

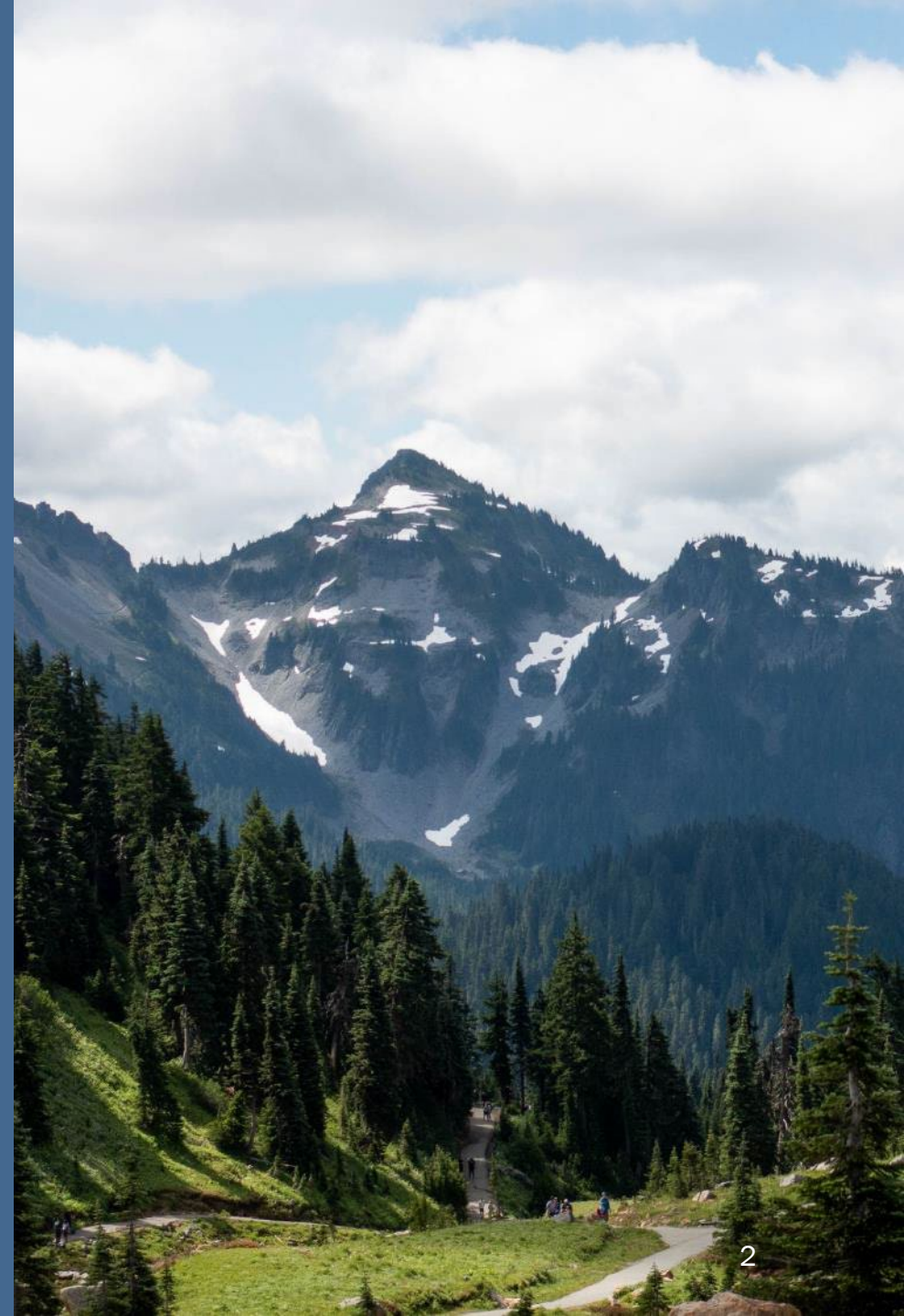


Water Supply Availability Committee

November 14, 2024



Recording!



Agenda

| Time | Agenda item | Responsible |
|------------|---|--------------------------|
| 10:00 a.m. | Welcome and agenda Recap: Drought declaration and implications | Caroline Mellor, Ecology |
| 10:10 a.m. | Regional Climate Setting / ENSO <ul style="list-style-type: none">• La Niña Deep Dive (Special for November!) | Karin Bumbaco, OWSC |
| 10:20 a.m. | Streamflow and Groundwater | Nick Sutfin, USGS |
| 10:35 a.m. | Mountain Conditions | Matt Warbritton, NRCS |
| 10:50 a.m. | Yakima Project | Chris Lynch, BOR |
| 11:00 a.m. | Water Supply Forecasts | Amy Burke, NWRFC |
| 11:15 a.m. | Discussion: What concerns do folks have for drought recovery and Water Year 2025? | All participants |
| 11:25 a.m. | Wrap-up and next steps | Caroline Mellor, Ecology |

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.

Meeting Objectives

- Share pertinent info and assess water supply conditions in Washington as we enter Water Year 2025
- Hear a deep dive into La Niña from the Office of the Washington State Climatologist.

Drought Emergency Declaration

On April 16, 2024,
Ecology declared a
Statewide drought due to
low snowpack and warm
and dry forecast.

Limited exceptions for
Puget Sound metro areas
with healthy water
storage.



Drought Conditions

Drought conditions - two requirements:

- 1. Hydrologic threshold** – An area is receiving, or is projected to receive, less than seventy-five percent of normal water supply.
- 2. Hardship threshold** – Water users and the environment are or are expected to experience undue hardship.

This Committee advises on the hydrologic threshold.

See: [RCW 43.83B.405](#) and [WAC 173-166-050](#).

Water Supply Factors

Water
year to
date

- Snowpack
- Precipitation
- Temperature
- Soil moisture

Hydrologic
threshold
for
drought
was met

Forecasts

- Streamflow
- Precipitation
- Temperature
- Soil moisture

Feb 2, 2024



Hurricane Ridge Webcam, National Park Service
Olympic National Park

Initial and Expected Impacts

Agricultural and livestock

- Fallowed land
- Economic impacts to be determined

Instream flows, fish and wildlife

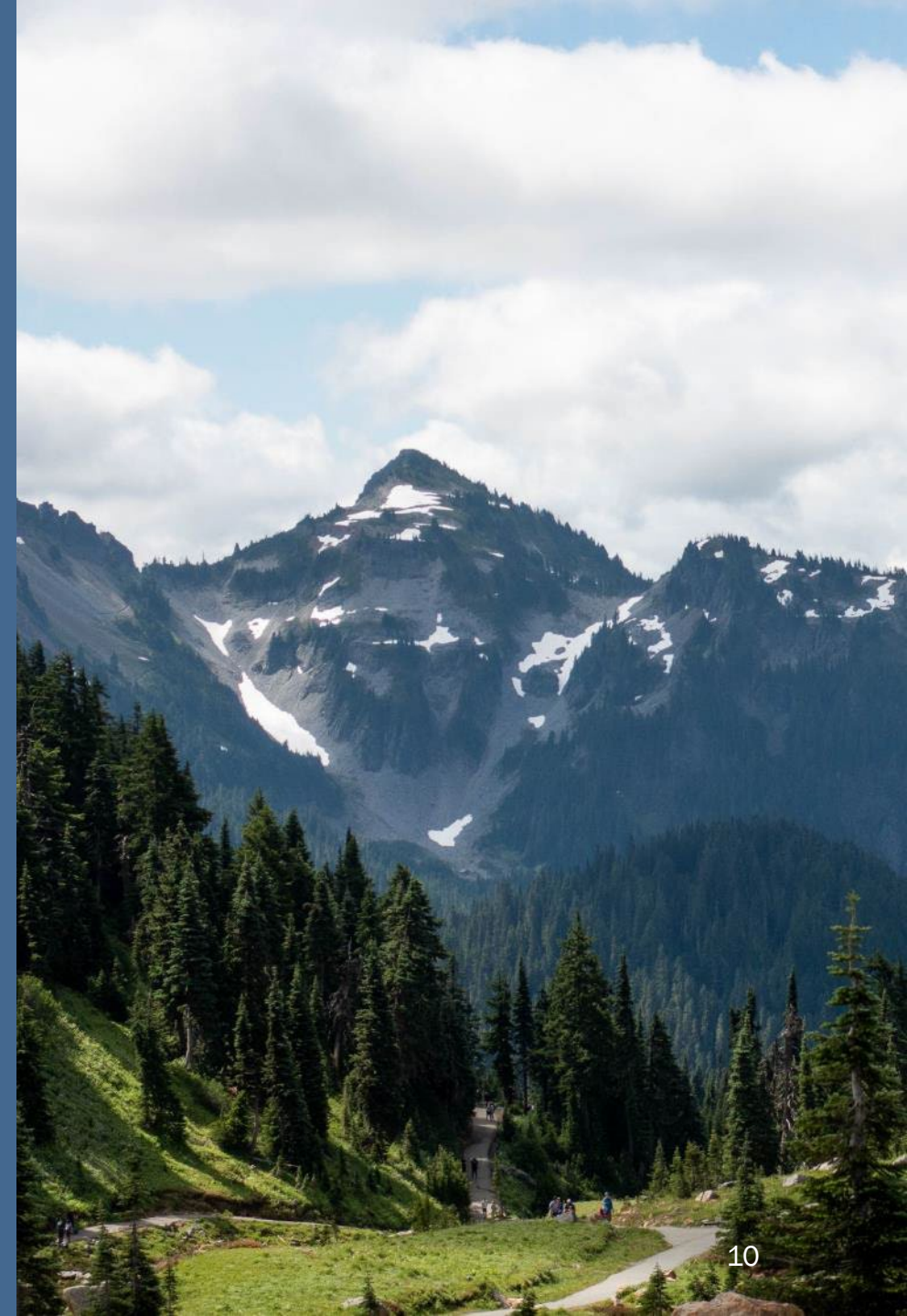
- Fish passage and fish mortality concerns
- Low flows and elevated stream temperatures through the fall

Public water systems and domestic uses

- Impacts likelier later in the season to small, rural water systems



Implications of a Drought Declaration



What Does a Declaration Do?

Provides Ecology with the authority to:

1. Expedite emergency water transfer applications.
2. Establish a grant program to mitigate hardships to water users and the environment.



Drought Response Funding

Grants to governmental entities:

- Federally recognized Tribes
- Counties, cities, and towns
- Water and sewer districts
- Public utility districts
- Port districts Conservation districts Irrigation districts
- Watershed management partnerships

Additional Implications

State agencies – Ecology can enter into interagency agreements to fund drought response efforts

- Examples: DOH, DFW, SCC, AGR

Eligibility for federal drought funding

Important communications tool

Drought response grants - Washington State Department of Ecology

Water resources drought response grants

This funding opportunity opens April 17, 2024.

We issued a [Drought Emergency Declaration](#) on April 16, 2024. On April 10, 2024, the state Executive Water Emergency Committee determined that specific areas in Washington meet the statutory criteria for drought conditions described in [Chapter 43.83B RCW](#), "water supply is less than 75 percent of normal, resulting in undue hardships to water users and the environment." Under [SHB 1138, Emergency Drought Response](#), funding became available to alleviate immediate conditions from this drought. The adopted [emergency drought funding rule](#), Chapter 173-167 WAC, remains effective until Aug. 14, 2024.

Ecology may extend the emergency rule based on evolving drought conditions. If the emergency rule is extended, these guidelines will be updated to reflect the extended date to which applications may be submitted.

I want to...

- [Apply for or manage a grant or loan](#)
- [Get guidance for managing a grant or loan](#)
- [Learn more about the 2024 drought](#)

Example Drought Response Grant Projects

Agriculture or livestock

- Purchasing or leasing water or water rights
- Replacing intakes, pumps, and related accessories

Public water supply

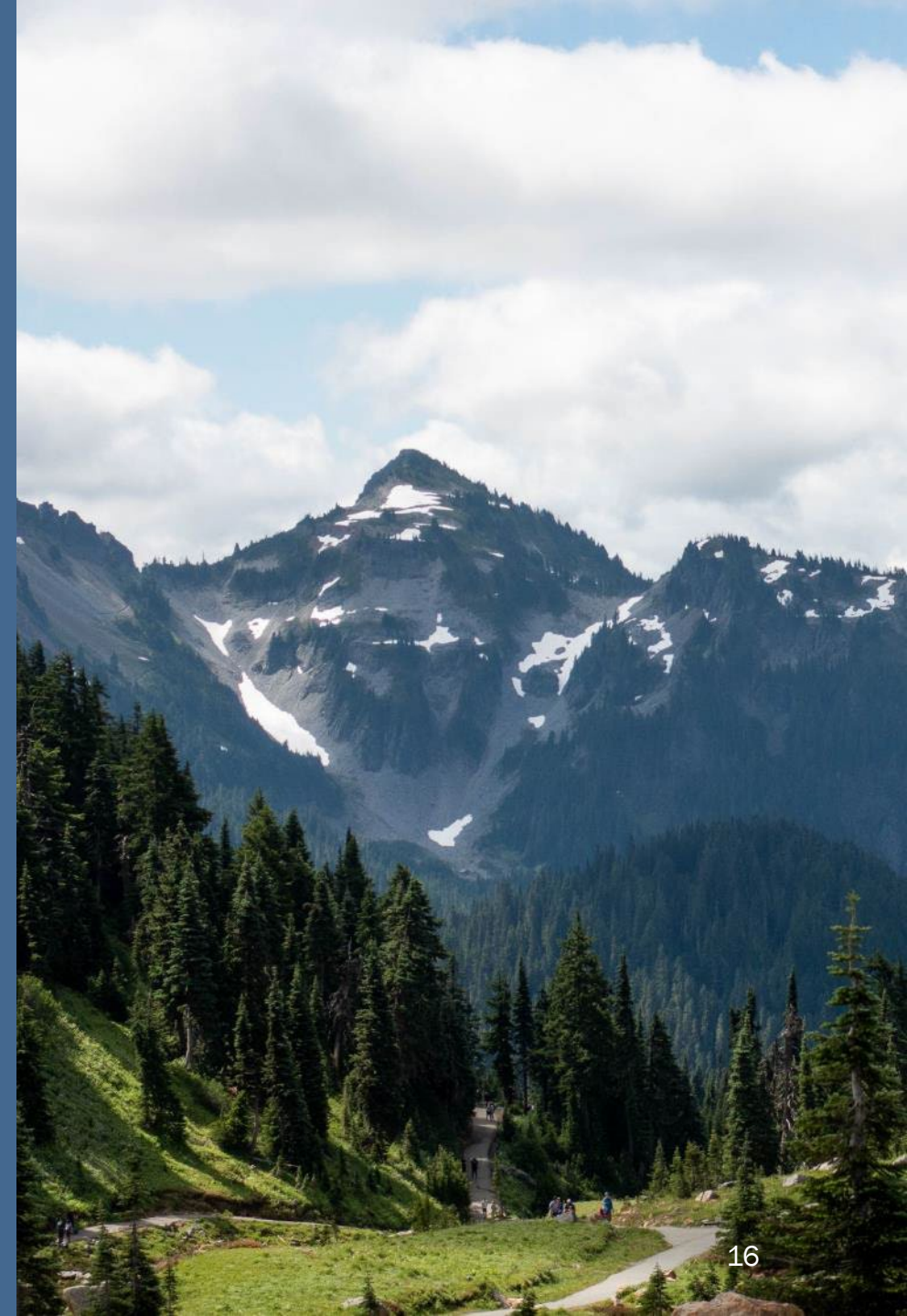
- Transporting emergency water supplies
- Implementing water conservation strategies

Fisheries and wildlife

- Eliminating migration barriers
- Modifying stream channels adjacent to a hatchery



Ongoing drought management



Drought response continues

Drought response funding remains open.

- Ecology re-issued the Emergency Drought Funding rule August 14.
- Ecology may re-issue the emergency rule again in December, depending on evolving conditions.



Drought response continues

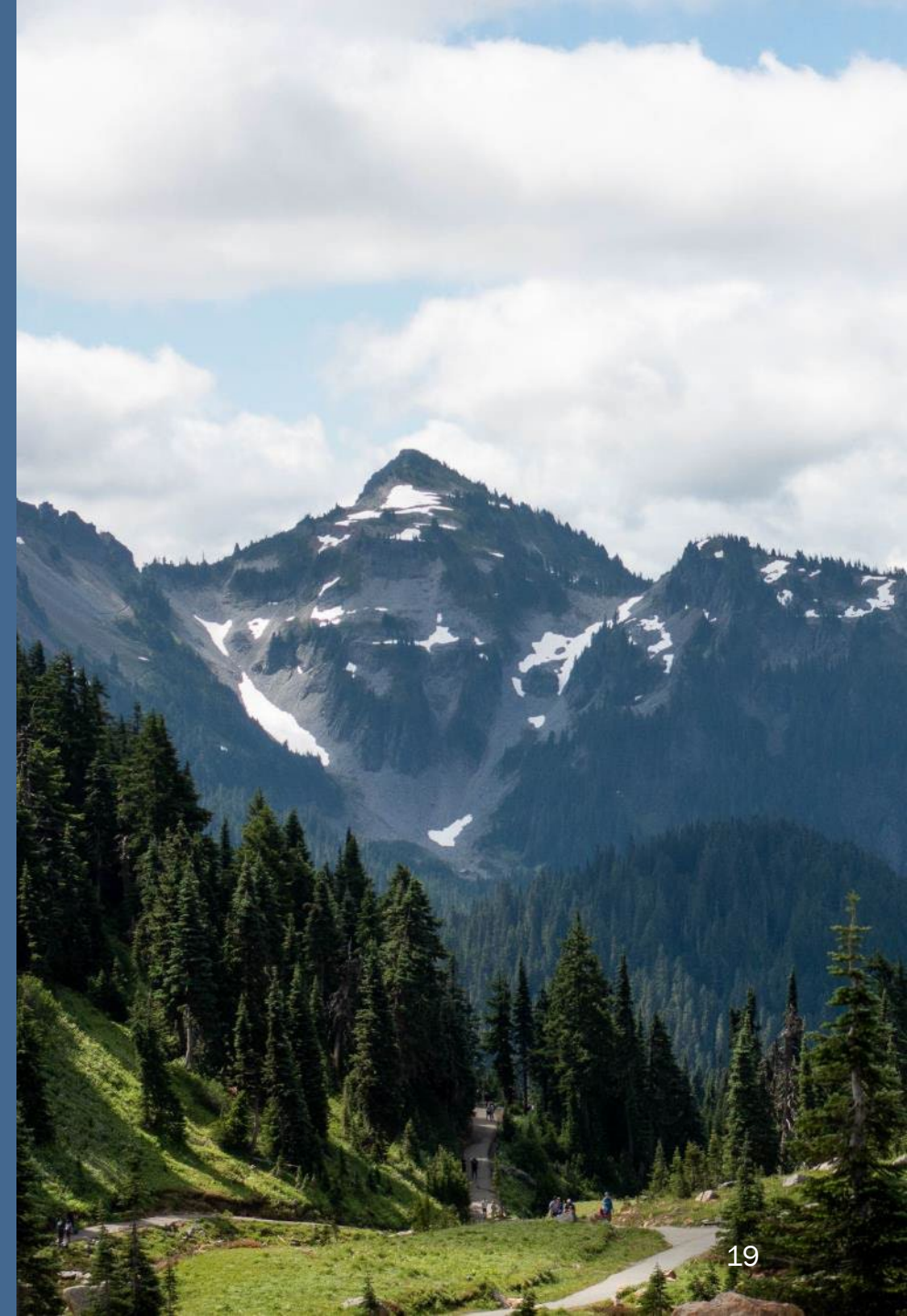
The Drought declaration is currently in place till April 2025.

- Ecology will continue to evaluate conditions throughout this fall and winter.





Presenters



Discussion Question

For all meeting attendees:

What concerns do folks have for drought recovery and Water Year 2025?

Drought Info

- Updated drought website: [Drought Response - Washington State Department of Ecology](#)
 - Declaration - [Order of Determination by the Director](#)
- [Water Supply Availability Committee \(WSAC\) website](#)

Take the PNW Water Year Impacts Assessment Survey: [2024 Water Year Impacts Survey](#)



Thank you

Contact: Committee Chair
Caroline Mellor
Statewide Drought Lead
Caroline.Mellor@ecy.wa.gov



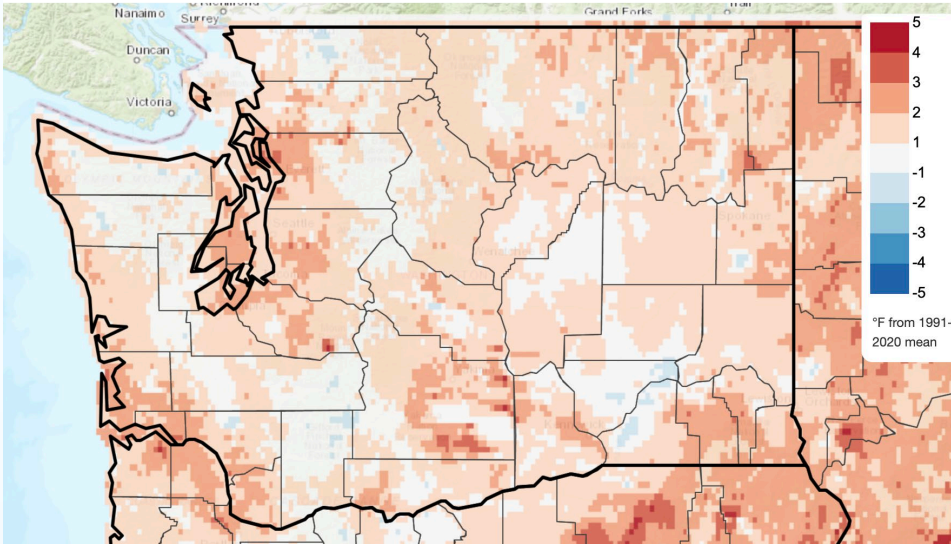
Current Conditions and Seasonal Outlook

Karin Bumbaco
Office of the Washington State Climatologist
Climate Impacts Group
University of Washington
November 14, 2024

Water Year 2025

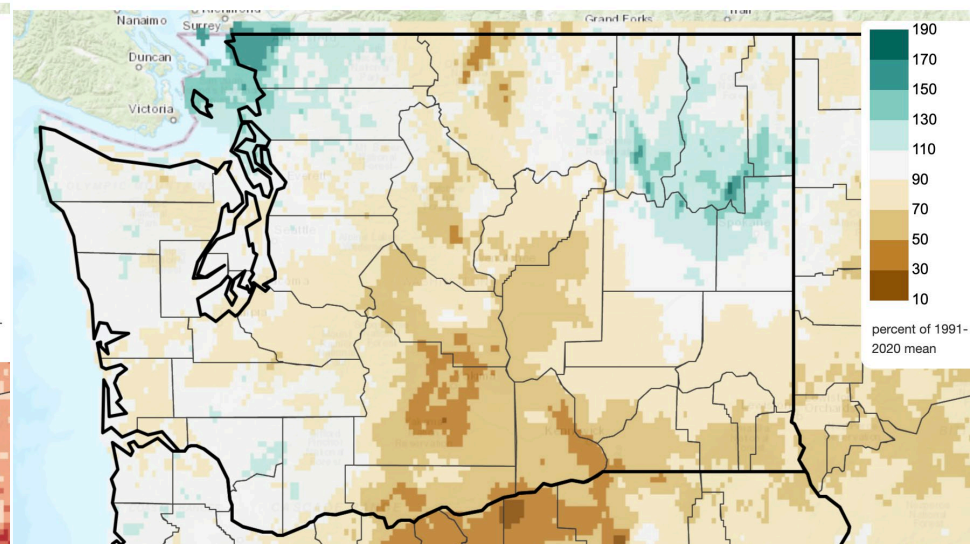
Temperature

Mean Daily Temperature Anomaly, Since Oct 1st
2024/10/01 - 2024/11/11



Precipitation

Total Precipitation Anomaly, Since Oct 1st
2024/10/01 - 2024/11/11



[Climate Toolbox](#)

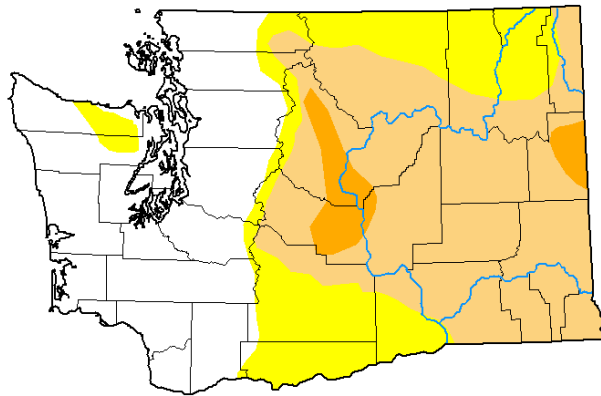
- Averaged statewide, October temperatures were 1.3°F above normal, tying as the 29th warmest*
- Averaged statewide, October precipitation was 84% of normal (tied for 58th driest)

*Records since 1895; Normal is 1991-2020

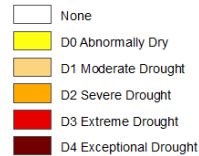
U.S. Drought Monitor

U.S. Drought Monitor Washington

November 12, 2024
(Released Thursday, Nov. 14, 2024)
Valid 7 a.m. EST



Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

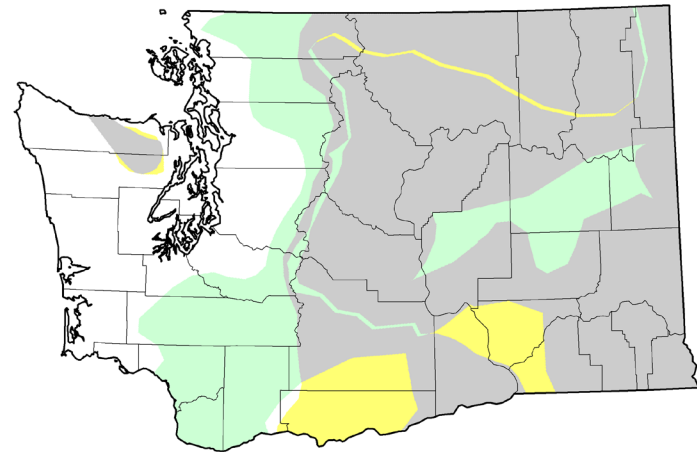
Author:

Richard Tinker
CPC/NOAA/NWS/NCEP



droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - Washington 5 Week

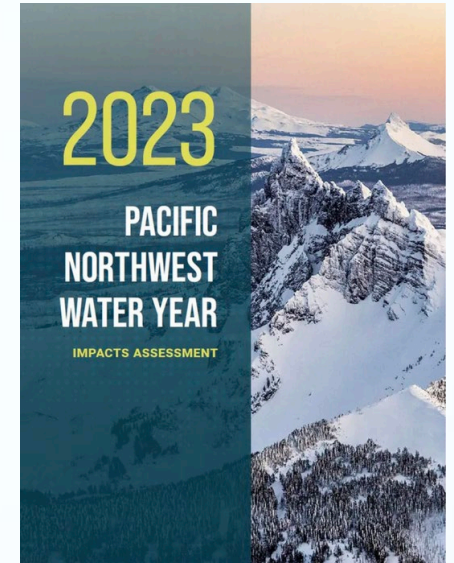
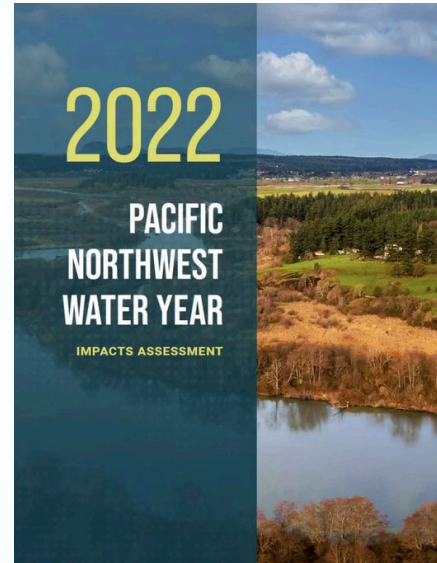
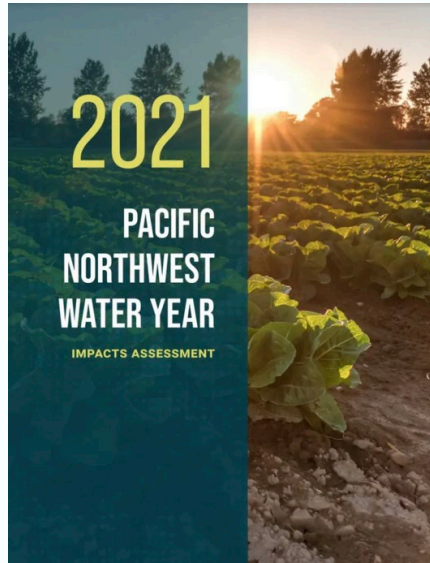
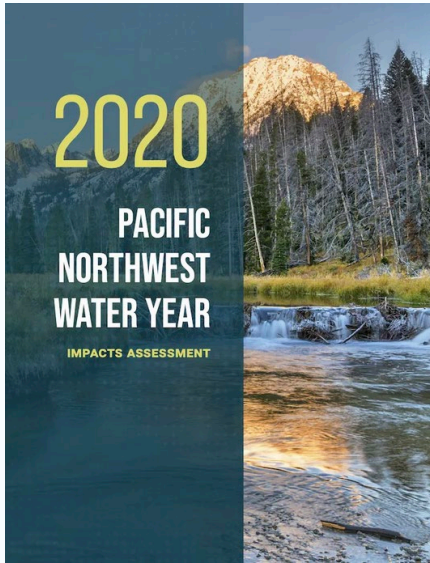


November 12, 2024
compared to
October 8, 2024

droughtmonitor.unl.edu



PNW Water Year Impacts Assessment



2024

Your Input Here

Take the PNW 2024
Water Year Impacts
Survey!

(open through November 27)

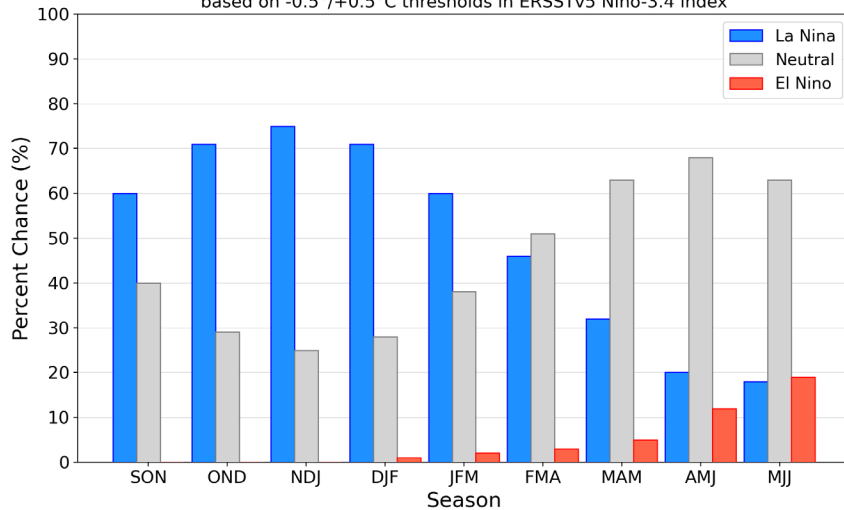


Current Status: Neutral Conditions

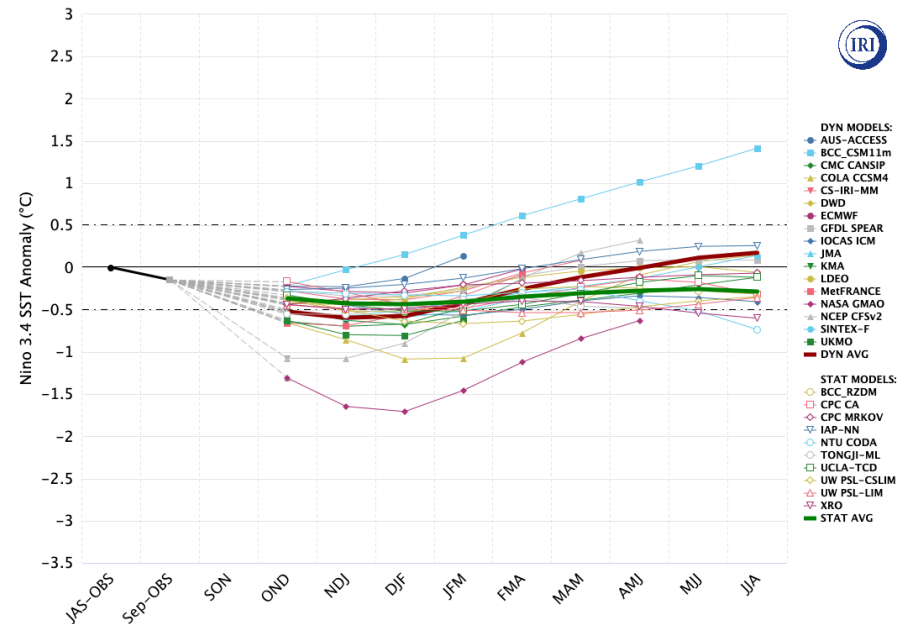
La Niña Watch

Official NOAA CPC ENSO Probabilities (issued October 2024)

based on $-0.5^{\circ}/+0.5^{\circ}\text{C}$ thresholds in ERSSTv5 Niño-3.4 index



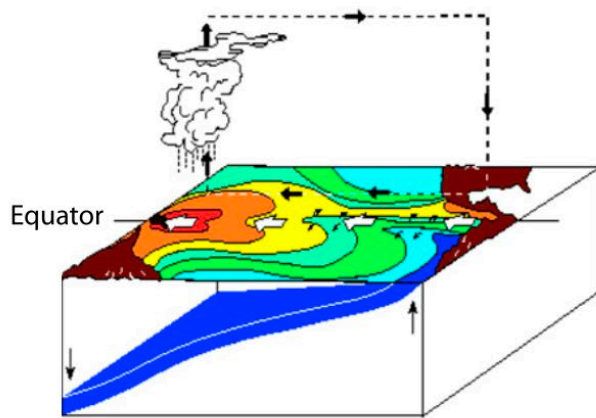
Model Predictions of ENSO from Oct 2024



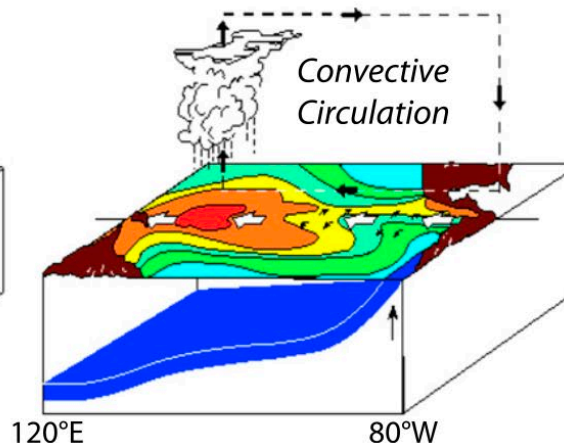
- Development of La Niña is still the most likely scenario though the probabilities have dropped since our last meeting
- More confident it will be a weak event

El Niño-Southern Oscillation

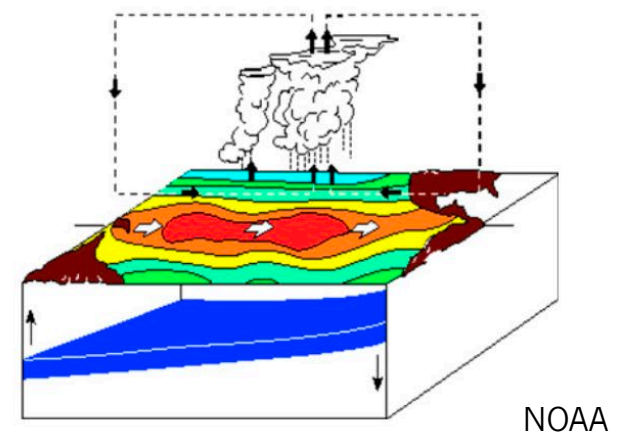
La Niña Conditions



Normal Conditions



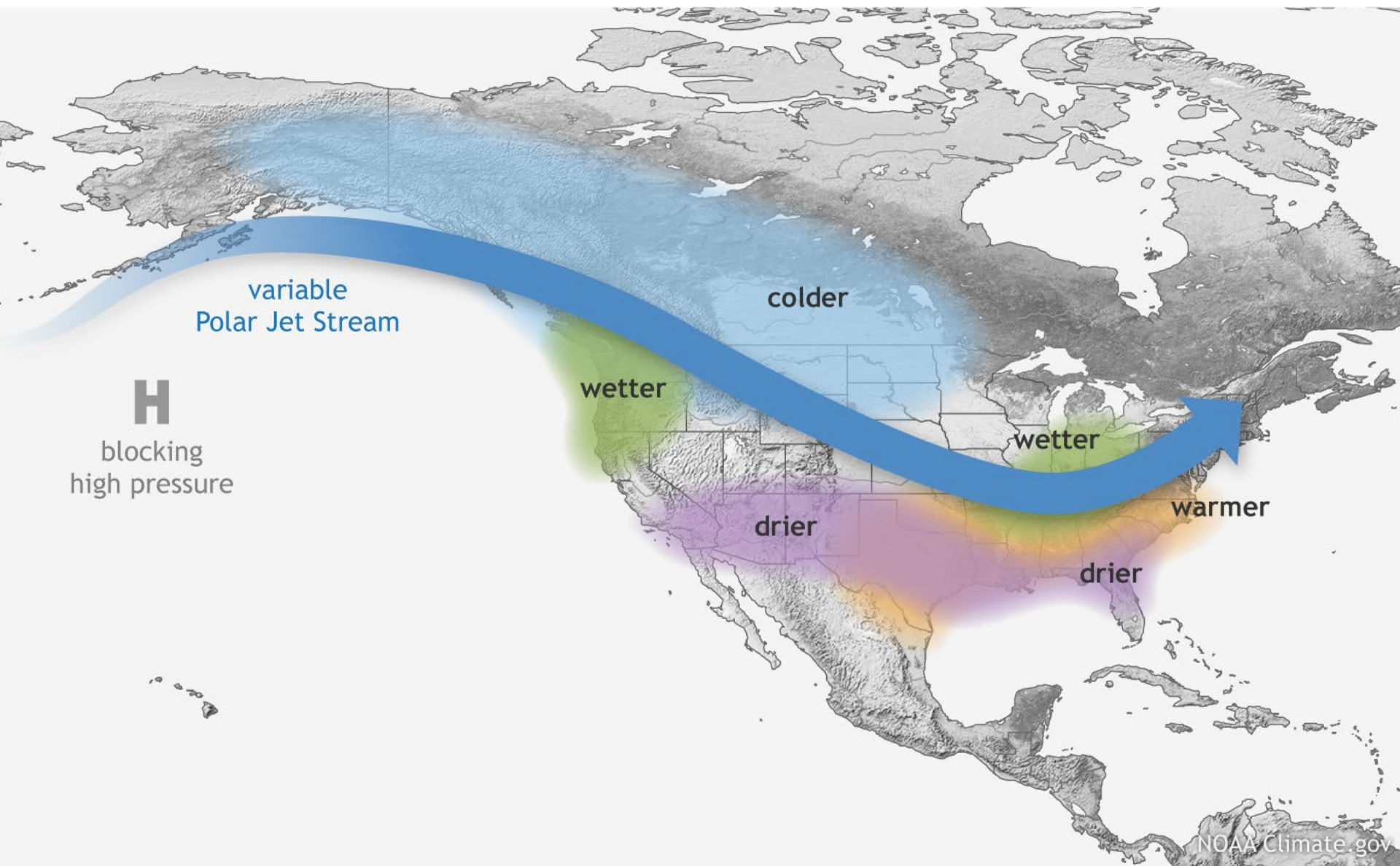
El Niño Conditions



Stronger trade winds
Cold water in eastern
Pacific
Increased upwelling
Rainfall further west

