

The Official Water Supply Forecasts for January through July are computed on the 3rd work day of the month. Flood Risk Management (FRM) is computed at standard intervals and posted at: www.nwd.usace.army.mil/Missions/Water/Columbia/FloodControl

The **JUNE** Water Supply Forecast sets BiOp actions as highlighted in the table below.

Forecast Point	Forecast period	Forecast	BiOp Actions to be Determined
Hungry Horse	April – August Provided by Reclamation	January, February, March	Sets min. flows at Hungry Horse and Columbia Falls
	May – September Provided by Reclamation	January, February, March	Sets VARQ FRM targets
		April	Sets VARQ FRM targets and VARQ refill flows
		May,	Sets VARQ refill flows Sets end of September draft target
		June	Sets VARQ refill flows
The Dalles	April – September Provided by NWRFC	March	Sets CRWMP adjustments at Grand Coulee
	April – August Provided by NWRFC	April	Sets spring flow objective at McNary Dam
		July	Sets end of August draft limit at Grand Coulee
Lower Granite	April – July Provided by NWRFC	April	Sets spring flow objective at Lower Granite
		June	Sets summer flow objective at Lower Granite
Libby	April – August Provided by Corps Seattle District	December	Sets end of December variable draft target
		January, February, March	Sets VARQ FRM targets
		April	Sets VARQ FRM targets and VARQ refill flows
		May	Sets Libby min. sturgeon flow volume and min. bull trout flows for after sturgeon pulse through Sept. Sets VARQ FRM targets and VARQ refill flows Sets end of September draft limit.
		June	VARQ refill flows
Dworshak	April – July Provided by Corps Walla Walla District	January to March	Manage for reservoir FRM, VDL, and Flood Control Refill Curve (FCRC)
		April to June	Manage for reservoir FRM and FCRC

June 2, 2022

Hungry Horse Dam – Official Water Supply Forecast JUNE 2022

Below are the volumes for the June 2022 final forecast for Hungry Horse:

- Jun-Jul: 1,120 kaf (127%)
- Apr-Aug: 2,100 kaf (103%)
- May-Sep: 1,900 kaf (107%)

The minimum flows downstream of Hungry Horse for the remainder of the calendar year are as follows:

- Columbia Falls: 3,500 cfs
- Hungry Horse: 900 cfs

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COLUMBIA - THE DALLES DAM (TDAO3)

Forecasts for Water Year 2022

Official Water Supply

ESP with 10 Days QPF Ensemble: 2022-06-03 Issued: 2022-06-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	91202	94445	100	97955	94166
APR-JUL	77084	79440	97	82828	81933
APR-AUG	85508	88101	99	92107	89196
JAN-SEP	109614	112857	97	116367	115946
JAN-JUL	95496	97852	94	101240	103714
OCT-SEP	127679	130922	99	134432	132314

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2022-06-03 Issued: 2022-06-03

