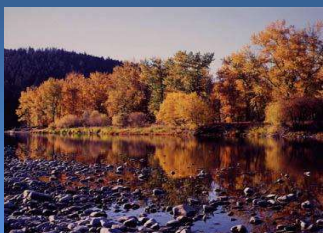




Northwest River Forecast Center



June 2023 Water Supply Briefing

Telephone Conference: (213) 929-4212
Audio Access Code: 949-968-637#

Geoffrey Walters, PE
NWRFC.watersupply@noaa.gov

*Audio PIN is provided when logging into the webinar and is required if you wish to ask questions at the end of presentation



Take Home Messages

Precipitation was below normal and temperatures were colder than normal this winter.

Despite below precipitation totals, and due to colder temperatures, snowpack was near to above normal.

May was unseasonably warm which led to rapid snowmelt. *Where did spring go?*

With the onset of spring snowmelt, adjusted runoff has had large increases over the last month.

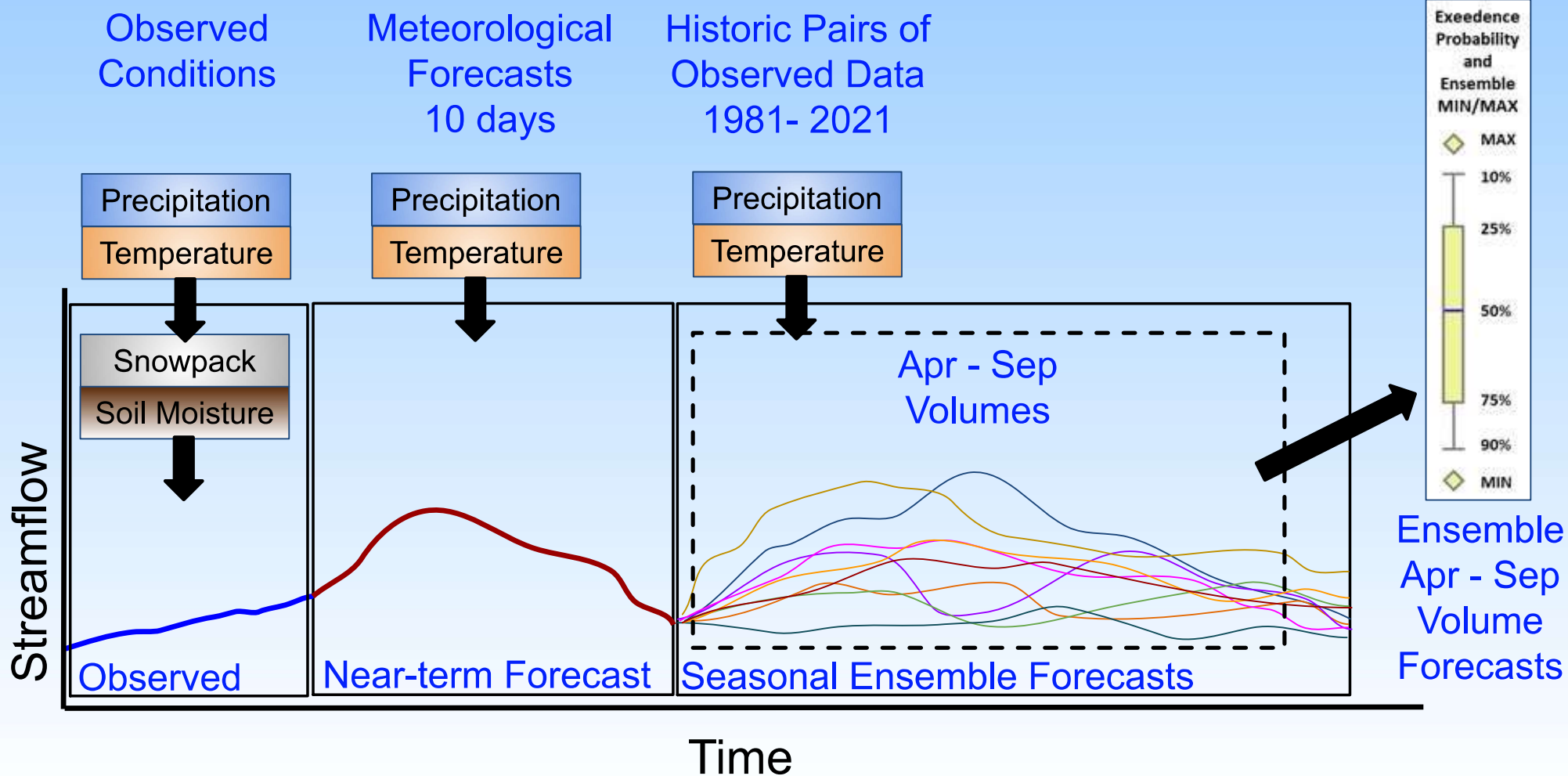
April-September volume forecasts have mostly decreased since the last briefing. The largest changes are in Eastern Oregon.

The median ESP10 April-September volume forecasts are a mix of above and below normal. The spread of the forecast interquartile range is generally small (1-10%).

The Snake River forecasted contribution to annual runoff volumes for the Columbia River System is projected to be well above normal.

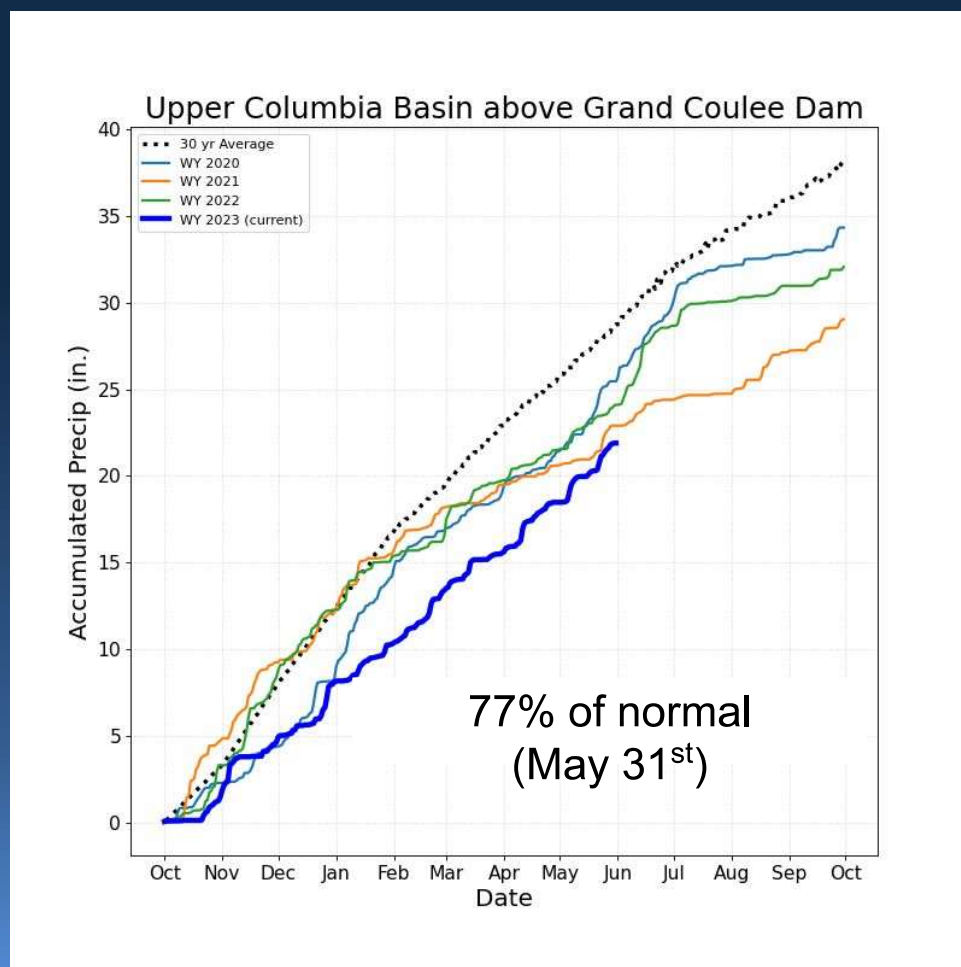
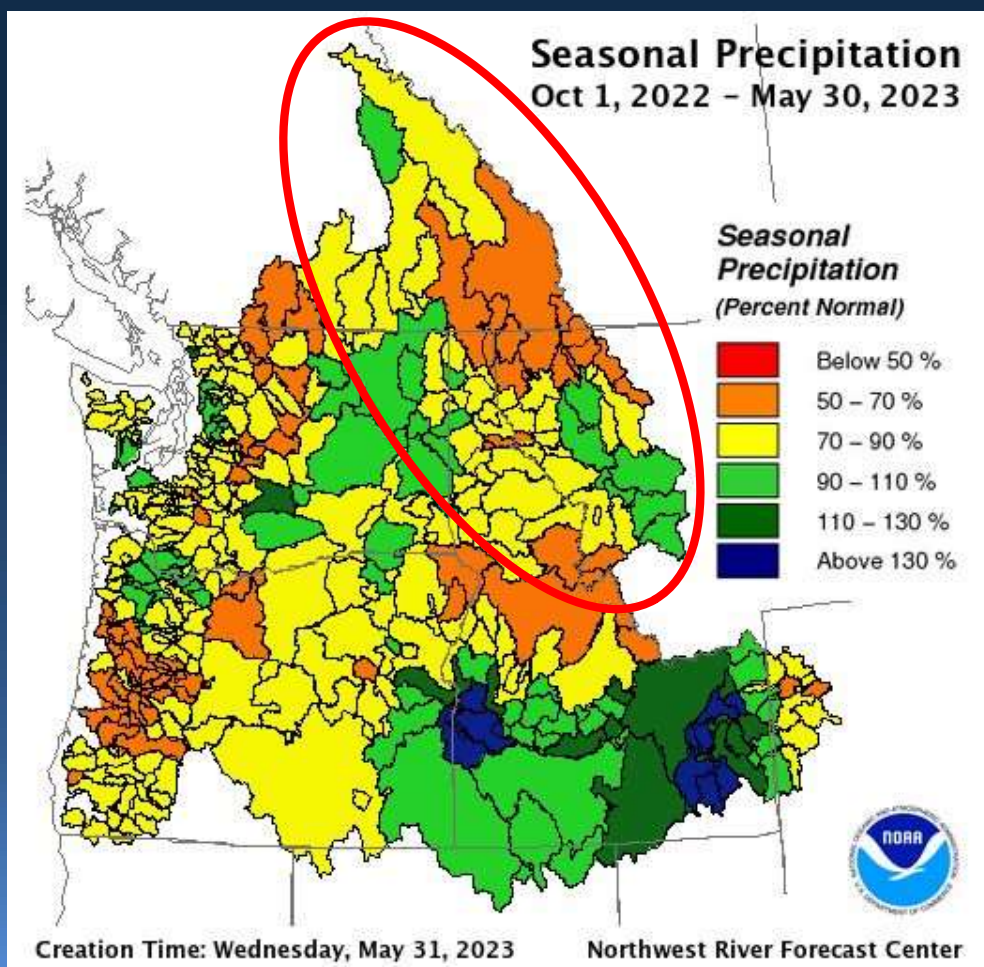


