

The Official Water Supply Forecast for January through July are 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 **FEBRUARY** 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/>

4-February-2020

Hungry Horse Dam – Official Water Supply Forecast FEBRUARY 2020

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

- Feb-Jul: 2,151 kaf (106%)
- Apr-Jul: 1,973 kaf (105%)
- Apr-Aug: 2,044 kaf (106%)
- May-Sep: 1,778 kaf (105%)

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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Columbia - Pacific Northwest Region
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Northwest River Forecast Center Water Supply Forecasts

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

Official Water Supply

ESP with 10 Days QPF Ensemble: 2020-02-05 Issued: 2020-02-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	86474	98151	106	110825	92704
APR-JUL	73396	83627	105	96735	79855
APR-AUG	81367	92647	106	104360	87532
JAN-SEP	105211	117975	103	136469	114216
JAN-JUL	92166	104294	103	120778	101368
OCT-SEP	117535	130300	100	148794	130518

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-02-05 Issued: 2020-02-05

APR-SEP	88401	97805	106	115000	92704
APR-JUL	76054	83214	104	101612	79855
APR-AUG	83565	92774	106	109966	87532
JAN-SEP	109036	116832	102	139228	114216
JAN-JUL	95379	103213	102	123269	101368
OCT-SEP	121361	129157	99	151553	130518

Reference

ESP with 0 Days QPF Ensemble: 2020-02-05 Issued: 2020-02-05

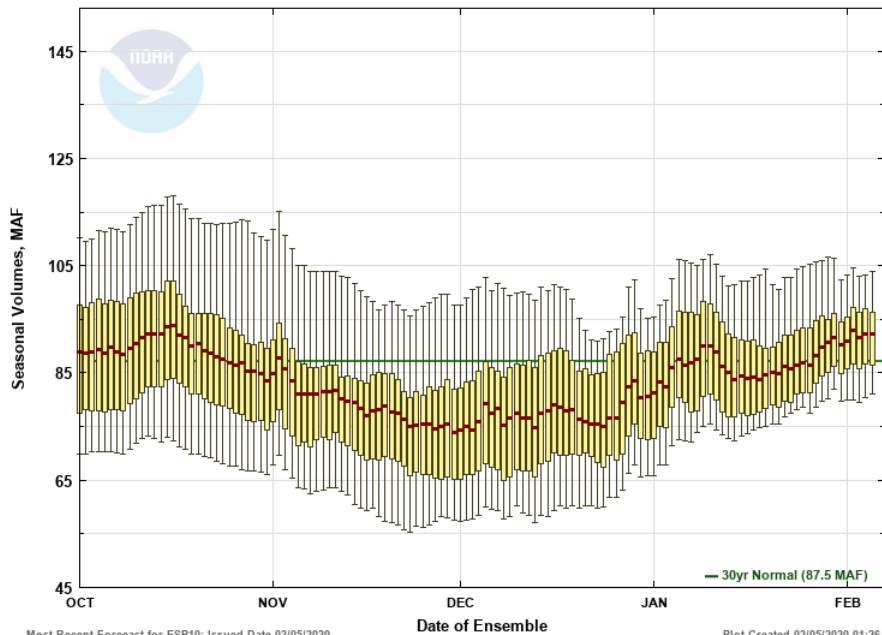
APR-SEP	86488	96267	104	114924	92704
APR-JUL	74267	82379	103	101373	79855
APR-AUG	81694	90721	104	109895	87532
JAN-SEP	106246	115796	101	140170	114216
JAN-JUL	92655	102726	101	122705	101368
OCT-SEP	118571	128122	98	152495	130518

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 02/05/2020

Plot Created 02/05/2020 01:26

☐ 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: 2020-02-05 Issued: 2020-02-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1981-2010)
	90 %	50 %	% Average	10 %	
APR-SEP	17063	21715	97	25725	22279
APR-JUL	14943	19317	97	23034	19848
APR-AUG	15987	20531	97	24364	21091
JAN-SEP	24015	29771	100	34305	29872
JAN-JUL	21561	27225	99	31736	27440
OCT-SEP	27929	33686	97	38220	34667

