

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 **APRIL** 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/>

2-April-2020

Hungry Horse Dam – Official Water Supply Forecast

APRIL 2020

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

- Apr-Jul: 2,040 kaf (109%)
- Apr-Aug: 2,120 kaf (109%)
- May-Sep: 1,890 kaf (112%)

The minimum flows downstream of Hungry Horse are as follows:

- Columbia Falls: 3,500 cfs
- Hungry Horse: 900 cfs

Joel Fenolio, P.E.

Water Management - Operations Team Supervisor
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Columbia - Pacific Northwest Region
Boise, ID 83706



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: 2020-04-03 Issued: 2020-04-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	83736	89695	97	100366	92704
APR-JUL	71288	77204	97	86005	79855
APR-AUG	79017	84445	96	94684	87532
JAN-SEP	100724	106683	93	117354	114216
JAN-JUL	88276	94192	93	102993	101368
OCT-SEP	113049	119008	91	129678	130518

Experimental Water Supply

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

APR-SEP	86457	93061	100	101419	92704
APR-JUL	73449	79721	100	87218	79855
APR-AUG	80784	87461	100	96246	87532
JAN-SEP	103445	110049	96	118408	114216
JAN-JUL	90437	96709	95	104206	101368
OCT-SEP	115769	122373	94	130732	130518

Reference

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

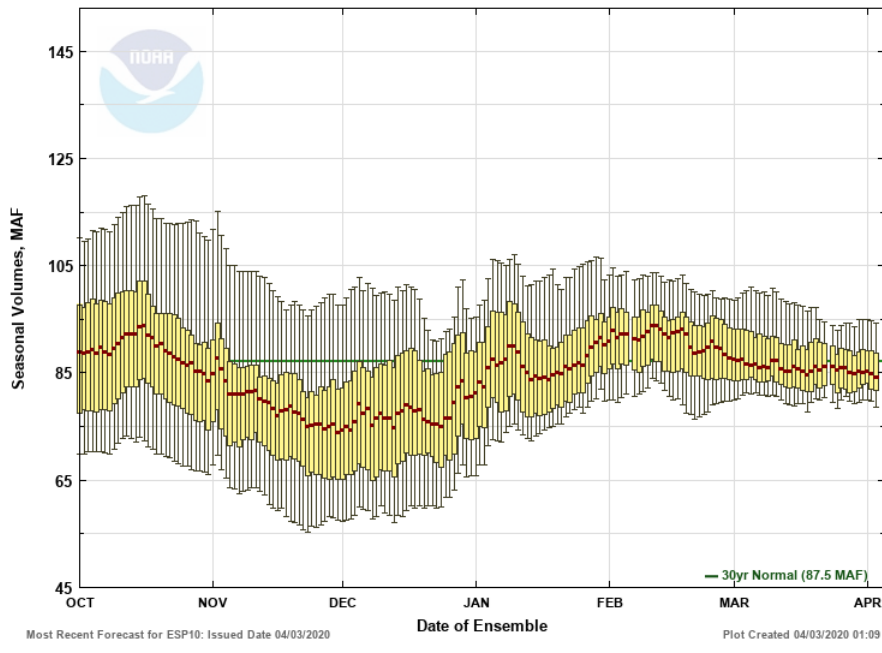
APR-SEP	86586	94259	102	102746	92704
APR-JUL	75032	81593	102	88593	79855
APR-AUG	81875	89063	102	97593	87532
JAN-SEP	103574	111247	97	119734	114216
JAN-JUL	92020	98581	97	105581	101368
OCT-SEP	115898	123572	95	132058	130518

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 04/03/2020

Plot Created 04/03/2020 01:09:11

☐ 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: 2020-04-03 Issued: 2020-04-03

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	17201	18881	85	22322	22279
APR-JUL	14923	16359	82	19614	19848
APR-AUG	16059	17542	83	20974	21091
JAN-SEP	22685	24366	82	27807	29872
JAN-JUL	20407	21843	80	25099	27440
OCT-SEP	26600	28280	82	31721	34667

