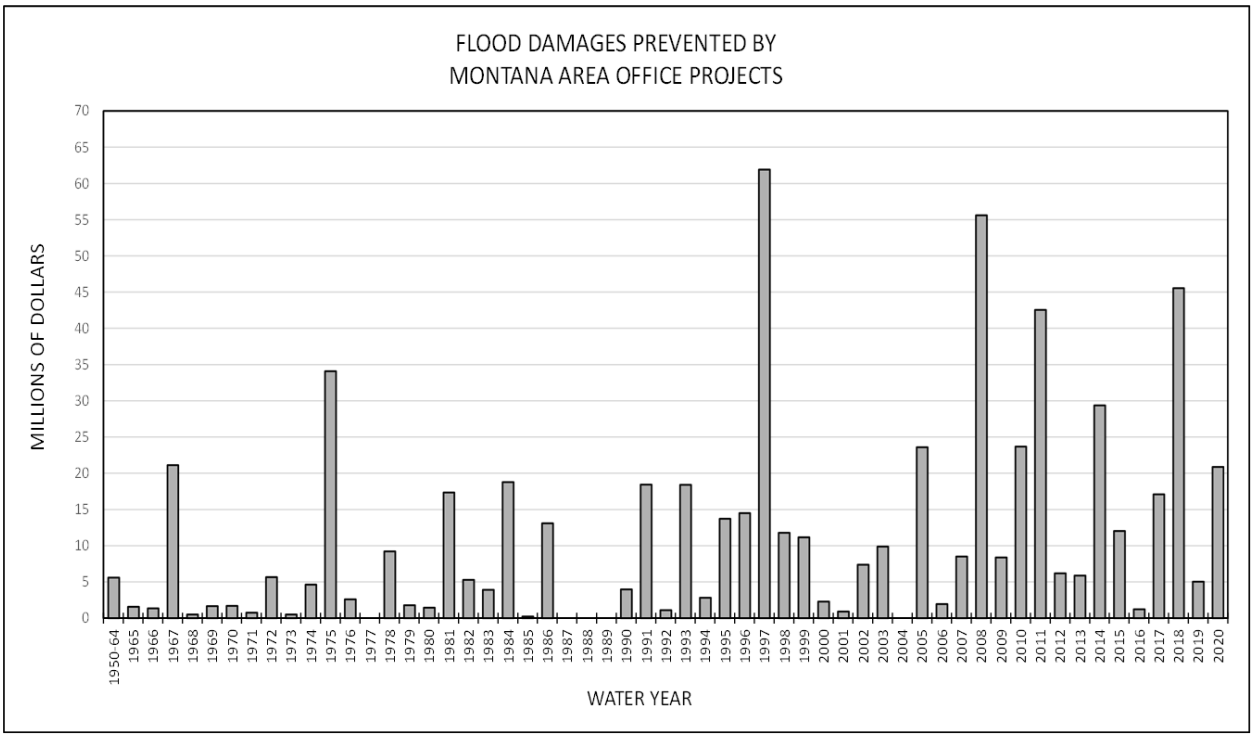


Figure MTG 14: Flood damages prevented by Montana Area Office Projects for each water year since 1964.

Unit Operational Summaries for Water Year 2020

Clark Canyon Reservoir

Clark Canyon Reservoir, a Pick Sloan Missouri River Basin Program (P S MBP) project is located on the Beaverhead River approximately 20 miles upstream from Dillon, Montana. It has a total capacity of 251,436 acre-feet (AF) (250,324 AF active). The reservoir is the storage facility for the East Bench Unit providing a full water supply for irrigation of 21,800 acres and a supplemental supply for about 28,000 acres. Flood control, recreation, and fish and wildlife are among the other functions served by the reservoir.

Figure MTG 15: Birds-eye view of Clark Canyon Reservoir.

In 2016, Reclamation surveyed Clark Canyon Reservoir to develop a topographic map and compute a present storage-elevation relationship (area-capacity tables). The data were used to calculate reservoir sediment accumulation since dam closure in August of 1964. The 2016 survey determined that Clark Canyon Reservoir has a storage capacity of 174,300 AF and a surface area of 5,138 acres at elevation 5,546.10 feet. Since closure in 1964, the reservoir has accumulated a sediment volume of 4,173 AF below elevation 5,546.10 feet. This volume represents a sediment accumulation of 2.3 percent of capacity. Since the last reservoir survey in 2000, the reservoir is estimated to have accumulated 67 AF of sediment. The revised area-capacity table was put into effect on October 1, 2020, reflecting the new storage levels.

Summary of 2020 Operations

WY 2020 started with a storage content of 109,508 AF at elevation 5,531.87 feet and a river release near 150 cfs. The river releases were further reduced to the winter release rate of 90 cfs by mid-October. The climatic conditions during October were cold, 12 degrees below normal with dry conditions, 50 percent of average precipitation. The Montana drought monitoring map was moderately dry for the Red Rock and Beaverhead Basins. Dry conditions continued in November

with normal temperatures. Inflows into Clark Canyon declined slightly from an average of 300 to 260 cfs. December's precipitation improved as southwest Montana had a record snowfall from December 24 to 26 with the town of Dillon receiving 13 inches of snow. By the end of December, the year to date mountain and valley precipitation was 83 and 72 percent of average, respectively. Inflows decreased to 225 cfs and Clark Canyon Dam storage content was 120,203 AF at elevation 5,534.57 feet.

On January 1, the snowpack near Clark Canyon was near average while the average temperature anomalies during January ranged from zero to six degrees above normal in the Beaverhead and Red Rock Basins. February brought cold temperatures and above normal precipitation to the Red Rocks and Beaverhead Basins. Temperatures ranged from four to eight degrees below normal while 150 to 400 percent of normal precipitation fell during the month. By the end of February, the year to date mountain and valley precipitation was 104 and 91 percent of average, respectively.

The March 1 measured snowpack was above average at 109 percent. Based on snowpack and basin conditions, the March 1 runoff projection for the April through July period was 82,000 AF, 105 percent of the 30-year average. The East Bench Unit Joint Board (Joint Board), consisting of three representatives from each water user entity, met in March 2020 to discuss the water supply outlook for the 2020 irrigation season. The forecast projected favorable storage levels with full allotments, therefore the Joint Board tentatively set full allotments with the Clark Canyon Water Supply Company (CCWSC) at 4.0 AF/acre and the East Bench Irrigation District (EBID) at 3.1 AF/acre. Near normal temperatures and slightly below average precipitation fell in the Beaverhead basin during March. The Red Rock basin however receive up to 200 percent of normal precipitation. Inflows varied between 140 to 260 cfs while releases remained at 90 cfs.

On April 1, the NRCS measured the mountain snowpack in the Beaverhead Basin at 112 percent of median. The water supply forecast prepared on April 1 predicted the April through July runoff into Clark Canyon Reservoir would be 120 percent of average, totaling approximately 96,000 AF. The forecasts increased from the March projections therefore, the Joint Board confirmed full allotments for the 2020 irrigation season.

The month of April brought 25 - 50 percent of normal precipitation (up to 1.8 inches below normal) to the basin with near normal temperatures occurring in the Red Rocks and Beaverhead basins. Inflows into Clark Canyon increased to near 420 cfs by April 11 while the snowpack above Clark Canyon peaked on April 18. A storm system brought precipitation to southwest Montana on April 23 and with snow melt caused inflows to rise to a peak of 450 cfs by April 30. Releases remained at 90 cfs through the months end to continue to store water.

The water supply forecast prepared on May 1 predicted a May through July runoff into Clark Canyon Reservoir of 59,800 AF, 95 percent of average. On May 1 the reservoir peaked at elevation 5,541.61 feet while releases for a flushing flow was initiated. The flushing flow was conducted in accordance to an MOU between Reclamation, the Joint Board, and Montana Fish, Wildlife, and Parks (MTFWP). The flushing flow was ramped up from 90 to 600 cfs and then decreased down to the irrigation demand of 400 cfs on May 2. May was very dry with 25 - 75 percent of average precipitation across the basin while temperatures were much above normal in the Red Rock basin. The snowpack above Clark Canyon Dam declined from 11.6 inches of SWE on May 1 to 3.4 inches of SWE by May 31.

The water supply forecast prepared on June 1 predicted a June through July runoff into Clark Canyon Reservoir of 33,500 AF, 84 percent of average. On June 5, precipitation deficits resulted in the Montana drought status map designating the Beaverhead basin as moderate drought status. Irrigation demand releases were decreased from 650 cfs to near 450 cfs by the month's end. Again, dry conditions persisted as only 70 percent of average precipitation fell in the basin during June. July produced cooler temperatures, two degrees below normal, with below normal precipitation in Beaverhead basin (.75 to 1.5 inches). As a result, total inflow during July was 15,200 AF, 86 percent of average. Releases changes from Clark Canyon Dam during July were based upon irrigation demands.

Snowmelt runoff during April through July was average at 96 percent, totaling 75,100 AF. Daily inflows into Clark Canyon Reservoir averaged 245 cfs during April, 170 cfs during May, 303 cfs during June and 247 cfs during July. Releases during the April through July time period averaged 90 cfs in April, 437 cfs in May, 489 cfs in June, and 617 cfs in July. Storage reached the peak for the year of 166,683 AF at elevation 5,544.61 feet on May 1.

Lima Reservoir is a private irrigation facility located upstream of Clark Canyon Reservoir on the Red Rock River, a tributary of the Beaverhead River. Lima Reservoir filled to elevation 6,580.0 feet on April 25 and remained at that elevation until July 6. Lima Reservoir then began to draft as irrigation demands were higher than inflows. Lima Reservoir ended the WY 2020 with a storage content of 33,505 AF, elevation 6,571.43 feet, and a release near 33 cfs. The drainage area above Lima Reservoir accounts for about 25 percent of the total drainage area above Clark Canyon Reservoir.

August temperatures were two to four degrees above normal and precipitation was 25-50 percent below average. Clark Canyon Reservoir drafted to 5,529.20 feet by August 31 as irrigation demands continued with the dry conditions. September brought some precipitation to the Beaverhead basin and temperatures returned to normal. On September 8, the Joint Board held a meeting to discuss winter releases as per Contract 069D670009 and Contract 069D670010. Reclamation provided a most probable reservoir operation plans with winter releases of 50 cfs. The Joint Board determined a 50 cfs rate was appropriate and Reclamation concurred. The Joint Board also agreed to set aside 2,100 AF for a flushing flow, if needed, during the spring of 2021. An MOU for the flushing flow was created.

Most of the storage water released from Clark Canyon Reservoir during WY 2020 was released from May 1 through September 30 for meeting downstream irrigation demands. The EBID water users received approximately 70,355 AF at the point of diversion, leaving 2,327 AF of their allotment in the reservoir. The CCWSC received supplemental water along with their water rights of 95,251 AF, leaving 6,420 of their supplemental water in the reservoir. The total May 1 through September 30 irrigation deliveries recorded by the river commissioner for the "non-signer" users on the Beaverhead River was 41,565 AF on approximately 8,000 acres.

The total inflow to Clark Canyon Reservoir during WY 2020 was 83 percent of the 30-year average, totaling approximately 165,143 AF. The total annual release to the Beaverhead River from Clark Canyon Reservoir was 181,520 AF. By the end of September, the total cumulative valley precipitation for the WY 2020 was 81 percent of average, while the total cumulative mountain precipitation was 94 percent of average.

The Corps determined that during WY 2020, Clark Canyon Reservoir did not prevent local or main stem flood damages.

Additional hydrologic and statistical information pertaining to the operation of Clark Canyon Reservoir during WY 2020 can be found in Tables MTT 8, 9, 10, and 11 and Figure MTG16.

Important Events – WY2020

May 1-2, 2020: Flushing flow was conducted.

Table MTT 8: Reservoir allocations for Clark Canyon Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	5,470.60	1,115	1,115
TOP OF ACTIVE CONSERVATION	5,535.70	125,016	123,901
TOP OF JOINT USE	5,546.10	174,300	49,284
TOP OF EXCLUSIVE FLOOD CONTROL	5,560.40	251,436	77,136

Based on new sediment survey data (effective as of 10/1/2020).

Table MTT 9: Storage and elevation data for Clark Canyon Reservoir.

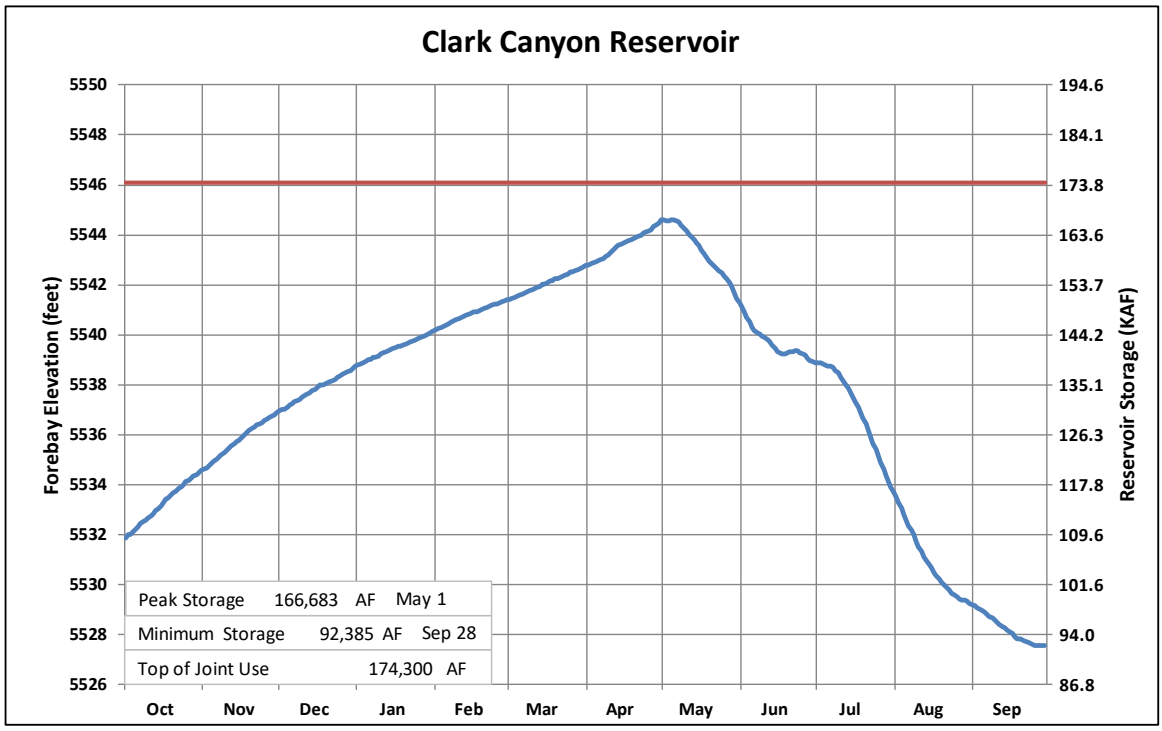
STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	5,531.78	107,593	10/1/2019
END OF YEAR	5,527.56	92,385	9/30/2020
ANNUAL LOW	5,527.56	92,385	9/28/2020
ANNUAL HIGH	5,544.61	166,683	5/1/2020
HISTORIC HIGH	5,564.70	283,073	6/25/1984

Table MTT 10: Inflow and discharge data for Clark Canyon Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	165,134	Oct '19-Sep '20	181,520	Oct '19-Sep '20
DAILY PEAK (CFS)	450	4/30/2020	833	7/24/2020
DAILY MINIMUM (CFS)	43	5/30/2020	85	1/15/2020
PEAK SPILL (CFS)			0	N/A
TOTAL SPILL (AF)			0	N/A

Table MTT 11: Water year 2020 monthly inflow, outflow, and storage data for Clark Canyon Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	18.1	105	6.6	78	120.2	144
NOVEMBER	15.4	88	5.4	71	130.1	138
DECEMBER	13.8	93	5.6	74	138.4	135
JANUARY	12.2	93	5.5	85	145	132
FEBRUARY	10.8	90	5.1	88	150.7	129
MARCH	12.2	81	5.5	82	157.4	126
APRIL	14.6	96	5.4	65	166.6	127
MAY	10.5	65	26.9	120	150.2	120
JUNE	18	68	29.1	90	139.2	119
JULY	15.2	71	38	88	116.4	126
AUGUST	13.5	89	31.4	99	98.5	131
SEPTEMBER	10.8	72	16.9	102	92.4	122
ANNUAL	165.1	83	181.5	92	-	-
APRIL-JULY	58.4	74	-	-	-	-



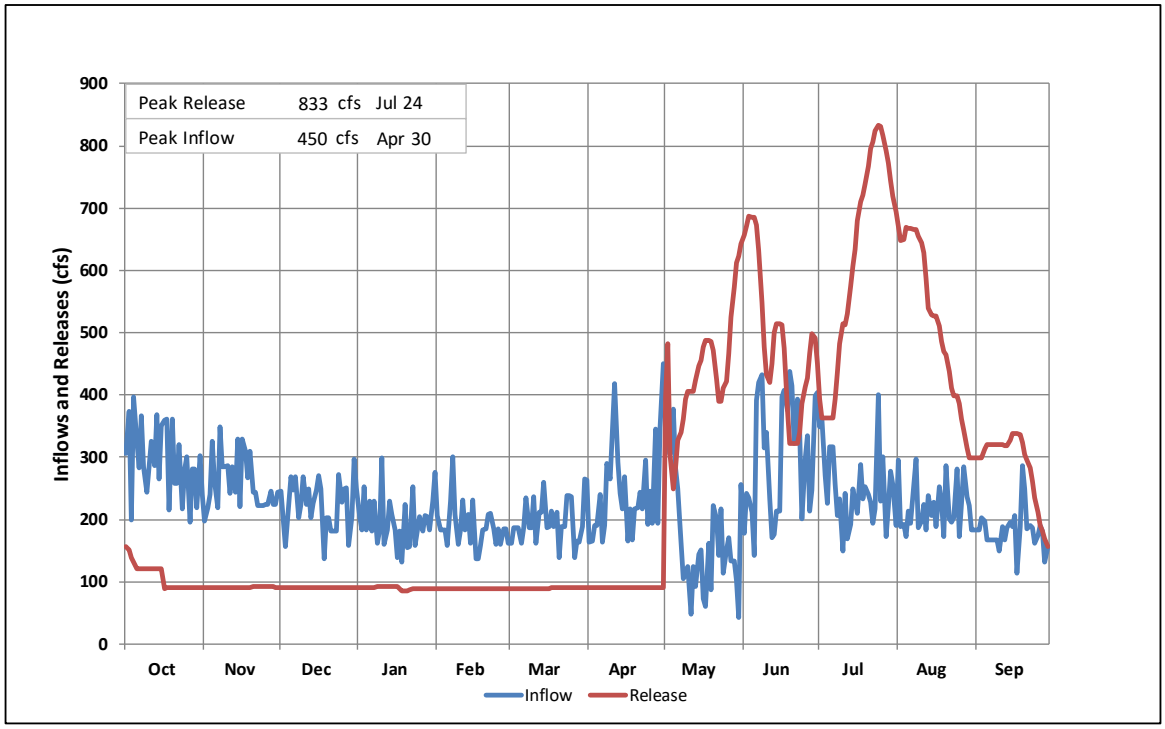


Figure MTG 16: Water year 2020 hydrologic data for Clark Canyon Reservoir.

Canyon Ferry Lake and Powerplant

Canyon Ferry Lake (P S MBP), formed by Canyon Ferry Dam, is located on the Missouri River near Helena, Montana. It has a total capacity of 1,992,977 AF. The top three feet were allocated to exclusive flood control in February 1966. The next 27 feet are allocated to joint conservation and flood control purposes. The joint use space is evacuated for flood control purposes, only to the extent that refill during the spring runoff is reasonably assured. The conservation storage is operated mainly for power generation and to provide replacement storage for several new irrigation developments located on the Missouri River and its tributaries above Great Falls, Montana. To date, however, the conservation storage has been used primarily for power production. The only new areas under irrigation are 5,000 acres on the Crow Creek Unit (P S MBP), 13,900 acres on the Helena Valley Unit (P S MBP), and 28,000 acres on the East Bench Unit (P S MBP). In addition, about 5,200 acres in the Helena Valley Unit that was once irrigated by pumping from Lake Helena and from other streams are now irrigated by pumping from Canyon Ferry Reservoir. About 33,700 acres on the East Bench Unit also receive supplemental water supply. A small amount of municipal water is also furnished to the city of Helena, Montana, through facilities for the Helena Valley Unit.

Figure MTG 17: View of Canyon Ferry Dam and Powerplant.

In 1997, a hydrographic and a topographic survey were conducted resulting in a new elevation-area capacity table and curve. The survey determined that Canyon Ferry Lake had a storage capacity of 1,992,977 AF and a surface area of 34,048 acres at reservoir elevation 3,800.00 feet. Since closure in 1953, the reservoir has accumulated a sediment volume of 59,746 AF below reservoir elevation 3800.00 feet. This volume represents a sediment accumulation of 2.91 percent of capacity and an average annual sediment accumulation of 1,345.6 AF. The revised area-capacity table was put into effect on October 1, 1998, reflecting the new storage levels.

Summary of 2020 Operations

WY 2020 started with a storage content of 1,624,470 AF at an elevation of 3,788.77 feet while releases to the Missouri River was 4,200 cfs.

October prevailed with 8 to 15 degrees below normal temperatures in the basins above Canyon Ferry Reservoir. Below normal precipitation prevailed during the first half of October, but above normal precipitation prevailed during the second half of the month. Inflows averaged 4,350 cfs while releases out of Canyon Ferry were 4,200 cfs which resulted in a flow of 4,500 cfs below Holter Dam. Inflows into Canyon Ferry increased to 5,300 cfs for a short time during the first week of November. November temperatures returned to normal while precipitation also slowly tapered back to normal conditions by the months end. Due to near normal climate patterns, inflows into Canyon Ferry remained near 4,300 cfs. The snow water equivalent by November 30 was 94 percent of average.

On December 31, the storage content of Canyon Ferry Reservoir was at 1,590,328 AF or elevation 3,787.69 feet with inflows near 3,000 cfs. Valley precipitation continued to decline and by the end of December the year-to-date percent of average was 81 in the Jefferson, 74 in the Madison, and 87 in the Gallatin.

On January 1 the mountain snowpack above Canyon Ferry Reservoir was 83 percent of average. Northwestern Energy requested additional flow due to the cold weather during the first week of January. Releases from Canyon Ferry were increased from 4,400 cfs on January 7 to 5,650 cfs by January 10. Releases were then reduced to 4,400 cfs from January 16 through the 18 as temperatures returned to normal.

On February 1 the mountain snowpack measured 94 percent of average. Northwestern Energy requested additional flow during the first week of February. Releases from Canyon Ferry were increased from 4,400 cfs to 4,800 cfs on February 5 and 6. Releases were then reduced to 4,700 cfs on February 29 as additional releases were needed to meet elevation targets. On February 29, the storage content of Canyon Ferry Reservoir was at 1,466,371 AF, elevation 3,783.67 feet with inflows near 3,800 cfs.

Temperatures during March were four degrees below normal throughout the Upper Missouri River Basin while precipitation was mixed. Mountain precipitation during the month increased the year-to-date average to 99 percent in Jefferson, 91 percent in Madison, and 117 percent in Gallatin River Basins.

On April 1 the mountain snowpack remained near average, 105 percent. Reclamation's April through July forecasted inflow volume was 118 percent of average (2,123 KAF). Diversions for the Helena Valley Irrigation District to the Helena Valley Reservoir also began on April 1. Inflows during the first week of April averaged at 3,625 cfs, much below normal. In response, releases were reduced from 5,300 cfs to 4,300 cfs by April 10 to conserve storage. There was no plains snowpack remaining and little precipitation fell, therefore, the reservoir drafted to a low point of 3,780.27 feet on April 11. Snow continued to accumulate resulting in a peak SWE of 17.5 inches on April 18. Inflow began to increase on April 22 while the National Weather Service (NWS) was forecasting inflows to reach 11,700 cfs on May 4 with high flows persisting. In response, releases were increased to 5,200 cfs on April 30 as the snowpack remained near normal. The precipitation deficit during April ranged from one to two inches (25 percent of normal). The reservoir rebounded somewhat and ended the month at elevation 3,781.28 feet.

On May 1, Reclamation's May through July forecasted inflow volume declined to 97 percent of average (1,432.0 KAF). Inflows reached 9,500 cfs on May 2 but inflows did not persist as originally

projected. Therefore, releases from Canyon Ferry were decreased to 4,600 cfs on May 4. Inflows slowly declined to 6,100 cfs by May 11 while releases were reduced to 4,300 cfs to continue filling the reservoir. Temperatures in the basin then began to melt the mid to high elevation snow and inflows began to rise to 13,300 cfs by May 23. The month of May exhibited dry conditions; a one to two inch precipitation deficit in the basins above Canyon Ferry. Drought conditions were starting to be designated in the Upper Missouri River Basin by the month's end.

On June 2 Canyon Ferry Reservoir was at elevation 3,790.44 feet with inflows rising to a peak runoff of 17,650 cfs and only 4 inches of SWE remaining. The updated June through July runoff forecast was 799.0 KAF, 98 percent of average. Inflows began to decrease, however, the NWS was forecasting a storm event on June 7 and 8 that could cause inflows into Canyon Ferry to reach 18,700 cfs by June 10. In response, releases were increased to 8,500 cfs by June 8 in preparation for the potential runoff. The forecasted inflows projected by the NWS did not occur and inflows continued to decline to 9,800 cfs by June 13. Releases from Canyon Ferry were slowly decreased to 6,400 cfs by June 14 to continue filling the remaining two feet of reservoir as there was only 1.3 inches of snow water equivalent left in the basin. A second storm event of one to two inches was forecasted to hit the Upper Missouri River Basin on June 16 and 17. The NWS was predicting inflows into Canyon Ferry to reach 17,500 cfs by June 20. Inflows from this storm peaked near 13,700 cfs on June 20 while releases were increased to 9,700 cfs by June 25 to control the rate of fill. Canyon Ferry entered the flood control pool on June 21. All releases were then coordinated with the Corps flood control release orders while in the flood control pool. Inflows receded to 8,450 cfs by June 28. Meanwhile, the NWS, for a third time during June, was predicting another one to two inch storm covering the Upper Missouri River Basin to hit on June 29 and 30. This storm was forecasted by the NWS on June 27 to cause inflows to rise to near 15,000 cfs by July 3. The peak inflow from this storm reached 10,500 cfs on July 1 and 2. In coordination with Corps, releases were increased to near 11,500 cfs by July 2 to evacuate the flood control space. The flood control space was evacuated by July 5 while inflows quickly receded to 7,600 cfs and releases were cut back to 10,000 cfs.

Releases during July continued to be reduced as inflows declined. Release were set near 4,400 cfs by July 22 as inflow were near 2,600 cfs and Canyon Ferry Reservoir elevation was 3,795.32 feet. July temperatures were near normal while precipitation conditions returned to dry. The April through July runoff into Canyon Ferry during WY 2020 was 100 percent of average, totaling approximately 1,822,300 AF. The April through July runoff volume into Canyon Ferry Reservoir is summarized in Figures MTG 18 and 19 as it relates to precipitation and temperatures.

August temperatures were four degrees warmer than normal with drought-like conditions persisting in all three of the upstream basins, Jefferson, Madison, and Gallatin River Basins. Canyon Ferry Reservoir continued to draft as inflows averaged 1,900 cfs and releases to the Missouri River below Holter Dam averaged near 4,100 cfs. September continued with drought-like conditions with precipitation in the headwater basins near 70 percent of average.

By the end of the WY 2020, Canyon Ferry Reservoir had a storage content of 1,533,618 AF at elevation of 3,786.24 feet (97 percent of average), with inflows near 4,480 cfs and releases near 3,600 cfs. The annual inflow to Canyon Ferry Reservoir was 102 percent of average, totaling 3,157,100 AF.

During WY 2020, Canyon Ferry Powerplant generated 367,841,000 kilowatt-hours, 97 percent of the long-term average dating back to 1967. The powerplant releases totaled 3,023,287 AF, 84 percent of the total water released from the dam. The other 16 percent was released to meet irrigation needs for Helena Valley Irrigation District (209,380 AF, six percent), 160,143 AF spilled through the river outlet gates (four percent) and 204,452 AF spilled through the spillway gates (six percent).

The Corps estimated that during WY 2020, Canyon Ferry Dam prevented $1,211,400 in local flood damages and prevented $9,496,200 in flood damages downstream on the Missouri River mainstem.

Additional statistical information of Canyon Ferry Reservoir and its operations during WY 2020 can be found on Tables MTT 12, 13, 14, and 15 and Figure MTG20.

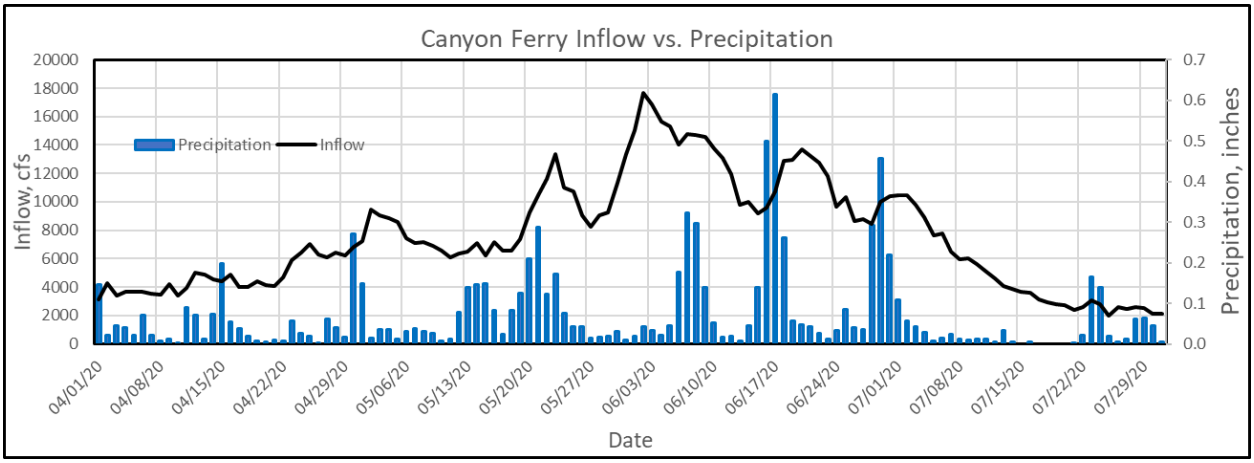


Figure MTG 18: Comparison of Canyon Ferry Inflows as Related to Basin Precipitation.

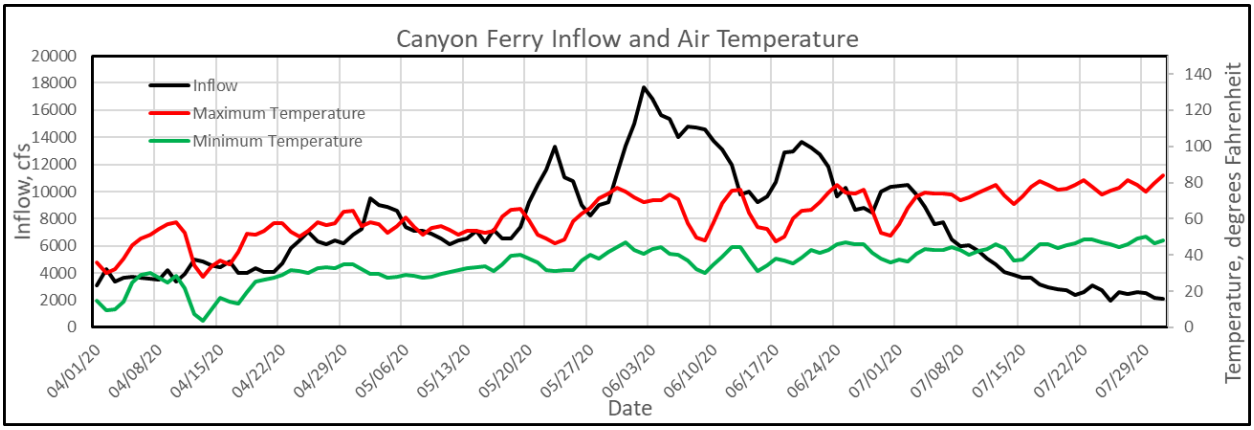


Figure MTG 19: Comparison of Canyon Ferry Inflows as Related to Basin Temperatures.

Important Events – WY2020

January 2020 and February 2020: In coordination with Northwestern Energy, releases were increased to meet power needs as cold weather decreased river flows. The extra volume delivered was in accordance with the operation agreement.

April 1, 2020: Helena Valley Irrigation District started pumping water to the Helena Valley Reservoir. Diversion from Canyon Ferry Reservoir were adjusted throughout the season to meet irrigation demands from the Helena Valley Reservoir.

April 2020: Canyon Ferry releases were decreased from 5,300 cfs to 4,300 cfs to conserve storage.

June 22-24, 2020: Corps issued flood control order number CAFE 20-1 through CAFE 20-4 to increase releases from 8,250 cfs to 10,000 cfs to evacuate storage in the flood pool.

July 1-2, 2020: Corps issued flood control order number. CAFE 20-5 and CAFE 20-6 to increase releases from 10,000 cfs to 11,500 cfs to evacuate storage in the flood pool.

July 5-6, 2020: Corps issued flood control order number CAFE 20-7 and CAFE 20-8 to decrease releases from 11,500 cfs to 8,750 cfs as inflows continue to drop and the flood pool is nearly evacuated.

October 1, 2020: HVID discontinued all diversions to Helena Valley Reservoir.

Table MTT 12: Reservoir allocations for Canyon Ferry Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	3,728.00	396,031	396,031
TOP OF ACTIVE CONSERVATION	3,770.00	1,097,599	701,568
TOP OF JOINT USE	3,797.00	1,891,888	794,289
TOP OF EXCLUSIVE FLOOD CONTROL	3,800.00	1,992,977	101,089

Table MTT 13: Storage and elevation data for Canyon Ferry Reservoir.

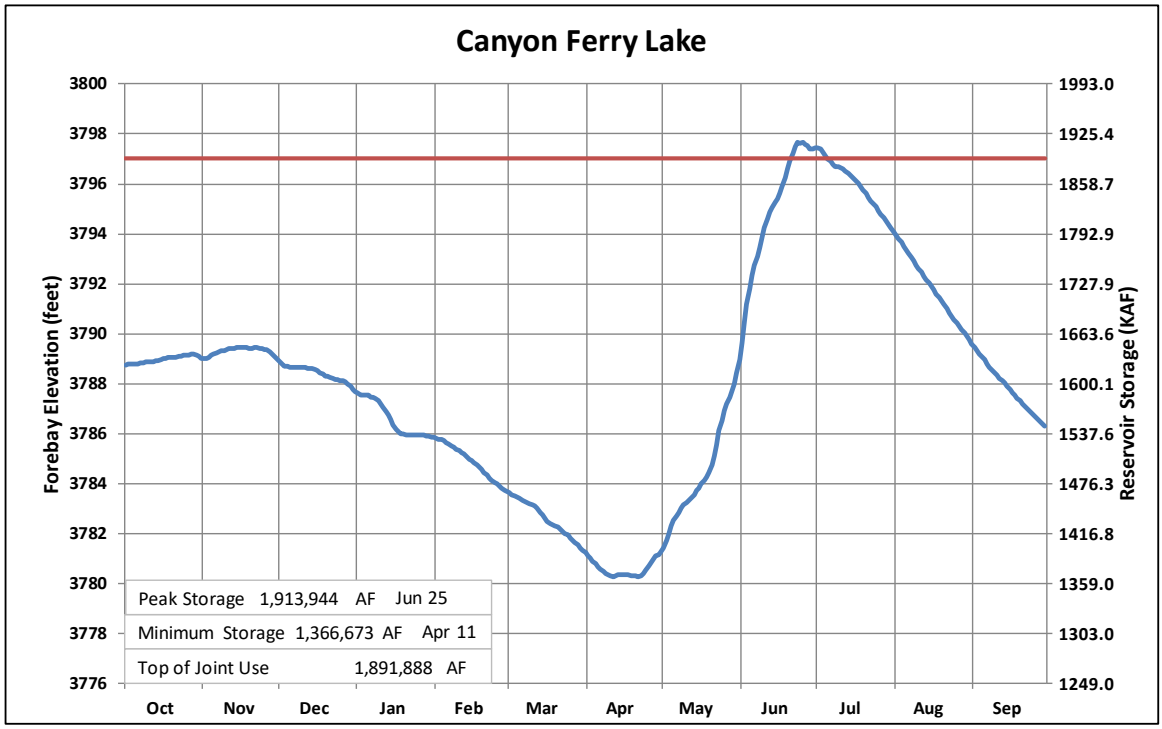
STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	3,788.77	1,624,470	10/1/2019
END OF YEAR	3,786.22	1,533,618	9/30/2020
ANNUAL LOW	3,780.27	1,366,673	4/11/2020
ANNUAL HIGH	3,797.66	1,913,944	6/25/2020
HISTORIC HIGH	3,800.00	2,050,900	6/23/1964

Table MTT 14: Inflow and discharge data for Canyon Ferry Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	3,506,411	Oct '19-Sep '20	3,597,263	Oct '19-Sep '20
DAILY PEAK (CFS)	17,655	6/2/2020	11,467	7/3/2020
DAILY MINIMUM (CFS)	1,555	8/21/2020	3,827	9/30/2020
PEAK SPILL (CFS)	-	-	6,424	7/3/2020
TOTAL SPILL (AF)	-	-	364,595	Oct '19-Sep '20

Table MTT 15: Water year 2020 monthly inflow, outflow, and storage data for Canyon Ferry Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow pumped to HVID, KAF	% of 30-yr Avg	Outflow to river, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	267	117	0.1	33	258.6	114	1,632.70	104
NOVEMBER	256.5	104	0	---	256.8	114	1,632.40	102
DECEMBER	229.1	110	0	---	271.2	106	1,590.30	103
JANUARY	234.2	111	0	---	291.9	111	1,532.60	102
FEBRUARY	216	107	0	---	282.3	115	1,466.40	101
MARCH	241.8	95	0	---	313.3	114	1,394.90	97
APRIL	278.7	89	7.3	95	270.5	94	1,395.80	96
MAY	525.8	100	17.4	106	273	77	1,631.10	102
JUNE	734.4	106	16.4	90	442.5	101	1,906.60	104
JULY	283.3	100	17.7	88	376.4	113	1,651.20	101
AUGUST	117	84	23	116	238.6	101	1,651.10	100
SEPTEMBER	133.3	83	19.3	172	220.8	101	1,533.60	97
ANNUAL	3,517.10	102	101.2	107	3,495.90	104	-	-
APRIL-JULY	1,822.30	100	-	-	-	-	-	-



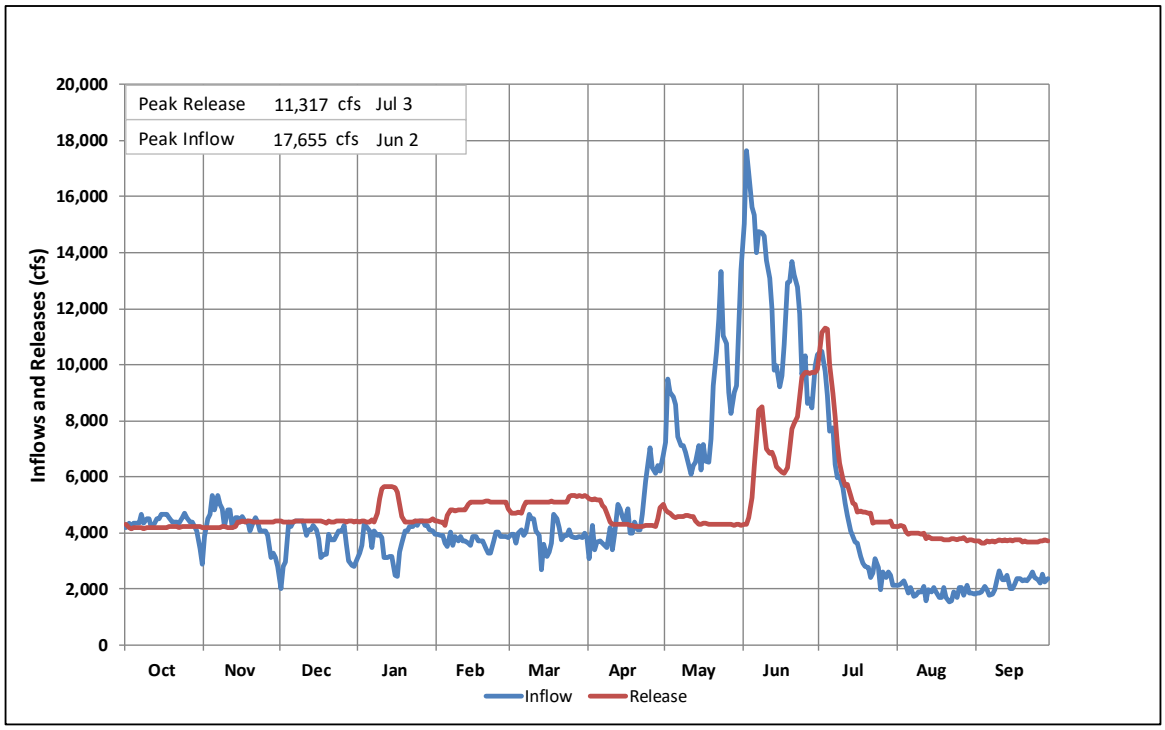


Figure MTG 20: Water year 2020 hydrologic data for Canyon Ferry Reservoir.

Helena Valley Reservoir

Helena Valley Reservoir is a regulating offstream reservoir for Helena Valley Unit (P S MBP), located west of Canyon Ferry Reservoir. It has a total capacity of 10,451 AF, which is used for irrigation and furnishing a supplemental municipal water supply to the city of Helena, Montana. Helena Valley Reservoir receives its entire water supply by pumping from Canyon Ferry Reservoir. When fully developed, Helena Valley Unit can irrigate about 14,100 acres of full-service land and 3,500 acres of supplemental service lands. Present development services about 13,867 full-service acres, including 5,200 acres previously irrigated by pumping from Helena Valley Reservoir or from other streams.

Figure MTG 21: View of Helena Valley Reservoir and Dam.

Summary of 2020 Operations

At the beginning of the WY 2020, storage in Helena Valley Reservoir was 8,898 AF at an elevation of 3,816.91 feet. Operating criteria goals were to fill Helena Valley Reservoir by May 1 and maintain it nearly full through June. In response, diversions to the Helena Valley Unit from Canyon Ferry Reservoir was started on April 10. Storage in Helena Valley Reservoir steadily increased with diversions from Canyon Ferry. Diversions were made as normal throughout the year to meet irrigation demands. By the end of water year, Helena Valley Reservoir ended with a storage content of 8,815 AF at elevation 3,816.73 feet. During the water year, 101,254 AF of water was pumped to Helena Valley Reservoir from Canyon Ferry Reservoir. HVID released 74,100 AF for irrigation and 1,474 AF for municipal use. All irrigation deliveries were discontinued for the 2020 season on October 1, 2020.