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2020-02-05 Issued: 2020-02-05

APR-SEP	16975	21135	95	25619	22279
APR-JUL	14895	18728	94	22934	19848
APR-AUG	15908	19974	95	24335	21091
JAN-SEP	22627	27411	92	33751	29872
JAN-JUL	20678	24946	91	31083	27440
OCT-SEP	26542	31326	90	37665	34667

Reference

ESP with 0 Days QPF Ensemble: 2020-02-05 Issued: 2020-02-05

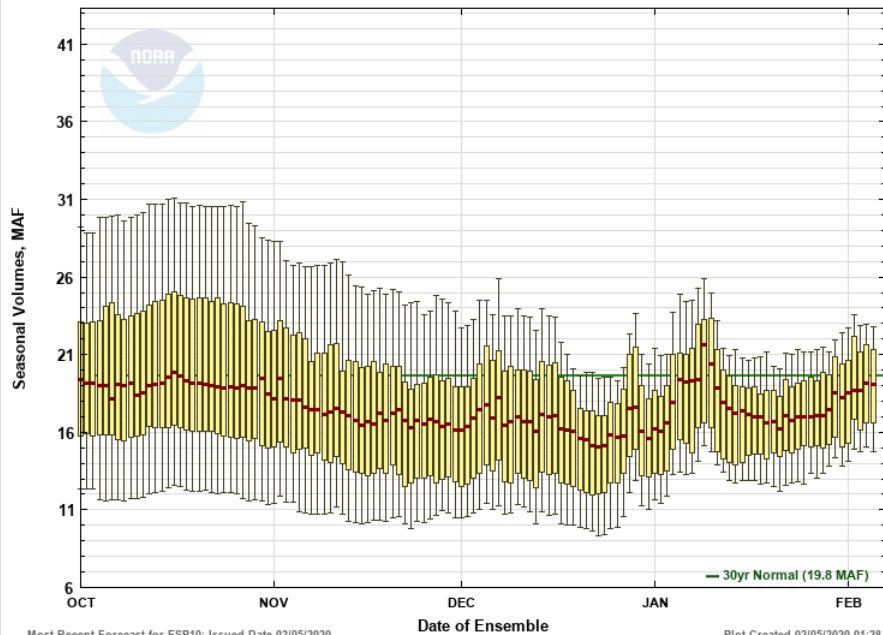
APR-SEP	16297	20225	91	25080	22279
APR-JUL	14249	17874	90	22401	19848
APR-AUG	15280	19064	90	23678	21091
JAN-SEP	22238	26240	88	33720	29872
JAN-JUL	20245	23889	87	31177	27440
OCT-SEP	26153	30154	87	37634	34667

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 02/05/2020

Plot Created 02/05/2020 01:28

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

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CSV (ESP10 / APR-JUL)

Forecast Ensemble



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Libby : February Runoff Forecast & Flood Risk Management Calculation

