The Offical 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 MAY 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

May 2, 2018

Hungry Horse Dam – Official Water Supply Forecast
MAY 2018

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

May-Jul: 2,350 kaf (150%)

Jan-Jul: 2,950 kaf (141%)

Apr-Aug: 2,780 kaf (144%)

May-Sep: 2,500 kaf (148%)

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

Columbia Falls: 3,500 cfs

Hungry Horse: 900 cfs

Thanks,

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

Northwest River Forecast Center

Water Supply Forecasts

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

Official Forecast

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

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	107514	113465	122	120278	92704
APR-JUL	94062	99275	124	106114	79855
APR-AUG	102291	107202	122	114849	87532
JAN-SEP	130766	136717	120	143530	114216
JAN-JUL	117314	122527	121	129365	101368
OCT-SEP	146982	152933	117	159746	130518

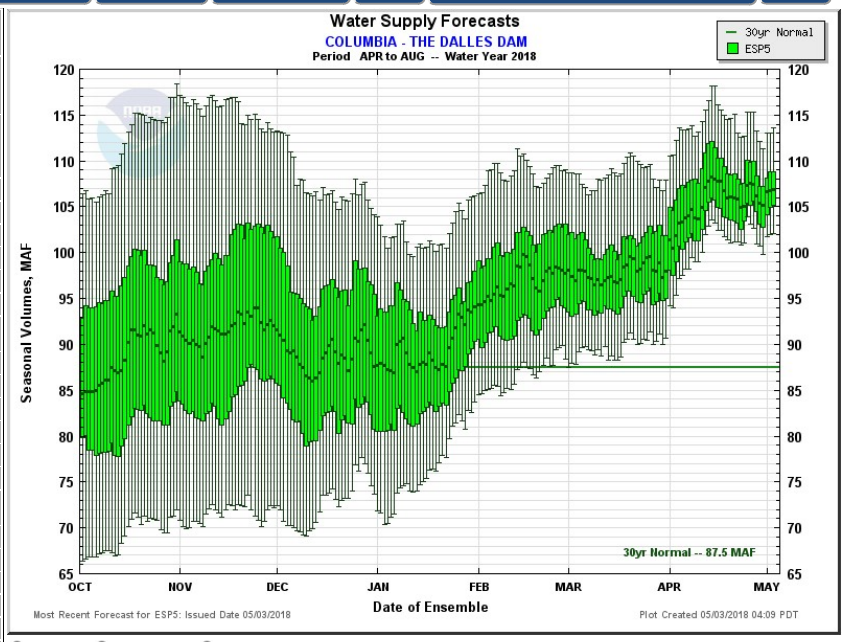
5 days QPF: ***Ensemble:*** **2018-05-03** ***Issued:*** 2018-05-03

APR-SEP	107767	112792	122	119532	92704
APR-JUL	92997	98894	124	105515	79855
APR-AUG	102108	106883	122	113623	87532
JAN-SEP	131019	136044	119	142784	114216
JAN-JUL	116249	122145	120	128767	101368
OCT-SEP	147236	152260	117	159001	130518

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

APR-SEP	107860	113066	122	121148	92704
APR-JUL	93330	98650	124	105367	79855
APR-AUG	102413	107297	123	114364	87532
JAN-SEP	131111	136317	119	144400	114216
JAN-JUL	116581	121902	120	128619	101368
OCT-SEP	147327	152533	117	160616	130518

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



Max Scale | Scale To Data | Scale To Last 45 Days

Overlay: ESP10 | ESP5 | ESP0

Data Files: CSV (ESP5 / APR-AUG) | Forecast Ensemble

Northwest River Forecast Center

Water Supply Forecasts

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

Official Forecast

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

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	24436	25570	115	28407	22279
APR-JUL	21946	22970	116	25501	19848
APR-AUG	23214	24281	115	26981	21091
JAN-SEP	33050	34184	114	37021	29872
JAN-JUL	30560	31584	115	34116	27440
OCT-SEP	38267	39401	114	42238	34667