The reservoir provided an adequate water supply to satisfy all irrigation requirements for the Helena Valley Unit and supplement the city of Helena's municipal water supply.

Statistical information pertaining to Helena Valley Reservoir is shown in Tables MTT 16, 17, 18, and 19.

Table MTT 16: Reservoir allocations for Helena Valley Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
Top of Inactive Storage	3,805.00	4,554	4,554
Top of Active Conservation Storage	3,820.07	10,451	5,897

Table MTT 17: Storage and elevation data for Helena Valley Reservoir.

STORAGE ELEVATION DATA	ELEVATION (FEET)	STORAGE (AF)	DATE
Beginning of Year	3,816.91	8,898	10/01/19
End of Year	3,816.73	8,815	09/30/20
Annual Low	3,812.35	6,967	03/30/20
Annual High	3,819.89	10,358	05/27/20
Historic High	3,820.60	10,738	6/02/75

Table MTT 18: Inflow and discharge data for Helena Valley Reservoir.

INFLOW-OUTFLOW DATA	ANNUAL
Pumped from Canyon Ferry to Helena Valley Unit	101,254 AF
Released from reservoir for irrigation	74,106 AF
Delivered to the City of Helena for municipal use	1,474 AF

Table MTT 19: Water year 2020 monthly elevation and storage data for Helena Valley Reservoir.

Month	Forebay Elevation (Feet)	Storage Content (KAF)	Pumped to Helena Valley (KAF)
OCTOBER	3,815.84	8.4	0.1
NOVEMBER	3,815.20	8.1	0
DECEMBER	3,814.52	7.8	0
JANUARY	3,813.77	7.5	0
FEBRUARY	3,813.05	7.2	0
MARCH	3,812.35	7	0
APRIL	3,817.94	9.4	7.3
MAY	3,819.52	10.2	17.4
JUNE	3,819.37	10.1	16.4
JULY	3,815.62	8.3	17.6
AUGUST	3,815.86	8.4	23
SEPTEMBER	3,816.73	8.8	19.2
ANNUAL	-	-	101.2

Sun River Project

Storage for the Sun River Project is provided by Gibson, Willow Creek, and Pishkun Reservoirs, which are all single purpose irrigation structures. The project serves 95,000 acres on the Greenfields and Fort Shaw Irrigation Districts. A diversion dam is located on the Sun River about three miles below Gibson Reservoir to divert flows down the Pishkun Supply Canal to Pishkun Reservoir, or down the Willow Creek Feeder Canal to Willow Creek Reservoir. Releases are made from Pishkun Reservoir to supply Greenfields Irrigation District (GID). Releases from Willow Creek Reservoir re-enter the Sun River where they can be diverted at the Fort Shaw Diversion Dam to supply Fort Shaw Irrigation District.

Gibson Reservoir: Summary of 2020 Operations

Gibson Reservoir is located on the Sun River west of Augusta, Montana, and has a total capacity of 96,477 AF. In 2009, a new hydrographic and topographic survey was conducted to measure reservoir volume, resulting an updated elevation-area capacity table and curve. The previous survey, completed in 1996 measured the sediment accumulations after major forest fires in 1988.

The 2009 survey data yielded a capacity increase of 2,211 AF at elevation 4,724.0 feet from the previous survey conducted in 1996. The increase was likely due to more detailed data collection and improved geographic information system capabilities since 1996. The revised area-capacity table established a storage capacity of 98,688 AF and a surface area of 1,334 acres at elevation 4,724.0 feet (top of active conservation). Since closure in 1929, the reservoir accumulated 6,172 AF of sediment below reservoir elevation 4,724.0 feet. The revised area-capacity table was placed into effect January 1, 2013.

The spillway crest is at elevation 4,712.0 feet (83,248 AF). Depending on runoff conditions and reservoir levels, spillway gates remain open during spring runoff, until inflows and remaining snowpack indicate that the runoff is receding. Once runoff has peaked, the spillway gates are progressively closed to fill the reservoir another 12 feet to the top of the conservation pool at elevation 4,724.0 feet (98,688 AF).

Figure MTG 22: View of Gibson Reservoir and Dam.

Gibson Reservoir began WY 2020 with a storage content of 7,653 AF with a corresponding elevation of 4,616.07 feet. Releases from Gibson during October fluctuated from 185 cfs to 290 cfs. GID passed most of the inflow during this time, which resulted in flows to the Sun River below Diversion Dam ranging from 220 cfs to 280 cfs. On October 19, 2019 diversions to the Willow Creek reservoir was initiated. Willow Creek reservoir was drained in WY 2019 for gate maintenance purposes. For more detail see the Willow Creek reservoir section below. Greenfield Irrigation District (GID) continued to divert water until December 17.

The month of October yielded valley and mountain precipitation at 163 and 154 percent of average, respectively in the Sun River Basin. However, the mountain precipitation gained slowly throughout November and December while another surge of valley precipitation occurred in November, 288 percent of average. The cumulative valley precipitation for October through December was at 163 percent of average while the cumulative mountain precipitation was 91 percent of average. By the end of December releases were reduced to near 150 cfs over Diversion Dam as inflows declined with colder weather.

The Sun River Basin SWE was at 113 percent of normal on January 1, as reported by the NRCS. January temperatures were near normal while precipitation amounts were much below normal, 25-50 percent of normal, throughout the Sun River basin. The snowpack above Gibson reservoir remained steady, which resulted in a February 1 mountain snowpack at 110 percent of average.

February brought normal precipitation and temperature patterns. Inflows during February averaged near 160 cfs while releases from Gibson Reservoir averaged 115 cfs. Gibson Reservoir continued to increase storage throughout February and ended the month at elevation 4,643.17 feet, 21,500 AF.

March continued to produce snow above Gibson Reservoir with cooler temperatures prevailing. Inflows during March remained steady at 160 cfs while release stayed near 120 cfs.

The NRCS reported April 6 SWE increased to 113 percent of median. The April through July spring forecast for Gibson Reservoir was 434,000 AF, 104 percent of average. On April 8, diversions to Willow Creek Reservoir via the Willow Creek Feeder Canal was initiated to continue refilling the reservoir. Inflows into Gibson Reservoir slowly increased from a steady 180 cfs at the beginning of April to approximately 3,200 cfs by the end of the month as the low elevation snowmelt runoff began.

The May - July spring runoff volume was forecasted at 111 percent of the 30-year average, 414,000 AF. On May 1, Gibson reservoir was at elevation 4,680.81 feet with inflows at 3,640 cfs and river releases to the Sun River near 1,200 cfs. GID began refilling Pishkun Reservoir through the Pishkun Supply Canal on May 1. Gibson Reservoir was filling as the snowmelt runoff continued. By May 21 inflows increased to near 5,820 cfs while the river release was near 1,300 cfs to control the rate of fill. The snowpack was declining rapidly during the May. The reservoir filled to the bottom of the spillway crest (4,712.0 feet) on May 28, while inflows peaked at 6,475 cfs on May 31. To control the peak inflow, release to the Sun River below Diversion Dam increased to 3,380 cfs. In coordination with GID, it was determined that the spillway gates could be closed to reduce the peak flow to the Sun River and to gradually fill the remaining 12 feet of storage.

Inflows in June continued to remain between 1,200 cfs and 2,000 cfs until June 15 when inflows were below 1,000 cfs. Gibson Reservoir reached full pool on June 10. On June 25, a severe storm was anticipated in the Sun River and Gibson drainage area. Three inches of rain was forecasted to hit the area on June 28 through June 30 with possible higher amounts above Gibson reservoir. Inflow forecasts were projected to reach 8,500 cfs on July 1. Fortunately, the inflow forecast did not materialize as inflows remained between 2,600 and 2,300 by July 1. The daily average release to the Sun River over Diversion Dam during this time was near 1,500 cfs. Figure MTG23 shows actual precipitation events during June. After the storm, releases to the Sun River were reduced to approximately 120 cfs by July 8. Releases remained at this rate throughout the rest of the month.

July brought cooler temperatures and below normal precipitation across the Sun River drainage. The end of month storage content was 67,361 AF at elevation 4,695.50 feet. The actual April through July runoff totaled 451,800 AF, 109 percent of average. Inflows during April, May, June, and July were 95, 119, 105, and 102 percent of average, respectively. The April through July runoff into Gibson Reservoir is summarized in Figure MTG 23 and 24 as it relates to precipitation and temperatures.

Table MTT 20: Gibson Dam and Sun River major precipitation events in June 2020.

Location	June 6-9	June 17-19	June 28-30
Valley Stations			
CASCADE 5	1.31	0.80	2.32
CHOTEAU 8	0.77	0.51	1.62
CHOTEAU	1.64	0.41	1.83
DUTTON 3.3	0.81	0.77	2.10
FAIRFIELD	0.90	0.71	1.50
GREATFALLSW	1.05	0.68	2.63
ROGERS P9	1.45	0.89	2.13
SUN R4	1.10	0.65	2.08
Mountain Stations			
DUPUYER CREEK	2.10	1.10	4.80
MOUNT LOCKHART	1.50	0.90	3.60
WALDRON	1.90	0.10	2.20
WOOD CREEK	1.90	0.70	4.10
GIBSON	2.10	0.74	2.22

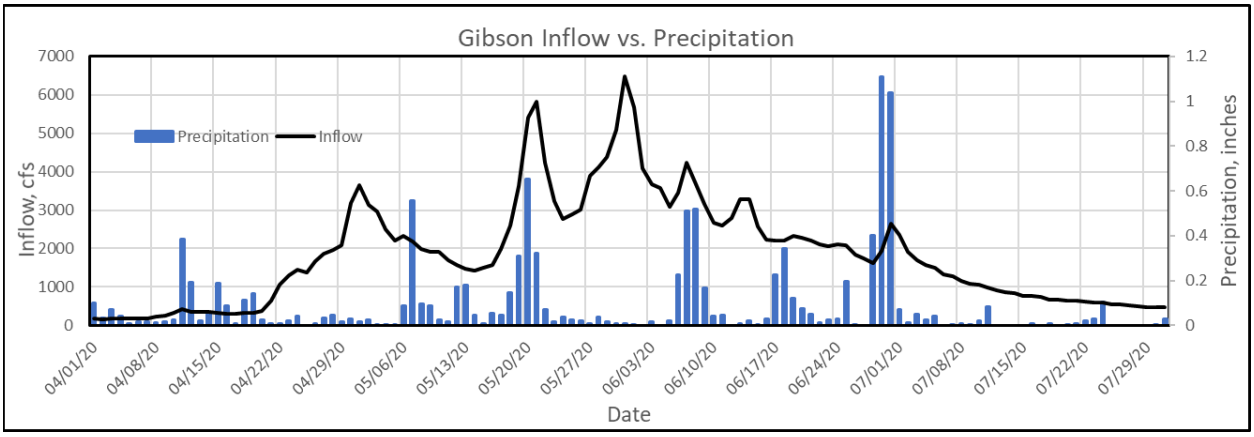


Figure MTG 23: Comparison of Gibson Inflow as Related to Precipitation.

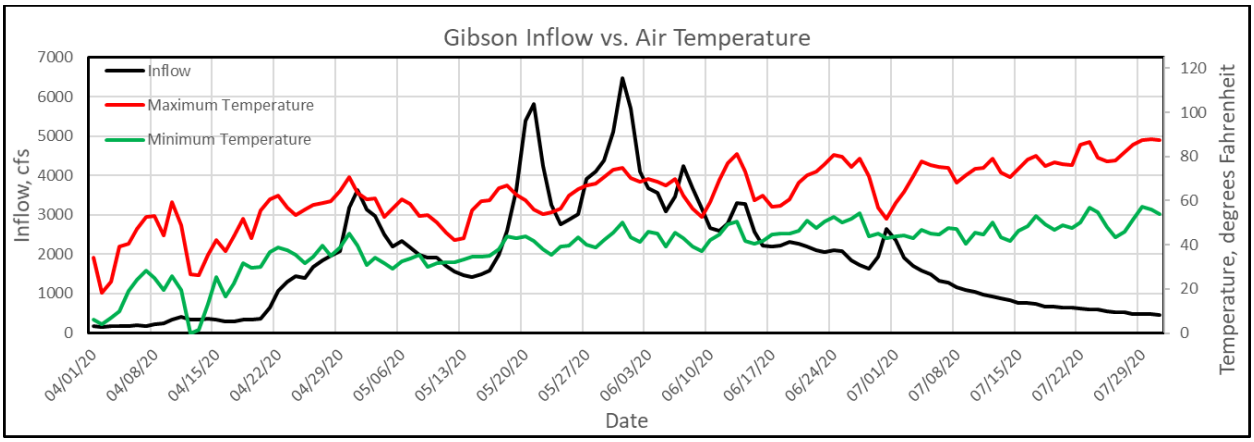


Figure MTG 24: Comparison of Gibson Inflow as Related to Temperature.

Conditions during August resulted in normal temperatures and much below normal precipitation. The valley precipitation was 31 percent of average, while mountain precipitation was 21 percent of average. From this point forward, releases from Gibson Reservoir were adjusted to meet downstream senior water rights and minimum river flows. Gibson Reservoir reached a storage content of 18,823 AF on August 31.

Temperatures during September were two to four degrees above normal while drought conditions persisted. Areas in the Sun River Basin were one inch below normal precipitation amounts for the month. Diversions from the Sun River to the Pishkun Supply Canal were discontinued on September 10. Gibson Reservoir ended the water year with a content of 7,212 AF of storage at elevation 4,614.96 feet on September 30.

Even though no space is allocated to flood control in Gibson Reservoir, the Corps still estimates flood damages prevented by Gibson Reservoir. The Corps determined that during WY 2020, Gibson Reservoir did not contribute to the reduction of flood damages locally or downstream on the Missouri River.

Pishkun Reservoir: Summary of 2020 Operations

Pishkun Reservoir, near Augusta, Montana, is an off-stream reservoir supplied by a feeder canal which diverts water from the Sun River below Gibson Reservoir. The reservoir serves the 81,000 acre Greenfields Division. The total capacity of the reservoir is 46,670 AF at elevation 4,370.0 feet.

In 2002, Reclamation surveyed Pishkun Reservoir to develop a bathymetric profile and compute a current storage-elevation relationship (area-capacity tables). Data was used to calculate sediment accumulation since the previous survey, completed in 1940. The 2002 survey determined that Pishkun Reservoir has a storage capacity of 46,694 AF and a surface area of 1,522 acres at reservoir elevation 4,370.0 feet. Comparisons show the total reservoir capacity in 2002 was slightly greater than the original volume computed in 1940. It is believed that the difference between the surveys resulted from differences in the detail of the two surveys. The revised area-capacity table was put into effect on October 1, 2005, reflecting the new storage levels.

The content in Pishkun Reservoir at the beginning of the WY 2020 was 27,919 AF at elevation 4,355.77 feet. Storage during the fall and winter was maintained between 27,900 AF and 26,400 AF

due to evaporation and ice storage. Diversions from the Sun River started refilling the reservoir on May 1, 2020. On May 6, irrigation releases from Pishkun Reservoir began and continued to slowly increase throughout the month to 1,020 cfs. Storage slowly filled and reached near the top of active conservation pool at elevation 4,370.0 feet on May 29.

Figure MTG 25: Birds-eye view of Pishkun Reservoir.

Pishkun releases from May through September were based on meeting irrigation demands. GID delivered a full allotment (2.0 AF per acre) to its water users in 2020. Approximately 270,000 AF of water was released from Pishkun Reservoir from May 6 through September 10 to help meet irrigation demands on the Sun River Project. All diversions from the Sun River into Pishkun Reservoir were discontinued on September 10.

By the end of the water year, the reservoir storage was 35,295 AF at elevation 4,362.01 feet, 128 percent of average and 75 percent of full capacity.

Additional hydrologic and statistical data pertaining to Pishkun Reservoir can be found in Table MTT 25, 26, 27, and 28 and Figure MTG28.

Willow Creek Reservoir: Summary of 2020 Operations

Willow Creek Reservoir obtains its water supply from Willow Creek and the Sun River via the Willow Creek Feeder Canal. The total reservoir capacity is 32,300 AF at elevation 4142.0 feet. Releases from Willow Creek Reservoir enter the Sun River and can be diverted for irrigation at the Fort Shaw Diversion Dam, the Floweree Canal of the Broken O Ranch, and other downstream senior water users.

In 2002, Reclamation surveyed Willow Creek Reservoir to develop a bathymetric profile map and compute a present storage-elevation relationship (area-capacity tables). Data were used to calculate reservoir sediment accumulation since dam closure in 1911. The 2002 survey determined that Willow Creek Reservoir has a storage capacity of 34,819 AF and a surface area of 1,509 acres at a

reservoir elevation of 4,144.00 feet. Since closure in 1911, the reservoir had an estimated volume change of 431 AF below reservoir elevation 4,144.00 feet. This volume represents a sediment accumulation of 1.2 percent of total capacity at this elevation. The revised area-capacity table was put into effect on October 1, 2005, reflecting the new storage levels.

Figure MTG 26: View of Willow Creek Dam and Reservoir.

Willow Creek Reservoir was empty at the beginning of WY 2020, at elevation 4,133.89 feet. The reservoir was drained in WY 2019 for gate maintenance purposes. The maintenance was completed on October 18, 2019 therefore the reservoir began to refill with diversion from the Sun River via the Willow Creek Feeder Canal. GID continued to divert water from October 19 until December 17. Through diversions and natural inflows, Willow Creek Reservoir gained approximately 9,460 AF of storage or 7.0 feet by March 30.

On April 8, GID again initiated diversions from the Sun River via the Willow Creek Feeder Canal to continue filling the reservoir. Diversions were discontinued on June 26 as a severe storm was anticipated in the drainage area of Willow Creek Reservoir. GID determined to increase releases to 200 cfs as the reservoir was nearing full. The storm did not produce as much precipitation as originally anticipated. Therefore, releases were shut off by July 1 to recover storage content. The reservoir peaked at elevation 4,141.67 feet, 31,366 AF on July 6. On July 7, releases were initiated for meeting downstream demands. These releases continued to fluctuate throughout the summer until releases ceased on September 9. The reservoir ended the water year with a storage content of 20,649 AF at elevation 4,133.81 feet.

Additional hydrologic and statistical data pertaining to Willow Creek Reservoir can be found in Table MTT 29, 30, 31, and 32 and Figure MTG29.

Important Events – WY2020

October 18, 2019: Began to refill Willow Creek Reservoir via Willow Creek Feeder Canal. Reservoir was empty.

May 1, 2020: Diversions to the Pishkun Supply Canal were initiated.

July 7, 2020: Releases from Willow Creek Reservoir were initiated.

September 9, 2020: Releases from Willow Creek Reservoir were discontinued.

September 21, 2020: Releases from Pishkun Reservoir for irrigation deliveries were discontinued for the season.

Table MTT 21: Reservoir allocations for Gibson Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,557.50	0	0
TOP OF ACTIVE CONSERVATION	4,724.00	98,687	98,687

Table MTT 22: Storage and elevation data for Gibson Reservoir.

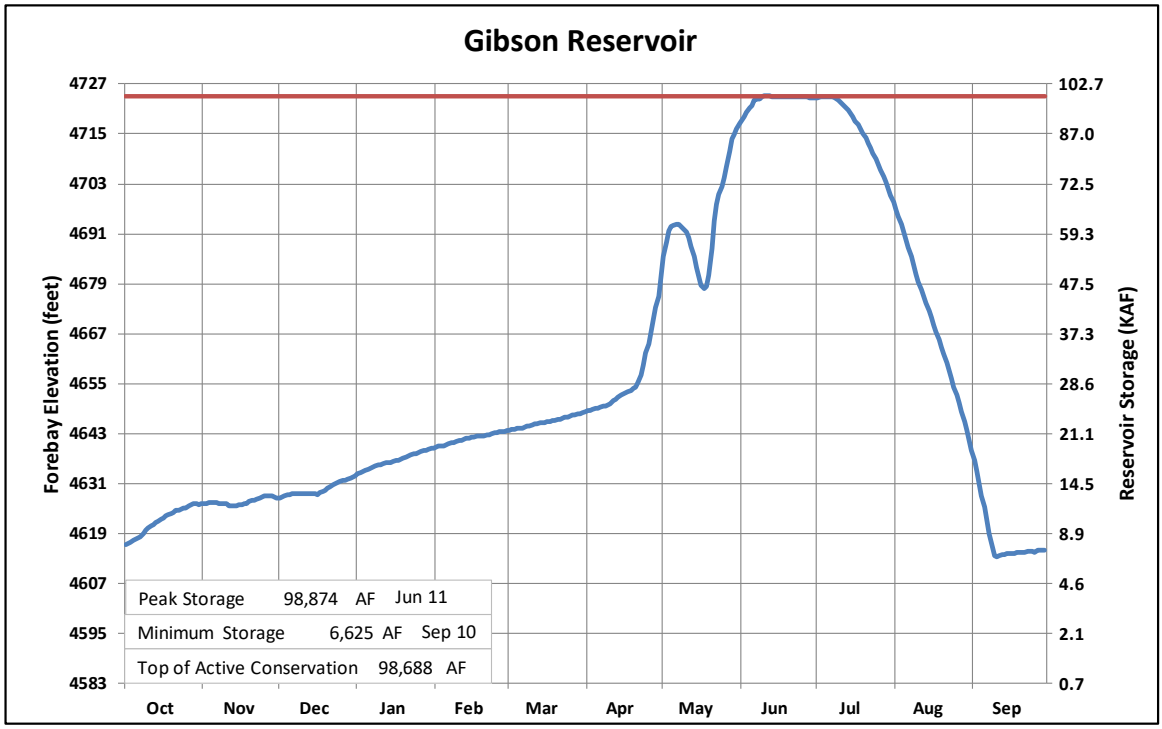
STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,616.07	7,653	10/1/2019
END OF YEAR	4,614.96	7,212	9/30/2020
ANNUAL LOW	4,613.43	6,625	9/10/2020
ANNUAL HIGH	4,724.14	98,874	6/10/2020
HISTORIC HIGH	4,732.23	116,400	6/8/1964

Table MTT 23: Inflow and discharge data for Gibson Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	563,833	Oct '19-Sep '20	564,274	Oct '19-Sep '20
DAILY PEAK (CFS)	6,475	5/31/2020	5,554	5/31/2020
DAILY MINIMUM (CFS)	105	2/3/2020	108	12/19/2019

Table MTT 24: Water year 2020 monthly inflow, outflow, and storage data for Gibson Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow to canal, KAF	% of 30-yr Avg	Outflow to river, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	18.7	134	2.4	68	13.9	181	12.1	59
NOVEMBER	16.6	109	5.5	180	12.9	136	12.8	54
DECEMBER	13.3	107	2.9	1657	10.5	100	15.5	59
JANUARY	10.6	99	0	---	9.6	106	19.1	66
FEBRUARY	9	91	0	---	8.9	108	21.5	68
MARCH	10	67	0	---	9.4	96	24.3	66
APRIL	43.8	95	3.3	36	18.9	90	49.2	90
MAY	185.6	119	48.6	104	96.7	117	90.3	99
JUNE	165.4	105	69.8	109	77.3	77	98.1	107
JULY	57.1	102	73.4	91	19	96	67.4	147
AUGUST	20.6	92	63.1	160	8.4	74	18.8	97
SEPTEMBER	13.1	89	14.7	125	11.8	124	7.2	48
ANNUAL	563.8	106	283.5	110	297.3	99	-	-
APRIL-JULY	451.9	109	-	-	-	-	-	-



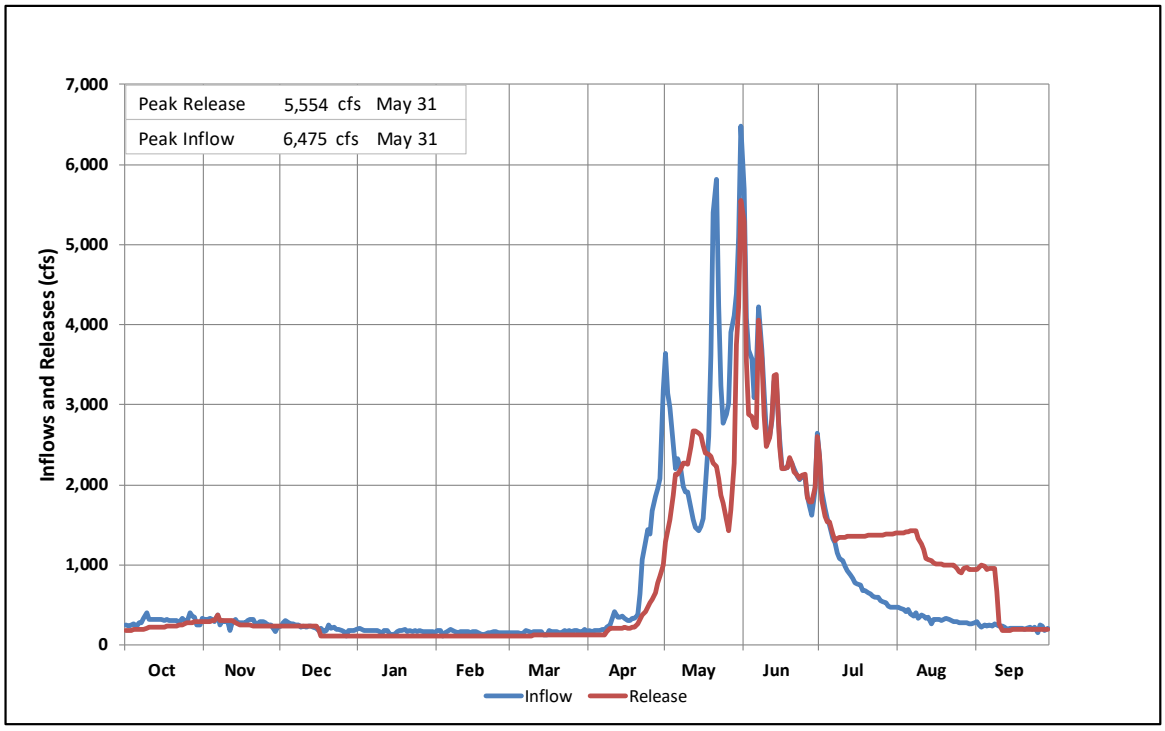


Figure MTG 27: Water year 2020 hydrologic data for Gibson Reservoir.

Table MTT 25: Reservoir allocations for Pishkun Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,342.00	16,008	16,008
TOP OF ACTIVE CONSERVATION	4,370.00	46,694	30,686

Table MTT 26: Storage and elevation data for Pishkun Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,355.77	27,919	10/1/2019
END OF YEAR	4,362.01	35,295	9/30/2020
ANNUAL LOW	4,354.26	26,372	4/8/2020
ANNUAL HIGH	4,369.99	46,679	7/4/2020
HISTORIC HIGH	4,371.40	48,950	7/4/1953

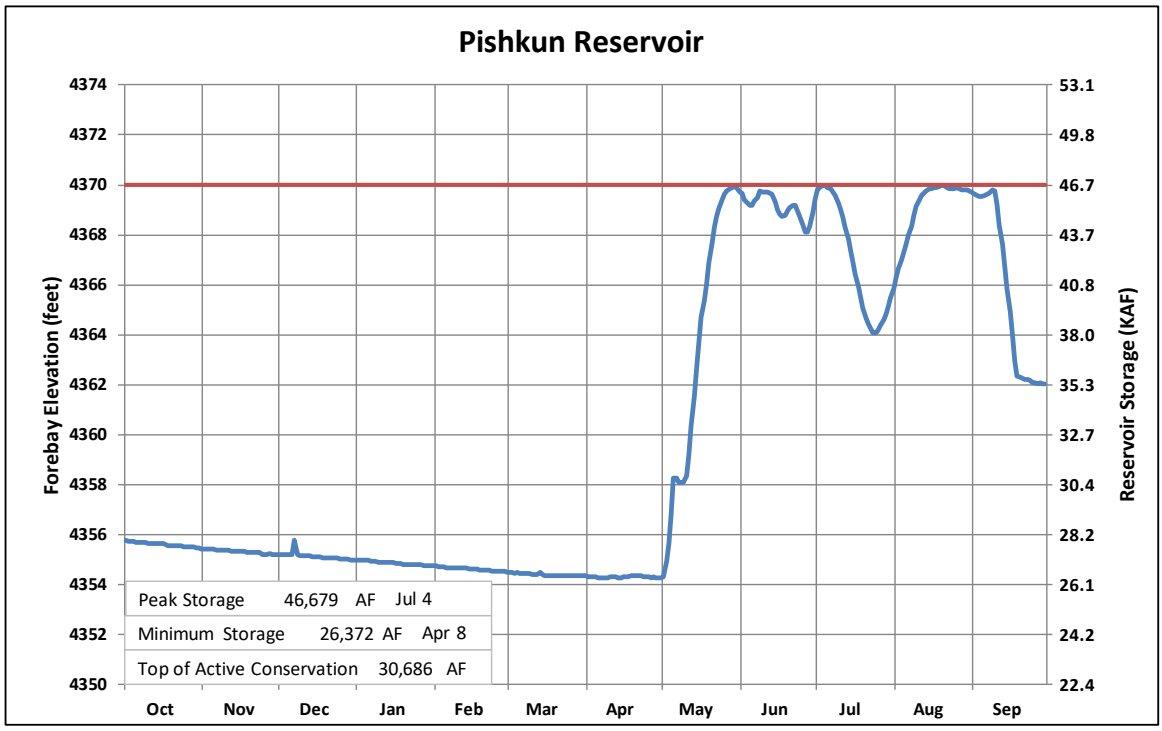
Table MTT 27: Inflow and discharge data for Pishkun Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	279,200	Oct '19-Sep '20	270,023	Oct '19-Sep '20
DAILY PEAK (CFS)	1,394	6/29/2020	1,670	7/16/2020
DAILY MINIMUM (CFS)	0	*	0	*

* During nonirrigation season

Table MTT 28: Water year 2020 monthly inflow, outflow, and storage data for Pishkun Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	0	---	0	---	27.6	98
NOVEMBER	0	---	0	---	27.3	94
DECEMBER	0	---	0	---	27.1	93
JANUARY	0	---	0	---	26.9	93
FEBRUARY	0	---	0	---	26.6	92
MARCH	0	---	0	---	26.5	88
APRIL	0	---	0	---	26.4	71
MAY	49.7	117	29.8	86	46.2	101
JUNE	70.5	115	70.9	105	45.9	114
JULY	73.7	183	79	99	40.6	109
AUGUST	66.3	86	60.7	143	46.3	137
SEPTEMBER	19	160	29.7	164	35.3	128
ANNUAL	279.2	115	270	111	-	-
APRIL-JULY	193.8	103	-	-	-	-



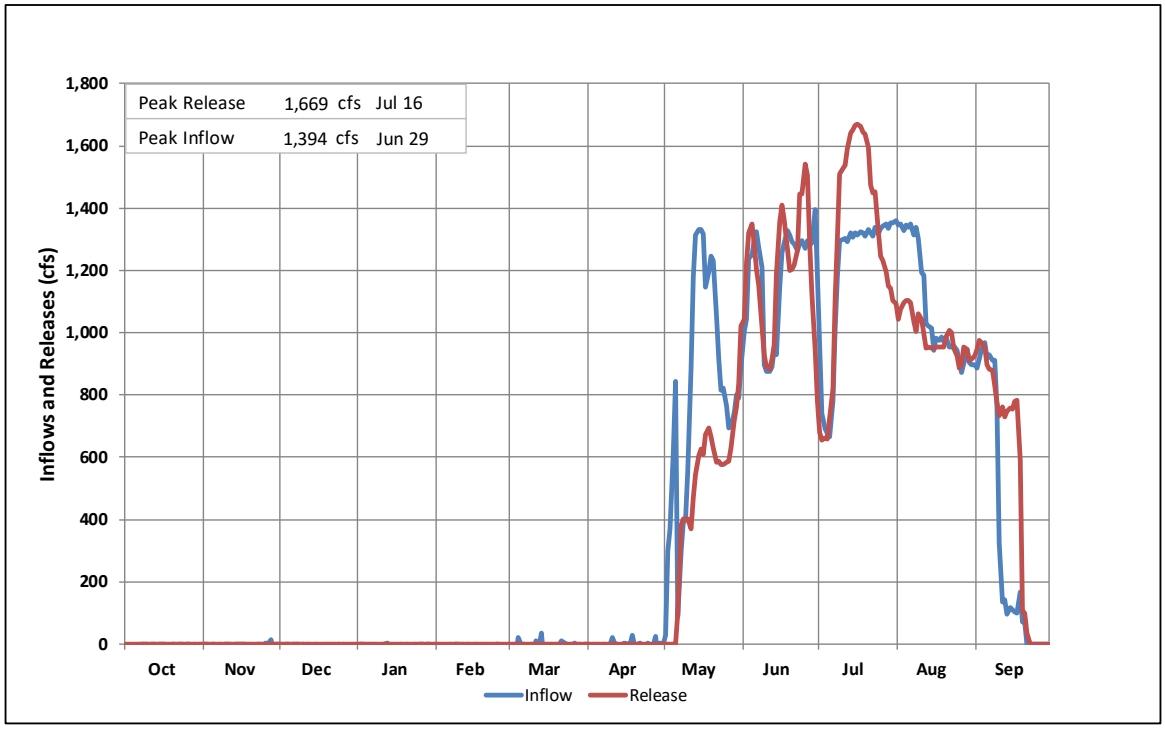


Figure MTG 28: Water year 2020 hydrologic data for Pishkun Reservoir.

Table MTT 29: Reservoir allocations for Willow Creek Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,085.28	1	1
TOP OF ACTIVE CONSERVATION	4,142.00	31,848	31,847

Table MTT 30: Storage and elevation data for Willow Creek Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,085.00	0	10/1/2019
END OF YEAR	4,133.81	20,649	9/30/2020
ANNUAL LOW	4,085.00	0	10/1/2019
ANNUAL HIGH	4,141.67	31,366	7/6/2020
HISTORIC HIGH	4,144.80	36,033	6/22/2018

Table MTT 31: Inflow and discharge data for Willow Creek Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	38,226	Oct '19-Sep '20	17,454	Oct '19-Sep '20
DAILY PEAK (CFS)	225	5/20/2020	213	7/31/2020
DAILY MINIMUM (CFS)	0	*	0	*

*During nonirrigation season

Table MTT 32: Water year 2020 monthly inflow, outflow, and storage data for Pishkun Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	3.6	210	1.3	1958	2.2	0
NOVEMBER	5.9	390	0	---	8.1	1
DECEMBER	4	967	0	---	12.1	1
JANUARY	0.9	300	0	---	13	55
FEBRUARY	0.7	233	0	---	13.7	57
MARCH	0.9	180	0	---	14.7	60
APRIL	3.6	240	0	---	18.3	70
MAY	7.5	208	0	---	25.8	90
JUNE	6.1	190	1.2	44	30.7	105
JULY	2.2	69	7.8	123	25	107
AUGUST	1.4	140	6.3	161	20.1	100
SEPTEMBER	1.3	233	0.8	124	20.6	103
ANNUAL	38.2	100	17.5	112	-	-

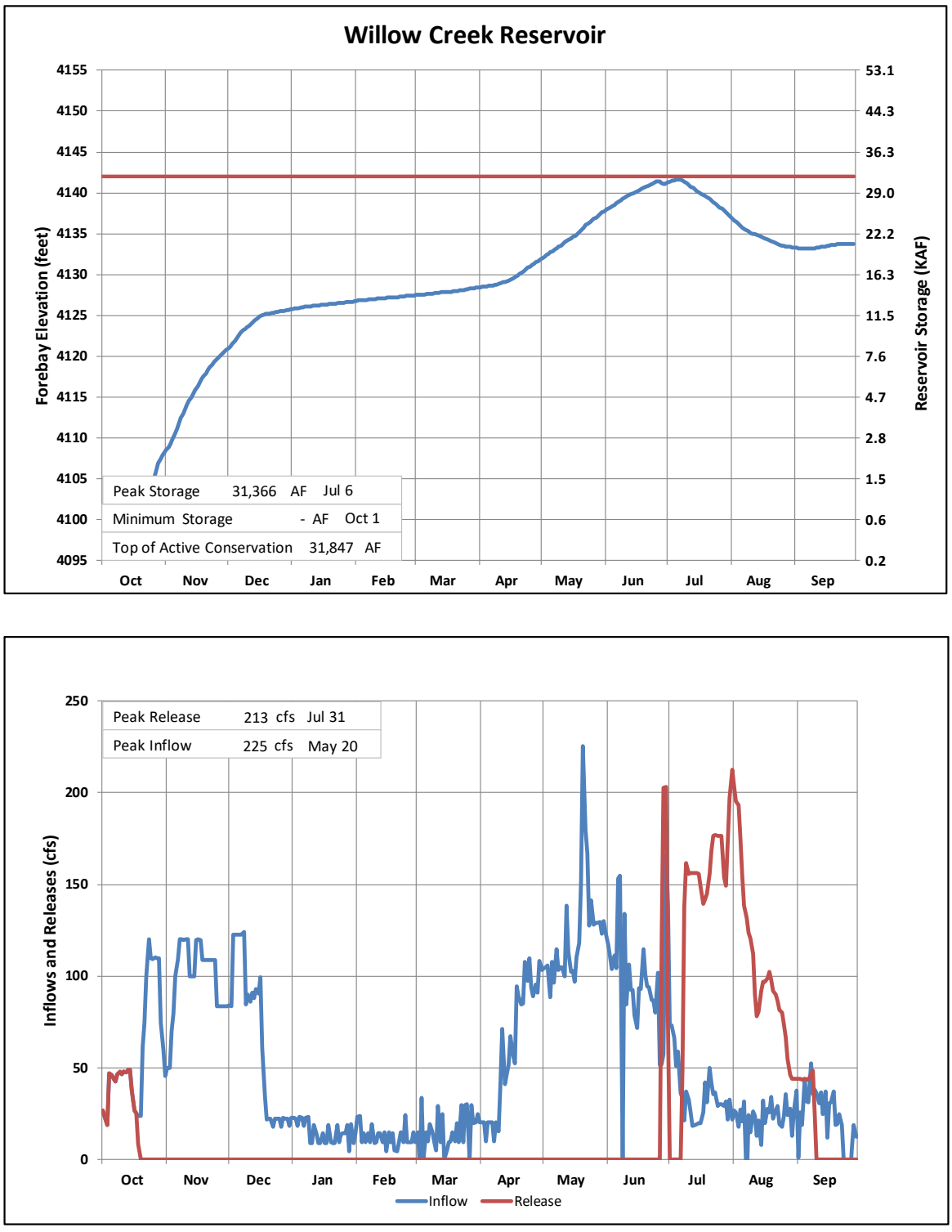


Figure MTG 29: Water year 2020 hydrologic data for Willow Creek Reservoir.

Lake Elwell (Tiber Dam)

Tiber Dam P S MBP is located on the Marias River near Chester, Montana. It was built to provide adequate water supply for 127,000 acres in the Lower Marias Unit and for flood control. The crest section of Tiber Dam spillway began settling in 1956, following initial filling of the reservoir. Restrictions were placed on reservoir operating levels in the late 1950s to safeguard the structure until repairs could be made. The rate of settlement increased following the flood of 1964 and the heavy runoff of 1965. The settlement was attributed to a weakness of the underlying shale formation in which small lenses of gypsum slowly dissolved as water passed through the shale. Measures to protect the structure were approved by Congress, and construction was initiated in 1967 and completed in 1970. The construction consisted of modifying the canal outlet works for use as an auxiliary outlet works and closing the entrance channel of the spillway by a temporary earth fill cofferdam. To accommodate these changed conditions, the reservoir operating criteria was further revised and the active capacity was eliminated. Work on modification of the spillway to restore active conservation capacity started in 1976 and was completed in October 1981. The construction consisted of replacing the upstream section of the spillway and raising the dam 5 feet. Since that time, all restrictions on operating levels were lifted and normal operations were restored at Lake Elwell.

Figure MTG 30: View of Tiber Dam and Lake Elwell.

Summary of 2020 Operations

Because the irrigation distribution works have not yet been constructed, the reservoir is operated for flood control, fishery and recreation benefits. The reservoir does provide irrigation water to several individual operators by water service contracts and provides about 1,500 AF to the Tiber County Water District for municipal, industrial, rural domestic, and livestock use. The city of Chester,

Montana receives a small amount of water from the reservoir annually for municipal use. Approximately 3,000 acres are irrigated by contract from Lake Elwell storage.

In 2002, Reclamation surveyed Lake Elwell to develop a topographic map and compute area-capacity tables. Data were used to calculate reservoir sediment accumulation since dam closure in October of 1957. The 2002 survey determined that Lake Elwell has a storage capacity of 925,649 AF and a surface area of 18,275 acres at a reservoir elevation of 2,993.00 feet. Since closure in 1957, the reservoir has accumulated a sediment volume of 42,179 AF below an elevation of 2,993.00 feet. This volume represents a 4.4 percent change in total capacity at this elevation. The revised area-capacity table was put into effect on October 1, 2005, reflecting the new storage levels.

Wet weather towards the end of September pushed inflows much above average. By the end of WY 2019, Lake Elwell storage was 858,565 AF at elevation 2,989.20 feet, 108 percent of normal. WY 2020 continued with wetter and cooler than average conditions during October and November. Conditions were drier than average during December. Cumulative valley precipitation through December was 162 percent of average and mountain precipitation was 86 percent of average. Inflow during this period totaled 108,388 AF, 202 percent of average. Releases were maintained at powerplant capacity, approximately 700 cfs due to the high inflows. By the end of December 2019, Lake Elwell storage was 839,330 AF, 112 percent of average.

On January 1, 2020 the NRCS reported mountain snowpack SWE in the Marias River Basin above Lake Elwell to be 114 percent of average. The January 1, 2020 inflow forecast, based primarily on mountain snowpack, was 383,000 AF, 99 percent of average for April through July. During January 2020, valley precipitation was 82 percent and mountain precipitation was 112 percent of average.

On February 1 the NRCS reported the mountain snowpack SWE was 112 percent of average. The February 1 water supply forecast indicated the April-July runoff would be about 396,000 AF, 103 percent of average. There was not much change from the previous month in water supply conditions.

Precipitation was above average in February and on March 1 the NRCS reported the mountain snowpack SWE was 119 percent of average. The March 1 water supply forecast indicated the April-July runoff would be 406,000 AF, 105 percent of average. The lowest storage content for the year occurred on March 22 at 813,641 AF, at elevation 2,985.66 feet. Warmer temperatures towards the end of March melted off low elevation snow and increased inflows into Lake Elwell. Inflows moderately increased to approximately 1,150 cfs on March 31. Although storage was high and runoff was forecasted to be above average, releases were kept at powerplant capacity, 685 cfs.

