

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 FEBRUARY 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 Sets 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
		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 and VDL
		April to June	Manage for reservoir FRM and refill

Source: 2021 Water Management Plan, page 15:
<http://pweb.crohms.org/tmt/documents/wmp/2021/>

February 2, 2021

Hungry Horse Dam – Official Water Supply Forecast FEBRUARY 2021

Below are the volumes for the February 2021 final forecast for Hungry Horse:

- Feb-Jul: 2,050 kaf (99%)
- Apr-Aug: 1,925 kaf (99%)
- May-Sep: 1,670 kaf (99%)

The minimum flows downstream of Hungry Horse are as follows:

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

Joel Fenolio, P.E.

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Northwest River Forecast Center

Water Supply Forecasts

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COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2021

Official Water Supply

ESP with 10 Days QPF Ensemble: 2021-02-03 Issued: 2021-02-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	76043	88671	96	100714	92704
APR-JUL	63465	74690	94	86635	79855
APR-AUG	70809	83271	95	94162	87532
JAN-SEP	92224	105920	93	124073	114216
JAN-JUL	80703	93176	92	107979	101368
OCT-SEP	107394	121089	93	139242	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2021-02-03 Issued: 2021-02-03

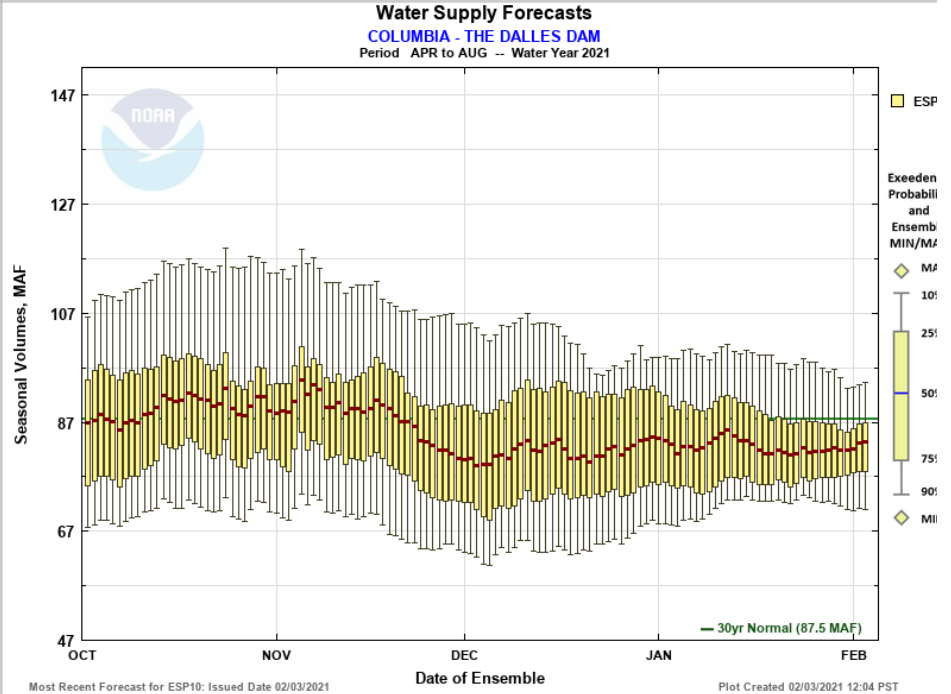
APR-SEP	82375	90852	98	108524	92704
APR-JUL	69829	76856	96	93600	79855
APR-AUG	77140	85724	98	102938	87532
JAN-SEP	98882	108525	95	130540	114216
JAN-JUL	86353	95692	94	114322	101368
OCT-SEP	114052	123694	95	145709	130518

Reference

ESP with 0 Days QPF Ensemble: 2021-02-03 Issued: 2021-02-03

APR-SEP	81641	89622	97	108037	92704
APR-JUL	68905	75529	95	92107	79855
APR-AUG	76161	84614	97	101408	87532
JAN-SEP	99355	108940	95	129697	114216
JAN-JUL	86048	95566	94	112694	101368
OCT-SEP	114525	124110	95	144866	130518

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



☐ Max Scale ☒ Scale To Data ☐ Scale To Last 45 Days ☐ Show Min/Max Ensemble Volume ☐ Show Tooltips Help

Overlay

ESP10

HEFS

ESPO

Data Files

CSV (ESP10 / APR-AUG)

Forecast Ensemble



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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2021