Experimental Water Supply

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

APR-SEP	17857	19892	89	24512	22279
APR-JUL	15594	17455	88	21496	19848
APR-AUG	16748	18668	89	23049	21091
JAN-SEP	23342	25377	85	29996	29872
JAN-JUL	21079	22939	84	26981	27440
OCT-SEP	27256	29291	84	33911	34667

Reference

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

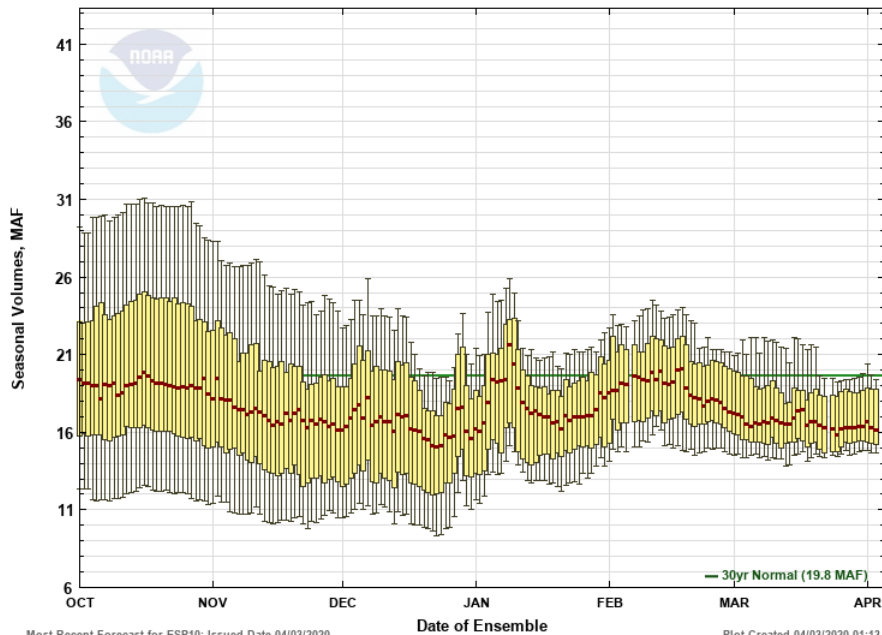
APR-SEP	18180	20170	91	24827	22279
APR-JUL	15803	17765	90	21801	19848
APR-AUG	17099	18985	90	23399	21091
JAN-SEP	23665	25654	86	30311	29872
JAN-JUL	21287	23249	85	27285	27440
OCT-SEP	27579	29569	85	34226	34667

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 04/03/2020

Plot Created 04/03/2020 01:13

☐ 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 : April Runoff Forecast & Flood Risk Management Calculation