NWRFC Forecast Technique





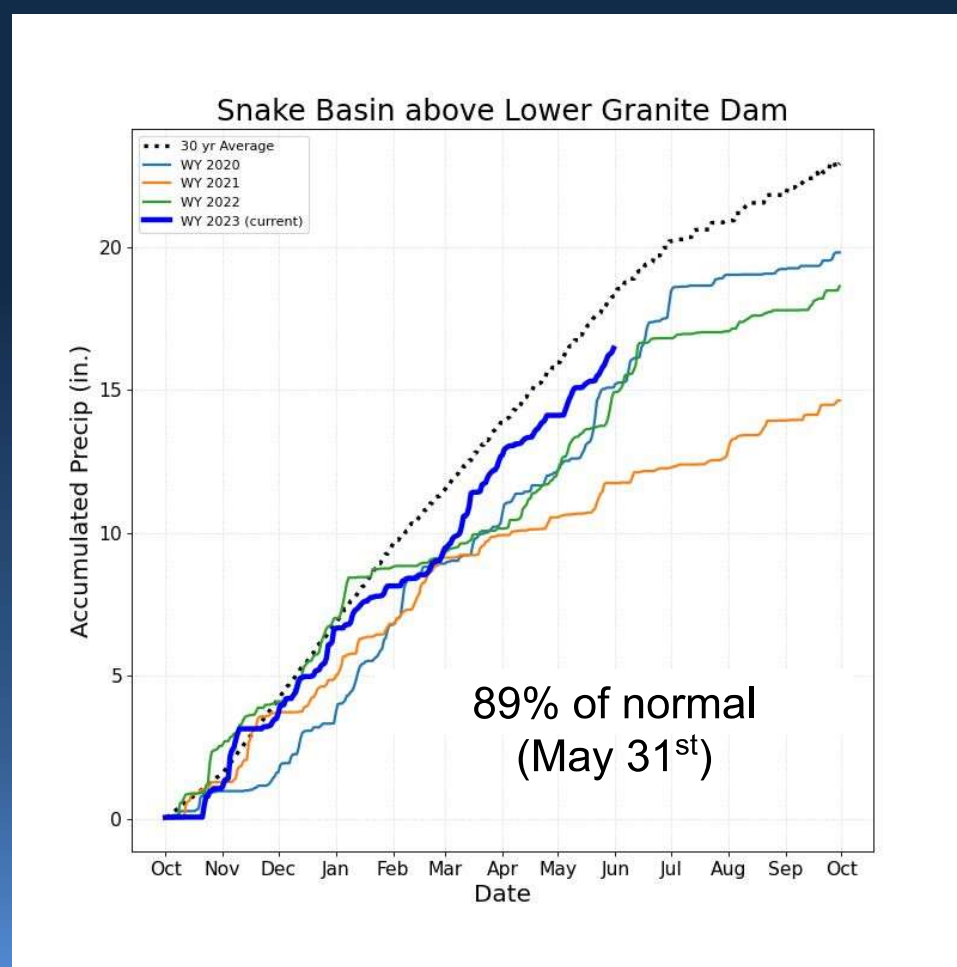
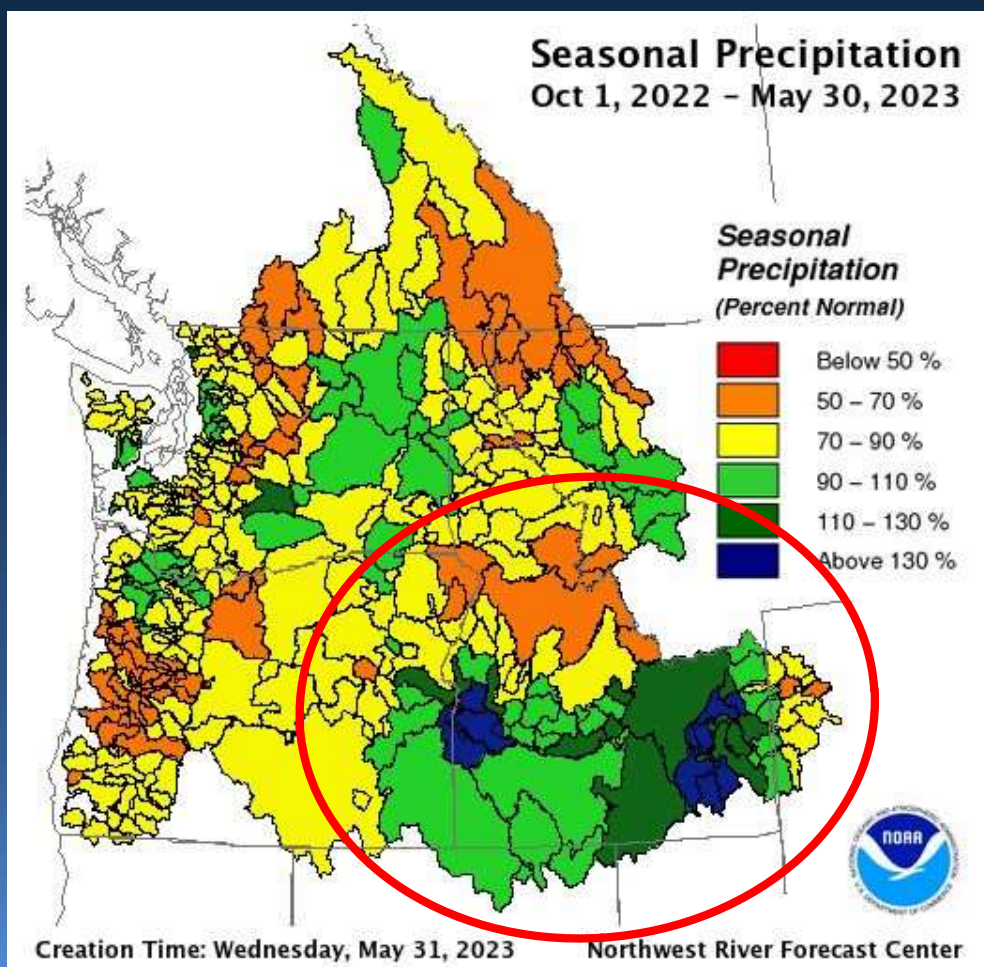
Water Year Precipitation



Precipitation averages from PRISM OSU and PCIC.



Water Year Precipitation

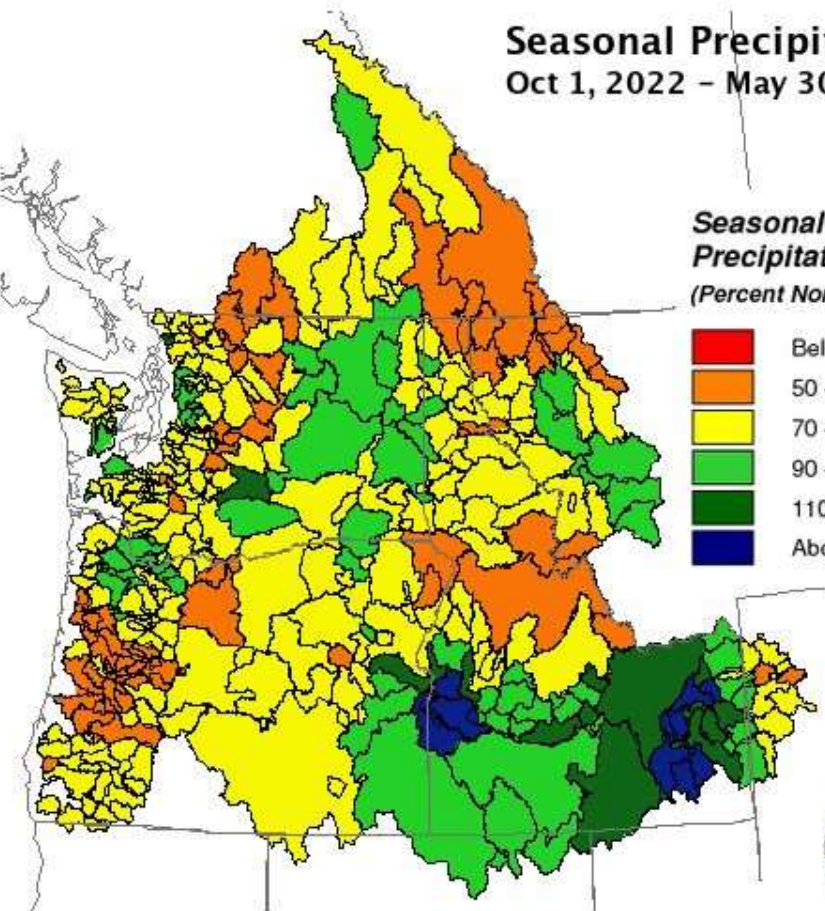
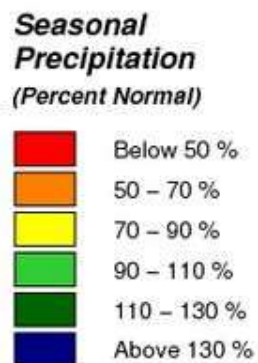


Precipitation averages from PRISM OSU and PCIC.



