

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 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 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/>

1-June-2020

Hungry Horse Dam – Official Water Supply Forecast

JUNE 2020

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

- Jun-Jul: 1,100 kaf (128%)
- Apr-Aug: 2,440 kaf (126%)
- May-Sep: 2,200 kaf (130%)

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: 2020-06-03 Issued: 2020-06-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	96514	99471	107	103059	92704
APR-JUL	83691	85565	107	88556	79855
APR-AUG	91145	93436	107	97509	87532
JAN-SEP	113502	116459	102	120046	114216
JAN-JUL	100678	102552	101	105544	101368
OCT-SEP	125826	128784	99	132371	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-06-03 Issued: 2020-06-03

APR-SEP	94824	98086	106	103561	92704
APR-JUL	81757	84322	106	87820	79855
APR-AUG	89234	92563	106	97671	87532
JAN-SEP	111811	115074	101	120549	114216
JAN-JUL	98745	101310	100	104807	101368
OCT-SEP	124136	127398	98	132874	130518

Reference

ESP with 0 Days QPF Ensemble: 2020-06-03 Issued: 2020-06-03

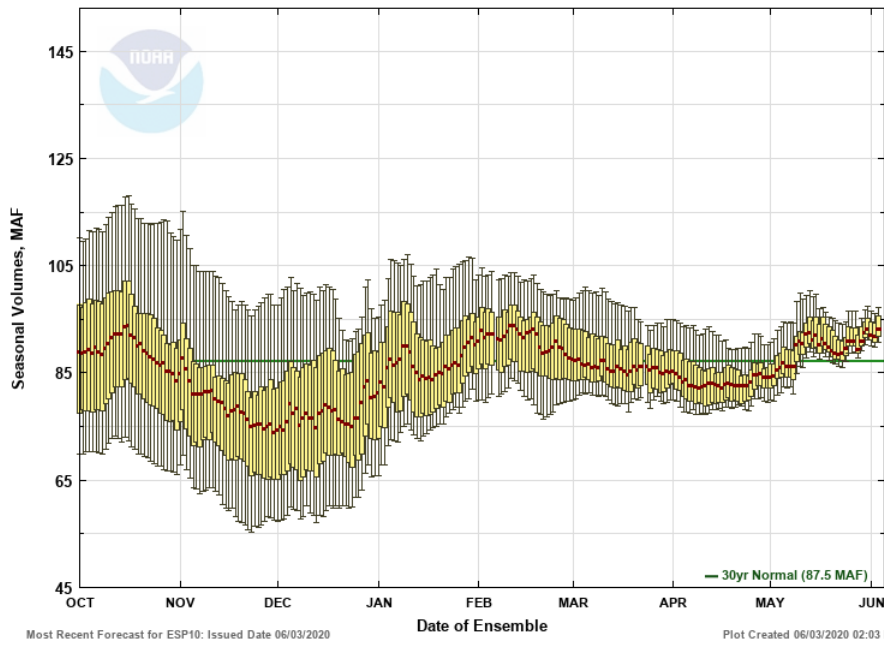
APR-SEP	95639	97511	105	103403	92704
APR-JUL	81608	84182	105	87833	79855
APR-AUG	89282	92088	105	97282	87532
JAN-SEP	112627	114499	100	120391	114216
JAN-JUL	98596	101170	100	104821	101368
OCT-SEP	124952	126824	97	132716	130518

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 2020



Most Recent Forecast for ESP10: Issued Date 06/03/2020

Plot Created 06/03/2020 02:03

☐ 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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Northwest River Forecast Center Water Supply Forecasts

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

Official Water Supply

ESP with 10 Days QPF Ensemble: 2020-06-03 Issued: 2020-06-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	20632	21016	94	21736	22279
APR-JUL	18232	18574	94	19006	19848
APR-AUG	19465	19803	94	20353	21091
JAN-SEP	26116	26500	89	27221	29872
JAN-JUL	23716	24058	88	24490	27440
OCT-SEP	30031	30415	88	31135	34667