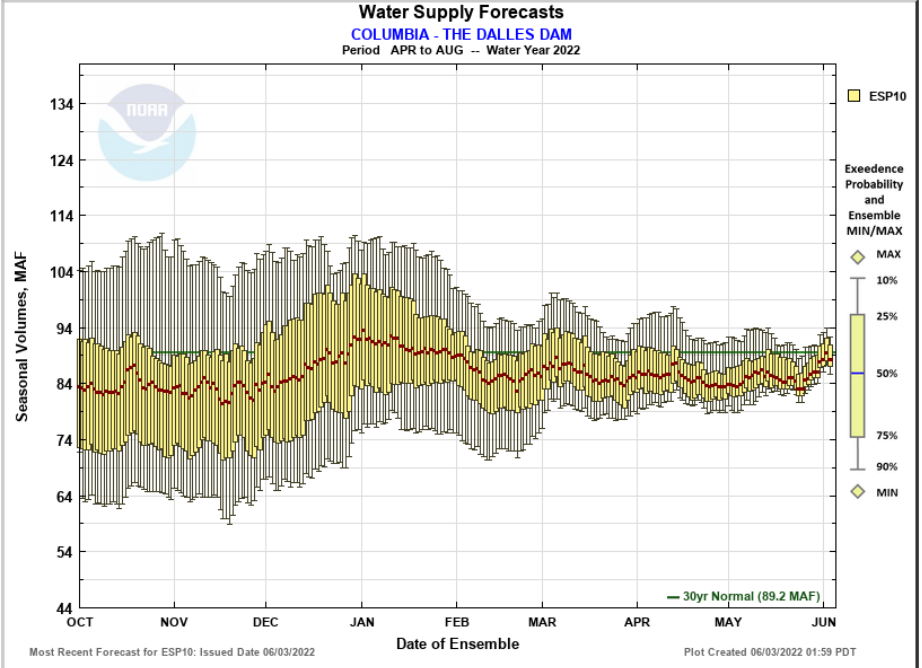
APR-SEP	92704	95070	101	100846	94166
APR-JUL	77799	80478	98	83874	81933
APR-AUG	86746	89301	100	94215	89196
JAN-SEP	111116	113483	98	119259	115946
JAN-JUL	96211	98890	95	102286	103714
OCT-SEP	129181	131548	99	137324	132314

Reference

ESP with 0 Days QPF Ensemble: 2022-06-03 Issued: 2022-06-03

APR-SEP	92172	94331	100	100334	94166
APR-JUL	76959	79769	97	84287	81933
APR-AUG	85989	88634	99	93995	89196
JAN-SEP	110584	112743	97	118746	115946
JAN-JUL	95371	98181	95	102699	103714
OCT-SEP	128649	130808	99	136812	132314

Move the mouse over the desired "Forecast Period" to display a graph.



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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2022

Official Water Supply

ESP with 10 Days QPF Ensemble: 2022-06-03 Issued: 2022-06-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	19661	20086	90	20844	22232
APR-JUL	17323	17716	89	18221	19946
APR-AUG	18524	18936	90	19586	21121
JAN-SEP	25148	25573	86	26330	29736
JAN-JUL	22810	23202	85	23708	27450
OCT-SEP	29053	29478	86	30235	34287

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2022-06-03 Issued: 2022-06-03

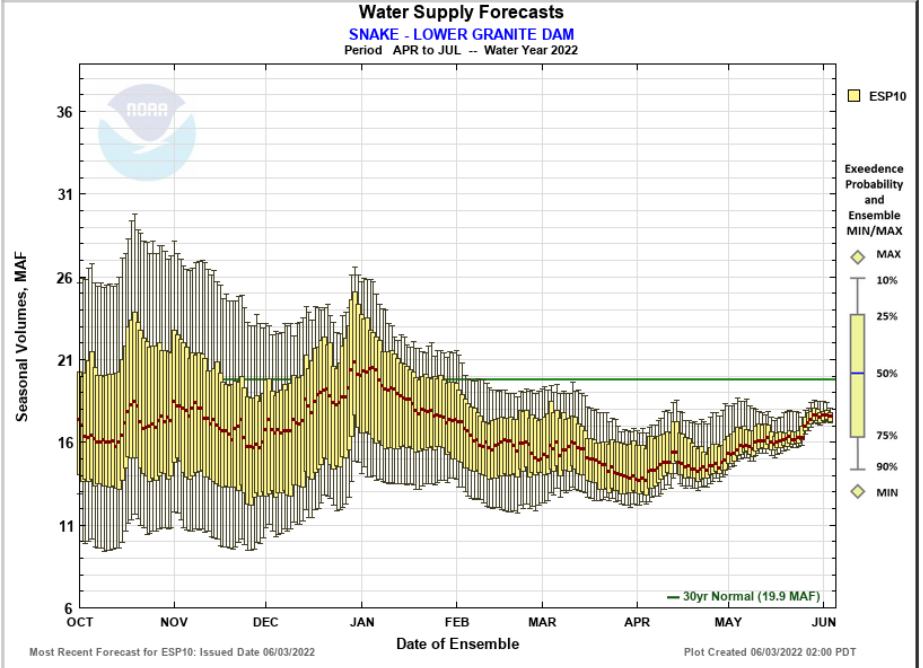
APR-SEP	19614	20132	91	21402	22232
APR-JUL	17319	17748	89	18802	19946
APR-AUG	18474	18943	90	20066	21121
JAN-SEP	25101	25619	86	26888	29736
JAN-JUL	22805	23234	85	24289	27450
OCT-SEP	29005	29524	86	30793	34287

