

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 **JANUARY** 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 Final	Sets min. flows at Hungry Horse and Columbia Falls
	May – September Provided by Reclamation	January, February, March Final	Sets VARQ FRM targets
		April Final	Sets VARQ FRM targets and VARQ refill flows
		May, June Final	Sets VARQ refill flows
The Dalles	April – September Provided by NWRFC	March Final	Sets CRWMP adjustments at Grand Coulee
	April – August Provided by NWRFC	April Final	Sets spring flow objective at McNary Dam
		May Final	Sets end of September draft limits at Hungry Horse and Libby
		July Final	Sets end of August draft limit at Grand Coulee
Lower Granite	April – July Provided by NWRFC	April Final	Sets spring flow objective at Lower Granite
		June Final	Sets summer flow objective at Lower Granite
Libby	April – August Provided by Corps Seattle District	December Final	Sets end of December variable draft target
		January, February, March Final	Sets VARQ FRM targets
		April Final	Sets VARQ FRM targets and VARQ refill flows
		May Final	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
		June Final	VARQ refill flows
Dworshak	April – July Provided by Corps Walla Walla District	January to June Final	Manage for reservoir FRM and refill

Source: 2020 Water Management Plan, page 13:
<http://pweb.crohms.org/tmt/documents/wmp/2020/>

January 7, 2020

**Hungry Horse Dam – Official Water Supply Forecast
JANUARY 2020**

Below are the volumes for the January 2020 final forecast for Hungry Horse:

Jan-Jul: 1,992 kaf (95%)

Apr-Aug: 1,842 kaf (95%)

May-Sep: 1,582 kaf (93%)

The minimum flows downstream of Hungry Horse 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 2020

Official Water Supply

ESP with 10 Days QPF Ensemble: 2020-01-06 Issued: 2020-01-06

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	78772	93622	101	111607	92704
APR-JUL	66300	79423	99	98882	79855
APR-AUG	72761	86909	99	106373	87532
JAN-SEP	97531	113828	100	136448	114216
JAN-JUL	86519	102657	101	119519	101368
OCT-SEP	109854	126150	97	148771	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-01-06 Issued: 2020-01-06

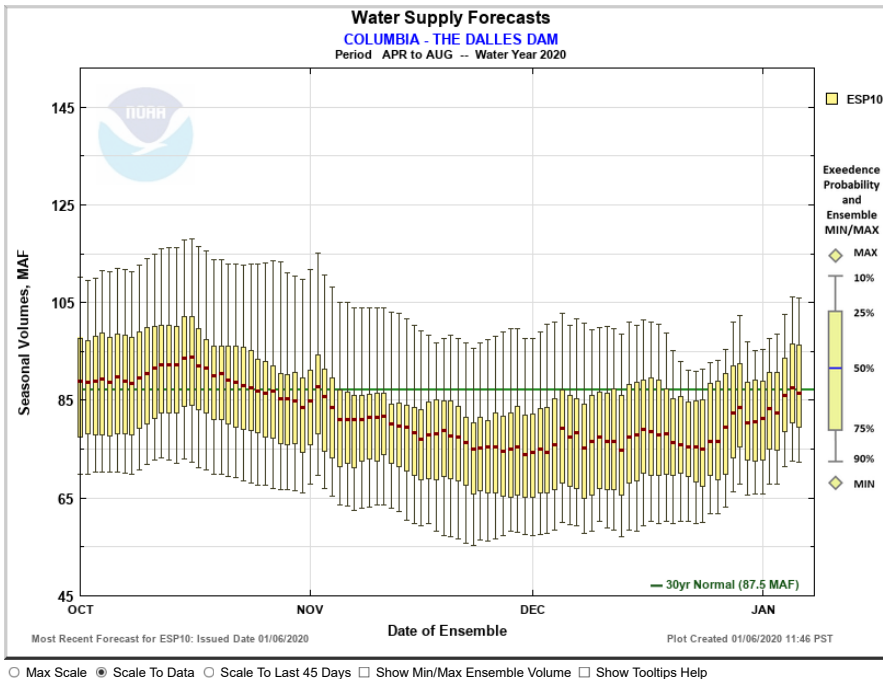
APR-SEP	74095	92394	100	109172	92704
APR-JUL	63712	78008	98	96703	79855
APR-AUG	69802	86690	99	104213	87532
JAN-SEP	93916	109811	96	134429	114216
JAN-JUL	82405	96965	96	119514	101368
OCT-SEP	106239	122133	94	146751	130518

