

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
	May – September Provided by Reclamation	January, February, March	Sets VARQ FRM targets
		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: 2023 Water Management Plan, page 15 - <https://pweb.crohms.org/tmt/documents/wmp/2023/>

Hungry Horse Dam – Official Water Supply Forecast APRIL 2023

Below are the volumes for the April 2023 final forecast for Hungry Horse:

- Apr-Jul: 1,700 kaf (86%)
- Apr-Aug: 1,770 kaf (87%)
- May-Sep: 1,680 kaf (95%)
- May-Jul: 1,560 kaf (94%)

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

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

Joel Fenolio, P.E.

Water Management - Operations Team Supervisor
U.S. Bureau of Reclamation
Columbia - Pacific Northwest Region
Boise, ID 83706



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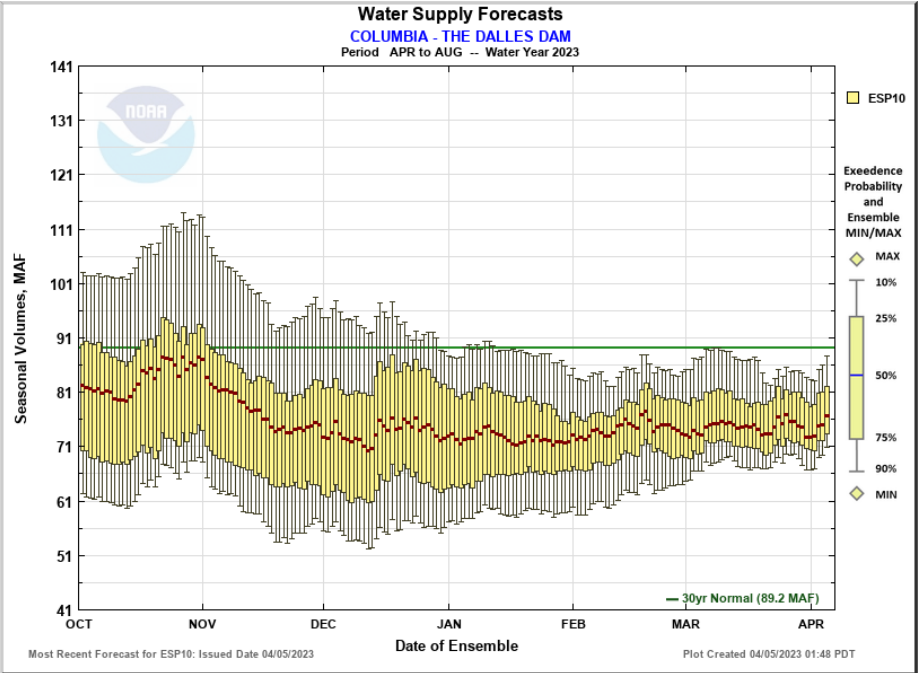
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COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2023					
Official Water Supply					
ESP with 10 Days QPF Ensemble: 2023-04-05 Issued: 2023-04-05					
Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	75672	81407	86	92748	94166
APR-JUL	62762	69945	85	79836	81933
APR-AUG	71028	76790	86	87692	89196
JAN-SEP	87275	93010	80	104351	115946
JAN-JUL	74365	81548	79	91439	103714
OCT-SEP	97659	103993	78	114734	132314

Experimental Water Supply					
HEFS with 15 days EQPF Ensemble: 2023-04-05 Issued: 2023-04-05					
Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	73649	80961	86	90352	94166
APR-JUL	62138	68776	84	77547	81933
APR-AUG	69104	76087	85	85350	89196
JAN-SEP	85252	92564	80	101955	115946
JAN-JUL	73741	80379	78	89150	103714
OCT-SEP	95635	102947	78	112338	132314

Reference					
ESP with 0 Days QPF Ensemble: 2023-04-05 Issued: 2023-04-05					
Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	72347	79477	84	88057	94166
APR-JUL	62076	68140	83	75842	81933
APR-AUG	68201	74621	84	83296	89196
JAN-SEP	83950	91079	79	99660	115946
JAN-JUL	73679	79743	77	87445	103714
OCT-SEP	94333	101463	77	110043	132314

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



Most Recent Forecast for ESP10: Issued Date 04/05/2023
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CSV (ESP10 / APR-AUG)

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SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2023