Operations were coordinated with MTFWP as part of a migration study of pallid sturgeon. MTFWP provided a preferred release schedule. Based on the coordination, water was conserved during March for higher releases in April, May, and June. Reclamation and MTFWP met on March 4, April 15, and May 11 to coordinate releases.

On April 1 the mountain snowpack SWE was 117 percent of average. The water supply forecast prepared in April indicated the April-July runoff was expected to be 111 percent of average, totaling 429,000 AF. Releases were maintained at 700 cfs through April 26 to conserve water for the coordinated operations with MTFWP. Releases were increased to 2,000 cfs from April 27 through May 1.

April precipitation was below average in the valley but above average in the mountains. April inflow was 74,100 AF, 129 percent of average. Snowpack peaked on April 19 at 130 percent of the average peak snowpack.

On May 1 the NRCS mountain snowpack SWE was 123 percent of average. The May 1 water supply forecast indicated May through July runoff of 362,000 AF, 110 percent of average. Snowmelt and precipitation increased inflows above 3,000 cfs at the beginning of May and above 4,000 cfs during the middle of May. Releases were reduced to 1,500 cfs on May 13 and 14 to conserve water for a second elevated release. Valley precipitation was greater than average during May. Inflows into Lake Elwell were 126 percent of average.

On June 1, the NRCS mountain snowpack SWE was 85 percent of average. Based on actual inflows, storage conditions, forecasted inflows, and the coordination with MTFWP, releases were incrementally increased to 3,000 cfs during June 1-11. Inflow gradually decreased through the month of June from a daily average of approximately 4,480 to 1,480 cfs as snowmelt tapered off. Releases were incrementally decreased to 1,500 cfs during June 18-25 to conserve storage and fill Lake Elwell. Heavy precipitation towards the end of June along with any remaining snowmelt resulted in a third and highest peak inflow of the year of 5,430 cfs on July 2. Monthly precipitation percentages for June were 138 and 169 percent of average for the valley and mountains, respectively. June inflow was 105 percent of average. Recorded precipitation totals in the Marias River Basin are show Table MTT 33.

Table MTT 33: Lake Elwell major precipitation events in June 2020.

Location	June 7-0	June 17-19	June 28-30
Valley Stations			
CHESTER	0.62	0.31	0.66
CONRAD	2.25	0.43	0.89
CUT BANK	0.9	0.36	1.18
DUNKIRK 19	1.32	0.20	1.30
EAST GLACIER	1.10	0.58	1.59
GALATA 16	1.24	0.73	2.38
SHELBY	0.72	0.69	1.03
Mountain Stations			
BADGER PASS	1.20	1.40	3.70
DUPUYER CREEK	1.80	1.10	4.80
MOUNT LOCKHART	1.20	0.90	3.60
PIKE CREEK	1.00	0.80	3.80
WALDRON	1.90	0.10	2.20

Storage peaked on July 5 at 935,552 AF, at elevation 2,993.54 feet. Operations were coordinated with the Corps due to use of the exclusive flood control pool. Releases were incrementally increased to 2,600 cfs from June 30 through July 6. All water was evacuated from the exclusive flood control pool on July 11. Releases were decreased during July 13-16 to 1,500 cfs as inflows continued to decrease. All powerplant bypass releases were made through the spillway until July 23 when releases were switched to the auxiliary outlet works. Releases were reduced a couple more times during July until they were at powerplant capacity of 725 cfs. Although precipitation during July was much below average, inflows were much above average at 192 percent of average. The April through July runoff into Lake Elwell is summarized in Figure MTG 31 and 32 as it relates to precipitation and temperatures.

Precipitation remained much below average for the remainder of WY 2020. Releases were decreased once more during WY 2020 to 600 cfs on September 16 to conserve storage. An efficiency test of the powerplant turbine was conducted on September 22 which required varied releases between 500 and 600 cfs.

Total annual valley precipitation and total annual mountain precipitation were 108 and 93 percent of average, respectively. The April-July runoff into Lake Elwell during WY 2020 was 126 percent of average, totaling 485,698 AF. This was 25,891 AF more than the April-July inflow experienced in 2019. The total annual inflow was 130 percent of average, totaling 704,723 AF. This was 92,811 AF more than the total annual inflow experienced in WY 2019. By the end of WY 2020, Lake Elwell storage was 828,178 AF at elevation 2,987.35 feet. This was 104 percent of normal and 30,387 AF, 1.85 feet lower than reported on September 30, 2019.

The Corps determined that during WY 2020, Lake Elwell prevented $2,266,500 in flood damages downstream on the Missouri River below Fort Peck Reservoir.

Additional hydrologic and statistical information pertaining to the operation of Lake Elwell during WY 2020 can be found in Tables MTT 34, 35, 36, and 37 and Figure MTG33.

Important Events – WY2020

April 27-May 1, 2020: Releases were increased from 690 cfs to 2,000 cfs over several days based on the water supply forecast and as part of the coordination with MTFWP regarding research on endangered pallid sturgeon.

May 13-14, 2020: Releases were decreased to 1,500 cfs. Releases were coordinated with MTFWP as part of a research project on endangered pallid sturgeon.

June 1-4, 2020: Releases were increased to 2,500 cfs. Releases were coordinated with MTFWP as part of a research project on endangered pallid sturgeon.

June 10-11, 2020: Releases were increased to 3,000 cfs. Releases were coordinated with MTFWP as part of a research project on endangered pallid sturgeon.

June 18-25, 2020: Releases were decreased to 1,500 cfs. Releases were coordinated with MTFWP as part of a research project on endangered pallid sturgeon.

June 30-July 1, 2020: Releases were increased to 2,250 cfs. Releases were coordinated with the Corps.

July 6, 2020: Releases were increased to 2,600 cfs. Releases were coordinated with the Corps.

July 13-16, 2020: Releases were decreased to 1,500 cfs. Releases were coordinated with the Corps.

July 21-23, 2020: Releases were decreased to 1,065 cfs to conserve storage.

July 29, 2020: Releases were decreased to 725 cfs to conserve storage.

September 16, 2020: Releases were decreased to 600 cfs to conserve storage.

September 22, 2020: An efficiency test was conducted on the powerplant turbine. Releases were briefly decreased to 500 and 550 cfs for the test. Releases returned to 600 cfs following the efficiency test.

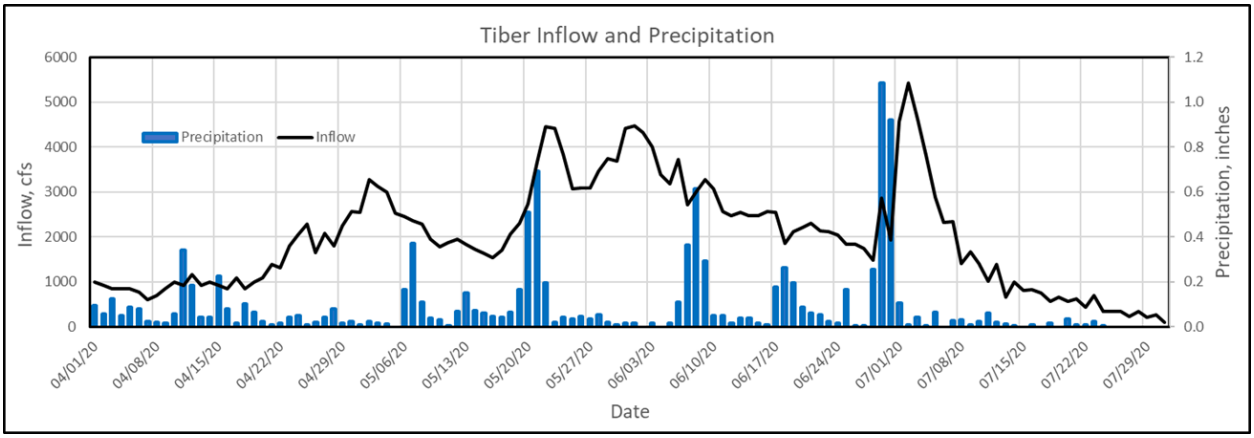


Figure MTG 31: Comparison of Lake Elwell Inflow and Marias River Basin Precipitation.

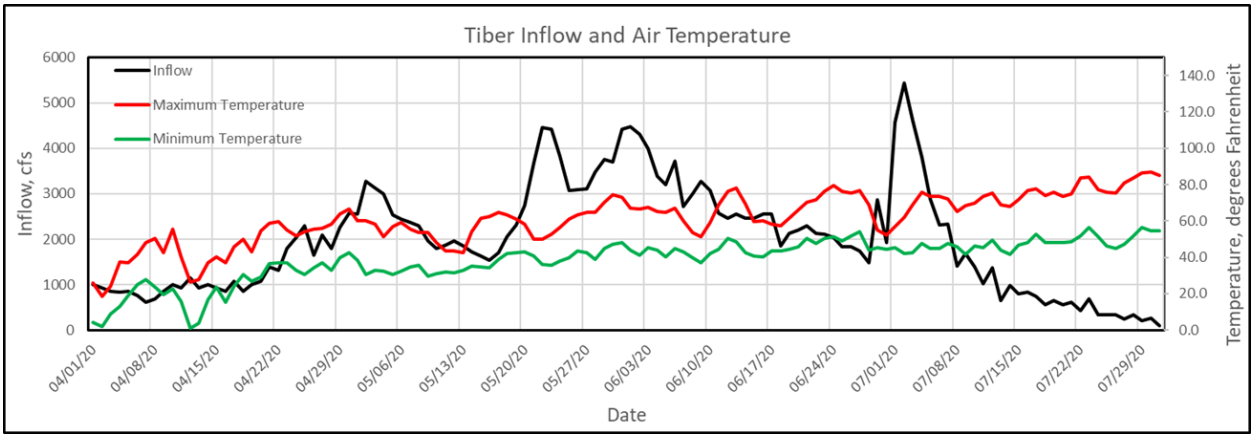


Figure MTG 32: Comparison of Lake Elwell Inflow and Marias River Basin Temperatures.

Table MTT 34: Reservoir allocations for Lake Elwell.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	2,966.40	554,330	554,330
TOP OF ACTIVE CONSERVATION	2,976.00	667,213	112,883
TOP OF JOINT USE	2,993.00	925,649	258,436
TOP OF EXCLUSIVE FLOOD CONTROL	3,012.50	1,328,723	403,074

Table MTT 35: Storage and elevation data for Lake Elwell.

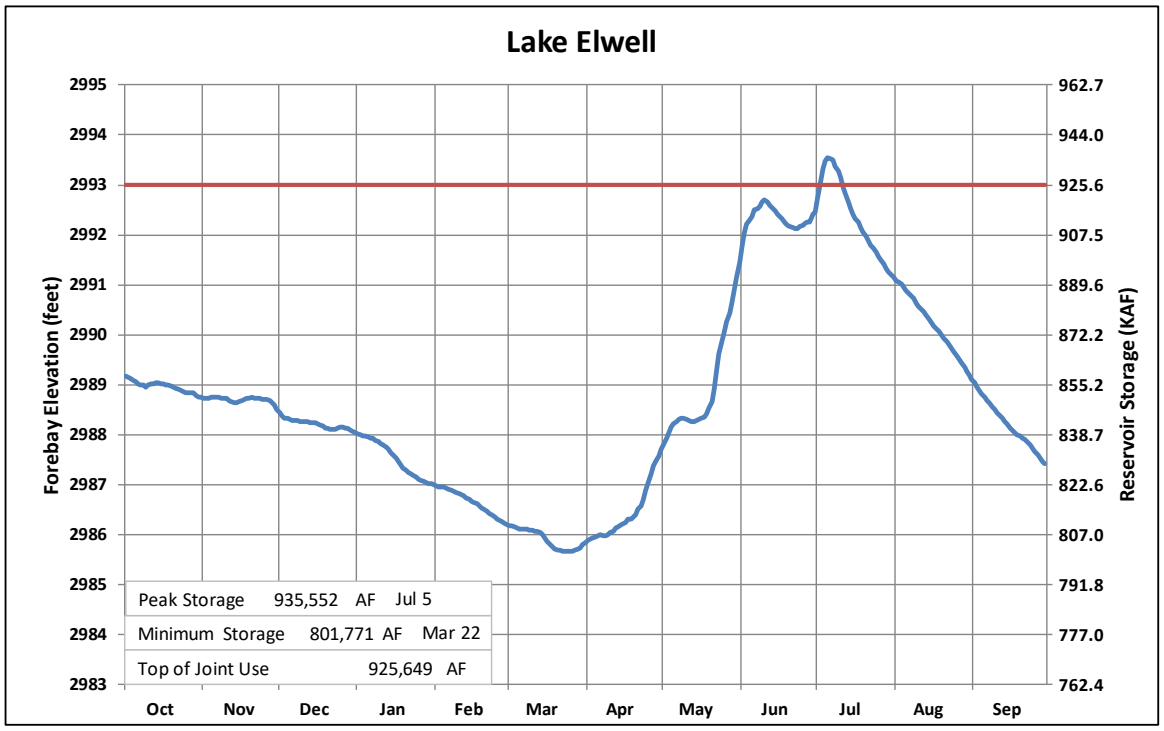
STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,989.20	858,565	10/1/2019
END OF YEAR	2,987.35	828,178	9/30/2020
ANNUAL LOW	2,985.66	801,771	3/22/2020
ANNUAL HIGH	2,993.54	935,552	7/5/2020
HISTORIC HIGH	3,011.42	1,303,858	7/19/2011

Table MTT 36: Inflow and discharge data for Lake Elwell.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	704,723	Oct '19-Sep '20	735,110	Oct '19-Sep '20
DAILY PEAK (CFS)	5,431	7/2/2020	3,016	6/15/2020
DAILY MINIMUM (CFS)	-61	8/14/2020	598	9/22/2020
PEAK SPILL (CFS)	-	-	2,326	6/15/2020
TOTAL SPILL (AF)	-	-	230,864	4/27-7/29/2020

Table MTT 37: Water year 2020 monthly inflow, outflow, and storage data for Lake Elwell.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	35.3	227	42.8	104	851	110
NOVEMBER	38.1	176	42.1	128	847.1	111
DECEMBER	35	198	42.7	131	839.3	112
JANUARY	25.8	156	42.7	130	822.4	112
FEBRUARY	27.7	133	39.9	131	810.2	112
MARCH	36.8	86	42.3	116	804.7	111
APRIL	74.1	129	44.8	114	834	112
MAY	170	126	106.1	192	897.8	109
JUNE	157.2	105	139.4	190	915.6	102
JULY	84.4	192	108	161	892.1	102
AUGUST	9.6	80	44.7	83	857.1	103
SEPTEMBER	10.7	110	39.6	87	828.2	104
ANNUAL	704.7	130	735.1	136	-	-
APRIL-JULY	485.7	126	-	-	-	-



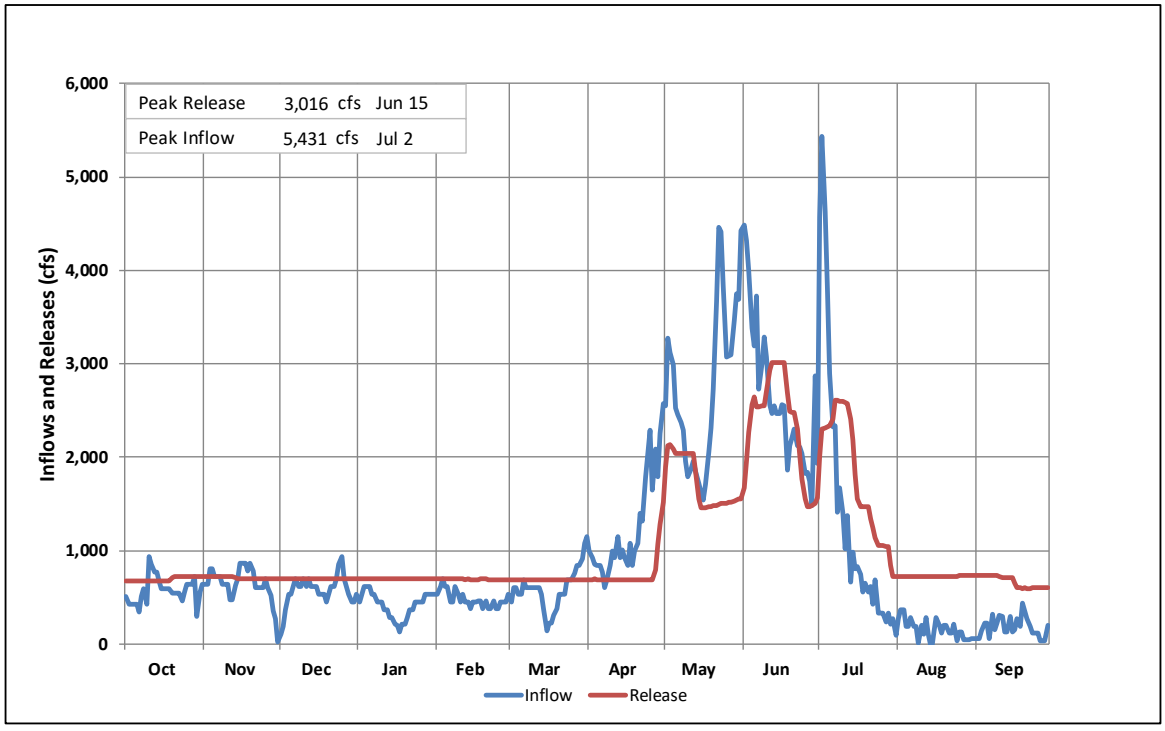


Figure MTG 33: Water year 2020 hydrologic data for Lake Elwell.

Milk River Project

The 117,000-acre Milk River Project, located in north-central Montana, is served by Sherburne, Fresno, and Nelson Reservoirs. Sherburne and Nelson Reservoirs are single-purpose irrigation structures. Fresno Reservoir has joint-use flood control space, provides a municipal water supply to several municipalities on or near the project, and serves as the primary irrigation storage structure for the Milk River Project. Approximately 101,500 acres are served by irrigation districts, 9,500 acres are served by private facilities and between 5,000 and 6,000 acres are served supplemental water by the Fort Belknap Indian Irrigation Project.

Lake Sherburne: Summary of 2020 Operations

Lake Sherburne is located in Glacier National Park on Swiftcurrent Creek, a tributary of the St. Mary River in the Hudson Bay Drainage Basin. Lake Sherburne has a total capacity of 66,147 AF at an elevation of 4,788.0 feet. The use of boundary waters of the St. Mary and Milk Rivers are divided between Canada and the United States by the 1909 Boundary Waters Treaty. The United States utilizes its entitlement to St. Mary River water by regulating flows through storage in Lake Sherburne and diverting St. Mary River flows through the St. Mary Canal to the Milk River Basin. The river outlet works has a capacity of 2,100 cfs at elevation 4,788.0 feet. The maximum combined discharge of the spillway and river outlet works is 4,000 cfs at a maximum water surface elevation of 4,810.0 feet.

Figure MTG 34: View of Lake Sherburne's outlet works.

In 2002, Reclamation surveyed Lake Sherburne to develop a topographic map and compute area-capacity tables. The data was used to calculate reservoir sediment accumulation since dam closure in 1919. The survey data determined a storage capacity of 66,147 AF and a surface area of 1,719 acres at a reservoir elevation of 4,788.0 feet. Since dam closure in 1919, the volume change at reservoir elevation 4,788.0 feet was estimated to be 1,707 AF between the 1983 and 2002 surveys. It is assumed the volume differences between the surveys were due to survey methods and the vertical

datum. The revised area-capacity table was put into effect on October 1, 2005, reflecting the new storage levels.

On September 30, 2019 the storage content in Lake Sherburne was 5,125 AF at elevation 4,735.15 feet, 33 percent of average. The low end of year storage was due to continued high demand for water in the Milk River Basin and below average runoff in the St. Mary River Basin, especially in July and August. This was the second year in a row with low carryover.

Releases from Lake Sherburne were shutoff for the winter on September 28, 2019. Diversions to the St. Mary Canal were shut off for the season on September 27, 2019.

Precipitation in October 2019 was 131 and 101 percent of average in the valley and mountains, respectively and inflow was 131 percent of average. Precipitation was below average during November and December 2019. Cumulative valley and mountain precipitation through December were 87 and 90 percent of average, respectively. October through December 2019 inflows were 89 percent of average. Storage in Lake Sherburne by the end of December 2019 was at 21,374 AF at an elevation of 4754.68 feet, 78 percent of average.

On January 1, 2020 the NRCS reported mountain snowpack SWE in the St. Mary Basin was 102 percent of average. The April-July runoff forecast for January 1 was 93,600 AF, 94 percent of average.

The February 1 mountain snowpack SWE for the St. Mary Basin was 118 percent of average. Temperatures and precipitation were near average during February. SWE increased to 117 percent of average on March 1, 2020. The April-July runoff forecast for March 1 was 113,000 AF, 114 percent of average.

March mountain precipitation was above average while temperatures were below average. Mountain snowpack SWE was at 126 percent of average on April 1. The April 1 runoff forecast for April-July was 108,000 AF, 109 percent of average. Based on the April forecast, Lake Sherburne was expected to fill to the normal full pool, elevation of 4,788.0 feet, 66,147 AF.

Diversions to the St. Mary Canal started on March 31 at an initial amount of approximately 80 cfs. The Biological Assessment (BA) for Bull Trout in the St. Mary Basin was being completed towards the start of April. The BA included potential operational changes for the St. Mary Canal and Lake Sherburne. Releases from Lake Sherburne were started on April 1.

A deficit delivery is allowed under the Letter of Intent which is part of the International Joint Commission (IJC) Procedures Manual for the natural flow calculations of the St. Mary and Milk River Basins (Procedures Manual). The U.S. can create a deficit delivery to Canada during March, April, and May in the St. Mary River Basin. A deficit delivery allows Reclamation to conserve storage in Lake Sherburne or maintain desired flows in the St. Mary Canal. Based on storage in Lake Sherburne, Fresno Reservoir and Nelson Reservoirs and runoff forecasts, a deficit delivery to Canada in the St. Mary River Basin was not expected in WY2020. However, a small deficit delivery of 145 AF occurred during the April 1-15 accounting period. The deficit occurred through several factors that affected the startup of the St. Mary Canal and Lake Sherburne releases including cold weather which kept natural flows in the St. Mary River Basin low.

No additional deficits occurred during March through May time period so the total deficit delivery of St. Mary water to Canada was 145 AF. This water debt was carried to September 15 in accordance with the Procedures Manual.

Mountain snowpack SWE peaked two weeks later than average on April 17 at 131 percent of the average peak SWE. Mountain snowpack SWE was at 128 percent of average on May 1. The May 1 runoff forecast for May-July was 101,000 AF, 113 percent of average. Due to the low carryover going into WY2020, a drawdown of storage was not required to prepare for snowmelt runoff. Releases were increased during the second half of May to control the rate of fill. Release changes were not needed during May for the IJC accounting.

Diversions to the St. Mary Canal were low during April as Fresno Reservoir was filling during April from runoff in the Milk River Basin. Diversions were increased starting on May 4 and by May 8 diversions were 400 cfs as irrigation was expected to start in the Milk River Basin around the middle of May. Seepage along a canal drainpipe was identified on May 14. Diversions were ramped down from May 15 through May 17 to allow for repairs to the seepage area. On May 17, Drop 5 of the St. Mary Canal failed. Since the canal was already being shut off for the seepage repair, no additional changes were needed at the canal headworks. The failure of Drop 5 was a catastrophic event that ended up shutting down the St. Mary Canal for the remainder of the WY 2020 and changed reservoir and river operations for the entire Milk River Project.

Mountain snowpack SWE was at 133 percent of average on June 1. The June 1 runoff forecast for June-July was 71,000 AF, 123 percent of average. Daily average inflow into Lake Sherburne peaked for the year on June 1 at approximately 1,315 cfs. Inflows decreased to about 700 cfs during June but peaked again on July 1 at 1,240 cfs. Releases from Lake Sherburne in June were increased to 750 cfs to control the rate of fill. Inflow for June was 113 percent of average at 43,700 AF as most of the remaining snow melted out. Precipitation in June was above average in the valley and mountains. Lake Sherburne peaked in storage on July 2 at 63,132 AF or elevation 4,786.23 feet. There was no need to fill closer to full pool, elevation 4788.0 feet, due to the St. Mary Canal not operating.

Precipitation was well below average in July and remained well below average for the remainder of WY 2020. Inflow was above average in July at 123 percent of average. Releases from Lake Sherburne were gradually decreased during July and were 225 cfs by July 16 and 165 cfs by July 31. Storage was conserved in Lake Sherburne was kept at a near constant level through the remainder of the WY 2020. The storage was being conserved with the plan to transfer the storage to Fresno Reservoir once the St. Mary Canal was repaired.

Releases from Lake Sherburne were decreased during August and September as inflows decreased. The St. Mary Canal repairs which included the replacement of Drops 2 and 5 were completed during the first part of October 2020. Releases from Lake Sherburne were increased in October to evacuate storage and move water to Fresno Reservoir through the St. Mary Canal. Releases from Lake Sherburne were not shutoff for the season until the November 3. A requirement under the Biological Opinion is to ramp down Sherburne releases and keep releases at the minimum gate opening for one gate for three days.

The dry conditions during the summer led to a deficit delivery of 63 AF in the Milk River Basin by Canada during the second part of July. The Canadian water users were shut off for the season on

July 24 which ended any additional deficits in the Milk River Basin. The deficit was not large enough to offset the U.S. deficit of 145 AF created in St. Mary River Basin during April. However, there was more than enough surplus delivery during the second half of September to repay the deficit difference.

The annual cumulative precipitation was 93 and 96 percent of average for valley and mountain areas, respectively. Lake Sherburne inflow for WY 2020 totaled 140,016 AF, 99 percent of average. This was approximately 15,890 AF more than the inflow experienced during WY 2019. The actual April-July runoff was 107 percent of average, totaling 106,041 AF. On September 30 the storage content in Lake Sherburne was 62,576 AF at an elevation of 4,785.90 feet, 427 percent of average. The record high end of year storage was due to conserving storage because the failure of the St. Mary Canal.

According to preliminary data, diversions from the St. Mary River to the Milk River totaled 32,712 AF. This included diversions during October 2020. Canal diversions from the St. Mary River to the Milk River were discontinued on November 2, 2020. The total was far less than average due to the failure of the St. Mary Canal. There were no diversions from May 19 through October 7.

During the 2020 irrigation season several conference calls were conducted with the IIJC Field Representatives. Reclamation provided many updates on the repairs to the St. Mary Canal during these calls. The early deficit on the St. Mary was partially offset by a deficit on the Milk River and the remaining deficit was repaid in the second half of September.

During WY 2020, Lake Sherburne did not contribute to the reduction of local flood damages.

Additional hydrologic and statistical information pertaining to the operation of Sherburne Reservoir during WY 2020 can be found in Tables MTT 38, 39, 40, and 41 and Figure MTG 37.

Fresno Reservoir: Summary of 2020 Operations

Fresno Reservoir is located above all project lands on the Milk River near Havre, Montana. A sediment survey in 2010 and finalized in 2013 determined the normal full pool capacity was 91,746 AF, reflecting sediment accumulation of 1,134 AF since the previous survey. Reclamation started using the revised elevation-area capacity tables on October 1, 2013.

The top 33,841 AF of storage is used jointly for flood control and conservation and is not filled until the start of spring runoff. Fresno Reservoir stores the natural flow of the Milk River along with water diverted into the Milk River from the St. Mary River and Lake Sherburne. Stored water is used principally for irrigation but Havre and Chinook, Montana have a contract for a minimum flow in the river of 25 cfs during the winter to maintain suitable water for municipal use. The city of Harlem and the Hill County Water District also have contracts for municipal water use.

Storage in Fresno Reservoir at the end of the WY 2019 was 59,103 AF, at elevation 2,567.34 feet, 138 percent of average and 64 percent of normal full capacity. Releases were reduced to the expected winter release rate of 50 cfs on September 23, 2019. This is the minimum amount of water that can be released from Fresno Reservoir based on minimum gate opening for one gate on the river outlet works.

Figure MTG 35: Areal view of Fresno Reservoir and Dam.

After the last of the St. Mary water reached Fresno Reservoir, inflows stayed above average for October 2019. Precipitation in the Milk River Basin above Fresno Reservoir was above average while temperatures were much below average during October. By the end of October, storage in Fresno Reservoir was 65,193 AF at elevation 2,569.0 feet, 148 percent of average. Based on storage levels and projected inflows, releases were increased to 70 cfs.

During November, Fresno Reservoir inflows were 198 percent of average. Releases were increased again to 80 cfs based on actual inflows during November. Precipitation was above average while temperatures were below average. December precipitation was below average.

Precipitation in the Milk River Basin from October through December 2019 was 134 percent of average due to the heavy precipitation in November. Reservoir inflow was 153 percent of average from October through December. End of December storage was 65,231 AF at elevation 2,569.01 feet, 154 percent of average.

On January 1, 2020 the NRCS reported mountain snowpack SWE in the Bear Paw Mountains was 138 percent of average. The NRCS reported mountain snowpack SWE on February 1 was 150 percent of average, 169 percent of average on March 1. This indicated that runoff between Fresno Dam and Dodson Diversion Dam would be above average.

Precipitation during January was below average. Releases were reduced to 50 cfs during the latter part of January to accommodate stream repair work in the Milk River below Fresno Reservoir and stayed at this level until April. Inflow was only 43 percent of average during January and 102 percent of average during February.

Spring runoff season generally occurs during March through June. The most reliable peak snowpack and water supply runoff forecast for the Milk River Basin occur on March 1. The March 1 forecast for natural runoff above Fresno Reservoir for March through September 2020 was 70,000 AF, 86 percent of median. The Milk River runoff forecast is provided by Alberta Environment and Parks.

The forecast was not made soon enough for the March operating plan but based on expected inflows and the storage level on March 1, Fresno Reservoir was expected to fill to the top of the conservation pool, elevation 2,575.0 feet, by the end of April with little to no water from the St. Mary River Basin.

March precipitation was above average above Fresno Reservoir and below average below Fresno Reservoir. Temperatures remained cooler than average until the last week of March. Inflows started increasing during the latter part of March from snowmelt runoff. Inflows into Fresno Reservoir peaked at 795 cfs on March 30 before decreasing as there was not much plains snowpack. Storage in Fresno Reservoir at the end of March was 72,360 AF, elevation 2,570.83 feet.

The Milk River Joint Board of Control set the initial irrigation allotment for the 2020 irrigation season at 2.0 AF/acre. No water had to be transferred from Fresno Reservoir to Nelson Reservoir.

Releases from Fresno Dam remained at the minimum release rate of 50 cfs until April 14 when releases were increased to control the rate of fill of Fresno Reservoir. Releases were initially increased to 150 cfs and were increased again to 800 cfs to leave some storage space in Fresno Reservoir for flexibility in operations for the irrigation districts and because of the higher inflows.

Some water from the St. Mary River Basin through the St. Mary Canal was reaching Fresno Reservoir but canal flows were low. Inflows peaked for the year at 1,200 cfs on April 25. The inflow was mainly driven by a couple days of precipitation. Overall precipitation during April was below average at 59 percent. On April 30, Fresno Reservoir was at elevation 2,574.33 feet, 88,346 AF, which was 129 percent of average.

Releases were decreased to 50 cfs on May 5 to allow Paradise Valley to place the false work on their diversion dam. On May 8, Fresno Reservoir reached normal full pool, elevation 2,575.0 feet. Water started to spill over the ungated spillway. Releases through the river outlet works were increased on May 9 based on irrigation water orders and were 680 cfs by May 19. Fresno Reservoir storage peaked at 2,575.30 feet, 93,306 AF, on May 10. Releases were 730 cfs at the end of the month.

After the failure of the St. Mary Canal, water was being closely managed due to much reduced water supply forecast for the Milk River Project. The irrigation allotment was reduced to 1.0 AF/acre.

Precipitation was mixed during May and June with some areas being drier than average and other areas being wetter than average. Fresno inflow for March and April was only 79 percent of average. Inflows were much below average for the remainder of the year due to the failure of the St. Mary Canal. Net inflow into Fresno Reservoir was zero starting June 2. Storage in Fresno Reservoir remained above average until June 12. By the end of June storage was 55,225 AF at elevation 2,566.22 feet, 75 percent of average as the lack of St. Mary River Basin water was affecting storage.

Conditions were generally dry during July and August. Precipitation towards the end of June did increase inflows into Fresno Reservoir and they remained above zero until the middle of July. Relying on only remaining storage in Fresno and Nelson Reservoirs, Reclamation worked closely with Milk River Joint Board of Control on end of irrigation season operations. Releases were reduced from June 18 through July 5 as some irrigation districts stopped irrigating to conserve water for July while others used their remaining allotment by about July 1.

Irrigation releases from Fresno Reservoir were ramped down during the week of July 27. Releases were decreased to 100 cfs on July 31. Releases were kept at 100 cfs until September 29 for Fort Belknap Indian Irrigation District. The final day of irrigation for the Milk River Project was based on an end of September storage target of 5,000 AF and projected inflows for August and September. Fresno Reservoir storage content was 28,109 AF at elevation 2,555.09 feet on July 31. This was only 52 percent of average.

By the end of August storage in Fresno Reservoir was at 21,728 AF at elevation 2,551.56 feet, 52 percent of average. With the shutdown of St. Mary River diversions and the dry conditions, inflows during August and September were very low. Releases were reduced on September 29 to the minimum amount, 45 cfs.

The March through September 2020 inflow for Fresno Reservoir, excluding St. Mary Canal water was approximately 75,990 AF, 47 percent of median, based on the United States Geological Survey computation for natural flow at the Milk River at Eastern Crossing gaging station. A majority of the flow occurred during March, April and May.

The cumulative valley precipitation through the end of September 2020 was 95 percent of average. Total inflow into Fresno Reservoir for WY 2020 was 104,739 AF, 41 percent of average. Diversions from the St. Mary River Basin to the Milk River Basin accounted for about 28 percent of the inflow to Fresno Reservoir during 2020. Storage in Fresno Reservoir at the end of the WY 2020 was 16,291 AF, at elevation 2,548.16 feet, 38 percent of normal full capacity. Repairs to the St. Mary Canal were completed in early October and St. Mary River Basin water was conveyed to Fresno in October 2020.

The Corps determined that during WY 2020, Fresno Reservoir prevented $46,400 in local flood damage and no main stem flood damages on the Missouri River below Fort Peck Reservoir.

Additional hydrologic and statistical information pertaining to the operation of Fresno Reservoir during 2020 can be found in Tables MTT 42, 43, 44, and 45 and Figure MTG 38.

Nelson Reservoir: Summary of 2020 Operations

Nelson Reservoir, located near Malta, Montana, is an off-stream reservoir, receiving its water supply from the Milk River by diversion through the Dodson South Canal. Nelson Reservoir is the only source of supply for the lower portion of the Malta Irrigation District. Nelson Reservoir also serves the Glasgow Irrigation District when water is not available from Fresno Reservoir. In 1999 a sediment survey was performed and finalized in 2001. Since Nelson Reservoir operation began in 1916, the measured total volume of sediment accumulation was 446 AF. The new revised elevation-area capacity data was implemented on October 1, 2001. Nelson Reservoir has a revised total capacity of 78,950 AF and an active capacity of 60,810 AF.

Figure MTG 36: Areal view of Nelson Reservoir.

Storage on September 30, 2019 was 77,103 AF at elevation 2,221.17 feet, 138 percent of average and 98 percent of normal full capacity. This was the second consecutive year that storage was near full pool going into the fall. Storage slowly decreased due to seepage through February 27, 2020, when low elevation snowmelt contributed to Nelson Reservoir inflow. Diversions through the Dodson South Canal started to reach Nelson Reservoir on March 7. Storage in Nelson Reservoir on March 31 was 76,849 AF at elevation 2,221.11 feet.

Releases through the Nelson North Canal to control storage levels started on April 7. Releases for irrigation demands started on approximately May 6. Releases through Nelson North Canal for Glasgow Irrigation District were required during July and August. Glasgow Irrigation District was allowed to irrigate longer than the other districts due to the late start to the irrigation season for Glasgow Irrigation District.

Operations of Nelson Reservoir were also impacted by the failure of the St. Mary Canal with reservoir operations being tightly managed which resulted in lower than average inflows. Storage in Nelson Reservoir was highest on May 5 at 78,345 AF at elevation 2,221.46. Releases from Nelson Reservoir were shut off from June 22 through July 12 except for a few days in early July to conserve storage.

Irrigation releases restarted on July 13. Releases to the Nelson South Canal were shut off on August 8 and to the Nelson North Canal August 14 for the irrigation season. Storage continued to decline for the remainder of WY 2020 from evaporation and seepage.

Diversions to Dodson South Canal were stopped in late August due to lack of water in the Milk River. Inflows into Nelson Reservoir stopped about August 28. Total net inflow to Nelson Reservoir during WY 2020 was 26,470 AF which was 47 percent of average. Storage on September 30, 2020 was 56,383 AF at elevation 2,215.88 feet, 99 percent of average and 71 percent of normal full capacity.

Additional hydrologic and statistical information pertaining to the operation of Nelson Reservoir during 2020 can be found in Tables MTT 46, 47, 48, and 49 and Figure MTG 39.

Important Events – WY2020

March 7, 2020: Diversions to Dodson South Canal reach Nelson Reservoir.

March 31, 2020: Diversion to St. Mary Canal were started to move water to the Milk River Basin.

April 1, 2020: Releases begin from Lake Sherburne to support diversions to the St. Mary Canal and manage storage levels for snowmelt runoff.

April 13, 2020: MRJBC set the irrigation allotment at 2.0 AF/acre. This approximately 0.3 AF/acre lower than a full water supply.

April 15, 2020: A conference call was held with the IJC Field Representatives to discuss St. Mary and Milk River apportionments.

May 9, 2020: Fresno Reservoir releases were increased for the first time for the year to meet irrigation demand.

May 6, 2020: Releases were initiated from Nelson Reservoir for irrigation demands.

May 17, 2020: Drop 5 of the St. Mary Canal failed. The failure required the St. Mary Canal to be shut off for the remainder of WY 2020. This resulted in reducing the irrigation allotment to 1.0 AF/acre.

May 26, 2020: A conference call was held with the IJC Field Representatives to discuss St. Mary and Milk River apportionments and status of the St. Mary Canal failure.

June 10, 2020: A conference call was held with the IJC Field Representatives to discuss St. Mary and Milk River apportionments and status of the St. Mary Canal repairs.

June 24, 2020: A conference call was held with the IJC Field Representatives to discuss the statuf of the St. Mary Canal repairs.

July 15, 2020: A conference call was held with the IJC Field Representatives to discuss St. Mary and Milk River apportionments and status of the St. Mary Canal repairs.

July 31, 2020: Releases from Fresno Reservoir are set at approximately 100 cfs. The release was greater than the minimum amount of 50 cfs to serve municipalities and Fort Belknap Irrigation District.

July 29, 2020: A conference call was held with the IJC Field Representatives to discuss status of the St. Mary Canal repairs.

August 14, 2020: Releases from Nelson Reservoir were discontinued.

August 19, 2020: A conference call was held with the IJC Field Representatives to discuss status of the St. Mary Canal repairs.

September 16, 2020: A conference call was held with the IJC Field Representatives to discuss St. Mary and Milk River apportionments and status of the St. Mary Canal repairs.

September 29, 2020: Releases from Fresno Reservoir are set at the winter release rate of approximately 40 cfs.

October 7, 2020: A conference call was held with the IJC Field Representatives to discuss planned St. Mary Canal and Lake Sherburne operations for October 2020.

October 8, 2020: St. Mary Canal diversions were initiated following repairs to the drop structures.

October 31, 2020: St. Mary Canal diversions were discontinued for the season.

November 3, 2020: Lake Sherburne releases were discontinued.

