



Northwest River Forecast Center



January 2022 Water Supply Briefing

Telephone Conference: (562) 247-8422

Audio Access Code: 146-348-602#

Ryan Lucas, PhD

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



Take Home Messages

New normals period of record (1991-2020) for runoff and snow.

Seasonal Precipitation near normal for most of the basin.

Snowpack near to above normal for most of the basin.

Water Supply Forecasts are near to above normal for most of the basin.



NWRFC Runoff and SWE Normals

NWRFC has updated our 30 year period for runoff and snow water equivalent normals.

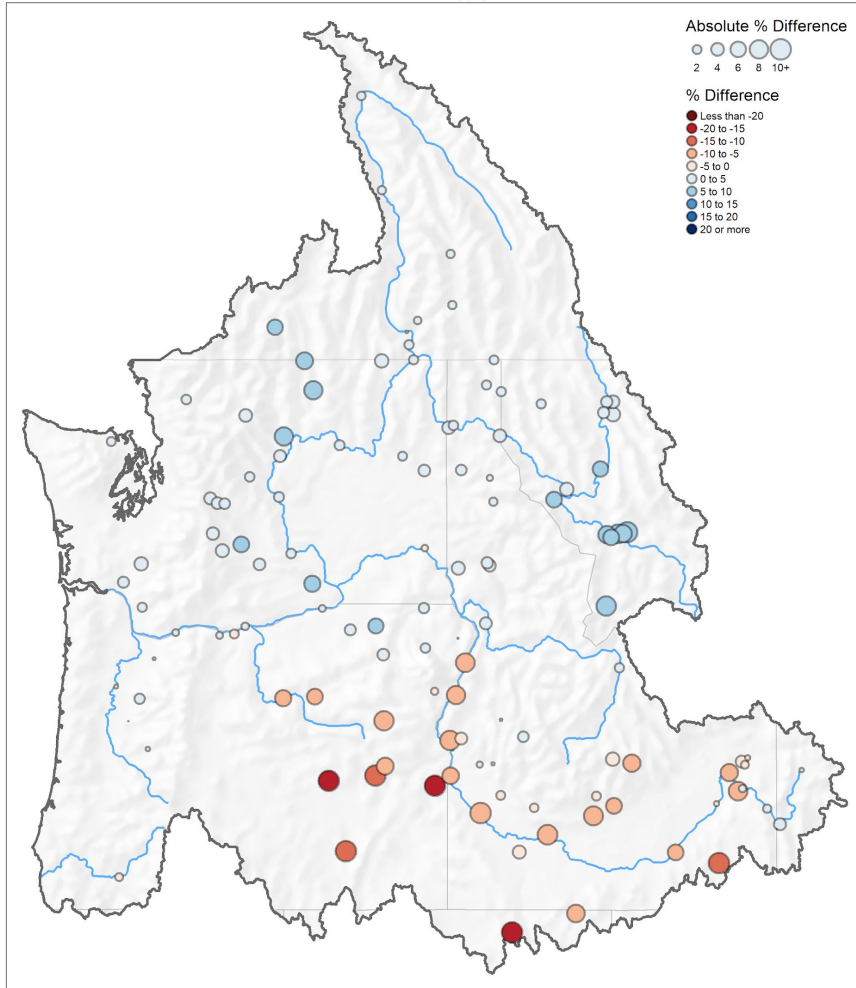
The 30 year period now consists of water years 1991-2020.

Data used to produce these normals was provided by many partner agencies.

NWRFC Runoff Normals

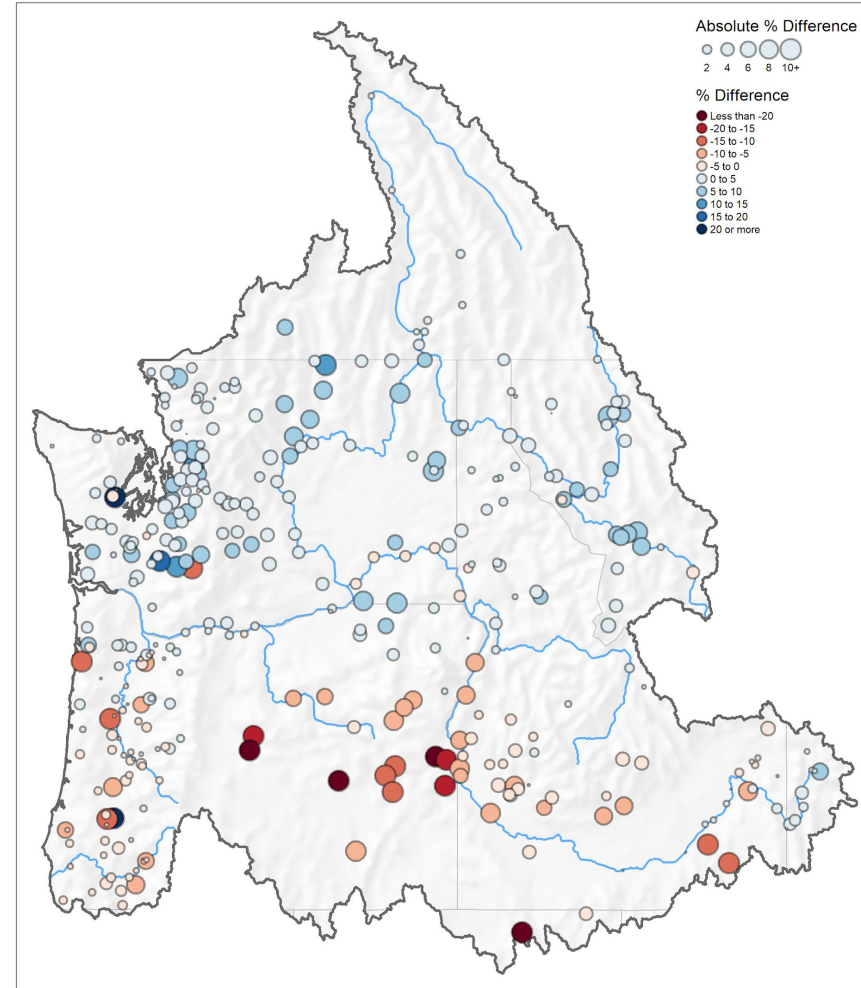
WS Runoff Normals

Percent Difference between WY1991-2020 and WY1981-2010 for
Annual Water Supply Runoff

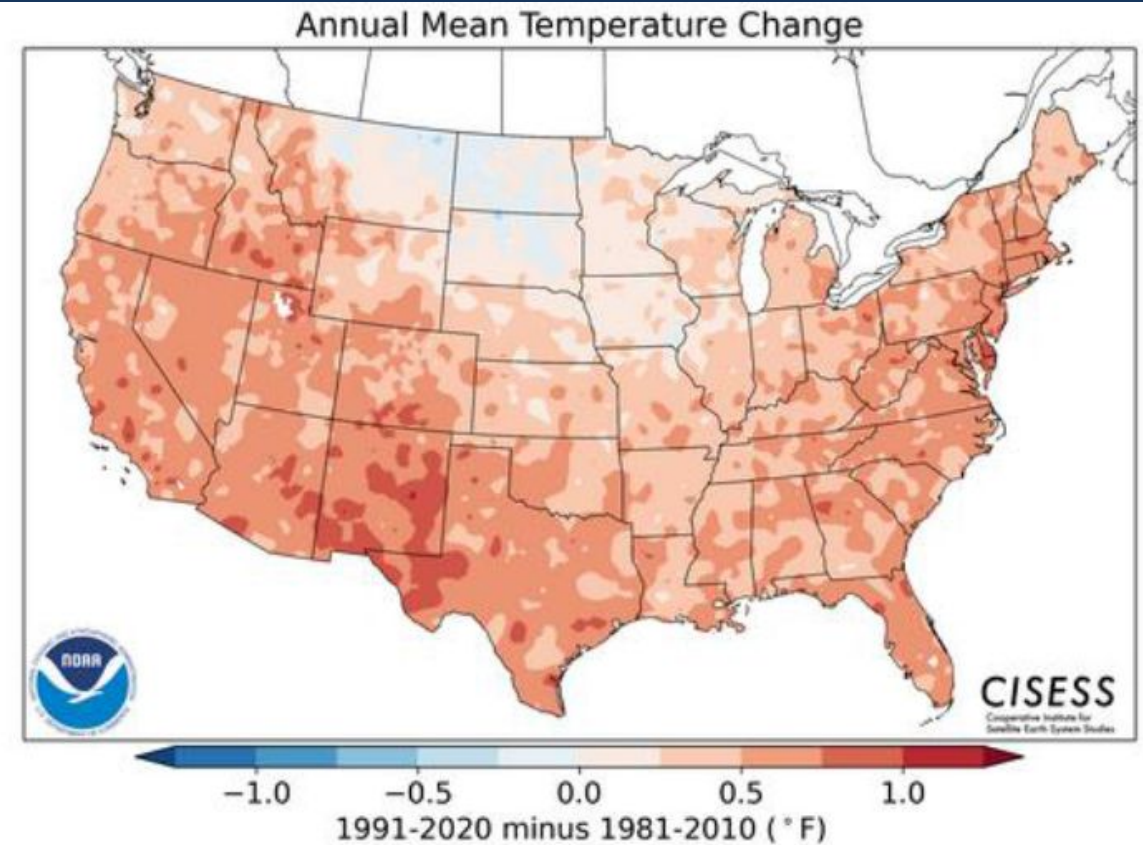
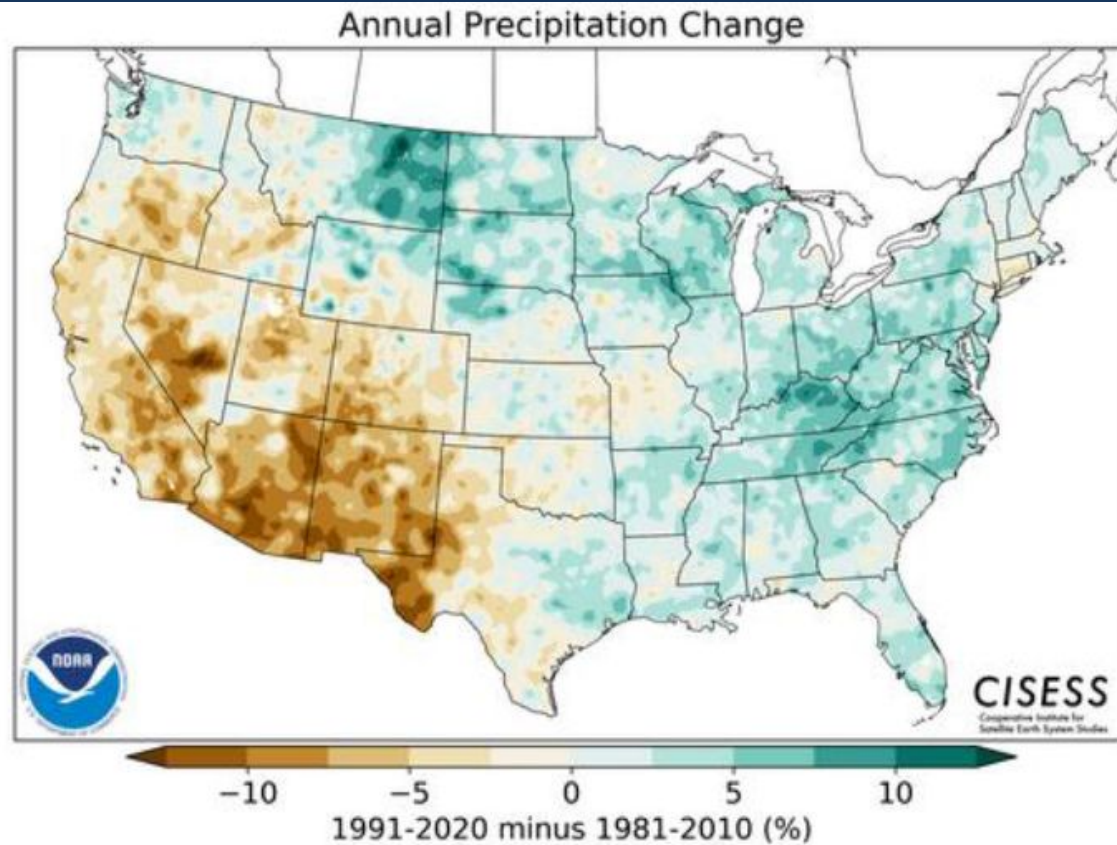


Natural Runoff Normals

Percent Difference between WY1991-2020 and WY1981-2010 for
Annual Natural Runoff



NOAA Precipitation and Temperature Normals



Source: <https://www.ncei.noaa.gov/products/land-based-station/us-climate-normals>



Water Supply Forecast Briefing

Observed Conditions:

- Temperature
- Precipitation
- Snowpack
- Runoff

Model States

Future Conditions:

- 10 days of quantitative forecast precipitation (QPF)
- 10 days of quantitative forecast temperature (QTF)
- Historical climate forcings appended thereafter