Official Water Supply

ESP with 10 Days QPF Ensemble: 2023-04-05 Issued: 2023-04-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	18780	20801	94	25434	22232
APR-JUL	16327	18178	91	22542	19946
APR-AUG	17619	19552	93	24042	21121
JAN-SEP	22907	24927	84	29560	29736
JAN-JUL	20453	22304	81	26668	27450
OCT-SEP	26376	28396	83	33029	34287

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2023-04-05 Issued: 2023-04-05

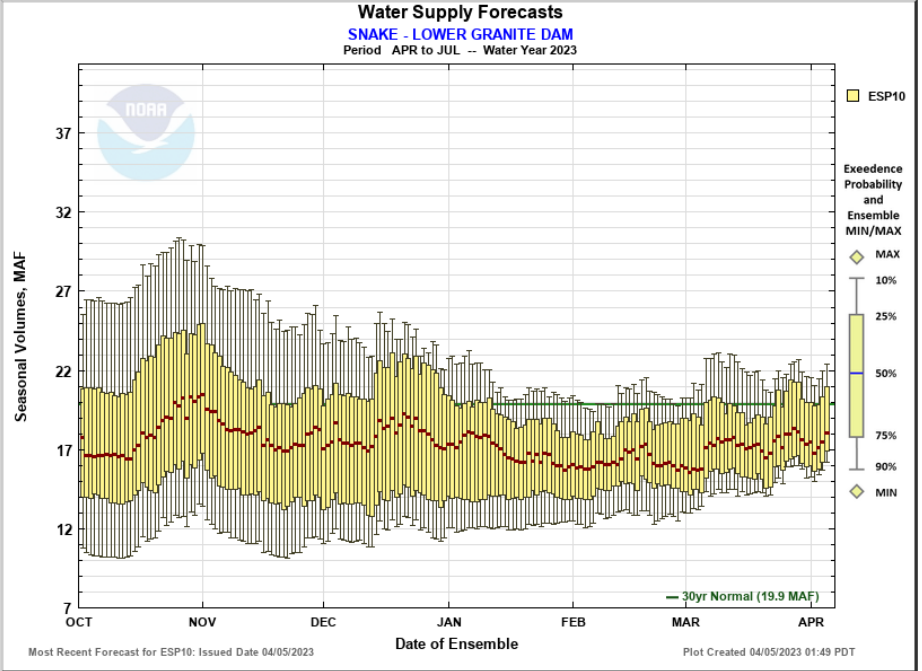
APR-SEP	17963	20527	92	25042	22232
APR-JUL	15569	17931	90	22269	19946
APR-AUG	16797	19236	91	23759	21121
JAN-SEP	22089	24653	83	29168	29736
JAN-JUL	19696	22058	80	26396	27450
OCT-SEP	25559	28123	82	32638	34287

Reference

ESP with 0 Days QPF Ensemble: 2023-04-05 Issued: 2023-04-05

APR-SEP	17901	20413	92	24300	22232
APR-JUL	15556	17845	89	21625	19946
APR-AUG	16732	19138	91	23032	21121
JAN-SEP	22027	24539	83	28427	29736
JAN-JUL	19683	21971	80	25751	27450
OCT-SEP	25496	28008	82	31896	34287

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Libby : April Runoff Forecast & Flood Risk Management Calculation