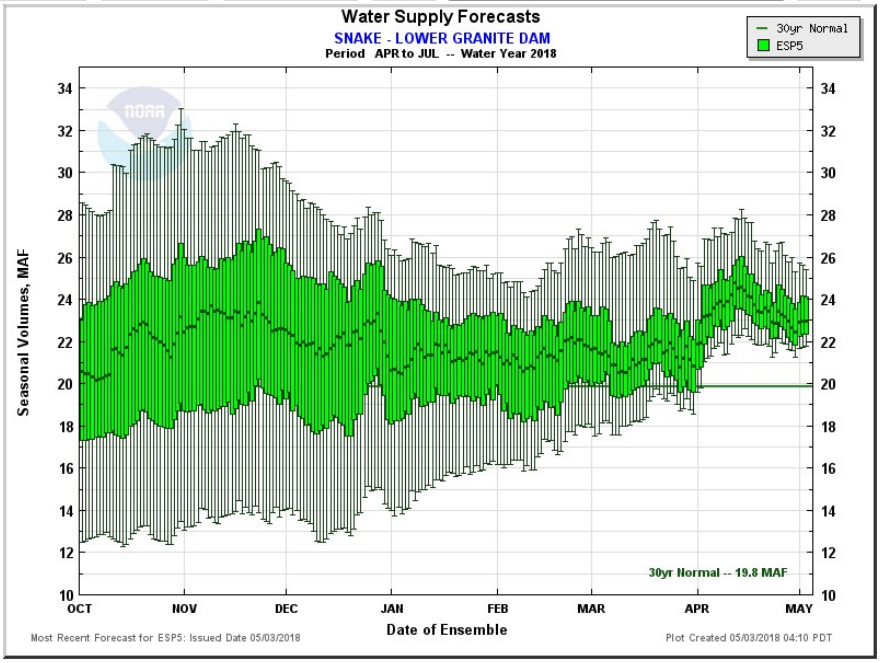
5 days QPF: ***Ensemble:*** **2018-05-03** ***Issued:*** 2018-05-03

APR-SEP	24276	25686	115	28323	22279
APR-JUL	21795	22978	116	25404	19848
APR-AUG	23086	24298	115	26848	21091
JAN-SEP	32890	34300	115	36937	29872
JAN-JUL	30409	31592	115	34018	27440
OCT-SEP	38107	39517	114	42154	34667

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

APR-SEP	24239	25622	115	28696	22279
APR-JUL	21729	23002	116	25863	19848
APR-AUG	23026	24337	115	27298	21091
JAN-SEP	32853	34236	115	37310	29872
JAN-JUL	30344	31616	115	34477	27440
OCT-SEP	38070	39453	114	42527	34667

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



○ Max Scale ◉ Scale To Data ○ Scale To Last 45 Days

Overlay

ESP10 | ESP5 | ESP0

Data Files

CSV (ESP5 / APR-JUL)

Forecast Ensemble

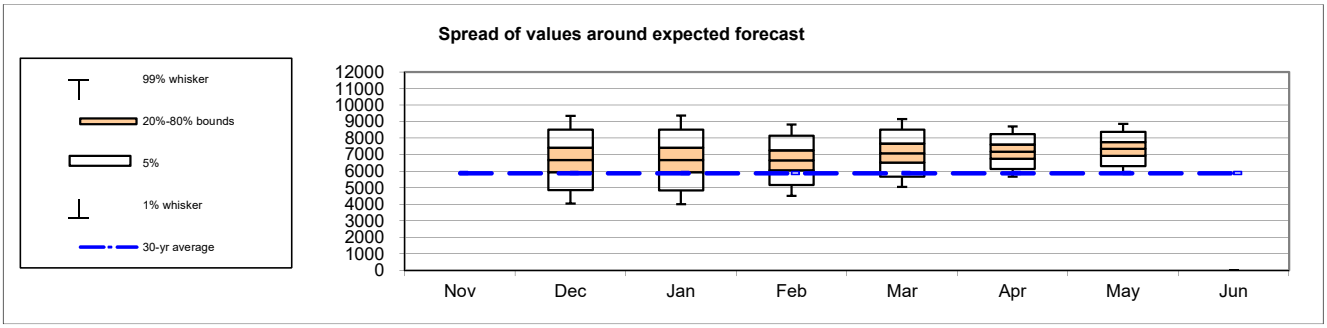
Libby: May Runoff Forecast & Flood Risk Management Calculation WY 2018