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-06-03 Issued: 2020-06-03

APR-SEP	20113	20791	93	21963	22279
APR-JUL	17799	18259	92	19330	19848
APR-AUG	18973	19500	92	20665	21091
JAN-SEP	25598	26275	88	27447	29872
JAN-JUL	23283	23743	87	24814	27440
OCT-SEP	29512	30190	87	31362	34667

Reference

ESP with 0 Days QPF Ensemble: 2020-06-03 Issued: 2020-06-03

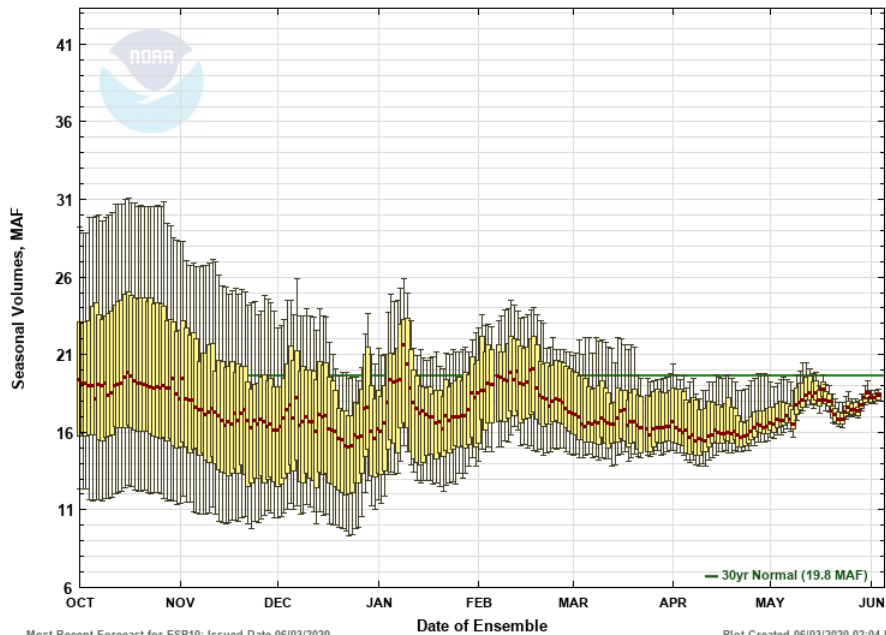
APR-SEP	19878	20564	92	21878	22279
APR-JUL	17561	18062	91	19167	19848
APR-AUG	18747	19266	91	20584	21091
JAN-SEP	25362	26048	87	27362	29872
JAN-JUL	23045	23546	86	24651	27440
OCT-SEP	29277	29963	86	31277	34667

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



Most Recent Forecast for ESP10: Issued Date 06/03/2020

Plot Created 06/03/2020 02:04

☐ 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 : June Runoff Forecast & Flood Control Calculation

WY 2020

Runoff Forecast and Flood Control

Most Probable Runoff Volume:

Apr-Aug	5795	KAF
Apr-Jul	5262	KAF
May-Jul	4918	KAF

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	98%	6282	92%
5342	98%	5720	92%
4821	102%	5199	95%

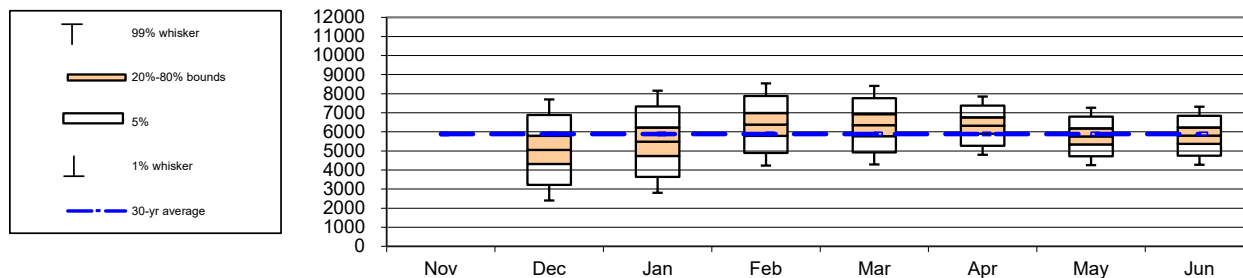
Seasonal Flood Control

VARQ Flood Control Implemented

Forecast Date >>	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast		5050	5481	6386	6349	6324	5759	5795
First-of-Month Elev	2440.8	2438.4	2426.4	2424.6	2406.2	2404.0	2405.5	2421.5

