

The Official Water Supply Forecast for January through July is 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 **MARCH** 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/>

Hungry Horse Dam – Official Water Supply Forecast MARCH 2020

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

- Mar-Jul: 2,160 kaf (109%)
- Apr-Jul: 2,000 kaf (107%)
- Apr-Aug: 2,070 kaf (107%)
- May-Sep: 1,830 kaf (108%)

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

Home Data/Normals Rankings ENSO / Runoff Adjustments Verification Verify All Years Archive Monthly Water Supply Forecasts

COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2020

Official Water Supply

ESP with 10 Days QPF Ensemble: 2020-03-04 Issued: 2020-03-04

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	86583	92394	100	106561	92704
APR-JUL	74733	79338	99	91256	79855
APR-AUG	81648	87043	99	100579	87532
JAN-SEP	105666	110895	97	125680	114216
JAN-JUL	93303	97882	97	110066	101368
OCT-SEP	117990	123219	94	138004	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-03-04 Issued: 2020-03-04

APR-SEP	86453	97557	105	106466	92704
APR-JUL	74074	83353	104	92023	79855
APR-AUG	80324	91855	105	100491	87532
JAN-SEP	105039	115362	101	126818	114216
JAN-JUL	93999	102291	101	114349	101368
OCT-SEP	117363	127686	98	139142	130518

Reference

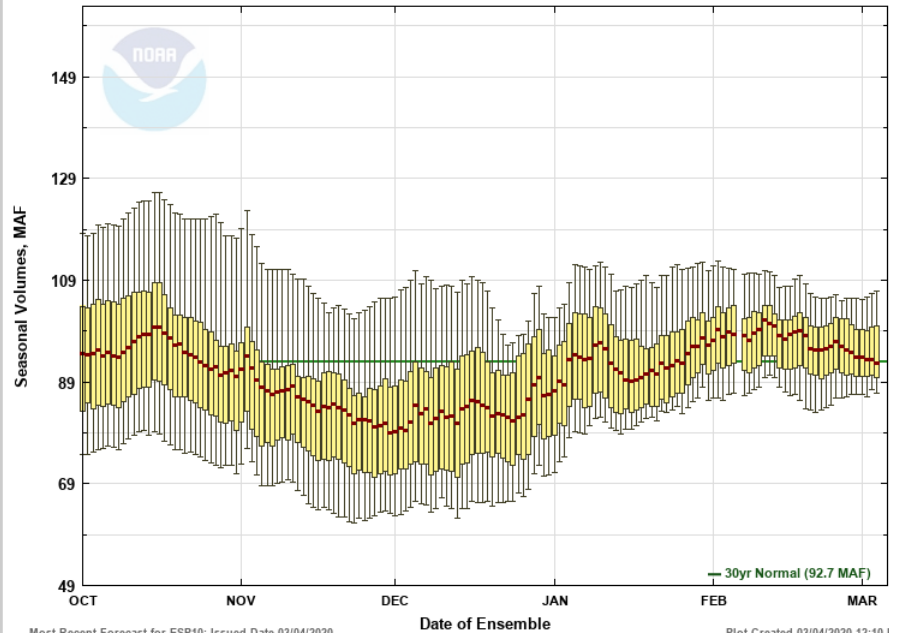
ESP with 0 Days QPF Ensemble: 2020-03-03 Issued: 2020-03-03

APR-SEP	85044	97568	105	108098	92704
APR-JUL	72779	83303	104	95537	79855
APR-AUG	79119	91413	104	103145	87532
JAN-SEP	105789	116772	102	129519	114216
JAN-JUL	93136	102970	102	115757	101368
OCT-SEP	118114	129096	99	141843	130518

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

Water Supply Forecasts

COLUMBIA - THE DALLES DAM
Period: APR to SEP -- Water Year 2020



Most Recent Forecast for ESP10: Issued Date 03/04/2020

Plot Created 03/04/2020 12:10

☐ 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-SEP)

Forecast Ensemble



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Northwest River Forecast Center Water Supply Forecasts

Home Data/Normals Rankings ENSO / Runoff Adjustments Verification Verify All Years Archive Monthly Water Supply Forecasts