Model Forcings

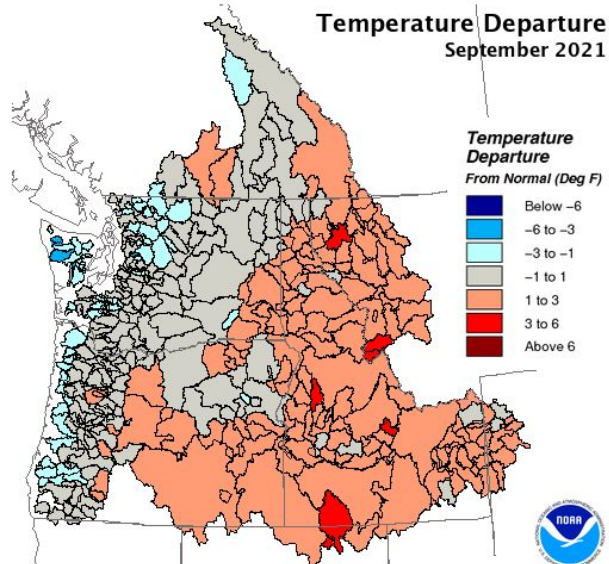
Model Inputs

Water Supply Forecasts



Monthly Temperature Departure

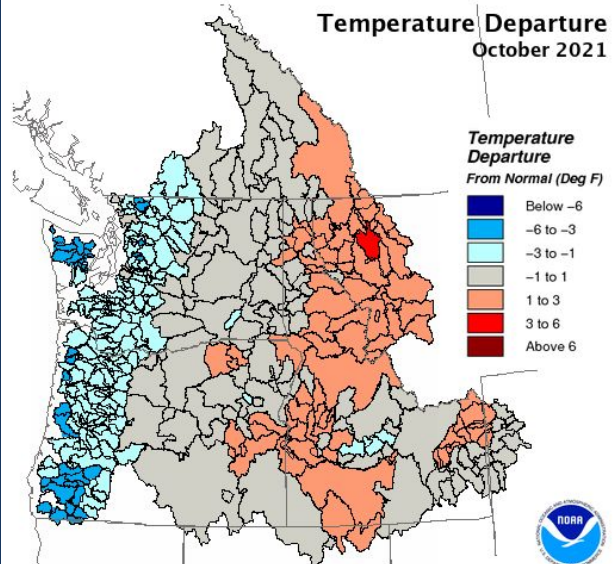
Temperature Departure
September 2021



Creation Time: Friday, Oct 1, 2021

Northwest River Forecast Center

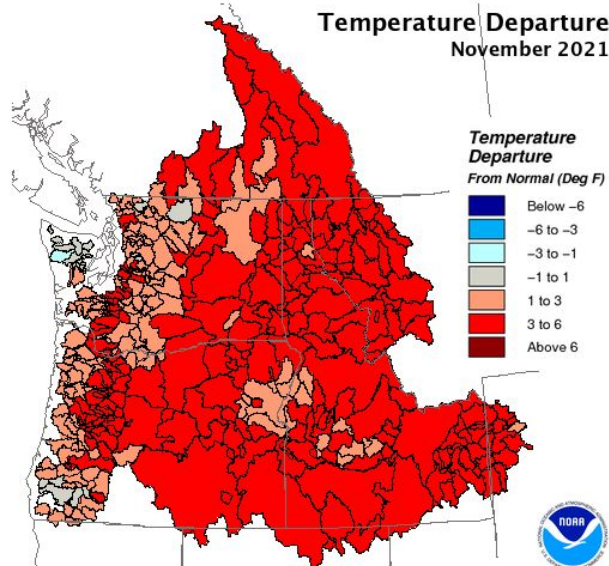
Temperature Departure
October 2021



Creation Time: Monday, Nov 1, 2021

Northwest River Forecast Center

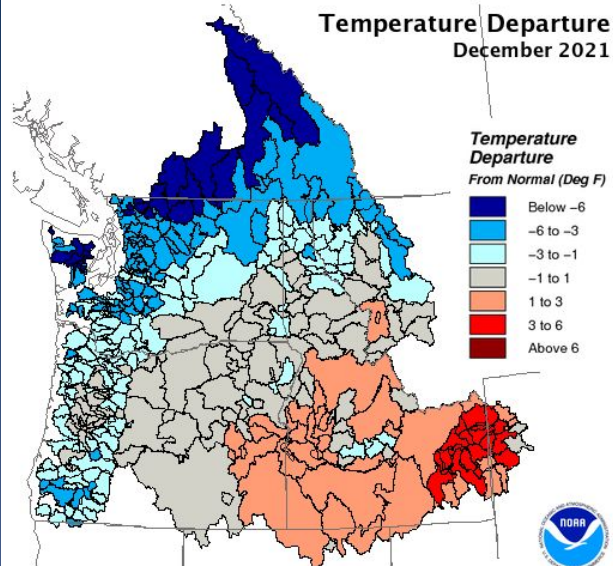
Temperature Departure
November 2021



Creation Time: Wednesday, Dec 1, 2021

Northwest River Forecast Center

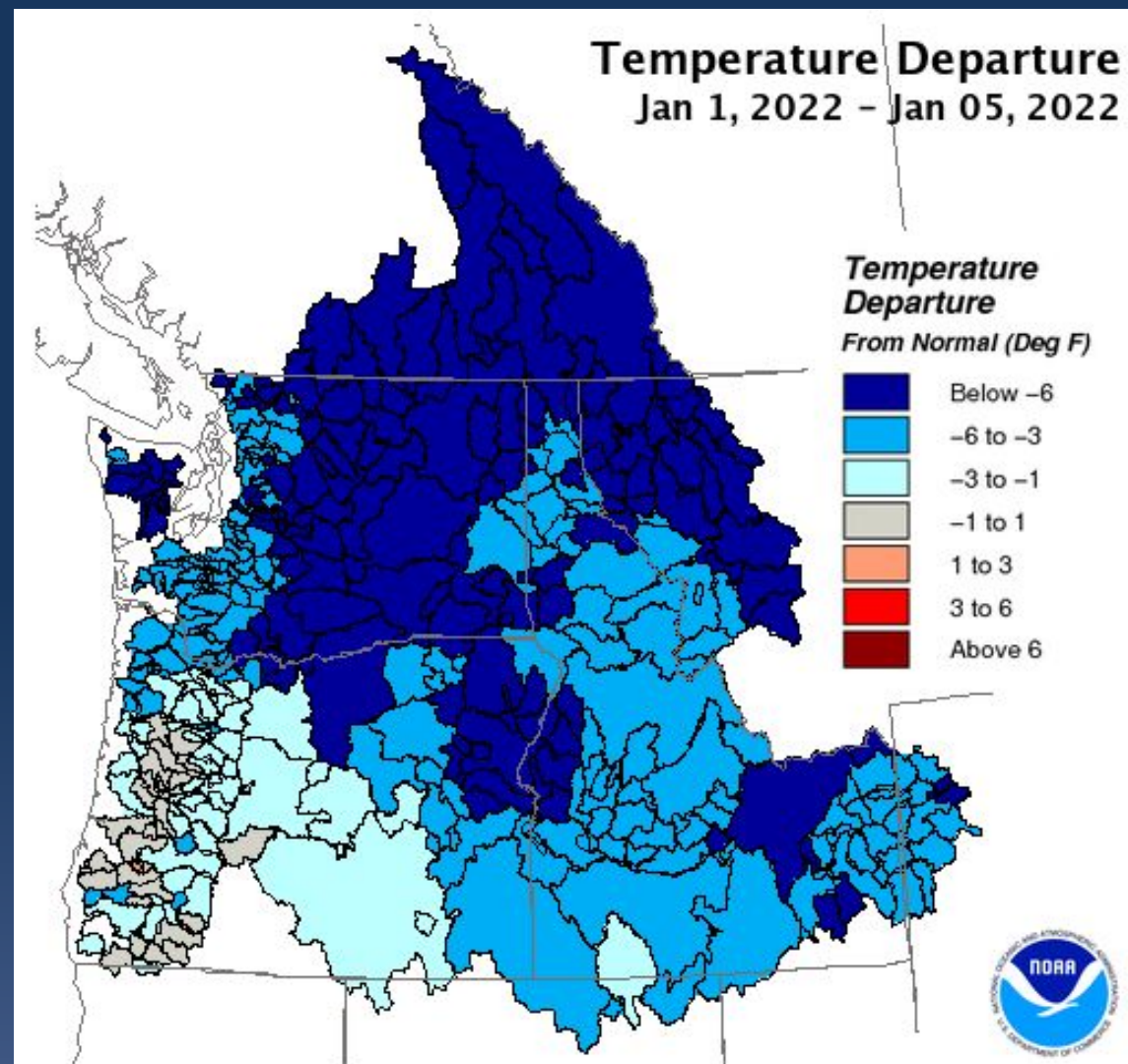
Temperature Departure
December 2021



Creation Time: Saturday, Jan 1, 2022

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Temperature Departure
Jan 1, 2022 - Jan 05, 2022