Reference

ESP with 0 Days QPF Ensemble: 2020-01-06 Issued: 2020-01-06

APR-SEP	69645	87500	94	102726	92704
APR-JUL	59552	73356	92	90625	79855
APR-AUG	65456	81801	93	97863	87532
JAN-SEP	89104	105440	92	127290	114216
JAN-JUL	78068	91954	91	114211	101368
OCT-SEP	101427	117762	90	139612	130518

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



Overlay

ESP10

HEFS

ESP0

Data Files

CSV (ESP10 / APR-AUG)

Forecast Ensemble



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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2020

Official Water Supply

ESP with 10 Days QPF Ensemble: 2020-01-06 Issued: 2020-01-06

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	Average	10 %	
APR-SEP	15556	21932	98	27722	22279
APR-JUL	13516	19469	98	24666	19848
APR-AUG	14531	20746	98	26269	21091
JAN-SEP	20985	27842	93	36719	29872
JAN-JUL	18945	25336	92	33956	27440
OCT-SEP	24900	31757	92	40633	34667

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-01-06 Issued: 2020-01-06

APR-SEP	13932	20104	90	25096	22279
APR-JUL	11903	17634	89	22385	19848
APR-AUG	12885	18891	90	23797	21091
JAN-SEP	19504	25454	85	32990	29872
JAN-JUL	17506	23022	84	30116	27440
OCT-SEP	23419	29368	85	36905	34667

Reference

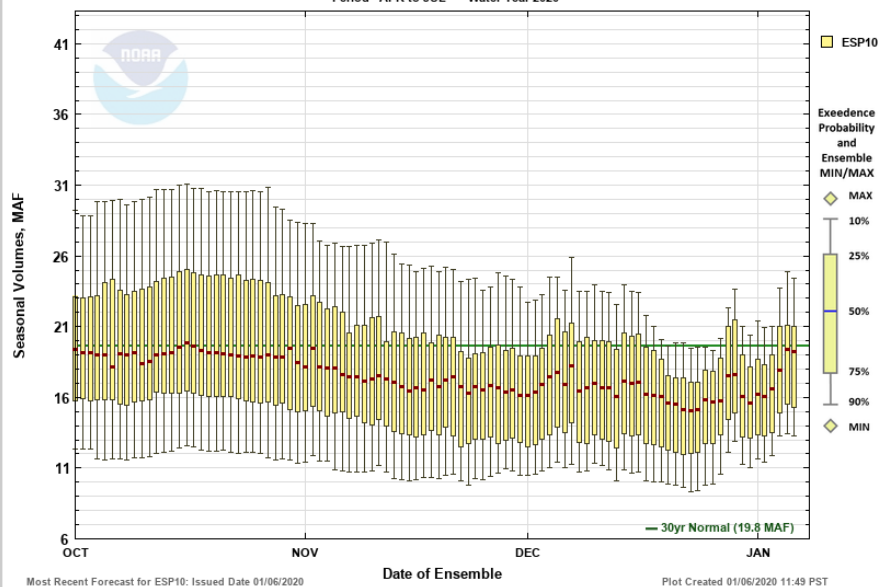
ESP with 0 Days QPF Ensemble: 2020-01-06 Issued: 2020-01-06

APR-SEP	12630	18409	83	23125	22279
APR-JUL	10649	15879	80	20421	19848
APR-AUG	11602	17183	81	21730	21091
JAN-SEP	18253	24338	81	31376	29872
JAN-JUL	16340	22031	80	28787	27440
OCT-SEP	22168	28252	81	35291	34667

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

Water Supply Forecasts SNAKE - LOWER GRANITE DAM

Period APR to JUL -- Water Year 2020



☐ Max Scale
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Overlay

ESP10 HEFS ESP0

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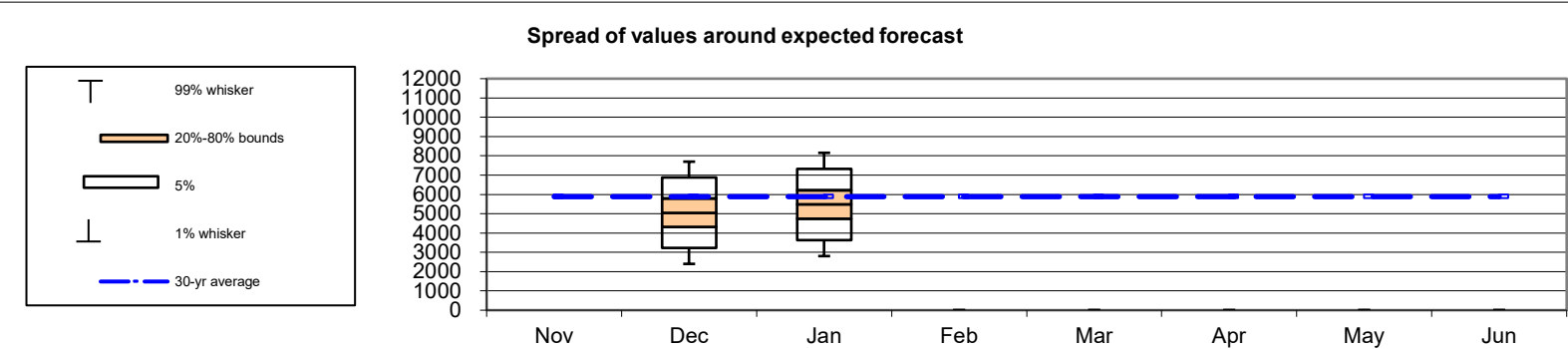
Libby : January Runoff Forecast & Flood Risk Management Calculation