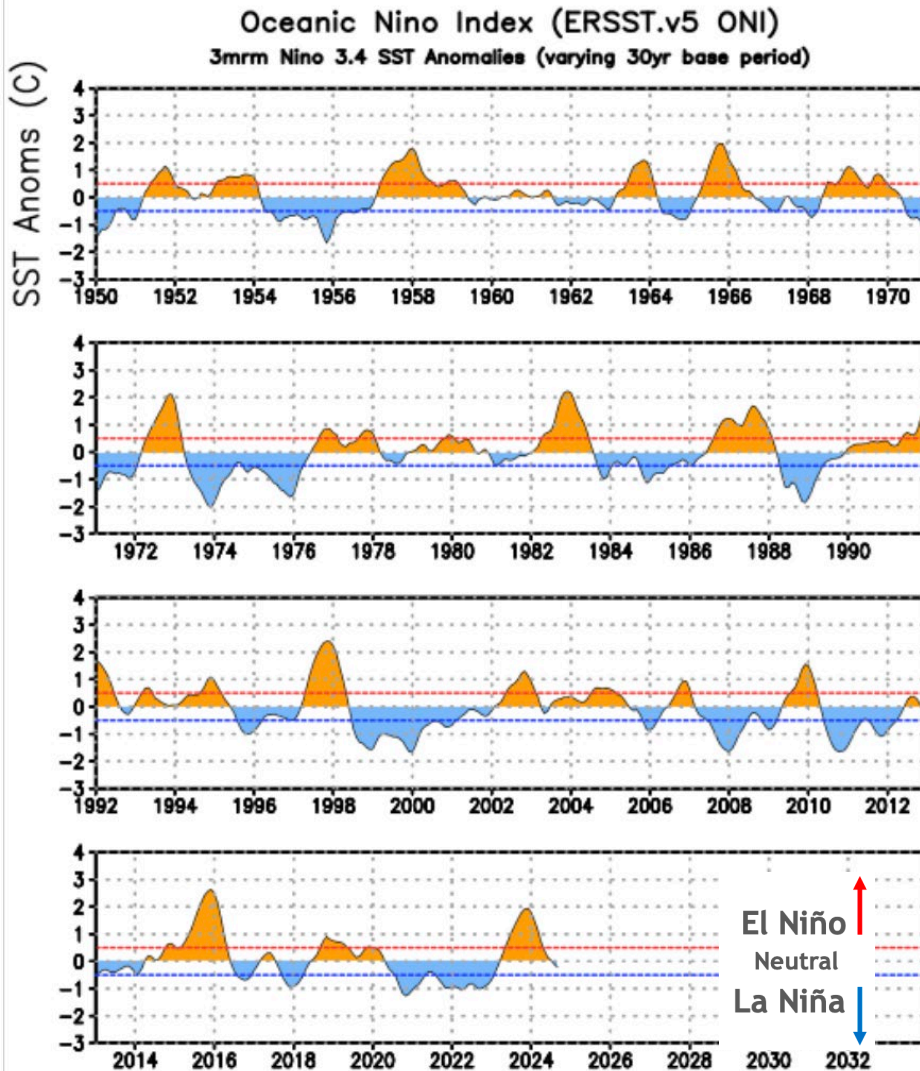
Relaxed trade winds
Larger warm pool
Reduced upwelling
Rainfall further east

Typical winter La Niña pattern

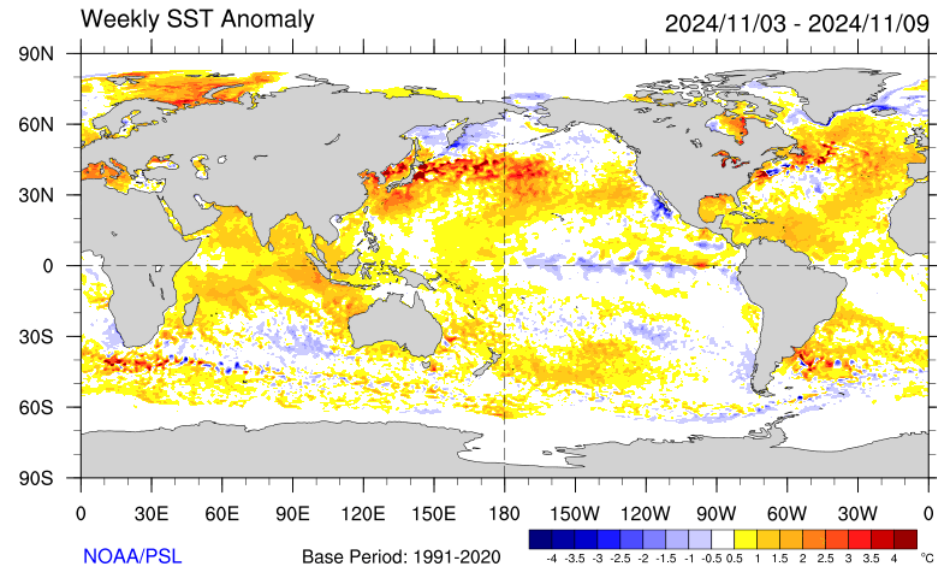


ENSO Sea Surface Temperatures (SSTs)

historical SST anomalies:

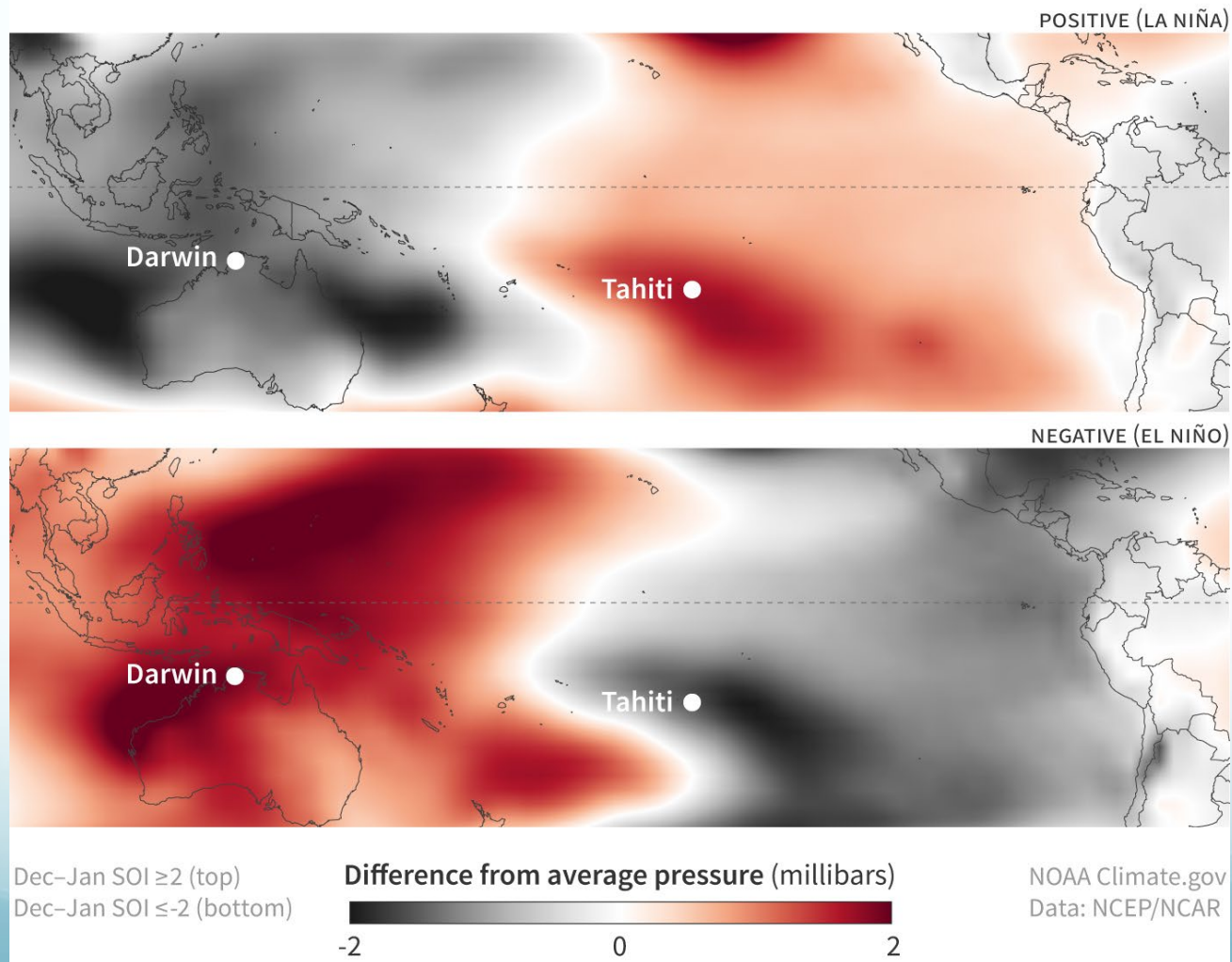


current weekly SST anomalies:

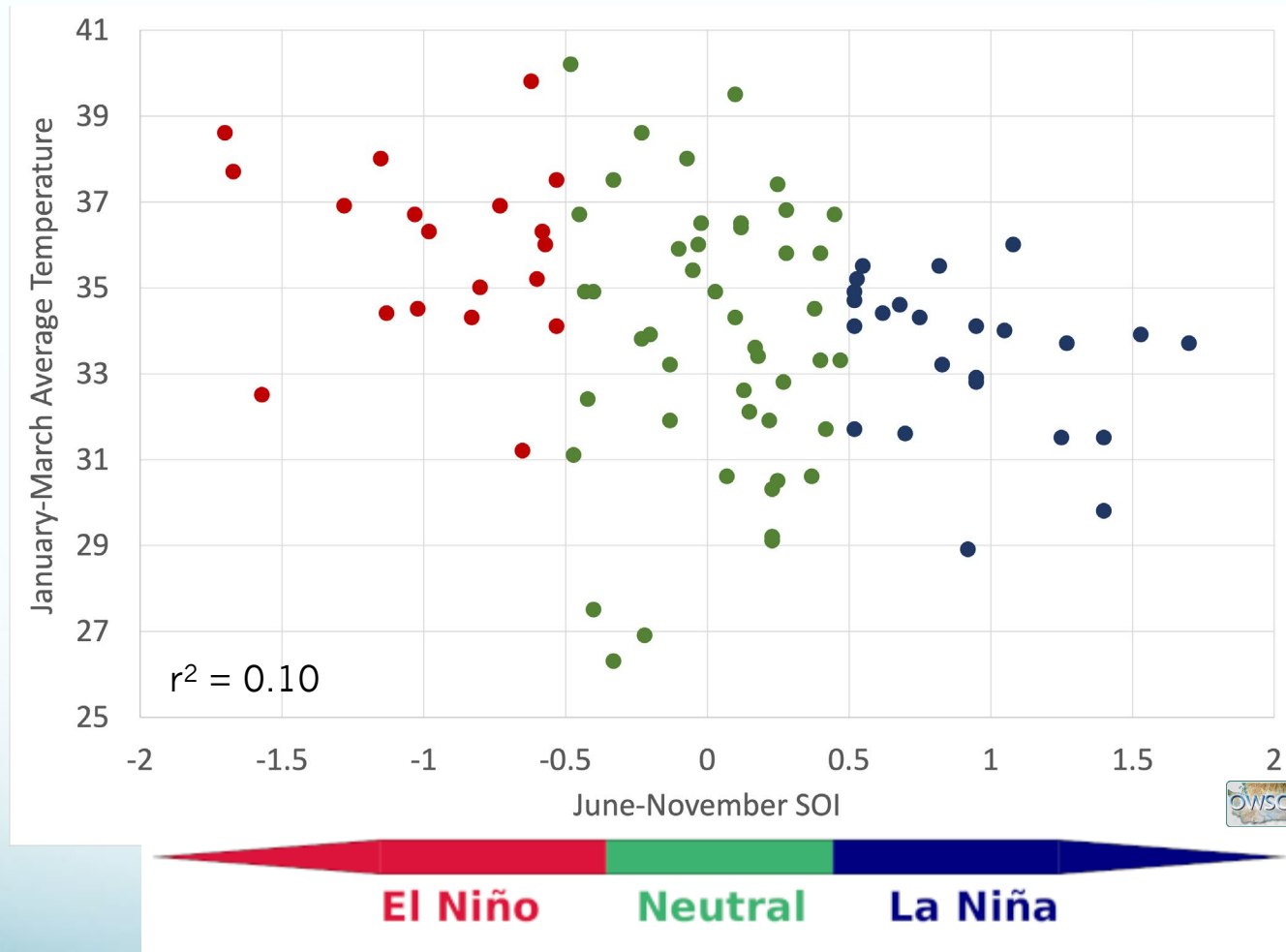


Southern Oscillation Index (SOI)

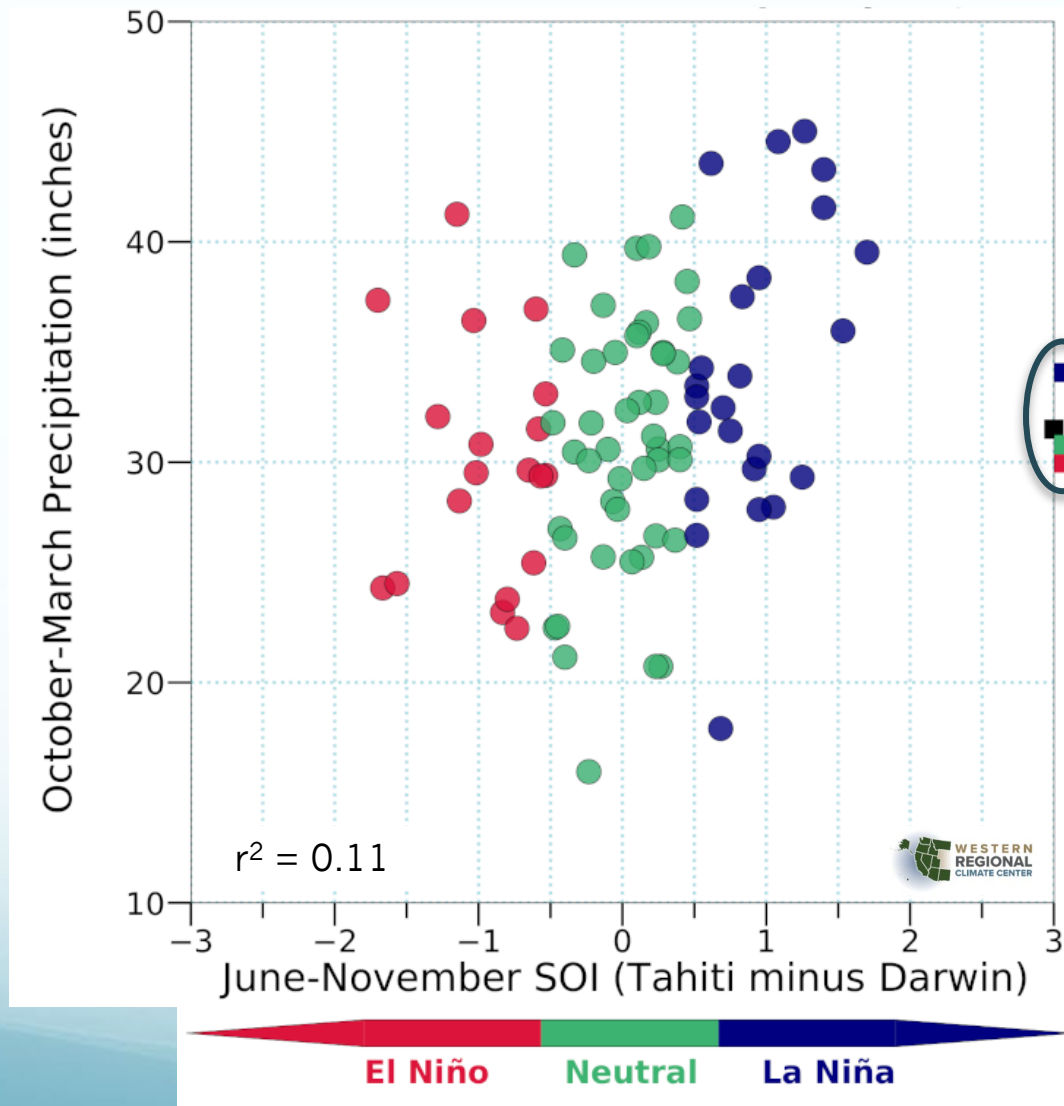
SOI PRESSURE PATTERNS



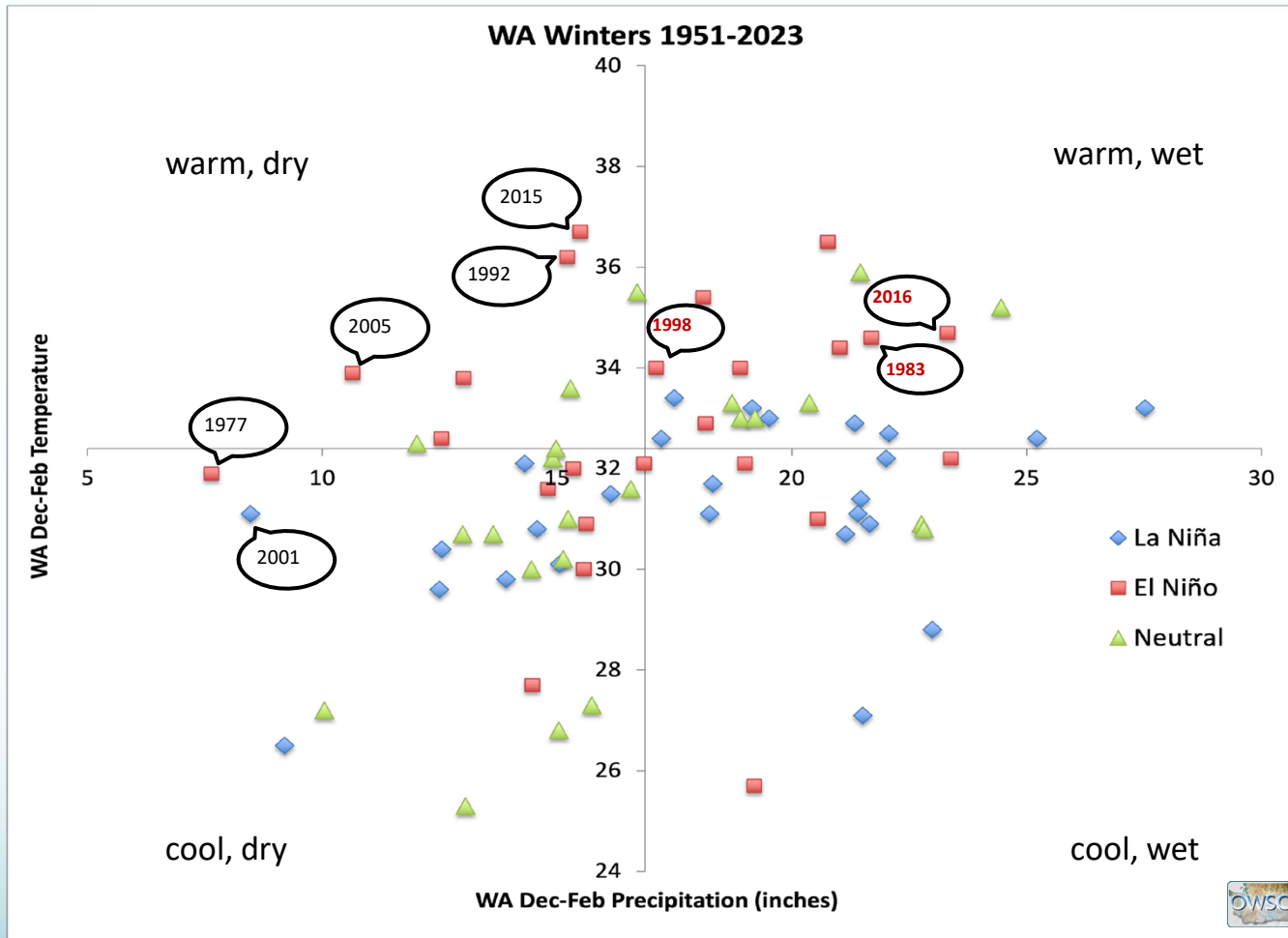
SOI vs WA Statewide Average Jan-Mar Temperatures



SOI vs WA Statewide Total Oct-Mar Precipitation

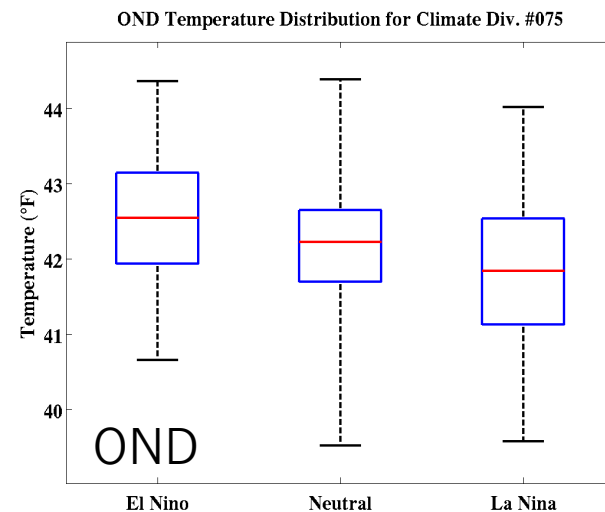
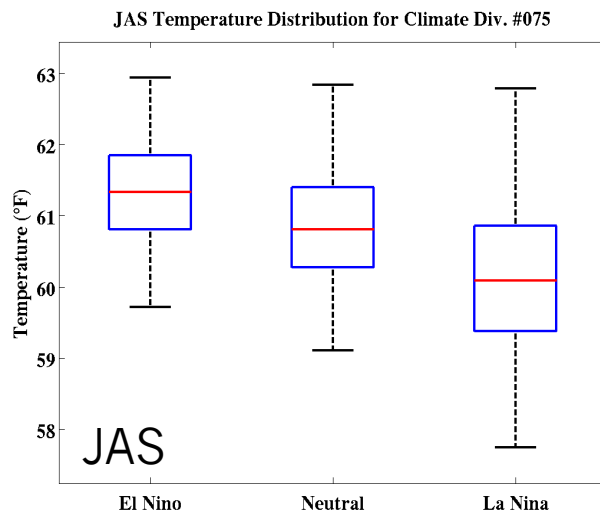
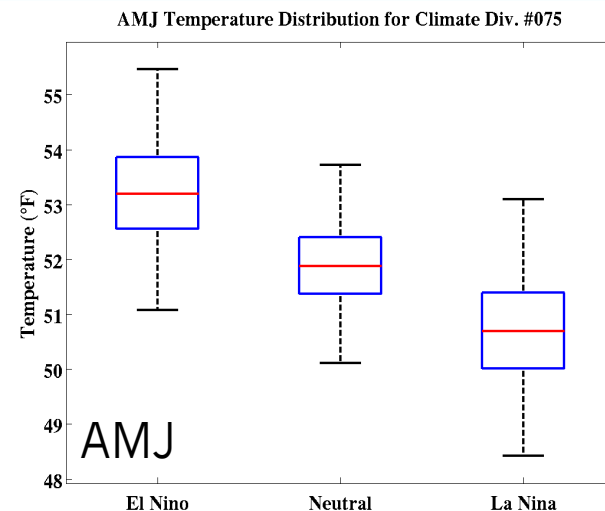
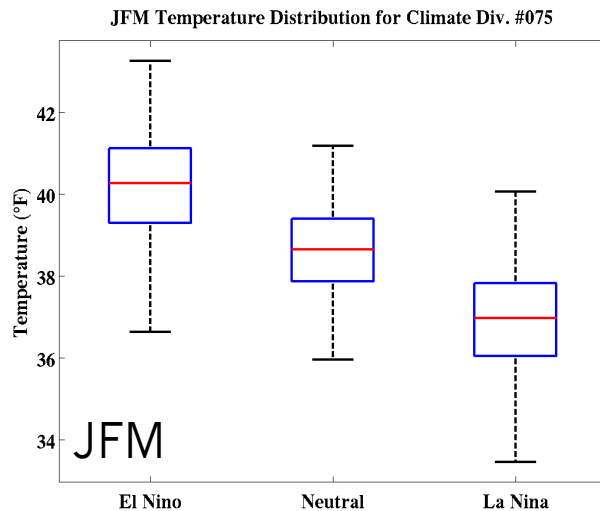
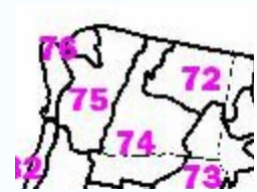


Dec-Feb Temperature and Precipitation

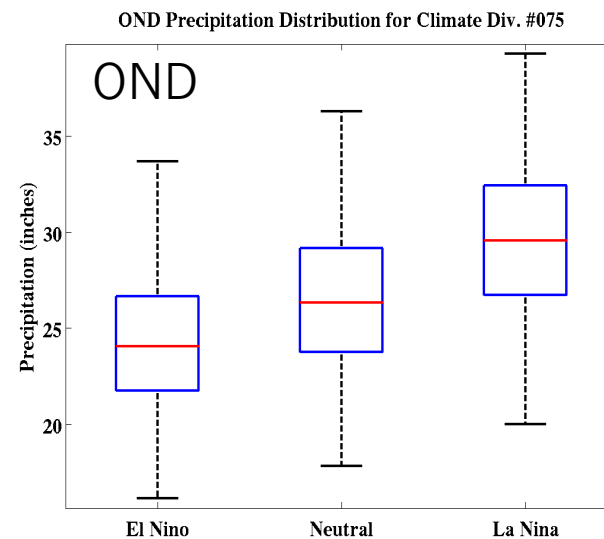
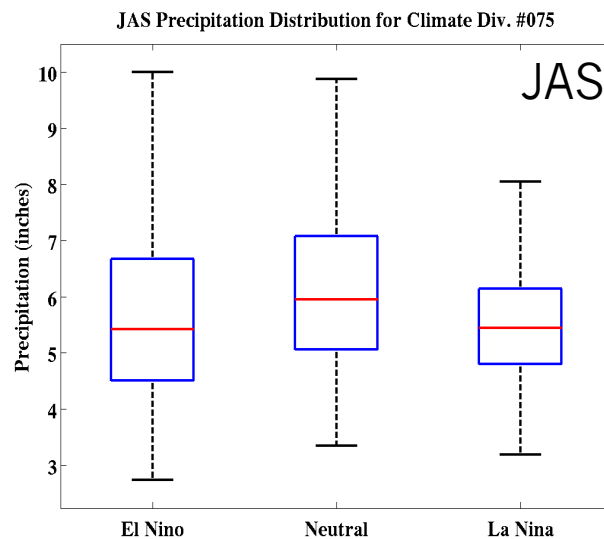
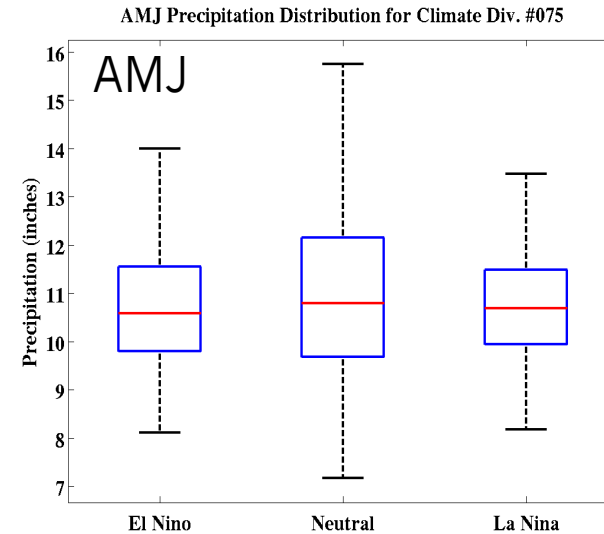
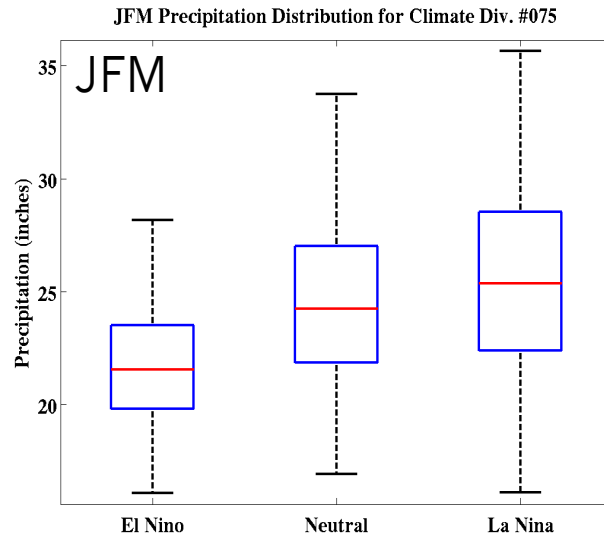


A few major drought years are highlighted in black; **red years** are very strong El Niño events

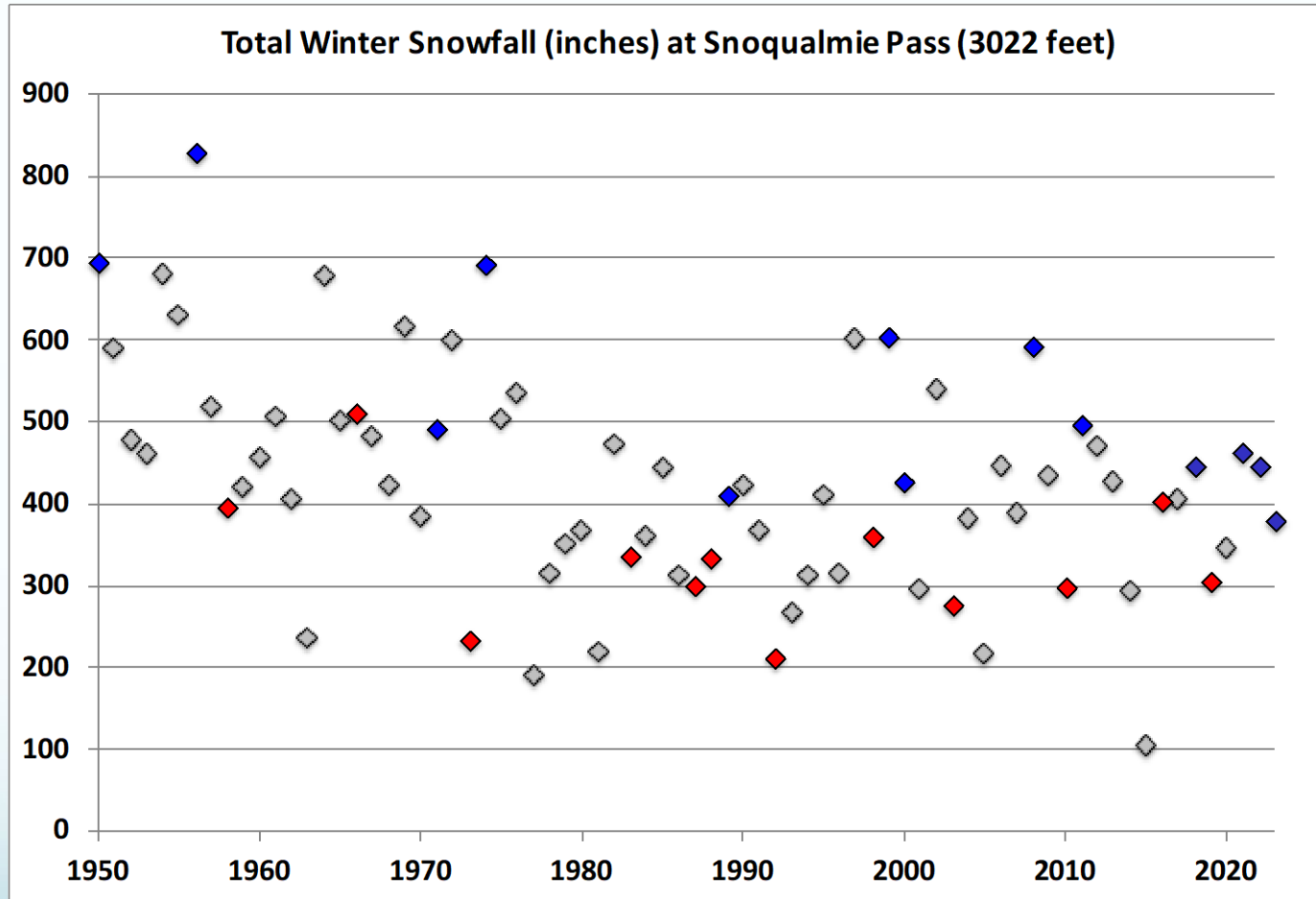
Temperatures are cooler, on average, during La Niña, in Jan-Mar and Apr-Jun



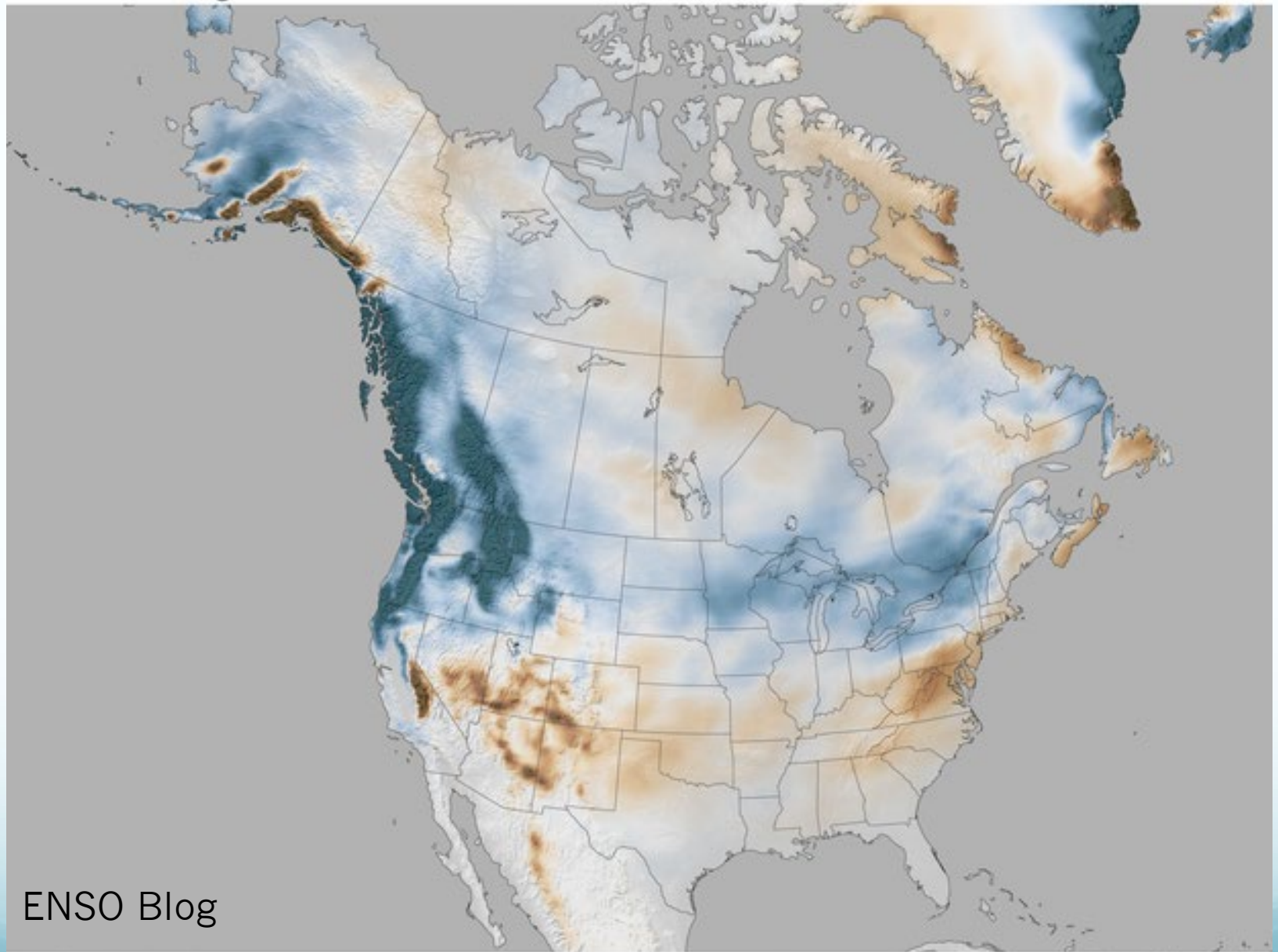
The above normal precipitation signal is more pronounced during Oct-Dec



Local example: Winter *Snowfall*



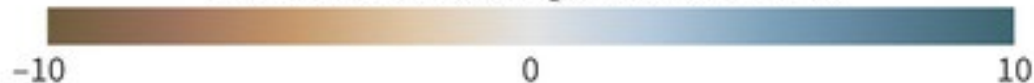
Snowfall during all La Niña winters (Jan-Mar)



ENSO Blog

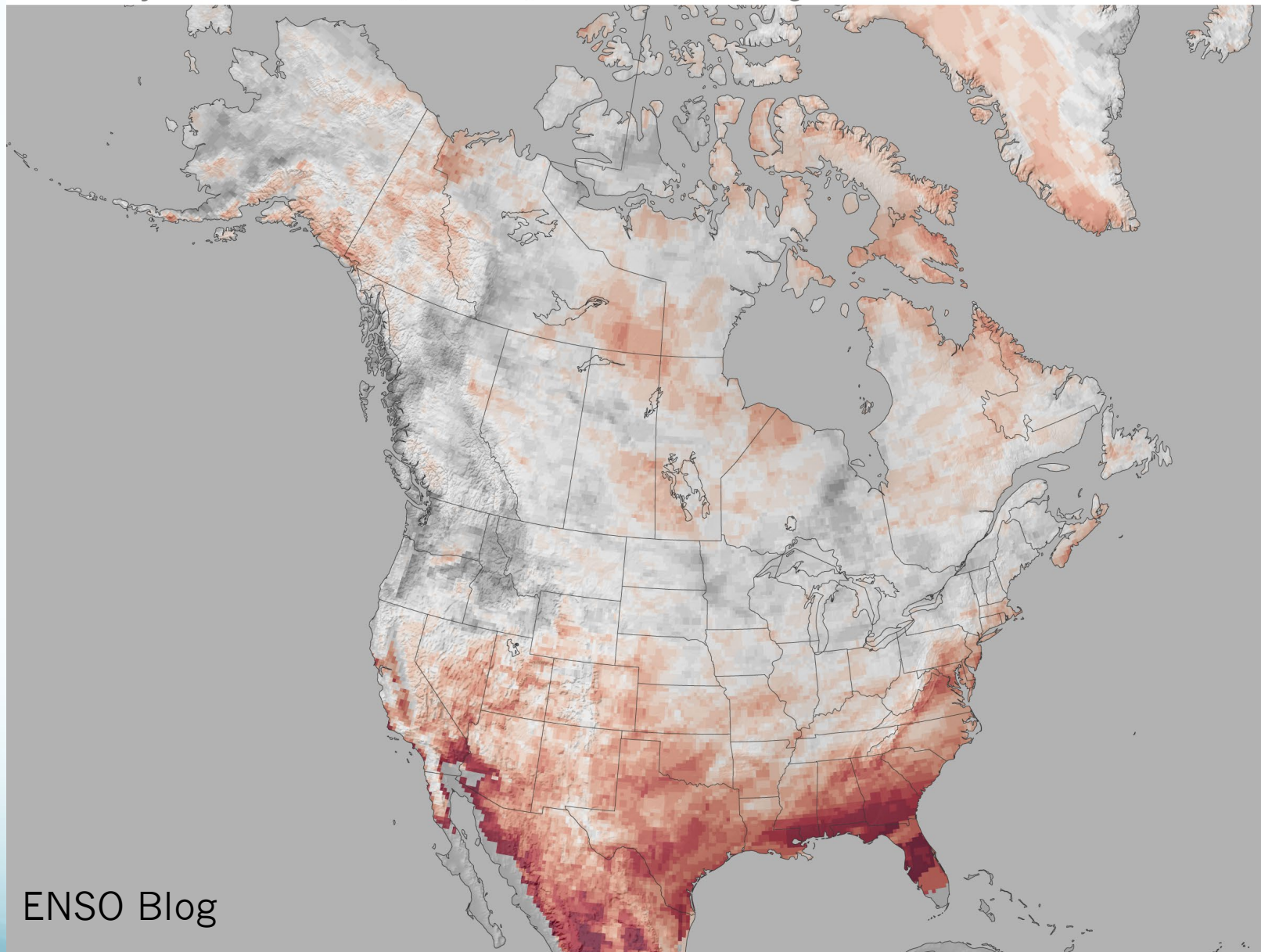
Jan-Mar 1959-2024
compared to
Jan-Mar 1991-2020

difference from average snowfall (inches)



NOAA Climate.gov
Data: ERA5

How many La Niña winters (Jan–Mar) had below-average snowfall?