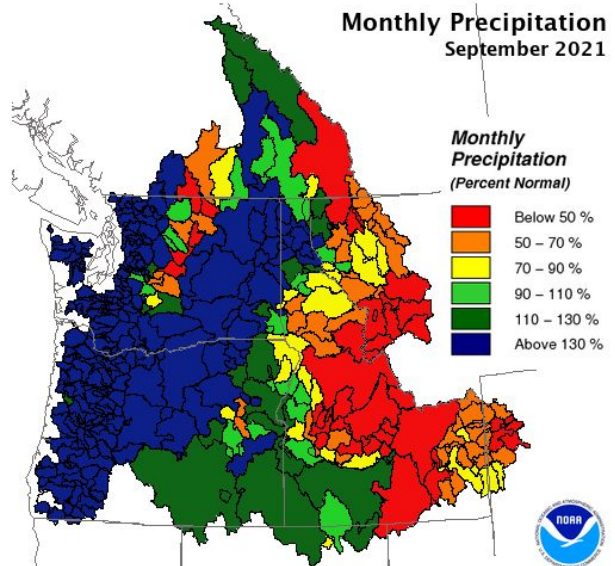


Creation Time: Thursday, Jan 6, 2022

Northwest River Forecast Center

Monthly Precipitation

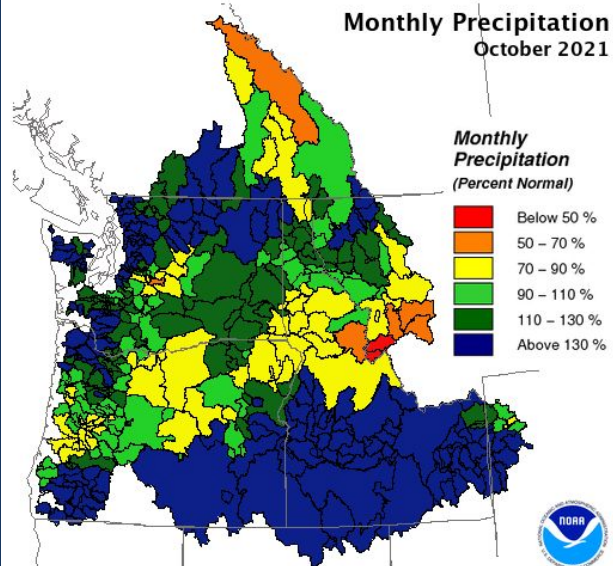
Monthly Precipitation
September 2021



Creation Time: Friday, Oct 1, 2021

Northwest River Forecast Center

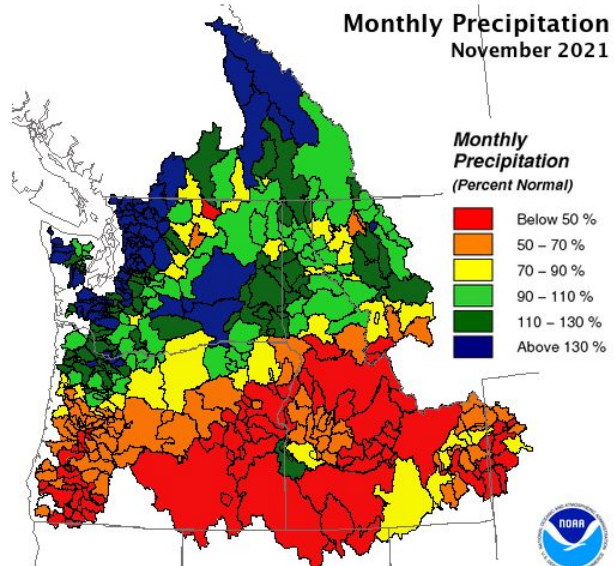
Monthly Precipitation
October 2021



Creation Time: Monday, Nov 1, 2021

Northwest River Forecast Center

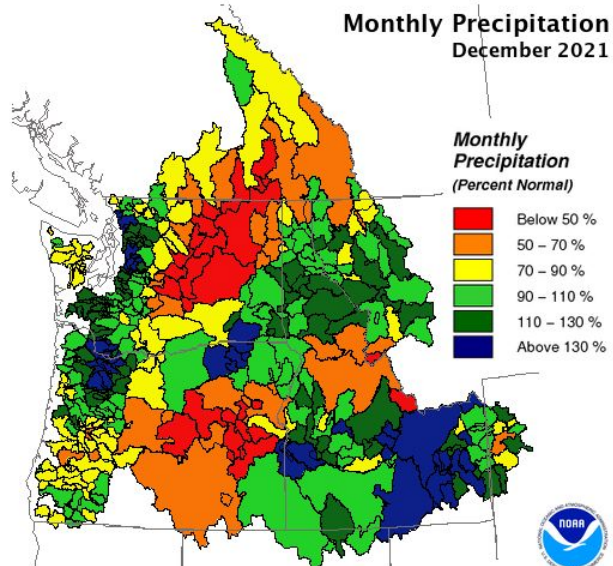
Monthly Precipitation
November 2021



Creation Time: Wednesday, Dec 1, 2021

Northwest River Forecast Center

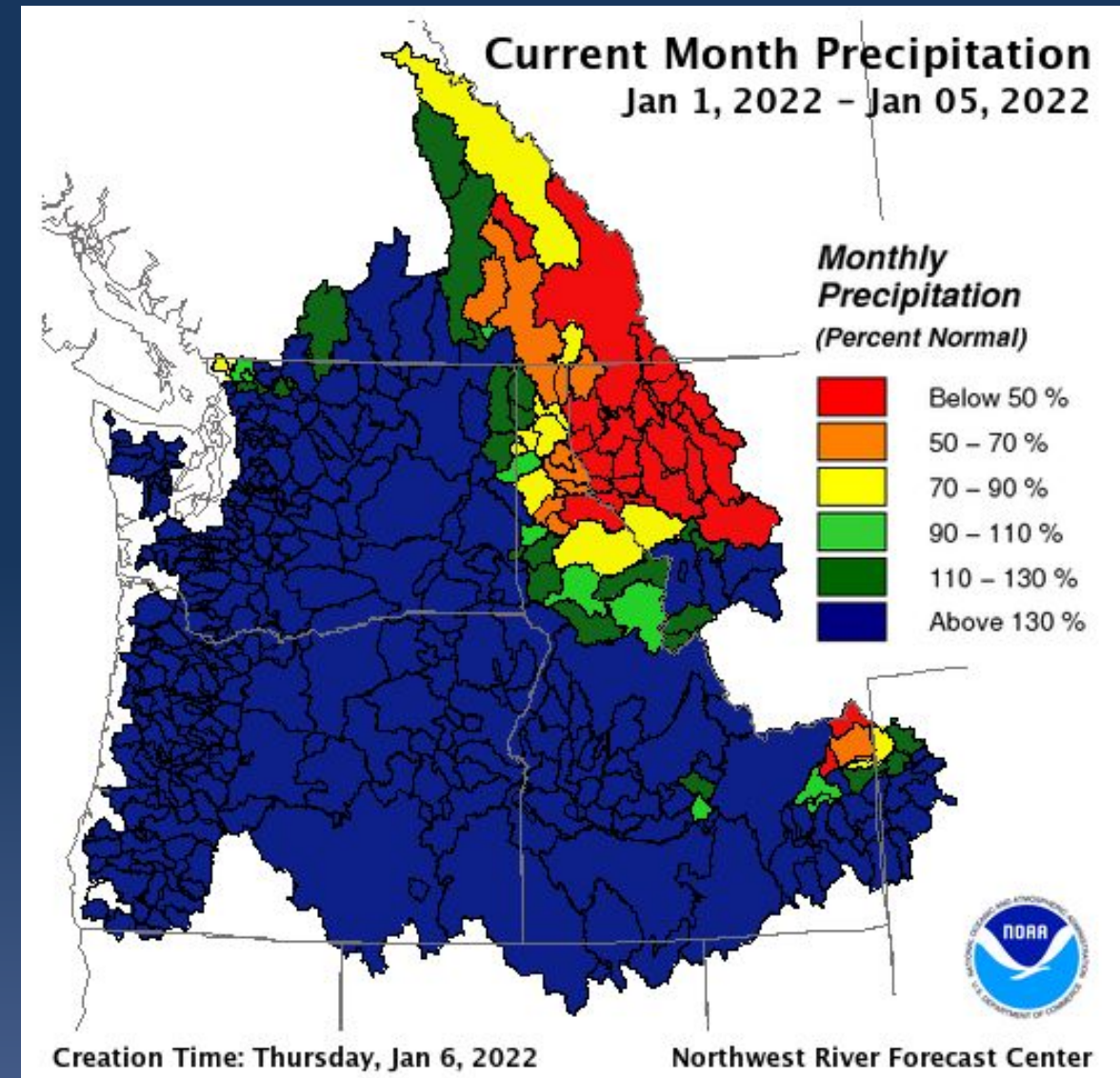
Monthly Precipitation
December 2021



Creation Time: Saturday, Jan 1, 2022

Northwest River Forecast Center

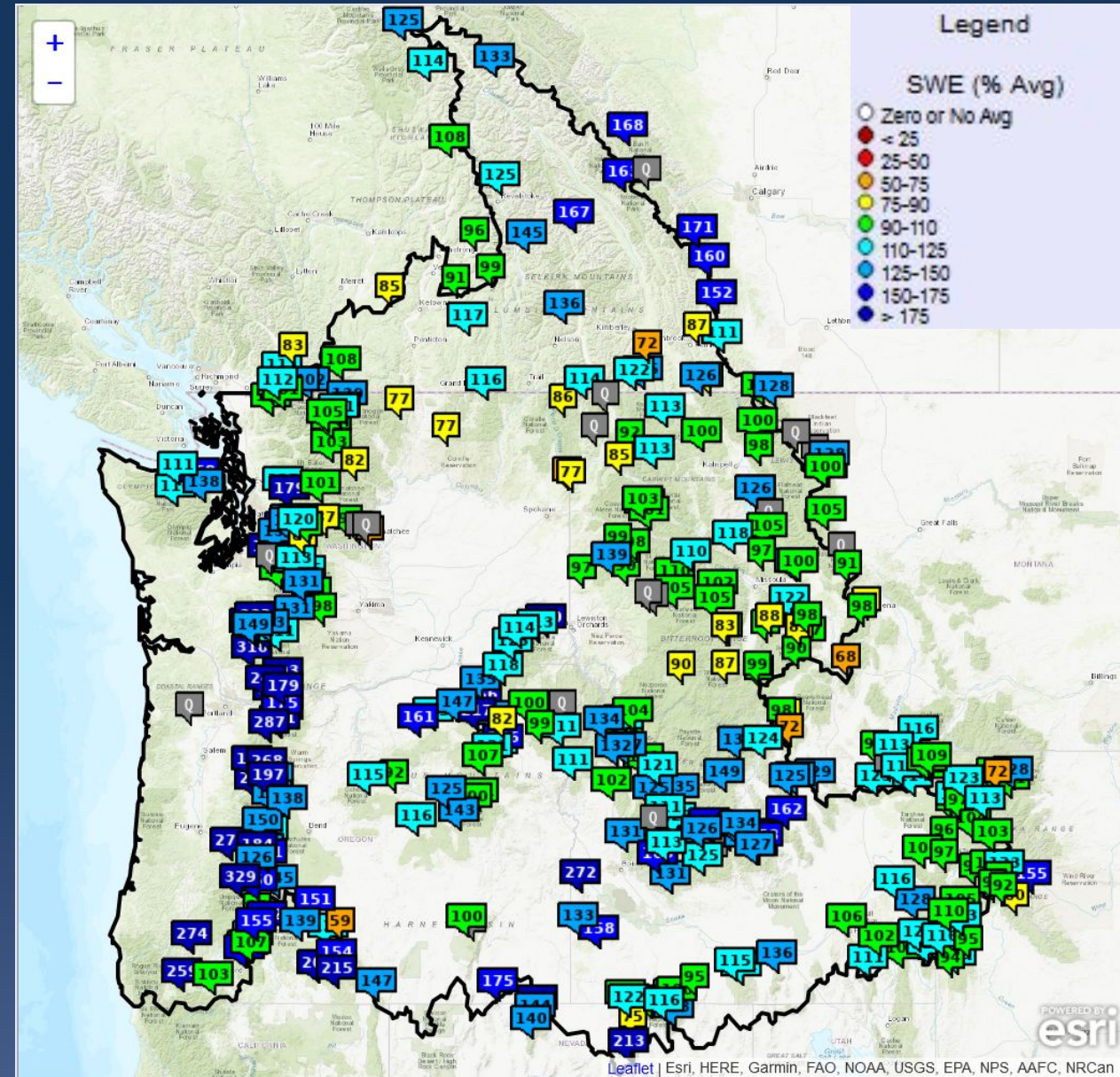
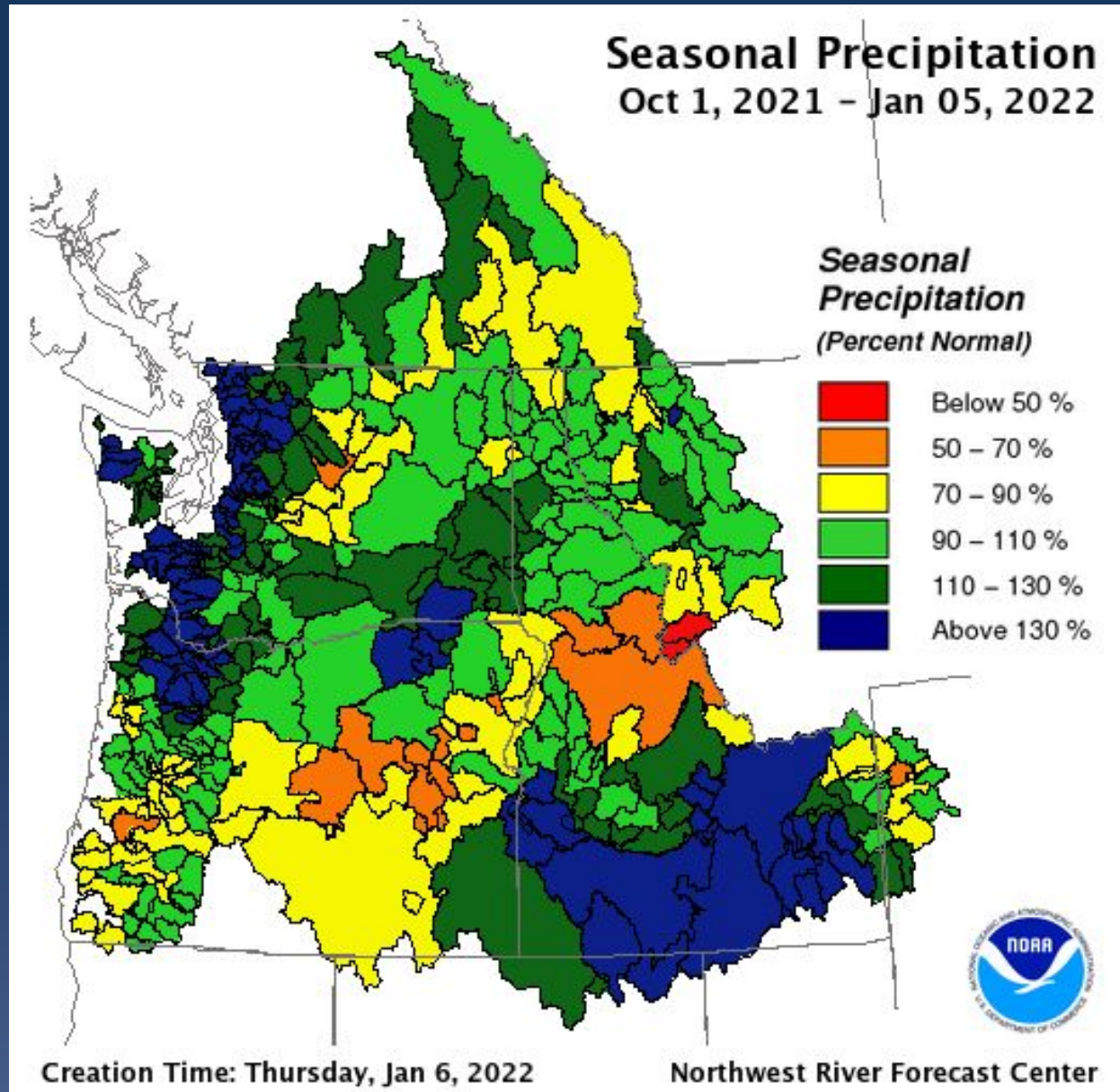
Current Month Precipitation
Jan 1, 2022 - Jan 05, 2022



Creation Time: Thursday, Jan 6, 2022

Northwest River Forecast Center

Precipitation and Snowpack





Snow Water Equivalent
SHEEP MOUNTAIN
 Water Year 2022 - Elevation 6570 feet

NOAA

Snow Water Equivalent, inches

Month

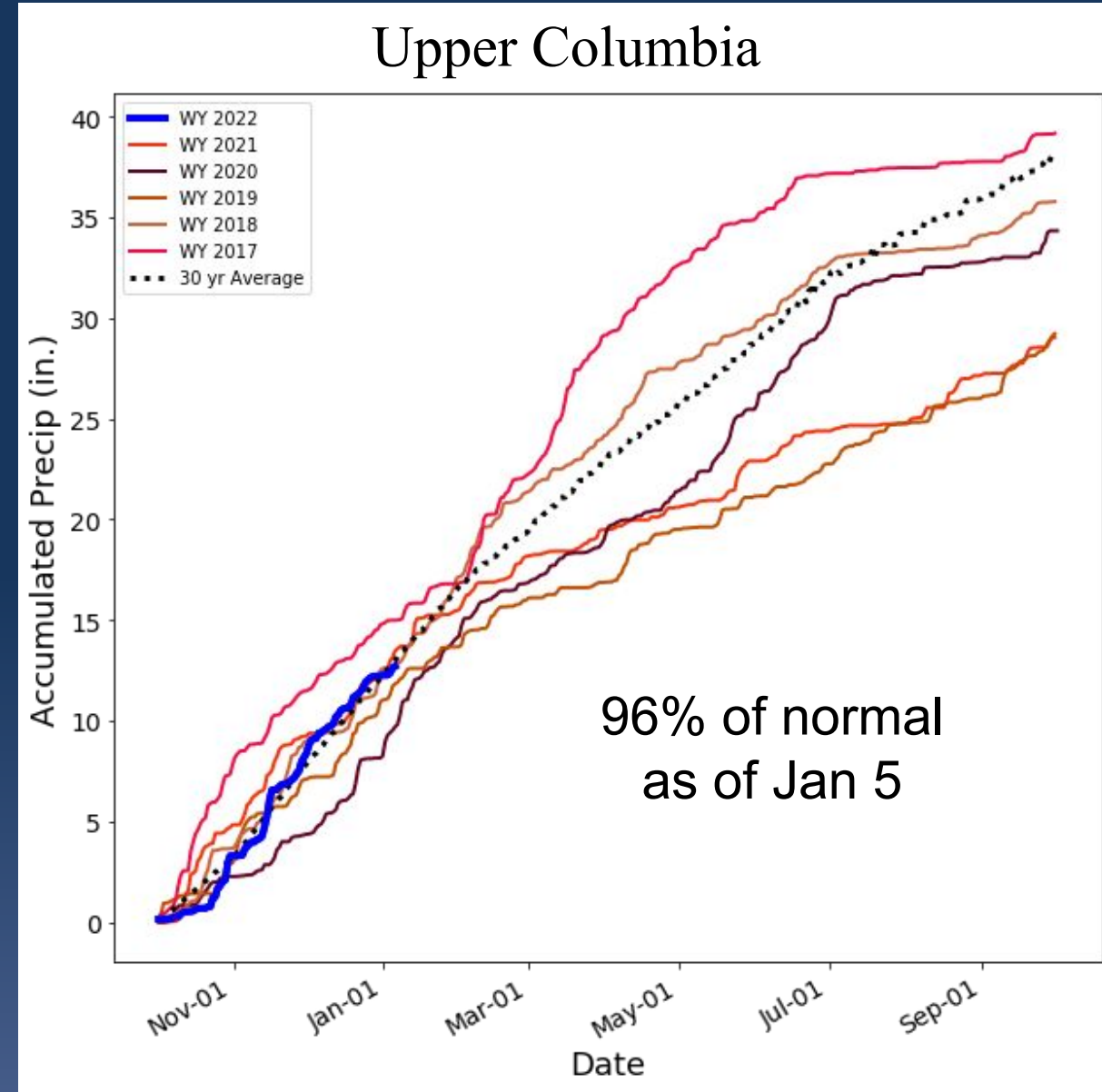
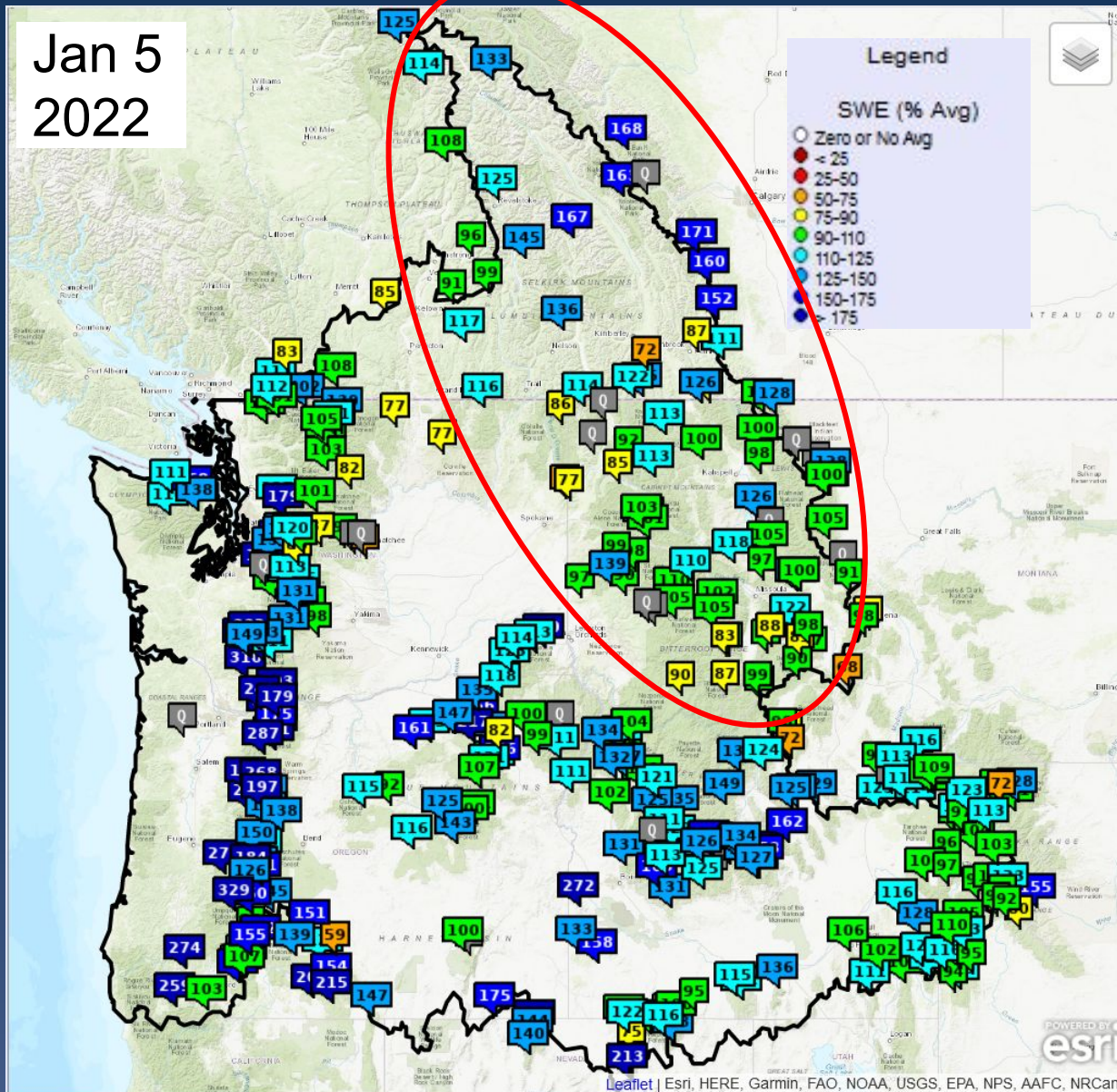
☐ POR Range
 ☒ 30Yr Avg
 ☒ 30Yr Med
 ☒ SWE Obs