Water Year Precipitation

Seasonal Precipitation Oct 1, 2022 - May 30, 2023

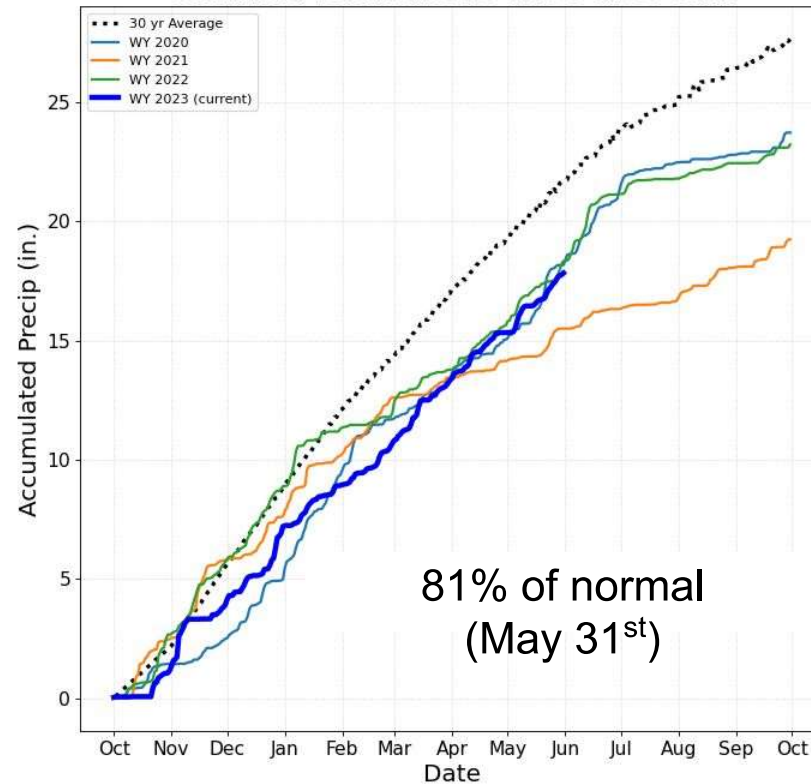


Creation Time: Wednesday, May 31, 2023

Northwest River Forecast Center



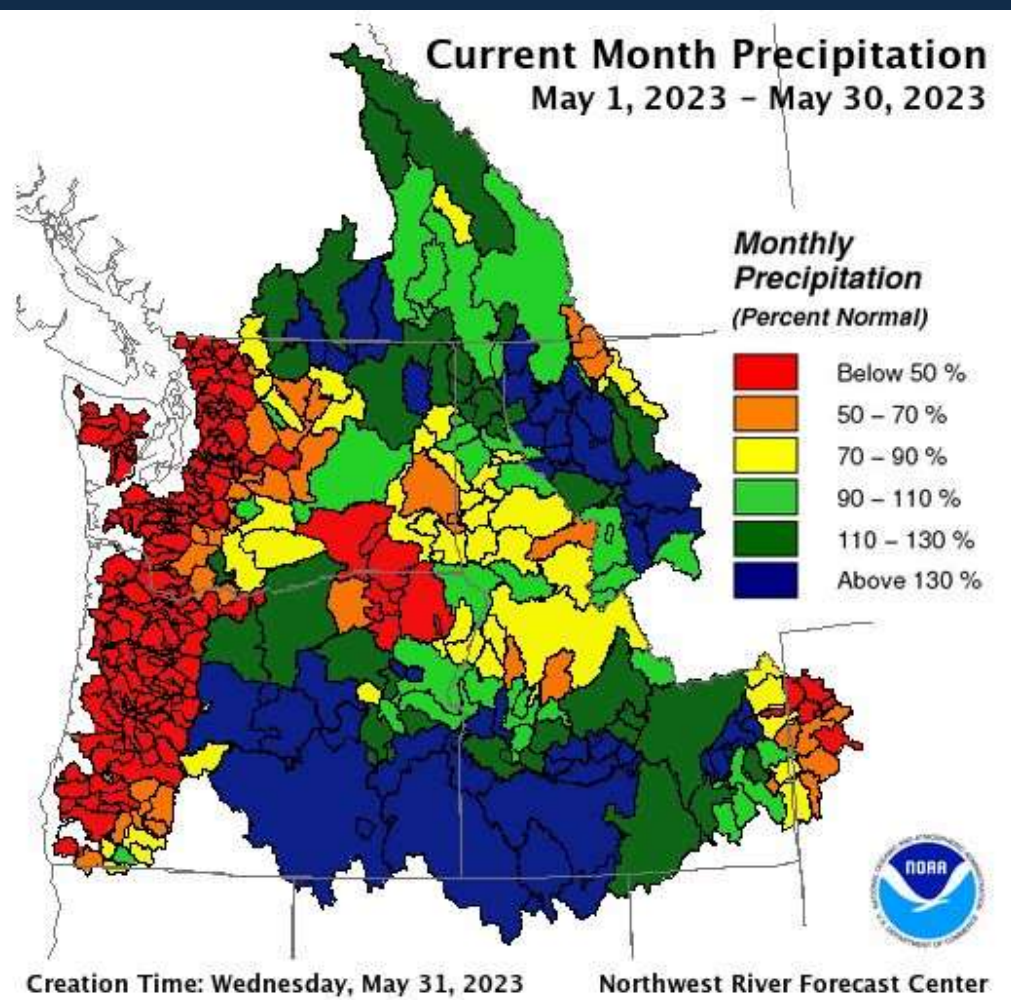
Columbia Basin above The Dalles Dam



Precipitation averages from PRISM OSU and PCIC.



Precipitation – Last Month



% Precipitation Departures for May

Upper Columbia Basin

Pend Oreille	123
Kootenia	110
Columbia above Arrow Dam	117
Above Grand Coulee Dam	117

Snake River Basin

American Falls	90
Lower Granite	101

Lower Columbia Basin

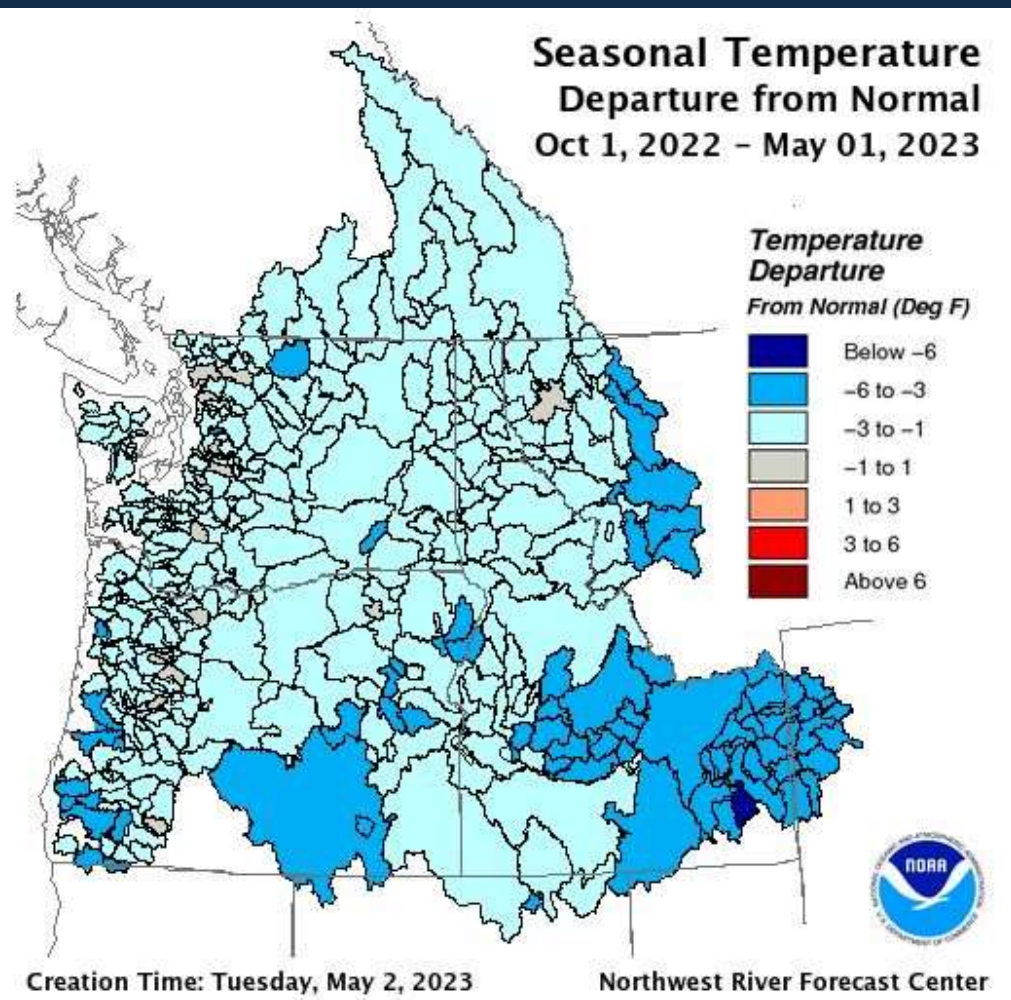
The Dalles	106
------------	-----

West of the Cascades

Skagit	46
Willamette	32
Rogue	58



Temperature – Water Year to May 1st



Temperature Departures Oct 1- May 1st (DegF)

Upper Columbia Basin

Pend Oreille	-2.8
Kootenia	-1.7
Columbia above Arrow Dam	-2.7
Above Grand Coulee Dam	-2.2

Snake River Basin

American Falls	-4.1
Lower Granite	-3.0

Lower Columbia Basin

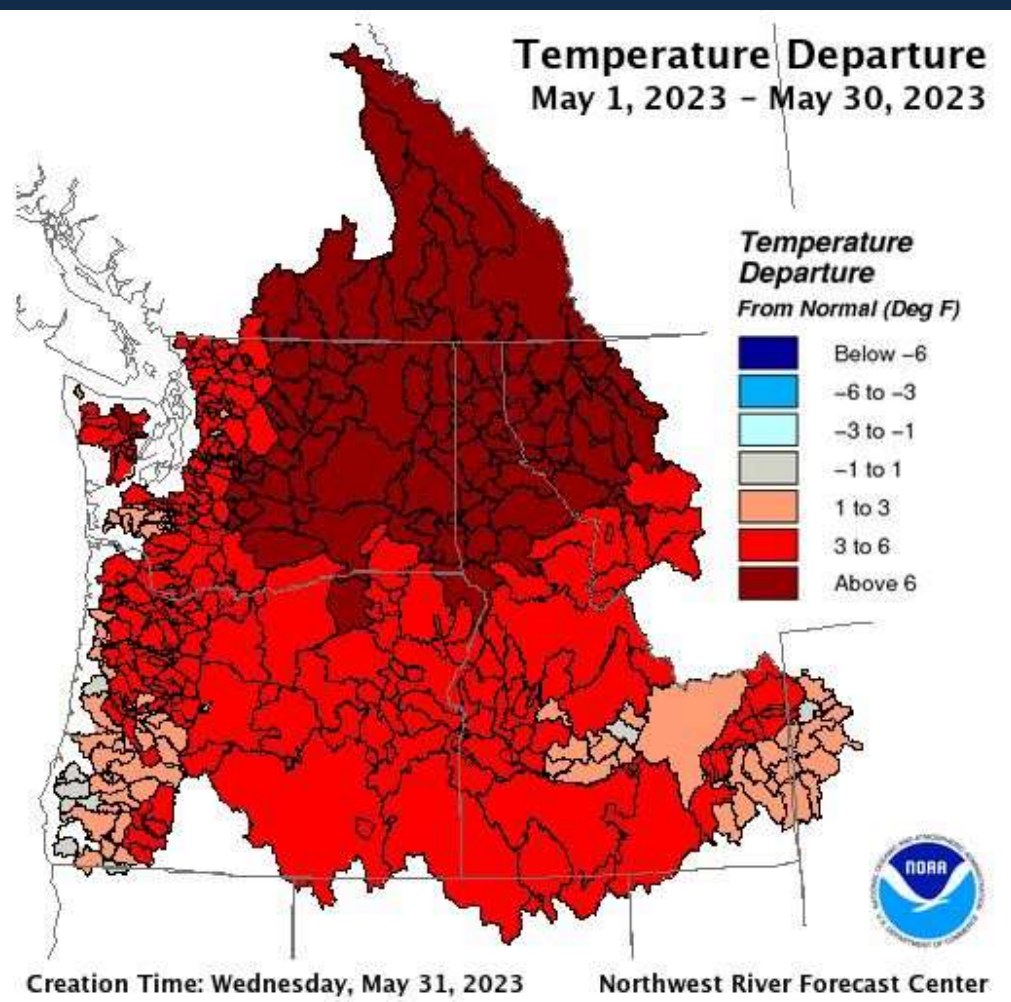
The Dalles	-2.4
------------	------

West of the Cascades

Skagit	-1.4
Willamette	-1.7
Rogue	-2.6



Temperature – Last Month



Temperature Departures for May (DegF)

Upper Columbia Basin

Pend Oreille	6.6
Kootenia	8.3
Columbia above Arrow Dam	7.8
Above Grand Coulee Dam	7.6