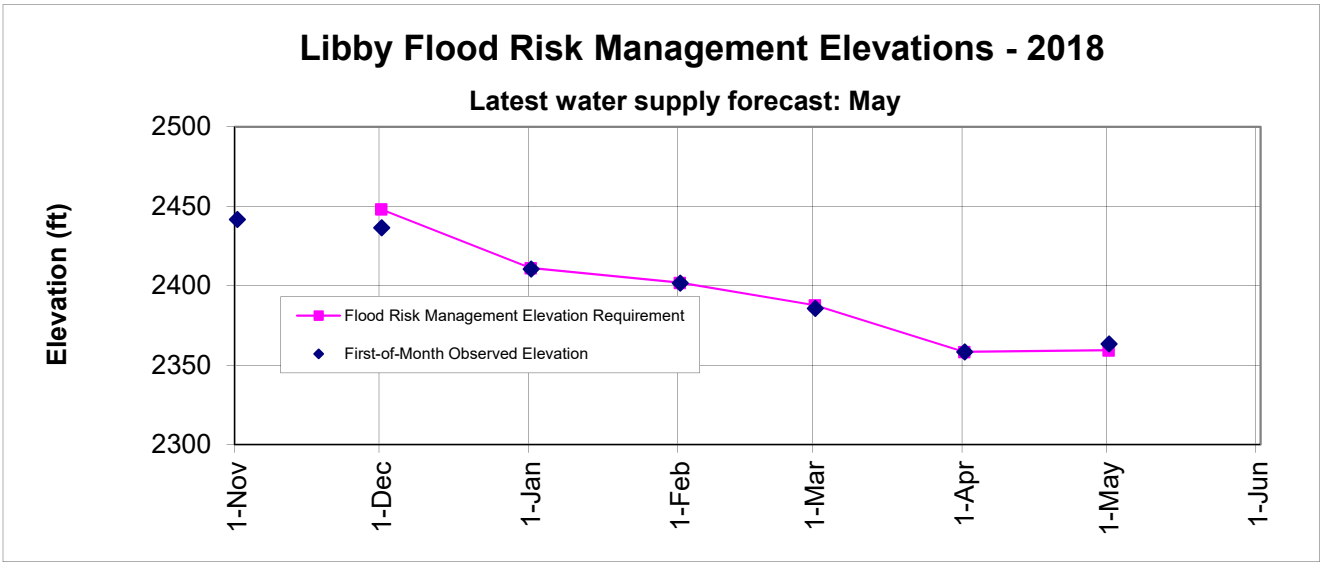
Runoff Forecast and Flood Risk Management				1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
Most Probable Runoff Volume:	Apr-Aug	7356	KAF	5885	125%	6282	117%
	Apr-Jul	6658	KAF	5342	125%	5720	116%
	May-Jul	6199	KAF	4821	129%	5199	119%

Seasonal Flood Risk Management VARQ Flood Risk Management Implemented

Forecast Date >>	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast		6687	6681	6668	7096	7189	7356	
First-of-Month Elev	2441.8	2436.5	2410.6	2401.8	2385.9	2358.4	2363.5	

Date >>	30-Nov	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr	
FRM Space	500	2000	2322	2762	3558	3533	
FRM Elevation	2448.0	2411.0	2401.8	2387.7	2358.3	2359.3	





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, Hand Creek, and Mount Odlum.

