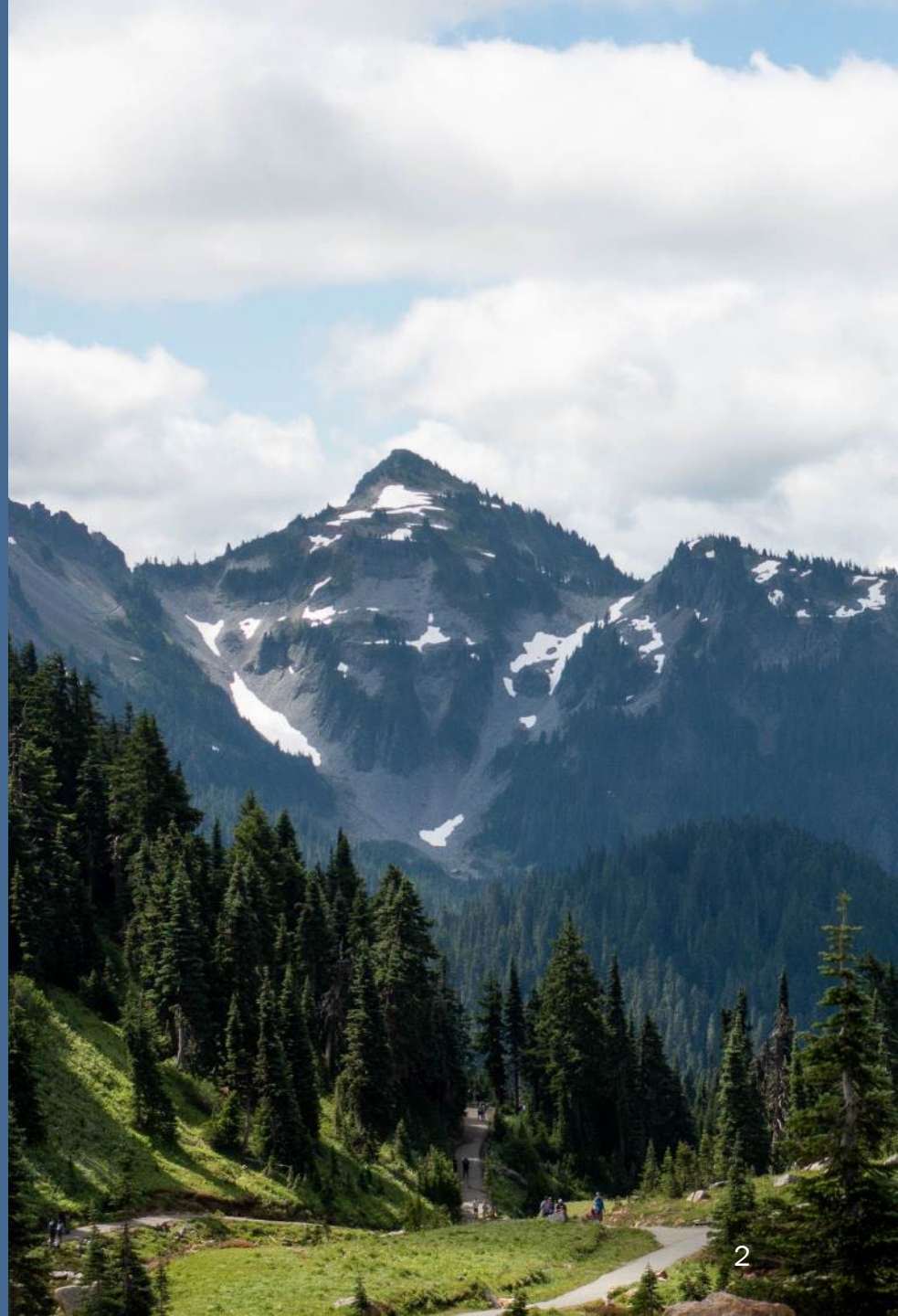
DEPARTMENT OF ECOLOGY
State of Washington

Water Supply Availability Committee

January 24, 2024

Recording!



Agenda

Time	Agenda item	Responsible
11:00a.m.	Welcome and agenda Committee role & declaration status	Caroline Mellor, Ecology
11:15a.m.	Regional Climate Setting / ENSO	Karin Bumbaco, OWSC
11:30a.m.	Mountain conditions	Matt Warbritton, NRCS
11:40a.m.	Streamflow and Groundwater	Nick Sutfin, USGS
11:50a.m.	Water Supply Forecasts	Amy Burke, NWRFC
12:00p.m.	Yakima Project	Chris Lynch, BOR
12:10p.m.	Discussion: What conditions and concerns do folks see on the ground?	All participants Ecology facilitates
12:25p.m.	Wrap-up and next steps	Caroline Mellor, Ecology

Meeting Objectives

- Share pertinent info and assess water supply conditions in Washington.
- Create a shared understanding of water supply conditions and forecasts

Committee Role

WSAC provides an important consultative and advisory role to Ecology related to:

- Current and forecasted water supply conditions;
- Whether the hydrologic drought threshold has been met or is likely to be met:

  Seventy-five percent of normal water supply within a geographic area.

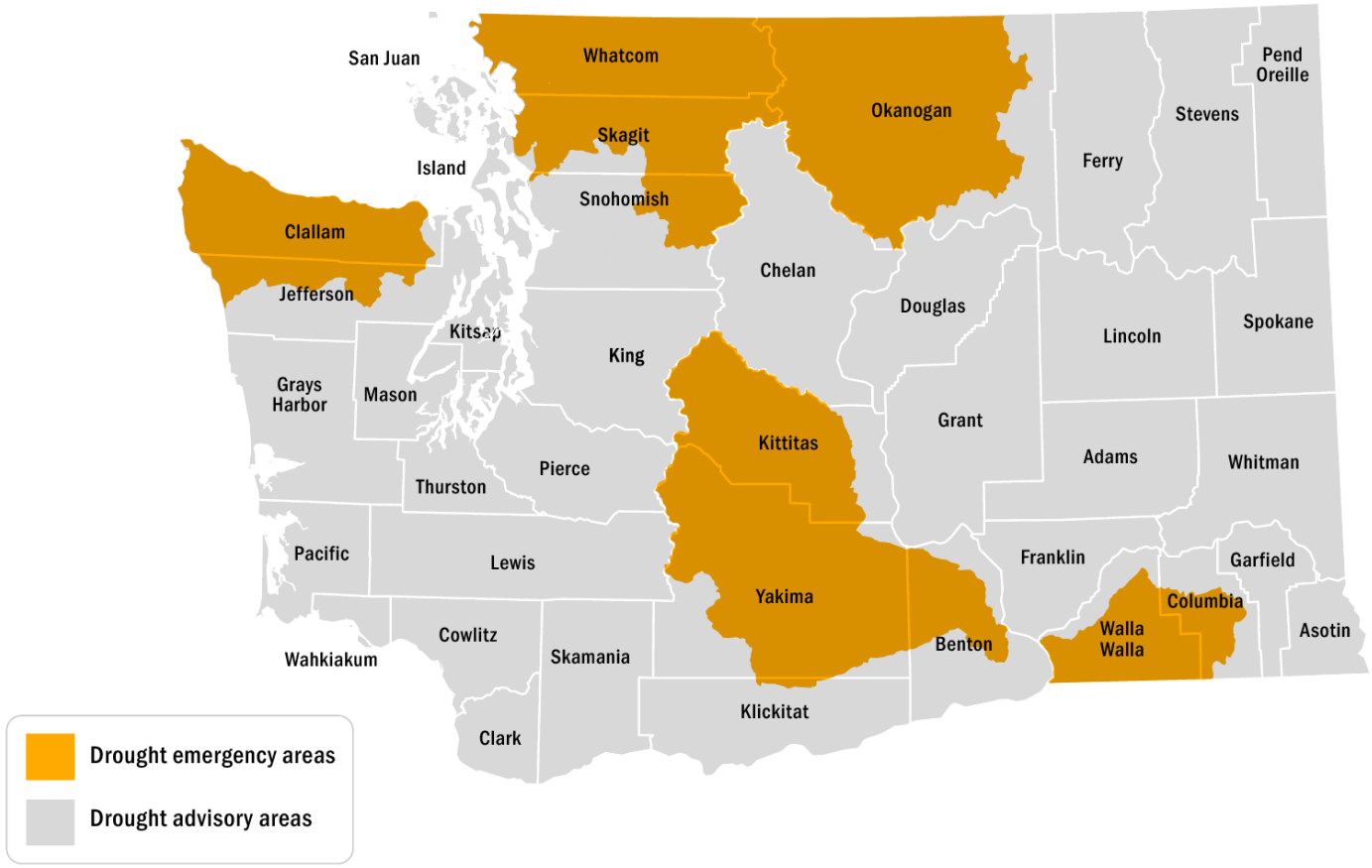
See: RCW 43.83B.405 and WAC 173-166-050.

Existing Drought Declaration Status

July 2023, Ecology declared a drought emergency for 12 watersheds in parts of Skagit, Whatcom, Clallam, Kittitas, Yakima, Snohomish, Jefferson, Walla Walla, Columbia, Okanogan, Benton, and Klickitat counties.

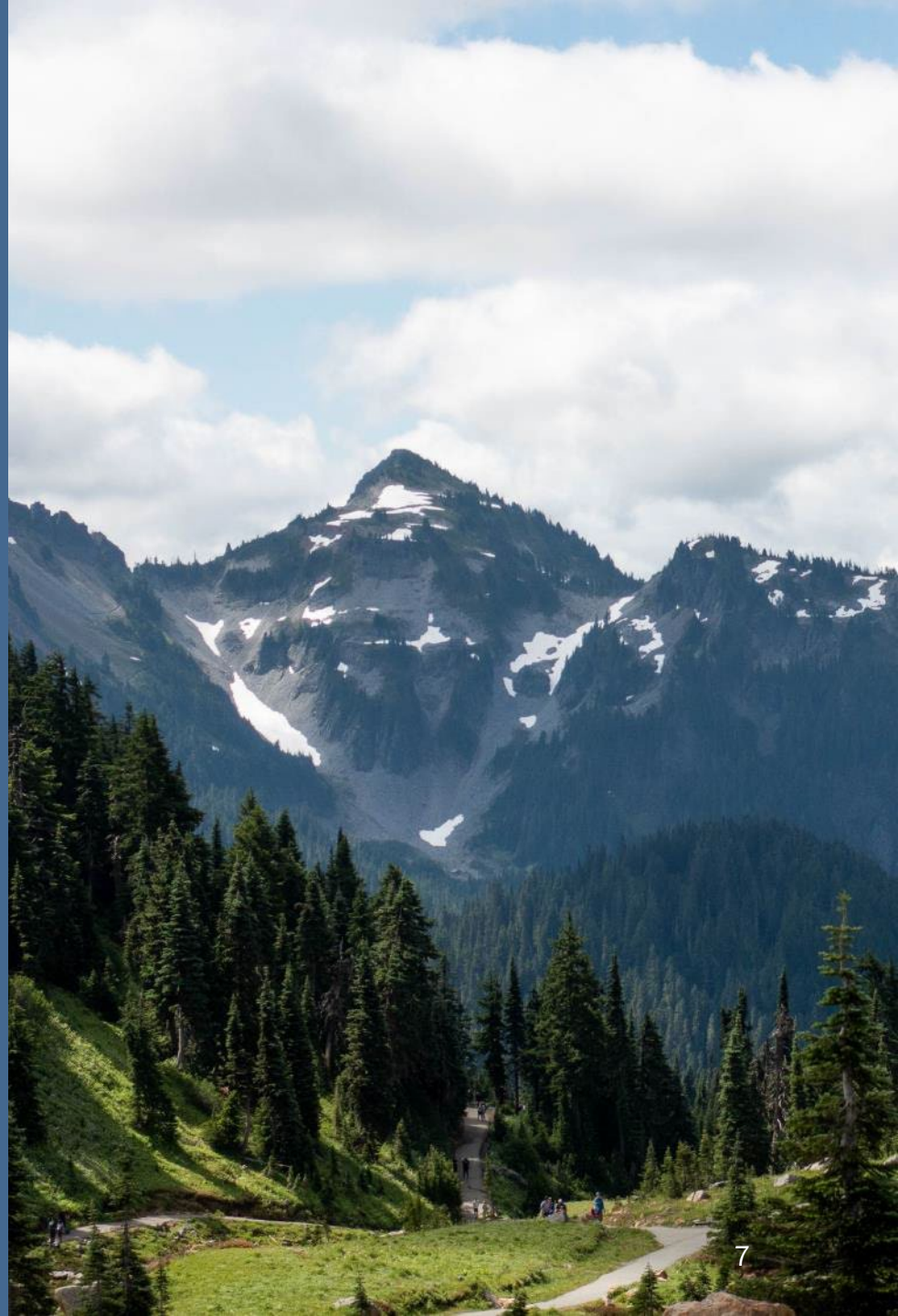
This is currently in effect through June 30, 2024.

Washington Drought Declaration Areas



More info: https://ecology.wa.gov/water-shorelines/water-supply/water-availability/statewide-conditions/drought-2023

Presenters



Discussion Question

Discussion Question: What conditions and concerns are folks seeing on the ground?

Next Steps

- Communications – WSAC website updated:
  - Meeting materials
  - Presentation recording
  - Social media outreach
- Next meeting
  - Tentatively February 28, 2024
- Ecology is closing monitoring conditions and coordinating with partners between meetings.

Thank you

Contact: Committee Chair (acting)

Caroline Mellor

Caroline.Mellor@ecy.wa.gov

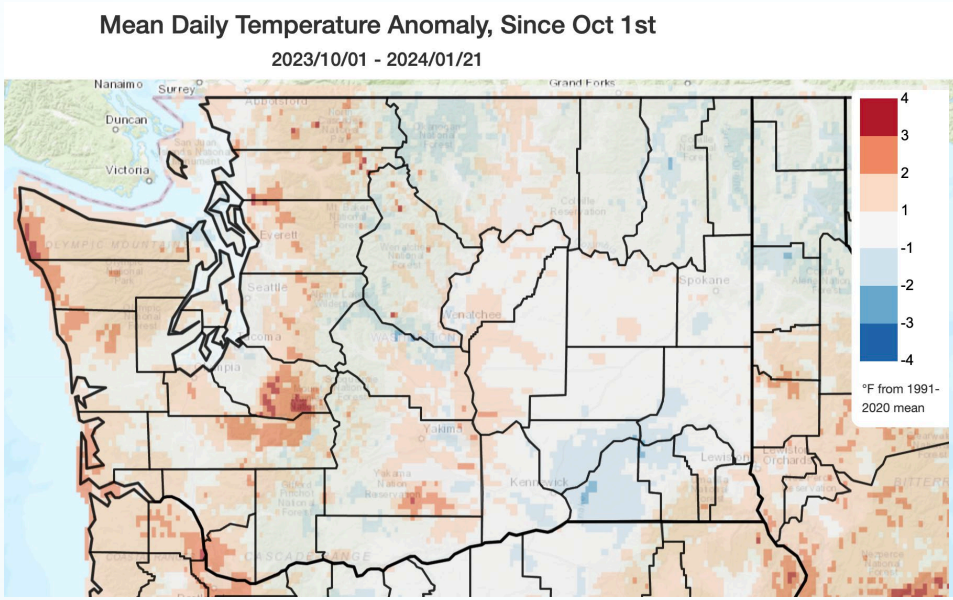
Office of the Washington State Climatologist

Current Conditions and Seasonal Outlook

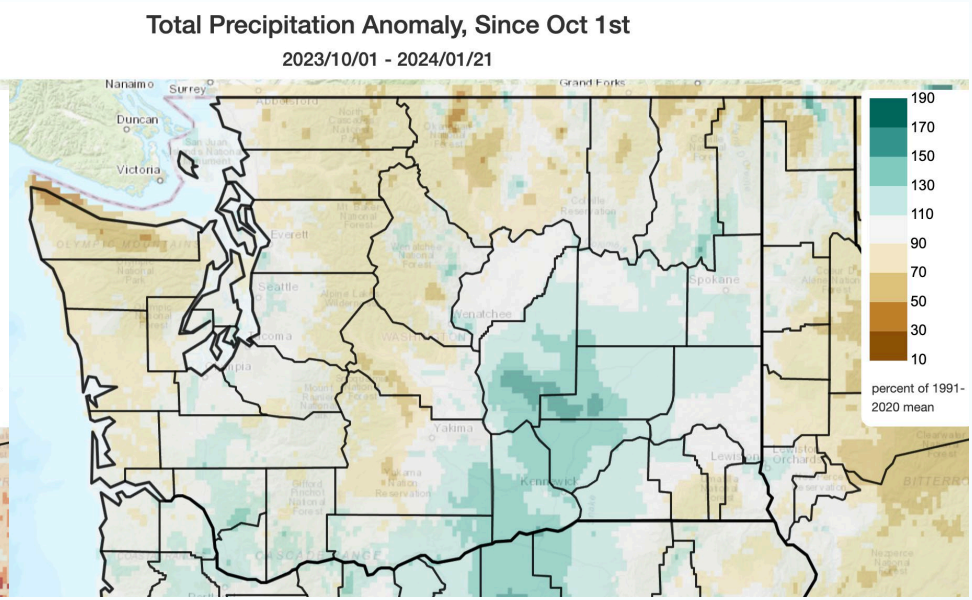
Karin Bumbaco & Nick Bond
Office of the Washington State Climatologist
Climate Impacts Group
University of Washington
24 January 2024

Water Year 2024

Temperature



Precipitation



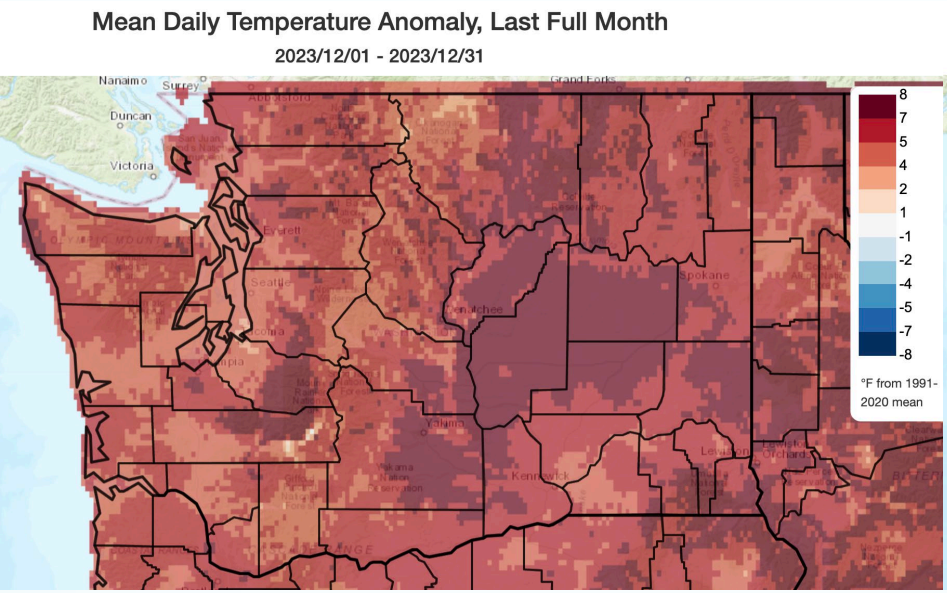
Climate Toolbox

- Averaged statewide, Oct-Dec ties 1933 as the 6th warmest (+2.4°F) start to the water year on record*
- Averaged statewide, Oct-Dec ranked as the 46th driest (-2.00")*, with 88% of normal

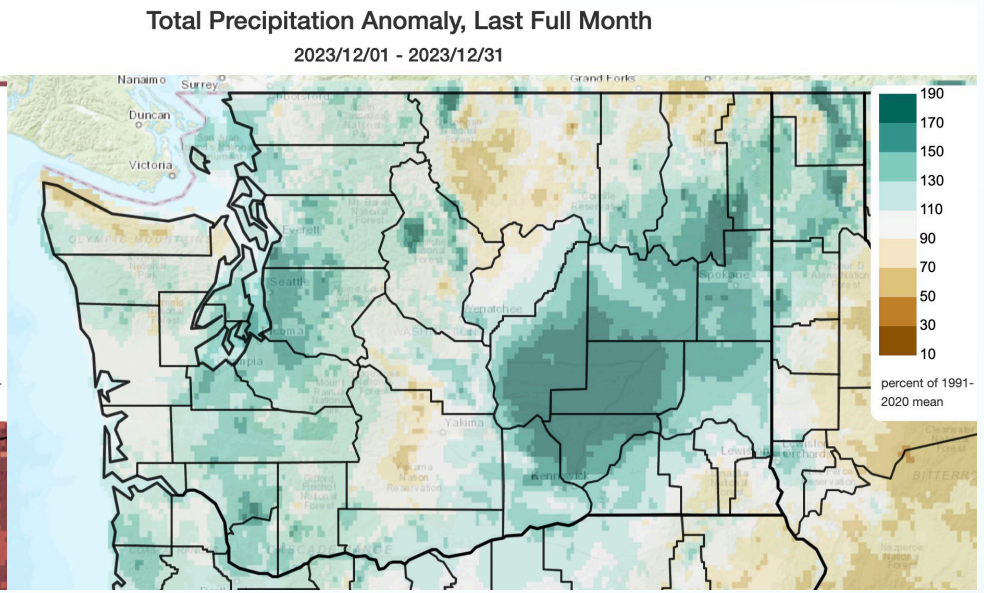
*Records since 1895; 1991-2020 normal

December 2023

Temperature



Precipitation

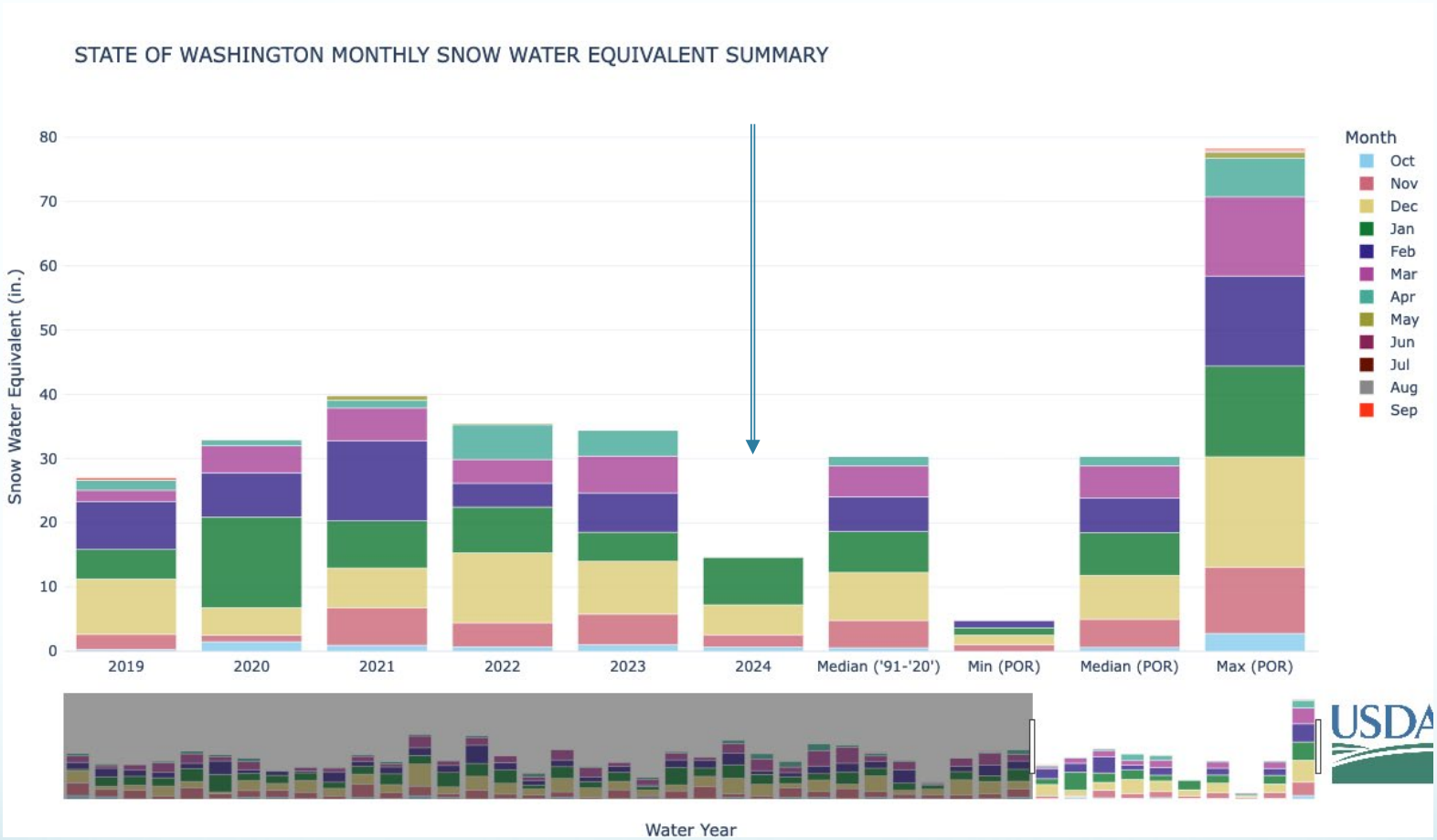


Climate Toolbox

- Averaged statewide, Dec was the 3rd warmest on record (+5.3°F)*
- Averaged statewide, Dec precipitation was above normal (113% of normal)