Table MTT 38: Reservoir allocations for Lake Sherburne.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,729.30	1,899	1,899
TOP OF ACTIVE CONSERVATION	4,788.00	66,147	64,248

Table MTT 39: Storage and elevation data for Lake Sherburne.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,735.15	5,125	10/1/2019
END OF YEAR	4,785.90	62,576	9/30/2020
ANNUAL LOW	4,735.15	5,125	10/1/2019
ANNUAL HIGH	4,786.23	63,132	7/2/2020
HISTORIC HIGH	4,788.30	68,371	6/30/1986

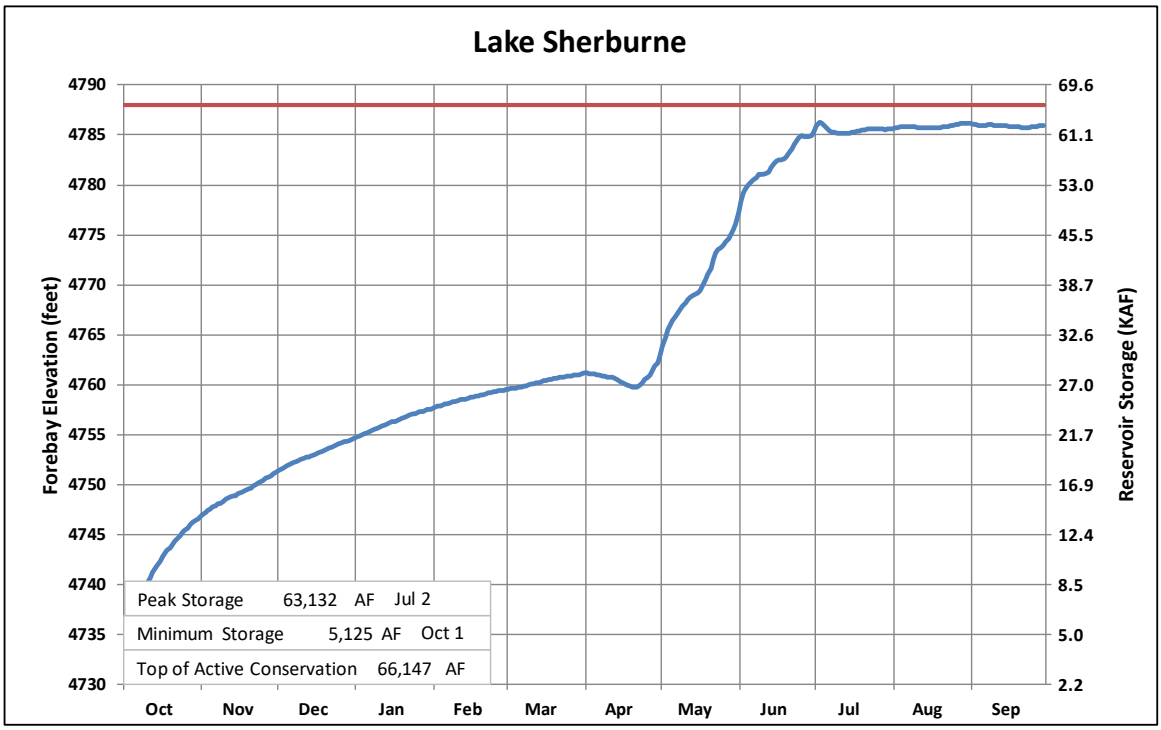
Table MTT 40: Inflow and discharge data for Lake Sherburne.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	140,016	Oct '19-Sep '20	82,458	Oct '19-Sep '20
DAILY PEAK (CFS)	1,314	6/1/2020	758	7/2/2020
DAILY MINIMUM (CFS)	0	*	0	*

*During non-irrigation season

Table MTT 41: Water year 2020 monthly inflow, outflow, and storage data for Lake Sherburne.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	8.9	131	0	---	14	75
NOVEMBER	4	51	0	---	18	73
DECEMBER	3.4	91	0	---	21.4	78
JANUARY	3	111	0	---	24.5	81
FEBRUARY	2	79	0	---	26.4	81
MARCH	1.9	48	0	---	28.3	90
APRIL	5.9	56	3.9	22	30.3	128
MAY	33.3	106	14.7	82	48.8	130
JUNE	43.7	112	30.8	160	61.6	106
JULY	23.2	122	22.6	89	62.2	123
AUGUST	7.1	80	6.4	20	62.9	231
SEPTEMBER	3.7	65	4	21	62.5	427
ANNUAL	140	99	82.4	58	-	-
APRIL-JULY	106	107	-	-	-	-



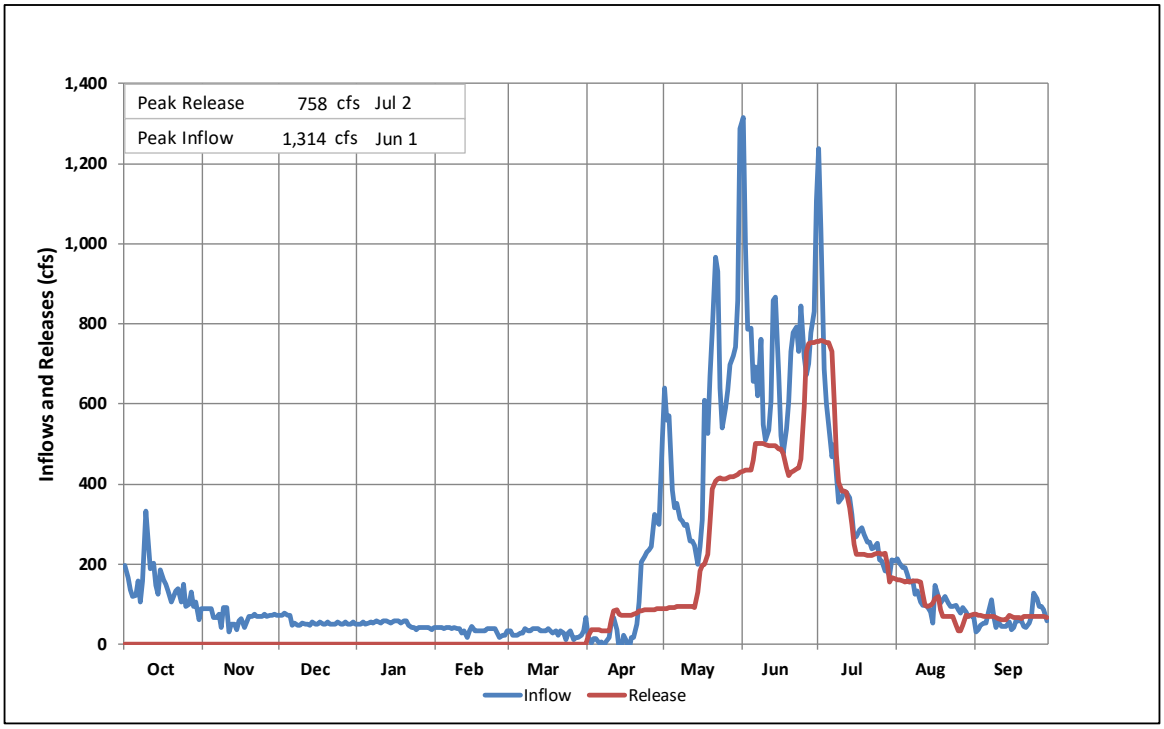


Figure MTG 37: Water year 2020 hydrologic data for Lake Sherburne.

Table MTT 42: Reservoir allocations for Fresno Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	2,530.00	158	158
TOP OF ACTIVE CONSERVATION	2,567.00	57,905	57,747
TOP OF JOINT USE	2,575.00	91,746	33,841

Table MTT 43: Storage and elevation data for Fresno Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,567.34	59,103	10/1/2019
END OF YEAR	2,548.16	16,291	9/30/2020
ANNUAL LOW	2,548.16	16,291	9/30/2020
ANNUAL HIGH	2,575.30	93,306	5/10/2020
HISTORIC HIGH	2,579.35	154,023	4/3/1952

Table MTT 44: Inflow and discharge data for Fresno Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	104,739	Oct '19-Sep '20	147,551	Oct '19-Sep '20
DAILY PEAK (CFS)	1,200	4/25/2020	839	6/3/2020
DAILY MINIMUM (CFS)	0	*	38	9/30/2020

*During non-irrigation season

Table MTT 45: Water year 2020 monthly inflow, outflow, and storage data for Fresno Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	9.2	116	3.1	51	65.2	148
NOVEMBER	5.4	196	4.4	151	66.2	151
DECEMBER	4	260	4.9	169	65.2	154
JANUARY	0.6	46	4.6	155	61.3	150
FEBRUARY	4.6	100	2.9	94	63	152
MARCH	12.4	50	3.1	29	72.4	135
APRIL	32.3	100	16.3	92	88.3	129
MAY	30.4	70	31.6	71	87.2	129
JUNE	1	1	33	70	55.2	75
JULY	4.7	15	31.8	63	28.1	52
AUGUST	-0.1	0	6.2	14	21.7	52
SEPTEMBER	0.3	0	5.8	28	16.3	38
ANNUAL	104.7	41	147.5	58	-	-
APRIL-JULY	68.4	43	-	-	-	-

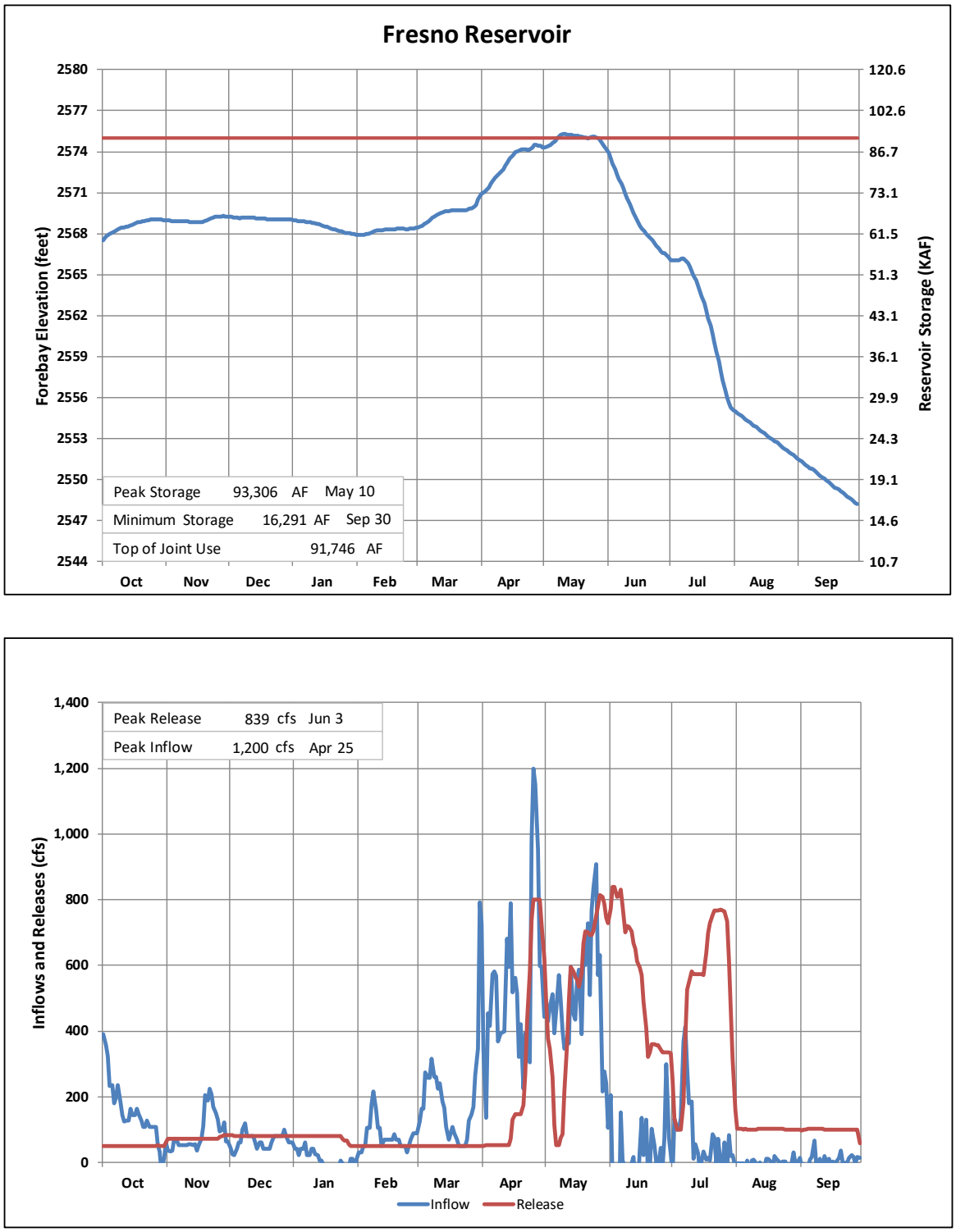


Figure MTG 38: Water year 2020 hydrologic data for Fresno Reservoir.

Table MTT 46: Reservoir allocations for Nelson Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	2,200.00	18,140	18,140
TOP OF ACTIVE CONSERVATION	2,221.60	78,950	60,810

Table MTT 47: Storage and elevation data for Nelson Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,221.17	77,103	10/1/2019
END OF YEAR	2,215.88	56,383	9/30/2020
ANNUAL LOW	2,215.88	56,383	9/30/2020
ANNUAL HIGH	2,221.46	78,345	5/5/2020
HISTORIC HIGH	2,221.68	79,297	6/1/2007

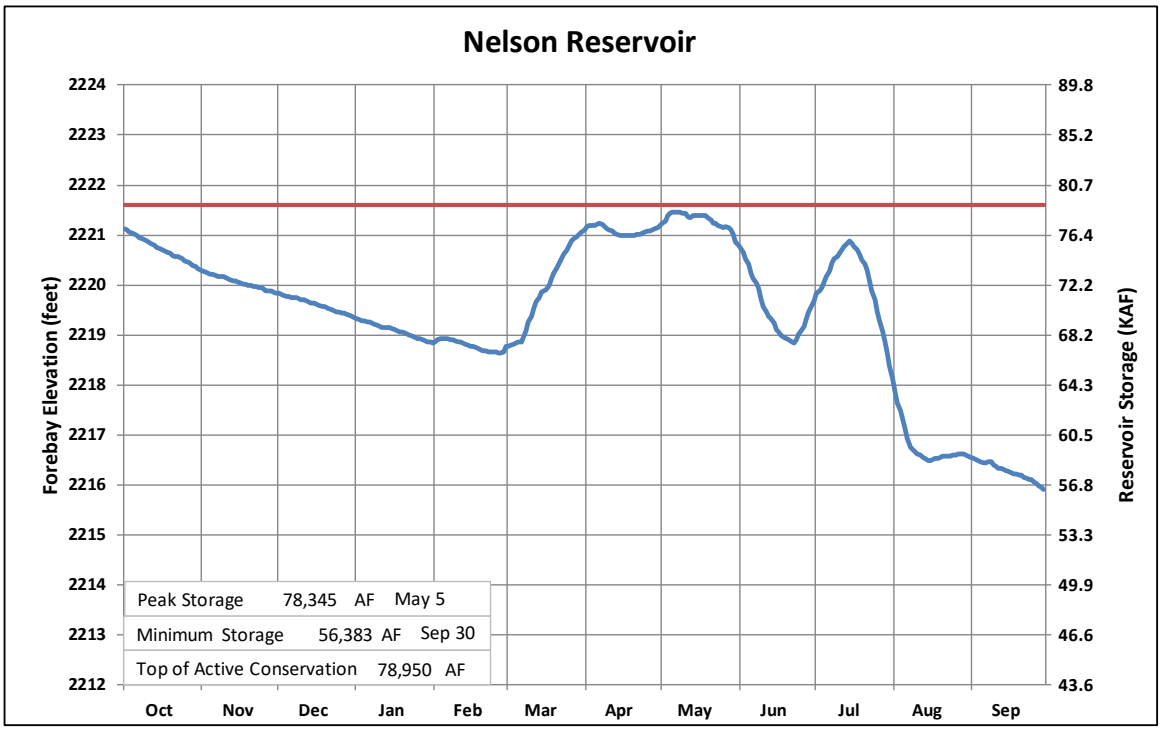
Table MTT 48: Inflow and discharge data for Nelson Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	26,470	Oct '19-Sep '20	47,316	Oct '19-Sep '20
DAILY PEAK (CFS)	408	7/7/2020	531	7/31/2020
DAILY MINIMUM (CFS)	0	*	0	*

*During non-irrigation season

Table MTT 49: Water year 2020 monthly inflow, outflow, and storage data for Nelson Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	-3.6	---	0	---	73.5	125
NOVEMBER	-1.9	---	0	---	71.5	125
DECEMBER	-2	---	0	---	69.6	126
JANUARY	-2	---	0	---	67.5	125
FEBRUARY	-0.3	---	0	---	67.3	128
MARCH	9.6	269	0	---	76.8	137
APRIL	5.1	50	4.7	14	77.2	118
MAY	11	120	128	121	75.4	115
JUNE	6.3	62	10.9	112	70.9	108
JULY	5.9	86	12.1	86	64.6	112
AUGUST	1	10	6.8	62	58.8	105
SEPTEMBER	-2.4	---	0	---	56.3	96
ANNUAL	26.5	48	47.3	86	-	-



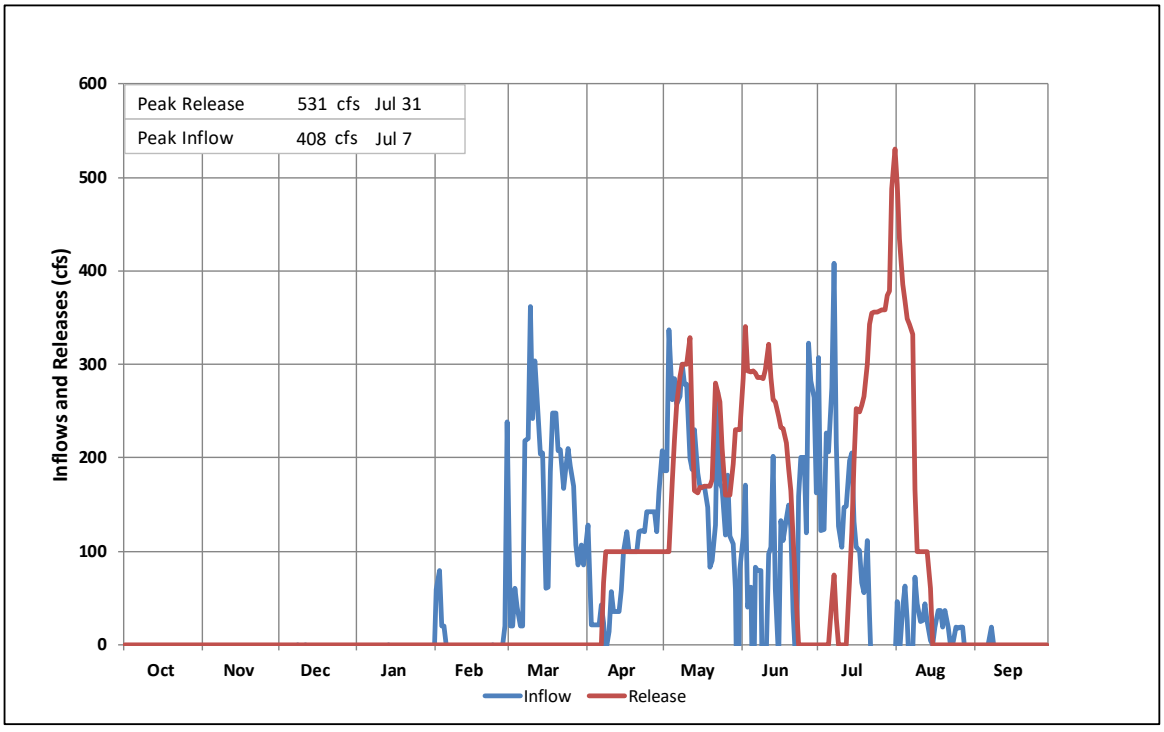


Figure MTG 39: Water year 2020 hydrologic data for Nelson Reservoir.

Bighorn Lake and Yellowtail Powerplant

Bighorn Lake P-S, MBP is located on the Bighorn River about 45 miles southwest of Hardin, Montana. It has a total capacity of 1,331,725 AF. The dam and reservoir were built for power generation, irrigation, flood control, fish and wildlife and recreation. The nameplate capacity of Yellowtail Powerplant is 250,000 kilowatts. The water is managed to support multiple beneficial uses. Reclamation has a storage allocation agreement with the Northern Cheyenne Tribe for 30,000 AF and the Crow Tribe for up to 300,000 AF of water. Reclamation has an industrial water service contract with Talen Energy for 6,000 AF. No additional water can be contracted out of Yellowtail Dam after the passage of the Crow Tribe Water Rights Settlement Act of 2010. Bull Lake, Boysen, and Buffalo Bill Reservoirs are three major tributary reservoirs located in Wyoming upstream of Bighorn Lake. These reservoirs are operated and managed by the Wyoming Area Office (WYAO) and all reservoir and river operations in the Bighorn River Basin are closely coordinated between the MTAO and WYAO.

Figure MTG 40: View of Yellowtail Dam and Powerplant.

In July 2007, a hydrographic and a topographic survey was conducted, and a new elevation-area capacity table and curve was developed. The 2007 survey determined Bighorn Lake has a storage capacity of 1,278,896 AF and a surface area of 17,279 acres at elevation 3,657.0 feet (the top of the spillway gates). Since closure of the dam in November 1965, Bighorn Reservoir accumulated a sediment volume of 103,415 AF below an elevation of 3,657.0 feet. The volume represents a 7.5 percent change in capacity and an average annual sediment accumulation of 2,480 AF from November 1965 through July 2007. The revised area-capacity table was put into effect on January 1, 2011, reflecting the new storage levels.

Summary of 2020 Operations

Inflows were above average during September 2019. River releases were maintained at 3,250 cfs throughout the month of September. Several shift changes to the river gage were required to keep up with the algae growth. Valley and mountain precipitation in September were well above average at 241 and 176 percent of average, respectively. Storage in Bighorn Lake ended WY 2019 with a content of 999,265 AF at elevation 3,638.27 feet.

Precipitation was below average in October, but inflows were above average. Unusually high precipitation during September above Boysen and Buffalo Bill required increased releases from those facilities. Releases were decreased during October to 2,850 cfs at the request of the National Park Service (NPS) for boat ramp construction at the Yellowtail Afterbay fishing access. The release rate was closely coordinated with MTFWP. Releases were restored to 3,250 cfs on October 18 after the NPS postponed the work indefinitely because inability to keep the construction site dewatered shut down the boat ramp repair operation.

With the lower flows for a portion of the month, Bighorn Lake stayed near full pool during October and ended the month at 1,014,813 AF at elevation 3639.54 feet. Snowpack started accumulating in October which was a good start to WY 2020.

The winter release was calculated to be 3,250 cfs to the Bighorn River in accordance with the operating criteria. The release was already at 3,250 cfs since October 18 so no changes to the release was needed. This winter release calculation is based on planned winter releases from Boysen and Buffalo Bill Dams, forecasted winter tributary gains below Boysen and Buffalo Bill Dam, and a March 31, 2020 elevation target of 3,617 feet.

Valley and mountain precipitation were above average in November with snowpack being 119 percent of average by the end of November. Temperatures were below average during November. Bighorn Lake inflow during November was 126 percent of average. Releases were decreased to 3,140 cfs on December 9 after releases from Boysen Dam were reduced to conserve storage.

Precipitation was below average during December. Cumulative precipitation through the end of December was 95 and 94 percent of average in the valley and mountains, respectively. Inflow into Bighorn Lake stayed well above average. The October through December inflow was 129 percent of average. Gains over the three-month period were 112 percent of average. Releases over the same three-month period were 126 percent of average.

Snow accumulated at a below average rate during December and on January 1, 2020 the mountain snowpack SWE at the NRCS Snotel sites decreased to 98 percent of average. Releases to the Bighorn River were increased to 3,220 cfs on January 9, 2020 because actual December inflows were higher than forecasted. The March 31 elevation target remained at elevation 3,617 feet.

During January snow fell in the mountains at an average rate. Temperatures were warmer than average in the Bighorn River Basin. On February 1, 2020 the NRCS measured the mountain snowpack SWE at 98 percent of average. Releases to the Bighorn River were increased to 3,280 cfs on February 10 to keep up with slightly higher inflows than forecasted for January.

Snowpack in February accumulated at an above average rate and on March 1, 2020 the NRCS measured the mountain snowpack SWE at 106 percent of average. On March 1, 2020, the forecasted April through July runoff was 1,458,700 AF, 116 percent of average. Under the operating criteria, on March 1, the Bighorn Lake storage target changes from March 31 to April 30. The April 30 target is based on the April-July runoff forecast and the associated operating rule curve. Based on the inflow forecast, the end of April target was 3,611.9 feet. Inflows increased during the first part of March due to snowmelt runoff from low elevation snow. Releases were increased to 4,250 cfs from March 9-12 and to 5,250 cfs from March 17-19 based on forecasted inflows. During the latter part of March, releases were increased to powerplant capacity out of Boysen Dam which were

about 2,350 cfs. Storage at the end of March in Bighorn Lake was 791,971 AF, at elevation 3,614.59 feet, 103 percent of average. The temperatures in the Basin were near average during March. Precipitation was below average with mountain and valley precipitation at 55 and 79 percent of average respectively.

The mountain snowpack SWE above Bighorn Lake was 102 percent of average on April 1. The April 1 forecast for April-July runoff was 1,468,900 AF, 117 percent of average. Based on the forecast, the end of April elevation target remained essentially the same at 3,611.8 feet. River releases were decreased to 4,750 cfs on April 14 based on a decrease in forecasted daily inflows. Canal diversions were started on April 16 and river releases were decreased to 4,650 cfs. Throughout the remainder of the year, diversion to the Bighorn Canal was adjusted as needed to meet irrigation demands. River releases were increased to 4,750 cfs on April 27.

Precipitation was slightly below average during April at 98 percent of average in the valley and 89 percent of average in the mountains. Temperatures in April were below average. Above Yellowtail Dam SWE peaked on April 18 at 14.9 inches, 111 percent of the average peak SWE.

By May 1 storage in Bighorn Lake decreased to 763,861 AF at elevation 3,609.98 feet. Mountain snowpack SWE on May 1, 2020 was 93 percent of average and the May through July runoff was forecasted to be 938,200 AF, 87 percent of average. Based on the forecast, the end of May elevation target was 3,621.1 feet. Releases to the Bighorn River were decreased to 2,500 cfs by May 14 with decreasing inflow forecasts. The minimum elevation for the year was 3,608.23 feet, 753,888 AF, occurring on May 8. By May 21, river releases were only 2,000 cfs as dry conditions reduced releases from Boysen. Temperatures were much warmer than average during May. Precipitation was well below average during May at 41 and 61 percent of average in the valley and mountains respectively. Inflows into Bighorn Lake started to increase on approximately May 20 due to snowmelt runoff.

Snowpack was melting out quicker than average during the latter part of May. Inflows were not as high as expected due to the dry conditions. On June 1, snowpack SWE was only 58 percent of average. The June 1, 2020 forecast for June through July runoff was 443,900 AF, 58 percent of average. On June 4, releases were increased to 2,250 cfs based on balance operations between storage and river releases. Bighorn Lake was only expected to fill to elevation 3,637.3 feet. Releases were decreased to 2,000 cfs on June 17 with a decreasing inflow forecast. Inflow on June 1 was 8,110 cfs and gradually decreased to 3,120 cfs by June 25 as snowmelt runoff was winding down for the season. Snowpack was zero by June 27.

June remained dry for most of the month. Towards the end of June, two weather systems with heavy precipitation moved through the Basin. On June 30, inflows were 9,260 cfs, the highest for the entire year. River releases were increased to 2,750 cfs. Storage in Bighorn Lake on June 30 was 1,000,351 AF, at elevation 3,638.36 feet. On June 29, projections showed increased inflows from the unexpected weather event would cause water to be stored in the exclusive flood control pool towards the end of June.

Through coordination with the Corps, releases to the river were increased to 4,000 cfs during July 1-3 due to sustained high inflows from increased releases from Buffalo Bill Dam. Storage peaked in Bighorn Lake on July 4 at 1,021,835 AF, at elevation 3,640.1 feet, 0.1 feet into the exclusive flood control pool. The increased releases ended up changing the shift to the river gage. After the USGS measured the Bighorn River flow on July 6, it was determined releases to the Bighorn River peaked

at 5,330 cfs on July 6. Starting on July 6, releases were gradually decreased until they were 2,500 cfs on July 16. The last of the water stored in the exclusive flood control pool was evacuated on July 8. During July, precipitation was below average and remained below average for the remainder of WY 2020. Temperatures during July were near average. Inflows into Bighorn Lake during July were only 69 percent of average.

Inflows during June and July were 73,790 AF higher than forecasted on June 1. A majority of the difference can be attributed to the precipitation events towards the end of June. This changed how much was stored in Bighorn Lake and river releases from what was expected under median inflow conditions but less than what was forecasted under maximum inflow conditions. The April through July runoff into Bighorn Lake is summarized in Figures MTG 41 and 42 as it relates to precipitation and temperatures.

Operations through snowmelt runoff were closely coordinated between the MTAO, WYAO, Corps, National Park Service, and Montana Fish, Wildlife and Parks. On July 31, 2020 storage in Bighorn Lake was 982,612 AF at elevation 3,636.86 feet, 106 percent of average. On August 17, releases to the Bighorn River were decreased to 2,400 cfs which was the expected winter release at the time the decrease was made to the Bighorn River. Inflows into Bighorn Lake during August were 133,200 AF, 86 percent of average.

Inflows remained below average during September. River releases were maintained at 2,400 cfs throughout the month of September. Several shift changes to the river gage were required to keep up with the algae growth. Valley and mountain precipitation in September were below average at 64 and 87 percent of average, respectively.

Storage in Bighorn Lake ended WY 2020 with a content of 940,905 AF at elevation 3,633.05 feet. This was 105 percent of average and 58,360 AF (5.2 feet in elevation) lower than at the end of WY 2019.

Inflows into Bighorn Lake during April-July were 83 percent of average, totaling 1,041,669 AF. April-July inflow in 2020 was 636,517 AF lower than the April-July inflow that occurred in 2019. The annual runoff into Bighorn Lake during WY 2020 totaled 2,322,518 AF, 99 percent of average.

The total amount of water released to the Bighorn River during WY 2020 was 2,312,507 AF, 101 percent of average. This was 605,360 AF lower than what was released to the Bighorn River in WY 2019.

The water levels of Bighorn Lake during WY 2020 allowed for full-service recreation at all marinas for most of the recreation season, from Memorial Day through Labor Day. The exception to this is Horseshoe Bend was not open during Memorial Day weekend because the reservoir elevation was lower than needed to launch boats.

Total generation produced at Yellowtail Powerplant during WY 2020 was 872,426 megawatt-hours, 111 percent of average. This was 24,071 megawatt-hours less than what was generated in WY 2019. Approximately 98 percent of all water released from Yellowtail Dam during WY 2020 was released through the powerplant, 2,332,059 AF. The remainder, 48,532 AF, was released either through the river outlet gates or the spillway gates.

The Corps estimated that during WY 2020, Bighorn Lake prevented $312,700 in local flood damages and $7,564,800 in flood damages downstream on the Missouri River below Fort Peck Reservoir.

Additional hydrologic and statistical information pertaining to the operations of Bighorn Lake during WY 2020 can be found on Table MTT 50, 51, 52, and 53 and MTG 12.

For more detailed information on the operations of Boysen and Buffalo Bill Reservoirs during WY 2020, refer to the narratives for Boysen Reservoir and Powerplant and Shoshone Project under the responsibility of the WYAO.

Important Events – WY2020

October 1, 2019 through September 30, 2020: Yellowtail Powerplant was limited to three units for most of the year due to a major rewind project with Unit 2 as the unavailable unit.

October 7-18, 2020: Maintenance of Unit 3 of the Yellowtail Powerplant was conducted. Yellowtail Powerplant was limited to two units during this timeframe.

October 8, 2019: Releases to the Bighorn River were decreased to 2,850 cfs to accommodate work on the Afterbay boat ramp by the NPS. (2,850 cfs to the Bighorn River and zero to the Bighorn Canal)

October 18, 2019: Releases to the Bighorn River were increased to 3,250 cfs after the NPS stopped work on the Afterbay boat ramp. (2,850 cfs to the Bighorn River and zero to the Bighorn Canal)

October 22, 2020: Spring key measurements on Unit 4 of the Yellowtail Powerplant was conducted. Yellowtail Powerplant was limited to two units.

December 9, 2019: Releases to the Bighorn River were decreased to 3,140 cfs based on reduced releases from Boysen Dam. (3,140 cfs to the Bighorn River and zero to the Bighorn Canal)

January 9, 2020: Releases to the Bighorn River were increased to 3,220 cfs based on actual December inflows. (3,220 cfs to the Bighorn River and zero to the Bighorn Canal)

February 10, 2020: Releases to the Bighorn River were increased to 3,280 cfs based on actual January inflows. (3,280 cfs to the Bighorn River and zero to the Bighorn Canal)

March 9-12, 2020: Releases to the Bighorn River were increased to 4,250 cfs based on current and forecasted inflows and the April 30 storage target. (4,250 cfs to the Bighorn River and zero to the Bighorn Canal)

March 17-19, 2020: Releases to the Bighorn River were increased to 5,250 cfs based on forecasted inflows and the April 30 storage target. (5,250 cfs to the Bighorn River and zero to the Bighorn Canal)

April 14, 2020: Releases to the Bighorn River were decreased to 4,750 cfs based on current and forecasted inflows and the April 30 storage target. (4,750 cfs to the Bighorn River and zero to the Bighorn Canal)

April 16, 2020: Diversions to the Bighorn Canal were started on April 16. Releases to the Bighorn River were decreased to 4,650 cfs based on current and forecasted inflows and the April storage target. (4,650 cfs to the Bighorn River and 100 cfs to the Bighorn Canal) Throughout the remainder of the irrigation season, diversion to the Bighorn Canal was adjusted as needed to meet the irrigation demands.

April 27, 2020: Releases to the Bighorn River were increased to 4,750 cfs based on current and forecasted inflows and the April 30 storage target. (4,750 cfs to the Bighorn River and 200 cfs to the Bighorn Canal)

May 5-7, 2020: Releases to the Bighorn River were decreased to 3,500 cfs based on current and forecasted inflows. (3,500 cfs to the Bighorn River and 300 cfs to the Bighorn Canal)

May 11-14, 2020: Releases to the Bighorn River were decreased to 2,500 cfs based on current and forecasted inflows. (2,500 cfs to the Bighorn River and 300 cfs to the Bighorn Canal)

May 20-21, 2020: Releases to the Bighorn River were decreased to 2,000 cfs based on current and forecasted inflows. (2,000 cfs to the Bighorn River and 300 cfs to the Bighorn Canal)

June 4, 2020: Releases to the Bighorn River were increased to 2,250 cfs based on current and forecasted inflows. (2,250 cfs to the Bighorn River and 490 cfs to the Bighorn Canal)

June 17, 2020: Releases to the Bighorn River were decreased to 2,000 cfs based on current and forecasted inflows. (2,000 cfs to the Bighorn River and 490 cfs to the Bighorn Canal)

June 29-30, 2020: Releases to the Bighorn River were increased to 2,750 cfs based on increasing inflows from precipitation in the Bighorn River Basin. (2,750 cfs to the Bighorn River and 200 cfs to the Bighorn Canal)

July 1-3, 2020: Releases to the Bighorn River were increased to 4,000 cfs at the directions of the Corps based on maximum storage projections. Based on a measurement made by the USGS on July 7, it was determined that releases peaked at 5,330 cfs before they were decreased. (5,330 cfs to the Bighorn River and 400 cfs to the Bighorn Canal)

July 6-10, 2020: Releases to the Bighorn River were decreased to 3,500 cfs at the directions of the Corps based on maximum storage projections. A shift change to the river gage also impacted reported river releases. (3,500 cfs to the Bighorn River and 400 cfs to the Bighorn Canal)

July 8, 2020: Exclusive flood control pool of Bighorn Lake is completed evacuated after storing a maximum of only 1,262 AF of water.

July 13-16, 2020: Releases to the Bighorn River were decreased to 2,500 cfs based on declining inflows. (2,500 cfs to the Bighorn River and 450 cfs to the Bighorn Canal)

August 17, 2020: Releases to the Bighorn River were decreased to 2,400 cfs to conserve storage. (2,400 cfs to the Bighorn River and 450 cfs to the Bighorn Canal)

September 8-25, 2020: Semi-annual maintenance of the Yellowtail Afterbay Dam sluicegates required the Yellowtail Afterbay Reservoir be maintained between elevations 3,186.0 and 3,190.0 feet to maintain river flows through the radial gates.

October 14, 2020: The Bighorn Canal was shut down for the irrigation season.

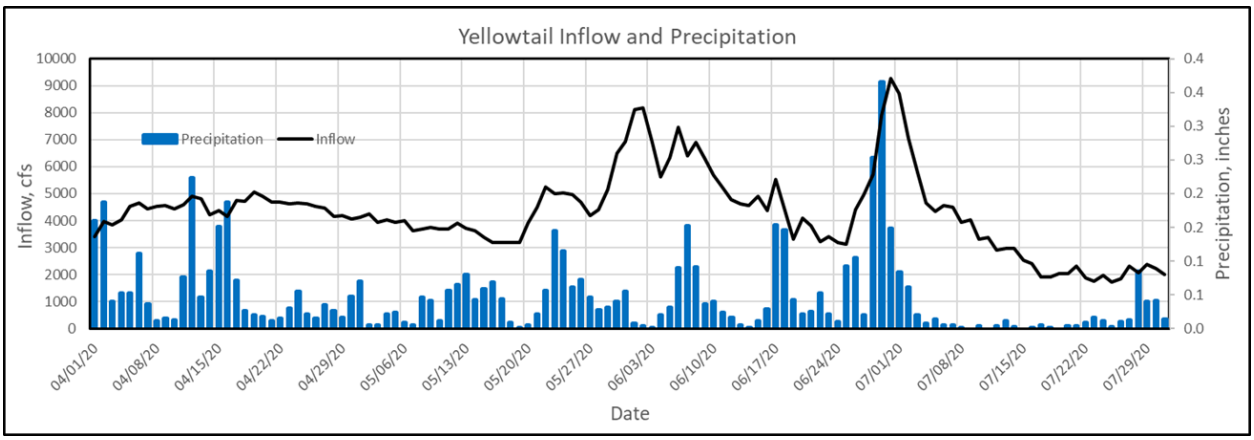


Figure MTG 41: Comparison of Bighorn Lake Inflow and Bighorn River Basin Precipitation.

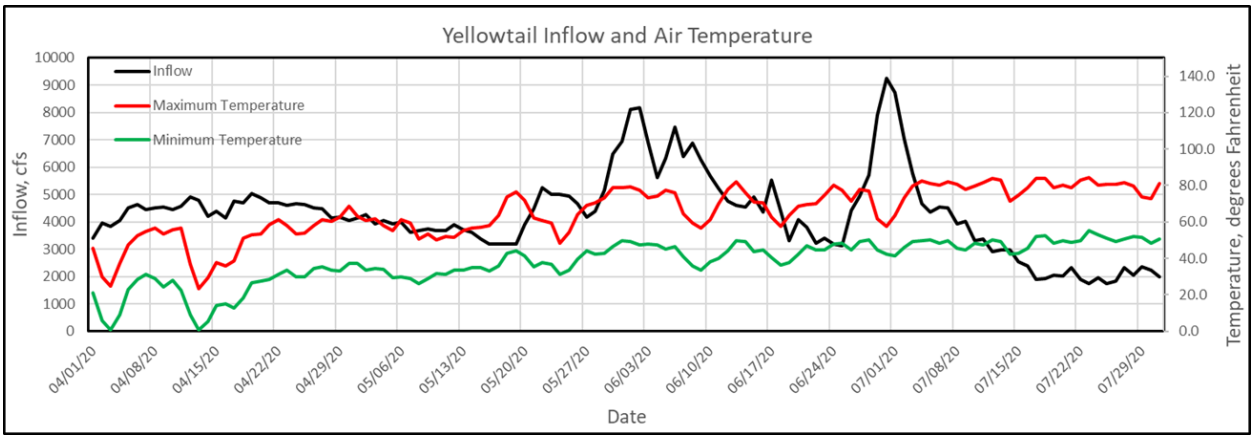


Figure MTG 42: Comparison of Bighorn Lake Inflow and Bighorn River Basin Temperatures.

Table MTT 50: Reservoir allocations for Bighorn Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	3,547.00	469,910	469,910
TOP OF ACTIVE CONSERVATION	3,614.00	788,208	318,298
TOP OF JOINT USE	3,640.00	1,020,573	232,365
TOP OF EXCLUSIVE FLOOD CONTROL	3,657.00	1,278,896	258,323

Table MTT 51: Storage and elevation data for Bighorn Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	3,638.27	999,265	10/1/2019
END OF YEAR	3,633.05	940,905	9/30/2020
ANNUAL LOW	3,608.23	753,888	5/8/2020
ANNUAL HIGH	3,640.10	1,021,835	Jul 4-6, 2020
HISTORIC HIGH	3,656.43	1,365,198	7/6/1967

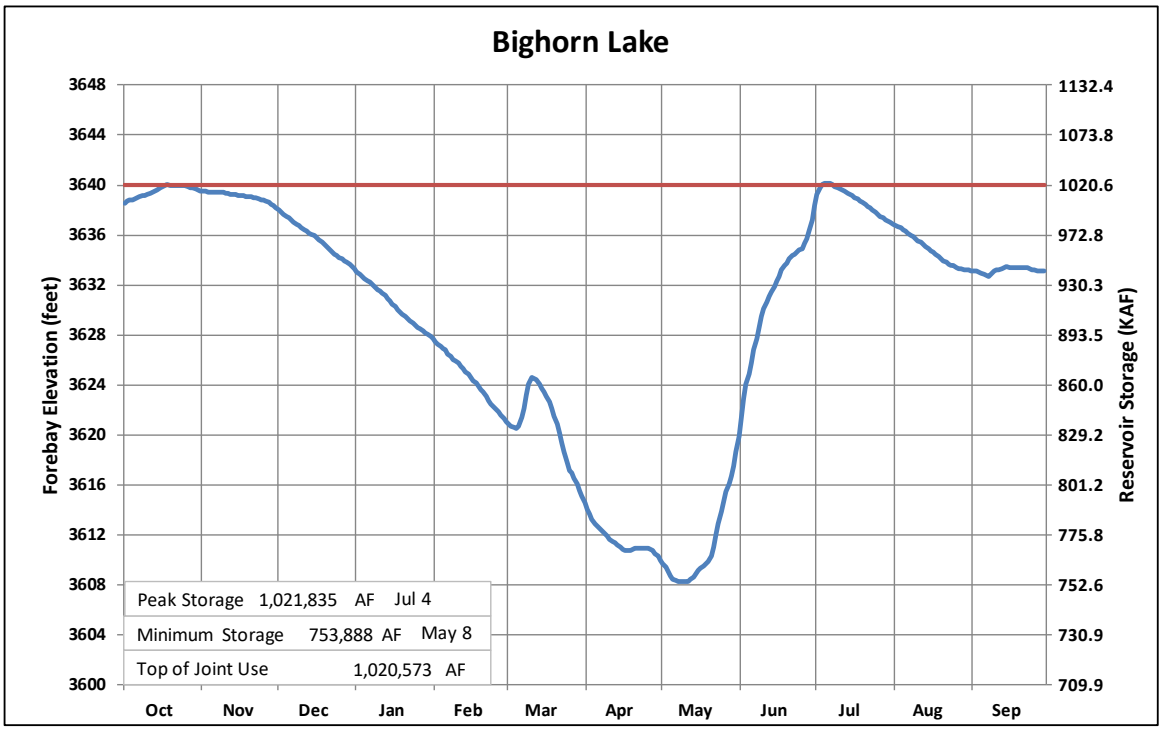
Table MTT 52: Inflow and discharge data for Bighorn Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW*	DATE
ANNUAL TOTAL (AF)	2,322,519	Oct '19-Sep '20	2,312,508	Oct '19-Sep '20
DAILY PEAK (CFS)	9,259	6/30/2020	5,237	4/10/2020
DAILY MINIMUM (CFS)	1,714	1/1/2020	1,960	5/26/2020
PEAK SPILL (CFS)			1,600	7/4/2020
TOTAL SPILL (KAF)			49,030	Mar 19, 2020 - Jul 10 ,2020

*Discharge to the Bighorn River

Table MTT 53: Water year 2020 monthly inflow, outflow, and storage data for Bighorn Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow to canal, KAF	% of 30-yr Avg	Outflow to river, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	202.4	122	0	---	191.1	119	1,014.80	112
NOVEMBER	172.7	139	0	---	193.1	132	998.4	112
DECEMBER	134.2	127	0	---	193.1	127	943.5	111
JANUARY	139	130	0	---	196.2	127	890.6	110
FEBRUARY	129.7	112	0	---	187.3	131	837.1	107
MARCH	217.6	141	0	---	266.9	153	792	103
APRIL	264.8	154	3.8	296	293.3	152	763.9	101
MAY	259.1	83	19.1	174	179.6	79	828.6	100
JUNE	322.5	66	28.3	131	126.9	38	1,000.40	106
JULY	195.2	69	25.9	95	190.9	69	982.6	106
AUGUST	133.2	86	27.8	104	150.6	86	942	106
SEPTEMBER	152.2	91	13.7	83	143.5	94	940.9	105
ANNUAL	2,322.50	99	118.7	111	2,312.50	101	-	-
APRIL-JULY	1,041.70	83	-	-	-	-	-	-



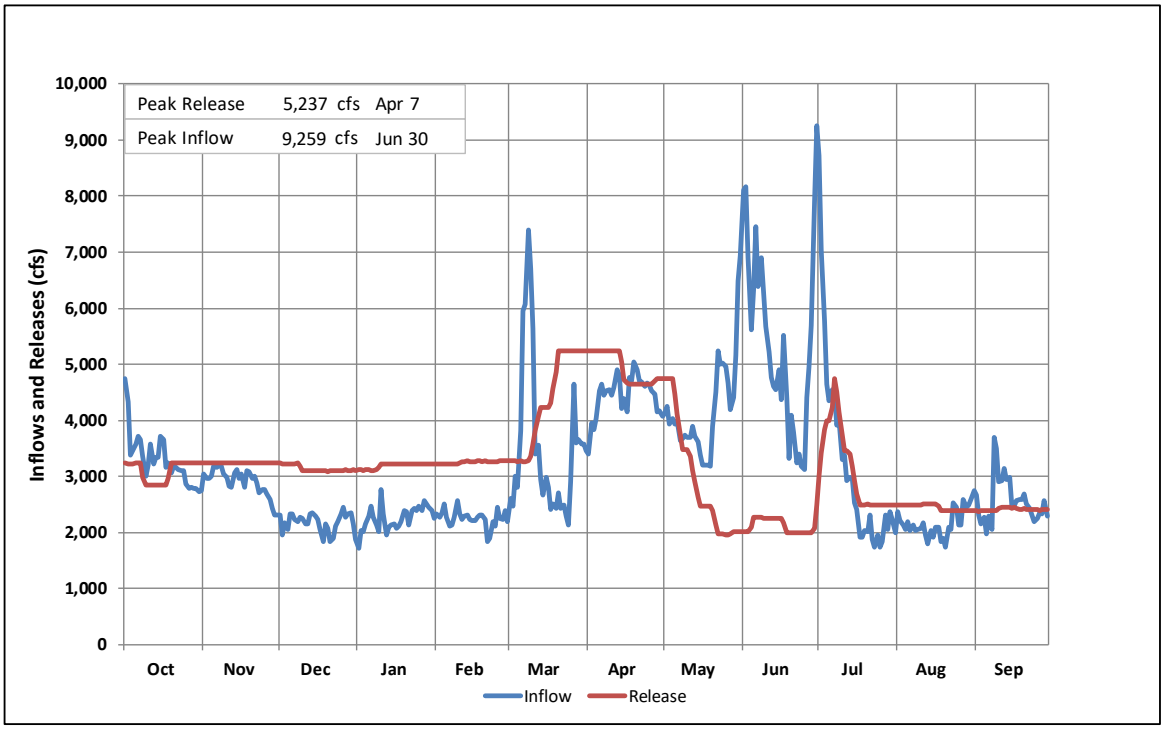


Figure MTG 43: Water year 2020 hydrologic data for Bighorn Reservoir.