ENSO Blog

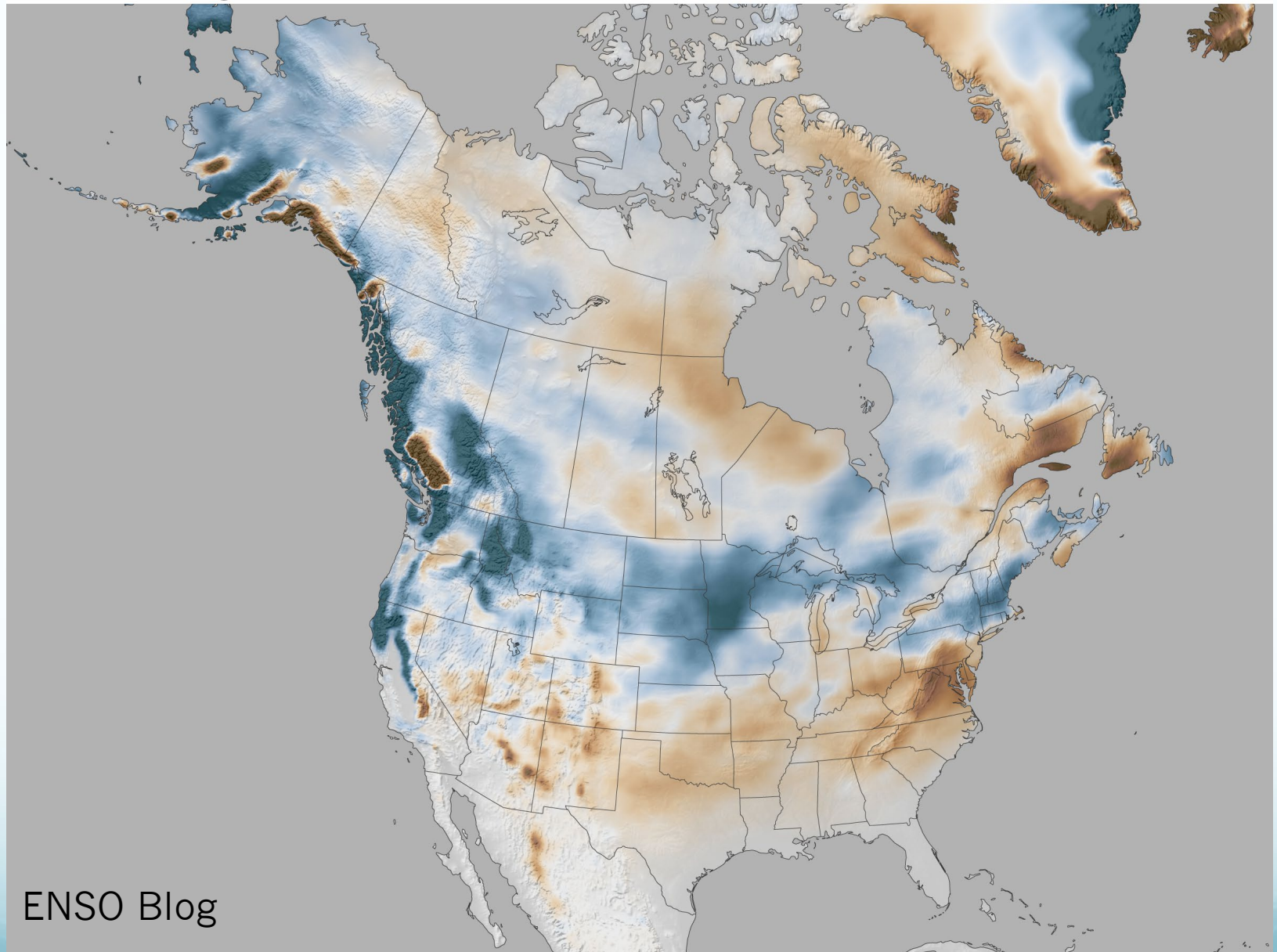
1959–2024

number of years (out of 22)



NOAA Climate.gov
Data: ERA5

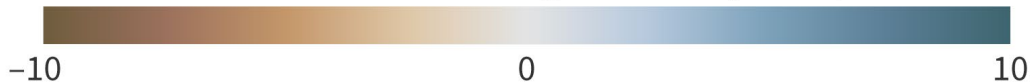
Snowfall during weak La Niña winters (Jan-Mar)



ENSO Blog

Jan-Mar 1959–2024
compared to
Jan-Mar 1991–2020

difference from average snowfall (inches)

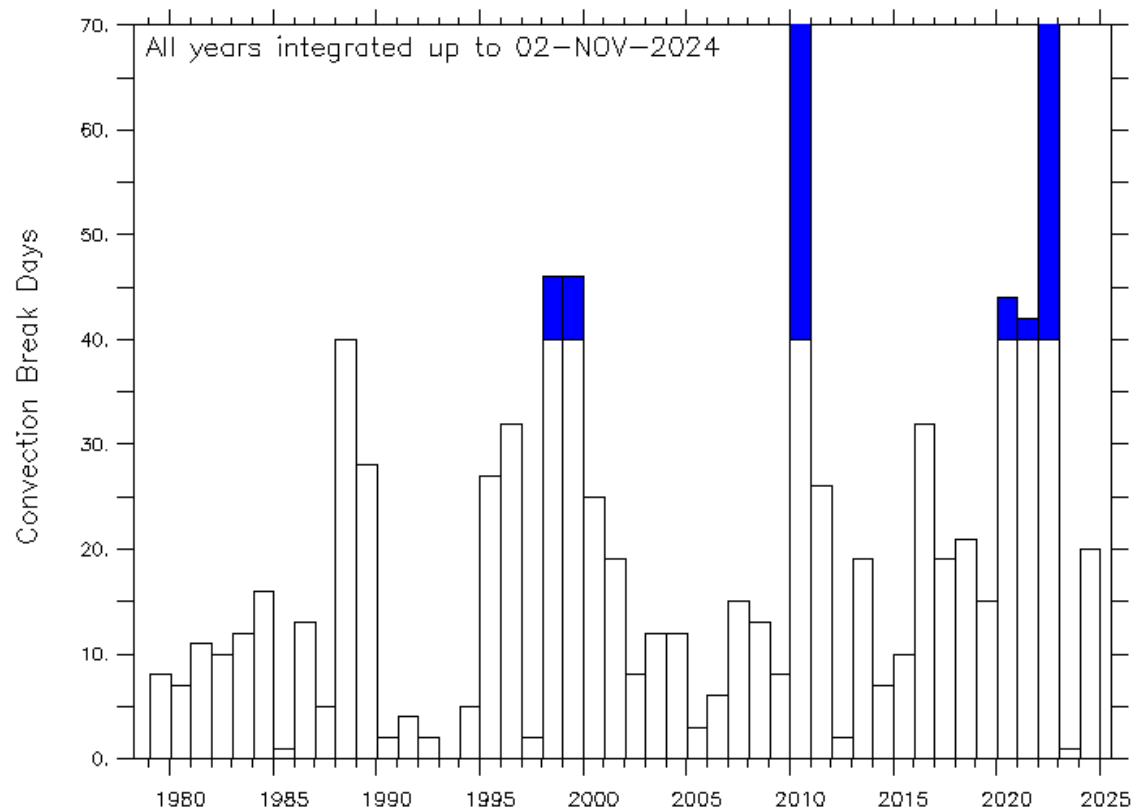


NOAA Climate.gov
Data: ERA5

Early indications that this La Niña may not be the main driver of our winter weather

Number of clear-sky days (less convection) in the west-central tropical Pacific

(Chiodi and Harrison, 2015)



courtesy of Andy Chiodi, CICOES, UW

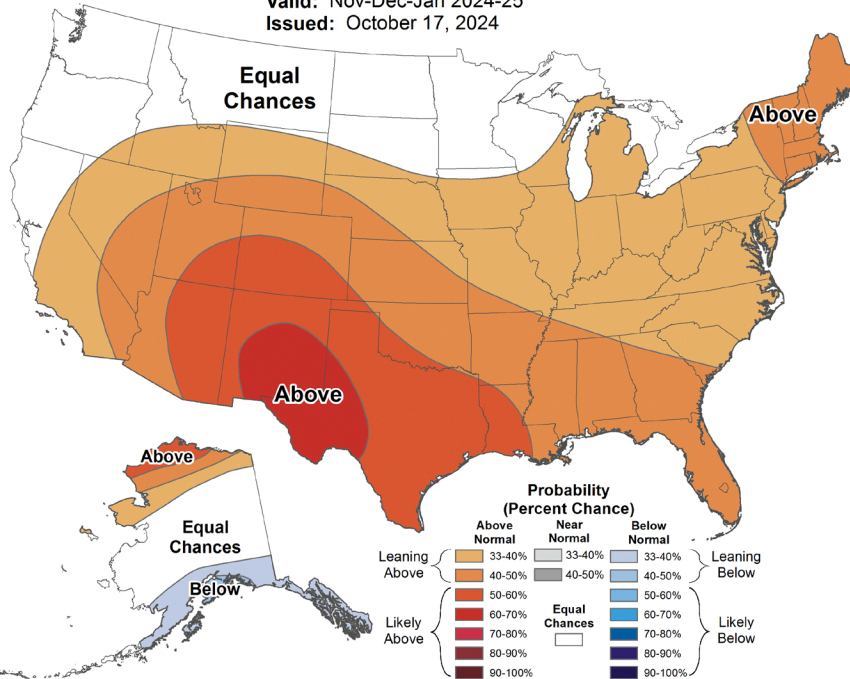
La Niña years that have mattered most to North American weather anomalies

Climate Prediction Center Outlook: **Nov-Jan**



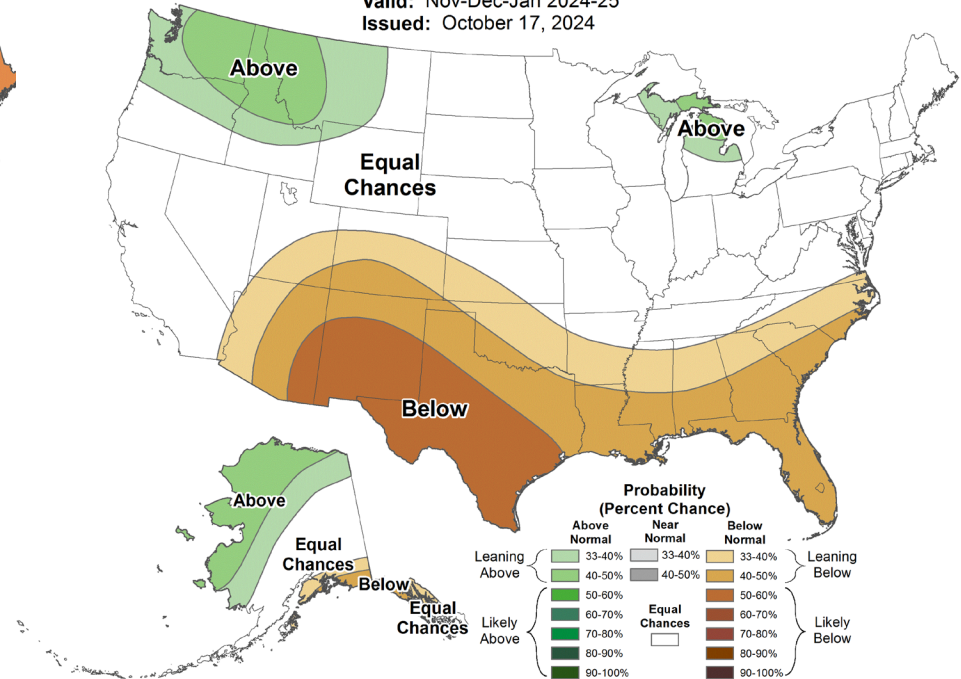
Seasonal Temperature Outlook

Valid: Nov-Dec-Jan 2024-25
Issued: October 17, 2024



Seasonal Precipitation Outlook

Valid: Nov-Dec-Jan 2024-25
Issued: October 17, 2024



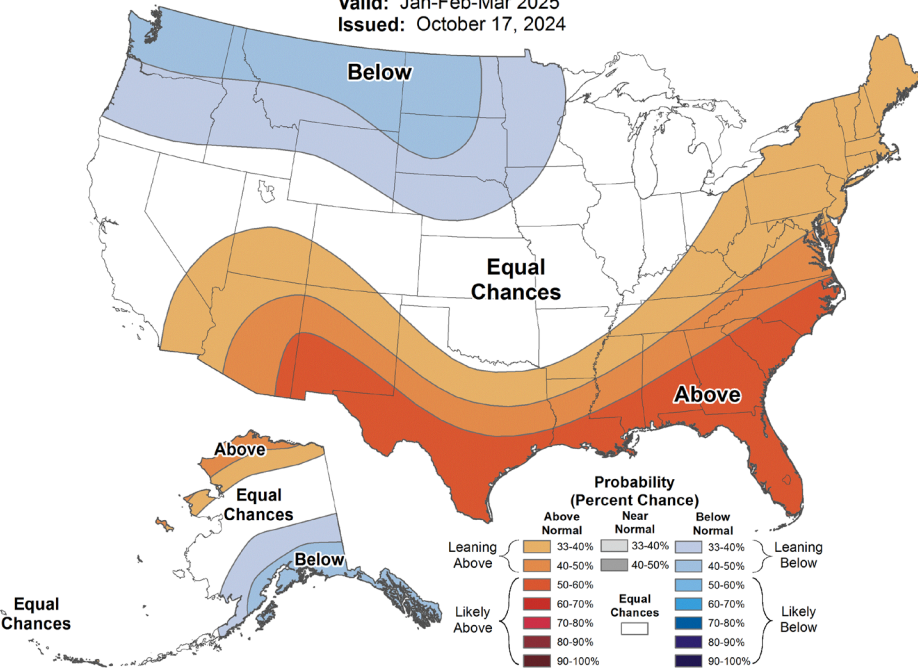
Climate Prediction Center Outlook: Jan-Mar



Seasonal Temperature Outlook



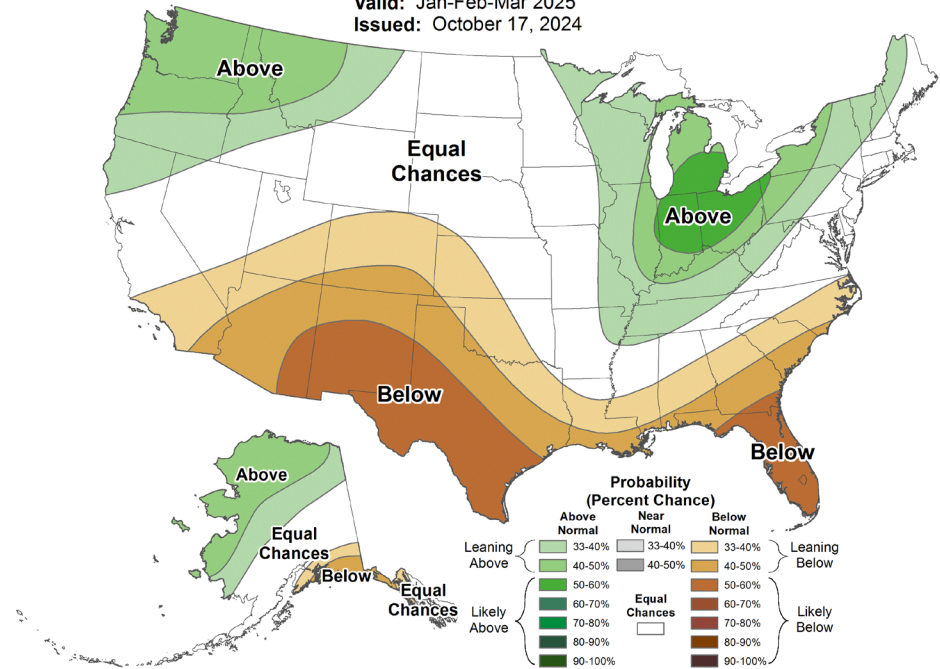
Valid: Jan-Feb-Mar 2025
Issued: October 17, 2024



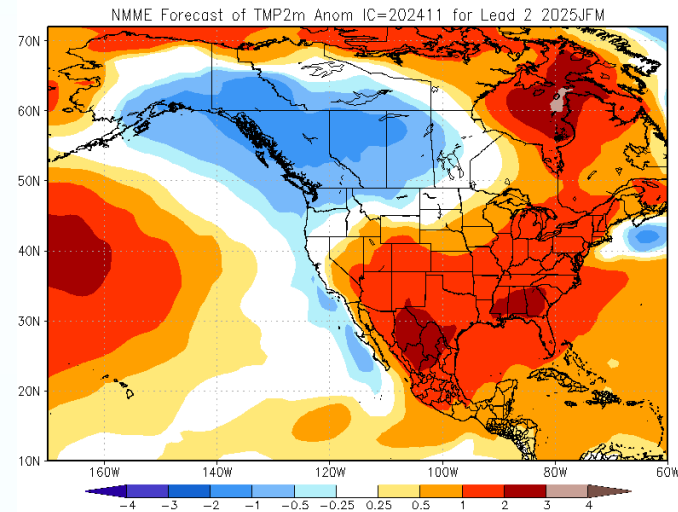
Seasonal Precipitation Outlook



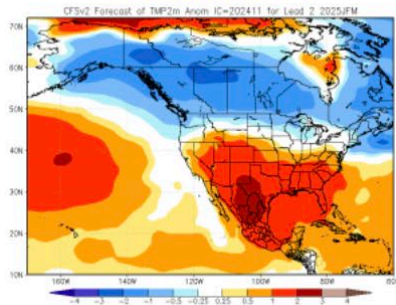
Valid: Jan-Feb-Mar 2025
Issued: October 17, 2024



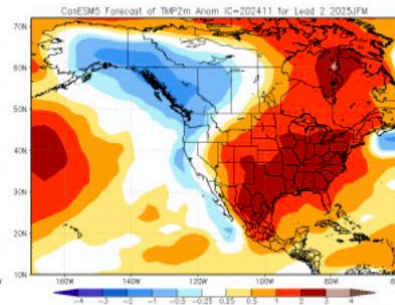
NMME: Jan-Mar Temperatures



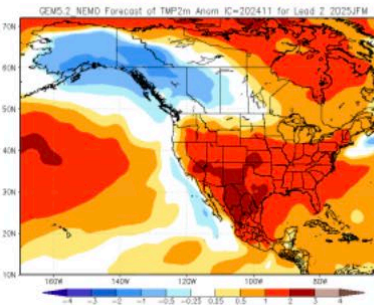
NCEP_CFSv2



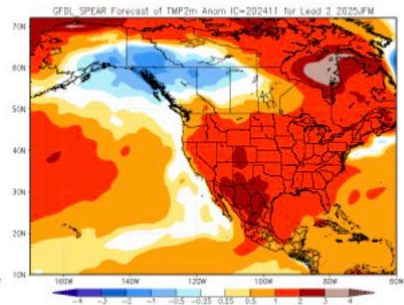
CanESM5



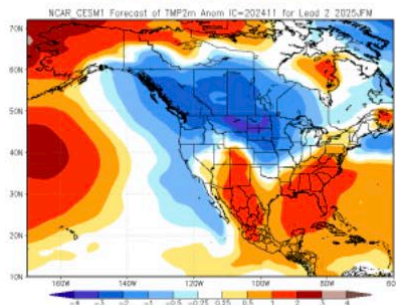
GEM5.2_NEMO



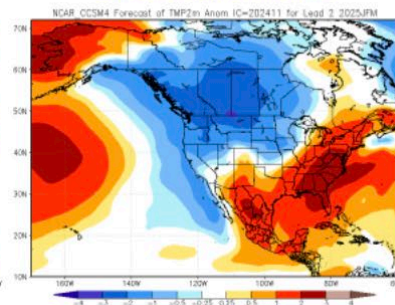
GFDL_SPEAR



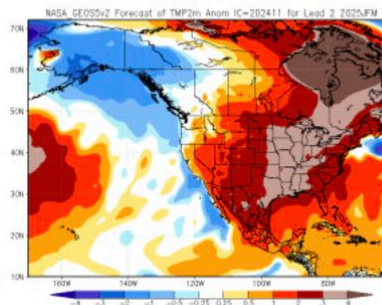
NCAR_CESM1



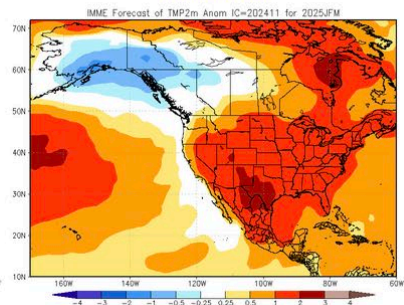
NCAR_CCSM4



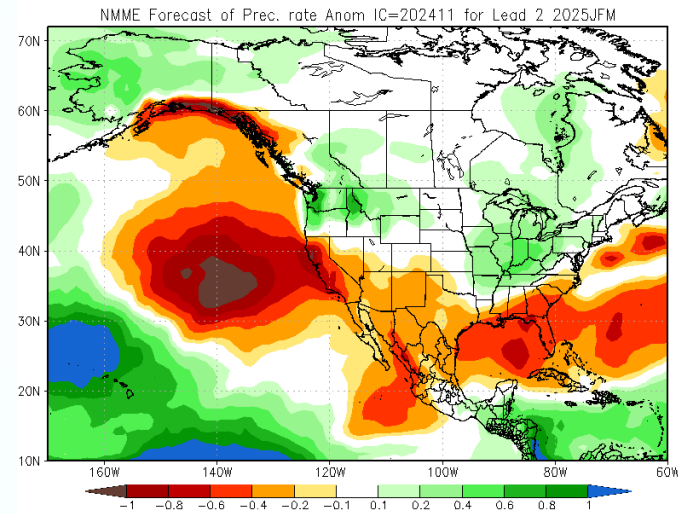
NASA_GEOS5v2



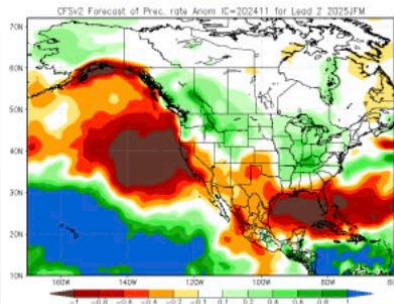
IMME



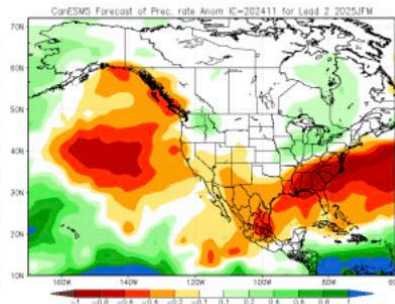
NMME: Jan-Mar Precipitation



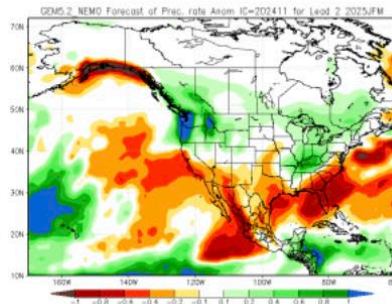
NCEP_CFSv2



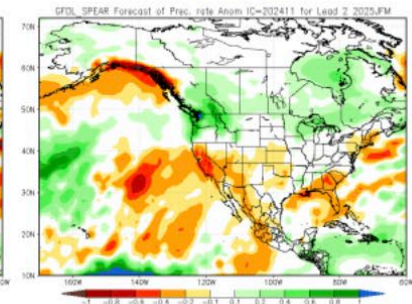
CanESM5



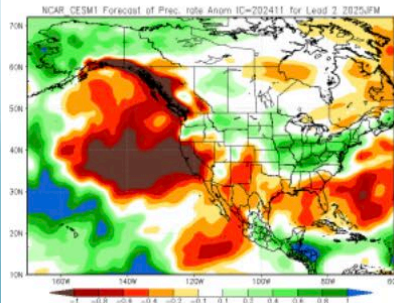
GEM5.2_NEMO



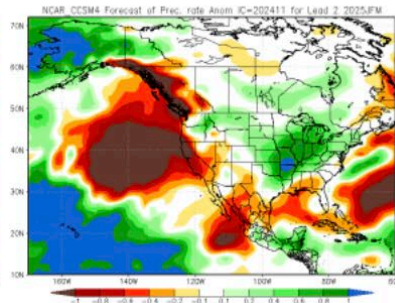
GFDL_SPEAR



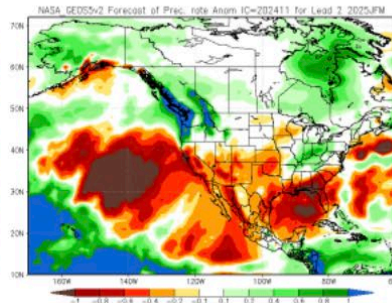
NCAR_CESM1



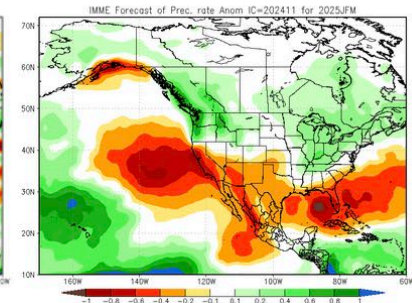
NCAR_CCSM4



NASA_GEOS5v2

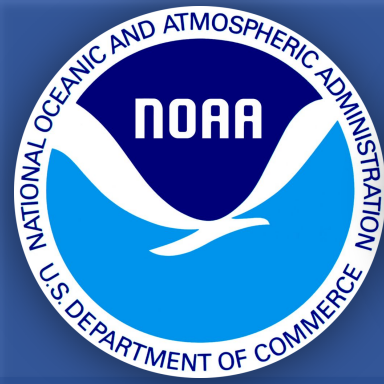


IMME



Summary

- Water year 2025 is warmer than normal statewide so far
 - Wetter than normal in the northern Puget Sound region and parts of northeastern WA
 - Drier than normal in central and southeastern WA
- Weak La Niña is still more likely to develop than not
- There are higher chances of above normal fall and winter precipitation
- There is more consistency in the forecast of below normal winter temperatures than at our last meeting but there is still some uncertainty (the IMME, for example)



NWS

November 2024 Washington Water Supply

Amy Burke, Sr Hydrologist - Northwest River Forecast Center

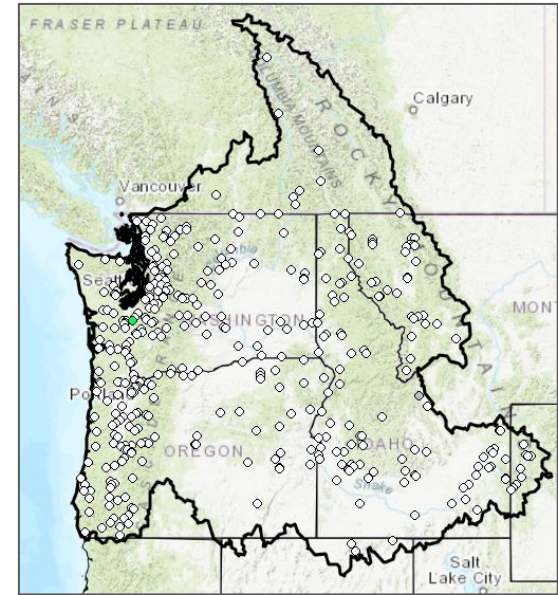
NWRFC.watersupply@noaa.gov

Brent Bower, Sr Service Hydrologist Seattle

Andy Bryant, Sr Service Hydrologist Portland

Robin Fox, Service Hydrologist Spokane

George Perry, Service Hydrologist Pendleton



Washington State - Areas of Responsibility



Northwest Washington - NWS Seattle - nws.seattle@noaa.gov



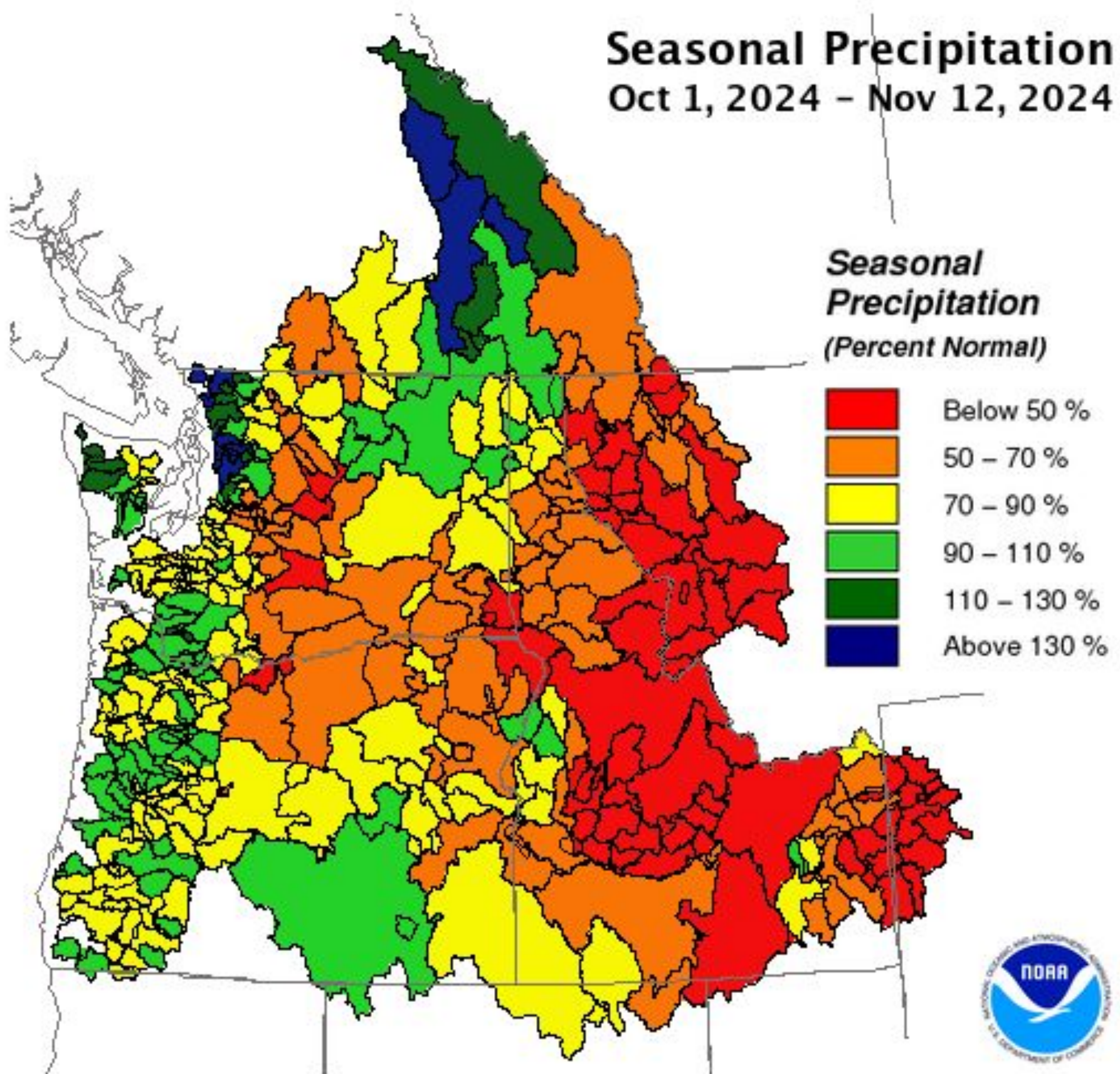
Southwest Washington - NWS Portland - nws.portland@noaa.gov



