

The Official WSF is computed on the 3rd work day of the month, January through July, using the 5-day QPF 50% exceedance value. FRM is computed at standard intervals and posted online at: <http://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

March 2, 2018

**Hungry Horse Dam – Official Water Supply Forecast
MARCH 2018**

The volumes for the March 2018 final forecast for Hungry Horse Inflows are:

Mar-Jul: 2674 kaf (136%)

Jan-Jul: 2863 kaf (136%)

Apr-Aug: 2633 kaf (136%)

May-Sep: 2302 kaf (136%)

The minimum flows downstream of Hungry Horse for the rest of the calendar year are as follows:

Columbia Falls: 3500 cfs

Hungry Horse: 900 cfs

Thanks,

Peter Cooper, P.E.
River and Reservoir Operations
U.S. Bureau of Reclamation
PN Regional Office
Boise, ID 83706



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COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2018

Official Forecast

10 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	96084	103937	112	113970	92704
APR-JUL	81565	88905	111	101418	79855
APR-AUG	89963	97951	112	108911	87532
JAN-SEP	118153	127129	111	138446	114216
JAN-JUL	104239	112141	111	124603	101368
OCT-SEP	134369	143344	110	154662	130518

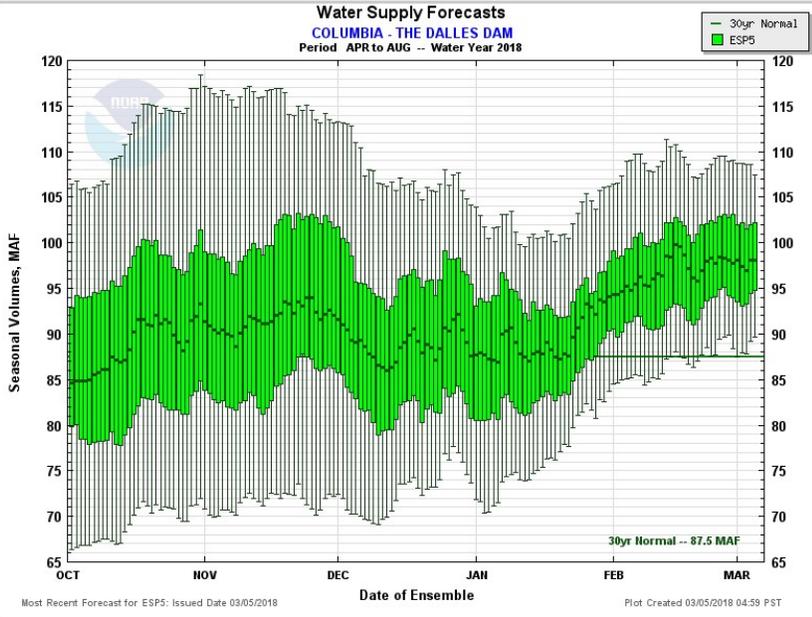
5 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	94487	105124	113	115006	92704
APR-JUL	81541	90009	113	99677	79855
APR-AUG	89626	98132	112	107425	87532
JAN-SEP	117775	128375	112	141267	114216
JAN-JUL	104373	113994	112	127167	101368
OCT-SEP	133990	144590	111	157483	130518

0 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	94640	105184	113	115911	92704
APR-JUL	81300	89916	113	100812	79855
APR-AUG	88806	99098	113	110620	87532
JAN-SEP	118061	128347	112	141100	114216
JAN-JUL	105595	114125	113	125486	101368
OCT-SEP	134277	144563	111	157315	130518

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



Most Recent Forecast for ESP5: Issued Date 03/05/2018

Plot Created 03/05/2018 04:59 PST

- Max Scale
- Scale To Data
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Overlay

ESP10 **ESP5** ESP0

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CSV (ESP5 / APR-AUG)

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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2018

Official Forecast

10 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	21482	24170	108	29965	22279
APR-JUL	19021	21592	109	27176	19848
APR-AUG	20270	22880	108	28612	21091
JAN-SEP	30061	32729	110	38630	29872
JAN-JUL	27692	30133	110	35853	27440
OCT-SEP	35278	37946	109	43847	34667