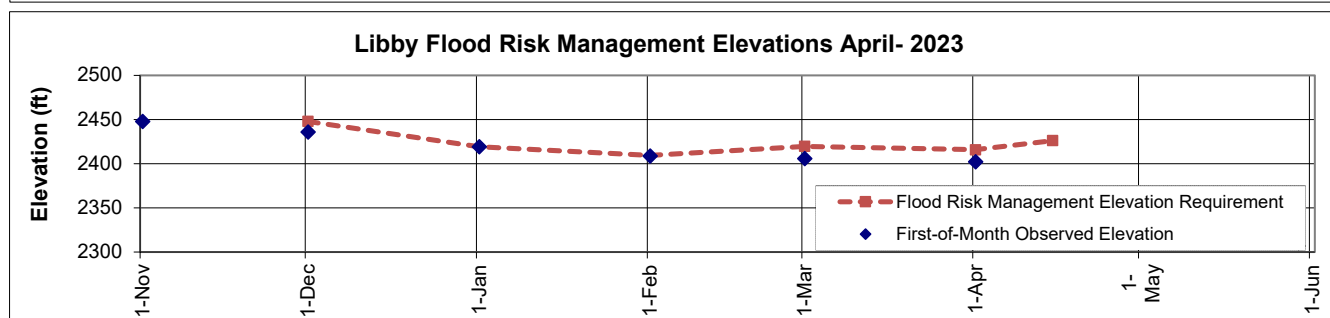
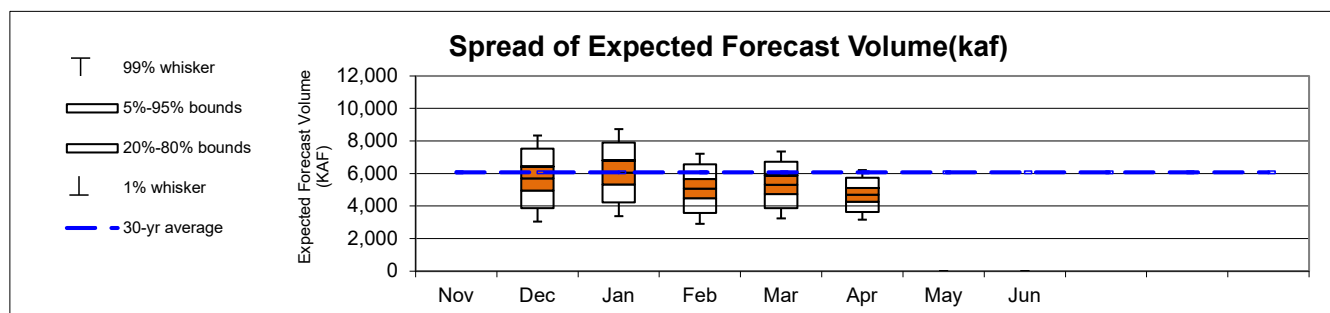
WY 2023

Runoff Forecast	April	Average	Average	Average	Average
Most Probable Runoff Volume: Apr-Aug (kaf)	4694	6080	77%	6259	75%
Most Probable Runoff Volume: Apr-Jul (kaf)	4300	5570	77%	5708	75%
Most Probable Runoff Volume: May-Jul (kaf)	3871	5014	77%	5183	75%

Flood Risk Management	April
30-Apr Flood Risk Management Space (kaf)	1419
30-Apr Flood Risk Management Elevation (ft)	2426.2

Forecast/Reservoir Data	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Aug Runoff Forecast (kaf)		5692	6061	5071	5298	4694		
First-of-Month Elev (ft)	2448.0	2435.9	2419.3	2409.0	2405.7	2402.4		

Seasonal FRM Requirements	30-Nov	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr		
Flood Risk Management Space (kaf)	500	1689	2054	1678	1821	1419		
Flood Risk Management Elevation (ft)	2448.0	2419.3	2409.5	2419.6	2415.9	2426.2		



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, Jason Chang (206) 764-3528, Lumas Helaire (206) 316-3875, Ethan Cheng (206) 316-3875, or Kevin Shaffer (206) 764-3660.
- 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		1.80			0.0
Eureka RS, MT	ΣOct:Mar Prcp	inches	3.91	63%	68.52	267.9
West Glacier, MT	ΣOct:Mar Prcp	inches	12.29	69%	29.47	362.2
Cranbrook A, BC	ΣOct:Mar Prcp	millimeters	115.60	67%	2.99	345.6
Fernie, BC	ΣOct:Mar Prcp	millimeters	452.52	66%	0.71	321.3
Hawkins Lake, MT	1-Apr SWE	inches	21.80	85%	22.43	489.0
Stahl Peak, MT	1-Apr SWE	inches	28.00	78%	19.70	551.6
East Creek, BC	1-Apr SWE	millimeters	670.00	75%	0.73	489.1
Moyie Mountain, BC	1-Apr SWE	millimeters	379.00	85%	1.21	458.6
Sunshine Village, AB	1-Apr SWE	millimeters	392.70	70%	1.43	561.6
Akamina Pass, AB	1-Apr SWE	millimeters	381.00	81%	0.72	274.3
South Racehorse Creek, AB	1-Apr SWE	millimeters	371.80	90%	1.35	501.9
Intercept			1		70.54	70.5
January Forecast	April - August	kaf				4693.6

Data used in Libby Water Supply Forecast

Climate Data	Jun-22	Jul-22
SOI	1.70	0.80

Precipitation Data	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Eureka RS, MT (inch)	0.40	1.08	1.57	0.19	0.53	0.14		
West Glacier, MT (inch)	2.02	2.76	4.48	0.76	1.83	0.44		
Cranbrook A, BC (mm)	13.00	24.50	36.20	31.80	6.00	4.10		
Fernie, BC (mm)	98.81	118.00	112.27	36.07	52.32	35.05		