Northeast Washington - NWS Spokane - nws.spokane@noaa.gov

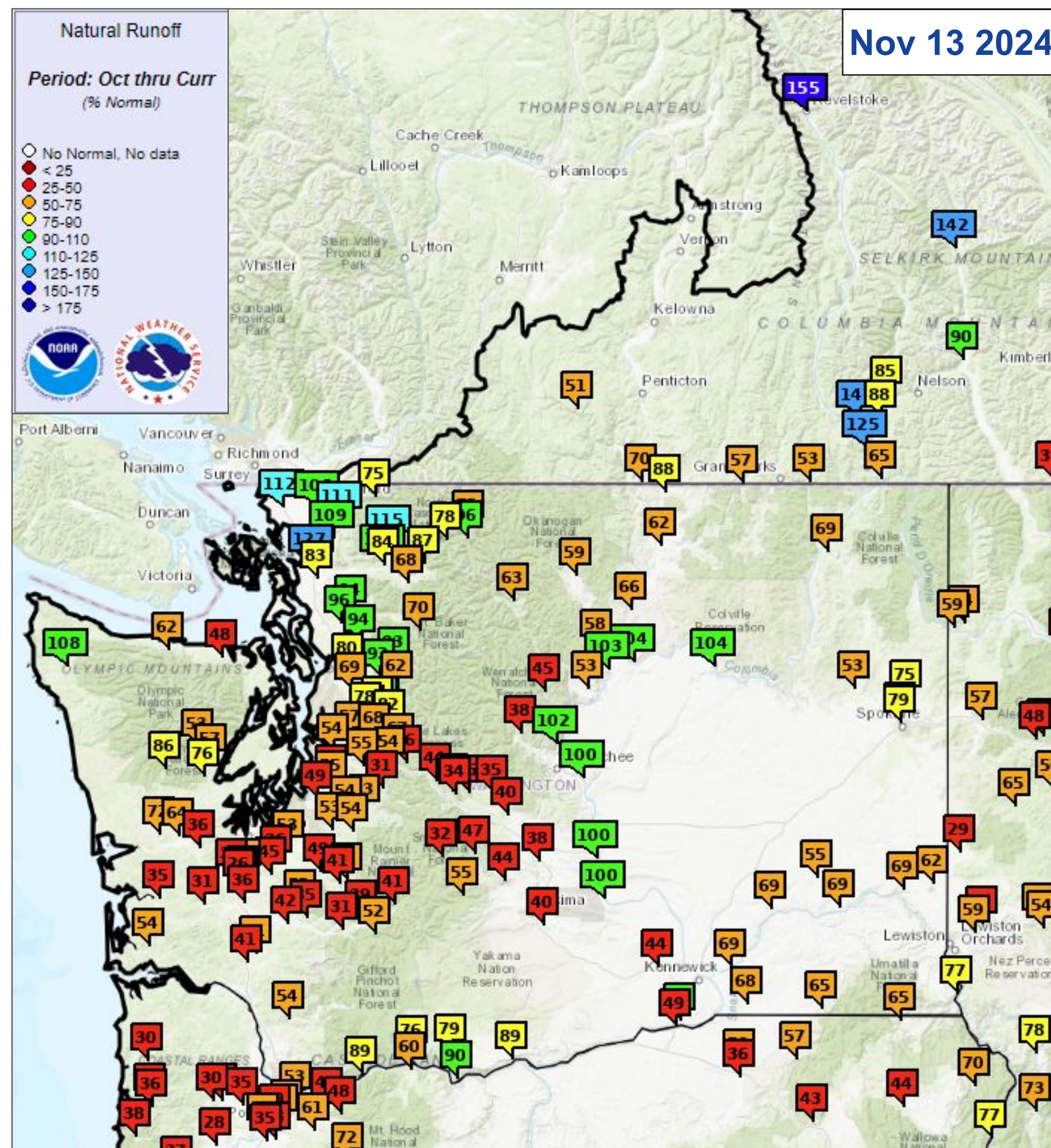


Southeast Washington - NWS Pendleton - pdt.operations@noaa.gov

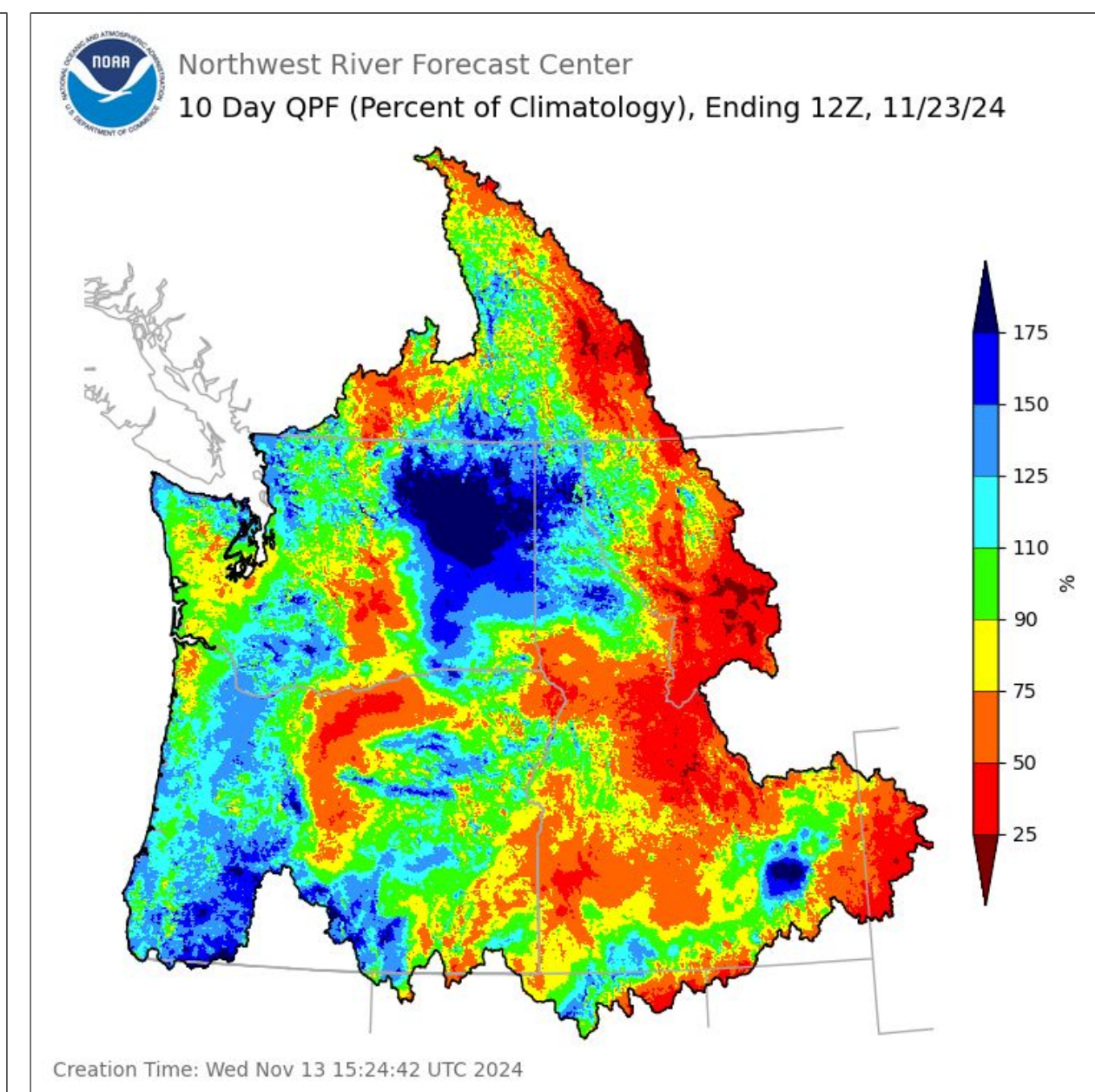
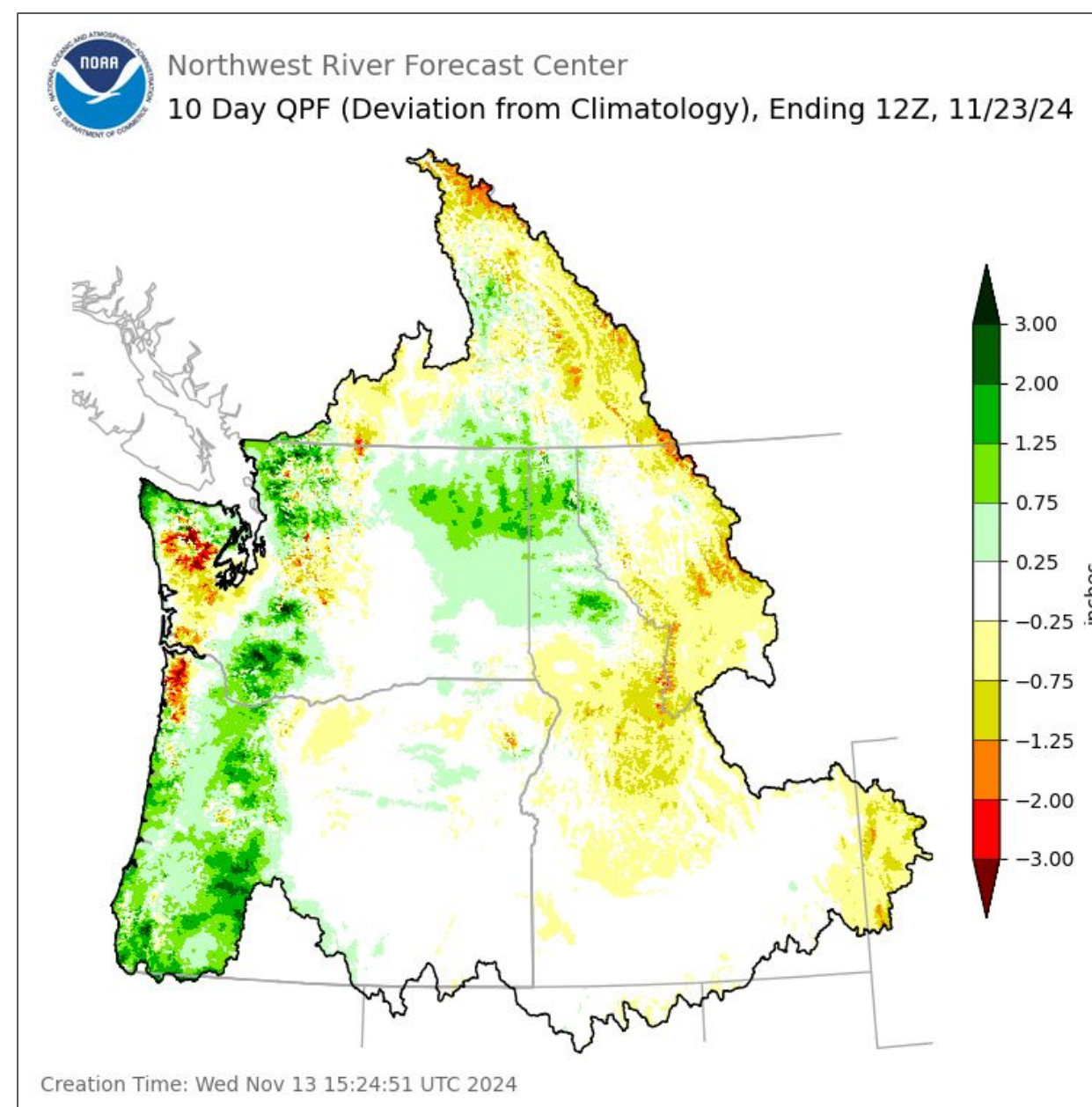
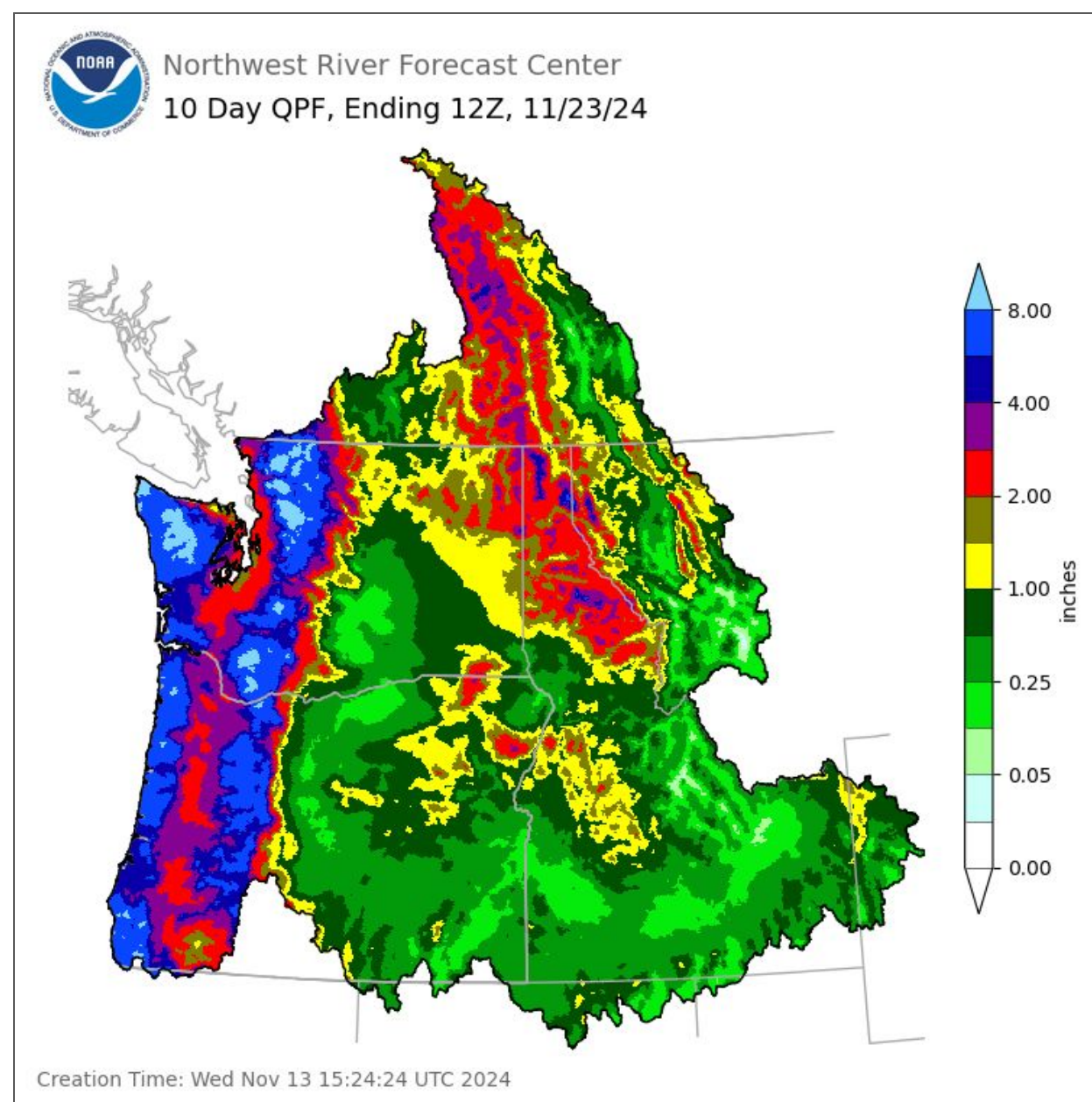


Creation Time: Wednesday, Nov 13, 2024

Northwest River Forecast Center

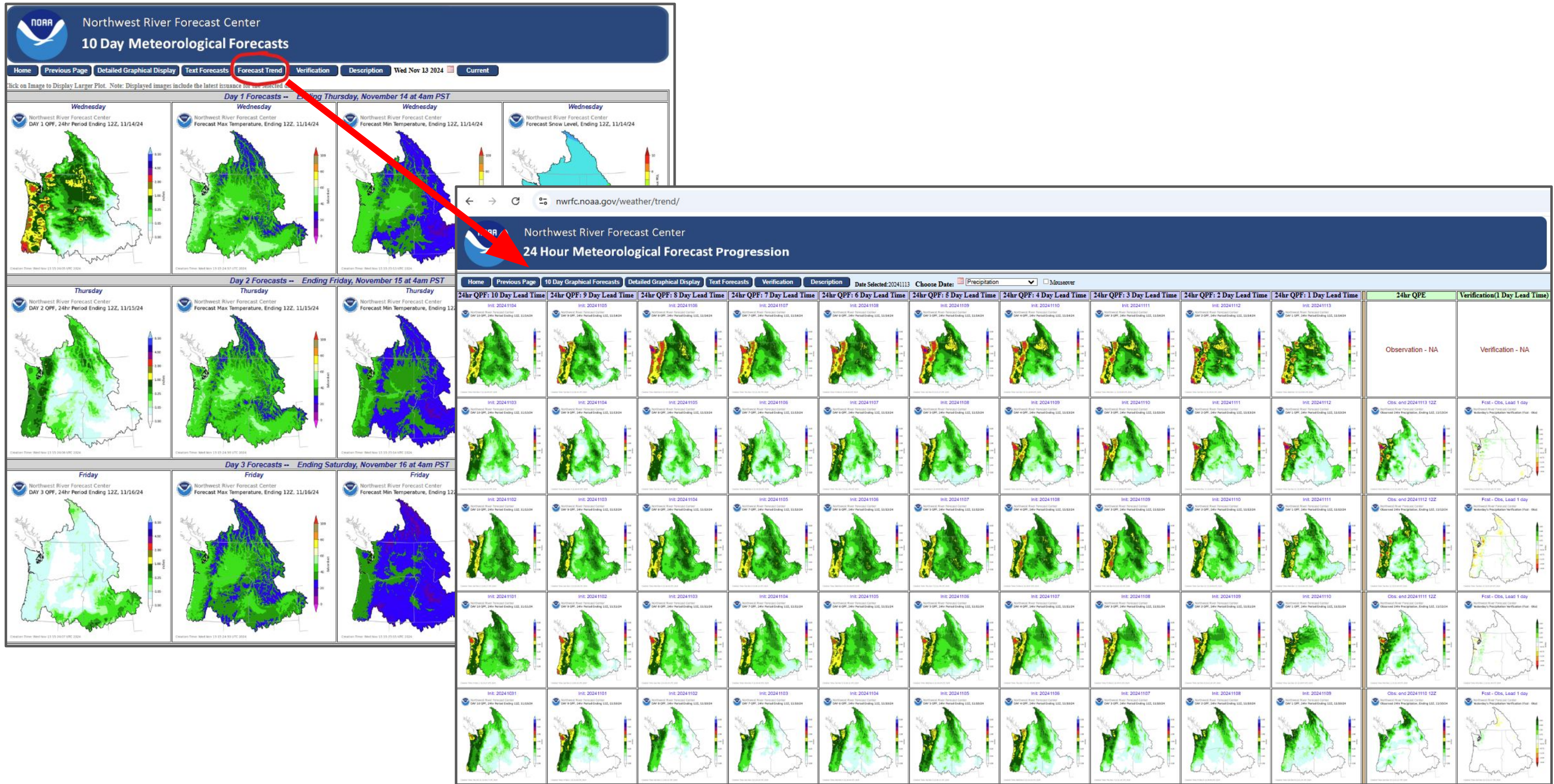


10 Day Precipitation Forecast used in ESP10 Forecasts

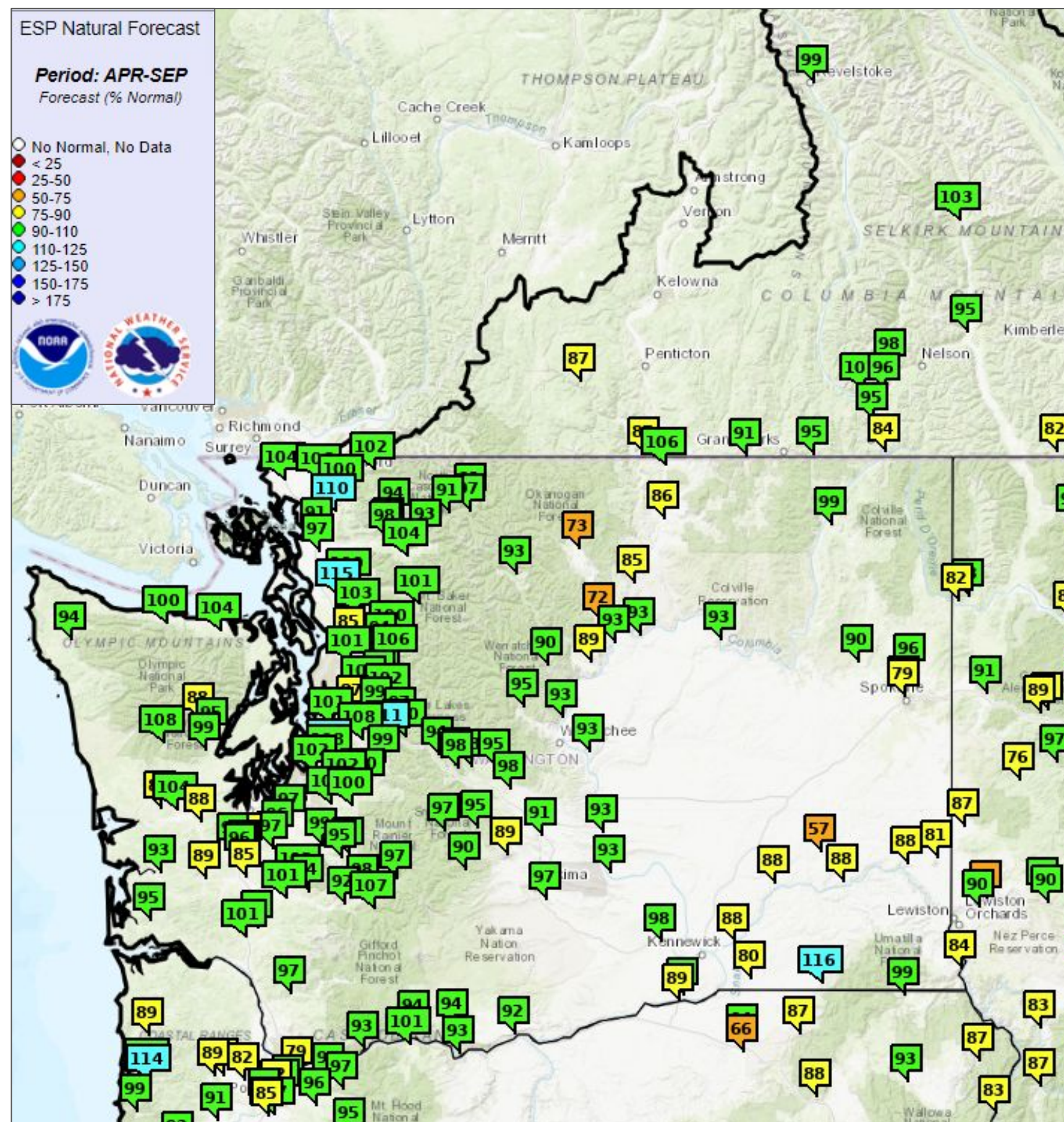
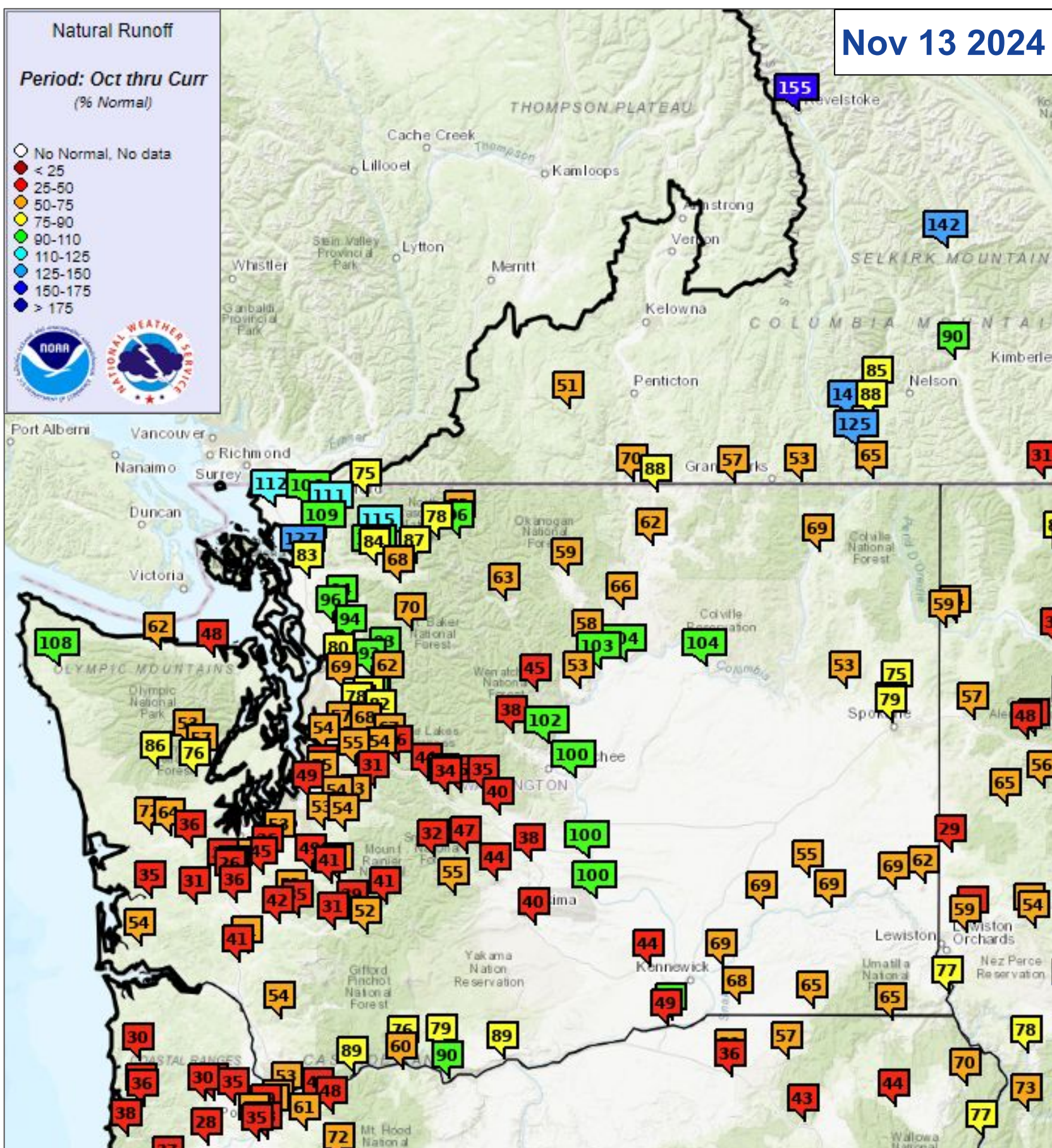


Quantitative Precipitation Forecast (QPF) Sources
 Days 1 - 2 NWS Weather Forecast Offices (WFO) in the US, WPC in BC
 Days 3 - 7 NWS Weather Prediction Center (WPC)
 Days 8 - 10 NWS National Blend of Models (NBM)

Precipitation Forecast Trend Tool



WY Runoff and Apr - Sep Forecasts

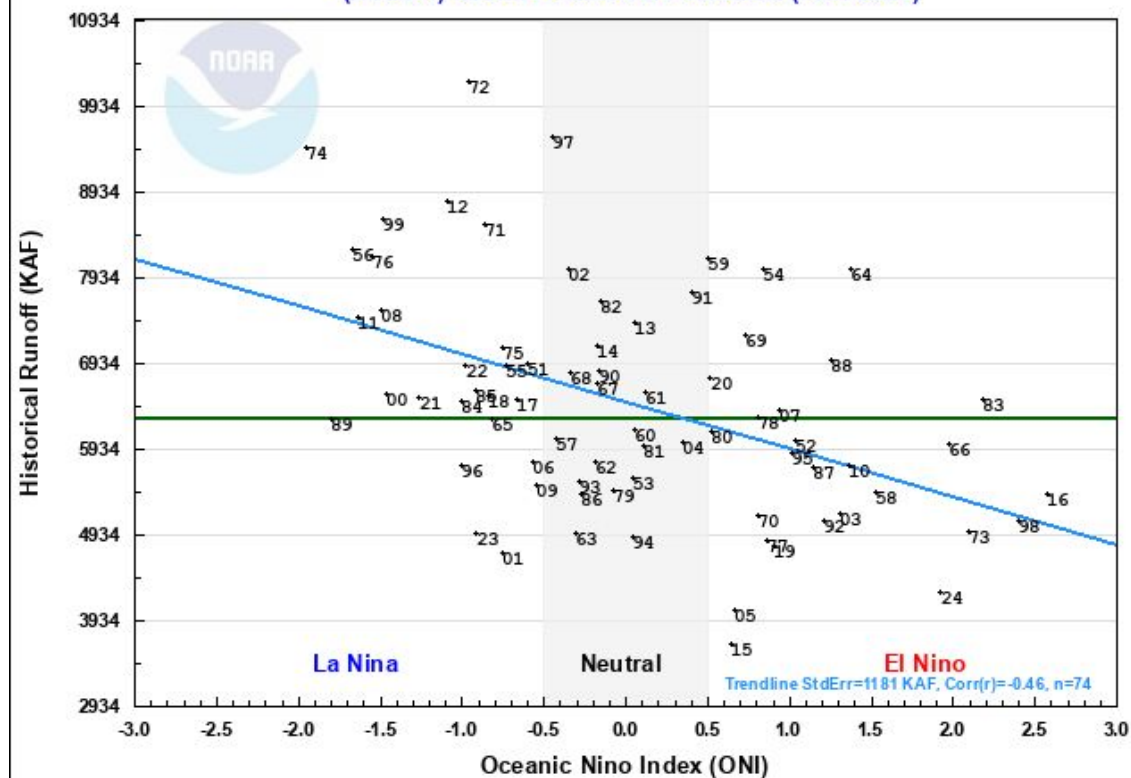




Apr - Sep Volumes and Oceanic Nino Index

OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff

(MVEW1) SKAGIT - NEAR MT VERNON (1951-2024)

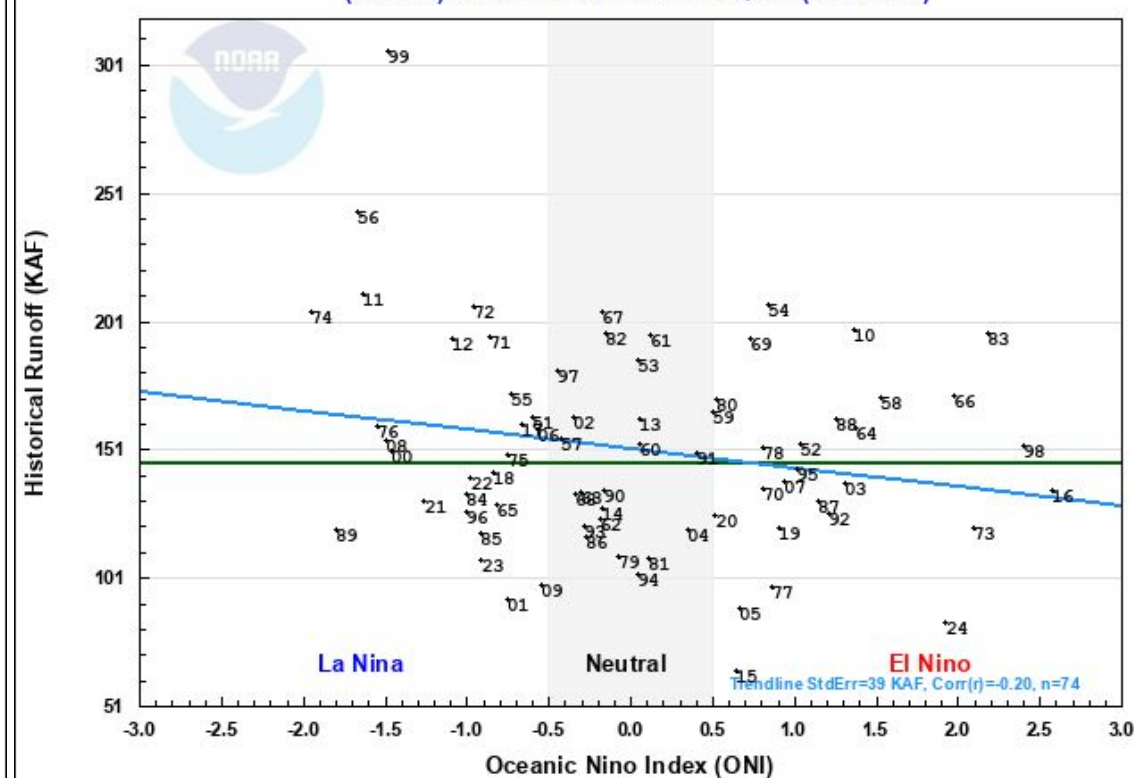


Latest Available ONI Index for OND:11/01/2023

Created: 11/13/2024 08:42 PST

OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff

(DRSW1) DUNGENESS - NEAR SEQUIM (1951-2024)

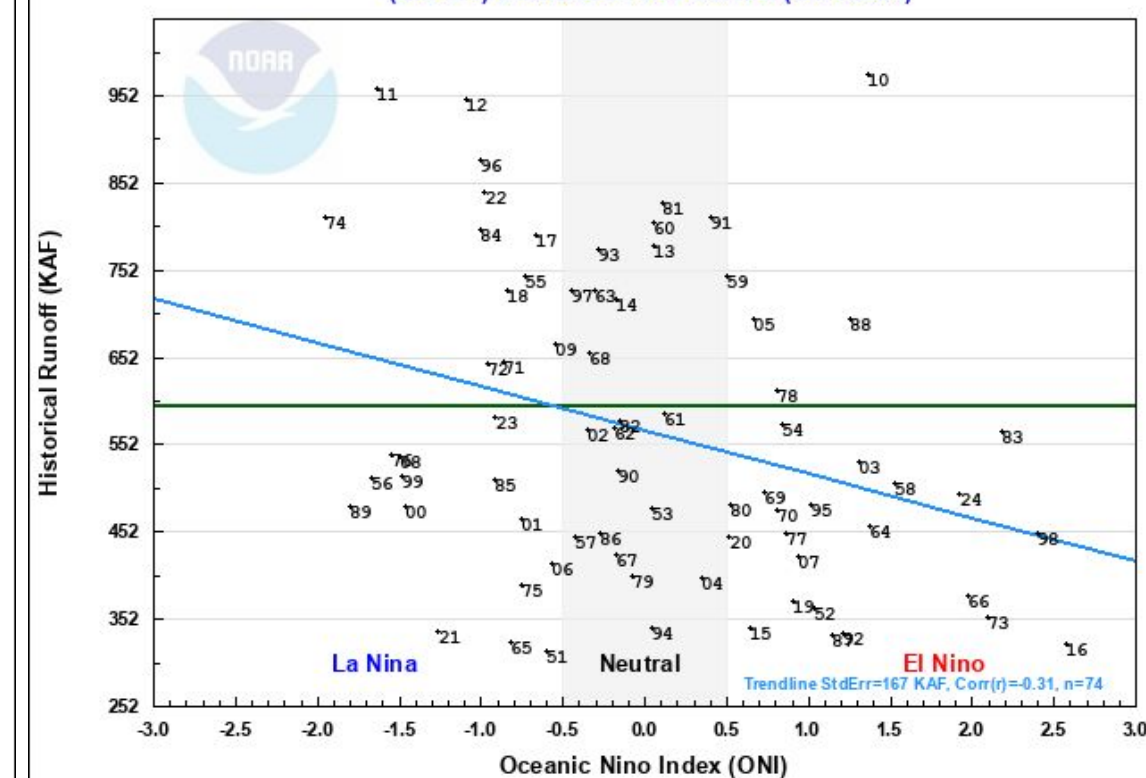


Latest Available ONI Index for OND:11/01/2023

Created: 11/13/2024 08:44 PST

OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff

(CRPW1) CHEHALIS - AT PORTER (1951-2024)

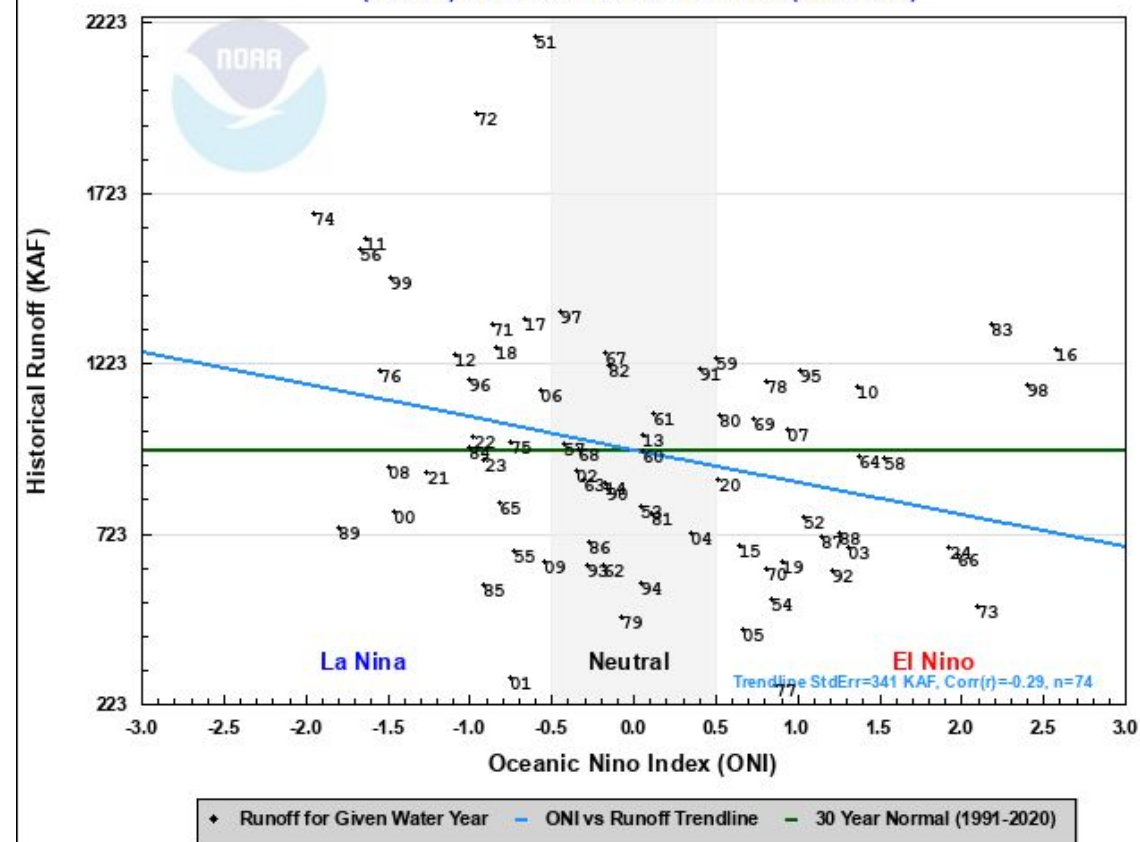


Latest Available ONI Index for OND:11/01/2023

Created: 11/13/2024 08:45 PST

Apr - Sep Volumes and Oceanic Nino Index

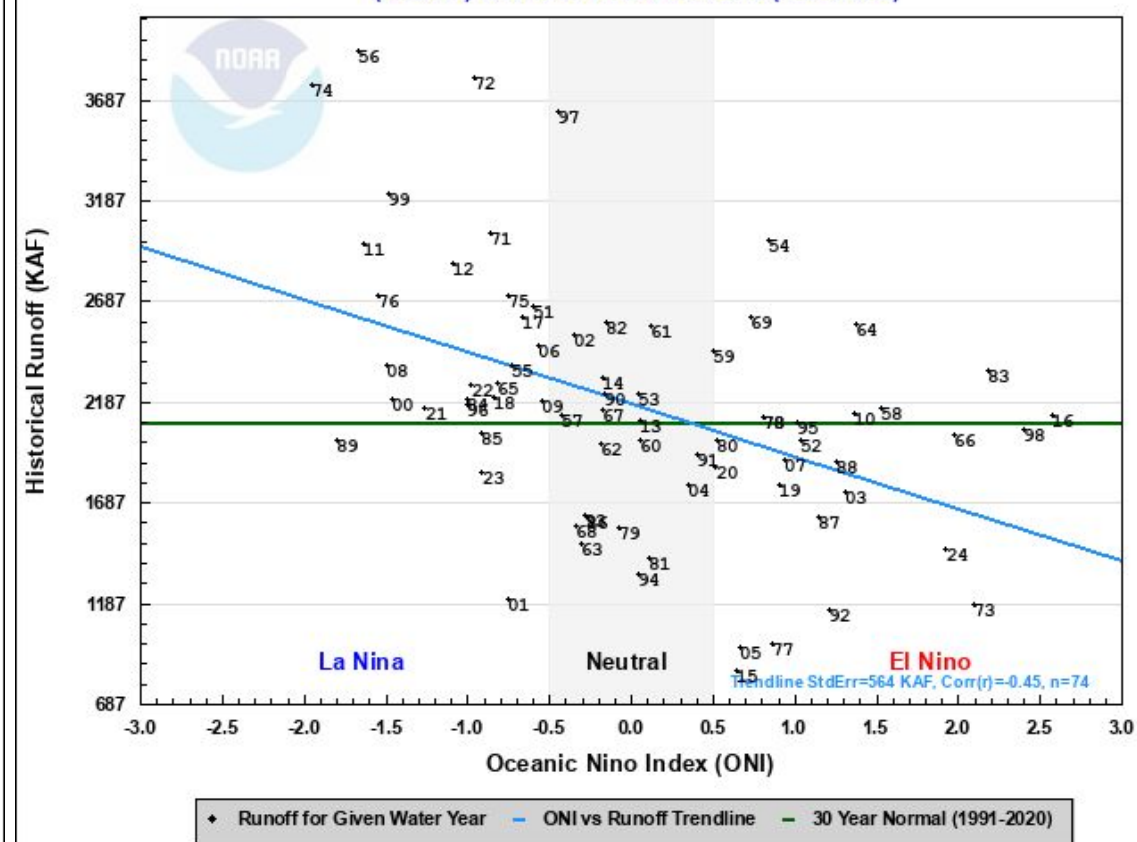
OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff
(PATW1) METHOW - NEAR PATEROS (1951-2024)



Latest Available ONI Index for OND:11/01/2023

Created: 11/13/2024 09:22 PST

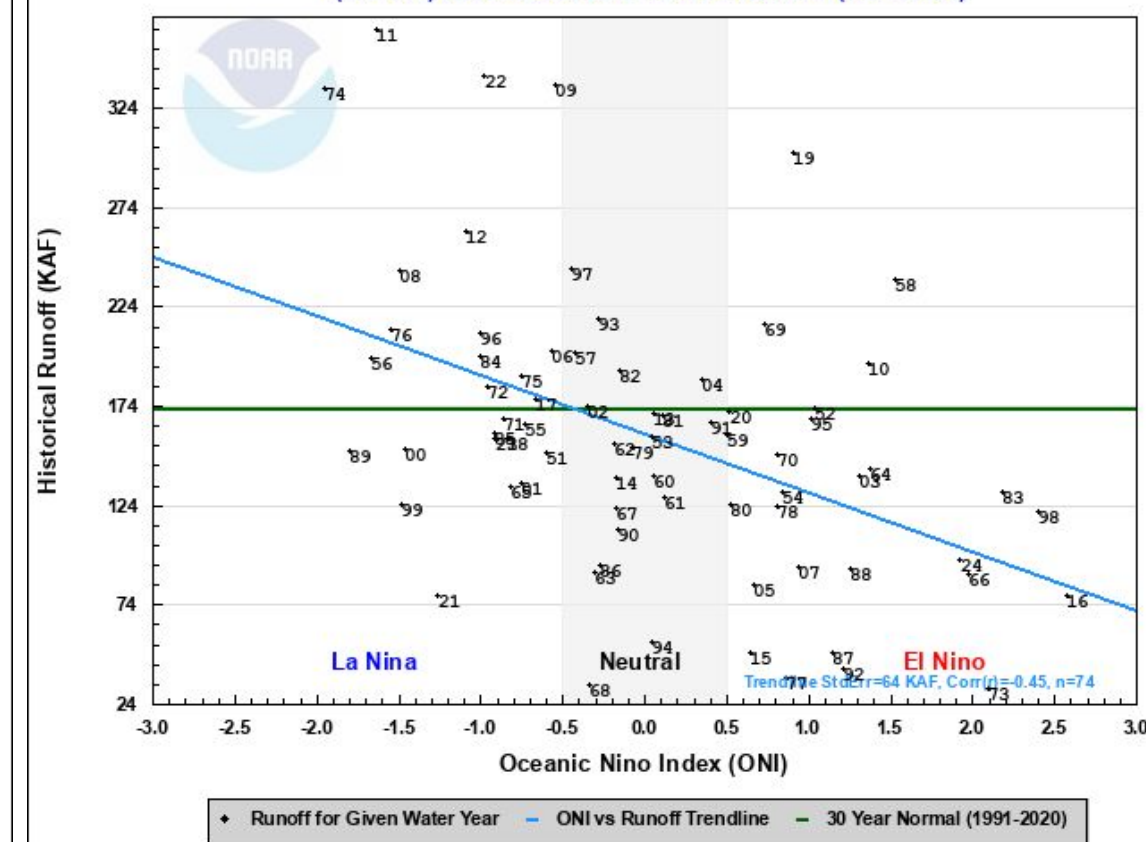
OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff
(PARW1) YAKIMA - NEAR PARKER (1951-2024)



Latest Available ONI Index for OND:11/01/2023

Created: 11/13/2024 09:22 PST

OCT-DEC Oceanic Nino Index vs APR-SEP Historical Natural Runoff
(TCHW1) WALLA WALLA - NEAR TOUCHET (1951-2024)



Latest Available ONI Index for OND:11/01/2023

Created: 11/13/2024 09:23 PST

Takeaways

- Runoff since October 1 has largely been below normal with some exceptions in the north.
- The active weather pattern is expected to continue.
- Precipitation has been less than forecast in the last 10 days.