Plot Created: 01/05/2022 2:35pm PST Observations Provided by NRCS

Snow data from NRCS, BC Hydro, and Alberta EP.



Snowpack and Seasonal Precipitation

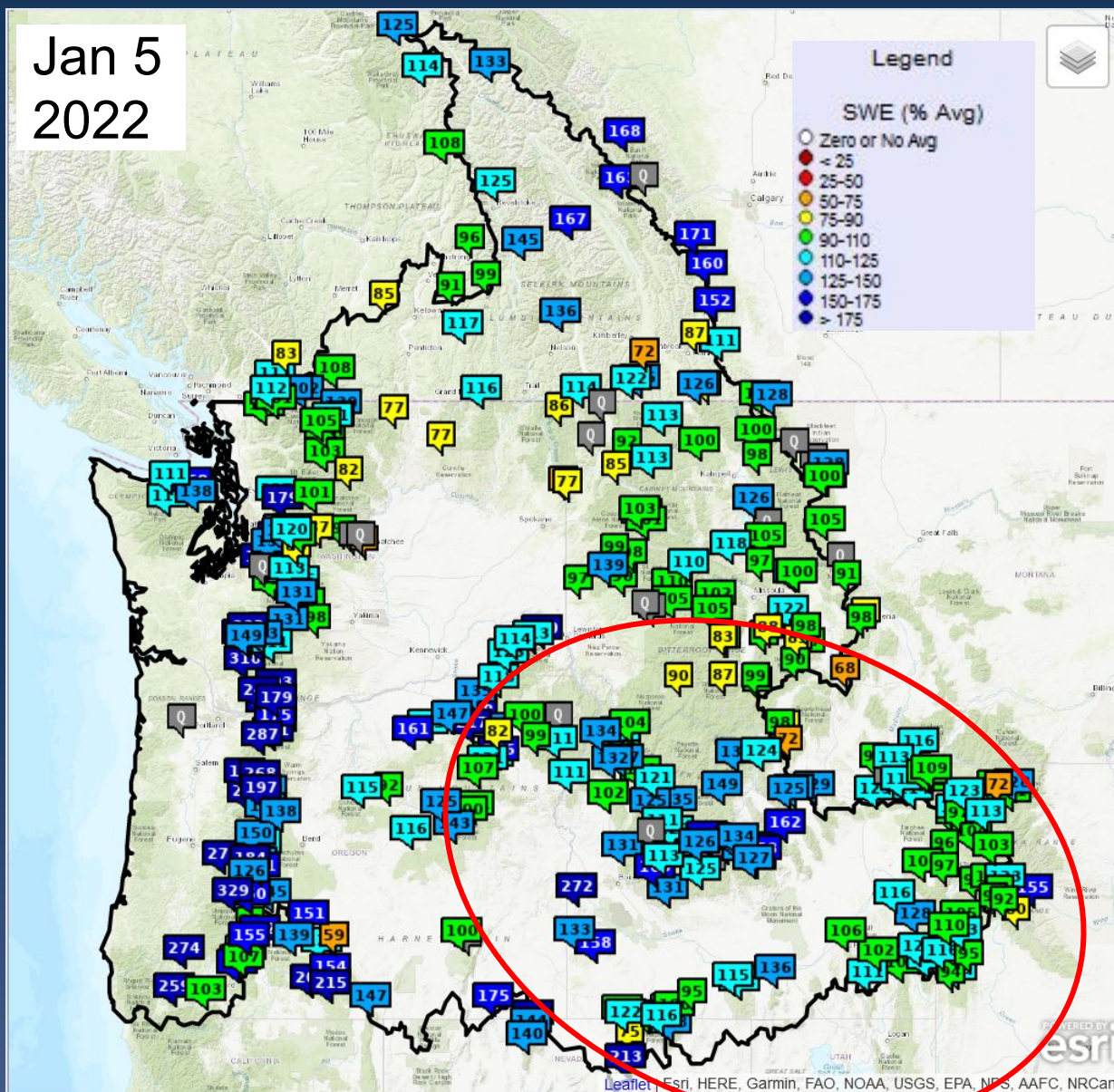


Data as of Jan 5, 2022. Snow data from NRCS, BC Hydro, and Alberta EP.

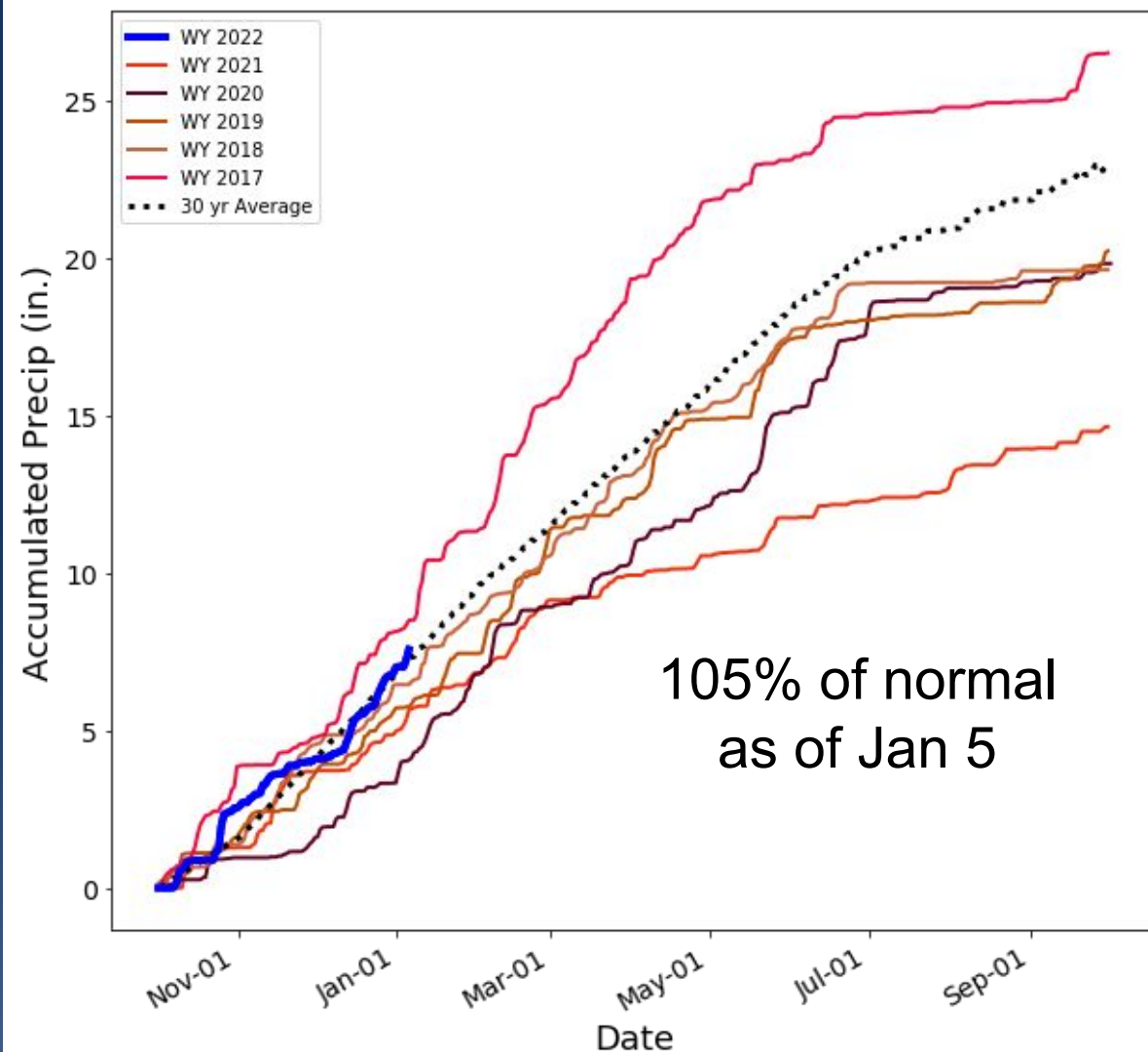


Snowpack and Seasonal Precipitation

Jan 5
2022



Snake River

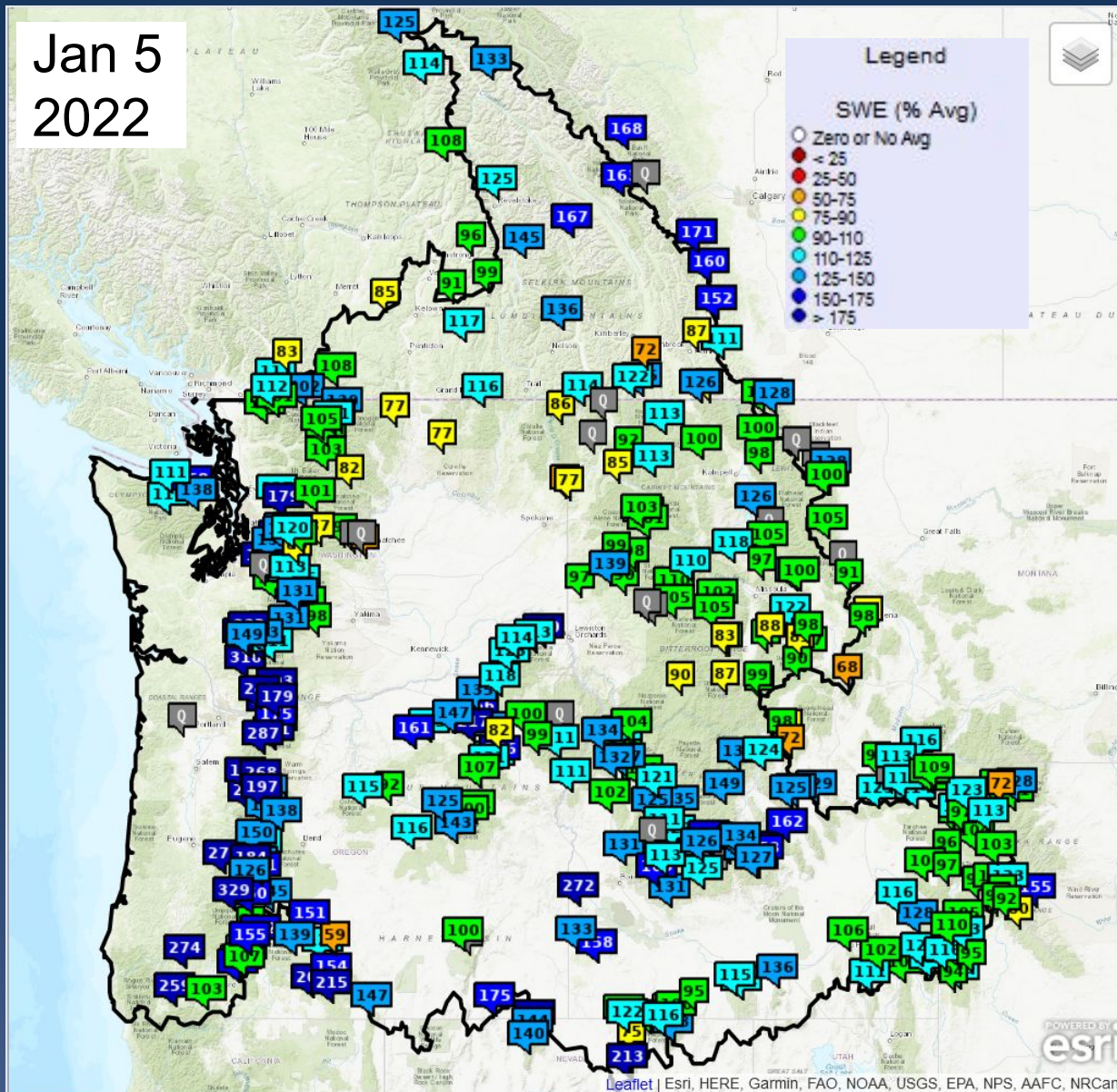


Data as of Jan 5, 2022. Snow data from NRCS, BC Hydro, and Alberta EP.