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

Official Water Supply

ESP with 10 Days QPF Ensemble: 2020-03-04 Issued: 2020-03-04

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	16659	19176	86	24171	22279
APR-JUL	14567	16773	85	21280	19848
APR-AUG	15598	17863	85	22786	21091
JAN-SEP	22582	24995	84	30547	29872
JAN-JUL	20499	22635	82	27570	27440
OCT-SEP	26497	28910	83	34461	34667

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-03-04 Issued: 2020-03-04

APR-SEP	17176	20503	92	24985	22279
APR-JUL	14931	17942	90	22343	19848
APR-AUG	16071	19412	92	23748	21091
JAN-SEP	23049	26157	88	30828	29872
JAN-JUL	20883	23787	87	28186	27440
OCT-SEP	26964	30072	87	34743	34667

Reference

ESP with 0 Days QPF Ensemble: 2020-03-04 Issued: 2020-03-04

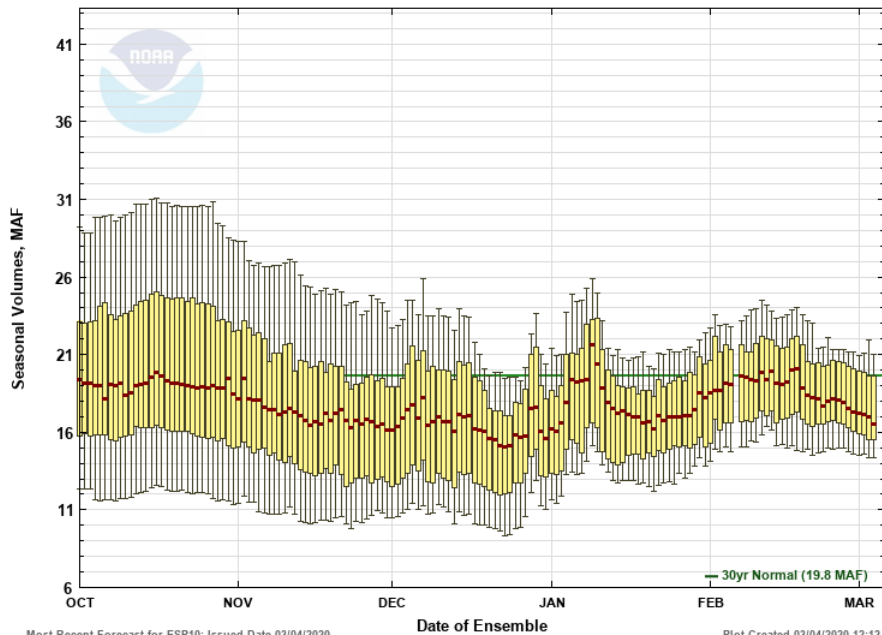
APR-SEP	17065	20976	94	24359	22279
APR-JUL	14938	18239	92	21541	19848
APR-AUG	16005	19680	93	22983	21091
JAN-SEP	23192	26924	90	32193	29872
JAN-JUL	20950	24521	89	29532	27440
OCT-SEP	27107	30838	89	36108	34667

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

Overlay

ESP10

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ESP0

Data Files

CSV (ESP10 / APR-JUL)