*Records since 1895; 1991-2020 normal

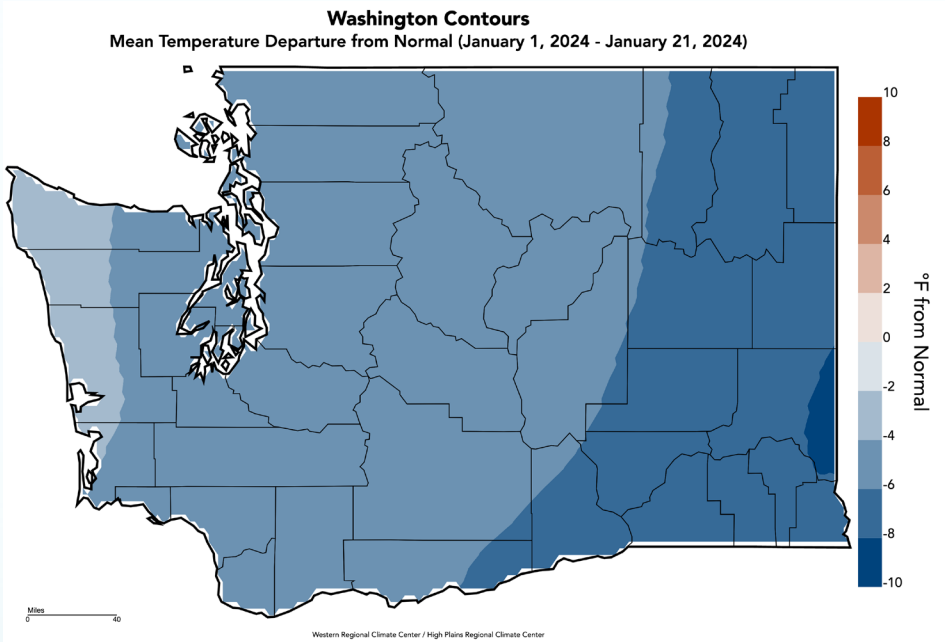
Snow Water Equivalent



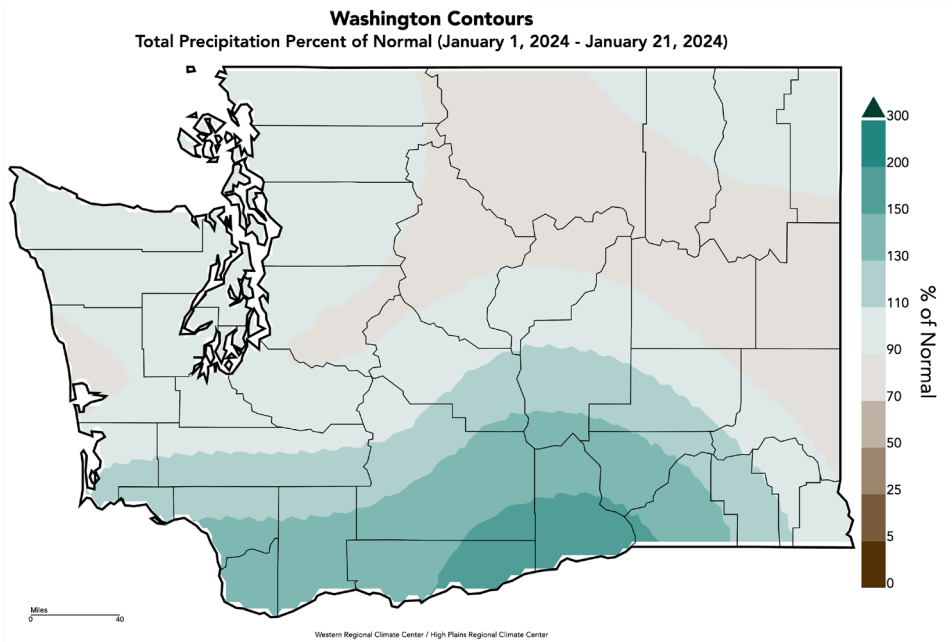
NRCS

January 2024

Temperature

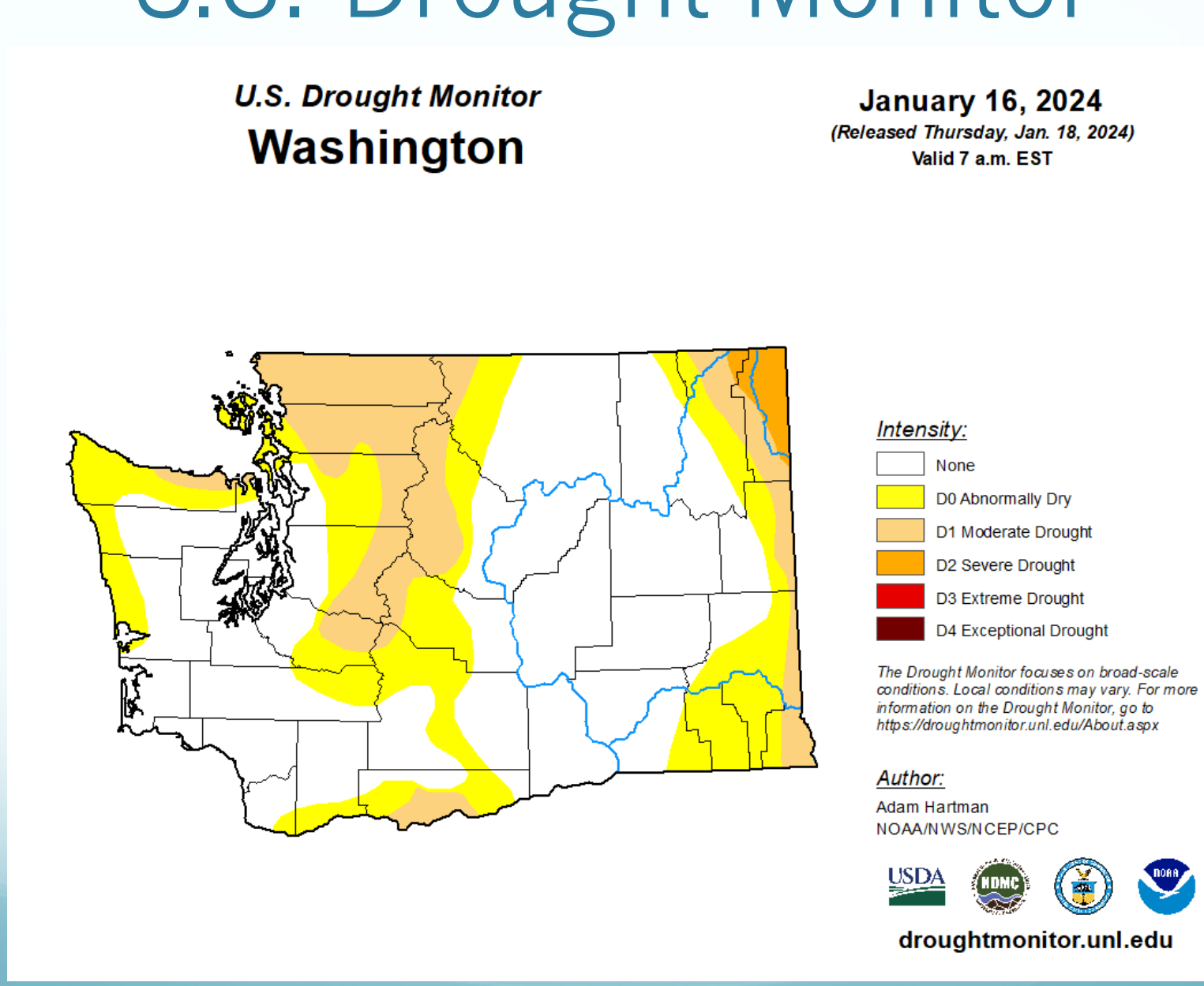


Precipitation

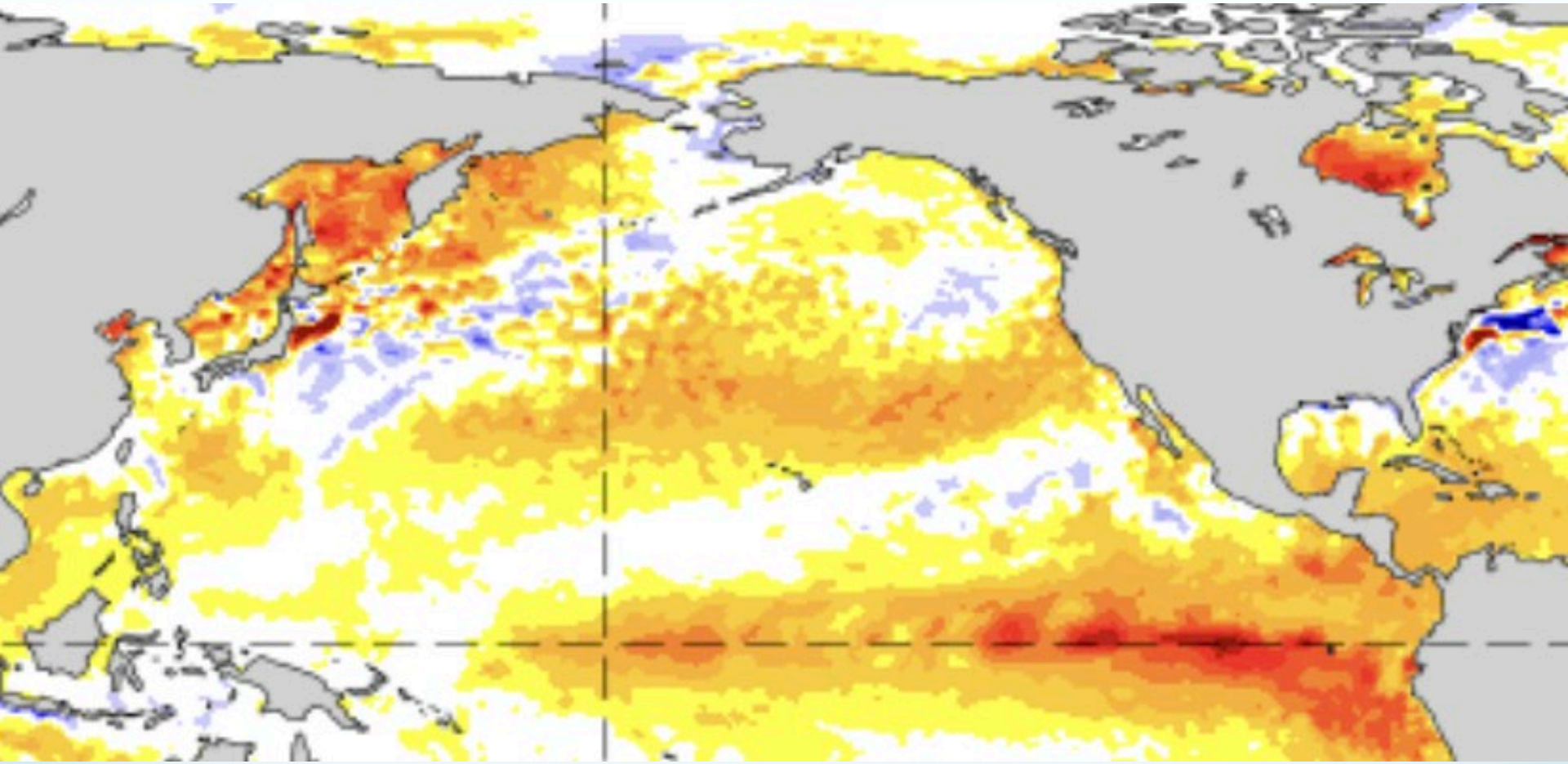


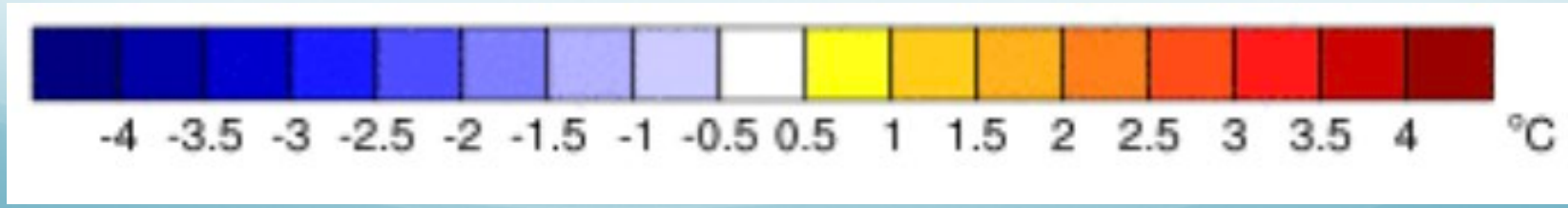
WRCC

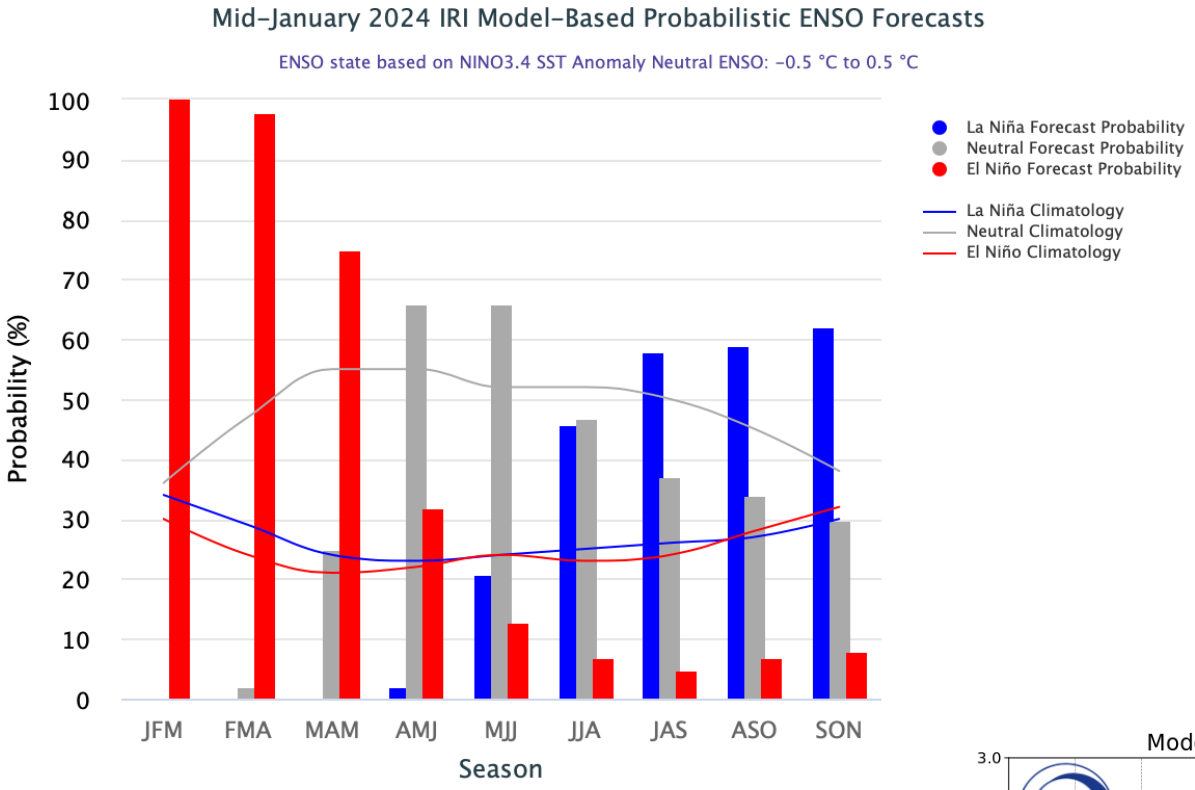
U.S. Drought Monitor



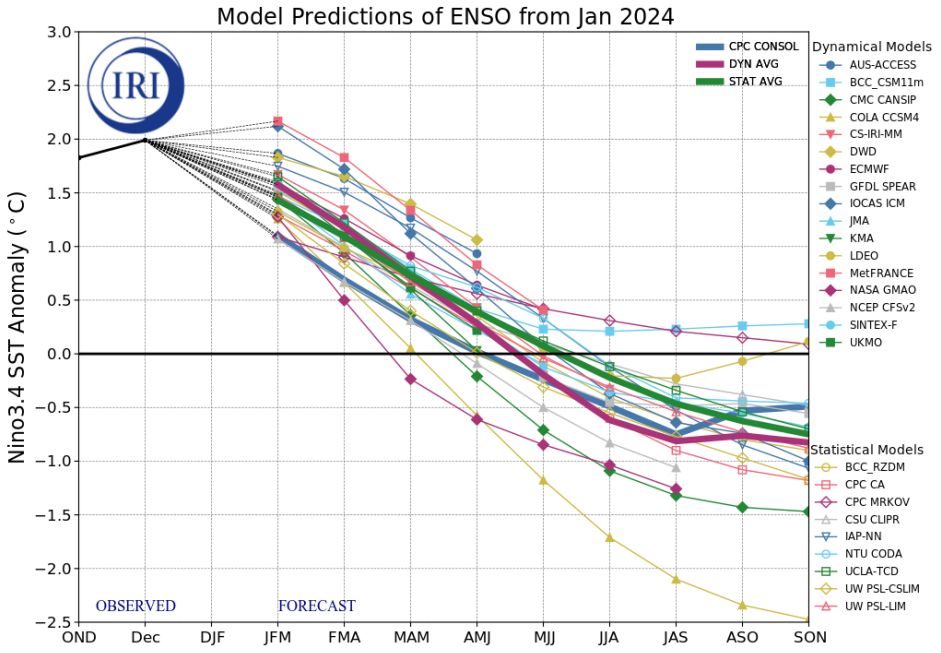
Sea Surface Temperature Anomalies: 15-21 Oct 2023



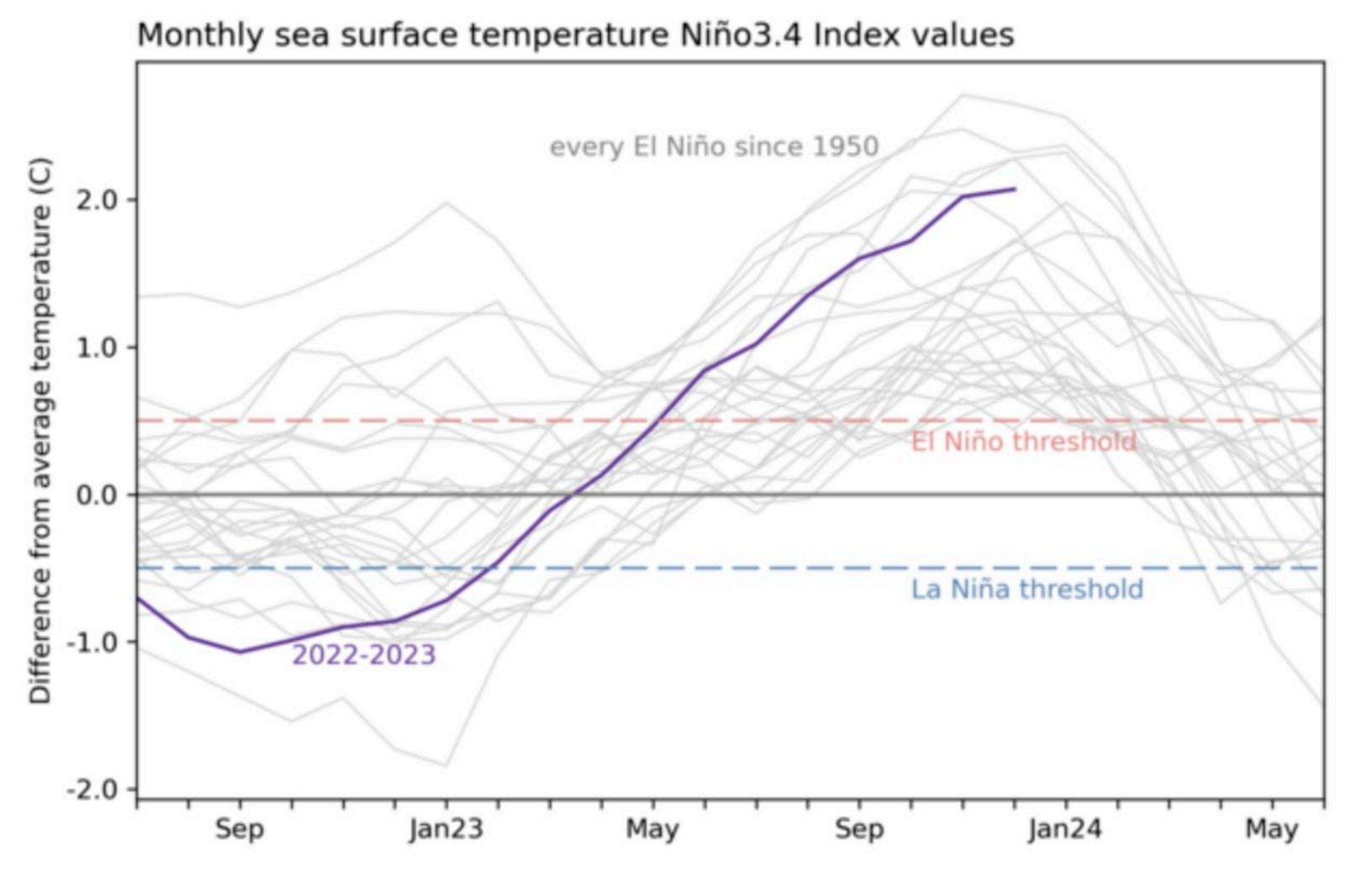




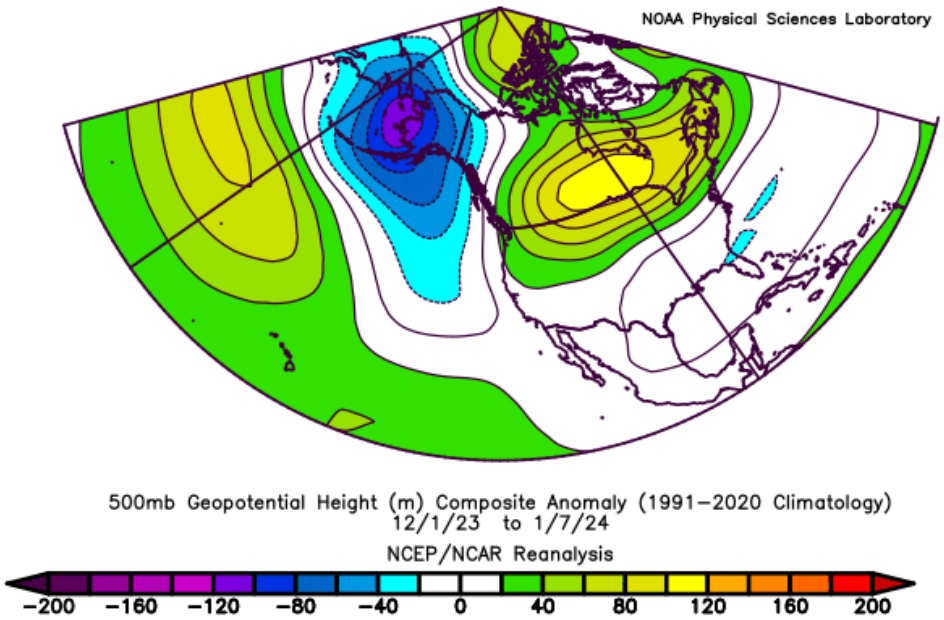
A transition from El Niño to La Niña is likely by the end of summer, which is generally the case



Did this El Niño end up in the strong category?

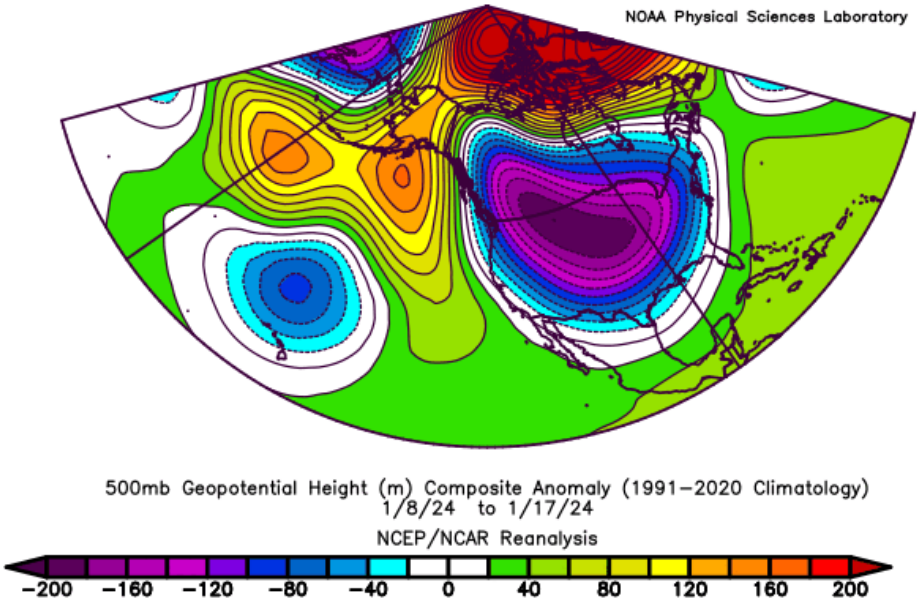


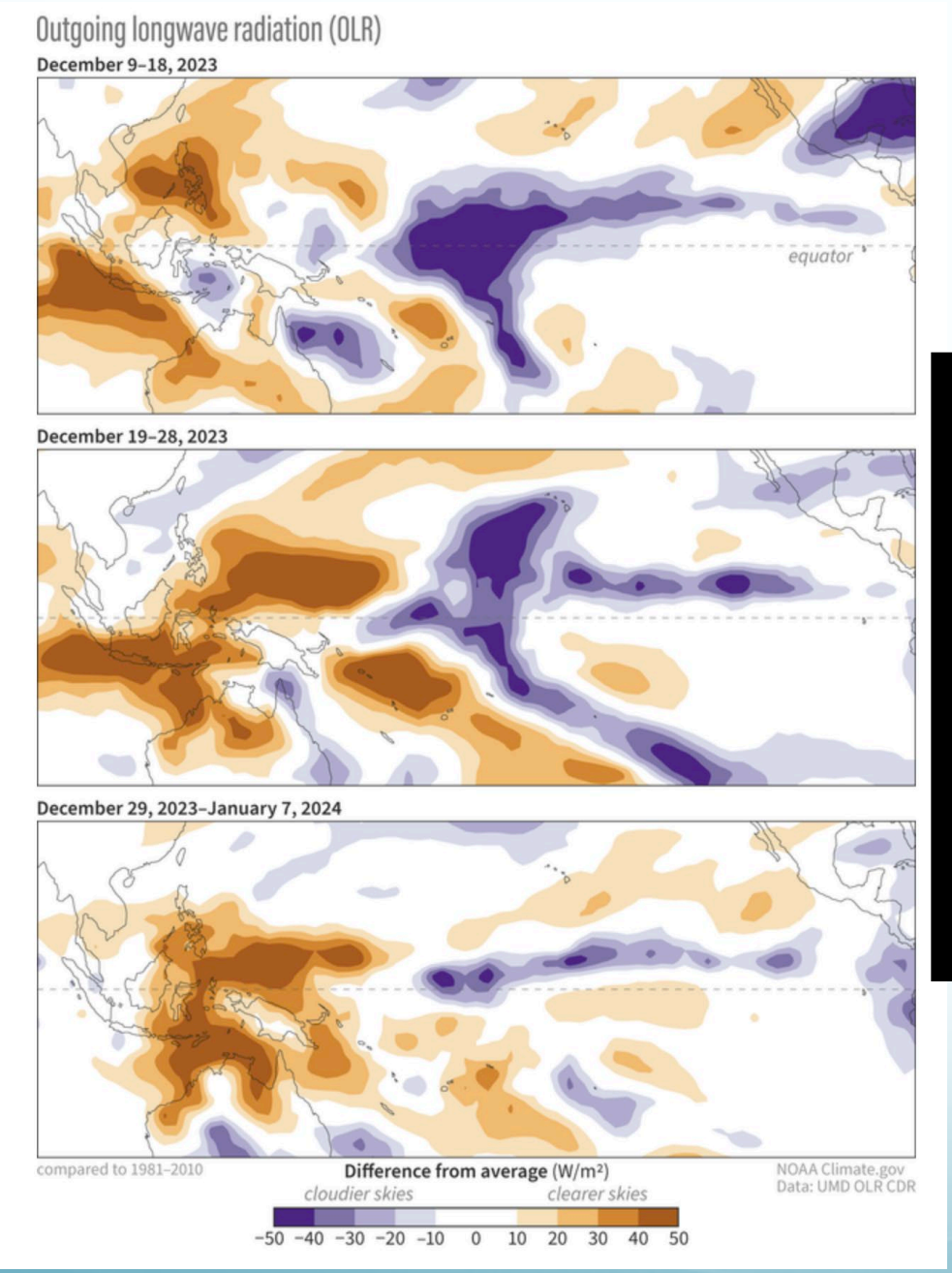
1 Dec – 7 Jan



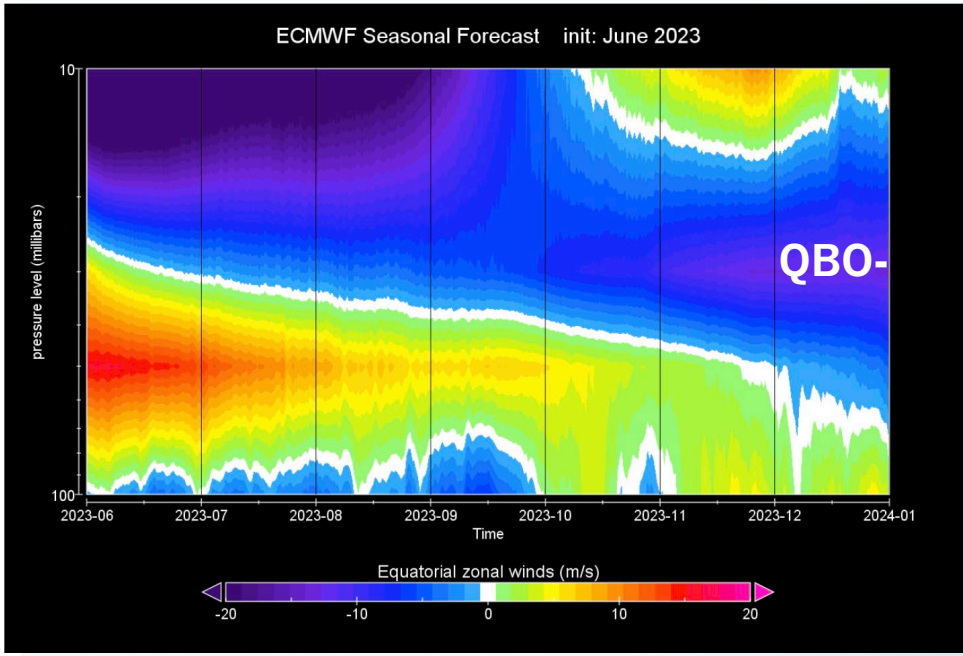
The atmospheric circulation pattern during weeks 2-3 of January 2024 was much different than that during the earlier part of the winter

8-17 Jan

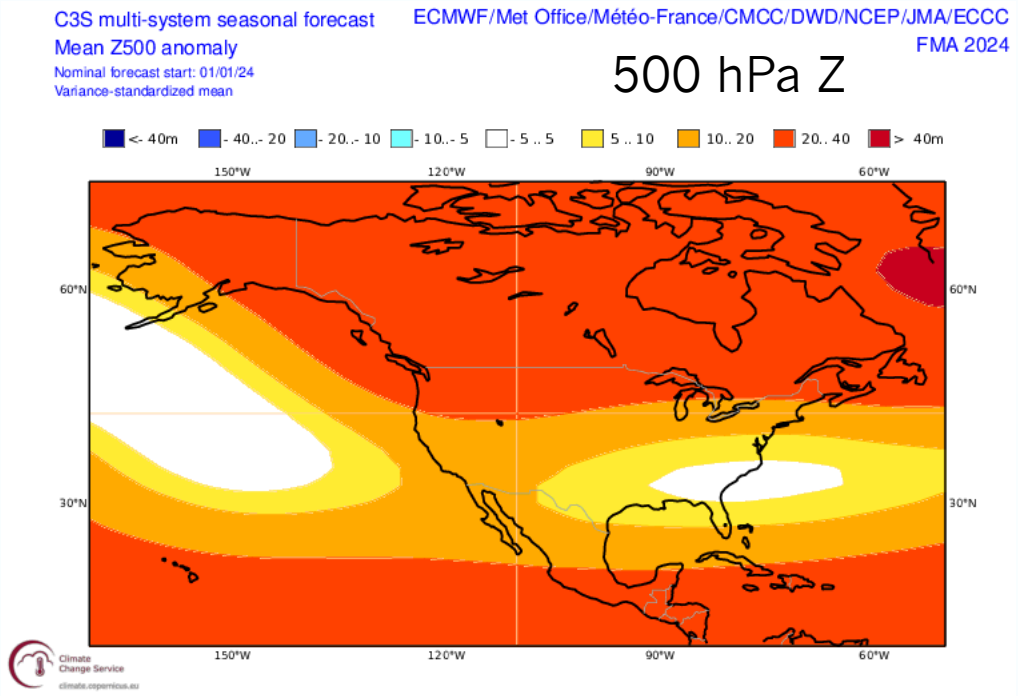


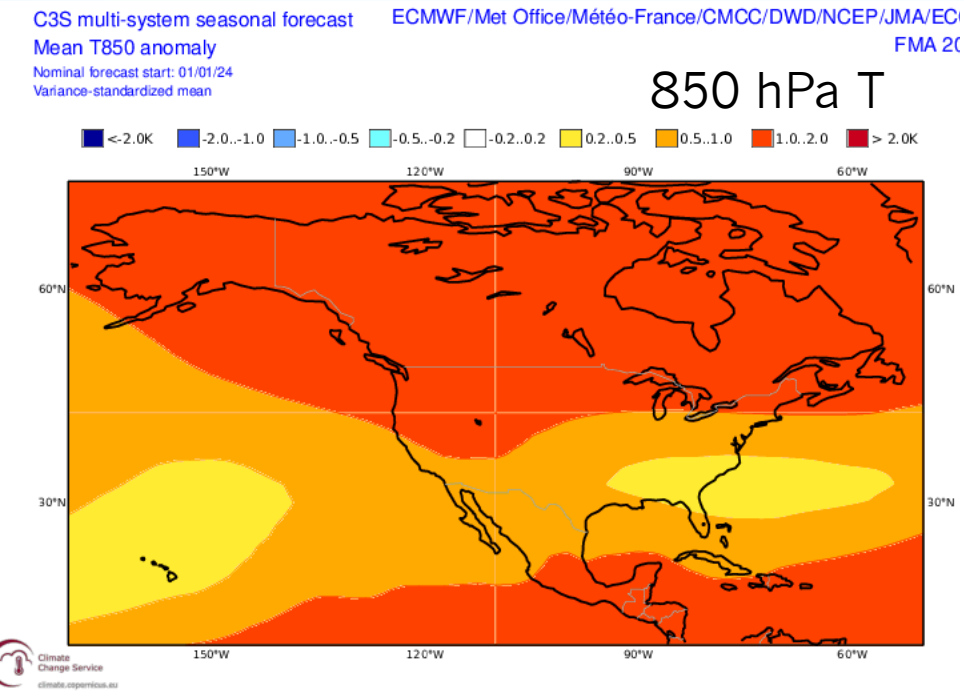


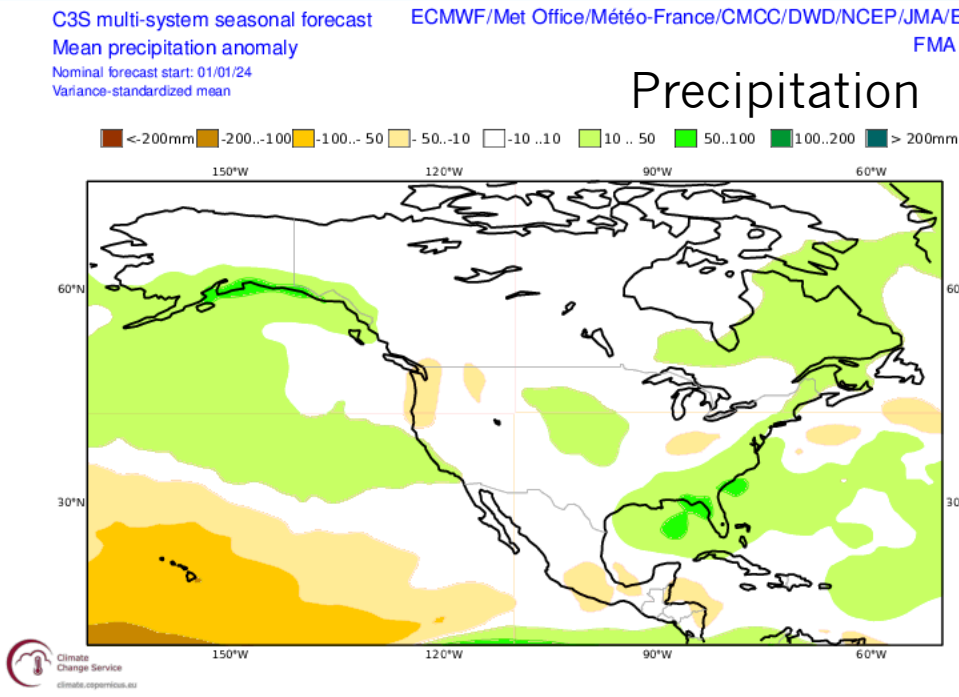
The combined effects of the MJO, and a breakdown of the polar vortex with a sudden stratospheric warming, is implicated in the cold-air outbreak that included the Pacific NW.



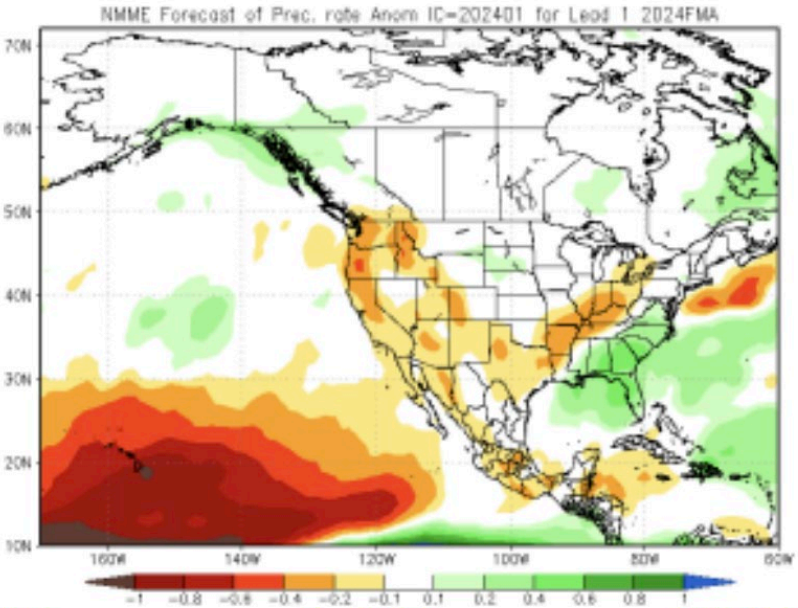
IMME Anomalies
Feb-Apr 2024







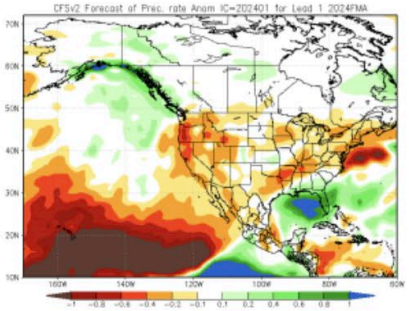
NMME



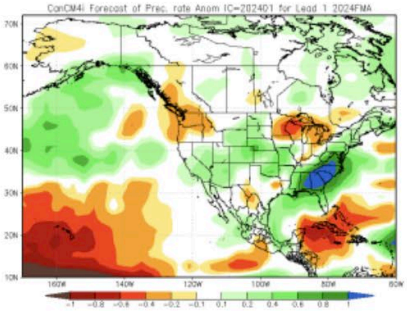
Climate Model Projections for WA State during Feb-Apr: Dry