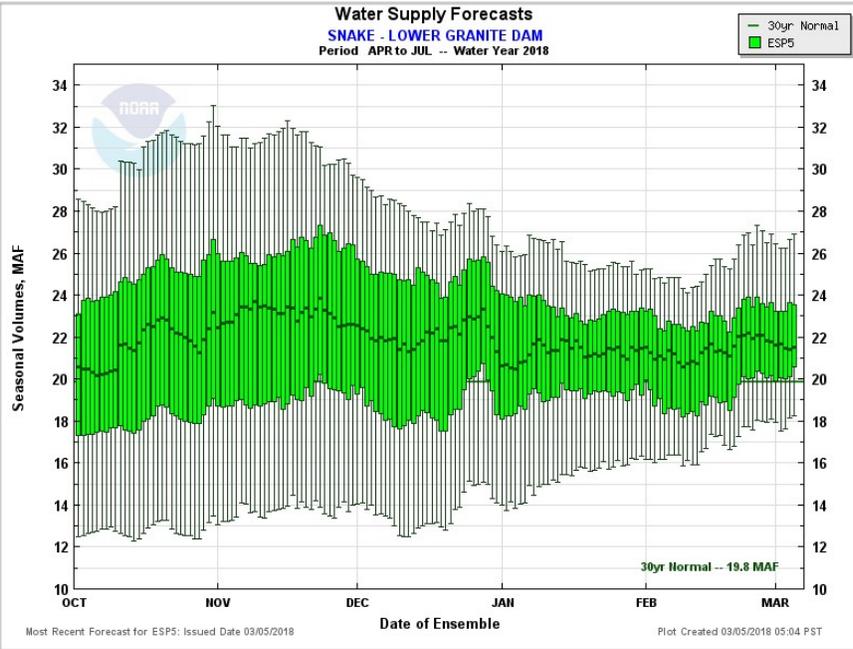
5 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	20610	24199	109	29742	22279
APR-JUL	18264	21518	108	26887	19848
APR-AUG	19442	22871	108	28268	21091
JAN-SEP	29814	33039	111	38874	29872
JAN-JUL	27469	30462	111	35974	27440
OCT-SEP	35031	38256	110	44091	34667

0 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	20567	24632	111	29623	22279
APR-JUL	18253	21980	111	26760	19848
APR-AUG	19448	23360	111	28229	21091
JAN-SEP	29220	33472	112	38201	29872
JAN-JUL	26876	30681	112	35234	27440
OCT-SEP	34437	38688	112	43418	34667

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



Most Recent Forecast for ESP5: Issued Date 03/05/2018

Plot Created 03/05/2018 05:04 PST

Max Scale
 Scale To Data
 Scale To Last 45 Days

Overlay

ESP10 **ESP5** ESP0

— [Slider] —

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Libby : March Runoff Forecast & Flood Risk Management Calculation

