

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	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/>

January 5, 2021

**Hungry Horse Dam – Official Water Supply Forecast
JANUARY 2021**

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

Jan-Jul: 2,200 kaf (105%)

Apr-Aug: 2,035 kaf (105%)

May-Sep: 1,820 kaf (107%)

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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Columbia - Pacific Northwest Region
Boise, ID 83706



Northwest River Forecast Center Water Supply Forecasts

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Choose Date: 01/07/2021 Archive: Water Year

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

Official Water Supply

ESP with 10 Days QPF Ensemble: 2021-01-06 Issued: 2021-01-06

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	74826	88117	95	105899	92704
APR-JUL	62670	74668	94	91154	79855
APR-AUG	69066	82416	94	100401	87532
JAN-SEP	91455	109296	96	128255	114216
JAN-JUL	80231	96440	95	111696	101368
OCT-SEP	106626	124466	95	143426	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2021-01-06 Issued: 2021-01-06

APR-SEP	75827	92114	99	108359	92704
APR-JUL	65067	77615	97	93973	79855
APR-AUG	71404	86434	99	101839	87532
JAN-SEP	96591	114269	100	132624	114216
JAN-JUL	85015	100550	99	118440	101368
OCT-SEP	111762	129439	99	147794	130518

Reference

ESP with 0 Days QPF Ensemble: 2021-01-06 Issued: 2021-01-06

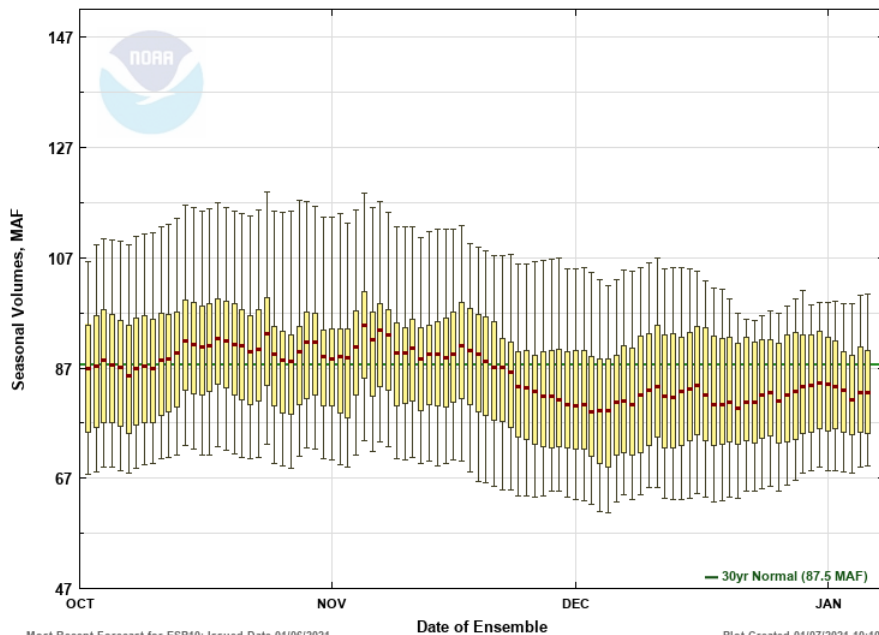
APR-SEP	74743	92456	100	108373	92704
APR-JUL	64078	78591	98	95523	79855
APR-AUG	70362	87014	99	103242	87532
JAN-SEP	95338	114681	100	134287	114216
JAN-JUL	83882	100687	99	119702	101368
OCT-SEP	110510	129851	99	149458	130518

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

Water Supply Forecasts

COLUMBIA - THE DALLES DAM

Period APR to AUG -- 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-AUG)

Forecast Ensemble



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Choose Date: 01/07/2021 Archive: Water Year

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

Official Water Supply

ESP with 10 Days QPF Ensemble: 2021-01-06 Issued: 2021-01-06

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	13897	18858	85	23275	22279
APR-JUL	11948	16552	83	20654	19848
APR-AUG	12888	17762	84	21919	21091
JAN-SEP	19371	25201	84	31887	29872
JAN-JUL	17515	22785	83	28892	27440
OCT-SEP	23468	29298	85	35984	34667