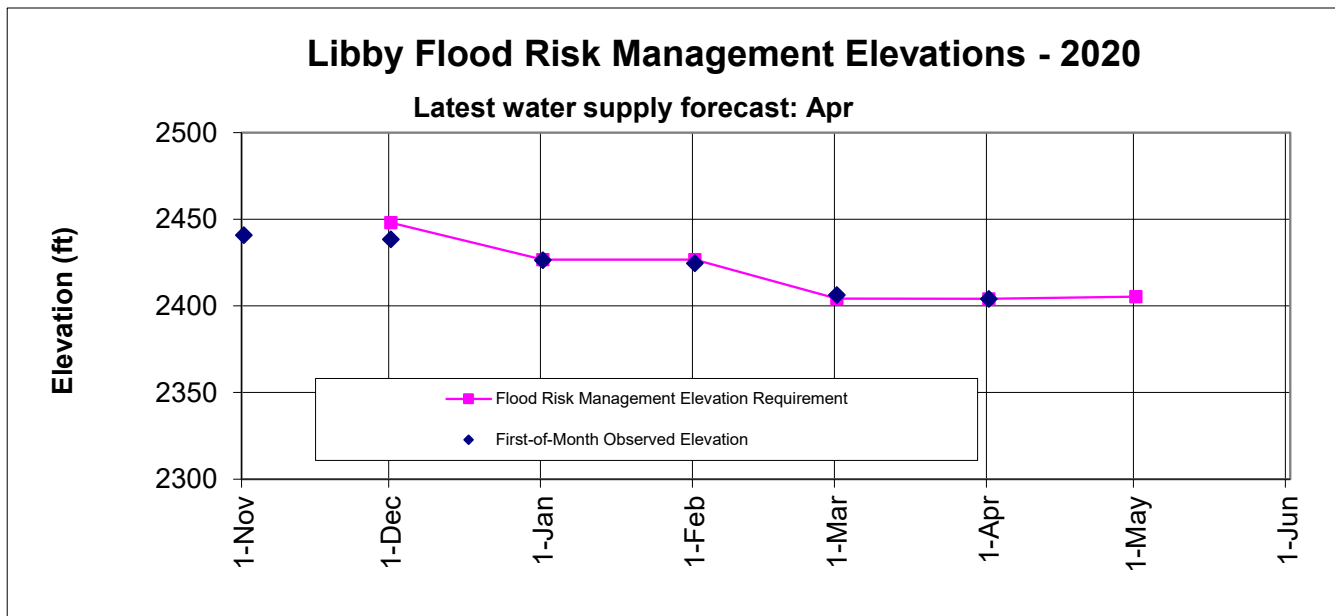
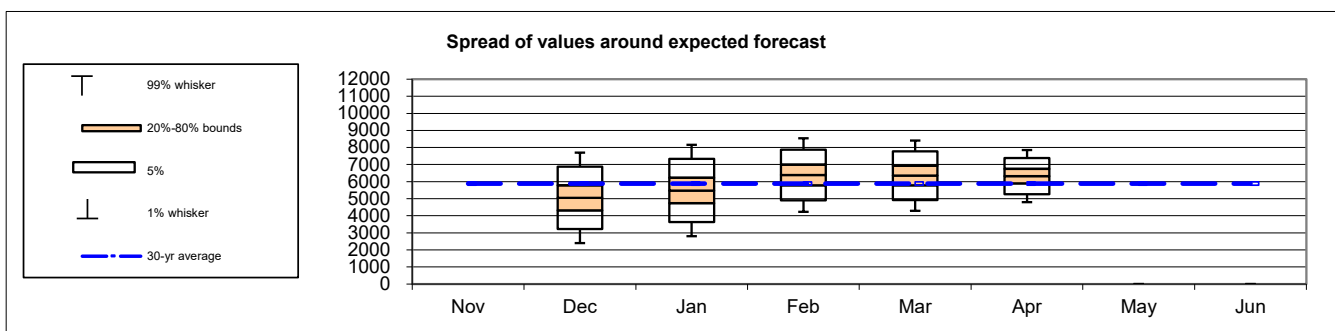
WY 2020

Runoff Forecast and Flood Risk Management			
Most Probable Runoff Volume:		Apr-Aug	6324 KAF
		Apr-Jul	5741 KAF
		May-Jul	5181 KAF
30-Apr Flood Risk Management Space		2202	KAF
30-Apr Flood Risk Management Elevation		2405.3	ft

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	107%	6282	101%
5342	107%	5720	100%
4821	107%	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	6324		
First-of-Month Elev	2440.8	2438.4	2426.4	2424.6	2406.2	2404.0		

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



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, Kevin Shaffer (206) 764-3660, or Sonja Michelsen (206) 316-3947.
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, Three Isle Lake, and Mount Odium.