WY 2018

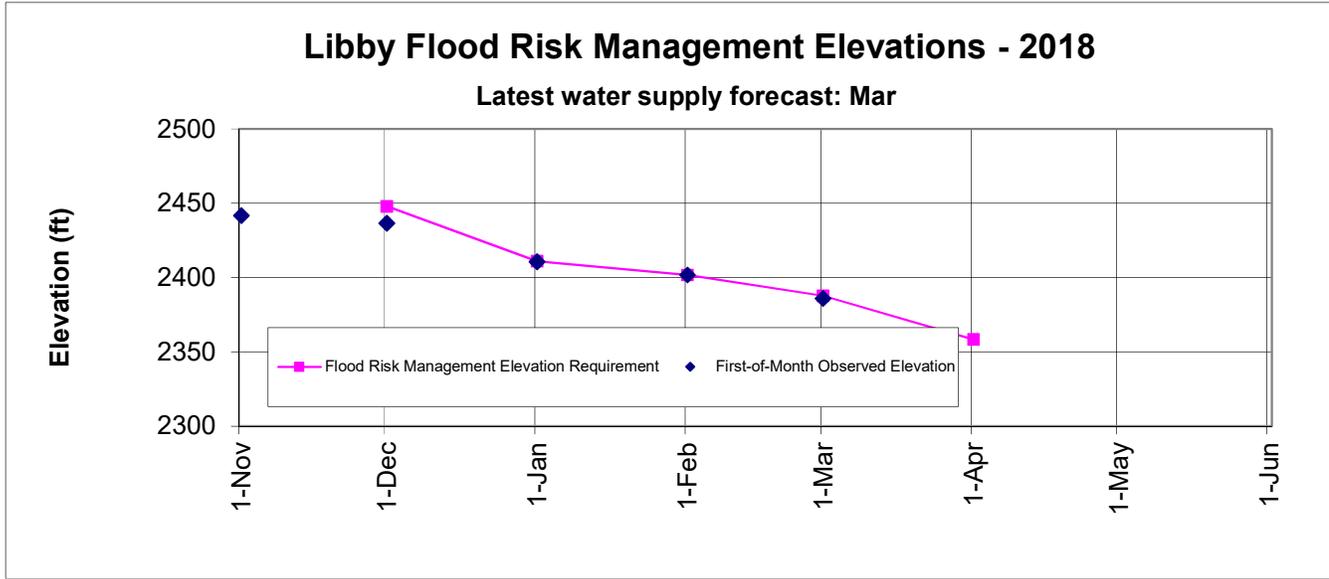
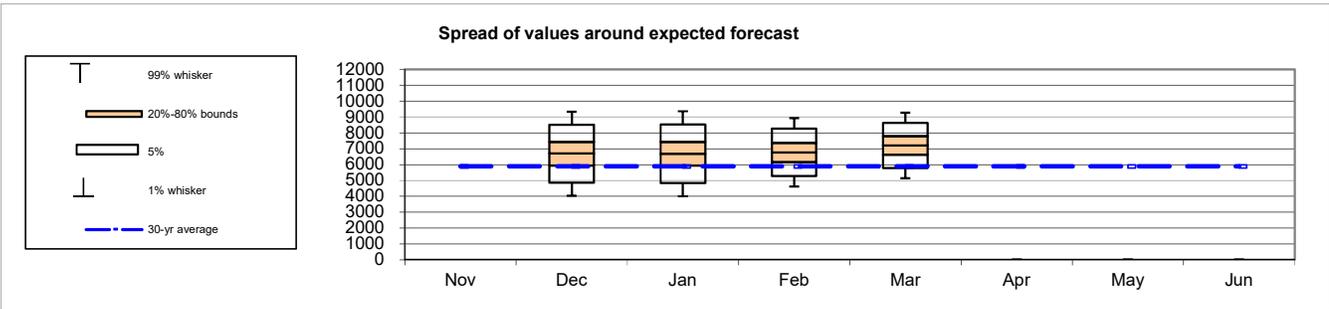
Runoff Forecast and Flood Risk Management

Most Probable Runoff Volume:	Apr-Aug	7205	KAF
	Apr-Jul	6540	KAF
	May-Jul	5902	KAF
31-Mar Flood Risk Management Space		3558	KAF
31-Mar Flood Risk Management Elevation		2358.3	ft

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	122%	6282	115%
5342	122%	5720	114%
4821	122%	5199	114%

Seasonal Flood Risk Management		VARQ Flood Risk Management Implemented						
Forecast Date >>	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast		6687	6682	6765	7205			
First-of-Month Elev	2441.8	2436.5	2410.6	2401.8	2385.9			

Date >>	30-Nov	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr
Flood Risk Management Space	500	2000	2322	2762	3558	
Flood Risk Management Elevation	2448.0	2411.0	2401.8	2387.7	2358.3	