Official Water Supply

ESP with 10 Days QPF Ensemble: 2021-02-03 Issued: 2021-02-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	Average	10 %	
APR-SEP	14395	18222	82	22000	22279
APR-JUL	12414	15990	81	19184	19848
APR-AUG	13371	17118	81	20688	21091
JAN-SEP	20021	23942	80	28404	29872
JAN-JUL	17987	21686	79	26050	27440
OCT-SEP	24118	28039	81	32501	34667

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2021-02-03 Issued: 2021-02-03

APR-SEP	14644	18562	83	22443	22279
APR-JUL	12681	16319	82	19911	19848
APR-AUG	13637	17477	83	21170	21091
JAN-SEP	20125	24470	82	29044	29872
JAN-JUL	18208	22215	81	26628	27440
OCT-SEP	24222	28567	82	33142	34667

Reference

ESP with 0 Days QPF Ensemble: 2021-02-03 Issued: 2021-02-03

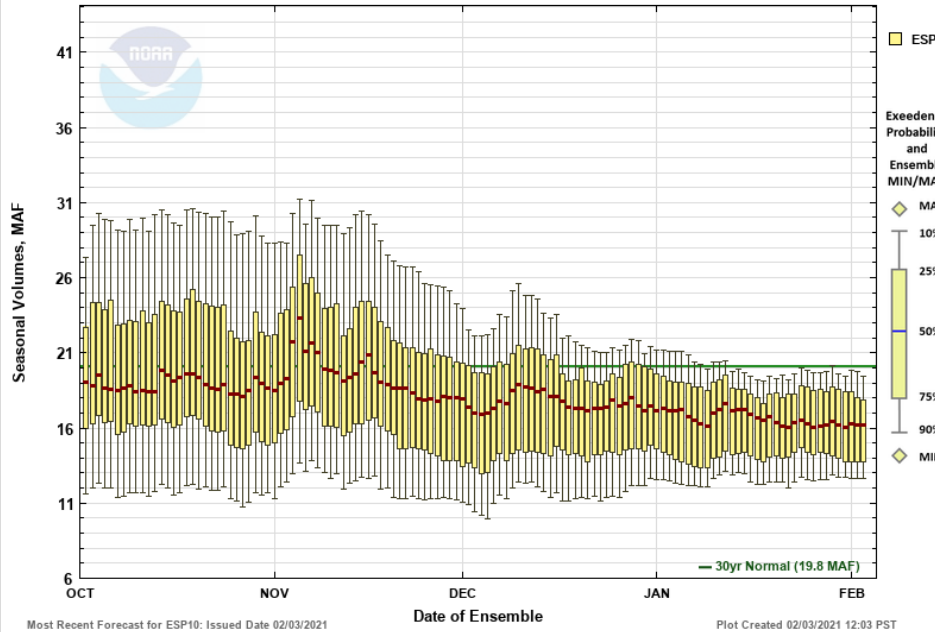
APR-SEP	14148	18174	82	22075	22279
APR-JUL	12216	15899	80	19422	19848
APR-AUG	13162	17022	81	20881	21091
JAN-SEP	19817	24034	80	28919	29872
JAN-JUL	17858	21798	79	26424	27440
OCT-SEP	23914	28131	81	33016	34667

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 2021



☐ Max Scale ☒ Scale To Data ☐ Scale To Last 45 Days ☐ Show Min/Max Ensemble Volume ☐ Show Tooltips Help

Overlay

ESP10 HEFS ESP0

Data Files

CSV (ESP10 / APR-JUL)

Forecast Ensemble



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Libby : February Runoff Forecast & Flood Risk Management Calculation

