

The Official Water Supply Forecasts for January through July are computed on the 3rd workday 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	Sets min. flows at Hungry Horse and Columbia Falls
		January, February, March	Sets VARQ FRM targets
	May – September Provided by Reclamation	April	Sets VARQ FRM targets and VARQ refill flows
		May	Sets VARQ refill flows Sets end of September draft target
		June	Sets VARQ refill flows
The Dalles	April – September Provided by NWRFC	March	Sets CRWMP adjustments at Grand Coulee
	April – August Provided by NWRFC	April	Sets spring flow objective at McNary Dam
		July	Sets end of August draft limit at Grand Coulee
Lower Granite	April – July Provided by NWRFC	April	Sets spring flow objective at Lower Granite
		June	Sets summer flow objective at Lower Granite
Libby	April – August Provided by Corps Seattle District	December	Sets end of December variable draft target
		January, February, March	Sets VARQ FRM targets
		April	Sets VARQ FRM targets and VARQ refill flows
		May	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 Sets end of September draft limit.
		June	VARQ refill flows
Dworshak	April – July Provided by NWRFC	January to March	Manage for reservoir FRM, VDL, and Flood Control Refill Curve (FCRC)
		April to June	Manage for reservoir FRM and FCRC

Source: 2024 Water Management Plan, page 15 - <https://pweb.crohms.org/tmt/documents/wmp/2024/>

2-April-2024

Hungry Horse Dam – Official Water Supply Forecast April 2024

Below are the volumes for the April 2024 final forecast for Hungry Horse:

- Apr-Jul: 1,450 kaf (73%)
- Apr-Aug: 1,504 kaf (74%)
- May-Jul: 1,184 kaf (71%)
- May-Sep: 1,279 kaf (72%)

The minimum flows downstream of Hungry Horse based on the Final March forecast of the Apr-Aug volume are as follows:

- Columbia Falls: 3,390 cfs
- Hungry Horse: 710 cfs

End of April forecasted forebay elevation at Hungry Horse is projected to be 3,544.6 ft.

Chris Runyan

U.S. Bureau of Reclamation | Columbia-Pacific Northwest Interior - Region 9
Water Management | Operations Group
Boise, ID