- 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, Jon Moen (206) 764-3561, or the general Water Management line (206) 764-3584.
 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	7.15	144%	65.9	471.0	
West Glacier, MT	ΣOct:Feb Prcp	inches	21.10	149%	28.5	601.6	
Cranbrook A, BC	ΣOct:Feb Prcp	millimeters	192.60	143%	2.7	525.8	
Fernie, BC	ΣOct:Feb Prcp	millimeters	666.80	117%	0.6	420.1	
Hawkins Lake, MT	1-Mar SWE	inches	23.40	116%	24.3	569.3	
Stahl Creek, MT	1-Mar SWE	inches	34.50	121%	19.1	659.3	
East Creek, BC	1-Mar SWE	millimeters	803.00	113%	0.7	522.0	
Moyie Mountain, BC	1-Mar SWE	millimeters	429.00	121%	1.3	544.8	
Sunshine Village, AB	1-Mar SWE	millimeters	519.00	111%	1.3	653.9	
Akamina Pass, AB	1-Mar SWE	millimeters	481.90	123%	1.0	501.2	
South Racehorse Creek, AB	1-Mar SWE	millimeters	424.00	123%	1.4	593.6	
Intercept			1		1142.0	1142.0	
1-Mar Forecast (KAF)					Σ	7204.5	

Data used in Libby Water Supply Forecast

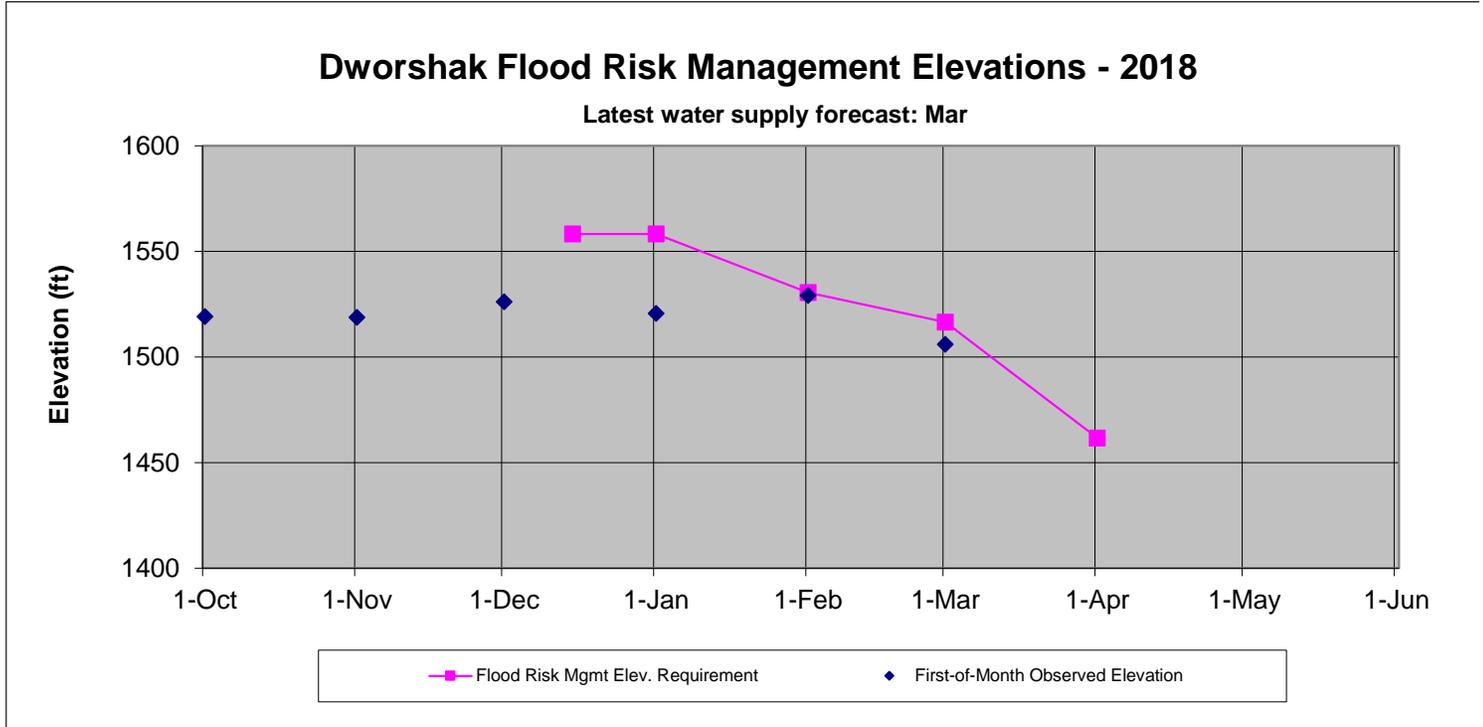
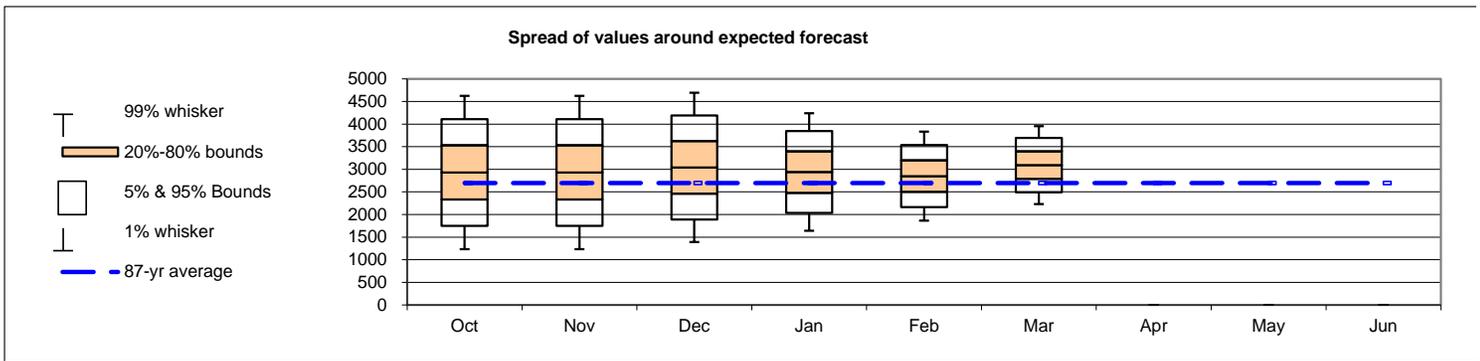
WY 2018