One outlier

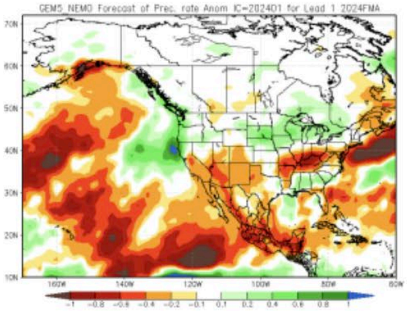
NCEP_CFSv2



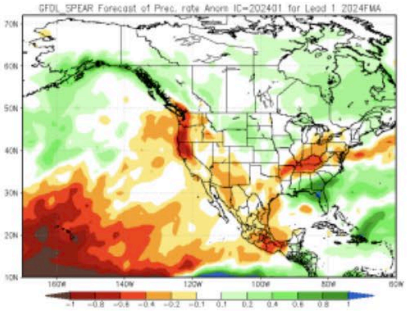
CanCM4i



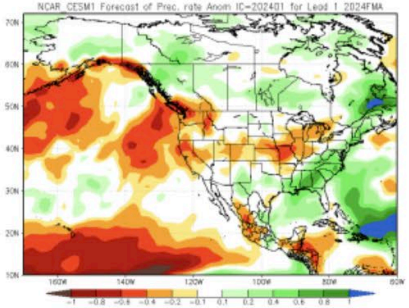
GEM5_NEMO



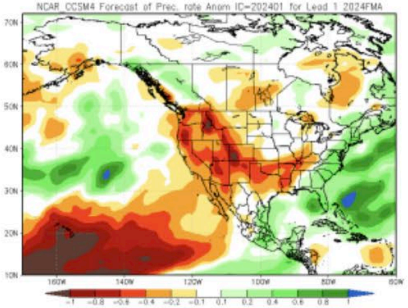
GFDL_SPEAR



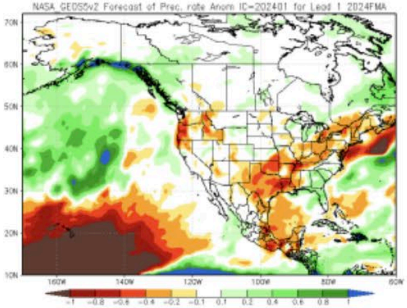
NCAR_CESM1



NCAR_CCSM4



NASA_GEOS5v2



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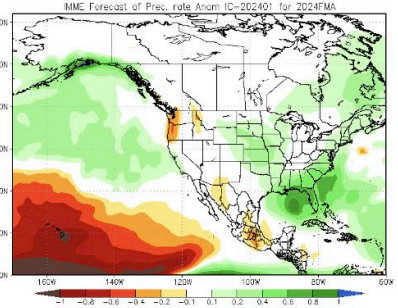
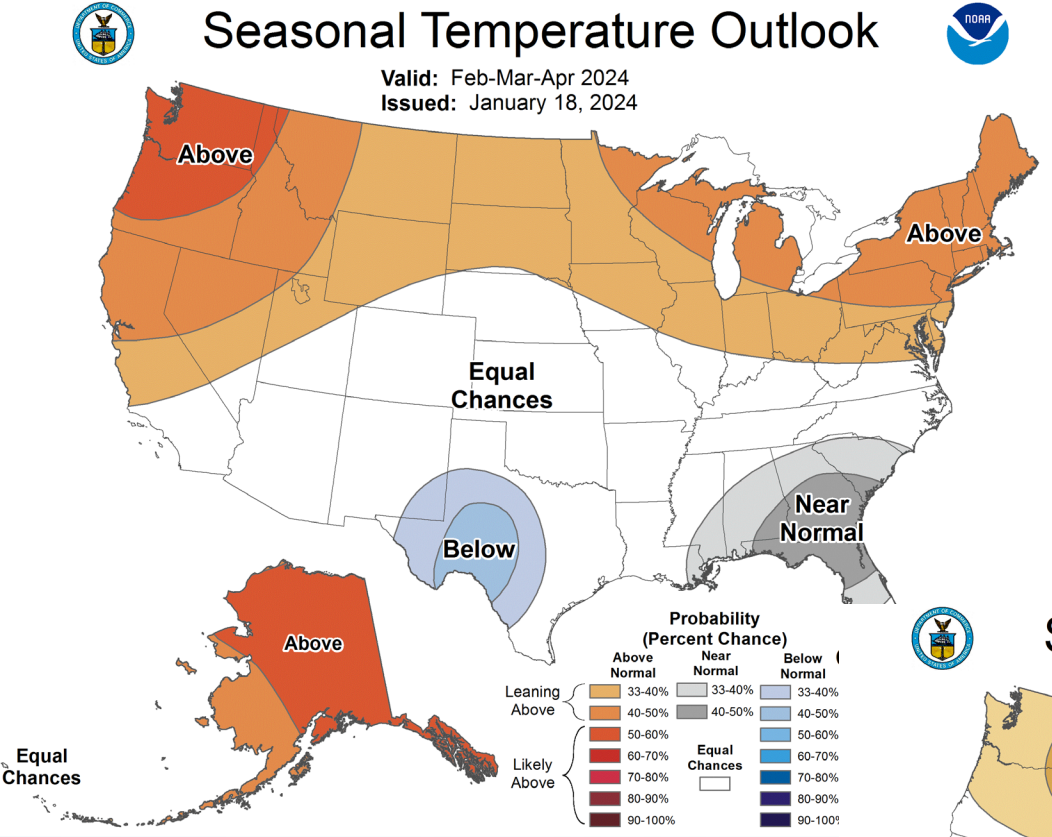
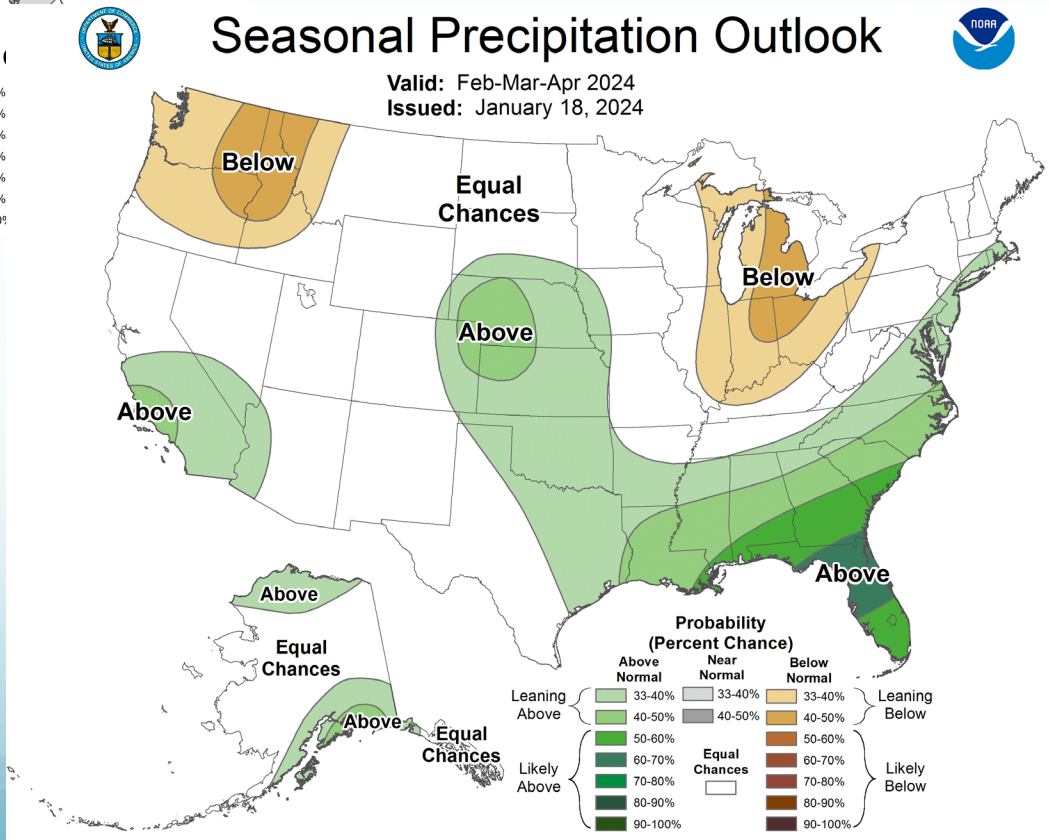


NOAA/CPC Forecasts for Feb-Apr 2024





Summary

- Temperatures for the 2024 water year so far have mostly been above normal, even with our recent cold snap
- Water year precipitation has been below normal for most of the state
- The kind of cold weather we have recently enjoyed is rare during El Niño
- The remainder of winter is apt be warm, and perhaps a bit dry, relative to seasonal norms
- Sibling rivalry? El Niño is liable to be replaced by La Niña

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Snow Survey and Water Supply Forecasting Program

Glacier Peak (taken by Willie Webster, NWAC)

Washington

Water Supply Availability Committee

January 24, 2024

Matt Warbritton
Supervisory Hydrologist
USDA NRCS SSWSF
Portland Data Collection Office
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503-307-2829

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Snowpack Conditions

Early January Storms

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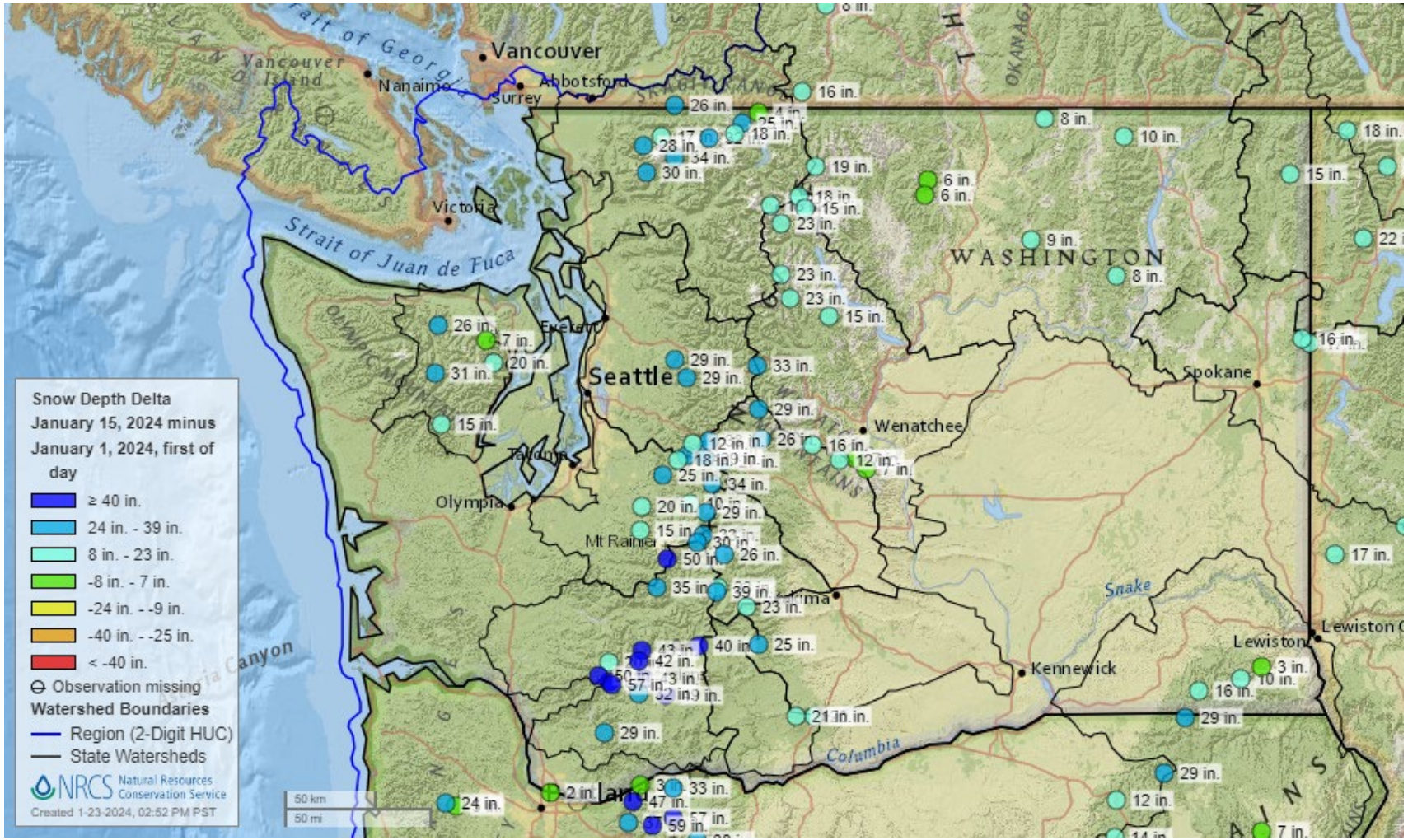
Change in snow depth from January 1-15



Snow Depth at SNOTEL Sites

Swift Creek (Helens) – 5.2 ft

Lost Horse (Yakama) – 2.1 ft

Paradise (Rainier) – 4.2 ft

Stevens Pass (Hwy 2) – 2.7 ft

MF Nooksack (Baker) – 2.3 ft

Buckinghorse (Olympics) – 2.6 ft

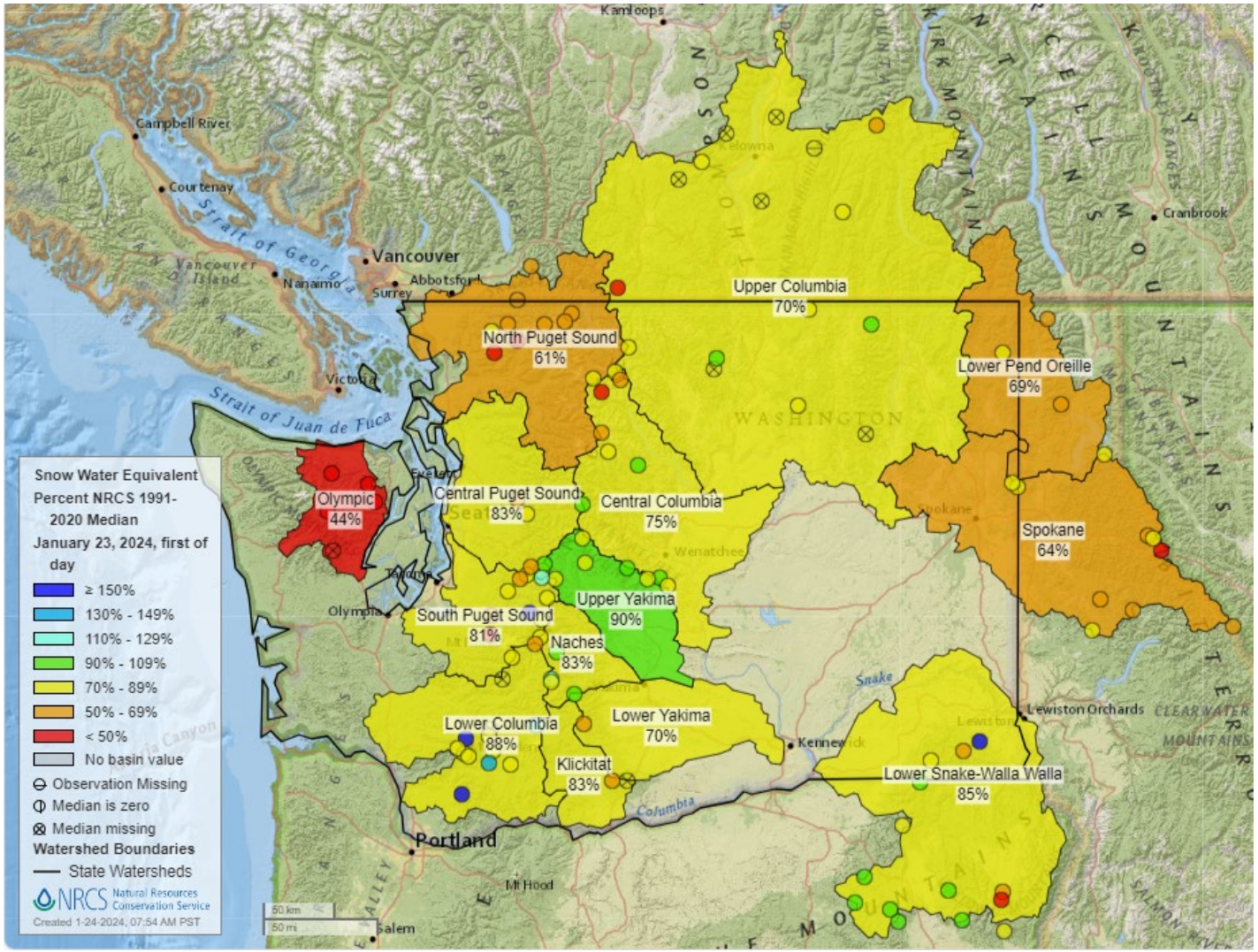
Touchet (Blues) – 1.3 ft

Gold Mountain (NE) – 0.7 ft

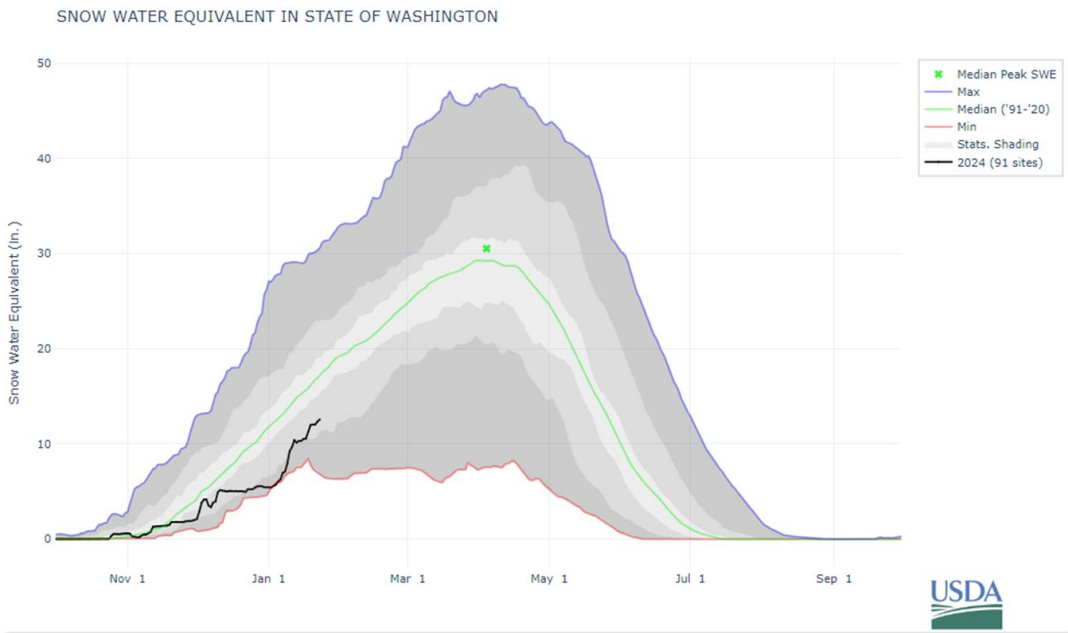
Quartz Peak (Spokane) – 1.3 ft

Snowpack Conditions

United States Department of Agriculture
Natural Resources Conservation Service



Statewide Snowpack:
75% of normal



Change in Snowpack: January 1 vs January 23

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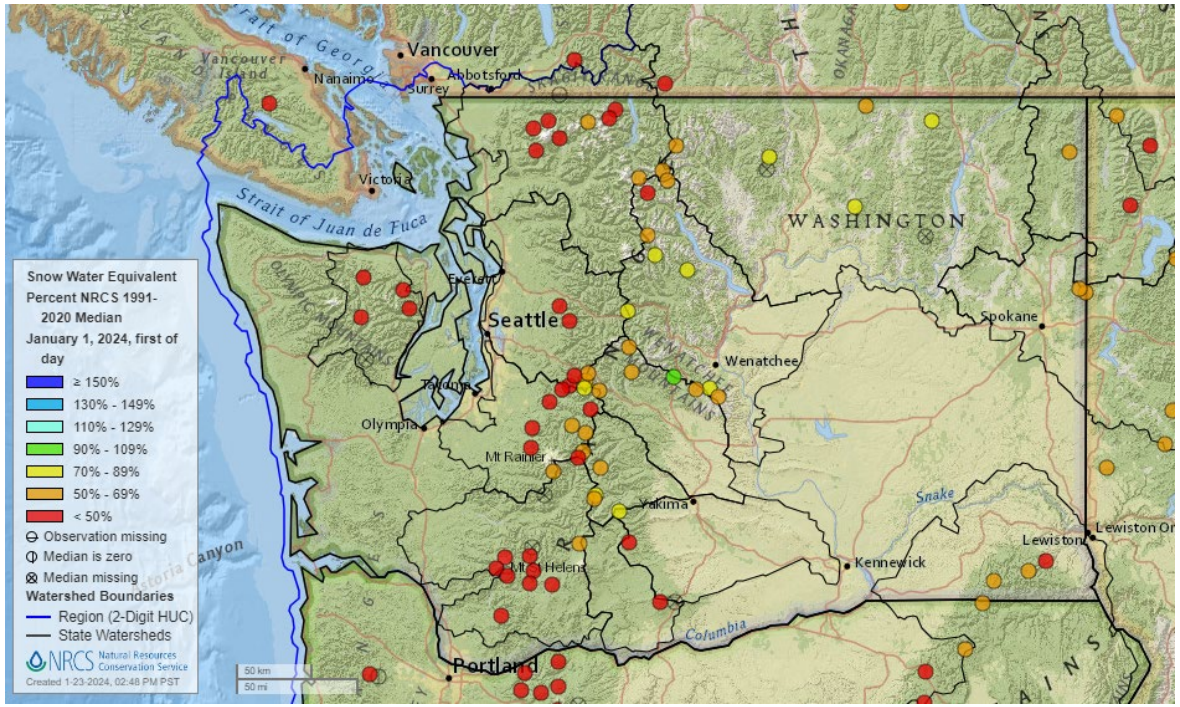
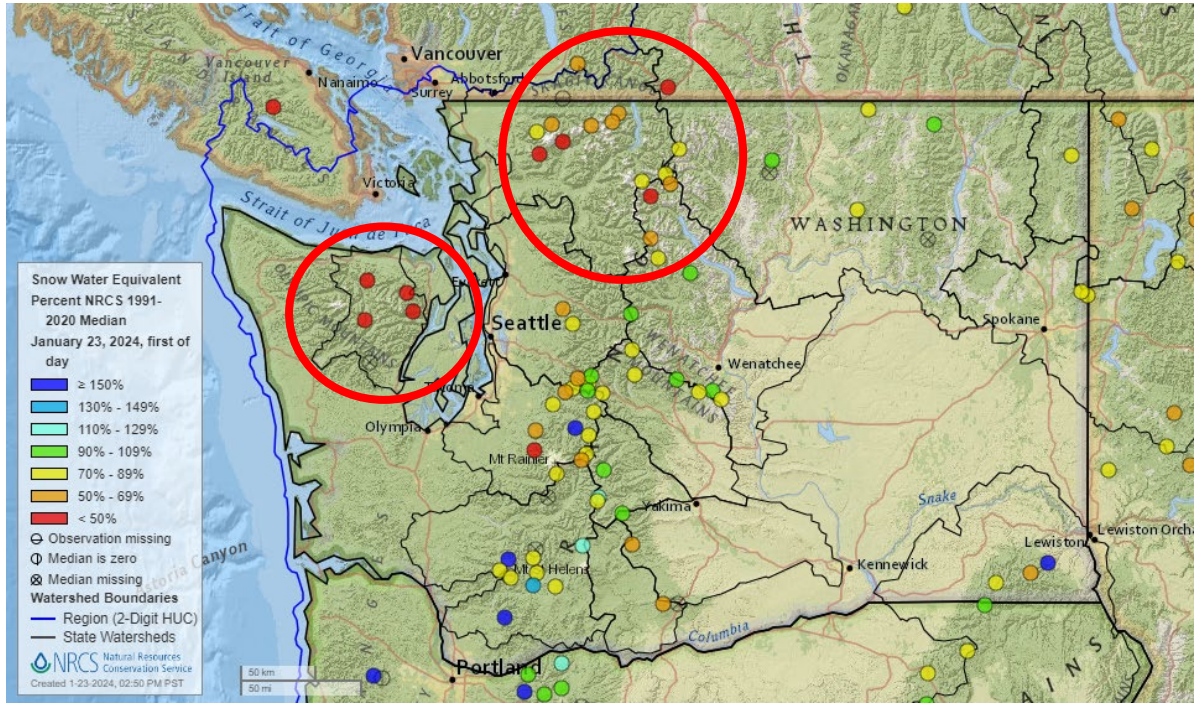
January 1



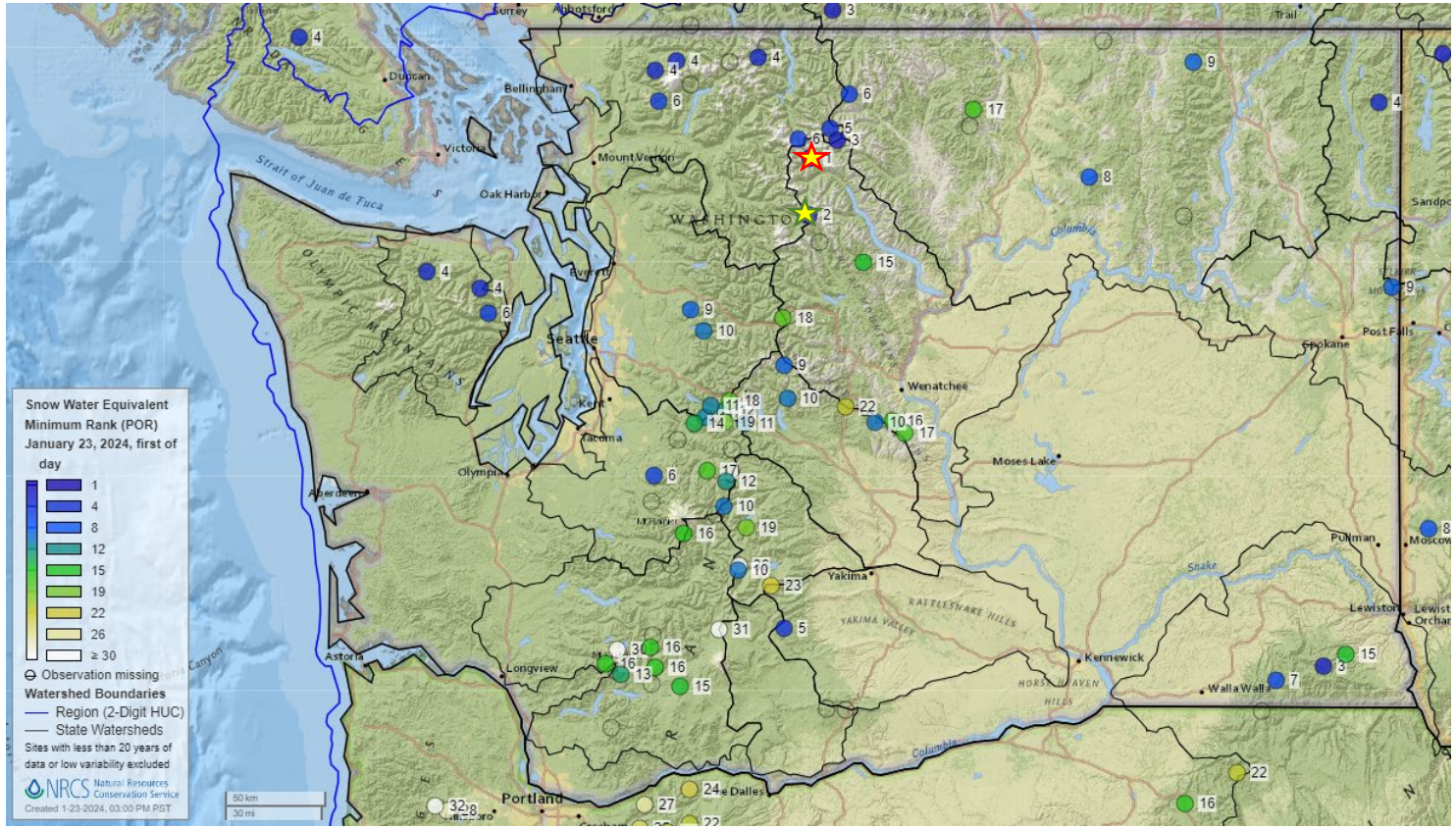
January 23



Snowpack Records?

United States Department of Agriculture
Natural Resources Conservation Service

Record low snowpack: Park Creek Ridge (since 1977)☆
2nd lowest snowpack: Lyman Lake (since 1978)☆



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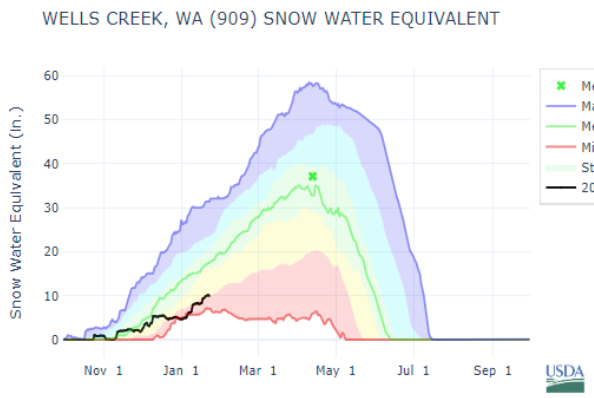
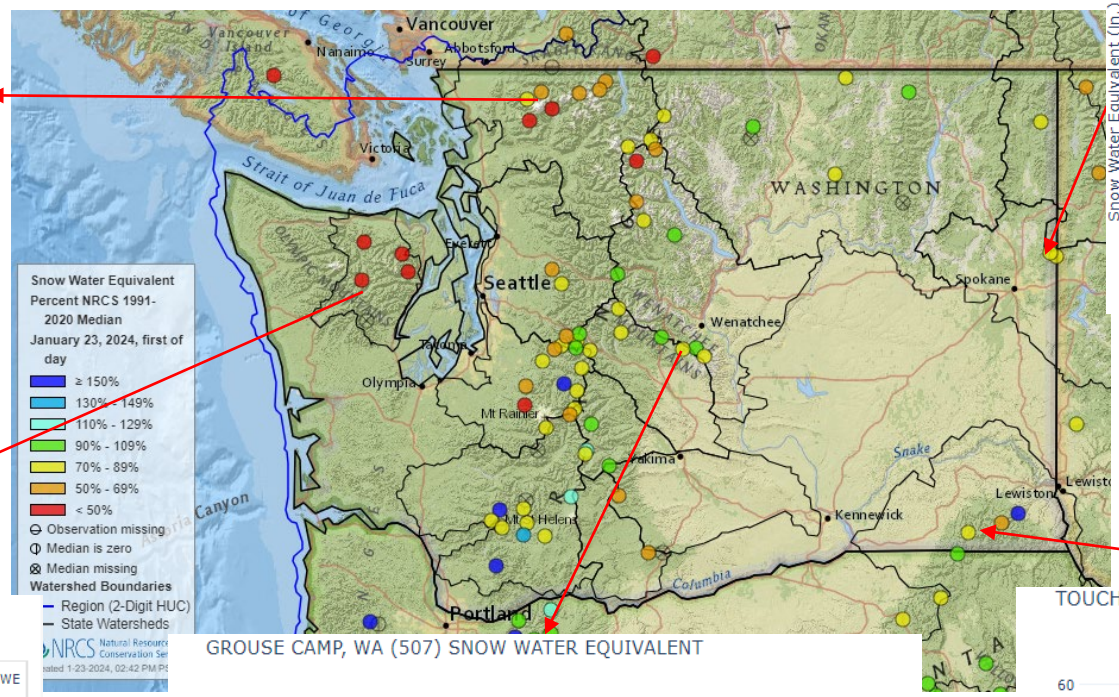
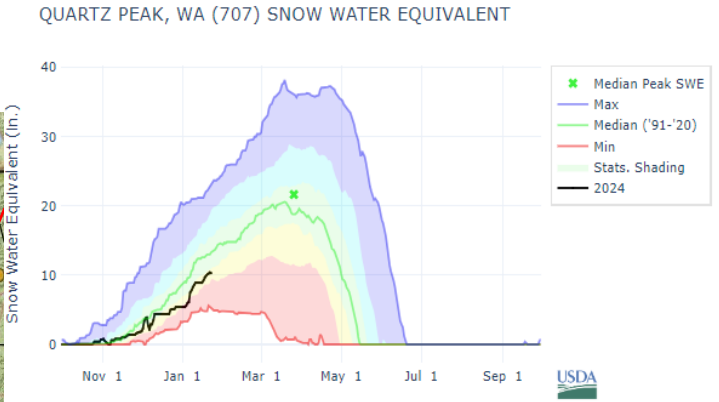
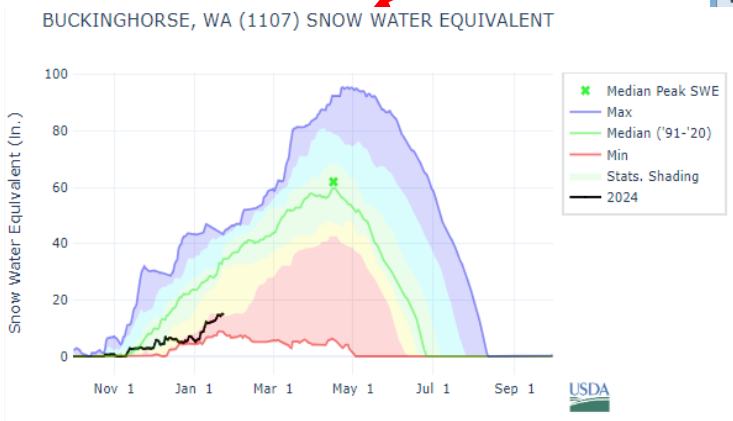
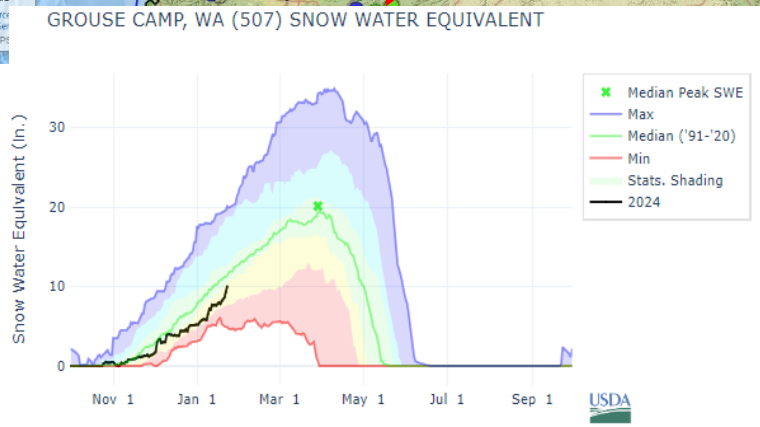
Snowpack Profiles

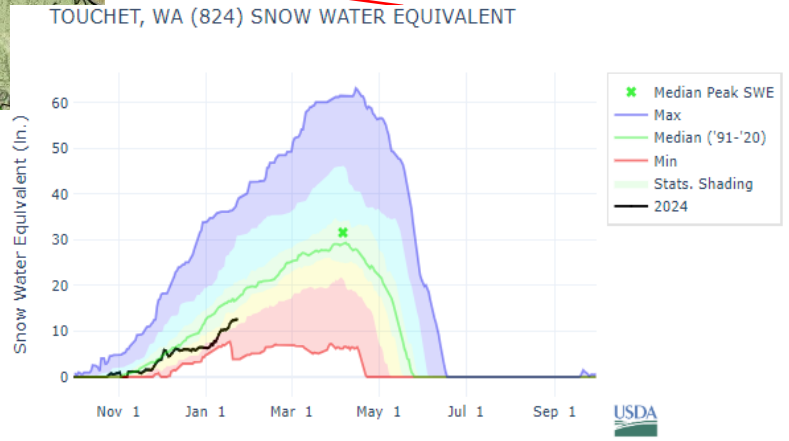












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Precipitation Conditions

Month-to-Date Precipitation – Basin and Site Map

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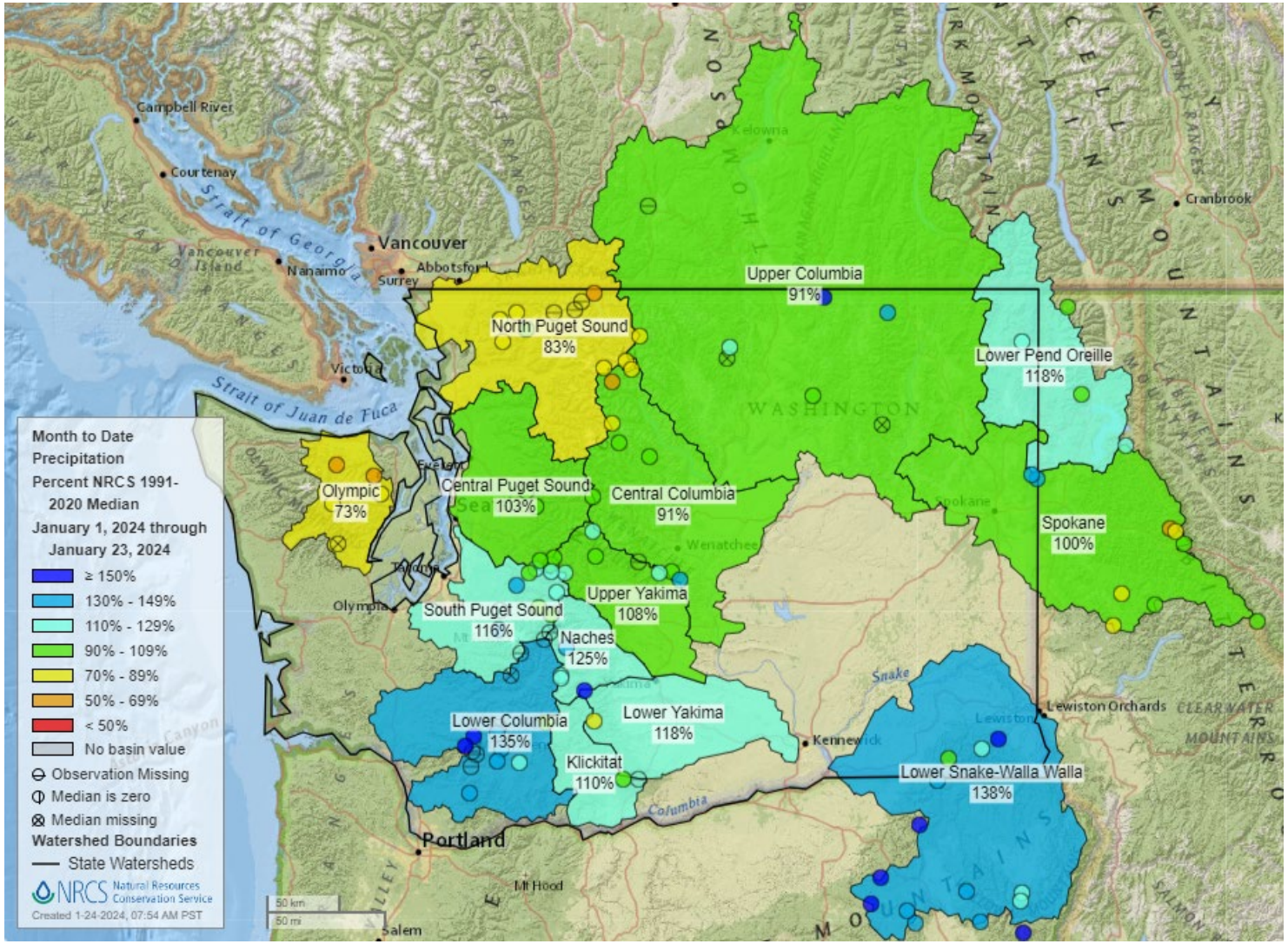