Libby: May 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	∑Jun:Jul					
Eureka RS, MT	∑Oct:Apr Prcp	inches	10.39	153%	57.5	596.9
West Glacier, MT	∑Oct:Apr Prcp	inches	25.30	137%	28.0	709.4
Cranbrook A, BC	∑Oct:Apr Prcp	millimeters	263.10	143%	2.8	736.7
Fernie, BC	∑Oct:Apr Prcp	millimeters	868.80	114%	0.6	530.0
Hawkins Lake, MT	1-May SWE	inches	31.60	120%	17.3	546.7
Stahl Creek, MT	1-May SWE	inches	51.60	138%	16.7	863.8
East Creek, BC	1-May SWE	millimeters	1033.00	112%	0.6	588.8
Moyie Mountain, BC	1-May SWE	millimeters	537.00	148%	0.9	488.7
Sunshine Village, AB	1-May SWE	millimeters	652.10	106%	1.3	821.6
Akamina Pass, AB	1-May SWE	millimeters	529.10	157%	0.6	291.0
South Racehorse Creek, AB	1-May SWE	millimeters	379.50	104%	0.8	315.0
Intercept			1		408.0	408.0
	Forecast May-August Inflow (KAF)				∑	6896.5
	Observed April Inflow (KAF)					459.4
	1-May Forecast, April-August Inflow (KAF)				∑	7355.9

Data used in Libby Water Supply Forecast **WY 2018**

Climate Data				Jun-17	Jul-17				
SOI				-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	1.01	2.23		inch
West Glacier, MT	3.10	4.57	4.23	4.18	5.02	1.73	2.47		inch
Cranbrook A, BC	25.00	63.60	47.00	29.80	27.20	26.40	44.10		mm
Fernie, BC	132.00	193.00	77.00	180.00	84.80	104.00	98.00		mm
Snow Water Equiv			**1-Jan**	**1-Feb**	**1-Mar**	**1-Apr**	**1-May**	**1-Jun**	**Units**
Hawkins Lake, MT				18	23	29	32		inch
Stahl Creek, MT			15	26	35	43	52		inch
East Creek, BC				659	803	905	1033		mm
Moyie Mountain, BC			194	318	429	518	537		mm
Sunshine Village, AB			284	407	511	609	652		mm
Akamina Pass, AB				362	479	598	529		mm
South Racehorse Creek, AB				240	356	445	380		mm
Streamflow			**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Units**
Libby Inflow Volume			205.1	166.2	214.4	459.4			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	2358.4	2363.5		feet

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

Logan Osgood-Zimmerman, P.E.
Upper Columbia Senior Water Manager
Seattle District

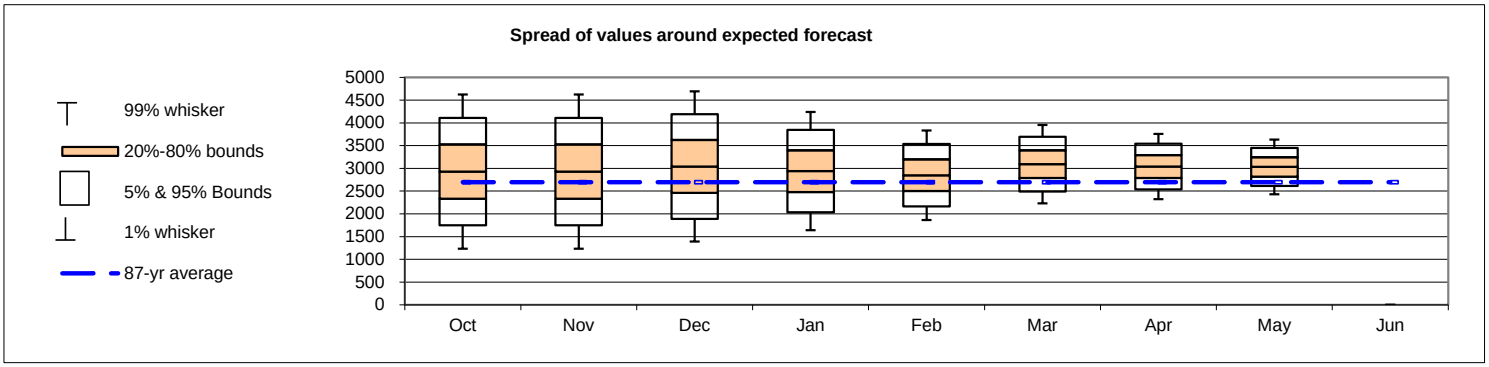
Dworshak : May Runoff Forecast & Flood Risk Management Calculation **WY 2018**