Reference

ESP with 0 Days QPF Ensemble: 2022-06-03 Issued: 2022-06-03

APR-SEP	19422	20149	91	22089	22232
APR-JUL	17116	17687	89	19455	19946
APR-AUG	18298	18925	90	20851	21121
JAN-SEP	24908	25635	86	27576	29736
JAN-JUL	22602	23174	84	24941	27450
OCT-SEP	28813	29540	86	31481	34287

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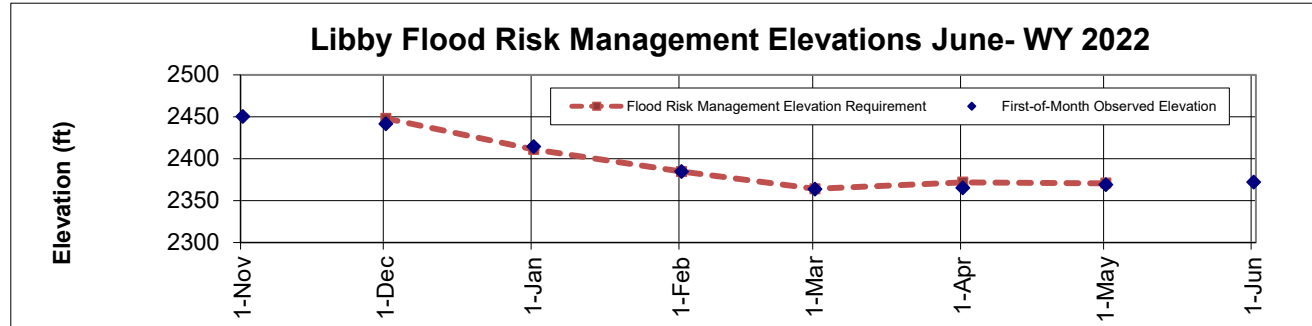
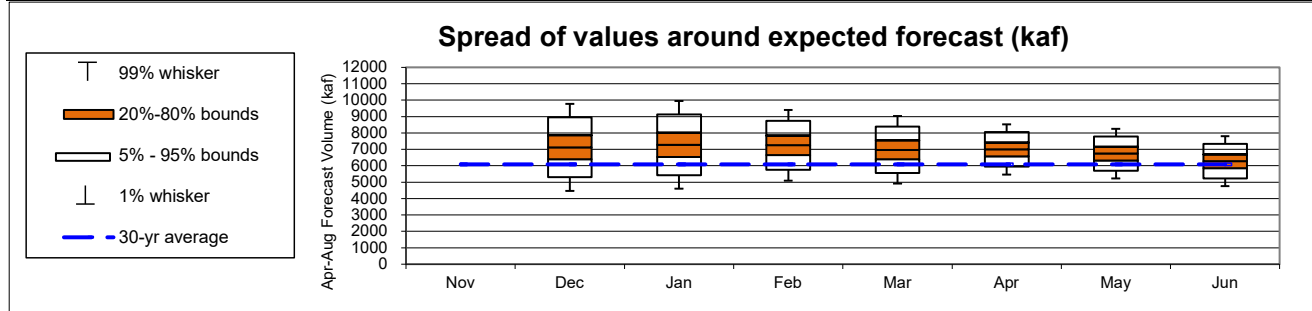
Libby : June Runoff Forecast & Flood Risk Management Calculation