Snake River Basin

American Falls	3.0
Lower Granite	4.3

Lower Columbia Basin

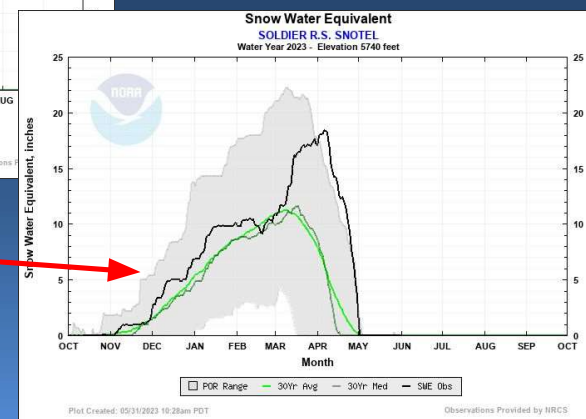
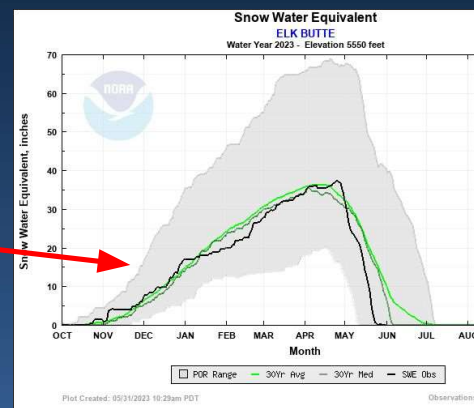
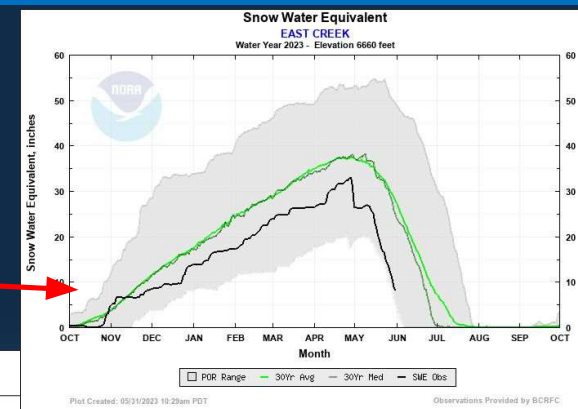
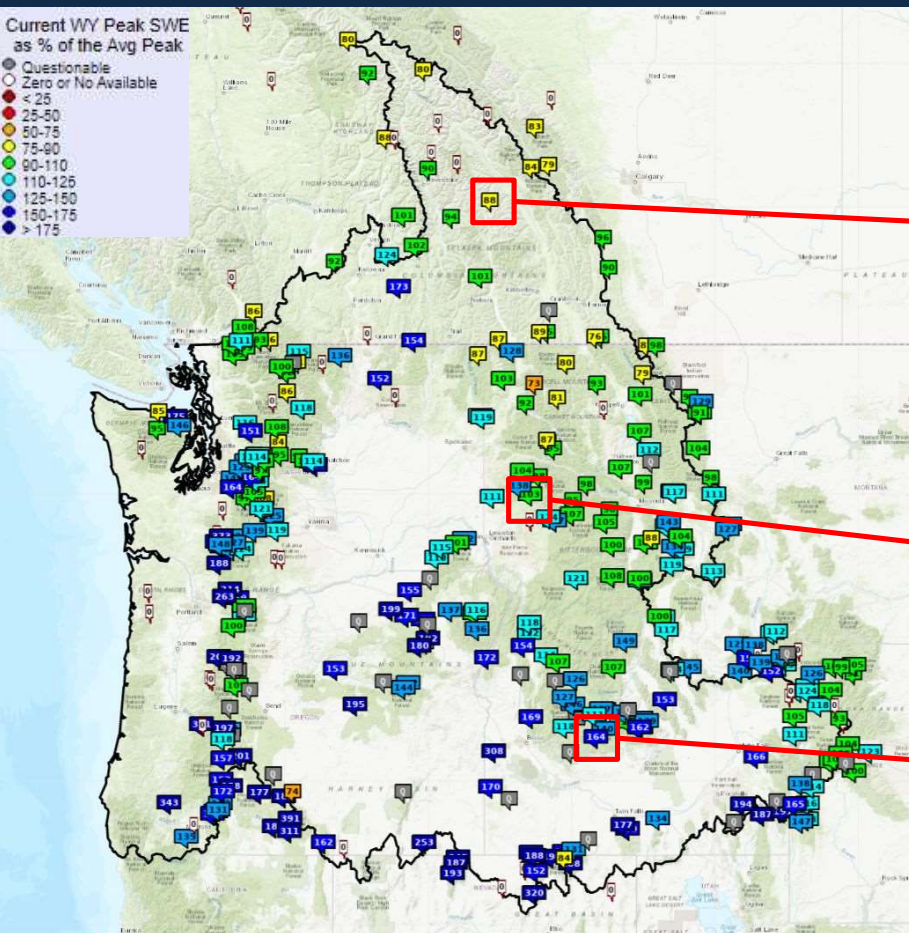
The Dalles	5.8
------------	-----

West of the Cascades

Skagit	5.0
Willamette	3.2
Rogue	2.6



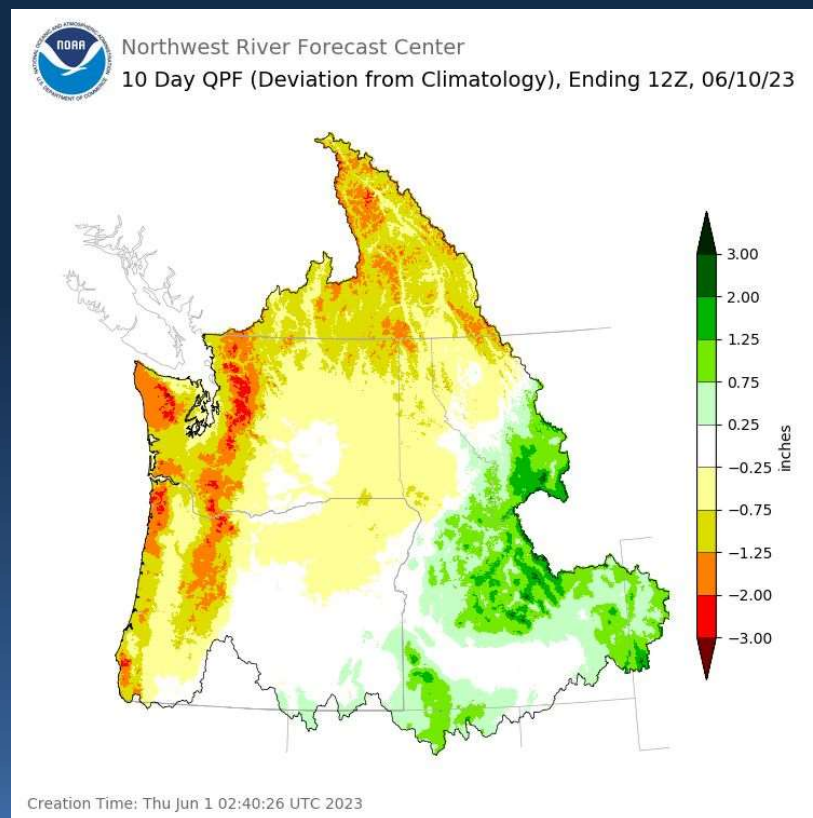
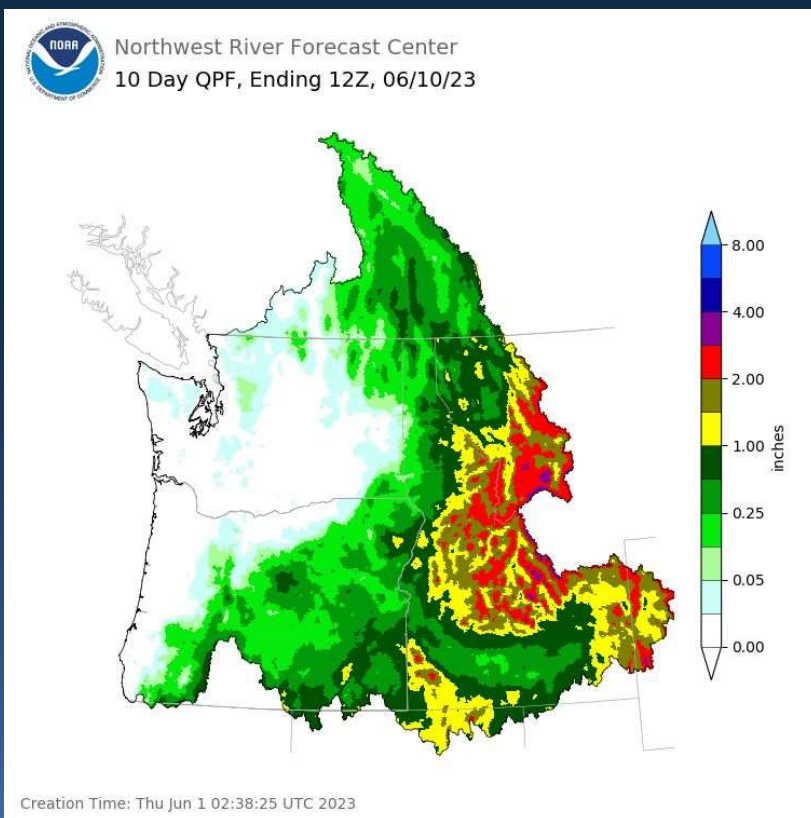
Snowpack – SWE Peak Percent of Normal



Snow data from Natural Resources Conservation Service, BC Hydro, and Alberta Environment and Parks.



10 Day Precipitation Forecast Used in ESP10

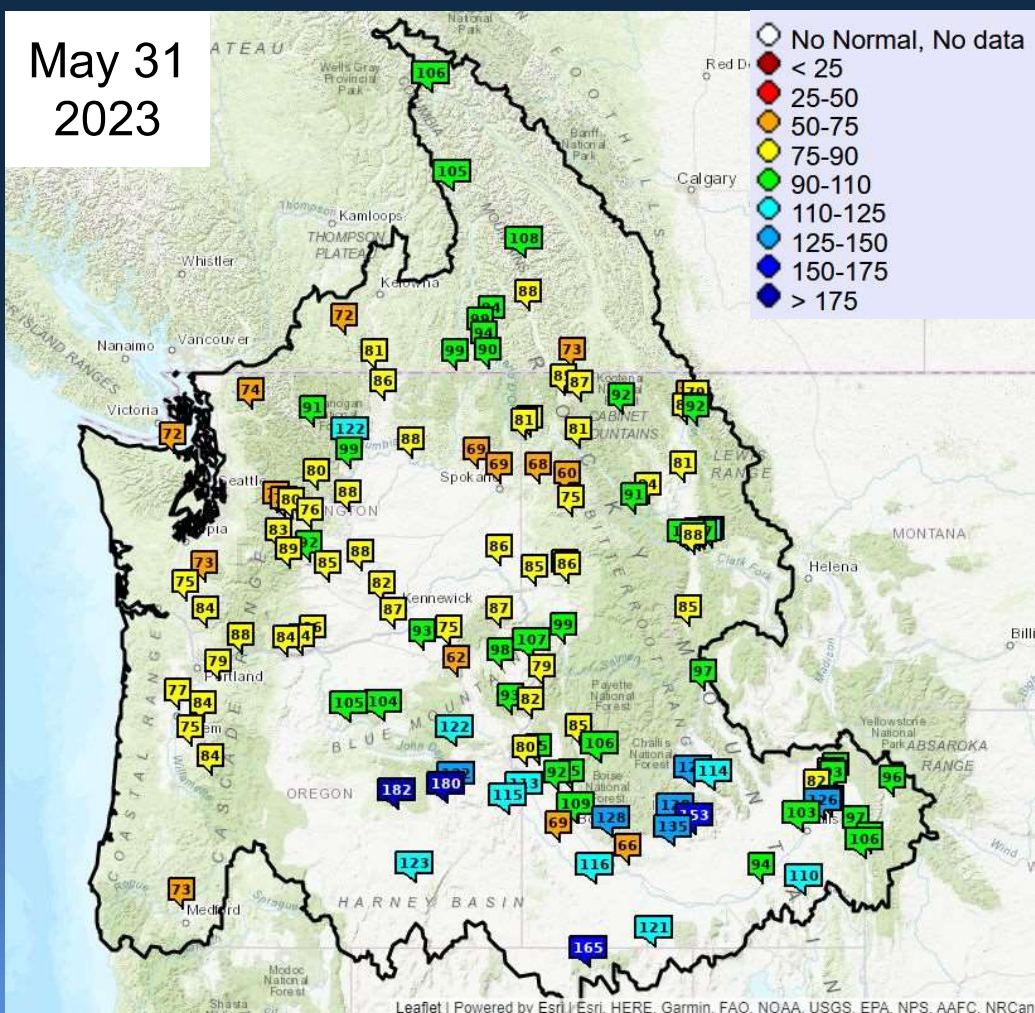


Quantitative Precipitation Forecast (QPF) Sources:
Days 1 - 2 NWS Weather Forecast Offices (WFO) in the US, WPC in BC
Days 3 - 7 NWS Weather Prediction Center (WPC)
Days 8 - 10 NWS National Blend of Models (NBM)



Water Year to Date Adjusted Runoff

May 31
2023



% Normal Runoff Oct 1- May 31

Upper Columbia Basin

Δ since May 3rd

Mica	106	39
Duncan	108	38
Queens Bay	88	31
Libby	92	29
Hungry Horse	92	27
Grand Coulee	88	29