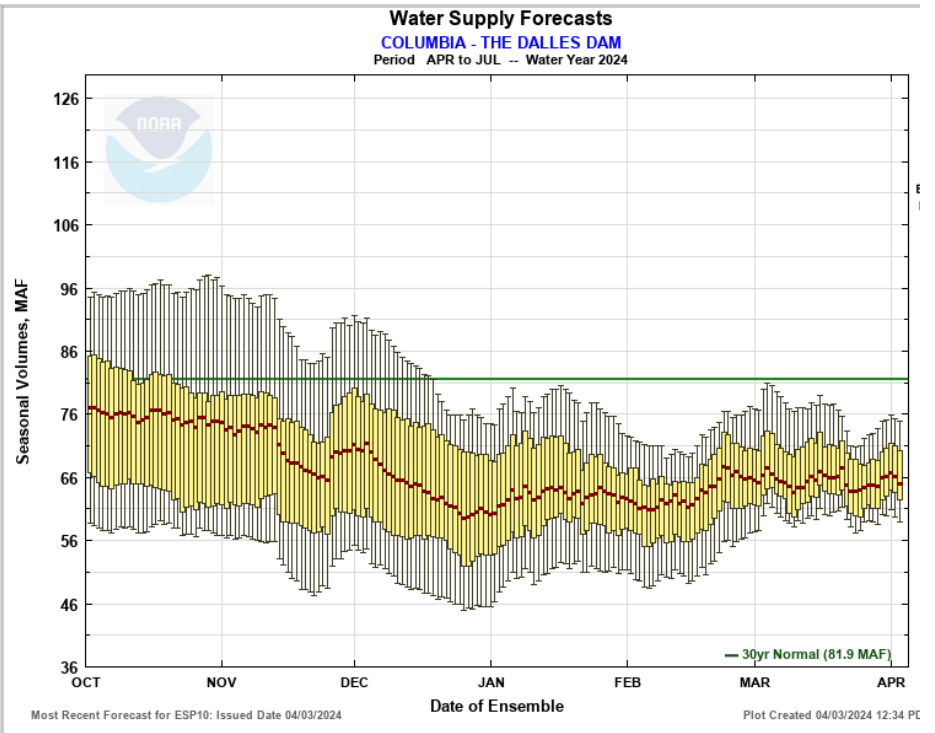
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COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2024					
Official Water Supply					
ESP with 10 Days QPF Ensemble: 2024-04-03 Issued: 2024-04-03					
Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	71432	76391	81	86831	94166
APR-JUL	59432	65544	80	75298	81933
APR-AUG	66697	71691	80	82134	89196
JAN-SEP	90752	95711	83	106151	115946
JAN-JUL	78753	84865	82	94618	103714
OCT-SEP	104006	108965	82	119405	132314
Experimental Water Supply					
HEFS with 15 days EQPF Ensemble: 2024-04-03 Issued: 2024-04-03					
APR-SEP	70742	78065	83	87136	94166
APR-JUL	60669	66897	82	75429	81933
APR-AUG	66226	72880	82	82448	89196
JAN-SEP	90062	97386	84	106456	115946
JAN-JUL	79990	86217	83	94750	103714
OCT-SEP	103317	110640	84	119711	132314
Reference					
ESP with 0 Days QPF Ensemble: 2024-04-03 Issued: 2024-04-03					
APR-SEP	69629	77189	82	84821	94166
APR-JUL	59906	65862	80	73251	81933
APR-AUG	65525	72175	81	80081	89196
JAN-SEP	88950	96509	83	104141	115946
JAN-JUL	79226	85183	82	92571	103714
OCT-SEP	102204	109763	83	117395	132314

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



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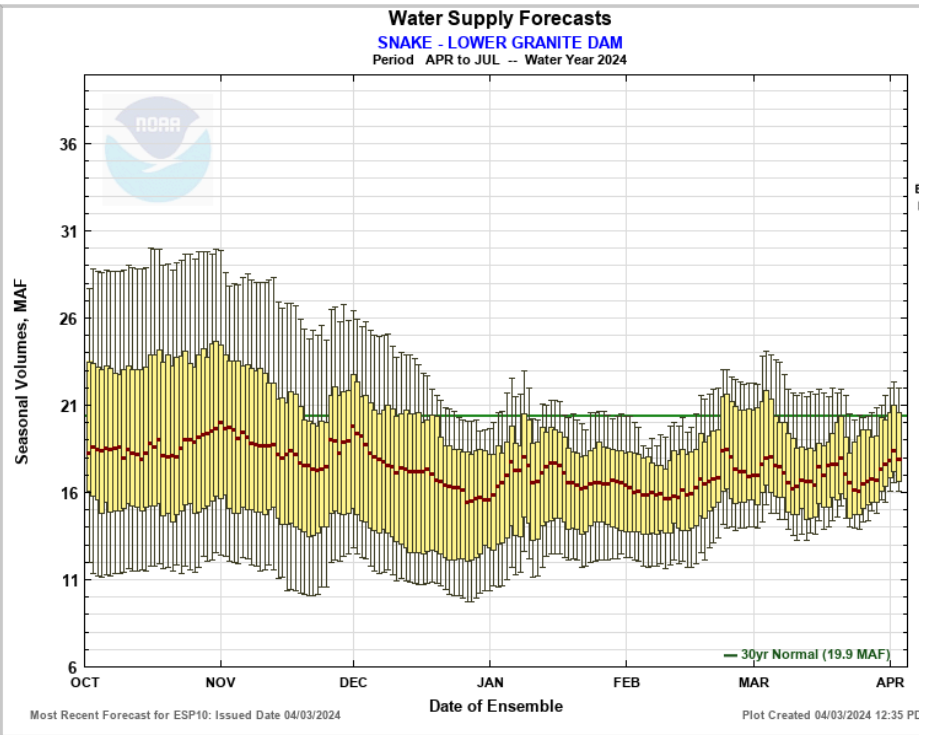
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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2024					
Official Water Supply					
ESP with 10 Days QPF Ensemble: 2024-04-03 Issued: 2024-04-03					
Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	17900	19824	89	24138	22232
APR-JUL	15682	17511	88	21564	19946
APR-AUG	16782	18700	89	22873	21121
JAN-SEP	23782	25706	86	30020	29736
JAN-JUL	21564	23393	85	27446	27450
OCT-SEP	27627	29550	86	33864	34287
Experimental Water Supply					
HEFS with 15 days EQPF Ensemble: 2024-04-03 Issued: 2024-04-03					
APR-SEP	17483	19770	89	24701	22232
APR-JUL	15201	17522	88	22138	19946
APR-AUG	16355	18664	88	23446	21121
JAN-SEP	23364	25652	86	30583	29736
JAN-JUL	21083	23404	85	28020	27450
OCT-SEP	27209	29497	86	34428	34287
Reference					
ESP with 0 Days QPF Ensemble: 2024-04-03 Issued: 2024-04-03					
APR-SEP	16374	19142	86	23087	22232
APR-JUL	14232	16800	84	20407	19946
APR-AUG	15287	18000	85	21756	21121
JAN-SEP	22256	25024	84	28968	29736
JAN-JUL	20113	22682	83	26289	27450
OCT-SEP	26101	28869	84	32813	34287