Streamflow & Groundwater Conditions in Washington State as of 14 November 2024

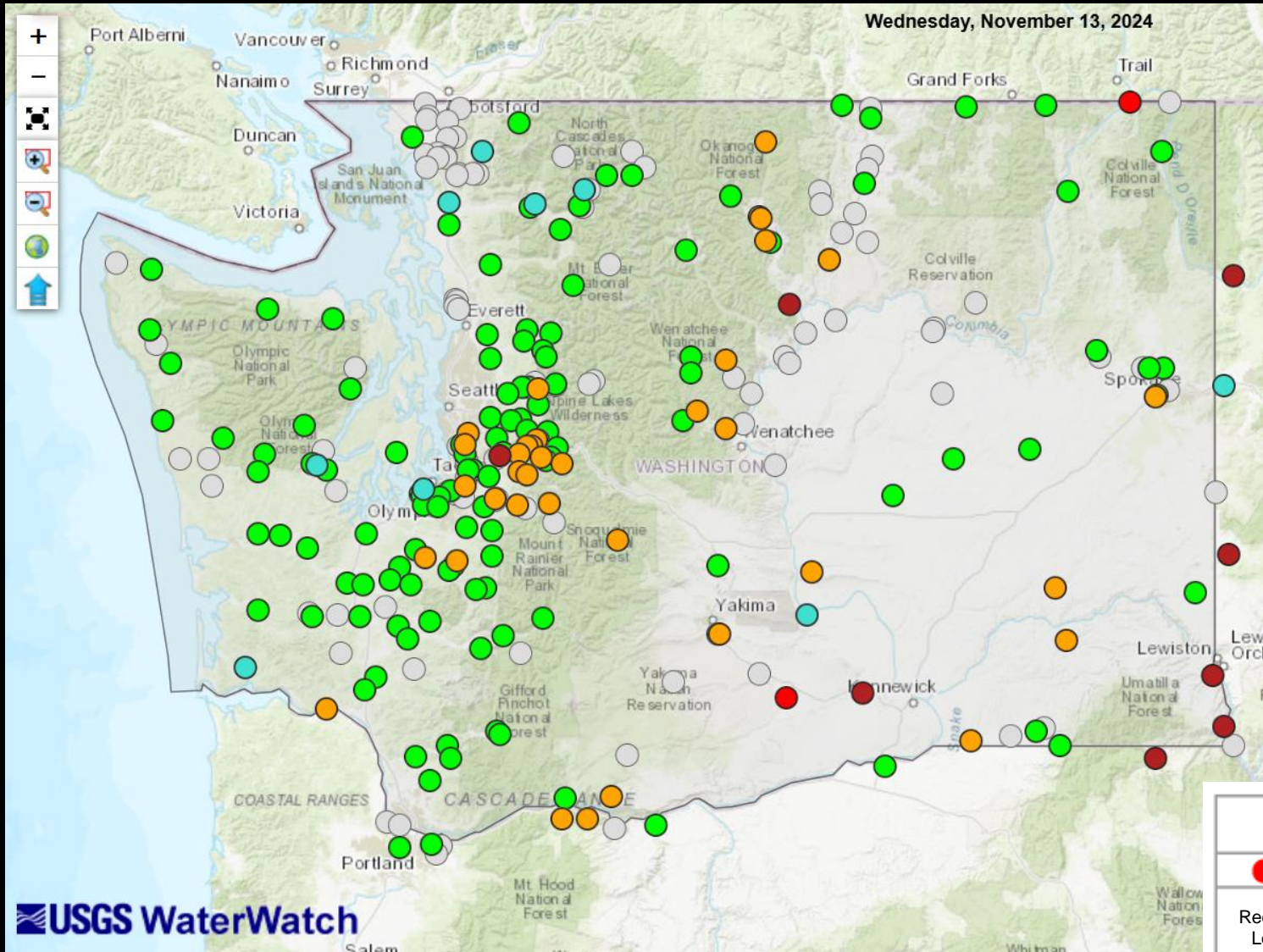


Presented on 14 November 2024
to the Washington Water Supply Availability Committee
by Nicholas Sutfin, nsutfin@usgs.gov
USGS Washington Water Science Center

This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.









7-day Average Streamflow

Conditions as of 13 November 2024



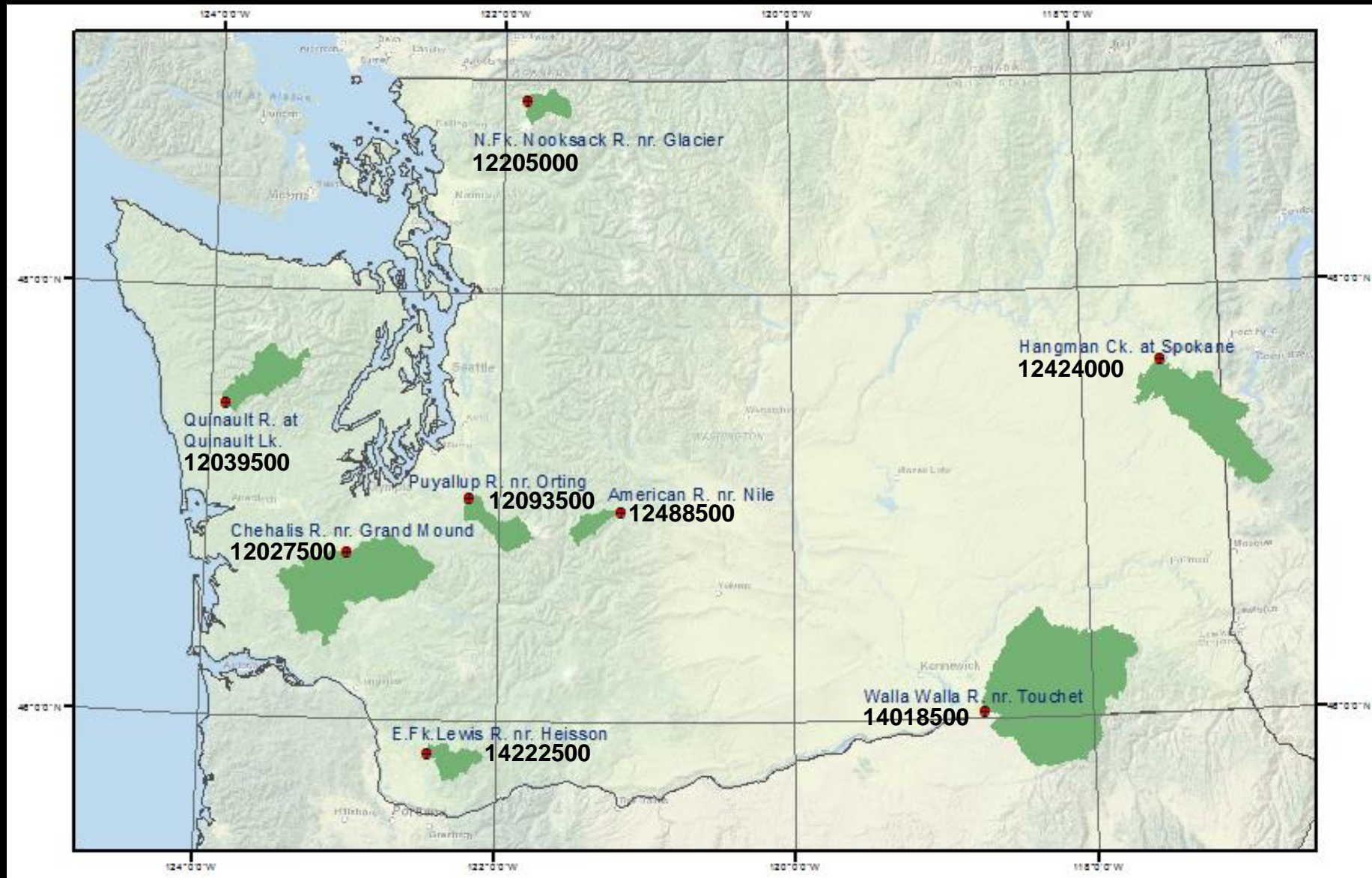
**Preliminary Information-
Subject to Revision. Not for
Citation or Distribution.**

**WaterWatch is scheduled
to be discontinued in 2026**

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

Index Gaging Stations

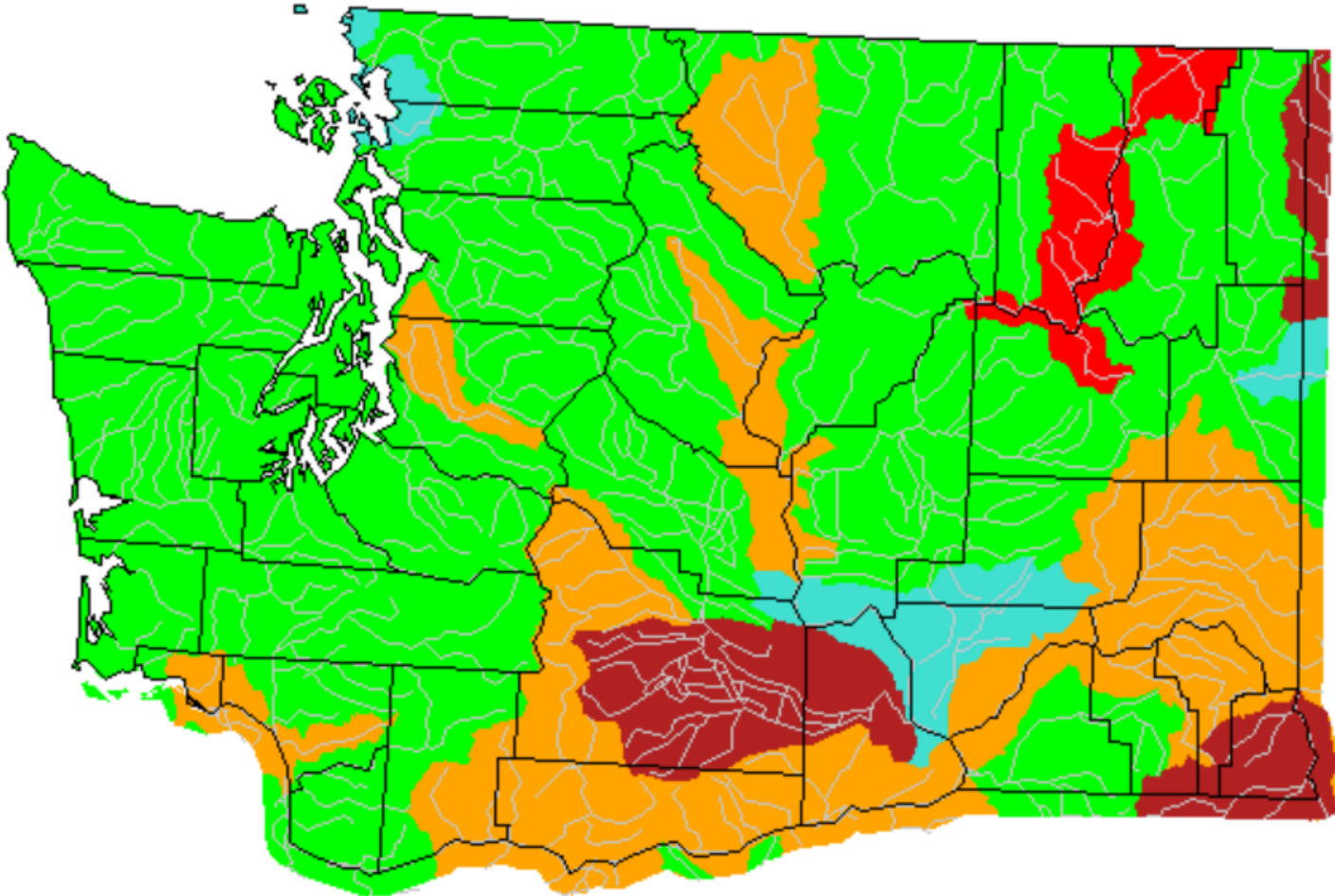
(Stations that measure natural or near-natural streamflow)





Average streamflow compared to historical streamflow

7-day average as of 13 November 2024

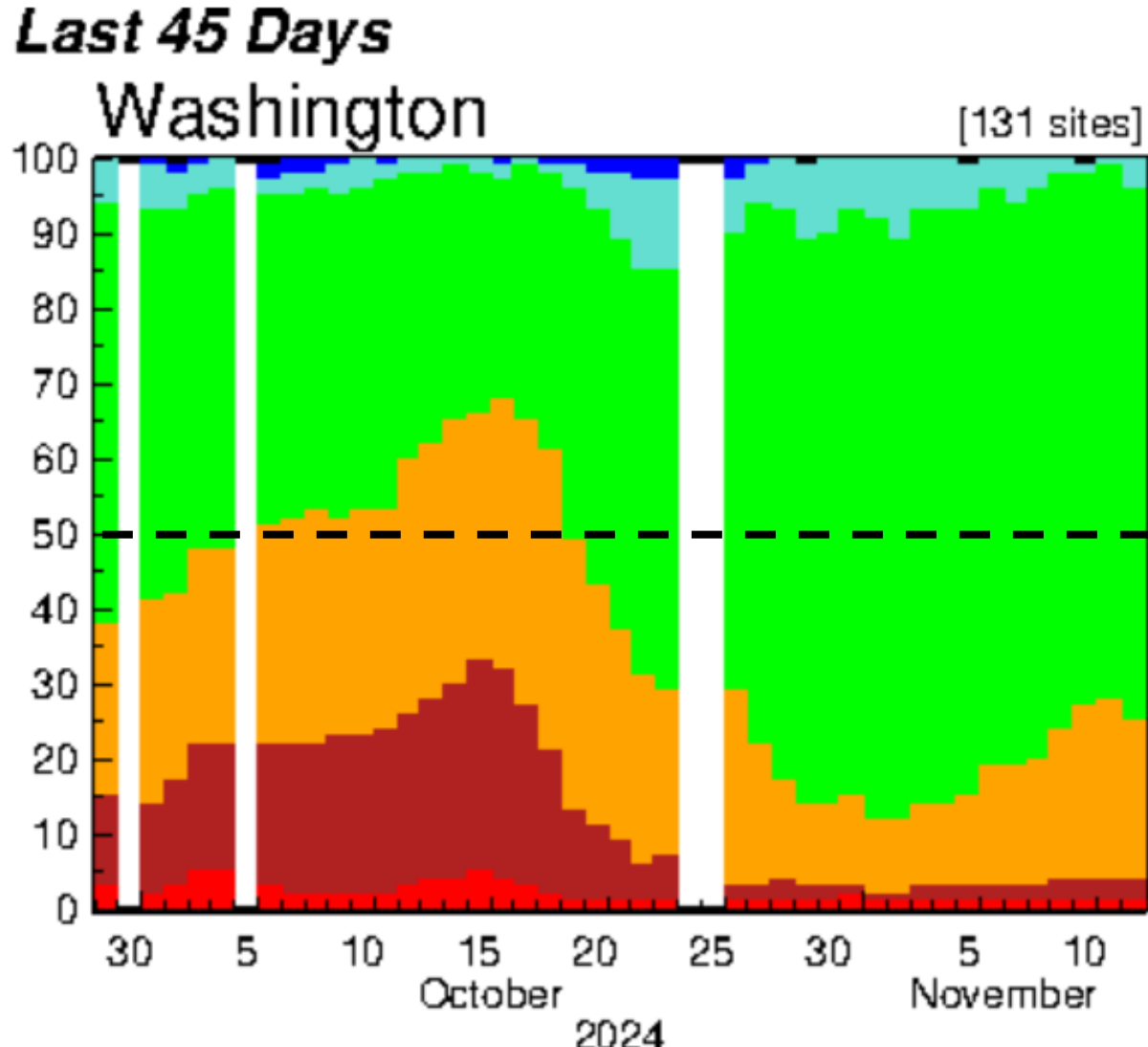


| Explanation - Percentile classes | | | | | | |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|-------------|
| | | | | | | |
| Record Low | <10 | 10-24 | 25-75 | 76-90 | >90 | Record High |
| | Much below normal | Below normal | Normal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

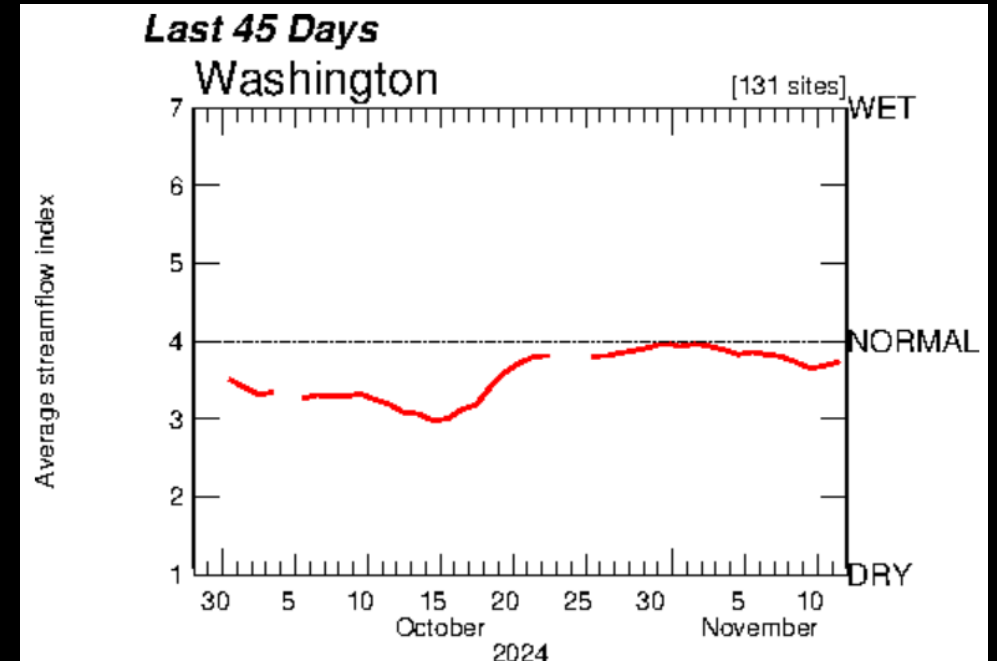
**Preliminary Information-
Subject to Revision. Not for
Citation or Distribution.**

7-day average streamflow

Most USGS stream gages at normal as of 13 Nov. 2024



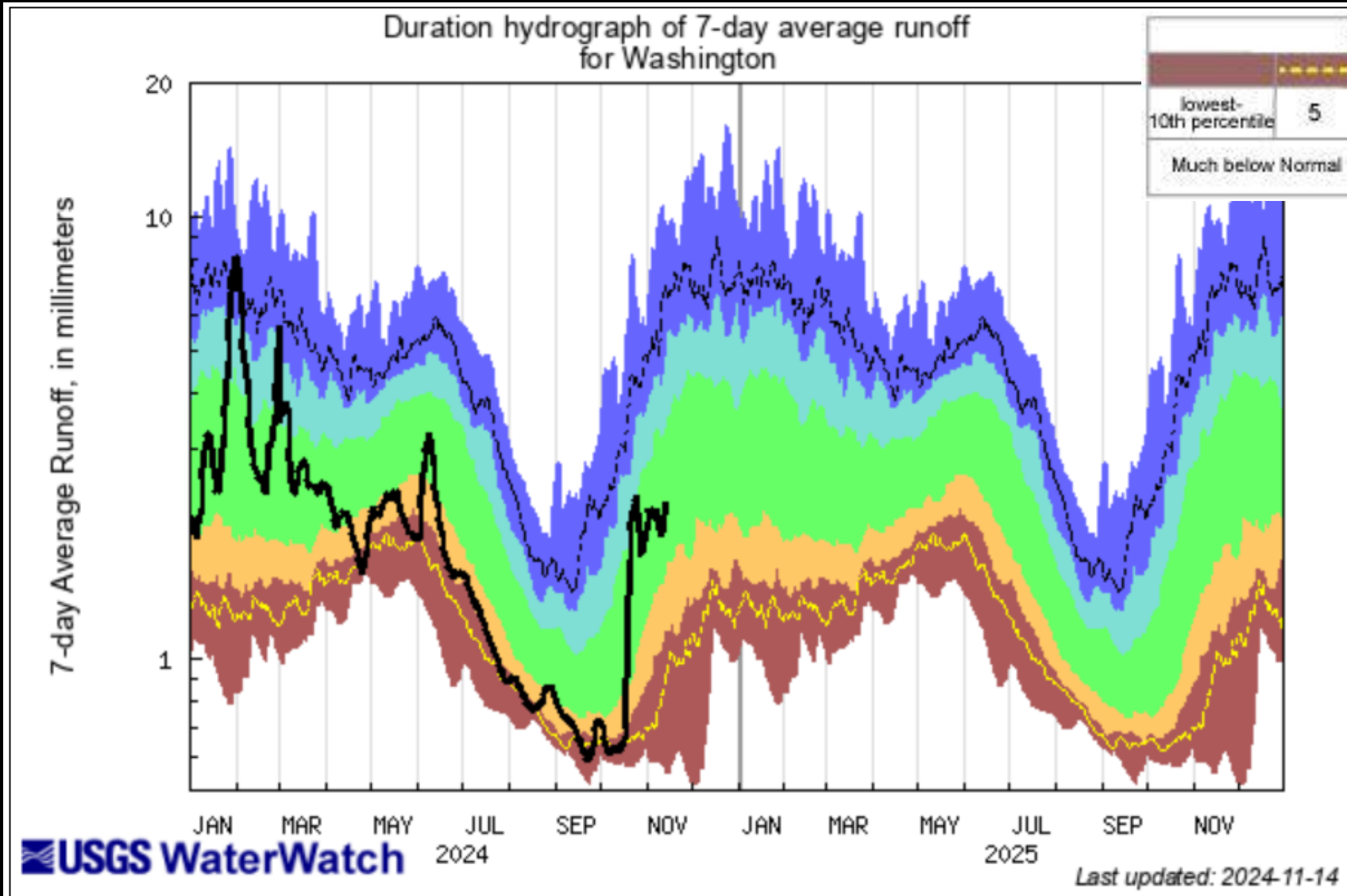
Preliminary Information-Subject to Revision.
Not for Citation or Distribution.



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

Area-Based Runoff Duration Hydrograph

7-day average streamflow as of 14 Nov. 2024 is normal



| Explanation - Percentile classes | | | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|----|---------------------------|
| lowest-10th percentile | 5 | 10-24 | 25-75 | 76-90 | 95 | 90th percentile - highest |
| Much below Normal | Below normal | Normal | Above normal | Much above normal | | Flow |

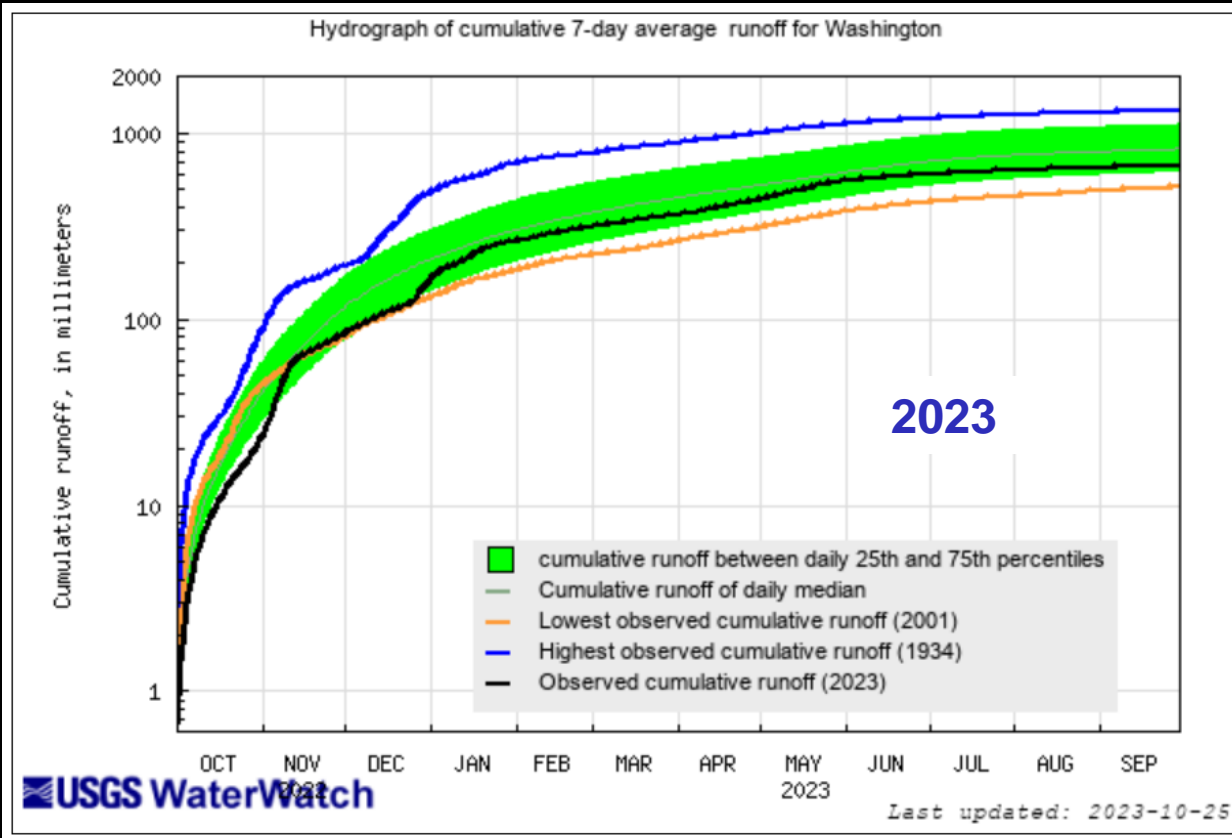
**Preliminary Information-
Subject to Revision. Not for
Citation or Distribution.**

**For some streams, flow
statistics may have been
computed from mixed
regulated
and unregulated flows; this
can affect depictions of flow
conditions.**

Cumulative runoff hydrograph

Area-based runoff based on 7-day average

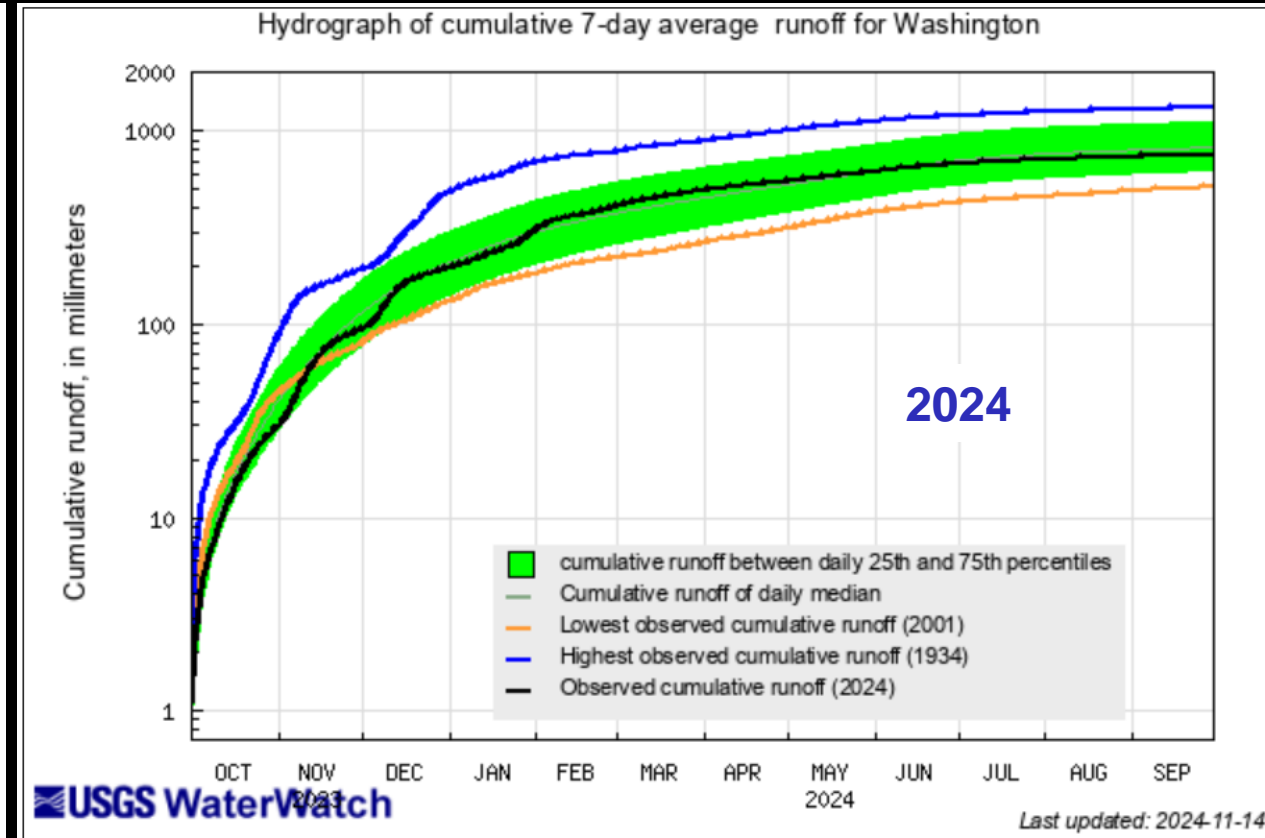
Normal for the end of water year 2024 as of 1 October



2023 water year

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

<https://waterwatch.usgs.gov/>

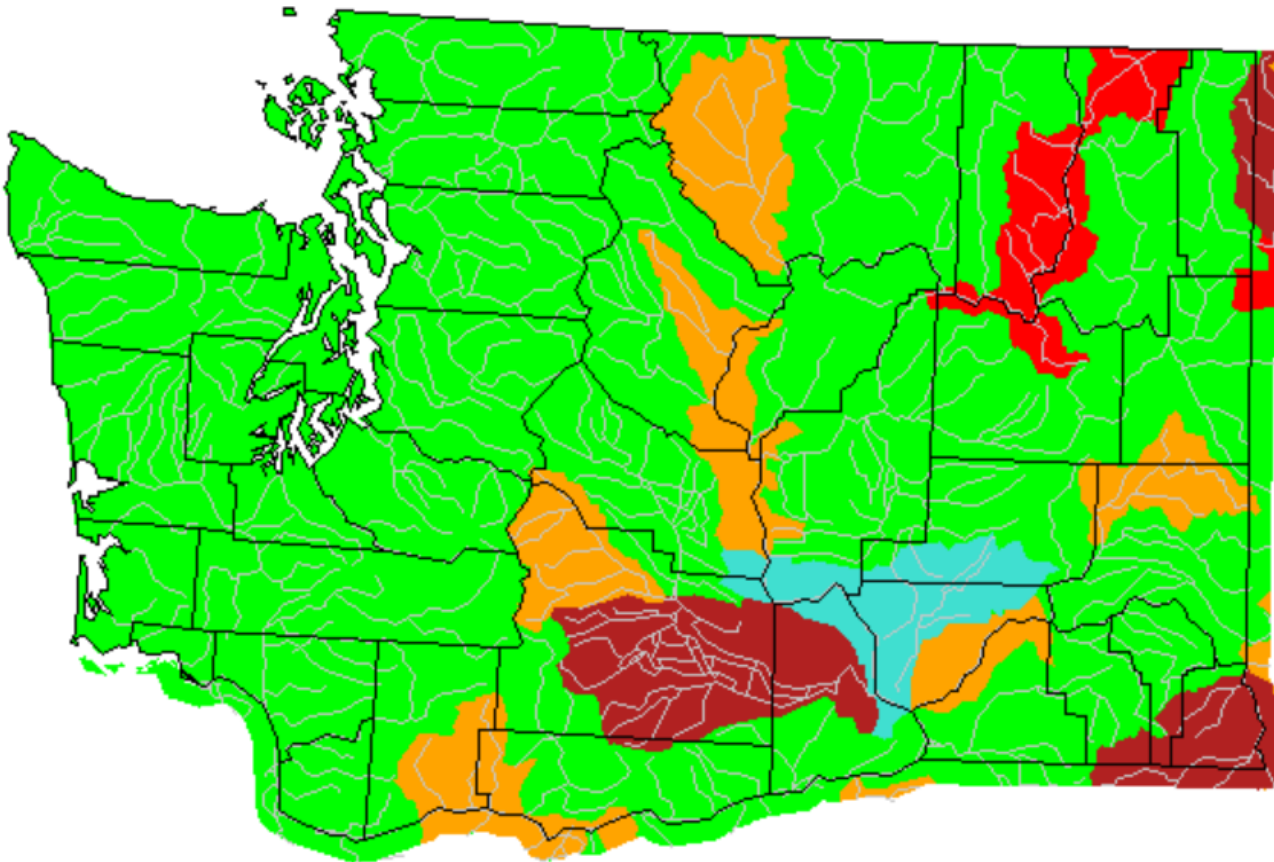


2024 water year

Preliminary Information-Subject to Revision.
Not for Citation or Distribution.

Monthly average streamflow compared to historical streamflow

**November average (last 14-days) as of 13
November 2024**



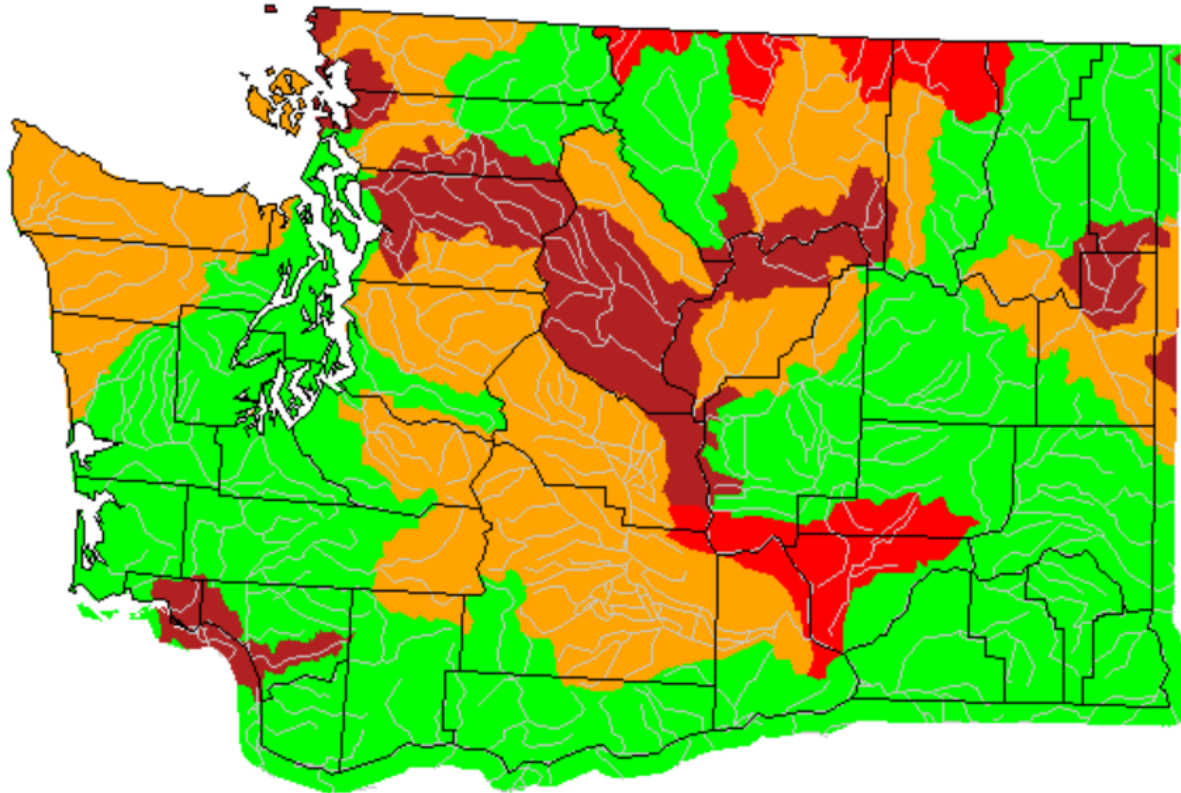
| Explanation - Percentile classes | | | | | | |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|-------------|
| | | | | | | |
| Record Low | <10 | 10-24 | 25-75 | 76-90 | >90 | Record High |
| | Much below normal | Below normal | Normal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

Preliminary Information-Subject to Revision. Not for Citation or Distribution.