Forecast Ensemble



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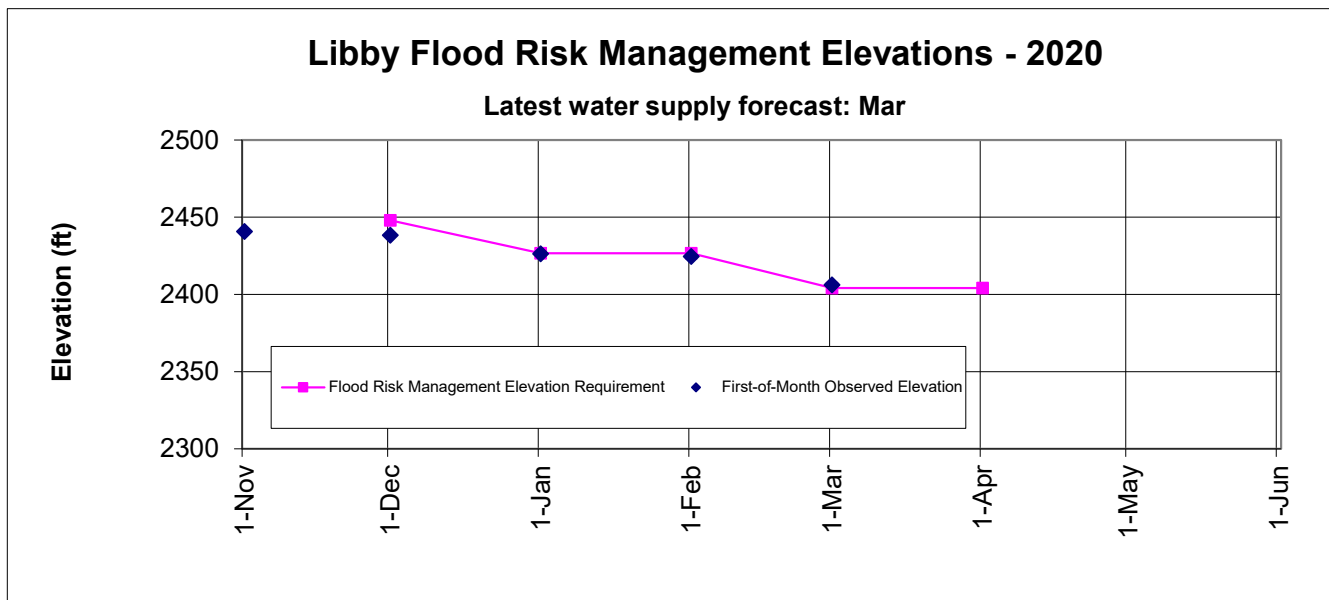
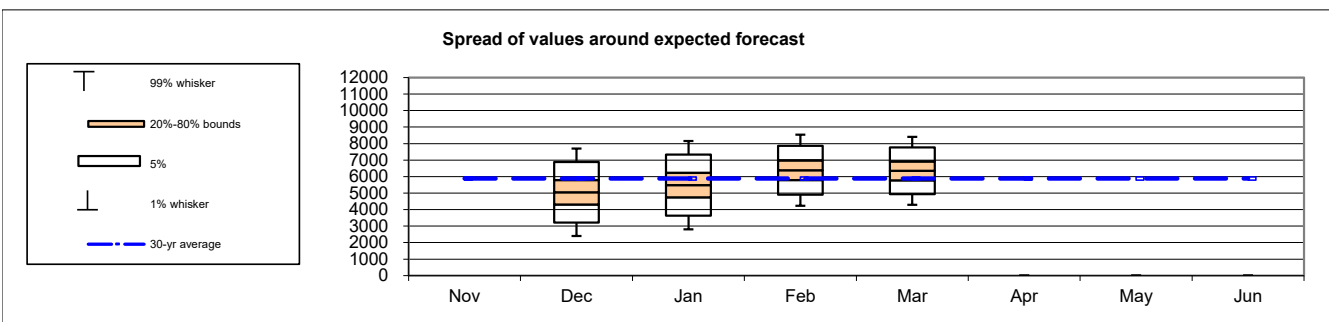
Libby : March Runoff Forecast & Flood Risk Management Calculation

WY 2020

Runoff Forecast and Flood Risk Management			
Most Probable Runoff Volume:	Apr-Aug	6349	KAF
	Apr-Jul	5763	KAF
	May-Jul	5201	KAF
31-Mar Flood Risk Management Space		2243	KAF
31-Mar Flood Risk Management Elevation		2404.1	ft

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	108%	6282	101%
5342	108%	5720	101%
4821	108%	5199	100%

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	6386	6349			
First-of-Month Elev	2440.8	2438.4	2426.4	2424.6	2406.2			
Date >>	30-Nov	31-Dec	31-Jan	29-Feb	31-Mar	30-Apr		
Flood Risk Management Space	500	1400	1400	2240	2243			
Flood Risk Management Elevation	2448.0	2426.7	2426.7	2404.2	2404.1			



Notes:

1. The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Jon Moen (206) 764-3561, Alex Nathan (206) 316-3155, 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. The Akamina Pass snow station was destroyed in a fire in Sept. 2017. Akamina Pass SWE was estimated based on a regression equation and observed values at nearby sites Grave Creek, Poorman Creek, Lost Creek South, and Mount Odlum.