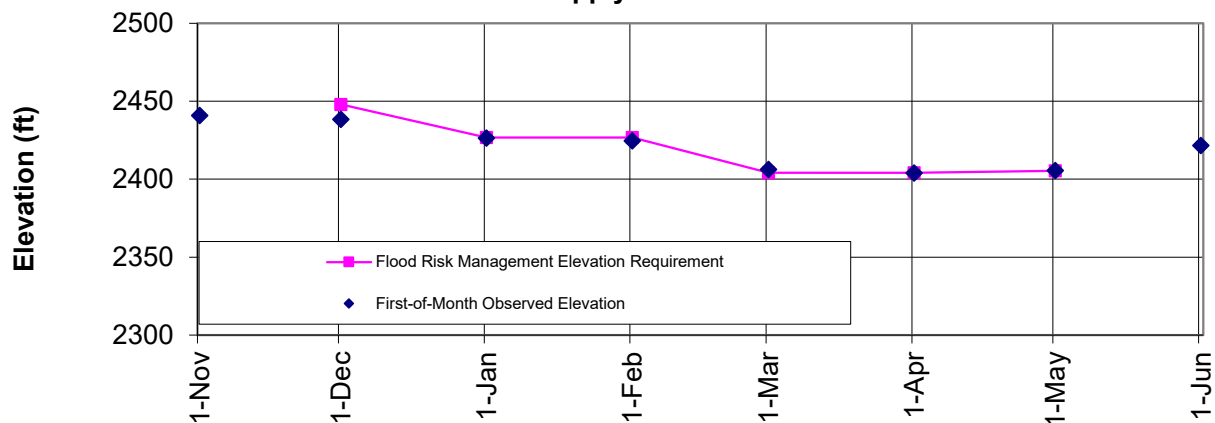
Date >>	30-Nov	31-Dec	31-Jan	29-Feb	31-Mar	30-Apr	
Flood Control Space	500	1400	1400	2240	2243	2202	
Flood Control Elevation	2448.0	2426.7	2426.7	2404.2	2404.1	2405.3	

Spread of values around expected forecast



Libby Flood Control Elevations - 2020

Latest water supply forecast: Jun



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, Morrissey Ridge, and Mount Odium.
4. Due to COVID-19, there were no overnight observers at Cranbrook A meaning no precipitation measurements were reported. The Cranbrook Airport Auto station was used instead.
5. Fernie, BC data was from direct communication with Environment and Climate Change Canada.

Libby : June Runoff Forecast & Flood Control Calculation

Apr-Aug Runoff Forecast Calculation:						
<i>Variable</i>	<i>Month(s)</i>	<i>Units</i>	<i>Observed Value</i>	<i>Percent of Average</i>	<i>Regression Coefficient</i>	<i>Marginal Runoff (KAF)</i>
			A		B	=A*B
SOI	ΣJun:Jul					
Eureka RS, MT	ΣOct:May Prcp	inches	7.99	92%	37.7	300.9
West Glacier, MT	ΣOct:May Prcp	inches	20.24	96%	22.5	454.7
Cranbrook A, BC	ΣOct:May Prcp	millimeters	180.70	78%	2.0	366.9
Fernie, BC	ΣOct:May Prcp	millimeters	922.20	109%	0.5	463.0
Hawkins Lake, MT	1-Jun SWE	inches	2.00	16%	10.1	20.2
Stahl Peak, MT	1-Jun SWE	inches	36.70	126%	10.3	378.3
East Creek, BC	1-Jun SWE	millimeters	818.00	112%	0.4	353.6
Moyie Mountain, BC	1-Jun SWE	millimeters	0.00	0%	0.8	0.0
Sunshine Village, AB	1-Jun SWE	millimeters	539.60	113%	0.6	335.3
Akamina Pass, AB	1-Jun SWE	millimeters	96.20	154%	0.7	65.4
South Racehorse Creek, AB	1-Jun SWE	millimeters	7.60	8%	0.6	4.9
Intercept			1		978.0	978.0