WY 2022

Runoff Forecast	June	1991-2020 Average	1991 - 2020 Percent of Average	1929-2020 Average	1929 - 2020 Percent of Average
Most Probable Runoff Volume: Apr-Aug (kaf)	6276	6080	103%	6259	100%
Most Probable Runoff Volume: Apr-Jul (kaf)	5634	5570	101%	5708	99%
Most Probable Runoff Volume: May-Jul (kaf)	5288	5014	105%	5183	102%

Forecast/Reservoir Data	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast (kaf)		7123	7273	7249	6972	6992	6740	6276
First-of-Month Elev (ft)	2450.2	2441.6	2414.4	2384.5	2363.5	2365.3	2369.0	2372.0

Seasonal FRM Requirements	30-Nov	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr		
Flood Risk Management Space (kaf)	500	2000	2851	3416	3208	3238		
Flood Risk Management Elevation (ft)	2448.0	2411.0	2384.6	2363.9	2371.8	2370.7		



Notes:

1. The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Leon Basdekas (208) 353-2564, Jason Chang (206) 764-3528, Logan Osgood-Zimmerman (206) 764-6928 or Kevin Shaffer (206) 764-3660.
2. If a prior month's forecast as published in this document is different than what was originally published in the issue month, then the earlier forecast has been adjusted to reflect updated values for precipitation or streamflow.
3. Cranbrook A gage data was used instead of Cranbrook Airport Auto used in previous months. Cranbrook A gage is the default gage for the WSF regression.

Libby : June Runoff Forecast & Flood Risk Management Calculation
Apr-Aug Runoff Forecast Calculation:

<i>Variable</i>	<i>Month(s)</i>	<i>Units</i>	<i>Observed Value A</i>	<i>Percent of Average (1991-2020)</i>	<i>Regression Coefficient B</i>	<i>Marginal Runoff (KAF) =A*B</i>
SOI	Σ Jun:Jul		1.8		0.0	0.0
Eureka RS, MT	Σ Oct:May Prcp	inches	7.6	142%	37.7	284.7
West Glacier, MT	Σ Oct:May Prcp	inches	26.8	177%	22.5	602.9
Cranbrook A, BC	Σ Oct:May Prcp	millimeters	208.5	143%	2.0	423.3
Fernie, BC	Σ Oct:May Prcp	millimeters	1100.8	191%	0.5	552.6
Hawkins Lake, MT	1-Jun SWE	inches	21.1	103%	10.1	212.9
Stahl Peak, MT	1-Jun SWE	inches	47.5	160%	10.3	489.6
East Creek, BC	1-Jun SWE	millimeters	1212.0	165%	0.4	523.9
Moyie Mountain, BC	1-Jun SWE	millimeters	82.0	22%	0.8	69.6
Sunshine Village, AB	1-Jun SWE	millimeters	746.5	168%	0.6	463.8
Akamina Pass, AB	1-Jun SWE	millimeters	169.2	42%	0.7	115.1
South Racehorse Creek, AB	1-Jun SWE	millimeters	82.3	25%	0.6	52.8
Intercept			1		978.0	978.0
Forecast Inflow	June-August	kaf				4769.3
Observed Inflow	April - May	kaf	1507.0			1507.0
May Forecast	April - August	kaf				6276.3

Data used in Libby Water Supply Forecast

<i>Climate Data</i>	<i>Jun-21</i>	<i>Jul-21</i>
SOI	0.4	1.4

<i>Precipitation Data</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>
Eureka RS, MT (inch)	1.5	1.1	0.6	0.7	0.9	0.9	0.4	1.5
West Glacier, MT (inch)	3.5	4.6	4.5	3.0	3.0	3.9	1.4	2.8
Cranbrook A, BC (mm)	34.2	34.1	45.8	33.2	3.8	23.9	12.4	21.1
Fernie, BC (mm)	180.9	337.0	194.8	106.2	52.1	99.8	37.1	93.0