Libby : March 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	ΣJun:Jul					
Eureka RS, MT	ΣOct:Feb Prcp	inches	3.92	79%	65.9	258.2
West Glacier, MT	ΣOct:Feb Prcp	inches	14.22	100%	28.5	405.4
Cranbrook A, BC	ΣOct:Feb Prcp	millimeters	90.60	67%	2.7	247.3
Fernie, BC	ΣOct:Feb Prcp	millimeters	636.00	111%	0.6	400.7
Hawkins Lake, MT	1-Mar SWE	inches	22.20	110%	24.3	540.1
Stahl Peak, MT	1-Mar SWE	inches	34.20	120%	19.1	653.6
East Creek, BC	1-Mar SWE	millimeters	893.00	126%	0.7	580.5
Moyie Mountain, BC	1-Mar SWE	millimeters	404.00	114%	1.3	513.1
Sunshine Village, AB	1-Mar SWE	millimeters	512.19	110%	1.3	645.4
Akamina Pass, AB	1-Mar SWE	millimeters	444.48	114%	1.0	462.3
South Racehorse Creek, AB	1-Mar SWE	millimeters	357.59	103%	1.4	500.6
Intercept			1		1142.0	1142.0
1-Mar Forecast (KAF)					Σ	6349.1

Data used in Libby Water Supply Forecast

WY 2020

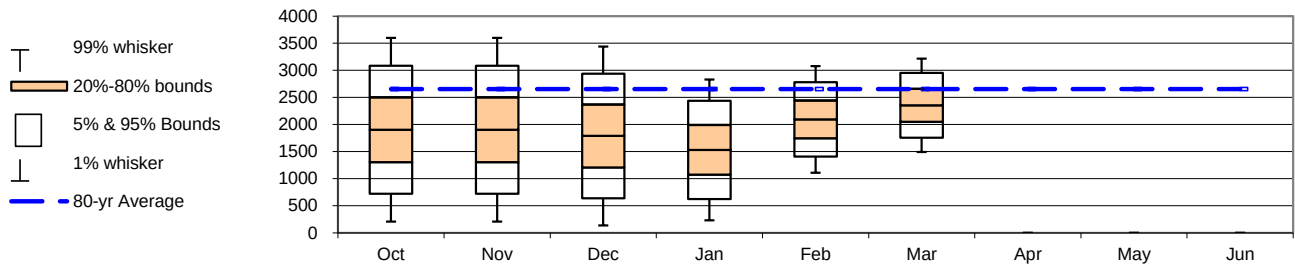
Climate Data				Jun-19	Jul-19				
SOI				-0.50	-0.40				
Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Units
Eureka RS, MT	0.75	1.23	0.46	1.01	0.47				inch
West Glacier, MT	2.08	1.65	2.69	5.81	1.99				inch
Cranbrook A, BC	16.60	14.30	28.60	22.90	8.20				mm
Fernie, BC	103.00	35.00	216.00	185.00	97.00				mm
Snow Water Equiv			1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units
Hawkins Lake, MT				19	22				inch
Stahl Peak, MT			15	29	34				inch
East Creek, BC				778	893				mm
Moyie Mountain, BC			193	320	404				mm
Sunshine Village, AB			273	408	512				mm
Akamina Pass, AB				363	444				mm
South Racehorse Creek, AB				289	358				mm
Streamflow			Jan	Feb	Mar	Apr	May	Jun	Units
Libby Inflow Volume			172.2	209.1					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	2424.6	2406.2				feet