WYTD Precipitation – Basin Map

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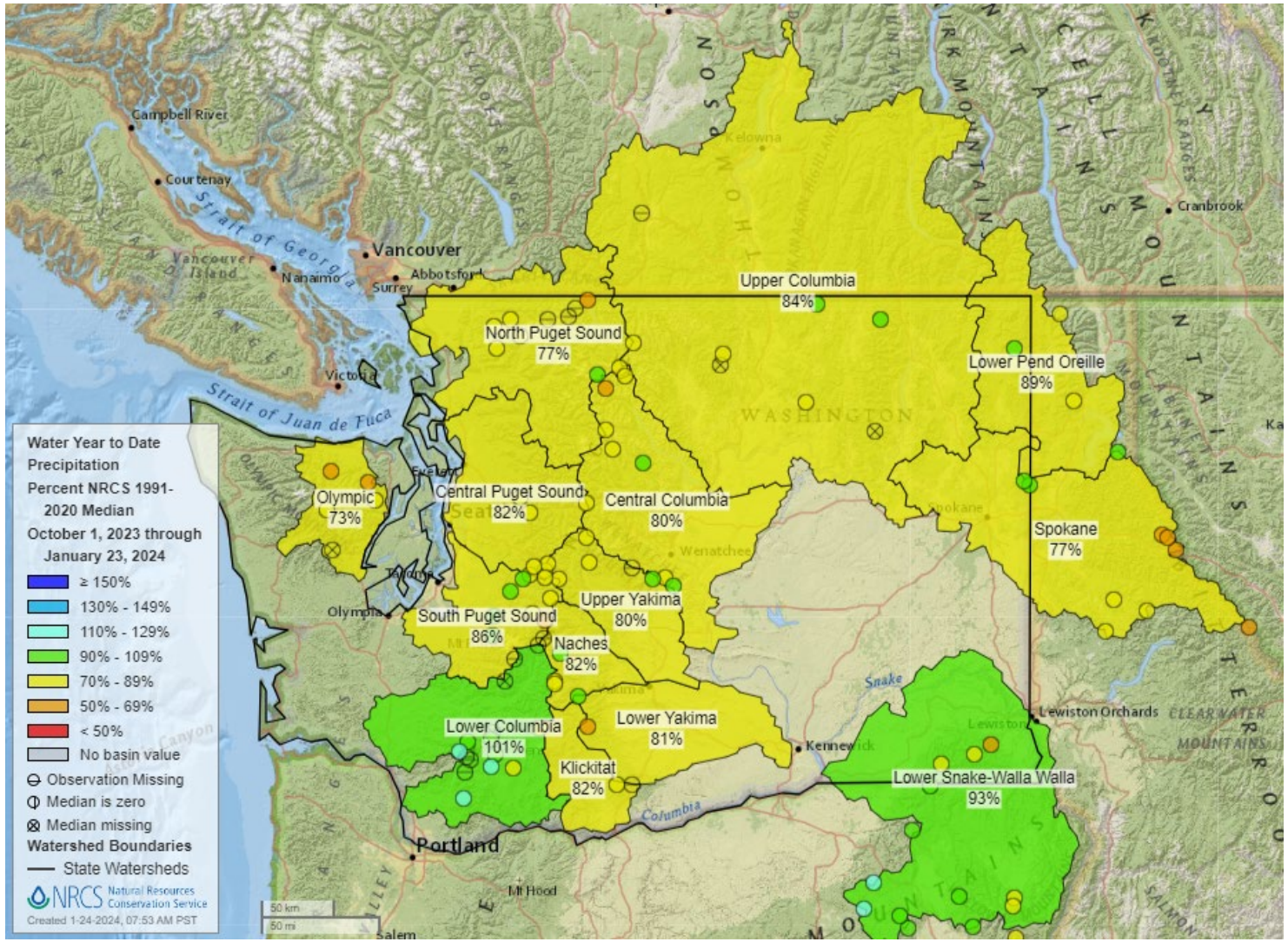
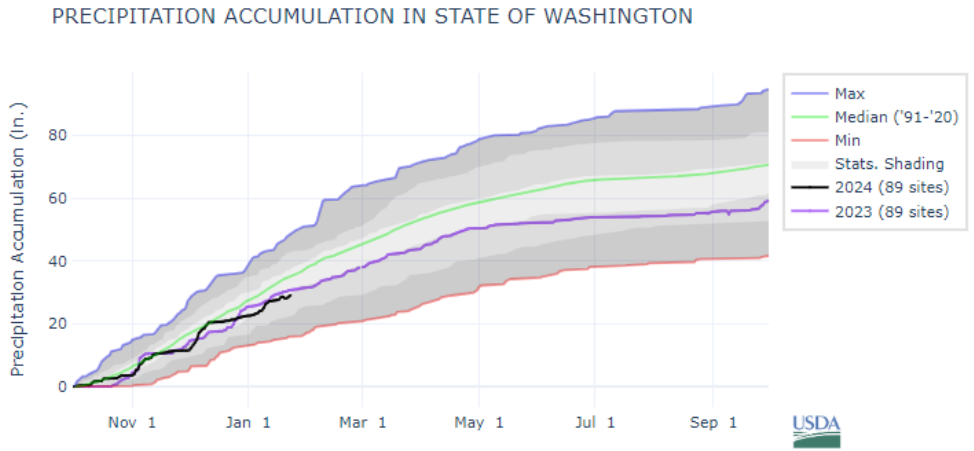


Statewide WYTD Precipitation:
86% of normal



Precipitation: Compounding Deficits

24-month Precipitation – Normal Departure

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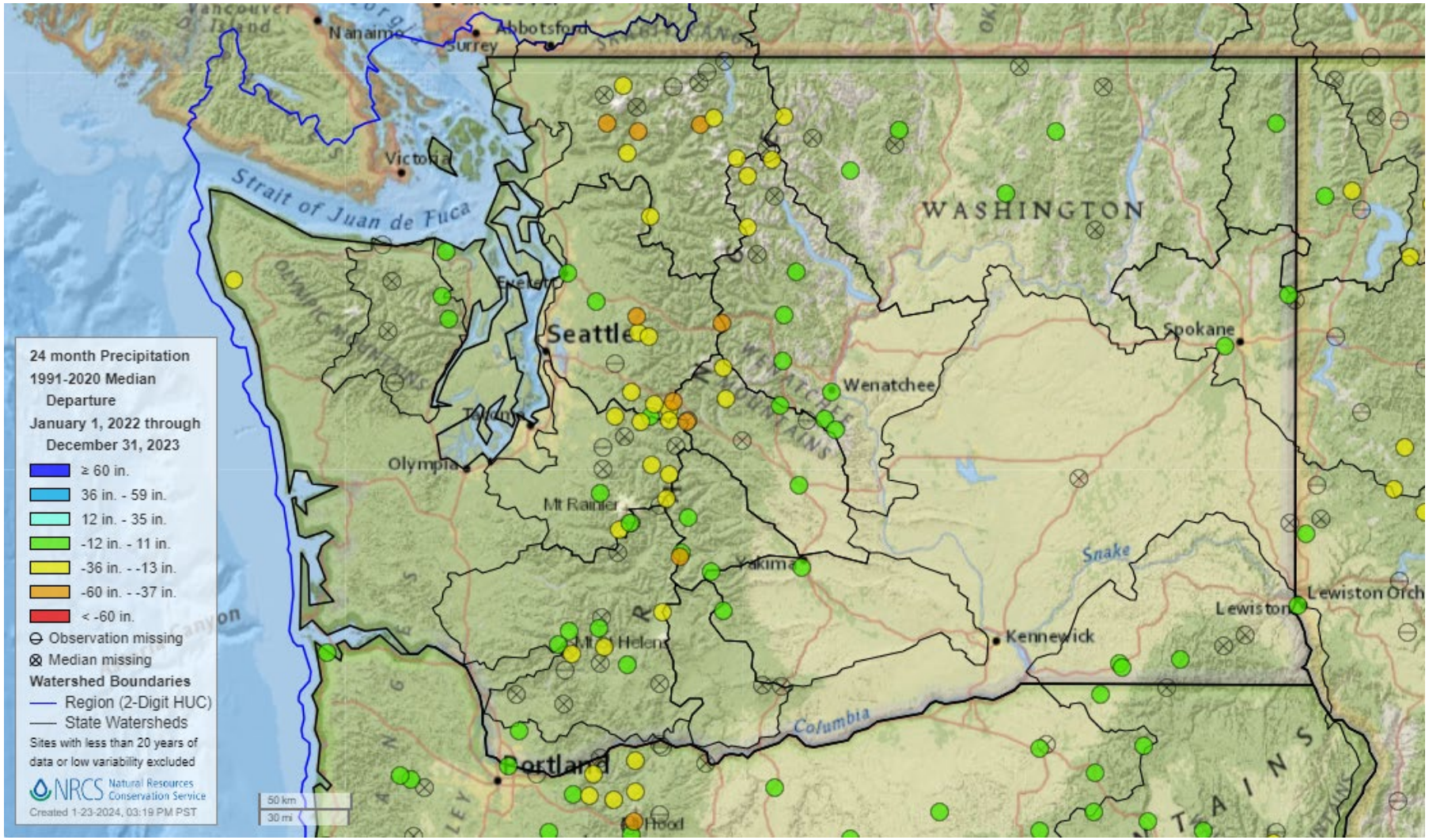


USDA United States Department of Agriculture

Natural Resources Conservation Service

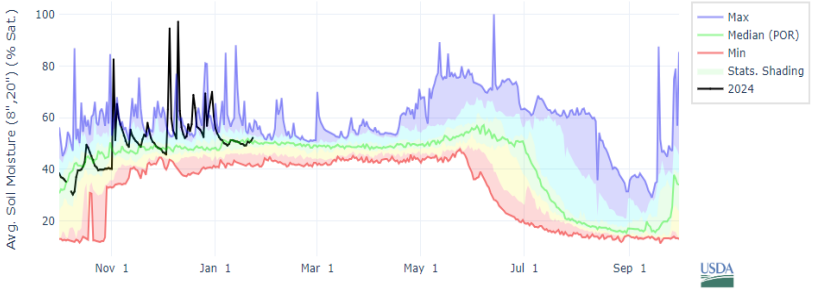
Soil Moisture

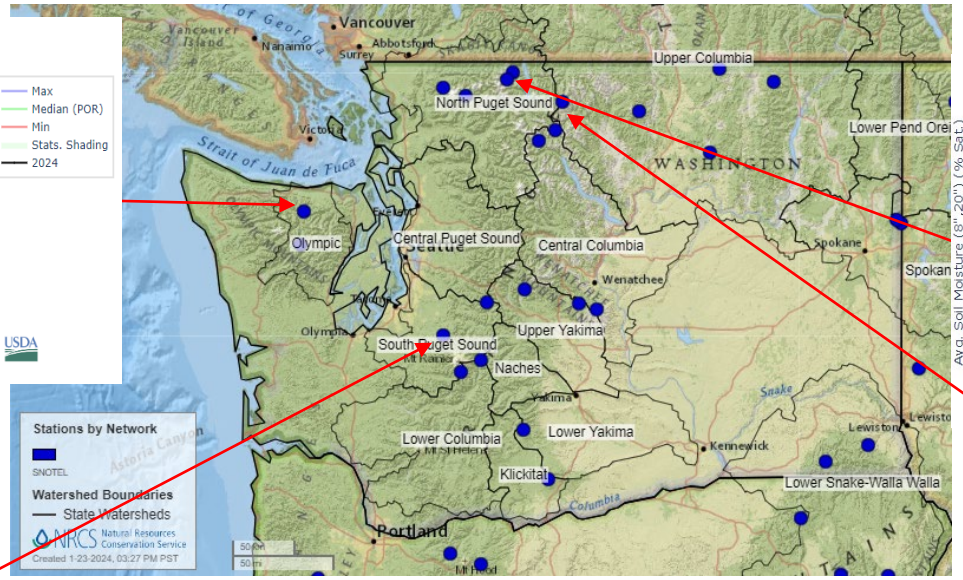
Soil Moisture

WY 2024 – Select Site Charts

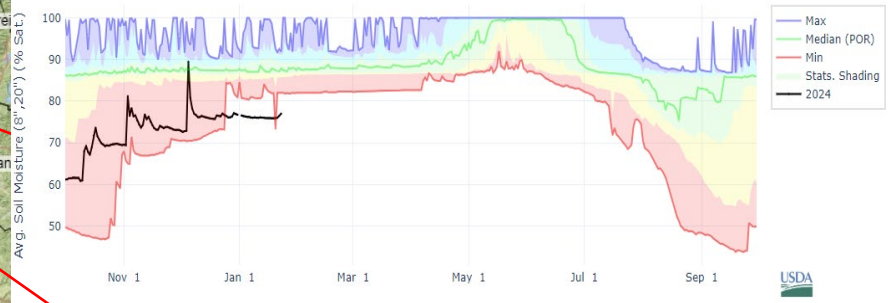
United States Department of Agriculture
Natural Resources Conservation Service

BUCKINGHORSE, WA (1107) AVG. SOIL MOISTURE (8",20")

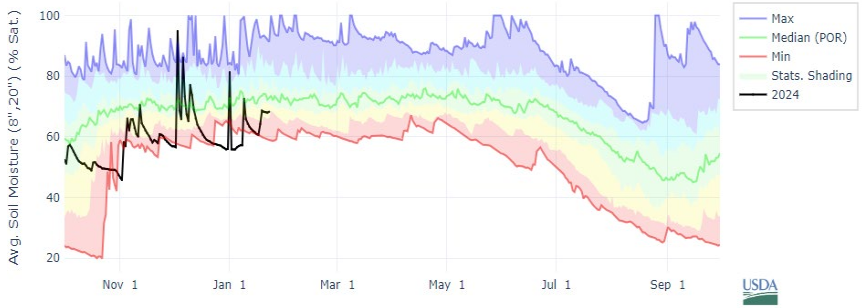




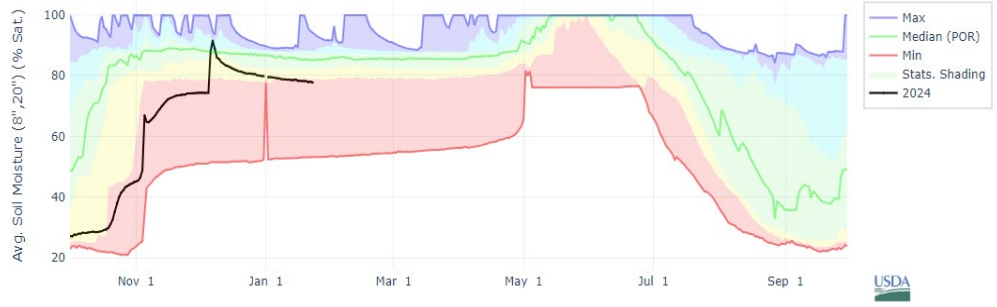
BEAVER PASS, WA (990) AVG. SOIL MOISTURE (8",20")



BURNT MOUNTAIN, WA (942) AVG. SOIL MOISTURE (8",20")



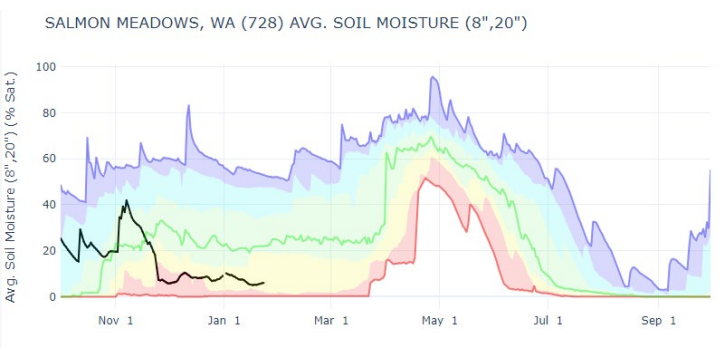
RAINY PASS, WA (711) AVG. SOIL MOISTURE (8",20")

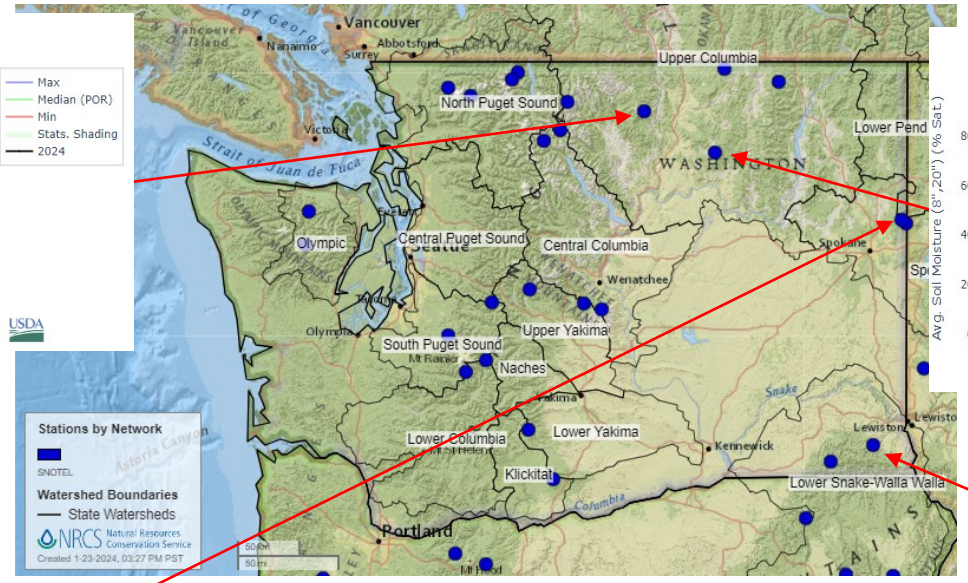


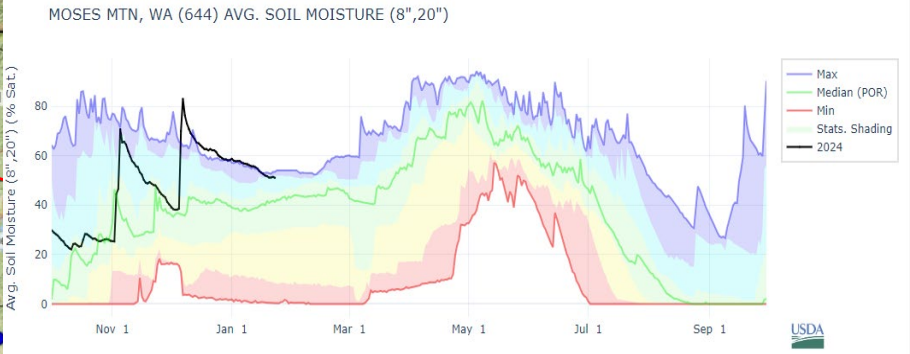
Soil Moisture

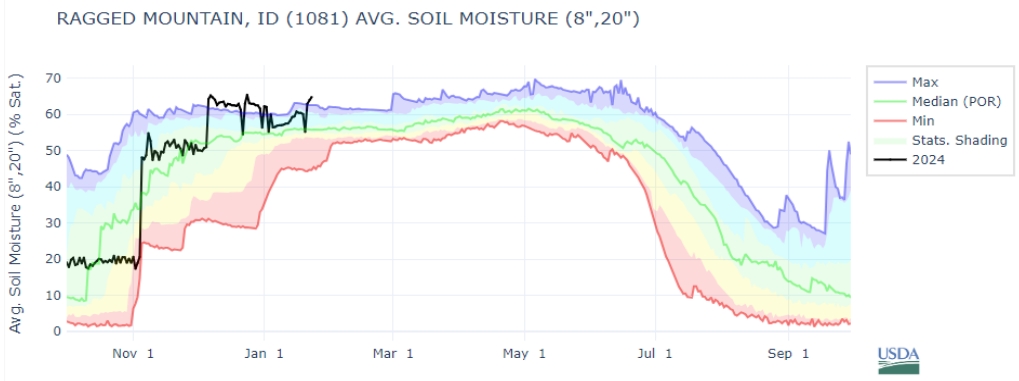
WY 2024 – Select Site Charts

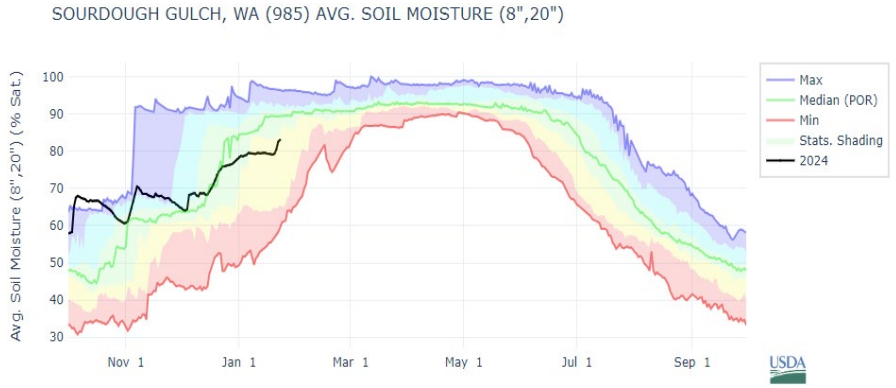
United States Department of Agriculture
Natural Resources Conservation Service









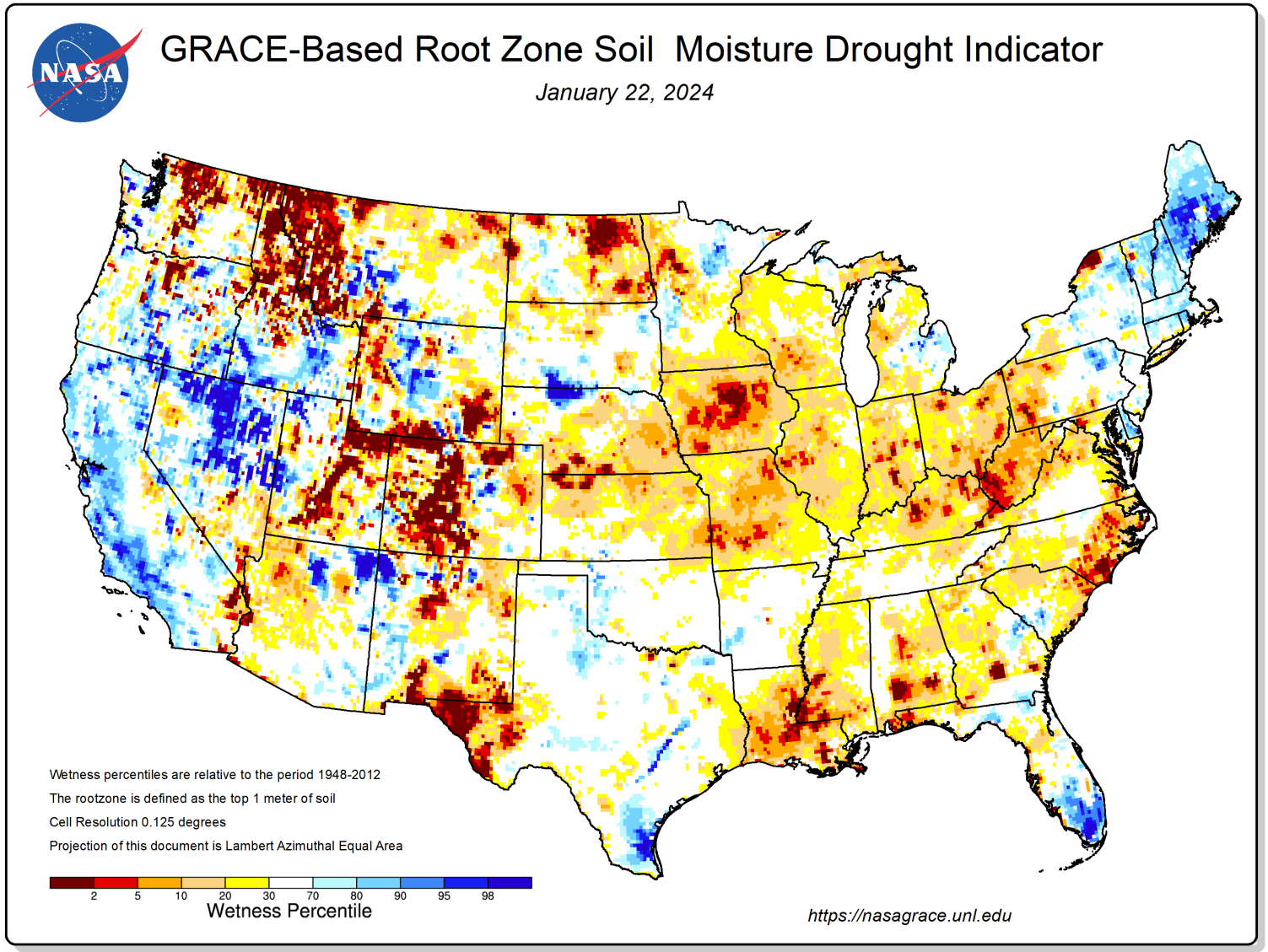


Soil Moisture

NASA GRACE

United States Department of Agriculture

Natural Resources Conservation Service



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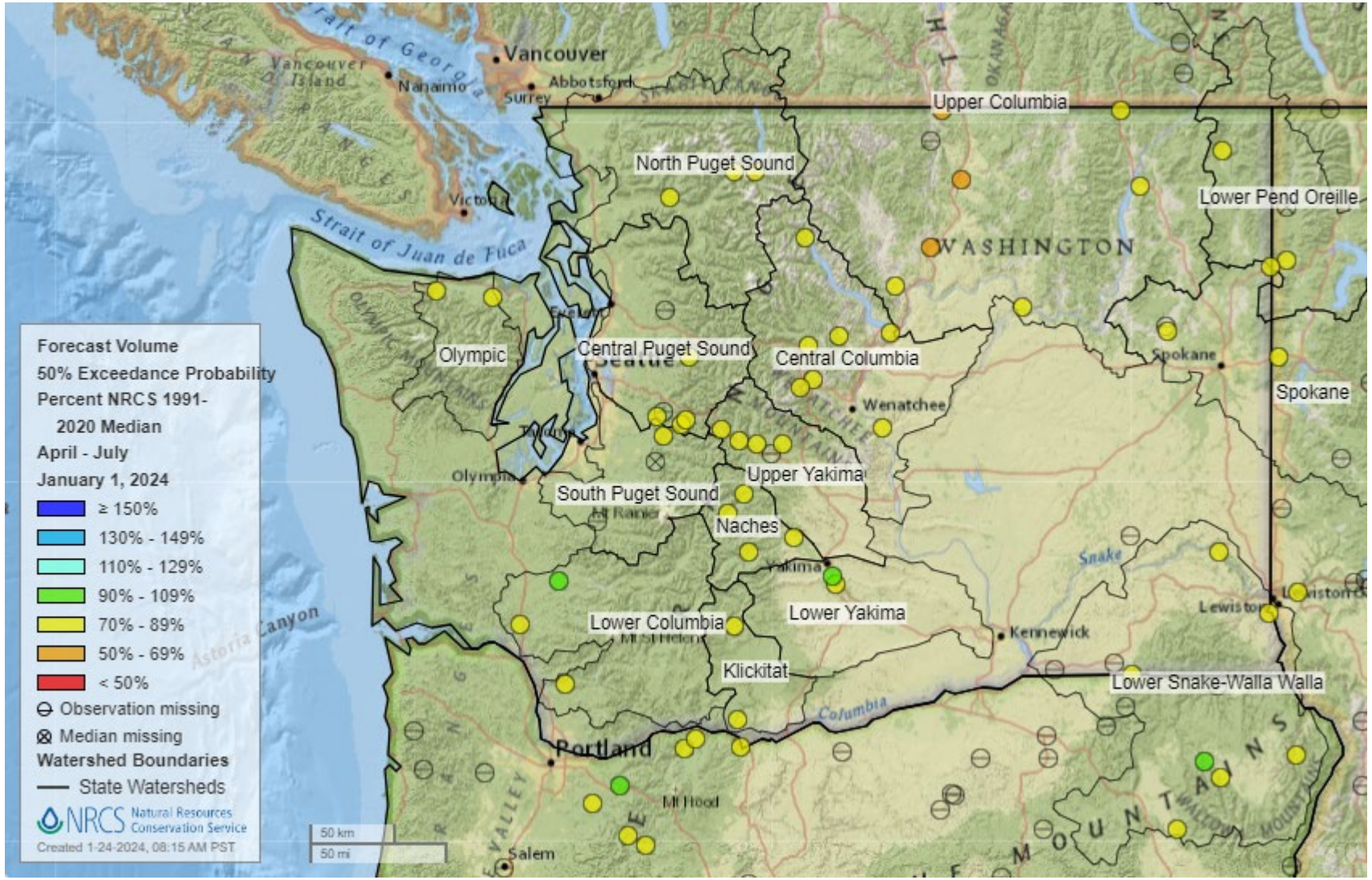
Natural Resources Conservation Service

Water Supply Outlook

January 1: Water Supply Forecasts

April-September Volumetric Streamflow

United States Department of Agriculture
Natural Resources Conservation Service



Next distribution: week of Feb. 5

Reports available here

USDA United States Department of Agriculture

Natural Resources Conservation Service

Thank you!

Matt Warbritton
Supervisory Hydrologist
USDA NRCS SSWSF
Portland Data Collection Office
matt.warbritton@usda.gov
503-307-2829

Washington Snow Survey and Water Supply Program Website

Streamflow & Groundwater Conditions in Washington State as of 23 Jan. 2024

Presented to
The Washington State Water Supply Availability Committee on 24 Jan. 2024
by Nicholas Sutfin, USGS Washington Water Science Center

Data presented here may be provisional and subject to revision until they have been thoroughly reviewed and received final approval.