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2021-01-06 Issued: 2021-01-06

APR-SEP	14029	19380	87	23038	22279
APR-JUL	12077	17006	86	20534	19848
APR-AUG	13018	18222	86	21842	21091
JAN-SEP	19564	25936	87	31462	29872
JAN-JUL	17672	23514	86	28799	27440
OCT-SEP	23661	30034	87	35559	34667

Reference

ESP with 0 Days QPF Ensemble: 2021-01-06 Issued: 2021-01-06

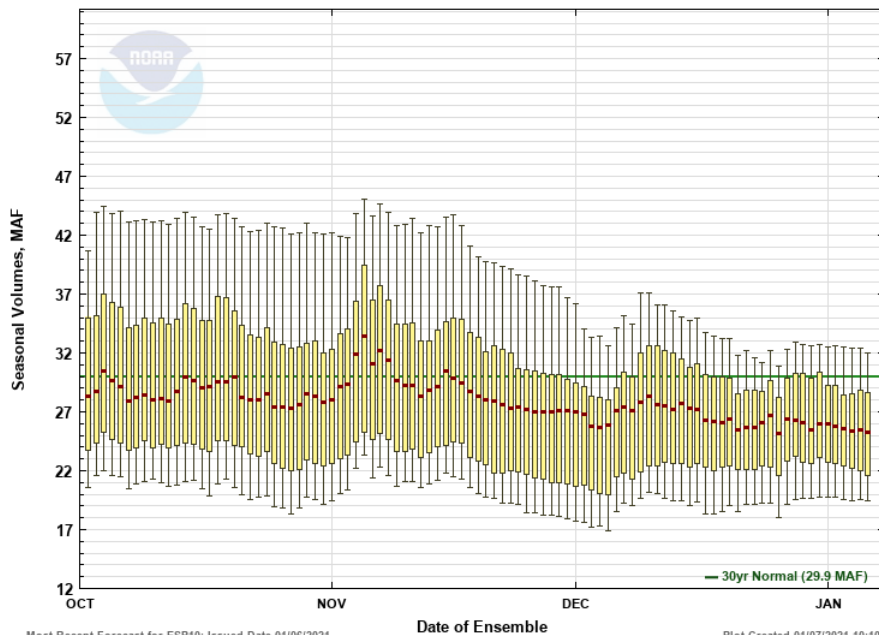
APR-SEP	13916	20092	90	24036	22279
APR-JUL	11969	17590	89	21483	19848
APR-AUG	12906	18924	90	22784	21091
JAN-SEP	19680	26723	89	32945	29872
JAN-JUL	17788	24312	89	30269	27440
OCT-SEP	23778	30820	89	37042	34667

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

Water Supply Forecasts

SNAKE - LOWER GRANITE DAM

Period JAN to SEP -- Water Year 2021



Most Recent Forecast for ESP10: Issued Date 01/06/2021 Plot Created 01/07/2021 10:10

Overlay

ESP10 HEFS ESP0

Data Files

CSV (ESP10 / APR-JUL)

Forecast Ensemble



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Libby : January Runoff Forecast & Flood Risk Management Calculation