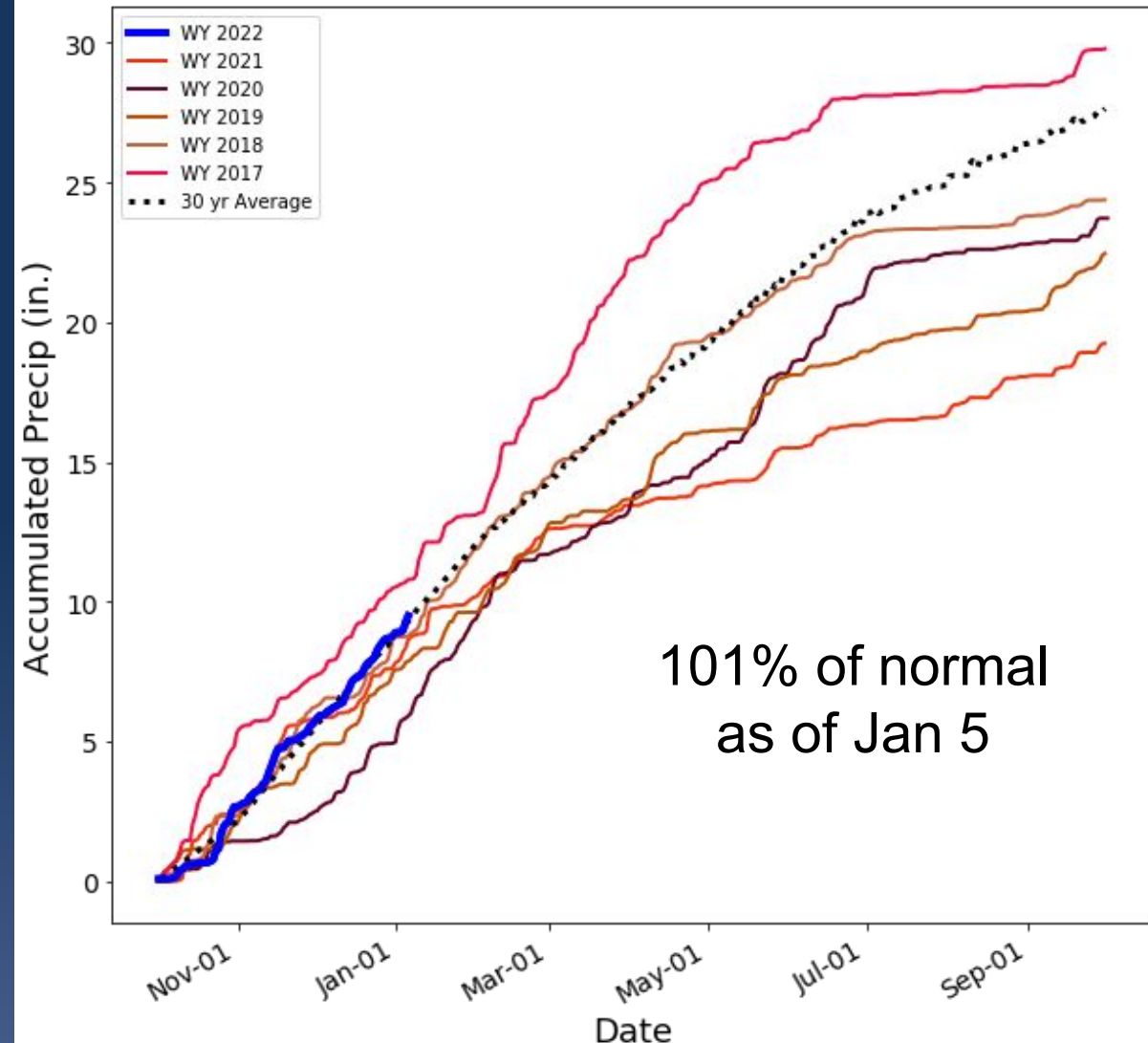


Snowpack and Seasonal Precipitation

Jan 5
2022



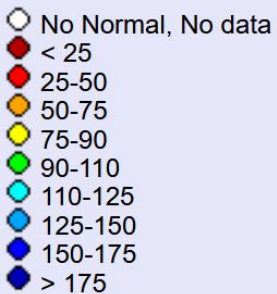
Columbia River above The Dalles



Data as of Jan 5, 2022. Snow data from NRCS, BC Hydro, and Alberta EP.

YTD Adjusted Runoff - East

Jan 5
2022



% Normal Runoff Oct 1-Jan 5

Upper Columbia Basin

Mica	115
Duncan	125
Queens Bay	153
Libby	144
Hungry Horse	124
Grand Coulee	129

Snake River Basin

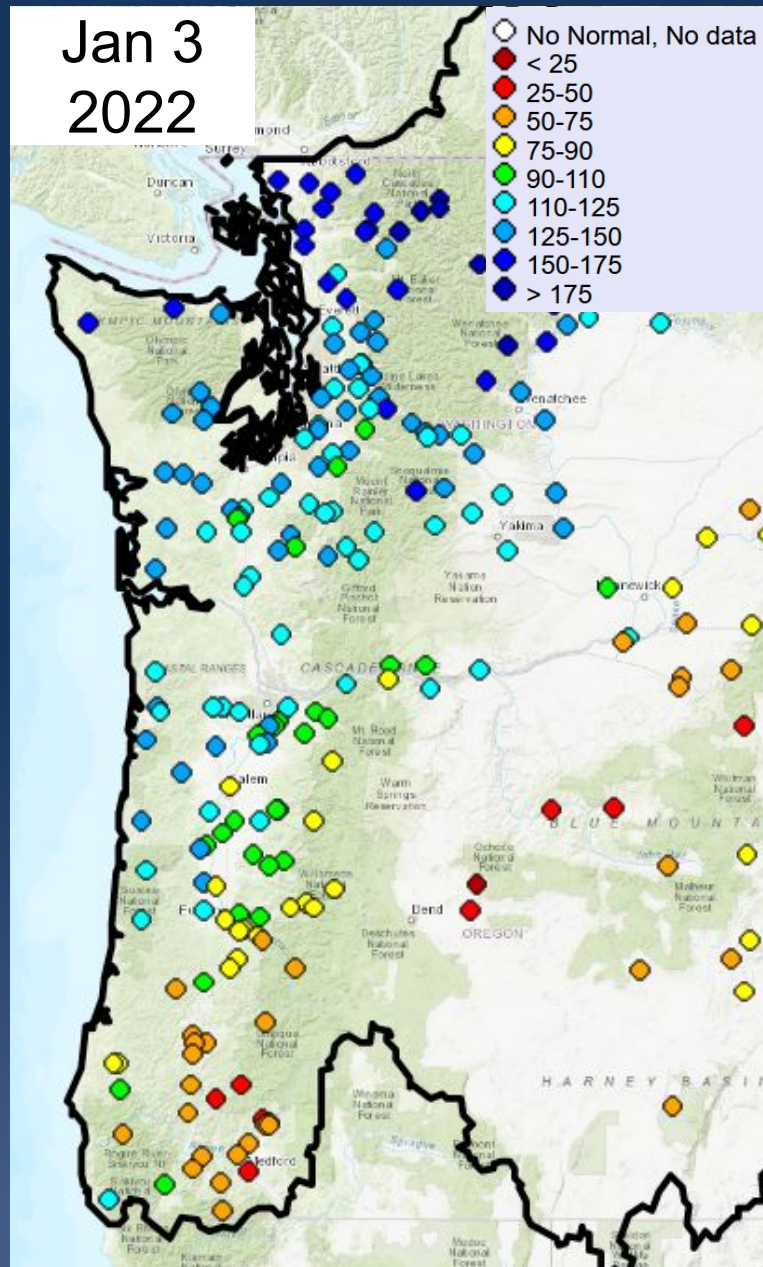
American Falls	88
Lucky Peak	87
Dworshak	98
Lower Granite	84

Lower Columbia Basin

The Dalles	108
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YTD Adjusted Natural Runoff - Western OR, WA



% Normal Runoff Oct 1- Jan 5

Washington

Skagit nr Mt Vernon	164
Dungeness nr Sequim	136
Chehalis at Porter	130
Okanogan at Malott	232
Methow nr Pateros	208
Yakima at Parker	123
Walla Walla nr Touchet	52

Oregon

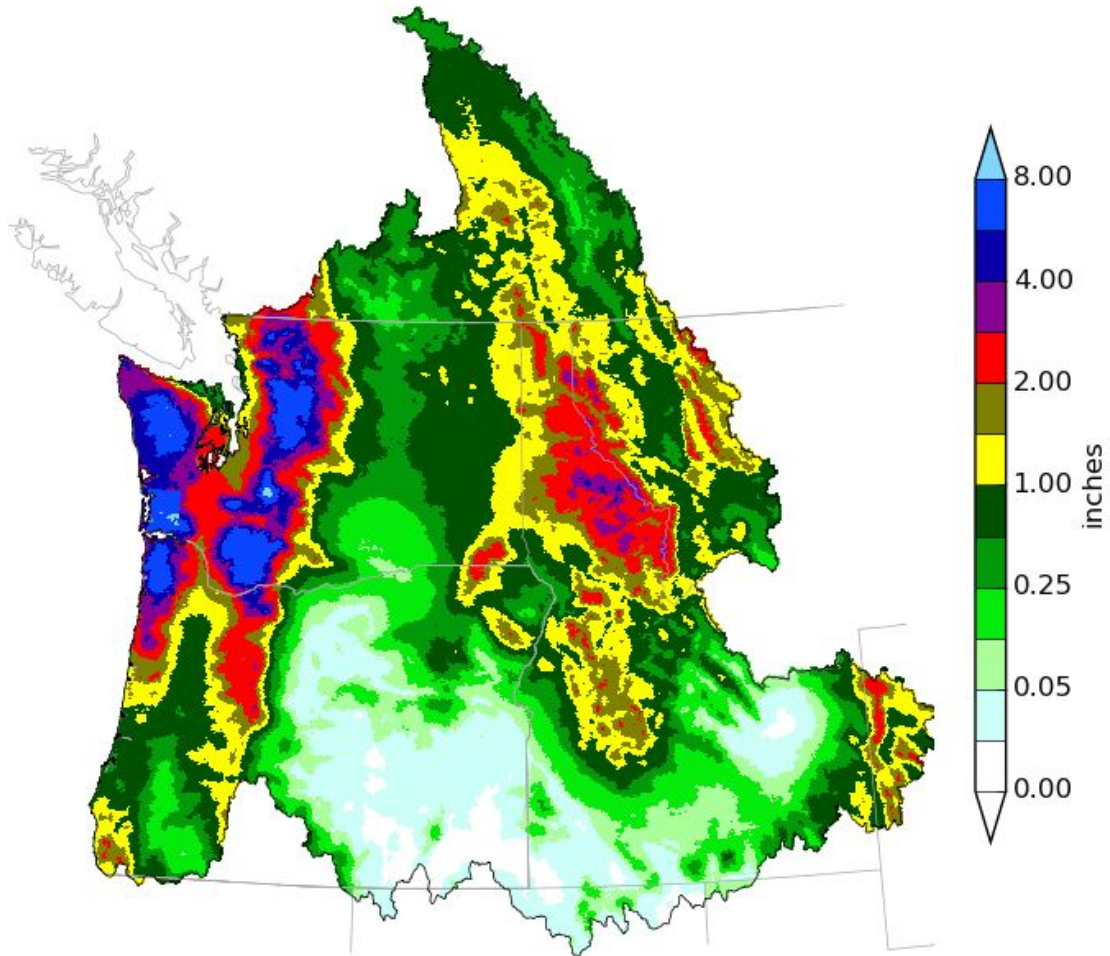
Willamette at Salem	88
Rogue at Raygold	59
Umatilla at Pendleton	67
Grande Ronde at Troy	70
Owyhee Dam	78



Precipitation Forecast (Jan 6-16)