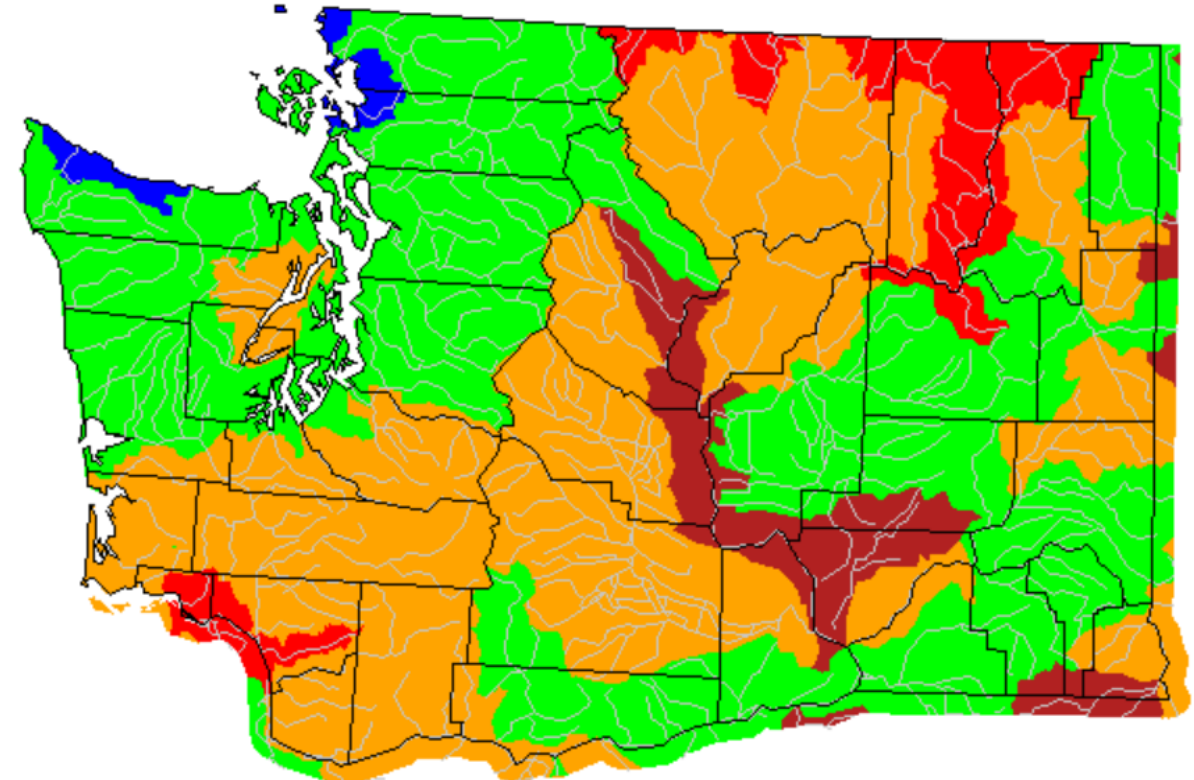
Monthly average streamflow compared to historical streamflow

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

October 2023



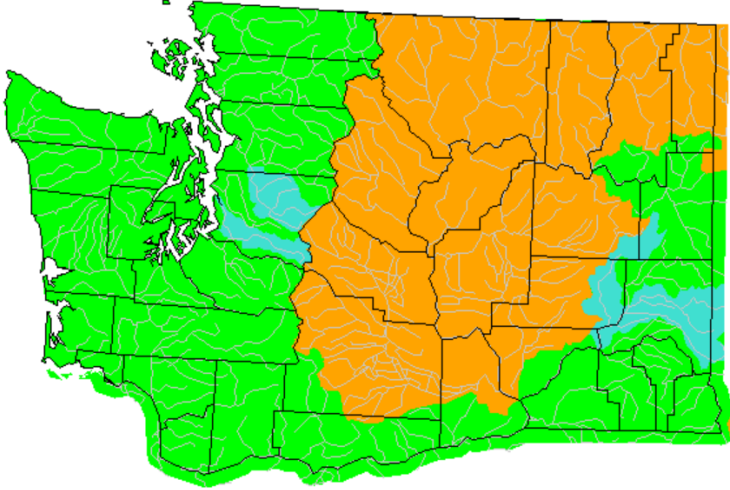
October 2024



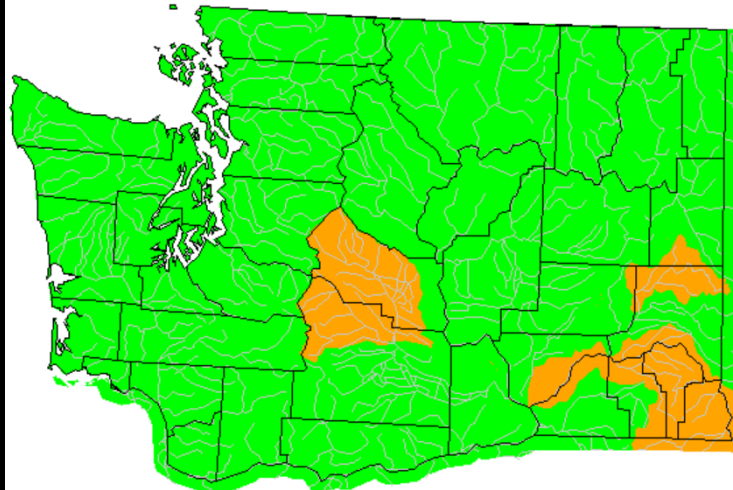
Preliminary Information-Subject to Revision. Not for Citation or Distribution.

September monthly average streamflow compared to historical streamflow

October 2001



October 2005

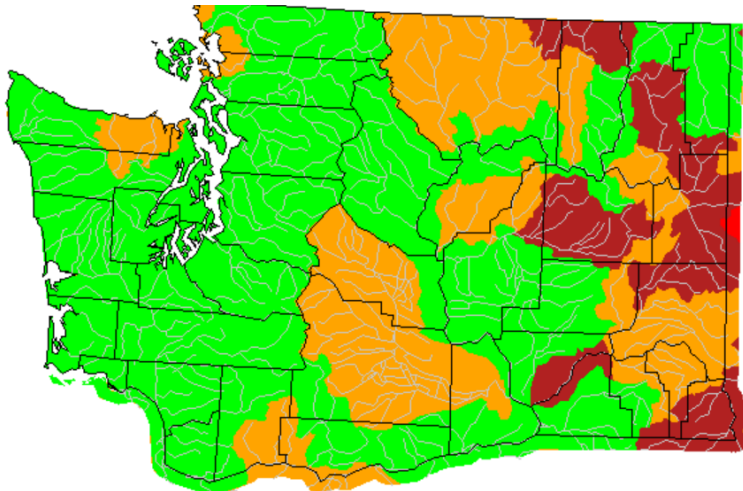


| Explanation - Percentile classes | | | | | | |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|-------------|
| | | | | | | |
| Record Low | <10 | 10-24 | 25-75 | 76-90 | >90 | Record High |
| | Much below normal | Below normal | Normal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

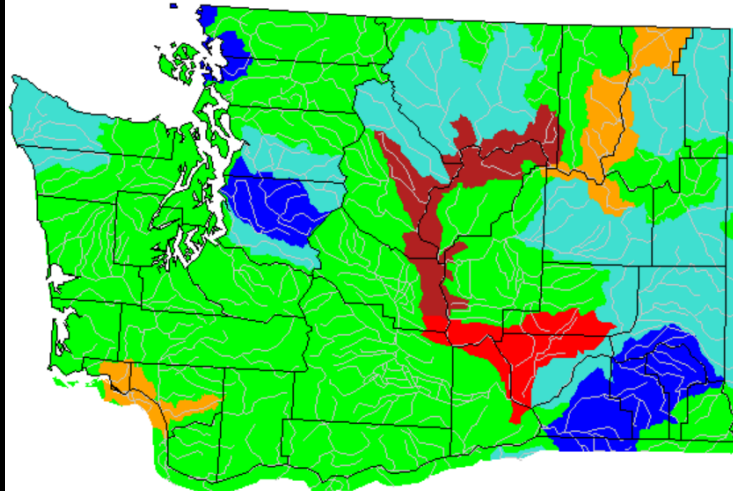
<https://waterwatch.usgs.gov/>

**Preliminary Information-
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Distribution.**

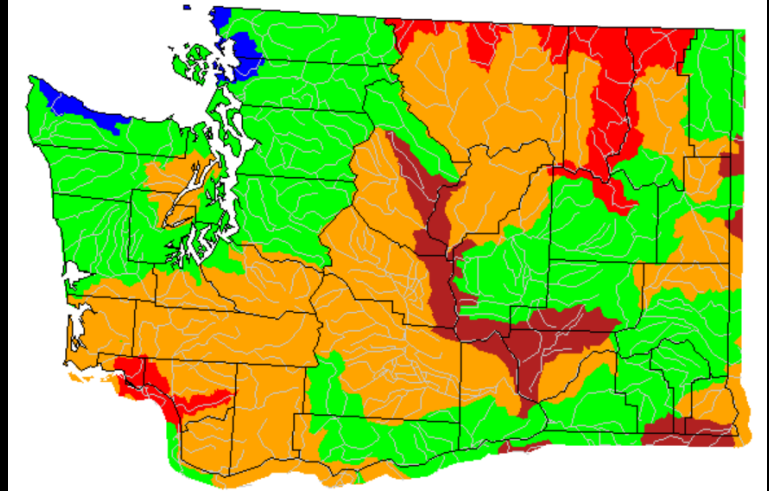
October 2015



October 2019

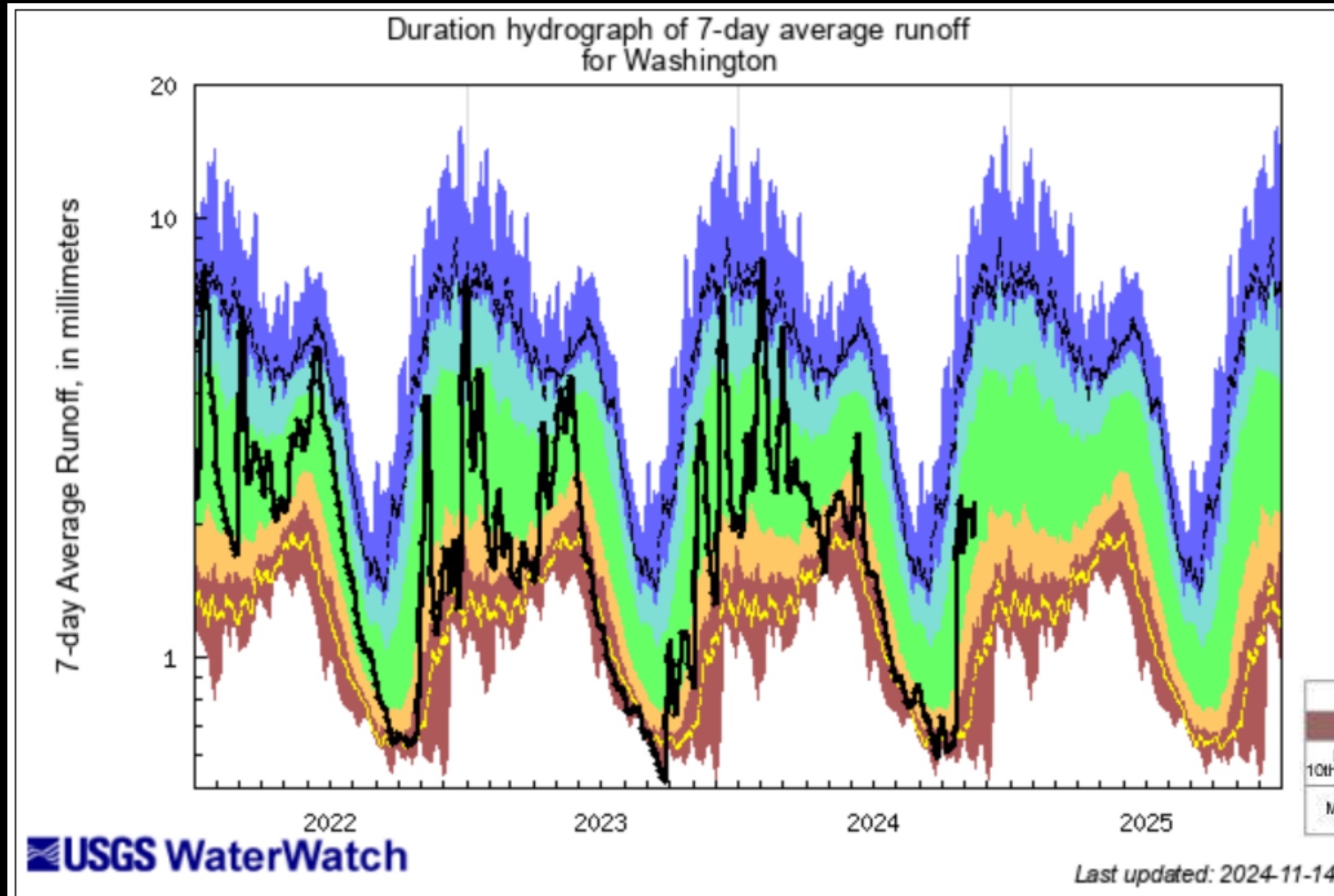


October 2024



Area-Based Runoff Duration Hydrograph

7-day average streamflow



| Explanation - Percentile classes | | | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|----|---------------------------|
| lowest-10th percentile | 5 | 10-24 | 25-75 | 76-90 | 95 | 90th percentile - highest |
| Much below Normal | Below normal | Normal | Above normal | Much above normal | | Flow |

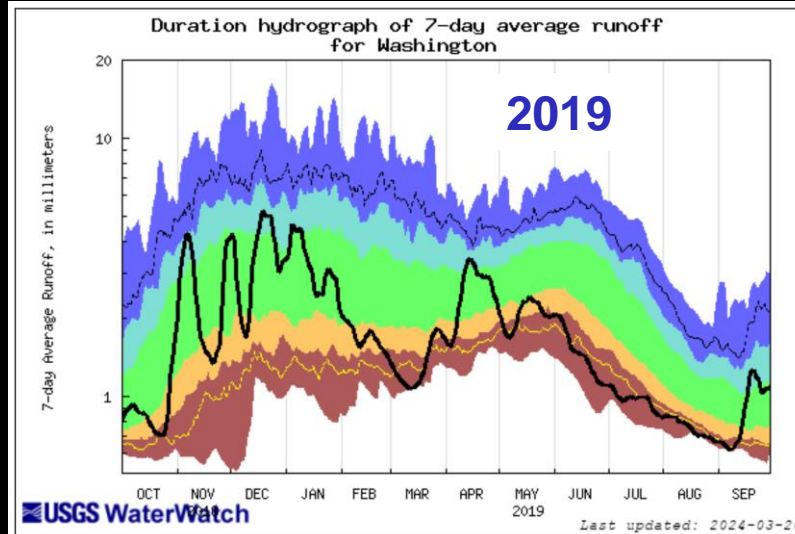
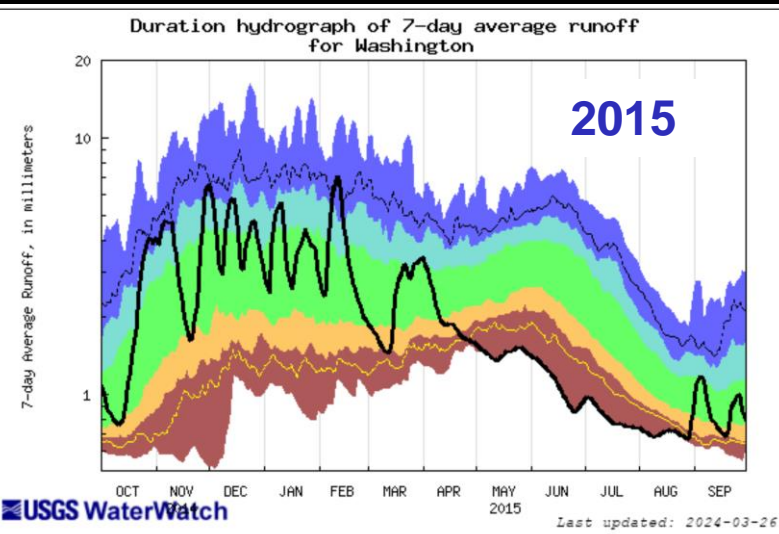
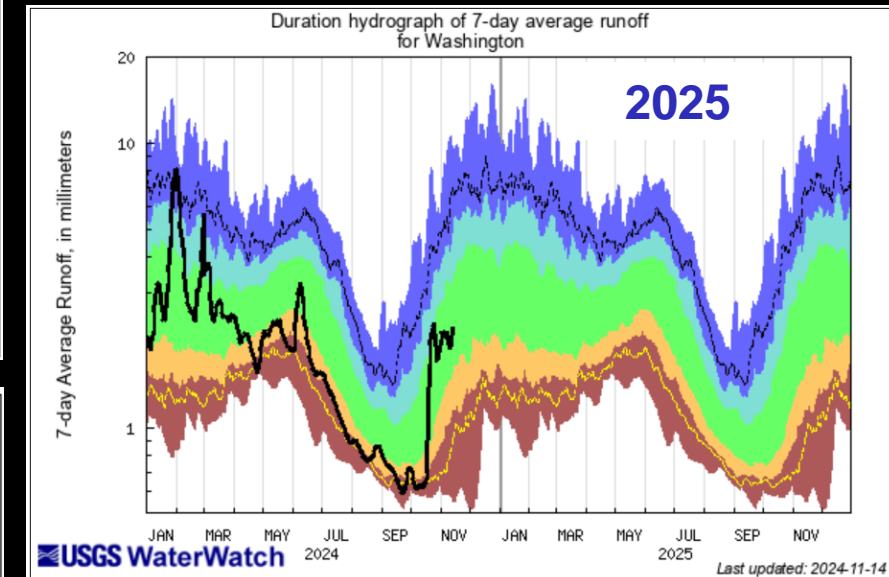
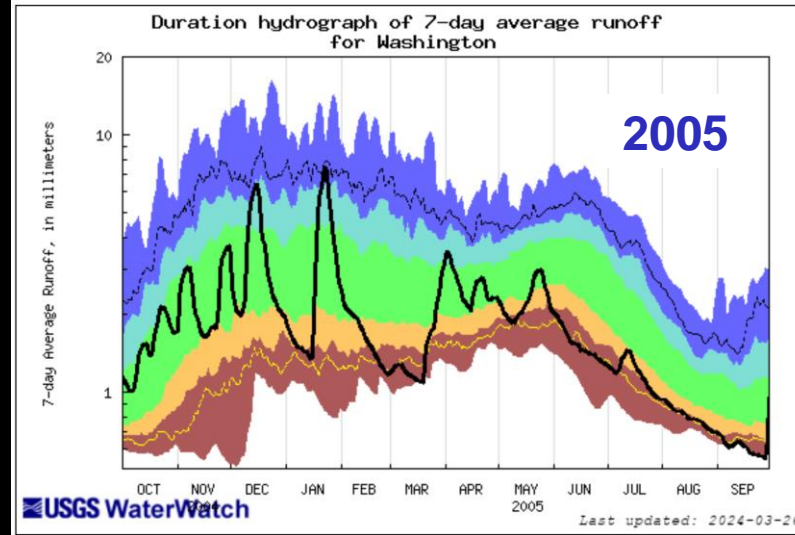
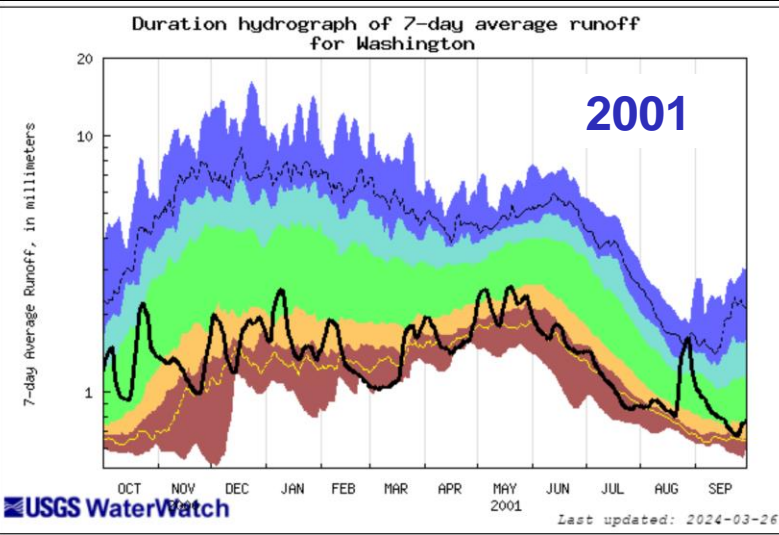
Preliminary Information-Subject to Revision. Not for Citation or Distribution.

<https://waterwatch.usgs.gov/>

Area-Based Runoff Duration Hydrograph

7-day average streamflow

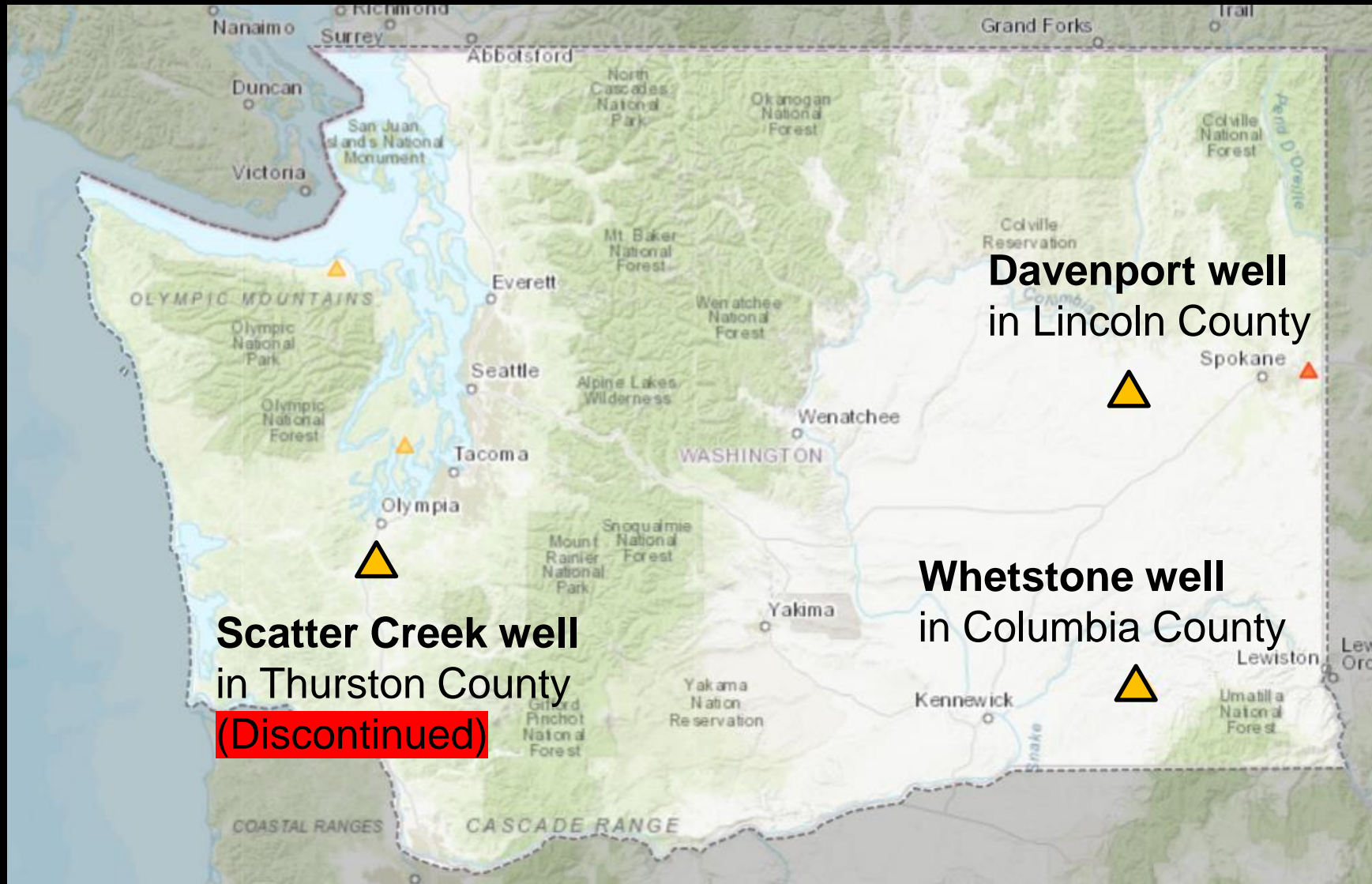
Duration hydrograph for the year compared to recent years of drought



| Explanation - Percentile classes | | | | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|----|-------------------------|------|
| lowest-10th percentile | 5 | 10-24 | 25-75 | 76-90 | 95 | 90th percentile-highest | Flow |
| Much below Normal | Below normal | Normal | Above normal | Much above normal | | | |

Preliminary Information-Subject to Revision. Not for Citation or Distribution.

Two reference groundwater wells



- All three groundwater Monitoring Network wells on the west side of the state are discontinued due to a lack of funding, including Scatter Creek well.
- Equipment has been removed
- Three wells remain on the east side of the state.

**Preliminary Information-
Subject to Revision. Not
for Citation or
Distribution.**

Davenport Well Groundwater Conditions

24N/36E-16A01 - 473442118162201

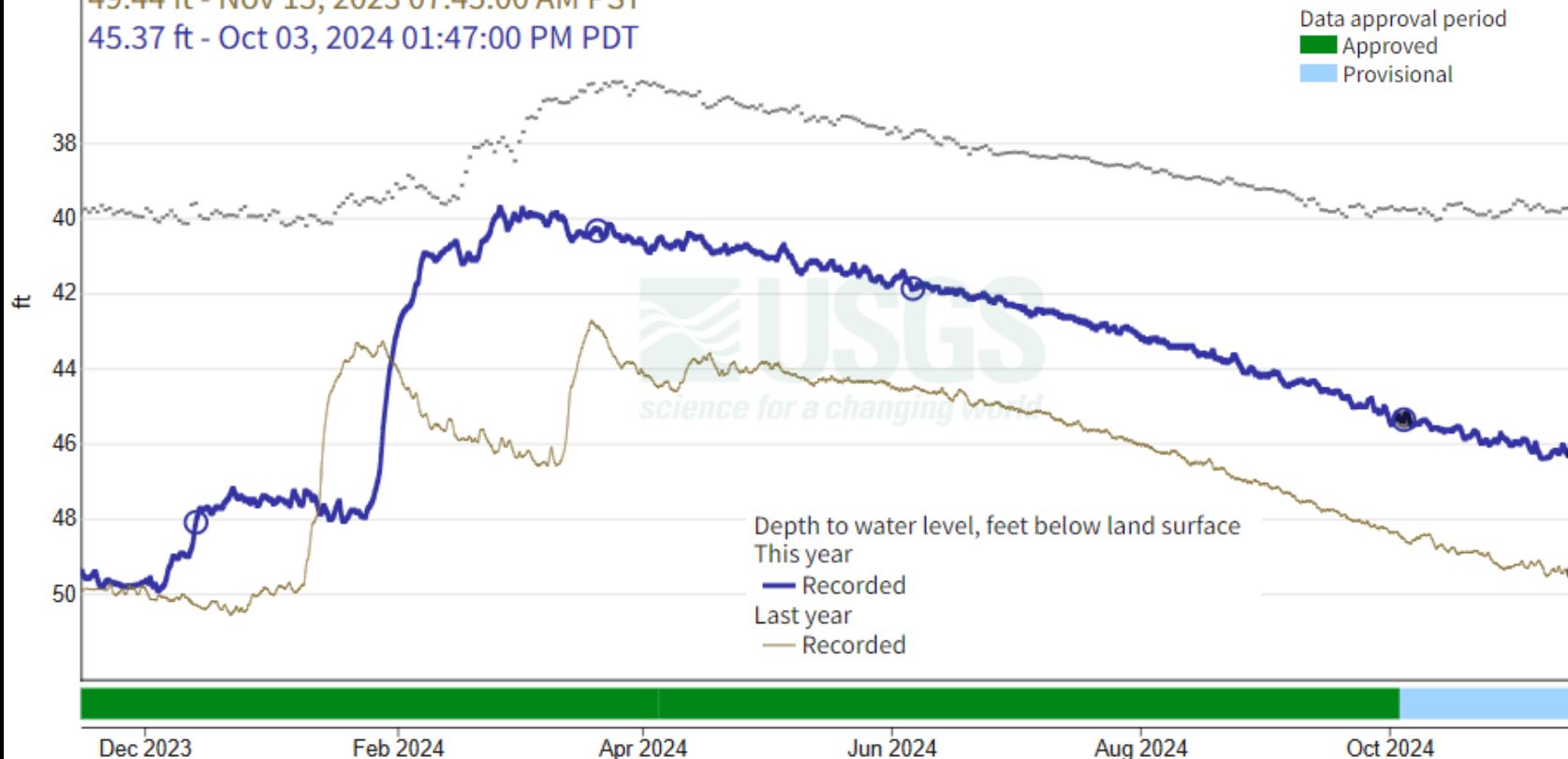
November 15, 2023 - November 14, 2024

Depth to water level, feet below land surface

46.27 ft - Nov 14, 2024 07:45:00 AM PST

49.44 ft - Nov 15, 2023 07:45:00 AM PST

45.37 ft - Oct 03, 2024 01:47:00 PM PDT



Davenport well

Well Details

- Lincoln County
- 117-ft deep
- Wanapum Basalt

Preliminary Information-Subject to Revision. Not for Citation or Distribution.

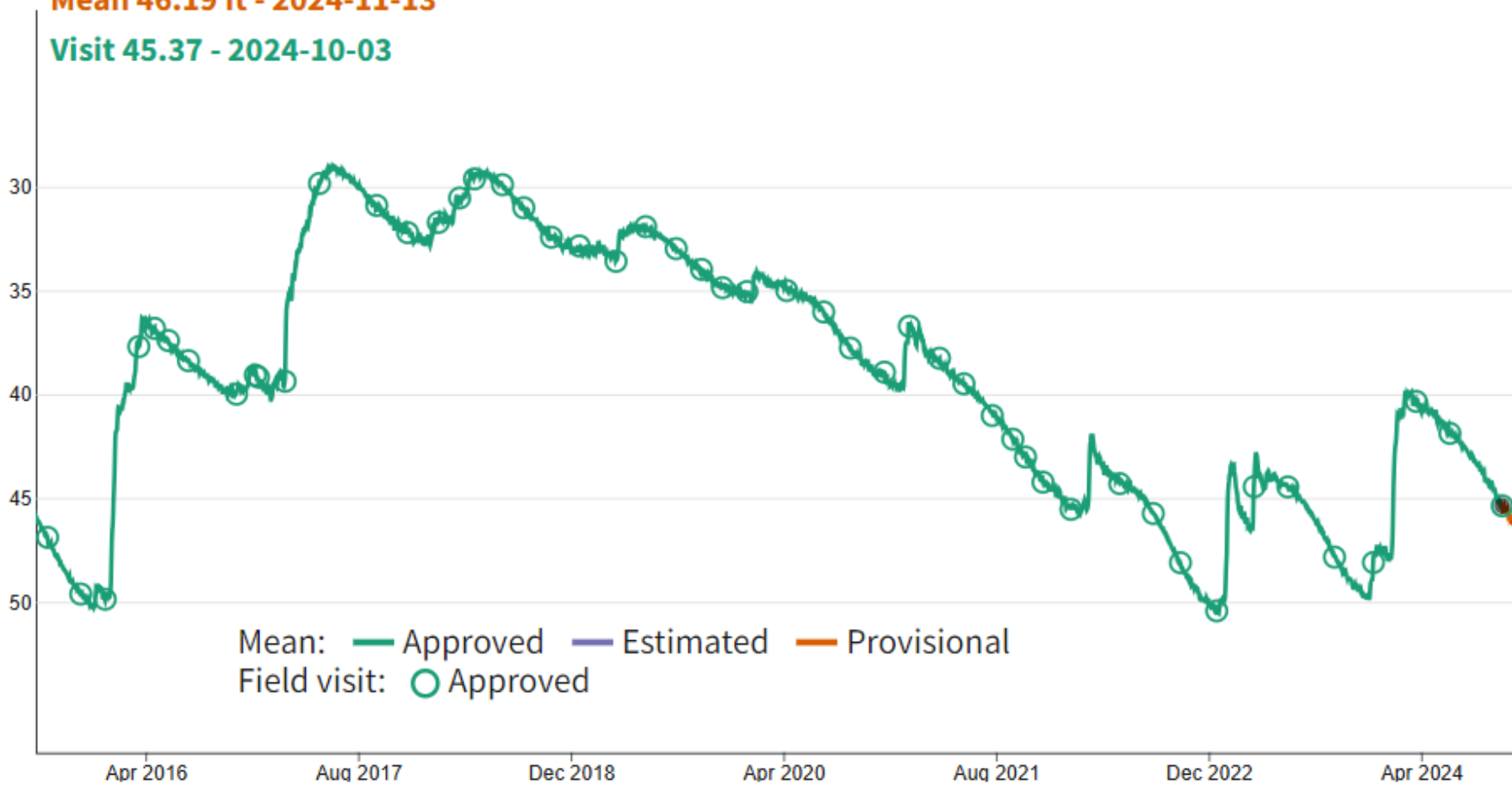
Davenport Well Groundwater Conditions

Well ID: 24N/36E-16A01 - 473442118162201

Depth to water level, ft below land surface, ft

Mean 46.19 ft - 2024-11-13

Visit 45.37 - 2024-10-03



Well Details

- Lincoln County
- 117-ft deep
- Wanapum Basalt

Preliminary
Information-
Subject to
Revision. Not for
Citation or
Distribution.