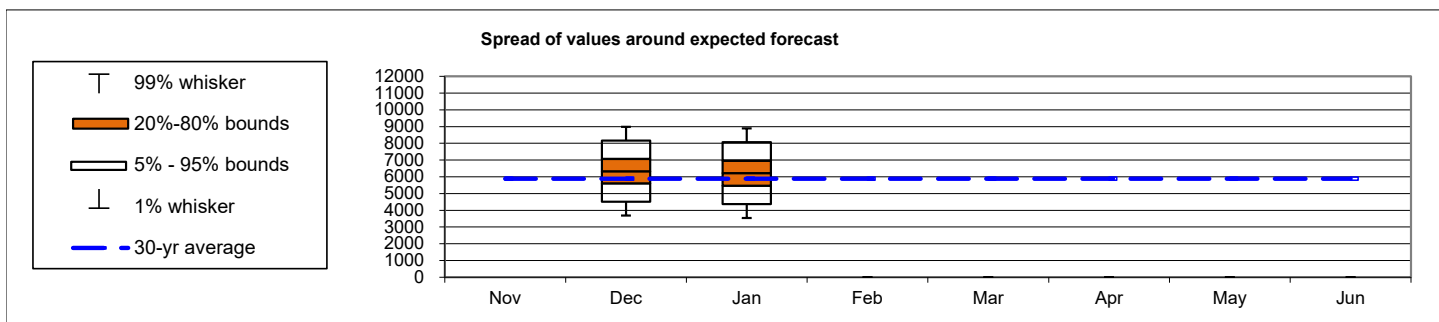
WY 2021

Runoff Forecast	January	1981-2010 Average	1981 - 2010 Percent of Average	1929-2008 Average	1929 - 2008 Percent of Average
Most Probable Runoff Volume: Apr-Aug (kaf)	6215	5885	106%	6282	99%
Most Probable Runoff Volume: Apr-Jul (kaf)	5642	5342	106%	5720	99%
Most Probable Runoff Volume: May-Aug (kaf)	5092	4821	106%	5199	98%

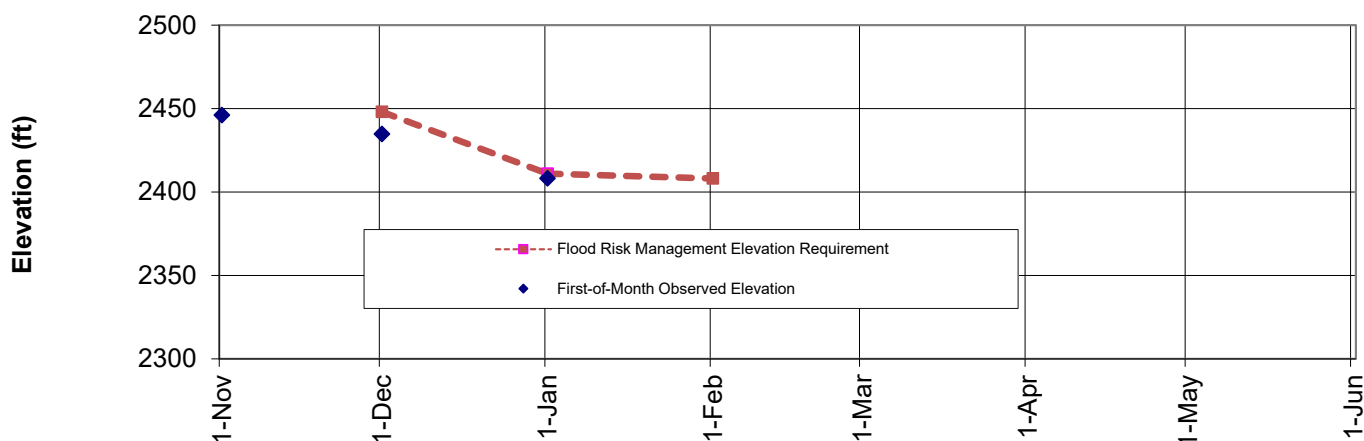
Flood Risk Management	January
31-Jan Flood Risk Management Space (kaf)	2105
31-Jan Flood Risk Management Elevation (ft)	2408.1

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

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



Libby Flood Risk Management Elevations January- 2021



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.
- Fernie forecast data is supplemented with alternate gage data provided by Government of Canada's Historical Climate Database found on their website: <https://climate.weather.gc.ca/>. This alternate gage data is used for 01 October - 13 November.
- Cranbrook A gage data was intermittent in the month of December. Nearby Cranbrook Airport Auto gage data was used instead.