WY 2020

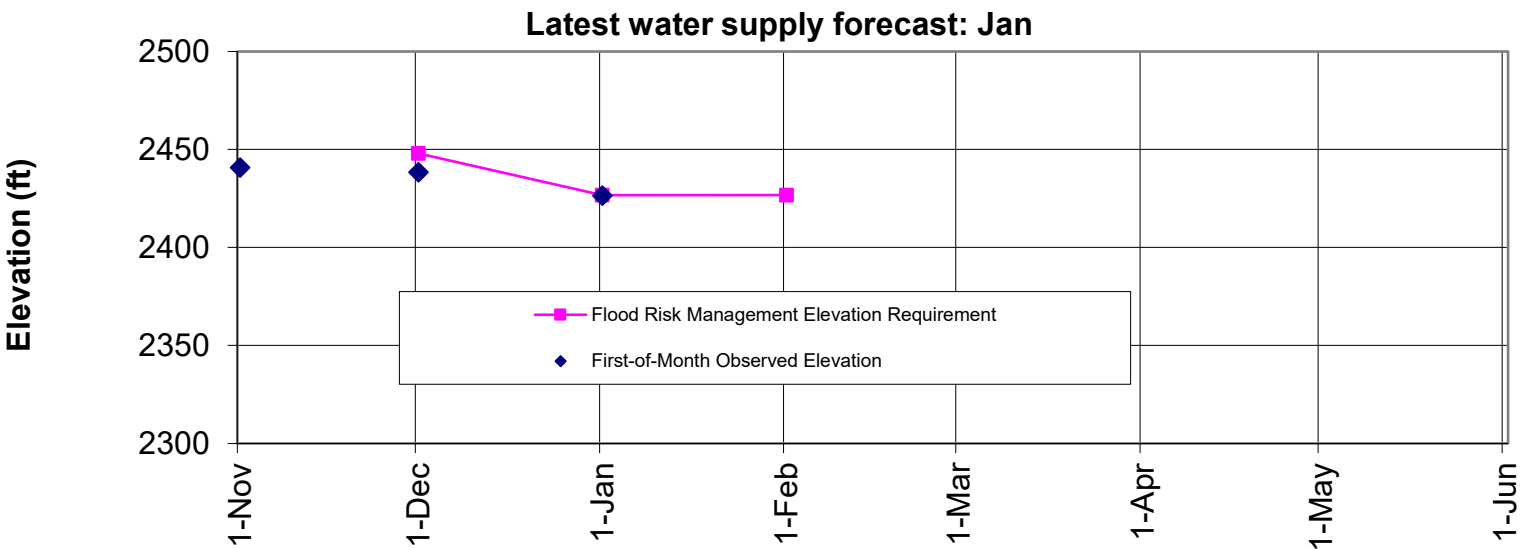
Runoff Forecast and Flood Risk Management			
Most Probable Runoff Volume:	Apr-Aug	5481	KAF
	Apr-Jul	4975	KAF
	May-Jul	4490	KAF
31-Jan Flood Risk Management Space		1400	KAF
31-Jan Flood Risk Management Elevation		2426.7	ft

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	93%	6282	87%
5342	93%	5720	87%
4821	93%	5199	86%

Seasonal Flood Risk Management VARQ Flood Risk Management Implemented								
Forecast Date >>	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast		5050	5481					
First-of-Month Elev	2440.8	2438.4	2426.4					
Date >>	30-Nov	31-Dec	31-Jan	29-Feb	15-Mar	31-Mar	15-Apr	30-Apr
Flood Risk Management Space	500	1400	1400					
Flood Risk Management Elevation	2448.0	2426.7	2426.7					



Libby Flood Risk Management Elevations - 2020



Notes:

1. The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Logan Osgood-Zimmerman (206) 764-6928, Kevin Shaffer (206) 764-3660, Sonja Michelsen (206) 316-3947, or Alexander Nathan (206) 316-3155.
2. If you notice that 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.