Climate Data	SOI	Jun-17	Jul-17						Units
		-0.40	0.80						
Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Units
Eureka RS, MT	0.87	1.76	2.33	0.84	1.35				inch
West Glacier, MT	3.10	4.57	4.23	4.18	5.02				inch
Cranbrook A, BC	25.00	63.60	47.00	29.80	27.20				mm
Fernie, BC	132.00	193.00	77.00	180.00	84.80				mm
Snow Water Equiv	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units		
Hawkins Lake, MT		18	23						inch
Stahl Creek, MT		15	26	35					inch
East Creek, BC			659	803					mm
Moyie Mountain, BC		194	318	429					mm
Sunshine Village, AB		284	399	519					mm
Akamina Pass, AB			365	482					mm
South Racehorse Creek, AB			309	424					mm
Streamflow	Jan	Feb	Mar	Apr	May	Jun	Units		
Libby Inflow Volume		205.1	166.2						KAF
Reservoir Elevation	1-Nov	1-Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units
Libby FOM Elev	2441.8	2436.5	2410.6	2401.8	2385.9				feet

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

Logan Osgood-Zimmerman, P.E.
 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	3093	KAF	2438	127%	2696	115%		
	May-Jul	2261	KAF	1784	127%	1972	115%		
31-Mar Flood Risk Management Space		1863	KAF						
31-Mar Flood Risk Management Elevation		1461.6	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	2929	2929	3043	2941	2849	3093			
First-of-Month Elev	1519.1	1518.7	1526.2	1520.7	1529.1	1506.0			
Date >>		15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr	31-May
FRM Space	--	700	700	1090	1276	1863			
FRM Elevation	--	1558.2	1558.2	1530.5	1516.5	1461.6			