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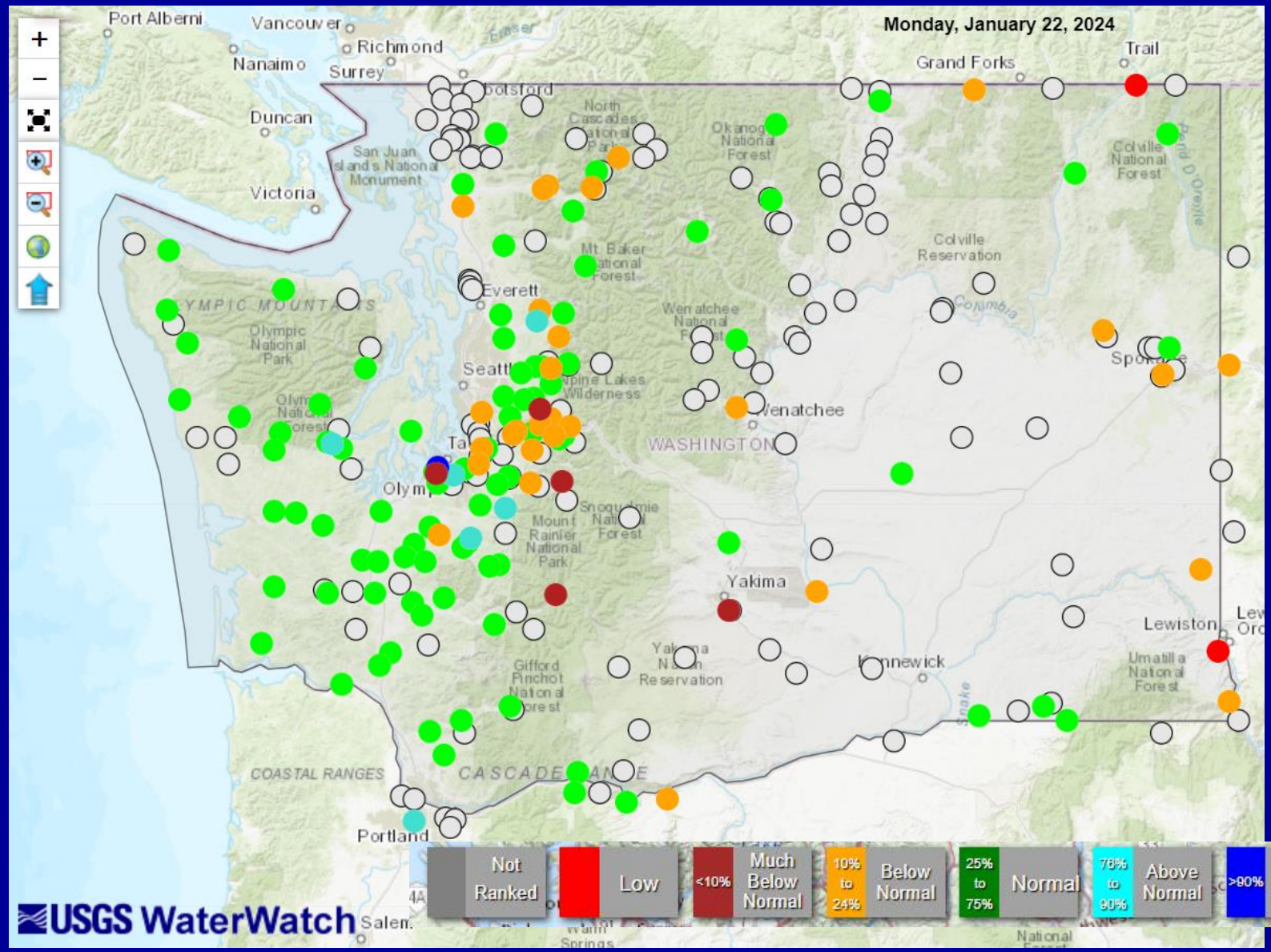
7-day Average Streamflow Conditions as of 23 Jan. 2024



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https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

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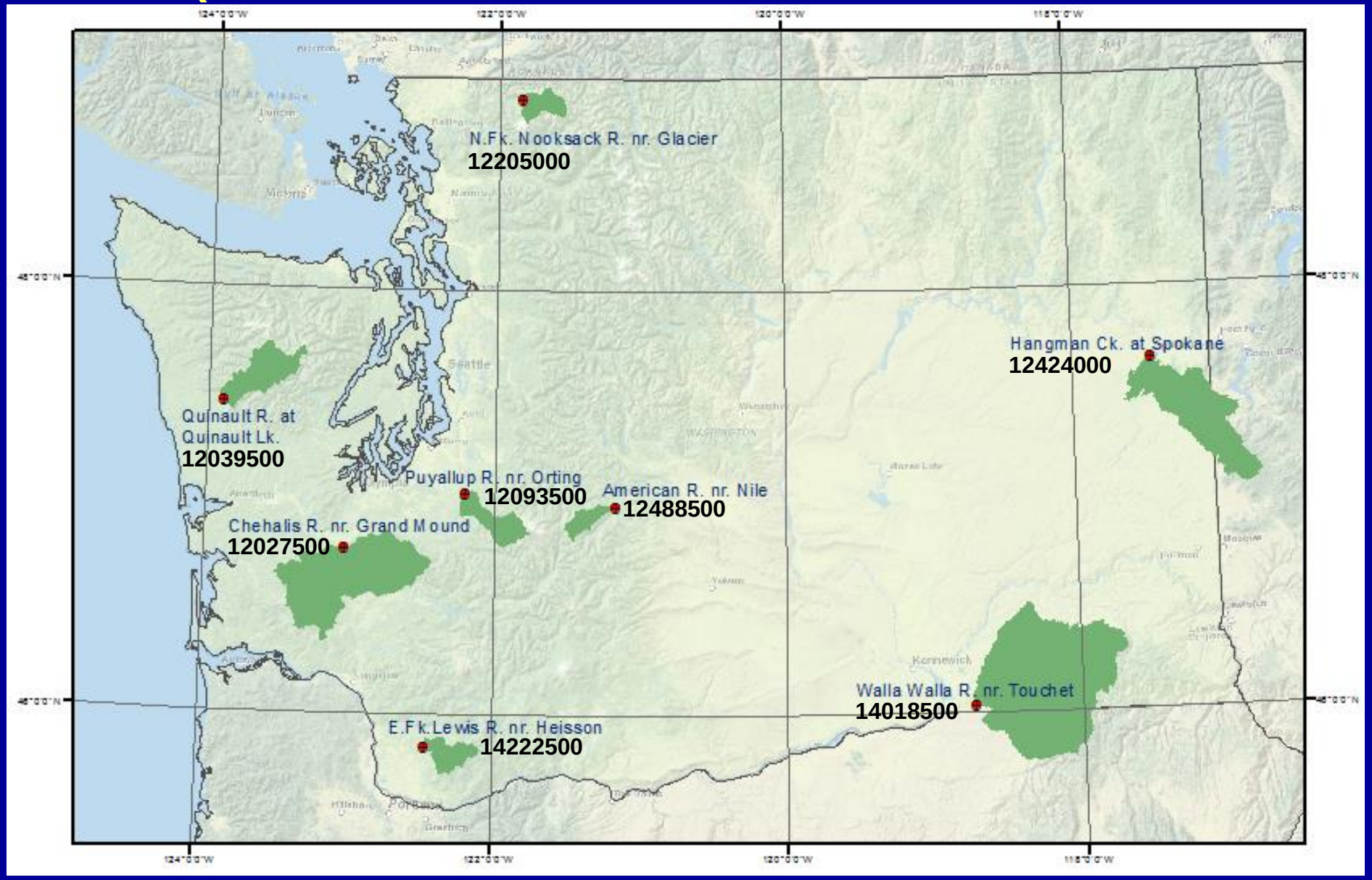
Index Gaging Stations

(Stations that measure natural or near-natural streamflow)



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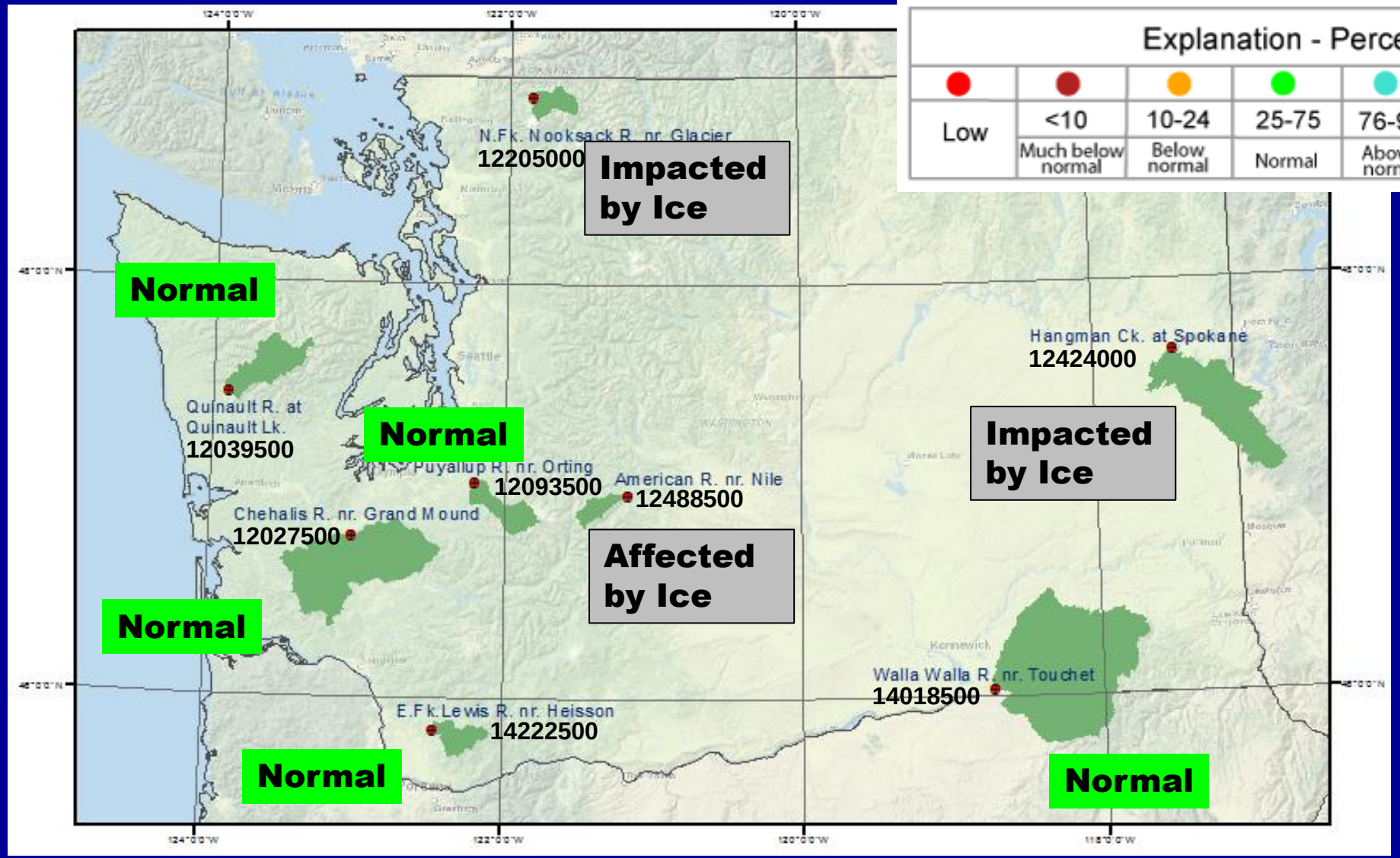
Index Gaging Stations
7-day average streamflow (as of 23 Jan. 2024)



Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

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https://waterwatch.usgs.gov/

USGS science for a changing world

7-day average streamflow compared to historical streamflow, Dec. 2023 to Jan. 2024

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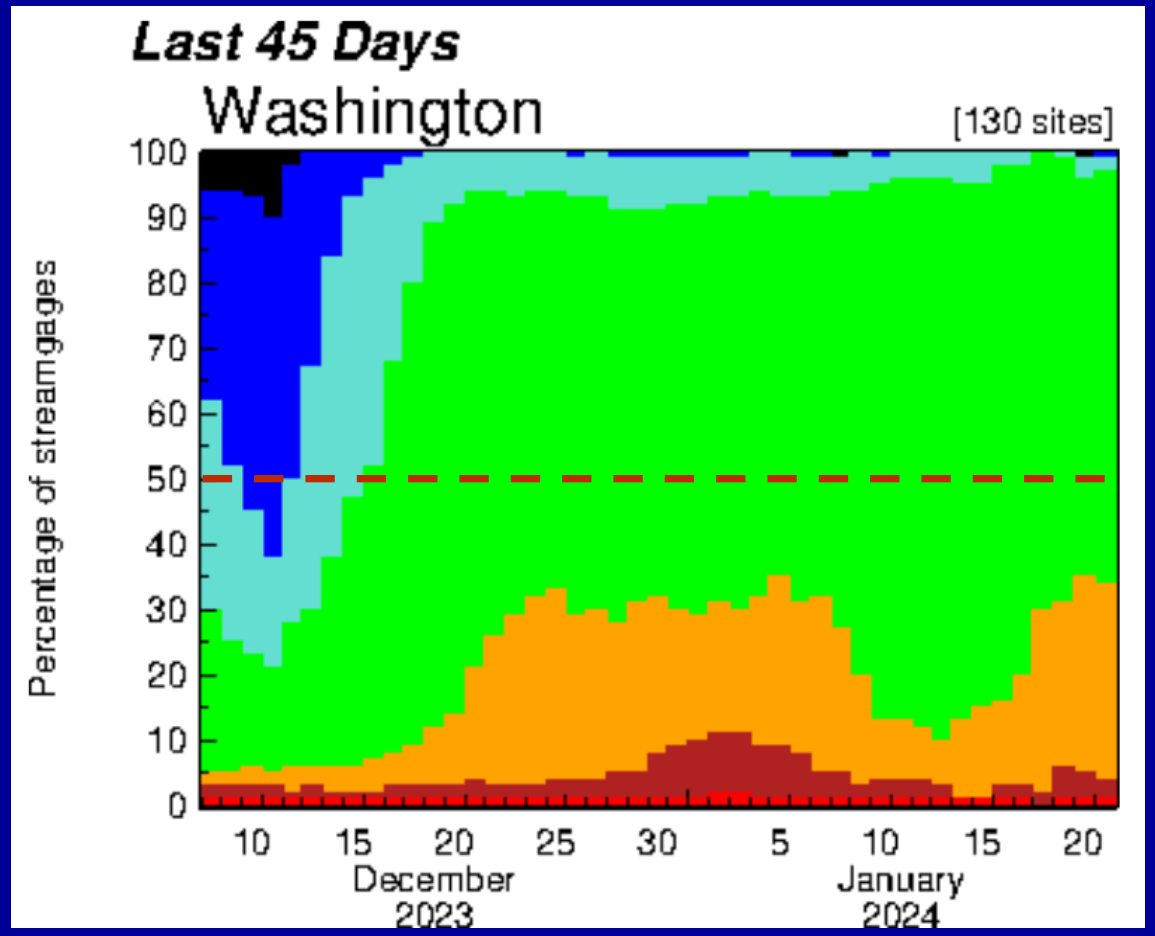

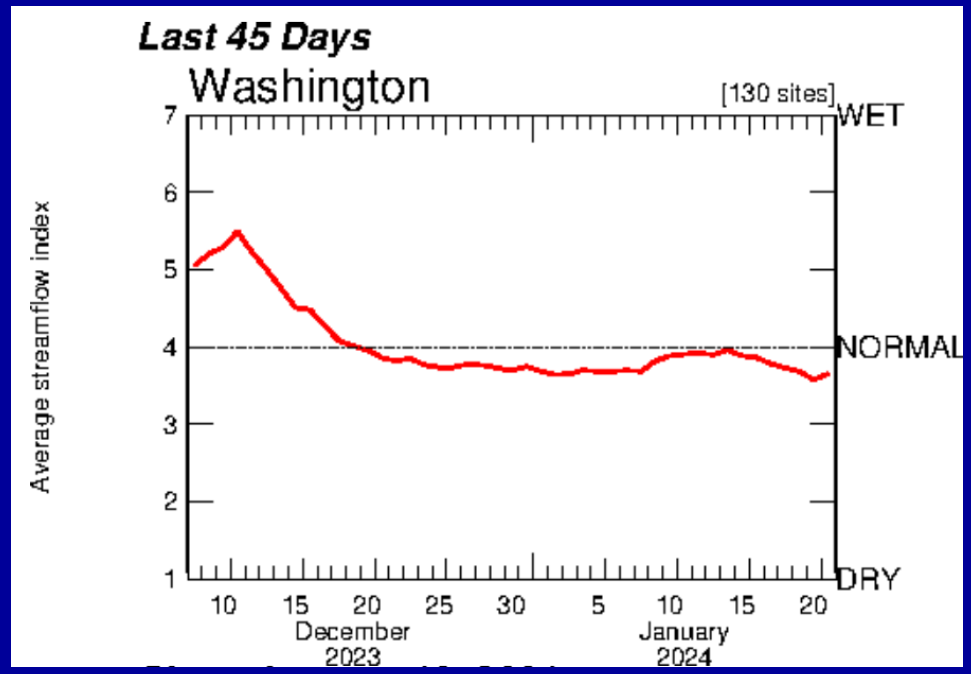

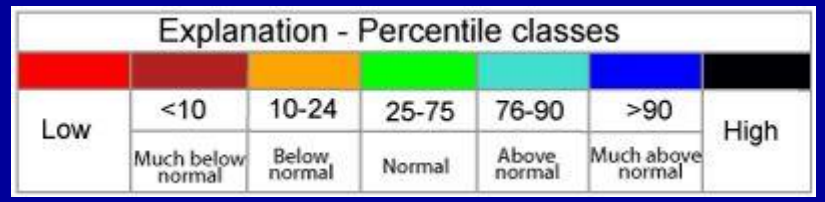

https://waterwatch.usgs.gov/

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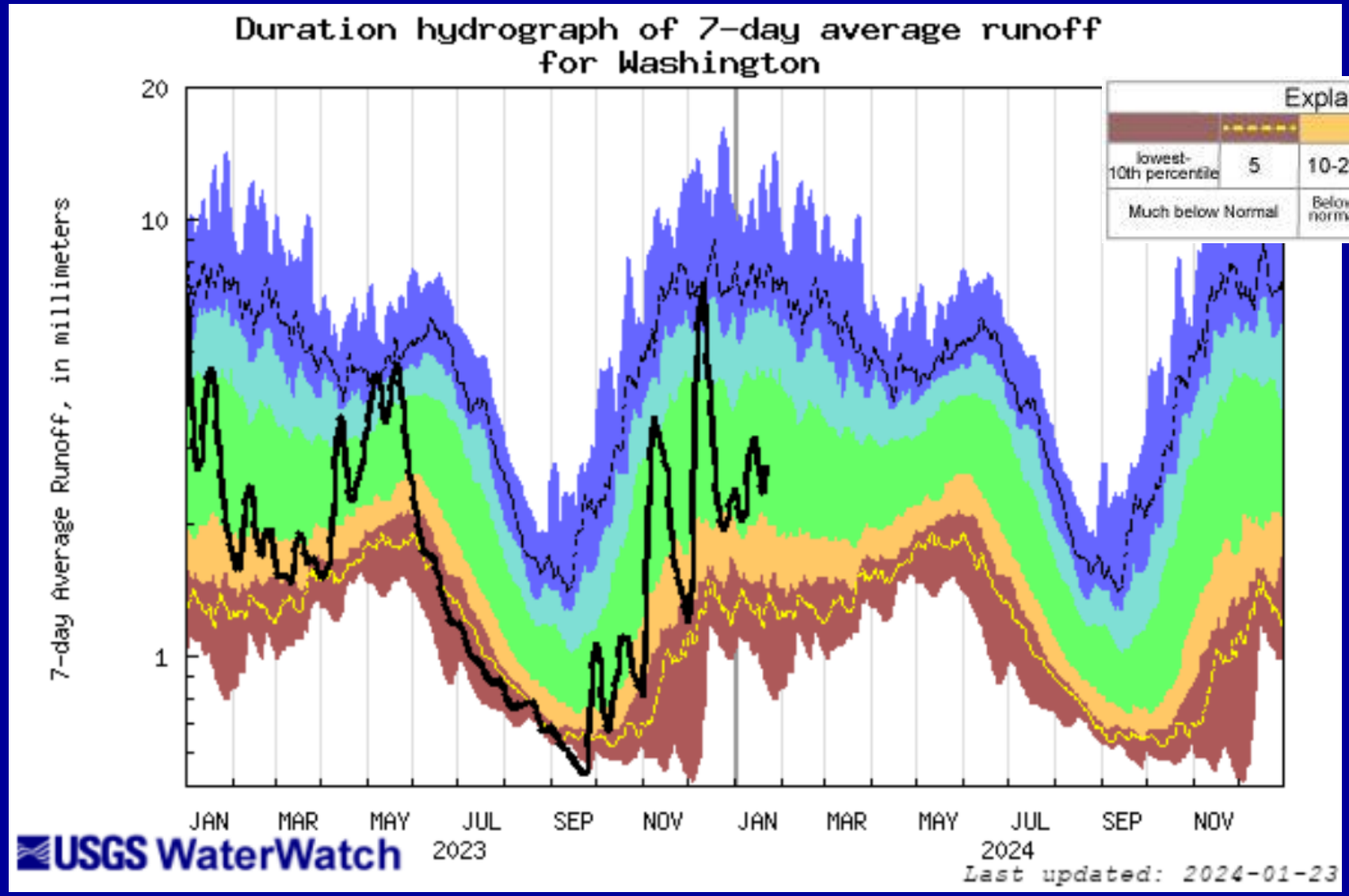
Duration Hydrograph

7-day average streamflow (as of **23 Jan. 2024**) is below normal



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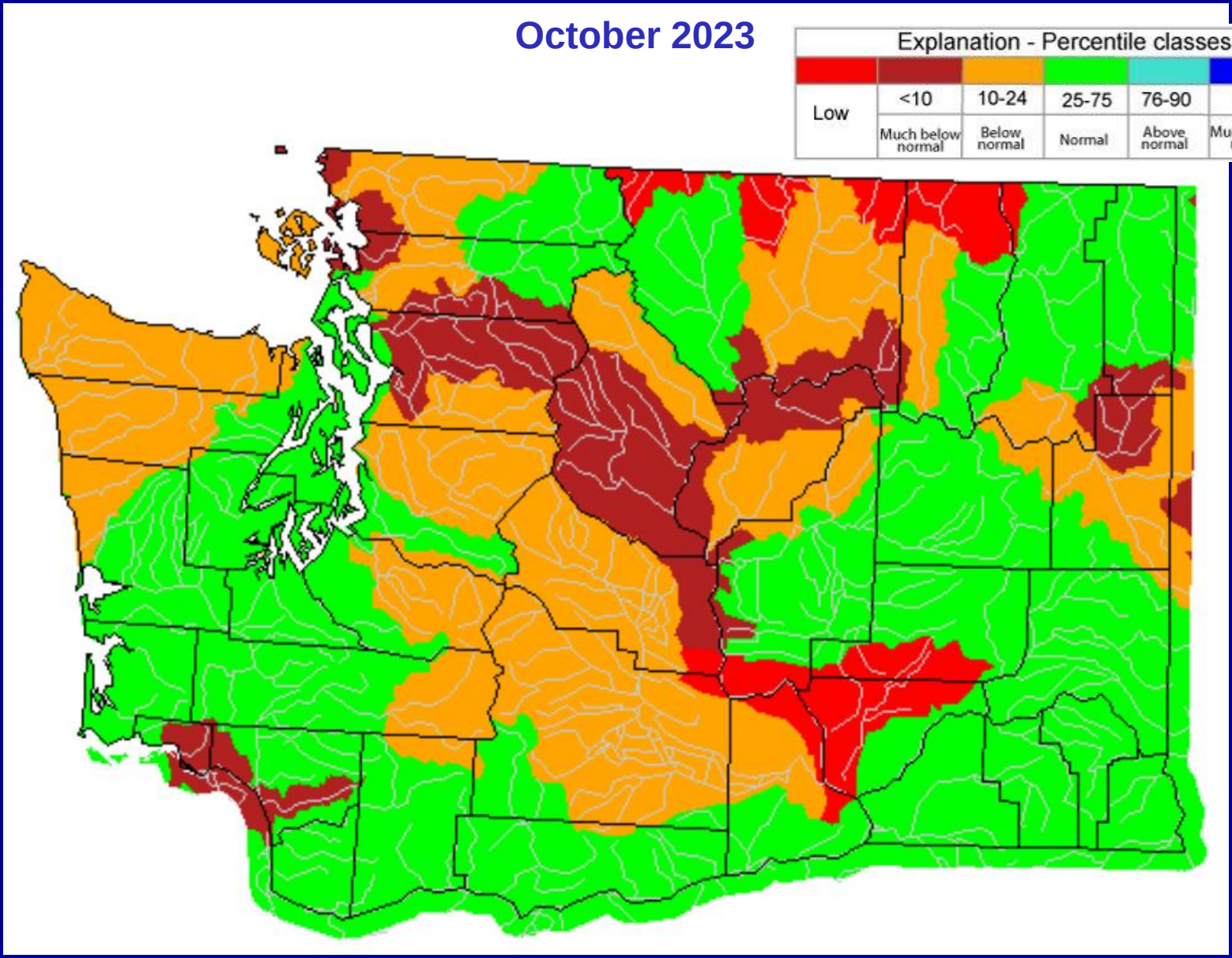
https://waterwatch.usgs.gov/

USGS science for a changing world

Monthly average streamflow compared to historical streamflow



https://waterwatch.usgs.gov/

USGS
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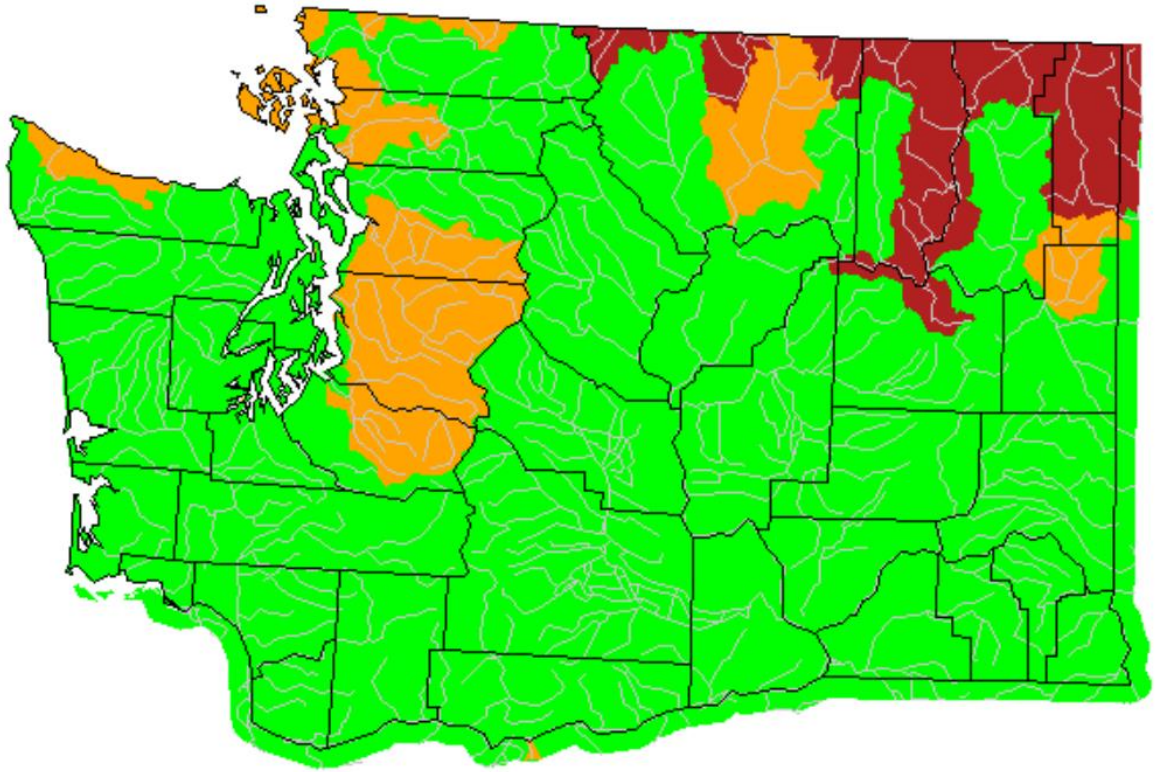
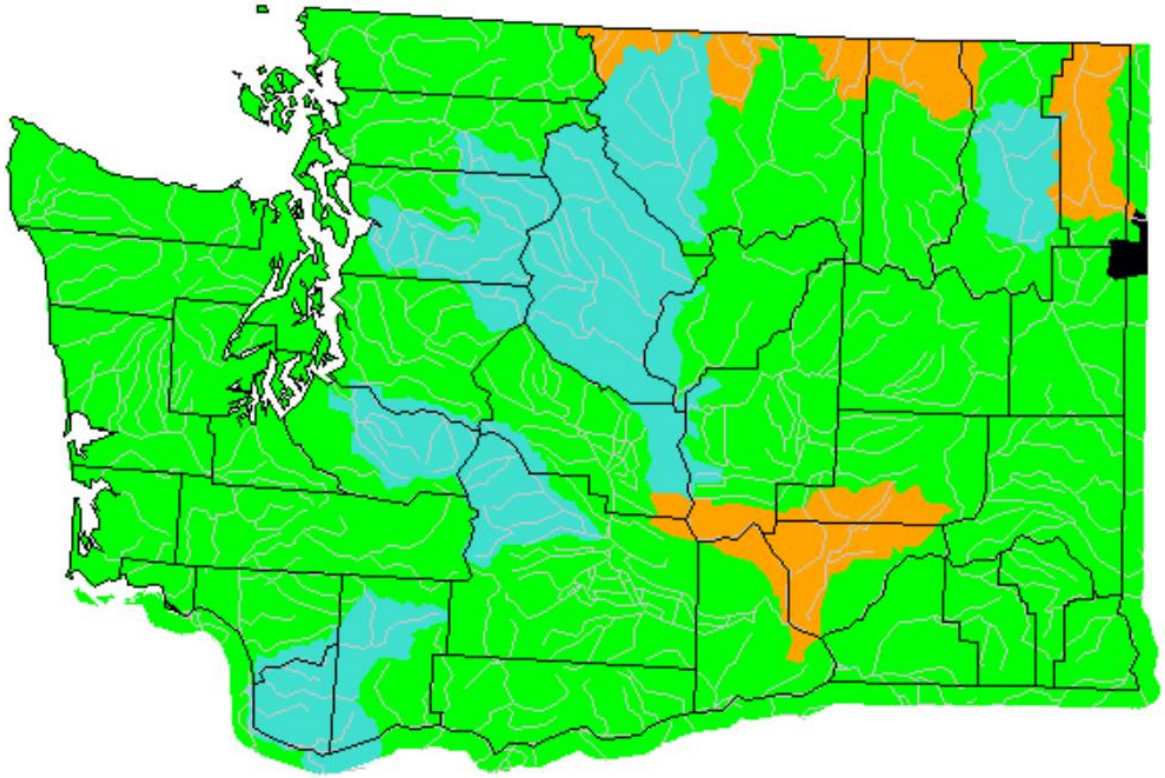
Monthly average streamflow compared to historical streamflow

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

November 2023



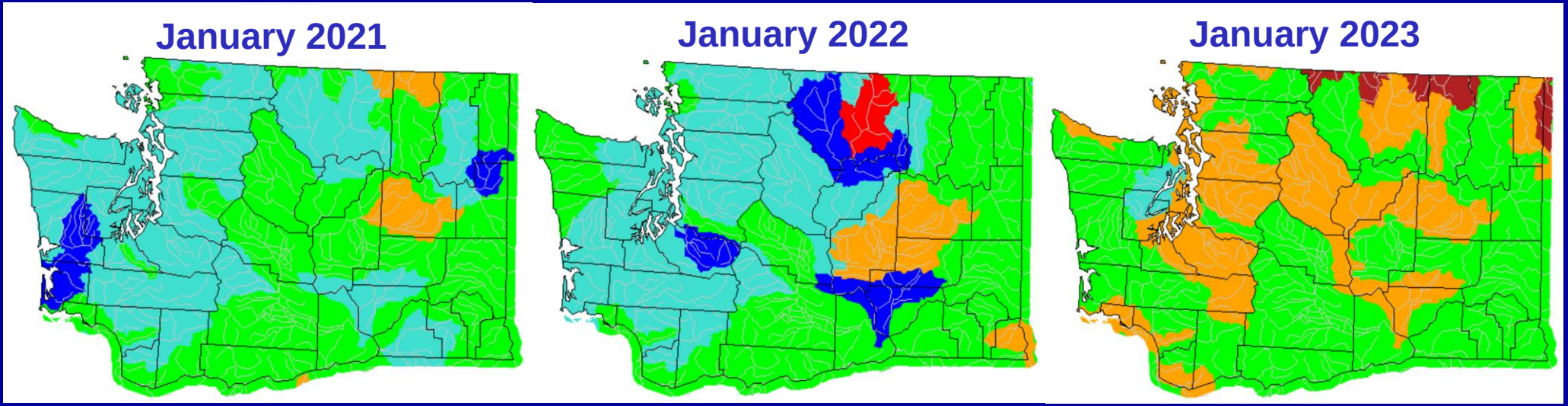
December 2023



https://waterwatch.usgs.gov/

USGS science for a changing world

Monthly average streamflow compared to historical streamflow



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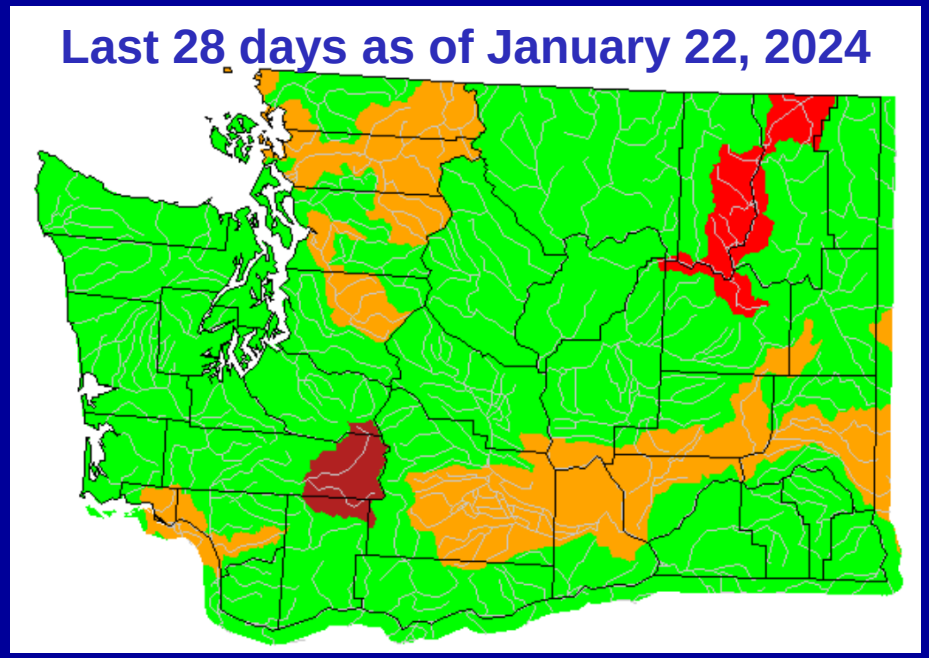

Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

https://waterwatch.usgs.gov/

USGS science for a changing world

7-day average runoff compared to historical runoff

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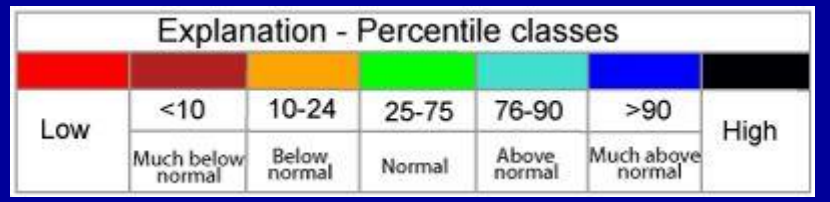
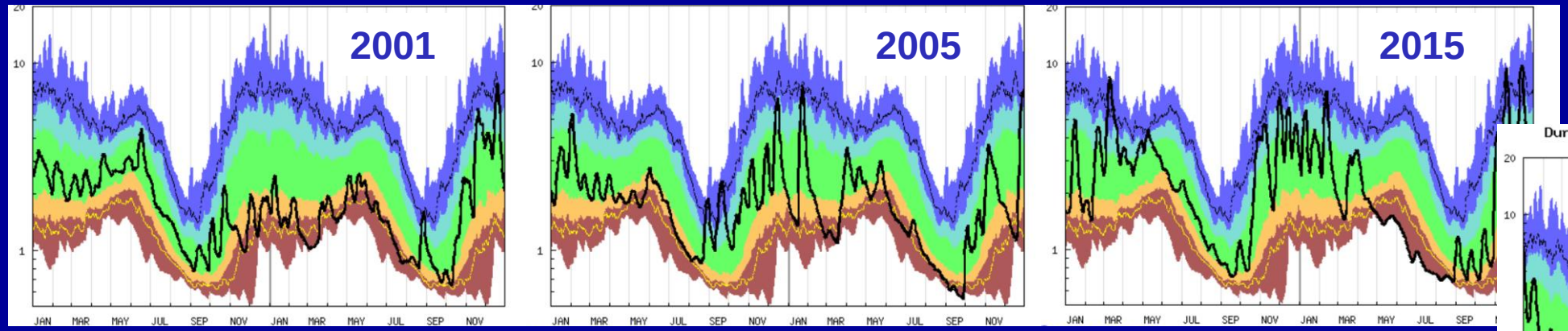
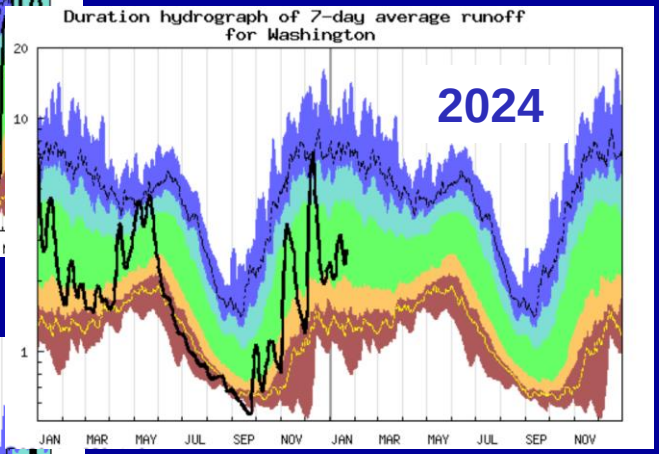
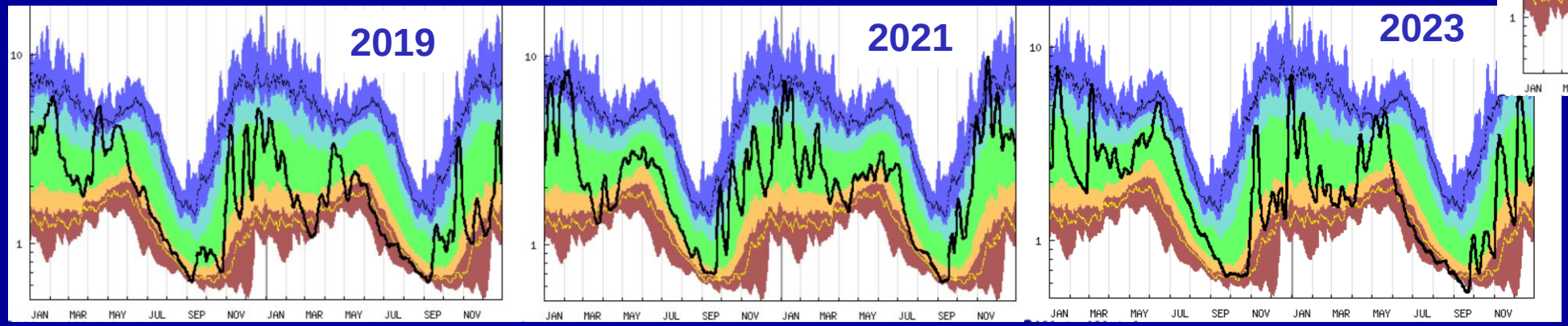