Snake River Basin

American Falls	94	17
Lucky Peak	109	30
Dworshak	77	20
Lower Granite	86	18

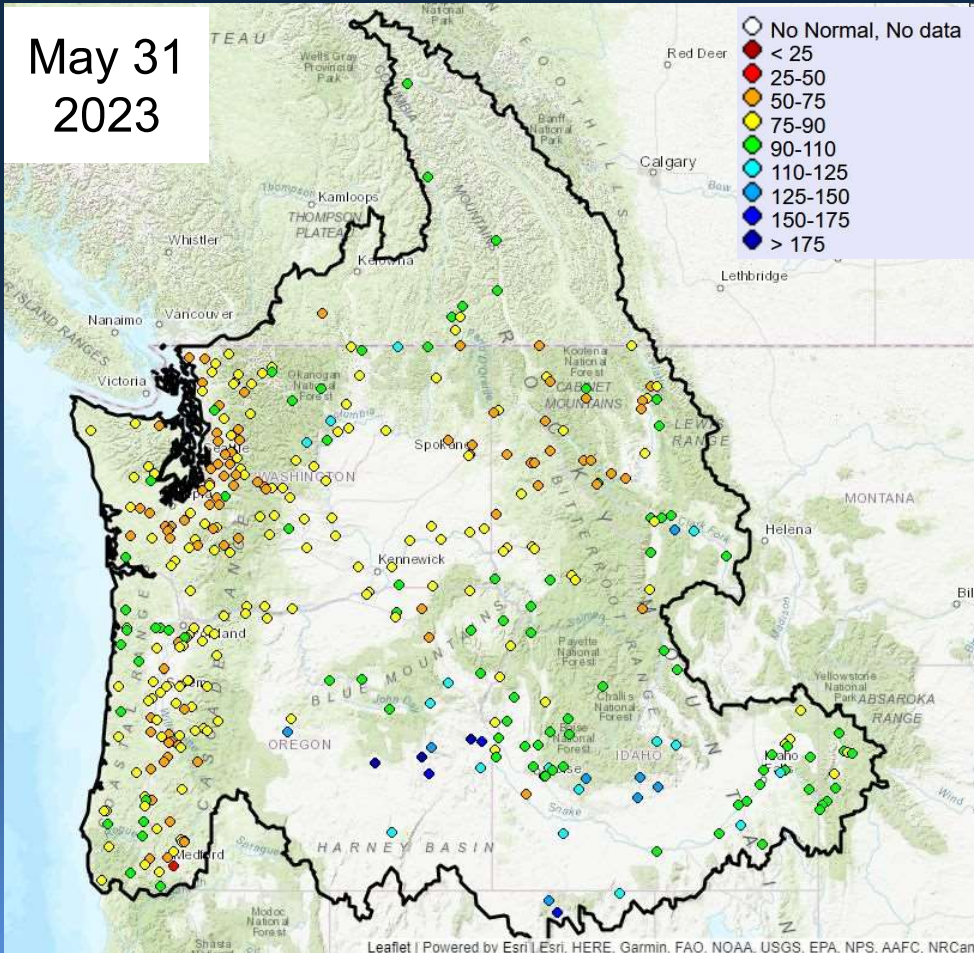
Lower Columbia Basin

The Dalles	84	23
------------	----	----



Water Year to Date Adjusted Runoff

May 31
2023



% Normal Runoff Oct 1- May 31

Washington

		<u>Δ since May 3</u>
Skagit nr Mt Vernon	78	15
Dungeness nr Sequim	71	12
Chehalis at Porter	71	0
Okanogan at Malott	86	29
Methow nr Pateros	120	58
Yakima at Parker	85	16
Walla Walla nr Touchet	92	2

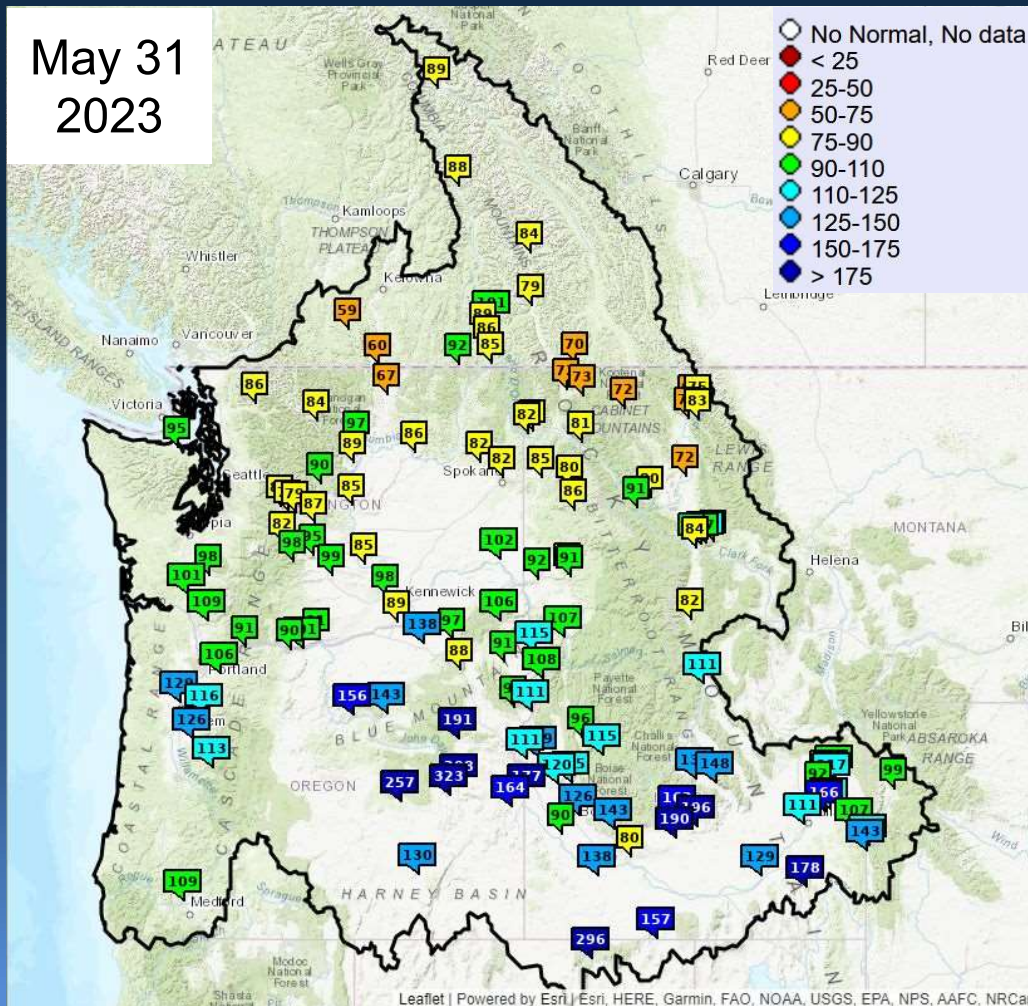
Oregon

Willamette at Salem	71	3
Rogue at Raygold	74	7
Umatilla at Pendleton	92	8
Grande Ronde at Troy	86	16
Crooked nr Prineville	127	29
Owyhee Dam	117	2



Water Supply Forecasts

May 31
2023



% Normal Apr-Sep Volume

Upper Columbia Basin

		<u>Δ since May 3</u>
Mica	89	4
Duncan	84	-2
Queens Bay	79	-8
Libby	72	-9
Hungry Horse	83	-10
Grand Coulee	86	-3

Snake River Basin

American Falls	129	7
Lucky Peak	126	3
Dworshak	88	-17
Lower Granite	102	-2

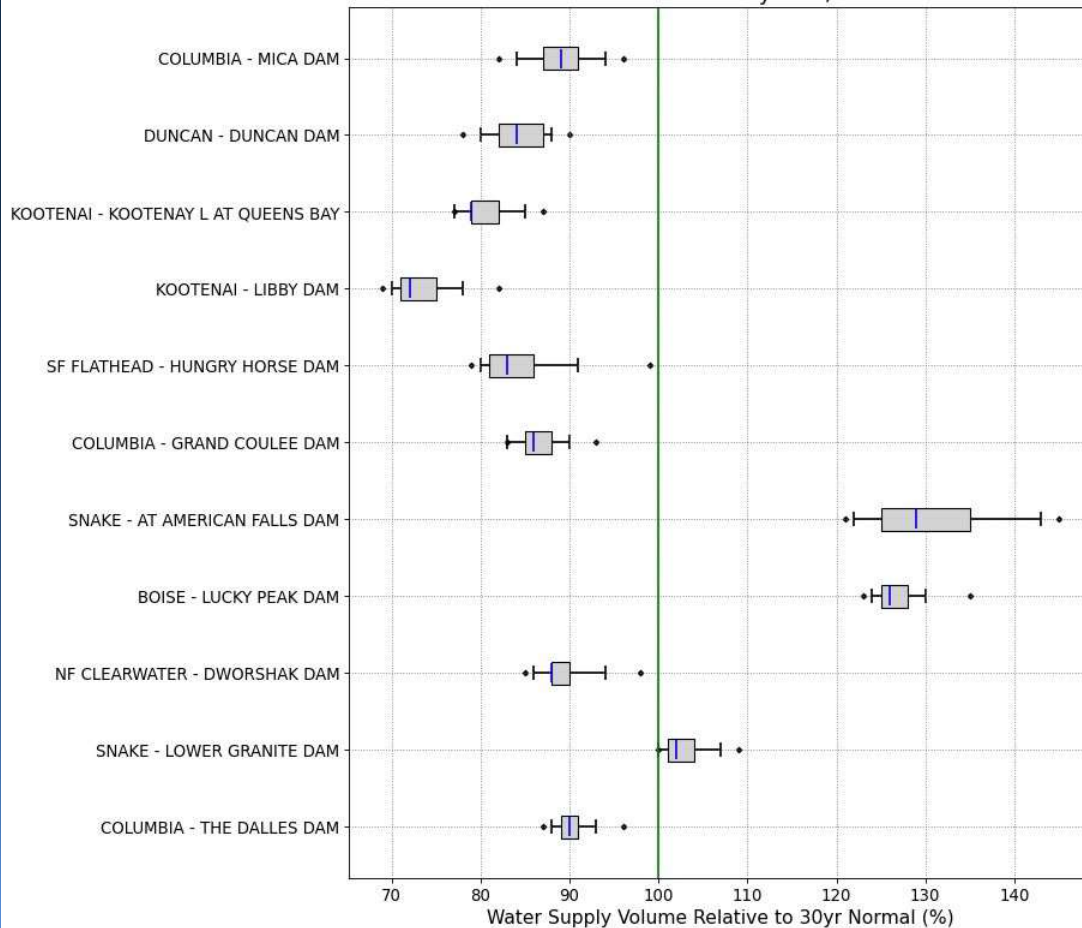
Lower Columbia Basin

The Dalles	90	-3
------------	----	----



Water Supply Forecasts

ESP10 Apr-Sep Water Supply Forecast
Summary of Ensemble Members as a Percent of Normal
Issuance Date: May 31st, 2023



% Normal Apr-Sep Volume

Upper Columbia Basin

Δ since May 3

Mica	89	4
Duncan	84	-2
Queens Bay	79	-8
Libby	72	-9
Hungry Horse	83	-10
Grand Coulee	86	-3