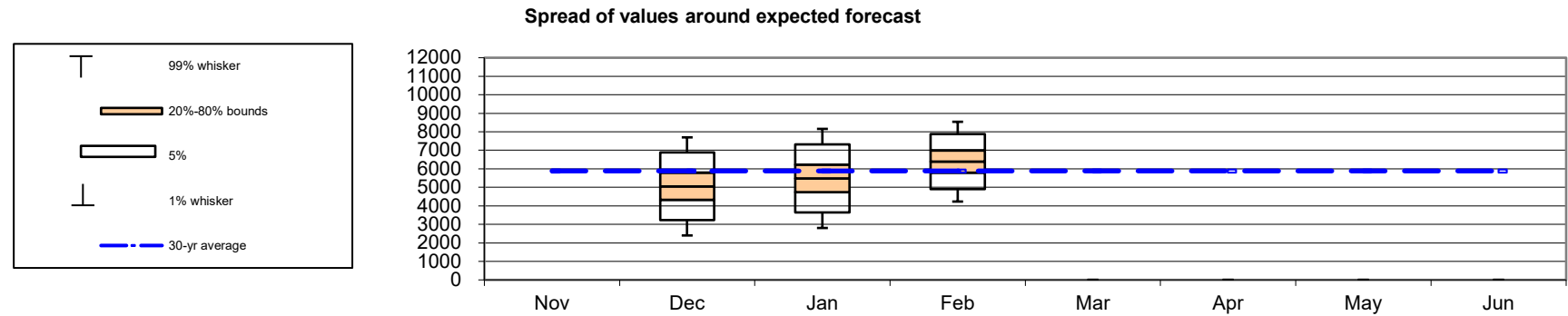
WY 2020

Runoff Forecast and Flood Risk Management

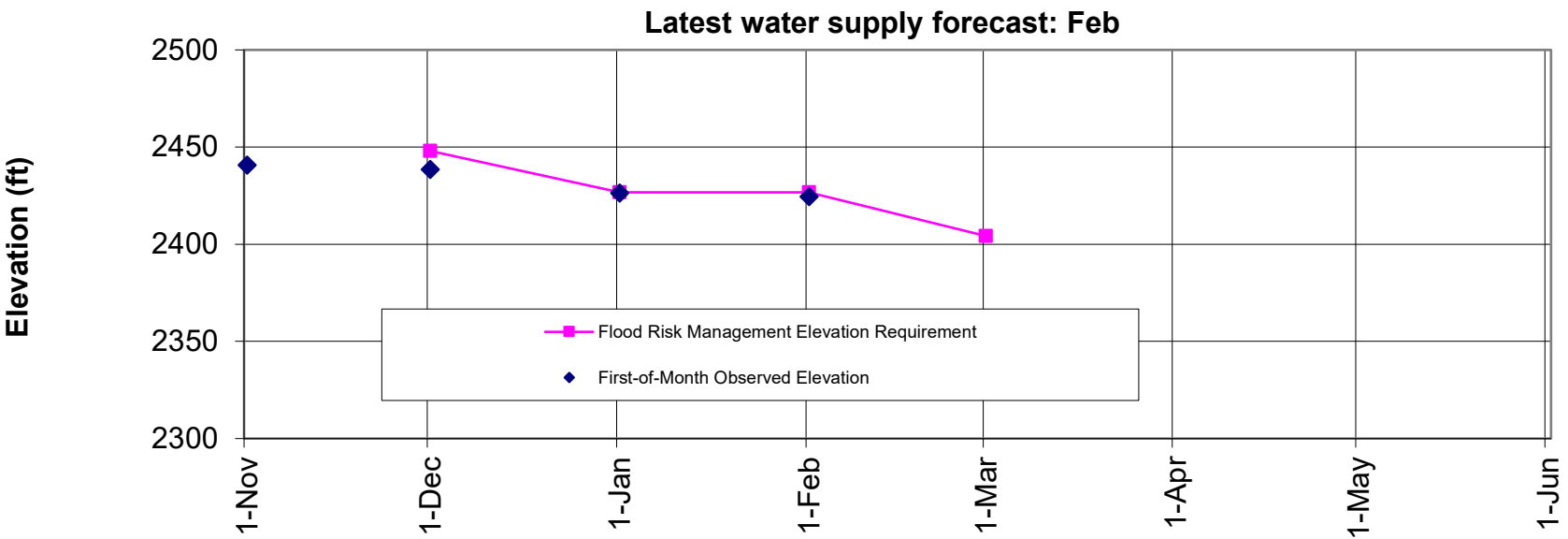
Most Probable Runoff Volume:	Apr-Aug	6386	KAF
	Apr-Jul	5797	KAF
	May-Jul	5231	KAF
29 Feb Flood Risk Management Space		2240	KAF
29 Feb Flood Risk Management Elevation		2404.2	ft

1981-2010 Average	Percent of Average	1929-2008 Average	Percent of Average
5885	109%	6282	102%
5342	109%	5720	102%
4821	109%	5199	102%

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				
First-of-Month Elev	2440.8	2438.4	2426.4	2424.6				
Date >>	30-Nov	31-Dec	31-Jan	29-Feb	15-Mar	31-Mar	15-Apr	30-Apr
Flood Risk Management Space	500	1400	1400	2240				
Flood Risk Management Elevation	2448.0	2426.7	2426.7	2404.2				



Libby Flood Risk Management Elevations - 2020



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, Kevin Shaffer (206) 764-3660, Sonja Michelsen (206) 316-3947, or Alexander Nathan (206) 316-3155.