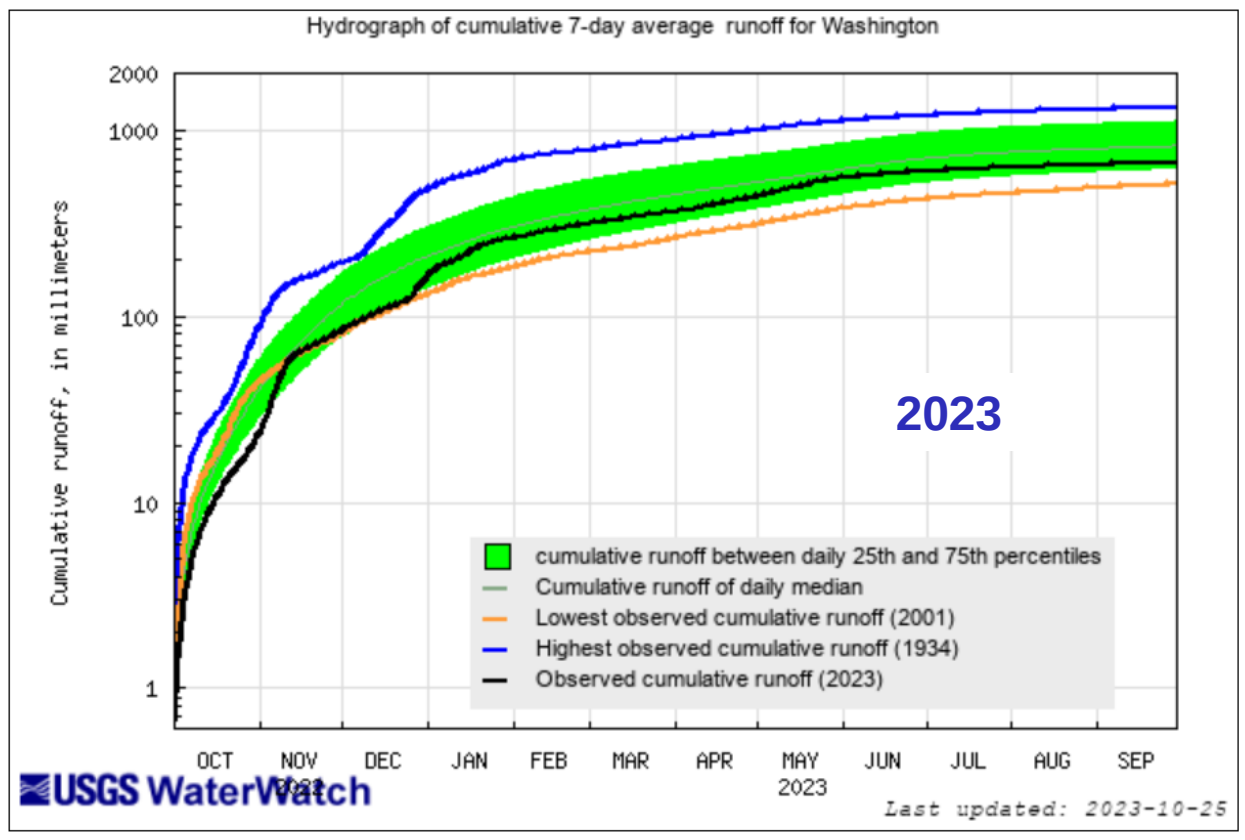
https://waterwatch.usgs.gov/

USGS science for a changing world

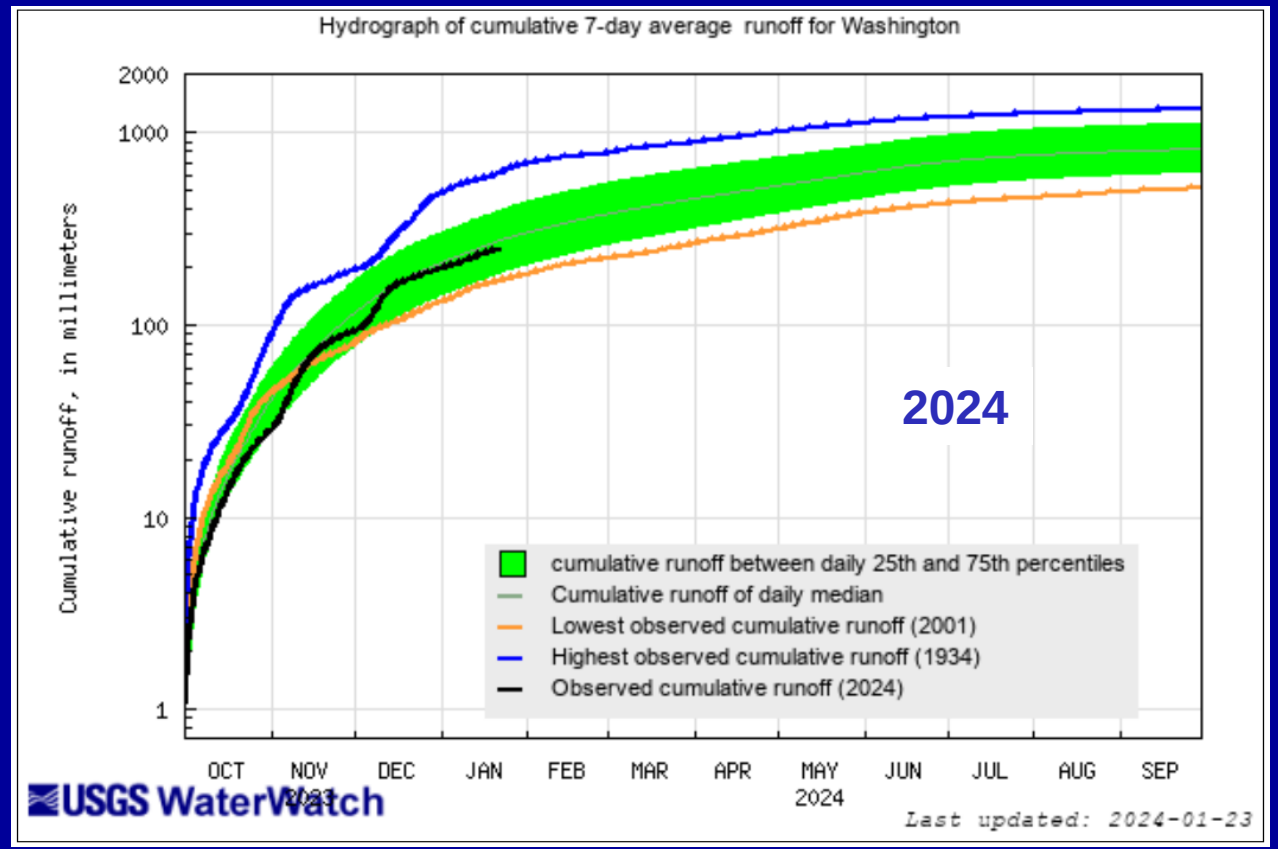
Cumulative runoff hydrograph

(Area-based runoff based on 7-day average)

2024 Water year (as of **23 Jan. 2024**) is normal



2023 water year



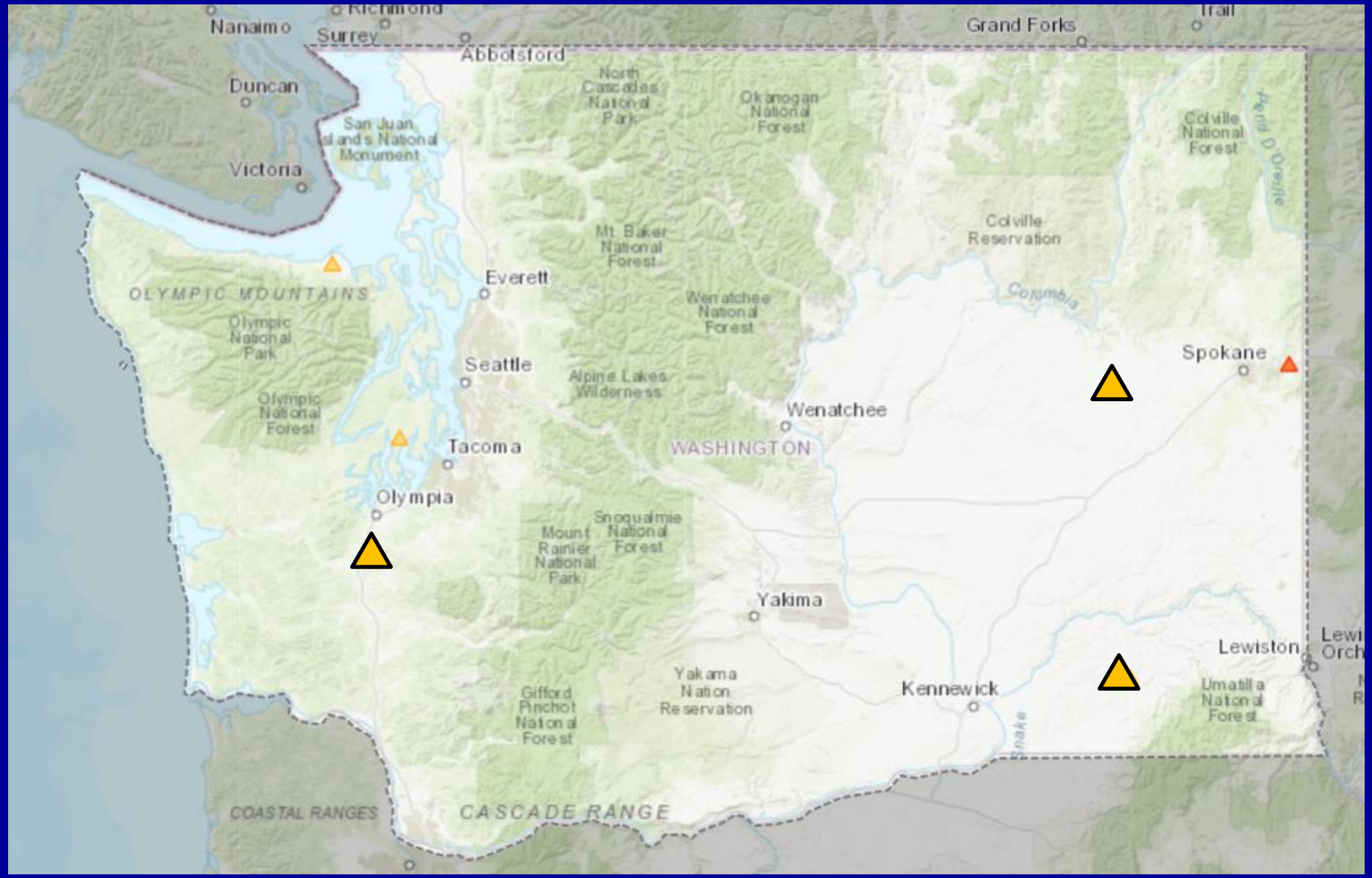
2024 water year

https://waterwatch.usgs.gov/

Area-based runoff may have been computed from mixed regulated and unregulated streamflows

USGS science for a changing world

Three reference groundwater wells



Groundwater Levels

DEPTH TO WATER

- 0 – 50 feet
- > 50 – 100 feet
- > 100 – 150 feet
- > 150 – 200 feet
- > 200 – 250 feet
- > 250 feet
- Measurement flag
- Recent measurement unavailable
- Depth to water unavailable

https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

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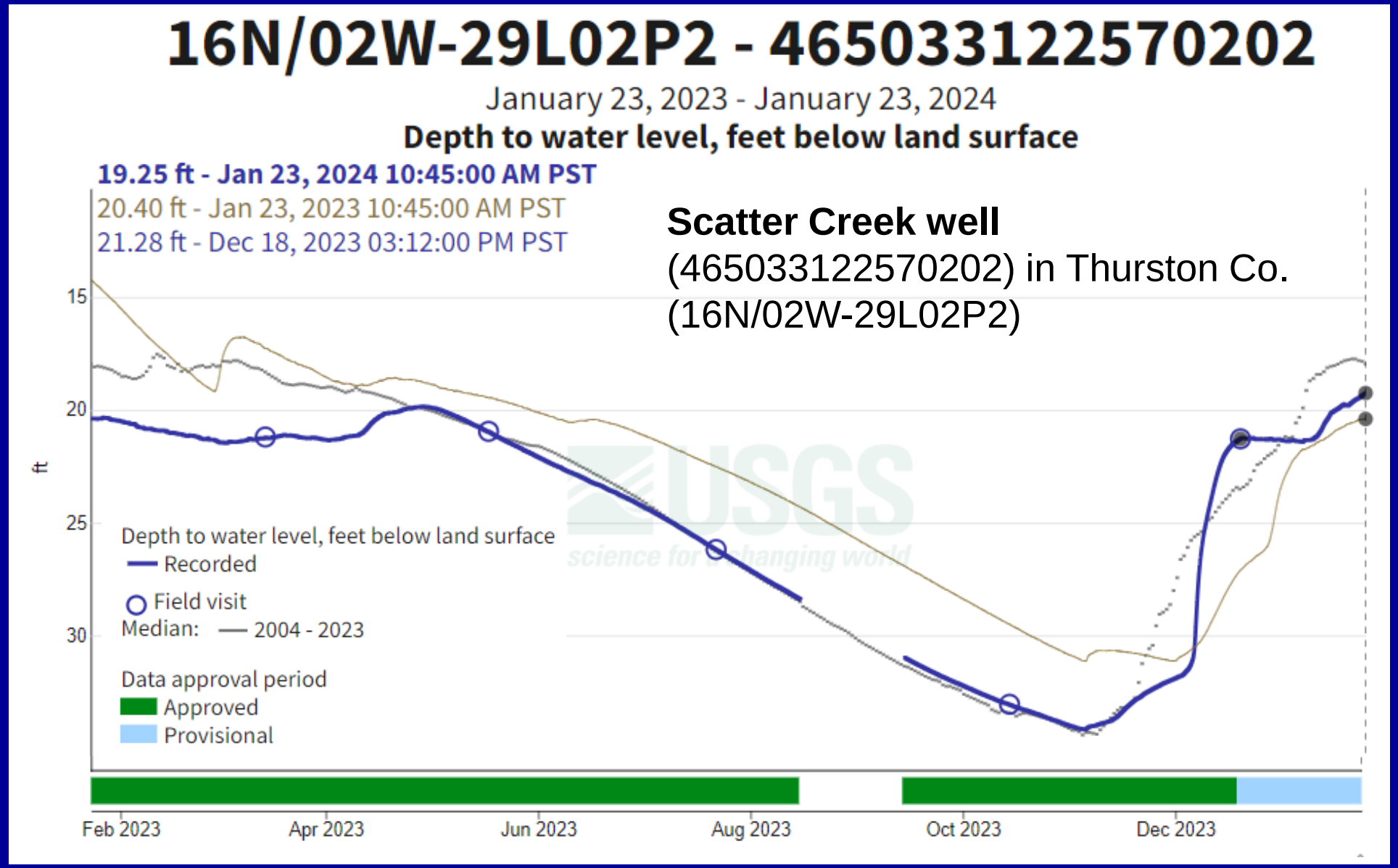
Scatter Creek Well Groundwater Conditions



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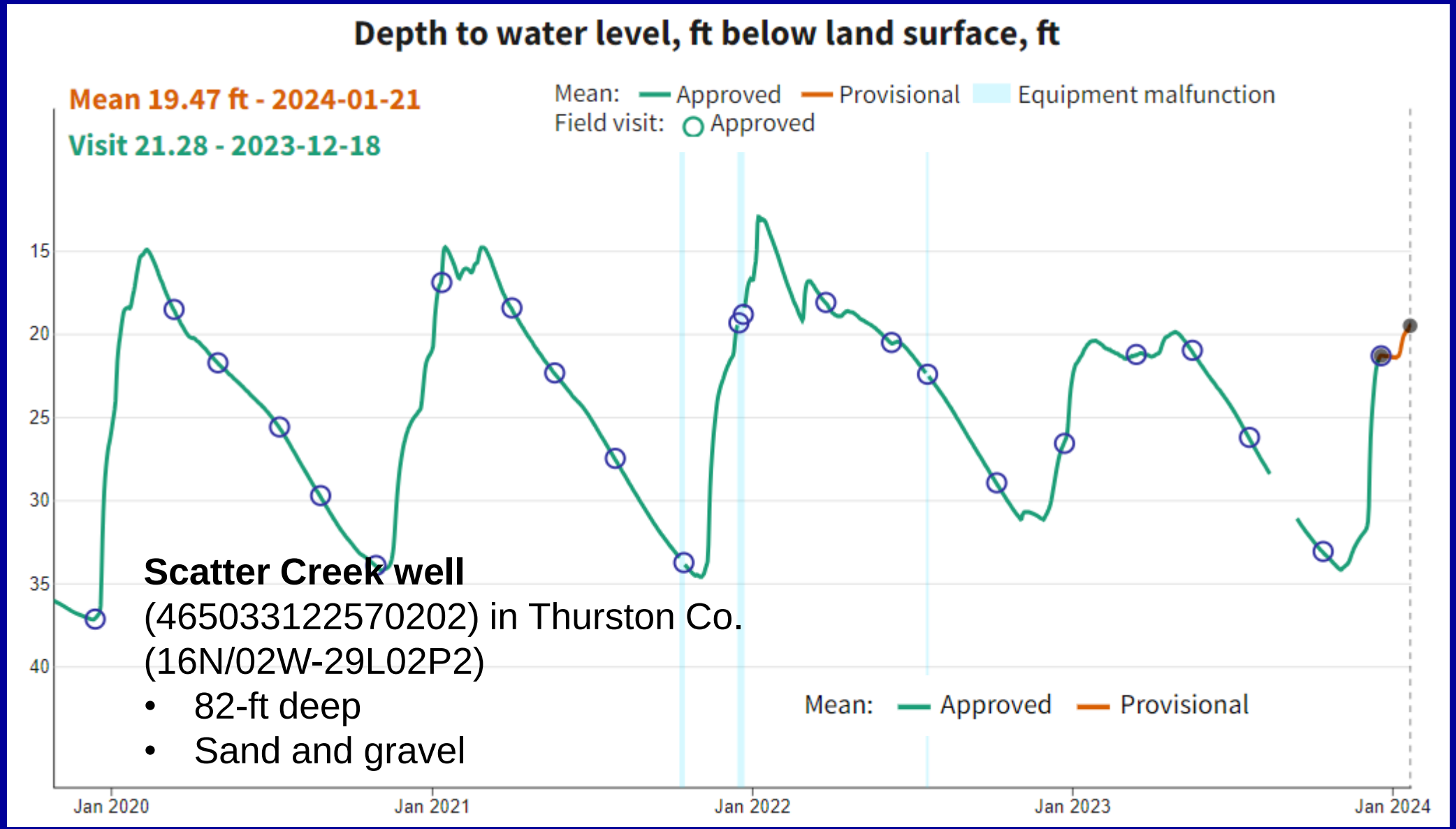
Scatter Creek Well Groundwater Conditions



Scatter Creek well
(465033122570202) in Thurston Co.
(16N/02W-29L02P2)

- 82-ft deep
- Sand and gravel

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https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

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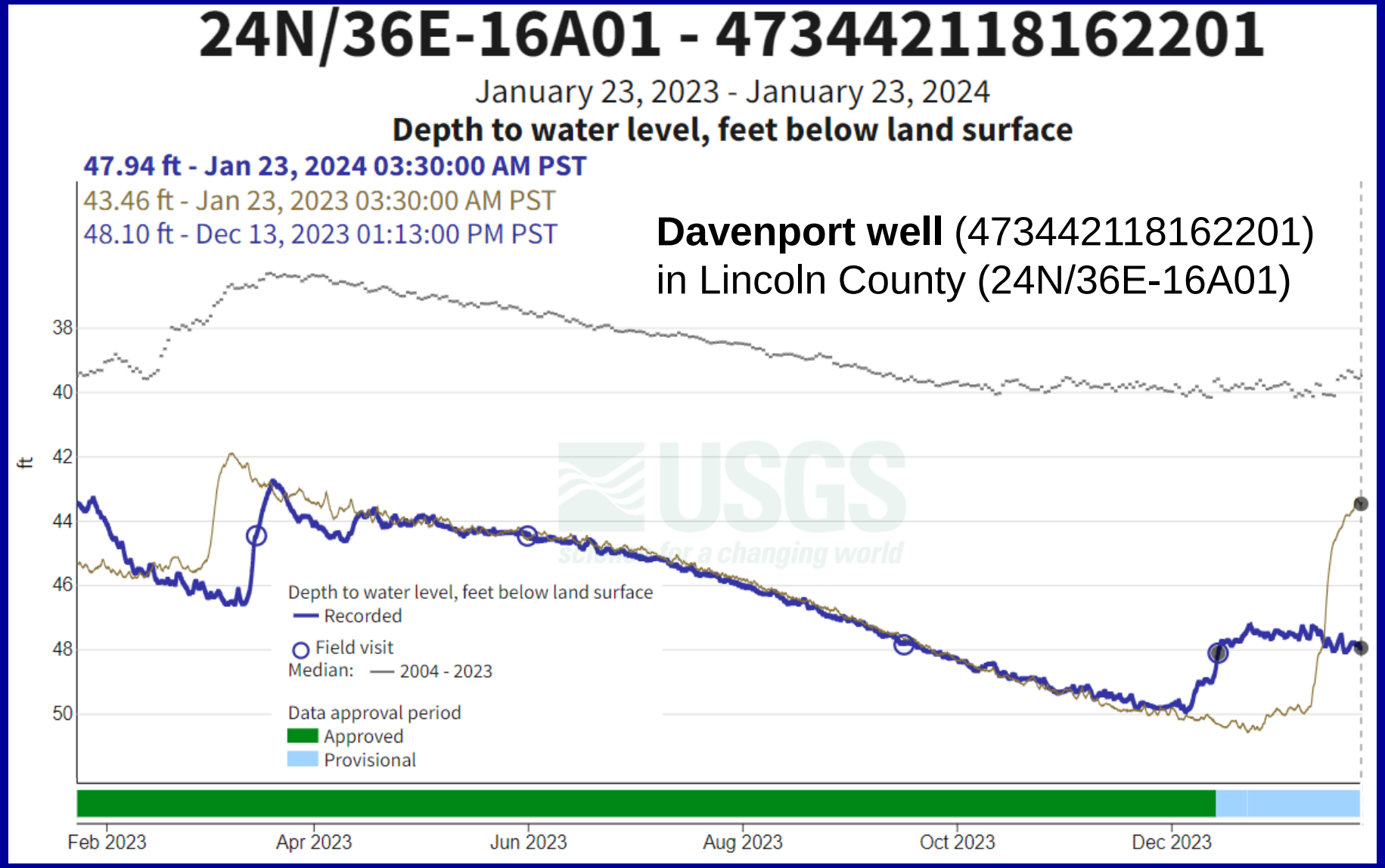
Davenport Well Groundwater Conditions



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https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

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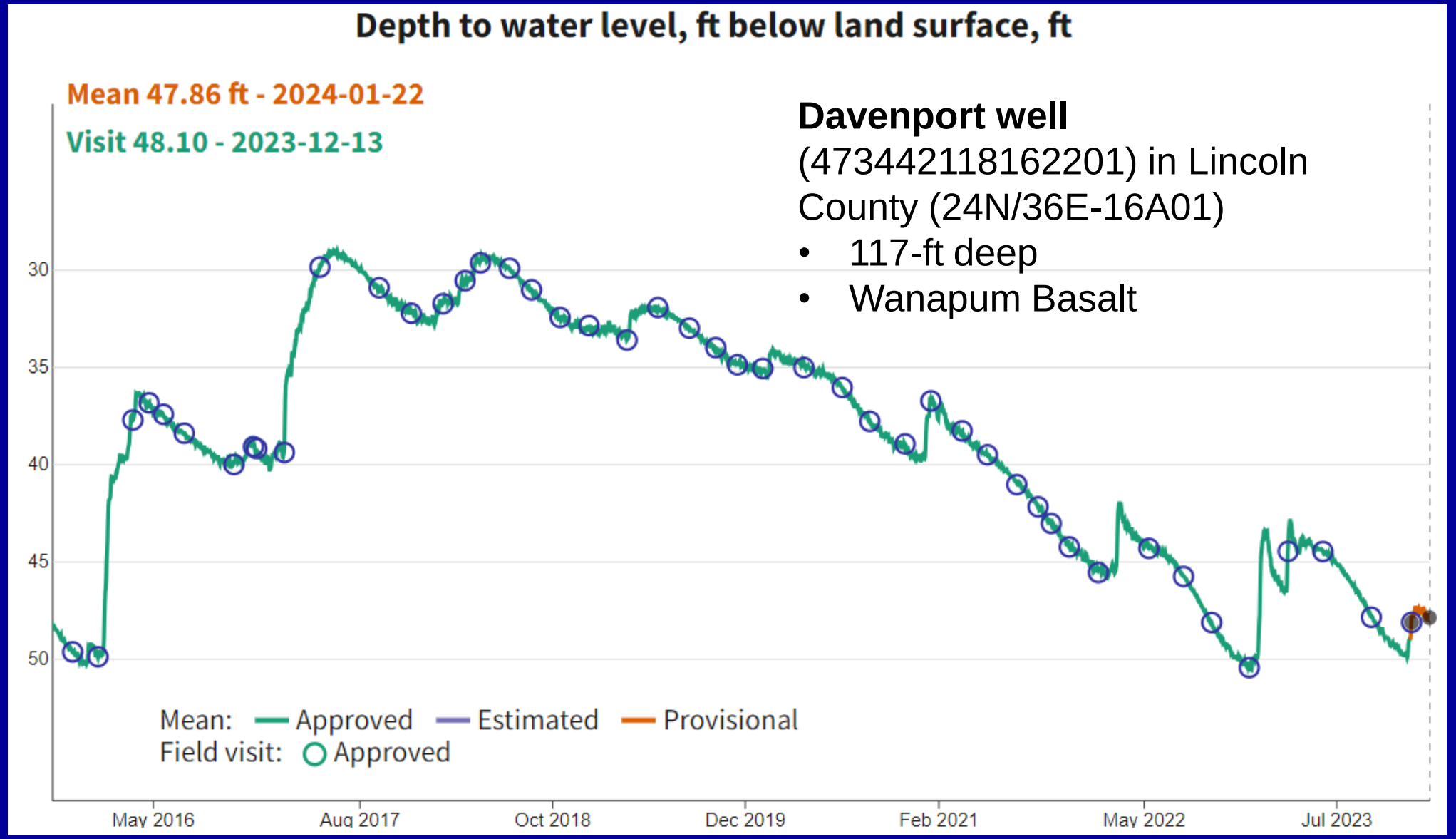
Davenport Well Groundwater Conditions



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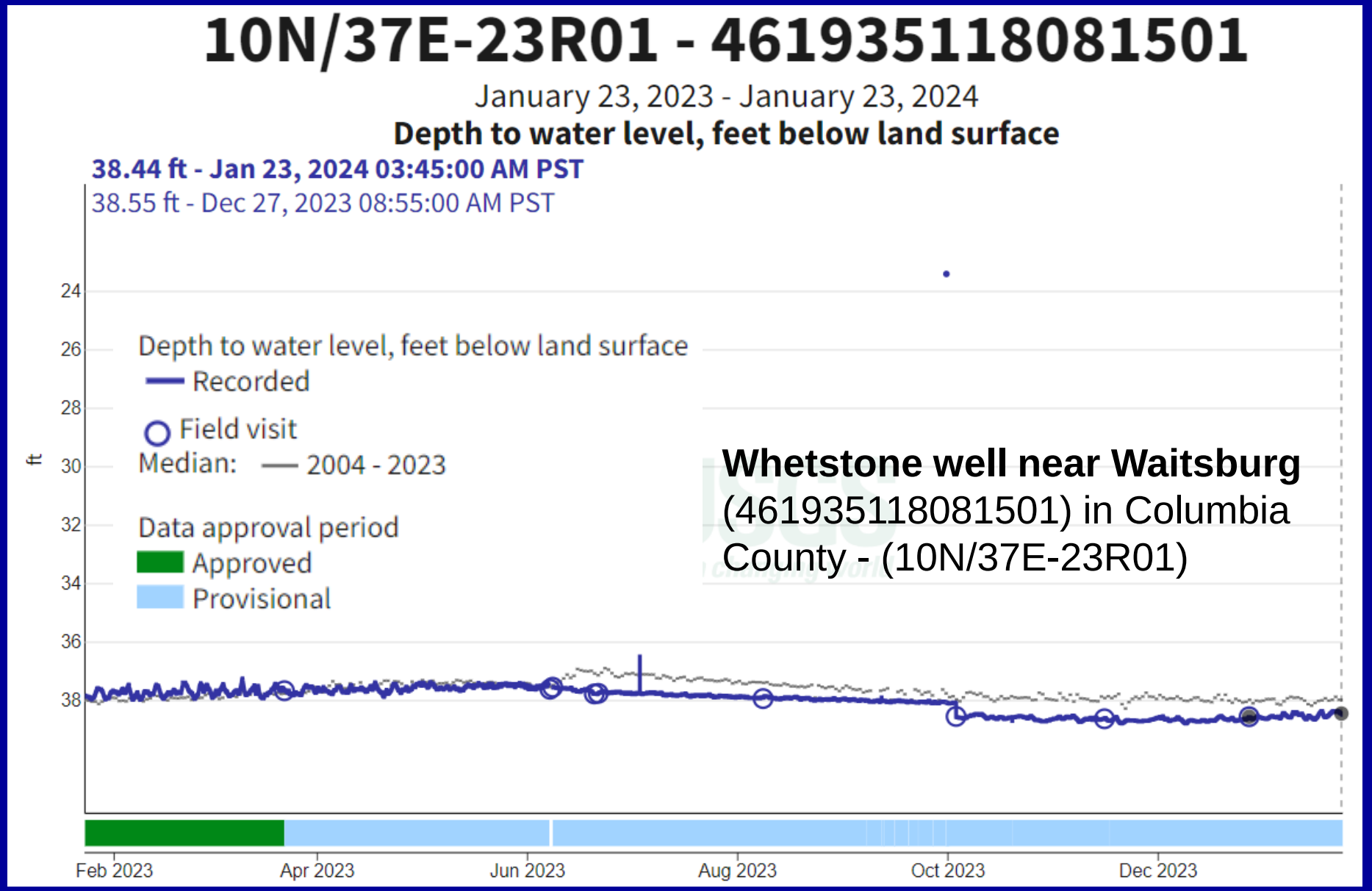
https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

USGS science for a changing world

Whetstone Well Groundwater Conditions



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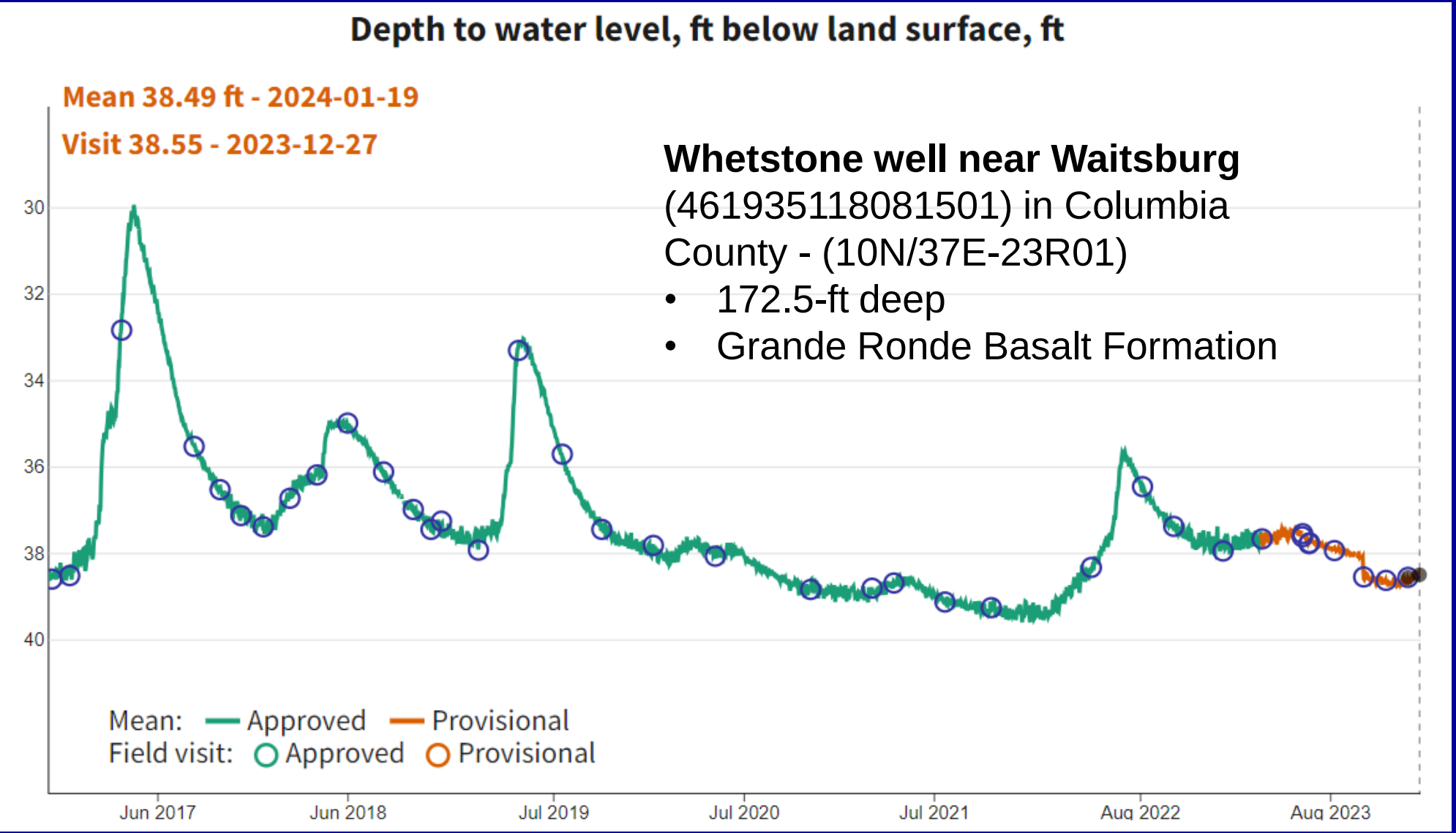
https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