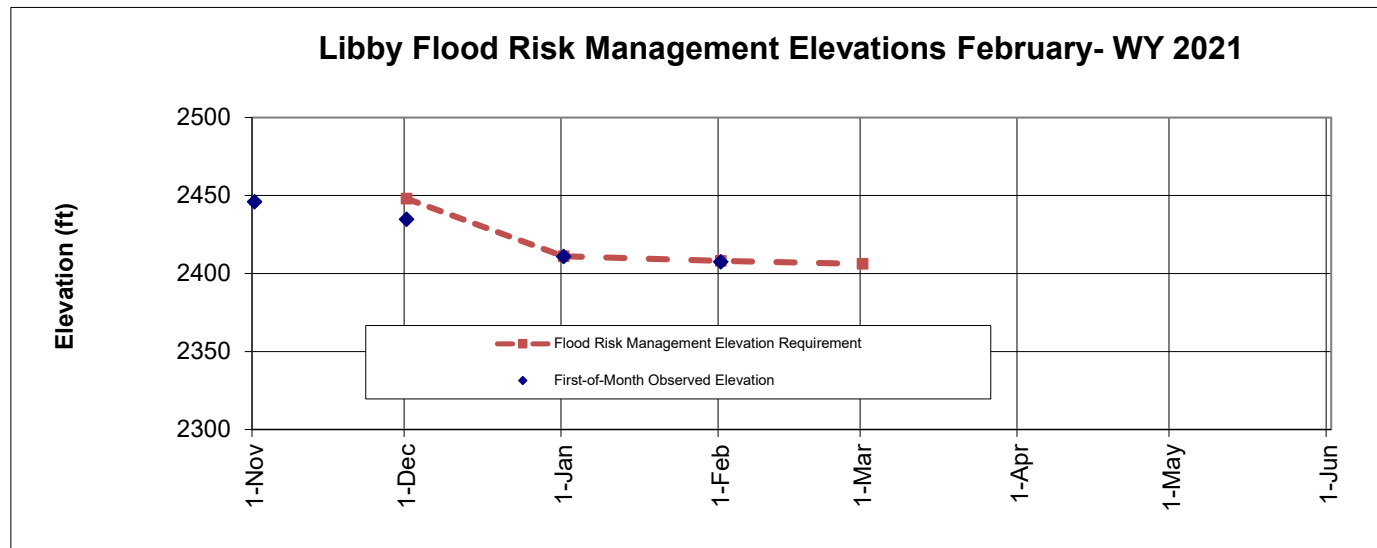
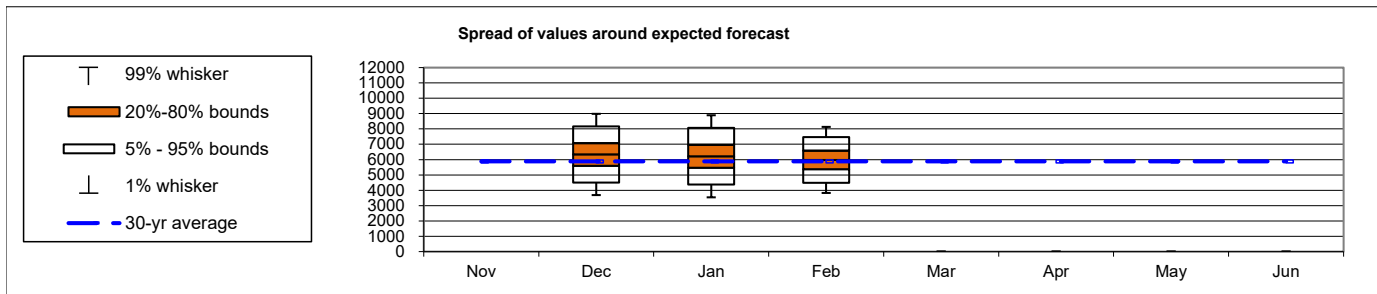
WY 2021

Runoff Forecast	February	1981-2010 Average	1981 - 2010 Percent of Average	1929-2008 Average	1929 - 2008 Percent of Average
Most Probable Runoff Volume: Apr-Aug (kaf)	5979	5885	102%	6282	95%
Most Probable Runoff Volume: Apr-Jul (kaf)	5428	5342	102%	5720	95%
Most Probable Runoff Volume: May-Jul (kaf)	4898	4821	102%	5199	94%

Flood Risk Management	February
28-Feb Flood Risk Management Space (kaf)	2173
28-Feb Flood Risk Management Elevation (ft)	2406.2

Forecast/Reservoir Data	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast (kaf)		6336	6215	5979				
First-of-Month Elev (ft)	2446.1	2434.8	2410.9	2407.6				

Seasonal FRM Requirements	30-Nov	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr
Flood Risk Management Space (kaf)	500	2000	2105	2173		
Flood Risk Management Elevation (ft)	2448.0	2411.0	2408.1	2406.2		



Notes:

- The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Jon Moen (206) 764-3561, Justin Lawrence (206) 764-3699, Logan Osgood-Zimmerman (206) 764-6928, or Kevin Shaffer (206) 764-3660.
- 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.
- Cranbrook A gage data was intermittent during December and January. Nearby Cranbrook Airport Auto gage data was used instead.