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, Hand Creek, Lost Creek South, Mount Odium, and Three Isle Lake.

Libby : February 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	Σ Jun:Jul					
Eureka RS, MT	Σ Oct:Jan Prcp	inches	3.45	80%	78.5	270.7
West Glacier, MT	Σ Oct:Jan Prcp	inches	12.23	100%	31.0	378.5
Cranbrook A, BC	Σ Oct:Jan Prcp	millimeters	82.40	71%	2.8	234.0
Fernie, BC	Σ Oct:Jan Prcp	millimeters	539.00	109%	0.7	388.1
Hawkins Lake, MT	1-Feb SWE	inches	19.20	117%	30.6	587.5
Stahl Peak, MT	1-Feb SWE	inches	29.40	125%	23.0	675.9
East Creek, BC	1-Feb SWE	millimeters	777.50	127%	0.8	583.1
Moyie Mountain, BC	1-Feb SWE	millimeters	320.00	111%	1.5	473.6
Sunshine Village, AB	1-Feb SWE	millimeters	408.24	106%	1.5	600.1
Akamina Pass, AB	1-Feb SWE	millimeters	363.22	114%	1.3	461.3
South Racehorse Creek, AB	1-Feb SWE	millimeters	288.53	103%	1.5	441.5
Intercept			1		1291.5	1291.5
1-Feb Forecast (KAF)					Σ	6385.8

Data used in Libby Water Supply Forecast

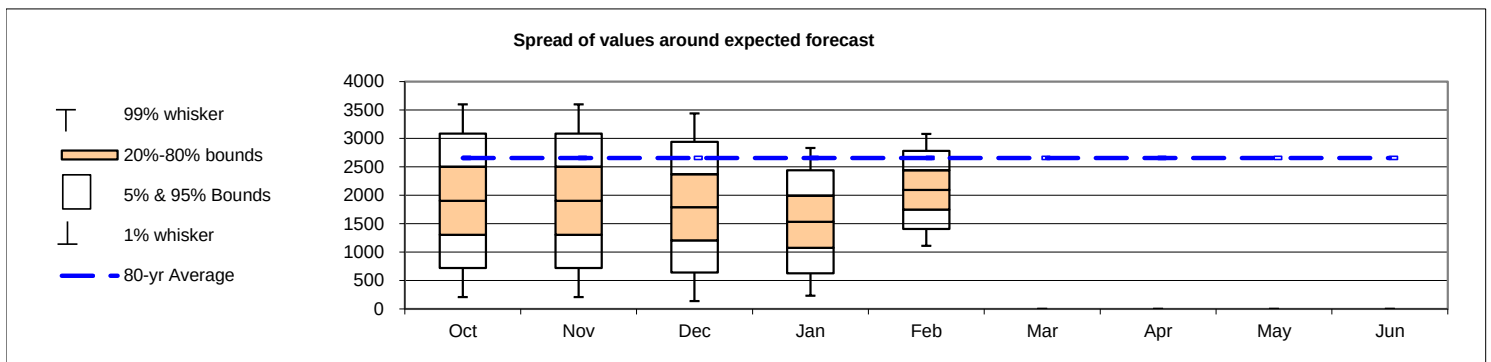
WY 2020

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					inch
West Glacier, MT		2.08	1.65	2.69	5.81					inch
Cranbrook A, BC		16.60	14.30	28.60	22.90					mm
Fernie, BC		103.00	35.00	216.00	185.00					mm
Snow Water Equiv		1-Jan			1-Feb	1-Mar	1-Apr	1-May	1-Jun	Units
Hawkins Lake, MT					19					inch
Stahl Creek, MT					15					inch
East Peak, BC					778					mm
Moyie Mountain, BC					193					mm
Sunshine Village, AB					273					mm
Akamina Pass, AB					363					mm
South Racehorse Creek, AB					289					mm
Streamflow		Jan			Feb	Mar	Apr	May	Jun	Units
Libby Inflow Volume		172.2								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					feet