Annual Operating Plans for Water Year 2020 for Missouri Basin Units Under the Responsibility of the Dakotas Area Office (DKAO)

Weather Summary for North and South Dakota: Water Year 2020

October precipitation was very much above normal at Heart Butte, and Shadehill reservoirs; much above normal at Belle Fourche reservoir; above normal at Deerfield, and Jamestown reservoirs; normal at Dickinson, Keyhole, and Pactola reservoirs; and much below normal at Angostura reservoir.

November precipitation was very much above normal at Dickinson, and Keyhole reservoirs; much above normal at Pactola reservoir; above normal at Belle Fourche, and Shadehill reservoirs; normal at Angostura reservoir; below normal at Dickinson reservoir; much below normal at Heart Butte reservoir; and very much below normal at Jamestown reservoir.

December precipitation was very much above normal at Angostura, and Deerfield reservoirs; below normal at Belle Fourche, and Heart Butte reservoirs; much below normal at Jamestown, and Shadehill reservoirs; and very much below normal at Dickinson, Keyhole, and Pactola reservoirs.

January precipitation was very much above normal at Deerfield reservoir; normal at Angostura, Belle Fourche, and Pactola reservoirs; below normal at Keyhole reservoir; much below normal at Dickinson reservoir; and very much below normal at Heart Butte, Jamestown, and Shadehill reservoirs.

February precipitation was very much above normal at Keyhole, and Pactola reservoirs; much above normal at Belle Fourche reservoir; above normal at Angostura, and Deerfield reservoirs; normal at Shadehill reservoir; below normal at Heart Butte reservoir; and very much below normal at Dickinson, and Jamestown reservoirs.

March precipitation was above normal at Deerfield, and Pactola reservoirs; normal at Angostura reservoir; below normal at Dickinson reservoir; much below normal at Belle Fourche, Heart Butte, and Shadehill reservoirs; and very much below normal at Jamestown, and Keyhole reservoirs.

April precipitation was normal at Deerfield reservoir; below Pactola reservoir; much below normal at Dickinson, and Keyhole reservoirs; and very much below normal at Angostura, Belle Fourche, Heart Butte, Jamestown, and Shadehill reservoirs.

May precipitation was very much above normal at Deerfield reservoir; above normal at Jamestown reservoir; below normal at Belle Fourche, Keyhole, and Pactola reservoirs; much below normal at Angostura, and Dickinson reservoirs; and very much below normal at Heart Butte, and Shadehill Reservoirs.

June precipitation was very much above normal at Shadehill reservoir; above normal at Belle Fourche reservoir; normal at Heart Butte reservoir; below normal at Dickinson reservoir; much below normal at Angostura, and Deerfield, Keyhole, and Pactola reservoirs; and very much below normal at Jamestown reservoir.

July precipitation was very much above normal at Pactola reservoir; above normal at Belle Fourche, and Jamestown reservoirs; normal at Deerfield, Heart Butte, Keyhole, and Shadehill reservoirs; and below normal at Angostura, and Dickinson reservoirs.

August precipitation was very much above normal at Belle Fourche reservoir; above normal at Pactola reservoir; normal at Deerfield, Heart Butte, Jamestown, and Shadehill reservoirs; much below normal at Angostura, and Keyhole reservoirs; and very much below normal at Dickinson reservoir.

September precipitation was normal at Shadehill reservoir; below normal at Belle Fourche, Dickinson, and Heart Butte reservoirs; much below normal at Angostura, Deerfield, and Keyhole reservoirs; and much below normal at Jamestown, and Pactola reservoirs.

Total annual precipitation for Reclamation facilities in North Dakota, South Dakota, and northeastern Wyoming are shown on Table DKT1.

Table DKT 1: Total annual precipitation for Reclamation reservoirs in North Dakota, South Dakota, and Northeastern Wyoming in inches.

Reservoir	2020 Total	Average Total	Percent
Angostura 1/	10.46	17.67	59
Belle Fourche 2/	15.92	15.86	100
Deerfield 3/	15.41	14.38	107
Keyhole 4/	14.93	19.2	78
Pactola	18.99	20.58	92
Shadehill 5/	17.57	17.86	98
Dickinson	8.73	15.77	55
Heart Butte	12.07	16.27	74
Jamestown	12.67	18.77	68

1/ Angostura Reservoir's annual precipitation data is from the Hot Springs, SD, climate station.
2/ Belle Fourche Reservoir's annual precipitation data is from the Newell, SD climate station.
3/ Deerfield reservoir's annual and average precipitation data is from the Deerfield, Dam flip bucket rain gauge recorded by Hydromet.
4/ Keyhole Reservoir's annual precipitation data is from the Sundance, WY climate station.
5/ Shadehill Reservoir's annual precipitation data is from the Lemmon, SD climate station.

Table DKT 2: Comparison of end-of-water-year storage content for reservoirs in North Dakota, South Dakota, and Northeastern Wyoming in acre-feet.

Reservoir	Storage 9/30/2019	Storage 9/30/2020	Change in Storage
Angostura	104,303	80,380	-23,923
Belle Fourche	137,476	97,695	-39,781
Deerfield	15,035	15,015	-20
Keyhole	167,307	153,944	-13,363
Pactola	53,628	53,262	-366
Shadehill	113,133	107,019	-6,114
Dickinson	8,914	5,733	-3,181
Heart Butte	62,386	52,016	-10,370
Jamestown	31,175	28,302	-2,873

This table displays the changes in storage content between September 30, 2019, and September 30, 2020, at reservoirs in North and South Dakota and eastern Wyoming.

Water Year 2020 Flood Benefits

One of Reclamation's reservoir in North Dakota provided flood relief during WY 2020. It was Jamestown reservoir on the James River near Jamestown, North Dakota.

The information on the distribution of flood damages prevented is provided by the Corps of Engineers. The distributions of flood damages prevented for each reservoir are as follows:

Table DKT 3: Flood damages prevented by DKAO facilities in 2020, and accumulated totals for 1950-2020.

Reservoir	Local	Main-Stem	2020 Total	Previous Accumulations	1950-2020 Accum Totals
Heart Butte	$0	$0	$0	$17,008,700	$17,008,700
Shadehill	$0	$0	$0	$14,120,200	$14,120,200
Angostura	$0	$0	$0	$22,900	$22,900
Pactola	$0	$0	$0	$4,945,800	$4,945,800
Keyhole	$0	$0	$0	$4,900,800	$4,900,800
Jamestown	$4,270,400	$0	$4,270,400	$216,492,400	$220,762,800
Total	$4,270,400	$0	$4,270,400	$257,490,800	$261,761,200

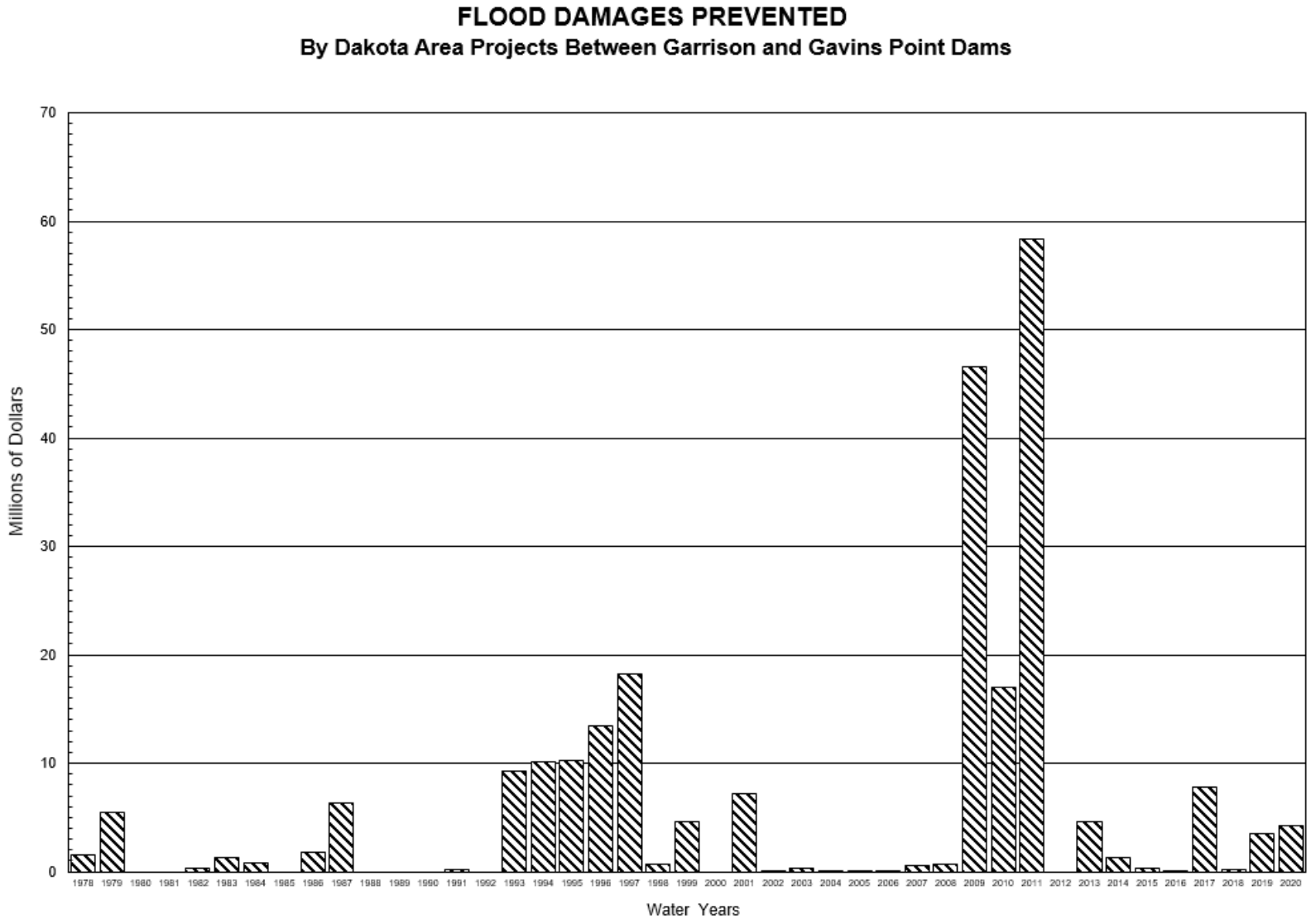


Figure DKG 1: Plot of total yearly flood damages prevented by DKAO Projects between Garrison and Gavins Point Dams.

Unit Operational Summaries for Water Year 2020

Dickinson Reservoir

Dickinson Dam and Edward Arthur Patterson Lake (Dickinson Reservoir) is located on the Heart River one mile west of Dickinson, North Dakota. The reservoir has a dead capacity of 356 acre-feet (AF), an inactive capacity of 100 AF and an active conservation capacity of 8,156 AF (for a total storage capacity of 8,612 AF at the top of conservation elevation 2,420.00 feet). Reservoir water is used for irrigating approximately 230 acres along the Heart River downstream of the dam and for municipal use by the Dickinson Parks and Recreation District.

Summary of 2020 Operations

Dickinson Reservoir started WY 2020 at elevation 2,420.38 feet and storage of 9,073 AF, which is 0.38 feet, and 461 AF above the top of the conservation pool (elevation 2,420.00 and storage 8,612 AF). Dickinson Reservoir peaked at elevation 2,420.57 feet on October 5, 2019 with 9,310 AF of storage. The minimum reservoir elevation for WY 2020 was 2,417.25 with storage of 5,733 AF occurred on September 30, 2020. The reservoir elevation on September 30, 2020 was 2,417.25 feet with storage of 5,733 AF, which is 2.75 feet, and 2,879 AF below the top of conservation pool.

The maximum instantaneous discharge of 362 cfs occurred on March 2, 2020. Reservoir net inflows for water year 2020 totaled 17,030 AF, 86 percent of average. The maximum 24 hour computed inflow occurred on March 1, 2020 with 372 cfs. Precipitation for the water year totaled 8.73 inches, which is 55 percent of average.

202 AF of water was released specifically for downstream irrigation.

An Emergency Management program, orientation seminar and communications drill were conducted on February 26, 2020.

E.A. Paterson Reservoir (Dickinson Dam) started water year 2020 in Internal Alert with a reservoir elevation over elevation 2,420.00 feet and remained there until November 15, 2019, when normal operations began. On February 2, 2020, the reservoir went into internal alert and remained there until February 11, when normal operations resumed. On February 29, 2020, went into Internal Alert and remained there until March 17, when normal operation resumed and remained in normal operations for the rest of the calendar year.

An Annual Site Inspection Review (ASI) was conducted on July 15, 2020 by personnel from the Dakotas Area Office.

Record and near record monthly inflows in 69 years of record keeping were recorded in the following months: October had its third highest inflow, November had its fourth highest inflow, December had its third highest inflow, January had its eighth highest inflow, February had its fourth highest inflow, and July had its tenth lowest inflow.

Record or near record monthly end of month content in 69 years of record keeping were recorded in the following months: October had its sixth highest storage, November had its eighth highest storage, December had its seventh highest storage, January had its ninth highest storage, and February had its eighth highest storage.

Additional statistical information on Dickinson Reservoir and its operations during 2020 can be found on Tables DKT 4, 5, 6, and 7 and Figure DKG2.

Table DKT 4: Reservoir allocations for Dickinson Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE	2,405.00	438	438
TOP OF ACTIVE CONSERVATION	2,420.00	8,452	8,014

Table DKT 5: Storage and elevation data for Dickinson Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,420.38	9,073	10/1/2019
END OF YEAR	2,417.25	5,733	9/30/2020
ANNUAL LOW	2,417.25	5,733	9/30/2020
ANNUAL HIGH	2,420.57	9,310	10/5/2020
HISTORIC HIGH	2,422.19	*9,348	3/21/1997

*Due to new area-capacity table, the capacity that corresponds to the new historic high elevation is less than a previous historic high capacity amount (11,520 AF @ Elevation 2,421.08 feet on June 9, 1982).

Table DKT 6: Inflow and discharge data for Dickinson Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	13,862	OCT 19-SEP 20	17,030	OCT 19-SEP 20
DAILY PEAK (CFS)[1]	372	3/1/2020	362	3/2/2020
DAILY MINIMUM (CFS)*	0	*	0	*

1- 24-Hour daily inflow and 15-minute instantaneous discharge.
*Frequently observed during fall and winter months.

Table DKT 7: Water year 2020 monthly inflow, outflow, and storage data for Dickinson Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	3,515	579	3,745	501	8,684	157
NOVEMBER	799	487	1,735	807	7,747	141
DECEMBER	617	467	380	330	7,972	145
JANUARY	517	119	149	85	8,340	149
FEBRUARY	4,195	182	3,548	496	8,987	151
MARCH	4,435	393	5,393	90	8,029	114
APRIL	989	62	2,055	48	6,963	97
MAY	74	22	1	0	7,036	98
JUNE	-267	3	0	0	6,769	95
JULY	-279	NA	1	0	6,489	99
AUGUST	-425	NA	17	2	6,047	99
SEPTEMBER	-310	NA	4	1	5,733	99
ANNUAL	13,860	70	17,028	86	-	-
APRIL-JULY	517	5	-	-	-	-

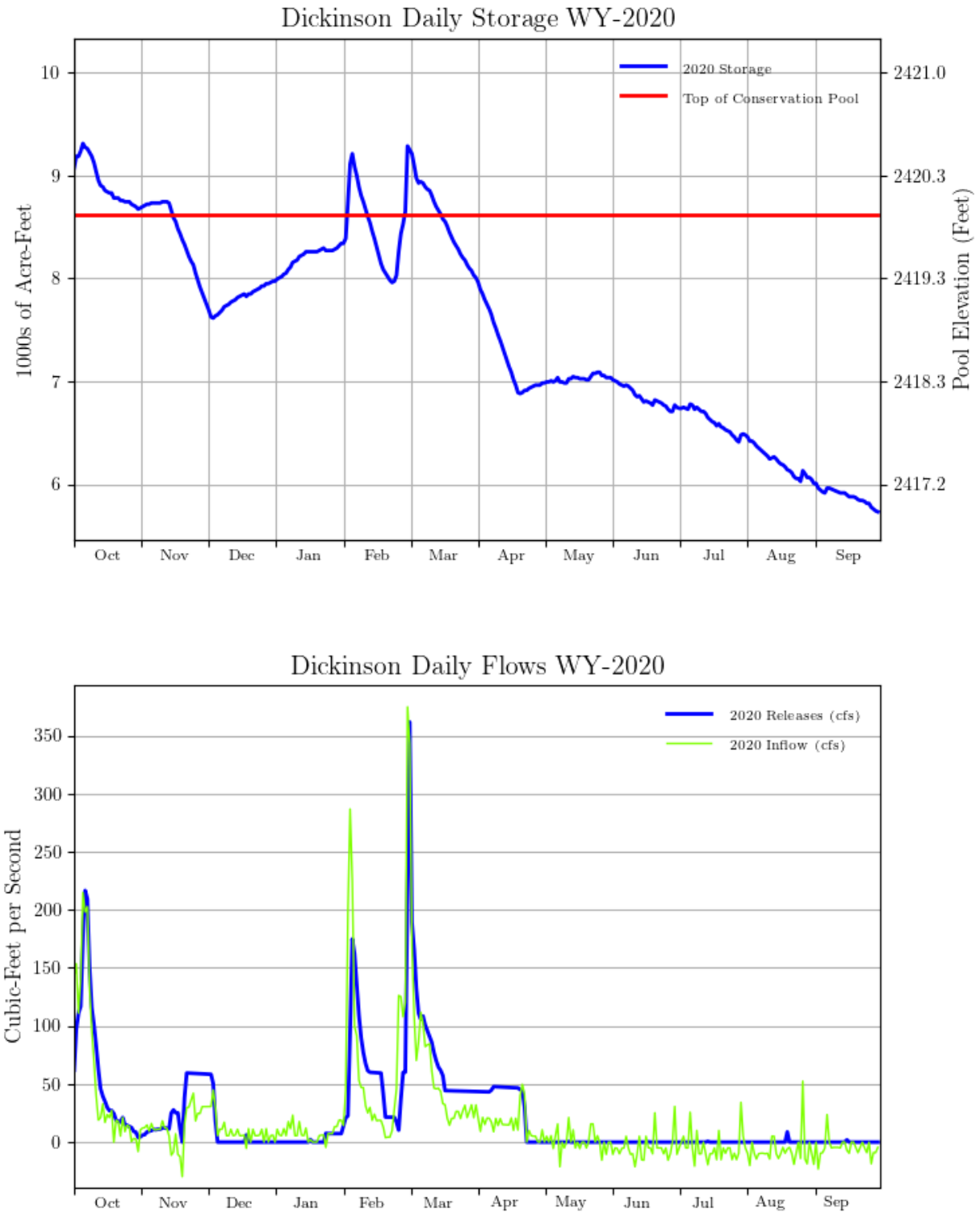


Figure DKG 2: Water year 2020 hydrologic data for Dickinson Reservoir.

Heart Butte Reservoir

Heart Butte Dam and Lake Tschida (Heart Butte Reservoir) is located on the Heart River 15 miles south of Glen Ullin, North Dakota. The reservoir has a dead storage capacity of 5,227 AF, an active conservation capacity of 61,915 AF (for a total storage capacity of 67,142 AF at the top of active conservation elevation 2,064.50feet), and an exclusive flood control space of 147,027 AF. Flood control storage is located above the crest of an ungated morning glory inlet spillway. Heart Butte Reservoir is primarily used for flood control and the authorized irrigation of up to 13,100 acres of which about 7,320 acres are now being irrigated.

Summary of 2020 Operations

Heart Butte Reservoir started WY 2020 at elevation 2,062.79 feet and storage of 61,627 AF, which is 1.71 feet, and 5,515 AF below the top of conservation pool (elevation 2,064.50 and storage 67,142 AF). Heart Butte Reservoir peaked at elevation 2,066.15 feet on March 8 with 72,702 AF of storage. The minimum reservoir elevation was 2,059.60 feet and storage of 59,016 AF occurred on September 30, 2020. The reservoir elevation on September 30, 2020 was 2,059.60 feet with storage of 59,016 AF, which is 4.90 feet and 8,216 AF below the top of conservation pool.

A maximum discharge of 642 cfs occurred on October 12. Reservoir net inflows for water year 2020 totaled 62,783 AF, 71 percent of average. The maximum 24 hour computed inflow occurred on March 4, 2020 with 983 cfs. Precipitation for the water year totaled 12.07 inches, which is 74 percent of average.

11,580 Ac-ft was released specifically for downstream irrigation.

An Emergency Management program, orientation seminar and communications drill were conducted on March 3, 2020.

Lake Tschida Reservoir (Heart Butte Dam) started water year 2020 in normal operations with a reservoir elevation under 2,064.50 feet. On March 2, 2020, the reservoir went into Internal Alert and remained there until March 23, when the reservoir elevation dropped below elevation 2,064.50 feet and normal operations resumed and remained there for the rest of the water year.

An Annual Site Inspection (ASI) was conducted on July 16, 2020 by personnel from the Dakotas Area Office.

Record and near record monthly inflows in 71 years of record keeping were recorded in the following months: October had its third highest inflow, November had its fourth highest inflow, December had its second highest inflow, February had its eleventh highest inflow, and June had its ninth lowest inflow.

Record or near record monthly end of month content in 71 years of record keeping were recorded in the following months: June had its ninth lowest storage, August had its tenth lowest storage, and September had its eleventh lowest storage.

Additional statistical information on Heart Butte Reservoir and its operations during 2020 can be found on Tables DKT 8, 9, 10, and 11 and Figure DKG3.

Table DKT 8: Reservoir allocations for Heart Butte Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	2,030.00	4,328	4,328
TOP OF ACTIVE CONSERVATION	2,064.50	65,091	60,763
TOP OF EXCLUSIVE FLOOD CONTROL	2,094.50	212,696	147,605

Table DKT 9: Storage and elevation data for Heart Butte Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,062.79	61,627	10/1/2019
END OF YEAR	2,059.60	59,016	9/30/2020
ANNUAL LOW	2,059.60	59,016	9/30/2020
ANNUAL HIGH	2,066.15	72,702	3/8/2020
HISTORIC HIGH	2,086.23	173,203	4/9/1952

Table DKT 10: Inflow and discharge data for Heart Butte Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	62,783	OCT 19-SEP 20	73,152	OCT 19-SEP 20
DAILY PEAK (CFS)	983	3/4/2020	642	10/12/2019
DAILY MINIMUM (CFS)	0	*	0	*

*Frequently observed during fall and winter months.

Table DKT 11: Water year 2020 monthly inflow, outflow, and storage data for Heart Butte Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	13,775	944	13,616	621	62,545	108
NOVEMBER	4,149	327	4,814	342	61,880	107
DECEMBER	3,111	338	4,116	323	60,874	106
JANUARY	1,261	107	2,072	179	60,063	104
FEBRUARY	9,557	265	4,604	221	65,016	110
MARCH	24,296	83	24,328	134	64,984	92
APRIL	4,988	21	6,246	25	63,726	92
MAY	1,658	16	2,681	25	62,703	91
JUNE	575	6	3,091	32	60,187	87
JULY	1,051	26	2,258	30	58,980	90
AUGUST	-1,152	-67	3,367	61	54,461	88
SEPTEMBER	-485	-69	1,960	66	52,016	87
ANNUAL	62,783	71	73,153	84	-	-
APRIL-JULY	8,272	17	-	-	-	-

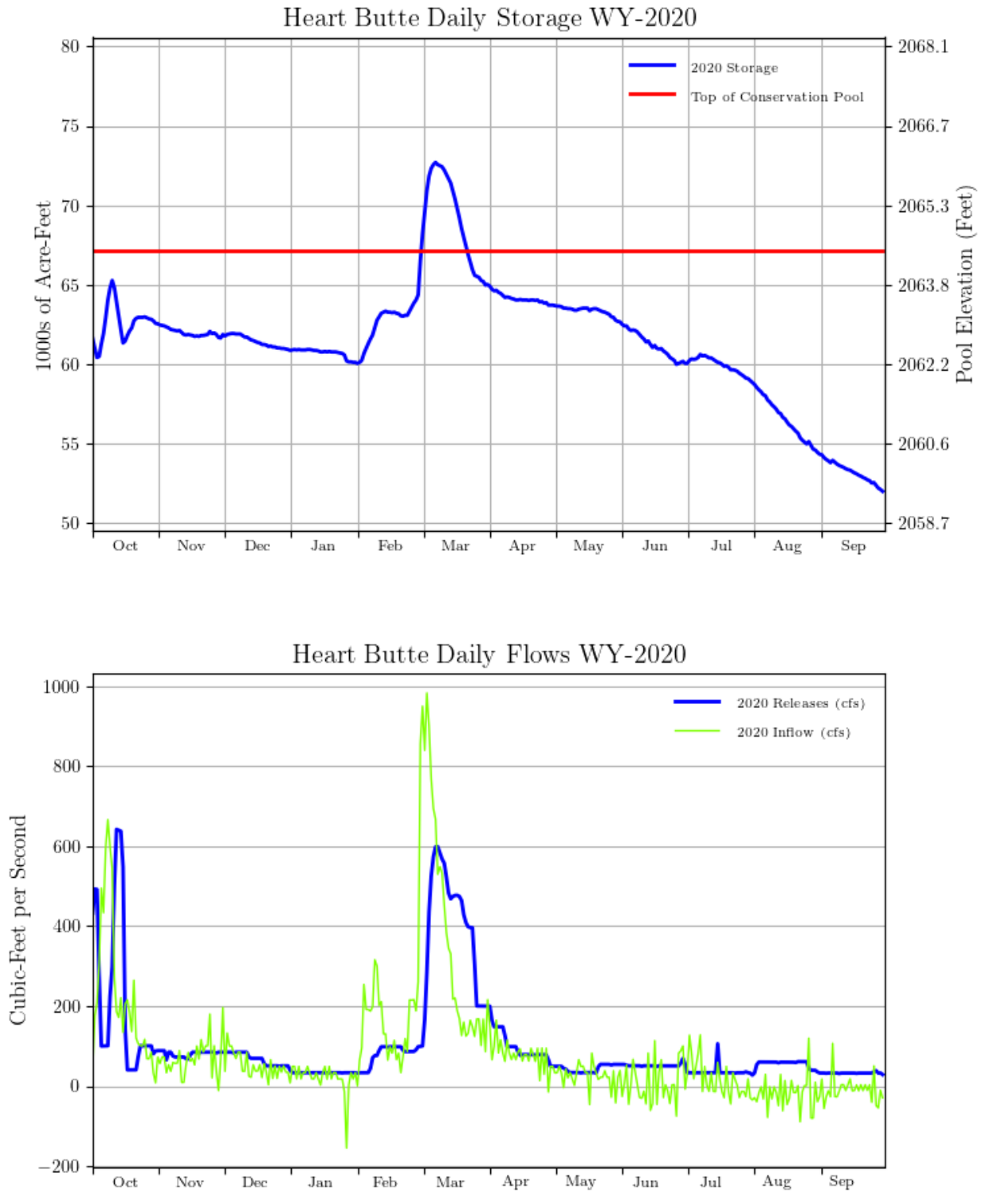


Figure DKG 3: Water year 2020 hydrologic data for Heart Butte Reservoir.

Jamestown Reservoir

Jamestown Reservoir is located on the James River just above the city of Jamestown, North Dakota. The reservoir has a dead capacity of 292 AF, an active conservation capacity of 23,934 AF (for a total top of active conservation capacity of 24,226 AF at elevation 1,428.00 feet), a joint-use capacity of 6,262 AF, and an exclusive flood control space of 190,502 AF. Exclusive flood control storage is located below the crest of an ungated morning glory inlet spillway and flood control releases are controlled by two gated outlets. The joint-use space is available for flood control at the beginning of spring runoff and is used for conservation purposes during the summer months.

Summary of 2020 Operations

Jamestown Reservoir started WY 2020 at elevation 1,431.41 feet and storage of 31,484 AF, which is 3.41 feet, and 7,258 AF above the top of the conservation pool (elevation 1,428.00 feet and storage 24,226 AF). Jamestown Reservoir peaked at elevation 1,442.07 feet on November 11, 2019 with 89,688 AF of storage. The minimum reservoir elevation was 1,423.87 feet and storage of 17,261 AF occurred on March 19, 2020. The reservoir elevation on September 30, 2020 was 1,430.03 feet with storage of 28,302 AF, which is 2.03 feet, and 4,076 AF above the top of active conservation pool.

The maximum instantaneous discharge of 1,230 cfs occurred on October 27, 2019. Reservoir net inflows totaled 312,218 AF, 537 percent of average. The maximum 24 hour computed inflows occurred on October 26 with 4,334 cfs. Precipitation for the water year totaled 12.67 inches at 68 percent of average.

No water was released specifically for downstream irrigation.

An Emergency Management program, orientation seminar and communications drill were conducted on March 11, 2020.

Jamestown Reservoir (Jamestown Dam) started the water year in internal alert with a reservoir elevation over 1,431.00 feet and remained there until October 28, when it entered Response Level 1, with a reservoir elevation over 1,440.00 feet. The reservoir elevation peaked at 1,442.07 feet on November 19. On December 23, 2019, the reservoir went into internal alert with a reservoir elevation under 1,440.00 feet and remained there until February 25, when the reservoir elevation dropped below elevation 1,431.00 feet and normal operations resumed.

On July 17, 2020, the reservoir went back into internal alert with a reservoir elevation over 1,431.00 feet and remained there until August 7, when the reservoir elevation dropped below elevation 1,431.00 feet and normal operations resumed and remained in normal operation for the rest of the water year.

An Annual Site Inspection (ASI) was conducted on July 19, 2020 by personnel from the Dakotas Area Office.

Record and near record monthly inflows in 67 years of record keeping were recorded in the following months: October had its highest inflow, November had its highest inflow, December had its highest inflow, January had its highest inflow, February had its highest inflow, March had its eighth highest inflow, April had its ninth highest inflow, May had its ninth highest inflow, July had its eighth highest inflow, and August had its eighth highest inflow.

Record and near record monthly end of month content in 67 years of record keeping were recorded in the following months: October had its highest storage, November had its highest storage, December had its highest storage, and January had its highest storage.

Additional statistical information on Jamestown Reservoir and its operations during 2020 can be found on Tables DKT 12, 13, 14, and 15 and Figure DKG4.

Table DKT 12: Reservoir allocations for Jamestown Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	1,400.00	292	292
TOP OF ACTIVE CONSERVATION	1,428.00	24,226	23,934
TOP OF JOINT USE	1,431.00	30,488	6,262
TOP OF EXCLUSIVE FLOOD CONTROL	1,454.00	220,990	190,502

Table DKT 13: Storage and elevation data for Jamestown Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	1,431.41	31,484	10/1/2019
END OF YEAR	1,430.03	28,302	9/30/2020
ANNUAL LOW	1,423.87	17,261	3/19/2019
ANNUAL HIGH	1,442.07	89,688	11/11/2019
HISTORIC HIGH	1,454.10	222,318	4/26/2009

Table DKT 14: Inflow and discharge data for Jamestown Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	309,345	OCT 19-SEP 20	312,218	OCT 19-SEP 20
DAILY PEAK (CFS)	4,334	10/26/2019	1,230	10/27/2019
DAILY MINIMUM (CFS)	0	*	0	*

* Frequently observed during fall and winter months

Table DKT 15: Water year 2020 monthly inflow, outflow, and storage data for Jamestown Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content, KAF	% of 30-yr Avg
OCTOBER	102,319	8,783	53,225	1,631	80,269	315
NOVEMBER	53,818	5,497	55,332	4,117	78,755	313
DECEMBER	17,311	4,132	28,135	7,289	67,931	270
JANUARY	4,323	2,589	27,629	18,924	44,625	177
FEBRUARY	9,127	3,248	26,822	21,287	26,930	106
MARCH	15,521	244	15,231	2,064	27,220	88
APRIL	61,260	246	25,448	268	63,032	136
MAY	24,761	259	49,172	326	38,621	95
JUNE	3,870	95	12,902	129	29,589	85
JULY	9,927	238	7,442	114	32,074	99
AUGUST	6,014	148	8,477	169	29,611	94
SEPTEMBER	1,094	75	2,403	48	28,302	101
ANNUAL	309,345	537	312,218	546	-	-
APRIL-JULY	99,818	233	-	-	-	-

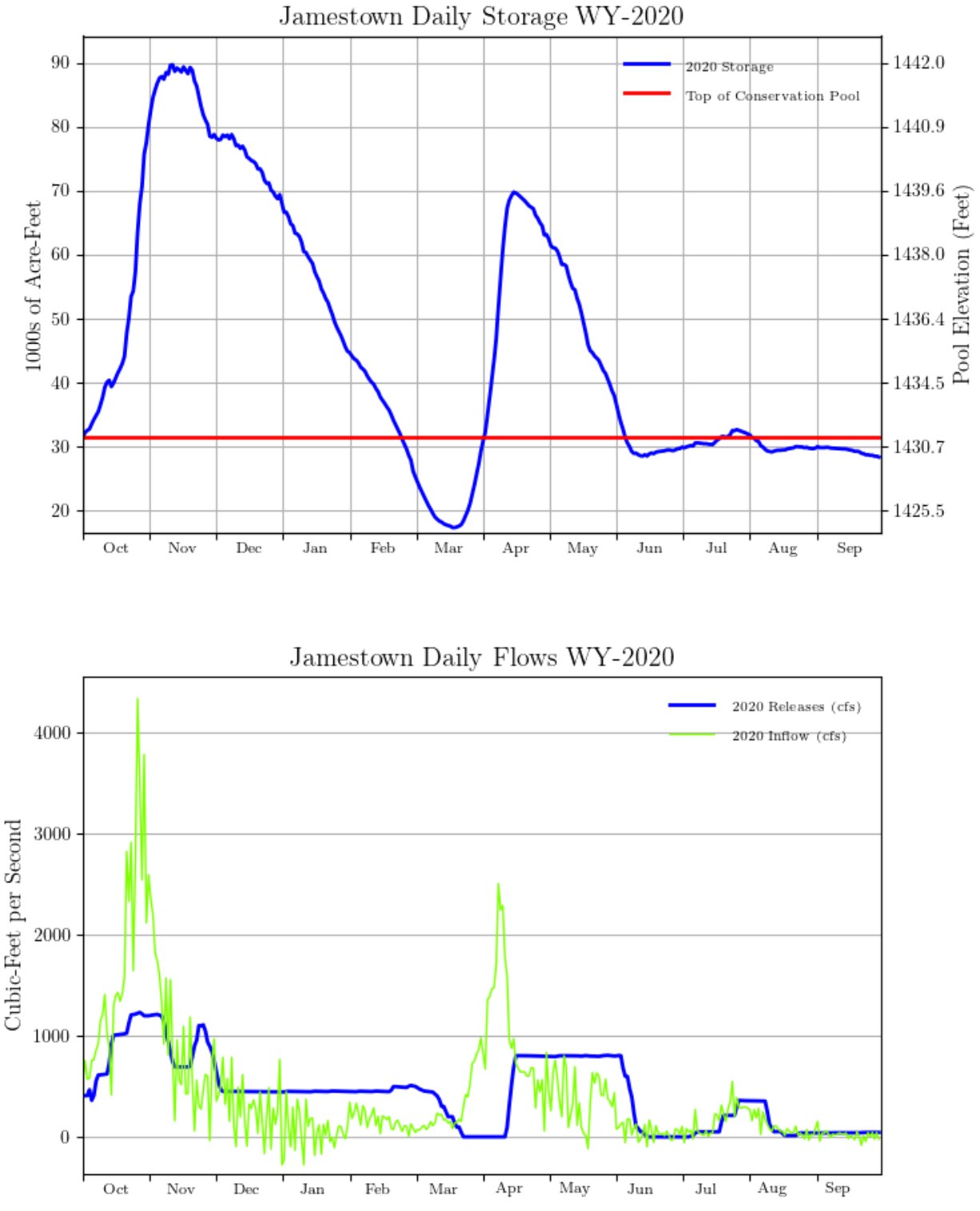


Figure DKG 4: Water year 2020 hydrologic data for Jamestown Reservoir.

Angostura Reservoir

Angostura Reservoir (P S MBP), located on the Cheyenne River above Hot Springs, South Dakota, was built to service about 12,200 acres in the Angostura Unit (P S MBP) and for power generation. It has a total capacity of 123,048 AF with an additional surcharge capacity of 57,308 AF. Its principle use is for irrigation of the Angostura Unit, which diverts its water from a high-level outlet at the dam. In the early years, water surplus to irrigation needs was released to the river through a small power plant with a nameplate capacity of 1,200 kilowatts. Because of the low runoff, and because actual irrigation diversions were higher than previously anticipated, it was concluded that continued operation of the power plant was economically infeasible. Except for a few operations of less than 24 hours each, the plant was last operated in February 1959. In 1966, the plant was officially closed, and the equipment was declared surplus in March 1968. Disposal of this equipment was completed in 1971. Releases for irrigation are made through the canal outlet works into the Angostura Main Canal having a design capacity of 290 cfs. Releases to the Cheyenne River are only made when the reservoir is assured of filling.

Reclamation's Sedimentation and River Hydraulics Group of the Technical Service Center in Denver conducted a sedimentation survey of Angostura Reservoir in 2004 and provided a survey report and new Area and Capacity Tables in August of 2005. The previous survey was done in 1979. Angostura Reservoir accumulated 7,716 AF of sediment since the last survey. Since construction in 1949, Angostura has accumulated 36,867 AF of sediment. The sedimentation rate from 1949 2004 has averaged 670 AF per year. The new Area and Capacity Tables were first used in WY 2006.

Summary of 2020 Operations

Angostura Reservoir Started WY 2020 at elevation 3,182.91 feet and with a storage of 104,303 AF, which is 4.29 feet and 18,745 AF below the top of the conservation pool. Precipitation for WY 2020 was 59 percent of average. Inflows for WY 2020 totaled 78,506 AF (93 percent of average). Peak inflows occurred in March, totaling 29,989 AF for the month. The peak reservoir elevation for WY 2020 was 3,185.70 feet, storage of 116,257 AF and occurred on May 22, 2020. The minimum elevation for WY 2020 was 3,176.57 feet, storage of 80,380 AF, and occurred on September 30, 2020. WY 2020 ended at elevation 3,176.57 feet, and storage of 80,380 AF, which is 10.63 feet and 42,668 AF below the top of the conservation pool. Angostura Reservoir ended the water year with 38,175 AF in active storage.

The Angostura Irrigation District had a full water allotment for its irrigators. The canal was turned on May 21, 2020 with deliveries beginning on May 28, 2020. Releases reached a peak of 261 cfs on July 9, 2020. The irrigation release was terminated on September 17, 2020. Total irrigation deliveries were 26,475 AF.

An Emergency Action Plan Orientation Meeting and functional exercise was held on March 12, 2020.

A Comprehensive Review (CR) for Angostura Dam was conducted on August 26, 2020.

Angostura Dam entered Internal Alert for equipment taken out of service on February 5, 2020. Spillway Gate No. 4 was taken out of service for maintenance, and Gate No. 2 was taken out of service for symmetrical operations. The District was directed with the following instructions: Variance: In coordination between Dakota Area Office, the Regional Office, and the Technical Services Center (TSC), an agreed upon temporary alternative for operation of the spillway gates has

been developed. The alternate operating procedures is as follows: - Do not operate spillway gates 2 and 4. - Operate gates 1, 3, and 5 symmetrically according to the SOP to maintain the reservoir water level elevation below the top of gates 2 and 4. - Visually inspect flow in the spillway chute and flip bucket for a reasonably symmetric flow pattern. Gates 1, 3, and 5 can be operated if a symmetric flow pattern is observed. - If a symmetric flow pattern is not observed in the spillway chute or flip bucket, notify the Area Office, Regional Office, and TSC immediately. - Gates 1, 3, and 5 can be opened at reservoir water level elevations lower than those specified in the SOP at the direction of the Watermaster or the discretion of the Dam Operator based on the severity of the conditions. - Automatic Operation must be disabled. The request for temporary variance to SOP gate operation was approved on February 19, 2020. The temporary variance was discontinued when the climb team removed all pack rust from Spillway Gate No. 4 trunnion pins on March 11, 2020. Angostura Dam was removed from Internal Alert on March 11, 2020.