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Libby : April Runoff Forecast & Flood Risk Management Calculation

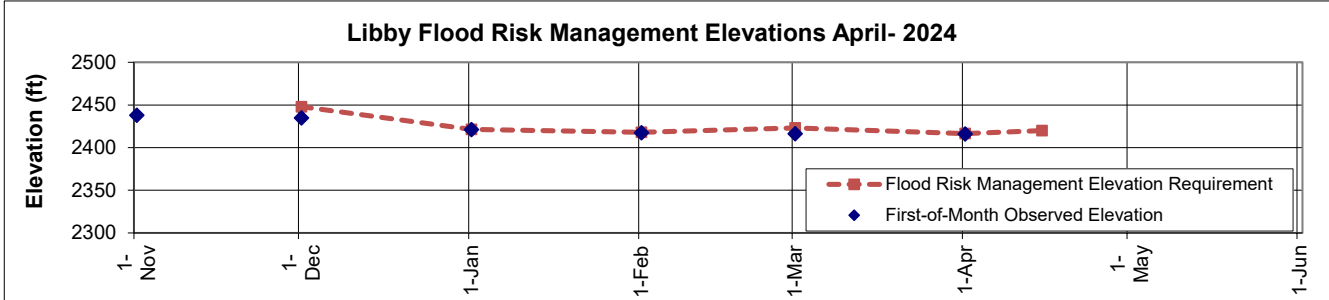
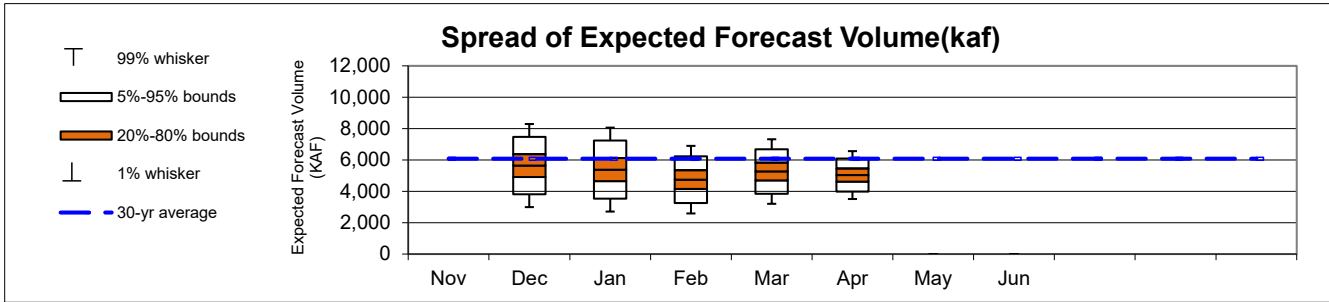
WY 2024