Whetstone Well Groundwater Conditions

10N/37E-23R01 - 461935118081501

November 15, 2023 - November 14, 2024

Depth to water level, feet below land surface

39.17 ft - Nov 14, 2024 07:00:00 AM PST

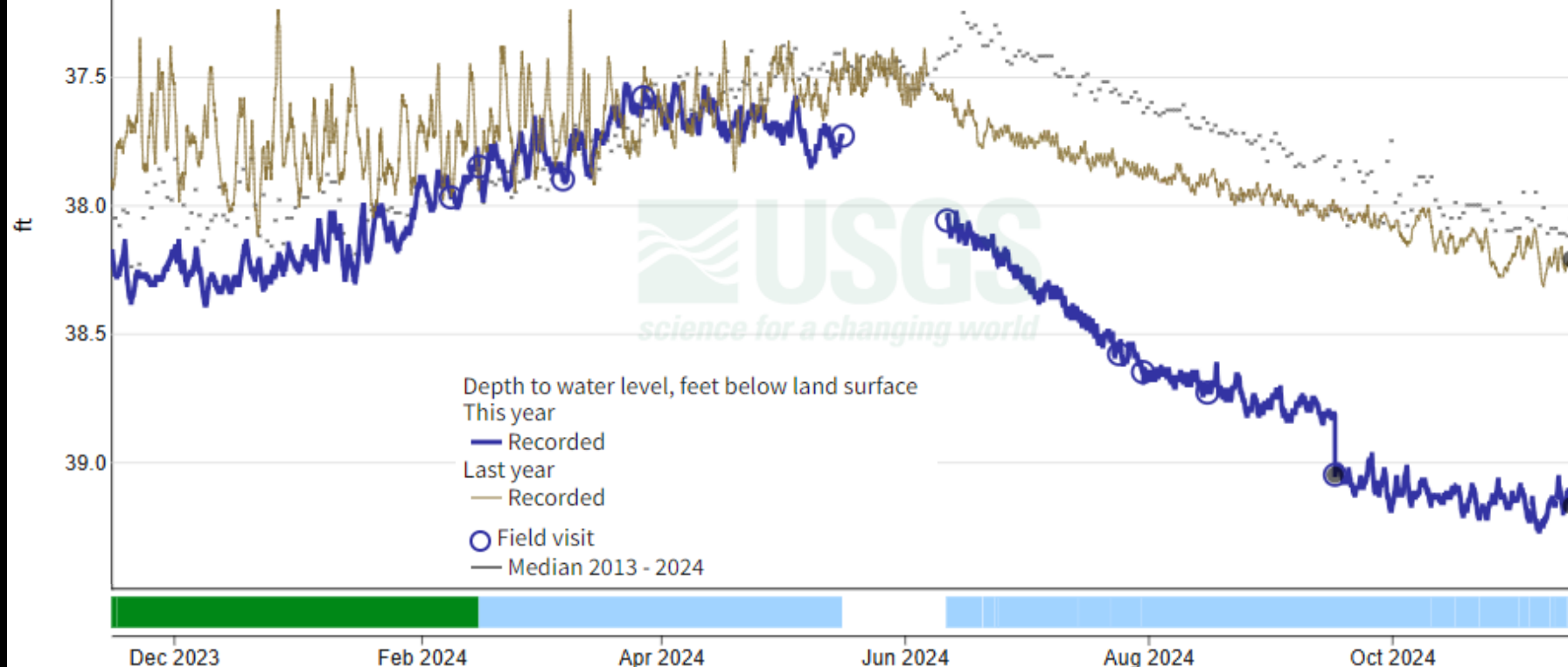
38.21 ft - Nov 15, 2023 07:00:00 AM PST

39.05 ft - Sep 16, 2024 08:54:00 AM PDT

Data approval period

Approved

Provisional



Whetstone well

Well Details:

- Columbia County near Waitsburg
- 172.5-ft deep
- Grande Ronde Basalt Formation

**Preliminary Information-
Subject to Revision. Not
for Citation or
Distribution.**

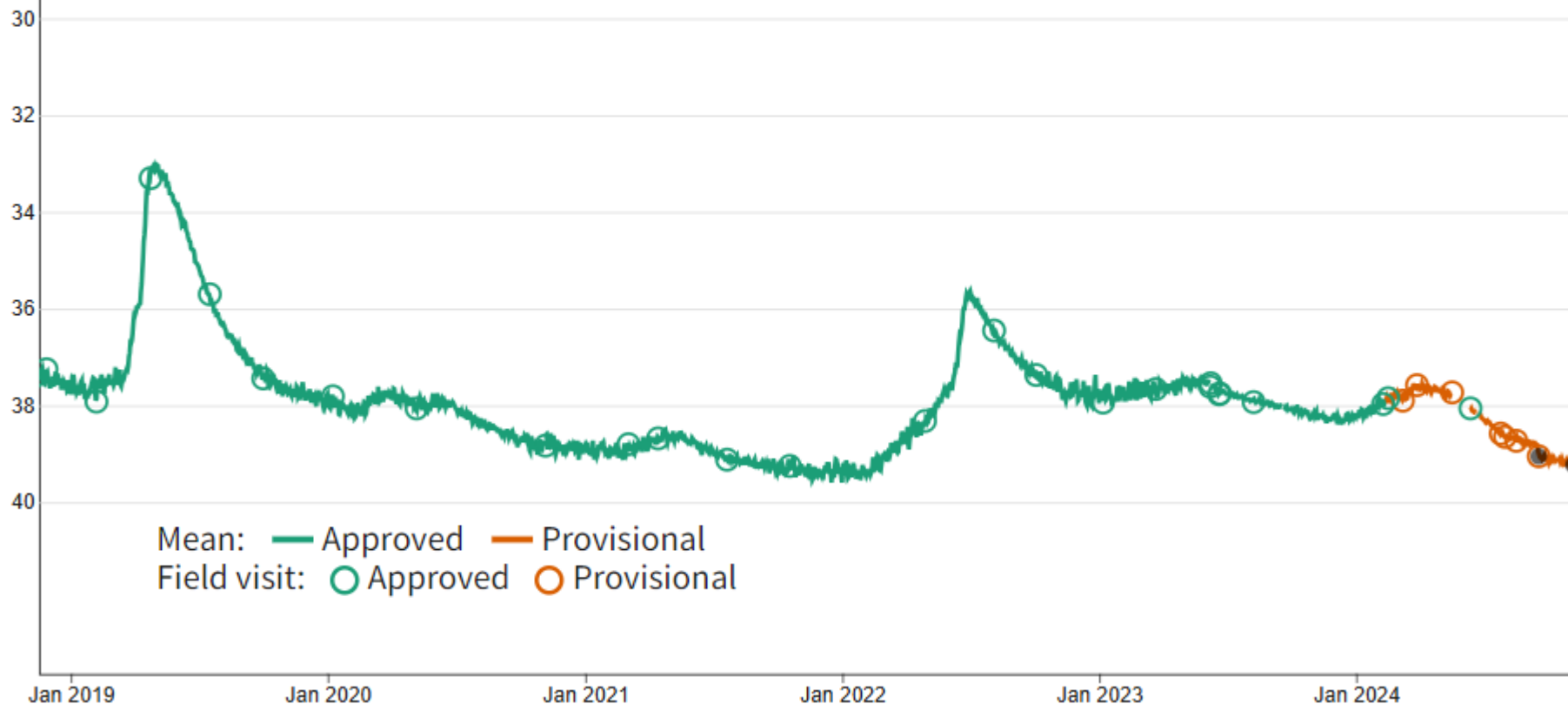
Whetstone Well Groundwater Conditions

Well ID: 10N/37E-23R01 - 461935118081501

Depth to water level, ft below land surface, ft

Mean 39.23 ft - 2024-11-05

Visit 39.05 - 2024-09-16



Well Details:

- Columbia County near Waitsburg
- 172.5-ft deep
- Grande Ronde Basalt Formation

Preliminary
Information-
Subject to
Revision. Not for
Citation or
Distribution.

Summary of Washington Streamflow and Groundwater Conditions as of 14 Nov. 2024

7-day average streamflow at eight index gaging stations:

Normal

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

Below Normal

- Hangman Creek
- Walla Walla River
- American River

Cumulative Runoff Hydrograph Normal for water year 2024

Monthly average groundwater conditions:

- Davenport well –
 - below median
 - above 2023
- Whetstone well
 - below median
 - below 2023

**Preliminary Information-
Subject to Revision. Not for
Citation or Distribution.**



USDA Natural Resources Conservation Service Snow Survey and Water Supply Forecasting Program



Mount Mastiff - Stevens Pass region
*Photo: unknown, submitted to Northwest Avalanche Center
(11/9/2024)*

Washington Water Supply Availability Committee

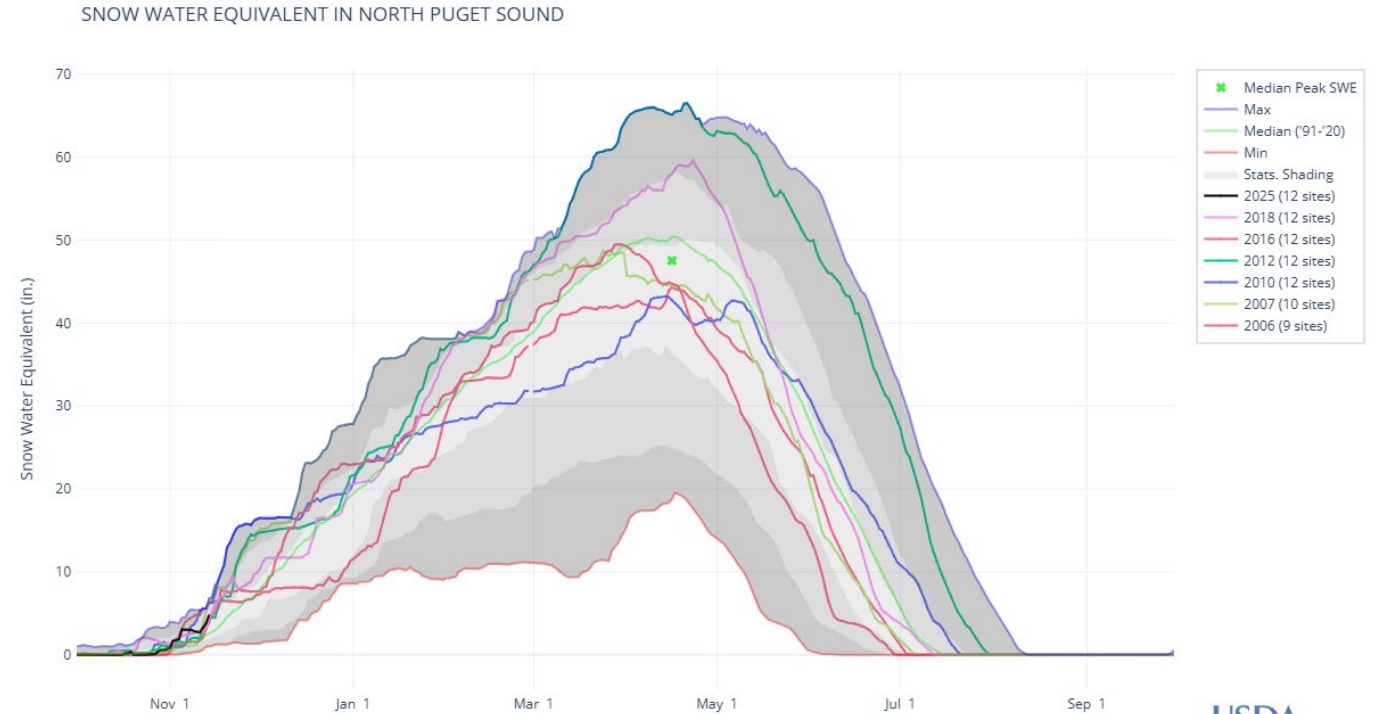
Nov. 14, 2024

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

Early season snow!

Key reminders

- Early season snowpack is generally not a good predictor for the season ahead
- Early season snowpack can yield “extreme” percent-of-normal values since median values at this time tend to be quite low.
- Lack of precipitation falling as rain early in the season could impact soil-moisture and stream baseflow recovery





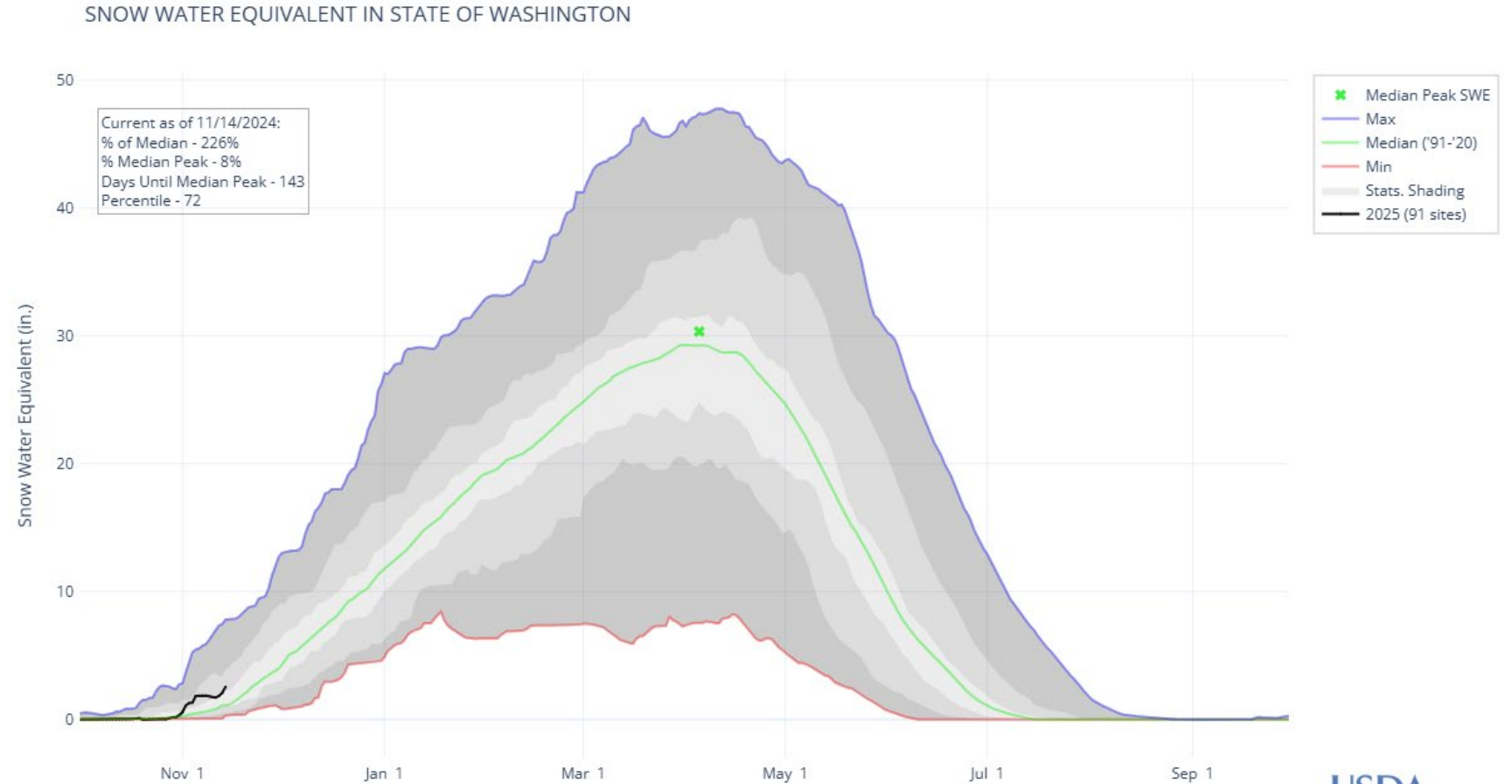
Snowpack Conditions

Statewide Snowpack

Profile for Snow Water Equivalent

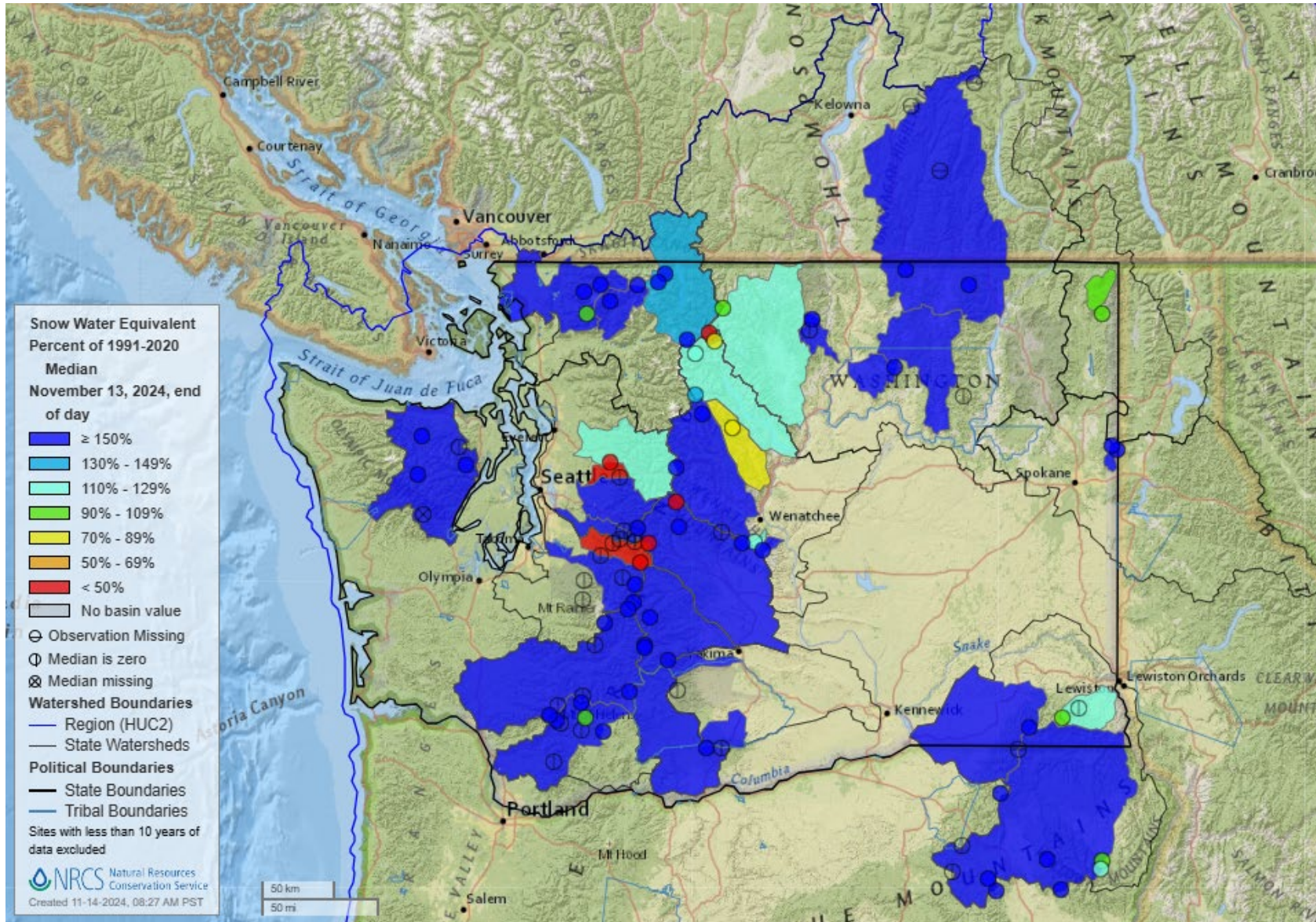
Statewide Snowpack:
226% of normal

Snowpack Percentile: 72



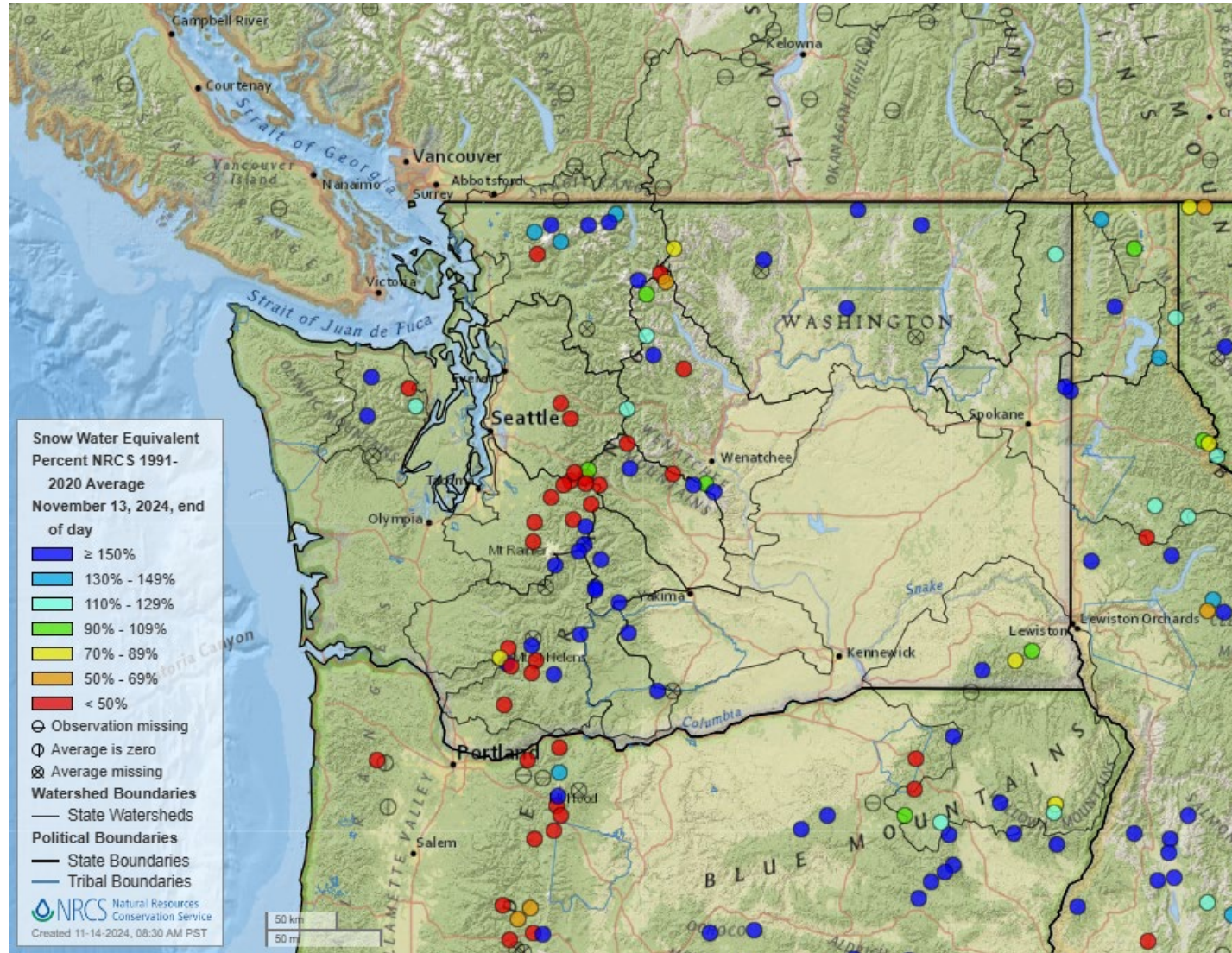
Basin Snowpack

Sub-basin and site map



Site Map

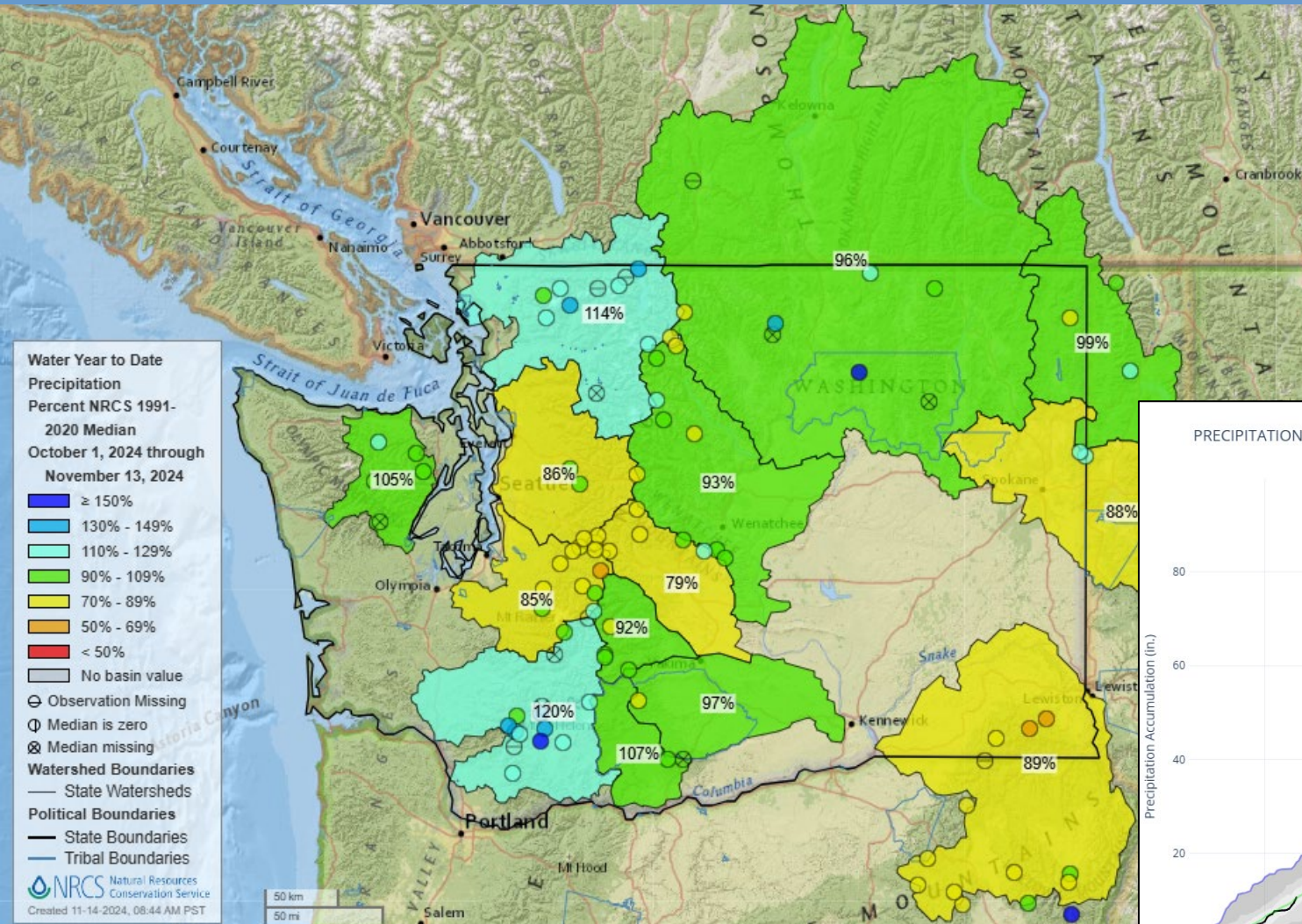
% of Average (opposed to the median which is used as the normal)





Precipitation Conditions

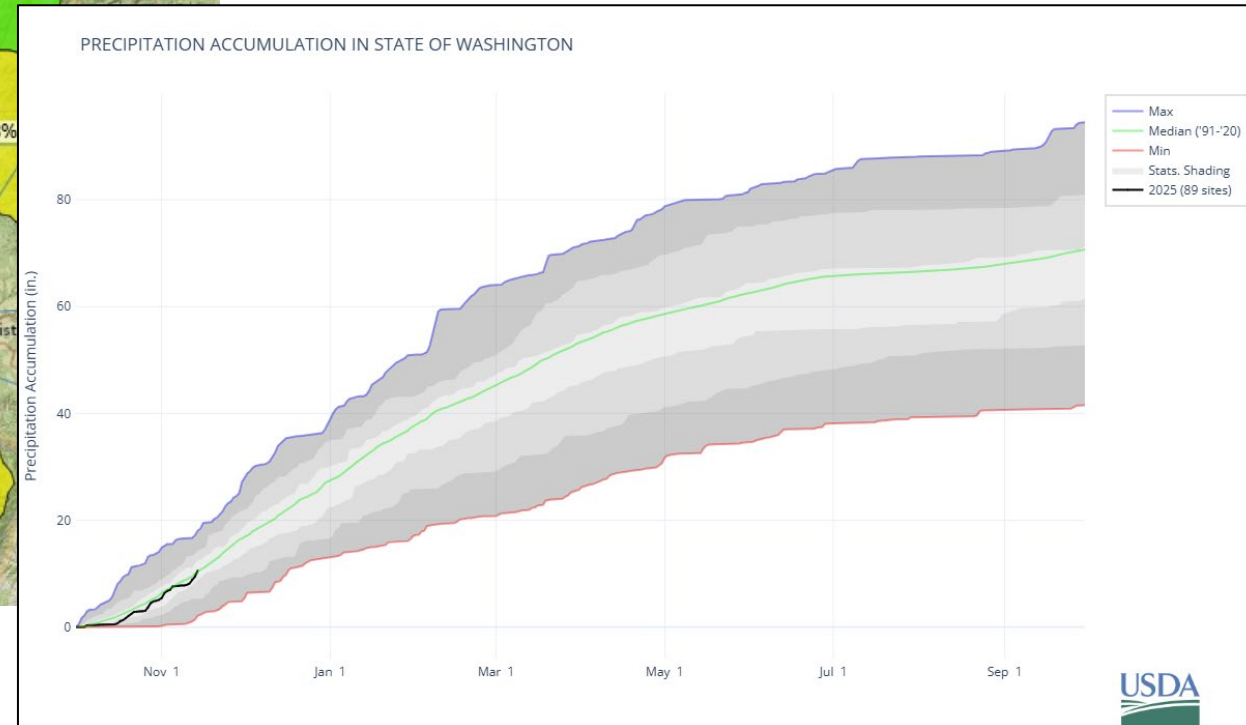
WYTD Precipitation – Basin Map



Statewide WYTD Precipitation:

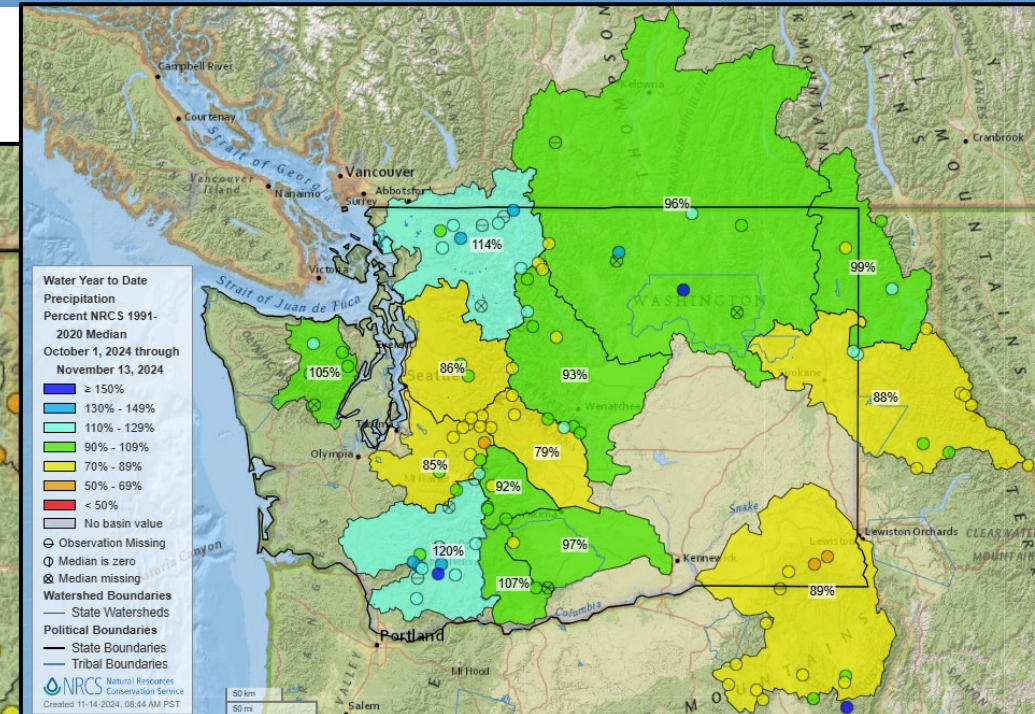
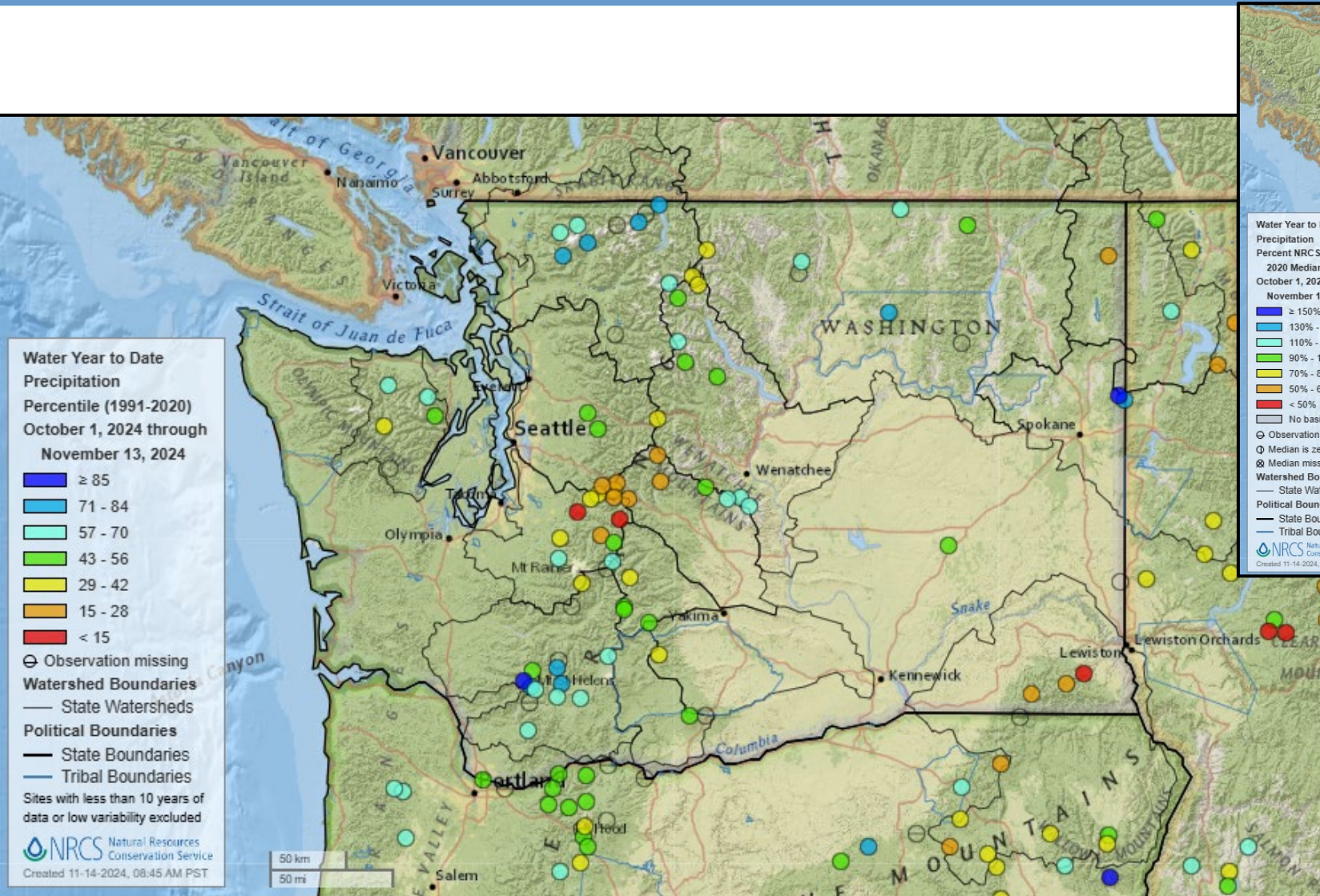
101% of normal

49 – percentile (normal period)

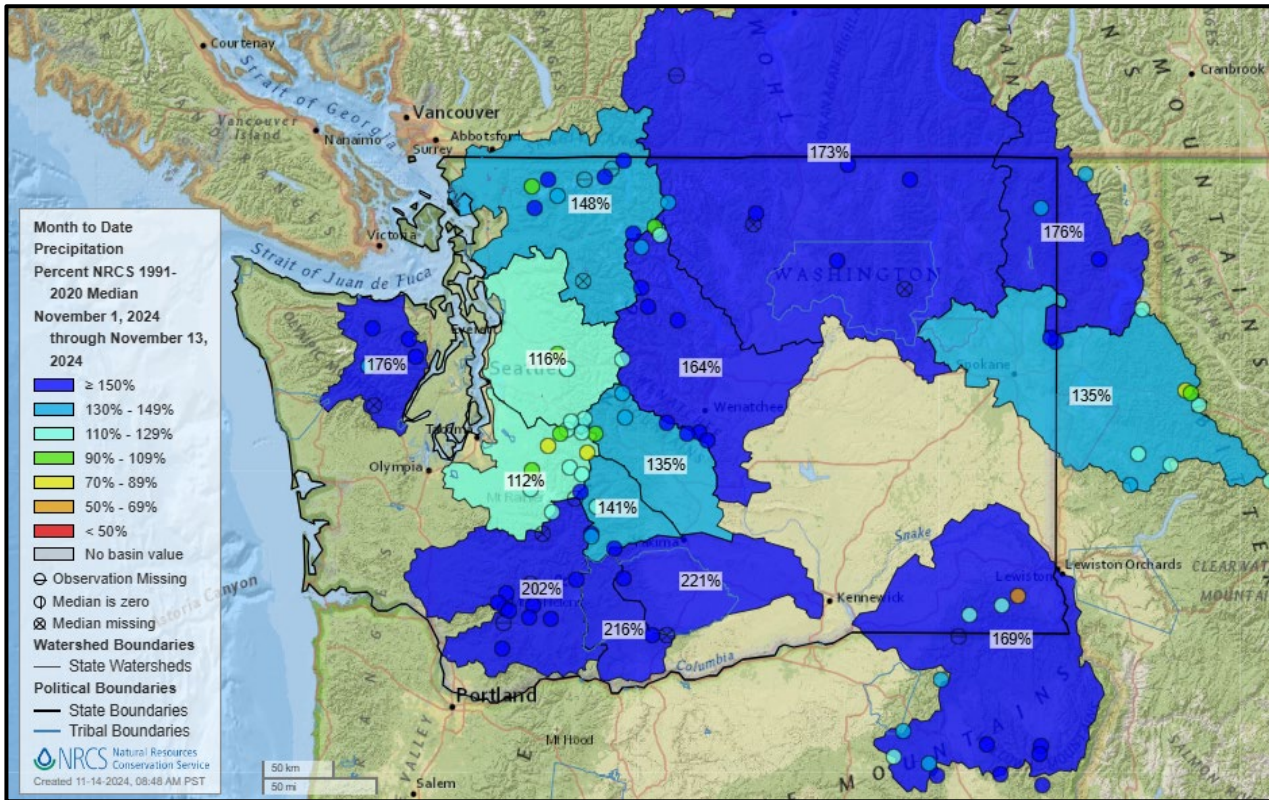


WYTD Precipitation – Site Map

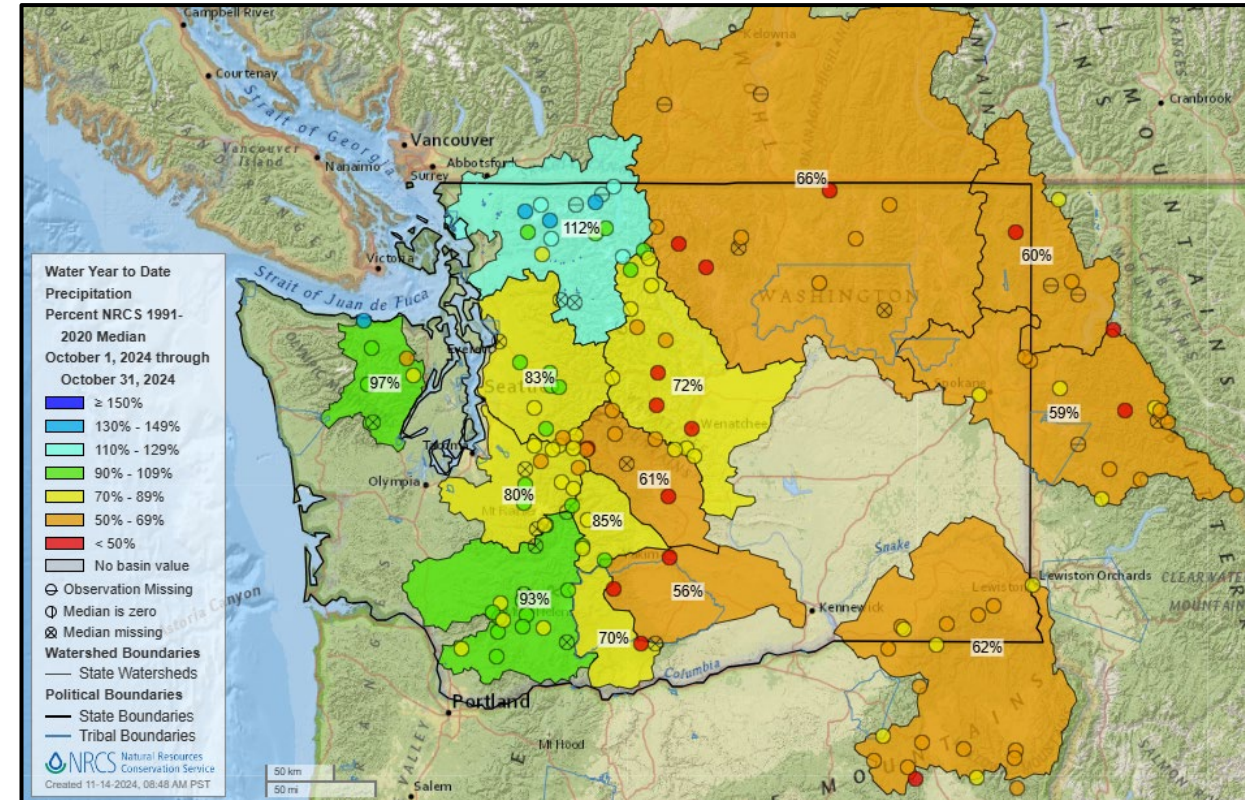
Percentile (normal)