Libby : February Runoff Forecast & Flood Risk Management Calculation

Apr-Aug Runoff Forecast Calculation:

Variable	Month(s)	Units	Observed Value A	Percent of Average	Regression Coefficient	Marginal Runoff (kaf) =A*B
SOI	ΣJun:Jul					
Eureka RS, MT	ΣOct:Jan Prcp	inches	4.04	94%	78.5	317.0
West Glacier, MT	ΣOct:Jan Prcp	inches	14.10	115%	31.0	436.4
Cranbrook A, BC	ΣOct:Jan Prcp	millimeters	110.00	95%	2.8	312.4
Fernie, BC	ΣOct:Jan Prcp	millimeters	493.21	100%	0.7	355.1
Hawkins Lake, MT	1-Feb SWE	inches	15.60	95%	30.6	477.4
Stahl Peak, MT	1-Feb SWE	inches	20.90	89%	23.0	480.5
East Creek, BC	1-Feb SWE	millimeters	715.00	117%	0.8	536.3
Moyie Mountain, BC	1-Feb SWE	millimeters	235.00	82%	1.5	347.8
Sunshine Village, AB	1-Feb SWE	millimeters	422.41	109%	1.5	620.9
Akamina Pass, AB	1-Feb SWE	millimeters	316.27	99%	1.3	401.7
South Racehorse Creek, AB	1-Feb SWE	millimeters	262.99	94%	1.5	402.4
Intercept			1.00		1291.5	1291.5
February Forecast	April - August	kaf				5979.3

Data used in Libby Water Supply Forecast

WY 2021

Climate Data	Jun-20	Jul-20
SOI	-0.40	0.40

Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Eureka RS, MT (inch)	1.77	0.92	0.98	0.37				
West Glacier, MT (inch)	4.52	4.32	2.34	2.92				
Cranbrook A, BC (mm)	27.60	21.90	26.30	34.20				
Fernie, BC (mm)	118.80	158.00	106.68	109.73				
Snow Water Equiv	1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Hawkins Lake, MT (inch)				16				
Stahl Peak, MT (inch)			16	21				
East Creek, BC (mm)				715				
Moyie Mountain, BC (mm)			166	235				
Sunshine Village, AB (mm)			322	422				
Akamina Pass, AB (mm)				316				
South Racehorse Creek, AB (mm)				263				
Streamflow	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Libby Inflow Volume (kaf)			182.3					
Reservoir Elevation	1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Libby FOM Elev (feet)	2446.1	2434.8	2410.9	2407.6				

William D. Proctor, P.E.
 Approving Official
 Ch., Hydrologic Engineering and Power Branch
 Northwestern Division

Jonathan Moen
 Upper Columbia Senior Water Manager
 Seattle District

Dworshak : February Runoff Forecast and Flood Risk Management Calculation

WY 2021

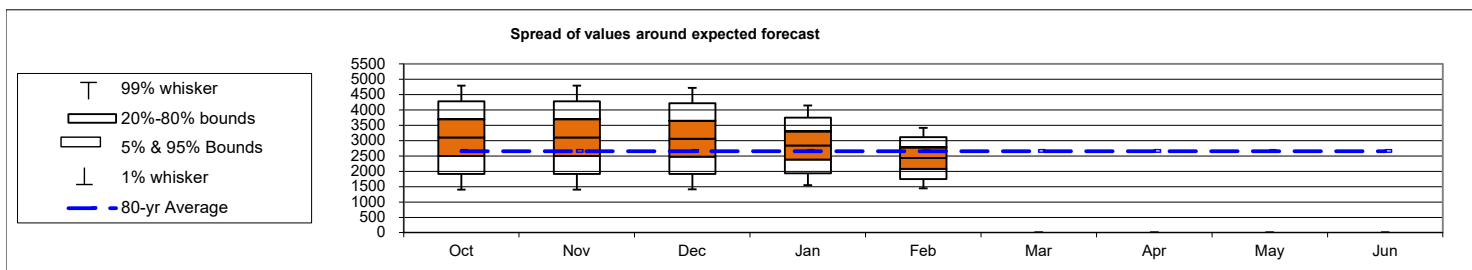
Runoff Forecast	February	1981-2010 Average	1981 - 2010 Percent of Average	1929-2008 Average	1929 - 2008 Percent of Average
Most Probable Runoff Volume: Apr-Jul (KAF)	2432	2438	100%	2655	92%
Most Probable Runoff Volume: May-Jul (KAF)	1779	1784	100%	1959	91%