Runoff Forecast	April	1991-2020 Average	1991 - 2020 Percent of Average	1929-2020 Average	1929 - 2020 Percent of Average
Most Probable Runoff Volume: Apr-Aug (kaf)	5036	6080	83%	6259	80%
Most Probable Runoff Volume: Apr-Jul (kaf)	4614	5570	83%	5708	81%
Most Probable Runoff Volume: May-Jul (kaf)	4153	5014	83%	5183	80%

Flood Risk Management		April
30-Apr Flood Risk Management Space (kaf)		1666
30-Apr Flood Risk Management Elevation (ft)		2419.9

Forecast/Reservoir Data	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast (kaf)		5642	5385	4743	5261	5036		
First-of-Month Elev (ft)	2437.9	2434.8	2421.2	2417.5	2416.4	2415.9		

Seasonal FRM Requirements	30-Nov	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr		
Flood Risk Management Space (kaf)	500	1613	1745	1547	1799	1666		
Flood Risk Management Elevation (ft)	2448.0	2421.3	2417.9	2423.0	2416.4	2419.9		



Notes:

- The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Leon Basdekas (208) 353-2564, Courtney Moore (206) 316-3005, David Varner (206) 316-3155 or Jason Chang (206) 764-3528.
- 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.

Libby : April Runoff Forecast & Flood Risk Management Calculation
Apr-Aug Runoff Forecast Calculation:

Variable	Month(s)	Units	Observed Value A	Percent of Average (1991-2020)	Regression Coefficient B	Marginal Runoff (KAF) =A*B
SOI	ΣJun:Jul					
Eureka RS, MT	ΣOct:Mar Prcp	inches	5.82	93%	68.52	398.5
West Glacier, MT	ΣOct:Mar Prcp	inches	16.19	91%	29.47	477.1
Cranbrook A, BC	ΣOct:Mar Prcp	millimeters	127.60	74%	2.99	381.5
Fernie, BC	ΣOct:Mar Prcp	millimeters	745.41	109%	0.71	529.2
Hawkins Lake, MT	1-Apr SWE	inches	20.50	80%	22.43	459.8
Stahl Peak, MT	1-Apr SWE	inches	30.70	86%	19.70	604.8
East Creek, BC	1-Apr SWE	millimeters	711.53	80%	0.73	519.4
Moyie Mountain, BC	1-Apr SWE	millimeters	270.04	61%	1.21	326.7
Sunshine Village, AB	1-Apr SWE	millimeters	372.21	66%	1.43	532.3
Akamina Pass, AB	1-Apr SWE	millimeters	383.89	82%	0.72	276.4
South Racehorse Creek, AB	1-Apr SWE	millimeters	340.74	82%	1.35	460.0
Intercept			1		70.54	70.5
April Forecast	April - August	kaf				5036.3

Data used in Libby Water Supply Forecast

Climate Data	Jun-23	Jul-23
SOI	0.30	-0.30

Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Eureka RS, MT (inch)	0.58	1.88	0.70	1.12	0.56	0.98		
West Glacier, MT (inch)	1.52	4.12	2.74	3.39	2.46	1.96		
Cranbrook A, BC (mm)	4.80	22.20	27.40	24.10	25.30	23.80		
Fernie, BC (mm)	98.30	129.79	243.33	87.63	96.44	89.92		


Snow Water Equiv	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Hawkins Lake, MT (inch)				8.7	15.6	20.5		
Stahl Peak, MT (inch)			11.9	21.4	26.3	30.7		
East Creek, BC (mm)				433.0	602.5	711.5		
Moyie Mountain, BC (mm)			85.0	138.4	226.5	270.0		
Sunshine Village, AB (mm)			168.7	233.9	370.1	372.2		
Akamina Pass, AB (mm)				211.6	289.5	383.9		
South Racehorse Creek, AB (mm)				147.6	264.0	340.7		