USGS science for a changing world

Whetstone Well Groundwater Conditions



Whetstone well near Waitsburg (461935118081501) in Columbia County - (10N/37E-23R01)

- 172.5-ft deep
- Grande Ronde Basalt Formation

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https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=state-wa

USGS science for a changing world

Summary of Washington Streamflow conditions as of 23 Jan. 2024

- **7-day average streamflow statewide is normal**
- 7-day average streamflow at eight index gaging stations:

  Normal
  - Chehalis River nr. Grand Mound
  - EF Lewis River
  - Quinault River
  - Walla Walla River
  - Puyallup River nr. Orting

  Affected by ice
  - NF Nooksack River
  - Hangman Creek
  - American River

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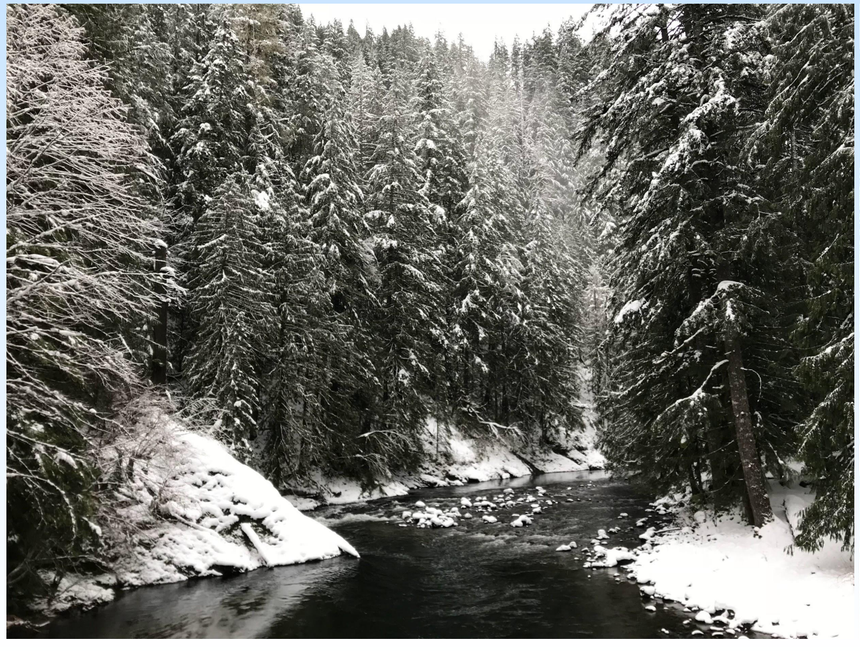
Northwest River Forecast Center

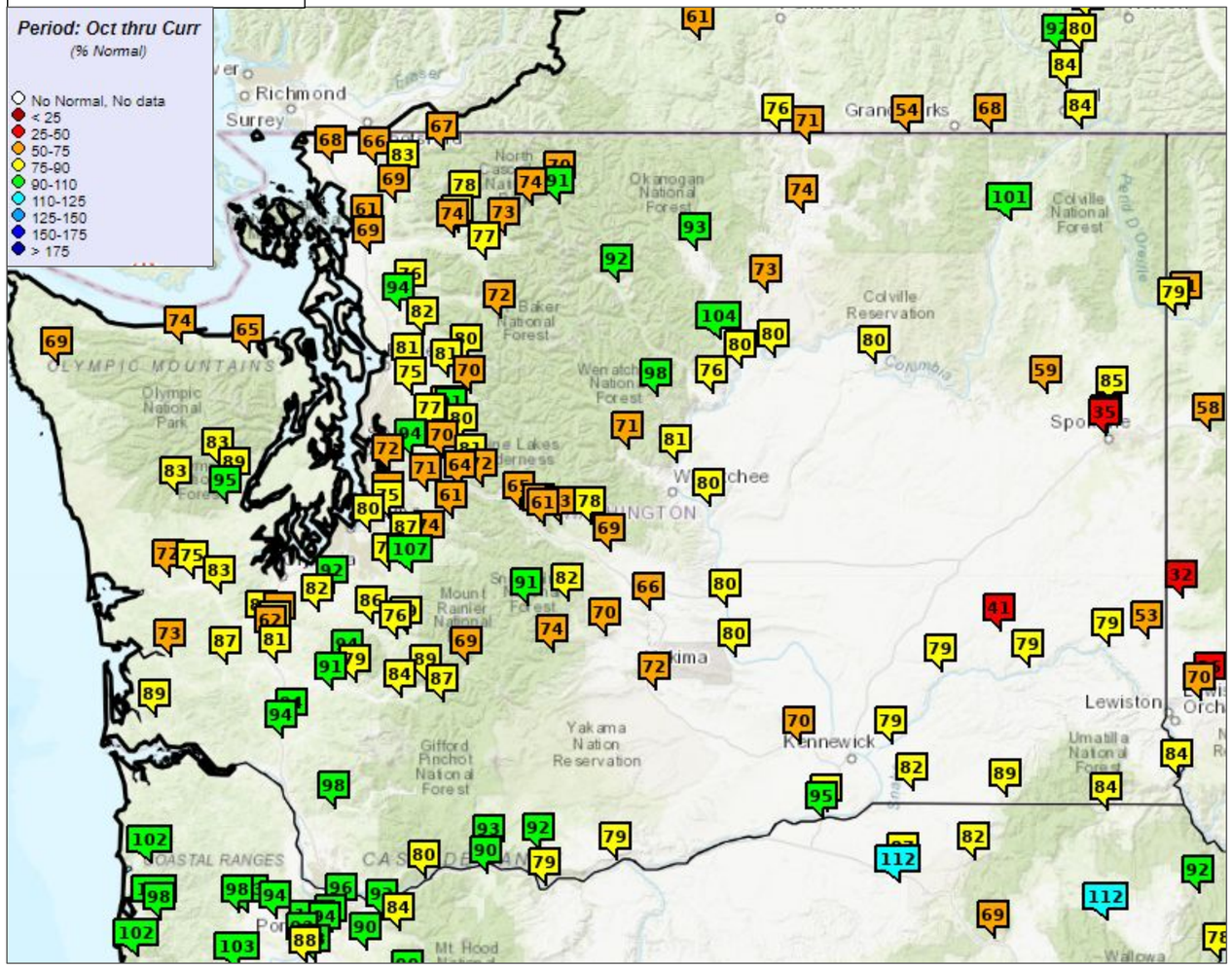
Jan 2024 Washington Water Supply Briefing

Amy Burke, Hydrologist
NWRFC.watersupply@noaa.gov

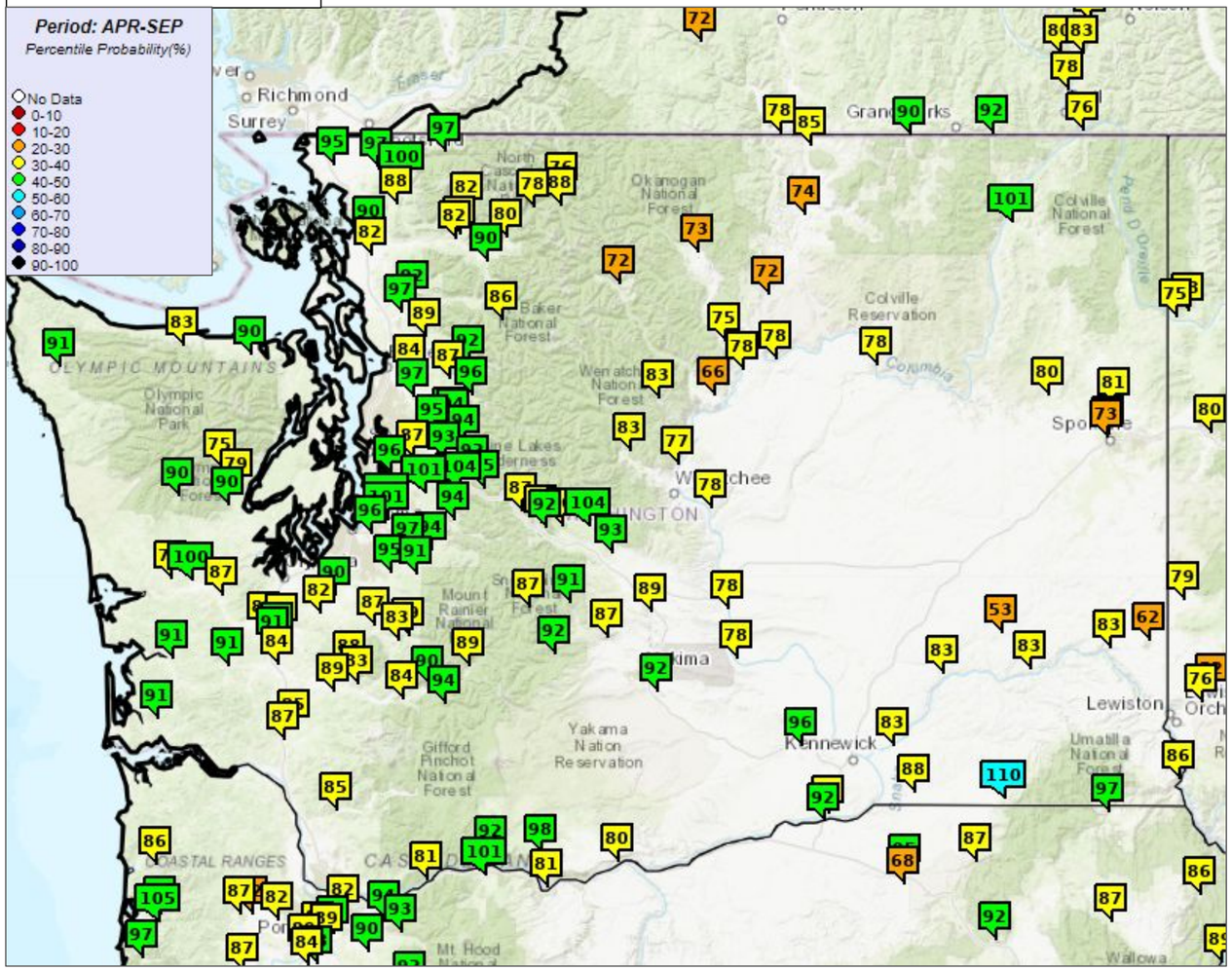


Runoff and Forecasts

Oct - Sep Runoff

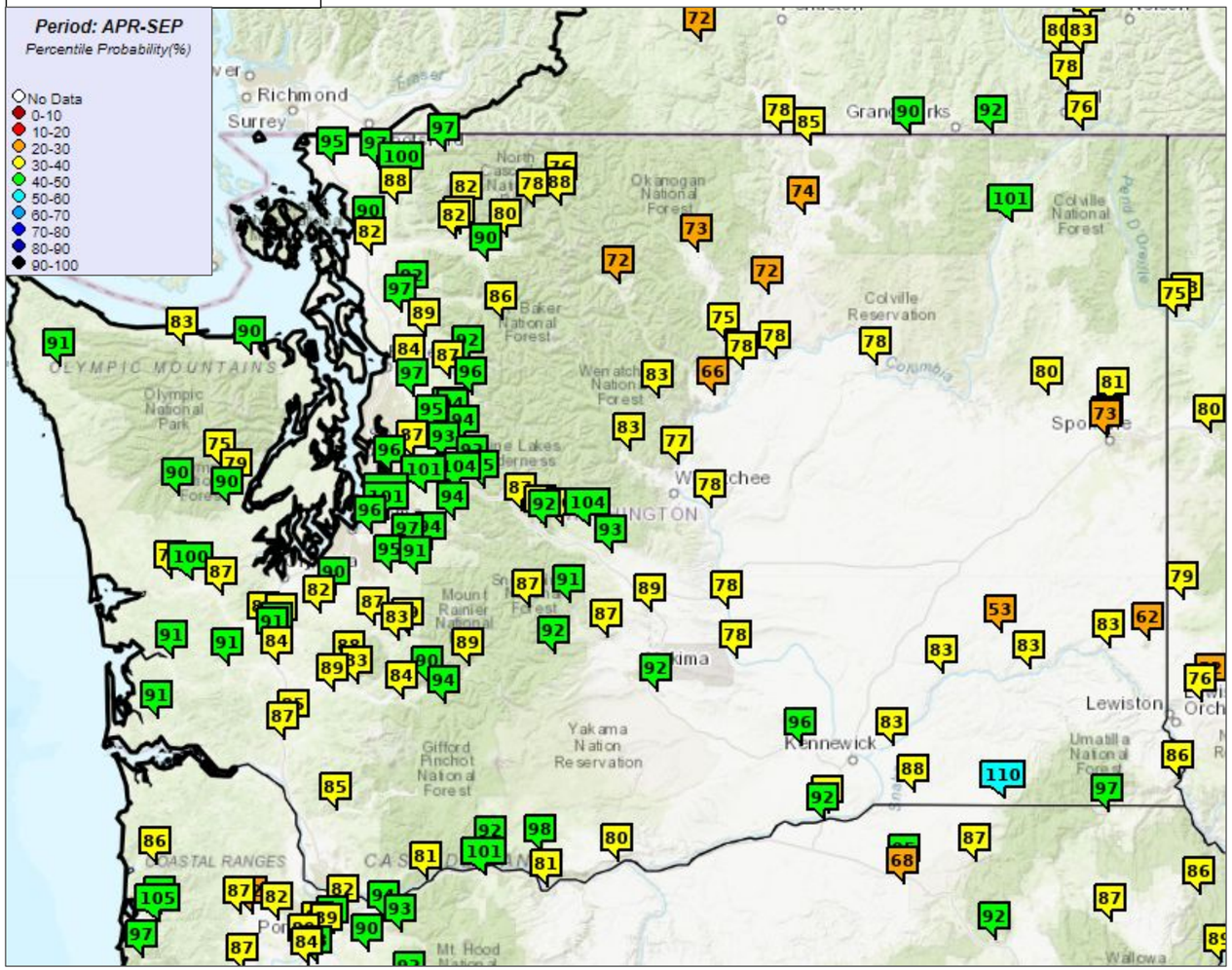


Apr - Sep Forecast Percent Normal

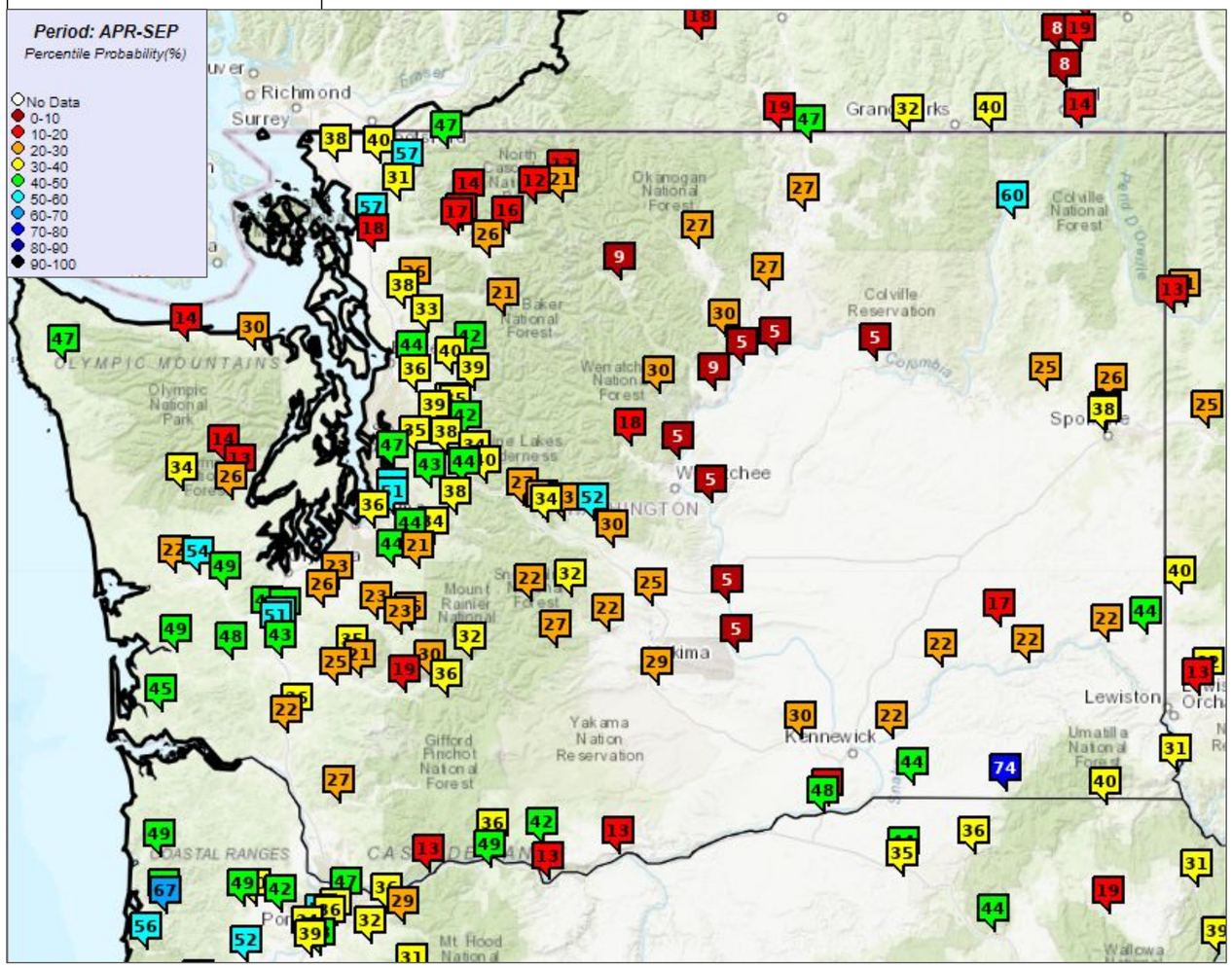


Runoff and Forecasts

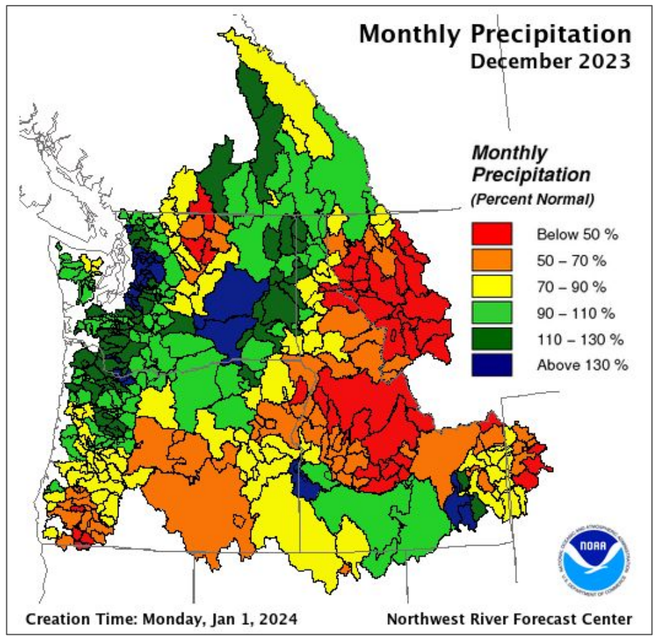
Apr - Sep Forecast
Percent Normal

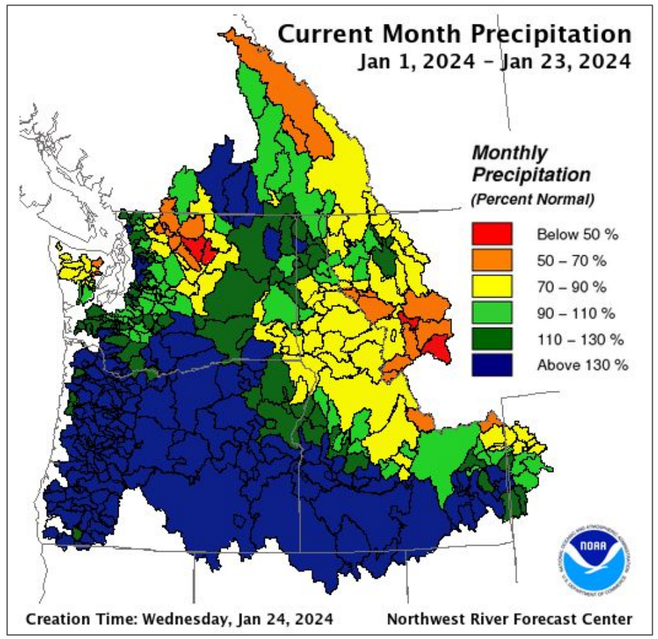


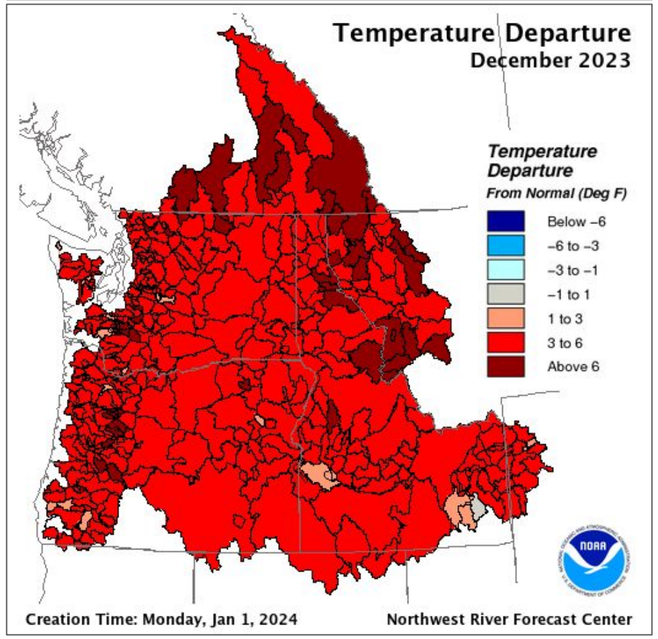
Apr - Sep Forecast
Percentile

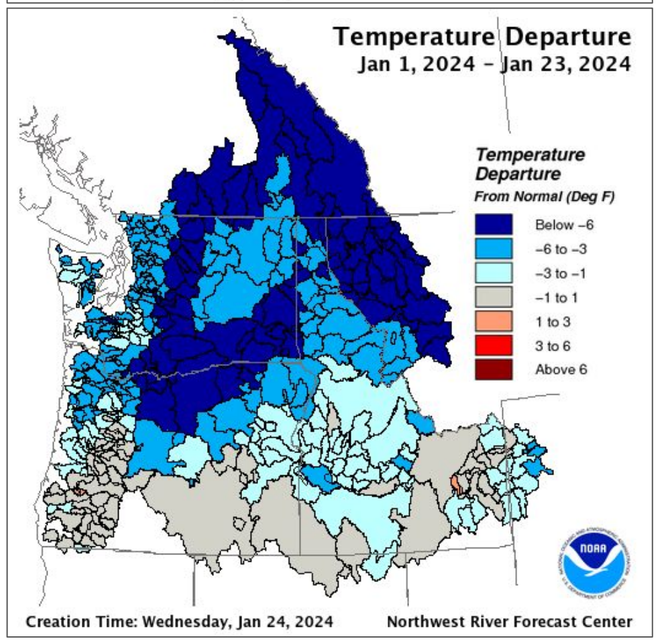


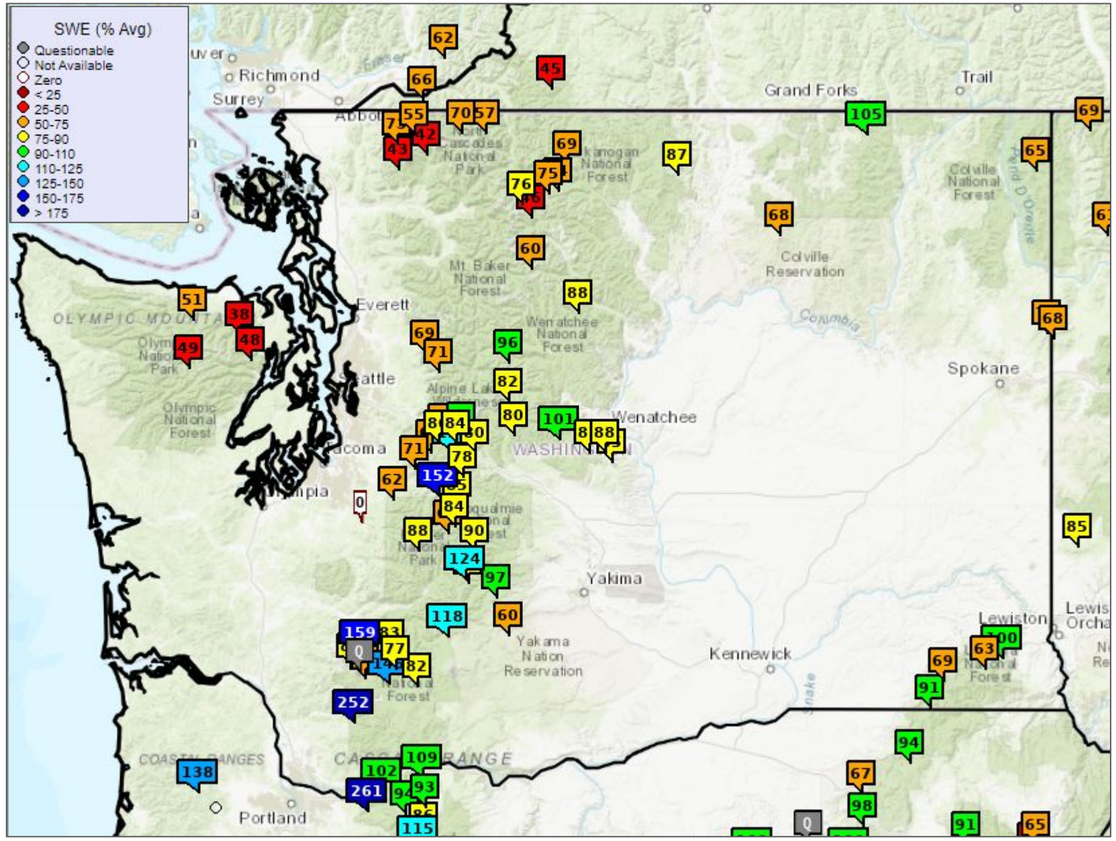
Precipitation, Temperature and Snowpack





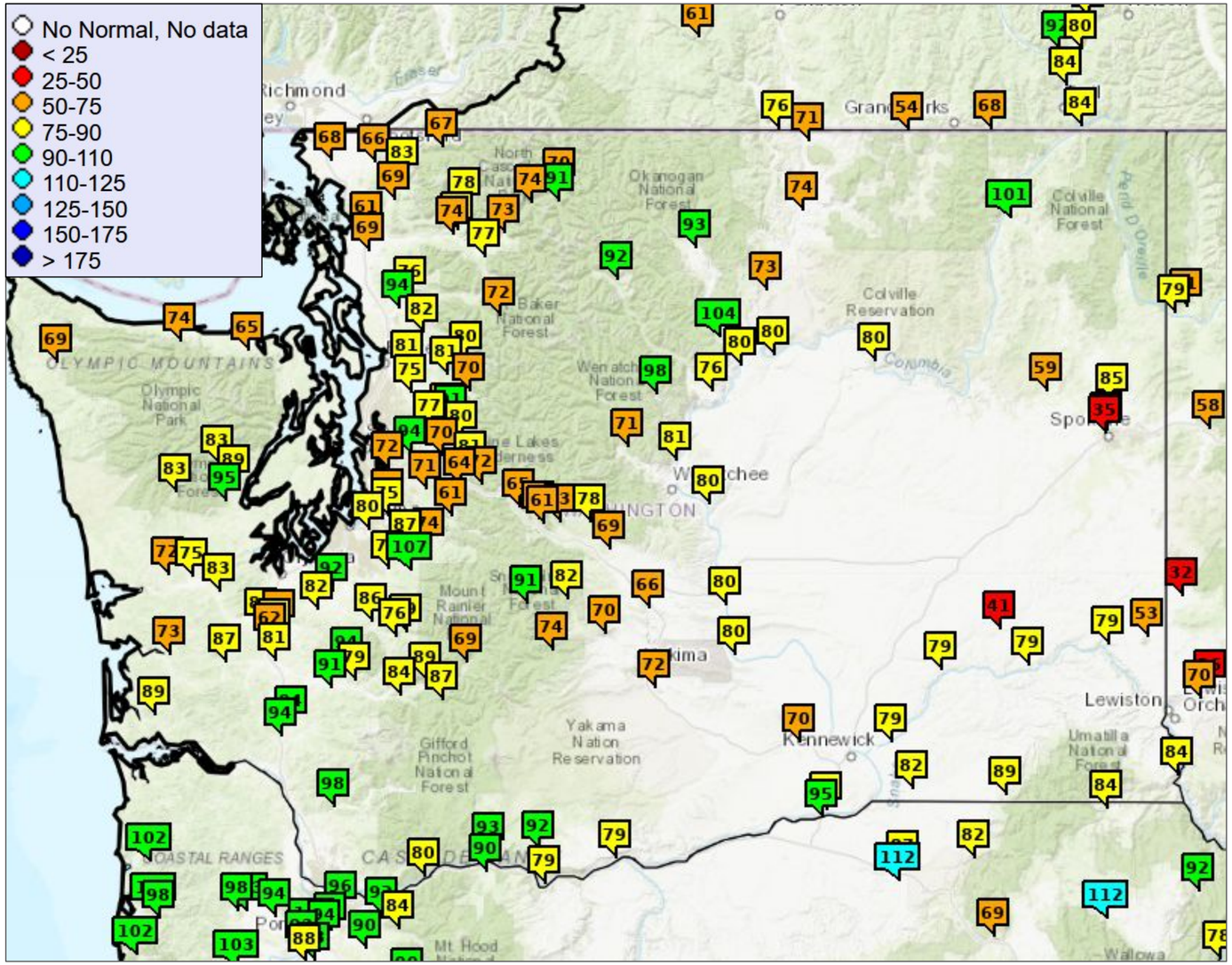






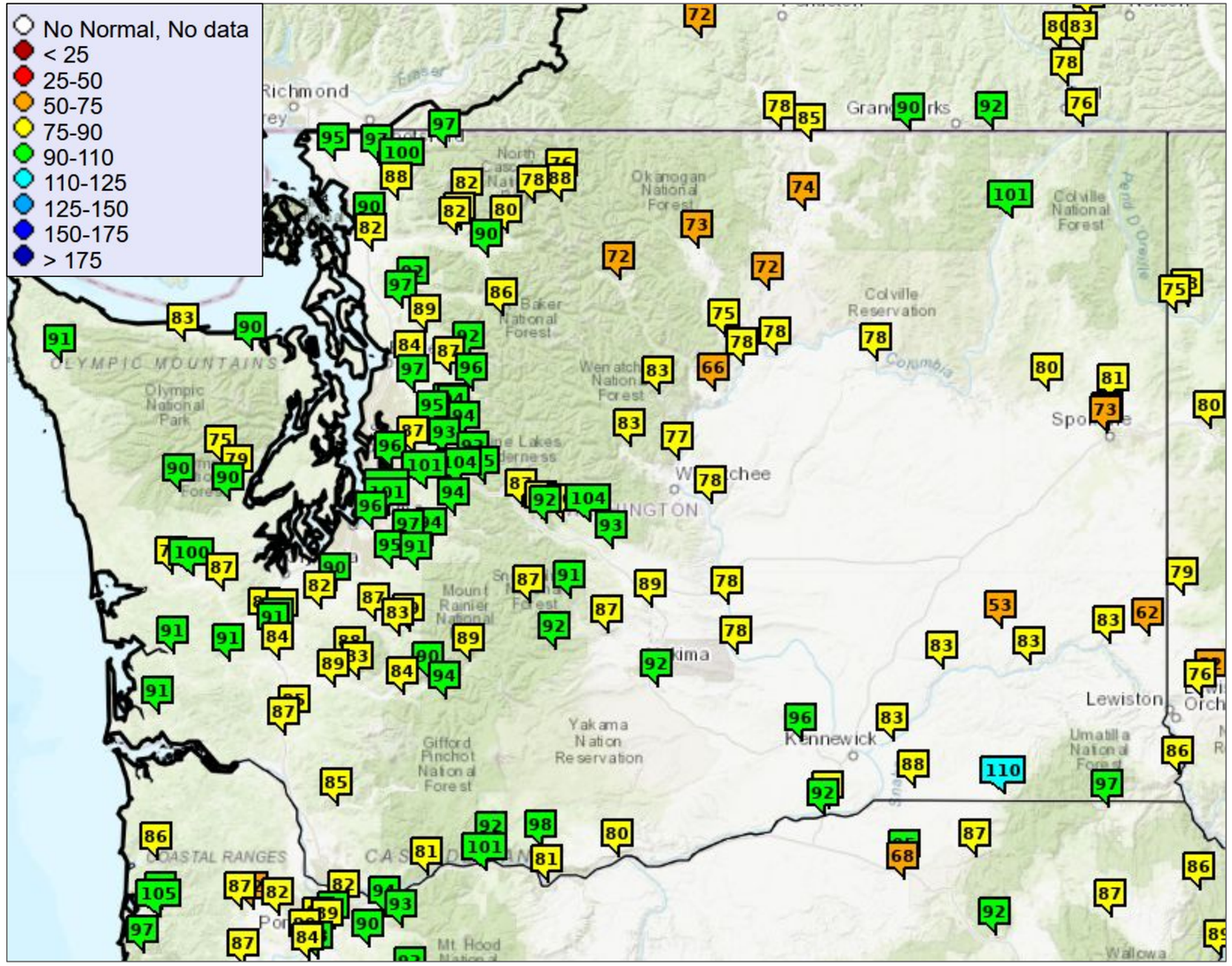
Water Year to Date Natural Runoff

Forecast Point	% Normal Runoff Oct 1 - Jan 23
Skagit nr Mt Vernon	69
Dungeness nr Sequim	65
Chehalis at Porter	83
Okanogan at Malott	73
Methow nr Pateros	104
Yakima at Parker	72
Walla Walla nr Touchet	82