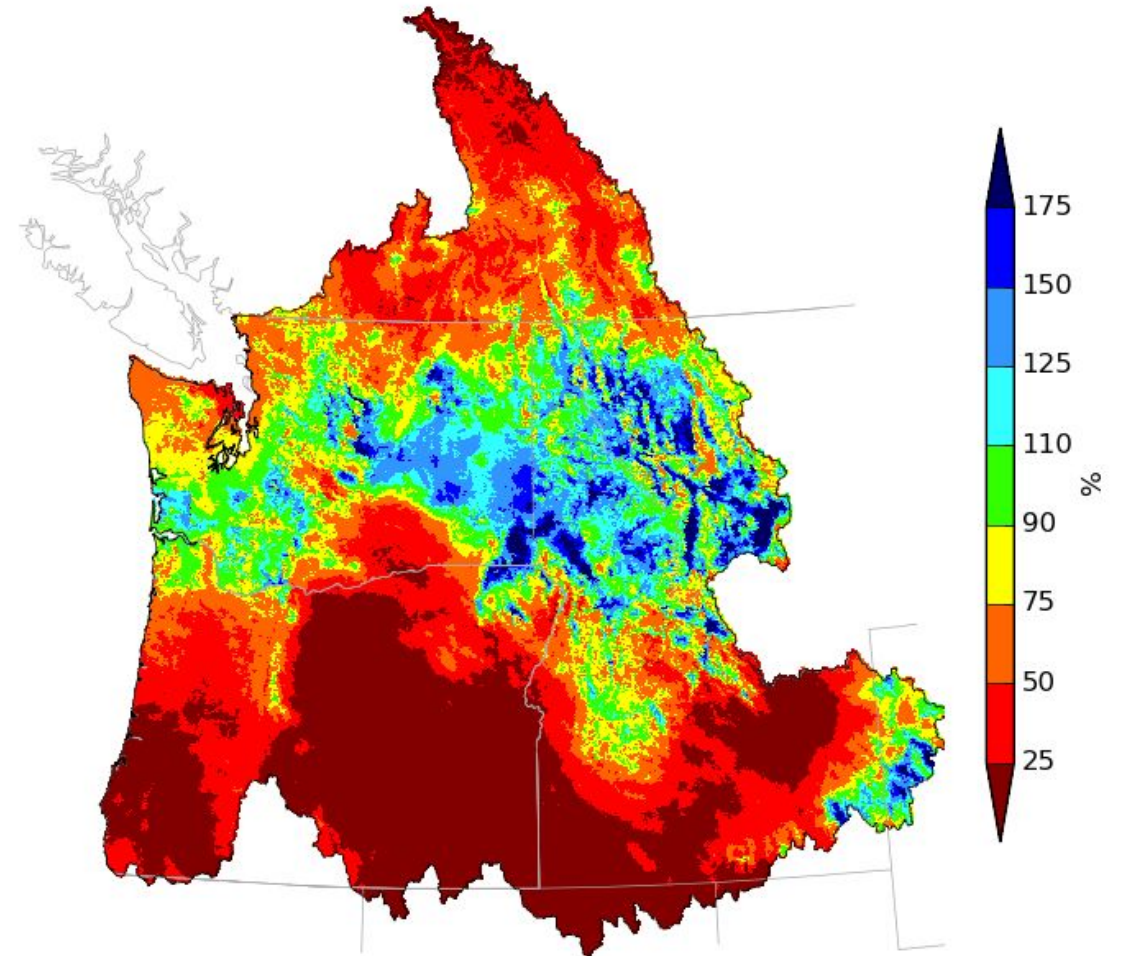
Northwest River Forecast Center
10 Day QPF, Ending 12Z, 01/16/22



Creation Time: Thu Jan 6 16:14:04 UTC 2022



Northwest River Forecast Center
10 Day QPF (Percent of Climatology), Ending 12Z, 01/16/22



Creation Time: Thu Jan 6 16:14:55 UTC 2022



ESP Water Supply Forecast Method

Ensemble Streamflow Prediction combines current conditions with historical temperature and precipitation pairs

Forecast
Hydrograph
Ensemble

Exceedance
Probabilities
As Boxplots

Exceedance
Probability
and
Ensemble
MIN/MAX

◇ MAX

10%

25%

50%

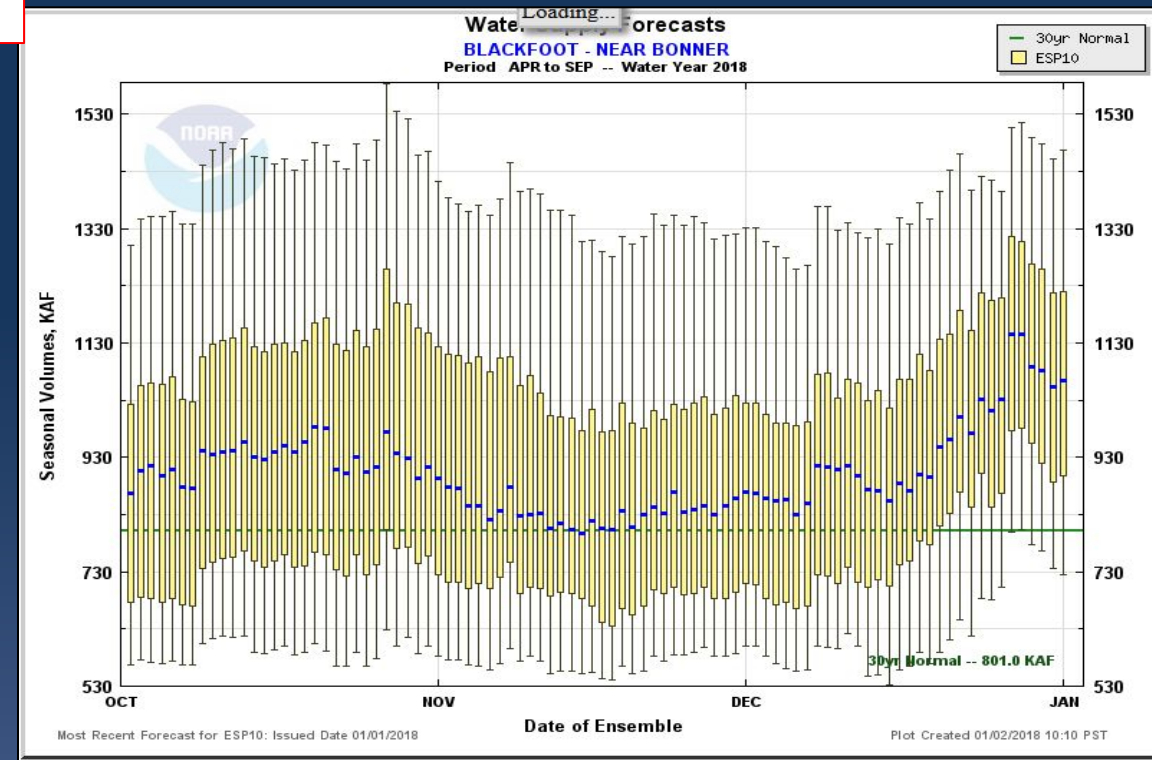
75%

90%

◇ MIN

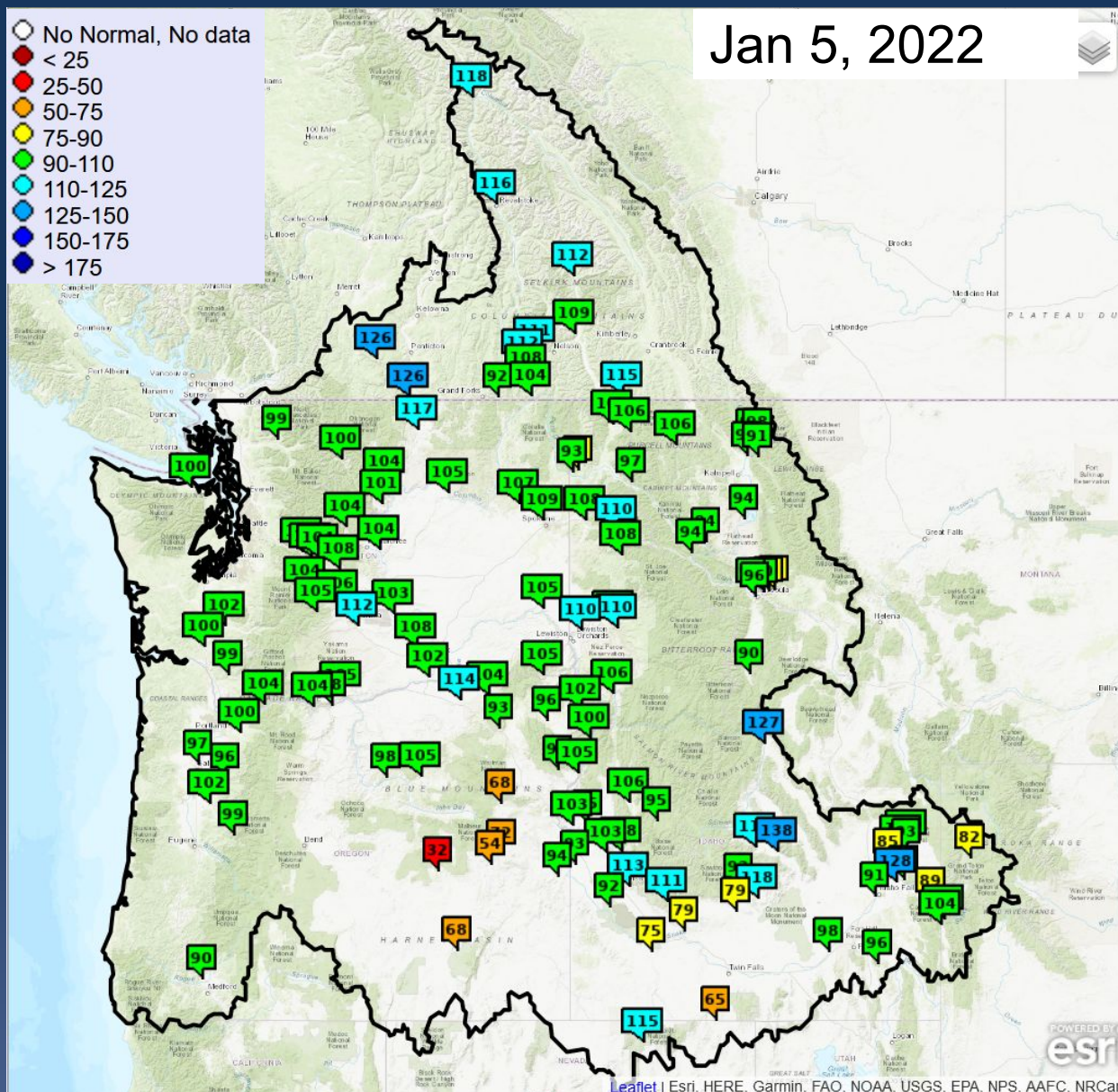
Issuance Date

Apr-Sep Forecast Period



Water Supply Forecast (Trend Plot)

ESP10 Water Supply Forecasts - East



% Normal Apr-Sep Volume

Upper Columbia Basin

Mica	118
Duncan	112
Queens Bay	109
Libby	106
Hungry Horse	91
Grand Coulee	105

Snake River Basin

American Falls	98
Lucky Peak	113
Dworshak	104
Lower Granite	105

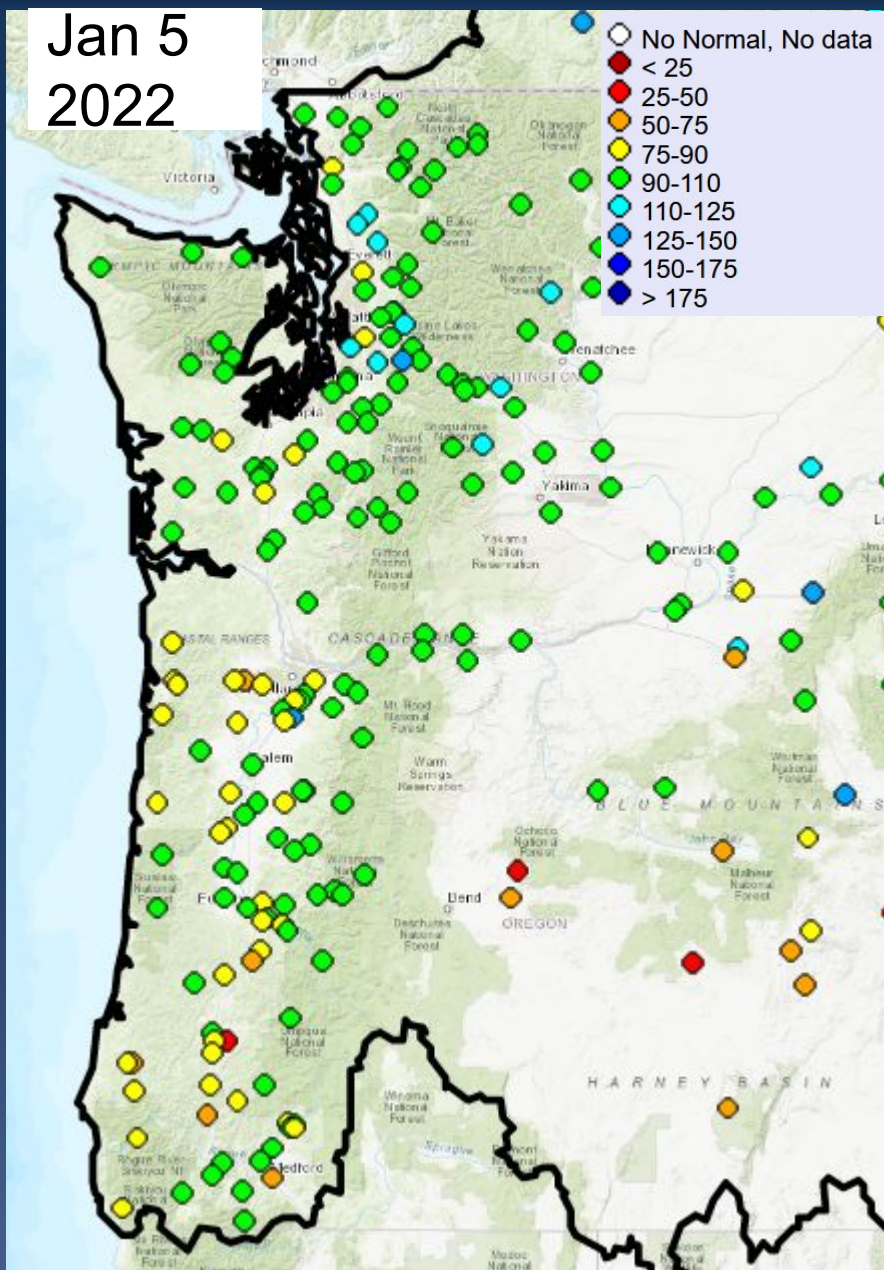
Lower Columbia Basin

The Dalles	104
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ESP10 Natural Forecasts - Western OR, WA

Jan 5
2022



% Normal Apr -Sep Vol

Washington

Skagit nr Mt Vernon	100
Dungeness nr Sequim	100
Chehalis at Porter	89
Okanogan at Malott	114
Methow nr Pateros	104
Yakima at Parker	101
Walla Walla nr Touchet	87

Oregon

Willamette at Salem	91
Rogue at Raygold	90
Umatilla at Pendleton	113
Grande Ronde R at Troy	105
Owyhee Dam	92