<i>Snow Water Equiv</i>	<i>1-Nov</i>	<i>1-Dec</i>	<i>1-Jan</i>	<i>1-Feb</i>	<i>1-Mar</i>	<i>1-Apr</i>	<i>1-May</i>	<i>1-Jun</i>
Hawkins Lake, MT (inch)				16.9	19.8	22.5	25.4	21.1
Stahl Peak, MT (inch)			19.3	28.1	35.1	42.0	48.0	47.5
East Creek, BC (mm)				935.0	1040.0	1177.0	1264.0	1212.0
Moyie Mountain, BC (mm)			127.0	235.0	300.0	349.0	359.0	82.0
Sunshine Village, AB (mm)			432.5	596.9	617.5	707.4	757.7	746.5
Akamina Pass, AB (mm)				420.3	455.2	558.7	448.5	169.2
South Racehorse Creek, AB (mm)				347.2	396.4	461.7	398.3	82.3

<i>Streamflow</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
Libby Inflow Volume (kaf)			299.2	206.1	291.0	346.3	1160.7	

<i>Reservoir Elevation</i>	<i>1-Nov</i>	<i>1-Dec</i>	<i>1-Jan</i>	<i>1-Feb</i>	<i>1-Mar</i>	<i>1-Apr</i>	<i>1-May</i>	<i>1-Jun</i>
Libby FOM Elev (feet)	2450.2	2441.6	2414.4	2384.5	2363.5	2365.3	2369.0	2372.0

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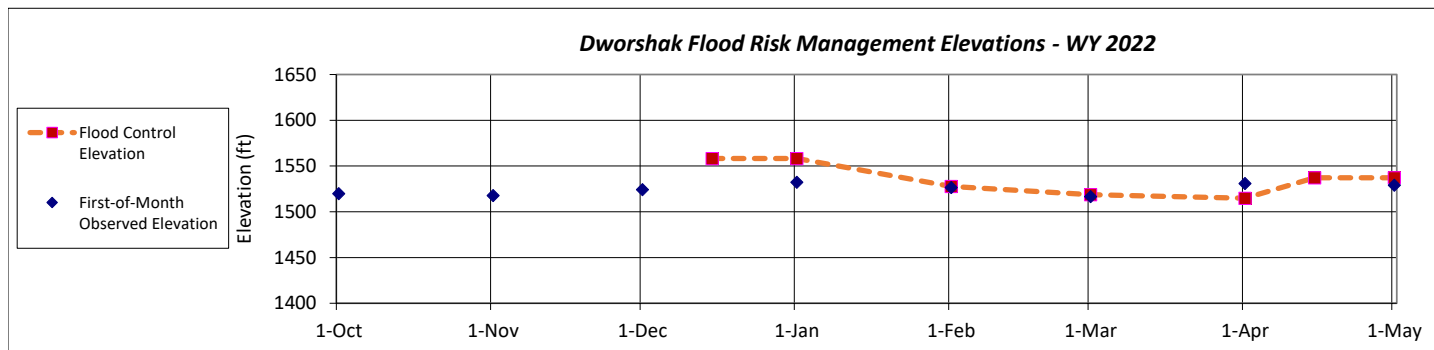
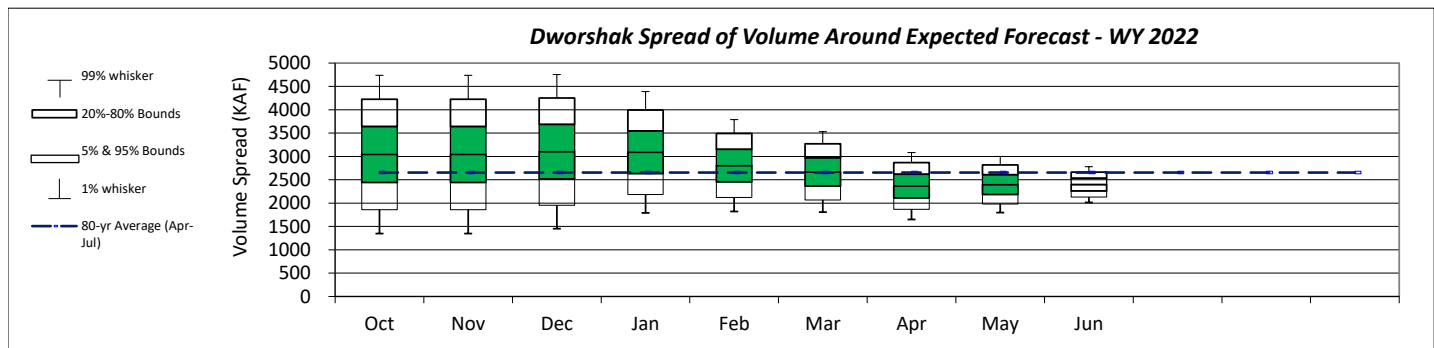
Dworshak : June Runoff Forecast & Flood Risk Management Calculation