Libby : April 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:Mar Prcp	inches	4.39	75%	68.5	300.8
West Glacier, MT	ΣOct:Mar Prcp	inches	15.48	94%	29.5	456.2
Cranbrook A, BC	ΣOct:Mar Prcp	millimeters	108.60	68%	3.0	324.7
Fernie, BC	ΣOct:Mar Prcp	millimeters	718.00	107%	0.7	509.8
Hawkins Lake, MT	1-Apr SWE	inches	26.20	104%	22.4	587.7
Stahl Peak, MT	1-Apr SWE	inches	39.70	114%	19.7	782.1
East Creek, BC	1-Apr SWE	millimeters	1050.00	122%	0.7	766.5
Moyie Mountain, BC	1-Apr SWE	millimeters	526.00	123%	1.2	636.5
Sunshine Village, AB	1-Apr SWE	millimeters	614.25	109%	1.4	878.4
Akamina Pass, AB	1-Apr SWE	millimeters	526.63	114%	0.7	379.2
South Racehorse Creek, AB	1-Apr SWE	millimeters	468.27	109%	1.4	632.2
Intercept			1		70.5	70.5
	1-Apr Forecast (KAF)				Σ	6324.5

Data used in Libby Water Supply Forecast

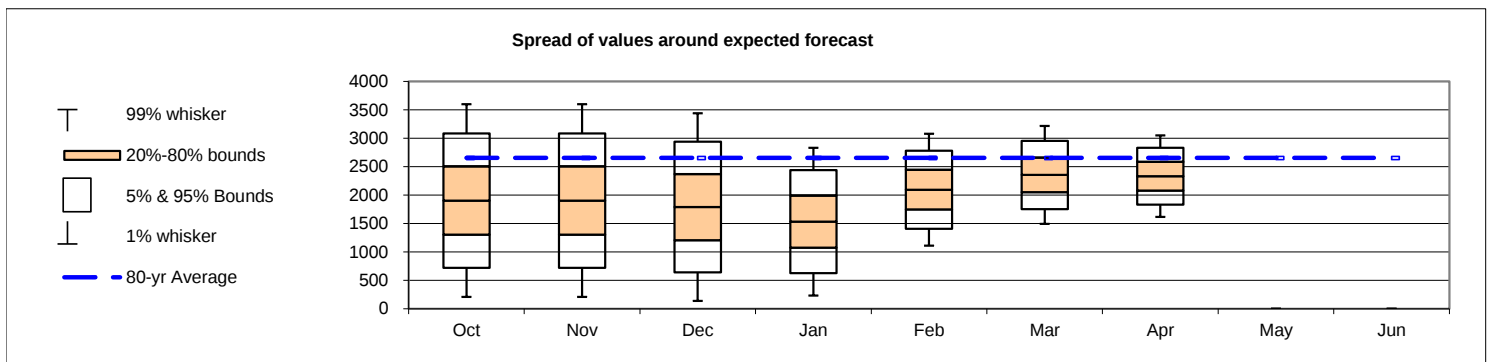
WY 2020

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	0.47			inch
West Glacier, MT	2.08	1.65	2.69	5.81	1.99	1.26			inch
Cranbrook A, BC	16.60	14.30	28.60	22.90	8.20	18.00			mm
Fernie, BC	103.00	35.00	216.00	185.00	97.00	82.00			mm
Snow Water Equiv	1-Jan			1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units
Hawkins Lake, MT				19	22	26			inch
Stahl Peak, MT	15			29	34	40			inch
East Creek, BC				778	893	1050			mm
Moyie Mountain, BC	193			320	404	526			mm
Sunshine Village, AB	273			408	512	614			mm
Akamina Pass, AB				363	444	527			mm
South Racehorse Creek, AB				289	358	468			mm
Streamflow	Jan			Feb	Mar	Apr	May	Jun	Units
Libby Inflow Volume	172.2			209.1	171.0				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	2404.0			feet