Libby : January Runoff Forecast & Flood Risk Management Calculation

Apr-Aug Runoff Forecast Calculation:						
Variable	Month(s)	Units	Observed Value	Percent of Average	Regression Coefficient	Marginal Runoff (KAF)
			A		B	=A*B
SOI	Σ Jun:Jul		-0.90		95.3	-85.8
Eureka RS, MT	Σ Oct,Nov,Dec Prcp	inches	2.44	72%	141.7	345.8
West Glacier, MT	Σ Oct,Nov,Dec Prcp	inches	6.42	71%	58.4	375.1
Cranbrook A, BC	Σ Oct,Nov,Dec Prcp	millimeters	59.50	65%	4.6	272.5
Fernie, BC	Σ Oct,Nov,Dec Prcp	millimeters	354.00	97%	1.2	424.8
Hawkins Lake, MT	1-Jan SWE	inches				0.0
Stahl Peak, MT	1-Jan SWE	inches	15.40	95%	34.6	533.3
East Creek, BC	1-Jan SWE	millimeters				0.0
Moyie Mountain, BC	1-Jan SWE	millimeters	193.00	108%	1.6	305.9
Sunshine Village, AB	1-Jan SWE	millimeters	273.11	100%	2.1	584.5
Akamina Pass, AB	1-Jan SWE	millimeters				0.0
South Racehorse Creek, AB	1-Jan SWE	millimeters				0.0
Intercept			1		2724.4	2724.4
1-Jan Forecast (KAF)					Σ	5480.6

Data used in Libby Water Supply Forecast

WY 2020

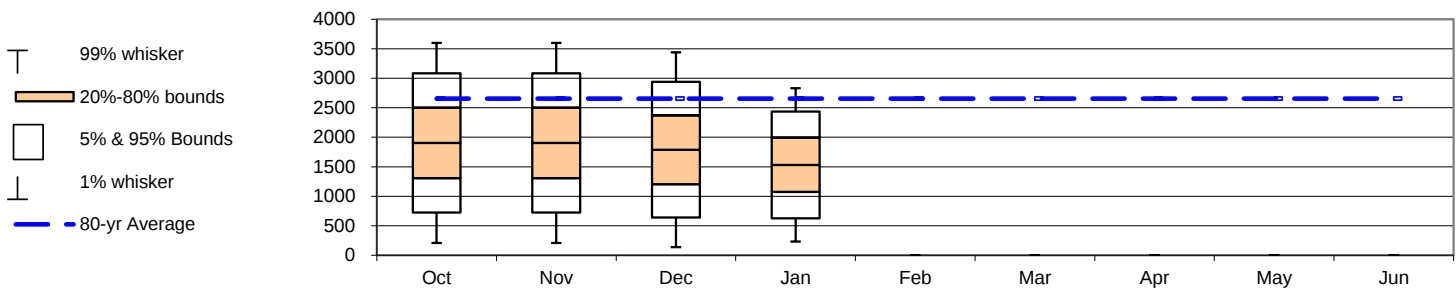
Climate Data					Jun-19	Jul-19					
SOI					-0.50	-0.40					
Precipitation Data		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Units	
Eureka RS, MT		0.75	1.23	0.46						inch	
West Glacier, MT		2.08	1.65	2.69						inch	
Cranbrook A, BC		16.60	14.30	28.60						mm	
Fernie, BC		103.00	35.00	216.00						mm	
Snow Water Equiv		1-Jan			1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units	
Hawkins Lake, MT										inch	
Stahl Peak, MT					15						inch
East Creek, BC											mm
Moyie Mountain, BC					193						mm
Sunshine Village, AB					273						mm
Akamina Pass, AB											mm
South Racehorse Creek, AB										mm	
Streamflow		Jan			Feb	Mar	Apr	May	Jun	Units	
Libby Inflow Volume										KAF	
Reservoir Elevation		1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units	
Libby FOM Elev		2440.8	2438.4	2426.4						feet	