Snow Water Equiv	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Hawkins Lake, MT (inch)				14.1	18.5	21.8		
Stahl Peak, MT (inch)			15.6	19.0	25.5	28.0		
East Creek, BC (mm)				437.0	604.0	670.0		
Moyie Mountain, BC (mm)			219.0	256.0	325.0	379.0		
Sunshine Village, AB (mm)			236.1	261.3	356.4	392.7		
Akamina Pass, AB (mm)				254.4	339.9	381.0		
South Racehorse Creek, AB (mm)				242.2	326.4	371.8		

Streamflow	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Libby Inflow Volume (kaf)			170.3	122.5	131.7			

Reservoir Elevation	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Libby FOM Elev (feet)	2448.0	2435.9	2419.3	2409.0	2405.7	2402.4		

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

Leon Basdekas, P.E.
 Upper Columbia Senior Water Manager
 Seattle District

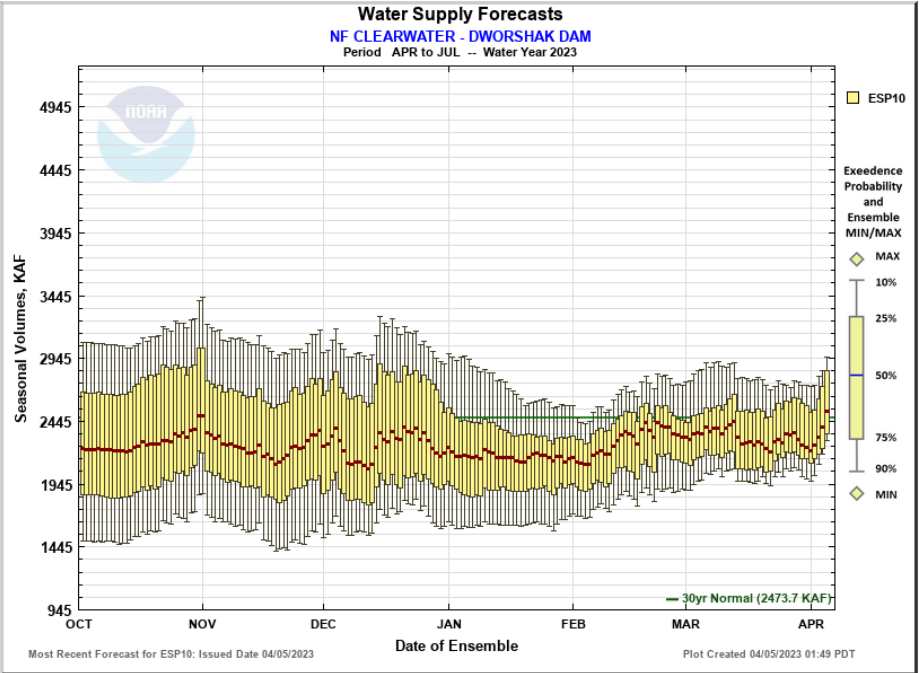


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NF CLEARWATER - DWORSHAK DAM (DWR11) Forecasts for Water Year 2023					
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	90 %	50 %	% Average	10 %	
APR-SEP	2417	2658	101	3122	2620
APR-JUL	2293	2521	102	2961	2474
JAN-SEP	2801	3042	86	3505	3543
JAN-JUL	2677	2905	86	3344	3397
OCT-SEP	3093	3334	83	3798	3998
Experimental Water Supply					
HEFS with 15 days EQPF Ensemble: 2023-04-05 Issued: 2023-04-05					
APR-SEP	2281	2602	99	3073	2620
APR-JUL	2155	2456	99	2899	2474
JAN-SEP	2665	2986	84	3457	3543
JAN-JUL	2539	2840	84	3283	3397
OCT-SEP	2957	3278	82	3749	3998
Reference					
ESP with 0 Days QPF Ensemble: 2023-04-05 Issued: 2023-04-05					
APR-SEP	2223	2520	96	2971	2620
APR-JUL	2101	2387	96	2782	2474
JAN-SEP	2607	2903	82	3355	3543
JAN-JUL	2485	2771	82	3166	3397
OCT-SEP	2899	3196	80	3647	3998
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