Month-to-Date Precipitation



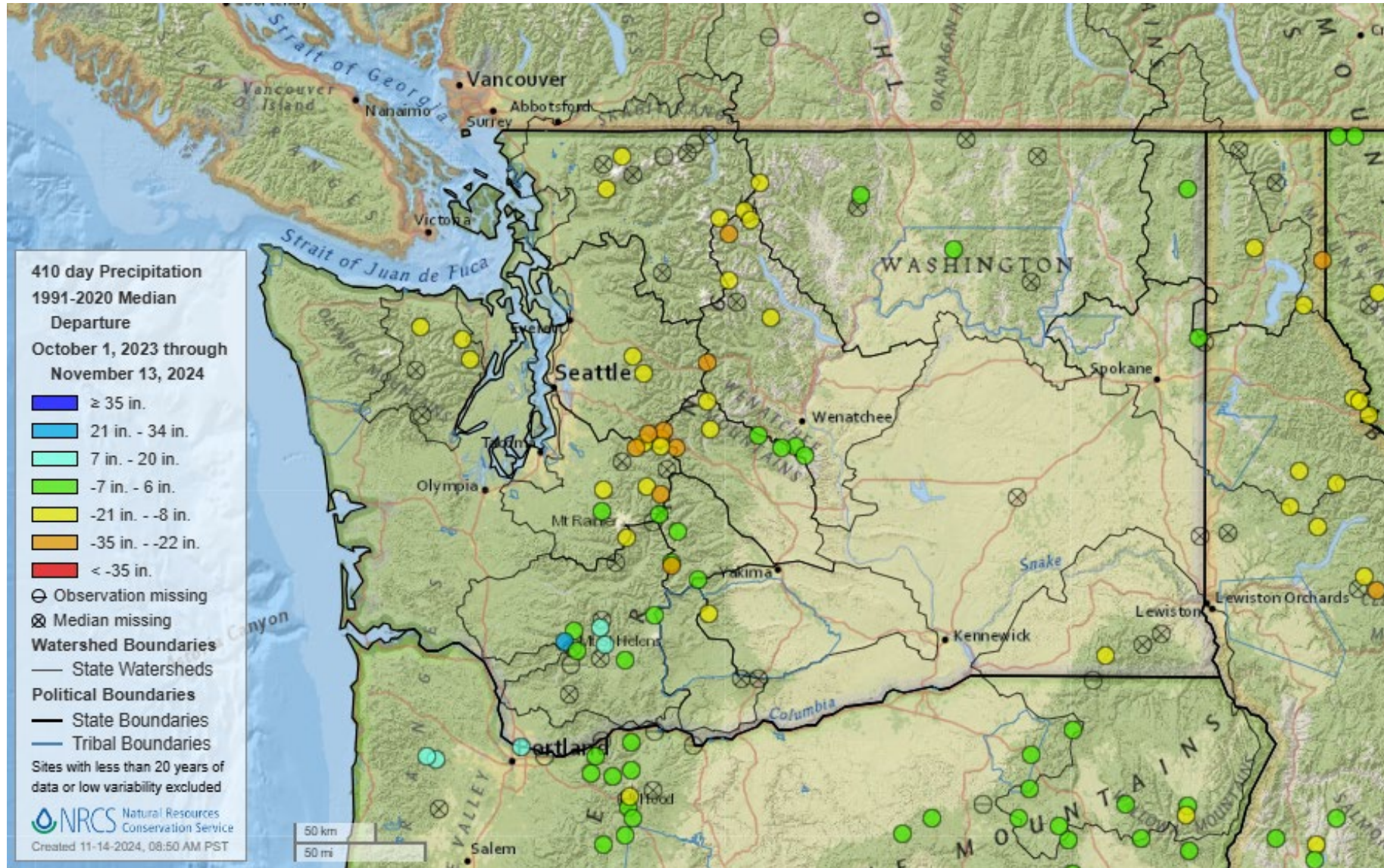
October



Month-to-date

Precipitation: Compounding Deficits

Oct. 1 2023 - present



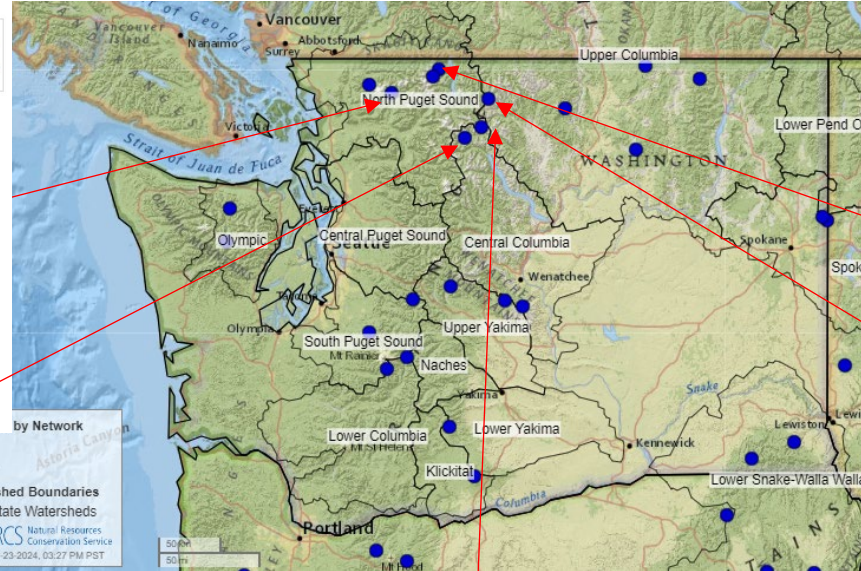
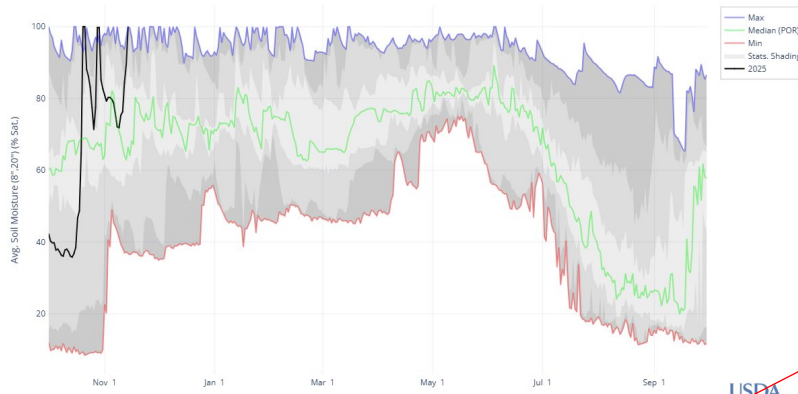


Soil Moisture

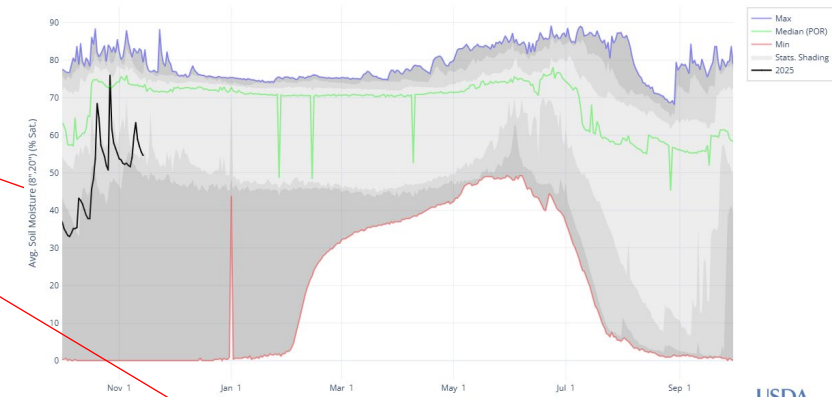
Soil Moisture

WY 2024 – Select Site Charts

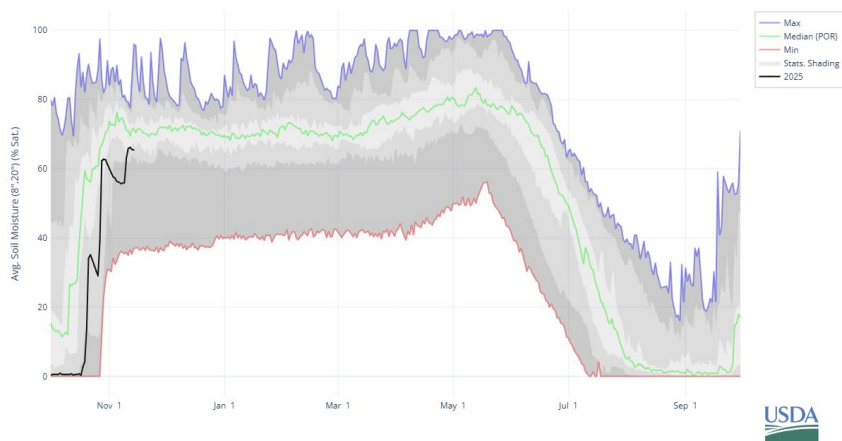
MARTEN RIDGE, WA (999) AVG. SOIL MOISTURE (8",20")



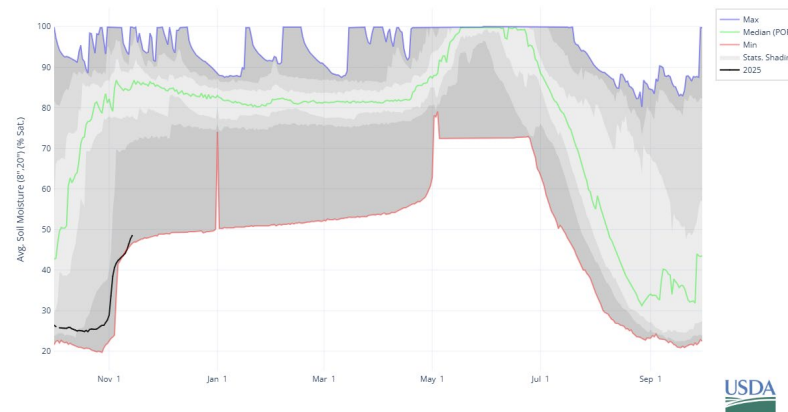
BROWN TOP, WA (1080) AVG. SOIL MOISTURE (8",20")



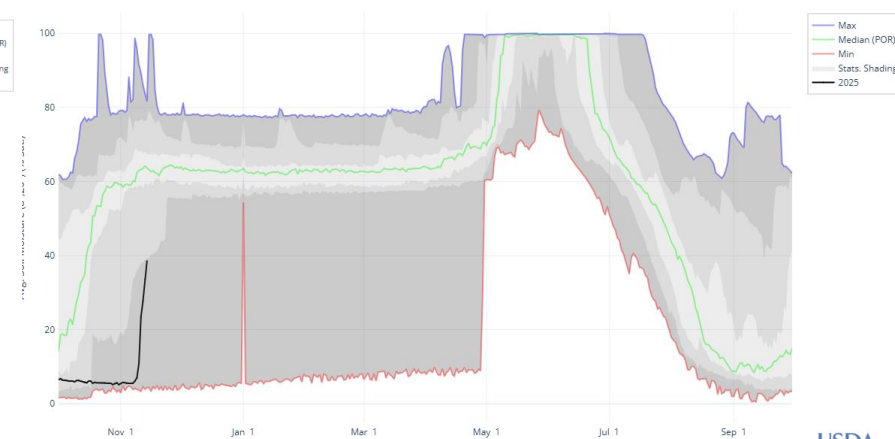
PARK CREEK RIDGE, WA (681) AVG. SOIL MOISTURE (8",20")



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



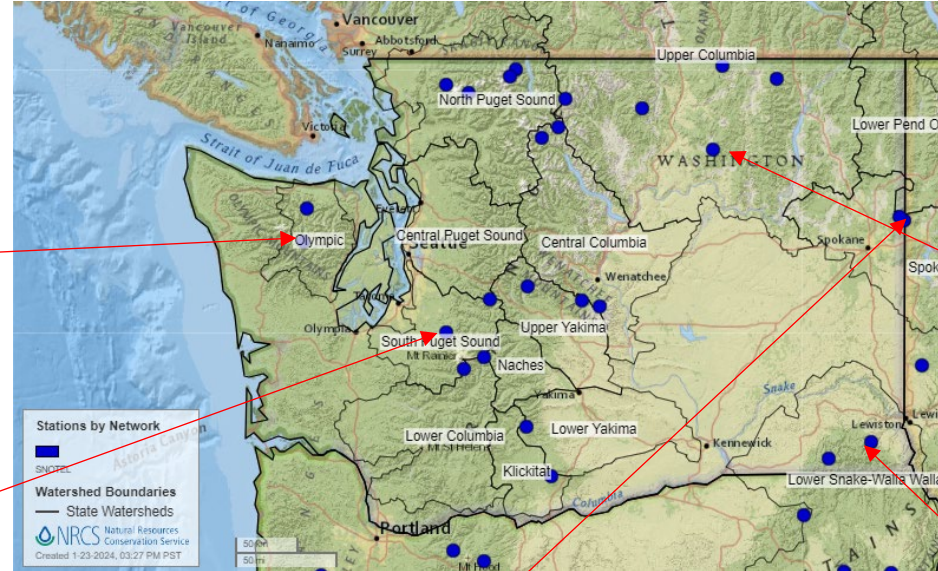
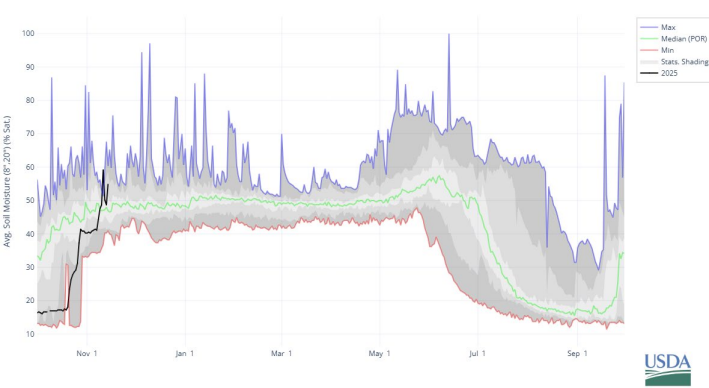
HARTS PASS, WA (515) AVG. SOIL MOISTURE (8",20")



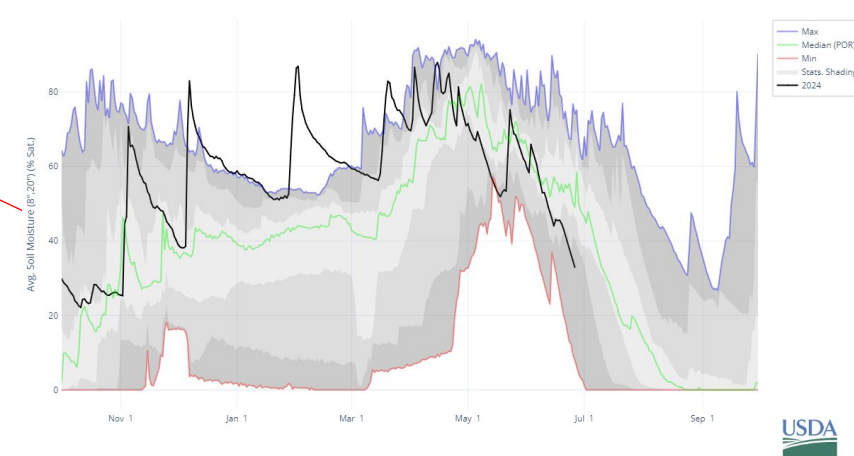
Soil Moisture

WY 2024 – Select Site Charts

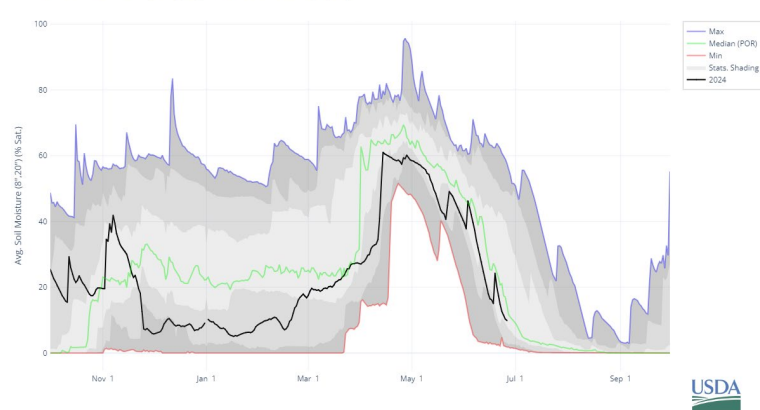
BUCKINGHORSE, WA (1107) AVG. SOIL MOISTURE (8",20")



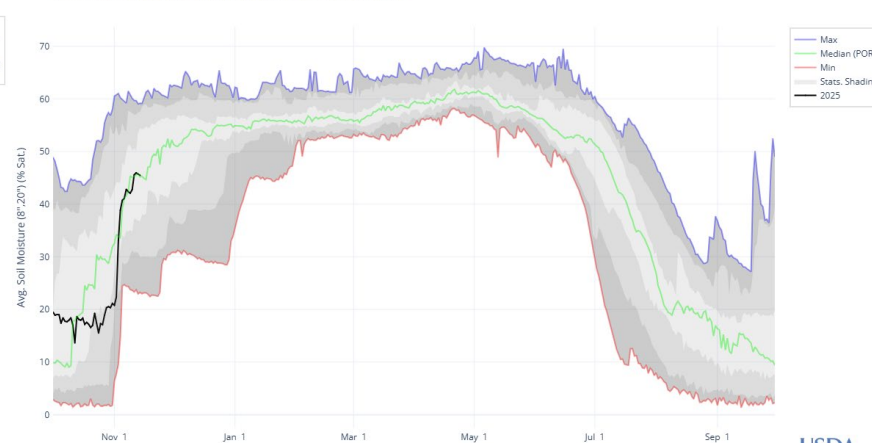
MOSES MTN, WA (644) AVG. SOIL MOISTURE (8",20")



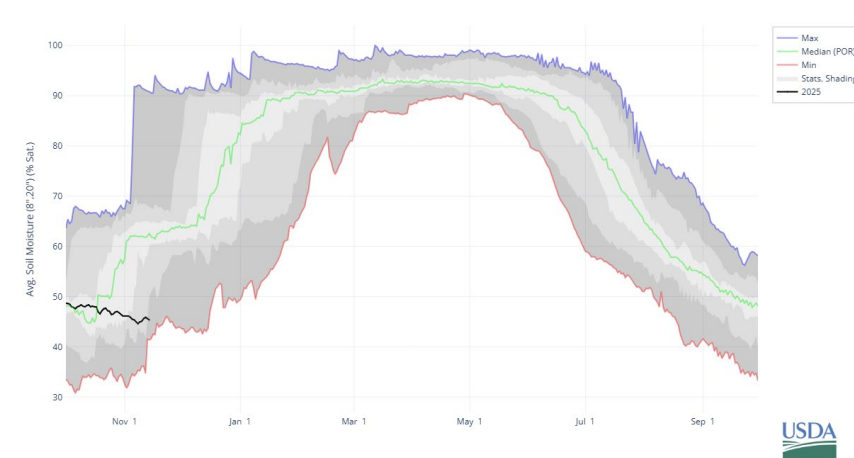
SALMON MEADOWS, WA (728) AVG. SOIL MOISTURE (8",20")



RAGGED MOUNTAIN, ID (1081) AVG. SOIL MOISTURE (8",20")



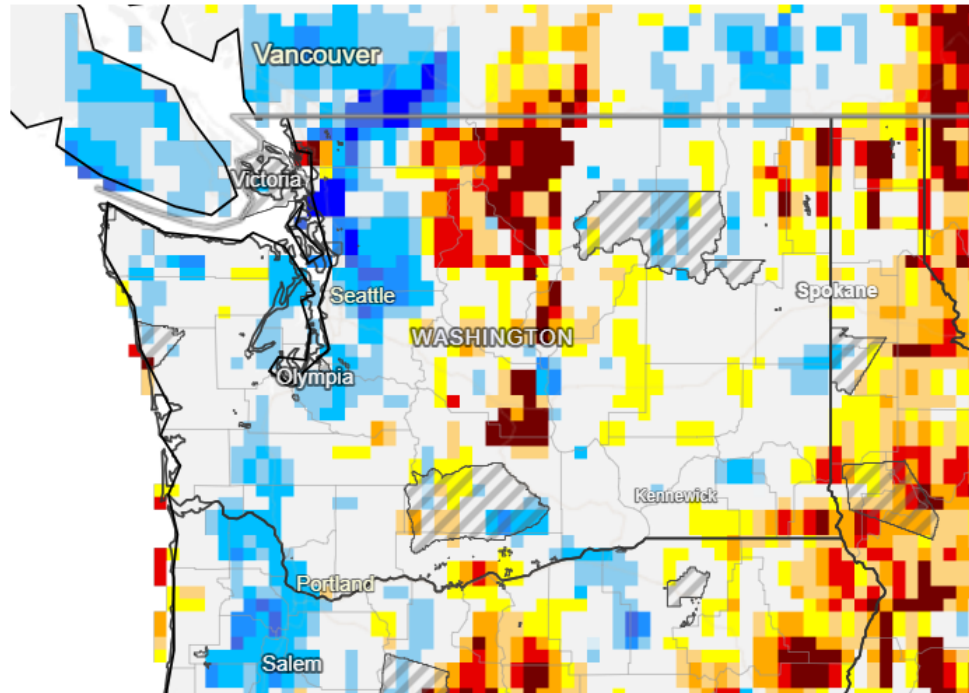
SOURDOUGH GULCH, WA (985) AVG. SOIL MOISTURE (8",20")



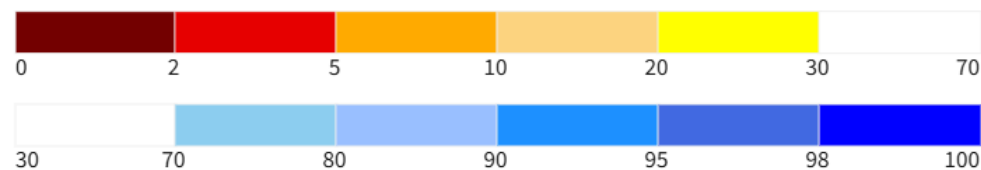
Soil Moisture

NASA GRACE and SPoRT-LiS

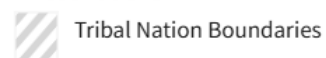
Root Zone



Root Zone Soil Moisture: Wetness Percentile



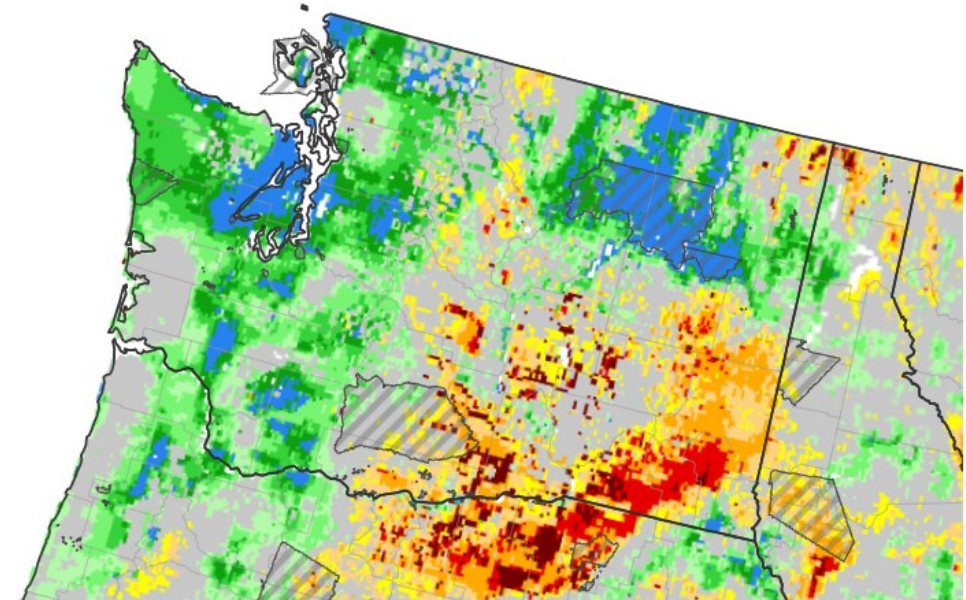
Tribal Nations



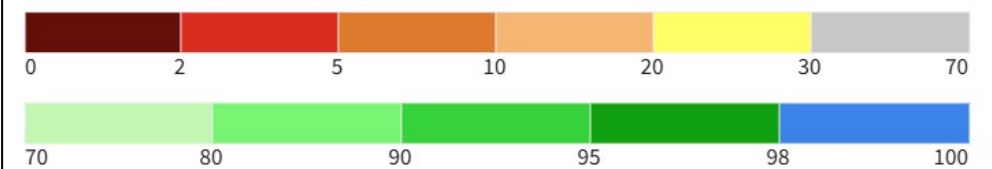
Last Updated: 11/09/24

Drought.gov

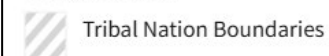
0-100 cm Soil Moisture Percentile



0-100 cm Soil Moisture Percentile



Tribal Nations



Source(s): NASA
Data Valid: 11/14/24

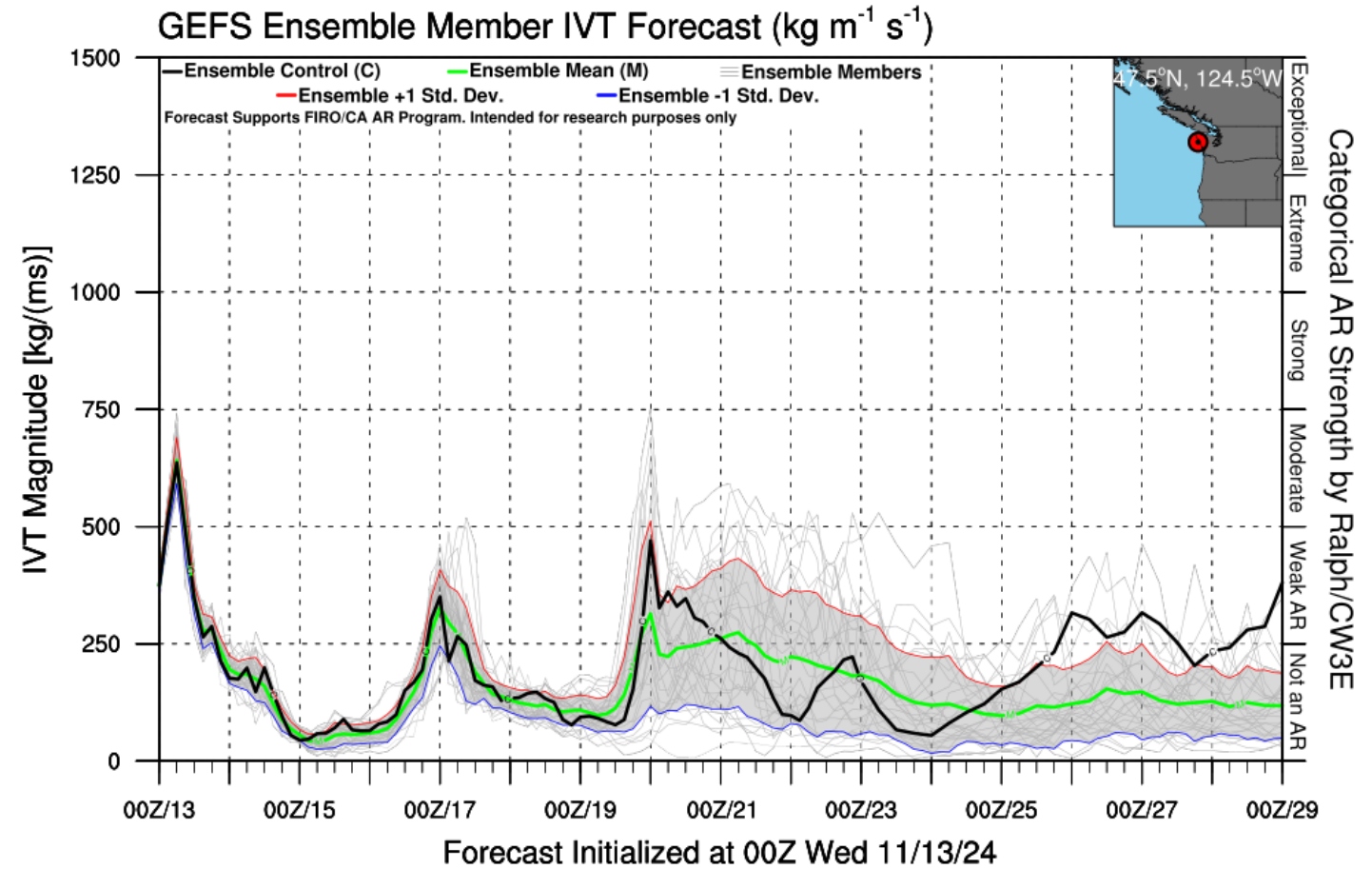
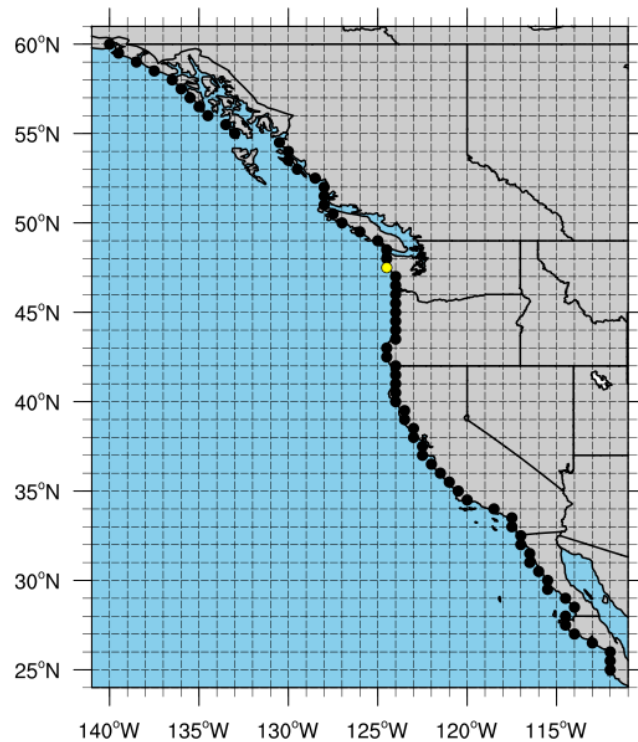
Drought.gov



Looking ahead

Atmospheric River Forecast

CW3E

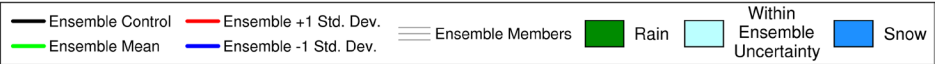
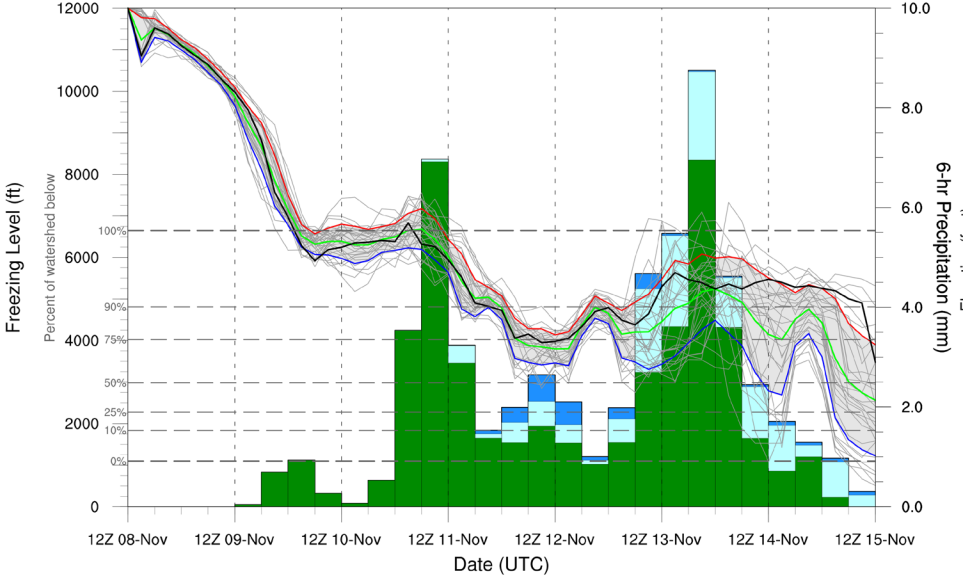


Atmospheric River Forecast

CW3E

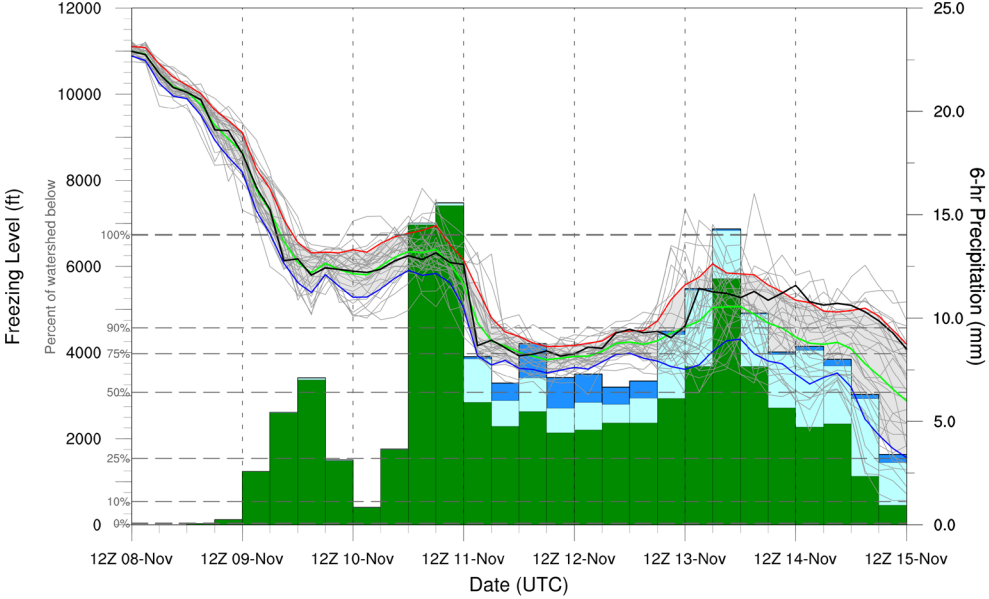
Upper Yakima; GEFS Forecast Initialized 2024-Nov-08 12 UTC

7-day WPC Precipitation Total: 57.79 mm (2.28 in); 75.6% Rain, 20.2% Uncertain, 4.1% Snow



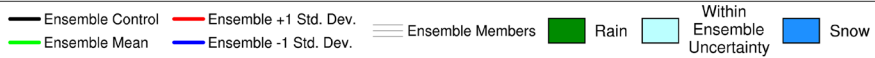
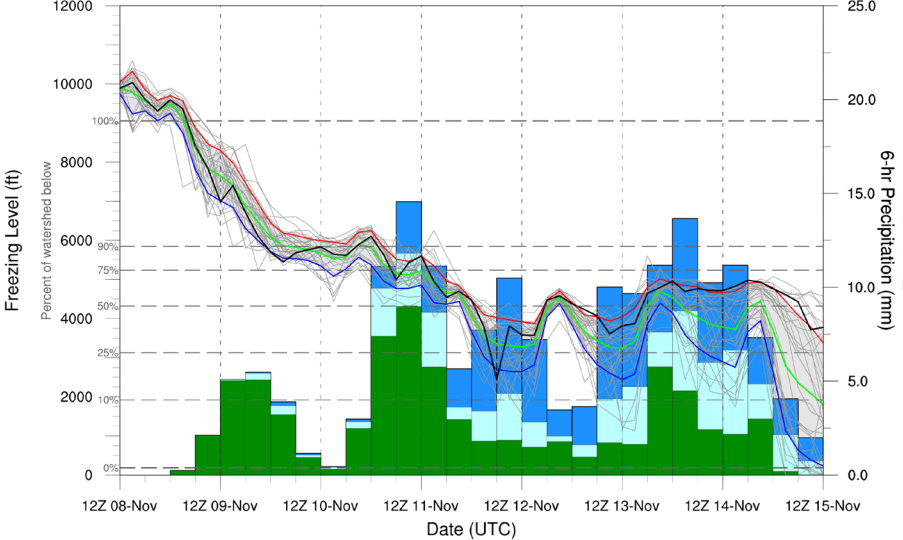
Skykomish; GEFS Forecast Initialized 2024-Nov-08 12 UTC

7-day WPC Precipitation Total: 185.07 mm (7.29 in); 75.6% Rain, 19.7% Uncertain, 4.7% Snow

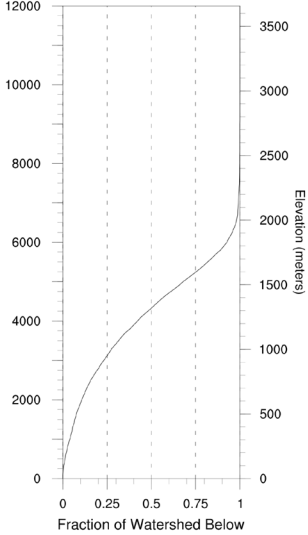


Upper Skagit; GEFS Forecast Initialized 2024-Nov-08 12 UTC

7-day WPC Precipitation Total: 175.64 mm (6.92 in); 42% Rain, 23.3% Uncertain, 34.7% Snow



Upper Skagit Hypsometry



Thank you!

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503-307-2829

[Washington Snow Survey and Water
Supply Program Website](#)

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