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	0.60		220.73	132.4
HQSI Cumulative Precip	Oct-Date	27.45	122%	23.39	642.1
Elk Butte SWE	1-Mar	36.5	124%	10.16	370.8
Hoodoo Basin SWE	1-Mar	39.8	122%	10.01	398.4
Sherwin SWE	1-Mar	10.7	123%	25.42	272.0
Lost Lake SWE	1-Mar	52.6	122%	6.99	367.7
Crater meadows SWE	1-Mar	46.9	132%	13.06	612.5
Intercept		1		296.75	296.8
1-Mar Forecast (KAF)				Σ	3092.7

Data Station	Sept	Nov	Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Climate (Stdzd SOI)									
September SOI	0.60								
Precipitation (in)									
Oct									
Headquarters, ID	3.65	6.20	6.10	4.50	7.00	--	--		
Cumulative HQSI Data	3.65	9.85	15.95	20.45	27.45	--	--		
Snow Water Equiv (First of Month values) (in)									
Elk Butte, ID				16.1	31.9	36.5	--		
Cool Creek, ID				18.9	32.0				
Hoodoo Basin, MT				18.7	29.5	39.8	--	--	--
Sherwin, ID				5.1	7.0	10.7	--		
Shanghi Summit, ID							--	--	
Lost Lake, ID				22.3	38.0	52.6	--	--	--
Hemlock, ID							--	--	
Crater Meadows Mar						46.9	--		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				326	520	--	--	--	--

Notes:

- The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact Steve Hall (509 527 7550), Wayne Jousma (509-527-7606), Amanda Morelos (509-527-7632), or Alfredo Rodriguez (509-527-7532).
- Due to updated values for precipitation, snow or streamflow, subsequent forecasts may be different from the forecast published herein.

Approval:

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

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



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COLUMBIA - GRAND COULEE DAM (GCDW1) Forecasts for Water Year 2018

Official Forecast

10 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	64004	69435	116	75170	60110
APR-JUL	54066	58391	114	64979	51015
APR-AUG	60275	65138	115	71083	56763
JAN-SEP	73387	78672	115	84772	68694
JAN-JUL	62997	67888	114	75345	59599
OCT-SEP	80806	86090	112	92190	76824

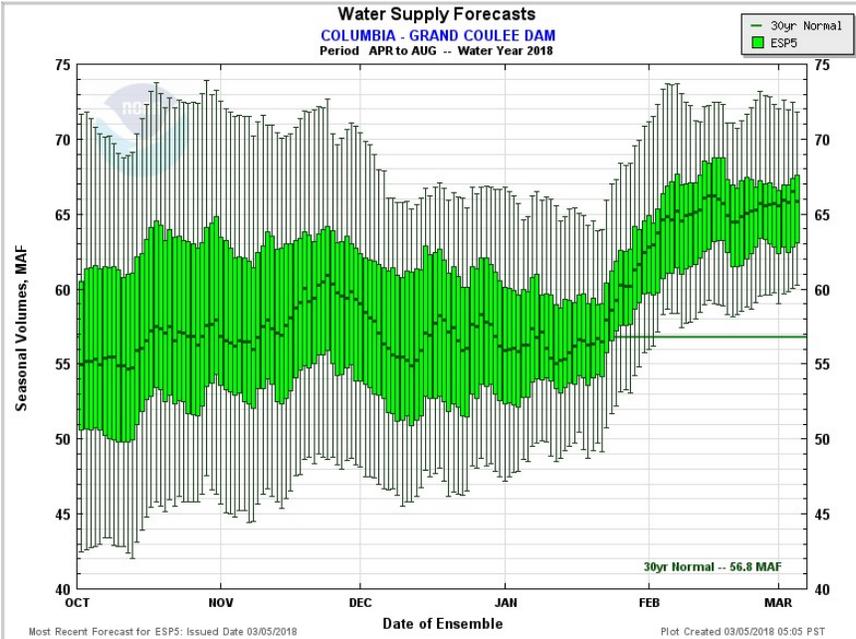
5 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	64355	70235	117	75865	60110
APR-JUL	53859	59167	116	64944	51015
APR-AUG	60226	65870	116	71793	56763
JAN-SEP	73095	79856	116	85708	68694
JAN-JUL	62569	68642	115	75264	59599
OCT-SEP	80513	87274	114	93126	76824