ESP10 Apr-Sep Water Supply Forecasts

COLUMBIA - GRAND COULEE DAM (GCDW1) Forecasts for Water Year 2022

Official Water Supply

ESP with 10 Days QPF Ensemble: 2022-01-05 Issued: 2022-01-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	53739	64453	105	76184	61483
APR-JUL	44436	54463	103	65081	52774
APR-AUG	49780	60042	103	71830	58186
JAN-SEP	62017	73522	104	86468	70457
JAN-JUL	52701	63865	103	73868	61749
OCT-SEP	72858	84363	107	97309	78842

Experimental Water Supply

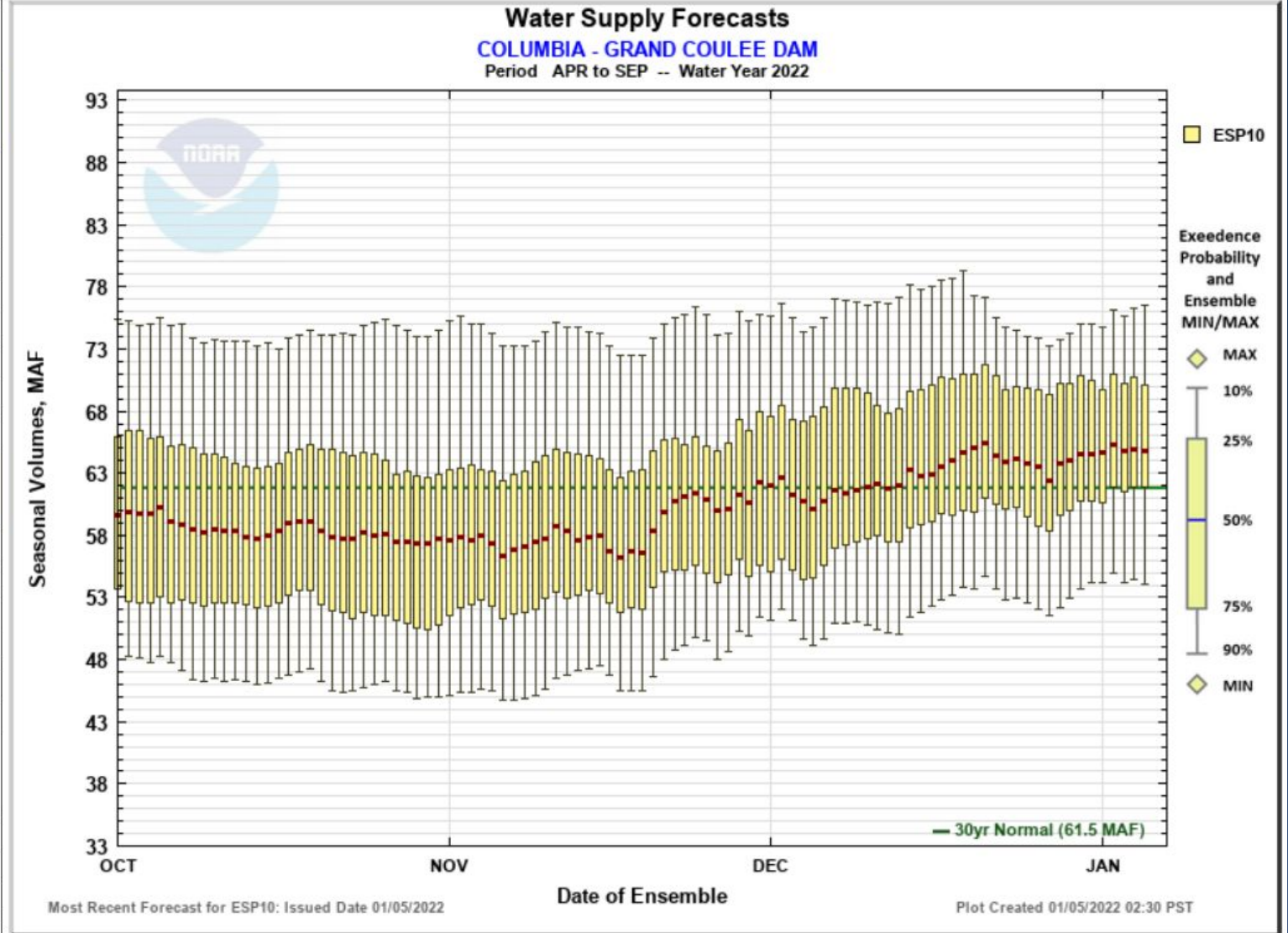
HEFS with 15 days EQPF Ensemble: 2022-01-05 Issued: 2022-01-05

APR-SEP	54542	65789	107	77474	61483
APR-JUL	45338	55378	105	66127	52774
APR-AUG	50559	62118	107	72215	58186
JAN-SEP	62648	75215	107	86852	70457
JAN-JUL	53283	65658	106	77111	61749
OCT-SEP	73489	86056	109	97693	78842

Reference

ESP with 0 Days QPF Ensemble: 2022-01-05 Issued: 2022-01-05

APR-SEP	54280	65984	107	76447	61483
APR-JUL	44768	55406	105	65666	52774
APR-AUG	50166	62606	108	71733	58186
JAN-SEP	62761	75405	107	85966	70457
JAN-JUL	53249	65037	105	76798	61749
OCT-SEP	73602	86246	109	96806	78842



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



ESP10 Apr-Sep Water Supply Forecasts

SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for Water Year 2022

Official Water Supply

ESP with 10 Days QPF Ensemble: 2022-01-05 Issued: 2022-01-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	16200	23314	105	28980	22232
APR-JUL	14094	20691	104	25830	19946
APR-AUG	15142	22061	104	27503	21121
JAN-SEP	22809	29716	100	38435	29736
JAN-JUL	20716	27038	99	35715	27450
OCT-SEP	26714	33621	98	42340	34287

Experimental Water Supply

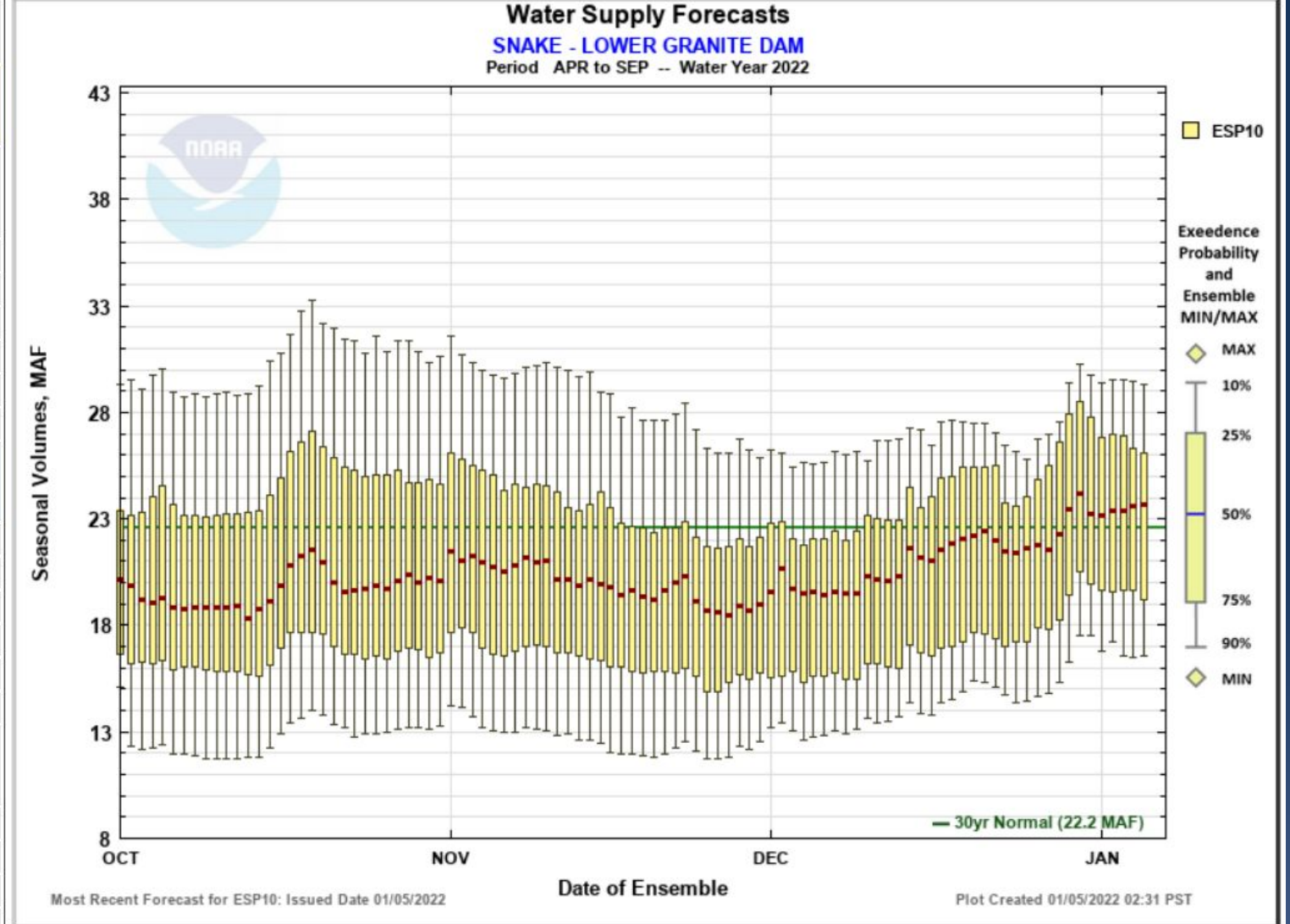
HEFS with 15 days EQPF Ensemble: 2022-01-05 Issued: 2022-01-05

APR-SEP	16210	23173	104	27644	22232
APR-JUL	14138	20619	103	24879	19946
APR-AUG	15175	21931	104	26229	21121
JAN-SEP	22098	30117	101	36859	29736
JAN-JUL	20054	27495	100	33949	27450
OCT-SEP	26003	34022	99	40764	34287

Reference

ESP with 0 Days QPF Ensemble: 2022-01-05 Issued: 2022-01-05

APR-SEP	15148	22535	101	27634	22232
APR-JUL	13068	19928	100	24973	19946
APR-AUG	14096	21287	101	26384	21121
JAN-SEP	21865	28846	97	36664	29736
JAN-JUL	19757	26273	96	33777	27450
OCT-SEP	25770	32751	96	40569	34287



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



ESP10 Apr-Sep Water Supply Forecasts

COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for Water Year 2022

Official Water Supply

ESP with 10 Days QPF Ensemble: 2022-01-05 Issued: 2022-01-05

Forecast Period	Forecasts Are in KAF				30 Year Average (1991-2020)
	90 %	50 %	% Average	10 %	
APR-SEP	81480	97639	104	115713	94166
APR-JUL	69987	82855	101	101298	81933
APR-AUG	76585	91310	102	109614	89196
JAN-SEP	100067	119508	103	141867	115946
JAN-JUL	87906	106825	103	127210	103714
OCT-SEP	118122	137563	104	159922	132314

Experimental Water Supply

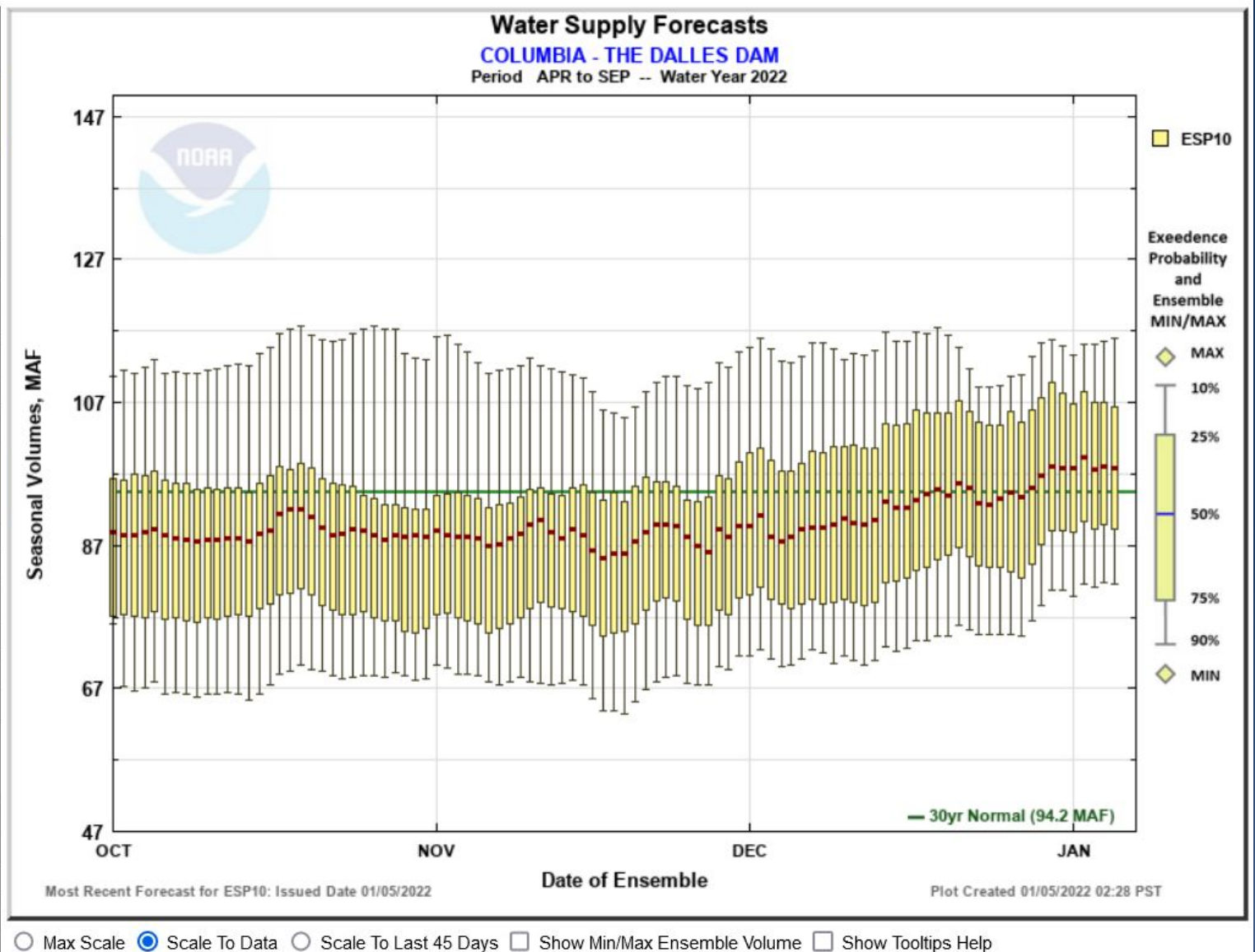
HEFS with 15 days EQPF Ensemble: 2022-01-05 Issued: 2022-01-05