Libby : January Runoff Forecast & Flood Risk Management Calculation

Apr-Aug Runoff Forecast Calculation:

Variable	Month(s)	Units	Observed Value A	Percent of Average	Regression Coefficient B	Marginal Runoff (KAF) =A*B
SOI	Σ Jun:Jul		0.00		95.28	0.0
Eureka RS, MT	Σ Oct:Dec Prcp	inches	3.67	108%	141.74	520.2
West Glacier, MT	Σ Oct:Dec Prcp	inches	11.18	124%	58.42	653.1
Cranbrook A, BC	Σ Oct:Dec Prcp	millimeters	75.80	83%	4.58	347.2
Fernie, BC	Σ Oct:Dec Prcp	millimeters	383.48	105%	1.20	460.2
Hawkins Lake, MT	1-Jan SWE	inches				
Stahl Peak, MT	1-Jan SWE	inches	16.10	99%	34.63	557.5
East Creek, BC	1-Jan SWE	millimeters				
Moyie Mountain, BC	1-Jan SWE	millimeters	166.00	93%	1.59	263.1
Sunshine Village, AB	1-Jan SWE	millimeters	322.24	118%	2.14	689.6
Akamina Pass, AB	1-Jan SWE	millimeters				
South Racehorse Creek, AB	1-Jan SWE	millimeters				
Intercept			1		2724.44	2724.4
January Forecast	April - August	kaf				6215.3

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					
West Glacier, MT (inch)	4.52	4.32	2.34					
Cranbrook A, BC (mm)	27.60	21.90	26.30					
Fernie, BC (mm)	118.80	158.00	106.68					
Snow Water Equiv	1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Hawkins Lake, MT (inch)								
Stahl Peak, MT (inch)			16					
East Creek, BC (mm)								
Moyie Mountain, BC (mm)			166					
Sunshine Village, AB (mm)			322					
Akamina Pass, AB (mm)								
South Racehorse Creek, AB (mm)								
Streamflow	1-Nov	1-Dec	Jan	Feb	Mar	Apr	May	Jun
Libby Inflow Volume (kaf)								
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					

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 Approving Official
 Ch., Hydrologic Engineering and Power Branch
 Northwestern Division

Jonathan Moen
 Upper Columbia Senior Water Manager
 Seattle District

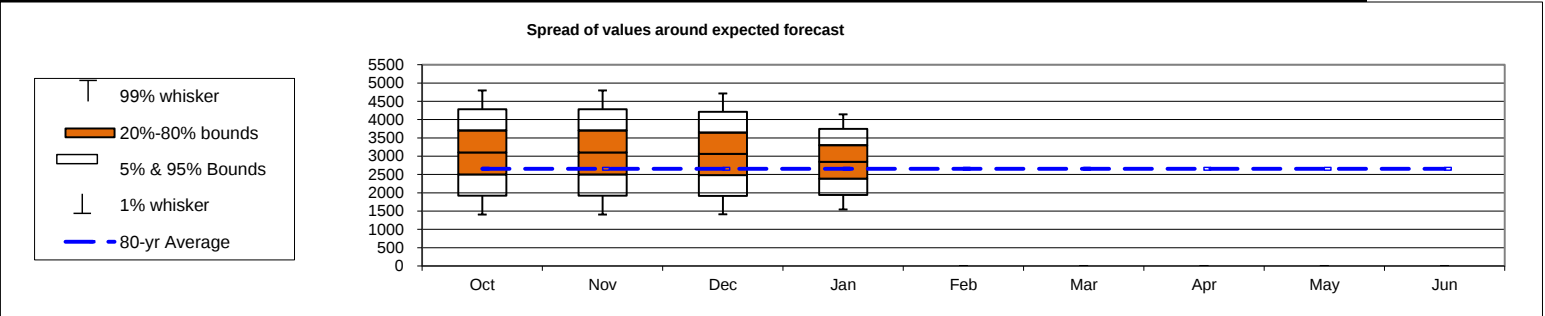
Runoff Forecast	January Value	1981-2010 Average	1981 - 2010 Percent of Average	1929-2008 Average	1929 - 2008 Percent of Average
Most Probable Runoff Volume: Apr-Jul (KAF)	2843	2438	117%	2655	107%
Most Probable Runoff Volume: May-Jul (KAF)	2080	1784	117%	1959	106%

Flood Risk Management (FRM)	January Value
31-January Flood Risk Management Space (KAF)	1057
31-January Flood Risk Management Elevation (ft)	1533.0