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

Jonathan Moen
 Water Management Section
 Seattle District

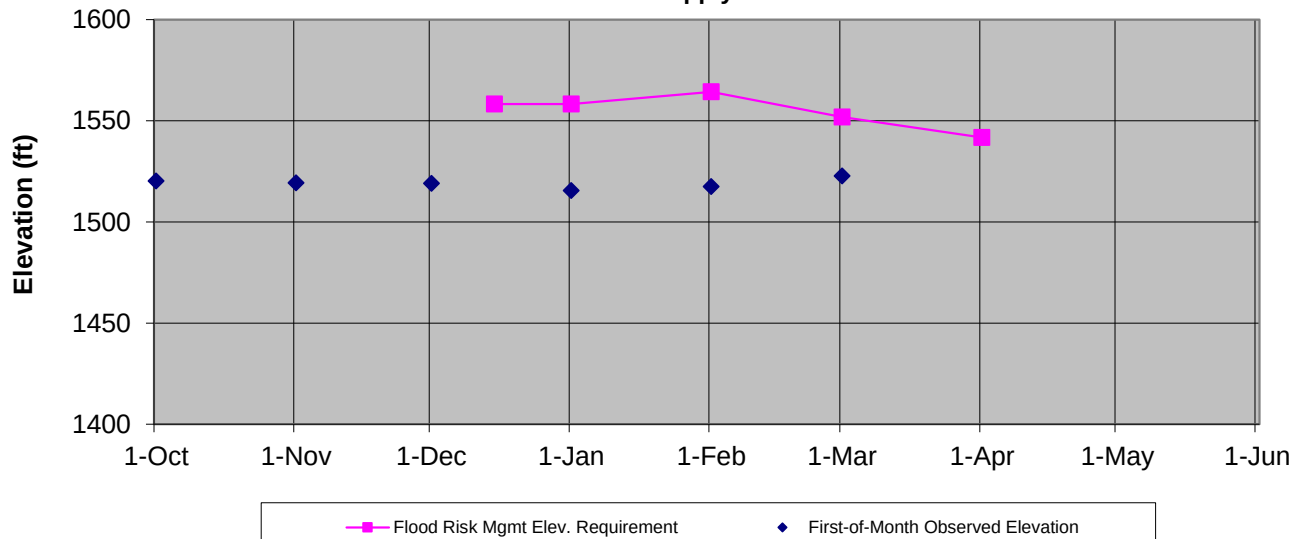
Runoff Forecast and Flood Risk Management (FRM)						1981-2010 Average	Percent of 30yr Average	1929-2008 Average	Percent of Average	
Most Probable Runoff Volume				Apr-Jul	2355	KAF	2438	97%	2655	89%
				May-Jul	1723	KAF	1784	97%	1959	88%
31-Mar Flood Risk Management Space				936	KAF					
31-Mar Flood Risk Management Elevation				1541.7	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	2095	2355			
First-of-Month Elev		1520.3	1519.3	1519.0	1515.4	1517.4	1522.7			
Date >>		15-Dec	31-Dec	31-Jan	29-Feb	31-Mar	15-Apr	30-Apr	31-May	
FRM Space		--	700	700	610	793	936			
FRM Elevation		--	1558.2	1558.2	1564.3	1551.9	1541.7			

Spread of values around expected forecast



Dworshak Flood Risk Management Elevations - WY 2020

Latest water supply forecast: Mar



Dworshak : March Runoff Forecast & Flood Risk Management Calculation

Apr-Jul Runoff Forecast Calculation					
Variable	Month	Observed Value	% of Average	Regression Coefficient	Marginal Runoff (KAF)
		A		B	=A*B
SOI	Sep	-1.20		220.73	-264.9
HQSI Cumulative Precip	Oct-Date	20.40	91%	23.39	477.2
Elk Butte SWE	1-Mar	35.2	120%	10.16	357.6
Hoodoo Basin SWE	1-Mar	33.1	102%	10.01	331.3
Sherwin SWE	1-Mar	10.5	121%	25.42	266.9
Lost Lake SWE	1-Mar	46.1	107%	6.99	322.2
Crater meadows SWE	1-Mar	43.5	123%	13.06	568.1
Intercept		1		296.75	296.8
1-Mar Forecast (KAF)				Σ	2355.3

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	7.60	4.10	--	--		
Cumulative HQSI Data	3.30	5.20	8.70	16.30	20.40	--	--		
Snow Water Equiv (First of Month values) (in)									
Elk Butte, ID				8.8	26.2	35.2	--		
Cool Creek, ID				10.2	28.5				
Hoodoo Basin, MT				9.4	25.1	33.1	--	--	--
Sherwin, ID				2.3	7.9	10.5	--		
Shanghi Summit, ID								--	--
Lost Lake, ID				10.9	33.3	46.1	--	--	--
Hemlock, ID								--	--
Crater Meadows Mar						43.5	--		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				138	160	--	--	--	--

Notes:

1. The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact 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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Ch., Hydrologic Engineering and Power Branch
Columbia Basin Water Management Division