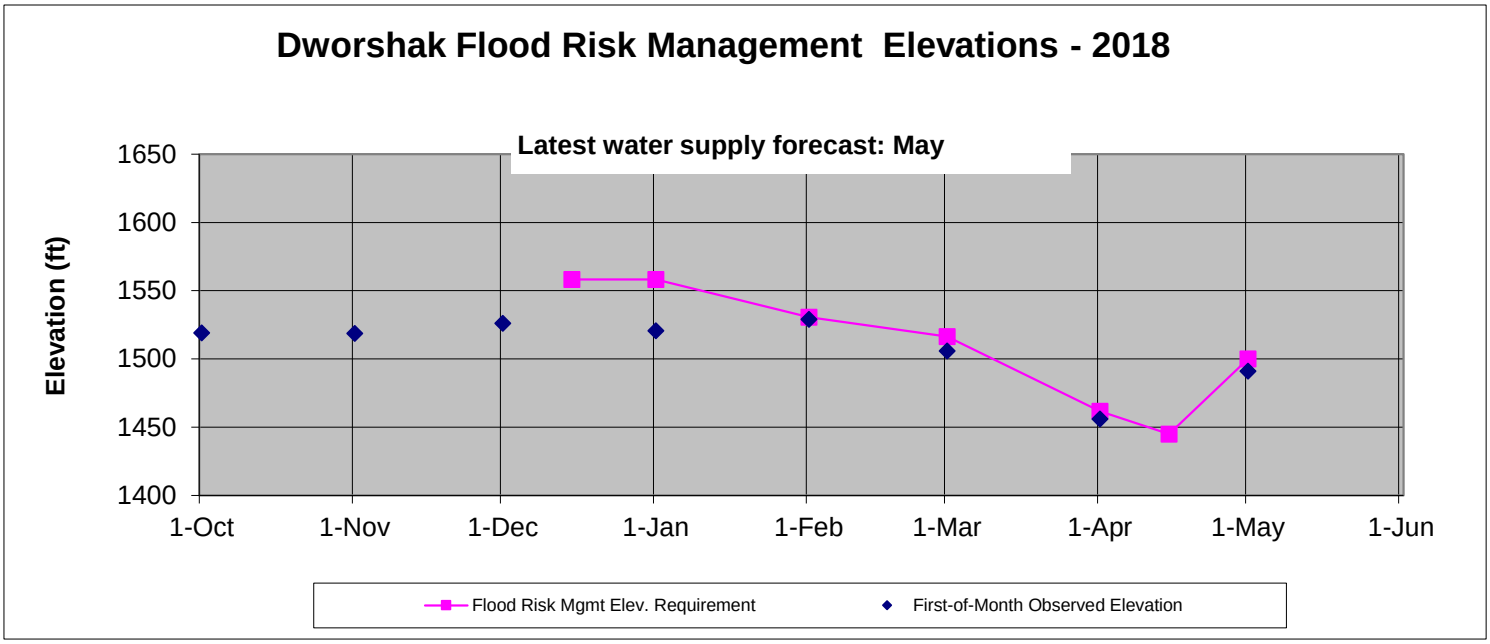
Runoff Forecast and Flood Risk Management (FRM)				1981-2010 Average	Percent of 30yr Average	1929-2008 Average	Percent of Average
Most Probable Runoff Volume	Apr-Jul	3032	KAF	2438	124%	2696	112%
	May-Jul	2217	KAF	1784	124%	1972	112%

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	3040	3032	
First-of-Month Elev	1519.1	1518.7	1526.2	1520.7	1529.1	1506.0	1456.0	1491.1	

Date >>		15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr	31-May
FRM Space	--	700	700	1090	1276	1863	2016	2016	
FRM Elevation	--	1558.2	1558.2	1530.5	1516.5	1461.6	1445.0	1500.0	