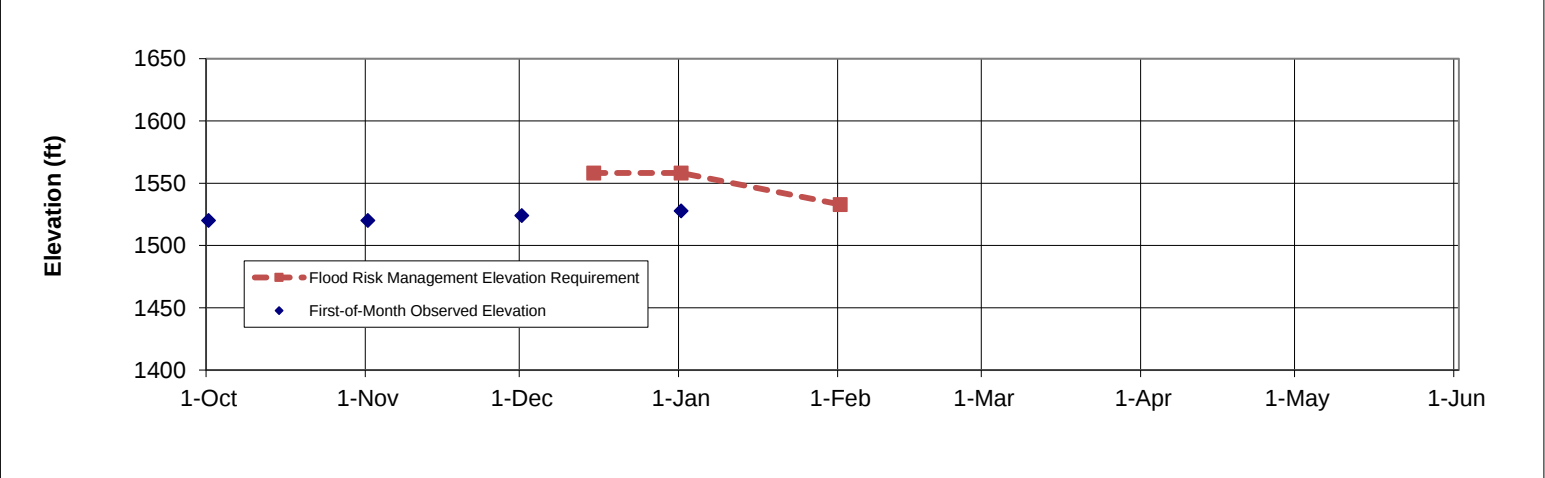
Seasonal Flood Risk Management (assumes no shift of Flood Risk Management space to Grand Coulee)

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

Seasonal FRM Space	15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr	31-May
Flood Risk Management Space	700	700	1057					
Flood Risk Management Elevation	1558.2	1558.2	1533.0					



Dworshak Flood Risk Management Elevations - WY 2021



Dworshak : January 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		355.71	320.1
HQSI Cumulative Precipitation	Oct-Date	Inch	13.40	96%	48.12	644.8
Elk Butte SWE	1-Jan	Inch	13.00	88%	6.25	81.3
Cool Creek SWE	1-Jan	Inch	16.4	91%	9.96	163.3
Hoodoo Basin SWE	1-Jan	Inch	14.9	88%	12.22	182.1
Sherwin SWE	1-Jan	Inch	5.6	123%	44.69	252.1
Lost Lake SWE	1-Jan	Inch	18.8	82%	4.24	79.6
Intercept			1		1119.86	1119.9
1-Jan Forecast	Apr-Jul	KAF				2843.2

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	-	-	-	-	
Cumulative HQSI Data (inch)		4.00	8.30	13.40	-	-	-	-	
Snow Water Equivalent, 1st of Month	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Elk Butte, ID (inch)				13.0	--	--	--		
Cool Creek, ID (inch)				16.4	--				
Hoodoo Basin, MT (inch)				14.9	--	--	--	--	--
Sherwin, ID (inch)				5.6	--	--	--		
Shanghi Summit, ID (inch)								--	--
Lost Lake, ID (inch)				18.8	--	--	--	--	--
Hemlock, ID (inch)								--	--
Crater Meadows Mar (inch)						--	--		
Streamflow	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Dworshak Inflow Volume (KAF)				160	--	--	--	--	--

- 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.

Approval:

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