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

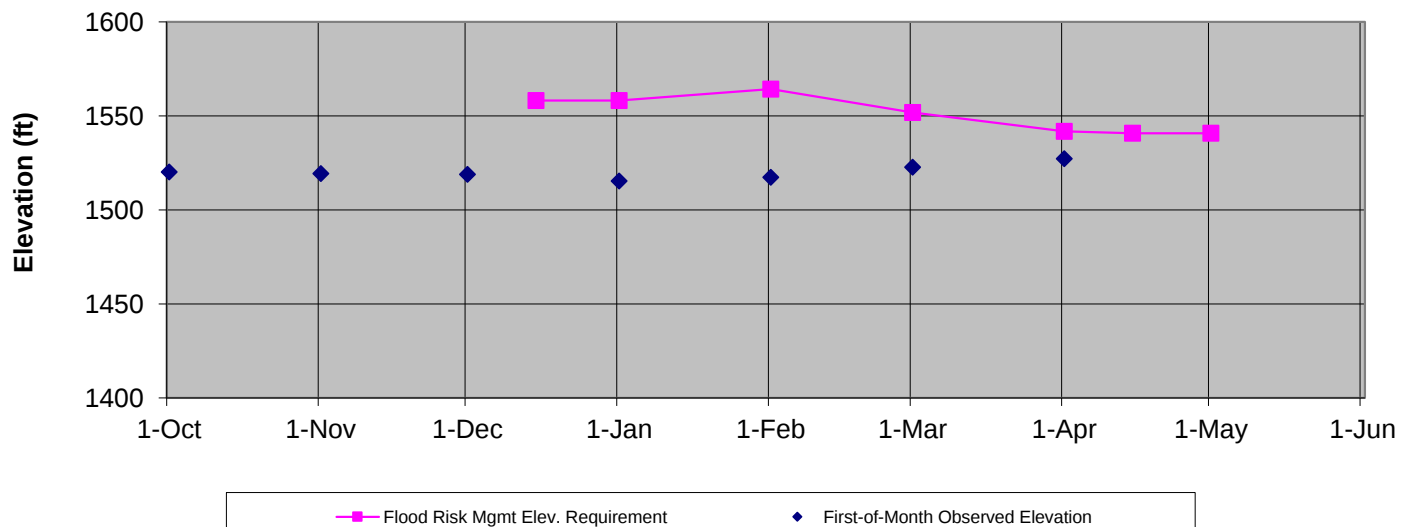
Jon Moen
 Upper Columbia Senior Water Manager
 Seattle District

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	2333	KAF	2438	96%	2655	88%
			May-Jul	1707	KAF	1784	96%	1959	87%
30-Apr Flood Risk Management Space			950	KAF					
30-Apr Flood Risk Management Elevation			1540.8	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	2333		
First-of-Month Elev	1520.3	1519.3	1519.0	1515.4	1517.4	1522.7	1527.2		
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	950	
FRM Elevation	--	1558.2	1558.2	1564.3	1551.9	1541.7	1540.8	1540.8	



Dworshak Flood Risk Management Elevations - WY 2020

Latest water supply forecast: Apr



Dworshak : April Runoff Forecast & Flood Risk Management Calculation

Apr-Jul Runoff Forecast Calculation					
Variable	Month	Observed Value	% of Average	Regression Coefficient	Runoff (KAF)
		A		B	=A*B
SOI	Sep	-1.20		171.32	-205.6
HQSI Cumulative Precip	Oct-Date	22.70	83%	22.32	506.7
Elk Butte SWE	1-Apr	40.0	116%	11.61	464.0
Hoodoo Basin SWE	1-Apr	36.9	94%	10.27	378.9
Sherwin SWE	1-Apr	6.4	93%	19.49	124.9
Lost Lake SWE	1-Apr	52.5	101%	7.91	415.4
Crater meadows SWE	1-Apr	49.7	116%	13.37	664.5
Intercept		1		-15.43	-15.4
1-Apr Forecast (KAF)				Σ	2333.3

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	2.30	--		
Cumulative HQSI Data	3.30	5.20	8.70	16.30	20.40	22.70	--		
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	--	--
Sherwin, ID				2.3	7.9	10.5	6.4		
Shanghi Summit, ID								--	--
Lost Lake, ID				10.9	33.3	46.1	52.5	--	--
Hemlock, ID								--	--
Crater Meadows Mar						43.5	49.7		
Streamflow (End of Month) (kaf)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				138	160	209	--	--	--

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:

John J. Heitstuman P.E., D.WRE
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Walla Walla District USACE

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