Snake River Basin

American Falls	129	7
Lucky Peak	126	3
Dworshak	88	-17
Lower Granite	102	-2

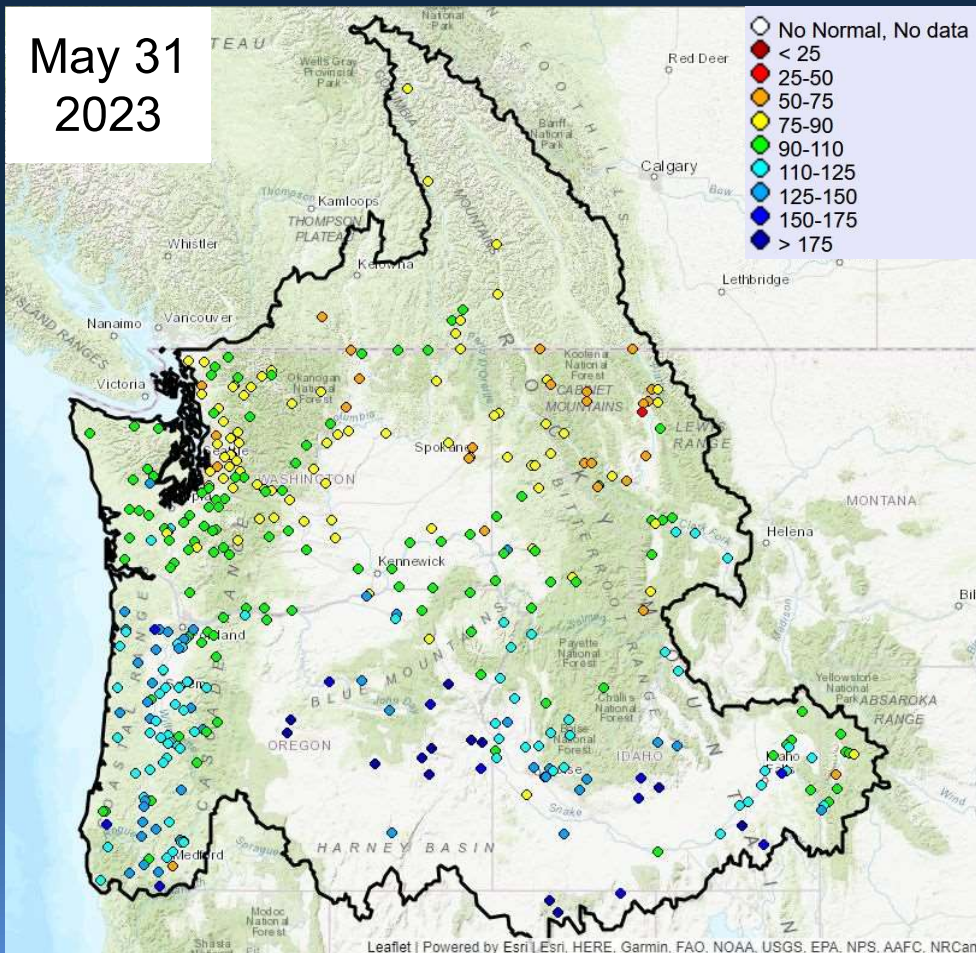
Lower Columbia Basin

The Dalles	90	-3
------------	----	----



Water Supply Forecasts (Natural)

May 31
2023



% Normal Apr -Sep Volume

Washington

		<u>Δ since May 3</u>
Skagit nr Mt Vernon	89	-4
Dungeness nr Sequim	94	-4
Chehalis at Porter	99	-11
Okanogan at Malott	67	-10
Methow nr Pateros	97	-7
Yakima at Parker	93	-8
Walla Walla nr Touchet	93	-26

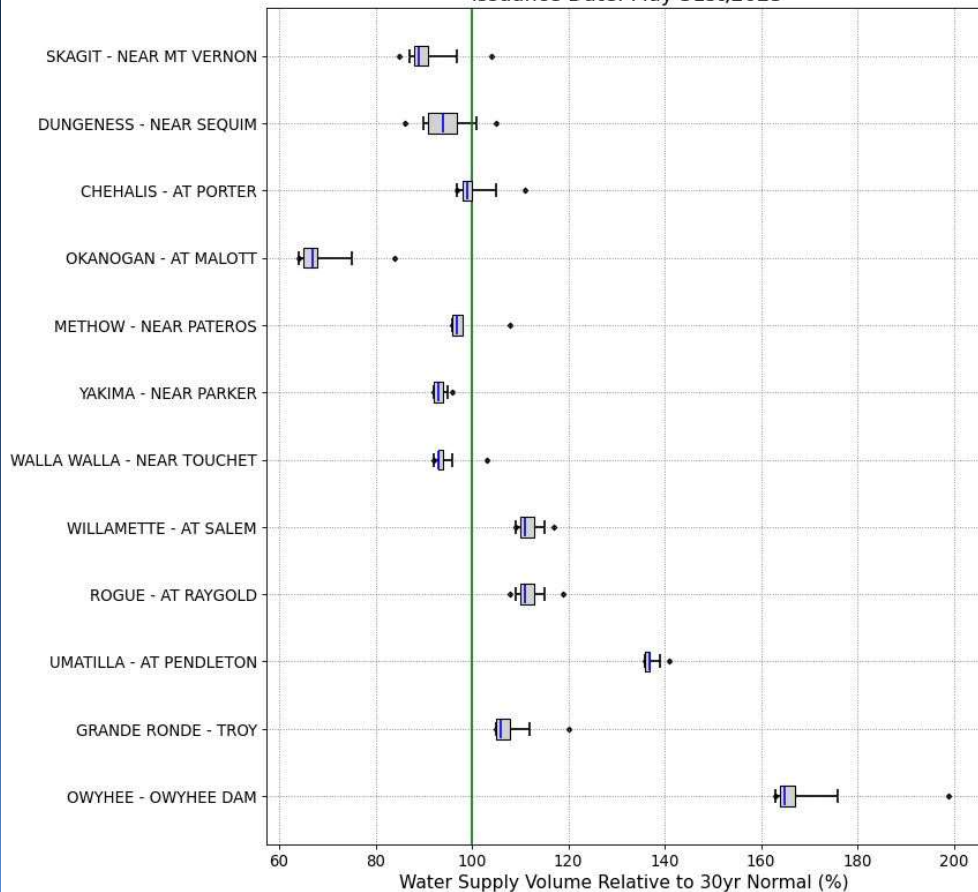
Oregon

Willamette at Salem	111	-7
Rogue at Raygold	111	-1
Umatilla at Pendleton	137	-18
Grande Ronde R at Troy	106	-11
Crooked nr Prineville	259	56
Owyhee Dam	165	-18



Water Supply Forecasts (Natural)

ESP10 Apr-Sep Water Supply Forecast (Natural)
Summary of Ensemble Members as a Percent of Normal
Issuance Date: May 31st, 2023



% Normal Apr -Sep Volume

Washington

		<u>Δ since May 3</u>
Skagit nr Mt Vernon	89	-4
Dungeness nr Sequim	94	-4
Chehalis at Porter	99	-11
Okanogan at Malott	67	-10
Methow nr Pateros	97	-7
Yakima at Parker	93	-8
Walla Walla nr Touchet	93	-26

Oregon

Willamette at Salem	111	-7
Rogue at Raygold	111	-1
Umatilla at Pendleton	137	-18
Grande Ronde R at Troy	106	-11
Crooked nr Prineville	259	56
Owyhee Dam	165	-18



Water Supply Forecasts

COLUMBIA - GRAND COULEE DAM (GCDW1) Forecasts for Water Year 2023

Official Water Supply

ESP with 10 Days QPF Ensemble: 2023-05-31 Issued: 2023-05-31

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	51255	53013	86	55227	61483
APR-JUL	45107	46182	88	48273	52774
APR-AUG	48755	50217	86	52485	58186
JAN-SEP	56276	58035	82	60248	70457
JAN-JUL	50128	51203	83	53294	61749
OCT-SEP	61140	62898	80	65112	78842

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2023-05-31 Issued: 2023-05-31

APR-SEP	51827	53462	87	56202	61483
APR-JUL	45342	46441	88	49183	52774
APR-AUG	48985	50417	87	53313	58186
JAN-SEP	56848	58483	83	61223	70457
JAN-JUL	50363	51462	83	54204	61749
OCT-SEP	61712	63347	80	66086	78842

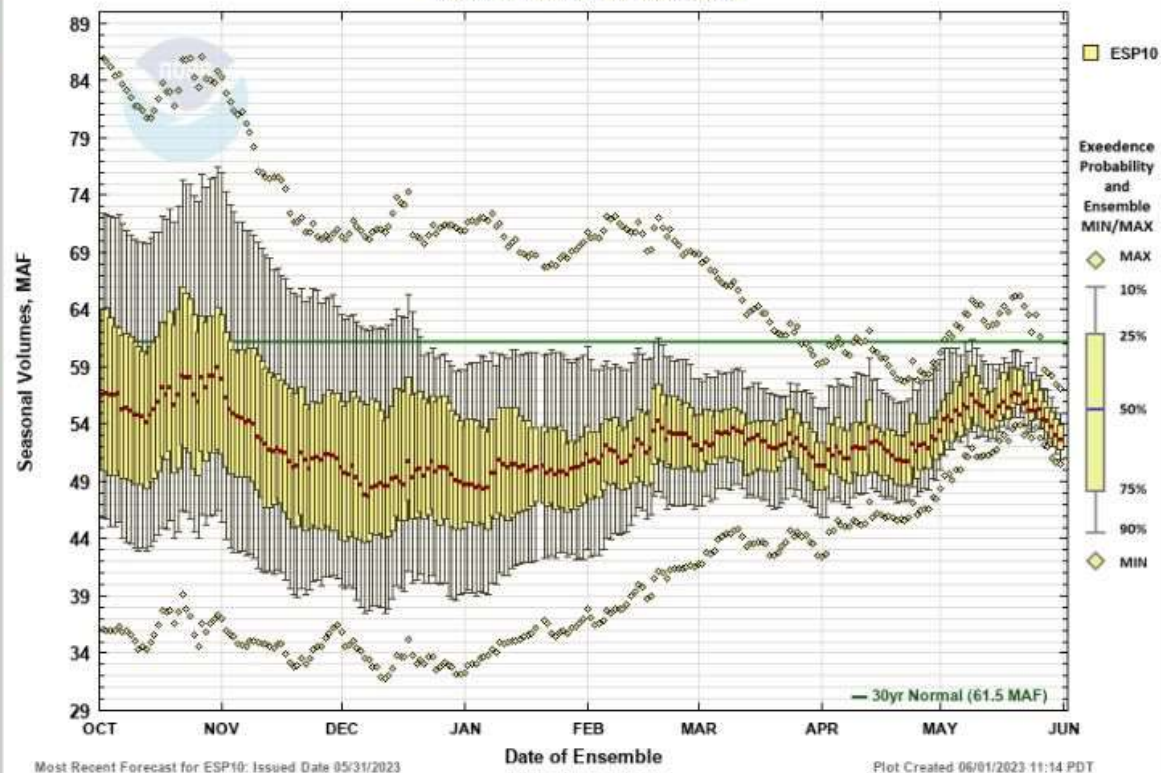
Reference

ESP with 0 Days QPF Ensemble: 2023-05-31 Issued: 2023-05-31

APR-SEP	51829	53952	88	57744	61483
APR-JUL	45244	47018	89	49911	52774
APR-AUG	49044	50996	88	54731	58186
JAN-SEP	56850	58974	84	62765	70457
JAN-JUL	50265	52040	84	54933	61749
OCT-SEP	61714	63837	81	67628	78842

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

Water Supply Forecasts COLUMBIA - GRAND COULEE DAM Period APR to SEP -- Water Year 2023