Flood Risk Management (FRM)	February Value
28-February Flood Risk Management Space (KAF)	1013
28-February Flood Risk Management Elevation (ft)	1536.2

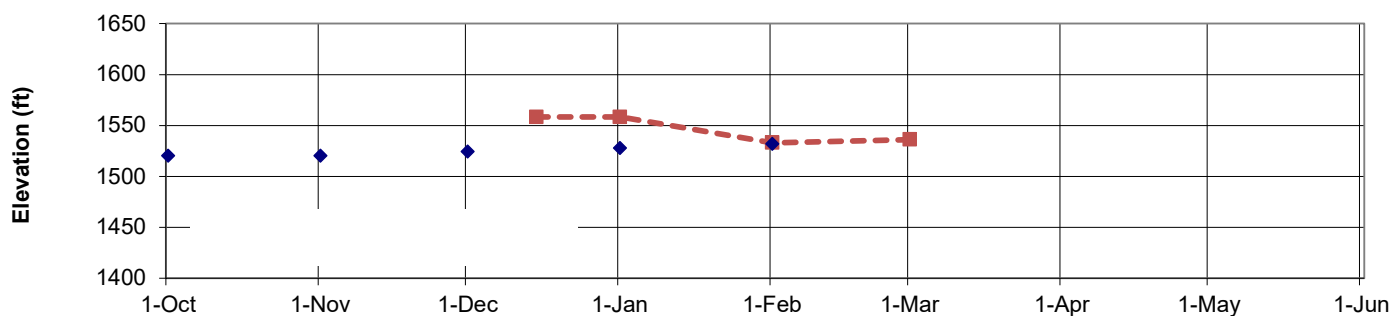
Seasonal Flood Risk Management (assumes no shift of Flood Risk Management space to Grand Coulee)

Seasonal FRM Forecast	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast (KAF)	3100	3100	3063	2843	2432				
First-of-Month Elevation (ft)	1520.2	1520.2	1524.2	1527.8	1531.7				

Seasonal FRM Space	15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr	31-May
Flood Risk Management Space (KAF)	700	700	1057	1013				
Flood Risk Management Elevation (ft)	1558.2	1558.2	1533.0	1536.2				



Dworshak Flood Risk Management Elevations - WY 2021



Dworshak : February Runoff Forecast and Flood Risk Management Calculation

Apr-Jul Runoff Forecast Calculation:

Variable	Month(s)	Units	Observed Value A	Percent of Average	Regression Coefficient B	Marginal Runoff (KAF) = A*B
SOI	Sept		0.90		264.27	237.8
HQSI Cumulative Precipitation	Oct-Date	Inch	17.70	91%	27.04	478.6
Elk Butte SWE	1-Feb	Inch	19.2	83%	12.06	231.6
Cool Creek SWE	1-Feb	Inch	24.3	84%	11.35	275.8
Hoodoo Basin SWE	1-Feb	Inch	21.1	82%	10.97	231.5
Sherwin SWE	1-Feb	Inch	6.8	88%	29.17	198.4
Lost Lake SWE	1-Feb	Inch	27.0	78%	7.60	205.2
Intercept			1		572.93	572.9
1-Feb Forecast	Apr-Jul	KAF				2431.8

Data used in Dworshak Water Supply Forecast:

Climate Data	Sept								
SOI	0.90								
Precipitation Data	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Headquarters, ID (inch)		4.00	4.30	5.10	4.30	--	--	--	
Cumulative HQSI Data (inch)		4.00	8.30	13.40	17.70	--	--	--	
Snow Water Equivalent, 1st of Month	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Elk Butte, ID (inch)				13.0	19.2	--	--		
Cool Creek, ID (inch)				16.4	24.3				
Hoodoo Basin, MT (inch)				14.9	21.1	--	--	--	--
Sherwin, ID (inch)				5.6	6.8	--	--		
Shanghi Summit, ID (inch)								--	--
Lost Lake, ID (inch)				18.8	27.0	--	--	--	--
Hemlock, ID (inch)								--	--
Crater Meadows Mar (inch)						--	--		
Streamflow	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Dworshak Inflow Volume (KAF)				160	205	--	--	--	--

- 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. There is a snow flight scheduled in mid-Feb. to verify snow density in the basin.

Approval:

John J. Heitstuman P.E., D.WRE
Chief Hydrology Section
Walla Walla District USACE

William D. Proctor, P.E.
Ch., Hydrologic Engineering and Power Branch
Columbia Basin Water Management Division