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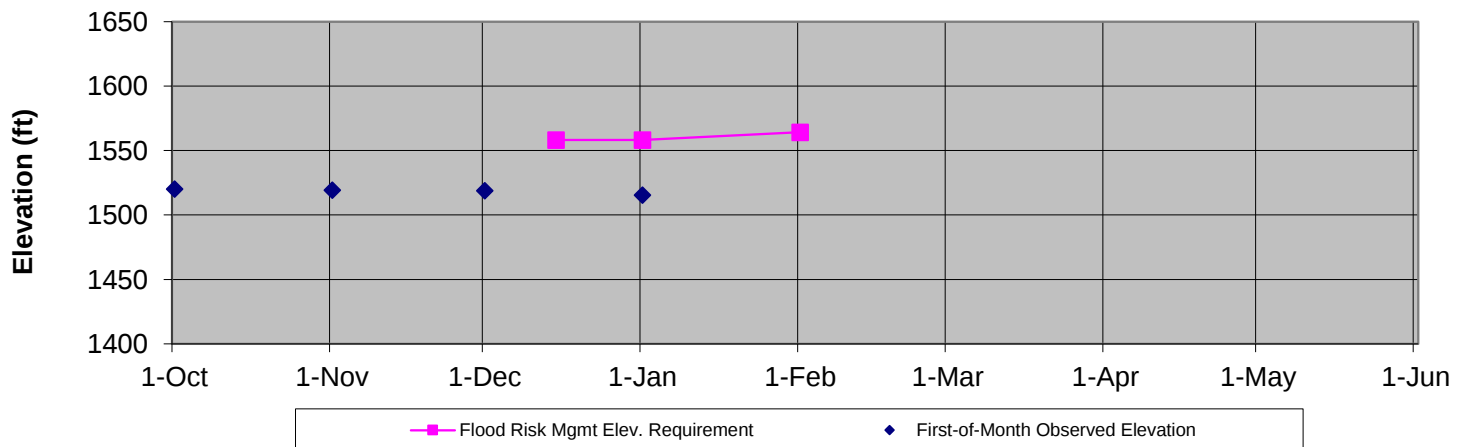
Runoff Forecast and Flood Risk Management (FRM)					1981-2010 Average	Percent of 30yr Average	1929-2008 Average	Percent of Average	
Most Probable Runoff Volume		Apr-Jul	1532	KAF	2438	63%	2655	58%	
		May-Jul	1121	KAF	1784	63%	1959	57%	
31-Jan Flood Risk Management Space			610	KAF					
31-Jan Flood Risk Management Elevation			1564.3	ft					
Seasonal Flood Risk Management (assumes no shift of flood risk management space to Grand Coulee)									
Forecast Date>>	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast	1904	1904	1789	1532					
First-of-Month Elev	1520.3	1519.3	1519.0	1515.4					
Date >>	15-Dec	31-Dec	31-Jan	29-Feb	31-Mar	15-Apr	30-Apr	31-May	
FRM Space	--	700	700	610					
FRM Elevation	--	1558.2	1558.2	1564.3					

Spread of values around expected forecast



Dworshak Flood Risk Management Elevations - WY 2020

Latest water supply forecast: Jan



Dworshak : January Runoff Forecast & Flood Risk Management Calculation

Apr-Jul Runoff Forecast Calculation					
Variable	Month	Observed Value	% of Average	Regression Coefficient	Runoff (KAF)
		A		B	=A*B
SOI	Sep	-1.20		355.71	-426.9
HQSI Cumulative Precip	Oct-Date	8.70	62%	48.12	418.6
Elk Butte SWE	1-Jan	8.80	59%	6.25	55.0
Cool Creek SWE	1-Jan	10.2	56%	9.96	101.6
Hoodoo Basin SWE	1-Jan	9.4	55%	12.22	114.9
Sherwin SWE	1-Jan	2.3	50%	44.69	102.8
Lost Lake SWE	1-Jan	10.9	48%	4.24	46.2
Intercept		1		1119.86	1119.9
1-Jan Forecast (KAF)				Σ	1532.1

Data Station	Sept	Nov	Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Climate (Stdzd SOI)									
September SOI	-1.20								
Precipitation (in)	Oct								
Headquarters, ID	3.30	1.90	3.50	--	--	--	--		
Cumulative HQSI Data	3.30	5.20	8.70	--	--	--	--		
Snow Water Equiv (First of Month values) (in)									
Elk Butte, ID				8.8	--	--	--		
Cool Creek, ID				10.2	--				
Hoodoo Basin, MT				9.4	--	--	--	--	--
Sherwin, ID				2.3	--	--	--		
Shanghi Summit, ID								--	--
Lost Lake, ID				10.9	--	--	--	--	--
Hemlock, ID								--	--
Crater Meadows Mar						--	--		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				--	--	--	--	--	--

Notes:

1. The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact Steve Hall (509-527-7550), Alfredo Rodriguez (509-527-7532), 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.

Approval:

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