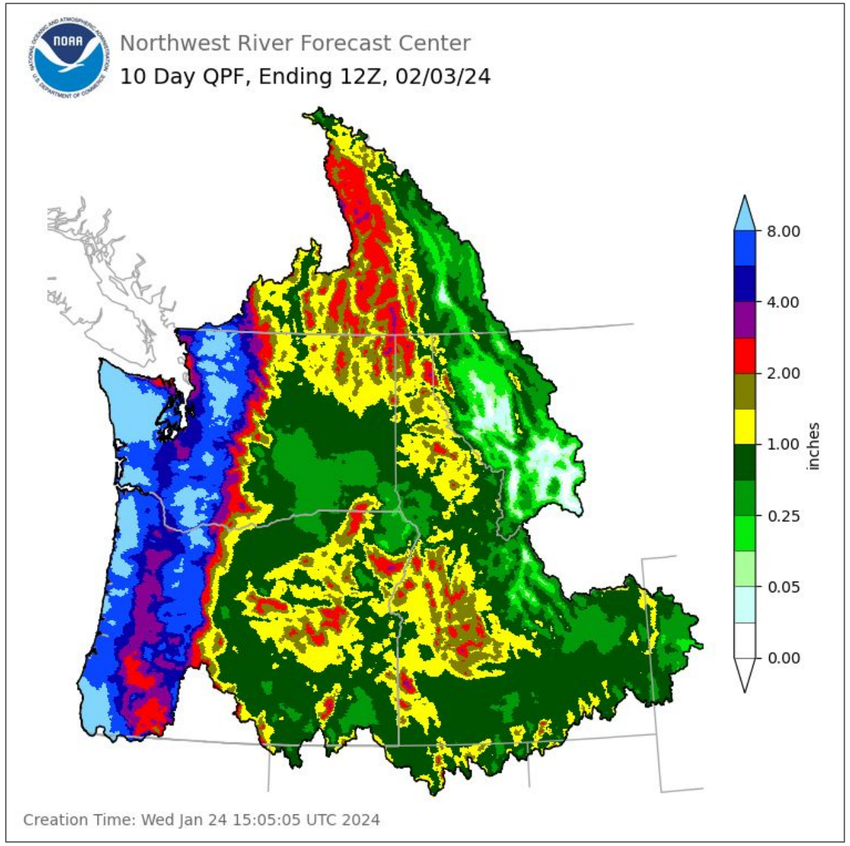


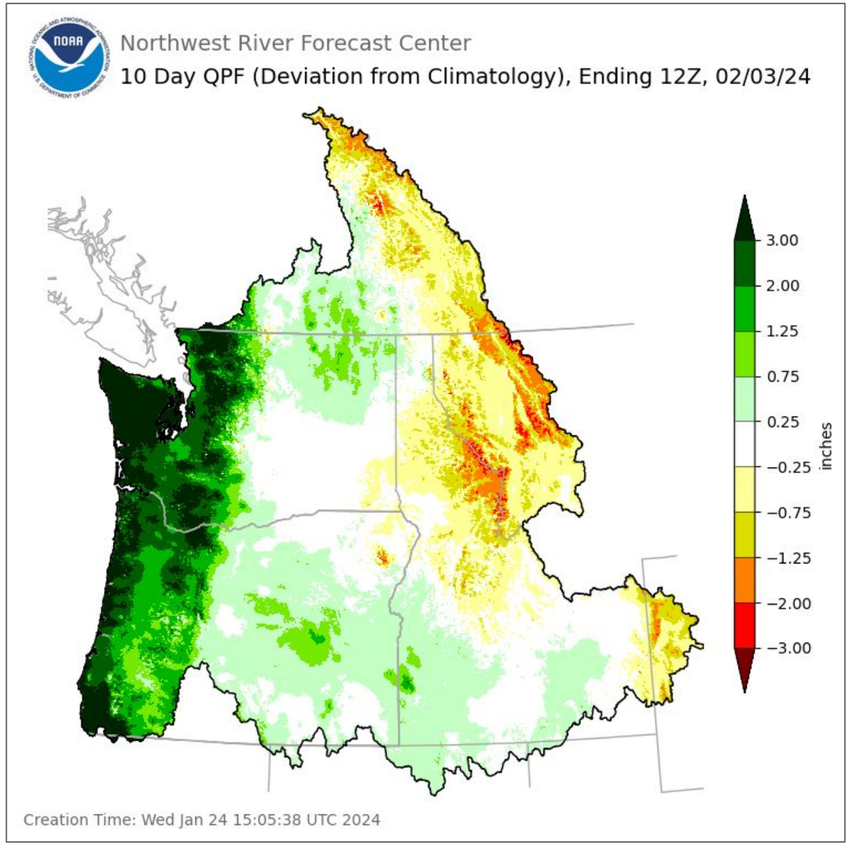
Natural Water Supply Forecasts

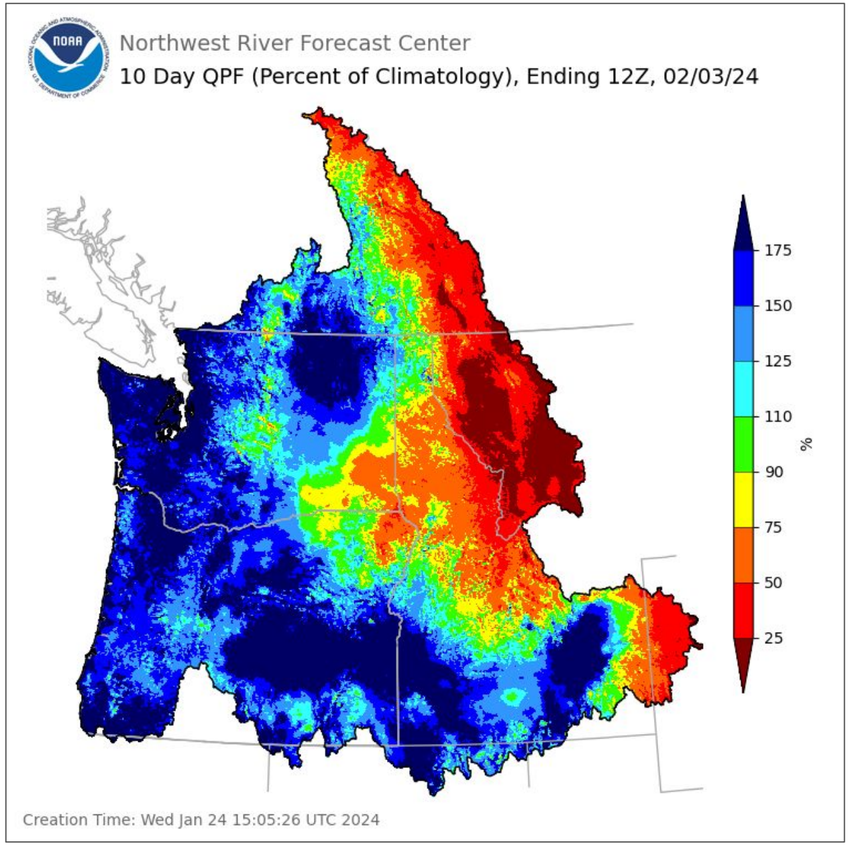
Forecast Point	% Normal Apr - Sep Vol
Skagit nr Mt Vernon	82
Dungeness nr Sequim	90
Chehalis at Porter	72
Okanogan at Malott	83
Methow nr Pateros	75
Yakima at Parker	92
Walla Walla nr Touchet	88



10 Day Precipitation Forecast used in ESP10





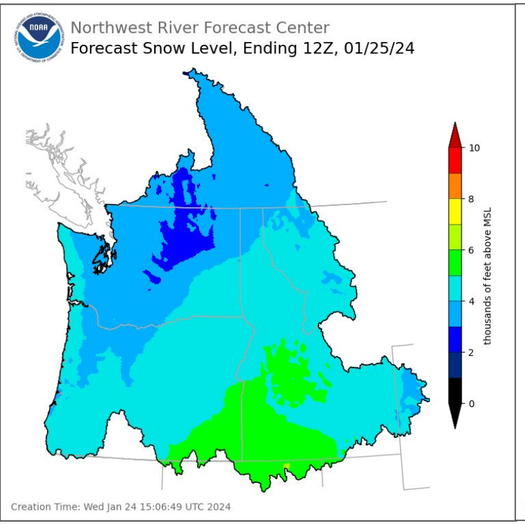


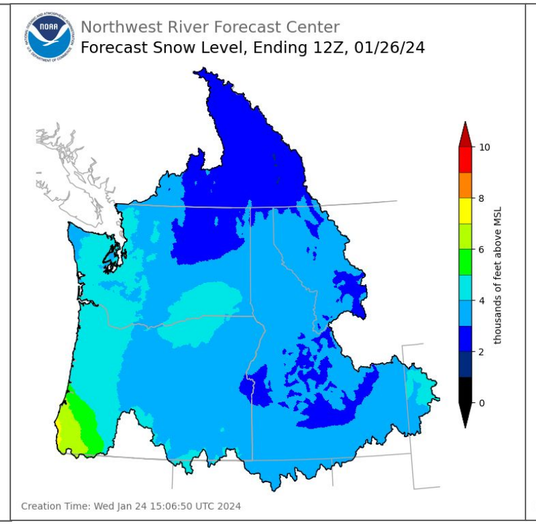
Quantitative Precipitation Forecast (QPF) Sources
Days 1 - 2 NWS Weather Forecast Offices (WFO) in the US, WPC in BC
Days 3 - 7 NWS Weather Prediction Center (WPC)
Days 8 - 10 NWS National Blend of Models (NBM)

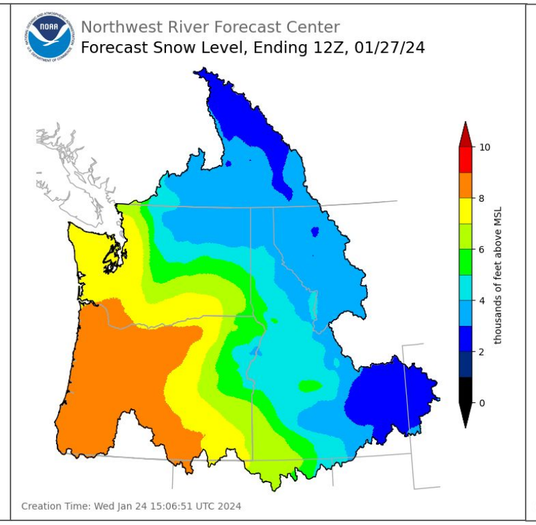
10 Day Snow Level Forecast

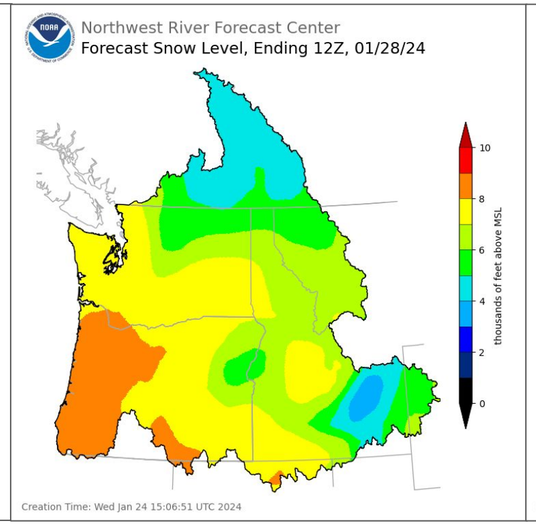
NWRFC

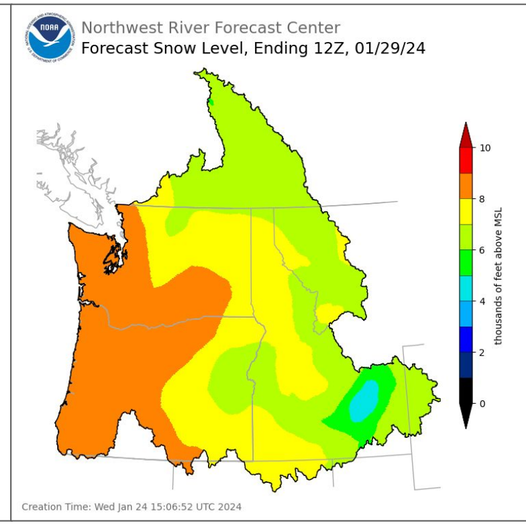
Jan 24, 2024

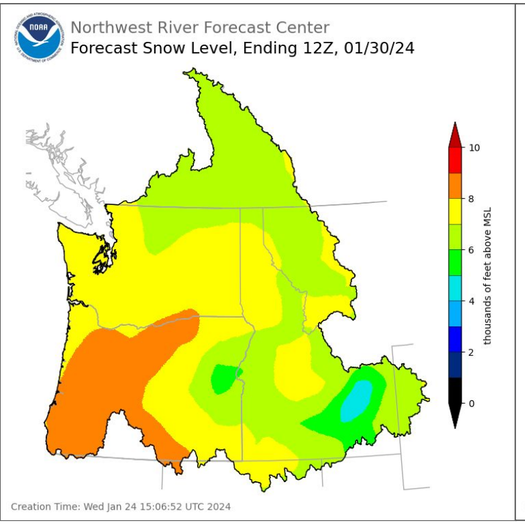


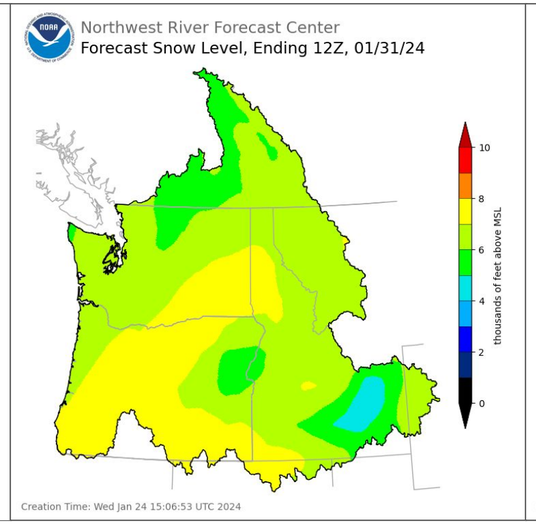


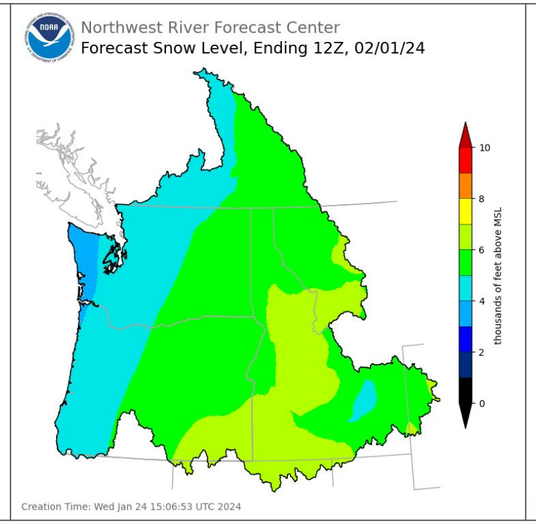


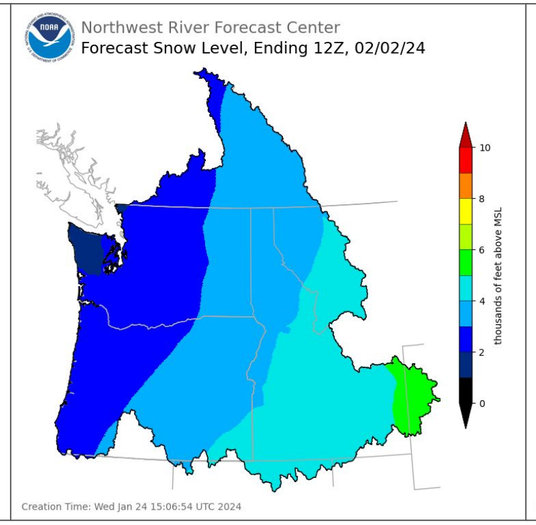


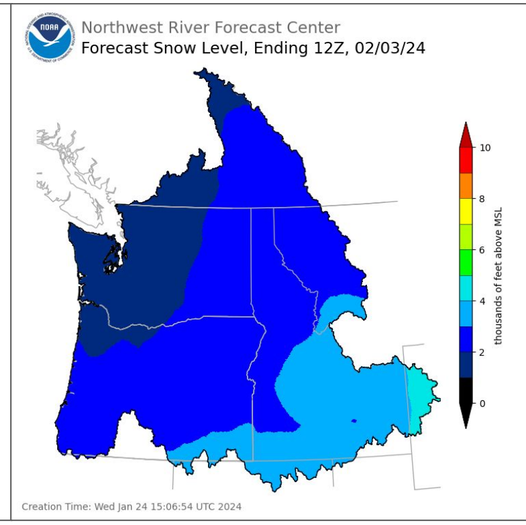








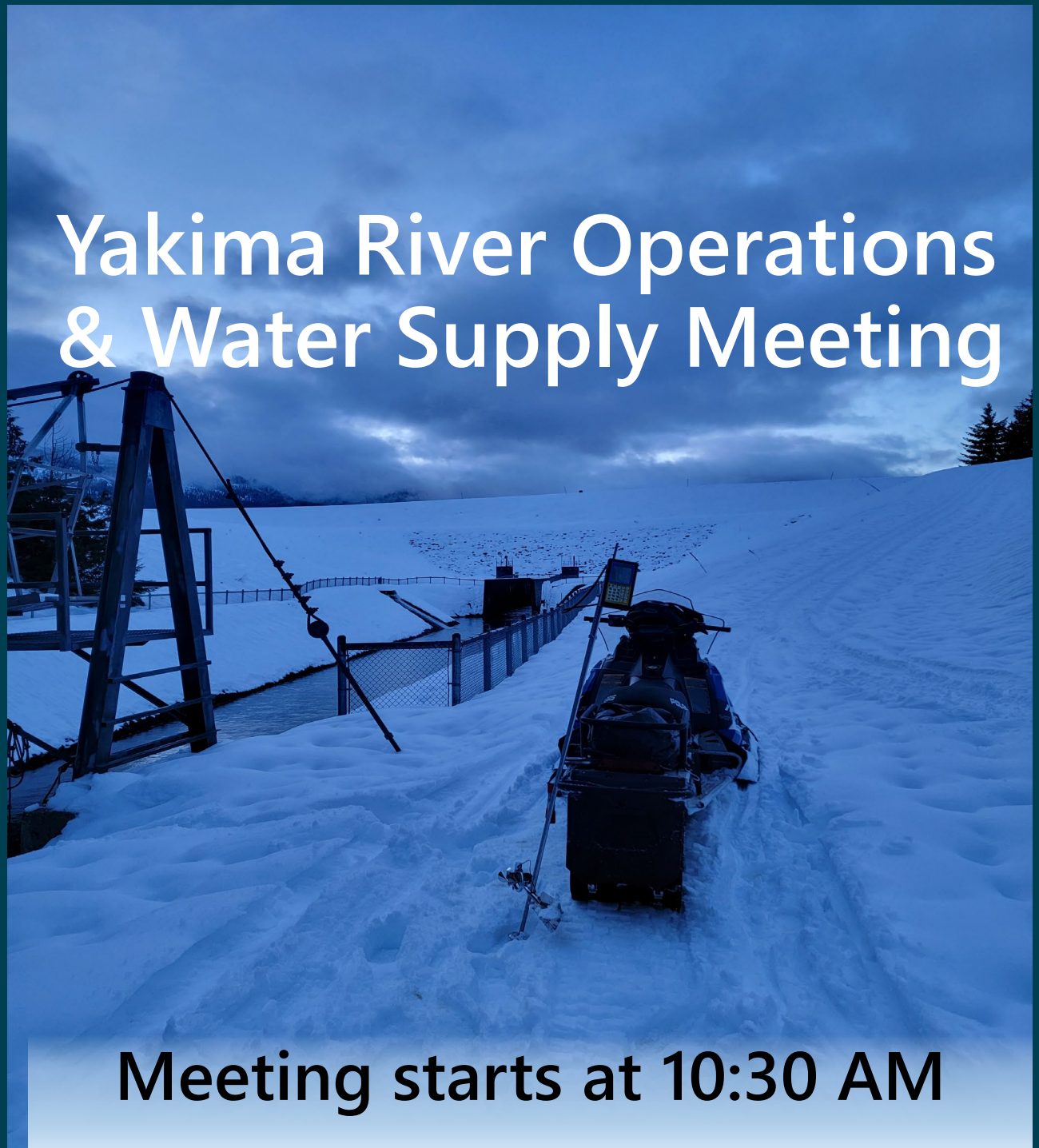




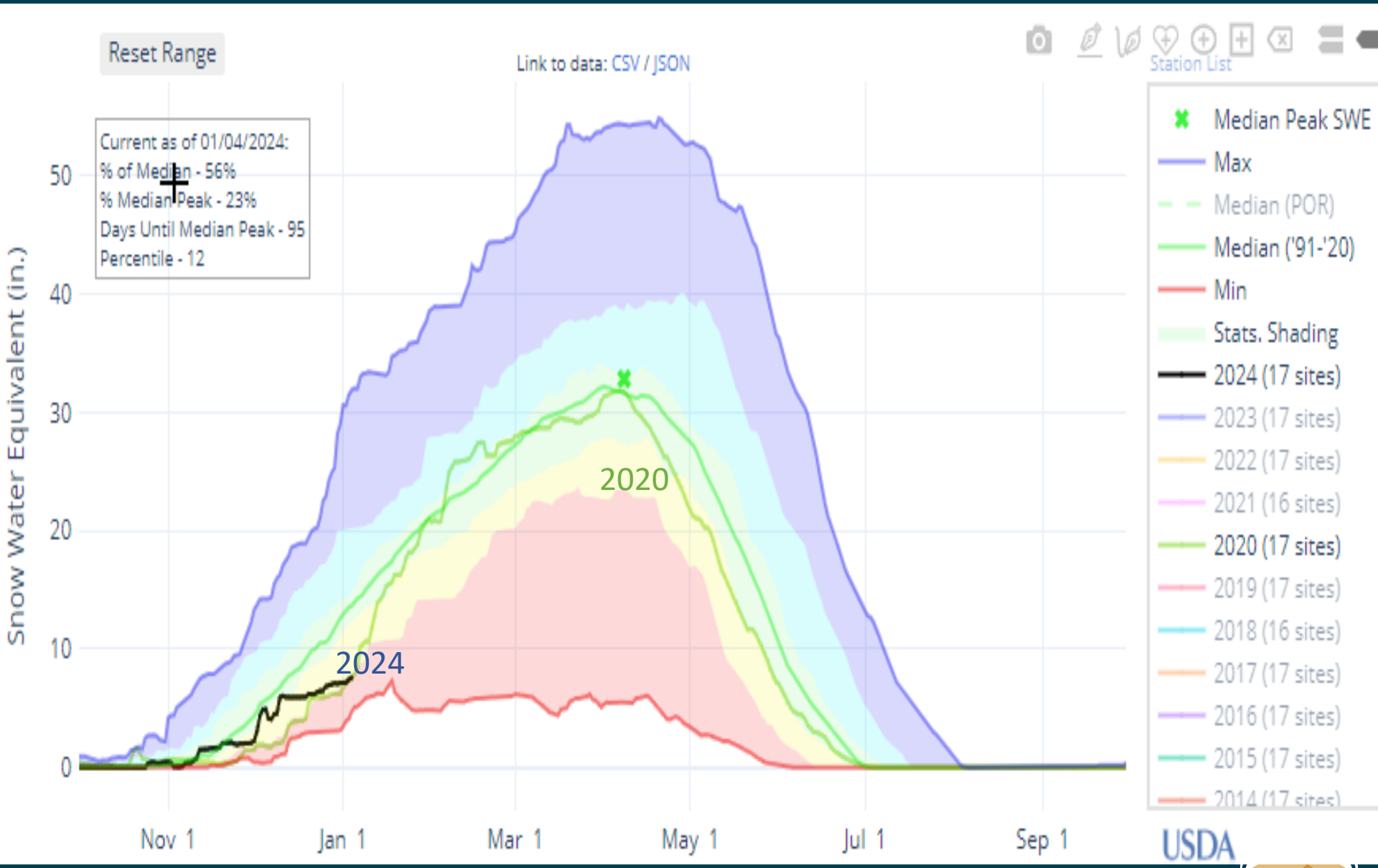
Takeaways

- Water year 2024 has been drier and warmer than normal
- Snowpacks are below normal
- Runoff volumes since October 1 are mostly below normal
- Water supply forecasts are a mix of normal to below normal, percentiles are quite low in some places
- Next 10 days expected to bring more than normal precipitation to western Washington but temperature are expected to be warm.

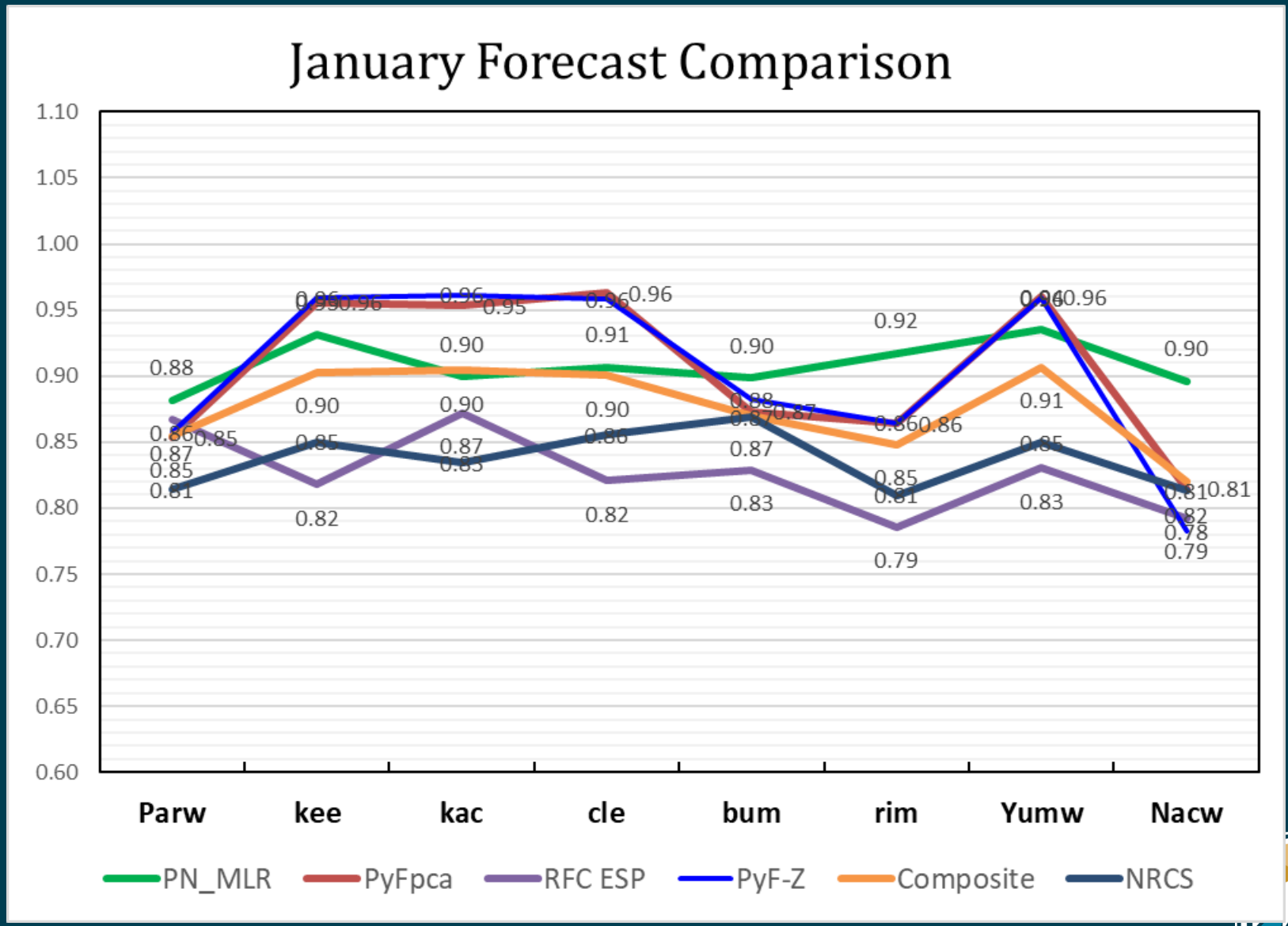
Yakima River Operations & Water Supply Meeting



Meeting starts at 10:30 AM


Reset Range
Link to data: CSV / JSON
Station List
Current as of 01/04/2024:
% of Median - 56%
% Median Peak - 23%
Days Until Median Peak - 95
Percentile - 12
Snow Water Equivalent (in.)
50
40
30
20
10
0
2020
2024
Nov 1
Jan 1
Mar 1
May 1
Jul 1
Sep 1
Median Peak SWE
Max
Median (POR)
Median ('91-'20)
Min
Stats. Shading
2024 (17 sites)
2023 (17 sites)
2022 (17 sites)
2021 (16 sites)
2020 (17 sites)
2019 (17 sites)
2018 (16 sites)
2017 (17 sites)
2016 (17 sites)
2015 (17 sites)
2014 (17 sites)
USDA

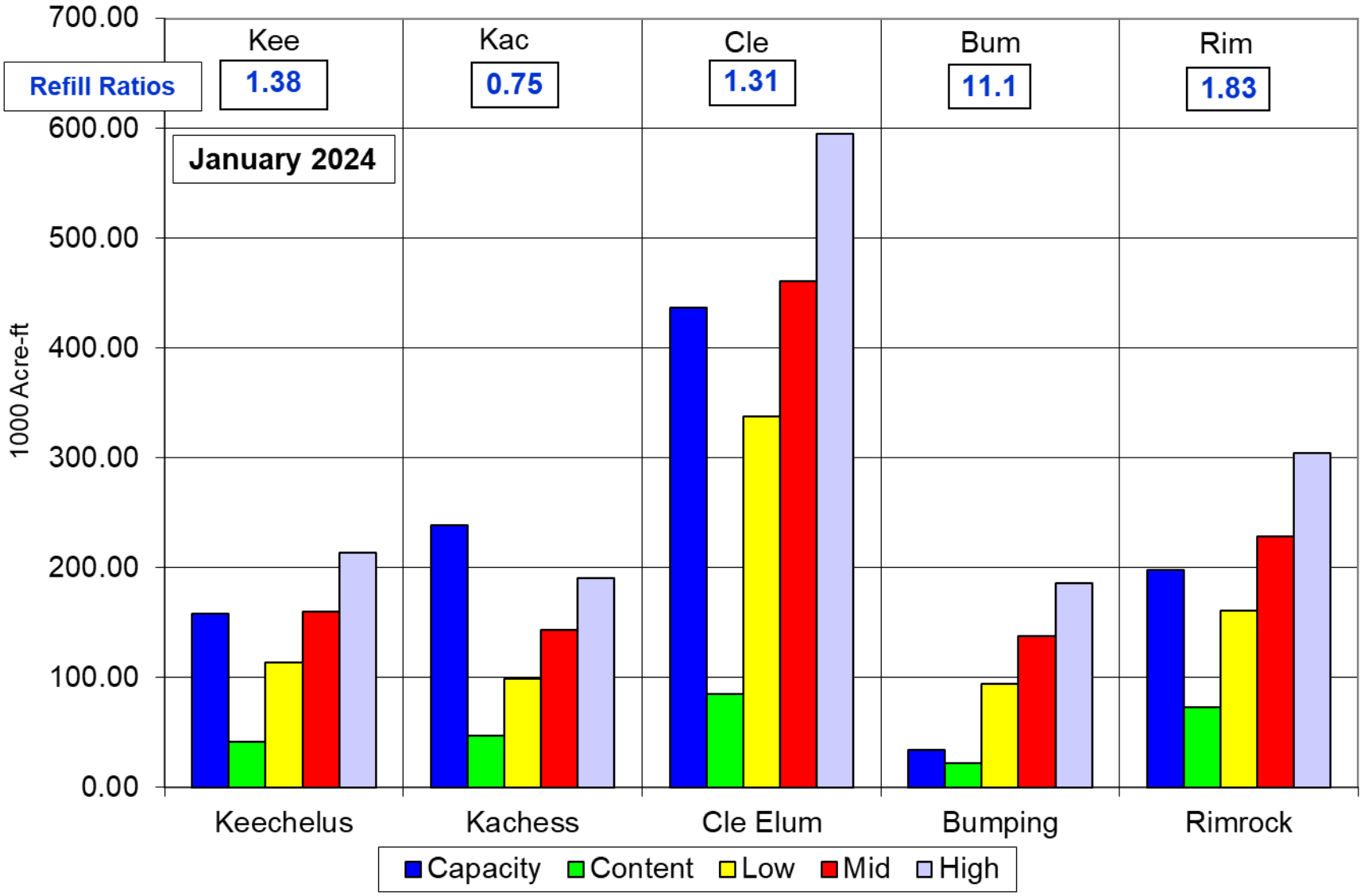
Yakima Subbasin forecasts, WY24



Yakima Subbasin forecasts

Yakima Basin Forecasts, Jan-Jul, AF						
Jan, 2024	Min	Composite	Max	Min	Composite	Max
Parw	1457187	2201709	3026197	57%	85%	117%
kee	113320	160052	213370	64%	90%	120%
kac	99125	143044	190565	63%	90%	120%
cle	337950	460816	595143	66%	90%	116%
bum	94543	137513	186028	60%	87%	118%
rim	161239	228828	304545	60%	85%	113%
Yumw	733660	1022912	1340544	65%	91%	119%
Nacw	531695	846035	1175537	52%	82%	114%

Yakima Project Runoff Forecast to Reservoir Space Available



Hydrologic Summary

- Yakima Reservoir Storage is low, 268, 55% avg.
- Went from 3rd lowest to 6th lowest (1971-2023).
- Fall precip and flows were low
- Dec was wet
- YRBWEP Conservation: 22.4 KAF
- Spawning flows are set to the BA minimum.
- Forecasts are not too grim in January, as is typical.