Runoff Forecast	June Value	1991-2020 Average	1991 - 2020 Percent of Average	1929-2008 Average	1929 - 2008 Percent of Average
Most Probable Runoff Volume: Apr-Jul (KAF)	2397	2474	97%	2655	90%
Most Probable Runoff Volume: Jun-Jul (KAF)	954	810	118%	914	104%

Seasonal Flood Risk Management (assumes no shift of Flood Risk Management space to Grand Coulee, nor refill on the Flood Control Refill Curve)

Seasonal FRM Forecast	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast (KAF)	3043	3043	3104	3090	2805	2669	2367	2399	2397
First-of-Month Elevation (ft)	1519.7	1517.7	1524.3	1532.3	1526.5	1516.7	1530.9	1529.0	1580.6

Seasonal FRM Space	15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr
Flood Risk Management Space (KAF)	700	700	1127	1248	1297	1000	1000
Flood Risk Management Elevation (ft)	1558	1558	1527.8	1518.6	1514.8	1537	1537.2



Dworshak : June Runoff Forecast & Flood Risk Management Calculation

Jun-Jul Runoff Forecast Calculation

Variable	Month(s)	Units	Observed Value A	Percent of Average (1991-2020)	Regression Coefficient B	Marginal Runoff (KAF) A*B
Hoodoo Basin SWE	1-Jun	Inch	37.40	130%	8.21	307.1
Shanghi Summit SWE	1-Jun	Inch	0.10	0%	10.26	1.0
Lost Lake SWE	1-Jun	Inch	44.70	135%	6.14	274.5
Hemlock SWE	1-Jun	Inch	30.80	178%	7.57	233.2
Intercept			1		138.78	138.8
1-Jun Forecast	Jun-Jul	KAF				954.5

Data used in Dworshak Water Supply Forecast

Climate Data					Sept				
SOI					0.80				

Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Headquarters, ID (inch)	2.30	7.10	7.50	5.70	2.60	3.30	4.20		
Cumulative HQSI Data (inch)	2.30	9.40	16.90	22.60	25.20	28.50	32.70		

Snow Water Equivalent, 1st of Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Elk Butte, ID (inch)				13.0	21.4	24.8	25.6		
Cool Creek, ID (inch)				20.7	31.2				
Hoodoo Basin, MT (inch)				18.1	26.0	31.8	36.6	42.4	37.4
Sherwin, ID (inch)				6.1	9.1	10.9	2.5		
Shanghi Summit, ID (inch)								16.6	0.1
Lost Lake, ID (inch)				21.3	32.5	39.4	42.3	49.3	44.7
Hemlock, ID (inch)								51.0	30.8
Crater Meadows Mar (inch)						37.0	41.3		

Streamflow	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Dworshak Inflow Volume (KAF)				205	145	109	533	414	1029

Notes:

1. The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact Willow Walker (509-527-7073), or Jon Roberts (509-527-7518).
2. Due to updated values for precipitation, snow or streamflow, subsequent forecasts may be different from the forecast published herein.
3. 15-Dec and 31-Dec Flood Management Space is fixed at 700 KAF.

Approval:

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Walla Walla District USACE

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Ch., Hydrologic Engineering and Power Branch
Columbia Basin Water Management Division