There were no large construction contracts at Angostura in 2020.

Record and near record monthly inflows in 69 years of record keeping were recorded in the following months: October had its seventh highest inflow, November had its third highest inflow, December had its second highest inflow, January had its fourth highest inflow, February had its ninth highest inflow, and March had its seventh highest inflow.

Record and near record monthly end of month content in 69 years of record keeping were recorded in the following months: No storage records were achieved.

Additional statistical information on Angostura Reservoir and its operations during Water Year 2020 can be found on Tables DKT 16, 17, 18, and 19 and Figure DKG5.

Table DKT 16: Reservoir allocations for Angostura Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	3,163.00	42,205	42,205
TOP OF ACTIVE CONSERVATION	3,187.20	123,048	80,843

Table DKT 17: Storage and elevation data for Angostura Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	3,182.91	104,303	9/30/2019
END OF YEAR	3,176.57	80,380	9/30/2020
ANNUAL LOW	3,176.57	80,380	9/30/2020
ANNUAL HIGH	3,185.70	116,257	5/22/2020
HISTORIC HIGH	3,189.37	**152,228	5/20/1978

** Due to new area-capacity table, the capacity that corresponds to the new historic high elevation is less than a previous high capacity amount (169,020 AF @ Elevation 3189.0 feet on June 18, 1962)

Table DKT 18: Inflow and discharge data for Angostura Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	78,506	OCT 01-SEP 30	102,429	OCT 01-SEP 30
DAILY PEAK (CFS)	1,465	3/5/2020	1,007	3/12/2020
DAILY MINIMUM (CFS)	-136	8/30/2020	1	2/20/2020

Table DKT 19: Water year 2020 monthly inflow, outflow, and storage data for Angostura Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content*, KAF	% of 30-yr Avg
OCTOBER	5,105	226	454	39	108,954	112
NOVEMBER	6,305	266	7,955	527	107,304	109
DECEMBER	6,170	304	9,129	1,308	104,345	105
JANUARY	4,943	221	5,396	890	103,892	102
FEBRUARY	7,947	177	2,757	305	109,082	104
MARCH	29,989	215	28,879	436	110,192	98
APRIL	9,324	119	5,686	139	113,830	98
MAY	5,959	33	4,330	30	115,459	96
JUNE	1,627	8	9,740	47	107,346	90
JULY	597	8	13,178	82	94,765	86
AUGUST	97	3	11,598	91	83,264	82
SEPTEMBER	442	43	3,326	62	80,380	83
ANNUAL	78,505	92	102,428	121	-	-
APRIL-JULY	17,507	34	-	-	-	-

*Content measured at end-of-month.

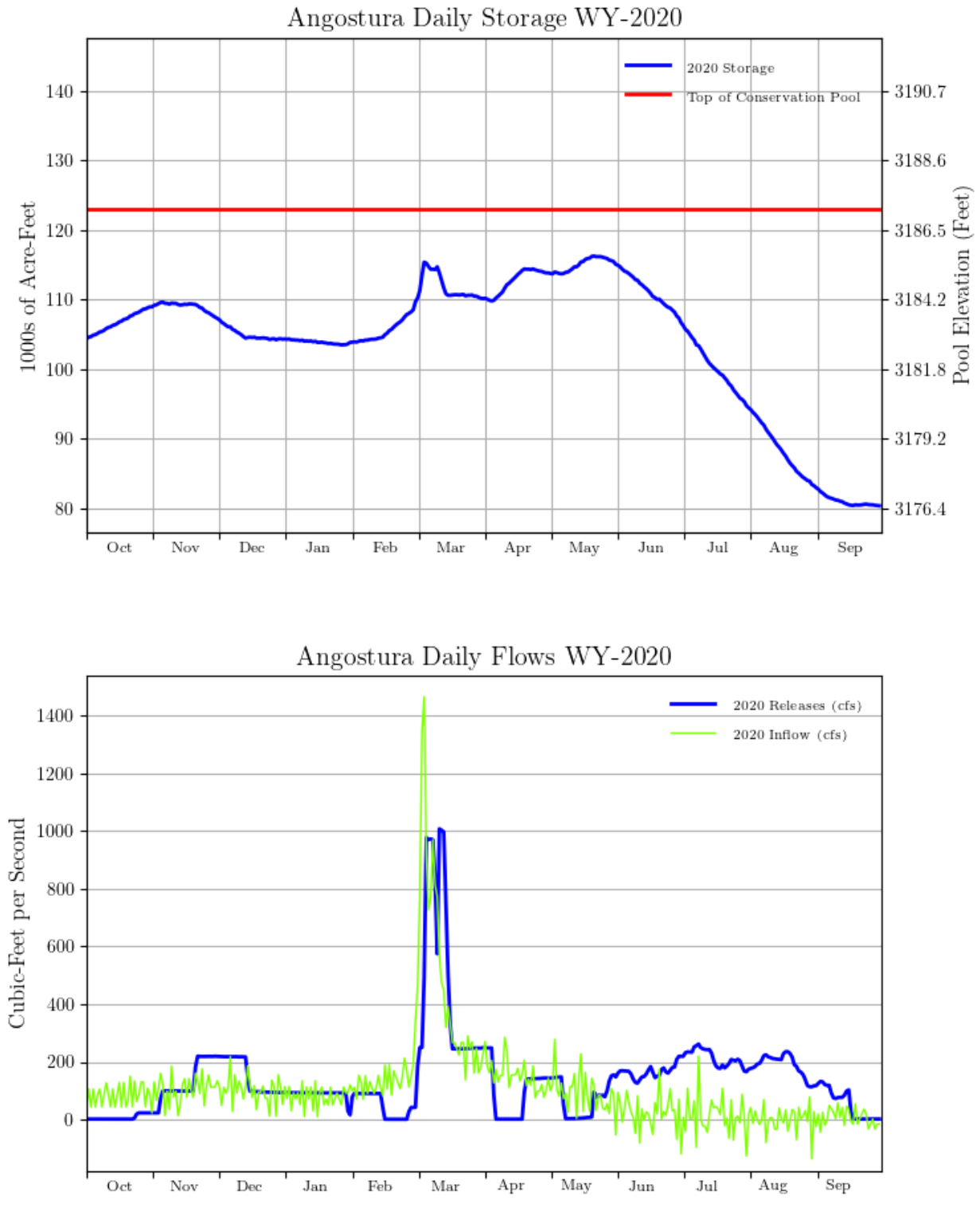


Figure DKG 5: Water year 2020 hydrologic data for Angostura Reservoir.

Belle Fourche Reservoir

Belle Fourche Reservoir located near Belle Fourche, South Dakota, is formed by Belle Fourche Dam on Owl Creek, a tributary of the Belle Fourche River. It has a total capacity of 172,873 AF (169,790 AF active). The reservoir is filled by diverting water from the Belle Fourche River through the Inlet Canal, which has a capacity of 1,300 cfs. The reservoir is used for irrigation of 57,000 acres in the Belle Fourche Project, which also receives a supplemental supply from Keyhole Reservoir. From November 1965 - May 1977, the active capacity of the reservoir was temporarily limited to 160,300 AF at elevation 2,981.8 feet until the damaged spillway was replaced.

When the Belle Fourche Reservoir storage right is satisfied by the reservoir filling, the South Dakota Department of Environment and Natural Resources provide guidelines for complying with water rights on the Belle Fourche River. The District is required to continue to bypass 5 cfs for domestic use prior to diverting the Johnson Lateral water right for up to 40 cfs. If flows into the diversion dam are greater than 45 cfs, the District is required to bypass up to 60 cfs for downstream irrigation rights. Any flows in excess of these amounts can be diverted into the reservoir and stored. If all these rights are not needed, the District can divert flows into the reservoir.

Reclamation's Sedimentation and River Hydraulics Group (of the Technical Service Center in Denver) conducted a sedimentation survey of Belle Fourche Reservoir in 2006 and provided a survey report and new area and capacity tables in April 2007. The previous survey was done in 1949. Belle Fourche Reservoir accumulated 19,204 AF of sediment since the 1949 survey and 36,364 AF since the original survey in 1910. The sedimentation rate from 1910 - 2006 averages 375 AF per year. The new Area and Capacity Tables were first used in WY 2008.

Summary of 2020 Operations

Belle Fourche Reservoir started WY 2020 at elevation 2,970.36 feet and with a storage of 137,476 AF of storage, which is 4.64 feet and 35,397 AF below top of conservation pool. Precipitation for WY 2020 was 100 percent of average. Inflows for WY 2020 totaled 67,678 AF (59 percent of average). Peak inflows occurred in May, totaling 16,220 AF for the month. The peak reservoir elevation for 2020 was 2,973.98 feet, storage of 164,764 AF, and occurred on May 20, 2020. The minimum elevation for WY 2020 was 2,964.20 feet, storage of 97,695 AF, and occurred on September 29, 2020. WY 2020 ended at elevation 2,964.20 feet and storage of 97,695 AF, which is 10.80 feet and 75,178 AF below the top of the conservation pool. Belle Fourche Reservoir ended the water year with 94,612 AF in active storage.

The Belle Fourche Irrigation District (BFID) had a full water allotment of 24 inches for its irrigators. The North Canal and South Canals were turned on May 11, 2020 with deliveries beginning on June 1, 2020. Releases reached a peak of 370 cfs on August 23, 2020 for North Canal and a peak of 270 cfs on August 6, 2020 for South Canal. The South Canal was shut off September 18, 2020. The North Canal was shut off October 2, 2020. Total irrigation releases for the 2020 season were 103,020 AF with 54,071 AF delivered.

Normal operations: no emergency levels activated.

Belle Fourche Road Maintenance is a three-year contract that was awarded to Bachman Construction LLC from Fruitdale, SD for $117,993.40 in 2020. The contract will gravel, water, blade, and mow 13 miles of government managed gravel roads at Belle Fourche Reservoir three times during the summer recreation season. This contract will extend into FY2022.

An Emergency Action Plan Orientation Meeting and functional exercise was held on March 4, 2020.

The Annual Site Inspection (ASI) for Belle Fourche Dam was conducted July 8, 2020.

Record and near record monthly inflows in 69 years of record keeping were recorded in the following months: October had its second lowest inflow, November had its fourth lowest inflow, December had its third lowest inflow, January had its seventh lowest inflow, February had its eighth lowest inflow, and September had its tenth highest inflow.

Record and near record monthly end of month content in 69 years of record keeping were recorded in the following months: November had its twelfth highest storage.

Additional statistical information on Belle Fourche Reservoir and its operations during Water Year 2020 can be found on Tables DKT 20, 21, 22, and 23 and Figure DKG6.

Table DKT 20: Reservoir allocations for Belle Fourche Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	2,927.00	3,083	3,083
TOP OF ACTIVE CONSERVATION	2,975.00	172,873	169,790

Table DKT 21: Storage and elevation data for Belle Fourche Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,970.36	137,476	9/30/2019
END OF YEAR	2,964.20	97,695	9/30/2020
ANNUAL LOW	2,964.20	97,695	9/29/2020
ANNUAL HIGH	2,973.98	164,764	5/20/2020
HISTORIC HIGH	2,975.92	196,792	5/30/1996

Table DKT 22: Inflow and discharge data for Belle Fourche Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	67,678	OCT 01-SEP 30	107,459	OCT 01-SEP 30
DAILY PEAK (CFS)	640	8/6/2020	603	8/23/2020
DAILY MINIMUM (CFS)	-216	11/27/2019	0	10/8/2019

Table DKT 23: Water year 2020 monthly inflow, outflow, and storage data for Belle Fourche Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content*, KAF	% of 30-yr Avg
OCTOBER	617	6	3,348	544	134,745	177
NOVEMBER	502	5	0	0	135,247	158
DECEMBER	-72	-1	0	0	135,175	144
JANUARY	359	4	0	0	135,534	132
FEBRUARY	1,581	17	0	0	137,115	122
MARCH	10,489	66	0	0	147,604	116
APRIL	5,647	41	0	0	153,251	109
MAY	16,220	111	5,335	71	164,136	111
JUNE	11,312	98	21,588	129	153,860	108
JULY	7,406	185	28,654	80	132,612	120
AUGUST	3,818	136	33,115	96	103,315	131
SEPTEMBER	9,798	194	15,418	89	97,695	146
ANNUAL	67,677	59	107,458	95	-	-
APRIL-JULY	40,585	92	-	-	-	-

*Content measured at end-of-month.

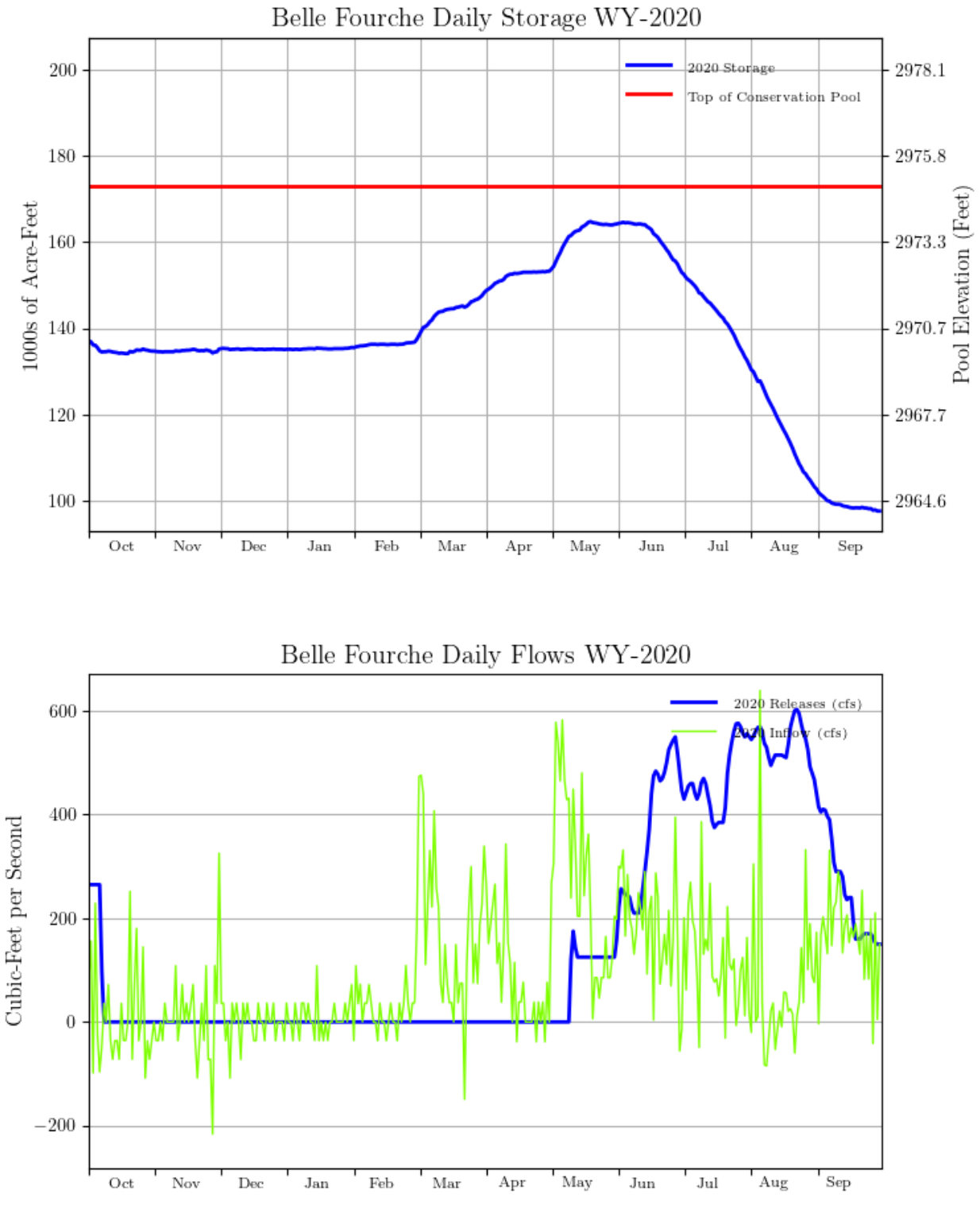


Figure DKG 6: Water year 2020 hydrologic data for Belle Fourche Reservoir.

Deerfield Reservoir

Deerfield Reservoir is located on Castle Creek, a tributary of Rapid Creek above Rapid City. Deerfield Reservoir (Rapid Valley Project) and Pactola Reservoir (Rapid Valley Unit, P S MBP), furnish a supplemental irrigation supply to about 8,900 acres in the Rapid Valley Water Conservancy District (District) and furnish replacement water for a portion of the water used from Rapid Creek by Rapid City. A contract is in place between the United States, Rapid City, South Dakota, and the District for the storage space at Deerfield Reservoir. The majority of prior rights to the flows of Rapid Creek during the irrigation season is held by individuals and ditch companies in the Rapid Valley Water Conservancy District.

In 1985, Deerfield Dam was modified to accommodate a larger flood as determined from the results of the Probable Maximum Flood analysis. These modifications consisted of raising the crest of the dam 38 feet, excavating an unlined auxiliary spillway, removing, and filling in the old spillway, and extending the existing emergency gate passageway to the new control house at the higher crest elevation. The reservoir has a total capacity of 15,654 AF with an additional 26,657 AF of surcharge capacity.

During the winter of 1995-1996 the hollow jet valves were removed to allow the installation of the jet flow valves as part of the outlet works modification contract. The work was done to improve fish habitat in 1.5 miles of the creek immediately downstream of the dam. The stream improvement project was a cooperative effort accomplished by the City of Rapid City, Rapid Valley Water Conservancy District, Black Hills Fly Fishers, Bureau of Reclamation, US Forest Service, and SD Game Fish and Parks. The project modified the outlet works of Deerfield Dam by installing Jet Flow Gates to allow greater minimum winter releases than the 6-in bypass can provide.

Summary of 2020 Operations

Deerfield Reservoir started WY 2020 at elevation 5,906.50 feet and with a storage of 15,035 AF, which is 1.50 feet and 619 AF below the top of the conservation pool. Precipitation for WY 2020 was 15.41 inches and 107 percent of average. Inflows for WY 2020 totaled 20,895 AF (207 percent of average). Peak inflows occurred in July, totaling 3,856 AF for the month. The peak reservoir elevation for WY 2020 was 5,907.87 feet, storage of 15,609 AF and occurred on April 19, 2020. The minimum elevation for WY 2020 was 5,904.42 feet, storage of 14,187 AF, and occurred on October 31, 2019. WY 2020 ended at elevation 5,906.45 feet and with a storage of 15,015 AF, which is 1.55 feet and 639 AF below the top of the conservation pool. Deerfield ended the water year with 14,864 AF in active storage.

Natural flows in Rapid Creek were very high throughout the water season. Rapid Valley Conservation District and the City of Rapid City did not need to make water orders in 2020 due to sufficient natural flows to meet the water demands.

An emergency Action Plan Orientation Meeting was held on July 30, 2020.

An Annual Site Inspection (ASI) was performed August 5, 2020.

Deerfield Reservoir remained in normal operation throughout WY2020.

No construction contracts occurred at Deerfield Dam in 2020.

Record and near record monthly inflows in 68 years of record keeping were recorded in the following months: October had its third highest inflow, November had its fourth highest inflow, December had its fifth highest inflow, January had its fourth highest inflow, March had its eighth highest inflow, April had its third highest inflow, May had its third highest inflow, July had its tenth highest inflow, August had its sixth highest inflow, and September had its fifth highest inflow.

Record and near record monthly end of month content in 68 years of record keeping were recorded in the following months: January had its eighth highest storage, and September had its tenth highest storage.

Additional statistical information on Deerfield Reservoir and its operations during Water Year 2020 can be found on Tables DKT 24, 25, 26, and 27 and Figure DKG7.

Table DKT 24: Reservoir allocations for Deerfield Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	5,839.00	151	151
TOP OF ACTIVE CONSERVATION	5,908.00	15,654	15,503

Table DKT 25: Storage and elevation data for Deerfield Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	5,906.50	15,035	10/1/2019
END OF YEAR	5,906.45	15,015	9/30/2020
ANNUAL LOW	5,904.42	14,187	10/31/2019
ANNUAL HIGH	5,907.87	15,609	4/19/2020
HISTORIC HIGH	5,909.05	16,157	2/25/1985

Table DKT 26: Inflow and discharge data for Deerfield Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	19,661	OCT 01-SEP 30	19,681	OCT 01-SEP 30
PEAK DAILY (CFS)	85	5/23/2020	65	5/4/2020
MINIMUM DAILY (CFS)	9	2/5/2020	13	12/13/2019

Table DKT 27: Water year 2020 monthly inflow, outflow, and storage data for Deerfield Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content*, KAF	% of 30-yr Avg
OCTOBER	1,465	210	2,313	292	14,187	111
NOVEMBER	1,318	210	1,016	234	14,489	112
DECEMBER	1,275	194	841	211	14,923	113
JANUARY	1,204	185	833	212	15,294	113
FEBRUARY	698	117	1,035	263	14,957	109
MARCH	1,393	156	1,323	206	15,027	108
APRIL	2,443	199	1,979	188	15,491	110
MAY	3,334	229	3,372	244	15,453	109
JUNE	2,028	158	2,263	171	15,218	108
JULY	1,647	176	1,680	143	15,185	109
AUGUST	1,449	198	1,537	128	15,097	113
SEPTEMBER	1,406	216	1,488	130	15,015	116
ANNUAL	19,660	189	19,680	190	-	-
APRIL-JULY	9,452	132	-	-	-	-

*Content measured at end-of-month.

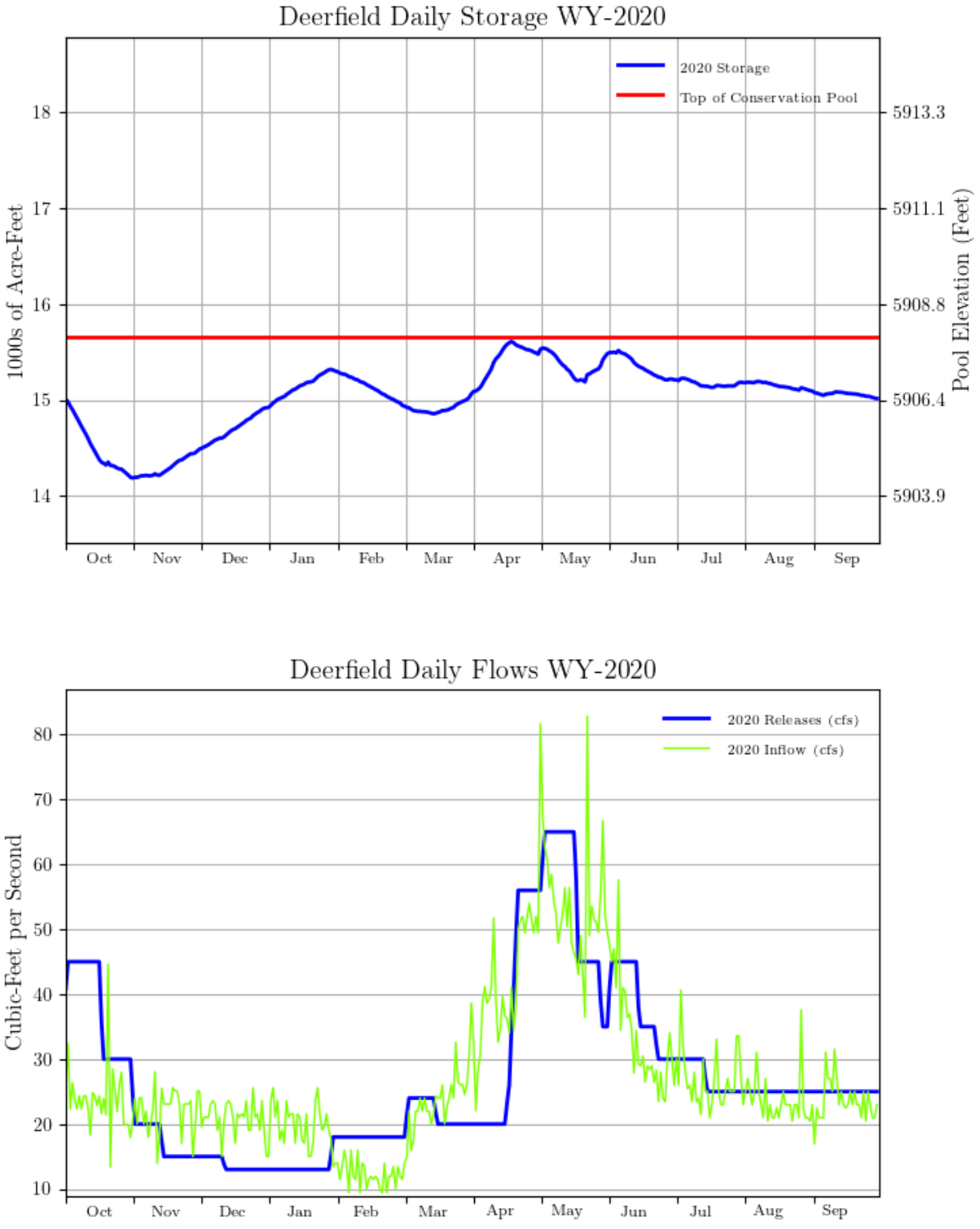


Figure DKG 7: Water year 2020 hydrologic data for Deerfield Reservoir.

Keyhole Reservoir

Keyhole Reservoir (P S MBP) located on the Belle Fourche River below Moorcroft, Wyoming, has a conservation capacity of 188,671 AF (182,079 AF active) and 140,463 AF of exclusive flood control space. It was constructed to furnish a supplemental irrigation supply to 57,000 acres in the Belle Fourche Project and for flood control. Keyhole Reservoir is subject to the Belle Fourche River Compact, and the inflows and storage in the reservoir are allocated 10 percent to Wyoming users and 90 percent to South Dakota users, subject to prior rights. On January 3, 1963, the Belle Fourche Irrigation District executed a long-term contract for the use of 7.7 percent of active storage space in the reservoir. This space will be used to store water belonging to the irrigation district under its prior water right along with the District's pro rata share of storable inflows to Keyhole Reservoir. On January 1, 1985, the Crook County Irrigation District's contract for 18,080 AF of space in Keyhole Reservoir became effective. The allocated space is used by each organization to store its pro rata share of inflows to Keyhole Reservoir. The flood control space at Keyhole Reservoir is all located above an ungated spillway. The spillway capacity is 11,000 cfs at maximum water surface elevation. The downstream safe channel capacity is 3,000 cfs. Formulas for forecasting inflows have not been developed. Research by the Soil Conservation Service during water years 1992 - 1994 show that inflow forecasting to Keyhole Reservoir is not reliable since there is no consistent snowpack and precipitation is highly cyclical. No further efforts to develop forecast models are planned.

Reclamation's Sedimentation and River Hydraulics Group of the Technical Service Center in Denver conducted a sedimentation survey of Keyhole Reservoir in 2003 and provided a survey report and new area and capacity tables in July of 2005. The previous survey was done in 1978. Keyhole Reservoir accumulated 5,082 AF of sediment since the previous survey. Since construction in 1952, Keyhole has accumulated 12,495 AF of sediment. The sedimentation rate from 1952 2003 has averaged 240 AF per year. The new Area and Capacity Tables were first used in WY 2006.

Summary of 2020 Operations

Keyhole Reservoir started WY 2020 at elevation 4,096.93 feet and storage of 167,307 AF, which is 2.37 feet and 21,364 AF below the top of the conservation pool. Precipitation for WY 2020 was 78 percent of average. Inflows for WY 2020 totaled 13,924 AF (82 percent of average). Peak inflows occurred in March, totaling 20,522 AF for the month. The peak reservoir elevation for WY 2020 was 4,099.58 feet, storage of 191,320 AF, and occurred on March 14, 2020. The minimum elevation for WY 2020 was 4,095.33 feet, storage of 153,944 AF, and occurred on September 30, 2020. WY 2020 ended at elevation 4,095.33 feet and storage of 153,944 AF, which is 3.97 feet and 34,727 AF below the top of the conservation pool. Keyhole Reservoir ended the water year with 147,532 AF in active storage.

Belle Fourche Irrigation District (BFID) ordered 4,661 AF and the Crook County Irrigation District (CCID) ordered 283 AF for WY 2020.

Keyhole went into Internal Alert on March 6, 2020 at Keyhole Reservoir after reaching reservoir elevation 4,098.3 feet, (4,099.3 feet is the top of conservation and spill elevation for the spillway). The reservoir elevation was at 4,098.56 and inflows were approx. 970 cfs. The high inflows were due to snowmelt upstream of the reservoir. The highest elevation for 2020 was 4,099.58 feet March 14, 2020. Keyhole returned to normal operations on April 6, 2020 After reaching reservoir elevation of 4,098.86 and low precipitation forecasted.

There were no construction contracts at Keyhole in 2020.

An Emergency Action Plan Orientation Meeting was held on July 29, 2020.

A Periodic Facility Review (PFR) of Keyhole dam was conducted on August 27, 2020.

Record and near record monthly inflows in 69 years of record keeping were recorded in the following months: November had its third highest inflow, December had its fourth highest inflow, March had its seventh highest inflow, June had its sixth lowest inflow, and August had its third lowest inflow.

Record and near record monthly end of month content in 69 years of record keeping were recorded in the following months: October had its fifth highest storage, November had its fourth highest storage, December had its fourth highest storage, January had its fifth highest storage, February had its sixth highest storage, March had its third highest storage, and April had its fifth highest storage.

Additional statistical information on Keyhole Reservoir and its operations during Water Year 2020 can be found on Tables DKT 28, 29, 30, and 31 and Figure DKG8.

Table DKT 28: Reservoir allocations for Keyhole Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,051.00	6,592	6,592
TOP OF ACTIVE CONSERVATION	4,099.30	188,671	182,079
TOP OF EXCLUSIVE FLOOD CONTROL	4,111.50	329,134	140,463

Table DKT 29: Storage and elevation data for Keyhole Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,096.93	167,307	9/30/2019
END OF YEAR	4,095.33	153,944	9/30/2020
ANNUAL LOW	4,095.33	153,944	9/30/2020
ANNUAL HIGH	4,099.58	191,320	3/14/2020
HISTORIC HIGH	4,100.38	210,222	5/21/1978

Table DKT 30: Inflow and discharge data for Keyhole Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	13,924	OCT 01-SEP 30	27,287	OCT 01-SEP 30
DAILY PEAK (CFS)	1,353	3/7/2020	300	3/31/2020
DAILY MINIMUM (CFS)	-332	5/21/2020	0	10/2/2019

Table DKT 31: Water year 2020 monthly inflow, outflow, and storage data for Keyhole Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content*, KAF	% of 30-yr Avg
OCTOBER	342	-93	85	123	167,564	173
NOVEMBER	1,124	-366	0	0	168,688	175
DECEMBER	695	384	0	0	169,383	176
JANUARY	698	136	0	0	170,081	175
FEBRUARY	2,545	93	0	0	172,626	173
MARCH	20,522	252	5,511	622	187,637	176
APRIL	1,651	66	10,226	653	179,062	168
MAY	-653	-13	2,408	153	176,001	160
JUNE	-2,579	-81	1,854	91	171,568	155
JULY	-2,866	347	1,912	49	166,790	157
AUGUST	-4,807	258	2,881	81	159,102	158
SEPTEMBER	-2,749	159	2,409	265	153,944	157
ANNUAL	13,923	81	27,286	185	-	-
APRIL-JULY	-4,447	0	-	-	-	-

*Content measured at end-of-month.

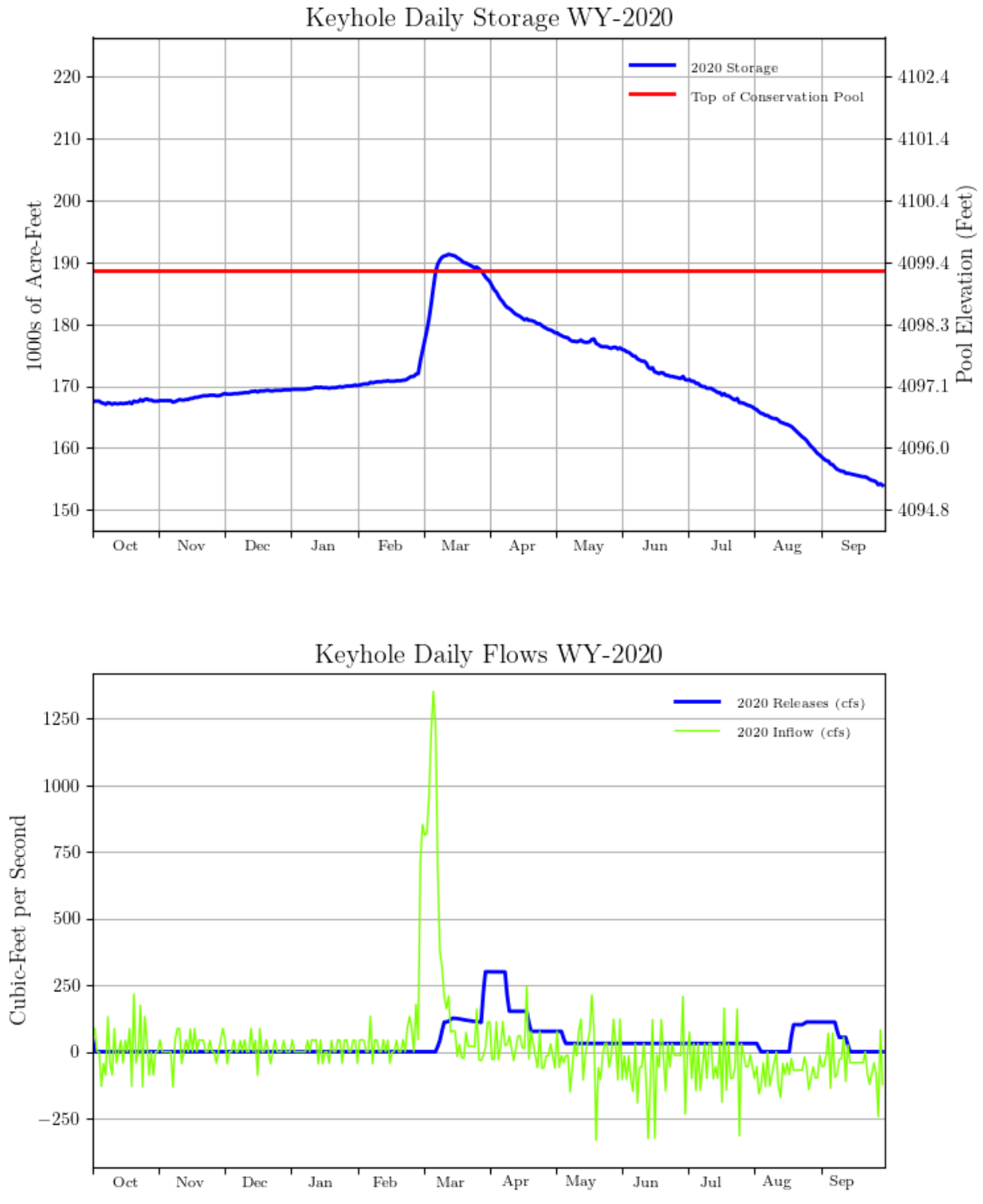


Figure DKG 8: Water year 2020 hydrologic data for Keyhole Reservoir.

Pactola Reservoir

Pactola Reservoir, Rapid Valley Unit (P S MBP), located on Rapid Creek above Rapid City, South Dakota, acts in conjunction with Deerfield Reservoir, Rapid Valley Project, to furnish a supplemental irrigation supply to about 8,900 acres in the Rapid Valley Water Conservancy District, replacement water for Rapid City, and a supply of domestic water for private water systems both above and below the city. The reservoir is also operated to provide flood control. It has a conservation capacity of 55,972 AF (54,955 AF active) and 43,057 AF of exclusive flood control space. The flood control space is all below the ungated spillway crest, and releases in this pool are controlled by the river outlet works. Rapid City has contracts for Pactola and Deerfield Reservoir water. The Rapid Valley Sanitation District and Hisega Meadows Water Inc. also have contracts for water service from Pactola Reservoir. Operation of the two reservoirs is integrated to maintain as much water as possible in the upstream facility, Deerfield Reservoir, and at the same time maintain a uniform outflow from Deerfield to maximize fishery benefits in the stream between the reservoirs. Since no inflow forecasts are available, the reservoir is normally operated as full as possible. Two Snotel (North Rapid Creek and Blind Park) sites were installed in the Pactola and Deerfield drainage basin in May of 1990.

As part of the Safety Examination of Existing Structures (Safety of Dams) Program, a study was made in the early 1980s to determine the adequacy of Pactola Dam, Spillway, and Reservoir to safely pass the new Inflow Design Flood (IDF) determined on the basis of present day hydrologic technology. The studies showed that the facility was not able to safely handle the new IDF. Modification work was completed in 1987 and provided sufficient surcharge storage and spillway capacity to pass the IDF. Modification work consisted of raising the crest of the dam 15 feet, widening the existing rock-cut spillway chute and stilling basin from 240 feet to 425 feet, relocating Highway 385 to the new dam crest, extending the existing gate access shaft to the higher crest elevation, and reconstructing a new two-level gate control house at the higher crest elevation.

A new long-term storage contract was signed on July 31, 2007 between Reclamation and the city of Rapid City. The contract provides storage space of 49,000 AF for the city and 6,000 AF was retained by Reclamation.

Summary of 2020 Operations

Pactola Reservoir started WY 2020 at elevation 4,577.43 feet and with a storage of 53,628 AF, which is 2.77 feet and 2,344 AF below the top of the conservation pool. Precipitation for WY 2020 was 92 percent of average. Inflows for WY 2020 totaled 68,703 AF (179 percent of average). Peak inflows occurred in May, totaling 12,281 AF for the month. The peak reservoir elevation for WY 2020 was 4,580.32 feet, storage of 56,078 AF, and occurred on April 12, 2020. The minimum elevation for WY 2020 was 4,574.98 feet, storage of 51,618 AF, and occurred on November 12, 2019. WY 2020 ended at elevation 4,576.99 feet and storage of 53,262 AF, which is 3.21 feet and 2,710 AF below the top of the conservation pool. Pactola Reservoir ended the water year with 52,245 AF in active storage.

Natural flows in Rapid Creek were high throughout the water season. Rapid Valley Conservation District and the City of Rapid City did not need to make water orders in 2020 due to sufficient natural flows to meet the water demands.

Emergency Action Plan Orientation Meeting was held on July 30, 2020.

An Annual Site Inspection (ASI) was performed August 18, 2020.

Normal operation: No emergency levels activated.

No construction contracts occurred at Pactola Dam 2020. Elevator refurbishment is being performed by the City of Rapid City and is ongoing.

Record and near record monthly inflows in 65 years of record keeping were recorded in the following months: October had its third highest inflow, November had its second highest inflow, December had its second highest inflow, January had its fourth highest inflow, February had its third highest inflow, March had its fourth highest inflow, and April had its fourth highest inflow.

Record and near record monthly end of month content in 65 years of record keeping were recorded in the following months: February had its fourth highest storage, and March had its highest ever storage.

Additional statistical information on Pactola Reservoir and its operations during Water Year 2020 can be found on Tables DKT 32, 33, 34, and 35 and Figure DKG9.

Table DKT 32: Reservoir allocations for Pactola Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	4,456.10	1,017	1,017
TOP OF ACTIVE CONSERVATION	4,580.20	55,972	54,955
TOP OF EXCLUSIVE FLOOD CONTROL	4,621.50	99,029	43,057

Table DKT 33: Storage and elevation data for Pactola Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	4,577.43	53,628	9/30/2019
END OF YEAR	4,576.99	53,262	9/30/2020
ANNUAL LOW	4,574.98	51,618	11/12/2019
ANNUAL HIGH	4,580.32	56,078	4/12/2020
HISTORIC HIGH	4,589.43	64,246	6/29/2015

Table DKT 34: Inflow and discharge data for Pactola Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	68,703	OCT 01-SEP 30	69,069	OCT 01-SEP 30
DAILY PEAK (CFS)	268	5/3/2020	243	5/4/2020
DAILY MINIMUM (CFS)	27	1/11/2020	39	12/11/2019

Table DKT 35: Water year 2020 monthly inflow, outflow, and storage data for Pactola Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content*, KAF	% of 30-yr Avg
OCTOBER	6,175	270	8,096	419	51,707	114
NOVEMBER	4,419	256	3,761	245	52,365	115
DECEMBER	3,683	251	2,761	179	53,287	117
JANUARY	3,477	228	2,769	190	53,995	118
FEBRUARY	3,653	240	2,512	190	55,136	120
MARCH	5,203	203	4,613	248	55,726	120
APRIL	10,611	244	11,253	371	55,084	115
MAY	12,281	175	12,340	216	55,025	112
JUNE	7,495	103	7,742	114	54,778	110
JULY	5,210	120	5,328	90	54,660	114
AUGUST	3,473	118	4,314	100	53,819	117
SEPTEMBER	3,023	130	3,580	123	53,262	118
ANNUAL	68,703	175	69,069	180		
APRIL-JULY	35,597	155				

*Content measured at end-of-month.