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

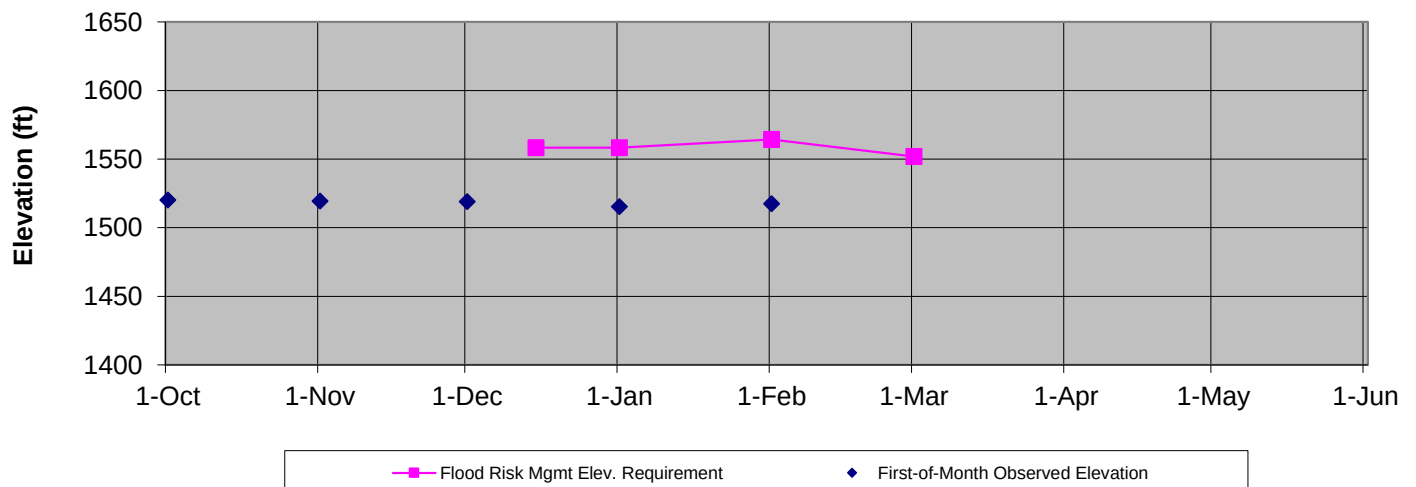
Logan Osgood-Zimmerman, P.E.
Upper Columbia Senior Water Manager
Seattle District

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	2095	KAF	2438	86%	2655	79%	
		May-Jul	1533	KAF	1784	86%	1959	78%	
29-Feb Flood Risk Management Space		793	KAF						
29-Feb Flood Risk Management Elevation		1551.9	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				
First-of-Month Elev	1520.3	1519.3	1519.0	1515.4	1517.4				
Date >>	15-Dec	31-Dec	31-Jan	29-Feb	31-Mar	15-Apr	30-Apr	31-May	
FRM Space	--	700	700	610	793				
FRM Elevation	--	1558.2	1558.2	1564.3	1551.9				



Dworshak Flood Risk Management Elevations - WY 2020

Latest water supply forecast: Feb



Dworshak : February 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		264.27	-317.1
HQSI Cumulative Precip	Oct-Date	16.30	84%	27.04	440.8
Elk Butte SWE	1-Feb	26.2	113%	12.06	315.9
Cool Creek SWE	1-Feb	28.5	99%	11.35	323.7
Hoodoo Basin SWE	1-Feb	25.1	97%	10.97	275.2
Sherwin SWE	1-Feb	7.9	103%	29.17	230.4
Lost Lake SWE	1-Feb	33.3	96%	7.60	252.8
Intercept		1		572.93	572.9
1-Feb Forecast (KAF)				Σ	2094.7

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

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), 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. There is a snow flight scheduled in mid-Feb. to verify snow density in the basin.

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