APR-SEP	80292	99486	106	115924	94166
APR-JUL	68119	84488	103	100858	81933
APR-AUG	74695	93631	105	109209	89196
JAN-SEP	98426	119676	103	140628	115946
JAN-JUL	86594	106034	102	126013	103714
OCT-SEP	116481	137731	104	158683	132314

Reference

ESP with 0 Days QPF Ensemble: 2022-01-05 Issued: 2022-01-05

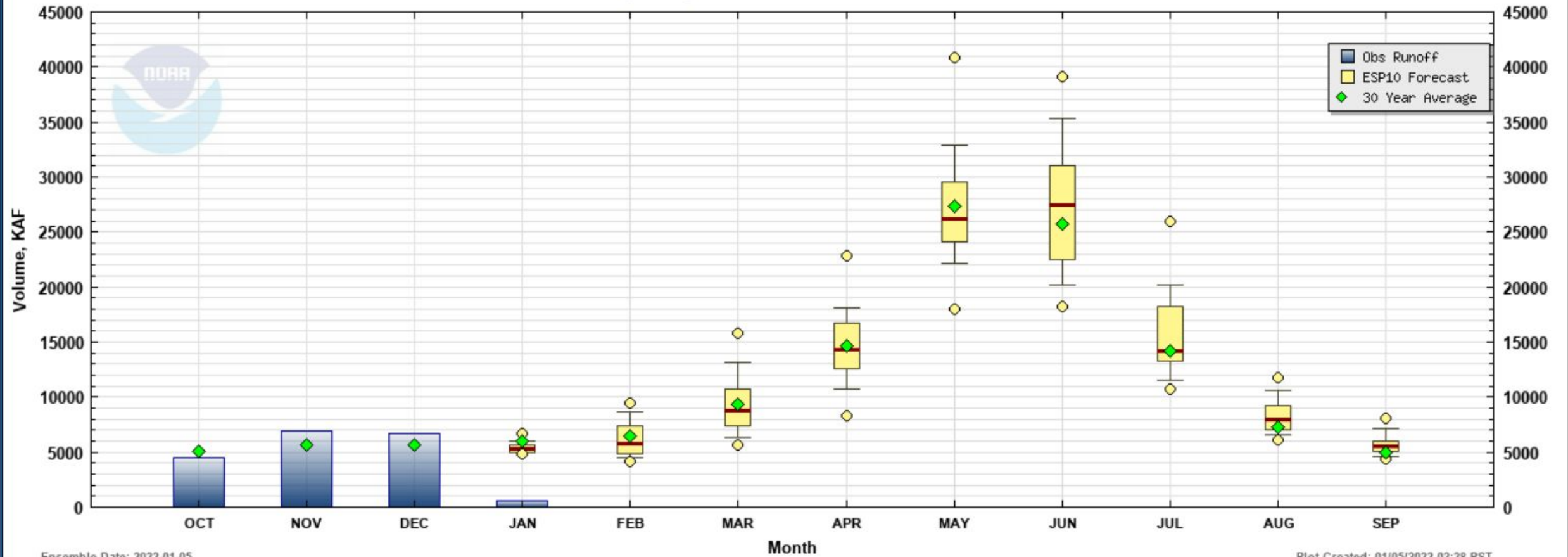
APR-SEP	78368	98892	105	115109	94166
APR-JUL	66407	84066	103	101915	81933
APR-AUG	72730	93725	105	109787	89196
JAN-SEP	97246	118619	102	141237	115946
JAN-JUL	85499	103325	100	125291	103714
OCT-SEP	115301	136674	103	159292	132314





ESP10 Water Supply Volume Monthly Forecasts

Water Supply Volume Monthly Forecasts (ESP10) for Water Year 2022
(TDAO3) COLUMBIA - THE DALLES DAM



Ensemble Date: 2022-01-05

Plot Created: 01/05/2022 02:28 PST

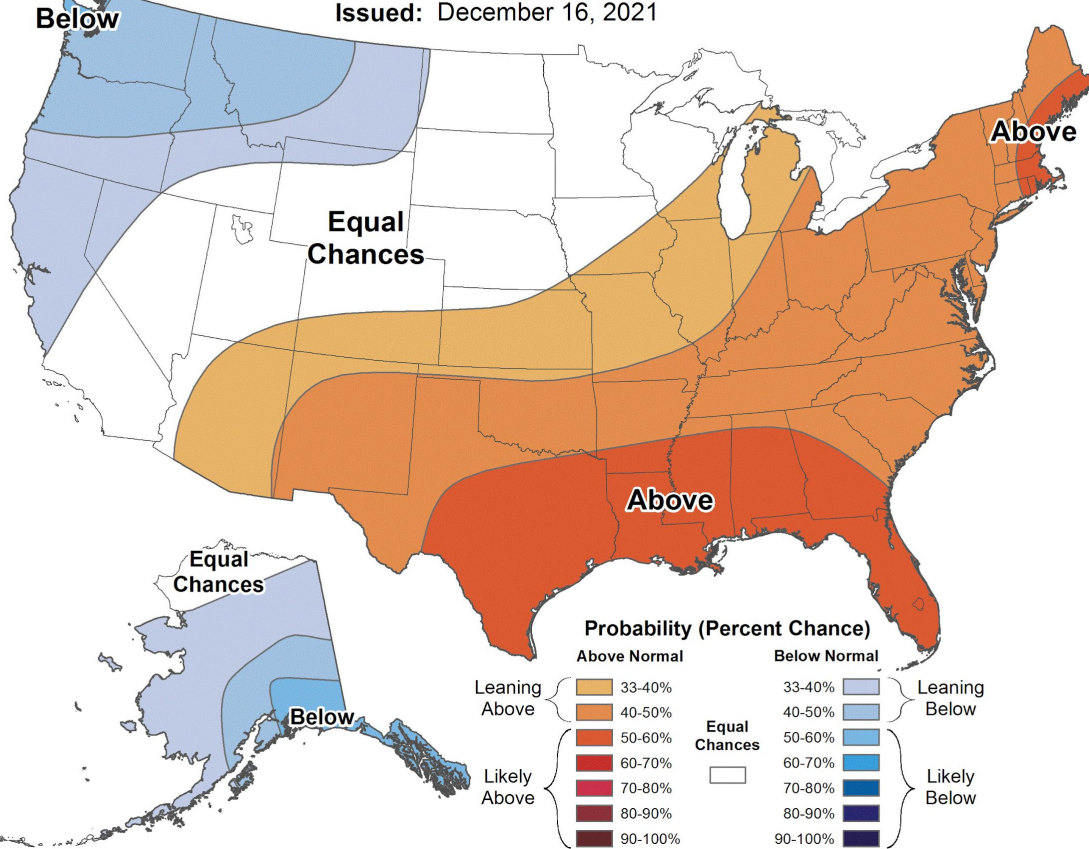
CPC Three-Month Outlook



Seasonal Temperature Outlook



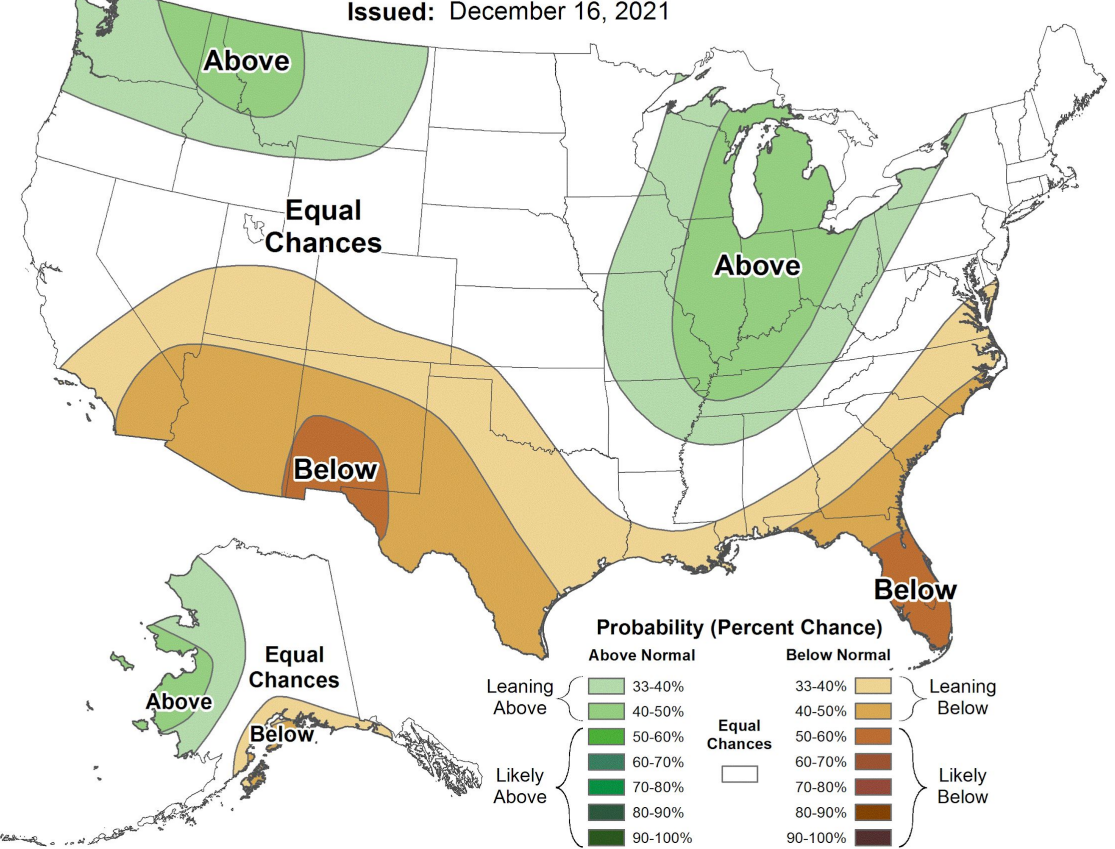
Valid: Jan-Feb-Mar 2022
Issued: December 16, 2021



Seasonal Precipitation Outlook



Valid: Jan-Feb-Mar 2022
Issued: December 16, 2021





CPC Model Predictions

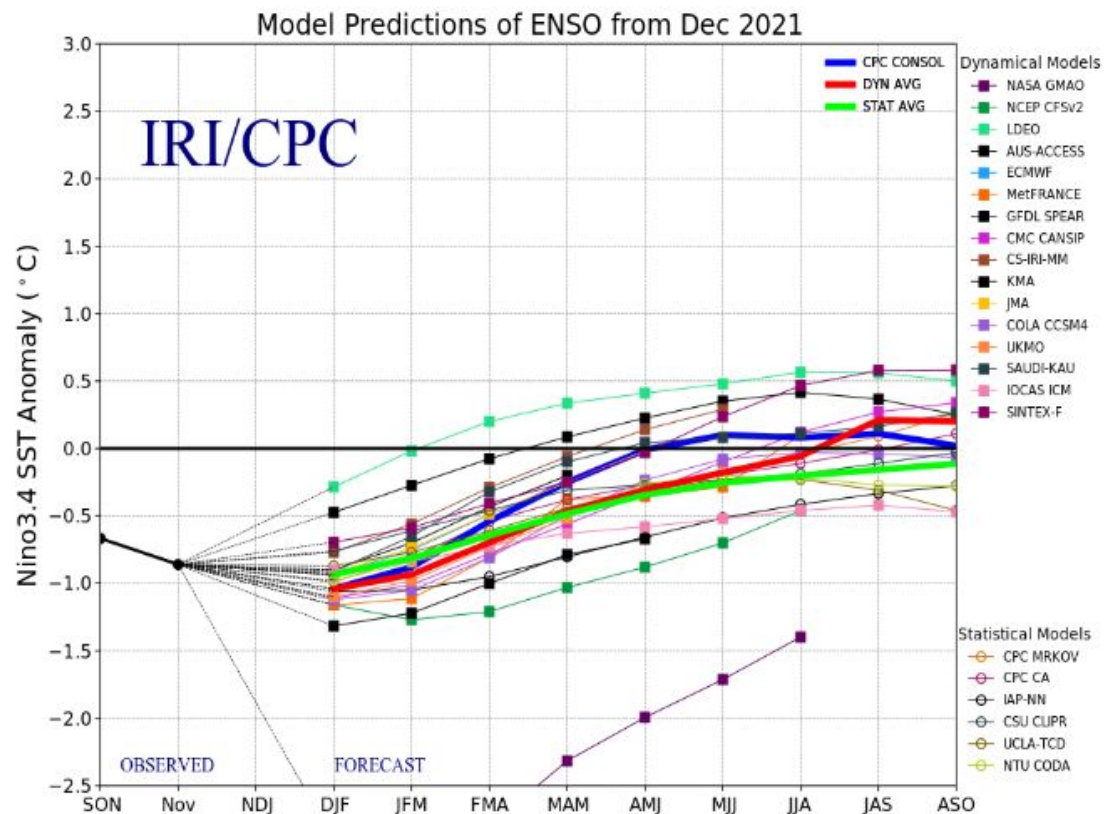


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 20 December 2021).

A majority of models indicate La Niña is expected to continue through winter 2021-22 and into spring 2022.

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf





Take Home Messages

New normals period of record (1991-2020) for runoff and snow.

Seasonal Precipitation near normal for most of the basin.

Snowpack near to above normal for most of the basin.

Water Supply Forecasts are near to above normal for most of the basin.



WY2022 Schedule for Live Water Supply Briefings

Feb	Mar	Apr	May
3	3	7	5
All presentations held at 10:00 am PST/PDT unless noted otherwise			

Telephone Conference Call Number
(same for each month's brief):
(562) 247 - 8422

Pass Code :
146-348-602#



Questions?

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You will be muted until the presenter unmutes you. If you have a question, use the 'Raise Hand' function to let us know to unmute your phone.

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