Dworshak : May 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		122.04	73.2
Hoodoo Basin SWE	*1-May*	49.7	123%	11.71	582.0
Shanghi Summit SWE	*1-May*	15.2	110%	14.41	219.0
Lost Lake SWE	*1-May*	65.6	128%	9.67	634.4
Hemlock SWE	*1-May*	53.9	135%	11.58	624.2
Intercept		1		84.24	84.2
	1-May Forecast (KAF)			∑	2217.0

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	3.10	--		
Cumulative HQSI Data	**3.65**	**9.85**	**15.95**	**20.45**	**27.45**	**30.55**	**--**		
Snow Water Equiv (First of Month values) (in)									
Elk Butte, ID				16.1	31.9	36.5	42.0		
Cool Creek, ID				18.9	32.0				
Hoodoo Basin, MT				18.7	29.5	39.8	43.6	49.7	--
Sherwin, ID				5.1	7.0	10.7	7.8		
Shanghi Summit, ID								15.2	--
Lost Lake, ID				22.3	38.0	52.6	59.9	65.6	--
Hemlock, ID								53.9	--
Crater Meadows Mar						46.9	53.1		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				316	520	358	815	--	--

Notes:

1. The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact Steve Hall (509-527-7550), Amanda Morelos (509-527-7632), 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.
3. 15-Dec and 31-Dec Flood Management Space is fixed at 700 KAF.

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

Northwest River Forecast Center

Water Supply Forecasts

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

Official Forecast

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

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	70917	75489	126	80417	60110
APR-JUL	61752	65121	128	70805	51015
APR-AUG	67537	71599	126	76574	56763
JAN-SEP	80090	84662	123	89590	68694
JAN-JUL	70925	74294	125	79978	59599
OCT-SEP	87508	92080	120	97008	76824

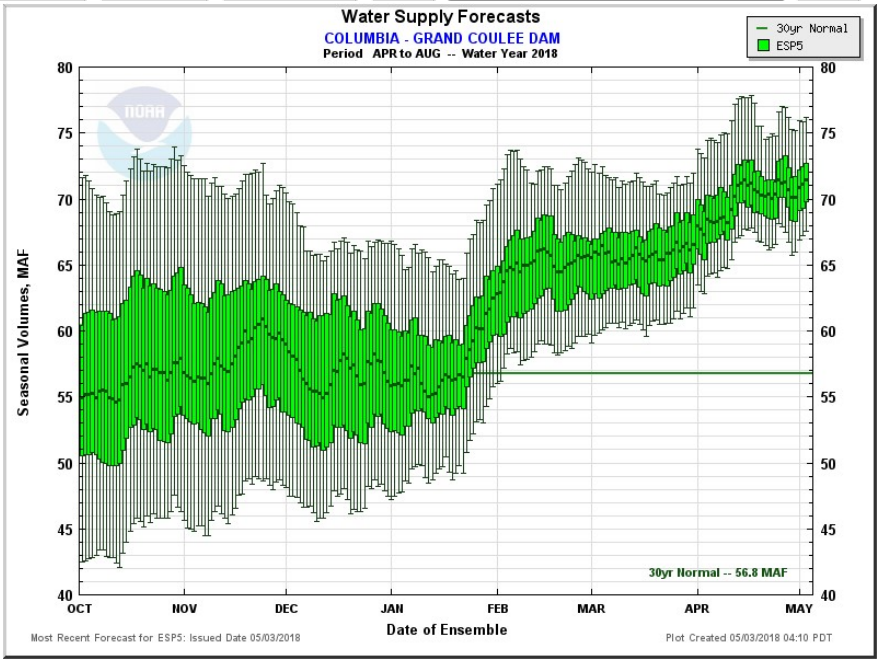
5 days QPF: ***Ensemble:*** 2018-05-03 ***Issued:*** 2018-05-03