Forecast June-August Inflow (KAF)	Σ	3721.0
Observed April-May Inflow (KAF)		2074.5
1-June Forecast, April-August Inflow (KAF)	Σ	5795.5

Data used in Libby Water Supply Forecast**WY 2020**

<i>Climate Data</i>				<i>Jun-19</i>	<i>Jul-19</i>				
SOI				-0.50	-0.40				
<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>	<i>Units</i>
Eureka RS, MT	0.75	1.23	0.46	1.01	0.47	0.47	0.93	2.67	inch
West Glacier, MT	2.08	1.65	2.69	5.81	1.99	1.26	1.22	3.54	inch
Cranbrook A, BC	16.60	14.30	28.60	22.90	8.20	18.00	13.90	58.20	mm
Fernie, BC	103.00	35.00	216.00	185.00	97.00	82.00	45.40	158.80	mm
<i>Snow Water Equiv</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>	<i>Units</i>
Hawkins Lake, MT				19	22	26	25	2	inch
Stahl Peak, MT			15	29	34	40	40	37	inch
East Creek, BC				778	893	1050	1057	818	mm
Moyie Mountain, BC			193	320	404	526	500	0	mm
Sunshine Village, AB			273	408	512	614	624	540	mm
Akamina Pass, AB				363	444	527	328	96	mm
South Racehorse Creek, AB				289	358	468	360	8	mm
<i>Streamflow</i>			<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Units</i>
Libby Inflow Volume			172.2	209.1	171.0	343.8	1730.7		KAF
<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>	<i>Units</i>
Libby FOM Elev	2440.8	2438.4	2426.4	2424.6	2406.2	2404.0	2405.5	2421.5	feet

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

Jon Moen
 Upper Columbia Senior Water Manager
 Seattle District

Dworshak : June Runoff Forecast & Flood Risk Management Calculation

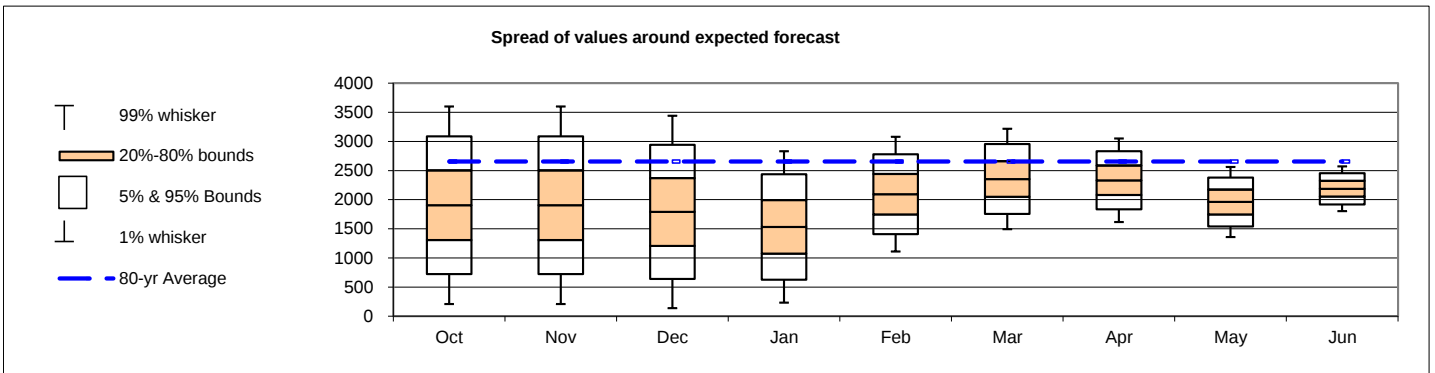
WY 2020

Runoff Forecast and Flood Risk Management (FRM)				1981-2010 Average	Percent of 30yr Average	1929-2008 Average	Percent of Average
	Apr-Jul	2187	KAF	2438	90%	2655	82%
	May-Jul	1669	KAF	1784	94%	1959	85%
	Jun-Jul	611	KAF	853	72%	914	67%