Streamflow	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Libby Inflow Volume (kaf)			161.5	192.0	226.6			

Reservoir Elevation	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Libby FOM Elev (feet)	2437.9	2434.8	2421.2	2417.5	2416.4	2415.9		

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Northwest River Forecast Center

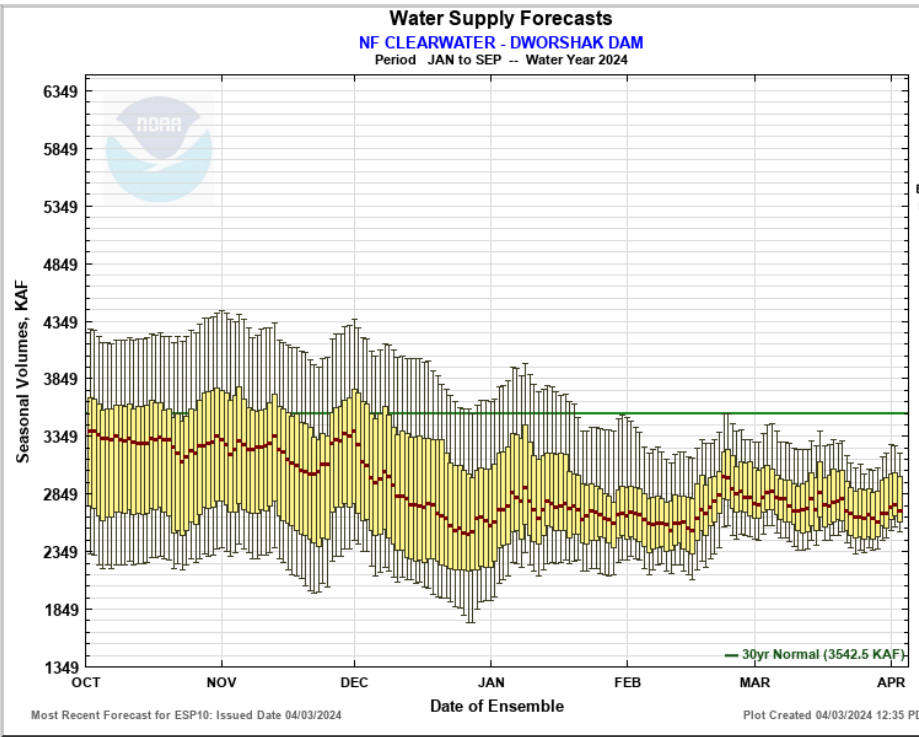
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NF CLEARWATER - DWORSHAK DAM (DWR11) Forecasts for Water Year 2024					
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Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	1805	1990	76	2493	2620
APR-JUL	1695	1865	75	2363	2474
JAN-SEP	2517	2702	76	3205	3543
JAN-JUL	2407	2577	76	3075	3397
OCT-SEP	2816	3002	75	3504	3998
Experimental Water Supply					
HEFS with 15 days EQPF Ensemble: 2024-04-03 Issued: 2024-04-03					
APR-SEP	1693	1989	76	2450	2620
APR-JUL	1585	1862	75	2301	2474
JAN-SEP	2405	2701	76	3162	3543
JAN-JUL	2297	2574	76	3013	3397
OCT-SEP	2705	3000	75	3461	3998
Reference					
ESP with 0 Days QPF Ensemble: 2024-04-03 Issued: 2024-04-03					
APR-SEP	1644	1954	75	2396	2620
APR-JUL	1532	1817	73	2263	2474
JAN-SEP	2356	2666	75	3108	3543
JAN-JUL	2244	2529	74	2975	3397
OCT-SEP	2655	2966	74	3408	3998

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Dworshak Flood Risk Management Requirements:
<https://www.nwd-wc.usace.army.mil/report/colsum/>