0 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	63862	70517	117	77235	60110
APR-JUL	54150	58994	116	65925	51015
APR-AUG	60436	66501	117	73007	56763
JAN-SEP	73617	80007	116	87173	68694
JAN-JUL	63171	68892	116	76050	59599
OCT-SEP	81035	87425	114	94592	76824

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



Max Scale Scale To Data Scale To Last 45 Days

Most Recent Forecast for ESP5: Issued Date 03/05/2018

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PEND OREILLE - ALBENI FALLS DAM (ALFW1) Forecasts for Water Year 2018

Official Forecast

10 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	15257	16882	132	19404	12815
APR-JUL	13949	15449	131	17739	11777
APR-AUG	14623	16284	132	18696	12354
JAN-SEP	18039	19674	129	22343	15226
JAN-JUL	16758	18272	129	20796	14189
OCT-SEP	20222	21857	127	24526	17218

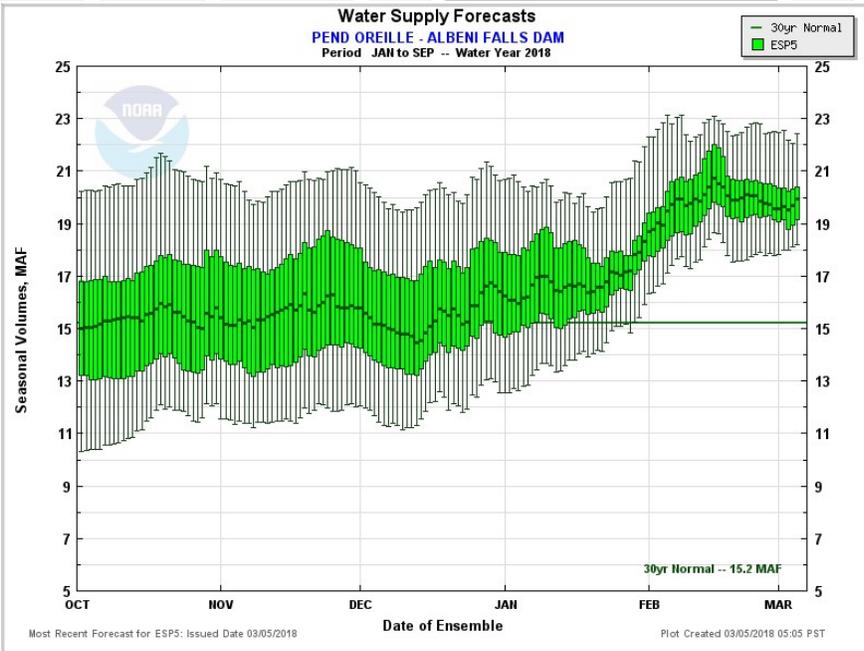
5 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	15398	17025	133	19542	12815
APR-JUL	13806	15578	132	17868	11777
APR-AUG	14624	16437	133	18842	12354
JAN-SEP	18213	19949	131	22438	15226
JAN-JUL	17010	18568	131	20714	14189
OCT-SEP	20396	22132	129	24621	17218

0 days QPF: Ensemble: 2018-03-05 Issued: 2018-03-05

APR-SEP	15342	16986	133	19480	12815
APR-JUL	13786	15563	132	17940	11777
APR-AUG	14437	16354	132	18841	12354
JAN-SEP	18188	19778	130	22674	15226
JAN-JUL	16868	18355	129	20987	14189
OCT-SEP	20371	21961	128	24857	17218

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



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