APR-SEP	71276	75518	126	79988	60110
APR-JUL	61272	64927	127	69866	51015
APR-AUG	67584	71449	126	76194	56763
JAN-SEP	80449	84691	123	89161	68694
JAN-JUL	70445	74100	124	79039	59599
OCT-SEP	87867	92109	120	96580	76824

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

APR-SEP	71151	75909	126	80541	60110
APR-JUL	61191	64634	127	70430	51015
APR-AUG	67399	71389	126	76888	56763
JAN-SEP	80324	85082	124	89714	68694
JAN-JUL	70364	73807	124	79603	59599
OCT-SEP	87742	92500	120	97132	76824

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



○ Max Scale ◉ Scale To Data ○ Scale To Last 45 Days

Overlay

ESP10 | ESP5 | ESP0

Data Files

CSV (ESP5 / APR-AUG)

Forecast Ensemble

Northwest River Forecast Center

Water Supply Forecasts

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

Official Forecast

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

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	17974	19079	149	20584	12815
APR-JUL	16633	17641	150	19178	11777
APR-AUG	17394	18465	149	19977	12354
JAN-SEP	20720	21826	143	23331	15226
JAN-JUL	19380	20387	144	21924	14189
OCT-SEP	22903	24009	139	25514	17218

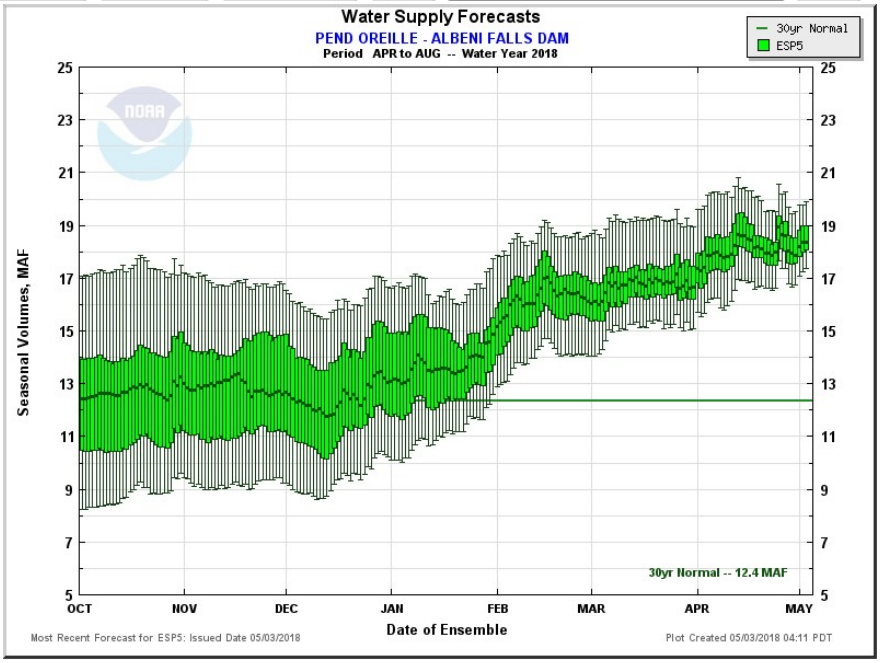
5 days QPF: ***Ensemble:*** 2018-05-03 ***Issued:*** 2018-05-03

APR-SEP	17947	19077	149	20456	12815
APR-JUL	16646	17558	149	19114	11777
APR-AUG	17369	18359	149	19877	12354
JAN-SEP	20694	21824	143	23202	15226
JAN-JUL	19393	20305	143	21861	14189
OCT-SEP	22877	24007	139	25385	17218

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

APR-SEP	17867	19225	150	20802	12815
APR-JUL	16552	17675	150	19280	11777
APR-AUG	17293	18531	150	20219	12354
JAN-SEP	20614	21972	144	23549	15226
JAN-JUL	19299	20421	144	22027	14189
OCT-SEP	22797	24155	140	25732	17218

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



○ Max Scale ◉ Scale To Data ○ Scale To Last 45 Days

Overlay: ESP10 | ESP5 | ESP0

Data Files: CSV (ESP5 / APR-AUG) | Forecast Ensemble