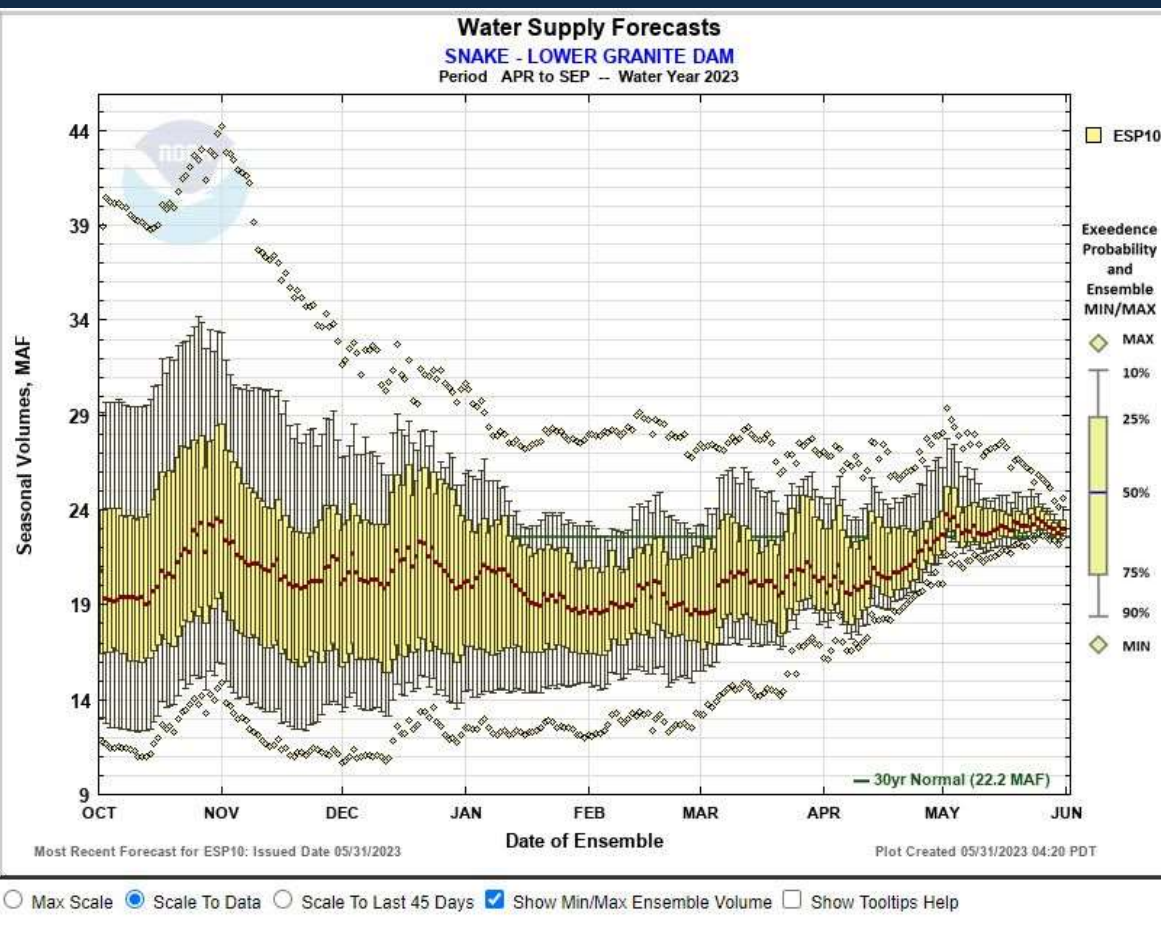


☐ Max Scale ☒ Scale To Data ☐ Scale To Last 45 Days ☒ Show Min/Max Ensemble Volume ☐ Show Tooltips Help



Water Supply Forecasts

SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2023					
Official Water Supply					
ESP with 10 Days QPF Ensemble: 2023-05-31 Issued: 2023-05-31					
Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	22318	22718	102	23830	22232
APR-JUL	19853	20110	101	21047	19946
APR-AUG	21112	21445	102	22504	21121
JAN-SEP	26445	26844	90	27957	29736
JAN-JUL	23979	24237	88	25174	27450
OCT-SEP	29914	30314	88	31426	34287
Experimental Water Supply					
HEFS with 15 days EQPF Ensemble: 2023-05-31 Issued: 2023-05-31					
APR-SEP	21966	22861	103	24692	22232
APR-JUL	19521	20272	102	21980	19946
APR-AUG	20788	21583	102	23358	21121
JAN-SEP	26092	26988	91	28818	29736
JAN-JUL	23647	24399	89	26107	27450
OCT-SEP	29562	30457	89	32287	34287
Reference					
ESP with 0 Days QPF Ensemble: 2023-05-31 Issued: 2023-05-31					
APR-SEP	21605	22473	101	24007	22232
APR-JUL	19166	19931	100	21349	19946
APR-AUG	20419	21250	101	22742	21121
JAN-SEP	25732	26599	89	28133	29736
JAN-JUL	23292	24058	88	25476	27450
OCT-SEP	29201	30069	88	31603	34287





Water Supply Forecasts

COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2023

Official Water Supply

ESP with 10 Days QPF Ensemble: 2023-05-31 Issued: 2023-05-31

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	82533	84460	90	87736	94166
APR-JUL	72678	74163	91	76988	81933
APR-AUG	78238	79708	89	83087	89196
JAN-SEP	94147	96074	83	99350	115946
JAN-JUL	84292	85777	83	88602	103714
OCT-SEP	104530	106457	80	109733	132314

Experimental Water Supply

HEFS with 15 days EQPF Ensemble: 2023-05-31 Issued: 2023-05-31

APR-SEP	83178	85046	90	89558	94166
APR-JUL	72658	74562	91	79131	81933
APR-AUG	78103	80346	90	84935	89196
JAN-SEP	94791	96660	83	101172	115946
JAN-JUL	84272	86176	83	90745	103714
OCT-SEP	105175	107044	81	111556	132314

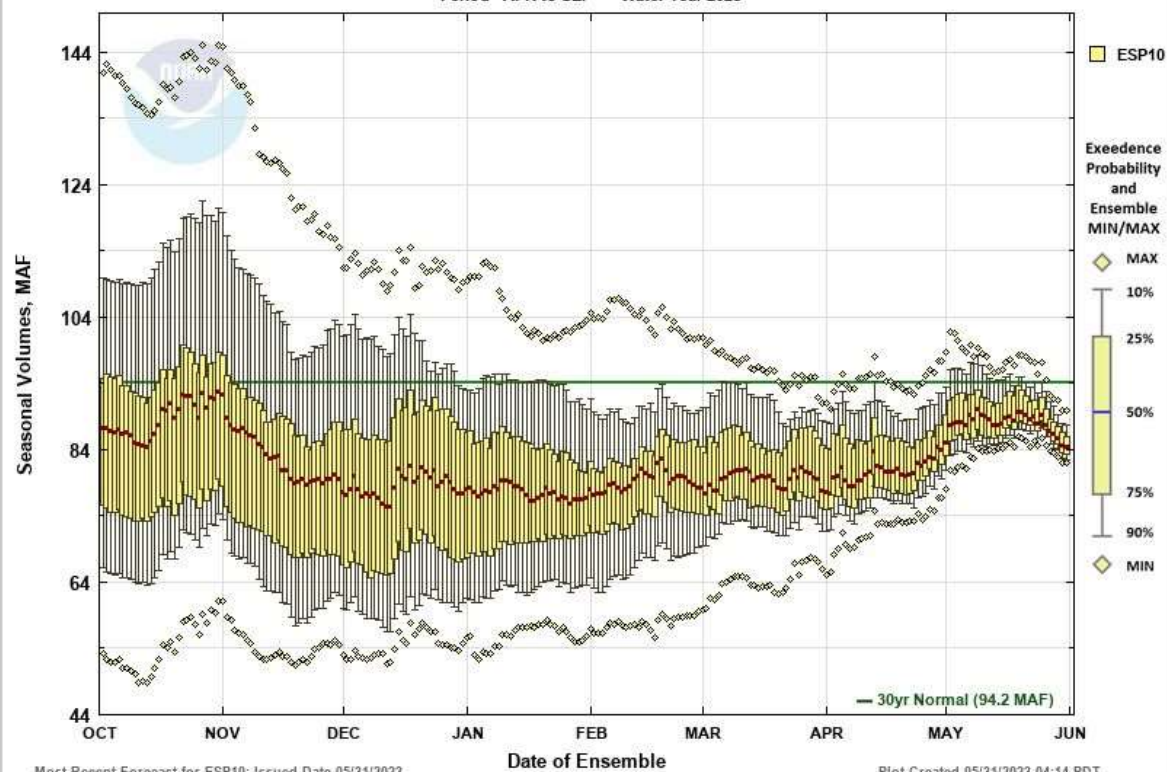
Reference

ESP with 0 Days QPF Ensemble: 2023-05-31 Issued: 2023-05-31

APR-SEP	82770	85407	91	89982	94166
APR-JUL	72584	74788	91	79362	81933
APR-AUG	78116	80690	90	85395	89196
JAN-SEP	94384	97021	84	101595	115946
JAN-JUL	84198	86402	83	90975	103714
OCT-SEP	104767	107404	81	111979	132314

Water Supply Forecasts

COLUMBIA - THE DALLES DAM
Period APR to SEP -- Water Year 2023

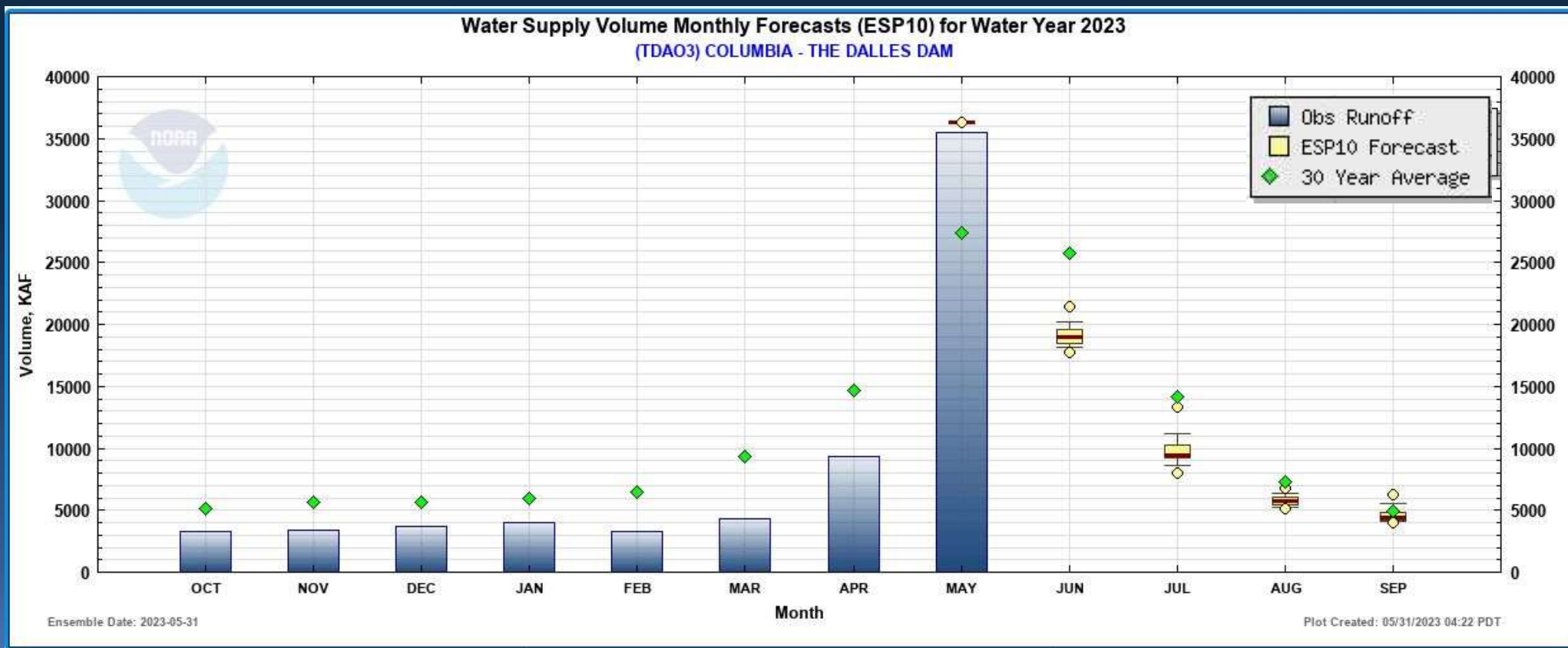


☐ Max Scale ☒ Scale To Data ☐ Scale To Last 45 Days ☒ Show Min/Max Ensemble Volume ☐ Show Tooltips Help