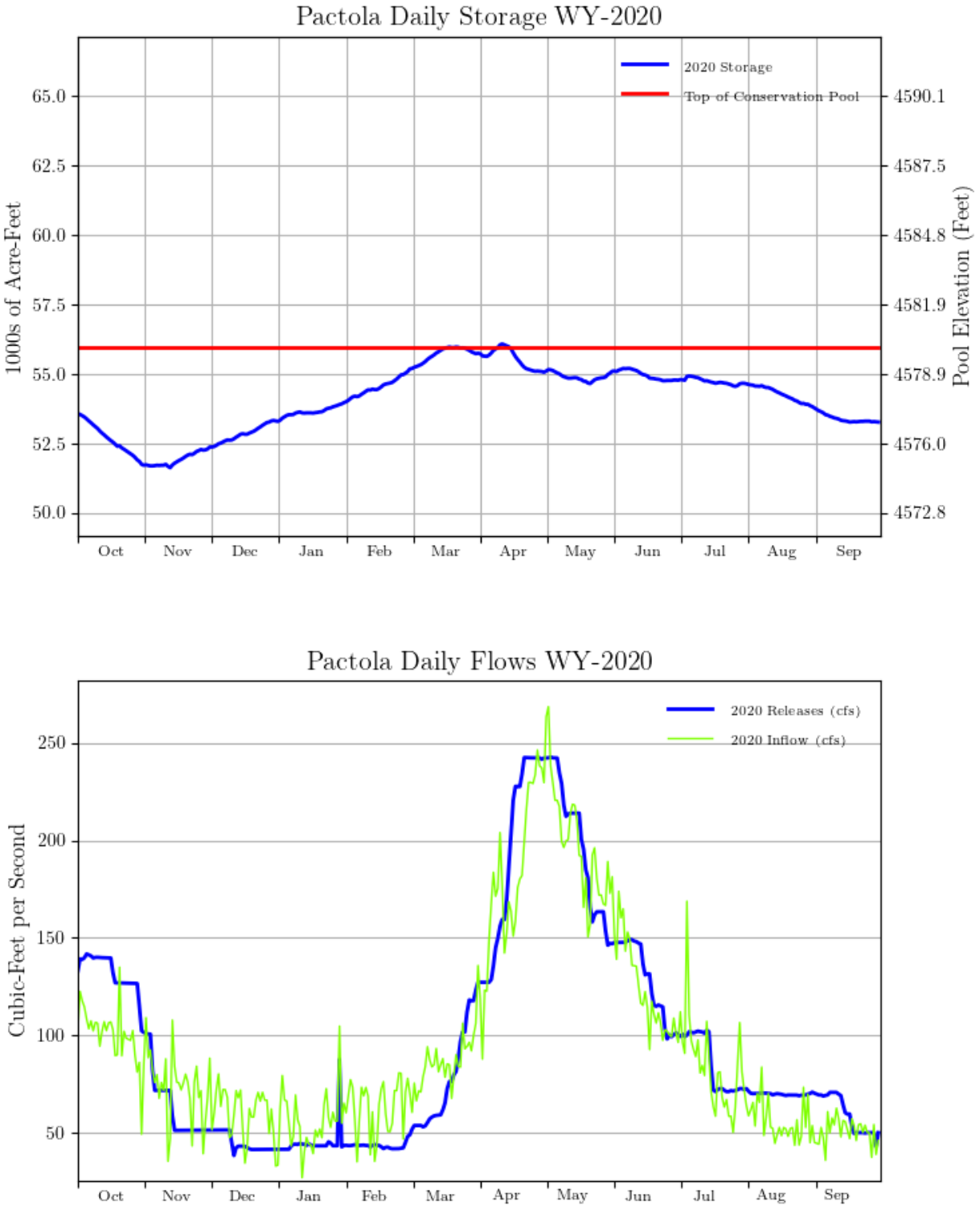


Figure DKG 9: Water year 2020 hydrologic data for Pactola Reservoir.

Shadehill Reservoir

Shadehill Reservoir, a feature of the Shadehill Unit (P S MBP), is located on the Grand River near Shadehill, South Dakota, and was constructed for irrigation of 9,700 acres, and for flood control, recreation, and fish and wildlife purposes. The reservoir has a dead and conservation capacity totaling 120,172 AF with an additional exclusive flood control capacity of 230,004 AF and a surcharge capacity of 119,560 AF. Flood control space is all located above the crest of an un-gated glory-hole spillway. Because of the questionable quality of water, it was decided to postpone construction of distribution works for irrigation.

After further study, it was concluded that water from Shadehill Reservoir can be used for sustained irrigation if certain limitations of soils, leaching water, soil amendments, and drainage are met. A definite plan report covering 6,700 acres which meets these limitations has been completed, approved by the Commissioner, and released for distribution. On December 17, 1963, landowners within the area voted 24 to 21 against formation of an irrigation district. Further action on development of the area was deferred until the attitude of the landowners was more favorable. Pending more extensive irrigation development, an additional 51,500 AF of space between elevations 2,260 feet and 2,272 feet was allocated to flood control. Allocations and evacuation of this space was made possible by modification of the outlet works in 1969 to permit a discharge of 600 cfs to the river. In June of 1975, the West River Conservancy Sub-District was formed combining all but one of the old individual contracts for water supply from the reservoir into one. Acreage contracted for by the District was 5,000 acres; however, only 3,064 acres were developed. On March 18, 1986, the contract between Reclamation and the West River Conservancy Sub-District was assigned to the Shadehill Water User District, an organization, which succeeded the Sub-District under South Dakota law. This contract has expired and presently conservation releases are meeting irrigation demands. Should irrigation releases be required a temporary water service contract will need to be executed with the Shadehill Water User District.

Because certain release criteria reduced the effectiveness of flood control operations in the zone between elevation 2,260 and 2,272, and because the Corps of Engineers has constructed Bowman Haley Reservoir upstream from Shadehill Reservoir with 53,800 AF of flood control space, the Corps requested that the interim flood control agreement be terminated and that responsibility for the operations of Shadehill Reservoir when the pool is between elevations 2,260 feet and 2,272 feet revert to Reclamation. By a revised field working agreement dated May 15, 1972, it was agreed that the space between elevation 2,260 feet and 2,272 feet (51,500 AF) be reallocated to conservation use. However, space below elevation 2,272 feet will continue to be evacuated before the start of the spring runoff, but to a lesser extent than in the past.

Summary of 2020 Operations

Shadehill Reservoir started WY 2020 at elevation 2,270.57 feet and with a storage of 113,133 AF, which is 1.43 ft and 7,039 AF below the top of the conservation pool. Precipitation for WY 2020 was 98 percent of average. Inflows for WY 2020 totaled 45,572 AF (60 percent of average). Peak inflows occurred in March, totaling 19,669 AF for the month. The peak reservoir elevation for WY 2020 was 2,272.02 feet, storage of 120,273 AF, and occurred on April 10, 2020. The minimum elevation for WY 2020 was 2,268.02 ft, storage of 101,263 AF, and occurred on February 24, 2020. WY 2020 ended at elevation 2,269.28 feet and storage of 107,019 AF, which is 2.72 feet and 13,153 AF below the top of the conservation pool. Shadehill Reservoir ended the water year with 63,150 AF in active storage.

All irrigation demands were met from river maintenance releases. There were no storage releases for irrigation needed during water year 2020.

Normal operations: no emergency levels activated.

The Shadehill Spillway Stabilization contract was awarded to Street Construction Company from Big Stone, SD for $43,520.00 in 2020. The contractor repaired the embankment, installed geofabric and repaired and replaced the riprap revetment for approximately 130 feet of the right and left bank.

An Emergency Action Plan Orientation Meeting was held on July 28, 2020.

An Annual Site Inspection (ASI) for Shadehill Dam was conducted on June 23, 2020.

Record and near record monthly inflows in 69 years of record keeping were recorded in the following months: October had its third highest inflow, and November had its second highest inflow.

Record and near record monthly end of month content in 69 years of record keeping were recorded in the following months: No storage records were achieved.

Additional statistical information on Shadehill Reservoir and its operations during Water Year 2020 can be found on Tables DKT 36, 37, 38, and 39, and Figure DKG10.

Table DKT 36: Reservoir allocations for Shadehill Reservoir.

RESERVOIR ALLOCATIONS	ELEVATION (FEET)	TOTAL RESERVOIR STORAGE (AF)	STORAGE ALLOCATION (AF)
TOP OF INACTIVE AND DEAD	2,250.80	43,869	43,869
TOP OF ACTIVE CONSERVATION	2,272.00	120,172	76,303
TOP OF EXCLUSIVE FLOOD CONTROL	2,302.00	350,176	230,004

Table DKT 37: Storage and elevation data for Shadehill Reservoir.

STORAGE-ELEVATION DATA	ELEVATION (FT)	STORAGE (AF)	DATE
BEGINNING OF YEAR	2,270.57	113,133	9/30/2019
END OF YEAR	2,269.28	107,119	9/30/2020
ANNUAL LOW	2,268.02	101,263	2/24/2019
ANNUAL HIGH	2,272.02	120,273	4/10/2020
HISTORIC HIGH	2,297.90	318,438	4/10/1952

Table DKT 38: Inflow and discharge data for Shadehill Reservoir.

INFLOW-OUTFLOW DATA	INFLOW	DATE	OUTFLOW	DATE
ANNUAL TOTAL (AF)	47,572	OCT 01-SEP 30	54,365	OCT 01-SEP 30
DAILY PEAK (CFS)	2,062	12/2/2019	202	11/22/2019
DAILY MINIMUM (CFS)	-2,072	12/1/2019	49	9/30/2020

Table DKT 39: Water year 2020 monthly inflow, outflow, and storage data for Shadehill Reservoir.

Month	Inflow, KAF	% of 30-yr Avg	Outflow, KAF	% of 30-yr Avg	Content*, KAF	% of 30-yr Avg
OCTOBER	9,170	715	8,348	213	113,955	105
NOVEMBER	6,004	635	9,318	278	110,641	104
DECEMBER	865	112	8,258	324	103,248	99
JANUARY	1,259	133	3,110	132	101,397	98
FEBRUARY	4,510	137	2,883	137	103,703	99
MARCH	19,669	80	3,350	30	120,022	101
APRIL	2,615	13	3,366	19	119,271	99
MAY	1,783	16	3,424	33	117,630	97
JUNE	1,718	19	3,197	38	116,151	95
JULY	1,514	44	3,126	57	114,539	95
AUGUST	-489	-137	3,075	73	110,975	96
SEPTEMBER	-1,047	-5235	2,909	81	107,019	95
ANNUAL	47,571	62	54,364	72		
APRIL-JULY	7,630	17				

*Content measured at end-of-month.

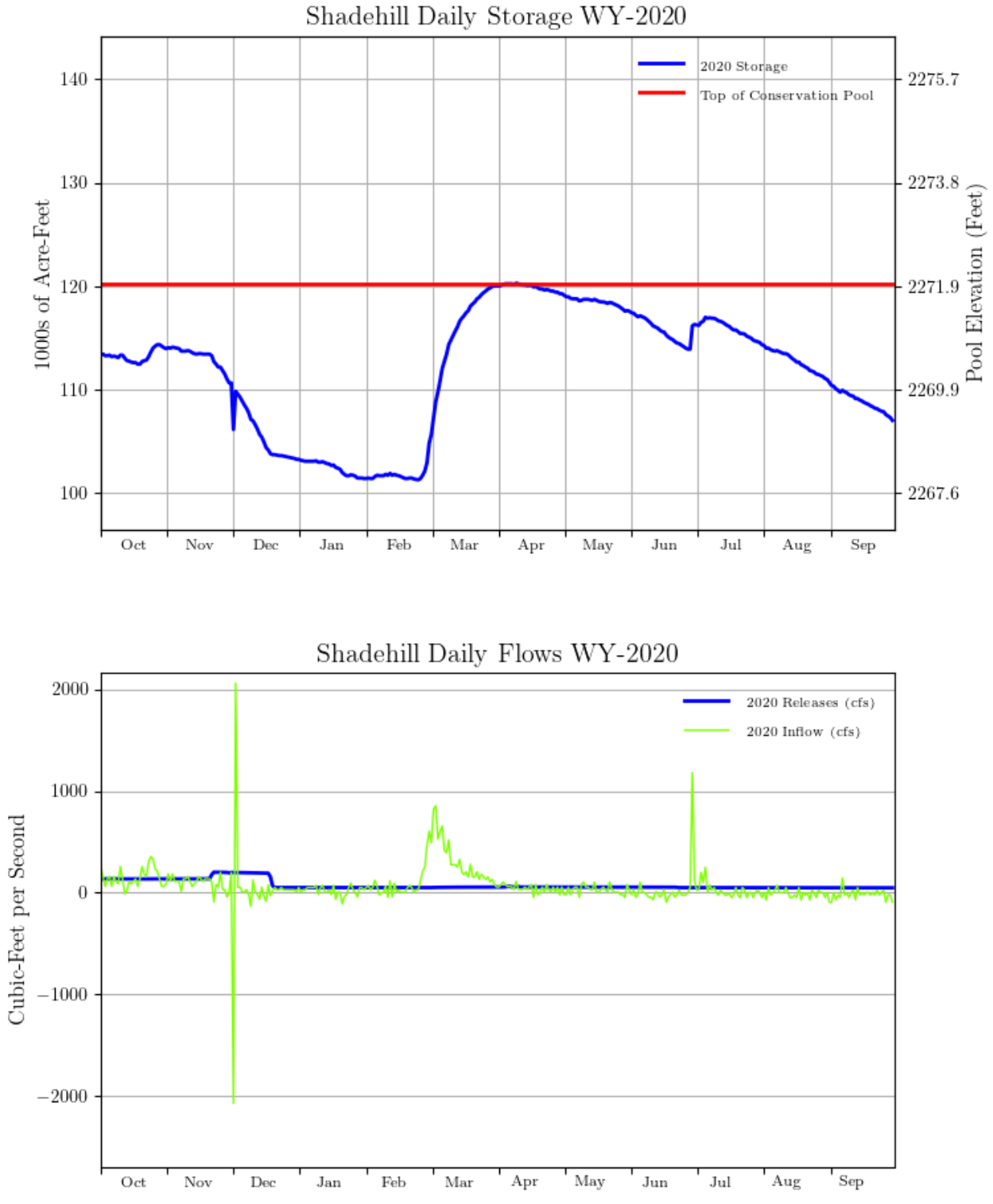


Figure DKG 10: Water year 2020 hydrologic data for Shadehill Reservoir.

Outlook and Annual Operating Plans for Water Year 2021 for Missouri Basin Reservoirs Under the Responsibility of the Dakotas Area Office (DKAO)

Dickinson Reservoir

At the beginning of WY 2021, Dickinson Dam and E. A. Patterson Lake (Dickinson Reservoir) had an elevation of 2,420.38 with a storage of 9,073 AF, which is 0.38 feet and 621 AF above the top of the active conservation pool (elevation 2,420.00 feet at 8,452 AF). The reservoir is normally operated as full as possible at all times. Excess water will be released by spilling over the Bascule gate after the reservoir has filled, and by gated releases through the 24-inch river outlet valve. No releases are planned until irrigation water is required or if the spring runoff deems it necessary for flood protection.

Heart Butte Reservoir

At the beginning of WY 2021, Heart Butte Dam and Lake Tschida (Heart Butte Reservoir) had an elevation of 2,062.79 with a storage of 61,626 AF, which is 1.71 feet and 3,764 AF below the top of the active conservation pool (elevation 2,064.50 at 65,091 AF). Since there are no accurate inflow forecasts available, plans are to operate the reservoir as close to the top of the conservation pool as possible while regulating releases required maintaining downstream conservation commitments and preserving flood control space. During winter months, and when the reservoir level is below the spillway crest at elevation 2,064.50 feet, the river releases will be maintained at about 10 cfs to ensure a live stream flows below Heart Butte Dam. This will continue through the winter until the spring runoff requires higher releases sometime in late March or early April. Excess water is released only when the reservoir is full or ensured of filling.

Jamestown Reservoir

At the beginning of WY 2021, Jamestown Reservoir had an elevation of 1,431.41feet with a storage of 31,484 AF, which is 3.41 feet and 7,258 AF above the top of the active conservation pool (elevation 1,428.00feet at 24,226 AF). Water releases will be shut off when the reservoir elevation reaches approximately 1,429.60 feet and will continue shut throughout the winter until spring runoff requires releases to be made for flood protection. The reservoir is normally operated under the following criteria and limitations set forth in the Field Working Agreement between the Corps and Reclamation that reads:

> Flood Control Regulation of Joint-Use Pool - Jamestown Reservoir

The joint space between elevations 1,428 feet and 1,431 feet will be used for seasonal multipurpose regulation. For purposes of flood control storage, the reservoir water elevation will be no higher than 1,429.8 feet at the beginning of spring runoff period. That portion of the joint-use pool between elevations 1,429.8 feet and 1,431.0 feet will be used for storage and regulation of the spring runoff and summer rainstorms. In addition, water stored in this zone may be used during the summer months for conservation purposes. Storage remaining in the joint-use pool above elevation 1,429.8 feet after September 1 will be evacuated as directed by the Corps of Engineers.

The Bureau has the option of lowering the reservoir below elevation 1,429.8 feet msl should it be desirable based on water supply needs. There are no requirements for maintaining a specified minimum reservoir release.

SEASON: BEGINNING OF SPRING RUNOFF TO SEPTEMBER 1

El. 1,429.80 feet (Base of flood control zone) to El. 1,431.00 feet (Top of Joint Use Pool)

Release greater of:

a. Conservation releases

b. Based on inflows occurring at the time and the existing potential for further inflows, releases will be maintained as necessary to result in a pool elevation of 1,431feet at the time inflows cease.

SEASON: SEPTEMBER 1 TO NOVEMBER 1

Make releases necessary to evacuate reservoir to elevation 1,429.80 feet prior to Nov 1.

SEASON: NOVEMBER 1 TO BEGINNING OF SPRING RUNOFF

Make releases necessary to maintain elevation 1,429.80 feet.

Angostura Reservoir

Angostura Reservoir started WY 2021 at elevation 3,176.57 feet, and storage of 80,380 AF, which is 10.63 feet and 42,668 AF below the top of the conservation (elevation 3,187.2 feet at 123,048 AF). Since Angostura Reservoir is the principle source of water for the Angostura Irrigation District and no accurate inflow forecasts are available for this reservoir, it is always operated as full as possible. Water may be released from the facility if the reservoir is expected to fill to meet irrigation demands; ergo, excess water is released through the spillway when the reservoir is nearly full and assured of filling.

Releases are made from Angostura Reservoir for flood control or irrigation requirements. Flood control releases are not expected unless precipitation events occur to fill the reservoir.

Belle Fourche Reservoir

Belle Fourche Reservoir started WY 2021 at elevation 2,964.20 feet and storage of 97,695 AF, which is 10.80 feet and 75,178 AF below the top of the conservation (elevation 2,975.0 feet at 172,873 AF). Normal operation at the Diversion Dam during the winter is to maintain flows in the Inlet Canal to store water in Belle Fourche Reservoir. A bypass of 5 cfs is made at the Belle Fourche Diversion Dam to provide flows for domestic use between the diversion dam and the Belle Fourche River confluence with Owl Creek. No releases from the reservoir are planned until irrigation begins in the spring. When the volume of water supply available from the reservoir can be estimated in May or June, the Belle Fourche Irrigation District will establish allotments of water to each irrigator and the storage will be used accordingly. The Standing Operating Procedures for Belle Fourche Dam limit the maximum drawdown of the reservoir to 0.3 feet per day as established in the 1984 Safety Evaluation of Existing Dams report.

Higher rates of drawdown are acceptable if the total drawdown is limited to 20 feet. This restriction will affect delivery rates to water users in the late summer if the reservoir does not fill. At low reservoir levels, the draw down rate becomes the governing factor for releases.

Deerfield Reservoir

Deerfield Reservoir started WY2021 at elevation 5,906.45 feet and with a storage of 15,015 AF, which is 1.55 feet to full and 639 AF below the top of the conservation (elevation 5,908 feet at 15,654 AF). The reservoir winter draw down was at 14,730 AF at December 1, 2020. A target of 15,000 AF of storage by March 1 will usually dictate the winter release, which is set near December 1. The winter release is set based on water usage from Deerfield by the Rapid Valley Water Conservancy District (District) and the storage target of 15,000 AF by March 1. The goal is to be near full by May 1 which is the start of the irrigation season. The Rapid Valley Water Conservancy District did not order water from Deerfield for irrigation in WY 2020. The City of Rapid City did not release water from Deerfield for municipal use in WY 2020.

A release of around 13 cfs will be maintained until the spring runoff requires higher releases in late March or early April. Excess water is normally released only when the reservoir is full or assured of filling. Since no inflow forecasts are available, the reservoir is normally operated as full as possible. Two Snotel sites (North Rapid Creek and Blind Park) are operated in the Pactola and Deerfield drainage basin. Deerfield storage may be required to meet District irrigation needs in WY 2020.

The jet flow gates are used for winter releases and provide minimum stream flows of 6 cfs or more which will enhance winter fishery conditions in Castle Creek and improve fishery production conditions in the stream.

Storage at the end of water year will depend on the amount of inflow to the Pactola-Deerfield system and the need for project water deliveries from Deerfield Reservoir. During average and above average inflow years, summer releases will be made to bring the reservoir storage to about 14,900 AF by September 30. This is to accommodate minimum releases of 6 cfs into Castle Creek during the winter. The actual release will depend on runoff conditions and will take into account downstream ice conditions in Castle Creek.

Keyhole Reservoir

Keyhole Reservoir started WY 2021 at elevation 4,096.93 feet and storage of 167,307 AF, which is 2.37 feet and 21,364 AF below the top of conservation (elevation 4,099.3 feet at 188,671 AF). At the beginning of WY 2021, South Dakota storage for the Belle Fourche Irrigation District is 12,901 AF and Wyoming storage for the Crook County Irrigation District is 15,996 AF.

Releases from Keyhole Reservoir are made for either irrigation requirements or flood control. Releases are not anticipated from the reservoir from October - May. Flood control releases are not expected unless extreme precipitation events occur to fill the reservoir.

Discharges from toe drains of the dam and downstream inflows normally satisfy downstream requirements for stock water and other minor uses during this period. Releases from storage accounts will be made during the summer in response to irrigation demand from the Belle Fourche Irrigation District in South Dakota and the Crook County Irrigation District in Wyoming. Each organization maintains a storage account in Keyhole Reservoir and the contract with the Belle Fourche Irrigation District also includes provisions for the annual purchase of additional unsold South Dakota storage. Peak irrigation demand releases are normally between 125 and 175 cfs.

The Belle Fourche Irrigation District has lands along the inlet canal that during drought conditions can depend entirely on Keyhole Reservoir for storage. These lands are served with flows from the Belle Fourche River and storage from Keyhole. Additionally, water contracted by Belle Fourche Irrigation District may be released from Keyhole Reservoir to supplement storage in Belle Fourche Reservoir if necessary. Finally, Crook Country Irrigation District also contracts irrigation water from Keyhole Reservoir.

Pactola Reservoir

Pactola Reservoir started WY 2021 at elevation 4,576.99 feet and storage of 53,262 AF, which is 3.21 feet and 2,710 AF below the top of the conservation (elevation 4,580.2 feet at 55,972). Operating criteria established for the reservoir in the Definite Plan Report called for minimum winter conservation releases to be 7 cfs from October 1 to April 15 and 20 cfs from April 15 to October 1 when the reservoir content is below 29,000 AF and releases of 15 cfs from October 1 March 1 and 20 cfs from March 1 through October 1 are established for reservoir content above 29,000 AF. Minimum summer conservation releases are 20 cfs at all reservoir contents.

1. Reservoir content less than 29,000 AF (with no water in the U.S. storage)
   October 1 – April 15 7 cfs
   April 15 - October 1 20 cfs

2. Reservoir content greater than 29,000 AF (with no water in the U.S. storage)
   October 1 – March 1 15 cfs
   March 1 - October 1 20 cfs

Pactola Reservoir is operated as close to the top of the conservation pool as possible, while regulating releases required to maintain a downstream fishery and to preserve flood control space.

The new long-term storage contract for Pactola, between Reclamation and the City of Rapid City, was signed on July 31, 2007. New operating criteria for releases to Rapid Creek were established in the Standard Operating Plans. The following minimum releases will be made as long as water is available in the Fisheries, Wildlife, and Recreation Pool.

1. Reservoir content less than 29,000 AF (with water in the U.S. storage)
   October 1 – April 15 15 cfs
   April 15 - October 1 20 cfs

2. Reservoir content greater than 29,000 AF (with water in the U.S. storage)
   Year round 20 cfs

Although it is not mandatory, if possible Pactola Releases can be adjusted during the summer months to aim for 40 cfs passing the gauging station in Founders Park. Also, if possible, during the cooler fall months the Bureau aims for 30 to 35 cfs passing the gauging station in Founders Park. Such releases are dependent on U.S. storage and inflows from the watershed below the dam.

The irrigators need to order flows from storage if their demand limits natural flows past Farmingdale to less than 10 cfs. Also, the Bureau of Reclamation has an instream flow right for U.S. storage release flows that is in addition to the 10 cfs minimum required by the state for natural flows past Farmingdale.

The winter release for WY 2021 is approximately 40 cfs and has been coordinated with the City of Rapid City, South Dakota Department of Game, Fish, and Parks, local water users, Forest Service, and Corps of Engineers. With a reservoir content of 29,000 AF and above, a release of 20 cfs has been specified in the Finding of No Significant Impact for the Environmental Assessment for the Pactola Reservoir Water Service Contact Renewal (FONSI No. DK600-00-03). Pactola winter releases can be increased by 2 or 3 cfs during extremely cold weather to replace water that is lost in the formation of ice in the creek channel. Once the channel is covered with ice and snow, which provides insulation for the stream, the releases can be reduced if below average snowpack and inflow conditions indicate a need to conserve storage. During the flood control season, total releases will be controlled between 20 cfs and 1000 cfs. Releases in excess of 200 cfs when storage is below the top of the conservation pool at elevation 4,580.20 will be cleared with the Corps of Engineers. The Corps will issue release orders on a current basis when storage is in the exclusive flood control pool. Contract negotiations with water users at Pactola Reservoir will provide the basis for future reservoir operations.

During the irrigation season of May 1 - October 30 sufficient natural flows to meet prior rights of the irrigators will be bypassed through the reservoir. Orders by water users will be released under the provisions of contracts with the water users. Drought conditions that have existed in past years have resulted in conservation measures being initiated by water users. Continuation of water conservation measures will assist in conserving reservoir storage and refilling of the reservoir.

Shadehill Reservoir

Shadehill Reservoir started WY 2021 at elevation 2,269.28 feet and storage of 107,019 AF, which is 2.72 feet and 13,153 AF below the top of the conservation (elevation 2,272.0 feet at 120,172 AF).

The winter release will be maintained at approximately 50 cfs to prepare the reservoir elevation for spring inflows. This release rate will be maintained constant until ice comes out of the channel in the spring to prevent ice jams at crossings. In the spring, after ice comes out of the channel, the release will be adjusted based on inflows and storage in the reservoir. Operation is to fill the reservoir in the spring, maintain a near full reservoir during the summer and position the reservoir in the fall as discussed in the SOP. Releases for irrigation demands will be met by conservation releases.

Shadehill Reservoir releases water year-round to meet minimum basic natural flow requirements of down stream water users which consist primarily of ranchers.

System Description and Annual Operating Plans for Water Year 2020 for Reservoirs Under the Responsibility of the U.S. Army Corps of Engineers

Overview

The Missouri River main stem reservoir system, consisting of six reservoirs located in Montana, North Dakota, South Dakota, and Nebraska, provides for the following beneficial uses: flood control, irrigation, navigation, power, municipal and industrial water supply, water quality control, fish and wildlife, and recreation. Based on information from the Corps' 2020-21 AOP, the capacity and storage allocations of the main stem system were updated to current values and are shown in upstream to downstream order as follows:

Table USACE 1: U.S. Army Corps Reservoir Storage Allocations (in KAF).

Dam	Permanent	Carryover Multiple Use	Flood Control and Multiple Use	Exclusive Flood Control	Storage
Fort Peck, MT	4,088	10,700	2,704	971	18,463
Garrison, ND	4,794	12,951	4,211	1,495	23,451
Oahe, SD	5,315	13,353	3,208	1,107	22,983
Big Bend, SD	1,631	0	118	61	1,810
Fort Randall, SD	1,469	1,532	1,306	986	5,293
Gavins Point, NE	295	0	79	54	428
Totals	17,592	38,536	11,626	4,674	72,428

Each main stem facility serves a powerplant. The number of generating units and total nameplate capabilities are shown below:

Table USACE 2: U.S. Army Corps Powerplant generating capacity for the Main Stem Missouri.

Powerplant	Units	Capacity (Kilowatts)
Fort Peck, MT	5	185,250
Garrison, ND	5	583,300
Oahe, SD	7	786,030
Big Bend, SD	8	494,320
Fort Randall, SD	8	320,000
Gavins Point, NE	3	132,300
Totals	36	2,501,200

Main stem system releases are regulated to support the multiple use purposes of the reservoirs. The navigation season on the Missouri River below the dams normally is from late March to late November. Generally, releases from the system for navigation are higher during late summer and fall lowering the system storage. During that time, much of the system's hydropower is generated from the lower most projects. During closure of the navigation season, higher releases are made and more power is generated from the upstream Fort Peck and Garrison Reservoirs. This offsets the reduced release and generation from the downstream projects during winter closure of the river for navigation. The desired annual target system storage level is 56.1 million acre feet on the first of March.

Operation of the Missouri River main stem reservoir system provides the following eight beneficial uses: flood control, irrigation, navigation, power, municipal and industrial water supply, water quality control, fish and wildlife, and recreation. Table USACE 3 presents the regulation benefit for most of those uses as recorded in 2019-2020, 2018-2019, and the average. Benefits are defined as the tons of produce shipped, dollars of damages prevented, kilowatt hours of electricity produced, and reservoir elevation and river stages maintained. For the shipping information, estimates also were provided this year which included the sand, gravel, and waterway material shipped. Table USACE 3 shows damages prevented at September 2020 price levels.

Table USACE 3: Flood damages prevented by the Missouri River main stem reservoir system.

Use of Regulated Water	Period of Use or Season	Totals (WY 2020)	Totals (WY 2019)	Long-Term
Navigation[1]	Apr. - Dec.[2]	0.459 million tons (2020)	0.429 million tons (2019)	1.59 million Tons[3]
Flood Damages Prevented	Oct. – Sept.	$0.30 billion (2020)	$ 8.62 billion (2019)	$ 77.9 billion[4]
Energy	Aug. - Jul.	12.9 billion kWh (Aug. 19-July 20)	12.2 billion kWh (Aug. 18-July 19)	9.5 billion kWh[5]

[1]If sand, gravel, and waterway material are included:
4.59 million tons (2020)
4.26 million tons (2019)
6.49 million tons (1967-2020 average)
[2]End of navigation season extended 10 days in 2019 and 0 days in 2020
[3]1967 2020 average. Peak tonnage shipped in 1977 (3.336 million tons)
[4]Total damages prevented (1938-2020)
[5]1968 2020 Average

A detailed description of the main stem system operations is presented in annual operating reports prepared by and available for distribution from the U.S. Missouri River Basin Water Management Division, U.S. Army Corps of Engineers, Northwestern Division, Omaha, Nebraska.

Energy Generation

There are 14 Federal powerplants located in the Upper Missouri River Basin that are currently operating. Eight of the power plants are owned and operated by Reclamation and have a total capacity of 348,100 kilowatts. The other six are owned and operated by the Corps and have a total capacity of 2,501,200. Energy generated by the 14 power plants is marketed by the Department of Energy.

Total generation in the combined system in WY 2020 was 13231.738 million kilowatt hours, 844.856 million kilowatt hours less than in WY 2019. A summary of the past 10 years of energy generation within the Upper Missouri River Basin is shown below.

Table USACE 4: Energy generation by Reclamation and U.S. Army Corps facilities on the Missouri River main stem system.

Year	USBR	USACE	TOTAL
2020	1470.049	11772.25	13231.7
2019	1488.146	12506.58	14076.6
2018	1790.992	11355.76	13146.8
2017	1560.628	9092.514	10652.1
2016	1164.801	7652.158	8816.97
2015	1316.344	9323.682	10640
2014	1559.297	8729.714	10289.2
2013	840.209	8183.967	9024.18
2012	1141.904	10779.03	11920.9
2011	1674.806	11267.59	12942.4

A comparison of 2019 and 2020 generation and other data from Missouri Basin Region powerplants is shown on Tables USACE 5. Tables USACE 6, 7, 8, 9, 10, and 11 show the monthly generation, power releases, and total downstream releases, respectively, for all Federal plants in the Missouri Basin Region. The annual energy generation for each of the last several years for all Reclamation, Corps, and combined plants is shown graphically on Figures USACE 1, 3, and 5, respectively, Monthly generation for each month during the past several years is shown graphically on Figures USACE 2, 4, and 6.

For a more detailed account of powerplants operation at Reclamation facilities during the year, refer to the 2020 operation summaries. Information on the Corps' powerplants operations can be obtained from the annual operating reports prepared by and available for distribution from the Missouri River Basin Water Management Division, U.S. Army Corps of Engineers, Northwestern Division, Omaha, Nebraska.

Table USACE 5: Water years 2019 and 2020 powerplant generation statistics for Missouri Basin facilities.

Powerplant	Installed Capacity (KW)	Million KWh Generated 2019	Million KWh Generated 2020	Water Used in 2020 (KAF)	% of Total Water Released	KWh per AF	River Release (KAF)	Total Release (KAF)
Reclamation Powerplants								
Canyon Ferry	50,000	372.444	367.841	3,023.287	84.0441	121.6692	3,495.858	3,597.263
Pilot Butte1	1,600	0	0	0	0	-	173.642	173.642
Boysen	15,000	70.3	72.035	903.5206	95.99373	79.72702	941.2288	941.2288
Shoshone	3,000	19.92	21.482	111.5441	10.63942	192.5874	-	-
Buffalo Bill	180,00	88.584	87.814	404.6024	38.59221	217.0378	-	-
Heart Mountain	6,000	22.661	21.588	100.9789	9.631677	213.7872	-	-
Spirit Mountain 2	4,500	17.66	16.305	156.689	14.94547	104.0597	-	-
Total for Buffalo Bill Reservoir3	31,500	148.825	147.189	773.8144	73.80877	190.2123	801.0957	1,048.404
Yellowtail	250,000	896.497	872.426	2,332.06	97.96134	374.101	2,312.508	2,380.592
U.S. Army Corps Powerplants								
Fort Peck	185,250	1,220.862	1,251.411	8,066	100	155.1464	8,066	8,066
Garrison	583,300	3,083.226	2,919.492	20,214	100	144.4292	20,214	20,214
Oahe	786,030	3,994.191	3,390.31	24,487	100	138.4535	24,487	24,487
Big Bend	494,320	1,400.464	1,349.511	24,280	100	55.58118	24,280	24,280
Fort Randall	320,000	2,134.539	2,151.454	26,311	100	81.77013	26,311	26,311
Gavins Point	132,300	755.166	710.069	17,296	58.64045	41.05394	29,495	29,495
Total Missouri Basin	**2,849,300**	**14,076.51**	**13,231.74**	**127,686.7**	**90.5617**	**103.6266**	**140,577.3**	**140,994.1**

Table USACE 6: Monthly 2020 Generation at Bureau of Reclamation Power Plants (in Million Kilowatt-hours).

Month	Canyon Ferry	Pilot Butte	Boysen	Heart Mountain	Spirit Mountain	Buffalo Bill	Shoshone	Yellowtail	Total
October	31.275	0.000	2.579	1.900	1.346	5.312	1.818	74.069	118.299
November	31.718	0.000	5.435	0.000	0.000	7.477	1.760	75.526	121.916
December	33.466	0.000	5.125	0.000	0.000	1.264	1.831	75.779	117.465
January	27.930	0.000	5.330	0.000	0.000	1.389	1.841	72.127	108.617
February	27.610	0.000	4.953	0.000	0.000	1.214	1.710	67.973	103.460
March	35.305	0.000	6.731	0.000	0.000	3.762	1.807	97.252	144.857
April	30.329	0.000	9.519	2.749	0.757	12.643	1.664	107.115	164.776
May	30.197	0.000	7.193	3.876	2.048	12.928	1.698	60.818	118.758
June	35.867	0.000	6.889	3.594	2.895	13.368	1.827	53.982	118.422
July	34.182	0.000	7.479	3.200	3.206	13.605	1.955	79.280	142.907
August	26.406	0.000	6.381	3.144	3.131	9.198	1.893	58.380	108.533
September	23.556	0.000	4.421	3.125	2.922	5.654	1.678	50.125	91.481
TOTAL	**367.841**	**0.000**	**72.035**	**21.588**	**16.305**	**87.814**	**21.482**	**872.426**	**1,459.491**

Table USACE 7: Monthly 2020 Generation at U.S. Army Corps Power Plants (in Million Kilowatt-hours).

Month	Fort Peck	Garrison	Oahe	Big Bend	Fort Randall	Gavins Point	Total	Total Missouri Basin
October	94.460	354.303	428.227	201.712	225.585	61.584	1,365.871	1,484.170
November	122.954	291.394	412.856	207.724	178.460	63.482	1,276.870	1,398.786
December	132.173	191.689	280.459	109.162	149.547	55.981	919.011	1,036.476
January	130.967	225.163	258.877	101.258	155.822	56.048	928.135	1,036.752
February	117.944	215.011	214.717	85.877	168.876	51.980	854.405	957.865
March	79.868	219.523	282.066	110.343	157.517	53.742	903.059	1,047.916
April	75.531	222.220	252.063	92.908	191.338	49.540	883.600	1,048.376
May	93.436	253.056	252.847	92.320	186.693	51.657	930.009	1,048.767
June	109.392	261.147	239.184	83.285	183.855	47.661	924.524	1,042.946
July	108.877	272.444	261.165	92.956	180.487	61.404	977.333	1,120.240
August	103.355	255.116	240.977	78.474	181.513	74.730	934.165	1,042.698
September	82.454	158.426	266.872	93.492	191.761	82.260	875.265	966.746
TOTAL	**1,251.411**	**2,919.492**	**3,390.310**	**1,349.511**	**2,151.454**	**710.069**	**11,772.247**	**13,231.738**

Table USACE 8: Water used (in KAF) for power generation at Bureau of Reclamation Plants.

Month	Canyon Ferry	Boysen	Pilot Butte	Shoshone	Buff. Bill	Heart Mtn	Spirit Mtn[1]	Yellowtail
October	254.941	41.104	0.000	9.445	27.291	8.790	13.291	186.788
November	256.779	64.397	0.000	9.144	35.003	0.000	0.000	189.059
December	271.176	65.252	0.000	9.490	12.448	0.000	0.000	188.769
January	232.586	65.545	0.000	9.539	12.355	0.000	0.000	191.931
February	233.505	60.316	0.000	8.884	11.350	0.000	0.000	183.156
March	303.803	85.545	0.000	9.388	20.251	0.000	0.000	250.494
April	260.788	120.986	0.000	8.640	50.604	12.383	6.700	278.910
May	252.901	96.794	0.000	8.819	60.940	17.770	20.526	189.969
June	278.301	84.320	0.000	9.487	52.426	16.647	27.819	150.830
July	261.937	85.731	0.000	10.156	51.324	15.461	30.384	195.092
August	215.506	75.669	0.000	9.835	39.915	15.170	29.867	173.730
September	201.065	57.861	0.000	8.718	30.695	14.759	28.102	153.333
TOTAL	**3,023.287**	**903.521**	**0.000**	**111.544**	**404.602**	**100.979**	**156.689**	**2,332.060**

1: Spirit Mountain Powerplant is used to dissipate energy in the transition from the pressurized portion of the Shoshone Canyon Conduit to the free flow section of the conduit. Water used for generation at Spirit Mountain Powerplant is then routed to Heart Mountain Canal or used for generation at Heart Mountain Powerplant.

Table USACE 9: Water used (in KAF) for power generation at U.S. Army Corps Plants.

Month	Fort Peck	Garrison	Oahe	Big Bend	Fort Randall	Gavins Point
October	906.000	2,887.000	3,823.000	3,709.000	4,609.000	1,609.000
November	910.000	2,531.000	3,863.000	3,710.000	4,414.000	1,635.000
December	841.000	1,260.000	1,954.000	1,883.000	2,007.000	1,259.000
January	785.000	1,492.000	1,742.000	1,781.000	1,617.000	1,273.000
February	708.000	1,430.000	1,442.000	1,502.000	1,725.000	1,206.000
March	480.000	1,427.000	1,872.000	1,950.000	1,542.000	1,310.000
April	458.000	1,439.000	1,672.000	1,655.000	1,798.000	1,328.000
May	568.000	1,634.000	1,648.000	1,663.000	1,740.000	1,372.000
June	653.000	1,668.000	1,529.000	1,540.000	1,701.000	1,201.000
July	645.000	1,721.000	1,676.000	1,715.000	1,672.000	1,460.000
August	614.000	1,662.000	1,543.000	1,475.000	1,673.000	1,725.000
September	498.000	1,063.000	1,723.000	1,697.000	1,813.000	1,918.000
TOTAL	**8,066.000**	**20,214.000**	**24,487.000**	**24,280.000**	**26,311.000**	**17,296.000**

Table USACE 10: Total Water Releases (in KAF) for water year 2020 at Bureau of Reclamation Plants.

MONTH	CANYON FERRY	BOYSEN	PILOT BUTTE	BUFFALO BILL	BULL LAKE	ANCHOR	YELLOWTAIL
October	258.775	71.308	6.730	56.746	2.042	0.408	186.788
November	256.779	68.287	0.000	44.338	1.989	0.000	189.059
December	271.176	65.668	0.000	22.119	2.046	0.000	188.769
January	291.860	65.545	0.000	22.069	1.930	0.000	191.931
February	282.257	60.316	0.000	20.401	1.663	0.000	183.156
March	313.302	88.074	0.000	29.814	1.217	0.000	262.725
April	277.858	120.986	1.769	108.918	1.224	0.160	292.958
May	290.467	96.794	27.719	142.777	4.492	2.008	194.348
June	458.968	84.980	34.128	208.582	28.635	3.519	150.830
July	394.081	85.731	40.601	184.433	34.854	1.071	212.966
August	261.621	75.678	39.176	116.103	58.074	0.509	173.730
September	240.118	57.861	23.519	92.104	33.637	0.234	153.333
TOTAL	**3,597.263**	**941.229**	**173.642**	**1,048.404**	**171.802**	**7.909**	**2,380.592**

Table USACE 11: Total Water Releases (in KAF) for water year 2020 at U.S. Army Corps Plants.

MONTH	FORT PECK	GARRISON	OAHE	BIG BEND	FORT RANDALL	GAVINS POINT
October	906.000	2,887.000	3,823.000	3,709.000	4,609.000	4,919.000
November	910.000	2,531.000	3,863.000	3,710.000	4,414.000	4,676.000
December	841.000	1,260.000	1,954.000	1,883.000	2,007.000	2,321.000
January	785.000	1,492.000	1,742.000	1,781.000	1,617.000	1,790.000
February	708.000	1,430.000	1,442.000	1,502.000	1,725.000	2,001.000
March	480.000	1,427.000	1,872.000	1,950.000	1,542.000	2,038.000
April	458.000	1,439.000	1,672.000	1,655.000	1,798.000	2,083.000
May	568.000	1,634.000	1,648.000	1,663.000	1,740.000	2,058.000
June	653.000	1,668.000	1,529.000	1,540.000	1,701.000	1,963.000
July	645.000	1,721.000	1,676.000	1,715.000	1,672.000	1,882.000
August	614.000	1,662.000	1,543.000	1,475.000	1,673.000	1,845.000
September	498.000	1,063.000	1,723.000	1,697.000	1,813.000	1,919.000
TOTAL	**8,066.000**	**20,214.000**	**24,487.000**	**24,280.000**	**26,311.000**	**29,495.000**

Table USACE 12: Total water storage contents (in KAF) for water years 2019 and 2020.