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

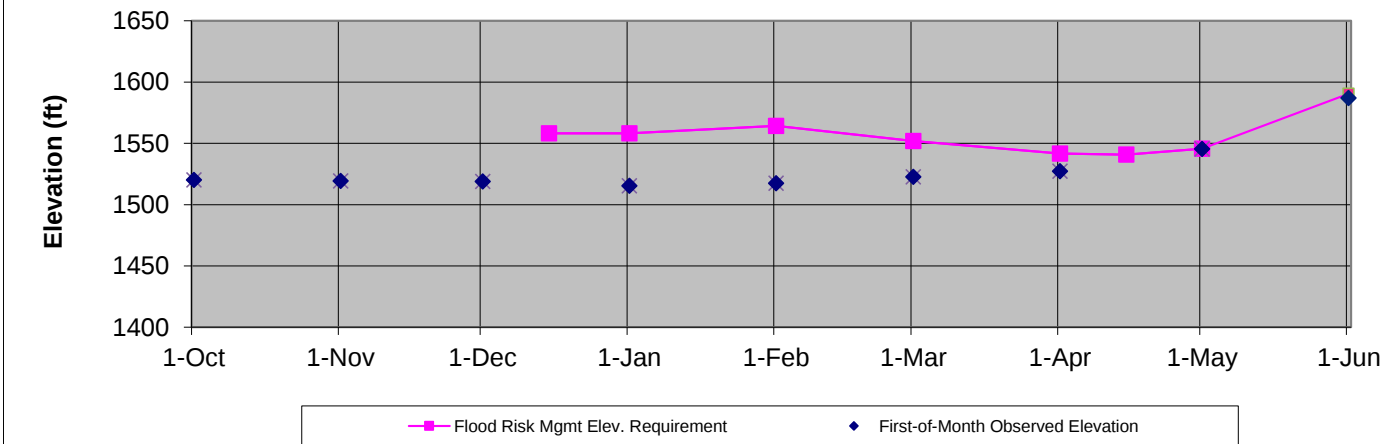
Forecast Date>>	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast	1904	1904	1789	1532	2095	2355	2333	1960	2187
First-of-Month Elev	1520.3	1519.3	1519.0	1515.4	1517.4	1522.7	1527.2	1545.4	1587.0

Date >>	15-Dec	31-Dec	31-Jan	29-Feb	31-Mar	15-Apr	30-Apr	31-May	
FRM Space	--	700	700	610	793	936	950	883	176
FRM Elevation	--	1558.2	1558.2	1564.3	1551.9	1541.7	1540.8	1545.6	1590.5



Dworshak Flood Risk Management Elevations - WY 2020

Latest water supply forecast: Jun



Dworshak : June Runoff Forecast & Flood Risk Management Calculation

Apr-Jul Runoff Forecast Calculation					
Variable	Month	Observed Value	% of Average	Regression Coefficient	Regression Runoff (KAF)
		A		B	=A*B
Hoodoo Basin SWE	1-Jun	27.7	107%	8.21	227.4
Shanghi Summit SWE	1-Jun	0.0	0%	10.26	0.0
Lost Lake SWE	1-Jun	33.3	102%	6.14	204.5
Hemlock SWE	1-Jun	5.3	30%	7.57	40.1
Intercept		1		138.78	138.8
1-Jun Forecast (KAF)				Σ	610.8

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	2.30	1.90		
Cumulative HQSI Data	3.30	5.20	8.70	16.30	20.40	22.70	24.60		
Snow Water Equiv (First of Month values) (in)									
Elk Butte, ID				8.8	26.2	35.2	40.0		
Cool Creek, ID				10.2	28.5				
Hoodoo Basin, MT				9.4	25.1	33.1	36.9	41.0	27.7
Sherwin, ID				2.3	7.9	10.5	6.4		
Shanghi Summit, ID								6.8	0.0
Lost Lake, ID				10.9	33.3	46.1	52.5	50.4	33.3
Hemlock, ID								37.9	5.3
Crater Meadows Mar						43.5	49.7		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				138	160	209	518	1058	--

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).

Approval:

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Columbia Basin Water Management Division