www.nwrfc.noaa.gov/water_supply/ws_forecasts.php?id=TDAO3



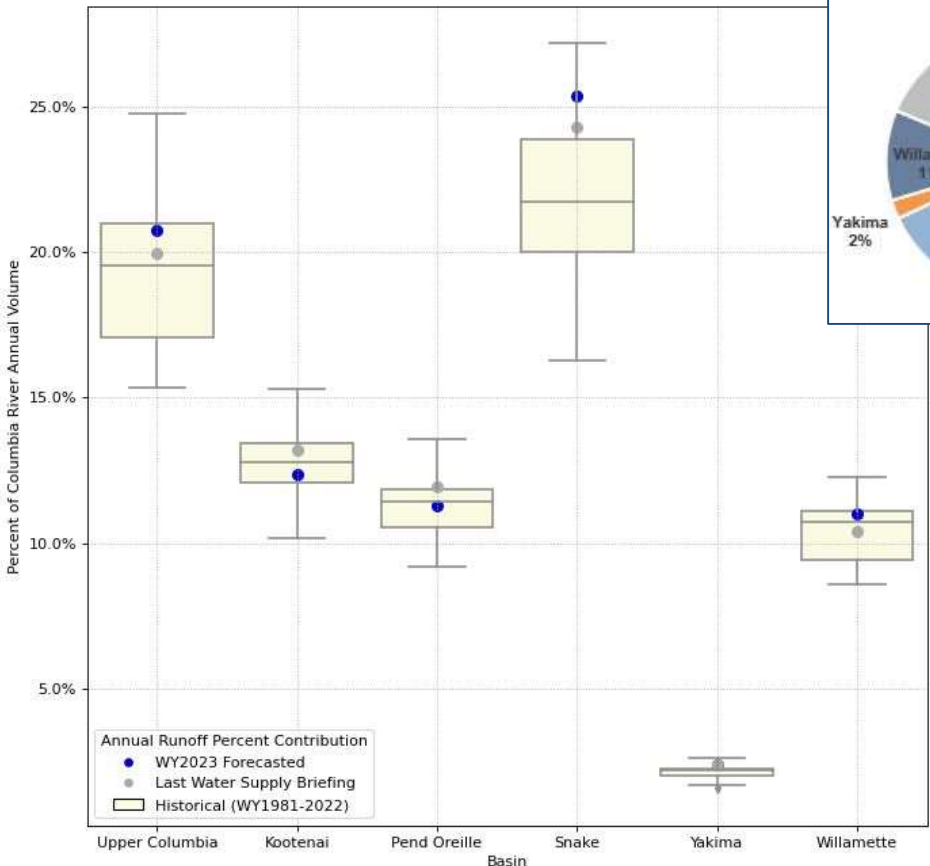
Monthly Water Supply Forecasts



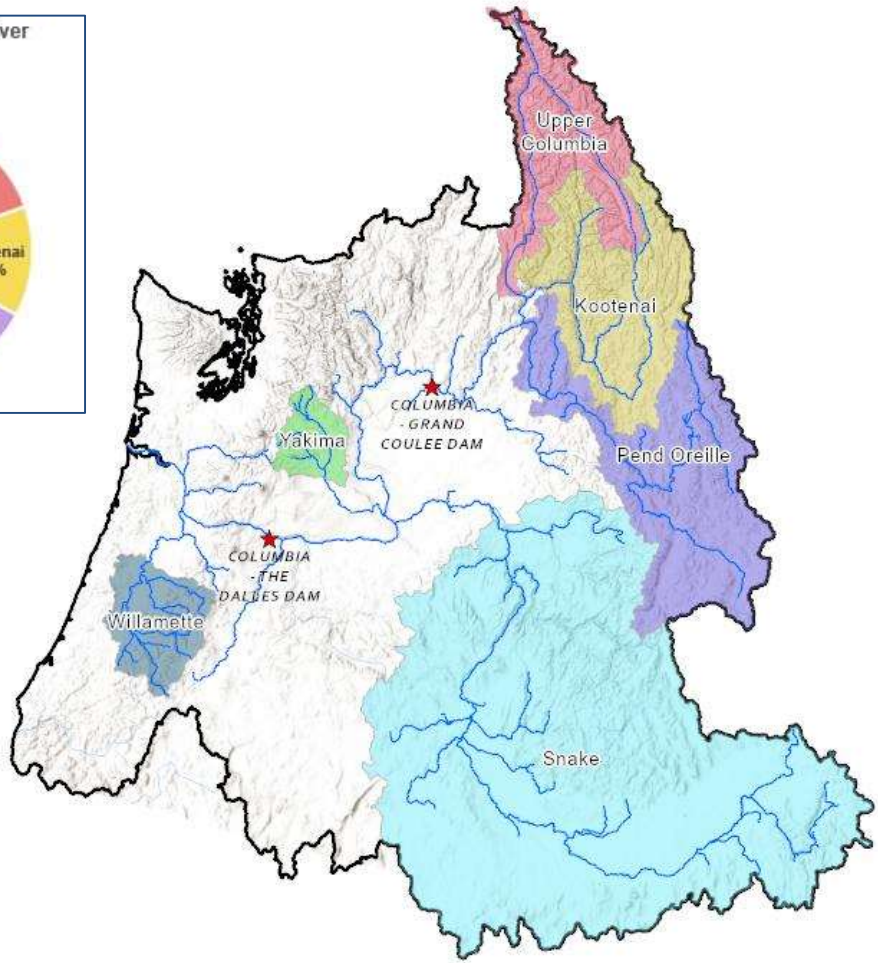
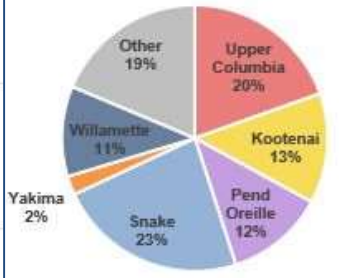


ESP10 Sep-Oct Percent Contributions

ESP10 Sep-Oct Water Supply Forecast
Percent contribution to Total Columbia River Volumes
(with historical percent contributions)

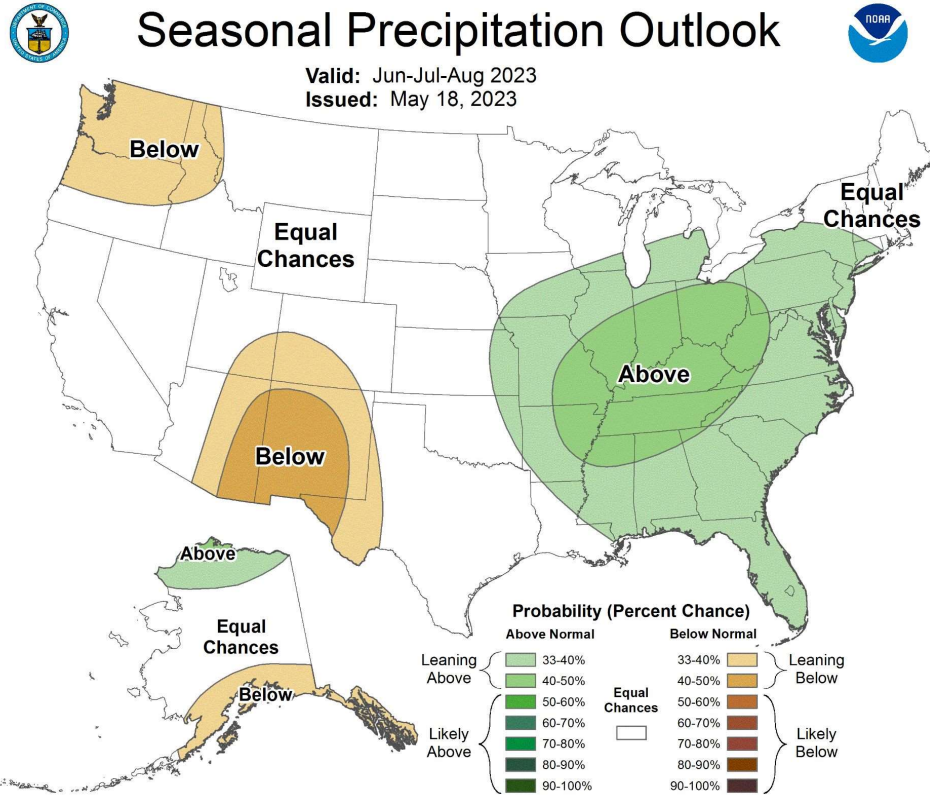
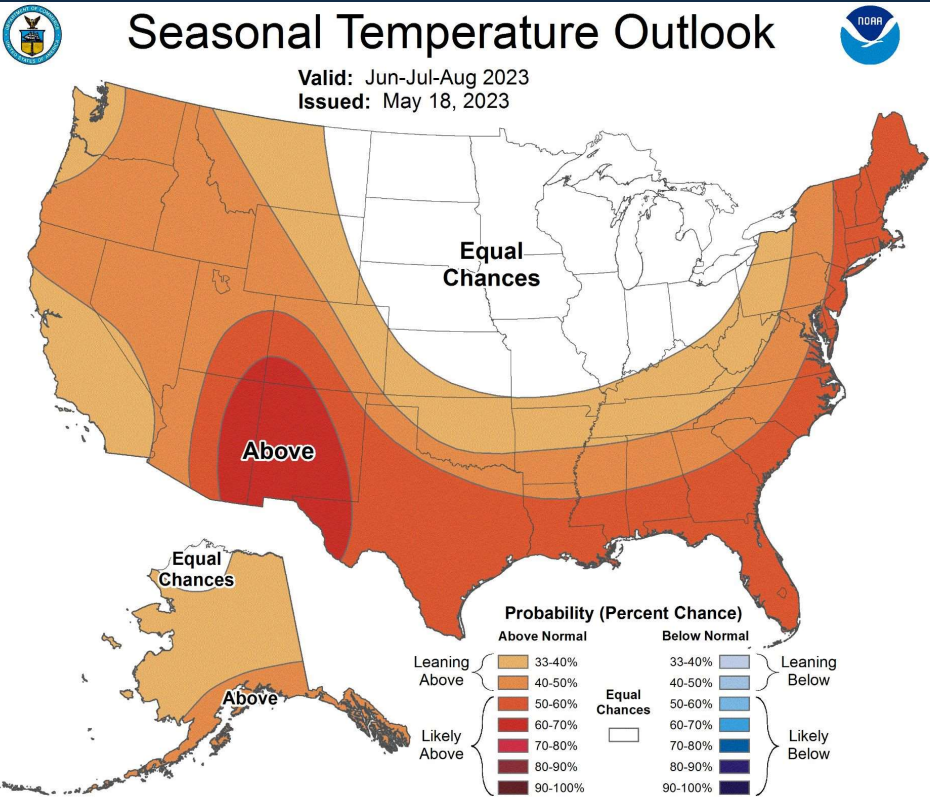


Percent of Columbia River Annual Volume





Climate Prediction Center Seasonal Outlook





Take Home Messages

Precipitation was below normal and temperatures were colder than normal this winter.

Despite below precipitation totals, and due to colder temperatures, snowpack was near to above normal.

May was unseasonably warm which led to rapid snowmelt. *Where did spring go?*

With the onset of spring snowmelt, adjusted runoff has had large increases over the last month.

April-September volume forecasts have mostly decreased since the last briefing. The largest changes are in Eastern Oregon.

The median ESP10 April-September volume forecasts are a mix of above and below normal. The spread of the forecast interquartile range is generally small (1-10%).

The Snake River forecasted contribution to annual runoff volumes for the Columbia River System is projected to be well above normal.



Questions?

If you have a question, use the 'Raise Hand' function we can unmute you or type your question in the chat.

To ask a question using your phone, enter the **AUDIO PIN** followed by the **#** sign. The **AUDIO PIN** was provided when you logged into the webinar. If you need to enter the PIN after you are connected, try **#PIN#**.

NWRFC.watersupply@noaa.gov
(503) 326-7291