Location	Top of Conservation Capacity[3]	Dead and Inactive Capacity	2019 Total Storage	2020 Total Storage	2019 Percent of Avg	2020 Percent of Avg
Bureau of Reclamation Reservoirs						
Clark Canyon	174.4	1.1	132.8	92.4	105%	98%
Canyon Ferry	1,891.9	396.0	1,633.0	1,533.6	95%	95%
Helena Valley	10.5	4.6	8.9	8.8	120%	118%
Gibson	96.5	0.0	17.1	7.2	24%	30%
Willow Creek	31.8	1.0	20.6	20.6	86%	102%
Pishkun	46.7	16.0	19.3	35.3	61%	109%
Lake Elwell	925.6	554.3	855.0	828.2	103%	104%
Sherburne	66.1	1.9	6.1	62.6	66%	369%
Fresno	92.9	0.4	41.0	16.3	93%	35%
Nelson	79.0	18.1	76.3	56.4	89%	99%
Bull Lake	152.5	0.7	81.7	74.7	159%	99%
Pilot Butte	33.7	3.8	16.5	18.9	100%	105%
Boysen	741.6	219.2	653.0	571.2	120%	95%
Anchor[1]	17.2	0.1	0.5	0.5	358%	144%
Buffalo Bill[2]	646.6	41.7	489.4	450.1	119%	101%
Bighorn Lake	1,020.6	469.9	952.1	940.9	107%	99%
E. A. Patterson	8.6	0.5	7.2	5.7	95%	92%
Lake Tschida	67.1	5.2	58.4	52.0	90%	92%
Jamestown Reservoir	31.5	0.8	27.8	28.3	102%	99%
Shadehill Reservoir	120.2	43.9	110.8	107.0	81%	101%
Angostura Reservoir	123.0	42.2	101.6	80.4	98%	95%
Deerfield Reservoir	15.7	0.2	15.0	15.0	116%	112%
Pactola Reservoir	56.0	1.0	53.4	53.3	111%	115%
Keyhole Reservoir	188.7	6.6	158.1	153.9	138%	174%
Belle Fourche Reservoir	172.9	3.1	126.6	97.7	79%	132%
U.S. Army Corps Reservoirs						

Location	Top of Conservation Capacity[3]	Dead and Inactive Capacity	2019 Total Storage	2020 Total Storage	2019 Percent of Avg	2020 Percent of Avg
Fort Peck	17,578.0	4,073.0	16,719.0	15,582.0	-	-
Garrison	22,332.0	4,980.0	20,466.0	18,433.0	-	-
Oahe	22,035.0	5,373.0	21,112.0	19,489.0	-	-
Big Bend	1,738.0	1,621.0	1,668.0	1,677.0	-	-
Fort Randall	4,433.0	1,517.0	3,746.0	3,281.0	-	-
Gavins Point	393.0	307.0	332.0	363.0	-	-
TOTAL UPPER MISSOURI BASIN	**75,320.2**	**19,703.3**	**69,705.1**	**64,136.1**	**-**	**-**

1 Percent of average content of Anchor Reservoir is based on an 22-year average, 1991-2012.

2 Percent of average content of Buffalo Bill Reservoir is based on an 20-year average, 1993-2012; to reflect the operation of the reservoir since 1992 when the dam was raised and the capacity of the reservoir was increased to 646,565 acre-feet.

3 Includes joint-use space.

Table USACE 13: Water year 2020 end of month reservoir contents (in KAF).

LOCATION	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Bureau of Reclamation Reservoirs												
CLARK CANYON RESERVOIR	120.2	130.1	138.4	145.0	150.6	157.4	166.6	150.2	139.2	116.4	98.5	92.4
% of Average	116.2%	116.1%	117.4%	118.0%	118.0%	116.1%	116.7%	108.8%	105.9%	105.3%	104.9%	98.0%
CANYON FERRY RESERVOIR	1,632.7	1,632.4	1,590.3	1,532.6	1,468.5	1,394.9	1,395.8	1,631.1	1,906.6	1,795.8	1,651.2	1,533.6
% of Average	99.8%	98.7%	99.3%	99.8%	98.7%	95.4%	94.0%	99.2%	103.0%	100.6%	98.6%	94.6%
HELENA VALLEY RESERVOIR	8.4	8.1	7.8	7.5	7.3	7.0	9.4	10.2	10.1	8.3	8.4	8.8
% of Average	120.6%	121.0%	121.1%	123.3%	126.1%	122.4%	101.8%	111.2%	112.7%	111.9%	104.1%	117.7%
GIBSON RESERVOIR	12.1	12.8	15.5	19.1	21.5	24.3	49.2	90.3	98.1	67.4	18.8	7.2
% of Average	41.2%	38.5%	42.6%	48.0%	49.8%	50.8%	78.4%	100.5%	108.8%	131.0%	70.2%	30.4%
WILLOW CREEK	2.2	8.1	12.1	13.0	13.7	14.7	18.3	25.8	30.7	25.0	20.1	20.6
% of Average	0.0%	37.9%	55.2%	58.5%	60.5%	62.4%	72.1%	90.8%	105.2%	103.3%	98.1%	102.4%
PISHKUN RESERVOIR	27.6	27.3	27.1	26.9	26.6	26.5	26.4	46.2	45.9	40.6	46.3	35.3
% of Average	0.1%	79.7%	79.5%	79.8%	79.0%	77.5%	66.2%	100.7%	109.5%	109.6%	129.1%	108.9%
LAKE ELWELL (TIBER DAM)	851.0	847.1	839.3	822.4	810.5	804.7	834.0	897.8	915.6	892.1	857.1	828.2
% of Average	111.8%	112.8%	113.8%	113.9%	113.3%	111.9%	113.0%	109.8%	104.3%	104.1%	104.2%	104.4%
SHERBURNE LAKE	14.0	18.0	21.4	24.5	26.4	28.3	30.3	48.8	61.6	62.2	62.9	62.6
% of Average	70.1%	71.7%	76.7%	79.2%	79.7%	98.4%	148.8%	142.2%	109.5%	127.0%	223.8%	368.8%
FRESNO RESERVOIR	65.2	66.2	65.2	61.3	62.9	72.4	88.3	87.2	55.2	28.1	21.7	16.3
% of Average	143.8%	146.3%	149.4%	145.1%	144.1%	122.3%	116.7%	120.3%	72.8%	48.3%	47.7%	35.2%
NELSON RESERVOIR	73.5	71.6	69.6	67.6	66.8	76.8	77.2	75.5	70.9	64.7	58.8	56.4
% of Average	124.8%	124.1%	124.4%	124.3%	125.7%	141.0%	125.8%	124.2%	116.8%	117.3%	108.2%	99.1%
BULL LAKE	92.2	93.3	93.4	93.0	92.6	92.1	94.0	115.7	147.6	145.9	103.0	74.7
% of Average	123.4%	123.7%	123.1%	122.2%	121.8%	121.0%	124.0%	130.0%	117.1%	113.2%	99.9%	98.5%
PILOT BUTTE RESERVOIR	28.0	27.9	27.8	27.7	27.7	27.6	29.5	19.9	30.9	21.5	17.4	18.9
% of Average	105.3%	100.7%	100.3%	99.5%	98.9%	93.7%	96.3%	73.9%	103.6%	84.5%	81.6%	104.8%
BOYSEN RESERVOIR	648.2	643.8	629.9	609.6	593.5	579.7	518.5	530.4	644.3	638.4	592.2	571.2

LOCATION	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
% of Average	108.8%	109.1%	110.0%	109.5%	108.6%	107.4%	98.6%	96.6%	98.2%	98.3%	95.9%	95.3%
ANCHOR RESERVOIR	0.45	0.45	0.46	0.47	0.46	0.44	0.83	1.33	0.64	0.65	0.46	0.47
% of Average[1]	157.3%	183.8%	195.3%	200.7%	177.6%	119.7%	165.7%	86.8%	18.9%	29.8%	77.3%	143.8%
BUFFALO BILL RESERVOIR	481.5	470.8	471.9	469.6	465.0	455.7	394.6	486.0	636.7	602.2	521.2	450.1
% of Average[2]	113.9%	110.5%	111.1%	111.1%	111.2%	110.1%	100.1%	111.0%	112.2%	104.7%	102.5%	101.1%
BIGHORN LAKE	1,014.8	998.4	943.5	890.6	839.1	792.0	763.9	828.6	1,000.4	982.6	942.0	940.9
% of Average	105.5%	106.7%	106.2%	105.8%	103.2%	98.6%	96.8%	95.9%	100.2%	100.0%	99.8%	99.1%
E. A. PATTERSON LAKE	8.7	7.7	8.0	8.3	8.6	8.0	7.0	7.0	6.8	6.5	6.0	5.7
% of Average	145.4%	131.2%	135.7%	140.7%	134.0%	102.5%	88.0%	90.5%	88.4%	91.0%	91.5%	92.1%
LAKE TSCHIDA	62.5	61.9	60.9	60.1	64.4	65.0	63.7	62.7	60.2	59.0	54.5	52.0
% of Average	109.4%	107.6%	105.9%	104.6%	107.8%	95.7%	96.8%	95.8%	92.1%	95.2%	93.5%	91.6%
JAMESTOWN RESERVOIR	80.3	78.8	67.9	44.6	27.8	27.2	63.0	38.6	29.6	32.1	29.6	28.3
% of Average	298.4%	297.8%	255.6%	167.1%	103.0%	74.7%	111.1%	85.0%	79.5%	94.4%	90.6%	98.5%
SHADEHILL RESERVOIR	114.0	110.6	103.2	101.4	102.9	120.0	119.3	117.6	116.2	114.5	111.0	107.0
% of Average	111.2%	109.2%	103.3%	102.8%	101.9%	104.2%	101.9%	100.5%	100.2%	100.5%	101.2%	101.4%
ANGOSTURA RESERVOIR	109.0	107.3	104.3	103.9	108.5	110.2	113.8	115.5	107.3	94.8	83.3	80.4
% of Average	126.0%	122.7%	117.0%	113.8%	113.4%	107.6%	107.6%	105.5%	98.8%	95.7%	93.7%	94.7%
DEERFIELD RESERVOIR	14.2	14.5	14.9	15.3	15.0	15.0	15.5	15.5	15.2	15.2	15.1	15.0
% of Average	105.9%	107.2%	108.6%	109.6%	106.1%	104.9%	107.8%	106.8%	105.6%	107.5%	110.7%	112.5%
PACTOLA RESERVOIR	51.7	52.4	53.3	54.0	55.1	55.7	55.1	55.0	54.8	54.7	53.8	53.3
% of Average	111.0%	111.9%	114.4%	116.0%	118.1%	117.6%	113.2%	110.2%	108.6%	112.4%	114.4%	114.8%
KEYHOLE RESERVOIR	167.6	168.7	169.4	170.1	172.0	187.6	179.1	176.0	171.6	166.8	159.1	153.9
% of Average	189.6%	191.7%	192.0%	191.8%	188.4%	192.4%	181.0%	173.1%	169.0%	173.8%	175.4%	173.6%
BELLE FOURCHE RESERVOIR	134.7	135.2	135.2	135.5	136.8	147.6	153.3	164.1	153.9	132.6	103.3	97.7
% of Average	163.6%	146.5%	133.5%	122.7%	114.6%	110.5%	106.0%	105.7%	103.1%	112.3%	120.3%	132.0%
U.S. Army Corps Reservoirs												
FORT PECK RESERVOIR	16,261.0	15,825.0	15,442.0	15,070.0	14,968.0	15,145.0	15,242.0	15,655.0	16,004.0	16,116.0	15,797.0	15,582.0
GARRISON RESERVOIR	19,289.0	18,209.0	18,259.0	17,905.0	17,870.0	18,555.0	18,609.0	18,797.0	19,686.0	19,680.0	18,783.0	18,433.0

LOCATION	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
OAHE RESERVOIR	20,449.0	19,323.0	18,785.0	18,571.0	18,880.0	19,437.0	19,438.0	19,856.0	20,063.0	20,196.0	20,237.0	19,489.0
BIG BEND RESERVOIR	1,647.0	1,640.0	1,680.0	1,665.0	1,666.0	1,671.0	1,660.0	1,677.0	1,668.0	1,649.0	1,674.0	1,677.0
FORT RANDALL RESERVOIR	2,869.0	2,198.0	2,320.0	2,584.0	2,557.0	3,371.0	3,360.0	3,470.0	3,483.0	3,640.0	3,433.0	3,281.0
GAVINS POINT RESERVOIR	343.0	344.0	356.0	335.0	329.0	348.0	334.0	337.0	330.0	359.0	345.0	363.0

1 Percent of average content of Anchor Reservoir is based on a 22-year average, 1991-2012; this is due to the availability of data for Anchor Reservoir.

2 Percent of average content of Buffalo Bill Reservoir is based on an 20-year average, 1993-2012; to reflect the operation of the reservoir since 1992 when the dam was raised and the capacity of the reservoir was increased to 646,565 acre-feet.

Table USACE 14: Water year 2020 monthly inflows into Bureau of Reclamation Reservoirs (in KAF).

RECLAMATION RESERVOIRS	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
CLARK CANYON RESERVOIR	18.1	15.4	13.8	12.2	10.8	12.2	14.6	10.5	18.0	15.2	13.5	10.8	165.1
% of Average	86.5%	76.8%	82.8%	85.6%	85.4%	74.8%	85.5%	49.5%	57.1%	58.8%	71.4%	60.0%	70.7%
CANYON FERRY RESERVOIR	267.0	256.5	229.1	234.2	216.0	241.8	278.7	525.8	734.4	283.3	117.0	133.3	3,517.1
% of Average	104.9%	96.8%	105.4%	109.7%	104.5%	95.5%	91.1%	105.5%	107.1%	96.4%	76.2%	72.9%	99.6%
HELENA VALLEY RESERVOIR	-0.5	-0.3	-0.3	-0.3	-0.3	-0.3	5.8	15.1	16.3	7.0	19.4	13.8	75.5
% of Average	N/A	N/A	N/A	N/A	N/A	N/A	0.1%	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%
GIBSON RESERVOIR	18.7	16.6	13.3	10.6	9.0	10.0	43.8	185.6	165.4	57.1	20.6	13.1	563.8
% of Average	115.6%	100.5%	97.4%	87.8%	83.8%	68.8%	104.4%	126.2%	109.3%	101.7%	86.0%	76.0%	108.1%
WILLOW CREEK	3.6	5.9	4.0	0.9	0.7	0.9	3.6	7.5	6.1	2.2	1.4	1.3	38.2
% of Average	0.5%	0.8%	0.9%	0.3%	0.2%	0.1%	0.2%	0.2%	0.2%	0.4%	N/A	0.3%	0.3%
PISHKUN RESERVOIR	-0.4	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	49.7	70.5	73.7	66.3	19.0	277.7
% of Average	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%
LAKE ELWELL (TIBER DAM)	35.3	38.1	35.0	25.8	27.7	36.8	74.1	170.0	157.2	84.4	9.6	10.7	704.7
% of Average	210.7%	178.6%	205.7%	162.6%	127.5%	95.2%	140.6%	137.0%	117.0%	201.6%	78.2%	93.1%	138.7%
SHERBURNE LAKE	8.9	4.0	3.4	3.1	2.0	1.9	5.9	33.3	43.7	23.2	7.1	3.7	140.0
% of Average	135.8%	58.3%	98.9%	102.6%	85.2%	52.6%	54.5%	108.0%	118.1%	124.2%	80.8%	61.0%	101.5%
FRESNO RESERVOIR	9.2	5.4	4.0	0.6	4.6	12.4	32.3	30.4	1.0	4.7	-0.1	0.3	104.7
% of Average	129.6%	245.0%	475.3%	63.9%	118.3%	52.3%	108.5%	70.7%	2.0%	13.9%	N/A	1.6%	42.8%
NELSON RESERVOIR	-3.6	-1.9	-2.0	-2.0	-0.3	9.6	5.1	11.0	6.3	5.9	1.0	-2.4	26.5
% of Average	N/A	N/A	N/A	N/A	N/A	0.7%	0.1%	0.2%	0.1%	0.1%	0.0%	N/A	0.1%
BULL LAKE	8.2	3.1	2.2	1.5	1.7	0.9	3.1	26.2	60.6	33.1	15.2	5.4	161.0
% of Average	145.8%	98.6%	88.3%	70.3%	105.9%	48.1%	82.0%	93.6%	98.3%	71.6%	72.6%	56.6%	86.2%
PILOT BUTTE RESERVOIR[1]	11.9	-0.1	-0.1	-0.1	0.0	-0.1	3.7	18.1	45.1	31.2	35.1	25.0	169.8
% of Average	106.5%	N/A	N/A	N/A	5.6%	N/A	52.6%	76.7%	121.2%	75.8%	108.2%	106.7%	94.8%
BOYSEN RESERVOIR	71.8	63.9	51.8	45.2	48.3	75.5	59.8	100.9	198.9	79.8	29.5	36.9	862.3
% of Average	121.8%	130.2%	137.5%	123.3%	129.2%	145.1%	122.2%	84.1%	77.7%	60.9%	51.6%	70.7%	92.0%

RECLAMATION RESERVOIRS	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
ANCHOR RESERVOIR	0.39	0.02	0.00	0.00	0.02	-0.05	0.55	2.51	2.83	1.08	0.32	0.25	7.92
% of Average[2]	0.1%	0.0%	N/A	N/A	0.0%	N/A	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%
BUFFALO BILL RESERVOIR	51.2	33.7	23.2	19.7	15.7	20.6	47.8	234.1	359.3	149.9	35.1	20.8	1,011.3
% of Average	198.9%	157.6%	148.2%	134.5%	120.7%	109.1%	116.8%	147.6%	119.4%	93.5%	78.2%	84.0%	120.4%
BIGHORN LAKE	202.3	172.7	134.2	139.0	129.7	217.6	264.8	259.1	322.5	195.2	133.2	152.2	2,322.5
% of Average	120.5%	133.8%	122.6%	125.9%	116.0%	147.3%	186.4%	101.7%	79.0%	76.8%	88.1%	91.8%	107.9%
E. A. PATTERSON LAKE	3.5	0.8	0.6	0.5	4.2	4.4	1.0	0.1	-0.3	-0.3	-0.4	-0.3	13.9
% of Average	867.9%	350.4%	408.5%	229.9%	252.0%	67.2%	29.7%	6.6%	N/A	N/A	N/A	N/A	80.6%
LAKE TSCHIDA	13.8	4.1	3.1	1.3	9.6	24.3	5.0	1.7	0.6	1.1	-1.2	-0.5	62.8
% of Average	922.6%	276.4%	324.1%	149.4%	197.9%	82.8%	29.6%	30.3%	7.9%	28.5%	N/A	N/A	85.0%
JAMESTOWN RESERVOIR	102.3	53.8	17.3	4.3	9.1	15.5	61.3	24.8	3.9	9.9	6.0	1.1	309.3
% of Average	6339.5%	4146.2%	2796.7%	1538.4%	2137.4%	143.1%	168.7%	268.1%	86.3%	179.1%	122.6%	54.3%	398.7%
SHADEHILL RESERVOIR	9.2	6.0	0.9	1.3	4.5	19.7	2.6	1.8	1.7	1.5	-0.5	-1.0	47.6
% of Average	873.3%	517.1%	94.2%	137.5%	103.3%	77.3%	14.0%	14.1%	29.0%	34.4%	N/A	N/A	62.6%
ANGOSTURA RESERVOIR	5.1	6.3	6.2	4.9	7.9	30.0	9.3	6.0	1.6	0.6	0.1	0.4	78.5
% of Average	211.9%	198.8%	310.5%	217.0%	156.9%	263.5%	110.6%	44.7%	10.5%	18.1%	5.8%	41.5%	112.8%
DEERFIELD RESERVOIR	1.5	1.3	1.3	1.2	0.7	1.4	2.4	3.3	2.0	1.6	1.4	1.4	19.7
% of Average	191.8%	192.7%	182.9%	176.6%	112.6%	140.0%	184.2%	215.8%	145.3%	165.4%	179.1%	197.7%	175.2%
PACTOLA RESERVOIR	6.2	4.4	3.7	3.5	3.7	5.2	10.6	12.3	7.5	5.2	3.5	3.0	68.7
% of Average	286.0%	237.4%	244.6%	221.1%	234.6%	186.1%	233.1%	178.0%	111.1%	137.7%	119.3%	141.3%	178.6%
KEYHOLE RESERVOIR	0.3	1.1	0.7	0.7	2.5	20.5	1.7	-0.7	-2.6	-2.9	-4.8	-2.7	13.9
% of Average	1368.8%	N/A	365.8%	141.6%	98.1%	328.1%	76.9%	N/A	N/A	N/A	N/A	N/A	104.3%
BELLE FOURCHE RESERVOIR	0.6	0.5	-0.1	0.4	1.6	10.5	5.6	16.2	11.3	7.4	3.8	9.8	67.7
% of Average	5.4%	5.1%	N/A	3.9%	17.6%	73.9%	48.2%	95.9%	109.9%	151.6%	176.3%	205.5%	59.6%

1 Negative values are the result of calculated inflow based on reservoir release and change in reservoir content.

2 Percent of average inflow for Anchor Reservoir is based on a 22-year average, 1991-2012, this is due to the availability of data for Anchor Reservoir.

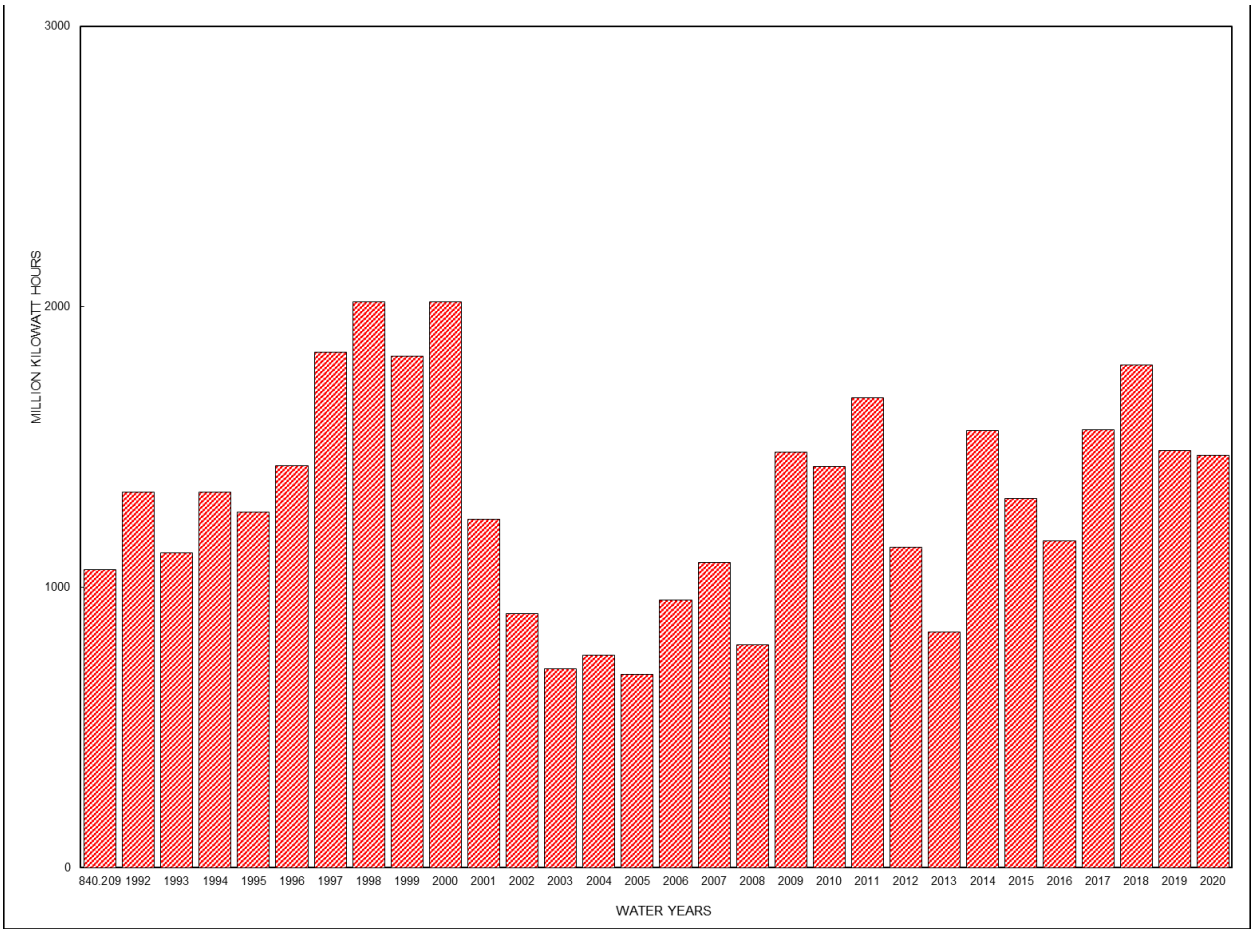


Figure USACE 1: Annual generation at Bureau of Reclamation Plants.

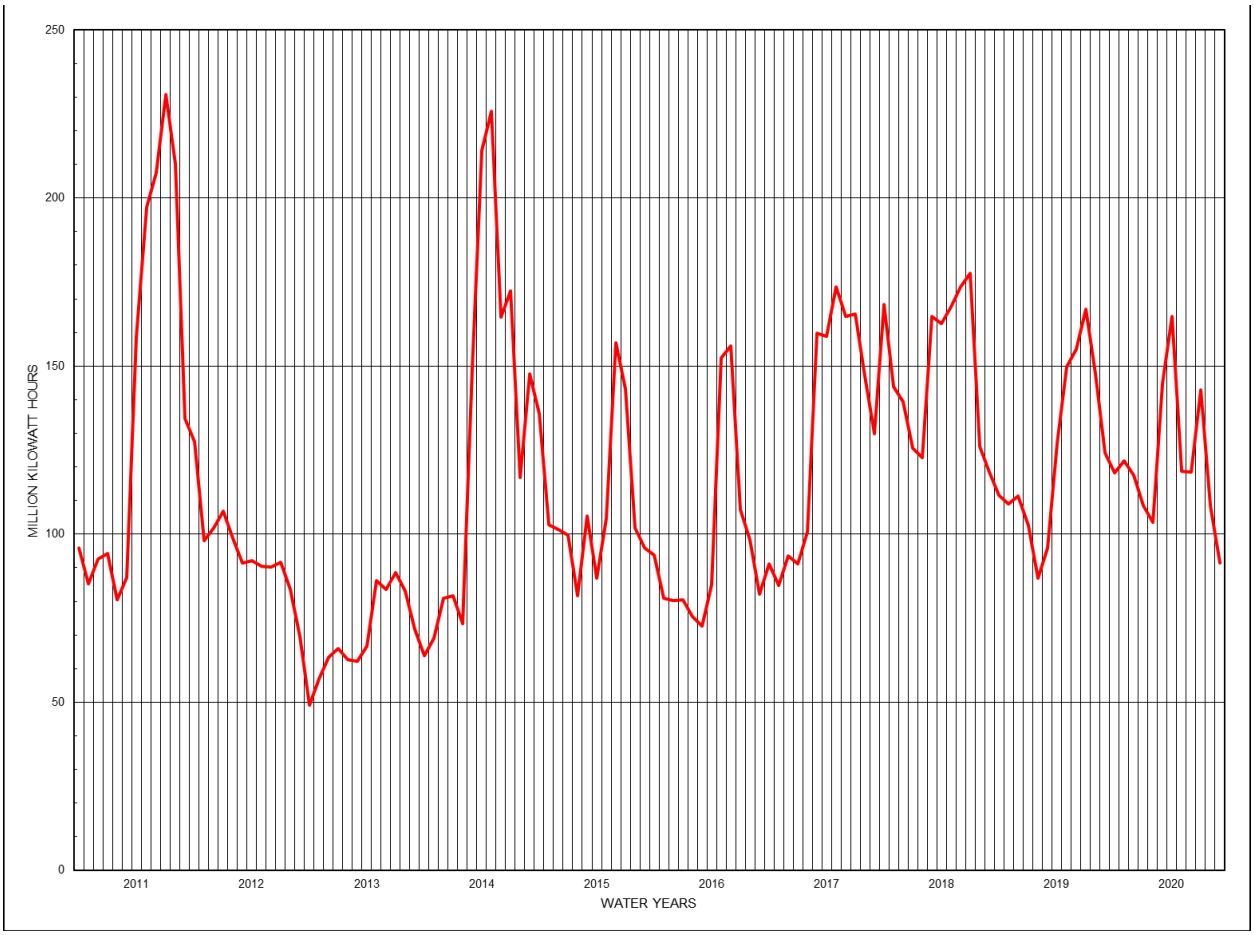


Figure USACE 2: Monthly power generation at Bureau of Reclamation plants.

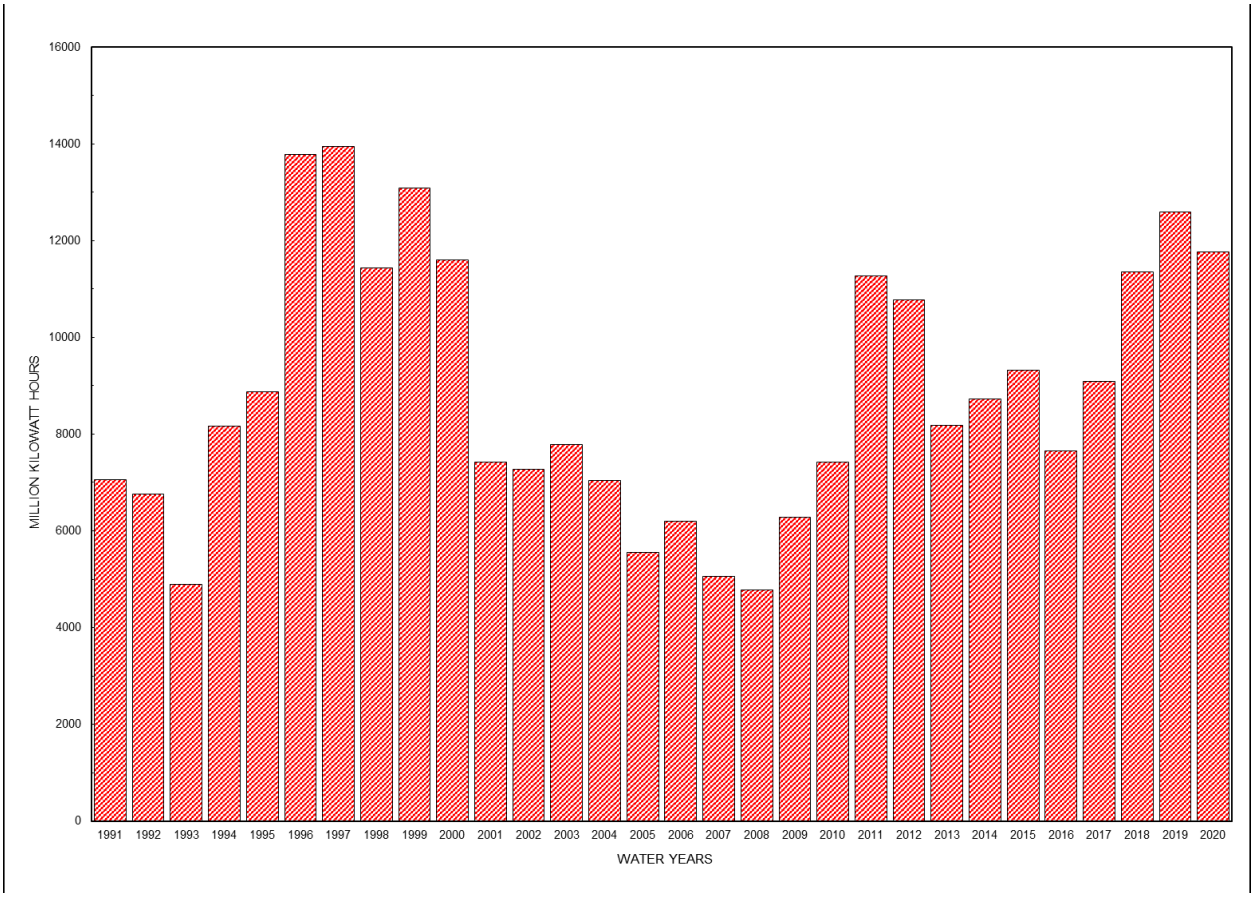


Figure USACE 3: Annual generation at U.S. Army Corps plants.

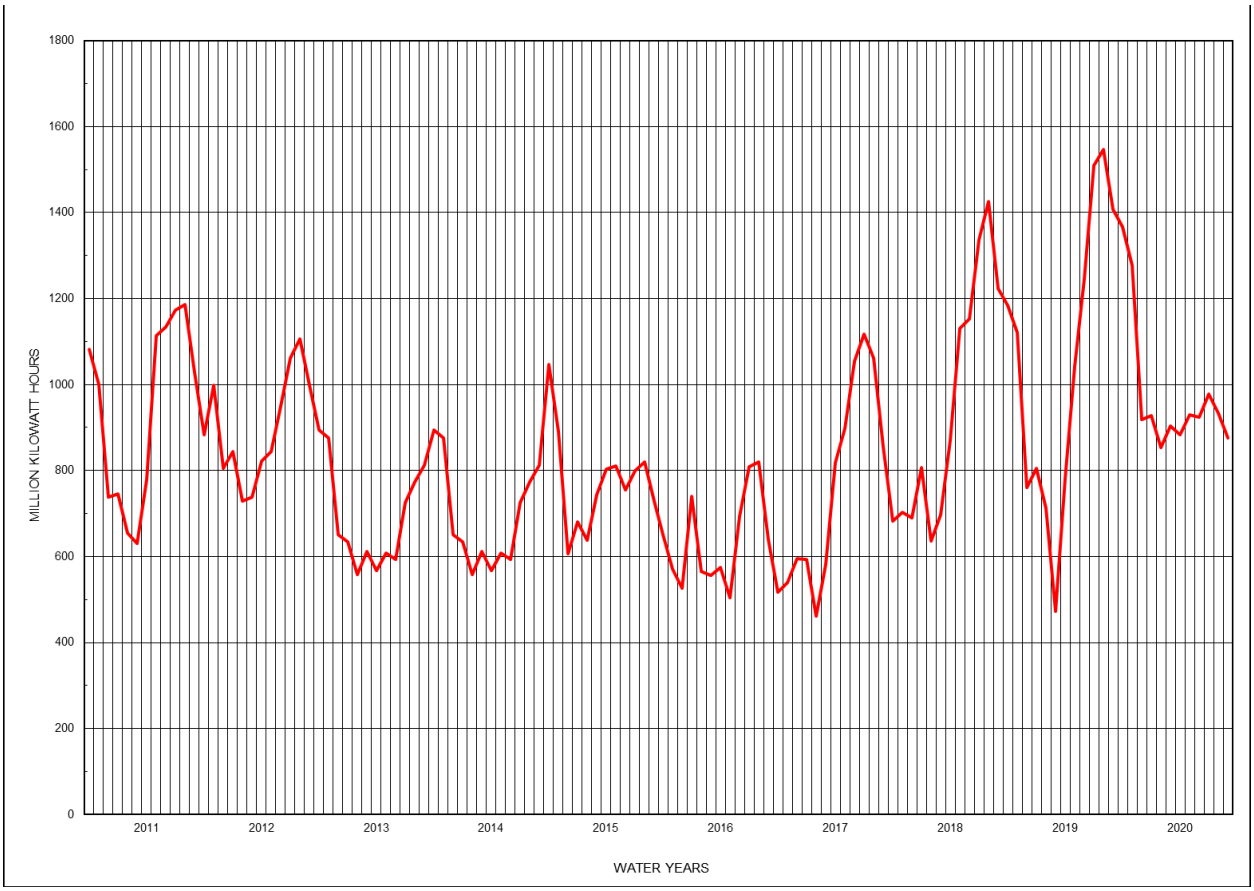


Figure USACE 4: Monthly power generation at U.S. Army Corps plants.

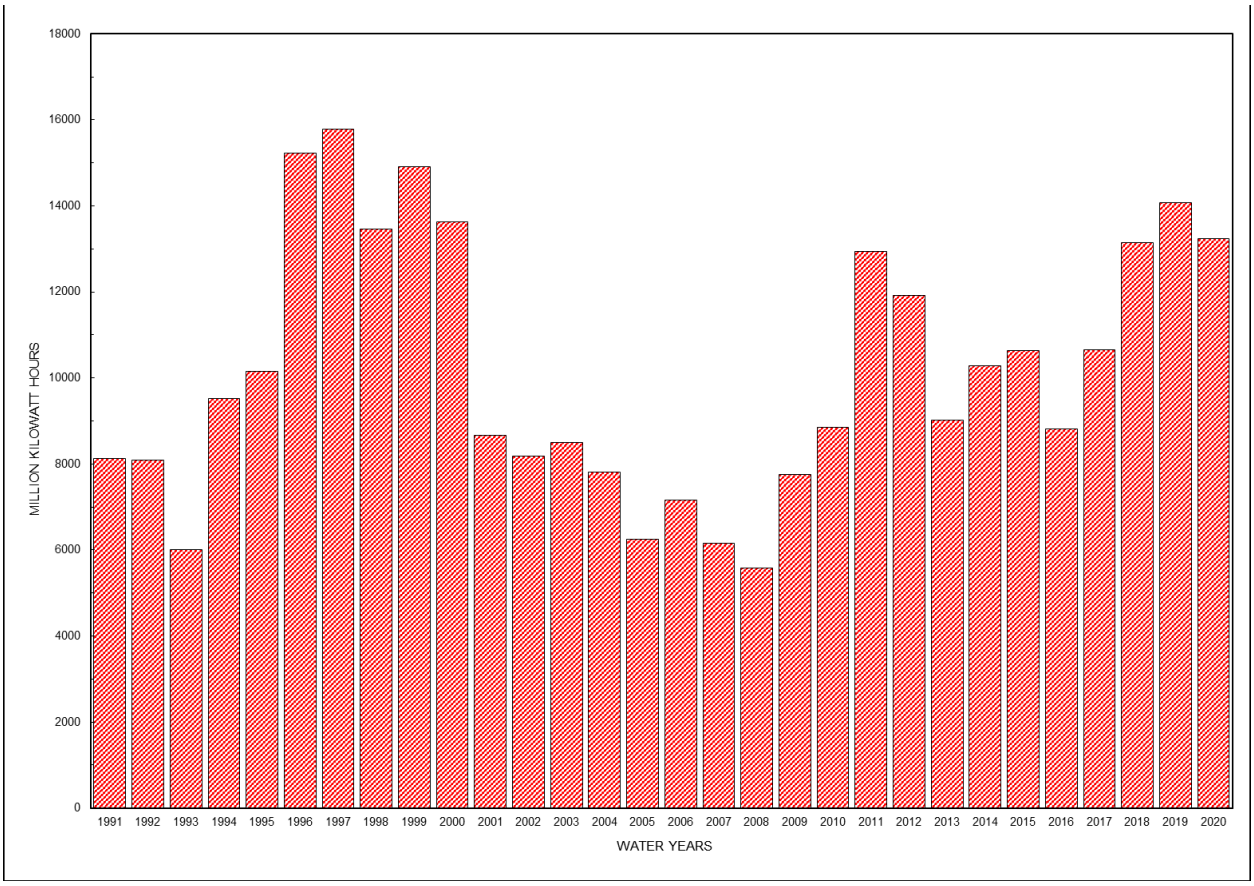


Figure USACE 5: Annual generation at Reclamation and U.S. Army Corps plants.

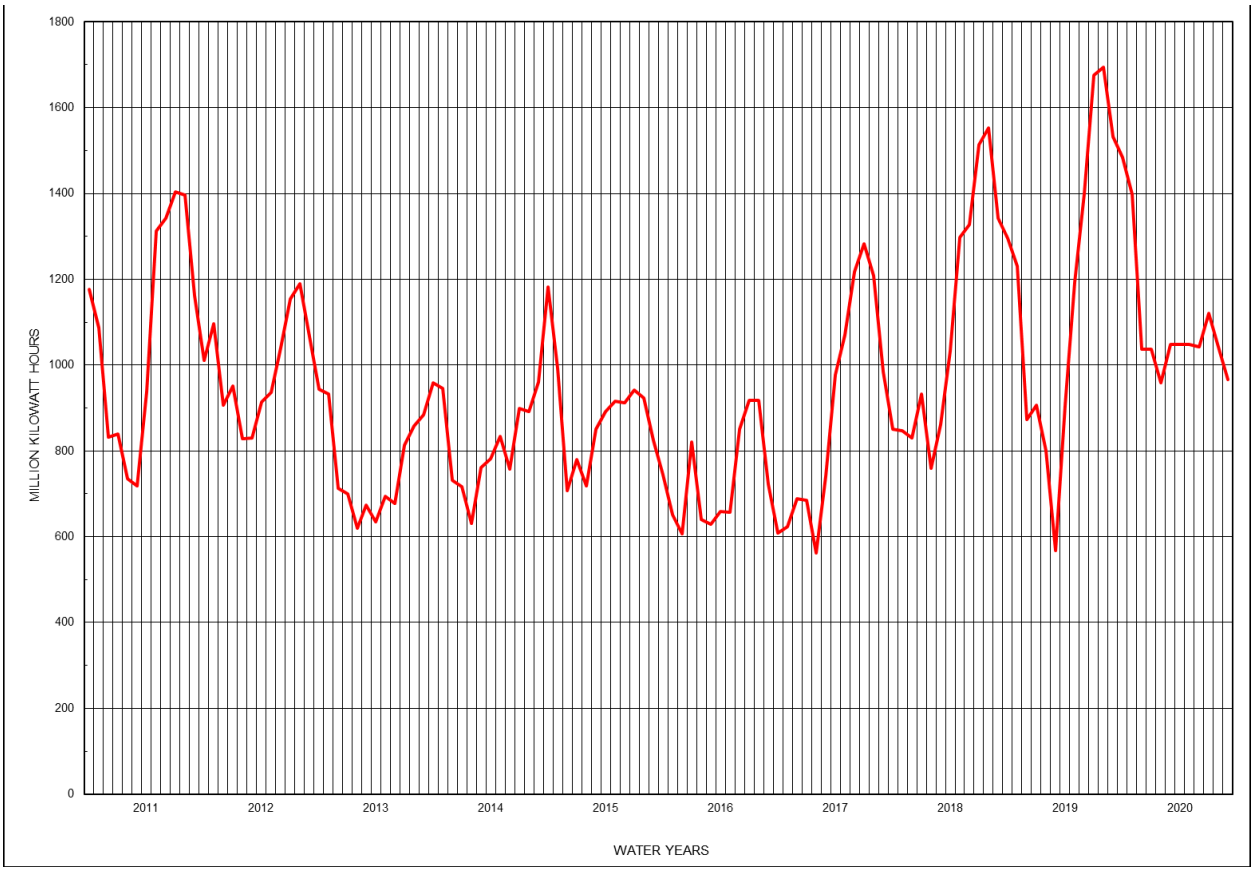


Figure USACE 6: Monthly power generation at Reclamation and U.S. Army Corps plants.